



VIMS

**DIGITAL READOUT
WITH MAGNETIC SENSOR**



OPERATION MANUAL

LINEAR MAGNETIC SENSORS

INDEX

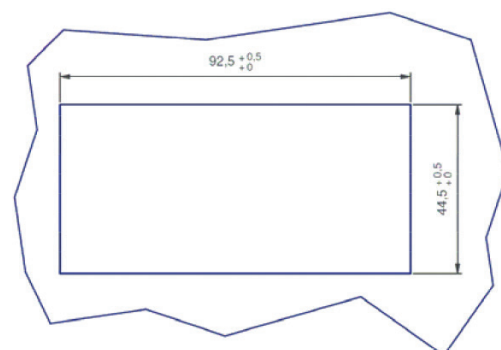
1. INTRODUCTION	2
2. INSTALLATION	2
3. DIMENSIONS	2
4. BATTERY INSERTION	2
5. FIXING OF MAGNETIC STRIP MP100/MP200	3
6. SENSOR MOUNTING	4
7. LEGEND - MESSAGES AND SIGNALS	4
8. STORING OF PROGRAMMES AND DATA	5
9. SETTING CONFIGURATION	5
+ P01 – CHOICE OF AXIS RESOLUTION	6
+ P02 – INVERSION OF COUNTING DIRECTION	7
+ P03 – LINEAR CORRECTION	7
+ P04 – ENABLE AND SET THE REF VALUE OF INCREMENTAL QUOTA.....	8
+ P05 – ENABLE AND SET THE REF VALUE OF ABSOLUTE QUOTA.....	8
+ P06 – ENABLE AND SET TIME FOR DEVICE SELF-SWITCHING OFF.....	9
+ P07 – ENABLE RESET/PRESET OF INCREMENTAL QUOTA	9
+ P08 – ENABLE RESET/PRESET OF ABSOLUTE QUOTA	9
+ P09 – ENABLE AND SET TIME FOR AUTOMATIC STAND-BY	10
+ P10 – ENABLE FREE CALCULATION PARAMETER.....	10
+ P80 – MODIFY PASSWORD TO ENTER INTO PARAMETERS.....	11
+ P89 – DEVICE DIAGNOSTICS	11
10. SELF - TEST	12
11. INCREMENTAL/ABSOLUTE COUNTING	12
10. RESETTING/PRESETTING OF A DATUM	12
12. SETTING “REF” QUOTA	12

1. INTRODUCTION


Manufacturer thanks the customer for the preference shown in purchasing the programmable readout SERIE VIMS Microcomputer and confirms the excellent choice made.

We must ask you to read through these pages carefully in order to ensure proper operation of your new system. This device is controlled by a powerful microcomputer and is programmable via the keyboard in order to get the best performance according to the type of machine tool.

This feature allows you to protect your investment in case of conversion, selling or substitution of the machine.



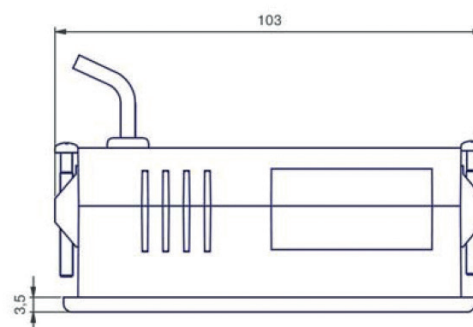
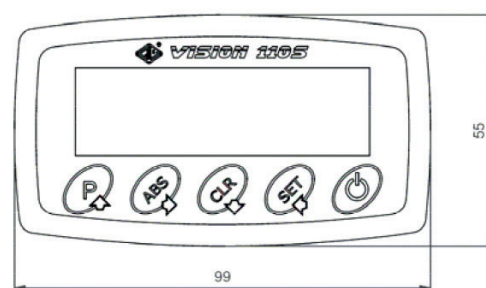
2. INSTALLATION

 All equipment connected to the instrument must be provided with insulation characteristics conforming to the current regulations. The installation of the instrument must be carried out by authorised skilled staff who will follow the regulations stated by the Manufacturer.

