

Complete machine description

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| 1 | 1 | <p>Completely refurbished vertical CNC-machining centre model MILL 2000
 Year of construction: 2008, weight: 11.600 kg</p> | |
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Machine-No. 418-62

Scope of delivery:

Column moving machining centre with fix table
 Machine base with integrated chip output to the left
 Linear-guideways with long-term-grease lubrication

Drilling capacity in steel 60	ø 42 mm (with insert drill)
Tapping capacity	M 30
Milling capacity in steel 60	600 cm ³ /min.

NC swivel head package - 12.000 rpm

Motor spindle for swivel head, grease lubrication
 12,5 kW at 100 % ED
 34,0 kW at 10 % ED, watercooled
 20 - 12.000 rpm, 140 Nm
 acceleration and deceleration 0 - 12.000 rpm 0,9 sec. each
 tool clamping with disk springs, hydraulic knock out,
 tool shaft for HSK-A 63 DIN 69893
 tool magazine prepared
 for tool holders according to HSK-A 63 DIN 69893

NC swivel axis ± 100 °
 - 30 rpm, lowest increment 0,001°
 - repetition accuracy ± 10" with direct measuring system
 - driving torque 280 Nm
 - with hydraulic clamping system, max. torque through clamping 1400 Nm

Remark:

With normal conditions the machine does not have to be anchored to the floor.
 (For slippery floors we recommend anchoring.)

Travel:

X-axis	2000 mm
Y-axis	480 mm (or rather 610/820 at option Y 630/840 mm)
Z-axis	horizontal spindle 715 mm / vertical spindle 630 mm



Pos.	Qty.	Article Description	Price / €
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Automatic tool changer, protected against chips

165 toolplaces
with dynamical background magazine, space-saving shelf-design,
mounted at the back of the machine.
During the operation movement of the machine the tool hand-over
from the background is simultaneously to the tool magazine of the basic
machine. With tool operating times shorter than 15 s the chip-to-chip-time may
increase.

Max. tool dia.	75 mm
if all magazine pos. are occupied	
Max. tool dia.	160 mm
if adjacent places are free	
Toll length	max. 200 mm at 110 places max. 320 mm at 55 places
Max. tool weight	4,0 kg
Tool change time	approx. 1,5 s (depends on CNC)
Chip-to-chip-time	approx. 4,0 s (depends on CNC)

including drip pans below the toolplaces to collect dripping coolant.

including **Siemens Tool lifetime control with:**

- tool place organization
- sister tool organization
- work field organisation via 4-digit program-no. in the screen
(just at machine with more than one work field)

Load and unload station for tools

for the exchange of cutting tools at the background magazine during machining

Table version with 3 humps

for mounting of turning spindle "left" and NC-indexing device with vice right
and 1 hump in the middle for support

AC-servo motors for x-, y- and z-axes

digital direct drives with indirect absolute path measuring system
rapid traverse in all axes 60 m/min.

SIEMENS CNC-control 840D

(PCU 50 / NCU 572.5, 6 measurement cycles, 1 canal)
incl. 10,4" TFT colour screen
full keyboard OP010S
control panel logic Windows XP
NC-memory 256 KB
(max.200 programmes storage capacity)
for ISO 66025 programming
hard disk with approx. 2 GB for free disposal



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drilling cycles G81-G89
drilling and milling cycles
M- and T- functions
circular interpolation (360 degrees)
re-start into program
Subroutines, parameter programming
simultaneous programming
contour programming
support through cycles
polar coordinates
tool offsets for geometry, wear
tool radius correction for intersection computing
crossing radius
4 zero offsets G54-G57
30 zero shifts programmable with G-functions
3D and helical interpolation
screen switch off
mirror function
scaling function
insert of chamfer and radius
Universal interface RS 232C (2 x V24) at control panel
Ethernet connection RJ45 in control panel
orientated spindle stop
drip feed function through V24 interface
dimension metric or inch
software limit switch
NC-diagnosis
machine-diagnosis
absolute indirect path measurement systems
power meter in screen
rigid tapping
look ahead function and dynamic pilot control

CHIRON Powersafe

Software package for selective shutdown of installed consumers like axis motors, drives, spindles, seal air, airsensing and ancillary equipment in production breaks or during programmable points in time using a shift calendar. Definable point in time at which the machine starts demand-oriented automatically with a variable warmup program to recovery the production readiness.



