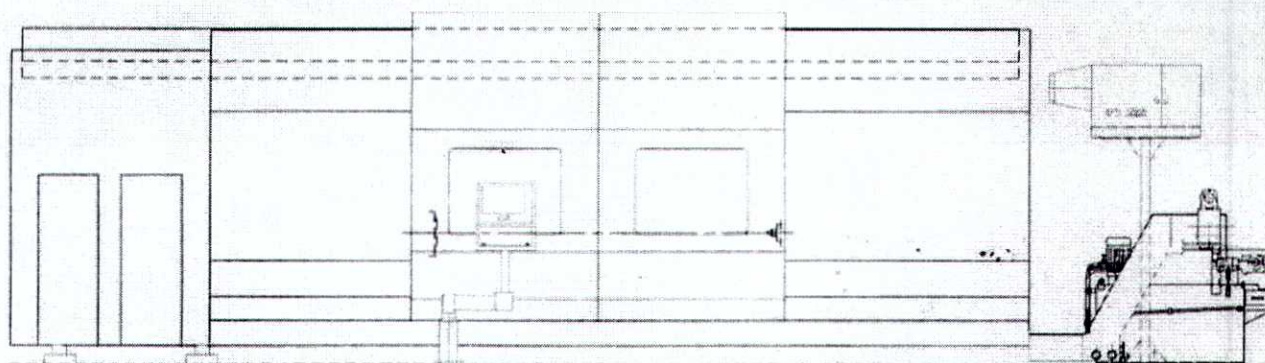


ORDER Nr.SM07-005

**CNC-MACHINING CENTRE
FOR TURNING AND MILLING**

NILES-SIMMONS N 50 MC x 6000 Si840 D



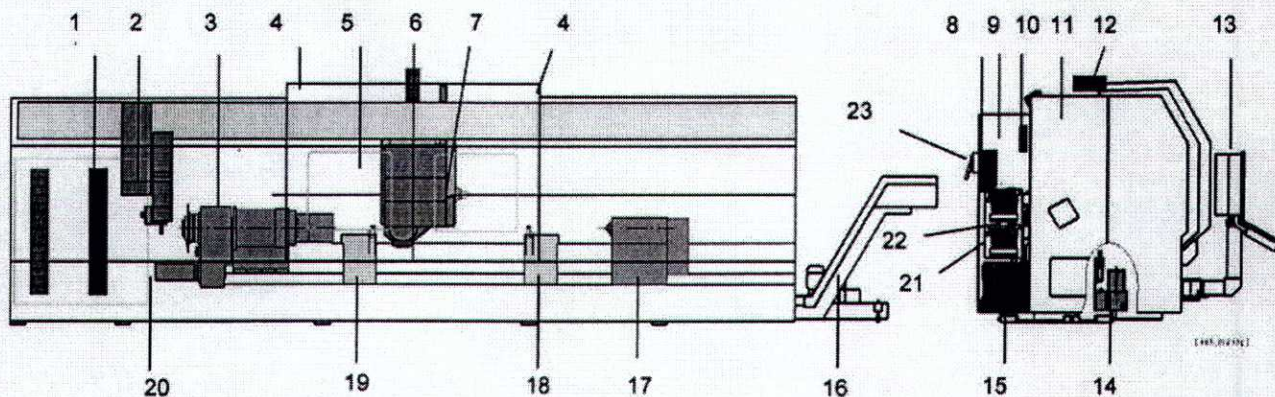
**Quality
Certified by DIN ISO 9001
and VDA 6.4**

NILES-SIMMONS Industrieanlagen GmbH
Zwickauer Straße 355, 09117 Chemnitz, Germany
Tel.: +49 371/ 802- 0 Fax: +49 371/ 852- 5 78
E-Mail: vertrieb@niles-simmons.de
Internet: <http://www.niles-simmons.de>

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1.1 Machine scheme



- 1 Tool magazine
- 2 Tool changer
- 3 Workpiece spindle with 2 step gearing
- 4 Front door
- 5 Working room
- 6 Feed drive X Axis
- 7 Milling unit (longitudinal- and cross slide)
- 8 Hydraulic valves
- 9 Switch cabinet
- 10 Pneumatic maintenance unit
- 12 Drive for front doors
- 13 Operator pendant, Control system Si 840 D
- 14 Lubrication unit for main spindle gearing
- 15 Hydraulic unit
- 16 Chip conveyor
- 17 Tailstock
- 18 Optional steady rest slide
- 19 Optional steady rest slide
- 20 Main spindle drive
- 21 Central lubrication unit
- 22 Lubrication unit for steady rest rolls and lever
- 23 Main switch

1.1 Description of basic machine

Slant bed

Cast iron, 30 degrees to the perpendicular towards the rear, Heavy bed execution with increased weight.

