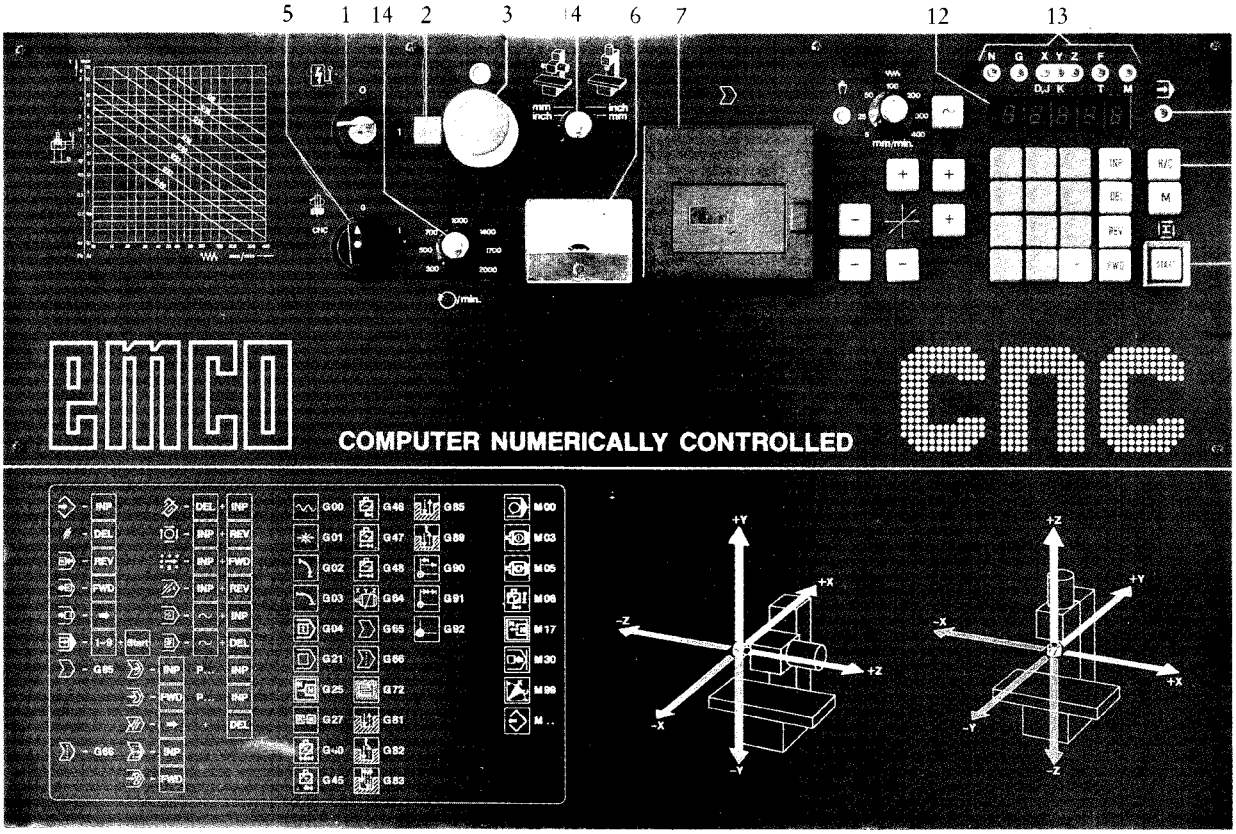
Operating Elements
Control Elements
CNC-Operation

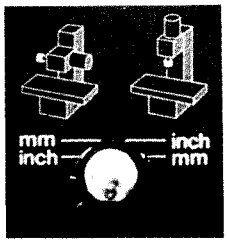


1. Main switch with removable key. Memory is being cleared when switching off.

2. Control lamp shows the power supply of machine and control unit.

3. Emergency stop button with interlock. Unlocking of button: turn button to the left. To switch on machine, turn main switch to zero and to 1 again. When switching off also memory will be cleared.

