HEIDENHAIN

Pilot

Working with the Display Unit

VRZ 460

Actual value/Input displays — REF · 150.580 · Decimal numeric keyboard

Operating modes

Decimal point key
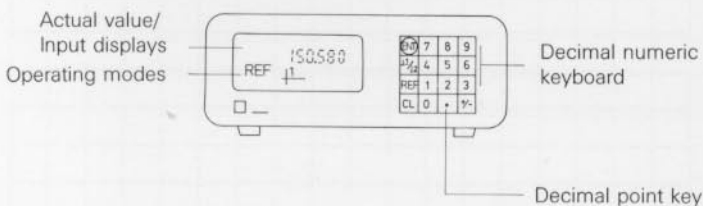
(ENT) Transfer entry to memory

⊥/⊥ Datum reset key for selection of appropriate datum

REF Reference mark evaluation

CL Clear entry/Call parameter key

+/− Change sign/Display mode key
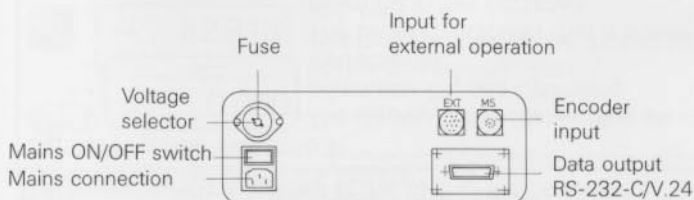
Fuse

Input for external operation

Voltage selector

Mains ON/OFF switch

Mains connection

EXT MS

Encoder input

Data output RS-232-C/V.24

Controls

Error Messages

Actual value/ Input displays — Operating modes

REF ꜔꜖ 150.580 ꜔꜖ +1 □ _

Decimal numeric keyboard
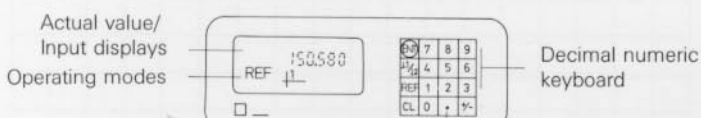
Switch-on/Working in REF Mode

Read the information in your **Operating Instructions** on initial operation before the first switch-on!

In REF mode the measured value display keeps the datum points in non-volatile storage. After activation of REF mode the reference mark of the encoder must be traversed (on encoders with distance-coded reference marks two reference marks must be traversed).
After traversing the reference mark(s) one time all datum points are reproduced.

The power switch is located at the rear of the housing.

Set **"0/1"** power switch to **1:**

0 1   0.000 +1
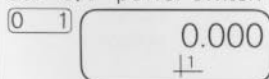
The display blinks (depending on parameter P1, see Operating Instructions).
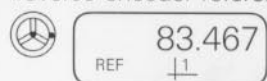The blinking indicates that a power interruption has occurred.

▼

Activate Reference Mark Evaluation:

REF   – 52.813 REF +1

REF blinks.
The displays indicate the stored REF values and remain "frozen".

▼

Traverse encoder reference mark(s):

⊘   83.467 REF +1

Display value changes concurrently: display value is based on the current datum.
REF glows continuously.

The measured value display is ready for operation and is in REF mode. New datum points may now be set.

⊘   This is the symbol for the handwheel of your machine or positioning device.

Deactivate REF mode

REF   83.467 +1

LED off.
REF mode is no longer active.
Datum points are not in non-volatile storage.

| Actual value/ Input displays | REF $:S0580$ | EN 7 8 9 ¼ 4 5 6 | Decimal numeric keyboard |

Actual value/
Input displays
Operating modes
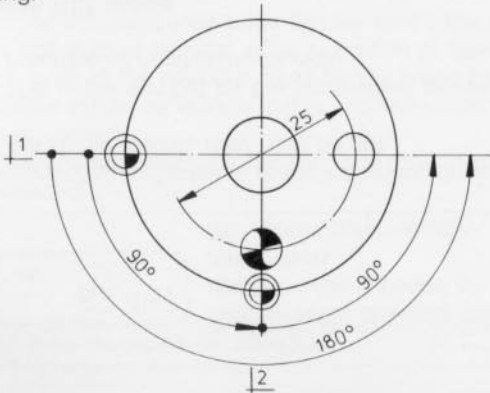
Datum Points

Using datum points you can set a defined correlation between
encoder position and the display value.
The VRZ 460 Display Unit permits the setting of two datum
points which are represented by the symbols ⊥1 and ⊥2 .
One datum, for example, can be used for incremental
positioning.

Switching to the Other Reference Point

| ⊥1/⊥2 | REF 84.551 ⊥2 | The display value changes suddenly. The value refers to the current datum indicated with the datum symbol (here ⊥2). |

A switch-over to the other datum is possible both in REF mode
("REF" display) as well as outside of the REF mode.

