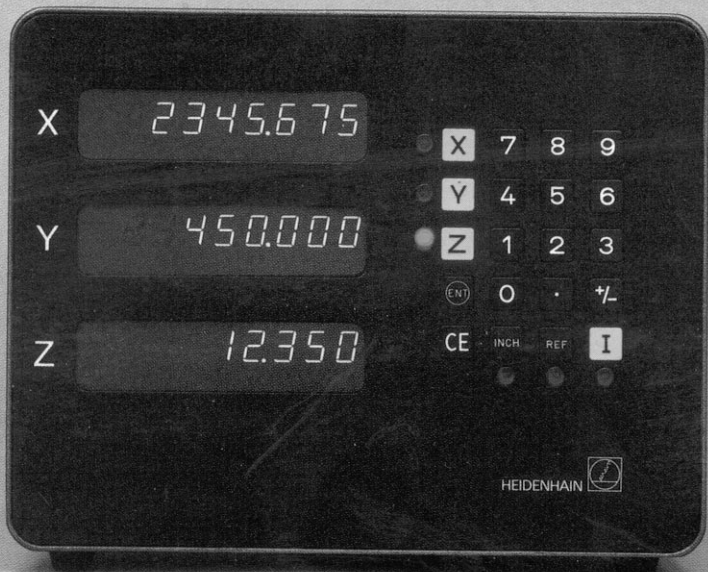




HEIDENHAIN

Pilot

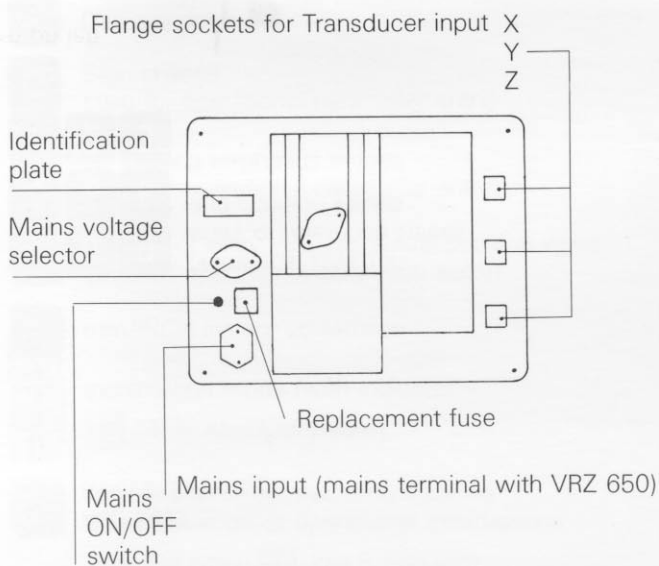
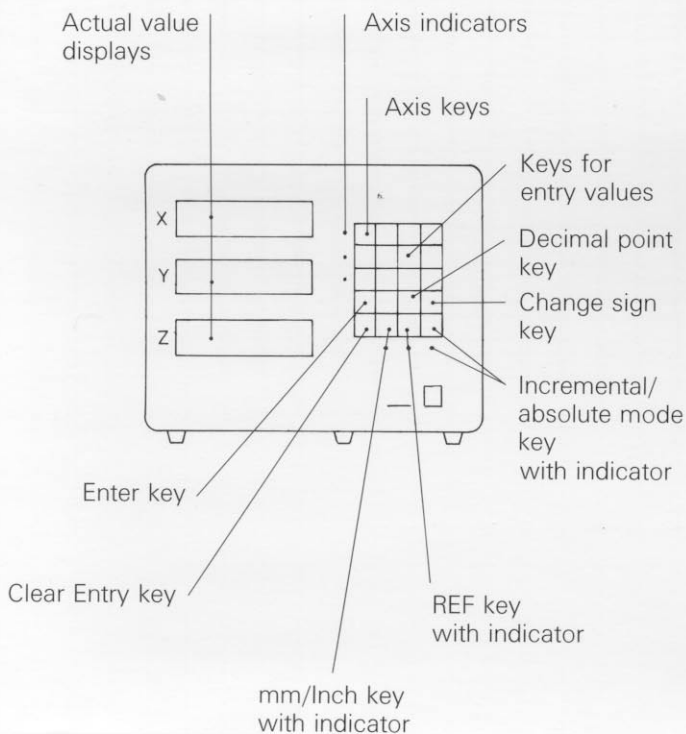


