3. Program Input - Operation

Program Input - Operation

(Survey)

[H/C] Switch key Hand/CNC-operation

[INP] Register key

[DEL] Delete key

[FWD] Forward within block (forward)

[REV] Reverse within block (backward)

[-] Minus key
1. Input of Minus values
2. Mainspindle off, if program is in dwell (M00 or INP + FWD)

[M] [-] M-key: The minus key features M-codes and test run function tool.
1. Cursor resp. read-out is on G:
   If the minus key is pressed M will be written.
2. Test run: Block Noo must be indicated

[INP] + [FWD] Intermediate Stop

[INP] + [REV]
1. Program Interruption
2. Delete Alarm

hold [DEL], then [INP]: Delete program

[~] + [INP] Insert blocks

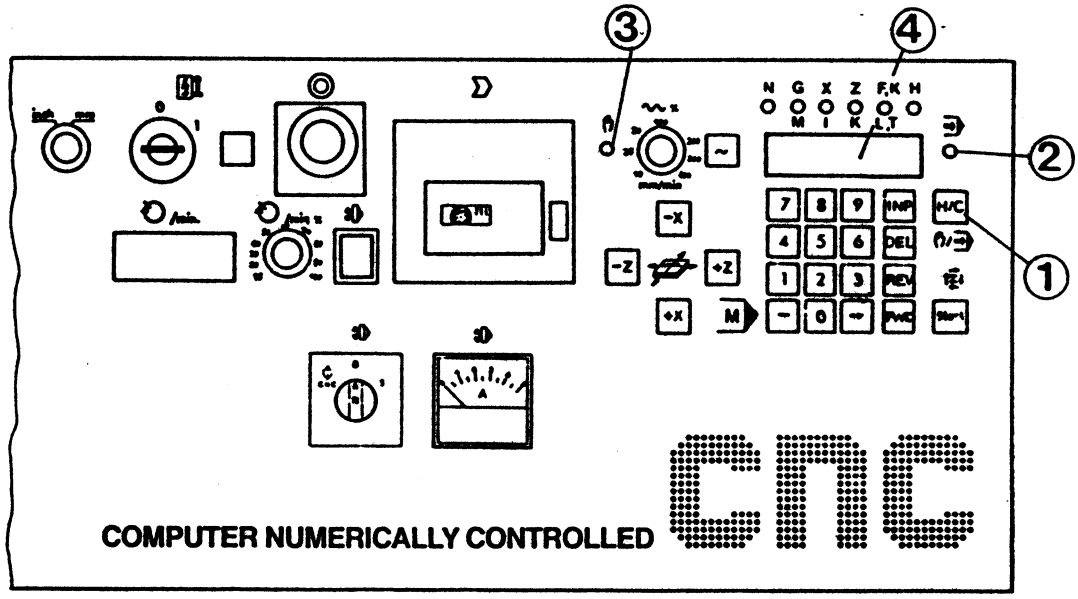
[~] + [DEL] Delete blocks

[1] [2] [3] ... [START] Single block operation

[START] Program start

Operating Elements CNC-Operation

1. Option key: Hand operation - CNC-Operation (H/C - pos. 1.)



By pressing the key H/C you change from hand operation to CNC-operation.

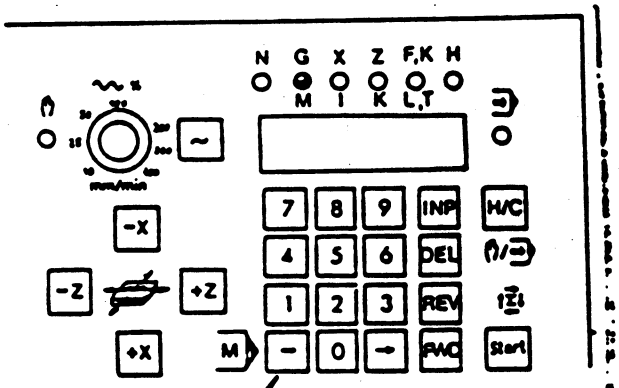
The mode in operation is indicated by lamp (position 2) or (position 3) angezeigt.

