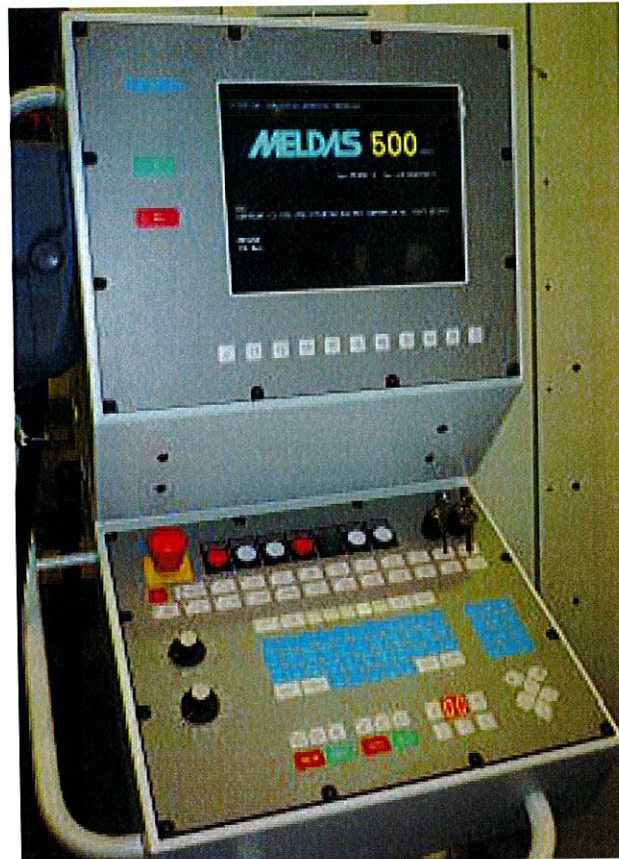


Operating Manual

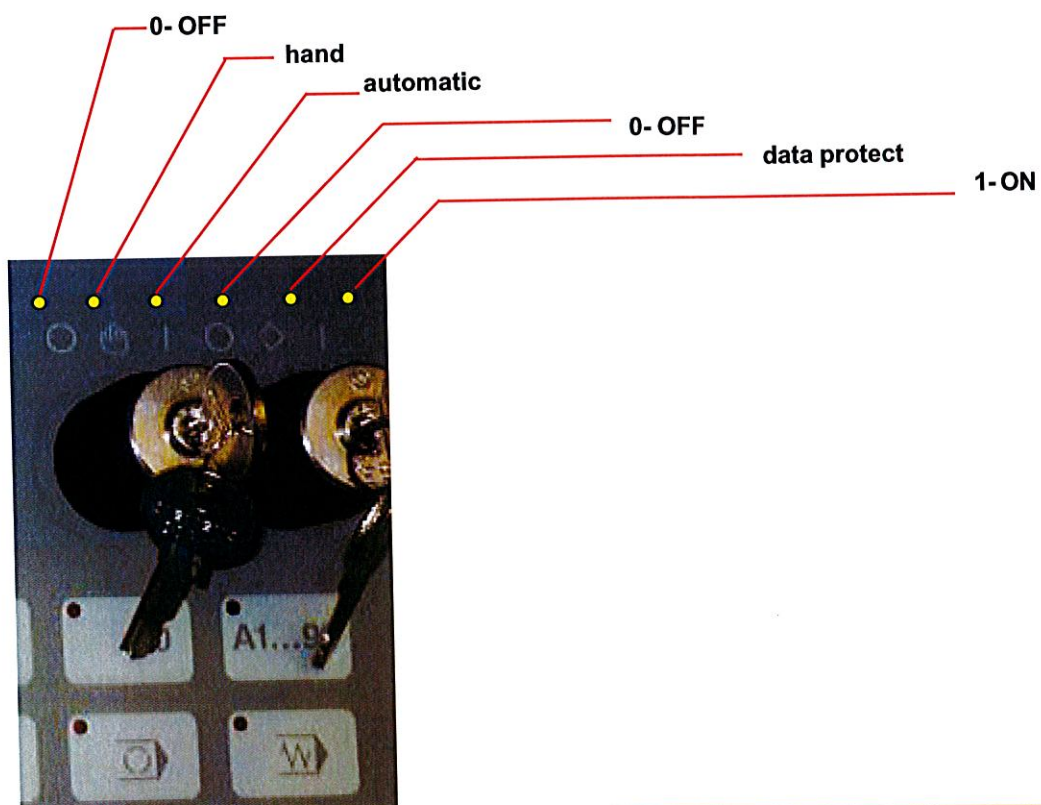
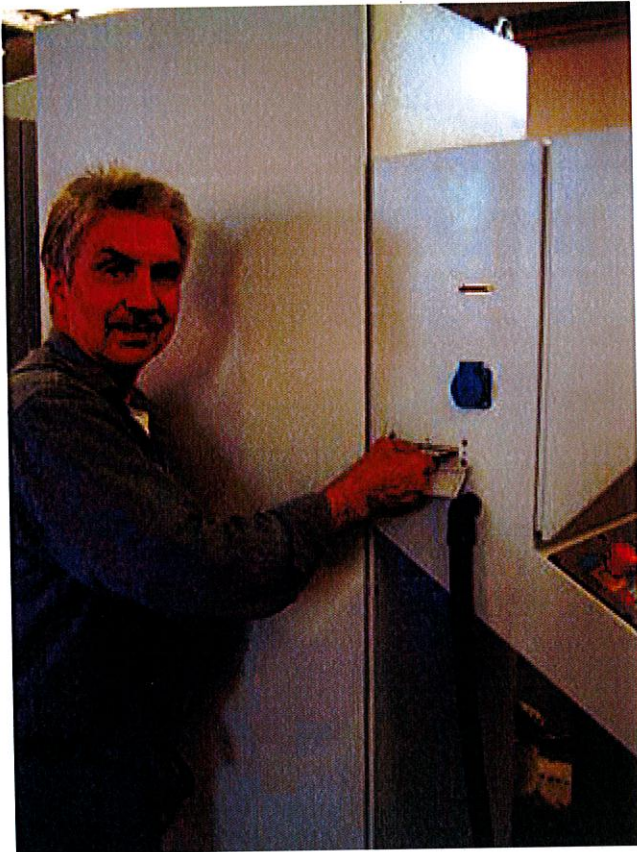
Mitsubishi M 530
for TL 1004