Working with the Display Units

VRZ 650

VRZ 710/750

**Operating panel VRZ 650 (3 Axes panel-type housing)
VRZ 710 (2 Axes)
VRZ 750 (3 Axes)**



Operating panel

Operating keys

Functional test

Operational parameters (Resolution)

Operational parameters (Grating period/Radius or ϕ -display)

Operational Parameters (Grating period) · Zero reset of axes

Axis preset

Correction of an entry

Maximum entry values

REF-reference mark evaluation

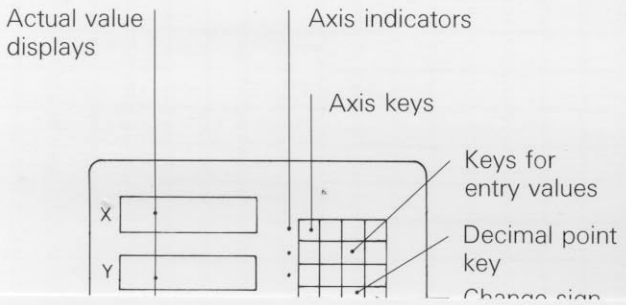
mm-INCH conversion

Absolute/Incremental positioning

Absolute/Incremental positioning

Linear compensation

VRZ 750 (3 Axes)



Operating keys

X Axis keys
(with indicators)

Y

Z

7 8 9 Numerical keys for
entry of reference values
and position values

4 5 6

1 2 3

0

. Decimal point

+/- Sign change
(also for operational parameter entry)

CE for erasing erroneous entries
(also for operational parameter entry)

ENT transfer of entry value as actual position value
(also for operational parameter entry)

INCH mm/INCH instant conversion

I Incremental mode (with indicator -
I off = Absolute values)

REF for retrieval of entered datum values
after power off or operational interruptions
(inactive when **I**-key is pressed)

Operating keys

Functional test

Operational parameters (Resolution)

Operational parameters (Grating period/Radius or \emptyset -display)