4. Optional switch for axis system and for metric or inch mode of operation.



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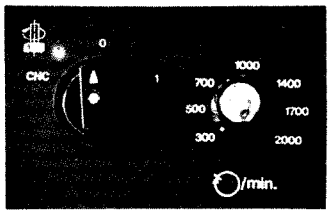
5. Switch for main spindle



Position 1 (main spindle ON, without M03)

Position CNC: main spindle is switched on by programming M03 and switched off by M05, M06 (with F≠0) and M30.

6. Ammeter

7. Magnetic tape

8. [H/C] switch key
Manual/CNC operation

9. Control lamp CNC operation

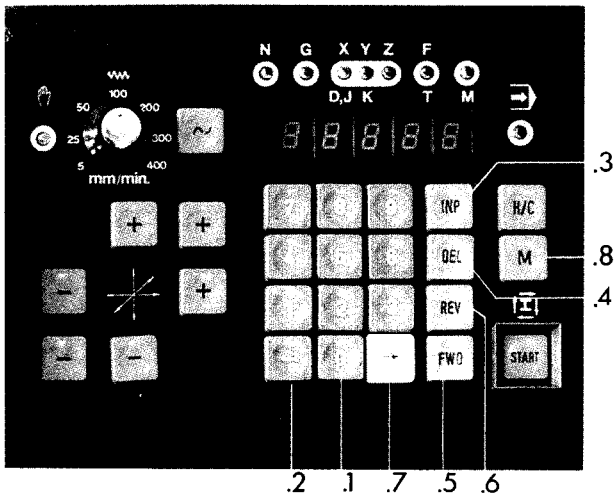
10. [START] key
The program is being worked off

12. VDU (display):
Indicates values for address letters and modes of operation

13. Control lamp address letters

14. Control of milling spindle speed

11. Keys for program input, correction, storing of program on tape, V24 operation etc. (see detailed explanations)



11.1. Number keys [0] - [9]

11.2. [-] The minus sign key
To enter minus values the minus sign [-] has to be pressed after input of numbers.

11.3. [INP] key (INPUT = storing)
Storing key

11.4. [DEL] key (DELETE = erase)
Erasing key

11.5. [FWD] key (FORWARD)
Program jumps forward block by block

11.6. [REV] key (REVERSE)
Program jumps backwards block by block

11.7. [→] Arrow key
Display jumps word by word

11.8. [M] key: key for entering of miscellaneous functions.

Survey

Preparatory Functions, G-Codes (metric)

Note: Formats inch: all X,Y,Z values have 4 digits
(No differences in horizontal and vertical
Axis system)

G 00 Rapid traverse

V: N3/G00/X±5/Y±4/Z±5

H: N3/G00/X±4/Y±5/Z±5

G 01 Linear interpolation

V: N3/G01/X±5/Y±4/Z±5/F3

H: N3/G01/X±4/Y±5/Z±5/F3

G 02 Circular interpolation clockwise

G 03 Circular interpolation counterclockwise

Quadrants:

V: N3/$\begin{matrix}G02\\G03\end{matrix}$/X±5/Y±4/Z±5/F3

H: N3/$\begin{matrix}G02\\G03\end{matrix}$/X±4/Y±5/Z±5/F3

N3/M99/J2/K2 (Partial circles)

G 04 Dwell

N3/G04

G 21 Empty block

N3/G21

G 25 Sub-routine program call

N3/G25/L(F)3

G 27 Jump instruction

N3/G27/L(F)3

G 40 Tool radius compensation cancelled

N3/G40

G 45 Add tool radius

N3/G45

G 46 Subtract tool radius

N3/G46

G 47 Add tool radius twice

N3/G47

G 48 Subtract tool radius twice

N3/G48

G 64 Feed motors without current (switching function)

N3/G64

G 65 Magnetic tape operation (switching function)

