

Преобразователи сигналов ND 287

Технические характеристики

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ND 287

Evaluation unit for measuring and inspection stations

Thanks to its extensive functionality, the ND 287 evaluation unit for one axis is well suited for measuring and inspection stations, and can also be used for simple positioning tasks. The universal encoder input permits the connection of all incremental encoders with 11 μ App and 1 Vpp signals, and absolute encoders with the EnDat 2.2 interface from HEIDENHAIN.

Design

The ND 287 features a sturdy aluminum die-cast housing. For displaying the measured values, a graphics-capable screen shows the status display and soft keys. Its splash-proof, full-travel keyboard is designed to handle the shop floor.

Functions

The ND 287 provides numerous functions for the metrological acquisition of individual values, including functions such as sorting and tolerance check mode, minimum and maximum value recording, and measurement series storage. Based on these data, mean values and standard deviations can be calculated and displayed in histograms or control charts. Thanks to its modular design, the ND 287 permits the connection of a second encoder for sum/difference measurement, or the connection of an analog sensor (e.g., for temperature compensation).

Data interfaces

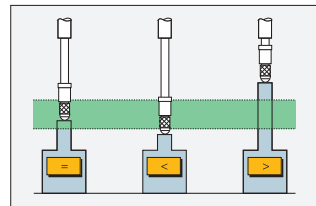
The ND 287 is equipped with serial interfaces for the transmission of measured values to a PC or printer, for the input/output of parameter lists and compensation value lists, and for diagnostics:

- USB
- RS-232-C/V.24
- Ethernet 100BaseT (option)

The transmission of measured values can be initiated on the ND keyboard or via an external command. With RS-232-C/V.24, this is done using the software command CTRL+B or a configurable internal clock.

Sorting and tolerance checking

With the sorting and tolerance checking function of the ND 287, workpieces can be inspected for dimensional accuracy and sorted into classes. The result is shown through symbols in the color status display, with a corresponding signal applied at the switching outputs.



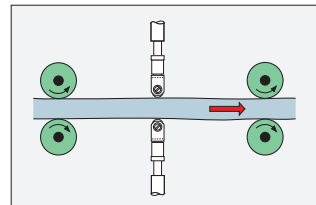
Sorting and tolerance checking

Display freeze

For readability, even during rapidly changing measured values, the display can be frozen with an external signal. The internal counter keeps on running.

Mathematical consideration of a second encoder

A second encoder or a sensor can be connected to the ND 287 through an optional **encoder module** or **analog module** input assembly. The data from the two encoders can be taken into account mathematically via operands. The result and the two measured values are saved. This opens up further areas of application, such as sum/difference display of two encoders or temperature compensation by means of a temperature sensor.

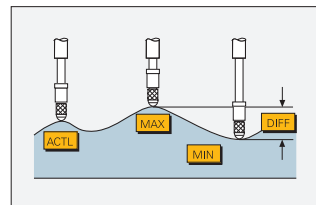


Sum measurement

Recording and evaluating measurement series

The ND 287 provides a measured-value memory for the storage of measurement series. Alternatively, during the measurement series, the minimum, maximum, or difference can be displayed. The displayed value can also be checked for tolerance conformity with the sorting function. The saved measured values are evaluated and displayed in the following ways:

- Statistical view (mean value $\bar{x}$, standard deviation s , and range r)
- Diagram (graph of the measured values with minimum, maximum, and mean values, as well as tolerance limits)
- Measured value overview as a table

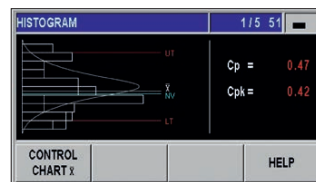


Measured value acquisition

Statistical Process Control (SPC)

For SPC, the ND 287 saves up to 1000 measured values in its nonvolatile FIFO memory. Evaluation is performed with the following functions:

- Statistical view of the measured values in the FIFO memory
- Measured value overview as a table
- Diagram of the last 30 measured values
- Histogram in ten classes with probability density function and process capability indexes C_p and C_{pk}
- Control charts for mean value $\bar{x}$, standard deviation s , and range r



	ND 287
Axes	One; option: second input through encoder module
Encoder inputs	$\sim 1 V_{pp}$, $\sim 11 \mu A_{pp}$ or EnDat ¹⁾ : 15-pin D-sub (female, automatic interface detection)
Input frequency	$\sim 1 V_{pp}$: ≤ 500 kHz $\sim 11 \mu A_{pp}$: ≤ 100 kHz
Subdivision factor	4096-fold
Display step²⁾	Adjustable, max. 9 digits <i>Linear axis:</i> $0.5 \mu m$ to $0.002 \mu m$ <i>Angular axis:</i> 0.5° to $0.000 01^\circ$ ($00^\circ 00' 00.1''$)
Analog input	Option: $\pm 10 V$ via analog module; resolution: 5 mV
Display	Screen for position values, dialog boxes, input fields, graphing functions, and soft keys
Functions	• REF reference-mark evaluation for distance-coded or single reference marks • Two presets and distance-to-go mode • External operation via serial interface • Sorting and tolerance checking • Measurement series with minimum and maximum value recording • Storage of measured values (up to 10 000) • Functions for statistical process control (SPC) • Graphical depiction of distribution/histogram • Sum/difference display (with second encoder module) • Thermal compensation (with analog module)
Axis-error compensation	<i>Linear axis:</i> linear, and segmented linear via 200 compensation points <i>Angular axis:</i> segmented linear with 180 compensation points (every 2°)
Data interface	RS-232-C/V.24; USB (Type B); option: Ethernet 100BaseT, via Ethernet module
Switching outputs for automation tasks	• Zero crossover; trigger points 1 and 2 • Sorting signals "<" and ">" • Errors
Switching inputs for automation tasks	• Zero reset, set displayed value • Move to reference point and ignore reference signals • Measured value output or display freeze • Start measurement series • Minimum, maximum, and difference display • Gating of the two encoder inputs • Sum or difference display • Display of measured value 1 or measured value 2
Accessories	Mounting adapter, encoder module, analog module, Ethernet module
Power connection	AC 100 V to 240 V (-15% to $+10\%$), 48 Hz to 62 Hz; 30 W
Operating temperature	$0^\circ C$ to $50^\circ C$ (storage temperature: $-40^\circ C$ to $85^\circ C$)
Protection EN 60529	IP40; front panel: IP54
Mass	≈ 2.5 kg

¹⁾ Purely serial, with no evaluation of incremental signals

²⁾ Depends on the signal period of the connected encoder (Display step $\approx$ Signal period/4096)

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