CHIRON Maintenance Management in the screen

display of the pending maintenance:

- advance warning = "prepare maintenance"
- warning = "carry out maintenance"
- machine stop = "catch up on maintenance"

Abridged instructions for the pending maintenance with graphic illustration on CD-ROM.
Password protected confirmation of the performed maintenance through the maintenance staff.

Working hours and piece counter in the screen

Socket 230 V at control panel

Socket for portable mini-hand wheel without emergency stop button, at control panel

Cabinet cooler as a door mounting unit

Signal lamp on control panel for 3 signals

Signal "red" = failure
Signal "white" = machine loaded
Signal "green" = machine is running

Machine enclosure

bolted on, with loading door, electrically interlocked,
2.500 mm high above floor, incl. machine lamp

Thermodrive indirect path measuring system

Installation elements

5-axes-machining

for the machining of three-dimensional curved or tilted surfaces with 3 linear and 2 additional axes (TRAORI).

- 5-axes-transformation with tool orientation and tool center point management.

The machining task is programmed completely in Cartesian coordinates with Cartesian position and orientation.

The movements of all 5 axes resultant from that are computed internally with the 5-axes-transformation.

- 5-axes-tool-offset. The length of the tool is automatically



- computed and compensated in the movements of the axes.
- Oriented tool withdrawal. With the interruption of Machining (e. g. tool breakage), the tool can be withdrawn orientated and defined.

Production package with high pressure pump PF 50 / FKA 900 consisting of:

- **Chip conveyor (scratch band)**
instead of coolant equipment with chip container discharge height 1.050 mm, discharge to the left, tank capacity 150 l, lift pump with 300 l/min. at 1,3 bar,
- **Coolant equipment PF 50 / KFA 900**
(for cast iron slurry, Al with Si \geq 12%)
tank capacity 900 l,
pump capacity from 100 l/min at 2,1 bar
up to 250 l/min at 1,8 bar
high pressure pump capacity 20 l/min at 30 bar
high pressure circuit with filtration via paper bond filter PF50,
filtration 50 μ m nominal.
twin filter in the high pressure circuit for the protection of the machine.
incl. bed flushing system (with Y480 mm or 500 mm)
(This filtration method will not eliminate increasing cast iron slurry from the coolant equipment.)
- **Machine preparation**
for through tool coolant system including:
sealing system in the DIN 69893 HSK A63* collet
coolant distributor installed at the main spindle drive
coolant leakage sensor
implemented mud flap in the high pressure piping
and flow control switch
solenoid valve, controlled via machine program

* At HSK we recommend for tool holders the use of our patented coolant tube with sieve.
Advantage: Decrease of the clogging in the internal coolant channel.



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70 bar high pressure pump

flow rate 20 l/min at 30 bar - 11 l/min at 70 bar
with vario pressure control valve
for 8 programmable pressure stages
pre-defined pressure steps (20, 30, 40, 50, 55, 60, 65, 70 bar)
instead of standard high pressure pump

Wash gun for MILL 2000

Automatic central grease lubrication

2 Suction points

for customer specific installation
Ø 200 mm right and left at the top of the machine enclosure
and electrical preparation in cabinet