Floppy Disk
in documentation
file 2/ 2

Machine type	IXION TL 1004	IXION GmbH & Co. KG Postfach 70 08 29 22008 Hamburg			
Order no.	570	Jenfelder Str. 30 22045 Hamburg			
Machine no.	950525	Domestic sales	Tel.	++49 (40) 66 98 09 - 48	
			Fax	++49 (40) 66 98 09 - 91	
Customer	Intec SG / CW	Foreign sales	Tel.	++49 (40) 66 98 09 - 46	
			Fax	++49 (40) 66 98 09 - 91	
Location	CW Singapore	Service	Tel.	++49 (40) 66 98 09 - 27	
			Fax	++49 (40) 66 98 09 - 32	
		Spares' departm.	Tel.	++49 (40) 66 98 09 - 77	
			Fax	++49 (40) 66 98 09 - 32	
		E-mail-Adress	see	http://www.ixion.de	

put the floppy disk
inside



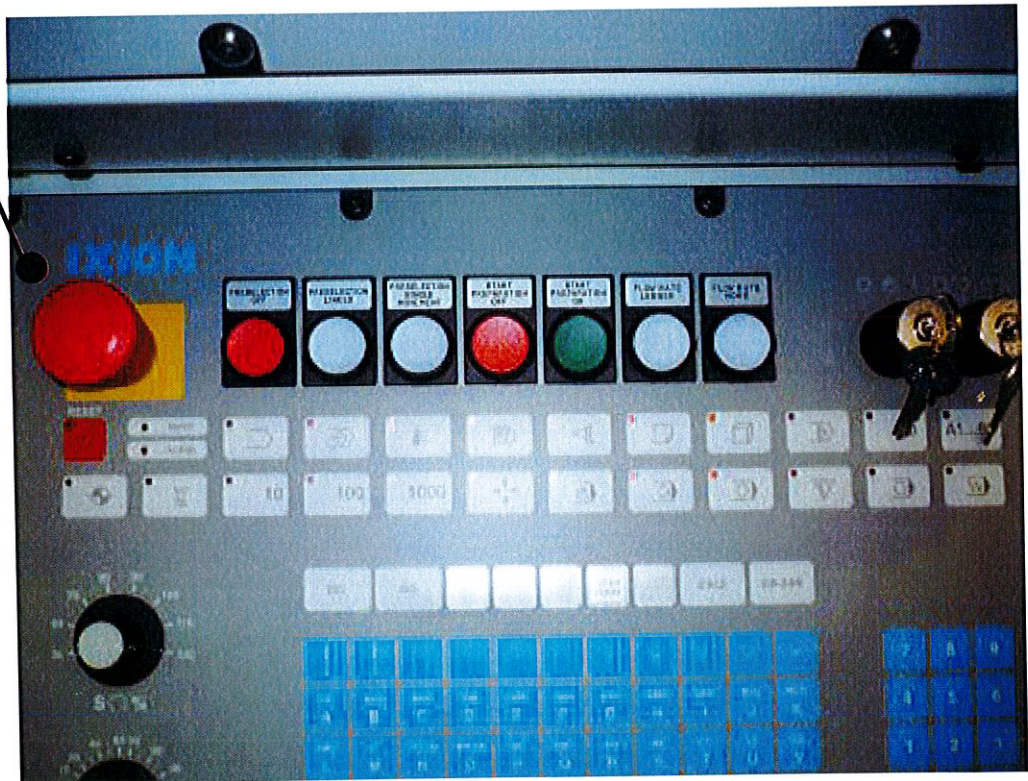
control panel

Important advice - EMERGENCY SHUTDOWN

- During breakdowns or in an emergency the plant can be switched off by activating an **EMERGENCY STOP switch**.
- An **EMERGENCY STOP switch** is located on the control panel, the others are on different parts of the plant.(options)

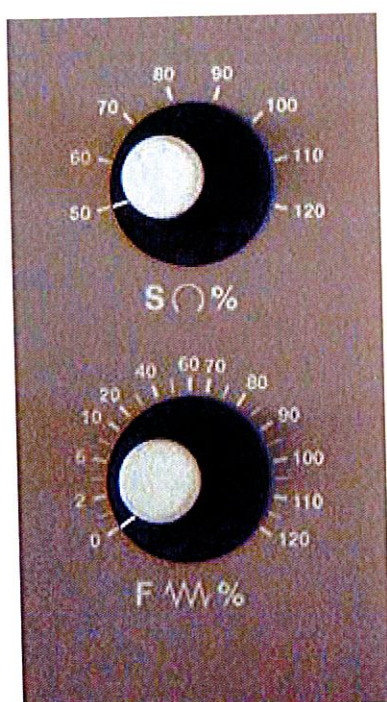
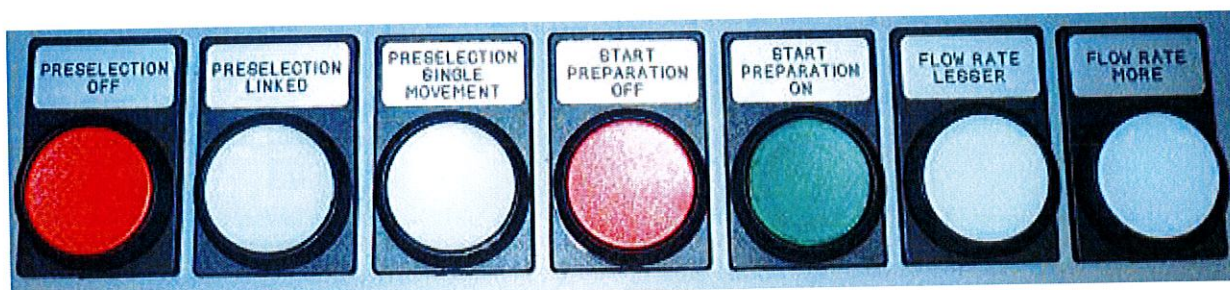
Procedure:

Activate EMERGENCY STOP switch / rectify the fault /
release EMERGENCY STOP switch