N3/G65

G 66 Activating RS 232 Interface

N3/G66

G 72 Pocket milling cycle

V: N3/G72/X±5/Y±4/Z±5/F3

H: N3/G72/X±4/Y±5

G 74 Thread-cutting cycle (left-hand)

N3/G74/K3/Z±5/F3

G 81 Fixed boring cycle

N3/G81/Z±5/F3

G 82 Fixed boring cycle with dwell

N3/G82/Z±5/F3

G 83 Fixed boring cycle with chip removal

N3/G83/Z±5/F3

G84 Thread-cutting cycle

N3/G84/K3/Z±5/F3

G85 Fixed reaming cycle

N3/G85/Z±5/F3

G89 Fixed reaming cycle with dwell

N3/G89/Z±5/F3

G90 Absolute value programming

N3/G90

G91 Incremental value programming

N3/G91

G92 Offset of reference point

V: N3/G92/X±5/Y±4/Z±5

H: N3/G92/X±4/Y±5/Z±5

V = Vertical

H = Horizontal

Miscellaneous or Switching Functions

M00 ≙ Dwell
N3/M00

M03 – Milling spindle ON, clockwise
N3/M03

M05 – Milling spindle OFF
N3/M05

M06 – Tool offset, milling cutter radius input
N3/M06/D5/S4/Z±5/T3

M17 – Return to main program
N3/M17

M08, M09, M20, M21, M22, M23 – Switching exits
N3/M2

M26 – Switching exit – impulse
N3/M26/H3

M30 – Program end
N3/M30

M99 – Parameters circular interpolation
(in connection with G02/03)
N3/M99/J2/K2

Alarm Signs

A00: Wrong G/M code

A01: Wrong radius / M99

A02: Wrong X-value

A03: Wrong F-value

A04: Wrong Z-value

A05: M30 code missing

A06: M03 code missing

A07: No significance

A08: Tape end with cassette operation SAVE

A09: Program not found

A10: Writing protection

A11: Loading mistake

A12: Checking mistake

A13: Inch/mm switching with full program memory

A14: Wrong mill head position/path increment with LOAD ⊥ /M or ⊣ /M

A15: Wrong Y-value

A16: Value of milling cutter radius missing

A17: Wrong sub-routine

A18: Path milling cutter compensation smaller zero

Possible Inputs
(Otherwise alarm signs)

	Metric		Inch	
	Values	Unit (mm)	Values	Unit (inch)
X_V	0-19999	1/100 mm	0-7999	1/1000"
X_H	0-9999	1/100 mm	0-3999	1/1000"
Y_V	0-9999	1/100 mm	0-3999	1/1000"
Y_H	0-19999	1/100 mm	0-7999	1/1000"
Z_{VH}	0-19999	1/100 mm	0-7999	1/1000"
Radii	0-9999	1/100 mm	0-3999	1/1000"
D(X) milling cutter radius with M06	0-9999	1/100 mm	0-3999	1/1000"
F	2-499	mm/min	2-199	1/10"/min
T(F) tool address M06	0-499	1	0-199	1
L(F) jump instructions	0-221			
H(F) exit signs M26	0-299			
J/K circular parameter	0-90			

Adresses

N, G, X, Y, Z, F, D, J, K, L, M, T, S, H

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INP	Storing of word contents
DEL	Deleting of word contents
FWD	Forward in program block by block
REV	Backward in program block by block
→	Forward in block word by word
M	Input of M-functions

Program hold:

INP + FWD

Program interruption

INP + REV

Delete program

DEL + INP

First DEL then INP

DEL remains pressed.

Delete alarm

INP + REV

Insert block

~ + INP

Delete block

~ + DEL

Single block mode

1 2 3 etc. + START

Testrun:

M

Operation – Magnetic tape

Storing of program on tape

G65 INP → FWD → Put in program number → INP

Transmit program from tape to memory

G65 INP → INP → Select program number → INP

Delete tape contents

G65 INP

↓

→ + DEL

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