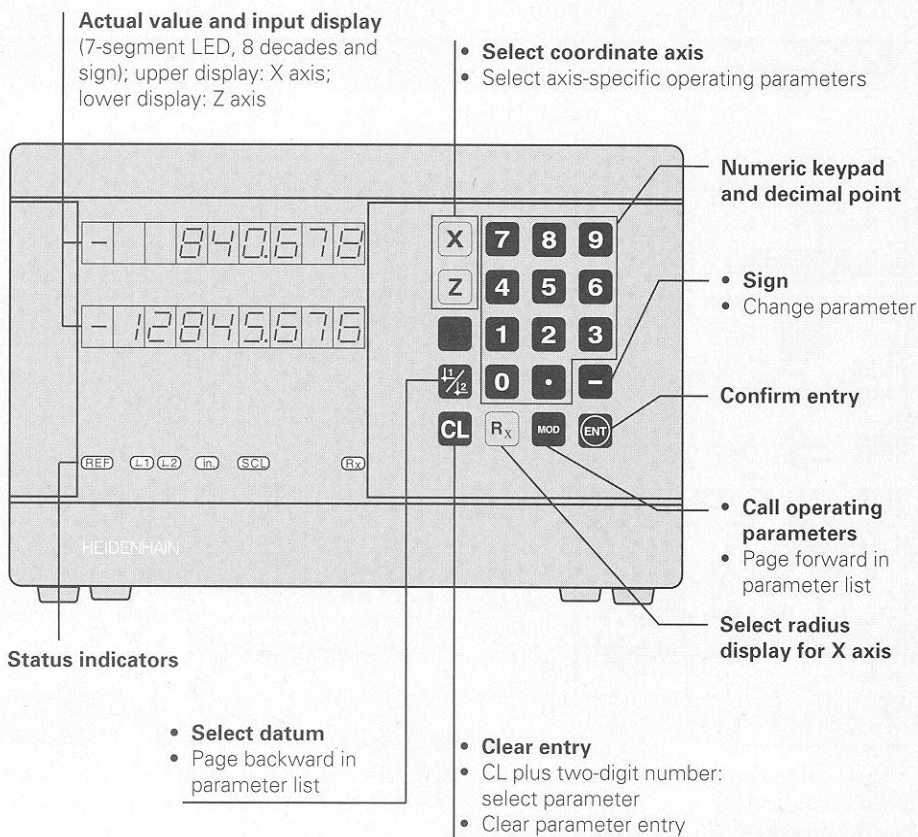




Working with the position display unit

ND 530



Indicator	Meaning
REF	Reference mark crossed over – datum points are now stored in nonvolatile memory. Blinking: Waiting for confirmation from operator.
↓1 / ↓2	Datum point 1 / Datum point 2 currently active.
in.	Position values displayed in inches
SCL	Scaling factor active
R _X	Radius display for X axis active

The ND 530 display unit for lathes is designed for use with two HEIDENHAIN linear encoders with sinusoidal output signals.

The linear encoders have one reference mark or several (preferably distance-coded) reference marks. When a reference mark is crossed over, a signal is generated which identifies that position as a reference point.

After switch-on, crossing over the reference marks restores the relationship between axis slide positions and display values last established by datum setting. With encoders that have distance-coded reference marks, this requires a traverse of no more than 20 mm.

Switch-On



Ent...CL

Turn on the display unit (switch located on rear panel).

- Display shows `Ent...CL`.
- REF blinks.



5 , 6 9 7

Switch on reference mark evaluation.

- The display shows the value last assigned to the reference mark position.
- REF glows.
- The decimal point blinks.



Cross over the reference mark.

Move the axis until the display becomes active and the decimal point stops blinking.

The display unit is now ready for operation.

If you do **not** wish reference mark evaluation, press **CL** instead of ENT.

Datum Setting

The datum setting procedure assigns a specific axis position to the associated display value. For example, you can set the workpiece face to $Z = 0$ mm and a shoulder on the workpiece to its associated X coordinate.

You can set two separate datum points.



Select datum point 1 or 2.



4 0

Enter a numerical value, such as 40.



Confirm your entry.

You can switch from one datum point to the other at any time.
Use datum point 2 if you want to display incremental dimensions.

Radius Display for the X Axis

There are two ways to switch the X axis from diameter to radius display:

- Operating parameter **P03.1** or
- The **R_X** key.