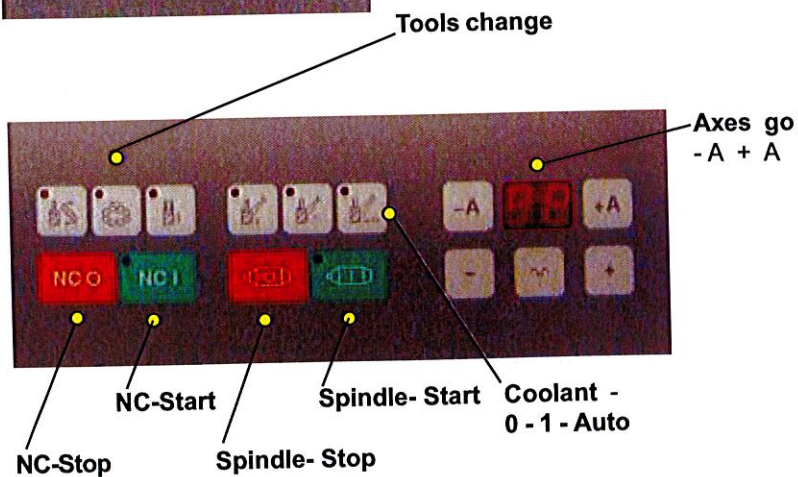
the others are on different parts of the plant.(options)

Details unit control



Feed rate - spindle

Feed rate - W- axis



Switching the machine on

The machine is switched on with the main switch at the **A1 control cabinet**.

The servo modules and the spindle module are connected to the electrical power through the main switch.

Switching the machine off

The machine is switched off with the main switch. It should be understood that switching off the machine at the main switch is the last action of a series of deactivation procedures.



The machine should only be switched off when the NC is in the Stop state, the spindle is stationary, the coolant has been switched off and both the start preparation and preselection are already off.

Switching ON the NC

The NC can now be switched on using the green key labelled I on the operating panel. When the machine has been switched off at the main switch, this also switches off the NC.

axes reference point is in the automatic

Emergency-off

The red mushroom switch on the operating panel will trigger EMERGENCY OFF.

All electrical power is immediately switched off as soon as this switch is pressed, so that the machine presents no further danger. It is impossible to activate a pre-selection or start preparation

as long as the EMERGENCY OFF switch is pressed.

The red mushroom head of the switch must be turned in order to unlatch the EMERGENCY OFF status.

MDI operating mode

In the MDI operating mode a program that has been entered through the MDI editor can be processed automatically after the NC has started.

NC-START

The green NC-start key on the operating panel is used to run an NC program in the MEMORY operating mode, or to start an MDI program in the MDI operating mode.

NC-STOP

The NC-stop key on the operating panel halts a running NC or MDI program.

Request tool change

Manual tool change is requested with the blue "Tool change request" button. The white "Tool change active" lamp will flash after this button has been pressed. The manual tool change request will only be successful if the spindle is stationary.

Deselect tool changing

Pressing the "Tool change request" button again will deactivate the manual tool change. The white "Tool change active" lamp will go out. It is not possible to start the spindle while tool changing is requested.

Cooling 0 -1- Auto

The selection switch Cooling - 0 - 1 switch the coolant off (as an override) in the 0 position. External cooling is switched on in the 1 position.