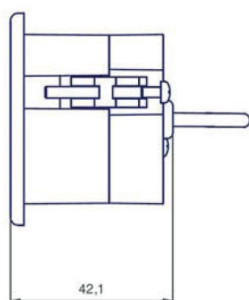
PREVENTION: To avoid explosion or fire, the readout should not be used or kept in proximity of inflammable or explosive gas.

INSTALLATION: Install the magnetic sensor following the instructions given by the Manufacturer.

CLEANING AND MAINTENANCE: Ensure the instrument is switched off before cleaning it. Please consider it is not protected against the penetration of liquids. Do not use solvents. Use a damp cloth for cleaning. No maintenance is required.




3. DIMENSIONS



4. BATTERY INSERTION

Open the door of battery case and insert two batteries Alkaline size AA 1.5V, taking care about the polarity (see the drawing). Close the door before switching on the device.

 Before removing batteries, switch off the device using the front button

5. FIXING OF MAGNETIC STRIP CSM

- i** In order to make the system more precise, magnetic strip ① must be 80 mm (40 mm for each side) longer than the machine run, i.e. $L = \text{Run} + 80\text{mm}$. Tape shall be centered on the run.
- i** Protect magnetic strip from external magnetic fields. Contact with any permanent magnet would irrevocably damage it.
- i** The minimum bending radius of magnetic strip is 130 mm.

Magnetic band can be fixed on any kind of non-magnetic surface.

For band CSM only

For a better protection of magnetic band from shavings, liquid sprinklings, powder, etc. we suggest to always use the metal sheet cover PS ②, already equipped with a double-sided adhesive tape ③ or the aluminium support AP (see picture).

IMPORTANT

No protective cover can be applied to magnetic band CSH. The best gluing temperature is between 20 and 30 °C; avoid making it when temperature is below 10°C.

In case of stocking magnetic strip at a lower temperature than the machine, it is advisable to wait for some hours before gluing. The adhesion of glued parts is completed after at least 48 hours.

+ Carry out the gluing of magnetic strip as follows:

- > Clean carefully the fixing surface from oil, fat or any kind of dirt, using trace-free solvents.
- > Raise up a few centimetres of adhesive protection ④ and place magnetic strip, lightly pushing on the initial adhesive zone.
- > Proceed with the placing of the strip, removing progressively the adhesive protection and applying an even pressure. If possible, use a small manual roller.

For band CSM only

- > Proceed as above to glue the stainless steel cover tape on the magnetic strip, after an accurate cleaning of the surface.
- > Use the remaining part of cover tape for mechanical fixing and "earth" connection of the structure by means of socket-head screws M3x8 ⑤.

+ Resistance to chemical agents

LOW-IMPACT AGENTS

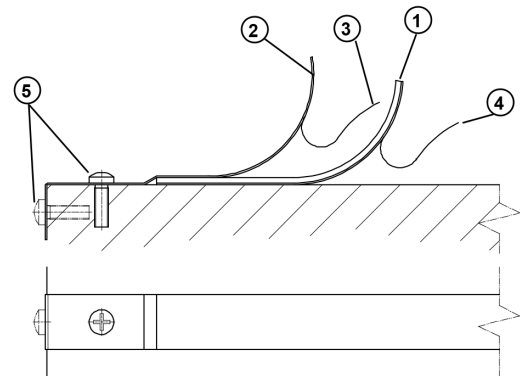
Formic acid, lactic acid, formaldehyde 40%, glycerine 93°C, hexane, isooctane, linseed oil, cotton oil, soybean oil, mineral oil.

MEDIUM-IMPACT AGENTS

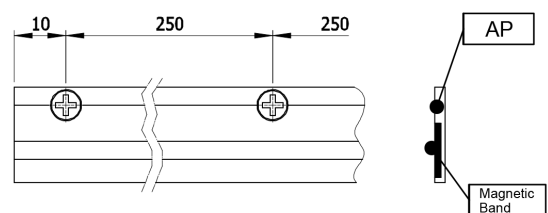
Acetylene, acetone, acetic acid, oleic acid, stearic acid 70°C, seawater, ammonia, gasoline, ether isopropyl, petroleum, vapour.