Guideways

Combined slide guideways consisting of linear compact roller guideways on top and hardened flat guideways in the middle and on the bottom of the machine bed. The guideways of X- and Y-axis are two linear compact roller guideways supported by damping surfaces, arranged close to the guideways.

Workpiece spindle

The workpiece spindle with spindle head according to DIN 55026 is mounted to the lower and the middle guideways on the left side of the machine bed and supported by life-time lubricated spindle bearings.

Main drive

AC-spindle motor, programmable speed over the whole range. with secondary transmission. C-axis is integrated in the turning spindle with independent measuring system.

Longitudinal slide/Cross slide/Feed drives

The longitudinal slide (Z-axis), travels on the middle and upper guideways. The guideways of cross slide (X-axis) to accept the turn-milling head are mounted to the longitudinal slide.

Milling-Turning-Boring unit

Mounted to the cross slide. With integrated Y-axis and B-axis. Main spindle for modular tooling systems.

The main spindle is driven in closed loop when live toolings are used and backlashfree clamped when turning tools are used.

Internal and external coolant supply

Integrated tool magazine/tool changer

- Chain-type magazine arranged on the spindle side (LH-side of machine)
- Loading and unloading of the magazine for exchange of worn tools from the front side of the machine
- Automatic tool change between magazine and working spindle via double-gripper arm

Tool change

- Easy programming by subroutine
- Variable tool change position in Z-axis
- Automatic data transfer for active tool
- Loading and unloading of complete tool lists or of single tools via manual loading position
- Tool management, life time control
- Counting of cutting time
- Workpiece counter
- Sister tool management
- Software package

Tailstock

Housing of the tailstock is cast iron made
Positioning by the bed slide, and moveable along hardened linear flat guideways, hydraulically clamped on the guideways,
Quill is hydraulically operated.

Chip conveyor

Hinge band conveyor, alongside of turning axis

Switch cabinet

Norm cabinet with duct wiring, degree of protection is IP 54
Incl. lighting and service sockets
Heat-dissipation via heat exchanger connected to the machine's cooling unit

Maintenance

A service platform between main panel and rear side of the machine together with service doors for maintenance on main spindles, chucking cylinders and servo drives allow easy maintenance access. The chip conveyor can be exchanged towards the front side of the machine. The workpiece spindle drive, quill, axis drive systems are maintenance free.

Safety features

- Machine with all-around enclosure and working area completely closed
- automatic working area door, safety glass windows
- Electromechanical safety locking of sliding door
- Travel range supervised by means of software limit switches
- Feed axes with overload clutches
- Clamping cylinder pressure- and stroke-dependent control
- All access doors electrically supervised
- incl. Sinumerik - Safety Integrated Step 2

Machine painting

Two-pot textured varnish, silk luster

Machine housing/inner side

light-gray

RAL 7035

Sliding door

gray-blue

RAL Design 260 40 35

Base, chip conveyor

traffic grey

RAL 7042

Sound level

Measuring-surface sound-pressure level LA max. 80 dBA

Measurement according to DIN 45635 (Part 1601)

Standard accessories

1 set of spanners incl. levelling gage

Hoisting bracket

1 set of levelling elements

1 set of manuals in paper and on CD

CNC control system

Technical data of control system SINUMERIK Si 840 D

Modular microprocessor CNC continuous-path control for turning and milling operations with integrated PLC S7-300, digital complete solution with SIMODRIVE 611-D NCU: 573.5 MMC: PCU 50, with 1.2Ghz, 512 MByte RAM,

