VISODATA PLUS

USER MANUAL

CE

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About this manual

The user manual is a guide containing all the procedures necessary for the use of VISODATA PLUS .
Throughout the manual, the messages present on the LCD are shown with characters of type **ABCD**, and the keys are indicated by characters of type **[A]**.

Power supply

The VISODATA PLUS visualiser functions in alternate current with a tension of 220 Volts and a frequency of 50 Hz; it absorbs 10 Watts.
All visualizers are fitted for being fed by means of a battery buffer (known as a BAT-BOX) which, in the case of power failure from the mains (220V a.c. line), avoids the loss of the axis positions.

Connectors for transducers

On the visualiser there are three 7 pin AMPHENOL socket connectors for receiving signals from 3 transducers.
The layout of the connector pins is as shown below:
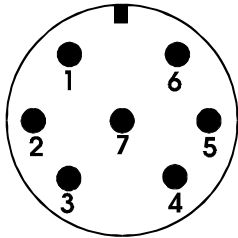
- Pin 1:   0 Volt
- Pin 2:   not used
- Pin 3:   phase A
- Pin 4:   phase B
- Pin 5:   +5 Volt
- Pin 6:   zero notch
- Pin 7:   not used

Three input channels are available with the following features:
- 5 Volt feed
- 3 signals per channel

These can be used for acquiring signals from optic scales or encoders, and mixed set-ups are possible (one scale and one encoder).
The feed for the transducers can be taken directly from the visualiser. 12 Volts can be supplied on request.
Each channel acquires 2 square waves (phases) which are displaced by 90 degrees, plus the zero notch.
The maximum input frequency of one phase is 50 Khz. (The inner multiplication for 4 ports gives a maximum actual frequency of 200 Khz).
The activity front of the zero notch can be programmed.

Output relay connector

A 6 pin AMPHENOL connector is fitted on the visualiser for the output of the 3 available relay outputs. The layout of the connector pins is as shown below:
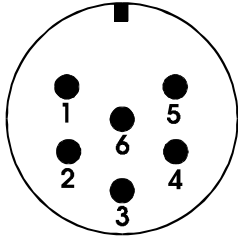
- Pin 1:   common Relay 1
- Pin 2:   output   Relay 1
- Pin 3:   common Relay 2
- Pin 4:   output   Relay 2
- Pin 5:   common Relay 3
- Pin 6:   output   Relay 3

The outputs of the relays can be used either normally open or normally closed (the machine is supplied with this setting).
The choice of the method to be used is made by jumpers inside the machine; therefore, if the method is to be modified, the machine must be opened and the position of the jumpers for the desired relays changed.
The following initials are on the card:

NO : Normally Open
NC : Normally Closed
1/2/3 : Relays 1/2/3

Example: all relay outputs normally closed
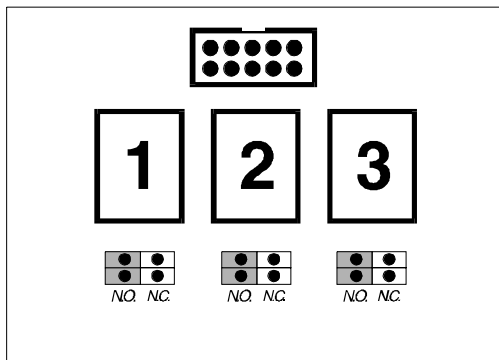
Probe connector

A 7 pin AMPHENOL plug connector is fitted on the visualiser to manage the digital input known as the probe.
The layout of the connector pins is as follows:
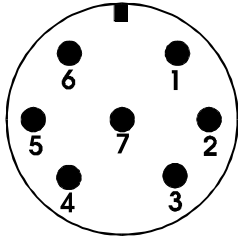
- Pin 1:   digital input
- Pin 2:   0 Volt
- Pin 3:   opto-insulated input
- Pin 4:   not used
- Pin 5:   com 24V
- Pin 6:   +24V
- Pin 7:   not used

RS232 serial port connector

There is a 9 pin plug on the visualiser for connecting a computer or printer via RS232.
The layout of the pins is as follows:
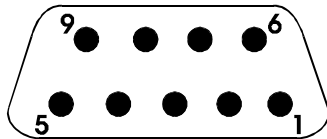
- Pin 1:   not used
- Pin 2:   receive   (RX)
- Pin 3:   transmit (TX)
- Pin 4:   not used
- Pin 5:   ground   (GND)
- Pin 6:   not used
- Pin 7:   request to send (RTS)
- Pin 8:   clear to send   (CTS)
- Pin 9:   not used

Switching on

Before switching the visualiser on, it is advisable to check the connections with the transducers and power supply. Having done this, switch the apparatus on using the switch on the back.
The device will give a beep then it will carry out a series of tests to check out the functions. During this phase, the LCD will display the message:

TEST

Internal circuit check

If an error is found, a message regarding this error is displayed. In this case, switch the device off and call assistance.

Memorised data check

In this phase the instrument checks all the data in the following memorised data blocks:

1 - Position data block
2 - Delta data
3 - Sectional alignment table data
4 - Data for temporary offsets
5 - Program data
6 - Tool data
7 - Instrument setting data
In the case of error, a message will appear on the LCD indicating the type of error found. At this point the data area involved in the error can be reset by pressing the **[⊕]** key twice, or left unvaried by pressing the **[.]** key.

The error messages that may be displayed are the following:

BLOCK DIMENSION
ERROR

DELTA MEMORY
ERROR

LINEAR
ERROR   (*)

ORIGINS MEMORY
ERROR

TOOLS MEMORY
ERROR

PROGRAM MEMORY
ERROR

E2PROM MEMORY
ERROR   (*)

(*) Cause immediate access to the instrument Preset phase.

BAT-BOX presence check

If the visualiser is fed by the BAT-BOX and its battery is flat at the start, the LCD will display the message:

**BATTERY
ERROR**

In this case press button **[.]** and wait for the display of the absolute references.

Check the Microprocessor memory

If there is an error in the microprocessor, the visualiser becomes locked.
In that case call for assistance immediately.

Keyboard, display and LCD
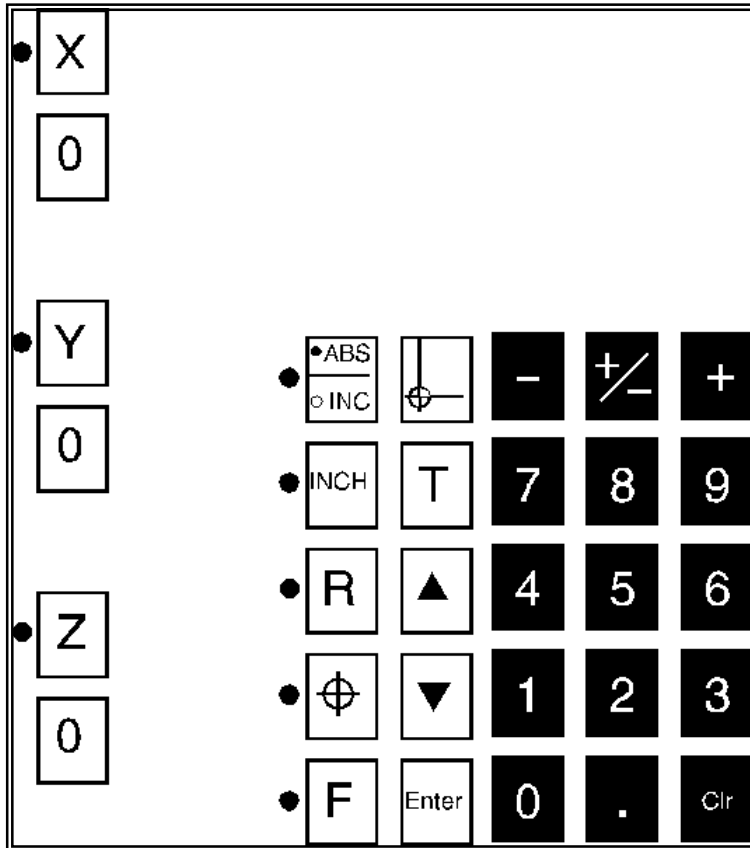
Technical description of keyboard

The keyboard is made of waterproof polyester which is oil-proof and insensitive to solvents, but sensitive to touch when the keys are pressed.
There are 31 keys, 8 of which are fitted with luminous indicators (LEDs) for immediate recognition of special modes or the functional status of the visualiser itself.

Description of keys

A brief description of the function of the individual keys is given below.

[X] [Y] [Z]

These keys are also used in absolute mode during the Set Point. They are the keys for selecting the axes in incremental mode. The condition of the axis selected is indicated by the LED of the key coming on. Any numerical settings made from the keyboard are accepted for selected axes only.

[ZERO]

This serves for setting the selected axis to zero, and can be used both in incremental and absolute mode.
The incremental positions are set at zero by simply pressing the **[ZERO]** key, while to set absolute values to zero the key must be pressed twice, the first time causing the value to flash. If the **[ZERO]** key is pressed by accident (Absolute value flashing), press any other key.

[ABS/INC]

Selects absolute or incremental mode, the first being indicated by the LED of the key coming on.

[INCH]

Selects the measuring unit to be used while the instrument is working. The use of inches is indicated by the relative LED coming on.
Since the visualizer must add two more digits so that the display conforms to the accuracy of the scale, the datum converted into inches may not be shown on the display.
In this case, dotted lines will appear on the display ("---.----") to indicate the overflow condition. Naturally, it is always possible to switch to millimetres without loosing the current dimension.

[R]

Converts the display of the dimension of a radius into a diameter and vice-versa.
This conversion can be activated on only one of the linear axes that is managed and selected during the commissioning phase (see Presetting Procedure).
The use of the display of the radius is indicated by the LED of the key coming on.

[⊕] (REFPOINT)

With this key, the Set Point procedure can be enabled, by means of which it is possible to determine the only point on the axis to which the absolute dimensions for that particular axis will be referred.
The operator can use the **[⊕]** keys in association with keys **[X] [Y] [Z]** to enable the Set Point procedure for the desired axes only.

[F]

A function can be called with this key in incremental mode.
By pressing the numerical keys, one of the functions can be called, for example by pressing **[0] [4]** function 4 will be carried out. To obtain a list of all the available functions, once the **[F]** key has been pressed, use the **[▲] [▼]** to move up and down the list (the number of each function will be displayed together with a description). To activate the selected function, press **[ENTER]** .
Refer to the chapter on functions for further details.

[ORIG]

This key serves for entering into the phase of selecting a Temporary Offset to be set.
Refer to the chapter on functions for further details.

[T]

This key serves for selecting a tool to be used.
Refer to the chapter on functions for further details.

[▲][▼]

These two keys are used for making selections and for moving up and down the lists of values and parameters.
Refer to the chapter on functions for further details.

[ENTER]

Serves for confirming all the numerical values entered, with the exclusion of those entered in incremental mode with selected axes.

[+] [-]

The visualiser can be used as a normal electronic calculator. On pressing **[+]** or **[-]** the set number, the incremental value is added or subtracted on the axis selected in incremental mode, determining a new value.
The result of the addition or subtraction appears on the display and the axes are automatically unselected (the LEDs of keys X, Y or Z go out).
The **[-]** key is also used for setting the frozen value as an incremental offset.

[+/-]

Serves for setting negative values.
If pressed after a value has been set, it changes the sign (the value becomes negative).
If **[+/-]** is pressed again, the displayed value returns positive.

Example

Value set:	123
Pressing **[+/-]** it becomes:	-123
Pressing **[+/-]** again, it returns to:	123

[0][1][2]....[9]

These keys are used for entering numerical values such as axis positions for movements in incremental mode.

[.]

Used as a decimal point when entering data with decimal figures.