Operational Parameters (Grating period) · Zero reset of axes

Axis preset

Correction of an entry

Maximum entry values

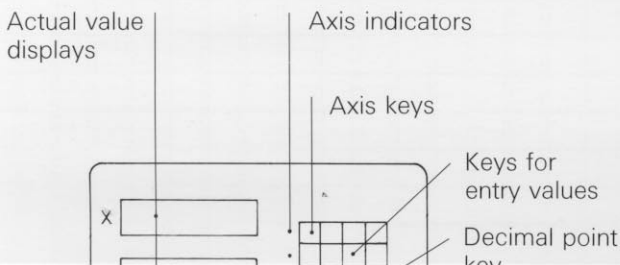
REF-reference mark evaluation

mm-INCH conversion

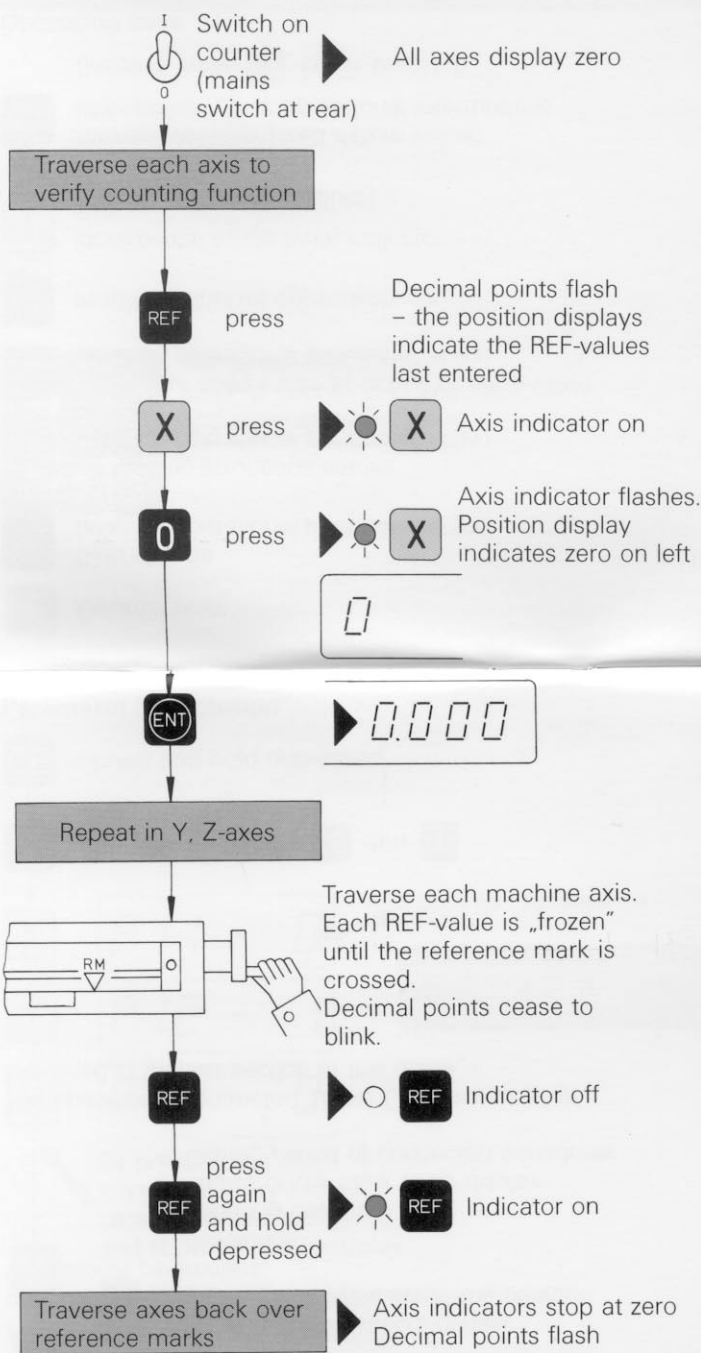
Absolute/Incremental positioning

Absolute/Incremental positioning

Linear compensation



Functional test



Functional test

Operational parameters (Resolution)

Operational parameters (Grating period/Radius or ϕ -display)

Operational Parameters (Grating period) · Zero reset of axes

Axis preset

Correction of an entry

Maximum entry values

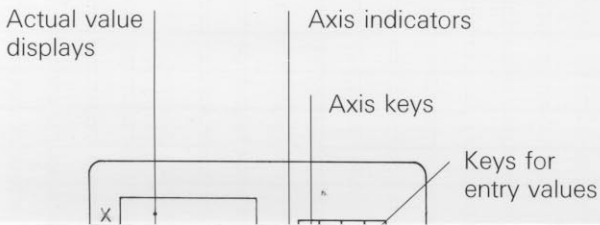
REF-reference mark evaluation

mm-INCH conversion

Absolute/Incremental positioning

Absolute/Incremental positioning

Linear compensation



Entry of operational parameters

Prior to initial digital readout operation, certain operational parameters have to be set at the counter. Operational parameters:

1. Resolution
2. Counting direction
3. Radius or diameter value display
4. Grating period of connected transducer

The operational parameter "Linear Compensation" is explained in the last section of this guide.

Parameter "Resolution"

CE press and hold depressed

1 press, now release **CE** and **1**

X Digit on right signifies a fine or coarse resolution.