Windows XP Pro EmbSys

- 19" flat panel with OP12 and 12.1" TFT-colour display
- display text-English, 2nd language switchable: German
- HMI-Advanced incl. technological routines for Drilling, Milling and Turning
- current rating display for main-/tool- drive (selectable)
- tool offsets for tool wear
- diagnostic systems, PLC-status, service protocol
- programming language acc. to DIN 66025 with extended code functions
- absolute and incremental dimension input
- diameter and radius programming
- block search run with/without calculation and REPOS (repositioning to contour)
- oriented spindle stop
- Axis, contour, position, shutdown supervision
- Backlash compensation for each axis, encoder system and lead screw error compensation
- RS 232 C (V 24) - universal interface, setting via clear-text mask
- cylinder interpolation
- coordinate transformation TRANSMIT

1.2 Technical parameter

Working range

Nominal Turning Length (between spindle nose and tailstock)	6000 mm
Swing-Ø - over Cross slide	1250 mm
- over Bed	1300 mm
Working height	1700 mm

Workpiece spindle

Spindle head acc. to DIN 55026	B 20
Spindle bore diameter	225 mm
Spindle diameter in front bearing	360 mm

Workpiece spindles drive

With two step gearing programmable speed over the whole range

- Rated power 100/60 % ED	78 / 87 KW
- Speed range, total	10 - 1244 1/min
- Speed ranges	2
- Speed range I	10 - 359 1/min
- Speed range II	10 - 1244 1/min
- Max. torque I, at 100 % ED	9880 Nm (up to 66 1/min)
- Max. torque II, at 100 % ED	2845 Nm (up to 236 1/min)

C-Axis

- Holding torque	5000 Nm
- Speed range	0-50 1/min
- Torque, max.(100% ED)	5000 Nm
- Resolution of encoder system ,degree	0,001
- Pa =0,006° (0,004°)*; P _{smax}	=0,005° (0,004°)*
U _{max} = 0,005°(0,003°)* P	=0,013° (0,009°)*

Longitudinal slide/Cross slide/Feed drives

Encoder system	cross X-axis	linear, absolut
	longitudinal Z-axis	up to NI linear, absolut
		NL 4500 distance encoded
Slide travels	cross X-axis	+1050...-20mm
	longitudinal Z-axis	8,070 mm
Rapid feed	cross X-axis	12 m/min
	longitudinal Z-axis	24 m/min
Feed range	cross X-axis	0,1 - 12.000 mm/min
	longitudinal Z-axis	0,1 - 24.000 mm/min
Feed force	cross X-axis	25 kN
	longitudinal Z-axis	30 kN

Universal Turning, Boring, Milling- tool carrier

Tool spindle

Spindle diameter in front bearing 110 mm

Modular interface for tool system HSK 100A

Main cutting force when spindle is clamped 25 kN

Main cutting force with live tooling 8 kN

Main spindle drive

Rated power 100% / 40% ED 38/48,3 kW

Speed range 0 .. 3.500 min⁻¹

Torque, max. at 100 %/60 % use 533/678 (up to 647 1/min)Nm

Y-axis

Measuring system linear, absolut

Travels -400 + 395 mm

Rapid feed 12 m/min

Feed range 0,5-12.000 mm/min

Feed force 20 kN

B-axis

Swivelling range , based on vertical 0-position -105 +95 deg

Rapid feed 180 °/s

Resolution 0,001 °

Holding torque, clamped on B-axis 8.000 Nm

Holding torque, clamped on B-axis as NC-axis 1.000 Nm

Holding torque, clamped on tool spindle 1.350 Nm

Clamping force HSK 100A 75 kN

Tool magazine

Number of positions 48

Max. tool diameter

all pos. used/ every 2nd position used 125/200 mm

Max. tool weight 25 kg

Max. tool length 600 mm

Ma. torque at gripper 35 Nm

Tailstock

Quill diameter 240 mm

Quill stroke 300

Quill centre, Morse taper , ME 80

Clamping force, manual setting 10 - 60 kN

Coolant attachment without oilskimmer

Coolant quantity 1000 l

Delivery rate, max. 40 l/min

Pressure 11 bar

Filtration (paperband) 40 µm

Chip conveyor

Band width	1050 mm
Discharge height	1.140 mm
Discharge direction	RH side

Electrical equipment

Equipment according to	VDE 0100/0113 and EN 60204 Part 1
Operating voltage / Mains frequency	380 Volt ($\pm 10\%$) / 50 cps ($\pm 2\%$)
Net	TN-C 3/PE

Electrical connection data depend on the customized specification of the machine and are available on request.