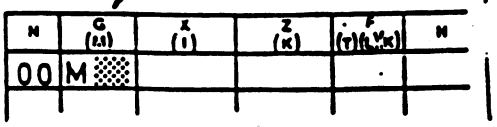
To put in a program you have to change over to CNC-operation.
After that you cannot move the slides by hand-operation anymore.

The ⊟-key and its Additional Functions

With software version A6C 114 004 the ⊟ key takes over the following function besides its function of determining the direction of X- and Y-movements.

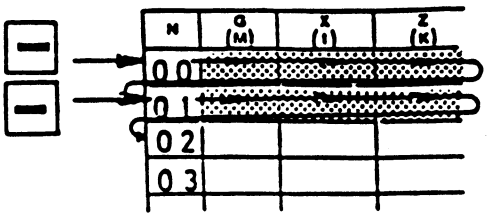
1) Input of M-codes.
2) Check of a ready program (test run)
3) Switching off main motor in dwell





1) Input of M-codes:

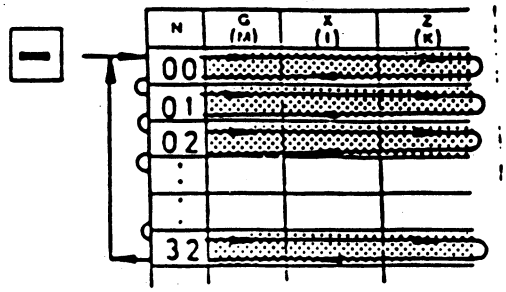
If the read-out is on LED G, and the ⊟ key is pressed, the read-out LED G starts flashing. That means: The computer waits for the input of an M-code.
On the monitor in column G the letter M appears.



2) Check of a Ready Program:

The cursor is at the begin of the program.
If the ⊟ key is pressed, the computer checks through the program for syntax errors.

Start touch: < 0,5 sec.
jump block by block
Permanent touch: program runs through
M30: jump back to N000.



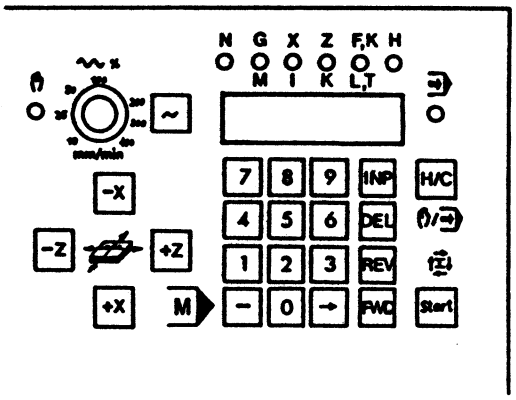
3) Switching off Main Motor in Dwell

If a dwell is effected (REV + FWD of M00) the main motor can be switched off by pressing the ⊟ key.
When program is continued (Start key) the main motor is automatically switched on. After 2 sec. the program continues to run. This allows time enough for the motor to run high.

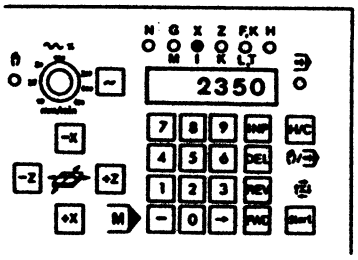
The INP Key = Memory Key

INP = Abbreviation for Input

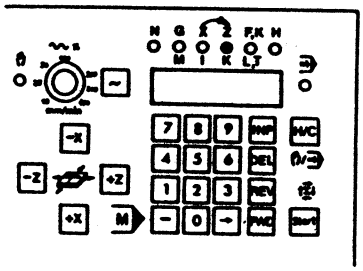
INP = Instruction to the computer to register the entered value.



Example:



- Lamp X lights up.
- Enter value 2350. The number appears for your information only, it is not in the computer yet.



- You press INP. By pressing this key, figures are registered; at the same time the number 2350 disappears and the light jumps to the next address letter.

