HEIDENHAIN

Product Overview

Digital Readouts
ND 500 Series

August 2007

Position Display Units
ND 500 Series

Whether milling, drilling, boring or turning, digital readouts from HEIDENHAIN are always the correct choice for you machine tool:

Higher productivity
By retrofitting your manually operated machine tools or measuring equipment with digital readouts from HEIDENHAIN, you've made a decision for increased productivity, higher precision and more operating ease.

Fast and safe production
HEIDENHAIN digital readouts save you time. The distance-to-go display feature allows you to approach the next nominal position quickly and reliably, simply by traversing to a display value of zero. Reference points can be set wherever needed. This simplifies positioning, especially for workpieces with complicated dimensions.

Unambiguous readings
A highly readable display shows the measured positions with respect to the selected reference point. As a result, the probability of error is reduced and machining becomes more reliable.

	ND 522	**ND 523**
Application	For milling machines and lathes	
Axes	2	3
Encoder inputs	⊓⊔ TTL; D-sub, 9-pin female connectors for linear encoders, angle encoders and rotary encoders	
Display step	5 µm (with 20 µm encoder signal period)	
Reference points	10	
Tool data	For 16 tools	
Functions	• REF reference mark evaluation for distance-coded and single reference marks • Distance-to-go display with nominal position input in absolute or incremental values	
For milling, drilling and boring machines	• Calculation of positions for hole patterns (circular and linear patterns) • Cutting data calculator • Graphically supported contour monitoring (milling of radii and bevels)	
Fur turning	• Radius/diameter display • Separate or sum display for Z and Z_O • Freezing the tool position for back-off • Taper calculator • Calculation back to coordinates for rotated top slide	
Interfaces	USB—for measured value output, parameter output and input, flash download of software, configuration files, compensation tables	

Graphic display

Besides the position values, the ND 500 graphic display shows useful information such as the reference point, tool, feed rate, machining time, unit of measure and display mode.

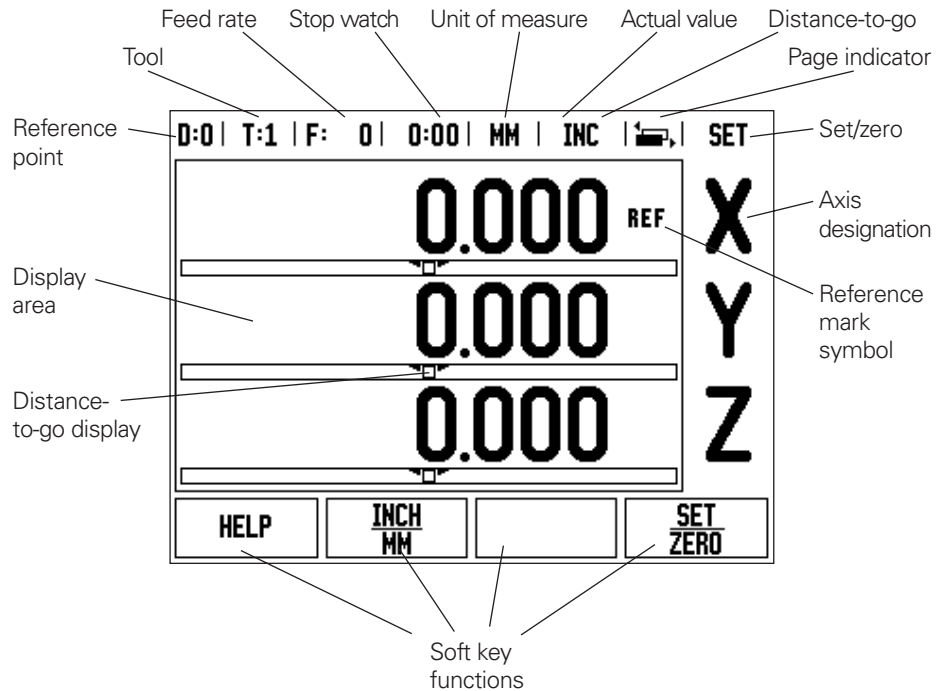When defining functions, the display supports you with **plain-language instructions** and **help graphics.**