[CLR]

Serves for deleting an incorrect entry in a phase of entering data or positions.
When entering a value in incremental mode causes the value of the selected axis to return to zero on the display.
This key is also used in combination with the **[F]** key for interrupting the execution of the functions (see relative chapter).
This key also permits the value displayed in that moment to be frozen (not to be used in the phase of setting or executing a function) and then de-frozen (also for freezing from the probe).

Description of display and LCD

The visualiser has three 7 segment displays and one LCD display with 32 characters (top right, above the keyboard).
The 7 segment displays are used for showing values, while the LCD display is able to display messages for guiding the operator to write in the necessary data.
The LCD display is the main feature of VISODATA PLUS; this simplifies the job of the operator by displaying helpful messages during the various working phases.

Absolute and incremental movement

Functions

It is possible to work from mechanical drawings with both absolute and incremental dimensions, without the operator having to keep on making calculations.

Method of calling

Press: **[ABS/INC]**.

Absolute mode
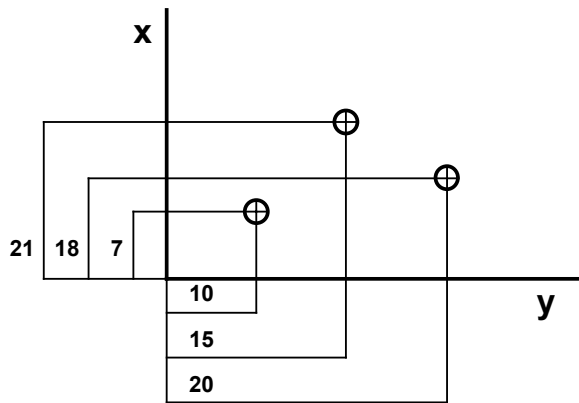
To select absolute mode

Pressing the **[ABS/INC]** key causes the relative LED to come on. In this way the current absolute values are displayed.
Absolute values means the dimension referred to a single point of the axis, known as the **Absolute Zero.** This point can be calculated with the Set Point procedure (a physical point of the axis), with the zero of the workpiece (zero point referred to a point on the workpiece being machined) or by simply pressing the **[ZERO]** key of the desired axis.

Movement in absolute mode

Having selected absolute mode, move along the desired axis until the established machining dimension is reached.

Example

We are on the X axis, at the current value of 1000.00 and we want to move to the value 1100.78 .
Move the X axis until the value 1100.78 is displayed.

Incremental mode
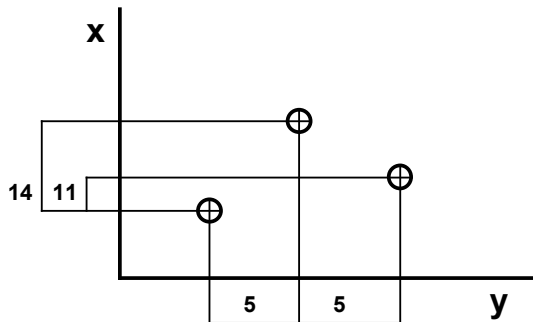
To select incremental mode

To select the incremental mode, press the **[ABS/INC]** key switching out the LED. In this way, the current incremental values are displayed.
Incremental values means the dimension referred to the previous position, a position which in practice becomes the offset. In turn, the new position will take on the significance of a new offset.

Movement in incremental mode

Having selected the incremental mode, the value of the movement to be made must be set, then the displayed value must be set at 0.
Imagine that that a movement must be made in incremental mode of a value of 123.45 on the X axis.
A list is given below showing the operations that must be carried out to obtain the desired incremental dimension.

[ABS/INC]
The LED of the key goes out and the display shows the incremental values.

[ZERO] axis X
The value of the incremental position of the axis is 0.00 .

[X]
The axis LED starts to flash and the display for the X axis shows the latest value set in incremental.

[1] [2] [3] [.] [4] [5]
The X axis display shows a value of 123.45

[+]
The display goes blank for an instant then comes back showing the result of the sum 123.45 which is the new incremental value of axis X.
Move the X axis taking the displayed value to zero.

Selecting an axis: latest setting

When an axis is selected, the axis display shows the latest setting made from the numerical keyboard and used for presetting a new value of the incremental position.
Referring back to the example in the previous paragraph, the setting made and used to modify the incremental value is: 123.45 .

Setting several axes simultaneously

If an incremental movement of equal value is to be made on more than one axis, the operations described above must be repeated pressing, as well as the X key, the keys for the other axes to be included in the incremental movement.

Set-point procedure

The Set Point procedure serves for determining the position of the **Absolute Zero** of the axis, this being the point to which all absolute values are referred.

This point, calculated through the Set Point procedure, features the simultaneous presence of the **Machine Zero Input** and the **Scale Zero Notch**; It is therefore a fixed point, peculiar to each axis and each machine tool.

The procedure is enabled in absolute mode only by pressing **[⊕]** key.

The LEDs of the following keys will light up:

[⊕] Set Point procedure enabled.
[X] Set point procedure enabled for axis X.
[Y] Set point procedure enabled for axis Y.
[Z] Set point procedure enabled for axis Z.

With this simple operation the visualizer is ready for determining the absolute zero of all the axes managed.

If the user wants to carry out the set point procedure on one axis only, the axes that are not involved in the operation can be disabled by simply pressing the axis selection keys.

For example, to carry out the set point procedure on the X axis only, a list is given below of all the procedures necessary:

- Press key **[⊕]** causing the LEDs of keys **[⊕] [X] [Y] [Z]** to light up.

- Press keys **[Z]** and **[Y]** and the respective LEDs go out. The procedure remains enabled for axis X only (LED still lit up).

- Move the X axis as far as the **Machine Zero** limit (limitswitch, proximity switch or similar device).

The simultaneous presence of the **Machine Zero** input and the **Scale Zero Reference** causes the absolute value of axis X to return to zero and the LEDs for keys **[⊕]** and **[X]** to switch off, showing that the Set Point procedure is finished.

Note
The set point procedure also causes the incremental value of the axis involved to return to zero. Therefore, having carried out the procedure, the absolute value will be the same as the incremental value.

Workpiece Zero

Function

This serves for machining with the **Absolute Zero** on the workpiece itself.

It is the result of the intersection of the co-ordinates on approaching and touching the workpiece with the tool.

The operator will then need to calculate the true workpiece zero, meaning that having touched the workpiece he will have to take into account the radius of the tool used.

Search for workpiece zero

Press the **[ABS/INC]** key to position in absolute mode (key LED on). Move the tool towards the point of the workpiece that is to be considered zero.

Touch the workpiece and set the values at zero by pressing the **[ZERO]** keys of the axes involved.

At this point a movement must be made towards the workpiece equal to the radius of the tool used. Move the tool and, having reached the value of the radius, press the **[ZERO]** key of the axes involved twice.

To facilitate these operations, the function Workpiece Zero (F20) can be used, by means of which the operator will see the value of the tool radius displayed, and once the true zero point of the workpiece has been reached and confirmed, the axes will be set to zero automatically.

Warning
For the movement towards the workpiece zero, a tool must have been previously mounted; the axes involved in the movement of the value of the radius are axes X and Y.

Conversions

Inches - millimetres

Function

This function converts values from mm. to inches and vice-versa and immediately shows the results on the displays.

Warning
Converting from mm. to inches, the values are displayed with a greater number of decimals, so that the same accuracy can be maintained. In this way, it is possible to obtain a value in inches that is not displayed since it requires a number of figures that are not available, so instead of the value, a dotted line is displayed (-------). This does not cause the loss of any values, and on returning the display to millimetres the old value appears.

Selecting millimetres

On pressing the **[INCH]** key, the relative LED goes out.

Selecting inches

On pressing the **[INCH]** key, the relative LED comes on.

Radius - diameter

Function

This function converts and immediately displays the values of an axis (predefined in the VISODATA PLUS commissioning phase) from the value of a radius to that of a diameter. The function is useful when working with a lathe.

Selecting radius

On pressing the **[R]** key, the relative LED comes on.

Selecting diameter

On pressing the **[R]** key, the relative LED goes out.

Calls

Setting the offset to be used

Function

This function calls an offset from the offset file, created with function (F07).

How to call

Press: **[ORIG]**.

How to quit

Press: **[F] [CLR]**.

To select an Offset

The following message is displayed on the LCD:

SET OFFSET
n. : _

Using the numerical keys, enter the number of the desired offset. If a temporary offset is to be used, enter a number from 1 to 9, and the current offset is to used enter 0. The use of the **[CLR]** key deletes the value present at that moment. Press **[ENTER]** to confirm the value entered.

Set tool to be utilised

Function

This function calls a tool from the tool file, created with function (F08).
This function must also be used when the probe is to be utilised.
It is advisable to use the probe as tool number 1 to facilitate the utilisation and the search.

How to call

Press: **[T]**.

How to quit

Press: **[F][CLR]**.

Selecting a tool number

The following message appears on the LCD:

TOOL MOUNTED
N. : __

Using the numerical keys, enter the number of the desired tool (from 1 to 99). If the tool is to be de-activated, enter 0. The use of the **[CLR]** key deletes the value present at that moment. Press **[ENTER]** to confirm the value entered.

Lathe tool offsets

Function

This function guides the operator, by means of simple manoeuvres, in the calculation of the 2 tool offsets necessary for using a tool on a lathe.
The data resulting from these manoeuvres will be automatically memorised in the tool file present in the VISODATA PLUS memory.
This function is called workpiece heading, and must be carried out with the part to be turned already on the lathe and for all the tools that are to be used for machining it.

Warning
Carry out the Set Point procedure beforehand.

How to call

Press: **[F] [X]** to obtain the offset in X of the tool currently mounted.
Press: **[F] [Z]** to obtain the offset in Z of the tool currently mounted.

How to quit

Press: **[F] [CLR]**.

Warning
This function can only be called for VISODATA PLUS devices installed on lathes. There must also be a tool mounted, otherwise the LCD will display the message:

**TOOL NOT
INSERTED**

Calculation of offset for axis X (diameter)

Having mounted the desired tool (pressed **[T]** and entered the tool number), skim the diameter of the workpiece with the tool, then press keys **[F] [X]**, move the tool away from the workpiece and measure the diameter.
At this point the LCD will display:

**PIECE DIAMETER
0.00**

Using the numerical keys and the **[.]** key, enter the value of the diameter measured.
This value must be positive and greater than 0.

The **[CLR]** deletes the values entered up to that moment. Press **[ENTER]** to confirm the value entered.
Example of offset calculation for tool n.1

Warning
As previously stated, the Set Point procedure must have been carried out previously.

- Press **[T]** and enter the number 1. Confirm with **[ENTER]**.

- Take a test bar and set it in the spindle, and mount tool n. 1 as well:
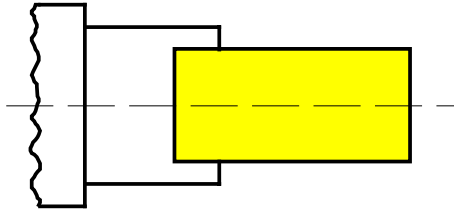
- Carry out a job with a tool.
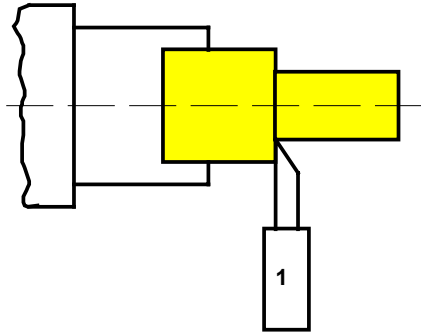
- Now press keys **[F][X]**. As a consequence, axis X will lock the values.