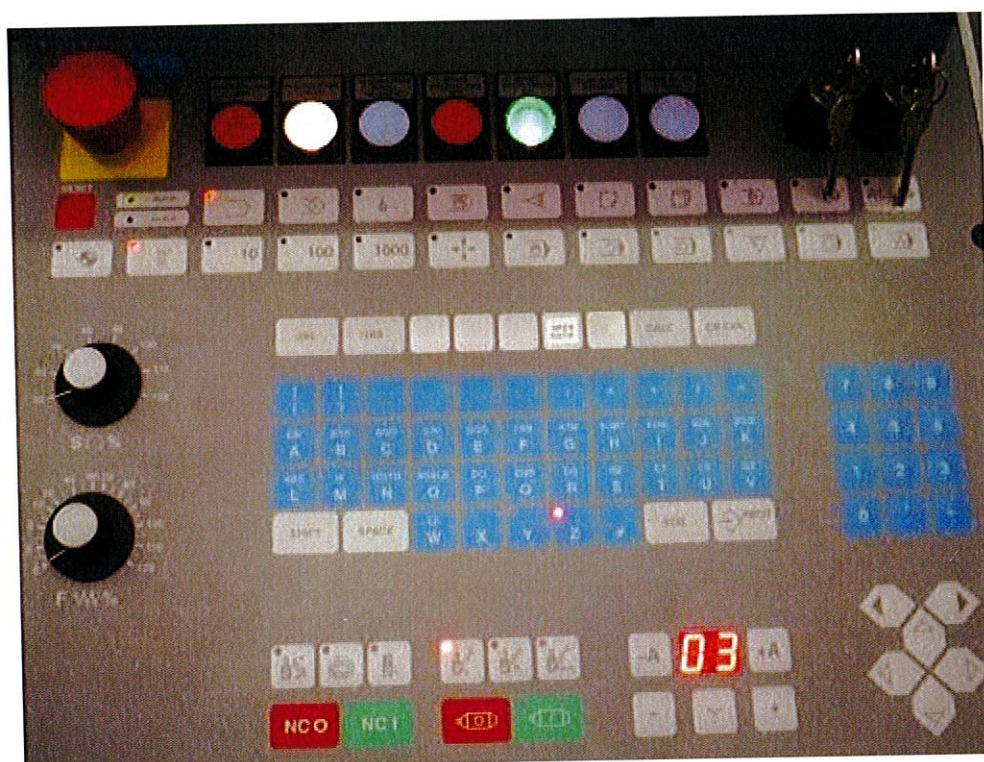
Modifying spindle speed

The selection switch for modifying the spindle speed on the operating panel can be used to change the programmed rotation speed of the spindle over a range from 50% - 120%.

Modifying the feed rate