If you change the display using the **R_X** key, operating parameter P03.1 is automatically adjusted.

To select or deselect radius display:

- Press **R_X**.
When the **R_X** indicator is on, this means that radius display is active.

Scaling Factors

You can have the display unit show the axis traverse lengthened or shortened by a **scaling factor**. First you enter a scaling factor separately for each axis, then you activate the scaling factors.

To enter scaling factors:

- Select **operating parameter P12**.
- Select the **coordinate axis** to which you want the scaling factor to apply.
Scaling factor for the **X** axis: P12.1
Scaling factor for the **Z** axis: P12.2
- Enter the **scaling factor**. Input range: 0.1 to 9.999 999
- Select the next **coordinate axis** and enter a scaling factor.
- When you have entered the scaling factors:
Press **ENT**.
The display unit stores the values and returns to display mode.
The **SCL** indicator glows.

Effect of scaling factors:

A scaling factor **larger than 1** will **increase** the size of the workpiece.

To activate the scaling factors:

- Select **operating parameter P11**.
- Set this parameter to **ON**.

To deactivate the scaling factors:

- Select **operating parameter P11**.
- Set this parameter to **OFF**.
The scaling factors in P12 no longer affect the display.

Error Messages

Message	Cause and effect
ERROR 10	Invalid numerical value for parameter
ERROR 12	Value entered cannot be displayed
ERROR 50	Encoder signal too small (scale may be contaminated)
ERROR 51	Input frequency too high (can occur with excessive traverse speed)
ERROR 52	Encoder signal too large
ERROR 53	Internal counter overflow
ERROR 55	Error while crossing over the reference marks
ERROR 80	Should any of these errors recur, contact your customer service agency.
ERROR 82	
ERROR 83	
ERROR 84	
ERROR 98	Check the operating parameters.
ERROR 99	If these errors recur, contact your customer service agency.

If **all decimal point light up**, the measured value is too large or too small.

- Set a new datum.

To clear error message ERROR:

When you have removed the cause of the error,

- press **CL**.

Operating Parameters

Operating parameters allow you to define the operating characteristics of the display unit and how the encoder signals are evaluated.

Operating parameters are designated by the letter P, a two-digit parameter number and an abbreviation. Example: `P 11 SCL`.

The current setting is shown under each operating parameter when you display it.

Axis assignment

Axis-specific parameters (those requiring separate entries for each axis) have **axis codes**:

1 = X axis, 2 = Z axis.

The axis code is separated from the parameter number by a point.

In the operating parameter list, these parameters are set off with a superscript "A" and the parameter for the X axis is given (e.g., `P 12.1 SCL`).

You select axis-specific operating parameters with the orange axis keys.

To access the operating parameters:

- Press MOD

To go directly to an operating parameter:

- Press and hold CL and press the first digit of the parameter number
- Release both keys and enter the second digit of the parameter number

To page through the operating parameters:

- **Page forward:** press MOD

- **Page backward:** press \uparrow 1 / \uparrow 2

Any changes made are automatically activated when you resume paging.

To change a parameter setting:

- Change the setting with the minus key, **or**
- Enter the desired value directly, e.g. for P12.

To correct an entry:

- Press CL

To exit the operating parameters:

- Press ENT

This activates all changes you made.

Operating Parameter List

Parameter	Meaning	Function / Effect	Setting
P01	Unit of measurement	Dimensions in millimeters	INCH OFF
		Dimensions in inches	INCH ON
P03.1	Radius/diameter display ^A	Radius	RADIUS
		Diameter	DIA
P 11 SCL Scaling	Scaling factors on/off	Scaling factors active	ON
		Scaling factors inactive	OFF
P 12.1 SCL	Scaling factor ^A	Enter a value for each axis separately. Input range: 0.1 to 9.999 999	