The **graphic positioning aid** in the distance-to go mode shows you the direction of traverse and helps you to move dead-on to the nominal position.
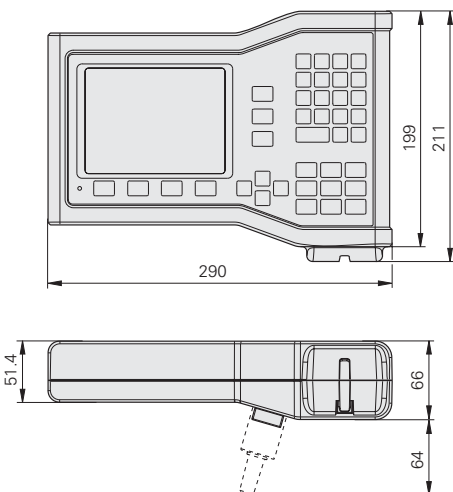
Fast access to functions

The most important functions offer quick and exact access. Soft keys with clear information in the local language enable you to make entries that fit your momentary situation.

Integrated pocket calculator

You can also access the pocket calculator without any detours so you can quickly calculate complex positions and load the value directly into the display.

Feed rate Stop watch Unit of measure Actual value Distance-to-go

Tool Page indicator

Reference point

`D:0 | T:1 | F:  0 | 0:00 | MM | INC | ⟨⟩ | SET`

Set/zero

Display area

0.000 REF X

Axis designation

Reference mark symbol

0.000 Y

Distance-to-go display

0.000 Z

| HELP | INCH MM | | SET ZERO |

Soft key functions

Dimensions

199
211

290

51.4

66

64

Dimensions in mm

Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

Mounting

You can set up the ND 500 either on a mounting arm on the machine or with the aid of a mounting base. The parts required for fastening the display on the mounting arm or base are included in delivery. The enable you to rotate and tilt the display.
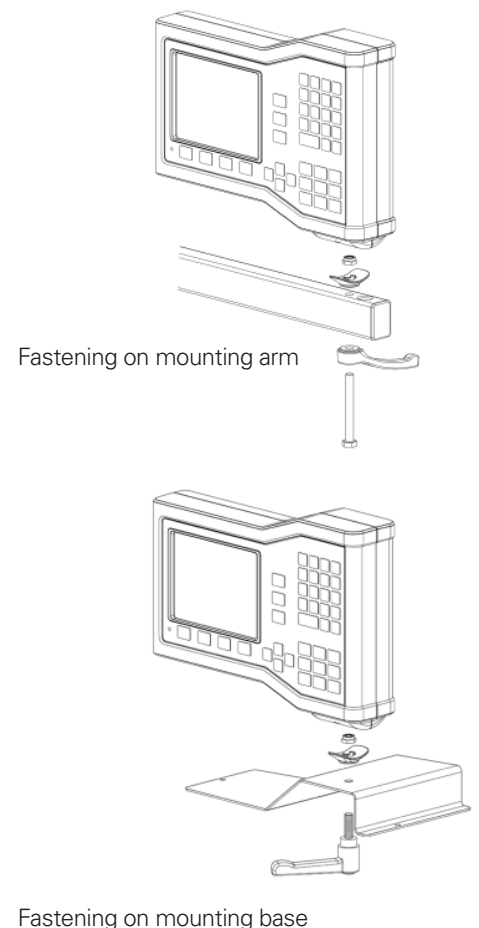
The mounting arm and base are available a accessories:

Mounting arm
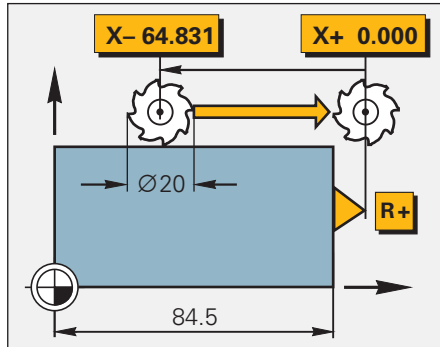ID 382893-01

Mounting base
ID 625491-01

Fastening on mounting arm
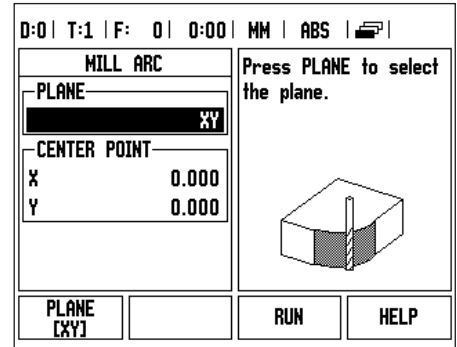

Fastening on mounting base

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Field-Proven Functions

Distance-to-go display

The distance-to-go display feature simplifies your work considerably. You enter the next nominal position, the readout shows you the shows you the distance remaining to the target position, and you simply traverse to the display value zero. In the milling mode of operation, it also takes into account the **tool radius** in the working plane (R+ or R–).
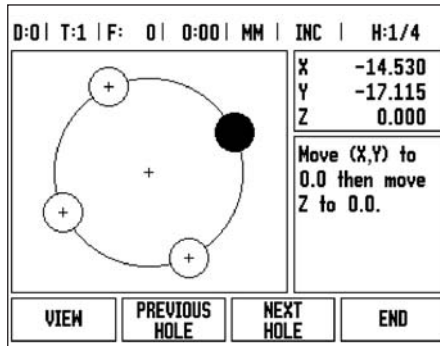
Contour monitoring

Particularly for 2-D milling and turning, the contour monitoring function shows you whether you are moving the tool within the tolerances that you set.

Hole patterns

In the milling mode, you can use the ND 500 to machine **bolt hole circles** (full circles or circle segments) and **linear hole patterns** without manual calculation: Simply enter the geometric dimensions and the number of holes from the drawing. The display calculates the coordinates of the individual holes in the working plane. The **graphic display** is a particularly useful feature: it lets you verify your input of the programmed bolt-hole pattern before machining.
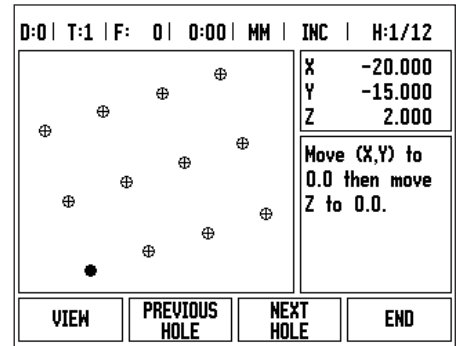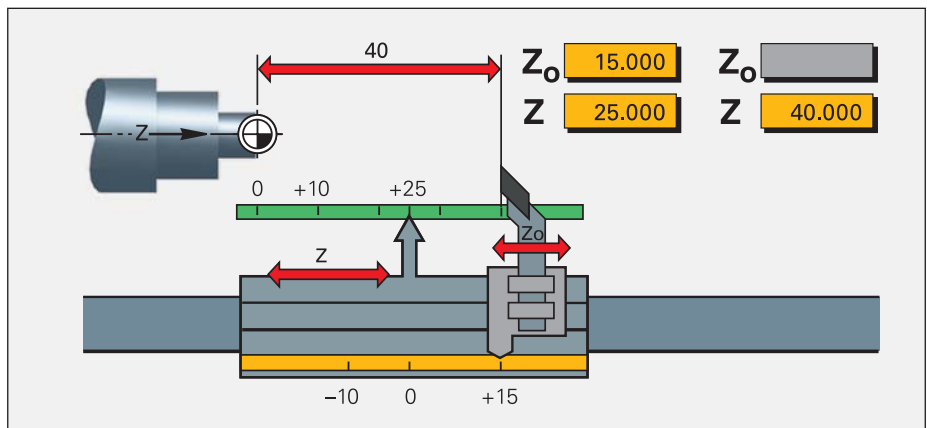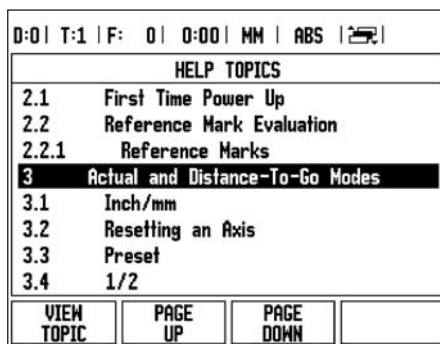
Sum display of longitudinal axes