STRONG-IMPACT AGENTS

Nitric acid, benzene, dimethylbenzene, tetraethyl furan, nitrobenzene, solvent, toluene, carbon tetrachloride, turpentine, trichloroethylene.



RECOMMENDED FIXING OF SUPPORT AP



- i** Do not use the double-sided adhesive ④ if you also have the support AP

6. SENSOR MOUNTING

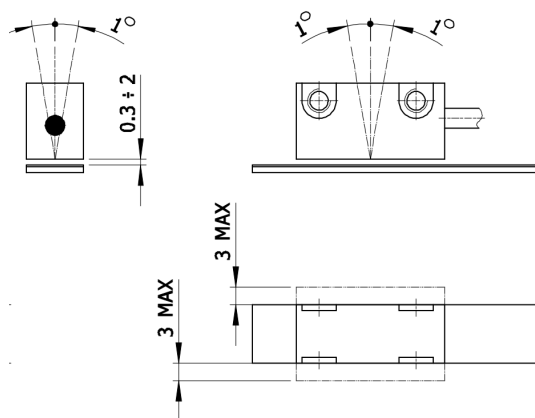
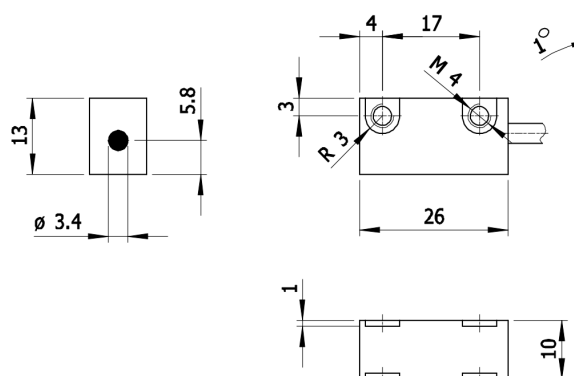
- > Proceed to fix magnetic sensor using the M4 threaded holes.
- > As an alternative you can use them as passing holes for socket head cap M3x18 screws.

The sensor can be mounted in any position, keeping the active side, marked by arrows, toward the surface of magnetic strip.

Once mounting is carried, place cables and move manually the sensor for the total run, in order to be sure it can freely slide without any obstacle.

Check that aligning tolerances between sensor and magnetic strip are respected along the whole run. Each positioning error must be corrected.

Dimensions of any brackets or supporting arms have to be conveniently calculated; any kind of their bending must be avoided.



7. LEGEND - MESSAGES AND SIGNALS

The following symbols are used in this manual:



SELECTION OF VALUES KEY
(SETTING DATA MODE)



SELECTION OF DIGIT KEY
(SETTING DATA MODE)



AXIS CLEAR KEY
(ALSO USED TO CANCEL THE SETTINGS)



CONFIRMING KEY



ON/OFF

* FLASHING AXIS LED

● FIXED AXIS LED

The instrument supplies a series of visual signals which indicate the correct operating mode.

Every time a key is pressed, messages in writing or figures will appear on the display, according to setting made (see manual) and indicates the function has been activated or ready to be carried out. If it is blinking, scale measuring is taking place; fixed light (or no light at all) indicates the function has been carried out. In case of incorrect procedures, the following message will appear on the display:

Error

The above message indicates the operator has inadvertently pressed the wrong key.

In case of "overflow" (if too many numbers were entered), the error is shown on display:



i ANY ANOMALY AND SITUATION OF "OPERATING LOCK" DUE TO ACCIDENTAL REASONS (ELECTRIC DISCHARGE, OVERVOLTAGE, ETC...) ARE SOLVED BY SWITCHING OFF THE DEVICE. FOR THE ABOVE PURPOSE KEEP THE BUTTON ON/OFF PUSHED FOR AT LEAST 4 SECONDS.