Y

Z

By pressing the axis keys the corresponding parameters are addressed and shown in the X-display

0 = fine		1 = coarse	
mm	inch	mm	inch
0.005	0.0002	0.01	0.0005

+/- switches 0 to 1 alternately in display.
Select required resolution

ENT stores the selected resolution

Operational parameters (Resolution)

Operational parameters (Grating period/Radius or ϕ -display)

Operational Parameters (Grating period) · Zero reset of axes

Axis preset

Correction of an entry

Maximum entry values

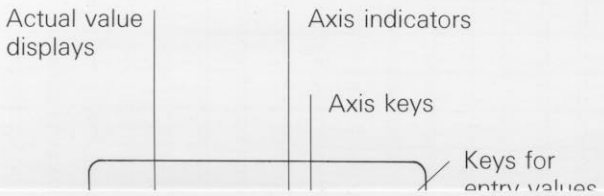
REF-reference mark evaluation

mm-INCH conversion

Absolute/Incremental positioning

Absolute/Incremental positioning

Linear compensation



Parameter "Counting direction"

CE press and hold depressed

2 press, now release **CE** and **2**

X P21 - 0 ← Digit on right (= parameter value) signifies either normal or reversed counting

Y P22 - 1

Z P23 - 0

0 = normal
1 = reverse

+/- switches 0 to 1 alternately in display.
Select required counting direction

ENT stores the selected counting direction for the individual axes.

Parameter "Radius or Diameter display"

CE

3

X P31 - 1 ← Digit on right signifies either radius or diameter display

Y P32 - 1

Z P33 - 0

Status code	Display
0	Display step = measured value
1	Display step = measured value x 2

+/- switches 0 to 1 alternately in display.
Select appropriate display for your machine axis.
(Normally diameter display for X-axis)

ENT stores the selected display status.

Operational parameters (Grating period/Radius or \varnothing -display)

Operational Parameters (Grating period) · Zero reset of axes
Axis preset

Correction of an entry

Maximum entry values

REF-reference mark evaluation

mm-INCH conversion

Absolute/Incremental positioning

Absolute/Incremental positioning

Linear compensation

Actual value displays

Axis indicators

Axis keys

Key for

Parameter "Grating period – Type of reference marks"

Setting of grating period – standard/distance-coded reference marks

CE press and hold depressed

4 press, then release **4** and **CE**

X

Y

Z

+/- Parameter values are sequentially continued by pressing +/-

ENT Stores the selected parameter values

The figure on the right (= parameter value) indicates various grating periods of the linear encoders.

Parameter code	Parameter value	Grating period/ Linear Encoder	
X = P41 Y = P42 Z = P43	0	10 µm	single reference marks
	1	20 µm	
	2	LS 101 C	Distance-coded reference marks
3	LS 107 C LS 303 C LS 403 C LS 404 C LS 603 C LS 704 C ULS 300 C		
4	LID 311 C LID 351 C		
5			

Zero reset of axes

Press

X Axis key X, Y or Z

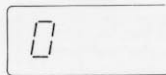


Axis indicator on

0 Zero key



Axis indicator flashes, Position display indicates zero on left.



ENT



Zero is displayed as a position. Axis indicator remains on.

If necessary, repeat procedure in the remaining axes.

Operational Parameters (Grating period) · Zero reset of axes

Axis preset

Correction of an entry

Maximum entry values

REF-reference mark evaluation

mm-INCH conversion

Absolute/Incremental positioning

Absolute/Incremental positioning

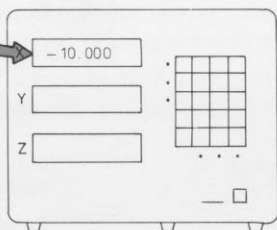
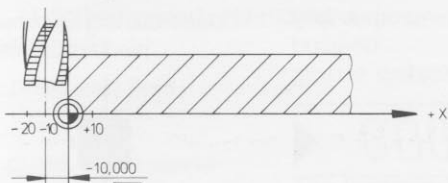
Linear compensation

Actual value displays

Axis indicators

Axis keys

Axis preset



For datum set, a certain position may be allocated with a predetermined value.