In lathe mode, the positions of the saddle and the top slide are displayed either separately or as the sum of both values. If you select **separate displays,** the position values are referenced to the datum for each individual axis. If only the saddle is moved, the displayed value for the top-slide axis remains unchanged. If **sum display** is selected, the counter adds both values. You can now read the absolute position of the tool in relation to the workpiece datum—without having to calculate!

Integrated help

The integrated help provides appropriate information and assistance in any situation. Simply press the HELP soft key and the display unit will show information relevant to the current operation. The LIST OF TOPICS soft key gives you access to information on further topics.

Distance-to-go display: Traversing to 0

Contour monitoring

Bolt hole circle

Linear pattern

Separate or sum display on lathes with saddle and top slide

List of topics in the integrated help

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Linear Encoders
## LS 328, LS 628

They determine the accuracy

The linear encoder measures the exact position of an axis directly at the axis slide. The backlash of machine transfer elements (lead screw and gears), as well as screw-pitch error, has no influence on the measured position display. The accuracy of the measurement greatly depends on the scale: LS linear encoders from HEIDENHAIN incorporate high-precision DIADUR scales.

Sturdy design for years of service

HEIDENHAIN linear encoders are robust, vibration-resistant and durable. The scale and scanning unit are protected against chips, swarf, dirt and splash fluids by an aluminum housing. Downward-oriented elastic lips seal the housing. The photoelectric scanning of the scales is contact-free, and therefore without wear for many years.

LS 328C
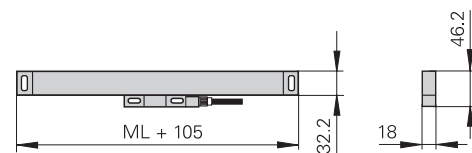
LS 628C
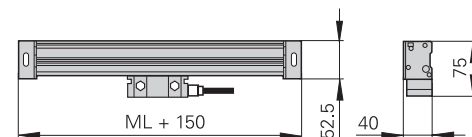
	LS 328C	LS 628C
Description	Slimline encoder for limited installation space	Universal linear encoder
Measuring standard Accuracy grade	Glass scale with DIADUR graduation ± 10 µm	
Measuring lengths ML	70 to 1240 mm	170 to 3040 mm
Incremental signals Grating period Reference marks	⊓⊔ TTL 20 µm Distance-coded	
Measuring step	5 µm (encoders with smaller measuring steps are available on request)	
Electrical connection	Separate adapter cable (1 m/3 m/6 m) connectable to mounting block	
Traversing speed **Required moving force**	≤ 60 m/min ≤ 5 N	
Vibration 55 to 2000 Hz **Shock** 6 ms	≤ 150 m/s^2 (IEC 60068-2-6) ≤ 300 m/s^2 (IEC 60068-2-27)	
Protection IEC 60529	IP 53 when mounted according to the mounting instructions	
Weight	0.27 g + 0.67 g/mm ML	0.7 g + 2 g/mm ML