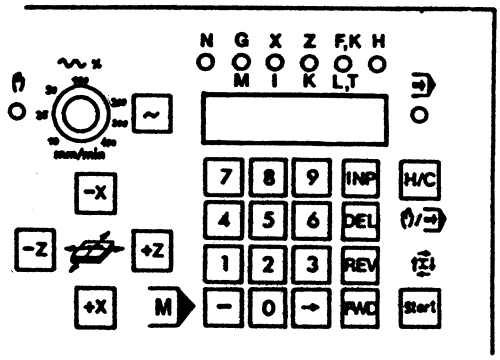
The DEL Key
= Delete Key, correction Key

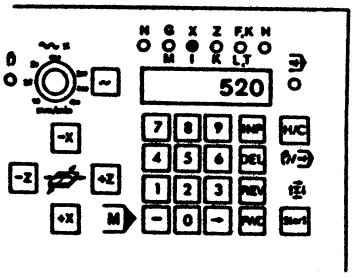
"DEL" is the abbreviation of "delete", which means to cancel, to extinguish.

You can delete only the value of the address letter which is indicated. If you correct a X-value e.g., the address letter X has to be on the digital read-out.

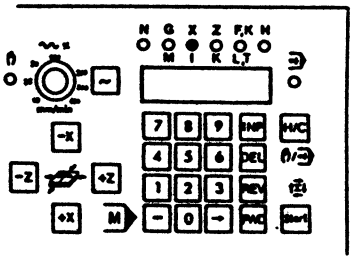
Attention:

With DEL only the digital read-out is cancelled, not the value in the register. You must put in a new value and store it with INP.

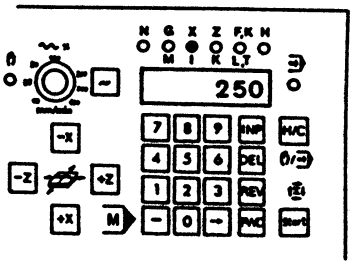




Example: You want to change value X from 520 to 250.



1. Press DEL key, the value 520 will disappear.

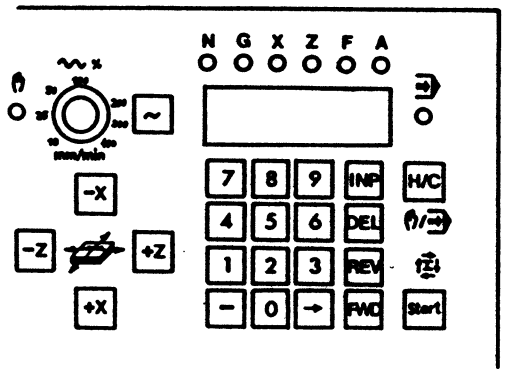


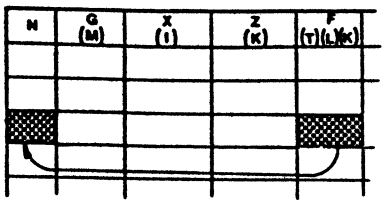
2. Put in the correct value (250).

3. Press INP key, value X is registered; light jumps to the next address letter.

The REV Key

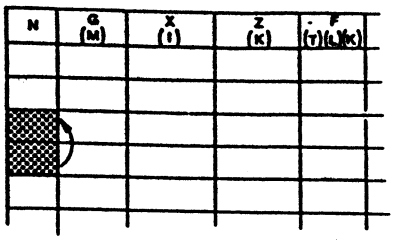
Instruction: to jump back in program block-by-block



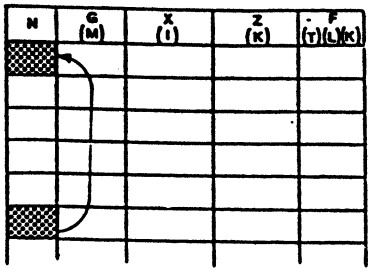


Function:

1. A given word is on the display. If you press key REV the program jumps to block number N.



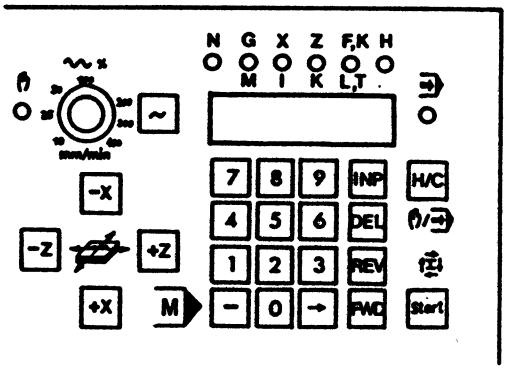
2. If block number N is indicated and you press key REV, then the program will jump to the previous block number.

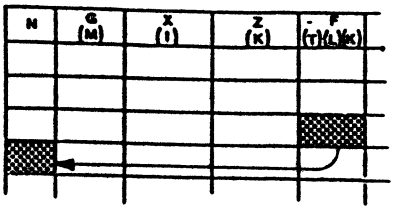


3. If you keep the REV key pressed the block number jumps back to N00 (permanent function).

The FWD Key

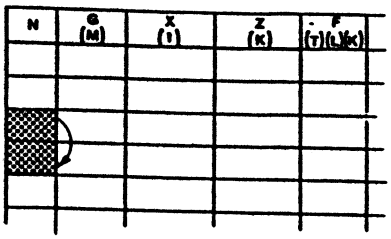
Instruction: to jump forward block-by-block



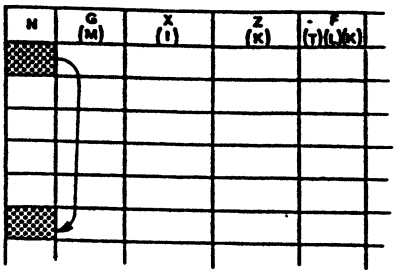


Function:

1. A given word is displayed. By pressing the FWD key the program jumps to the next block number.



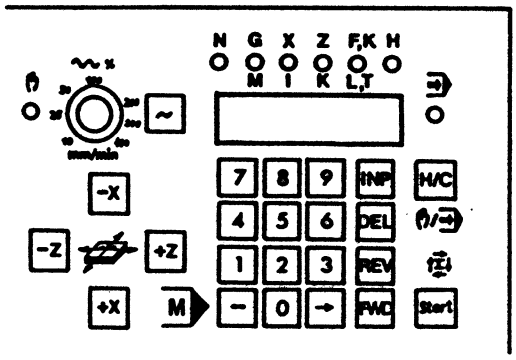
2. If a block number is indicated: when pressing the FWD key the program jumps to the next block number.



3. If you keep the FWD key pressed down, the program will jump block-by-block to the program end.

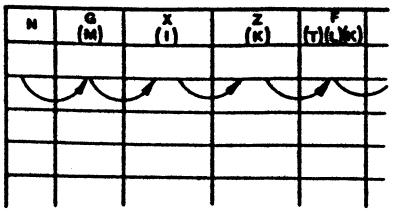
The [→] Key

Instruction: to jump forward within one block

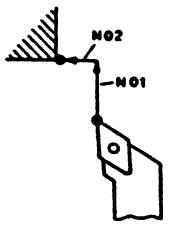


By pressing the key [→] the program will jump to the next word. The entered value of the next word will appear on the digital read-out.

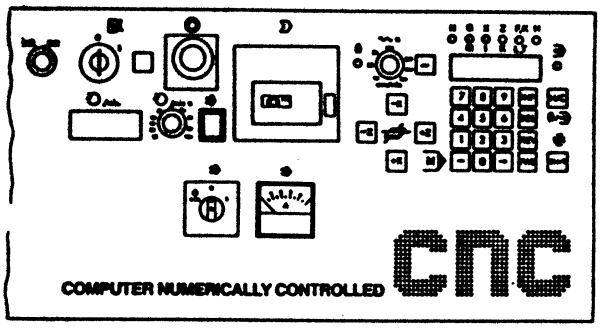
(Permanent function when you keep on pressing the key)