8. STORING OF PROGRAMMES AND DATA

The programming of counter **SERIE VIMS** is carried out by the Manufacturer who knows the access codes and the procedures (configuration). The operator can carry out all operations. All the information is stored permanently and can be only modified by reforming it all from the beginning.

Furthermore, the instrument can permanently memorise the latest operations which are considered as last data entered.

So the following information is maintained

- A) measurement unit selected (MM/INCH/DEG).
- B) function settings entered.
- C) last Axis counting position and eventual messages (not transitory) concerning abnormal situations, e.g. overflow message.

i When there is a power failure, the instrument cannot register any scale movement (through inertia, manual movements, thermal expansion) whether in ABS or INC. If this happens, the data on the display is not reliable because it cannot indicate new positions but only those previous to the power failure.

9. SETTING CONFIGURATION

For the configuration of the device some internal parameters have to be used. To recall the configuration, push the button P, enter the password number and confirm by button SET. The selection of parameter is made by repeatedly pressing button P.


- > To access parameters section, it is necessary to enter a 6-digit password (manufacturer code: "000000"). It is possible to change this code.
- > During the parameter setting, the display will show "P".


Parameters currently entered are the following:



01 -	CHOICE OF AXIS RESOLUTION
02 -	INVERSION OF COUNTING MODE
03 -	LINEAR CORRECTION
04 -	ENABLE AND SET THE REF VALUE OF INCREMENTAL QUOTA
05 -	ENABLE AND SET THE REF VALUE OF ABSOLUTE QUOTA
06 -	ENABLE AND SET TIME FOR DEVICE SELF-SWITCH. OFF
07 -	ENABLE RESET/PRESET INCREMENTAL QUOTA
08 -	ENABLE RESET/PRESET ABSOLUTE QUOTA
09 -	ENABLE AND SET TIME FOR STAND-BY OF DISPLAY
10 -	SET FACTOR OF FREE CALCULATION
80 -	MODIFY PASSWORD TO ENTER PARAMETERS
89 -	DEVICE DIAGNOSTIC
90 -	RESERVED


Example of selection of a parameter:


quota displayed 123.45


press  the display will show "P" (parameter configuration) *00000

press  if a password value matches the manufacturer's code display will show P 01


or press  and  to input a new password XXXXX*


and press  at the end the display will show P 01


press more  until the desired parameter will be shown, e.g. P 02

press  To confirm the selection and enter its setting. dir -

Set the parameter configuration following the instructions hereafter described in this manual.

press  To confirm the value and return to the parameters selection. P 02

press more  If a different parameter has to be selected; e.g. display will show P 03

press  To quit the configuration and return to display the quota 123.45

i BY PRESSING THE CLR BUTTON, IT IS POSSIBLE TO QUIT THE CURRENT PROGRAMMING STEP AT ANY TIME.

➕ P01 – CHOICE OF AXIS RESOLUTION

It is possible to set up the following resolutions:

- > 1 – 0.1 – 0.05 – 0.01 in millimetres
- > 0.01 – 0.001 – 1/16 – 1/32 – 1/64 in inches
- > 0 / 1 / 2 / 3 decimals in angular reading mode (measurement of sectors of a circle)

Example of setting up the resolution 0.1 mm:

press		To enter the configuration and select the parameter	P 01
press		To confirm the selection and enter its setting	r 0.01
press more		Until the desired resolution (e.g.: 0.1 in mm)	r 0.1
press		To confirm the value and return to the parameters	P 01
press		To quit the configuration	123.45

Example for setting a resolution 0.1° in angular mode:

press		To enter the configuration and select the parameter	P 01
press		To confirm the selection and enter its setting	r 0.01
press more		Up to Angular resolution	r Ang
press		First position of number will blink	*.XXXXX
press		To select the second position	0.*XXXX
press		To set the value (0-9)	0.*XXXX
push	and	To set the other values	0.2864*
press		To confirm the value and go into the selection of decimals.	r 0.01
press more		Up to the desired resolution (e.g.: 0.1 in degrees)	r 0.1
press		To confirm the value and return to the parameters	P 01
press		To quit the configuration.	123.4

Choice of axis resolution in angular reading mode

To make angular measurements (sectors of a circle), a calculation value is used which is the ratio between the angle to be measured and the length of the corresponding circumference.