- Now move the tool away from the test bar.
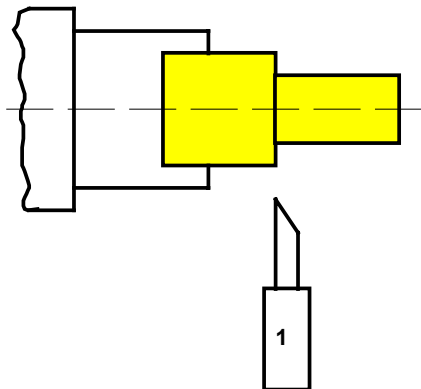
- The spindle can now be stopped and the diameter of the test bar measured with the gauge.
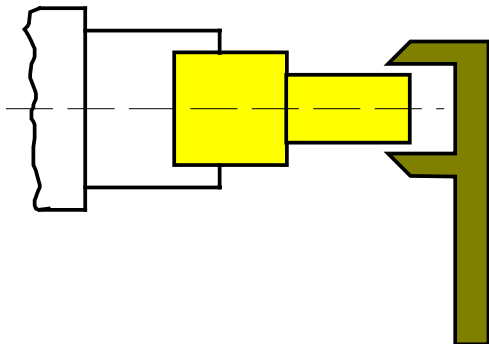
- Enter the value measured into the VISODATA PLUS then press **[ENTER]** to confirm.

In this way it will always be possible to know the correct diameter of the workpiece.

Calculation of offset for axis Z (length)

Having mounted the desired tool (pressed **[T]** and entered the tool number), skim the diameter of the workpiece with the tool, then press keys **[F] [Z]**.
At this point the LCD will display:

PIECE LENGTH
0.00

Using the numerical keys and the **[.]** key, enter the value of the length measured. This value must be positive and greater than 0.
The **[CLR]** deletes the values entered up to that moment. Press **[ENTER]** to confirm the value entered.

The operations to be carried out are the same as those described in the previous example.

Probe

Function

The probe is an external device that can be connected to the VISODATA PLUS (by means of a suitable connector).
This device supplies the machine with an impulse every time it touches an object, in this way reaching high precision for measurement checks.

Use of geometrical functions

In the VISODATA PLUS the probe can be used during the execution of geometrical functions such as the calculation of the mid point, the distance between two points, or the centre of a circumference that passes through three points. Normally in these functions the points are confirmed by pressing a key, but using the probe the points are located by the impulse supplied by the machine.
If the radius of the probe is to be taken into account when making measurements (the distance between two points and the centre of a circumference passing through three points) this radius must be set initially with the tool number of the probe (number 1 is advisable); the data of the probe (radius and length) must be previously set in the tool file.

Freezing values

Another use for the probe is that of freezing (or locking) values shown on the display at the moment in which the impulse is sent to the VISODATA PLUS.
When, during the normal use of the machine (not in the F functions), the impulse is received by VISODATA PLUS, the values displayed in that instant become locked (although any movement of the axes are still counted). At this point two operations can be carried out.

- Unlock the values : press **[CLR]**.
- Offset in frozen point (in incremental mode only): **[-]**.

Distance between two points

The procedure described above for setting an incremental offset in the frozen point can be used for calculating the distance between two points (in incremental mode only). Carry out the following operations:
- Touch the first point and the values become frozen.
- Press **[-]**.
- The values lock and the previously frozen point has become the offset.
- Touch the second point and the value, which will be frozen, is the exact distance between the two located points.

Warning
Freezing values must be enabled in the phase of presetting the machine parameters.

Transmission of values on the serial line

Every time that the VISODATA PLUS receives an impulse from the probe during normal machining (not in the F key function menu), or on pressing the **[+]** key, it sends the values calculated in that moment along the serial line.
The type of values transmitted depends on the choice made during the machine parameter presetting phase.
It can be decided whether to send always absolute values or always incremental values regardless of the selected mode, or to send the values in relation to the selected mode.

Freezing values with the CLR key

During normal machining (not in the F key function menu), on pressing the **[CLR]** key the values calculated in that moment are frozen on the display (any movements of the axes are however received). At this point two options are open:

- Defreeze the values: press **[CLR]**.
- Make an offset on the frozen point (in incremental only): press **[-]**.

Distance between two points

The procedure described above for setting an incremental offset in the frozen point can be used for calculating the distance between two points (in incremental mode only). Carry out the following operations:
- Touch the first point, press **[CLR]** and the values become frozen.
- Press **[-]**.
- The values lock and the previously frozen point has become the offset.
- Touch the second point and the value, which will be frozen, is the exact distance between the two located points.

Warning
Freezing values must be enabled in the phase of presetting the machine parameters.

F key functions

Switch off

Function

This serves for temporarily inhibiting the use of the display, LEDs and LCD.
It can be used during breaks, this way the power consumed by the machine decreases noticeably.

Warning
VISODATA PLUS is not completely switched off; if the axes are moved, the values are modified.

How to call

Press: **[F][0][0]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 00
SWITCH OFF

How to quit

Press any key.

Memorise delta

Function

Serves for memorising the absolute distance (DELTA) of the current point from the true absolute offset.
This function is used in cases where it is impossible to lock the axes to restart machining.

How to call

Press: **[F][0][1]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 01
STORE DELTA

Recall delta

Function

Serves for repositioning on the point on which the DELTA memorising function was called (F02).
When the machine is switched on (supposing that the DELTA point has been previously memorized), first carry out the Set Point procedure and then call the DELTA value.
Having called the function, the incremental values present on the display must be set at zero. Now the machine is in the exact point that it was in when the DELTA value was memorised before the machine was switched off.

How to call

Press: **[F][0][2]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 02
RECALL DELTA

Block dimensions

Function

This serves for memorising the status of the machine when the axes have been locked.
This way, when the machine is switched on again, it will be in the same conditions as when it was switched off.

How to call

Press: **[F][0][3]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 03
BLOCK DIMENSION

Once this function has been selected, all the displays and LEDs will go out and the following message will appear on the LCD:

SWITCH OFF
VISODATA PLUS

At this point switch the machine off and lock the axes.

Calculation of mid point between two points

Function

Serves for positioning a tool in the mid point between two selected points of a plane. The mid point can be calculated by two methods.

Mid point without the use of function F 04

This method is quicker, but can only be used in incremental mode.
The following operations must be carried out:

- Touch the first point and then zero out the incremental value by pressing **[ZERO]** for the desired axis.
- Touch the second point and press **[2][X]** to find the mid point for axis X; to find it for all the axes press **[2][Y]** and **[2][Z]** as well.
- Bring the incremental values of the desired axes to 0.00.

Warning
Using this function in ABS mode, the absolute offset will be set in the mid point calculated.

How to call

Press: **[F][0][4]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 04
MID POINT

How to quit

Press **[F][CLR]**.

Select operative mode

The method by which the mid point is to be found must be selected: The LCD will display the following message:

SELECT → ABS
MODE   INC

Using the **[ABS/INC]** or the **[▲] [▼]** keys select the chosen method by moving the symbol → so that it indicates the desired mode. The LED for the ABS/INC mode will go on or off according to the mode selected. Press **[ENTER]** to confirm the selection.

To select a couple of axes

The couple of axes must be selected that make up the plane on which the two points involved are situated. The LCD will display the message:

SELECT AXES
→ XY XZ YZ

Using keys **[▲][▼]** the couple of axes desired is selected by moving the arrow symbol and the LEDs of these axes will come on. Press **[ENTER]** to confirm the selection.

To select the first point

The first point on the machining plane formed of a couple of axes selected through the previous operation must be selected.
The LCD will show the following message:

ENTER TO CONFIRM
POINT 1

Move the selected axes to the desired point.
Press **[ENTER]** to confirm the selection of the point.

To select the second point

The second point must now be selected so that the mid point can be calculated.
The LCD will display the following message.

ENTER TO CONFIRM
POINT 2

Now move the selected axes to the desired point. Press **[ENTER]** to confirm the selection of the point.
At this stage VISODATA PLUS automatically calculates the values for obtaining the movement necessary to reach the mid point between the two previously selected points.
The values of the axes that form the selected working plane will become zero when the axes are moved and positioned on the calculated mid point.

Calculate centre of circumference by three points

Function

Serves for positioning the tool in the centre of a circumference which passes through three selected points in a plane.

Warning
Using this function in ABS mode the absolute offset will be set in the centre of the circumference calculated.

How to call

Press: **[F][0][5]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 05
CIRC. CENTRE

How to quit

Press: **[F][CLR]**.

Select method of measuring

The method or type of measuring to be used must be selected for touching the point with the tool. This can be carried out in three ways:

- **Central** : the centre of the tip of the tool touches the points.

- **Internal** : the points are touches with the side of the tool arriving from inside the circumference.
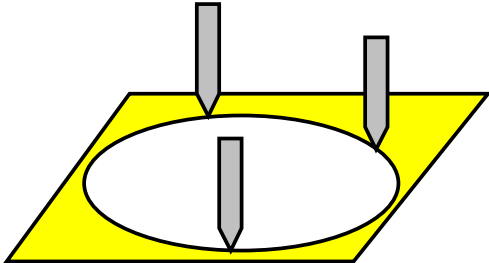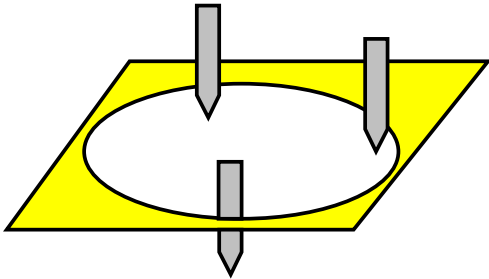
- **External** : the points are touched with the side of the tool arriving from outside the circumference.
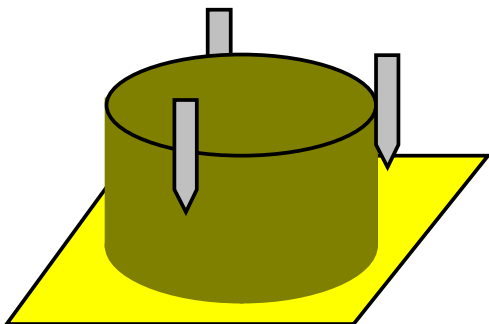
The following message will appear on the LCD:

MEASURING TYPE
→ **IN Ex CE**

(whereby **IN** internal **EX** external and **CE** central)

Using keys **[▲][▼]** select the type of measuring desired by moving the arrow symbol → until it indicates the desired method. Press **[ENTER]** to confirm the selection.
If internal or external measuring are selected, the tool must be loaded and have valid parameters (not null).
If these conditions are not found, the following messages may appear on the LCD display:

TOOL NOT
INSERTED

TOOL WITH

NULL VALUES

To select operative mode

Select the operative mode that is to be used for finding the centre of the circumference. The following message will appear on the LCD:

SELECT → ABS
MODE   INC

Using the **[ABS/INC]** or the **[▲][▼]** select the chosen mode by moving the arrow until it indicates the desired method. The ABS/INC key LED will go on or off according to the selected mode. Press **[ENTER]** to confirm the selection.

To select a couple of axes

The two axes that constitute the working plane on which the three points are situated must be selected for finding the centre of the circumference.
The following message is displayed on the LCD:

SELECT AXES
→ XY XZ YZ

Using keys **[▲][▼]** select the desired couple of axes by moving the arrow symbol, and the LEDs of the axes indicated will light up. Press **[ENTER]** to confirm the selection.

To select the first point

Select the first point on the plane formed by the couple of axes selected by the previous operation. The LCD will display the following message:

ENTER TO CONFIRM
POINT 1

Move the selected axes to the desired point.
Press **[ENTER]** to confirm the selection of the point.