The selection switch for modifying the feed rate on the operating panel can be used to change the programmed feed rate over a range from 0% - 120%.

Control Panel Mitsubishi 530



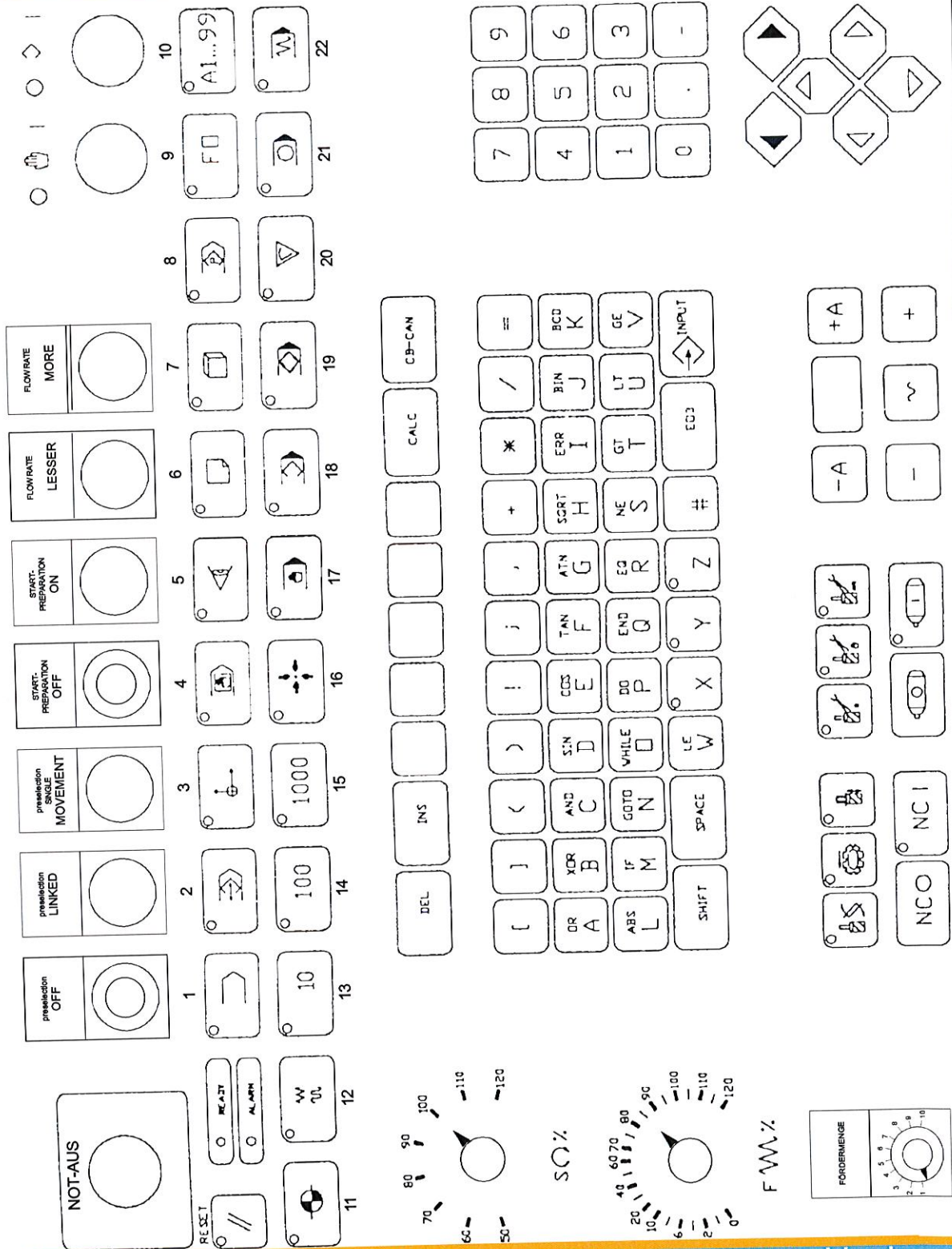
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Technical Documentation