Calculation is made through the following formula:

$$\text{value} = \frac{\text{angle}360^\circ}{\text{circumference}}$$

Example:

angle = 360° (in degrees)

radius = 200 mm

circumference = 2 π r (in millimetres) = 1256.64 mm

value = 360° / 1256.64 mm = 0.28648

Relevant resolution displayed in degrees is selectable by choosing the desired numbers after the point.

+ P02 – INVERSION OF COUNTING DIRECTION

Example setting:

press		To enter the configuration and select the parameter	P 02
press		To confirm the selection and enter its setting	dir -
press		The display will show	- dir
press		To confirm the value and return to the parameters	P 02
press		To quit the configuration	123.45

+ P03 – LINEAR CORRECTION

Working resolution displayed must be of linear type (selected by parameter 01).

Sensitive machining errors can derive from bad machine tool trim through wear or guides out of line, imperfect Carriage-guide coupling, badly distributed parts, etc... If the errors are of a linear type, that is proportional to the movement value carried out, they can be compensated through linear correction. The correction factor (CF) can be calculated by the operator following this formula:

$$CF = \frac{\text{MEASURED QUOTA (with accuracy)}}{\text{NOMINAL QUOTA (as per drawing)}}$$

Let us suppose we have machined moving X Axis 400.00 mm (X Axis display reading) but we have found an error (positive or negative). For example, the measured piece can be longer or shorter:

- A) mm 400.20 (longer piece has an error of 200 μm)**
- B) mm 399.88 (shorter piece has an error of 120 μm)**

In case **A** we will have → 400.20 / 400.00 = 1.0005 (CF)

In case **B** we will have → 399.88 / 400.00 = 0.9997 (CF)

To compensate these errors, input a CF value (manual mode).

As an alternative, in VIMS, it is possible to make the movement and manually enter the real value of it; that way the value of CF will be automatically calculated by the device.

Example for manually setting the value CF = 1.0005:

press		To go into the configuration and select the parameter	P 03
press		The display will show	Corr .
press		First position of quota will blink	*.XXXXX
press		To select a position	1.*XXXX
press		To input a value (0-9)	1.*XXXX
push	and	To input other digits	1.0005*
press		To confirm a value and return to parameter selection	P 03
press		To quit the configuration	123.45

Example for setting the value of CF based on the real displacement of the axis:

press		To enter the configuration and select the parameter	P 03
press		The display will show	Corr .
press		to select the way of calculation of CF	123.45

Place the reader head on the starting point of the movement (e.g. 0 mm)

press To input the first quota. Display will show for one second **StorE**

Place the reader head on the final point of the movement (e.g. 400 mm)

press To input the first quota. Display will show for "Store" and then ***400.00**

select and To set the real value of displacement **0400.20**

press To confirm the value and return to parameter selection **P 03**

CF value will be calculated as $400.20 / 400.00 = 1.00050$

press To quit the configuration. **123.45**

P04 – ENABLE AND SET THE REF VALUE OF INCREMENTAL QUOTA

It is an absolute reference value (physical reference point) of the measuring system, recallable when the device is in incremental counting mode.

Example of setting value of REF = 10.00 mm:

press To enter the configuration and select the parameter **P 04**

press Display will show "yes / no" to indicate the set mode **no**

press To enable the recalling mode **yes**

press The first digit will blink ***XXX.XX**

select and To set the value **0010.0***

press To confirm the value and return to parameter selection **P 04**

press To quit the configuration **123.45**

P05 – ENABLE AND SET THE REF VALUE OF ABSOLUTE QUOTA

It is an absolute reference value (physical reference point) of the measuring system, recallable when the device is in absolute counting mode.

Example of setting value of REF = 5.00 mm

press To enter the configuration and select the parameter **P 05**

press Display will show "yes / no" to indicate the set mode **no**

press To enable the recalling mode **yes**

press The first digit will blink ***XXX.XX**

select and To set the value **0005.0***

press To confirm the value and return to parameter selection **P 05**

press To quit the configuration **123.45**

+ P06 – ENABLE AND SET TIME FOR DEVICE SELF-SWITCHING OFF

It is possible to enable and program a stand-by time for an automatic switching off of the device. Time is displayed in seconds and maximum programmable time is 12 hours.