To select the second point

Select the second point on the plane formed by the couple of axes selected by the previous operation. The LCD will display the following message:

ENTER TO CONFIRM
POINT 2

Move the selected axes to the desired point.
Press **[ENTER]** to confirm the selection of the point.

To select the third point

Select the second point on the plane formed by the couple of axes selected by the previous operation. The LCD will display the following message:

ENTER TO CONFIRM
POINT 3

Move the selected axes to the desired point.
Press **[ENTER]** to confirm the selection of the point.

VISODATA PLUS now automatically calculates the diameter of the circumference passing through the three selected points. If no circumference passes through the three selected points, in other words the three points are on the same line or have coinciding points, the LCD will display the following message:

CIRCUMFERENCE
IMPOSSIBLE

If the selected points are correct, the value of the diameter of the circumference is displayed:

D: 123.45
ENTER CONFIRM

Press **[ENTER]**. To position in the centre of the circumference, zero out the values that will be displayed on the couple of axes the form the plane on which the circumference has been calculated. Press **[CLR]** if the values are not to be modified (if the function has been used only to calculate the diameter of the circumference).

To calculate the distance between two points

Function

Measures the distance between two selected points in a plane.

How to call

Press: **[F][0][6]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 06
**DISTANCE 2 POINTS**
How to quit

Press: **[F][CLR]**.

Select method of measuring

The method or type of measuring to be used must be selected for touching the point with the tool. This can be carried out in three ways:

- **Central** : the centre of the tip of the tool touches the points.
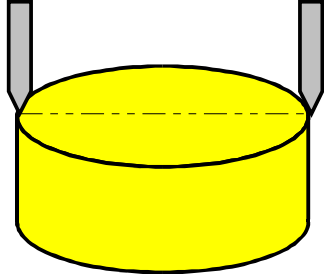
- **Internal** : the points are touched with the edge of the tool approaching from within the two points.
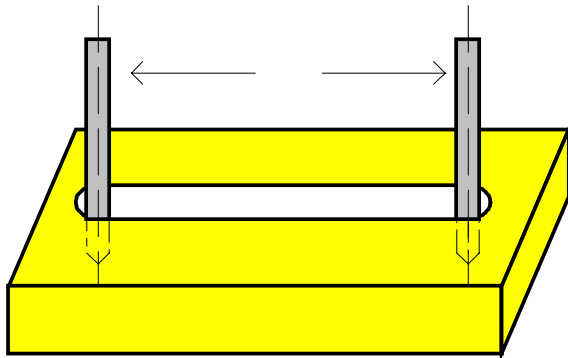
- **External** : the points are touched with the edge of the tool approaching from outside the two points.
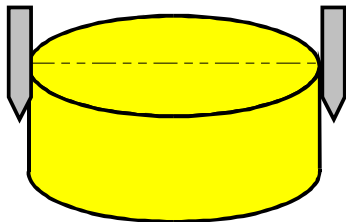
The following message will appear on the LCD:

TYPE OF MEASURING
→ IN EX CE

(whereby **IN** internal **EX** external and **CE** central)

Using keys **[▲][▼]** select the type of measuring desired by moving the arrow symbol → until it indicates the desired method. Press **[ENTER]** to confirm the selection.
If internal or external measuring are selected, the tool must be loaded and have valid parameters (not null).
If these conditions are not found, the following messages may appear on the LCD display:

TOOL NOT
INSERTED

TOOL WITH
NULL VALUES

To select operative mode

Select the operative mode that is to be used for finding the centre of the circumference. The following message will appear on the LCD:

SELECT → ABS
MODE   INC

Using the **[ABS/INC]** or the **[▲][▼]** select the chosen mode by moving the arrow until it indicates the desired method. The ABS/INC key LED will go on or off according to the selected mode. Press **[ENTER]** to confirm the selection.

To select a couple of axes

The two axes that constitute the working plane on which the three points are situated must be selected for finding the centre of the circumference.
The following message is displayed on the LCD:

SELECT AXES
→ XY XZ YZ

Using keys **[▲][▼]** select the desired couple of axes by moving the arrow symbol, and the LEDs of the axes indicated will light up. Press **[ENTER]** to confirm the selection.

To select the first point

Select the first point on the plane formed by the couple of axes selected by the previous operation. The LCD will display the following message:

ENTER TO CONFIRM
POINT 1

Move the selected axes to the desired point.
Press **[ENTER]** to confirm the selection of the point.

To select the second point

Select the second point on the plane formed by the couple of axes selected by the previous operation. The LCD will display the following message:

ENTER TO CONFIRM
POINT 2

Move the selected axes to the desired point.
Press **[ENTER]** to confirm the selection of the point.

VISODATA PLUS now automatically calculates the distance between the two selected points.
The LCD displays the following message:

DISTANCE 2 POINT
124.23

Editing the offset file

Function

This serves for editing the values of the 9 temporary offsets available that can be called in by means of a number. These offsets prove useful when machine a part with dimensions referred to several offsets.

How to call

Press: **[F][ORIG]**.
or
Press: **[F][0][7]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 07
EDIT OFFSETS

How to quit without saving data

To interrupt the file editing phase without saving the modified data, press **[F] [CLR]**.

Memorising and exit

Having finished entering all the desired offset parameters, press **[F] [ENTER]** and all the edited values will be saved.

Moving among the various offsets and their parameters

Every offset has three values: axis X, axis Y, axis Z .
The top line of the LCD shows the number of the currently displayed offset.
The second line of the LCD shows the value of the offset that can be modified
Press the **[▲][▼]** keys to pass among the various parameters of the offset and among the various offsets. The passage from one offset to another can be seen by the number on the top line of the LCD, which changes according to the offset displayed.

Position on a desired offset number

To pass directly to a desired offset number press **[T]** .
The number of the current offset will be replaced by a flashing hyphen.
Press the number of the desired offset (1..9). On pressing **[CLR]** the repositioning phase is abandoned and the current offset number is displayed once more.
Press **[ENTER]** to confirm the number of the offset entered and the parameter of the selected offset will be displayed.

Enter offset value

Once positioned on the desired offset number and on the value of the axis to be modified, use the numerical keys to enter the new value. When a key is pressed the displayed number will start to flash.
With the **[+/-]** key, the sign of the value entered at that moment can be modified.
In this case also (as in all the phases of entering numbers) on pressing the **[CLR]** key the original value that was current before the modification will be restored. Press **[ENTER]** to confirm the newly entered value.

Extraction of current dimension value

On pressing key **[X]** or **[Y]** or **[Z]** the value of the dimension relative to the key that was pressed will be copied in the parameter of the offset that is currently being modified.
This operation cannot be carried out in the phase of setting numbers.

Editing the tool file

Function

This serves for editing the values of the parameters (length and radius) of the 99 tools available in the file. These values will be used when the operator selects the use of a tool present in the file.
The operator has no need to set the values of length and radius every time, but simply call the tool by its number.

Note
For a lathe, the file can be created automatically by using the automatic tool offset calculation [F][X] and [F][Z].

How to call

Press: **[F][T]**.
or
Press: **[F][0][8]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 08
EDIT TOOLS

How to quit without saving data

To interrupt the file editing phase without saving the modified data, press **[F] [CLR]**.

Memorising and exit

Having finished entering all the desired tool parameters, press **[F] [ENTER]** and all the edited values will be saved.

Moving among the various tools and their parameters

Every tool has 2 values: Radius and Length.
The top line of the LCD shows the number of the currently displayed tool.
The second line of the LCD shows the value of the parameter that can be modified.
Press the **[▲][▼]** keys to pass among the various parameters of the tool and among the various tools. The passage from one tool to another can be seen by the number on the top line of the LCD, which changes according to the tool displayed.

Position on a desired tool number

To pass directly to a desired tool number press **[T]** .
The number of the current tool will be replaced by a flashing hyphen.
Press the number of the desired tool (1..99). On pressing **[CLR]** the repositioning phase is abandoned and the current tool number is displayed once more.
Press **[ENTER]** to confirm the number entered and the parameter of the selected tool will be displayed.

Enter radius/length value

Once positioned on the number of the desired tool and on the value of radius or length to be modified, use the numerical keys to enter the new value. When a key is pressed the displayed number will start to flash.
With the **[+/-]** key, the sign of the value entered at that moment can be modified.

In this case also (as in all the phases of entering numbers) on pressing the **[CLR]** key the original value that was current before the modification will be restored. Press **[ENTER]** to confirm the newly entered value.

Extraction of current dimension value

On pressing key **[X]** or **[Y]** or **[Z]** the value of the dimension relative to the key that was pressed will be copied in the parameter of the tool that is currently being modified.
This operation cannot be carried out in the phase of setting numbers.

Deg - dms conversion

Function

Serves for converting degrees from decimal mode (e.g. 15.17 decimal value) into sexagesimal mode (e.g. 15' 25" 00''' degrees, minutes, seconds).

Note
This function can be enabled only if at least one angular axis was set up during the VISODATA PLUS commissioning phase.
If no angular axes have been set up, the following message will be displayed:

NO ANGULAR
AXES EXIST

How to call

Press: **[F][0][9]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 09
conv. deg-dms

How to quit

Press: **[F][CLR]**.

Select mode for displaying degrees

The following message appears on the LCD

CONV   → ON
DEG-DMS   OFF

Using the **[▲][▼]** keys select the mode desired by moving the arrow to **ON** if the degrees are to be converted from decimal to sexagesimal mode.
Press **[ENTER]** to confirm the selection.

Operator test

Function

This function serves for testing an instrument (display, LED, external memory, eprom). In this way the operator can make a general check on the machine at any time.

How to call

Press: **[F][1][0]**.

or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 10
OPERATOR TEST

Test Display and LEDs

The following message appears on the LCD:

TEST DISPLAY
AND LEDS

After a few seconds the test starts automatically: all the Displays and LEDs start to flash. If a part of a display or a LED fails to come on, it means that it is burnt out and must be replaced.
Press a key to pass on to the next test.

Test External Microprocessor memory

The following message appears on the LCD:

EXTERNAL MEMORY
TEST

After a few seconds the test starts automatically: a test will be made on the external memory of the instrument.
If no errors are detected, the next test is made, or otherwise an error message is displayed for a few seconds.

Test Microprocessor Eprom Memory

The following message appears on the LCD:

TEST
EPROM MICROPROC.

After a few seconds the test starts automatically: a test will be made on the external memory of the instrument.
If no errors are detected, the next test is made, or otherwise an error message is displayed for a few seconds.

Relay outputs

Function

The 3 relay outputs can be used in 2 different ways, A and B. The selection of the method to be used is made during the machine parameter presetting phase.

Note
The use of the zero relays is only possible if these relays were enabled during the VISODATA PLUS commissioning phase. The check on the status of the values is only made in incremental mode and for axes with only one scale associated.

Mode A : one stop output per axis

An output relay is associated to each axis (stop relay) and for each axis a value without a sign must be programmed (stop value, set during the parameter presetting phase).
When the axis reaches the pre-established position, the relay associated to the axis is de-activated. With this method of working, the correspondence between axes and relays remains unchanged.

Relay 1 = Axis X
Relay 2 = Axis Y
Relay 3 = Axis Z

Example

Relay 1 wired to the motor that positions axis X. Stop value X = 0.00
Relay 2 wired to the motor that positions axis Y. Stop value Y = 1.00

Axis X must be moved 30.00 in incremental, and axis Y 40.00.

- Select the incremental mode by pressing the **[ABS/INC]** key.
- Zero out the incremental value for axis X, by pressing the axis **[ZERO]** key.
- Zero out the incremental value for axis Y, by pressing the axis **[ZERO]** key.
- Press **[X]** and enter the value 30.00 confirming with **[+]**.
- Press **[Y]** and enter the value 40.00 confirming with **[+]**.
- Press **[F] [1] [1]**.
- Enable the relay of axis X by pressing **[X]**, and the message ON will appear next to the axis symbol.
- Enable the relay of axis Y by pressing **[Y]**, and the message ON will appear next to the axis symbol.
- Exit from the functions menu by pressing **[ENTER]**.