Program Input

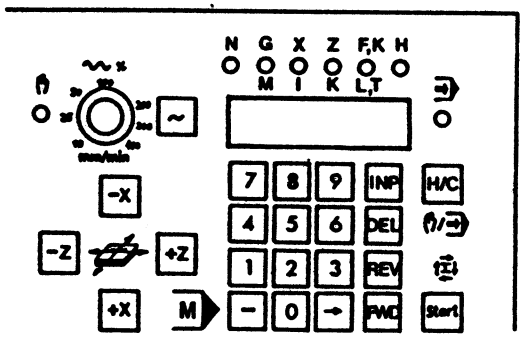


N	G (M)	X (I)	Z (K)	F (T)(L)(K)	H
00	M03				
01	00	-1000	00		
02	00	00	- 400		
03	M30				



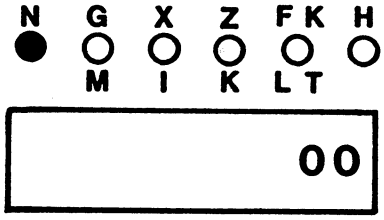
1. Switch on Main Switch

The control lamp "current supply" and the lamp indicating the mode of operation "hand operation" light up.



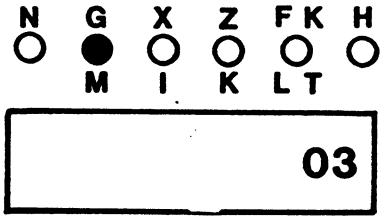
2: Press key H/C

- The light jumps from "hand-operation" to "CNC-operation".
- On digital read-out the light of address "N" lights up and you can read 00.



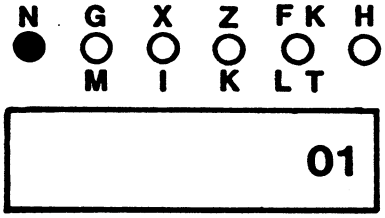
3. Press key INP

(= instruction to register block number N00) The light on the read-out jumps to the "waiting" position G(M).
The computer waits for the input of G- and M-codes.



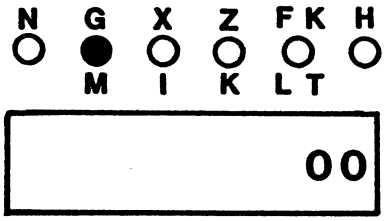
4. M ⊟ 0 3 INP to be pressed

⊟ key serves for input of M-codes. If the ⊟ key is pressed, the light of address "G/M" starts flashing. (= a M-code can be put in). On the monitor the letter M appears in the G-column when pressing the ⊟ key. Put in 03 and press INP ⊟ key. So the M-code is registered, and block N00 is finished. The light jumps back to N and the read-out indicates 01.



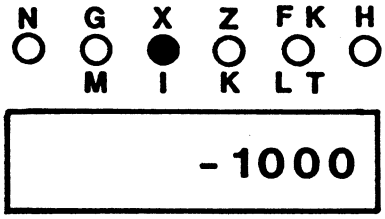
5. Press [INP]

The block number N01 is registered.
The light of address "G(M)" lights up.



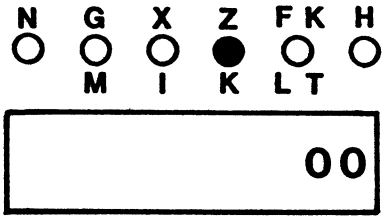
6. Press [0] [0] [INP]

G00 is registered. The light jumps to address "X".



7. Press [1] [0] [0] [0] [-] [INP]

The value X = -1000 is registered.
The light jumps to "Z".



8. Press [0] [0] [INP]

The value Z = 00 is registered. The light jumps back to address "N", and the display indicates 02.