2



Subject to change without prior notice

www.ixion.de

IXION 18.09.2009

TL 1004

2-13

IXION 03/98

e0549a02

- 1 Monitor
- 2 Data input / output
- 3 Datum shift Tool Parameters
- 4 Manual input, part programme memory
- 5 Diagnosis of error messages
- 6 2D graphics
- 7 3D graphics
- 8 WOP Workshop orientated Programme
- 9 IXION Technology programmes
- 10 Select axes A 1.....99
- 11 Reference point travel
- 12 Jog key
- 13 Incremental travel 0.1 mm
- 14 Incremental travel 0.01 mm
- 15 Incremental travel 0.001 mm
- 16 Set real values
- 17 Set theoretical values
- 18 Block for block
- 19 Series of blocks / Block for block deactivated
- 20 Teach mode for tool monitoring
- 21 M01 Selected Halt
- 22 Jump NC blocks

Technical Documentation

Switching the machine on

Switch on the mains switch on the side of the switch cabinet (red mains switch on yellow background).

Switching on the CNC - Controls

Switch on the controls on the top left of the screen. The control displays a start-up sequence text and the reference points of the various axis in manual mode.

Switching the machine off

Switching the machine off at the main switch is the last step in a series of measures to be taken before the machine can be switched off. Firstly:

1. Depress NC - STOP
2. Press SPINDLE - STOP
3. Press COOLANT OFF
4. Press PRESELECTION OFF
5. Press START PREPARATION OFF
6. NC off
7. Main switch off

Switching off the NC - Controls

For switching off the NC controls follow the first 6 steps mentioned above and then depress the 0 button on the machine tool board, to the left of the control screen.

Emergency Off

The red mushroom shaped button under the machine tool board serves to halt all machine movement so that the operator can bring the machine safely to a stop.



The AUTO mode cannot be reactivated for as long as this button is locked. Unlock to restart!

PRESELECTION SINGLE MOVEMENT (Manual Axes Movement Mode)

The MANUAL AXIS movement mode is for set-ups and tool setting jobs. Select this mode via a white illuminated button on the machine tool board.

Technical Documentation

PRESELECTION SINGLE MOVEMENT (Manual Axes Movement Mode)



The manual axis movement mode can only be activated by operating the key switch on the machine tool board. It is not possible to activate the machine once this key has been removed.



In this mode the axis and spindle can be moved within certain limits and without the safety doors on the machine being closed.

PRESELECTION LINKED (AUTO mode)

The AUTO mode is for running off programmes with the protective doors closed. Once the doors are closed, the machine can travel limitlessly.

START PREPARATION ON (CNC ON)

After choosing the MANUAL AXIS or AUTO mode the green switch for CNC ON lights up. Only once the AUTO / MANUAL key has been selected and the green button lights up, can the axes and spindle as well as all other machine functions be activated.

Difference between Modes

Distinction is made between the machine and the NC modes. The machine tool board is thus divided into 2 rows of operating keys for selecting the various modes.