The X axis relay is activated and remains so until the incremental value of the axis becomes 0.00.

The Y axis relay is activated and remains so until the incremental value of the axis becomes 1.00.

The same goes for a movement with a negative value; the comparison is made on the values without considering their sign.
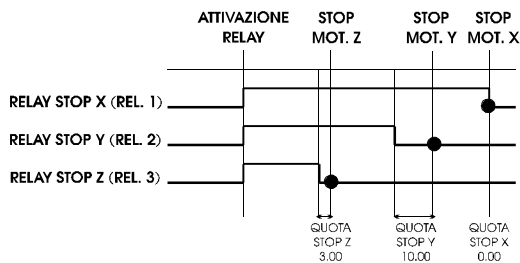
Mode B : stop + deceleration output that can be associated to one axis at a time

Using this method, the following relays can be associated to an axis of the VISODATA PLUS (the axes must be selected one at a time).

Relay 1 = Stop relay
Relay 2 = Deceleration relay
Relay 3 = Direction relay

For each axis a value without sign is programmed (stop value), while the deceleration value is the same for all the axes. When the axis reaches pre-established deceleration point, the deceleration relay (relay 2) is de-activated. Then on reaching the stop point, the stop relay (relay 1) is also de-activated.
The direction relay (relay 3) is active or not active depending on the sign of the current incremental value at the moment of exiting from this function by pressing **[ENTER]**. If the incremental value of the axis is positive, the relay will remain inactive, otherwise it will be activated.

Example

Stop and deceleration relays wired to the motor that positions axis X.
Stop value X = 0.00, deceleration value = 10.00.
The axis must be moved 30.000 in incremental.

- Select incremental mode by pressing **[ABS/INC] .**
- Zero out the incremental value of axis X by pressing the axis **[ZERO]** key.
- Press **[X]** and enter the value 30.00 confirming with **[+]**.
- Press **[F] [1] [1]**.
- Enable the stop and deceleration relays associating them to axis X by pressing **[X]**. Next to the symbol of the axis, the message ON will appear.
- Exit from the menu of functions by pressing **[ENTER]**.

Relay 3 will be de-activated while relays 1 and 2 will be activated and will remain so until the incremental value of the X axis reaches 10.00 for the deceleration relay and 0.00 for the stop relay.
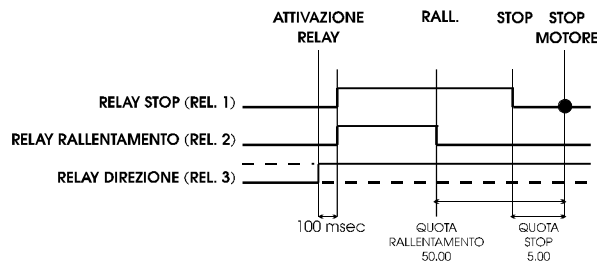
How to call

Press: **[F][1][1]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

**FUNCTION 11
ENABLE RELAY**

How to quit

Press: **[F] [CLR]**.

Select relay status (one relay for each axis)

The following message will be displayed on the LCD (example with no relay activated):

**set relay
x=.. y=.. z=..**

Use the **[X] [Y] [Z]** keys to activate the stop relays of the desired axes. The message ON must appear beside the name of the desired axes.
Press **[ENTER]** to confirm the selection.

Select relay status (stop and deceleration relays)

The following message will be displayed on the LCD (example with no relay activated):

**set relay
x=.. y=.. z=..**

Using the **[X]** or **[Y]** or **[Z]** key activate the stop and deceleration relays associated to the desired axis. The message ON must appear beside the name of the desired axis.
Press **[ENTER]** to confirm the selection. At this point the sign of the incremental value that is to be taken to 0.00 is checked; if the sign is positive the direction relay is de-activated, if negative it is activated.

Edit program

Function

This serves for creating or modifying a machining program that can be carried out by the operator at any time.

How to call

Press: **[F][1][2]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 12
EDIT PROGRAM

How to quit without saving the modifications

Press: **[F][CLR]**.
The following message is displayed:

ABANDON
MODIFICATIONS

How to save modifications

Press: **[F][ENTER]**.
During the phase of modifying the program, the following message is displayed:

SAVING
PROGRAM

Select number of program to be created or modified

The following message is displayed on the LCD:

EDIT PROGRAM
N. : __

Using the numerical keys, enter the number of the desired program. The **[CLR]** can be used for deleting the number entered. Press **[ENTER]** to confirm the number entered.

Display instruction on the LCD

Example of instruction

Movement in absolute of X axis to 14890 subtracting the radius of the tool used; the instruction is number 124 of program 12.

		Number of Program								Number of Instruction				
p	R	G		1	2			I	S	T	R		1	2	4
A	B	S	X	-	R					1	4	8	9	0	
	Type instruct.			Instruction suppl. Mill						Value instruction				

Number of program

This number indicates the number of the program (from 1 to 99) that is currently being modified and the number cannot be modified during the phase of entering or modifying instructions (it is a fixed field).

Number of instruction

This number indicates the number of the instruction (from 1 to 999) that is currently being modified and the number cannot be modified though it changes value on moving among the various instructions of the program.

Type of instruction

The following instructions can be selected:

- Absolute movement X: **ABSX**
- Absolute movement Y: **ABSY**
- Absolute movement Z: **ABSZ**
- Incremental movement X: I**NCX**
- Incremental movement Y: **INCY**
- Incremental movement Z: **INCZ**
- Incremental movement X+relay activation :   **RINX**
- Incremental movement Y+relay activation :   **RINY**
- Incremental movement Z+relay activation :   **RINZ**
- Offset change: **ORIG**
- Tool change: **TOOL**

Supplementary mill instruction

These instructions serve for taking into consideration the dimensions of the current tool during a movement. These instructions can only be selected when the VISODATA PLUS is installed on a milling machine. The following instructions can be selected:

- Add tool radius: **+R**
- Subtract tool radius: **- R**
- Add tool diameter: **+D**
- Subtract tool diameter: **- D**
- Add tool length: **+L**
- Subtract tool diameter: **- L**

Note
When an empty program is modified, the LCD initially displays only the number of the program and the number of the instruction.

To modify an instruction

To begin modifying or entering an instruction, start by pressing **[ENTER]**. This will cause the type of instruction to start flashing, that during the entry of a new instruction will be **ABSX** .

To select the **type of instruction** desired (the instruction type message must be flashing), press the **[▲][▼]** keys until the desired type of instruction is displayed. Press **[ENTER]** to confirm the selection made).

Having confirmed the type of instruction, if the VISODATA PLUS is installed on a milling machine, select the type of **supplementary instruction** desired. Press the **[▲][▼]** keys until the desired type of supplementary instruction desired is displayed (if no supplementary instruction is desired, select **_ _**). Press **[ENTER]** to confirm the selection made.

To enter the **value of the instruction** selected, the value must be flashing (it will be a value with decimals) for movement instructions, and a value without decimals for the instructions to change offset and set a tool.

Use the numerical keys, and **[+/-]** to enter the desired values, respecting the following limits:

- Movement instructions $\pm$ 99999.99
- Offset change 0..9
- Set tool 0..99

Press **[ENTER]** to confirm the number inserted and pass to the display of the next instruction.

Warning
*Instructions RINX RINY RINZ are not selected (accepted on pressing the **[ENTER]** key if the axis to which they are referred is associated to more than one scale.*

Note
*During any operation, in the phase of modifying an instruction, on pressing **[CLR]** **all the modifications made for that instruction are lost** and the old instruction displayed again.*

To move to the previous or following instruction

When in the phase of modifying an instruction it is not possible to move among the various instructions of a program.

In other conditions, to move to the next instruction (the instruction number incremented by 1) press the **[▲]** key. If this next instruction is empty, only the number of the program and of the instruction will be displayed.

If the current instruction is number 999, pressing **[▲]** will have no effect.

To move from the current instruction to the previous one (the number of the current instruct decreased by 1), press the **[▼]** key.

If the current instruction is number 1, pressing **[▼]** will have no effect.

To move to a desired instruction number

When in the phase of modifying an instruction it is not possible to move among the various instructions of a program.

To avoid having to press **[▲]** and **[▼]** repeatedly during movements between instructions with numbers that are a long way apart (e.g.: to move from instruction 12 to instruction 100), press **[T]** and the number of the current instruction will be replaced by flashing hyphens. Now enter the number of the desired instruction and confirm with **[ENTER]**. In this way the instruction will be displayed that corresponds to the number entered.

If, after confirming the number of the instruction entered, the flashing hyphens appear again, this means that the number of instruction entered was higher than the number of the last instruction present in the program.

To delete an instruction

When in the phase of modifying an instruction it is not possible to use this function.

To delete a program instruction, begin by displaying the desired instruction, then press keys **[F] [-]** in sequence.

In this way the instruction after the one that has been deleted will be displayed.

To insert an instruction between two existing instructions

When in the phase of modifying an instruction it is not possible to use this function.
To insert an instruction between two already present in the program, the instruction that must be moved to make room for the new one must be displayed. Now press keys **[F] [+]** in sequence.
Having done this, carry out the operations for modifying an instruction as described previously.

To delete a program

Function

This serves for deleting a program from the visualiser memory.
The function is useful for eliminating all those programs that have become obsolete, so that there is more space free for entering new programs.

How to call

Press: **[F][1][3]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following function on the LCD:

FUNCTION 13
DELETE PROGRAM

How to quit

Press **[F][CLR]** to exit during the phase of entering the number of the program to be deleted.

To select the number of the program to be deleted

The following message is displayed on the LCD:

DELETE PROGR.
N. : __

Using the numerical keys enter the number of the program to delete. Press **[CLR]** to delete the number entered in that moment, if desired.
Press **[ENTER]** to confirm the number entered.
If a program number has been entered that is not present in the memory, the following message will appear.

PROGRAM
NON EXISTENT

Otherwise, the following message will be displayed on the LCD for a few moments:

DELETING

To run a program

Function

This serves for running a program which is present in the memory of the visualiser.
It is possible to carry out jobs in mirror image or to scale by modifying the scale factors necessary.

How to call

Press: **[F][1][4]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 14
RUN PROGRAM

How to quit

Press: **[F][CLR]**.
The following message appears:

QUIT PROGRAM
RUN

Select number of program to run

The following message is displayed on the LCD:

RUN PROGRAM
N. : __

Use the numerical keys to enter the number of the desired program. On pressing **[CLR]** the number entered in that moment can be deleted.
Press **[ENTER]** to confirm the number entered.

To enter scale factors X Y Z

With these parameters it is possible to program in mirror image or to scale.
The following message is displayed on the LCD:

SCALE FACTOR X
　　　1.00

The number 1.00 will flash. If the program is to be carried out in scale 1:1 with no modification press **[ENTER]**.
Otherwise, using the numerical keys, the **[+/-]** key and the **[.]** key, enter the value of the desired scale factor (decimal number with sign).
Press **[ENTER]** to confirm the value; by pressing **[CLR]** it is possible to delete the value recently entered and return to the display of value 1.00.
Having entered the scale factor for axis X, the scale factors must now be entered for axes Y and Z using the same method.