Parameter Settings for HEIDENHAIN Linear Encoders

Model and signal period [μm]	Reference marks	P43	Display step (unit: P01)		Subdivision, P32	
			mm	inches		
LIP 40x	2	one	single	0.001	0.000 05	2
				0.000 5	0.000 02	4
				0.000 2	0.000 01	10
				0.000 1	0.000 005	20
				0.000 05	0.000 002	40
0.000 02	0.000 001	100				
LIP 101 A LIP 101 R	4	one	single	0.001	0.000 05	4
				0.000 5	0.000 02	8
				0.000 2	0.000 01	20
				0.000 1	0.000 005	40
				0.000 05	0.000 002	80
LIF 101 LF 401	4	one	single	0.001	0.000 05	4
				0.000 5	0.000 02	8
				0.000 2	0.000 01	20
				0.000 1	0.000 005	40
LID xxx/LID xxx C LS 103 / LS 103 C LS 405 / LS 405 C ULS/10	10	one/dist.cod.	single/2000	0.001	0.000 05	10
	10	one/dist.cod.	single/1000	0.000 5	0.000 02	20
				0.000 2	0.000 01	50
				0.000 1	0.000 005	100
LS 303 / LS 303 C LS 603 / LS 603 C	20	one/dist.cod.	single/1000	0.01	0.000 5	2
				0.005	0.000 2	4
LS 106 / LS 106 C LS 406 / LS 406 C LS 706 / LS 706 C ULS/20	20	one/dist.cod.	single/1000	0.01	0.000 5	2
				0.005	0.000 2	4
				0.002	0.000 1	10
				0.001	0.000 05	20
				0.000 5	0.000 02	40
LIDA 190 LB 101	40	one	single	0.002	0.000 1	20
				0.001	0.000 05	40
				0.000 5	0.000 02	80
LIDA 2xx LB 326 LB 301	100	one	single	0.01	0.000 5	10
				0.005	0.000 2	20
				0.002	0.000 1	50
				0.001	0.000 05	100
LIM 102	12800	one	single	0.1	0.005	128
				0.05	0.002	256

Example Linear encoder with signal period $s = 20 \mu\text{m}$

Desired display step $a = 0.005 \text{ mm}$

Subdivision $P32 = 0.001 \cdot s / a = 4$

Linear measurement with ballscrew and rotary encoder

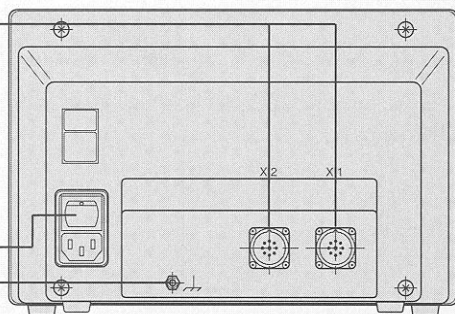
If you are measuring linear distance with a ballscrew and rotary encoder, calculate the signal period s as follows:

$$\text{Signal period } s = \frac{\text{Screw pitch [mm]} \cdot 1000}{\text{Line count}} \quad [\mu\text{m}]$$

Rear Panel

Inputs for two HEIDENHAIN linear encoders with sinusoidal output signals ($7\mu A_{PP}$ to $16\mu A_{PP}$),
Connecting cable max. 30 m (100 ft),
Input frequency max. 100 kHz

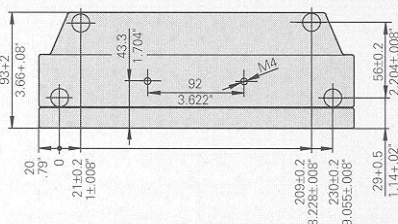
Power switch
Ground terminal



Interfaces X1 and X2 conform to the recommendations in VDE 0160, 5.88 for separation from line power.

Installation

The display unit can be mounted on a flat surface or on the tilting base from HEIDENHAIN (Id.-Nr. 281 619 01) with M4 screws.



Power Supply and Connection



Danger of electrical shock!

Unplug the power cable before opening the housing.
Connect a protective ground. This connection should never be interrupted.



Danger to internal components!

Do not engage or disengage any connections while the unit is under power.
Use only original replacement fuses.

Primary-clocked power supply, class 2 overvoltage resistance in accordance with VDE 0160, 5.88. **Voltage range** 100 V to 240 V (–15% to +10 %).

Frequency 48 Hz to 62 Hz. **Power consumption** 9 W. **Line fuse:** F 1 A (in unit).
Minimum cross-section of power cable: 0.75 mm².



To increase the noise immunity, connect the ground terminal on the rear panel to the central ground point of the machine. (Minimum cross-section 6 mm²)

Ambient Conditions

Temperature range Operation: 0°C to +45°C (32°F to 113°F)
Storage: –30°C to +70°C (–22°F to 158°F)

Rel. humidity Annual average: < 75%; maximum: < 90%

Weight 2.3 kg

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