Actual value/
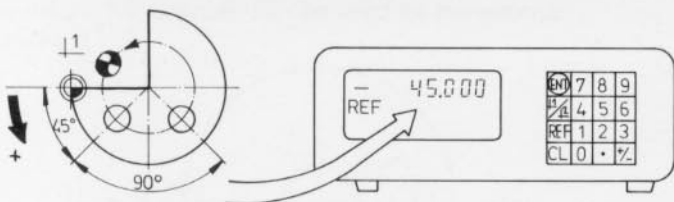Input displays

Setting the Datum

Non-volatile storage of datum points is only ensured
if the datum points are set in the REF mode (see
"switch-on/Working in REF mode").

Display range: see parameter P3

Addressing the datum:

| 25.493 |
| REF ⊥1 |

The symbol for datum 1 or 2
appears in the display.
Display value refers to the current
datum.

▼

Traverse the machine slide or tool to the datum position:

| 31.864 |
| REF ⊥1 |

▼

Enter the new datum value for the current position,
e. g. 45.000°:

4

5

| 45 |
| REF ⊥1 SET |

SET lights up.
The entry value appears *left*-justified
in the display.

▼

Transfer entry to memory:

| 45.000 |
| REF ⊥1 |

SET goes out.
The entry value appears *right*-
justified in the display.

Falsely entered values can be corrected at any time. If the entry
value is still left-justified in the display, then **CL** must be
pressed before entering the correct value.

Absolute Dimensions/Incremental Dimensions

Absolute dimensions   refer to one absolute, fixed datum.
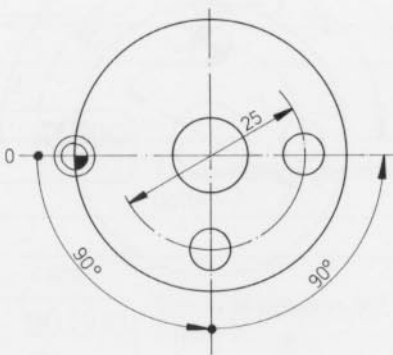The rotary table or the tool is to move
to a certain **position.**
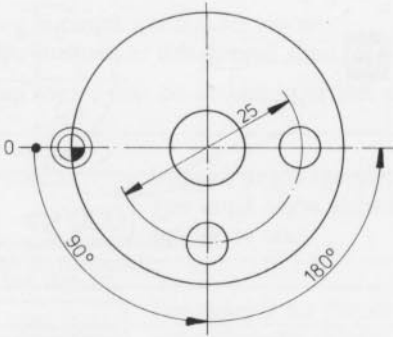
Incremental dimensions refer to the previous position of the
rotary table or tool.
The rotary table or the tool is to move
by a certain **amount.**

Positioning in Incremental Dimensions

With the datum point 1 the absolute datum ist set.
Datum 2 can be set to "0" after each positioning operation.
By switching to datum 1 you can recall the absolute value.

Example

The tool is at the absolute position $+90°$ and is to be moved in incremental dimensions by $+90°$.
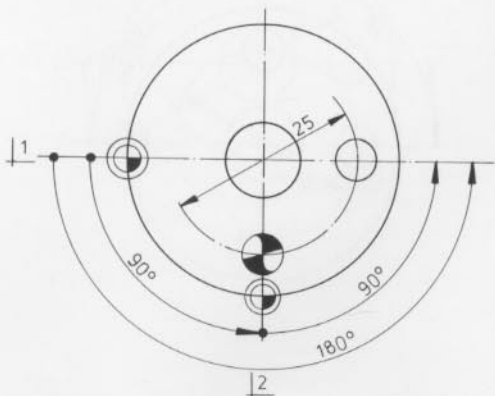
REF ⊥1	**90.000**	The display shows the absolute position value relative to datum 1.

▼

Switch to datum 2:

| ⊥1/⊥2 | REF ⊥2 | **31.864** | Symbol for datum 2 appears. Display value is based on a previously set datum 2. |

▼

Zero datum 2:

| **0** **(ENT)** | REF ⊥2 | **0.000** | Tool is at zero position relative to datum 2. |

▼

Move tool by +90°:

| ⊕ | REF ⊥2 | **90.000** | Tool is at position 90° relative to datum 2. |

▼

Recall the absolute position:

| ⊥1/⊥2 | REF ⊥1 | **180.000** | Tool is at position (90° + 90° =) 180° relative to datum 1. |

Parameters

The Display Unit has operating parameters in non-volatile storage which immediately become active upon switch-on. The parameters are identified by the letter P followed by a parameter number. More detailed information regarding parameters can be found in the Operating Instructions.

The parameters that are important for operation are included in the pages of this pilot which are marked with the symbol ●.

> Invalid parameter values will not be accepted by the display unit!

Parameter Entry (example parameter P3)

Call parameter (Press and hold CL key. Enter parameter **number** e.g. 3. Then release both keys):

CL **3**

| P3 | 2 |

The parameter and the current parameter value appear in the display.