The following examples make the concept clear:

Example 1

To double the proportions of the job.

scale factor X: 2.000
scale factor Y: 2.000
scale factor Z: 2.000
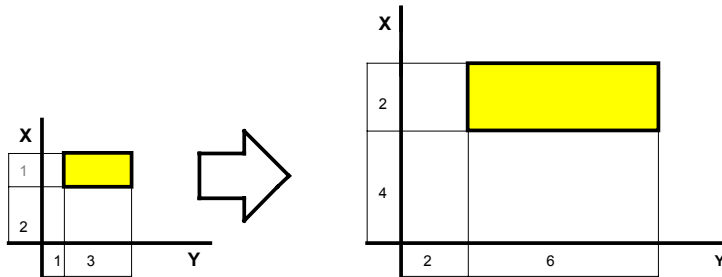
Example 2

To halve the proportions of the job.

scale factor X: 0.500
scale factor Y: 0.500
scale factor Z: 0.500

Example 3

To carry out the job in mirror image.

scale factor X: 1.000
scale factor Y: 1.000
scale factor Z: 1.000

To display the instructions to be carried out on the LCD

Example of instruction

Movement in absolute of X axis to 14890 subtracting the radius of the tool used; the instruction is number 124 of program 12.

```
              Number of  Program                    Number of Instruction
                       ∧                                        ∧
  ┌───┬───┬───┬───┬───┬───┬───┬───┬───┬───┬───┬───┬───┬───┬───┬───┐
  │ p │ R │ G │   │ 1 │ 2 │   │   │ I │ S │ T │ R │   │ 1 │ 2 │ 4 │
  ├───┼───┼───┼───┼───┼───┼───┼───┼───┼───┼───┼───┼───┼───┼───┼───┤
  │ A │ B │ S │ X │ - │ R │   │   │   │   │ 1 │ 4 │ 8 │ 9 │ 0 │   │
  └───┴───┴───┴───┴───┴───┴───┴───┴───┴───┴───┴───┴───┴───┴───┴───┘
          ∨                ∨                          ∨
        Type          Instruction              Value instruction
      instruct.       suppl. Mill
```

Number of program

This number indicates the number of the program (from 1 to 99) that is currently being run. The number flashes to differentiate the entering/modifying phase from the running phase, since in both cases the LCD displays identical messages.
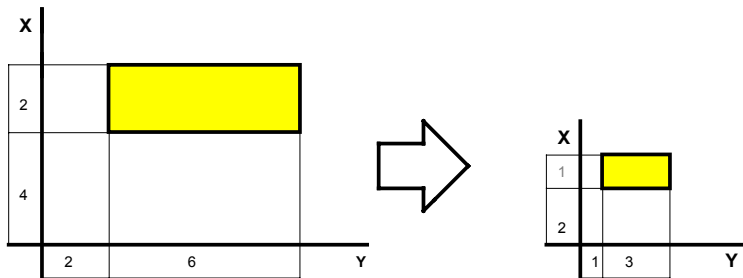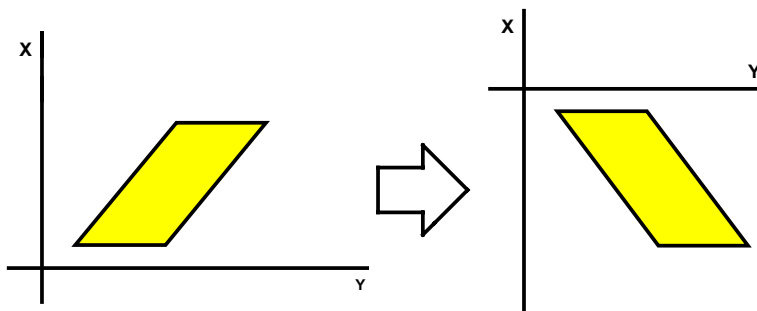
Number of instruction

This number indicates the number of the instruction (from 1 to 999) that is currently being displayed and that can be run.
The number will start flashing when the start of the execution of the instruction displayed has been confirmed with the **[ENTER]** key.

Repetition of an instruction or jump to next instruction

Use this modality for repeating the execution of a previous instruction or for skipping the displayed instruction and passing on to the next.
To move from the current instruction to the next (the instruction number incremented by 1) press **[▲]**.
If the current instruction is number 999, pressing the key will have no effect.
To return from the current instruction to the previous one (the number of the instruction minus 1), press **[▼]**. If the current instruction is number 1, pressing the key will have no effect.

Note
This function is only valid when the execution of the instruction displayed has not yet been confirmed.

To execute the instruction displayed

If the instruction displayed on the LCD at that moment is to be carried out, press **[ENTER]**.
If the execution of an offset change (ORIG) or a tool change (TOOL) has been confirmed, the next instruction to be carried out is immediately displayed.
Otherwise it is necessary to wait for the execution of the instruction to be concluded.
Having pressed **[ENTER]** the display will show the modified values relative to the instruction and the number of the instruction being carried out will flash.

To confirm the conclusion of the instruction displayed

Once the execution of an instruction has been concluded (apart from offset or tool change) press **[ENTER]** to inform the instrument of the event.
At this point the LCD will show the next instruction and the instruction number will stop flashing and remain fixed.
Execution of an instruction means bringing the values of the axis relative to the instruction to a value of 0.
When the last instruction has been carried out, the LCD will display the following message:

END OF PROGRAM
IN EXECUTION

Program printout

Function

This serves for making a paper printout of a program present in the VISODATA PLUS program memory. The corrections of a program become quicker and it is possible to file the drawing of the mechanical part together with the program that produces it.

How to call

Press: **[F][1][5]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 15
PRINT PROGRAM

How to quit

During the phase of entering the number of the program to be printed, keys **[F][CLR]** can be pressed to exit from the function.

Note
Before attempting to print, make sure that the printer is connected correctly to the device and check that the printer is switched on and On Line.

To select the number of the program to be printed

The following message appears on the LCD:

PRINT PROGRAM
N. __

Enter the number of the desired program (1..99) using the numerical keys. The **[CLR]** key can be pressed to delete the recently entered number. Press **[ENTER]** to confirm the number entered.
If the number of a program is entered that is not present in the memory, the following message appears:

PROGRAM
NON EXISTENT

During the printing phase, the number of the program being printed can be seen on the LCD together with the number of the instruction being printed currently.
The format of the printout is as shown below:

```
PROGRAM : 1

ORIG         9
ABSX  +R  12345.63
...............
.............
..........
........
......
....
INCZ      1234.45
TOOL         6
```

Note
If an EPSON LX 400 or compatible printer is used, the printout will be of a higher quality.

Conversion Feet - Inch

Function

This is used to convert from mm to feet.

Warning !!
If the feets conversion function is enabled and you insert an incremental value, using the keyboard, the value is always in inches !

Calling up the function

Press: **[F] [1] [6]**.
or
Press: **[F]**, use the keys **[▲][▼]** then confirm with **[ENTER]**, select on the display of the message:

FUN 16
feet

Method of interrupting

Press: **[F] [CLR]**.

To select feet display mode

The display will show the following message:

FEET- INCH
ON

Using keys **[▲][▼]** select the required mode by displaying the message ON to enable the feet conversion or OFF to inhibit it (inch are used).
Press **[ENTER]** to confirm the selection.

Examples

Number decimal digit NDEC=2

Mm mode	inch mode	feet mode
1760.30	**69.3031**	**509.3031**

The feets value 509.3031 means: 5 feets 09 inches 3031 part of inches
In this case you have 1 digit for the feets values

Number decimal digit NDEC=1

Mm mode	Inch mode	Feet mode
1760.3	**69.303**	**05.09.303**

The feets value 05.09.303 means: 05 feets 09 inches 303 part of inches.
In this case you have 2 digits for the feets values
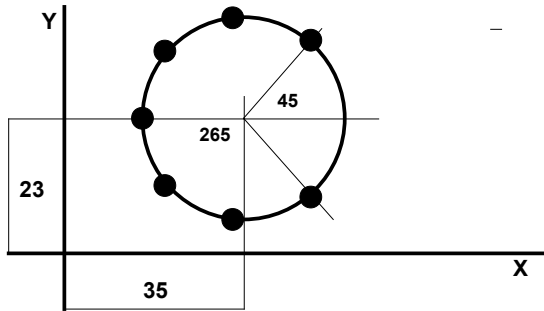
Number decimal digit NDEC=0

Mm mode	Inch mode	Feet mode
1760	**69.29**	**005.09.29**

The feets value 005.09.30 means: 005 feets 09 inches 303 part of inches
In this case you have 3 digits for the feets values

Note

• *To change the decimal digit value see the Preset Parameters Manual !*

Hole patterns

Function

This serves for creating a program for machining holes on a circumference. The program created by this function is memorized in the VISODATA PLUS memory and the number of the program must be entered by the user.

Warning
Use this function only when VISODATA PLUS is installed on a milling machine.

How to call

Press: **[F][1][8]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 18
HOLE PATTERNS

How to quit

Press: **[F][CLR]**.

To select couple of axes

The couple of axes must be selected that constitute the plane on which the circumference lies.
The following message is displayed on the LCD:

SELECT AXES
-> XY XZ YZ

Use the **[▲][▼]** to select the desired axes by moving the arrow. The LEDs of the selected axes will light up. Press **[ENTER]** to confirm the selection.

To enter the diameter of the circumference

The value of the diameter of the circumference must be entered and this cannot be 0.00. The following message is displayed on the LCD:

CROWN DIAMETER
       0.00

Using the numerical keys, **[+/-]**, and **[.]** enter the value of the diameter.
To delete the number just entered press **[CLR]** , and the value 0.00 will reappear. Press **[ENTER]** to confirm.

To enter the values of the centre of the circumference

The values of the centre of the circle must be entered; the values to enter are relative to the couple of axes selected.
Imagining that the axes selected previously was the couple X Y, the LCD will display the following message:

CROWN CENTER X
       0.00

Using the numerical keys, **[+/-]**, and **[.]** enter the desired value.
To delete the number just entered press **[CLR]**, and the initial value will reappear. Press **[ENTER]** to confirm.
Carry out the same procedure for establishing the centre on the other axis in the plane.

To enter the initial angle on the circumference

This parameter indicates the angle of the first hole to be machined on the circumference, and will be a value of between 0 and 360 degrees.
The following message is displayed on the LCD:

STARTING ANGLE
       0.00

Using the numerical keys, **[+/-]**, and **[.]** enter the desired value.
To delete the number just entered press **[CLR]**, and the initial value will reappear. Press **[ENTER]** to confirm the value entered.

To enter the angle of the amplitude of the flange

This parameter indicates the total amplitude of the flange in degrees and can assume a value of between 0 and 360 degrees.
The following message is displayed on the LCD:

AMPLITUDE ANGLE
       0.00

Using the numerical keys, **[+/-]**, and **[.]** enter the desired value.
To delete the number just entered press **[CLR]**, and the initial value will reappear. Press **[ENTER]** to confirm.

To enter the number of holes

This parameter indicates the number of holes to be machined on the crown, and can take on a value of between 1 and 200.
The following message is displayed on the LCD:

N. EXECUTIONS
(max 200) ___

Using the numerical keys, enter the desired value.
To delete the number just entered press **[CLR]**, and the initial value will reappear. Press **[ENTER]** to confirm the value entered.

To enter the program number in which the instructions are to be memorised

This parameter indicates the number of the program (from 1 to 99) that is to contain the instructions necessary for machining the hole patterns.
The following message is displayed on the LCD:

CROWN PROGRAM
Number __

Using the numerical keys enter the desired value.
To delete the number just entered press **[CLR]**, and the initial value will reappear. Press **[ENTER]** to confirm.
If the number of an existing program has been entered, the following message appears:

PROG. EXISTENT
ENTER TO CONFIRM

Press **[ENTER]** to confirm the value entered, or otherwise press another key to return to the phase of entering the number of the program.