NC Modes

Switch to NC controls by using the top row of operating keys on the machine tool board. The NC controls offer the following possibilities:

- 1 Monitor
- 2 Data input / output
- 3 Datum shift Tool Parameters
- 4 Manual input, part programme memory
- 5 Diagnosis of error messages
- 6 2D graphics
- 7 3D graphics
- 8 WOP Workshop orientated Programme
- 9 IXION Technology programmes
- 10 Select axis A 1.....99



For deep-hole drilling machines (TL) keys 7 and 8 have no function.

Operating mode Machine

The machine modes are switched on via the bottom row of keys on the machine tool board. The following are possible:

- 11 Reference point travel
- 12 Jog key
- 13 Incremental travel 0.1 mm
- 14 Incremental travel 0.01 mm
- 15 Incremental travel 0.001 mm
- 16 Set real values
- 17 Set theoretical values
- 18 Block for block
- 19 Series of blocks / Block for block deactivated
- 20 Teach mode for tool monitoring
- 21 M01 Selected Halt
- 22 Jump NC blocks



On deep-hole drilling machines (TL) key number 16 has no function.

Operating mode Reference Travel

This mode is for machine travel to the reference points, once the machine is switched on.



Pay attention to the correct sequence of keys!

The Z axis travels firstly to its reference point to avoid tool breakage and damage to the machine. Keep the axis key depressed until the reference point is attained.



Pay attention to the correct axis and directional keys!



The directional keys must be kept depressed until the reference point has been reached.

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Please take care to avoid collisions with the component, clamping vices by for example removing the drill bush carrier or flush box.



Only once all axis have reached their reference points can the RAPID TRAVEL key be activated.



After reference point travel, the machine can work off its programme automatically.

Manual directional Mode

The manual directional keys serve to move the selected axis in combination with the +/- keys in the respective direction. The feed rate used in this mode is 1000 mm/minute.



The feed rate can be influenced and altered in this mode.

Incremental Mode

In the incremental mode, using the 10 / 100 / 1000 selector switch, the axis travel is in the respective increment.

10	corresponds	0.1 mm
100	corresponds	0.01 mm
1000	corresponds	0.001 mm



These values are also applicable for the ELECTRONIC HANDWHEEL.

Handwheel Mode

The machine has a detachable portable electronic handwheel with selector switch. Depress the selector switch on the handwheel during the INCREMENTAL mode to activate the handwheel.



High speeds are attainable if the selector switch is positioned to 10 and the handwheel switch is erroneously turned quickly.

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Manual Run off

In this mode a partial programme in manual data input mode (MDI) can be run off automatically.

Block for block Mode

Depress this button to run each NC block off individually, i. e. after each NC block the next block is activated via the start button NC 1.



Depress the BLOCK SERIES button to continue the next series of blocks.

Operating mode Series of Blocks

This operating mode is for working off the partial programmes in the memory. Escape from this mode by depressing the key once again.

Spindle Influencing

Using the selector switch for influencing the spindle the programmed spindle speed can be varied within a range of 50% - 120%. Each increment on the spindle influencing dial amounts to 5% of the total speed range.

Feed Influencing

Using the selector switch for influencing the feed rate the programmed feed rate can be varied within a range of 0% - 120%. The value varies per increment on the selector dial.



At the setting 0% and having moved at least 1 axis, the following error message appears:

M01 operating error

NC 0

The NC 0 key is for interrupting a running programme.

NC 1

This key is for starting the NC programmes in the operating modes: Series of blocks, block for block and automatic run-off (MDI).

Spindle 0

The Spindle 0 key brings the spindle to a halt.

Spindle 1

The Spindle 1 key is used to start up the spindle in the MANUAL and INCREMENTAL modes using the programmed spindle speed, once the tool is clamped.



On starting up the spindle please pay attention to programme the spindle speed according to the tool in the spindle, particularly for GUNDRILLS. Apart from the required working speed rate, gundrills require a further guide. If such a guide is not used, the operator is at risk of an accident due to free flying tooling .

-

This key is used to move a selected axis in the manual or incremental mode in the negative direction.



There is a particular risk of an accident or collision on the Z axis or when the tool collides with the workpiece or drill bush carrier for example.