9. Put in the second and third Block in the Same Way

10. Press [M] [-] [3] [0] [INP]

Put in M30 = end of program

11. Press [START] key

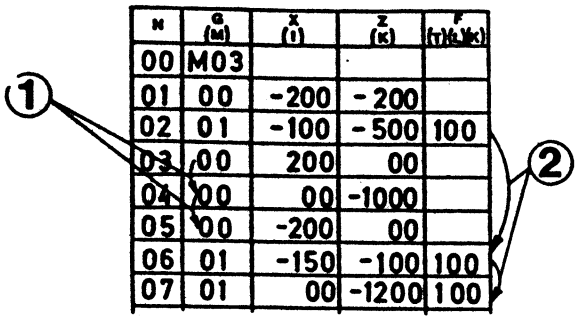
(=jump back to program start)

12 Press [START] key Again

Program runs off.

Take-over of registered values from previous blocks

By pressing the key [INP] the memory takes over the value of the relative word column G,X,Z,F,H which has been registered last.



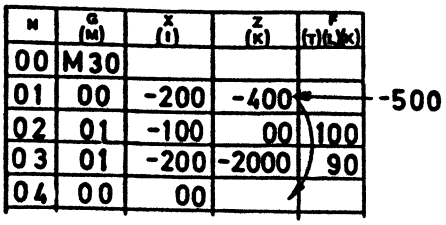
N	G (M)	X (I)	Z (K)	F (T)(I)(K)
00	M03			
01	00	-200	-200	
02	01	-100	-500	100
03	00	200	00	
04	00	00	-1000	
05	00	-200	00	
06	01	-150	-100	100
07	01	00	-1200	100

Example 1:

- Block N00 - N03 programmed.
- In block N04 address G flashes
- Press [INP]. Value 00 flashes and is being registered in block N04.
- The same with block N05.

Example 2:

In block N02 F100 was programmed. Thats the value put in last for F. If you press [INP], F100 is taken over in blocks N06 resp. N07.



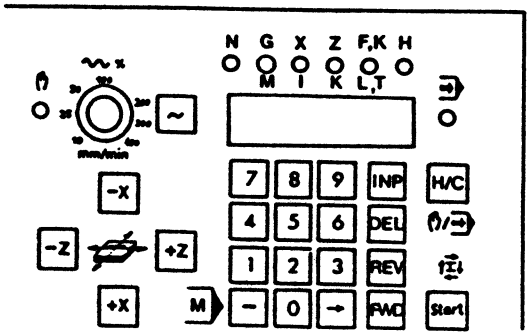
N	G (M)	X (I)	Z (K)	F (T)(I)(K)
00	M30			
01	00	-200	-400	
02	01	-100	00	100
03	01	-200	-2000	90
04	00	00		

Example 3:

You have registered block N03. You see by chance that the Z-value of block N01 is wrong. you correct it immediately, e.g. to Z = -500 and continue with putting in block N04.

If you press [INP] with the Z-value input also will register the value which was put in last, e.g. Z = -500.

Inserting and Deleting of Blocks



~ + INP = Inserting a block
~ + DEL = Deleting a block

Remark 1:
First press key ~ and then key INP (keep ~ pressed).

Remark 2:
Permanent function when you carry on pressing (more than 0,6 sec.), i.e. you insert permanently empty lines with G21.

~ + INP

N	G (M)	X (I)	Z (K)	F (T)(L)(K)	H
00	00	-200	-200		
01	01	-100	-1400	120	
02	00	300	1600		
03	01	-400	00	100	
04	00	600	00		
05	M30				

Example: Inserting ~ + INP

+ Digital read-out shows block NO2.
+ Press ~ + INP
+ In block NO2, G21 is automatically written.
+ The original block NO2 is autcmatically changed over to NO3 - also all subsequent blocks to the next block number.
+ In block NO2 you can program required instructions as you want.

00	00	-200	-200		
01	01	-100	-1400	120	
02	21				
03	00	300	1600		
04	01	-400	00	100	
05	00	600	00		
06	M30				

Procedure

+ Delete G21
+ Put in wanted block

00	00	-200	-200		
01	01	-100	-1400	120	
02	00	300	1600		
03	01	-400	00	100	
04	00	600	00		
05	M30				

Example: Deleting ~ + DEL

+ Digital read-out shows NO2
+ Press ~ + DEL
+ NO2 is deleted
+ All subsequent blocks are backnumbered: NO3 - NO2, NO4 - NO3, etc.