Press



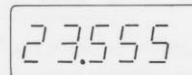
Axis key X, Y or Z



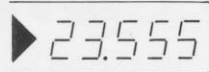
Axis indicator on



Key-in desired position value



Axis indicator flashes
Position display indicates entry value on left.



Entry value is displayed on right.



Axis indicator remains on

If necessary, also set datum values in the remaining axes.



Axis preset

Correction of an entry

Maximum entry values

REF-reference mark evaluation

mm-INCH conversion

Absolute/Incremental positioning

Absolute/Incremental positioning

Linear compensation

Actual value
displays

Axis indicators

Axis keys

Correction of an entry

The **CE** -key erases an incorrect or erroneous value which has been keyed-in.



The **CE** -key is also used for operational parameter entry see "Operational parameters"



Axis indicator flashes.
Position display indicates
entry value on left

CE

press



Axis indicator on.
Position display indicates
previous position value.

Correction of an entry**Maximum entry values****REF-reference mark evaluation****mm-INCH conversion****Absolute/Incremental positioning****Absolute/Incremental positioning****Linear compensation**

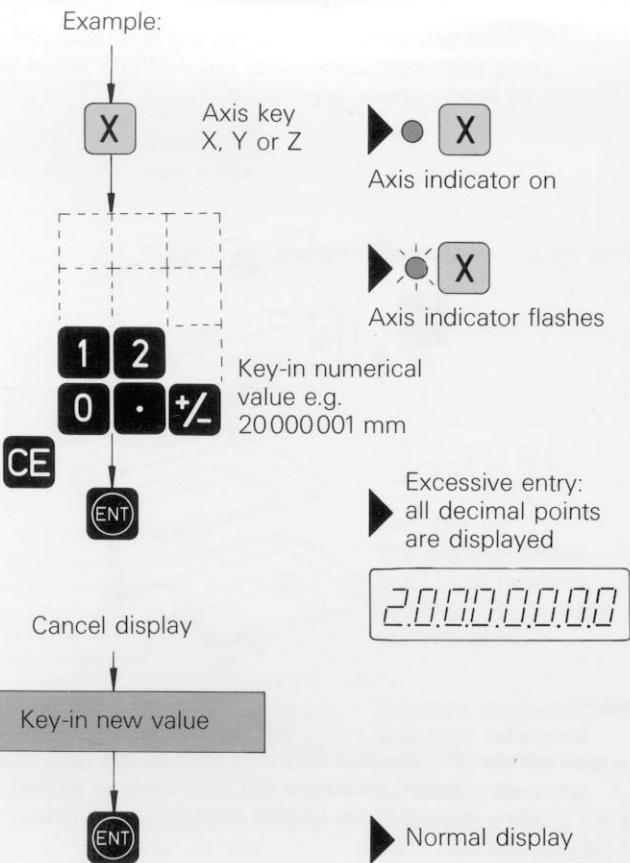
Actual value
displays

Axis indicators

Maximum entry values

The following maximum entry values may be entered:

Resolution	max. entry value
fine	20000.000 mm/787.4016 inches
coarse	20000.00 mm/787.4015 inches