Select operative mode

Select the machining mode that is to be used during the construction of the flange. The following message is displayed on the LCD:

SELECT ->ABS
MODE   INC

Using the **[ABS/INC]** key or **[▲][▼]** select the required mode by moving the arrow so that it indicates the desired mode, and the LED of the ABS/INC key will light up or go out according to the selected mode. Press **[ENTER]** to confirm the selection.

Calculation of instructions

On confirming the last parameter, the instrument will calculate the instructions necessary for obtaining the flange. During this phase the LCD will display the message:

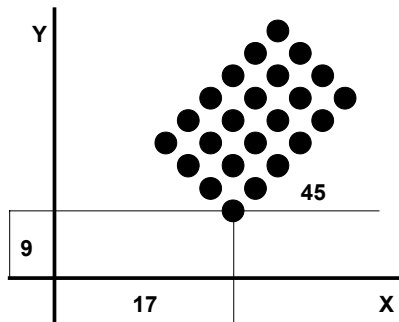**CALCULATING HOLE**
N. 1

The number, that will continue to increase, indicates the hole that is being calculated at that moment.
At the end of the calculations the following message will appear briefly:

SAVING PROGRAM

At this point the program for the flange can be run by using the function for carrying out a program (F 14).

Rectangular die

Function

This serves for creating a program for machining holes on a rectangular die (max 200 holes). The program created by this function is memorized in the VISODATA PLUS memory and the number of the program must be entered by the user.

Warning
Use this function only when VISODATA PLUS is installed on a milling machine.

How to call

Press: **[F][1][9]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 19
RECTANGULAR DIE

How to quit

Press: **[F][CLR]**.

To select couple of axes

The couple of axes must be selected that constitute the plane on which the rectangular die lies.
The following message is displayed on the LCD:

SELECT AXES
-> XY XZ YZ

Use the **[▲][▼]** to select the desired axes by moving the arrow. The LEDs of the selected axes will light up. Press **[ENTER]** to confirm the selection.

To enter the values of the first hole to be machined

This parameter indicates the position of the first hole on the rectangular die to be machined. The values to be entered are relative to the two axes selected.
Imagining that the axes selected previously was the couple X Y, the LCD will display the following message:

FIRST EXECUTION
X   0.00

Using the numerical keys, **[+/-]**, and **[.]** enter the desired value.

To delete the number just entered press **[CLR]** , and the initial value will reappear. Press **[ENTER]** to confirm.
Carry out the same procedure for establishing the position on the other axis in the plane.

To enter the number of lines of holes in the rectangular die

This parameter indicates the number of lines of holes that make up the rectangular die and can be a value of between 1 and 200.
It is important to remember that the maximum number of holes is 200, therefore if the value of 200 is entered for the number of lines, the number of columns must be 1.
The following message is displayed on the LCD:

NUMBER LINES
(l*c<=200)___

Using the numerical keys enter the desired value.
To delete the number just entered press **[CLR]** , and the initial value will reappear. Press **[ENTER]** to confirm.

To enter the number of columns in the rectangular die

This parameter indicates the number of columns that make up the rectangular die, and can be given a value of from 1 to 200.
It is important to remember that the maximum number of holes is 200, therefore the number to enter will depend on the number of lines entered previously.
The following message is displayed on the LCD:

NUMBER COLUMNS
(MAX ...) ___

Using the numerical keys enter the desired value.
To delete the number just entered press **[CLR]** , and the initial value will reappear. Press **[ENTER]** to confirm.

To enter pitch of lines

This parameter indicates the vertical distance between one hole and another, and can assume a positive value which is greater than 0.
The following message is displayed on the LCD:

LINE PITCH
     0.00

Using the numerical keys, **[+/-]**, and **[.]** enter the desired value.
To delete the value just entered press **[CLR]** , and the initial value will reappear. Press **[ENTER]** to confirm the value entered.

To enter pitch of columns

This parameter indicates the horizontal distance between one hole and the next, and can assume a positive number greater than 0.
The following message is displayed on the LCD:

COLUMNS PITCH
        0.00

Using the numerical keys, **[+/-]**, and **[.]** enter the desired value.
To delete the value just entered press **[CLR]** , and the initial value will reappear. Press **[ENTER]** to confirm the value entered.

To enter the angle of rotation

This parameter indicates the angle to be applied to the columns of the die, and can assume values greater than 0 and no greater than 360.
The following message is displayed on the LCD:

ANGLE ROTATION
          0.00

Using the numerical keys, **[+/-]**, and **[.]** enter the desired value.
To delete the value just entered press **[CLR]** , and the initial value will reappear. Press **[ENTER]** to confirm the value entered.

To insert the program number in which the instructions are to be memorised

This parameter indicates the number of the program (from 1 to 99) that is to contain the instructions necessary for machining the flange.
The following message is displayed on the LCD:

RECTANGULAR DIE
PROGRAM N. __

Using the numerical keys enter the desired value.
To delete the number just entered press **[CLR]** , and the initial value will reappear. Press **[ENTER]** to confirm.
If the number of an existing program has been entered, the following message appears:

PROG. EXISTENT
ENTER TO CONFIRM

Press **[ENTER]** to confirm the value entered, or otherwise press another key to return to the phase of entering the number of the program.

Select operative mode

Select the machining mode that is to be used during the construction of the flange. The following message is displayed on the LCD:

SELECT ->ABS
MODE   INC

Using the **[ABS/INC]** key or **[▲][▼]** select the required mode by moving the arrow so that it indicates the desired mode, and the LED of the ABS/INC key will light up or go out according to the selected mode. Press **[ENTER]** to confirm the selection.

Calculation of instructions

On confirming the last parameter, the instrument will calculate the instructions necessary for obtaining the rectangular die. During this phase the LCD will display the message:

CALCULATING HOLE
LIN 1   COL 1

The number, that will continue to increase, indicates the hole that is being calculated at that moment.
At the end of the calculations the following message will appear briefly:

SAVING PROGRAM

At this point the program for the rectangular flange can be run by using the function for carrying out a program (F 14).

Workpiece zero

Function

When the user has touched the workpiece with the tool and zeroed out the values, to obtain the true position of the absolute zero relative to the workpiece, a movement must be made that is equal to the radius of the tool. This function saves the user from having to set the value of the tool radius manually, since it is sufficient to take the values from 0 to the value of the radius displayed on the LCD, then on pressing **[ENTER]** the values will be taken to zero and the value of the absolute zero of the workpiece will be found.
If no tool is set, the following message appears:

TOOL NOT
INSERED

If the tool set has null values, the following message appears:

TOOL WITH
NULL VALUES

How to call

Press: **[F][2][0]**.
or
Press: **[F]**, using keys **[▲][▼]** and confirming later with **[ENTER]**, select the following message on the LCD:

FUNCTION 20
WORKPIECE ZERO

How to quit

Press: **[F] [CLR]**.

Confirm end of search for Workpiece Zero

The following message is displayed on the LCD (E.g.: tool with radius 10.00):

R: 10.00
ENTER CONFIRM

Press **[ENTER]** to confirm the end of the search, and in this way the ABS and INC values will be zeroed out because the point found is to be considered as the axis offset.
Carry out the same operations for the other value.

VISODATA PLUS

PARAMETER PRESETTING MANUAL

C E

Index

About this manual

The Parameter Presetting Manual is a guide containing all the procedures necessary for installing the VISODATA PLUS on any type of machine tool.
To help the installation engineer to manage the operations of modification and select the parameters, a logical method has been adopted which is valid for all the parameters present.
For conventional purposes, the messages displayed on the screen are written with the following type of character: **ABCD**. The keys are indicated by **[A]** for example.

Access to the presetting mode

To accede to the presetting mode, switch the VISODATA on and when the message **TEST** appears on the display, press **[CLR]**. After a few seconds the message **PASSWORD** appears; at this point enter the sequence **[7] [4] [2] [6] [9]**. An audible bleep will be emitted on pressing each key and a hyphen will appear on the Z axis display.

Saving parameters and exit

Exit from this mode causes all the modifications to be saved. The function of the visualizer returns to its status at switch-on, therefore the auto-diagnostics tests are repeated.
To save all the modifications and exit press the **[F]** key.

Premise

On the X axis display, the name of the parameter that can be modified at that moment is always displayed.
On the Z axis display, the current value of the parameter is shown.

- Logic: takes a value which can be selected from a set series.
- Whole numbers: numerical values without decimals.
- True numbers: numerical values with decimals.

Active keys

In the preset mode are active the following keys:
During the presetting procedure, the **[+]** and **[-]** keys are always dedicated to the selection of the parameters to be modified:
[+] : selects the next parameter
[-] : selects the previous parameter

To modify the value of the Logic parameter, use the **[+/-]** until the desired value is displayed.

To modify the value of the Whole Number parameter, use the following keys:
[Numerical], [CLR] (delete), **[+/-]** (sign), **[+]** (confirm).

To modify the value of the True Number parameter (number with decimals), use the following keys:
[Numerical], [CLR] (delete), **[+/-]** (sign), **[.]** (decimal point),**[+]** (confirm).

Programmable parameters

Type of machine

This parameter contains the set of default parameters to be used on the VISODATA PLUS, therefore the features of the following parameters depend on the type of machine chosen.
The LCD will be as follows:

MACHINE TYPE

The values that can be selected with the **[+/-]** key are:

MILL
LATHE

Machine zero

This parameter indicates the active status of the external inputs used with the zero notches of the scale or encoder to determine the Machine Zero point (set point procedure) of an axis.
The LCD will show the message:

ZERO MACHINE

The values that can be selected with the **[+/-]** key are:

active: open
active: CLOSE

If the "normally open" microswitch is used, program the CLOSE status.
If the "normally closed" microswitch is used, program the OPEN status

Scale zero

This parameter (one for each scale or encoder) indicates the level of active logic status of the zero pulse.
The LCD will show the message (example for scale 1):

zero SCAle 1

The values that can be selected with the **[+/-]** key are:

POSitive IMPuls
NEGAtive IMPULS

If "low-high-low" signal transition is used, program POSITIVE.
If "high-low-high" signal transition is used, program NEGATIVE.

Count direction

This parameter (one for each scale or encoder) determines the direction of counting for an axis without having to modify the cables wired to the VISODATA PLUS connectors.
Before modifying the parameter check the count direction and if it is not correct, change the status.
The LCD shows (example for scale 1):

COUNTER SCALE 1

The values that can be selected with the **[+/-]** key are:

signal: a-b
signal: b-a

Width of zero

This parameter (one for each scale or encoder) serves for compensating the error caused by the width of the zero notch. This error occurs on machine tools on which the Set Point is not always approached from the same direction.
The value of the width of the zero permits the point to be considered as the Absolute Zero to vary slightly (from 0 to 50 scale impulses) within the zero notch.
The LCD will show (example for scale 1):

zero 1 width

At this point enter the value of the width of the zero notch, which must be a whole number between 0 and 50.