The Program Sequence

1. Testrun:

The program runs in the computer. There are no instructions given for slide movements.

2. Single-block operation:

The program is worked off block by block. The slides move as programmed.

3. Automatic operation:

The total program is worked off. Switching instructions are carried out.

1. Testrun

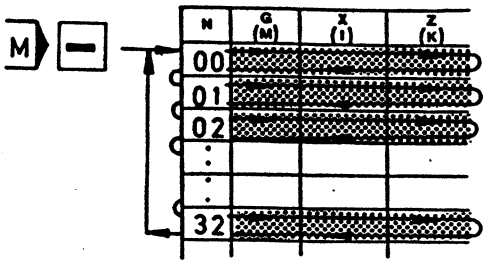
The program runs "in the mind". The instruction for slide movements are not given.

Reason for Test Run:

Mistakes are shown.

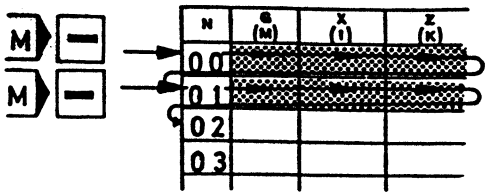
If you have written any subroutines or jump instructions, you can check their sequence.

Activation Testrun:



1. Check of Complete Program

- CNC-operation
- Read-out has to be at N00
- Press M-key. Program is checked.
- At end of program (e.g. N32/M30): automatic jump back to N00.

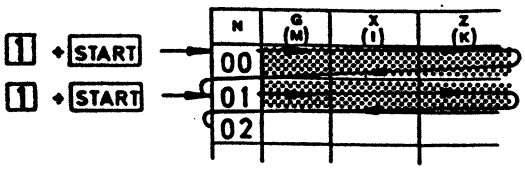


2. Check Block by Block

- CNC-operation
- Read-out has to be at N00-
- Press M-key (shorter than half a second/and one block will be worked through.
- Press M-key again and next block will be checked through.

2.Single block operation

In the testrun you do not see whether you run with e.g. G00 into the workpiece or whether ± directions are correct. This you see in the single block- or in the automatic operation.



Example:

1. Block N00

- Block indication is at N00.

⇩

- 1 + START

Press key 1, then key START (key 1 has to remain pressed).

⇩

Block N00 is worked off.

The screen shows "dwell in block N01".

2. Block N01

Press again 1 + START.

⇩

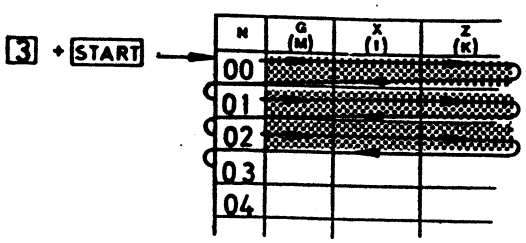
Block N01 is worked off.

⇩

The screen shows "dwell in block N02".

In this way the program can run in single block operation.

Single block operation (continued)



Various blocks in single block operation:

If you e.g. press keys 3 + START, there will be 3 blocks worked off. You can work off up to 9 blocks in one go 9 + START.

Dwell in single block operation:

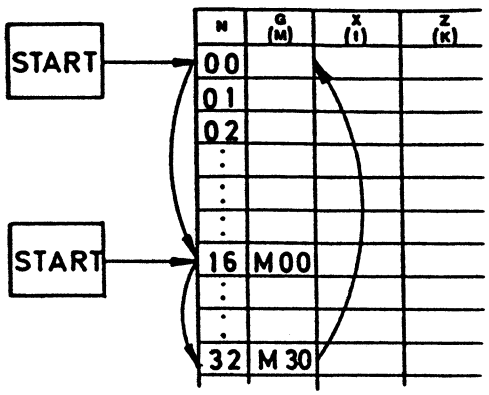
Press INP + FWD.
The slides stop.