Rapid override

This key is only active in combination with one of the directional keys + or - and increases the axis speed and rapid feed rate.

+

Using this key the preselected axis can be moved in the manual mode or incremental mode in the positive direction.

- A

Using this key the axis to be moved in the negative direction is selected. The digital display shows the number of the selected axis.



If axis No.1 is selected and the -A key is depressed, the axis selector automatically jumps to the highest axis number.

Technical Documentation

+ A

Using this key the axis to be moved in the positive direction is selected. The digital display shows the number of the selected axis.



If the axis with the highest number is selected and the +A key is depressed, the axis selector automatically jumps to the axis No 1.

COOLANT OFF

The COOLANT OFF key is used to select the coolant possibility.



Once the program is running the drill can be broken or workpiece damaged if the coolant is turned off.

Manual Coolant

FLOW RATE
LESSER or MORE

Using the Manual Coolant key the outer coolant can be switched on or off.

Automatic Coolant

Using the Automatic Coolant the type of coolant memorized in the programm is activated.
The following M functions are available for controlling the coolant type:

- M7 Inner coolant ON
- M8 External coolant ON
- M11 High pressure coolant ON
- M9 Coolant OFF



Only activate the high pressure coolant with M11 once you have made sure that no danger arises from high pressure coolant being emitted from the spindle.



Please note that drills and in particular gundrills can be damaged if no coolant is applied to them.

Request Toolchange

Using this key a toolchange is requested for the Manual, Handwheel and Incremental operating modes. The main spindle is halted. in the modes MANUAL run-off, block for block or series of blocks a manual tool change is confirmed using this key.

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Rotate ATC

Using this key, the auto-toolchanger is rotated (only machines with auto-toolchanger option). Prior to this the toolchange has to be activated via the NC programme or using the REQUEST TOOLCHANGE key.

Open Collet

The open collet key only functions once a toolchange has been requested. By depressing this key the collet on the spindle clamping is opened.



Once the collet is open the LED display under the OPEN COLLET key lights up. By depressing the OPEN COLLET key once more, the collet recloses.



Please take care to insert the tool shaft completely into the spindle taper to ensure that the tooling and collet are not damaged.

Reset

The reset key stops the program, the main spindle and the coolant pump immediately.



Do not depress this key once the programme is running. Risk of toolbreakage for gundrills.

M

Using this key it is possible to start a M function directly in the manual mode.

The M area is lit up with a light background on the screen and the required M function can be insert.



The inserted M function becomes IMMEDIATELY active once the M number is inserted and the input key depressed.

S

Using this key it is possible to insert the spindle speed directly in the manual mode.



As is the case for the M key, the new inserted spindle speed is IMMEDIATELY active once the input key is depressed.

Technical Documentation

DEL	This key deletes the last letters or digits which have been written.
INS	This key allows digits or letters to be inserted where the cursor is positioned.
CALC	Without function.
CB	Deletes the block where the cursor is positioned.
CAN (Shift + CB)	Deletes the complete program.
EOB	Ends an NC block with the last mark ;
#	This key permits parameters to be written.  An extensive list of commands for parametering can be collated from the programming manual.
Arrow	Command the cursor on the screen.
Learn	Using this key the load monitoring is converted from learning mode to the monitoring mode. Learning is active once the LED under this key is illuminated.  An extensive list of commands for parametering can be collated from the programming manual.

M01

Using this key a selective halt M01 is activated or deactivated during the NC programme. If the LED display under this key lights up the part programme is halted. As is the case for the M0 key, the NC1 key has to be depressed to reactivate the programme. If the LED display is not lit, the command M01 is ignored.

This key enables NC blocks beginning with / to be ignored. If the LED display under this key lights, the blocks are then ignored.

Software Keys on MITSUBISHI Control

The control offers the possibility of simulating certain keys in the control software. These are only applied to functions which are only rarely used by the operator during normal operation. Please refer to the MONITOR page under the Softkey PLC switch in the programming manual.

Software Switch AOLC #1

Using this switch the process monitoring programmed under the F0 key is switched on or off. For normal operation, this key has to be switched to the ON setting. The APLC is then illuminated on the screen. If APLC is switched off the PLC programme ladder stored under F0 is made available. This is only required for diagnosing error messages.