To switch on again the device press the button ON/OFF.

Example of setting a time of 30 minutes (1800 seconds):

press		To enter the configuration and select the parameter	P 06
press		Display will show "yes / no" to indicate the set mode	no
press		To enable the automatic switching off	yes
press		The first digit will blink	*XXX.XX
select	and	To set the time	00180*
press		To confirm the value and return to parameter selection	P 06
press		To quit the configuration	123.45

+ P07 – ENABLE RESET/PRESET OF INCREMENTAL QUOTA

If enabled it allows to reset/preset of quota in incremental counting mode.

Example of setting:

press		To enter the configuration and select the parameter	P 07
-------	--	---	-------------

press		Display will show "yes / no" to indicate the set mode	no
press		To enable the reset/preset of quota	yes
press		To confirm the value and return to parameter selection	P 07
press		To quit the configuration	123.45

+ P08 – ENABLE RESET/PRESET OF ABSOLUTE QUOTA

If enabled it allows to reset/preset of quota in absolute counting mode.

Example of setting:

press		To enter the configuration and select the parameter	P 08
press		Display will show "yes / no" to indicate the set mode	no
press		To enable the reset/preset of quota	yes
press		To confirm the value and return to parameter selection	P 08
press		To quit the configuration	123.45

+ P09 – ENABLE AND SET TIME FOR AUTOMATIC STAND-BY

It is possible to enable and program a waiting time for an automatic stand-by of the device. Time is displayed in seconds and maximum programmable time is 12 hours. During the stand-by time the device is operating anyway; to display the quota again it is enough to move the axis or press any button to select a function

Example of setting a time of 10 minutes (600 seconds):

press		To enter the configuration and select the parameter	P 09
press		Display will show "yes / no" to indicate the set mode	no
press		To enable the stand-by	yes
press		First number will blink	*XXX.XX
select	and	To set the time	00060*
press		To confirm the value and return to parameter selection	P 09
press		To quit the configuration	123.45

+ P10 – ENABLE FREE CALCULATION PARAMETER

The reading mode must be "linear" (select it through parameter 01).

In order to make special measurements which do not correspond to the real linear displacement of the axis (for instance diagonal cuts), it is possible to use a Free Calculation Parameter which corresponds to the ratio between the desired value to be displayed and the real valued shown on the display.

This device has 100 different Free Calculation Parameters which can be stored (from 0 to 99) and quickly recalled before each different work.

A Free Calculation Parameter FCL is calculated by the operator through the following formula:

$$FCL = \frac{\text{QUOTA TO BE DISPLAYED}}{\text{QUOTA DISPLAYED}}$$

Let us suppose we have to carry out an operation moving the axis for 400 mm but, in the meantime, we have to make a diagonal cut of 350.00 mm.

To balance what the device will display, it is necessary to manually enter a FCL value of 0.87500.

Example to enter the value FCL = 0.87500 in position 01:

press		To enter the configuration and select the parameter	P 10
press		The display will show	Store
press		The display will show	FCL *0
select	and	To set the digits 01	FCL 01
press		The first digit will blink	*.XXXXX
select	and	To set the value 0.87500	0.8750*
press		To confirm the value and return to the parameters	P 10
press		if one wants store different FCL in different positions	store
or press		To quit the configuration	123.45

Now the FCL (0.87500) is stored in position 01.

To recall it before starting:

press		To enter the configuration and select the parameter	P 10
press		Display will show	store
press		To recall the parameter, display will show	recall
press		Display will show	FCL *0
select	and	To set the digits 01	FCL 01
press		To confirm the value and return to parameter selection	P 10
press		To quit the configuration	123.45

select	and	To enter the password	XXXXX*
press		When setting is completed, it will show for 1 second.	set
		The display will show	*00000
use	and	To enter the new password,	XXXXX*
press		To confirm the value and return to the parameters	P 80
or press		To quit the configuration and return to display the quota	123.45

Now the FCL (0.87500) is stored in position 01.