If you press START the program continues.

Interuption of program:

Press INP + REV.
The program jumps back to N00.

3. Automatic operation



- Set block indication to N00.

Possibility 1

Press REV key, until N00 is indicated.

Possibility 2

Display shows any given block number. Press INP + REV, indication jumps to N00.

- Press key START. The program runs until a hold or until M30.

To continue program after hold

Press key START.

Program hold

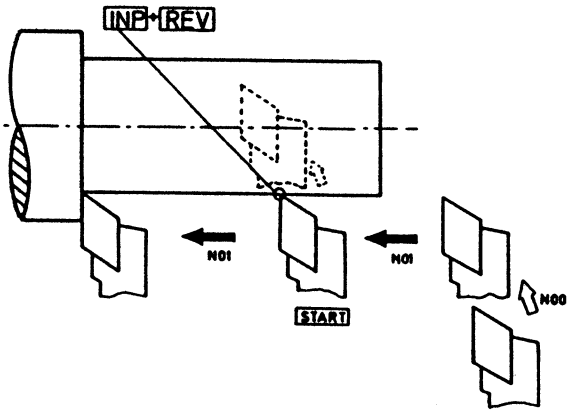
- Programmed hold M00.
- In connection with M06, if under the address T (F) a number 1 to 499 is programmed (with inch operating mode 1 to 199). If under T=0 is programmed, there is no hold.

Interventions during Program Flow

1. Program stop
2. Program interuption

1. Program stop

INP + REV



Press keys INP + REV. The program jumps back to N00 (start).

Pay attention:

If you press START key after INP + REV, the program starts with N00. Your tool is not in starting position! Collision!

New start: Measures

Position the tool in program start position.

OTHERWISE COLLISION !

2. Program Interruption

INP + FWD

resp.

M00

The program is stopped.

To continue program:

Press key START.

Why Program interruption?

You may e.g.

- **change the feed**
- **take measurements**
- **switch over to hand operation and carry out a correction by hand**
- **correct program, etc.**
- **Switching off:main spindle via main spindle switch (main spindle has to be switched on before start).**

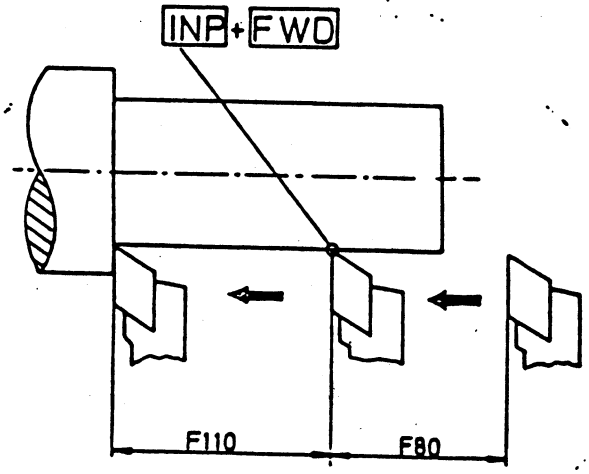
Switching off Main Spindle Via Minus Key (M-Key)

- **M03 active**
- **Switch to-hand operation**
- **Press Minus key main spindle is switched off.**

START:

- **Switch to CNC-operation**
- **Press START-key.**
  By pressing START the main spindle is switched via program. After 2 seconds the program continues. This little time lag is necessary to allow the main motor to run high.

Effectiveness of Corrections with Program Interruption



1. Corrections of feed:
   Feed corrections become effective in the interrupted block.

2. Corrections of G,M,X,Z-values in the interrupted block are only effective in the following program run.

3. Corrections of G,M,X,Z-values in subsequent blocks will be effective when the program is continued.

Deleting of a registered Program

Possibility 1

Switch off main switch.

Possibility 2

Press emergency stop button.

Possibility 3

A certain block number is indicated (NOO, NO1, NO2 ...).

Procedure

First press key DEL then INP (DEL remains pressed).

The registered program is deleted.
The digital read-out shows NOO.