▼

Enter parameter **value** (e.g. 1):

1

| P2 | 1 |

The parameter value appears right-justified in the display.

▼

Clear mistaken entry, if necessary:

CL

| P2 | 2 |

The parameter appears with the last valid value.

▼

A new value can then be entered:

0

| P2 | 0 |

The new parameter appears in the display.

▼

Transfer parameter to memory:

(ENT)

| | 31.864 |

The last position value appears in the display.

Parameter Entry

● **Function of the CL Key** ● **Display Range, Display Mode**

● **Tolerance Check Operating Mode**

Error Messages

Function of the CL Key

The function of the CL key is set with the parameter P2.
The CL key clears a false entry and calls the previous display
value back. With parameter P2 you can also choose whether
the display is set to "0" by pressing the CL key (without
entering a numerical value).

Parameter P2: Function of the CL Key

Function of the CL key	Parameter
CL Does **not** set the display to "0" if the CL key is pressed without entering a numerical value.	P2: 0
CL Sets the display to "0" if the CL key is pressed without entering a numerical value.	P2: 1

> During a datum entry or a parameter entry, display
> zeroing is not possible with the CL key.

Parameter P3: Display Range

Display Range	Parameter
0 ... 360°	P3: 0
0 ... ± 180°	P3: 1
0 ... ± max. display value	P3: 2

Display Mode
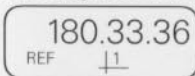
With the ±/ key the the display can be switched from

decimal-degree display to degrees-minutes-seconds display. It
is not possible to switch while entering a value or a parameter.

Example: The Display Unit is in the "decimal-degree" mode.

180.5600 REF �英	The position value appears in the display as a decimal number.

▼

Switch to degrees-minutes-seconds display:

±/ 180.33.36 REF �英	The converted decimal value appears in the display in degrees-minutes-seconds.

▼

Recall "decimal degree" display:

±/ 180.5600 REF �英	The actual position value appears again as a decimal number.

Tolerance Check Operating Mode

The lower and upper limit values are entered via parameters P8 and P9. P8 and P9 can only be called if beforehand the tolerance check operating mode was set with the parameter $P7 = 5$. In contrast to the previous parameter entry, the parameter number and the upper and lower limit values are displayed alternately in P8 and P9.

The tolerance status is output with the symbols:
$>$ measured value is greater than the upper limit value
$=$ measured value is within tolerance
$<$ measured value is less than the lower measured value
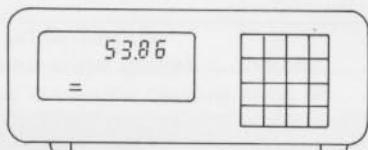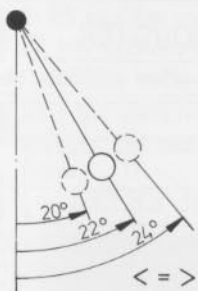
The measured value display can output the tolerance status through two lines for external subsequent processing (see "remote operation" in the operating instructions).

Parameters for the Tolerance Check Operating Mode

Tolerance Check Operating Mode	Parameter No.	Parameter Value
Switch to tolerance check mode	P7:	5
Set lower limit value	P8:	lower limit value with sign
Set upper limit value	P9:	upper limit value with sign

The lower limit value must always be less than the upper limit value filed under parameter P9. In case of false entry, all three tolerance status symbols light up!

When a parameter value is transferred to memory, one of the symbols for tolerance status appears, depending on the current measured value.

● Tolerance Check Operating Mode

Error Messages

Error 01	• A storage command followed another before the data output over the V.24 data interface was concluded.
	▶ Acknowledge this error message with **CL**.
Error 02	• A storage command was given although the external unit was not ready or connected (e.g. in the display stop operating mode, see operating instructions).
	▶ Acknowledge this error message with **CL**.
	A subsequent error of this type will no longer be indicated. An interruption in power activates this error message again.
Error 05	• The encoder output signals are too large and the display unit may no longer be able to interpolate correctly.
	▶ Acknowledge this error message with **CL**.
	A subsequent error of this type will no longer be indicated. An interruption in power activates this error message again.
Error 06	• The distance-coded reference marks were traversed too quickly.
	• The value given in parameter 5 for the distance coding of the reference marks does not correspond to the actual coding of the connected encoder.
	▶ Acknowledge this error message with **CL**.
9 9 9.9.9.9.9	• All decimal points light up. The maximum display value was exceeded.
	• All decimal points blink during an internal character overflow.
Display blinks	• A power interruption has occurred.
	• The output signals of the encoder are too weak, e.g. because of scale fouling.
	• Encoder is defective or not connected.
	• The encoder was traversed too quickly, the permissible input frequency was exceeded.
	▶ The blinking can be cleared with **REF**.
	In order to work in REF mode the reference marks of the encoder must then be traversed.