Loading door of total enclosure

opening and closing automatic
incl. thrust shaft switch

Technology package for turning from bar with flange inkl. ABS-receiver

Lathe spindle

water-cooled motor spindle, installed horizontal,
with hollow shaft as opening for bars up to ø 65 mm
14,1 kW at 100 %, 42,5 kW at 5 %
spindle speed range 15 - 4.500 rpm - 90 Nm
with direct measuring system
and hydraulic clamping 800 Nm
collet chuck with integrated hydraulic actuation
without clamping collet chuck
with adapter flange incl. ABS-receiver
(mechanical clamping, delivery from Komet)
Adapter plate to increase the center height for clamp-Ø 150 mm

NC-feeding unit as bar feeder

rapid traverse 60 m/min,
stroke max. 1.550 mm, depending on fixture
incl. interface NC axis, ready for plug-in

NC-turning unit with clamping vice

for the machining of the 6th side, installed on NC-feeding unit,
hub per chuck 16 mm max., clamp-Ø 150 mm
incl. interface NC axis,



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incl. hydraulic unit extension for clamping / unclamp clamping block
and rotary table clamping
incl. hydraulic connection
incl. pneumatic connection, uncontrolled, for air purge.
Technical description for NC-turning unit:
indexing accuracy $\pm 15''$, max. spindle rotation speed 45 rpm,
with hydraulic clamping, controlled via NC-program

Tailstock

Contact pressure controlled via current consumption
Standard pin with MK 3-receiver, changeable, center height adjusted.
Mounting bracket for measuring stand, screwed on back NC-indexing device
Model as tailstock.

Suction connection from behind

Stationary 3D Probe System

type TS 27 R, maker RENISHAW,
with adapter plate and air blow for the measuring stylus,
for tool breakage control (in one working area),
for automatic tool length measurement (at FZ),
for automatic temperature compensation,
including process-orientated measuring,
software for measuring cycles,
strategy program and tool holder with dowel pin $\varnothing 8$ mm.

Precondition for Fanuc:
- High speed skip and macro common variables

Measuring in JOG

for workpiece-measurement (e.g. determination of the zero point)
during tipping mode
(for Siemens 840 D)

Preondition: spindle probe

In C-Axis

angle measurement system RCN 226 (absolute measuring system)

Additional equipment for bar and extrusion machining system

Glass scales

overpressured
X, Y, Z = 2000 x 500 x 550 mm
at NC-swivel head Y, Z = 480 x 715 / 630 mm



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Safety glazing in the front doors

Extensions for the Sinumerik 840 D

Ethernet connection RJ45 at electrical cabinet
instead in control panel

Hydraulic unit

for continuous duty
pressure: 170 bar , flow rate: 11,3 l/min.
incl. valves for supply and pressure stage
for clamping of swivel head and automatic knock out of tool

External cooling: pump power: 20 ltr./min at 4 bar

SINDNC

Option to send and receive NC-programs in a network.
The client-software (e. g. UNIX, Novell, Windows NT)
and the wiring to the network is not included.

Precondition: PCU 50

Cutting tools

The cutting tools have to be balanced
according to DIN ISO 1940, class G 2,5,
in two levels, with max. operating speed

Machine colour

Two-components-structure varnish - 2 colours
light grey acc. to NCS S1502-B
basalt grey acc. to RAL 7012

Main circuit

total power supply 400 / 230V \pm 10 %, 50 cycles N/PE,
neutral conductor, load possible, pressure supply
6 bar, \pm 1 bar at all procedures,
room temperature max 40°

Information Export

We point out that the CNC-machining centres are subject
to controls. For the export from the European Union an export license
is necessary.



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Information Machine safety

The machine is designed and built in accordance with the European machine guideline, according placing the product on the first time onto the market.

Other safety features due to special company rules and specifications can be considered. The actual cost will be invoiced.

Information Coolant lubrication

The machine is designed for standard water soluble coolant and fully enclosed at the standard version. The machine must be equipped with fume extraction.

The machine contents different plastics, varnish, resin and glue, which are selected carefully for using coolant and cutting oil. The use of aggressive coolant and additive could cause major damages and machine stops. Contact in any case your coolant supplier before machine set-up and installation.