Ambient conditions

Environment free from aggressive matters and dust	
Ambient temperature / Storage and transport	-25 to +55 °C
Ambient temperature / Operation	+5 to +40 °C
Average temperature within 24 hrs	< +35 °C
Relative humidity at 40°/20° C, not condensing	max. 50/90 %

Machine dimensions / Weight

Nominal Turning Length	6.000 mm
Length with chip conveyor	17550 mm
Width (incl. service platform) x height	3.700 x 3.850 mm
Weight with chip conveyor, options excluded	approx. 65.000 kg

CNC control system

Input resolution	0,001 mm
NC user memory RAM	0,512-2,5 Mbyte
Central user memory on hard disk	
Feed override	0 to 120 %
Speed override	50 to 120 %
Feed per revolution	0.001 to 2000 mm/rev.
incremental feed, steps	0,001/ 0,01/ 0,1/ 1/ 10 mm

Price basic machine

Type N50 MC x 6000

Including

- CNC – Control Sinumerik Si 840D
- Universal Turning Boring – Tool carrier
- C – Axis including brake
- Tool magazine 48 positions
- Chip conveyor and coolant attachment
- Tail stock, ME80, manual setting

Nominal Turning Length: 6000

3 Work piece dependent accessories

3.1 3-Jaw-Power chuck : SMW for main spindle

- Type: KNCS N 630-165 with jaw quick change system
- incl. basic jaws and stepped hardened top jaws
- incl. rear activator

3.2 Clamping with two pressures

- 2 manual adjustable pressures

3.3 2 steady rest slide (NC-positioned)

- independent NC-axis with
- clamping nut and encoder system
- for accepting one steady each with supplementary hydraulic and add-on parts

Note: requires "NC-Positioning of Steady Slide" option

3.4 NC-motor for steady slide, tailstock

- Nominal length
- AC-servo motor and ball screw
- Traverse speed max.

6.000 mm

12 m/min

3.5 NC-positioning of steady slide, tailstock, counter spindle

- Nominal length
- AC-servo motor and ball screw
- Traverse speed max.

6.000 mm

12 m/min

3.6 2 Crankshaft steadies for centralized lubrication

- including assembly at steady - slide
- clamping range appr.: 100 – 450 mm
- opening diameter: max 680mm
- internal cooling

3.7 Central lubrication unit

- incl. control
- for steady rest or chuck

4 CNC control options

4.1 Tool management, Tool life observation

- Calculation of cutting time/ tool life
- Work piece counter
- Sister tooling
- *Software solution incl. FB of Si840D*

5 Tooling

- **Specific tooling needed to perform the run off of the machine at NILES SIMMONS with the part type 1) will be chosen by NILES SIMMONS.**
- **The tooling will be offered to _____ in an additional quotation after the specification of the tools until August 31st.**
- **Tooling costs are not included in the grand total price on page 18 of this draft version.**

8 Machine options

8.1 Exhauster connection for the working area

- Diameter of mist collection connection

300 mm

8.2 Filter for coolant mist (static system)

adapted to the machine housing

- Messrs.:
- Type:
- Exhaust air:

ILT
UNIFIL 60
3.600 m³/h

8.3 Extension of coolant attachment with high pressure pump

- pressure, max.
- delivery rate
- normal pressure, switchable
- delivery rate
- tank
- filtration (paperband)
- instead of standard version, without oilskimmer

80 bar
18 l/min
11 bar
40 l/min
1000 l
40µm

8.6 1 set of rotating window for working area door

1

Swivelling Tool Carrier / Tool Magazine

8.7 Extension tool magazine

Extension of basic magazine

48 to 96 tools, tool length 600mm

8.8 Tool identify system

Tool identify system with write-read-chip system

Instead of basic version with only-read-system

9 Automation

9.1 Operator call light

- Flash light lamp on the electrical cabinet with stages "Program running", "Operator call", "Error"

9.4 Tool Monitoring (Messrs. Artis)

- Monitoring of breakage and wear, Type CTM
- for tool in tool spindle
- System is installed ready for use
- Set up (by teaching) for a customer's work piece is not included