Maximum entry values

REF-reference mark evaluation

mm-INCH conversion

Absolute/Incremental positioning

Absolute/Incremental positioning

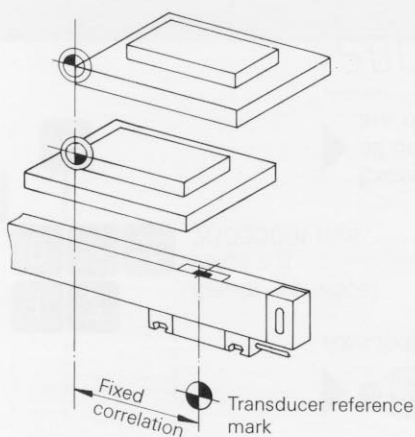
Linear compensation

Actual value
displays

Axis indicators

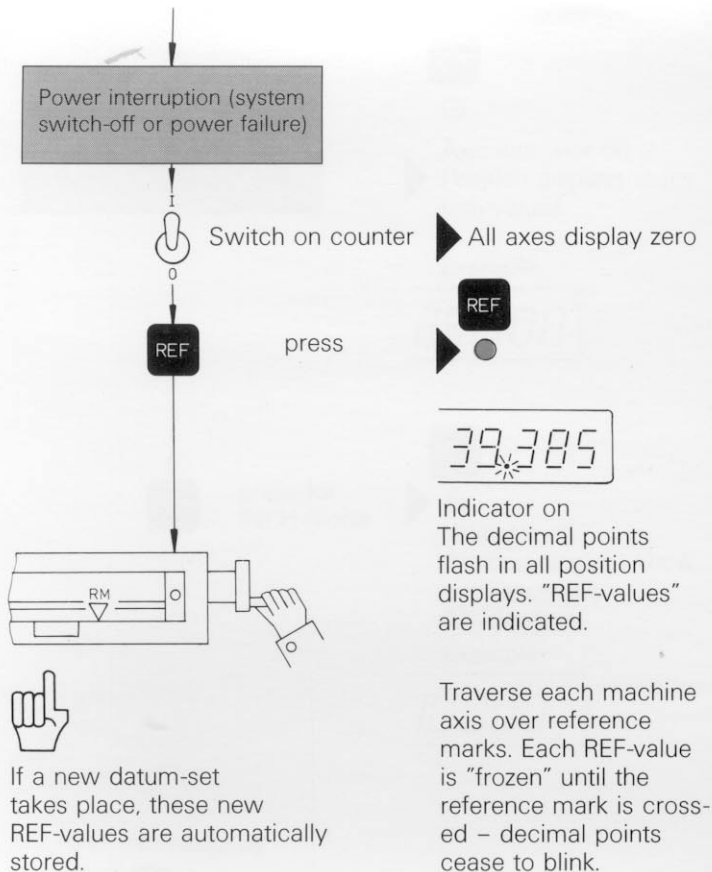
REF-reference mark evaluation

For retrieval of datum after switch on, press REF-key and traverse all axes over the reference marks. The displays then commence counting and indicate values with reference to the datum last set.



Datum reproduction is only possible when – prior to setting of the datum – the reference marks have been traversed over with the REF-function switched on.

Procedure:



If a new datum-set takes place, these new REF-values are automatically stored.

Traverse each machine axis over reference marks. Each REF-value is "frozen" until the reference mark is crossed – decimal points cease to blink.

REF-reference mark evaluation

mm-INCH conversion

Absolute/Incremental positioning

Absolute/Incremental positioning

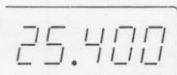
Linear compensation

mm/INCH conversion



Axis indicator off
Position displays show mm-values.

Example:




press for
INCH-mode



Indicator on.
Position displays show
corresponding
INCH-values

Example:



Return to mm-mode by
repressing 

mm-INCH conversion

Absolute/Incremental positioning

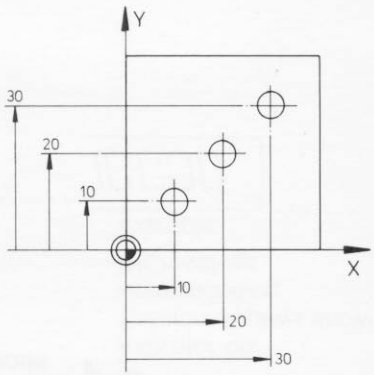
Absolute/Incremental positioning

Linear compensation

Absolute/Incremental positioning

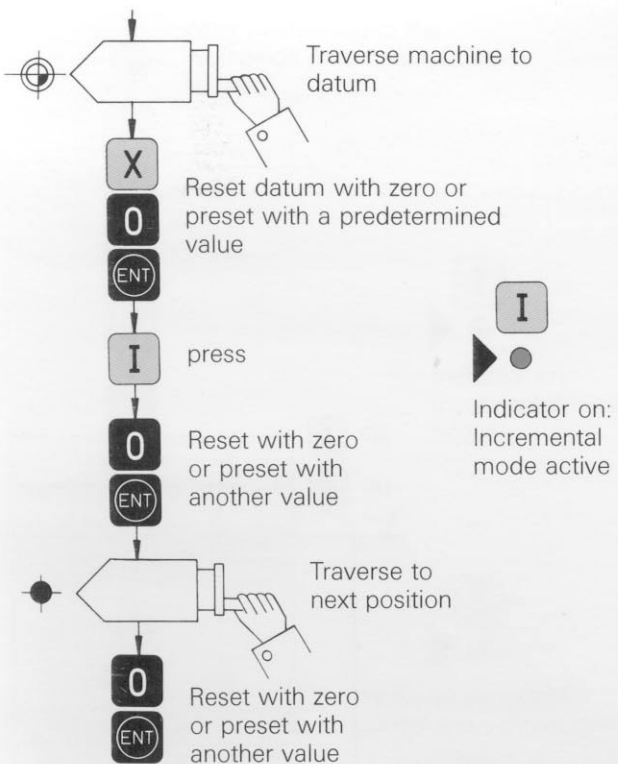
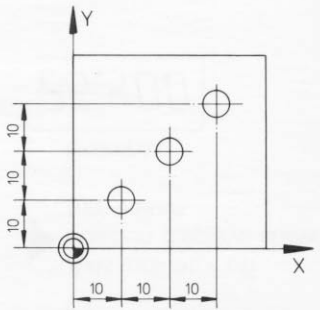
Absolute dimensions are referenced to the "absolute" datum.

for operation:
the machine is traversed **to** a certain dimension.



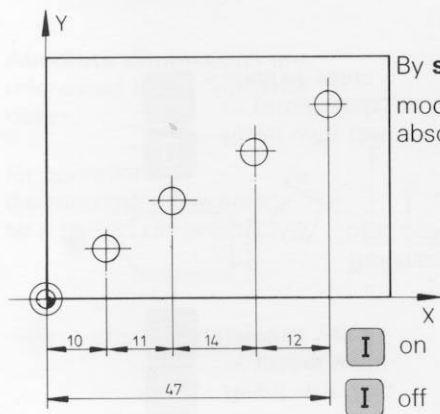
Incremental dimensions are referenced to each previous datum.

for operation:
the machine is traversed **by** a certain dimension.



Absolute/Incremental positioning

Absolute value recall



By **switching off** the **I** - mode, the counter displays absolute dimensions.



After positioning to the workpiece datum, reset datum to "zero".



Indicator on:
Incremental mode active

Series of incremental traverses with position zeroing



Indicator off:
Absolute mode active

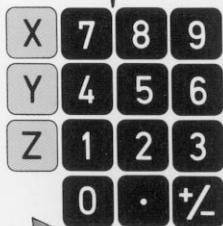
Absolute dimensions are displayed

Linear compensation (for machine errors)

Procedure:

CE press and hold depressed

5 press, now release **CE** and **5**



Selection of appropriate axis by pressing the axis keys



After setting the correction factor in all axes, the values are stored by pressing **ENT**

P51-999

P52- 0

P53- 123

Digit on right indicates the correction factor last entered. The factor is entered in $\pm 0 \dots 999$ ppm (parts per million) with sign. e.g. $+ 1 \mu\text{m}$ per $1000000 \mu\text{m}$

Correction range:
 $\pm 0 \dots 999$ ppm

Note:

A positive (+)-value corresponds to a length extension; a negative (-)-value corresponds to a length reduction of the scale