Type of axis

This parameter (one for each scale or encoder) defines the type of axis used in the system.
On the LCD, the following message is shown:

AXIS X TYPE

The values that can be selected with the **[+/-]** key are:

LINEAR
ANGULAR

Angle type

This parameter (one for each angular axis) selects the type of angles to use for each axis defined as angular.
The LCD will show:

ANGULAR TYPE

The values that can be selected with the **[+/-]** key are:

VALUE WITH SIGN
0 - 360 DEGREE

Number of decimals to display

This parameter (one for each axis) indicates how many digits are to be displayed after the decimal point.
The LCD will show:

X DECIMAL NUMBER

The values that can be selected with the **[+/-]** key are:

0: NO DECIMAL
1: 0,1
2: 0,01
3: 0,001
4: 0.0001

Approximation of last digit

This parameter (one for each axis) defines the approximation of the last digit displayed.
A distinction must be made between linear axes and angular axes.
For linear axes, program the value (1, 2 or 5). The last digit of the number displayed will be approximated by this value (the least significant digit). This approximation will only intervene on values expressed in mm. and not in inches.
For angular axes, program the approximation of the "seconds" when angles are expressed in degrees and seconds. If decimals of degrees are used, no approximation will be made.
The LCD will show:

APPROXIMATION X

Linear axes

The values that can be selected with the **[+/-]** key are:

LAST CIPHER= 1
LAST CIPHER= 2
LAST CIPHER= 5

Angular axis

The values that can be selected with the **[+/-]** key are:

1   secOND
2   secOND
10 secOND
30 secOND

Axis-scale association

This parameter (one for each axis), indicates which scale is connected to the axis.
In set-ups where the position of an axis is the result of the sum of several scales, the scales involved in the calculation of the position can be defined.
Obviously, certain types of programming are not possible (e.g.: 3 + 2 + 1) in machines fitted with only 2 scales.
The LCD will show:

SCALES -> AXIS X

The values that can be selected with the **[+/-]** key are:

1
2
1+2
3
1+3
2+3
1+2+3

Radius-diameter conversion

This parameter can only be selected for axes which have previously been defined as linear.
In set-ups where it is useful to be able to convert radius/diameter, program the utilisation of this function on the axis on which the conversion is to be made.
The conversion can be made on only one of the linear axes present, therefore when conversion is enabled for one of the axes managed, the visualizer will automatically inhibit the function on the other axes.
On the LCD, the following message is shown:

FUN R - D X

The values that can be selected with the **[+/-]** key are:

YES
NO

Scale resolution

This parameter (one for each scale or encoder) determines the impulse/unit (the value of the units will be established by the next parameter). The precise display of the positions of an axis will depend on the value of the next parameter.
For example, if on moving the axis the scale or encoder give 1230 impulses, 1230 must be set in the scale impulses parameter and 10 in the scale unit parameter.
The LCD will show:

SCALE 1 IMPULSE

At this point enter the value of the impulses which must be a whole positive number and not 0.

Measuring unit

This parameter (one for each scale or encoder) determines the ratio of impulses per unit.
The movements must be programmed in millimetres (for the linear axes) and degrees and decimals (for the angular axes) to which the number of impulses programmed in the previous parameter corresponds.
Normally, if optic scales are used, the value of 1.000 mm. is left and the exact number of corresponding impulses is programmed in the previous parameter (100 if the scale measures hundredths, 1000 if it measures thousandths).
This parameter is of particular importance when the machine is fitted with incremental optical encoders. Depending on the type of transmission and the mechanical ratios, values other than 1.000 must be programmed for this parameter.
On the LCD, the following message is shown (example for scale 1):

SCALE 1 unit

At this point enter the value of the impulses, which must be a whole positive number other than 0.

Important
The visualizer uses the two previously described parameters for calculating the ratio:

MEASURING UNIT / IMPULSES   *[mm./impulses] [degrees/impulses]*

This ratio must be a positive number: therefore the two parameters in question must be programmed with positive values.

Stop/deceleration relays

VISODATA PLUS is fitted with 3 relay outputs (option VISTOP3) which can be used in two different ways, known as A and B.
This parameter is used for selecting one of these two methods.
The function common to both is as follows: the active outputs remain unchanged until the associated axis, during its movement towards the incremental value of zero, reaches a position established during the presetting phase by the following para-meters.

Mode A :

Each relay output is associated to one axis

Relay 1   Axis X
Relay 2   Axis Y
Relay 3   Axis Z

A **stop value** is associated to each axis, corresponding to the compensation necessary to lock the movement of the axis at incremental value 0.0.
When machining in incremental mode, the current position is compared to this value.

Example 1

X Stop position   2.00
X Incremental position   10.00

- Axis X output activated (relay #1).
- Movement of axis X towards incremental value 0.0.
- When the incremental position reaches a value of 2.00 (axis X stop position) the axis X stop relay is deactivated.

Example 2

X Stop position   2.00
X Incremental position   10.00
Z Stop position   4.00
Z Incremental position   -15.00

- Axis X output activated (relay #1).
- Axis Z output activated (relay #3).
- Movement of axes X and Z towards incremental value 0.0.
- When the incremental position of axis X reaches the value of 2.00 (axis X stop position), the axis X stop relay (relay #1) becomes deactivated.
- When the incremental position of axis Z reaches the value of 4.00 (axis Z stop position), the axis Z stop relay (relay #3) becomes deactivated.

Mode B

All three relays are associated to one axis at a time.
Each relay works in a different way:

Relay 1   Stop
Relay 2   Deceleration (Slow)
Relay 3   Direction

For each axis, a **stop value** is associated which corresponds to the compensation necessary to lock the movement of the axis at incremental value 0.0.
There is also a **deceleration value** used for obtaining the deceleration of the axis speed.
When machining in incremental mode, the current position is compared to these values.
The third relay is activated when the incremental dimension has a negative sign.

Example

X axis stop position:	0.00
Deceleration position:	3.00
X incremental position:	10.00

- Relay association with axis X.
- Activation of stop and deceleration relays (#1 and #2); the direction relay (#3) is deactivated.
- Movement of axis X towards incremental value 0.00.
- When the incremental dimension reaches the value of 3.00 (deceleration point) the deceleration relay is deactivated.
- When the incremental dimension reaches a value of 0.00 (axis X stop position) the stop relay is deactivated.

The LCD shows the following message:

ZERO RELAY

The values that can be selected with the [+/-] key are:

NOT USED
ONLY STOP
STOP+SLOW

In which:
ONLY STOP   = one stop relay used for each axis
STOP+SLOW= all three relays used together

Control of axes not associated to stop/slow relays

Some machine tools are fitted with mechanical commands for enabling the movements of the axes desired.
This option serves for deactivating the stop and deceleration outputs if the movement is to be carried out on an axis not previously associated to the outputs.
The LCD will show the following message:

not assoc. axis

The following values can be selected with the [+/-] key are:

CONTROL
NOT CONTROL

Warning
This parameter can only be selected if the utilisation of the relays in the stop/decelerate/direction mode has been previously enabled.
The movement detected to deactivate the relays must be greater than or equal to 0.2 mm.

Values for deactivating the stop relays

This parameter (one for each axis) indicates the position that, when working in Incremental mode, is to be considered as the threshold for deactivating the relay associated to the axis. This value is an absolute value, in other words, without a sign, therefore the control will be carried out in both directions of movement using the same value.
The LCD shows the following message:

STOP REL. X DIM.

At this point enter the value of the position for deactivating the relay, which must be a positive number.

Example (axis X)

Stop value 10.00.

When axis X reaches a value <= +10.00: the X stop relay (#1) is deactivated.
When axis X reaches a value >= - 10.00: the X stop relay (#1) is deactivated.

Values for deactivating the deceleration relays

This parameter (identical for all the axes) indicates the position that, when working in Incremental mode, is to be considered as the threshold for deactivating the deceleration relay (relay #2). This value is an absolute value, in other words, without a sign, therefore the control will be carried out in both directions of movement using the same value.
The LCD shows the following message:

SLOW REL. DIM.

At this point enter the value of the position for deactivating the relay, which must be a positive number.

Example (axis X associated to the stop and deceleration relays)

Stop value 10.00
Deceleration value 15.00

When axis X reaches a value >= +15.00 : the deceleration relay is deactivated.
When axis X reaches a value >= +10.00 : the stop relay is deactivated.
When axis X reaches a value >= -15.00 : the deceleration relay is deactivated.
When axis X reaches a value >= -10.00 : the stop relay is deactivated.

Set-point value

This parameter (one for each axis) indicates (if so desired) the value that must be enforced at the moment of finding the Absolute Zero (Set Point procedure).
In this way it is possible to set a Zero Reference that is different from the physical point of the zero notch.
On the LCD, the following message is shown:

SET-POINT DIM. X

At this point enter the desired value.

Serial baud rate

This parameter is used for setting the speed of the serial communication with the device connected to the serial port (printer or computer).
The LCD display will show:

SERIAL

The values that can be selected with the [+/-] key are:

110 B
300 B
600 B
1200 B
2400 B
4800 B
9600 B

Serial data bit

This parameter selects the number of data bits for the serial communication:

SERIAL

The values that can be selected with the [+/-] key are:

7 DATA BIT
8 DATA BIT

Serial parity

This parameter selects the type of parity to be used in the serial communication.
If 8 data bits have been previously selected, the parity will be NONE and this cannot be modified.
The LCD will show:

SERIAL

The values that can be selected with the [+/-] key are:

ODD   PARITY
EVEN PARITY

Serial communication

This parameter selects the type of device with which the VISODATA PLUS must communicate via the serial line.
If an EPSON LX 400 or similar printer is used, top quality print outs can be obtained since special software has been developed for this type of printer.
The X axis display will show:

SERIAL

The values that can be selected with the [+/-] key are:

COMPUTER
LX 400 EPSON
OTHER PRINTER

Type of values for serial line

This parameter selects the type of values to be transmitted on the serial line every time the [+] key is pressed, during the normal use of the VISODATA PLUS, or at each impulse received from the keyboard. There are three different methods of transmission which can be selected: transmission of absolute values only, transmission of incremental values only, or transmission of absolute or incremental values according to the mode that is active.
The LCD shows:

SEND DIMENSION

The values that can be selected with the [+/-] key are:

ABS
INC
ABS-INC (SEL.)

Freezing probe values

This parameter enables or inhibits the freezing (locking) of value acquired from the probe input. The value will remain locked until the **[CLR]** or **[-]** key is pressed.
The LCD will show:

EDGE FINDER

The values that can be selected with the [+/-] key are:

FREEZ
NO FREEZ

Abbe correction

The Abbe correction is an excellent method of improving the precision of position, should there be a constant linear error along the entire length of the scale.
For each scale two values must be programmed: the True value and the Displayed value.
Both values must be expressed in millimetres.

Important
The visualizer uses the True and Displayed values for calculating the ratio known as the ABBE FACTOR. This must be a positive number, therefore these two parameters must be programmed only with positive numbers that are greater than 0.
If this feature of the visualizer is not to be used, leave both parameters at the predefined value of 1.000 mm.

REAL VALUE (true, read by a precision instrument)

The LCD will show (example for scale 1):

REAL SCALE 1

At this point enter the desired value which must be greater than 0.00 .

DISPLAYED VALUE (displayed on the VISODATA PLUS)

The LCD will show (example for scale 1):

DISPL. SCALE 1

At this point enter the desired value which must be greater than 0.00 .

Sectional linearity correction

This method can be used for compensating the linearity errors of the scale when it has a variable error along its length (for high precision positioning).
Nine sections of the scale can be defined, each of which is identified by two values: the True value and the Displayed value.
The user must therefore know and program 18 values (9 true and 9 displayed), expressed in millimetres, defining two Tables of values for each scale: the table of true values and the table of displayed values.

How to program the linearity tables:

- The values are numeric with decimal point and sign and they are referred to the absolute zero (Set-Point).
- Each value must be different from the previous and the following value.
- The values must be entered in increasing order from the position 1 of the table through to position 9.

Important
The visualizer checks these linearity tables, to make sure that they have been programmed correctly. If not, the sectional linearity is automatically disabled.
Since all the values are referred to the Zero Reference, the sectional linearity corrector is only enabled after the Set Point procedure has been carried out.

SCALE 1 LINEARITY CORRECTION

Value displayed on the VISODATA PLUS

The LCD will show:

DISP 1 SCALE 1

At this point enter the displayed value.

Value read by a precision instrument (true value)

The LCD will show:

REAL 1 SCALE 1

At this point enter the true value.

LINEARITY FOR SCALES 2 AND 3

As per scale 1.