Now the FCL (0.87500) is set and it remains permanently operating

i In the "0" position is stored the FCL = 1.00000 which cannot be modified. That way it is possible to recall it very quickly, refreshing the default configuration of the device for a standard use.

+ P80 – MODIFY PASSWORD TO ENTER INTO PARAMETERS

Password to enable the access into parameters is initially set in our factory to the value "000000".

It is possible to modify that password to avoid the free access into the configuration.

Example of setting:

press		To enter the configuration and select the parameter	P 80
press		The display will show	*00000

+ P89 – DEVICE DIAGNOSTICS

It is possible to carry out a diagnostic test of the LCD display, through parameter 89, in order to verify the correct operation of every segment. For example:

press		To enter the configuration and select the parameter	P 89
press		Display will show each available segment	-1888888
press		To enable the automatic running of switching on segment by segment.	-
press		To display again all the available segments, or	-1888888
press		To confirm the value and return to the parameters	P 89
press		To quit the configuration	123.4

10. SELF - TEST

A general test of the counter is automatically carried out every time it is switched on and analyses the validity of data held in memory. If the data is correct, the following message will appear on display during the self-test:

**tEst
no Err**

This operation works as previously described and then passes on to the following operation stage, i.e.:

DISPLAY SHOWING THE SAME SITUATION WE HAD BEFORE THE SWITCHING OFF.

11. INCREMENTAL/ABSOLUTE COUNTING

The display always indicates the current counting mode:

- > ABS = ABSOLUTE COUNTING
- > INC = INCREMENTAL COUNTING

SWITCHING ONE COUNTING MODE TO ANOTHER TAKES PLACE BY PRESSING THE ABS KEY. THE POINT WILL FLASH (OR SWITCH OFF) INDICATING THAT THE AXIS IS IN ABS MODE (OR IN INC MODE).








The counting system is governed by the counter which for the Axis has a twin internal counter (ABS/INC). All the information concerning movement of the Axis is simultaneously updated on both counters. Information entered by the operator, however, only affects the counting system counter previously chosen.

It is clear then that zero setting ABS counter at a point on the run (ORIGIN) and adopting incremental counting (more convenient and versatile to use), the operator will be able to carry out all zero settings, pre-selections, functions, etc.. he requires during machining as, any time he switches back to the ABS counter, he can be aware of what is the "absolute" position the Carriage has reached and therefore find again the ORIGINS previously set.

10. RESETTING/PRESETTING OF A DATUM

To make this operation enabled, set the corresponding parameter 07 (Incremental mode) or parameter 08 (Absolute mode).

Quite apart from the counting system selected, ABS or INC mode, zero resetting of a quota (reset) is obtained as follows:

		123.45
press		and datum is reset
		0.00
To enter a value (preset), for example 113.03 on the axis:		
press		the first digit will blink
		*XXX.XX
press		to select the second digit
		0*XX.XX
press		and input a value (0-9)
		0*XX.XX
select	 and 	to set the other digits
		0113.0*
press		and the value is preset
		113.03

The max. presettable value cannot be larger than the counting capacity of the instrument (6 ½ digits and one decimal point) e.g.:

- from -199999 9 to 1999999 for resolution in millimetres
- from -199999.9 to 199999.9 for decimal resolution
- from -19999.99 to 19999.99 for centesimal resolution

i TO ENTER A VALUE ON A DEVICE, SET IN INCHES (1/16–1/3 – 1/64) SUCH VALUE MUST BE ENTERED IN INCHES DECIMALS.

12. SETTING "REF" QUOTA

"REF"quota is a **pre-fixed value** which has to be set and enabled through parameters P04, in case of INC or counting mode, or P05, if in ABS counting mode.

Apart from the selected counting mode, it is possible to recall the corresponding "REF"quota through:

		quota displayed in INC mode	123.45
press		the first digit will blink	*XXX.XX
press again		to replace the value.	10.00