# Linear Encoders
Installation and Electrical Connections

Simple in installation and service
HEIDENHAIN linear encoder are quickly installed: you need only align the scale unit at several points along the machine guideway. Stop surfaces or stop pins can also be used for this. Use the shipping brace or—with the LS 328C, the mounting gauge—to easily and quickly set the gap between the scale housing and the scanning unit. You must also ensure that the lateral tolerance is maintained.
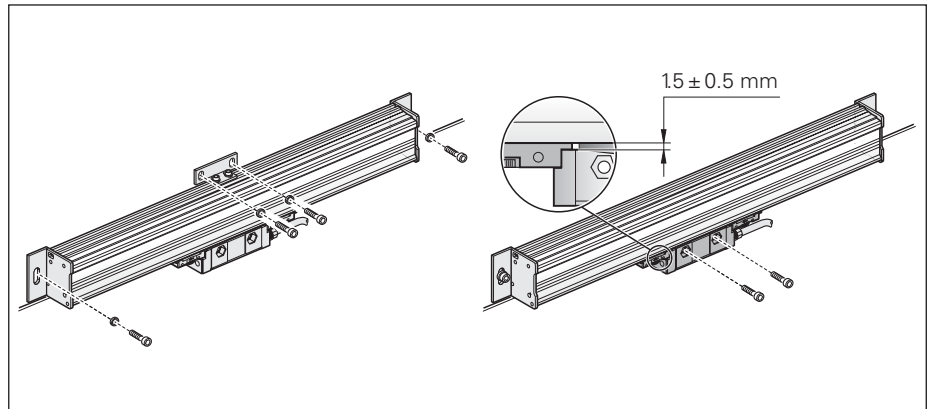
Accessory
Mounting gauge for LS 328C
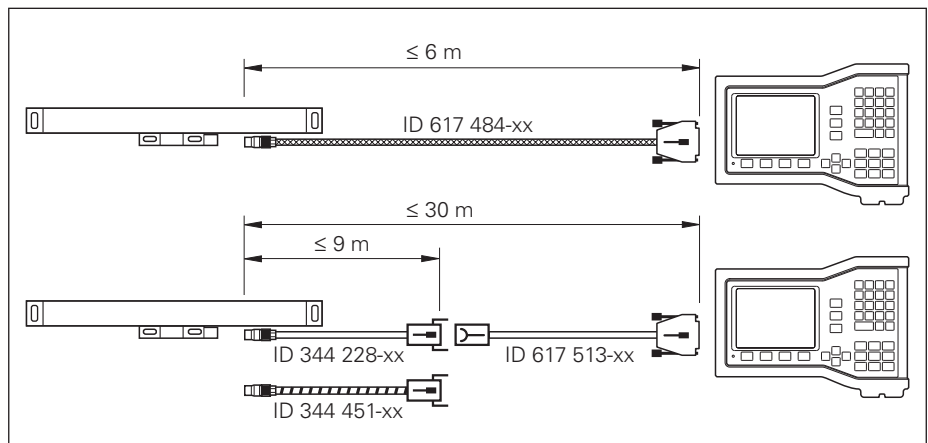ID 528 753-01
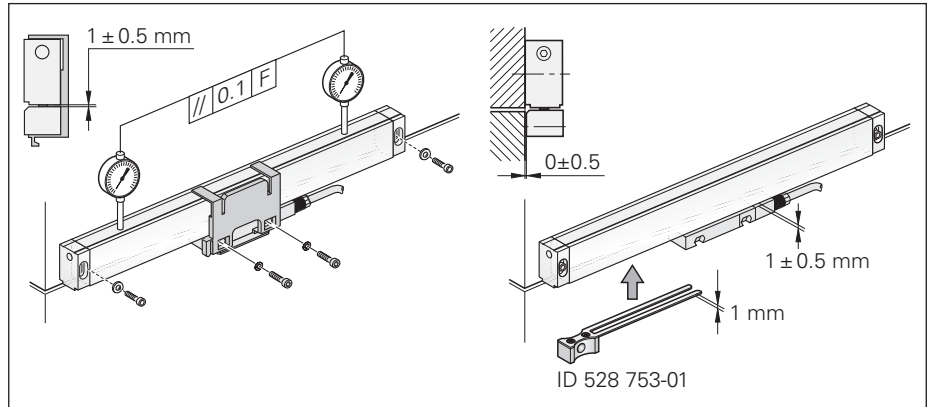
Mounting the LS 328C

Even the encoder cable stays out of the way during mounting. It can be connected to the mounting block and ordered in the length you need. And should the cable be damaged in the typically harsh shop-floor environment, it is easy to exchange without removing the encoder.

Mounting the LS 628C

Available cables
For lengths up to 6 m, the adapter cables can be connected directly to the position display. For cable length up to 30 m, a combination of two adapter cables with larger core cross sections are required. Here the adapter cable on the LS can be ordered as desired with or without metal armor.

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