9.5 Work piece measuring in the work area

- Measuring of work piece diameters and lengths in working area with switching measuring probe in tool carrier and reference dimension,
- incl. control option "close to process measuring" and measuring cycles

9.6 Cleaning of fixtures

Device for cleaning of chuck and centres etc

10. Machine acceptance

EUR

10.1 Machine pre - acceptance without work piece at Niles Simmons

- Functionality test
- Reliability test
- Geometrical test in accordance to DIN 8606,
- Machine tool accuracy, test acc. to DIN/ ISO 230-1 / 2
- Machining of test work pieces in acc. to VDI/DGQ 2851 sheet 2
- Positioning accuracy Laser measuring acc. to VDI/DGQ 3441

10.2 Machine acceptance with customer work piece at NILES-SIMMONS (RUN OFF)

The co-operation of the customer for sufficient provision of work pieces for testing is absolute necessary.

- machining of one workpiece to customers specification at NILES SIMMONS.
- 3 parts provided by the buyer, shipment included
- machining of one workpiece to customers specification at Samyoung Machinery

11 Training / SERVICES

Training in Chemnitz
In English language at NILES SIMMONS
Premises in GERMANY

Number of Trainees: 4

Duration: 10 working days

- **Maintenance training**
- **Programming training**
- **Operator's Training**
- **Training Artis**

Expenses for air fare, lodgings and meals will be covered by Niles Simmons

Pre qualification

Professional knowledge of trainees in the fields of mechanical engineering/servicing and/or technology/programming is supposed.

Total for TRAINING IN CHEMNITZ

11.8 Packing

- **Seaworthy packing**

11.9 Transport to German Seaport of Hamburg (FOB)

11.10 Erection, Commissioning

Machine will be installed by an NSI technician.

Customer has to unload, unpack and move the machine to the foundation place.

- **fine levelling**
- **functional check**
- **machining of an test piece**
- **test run, max. 3 hours**

Delay and attendance time at the commission which are not in responsibility of NILES-SIMMONS, will be invoiced to the customer

11.11 Production support

5 days, 1 Service man

11.12 Extended Warranty

24 months warranty instead of 12 Month,
but not longer than 27 month's from the day of delivery.

CE conformity

We confirm for a.m. product by means of the EU-conformity and CE-identification the corresponding of engineering and design of the machine according to the EU-directive 89/392/EEG for healthy and security protection.

All activities beyond standard commissioning as described above or caused by delays at customers site ("as occurs") not in the responsibility of NILES-SIMMONS will be charged separately.

12 Customer's requested options

12.1. Set of Wear and Spare Parts

Detailed part list will be provided after finalizing the machine specification. (In agreement with Niles Simmons Design department)

12.2 Additional Training at Customer site

Duration: 9 working days

Remarks:

1. Niles Simmons shall provide the drawings that were designed for tooling per part by a tool supplier
2. All the special tooling provided by _____ for the run off at Niles Simmons will be returned together with the ordered machine.
3. _____ will send the POS(Purchase Order Specification) to Niles Simmons later on.

EXPENSES:

- 3.1 All expenses occurring by the realization in the above mentioned item 1. are included in the Grand Total amount.
- 3.2 All the expenses occurring by return of the special tooling to _____ are included in the Grand Total amount. Worn out cutting tips are on the account of :

Terms of delivery

Basic terms as per the "General Conditions for the supply of Plant and Machinery for export LW 188" if not otherwise agreed.

- Date of delivery:** 18 month EXWorks after contract becomes effective after having been signed by both sides
- Price basis:** - net
- Basis of delivery:** - FOB Hamburg Seaport acc. to Incoterms 2000, with Seaworthy packing
- Warranty:** - 24 months after commissioning, but not longer than
- 27 months after the date of delivery
- Payment terms:** 20 % advanced payment with order against advanced payment guarantee
80% against irrevocable documentary letter of credit,
70% against shipping documents
10% after signing the final acceptance protocol

General Conditions:

Any and all claims of the Buyer exceeding the remedying of material defects, in particular claims in respect of damage to property other than the subject matter of supply, loss of profit and other consequential damages shall be expressly excluded.

- Liquidated damages:** In case the delivery is delayed due to reasons in the responsibility of the manufacturer liquidated damages after a grace period of 2 weeks
0,5% per completed week, but not exceeding 5.0% become due.