



ND 1202T	
<b>Axes</b>	2 (XZ)
<b>Encoder inputs*</b>	$\sim$ 1 V <sub>PP</sub> or $\square$ TTL (other interfaces upon request)
<b>Subdivision factor*</b>	10-fold (only for 1 V <sub>PP</sub> )
<b>Display step<sup>1)</sup></b>	Adjustable, max. 7 digits <i>Linear axis:</i> 1 mm to 0.0001 mm <i>Angular axis:</i> 1° to 0.0001° (00° 00' 01")
<b>Display</b>	5.7" monochrome flat-panel display for position values, dialogs and inputs, and soft keys
<b>Functions</b>	<ul style="list-style-type: none"> <li>• Point measurement with crosshairs</li> <li>• 99 tool adapters</li> <li>• Memory for 300 tools</li> <li>• Counting direction and axis assignment depend on the adapter</li> <li>• Radius/diameter switching</li> <li>• Entry of tolerances</li> <li>• Circle and angle measurement</li> </ul>
<b>Error compensation</b>	<ul style="list-style-type: none"> <li>• Linear, and segmented over up to 150 points</li> <li>• Parallelism error</li> </ul>
<b>Data interface</b>	<ul style="list-style-type: none"> <li>• RS-232-C/V.24</li> <li>• USB</li> </ul>
<b>Other connections</b>	Foot switch for two functions, or remote keypad
<b>Accessories</b>	Mounting base, foot switch, remote keypad, protective cover
<b>Main power input</b>	100 V~ to 240 V~ (-15 % to +10 %), 43 Hz to 63 Hz
<b>Operating temperature</b>	0 °C to 45 °C
<b>Protection EN 60529</b>	IP 00, front panel IP 40
<b>Weight</b>	<i>ND:</i> 1.6 kg; <i>Tilting base:</i> 3.2 kg

\* Please select when ordering

<sup>1)</sup> Depends on the signal period of the connected encoders as well as the subdivision factor

# ND 1200T TOOL-CHEK

## – the Digital Readout for Tool Presetters

The TOOL-CHEK ND 1200T digital readout is designed specifically for tool presetters. It supports X and Z axes.

### Description

The ND 1200T has a monochrome flat-panel display. The robust, diecast aluminum enclosure meets the demands of production floors.

### Functions

The self-explanatory user guidance of the TOOL-CHEK ND 1200T digital readout provides you with optimum support for all functions.

You can define up to 99 tool adapters for the tool holder. You can select either an absolute reference point, or one that refers to a master adapter. You can define the axis association and counting direction separately for each adapter.

Tool measurement usually consists of measuring the length and diameter or radius of a tool. You can also measure radii (e.g. for spherical cutters) and angles (e.g. for indexable inserts or lathe tools). The ND 1200T stores up to 300 tools. You can respectively show and print each actual value, nominal value and deviation.

You can group various tools, e.g. those that are necessary for machining a certain part. Create this setup plan either by selecting the tools from the tool list, or by measuring each tool.

For tools that are too large to be shown on the projector, such as teeth with a radius, you can freeze an axis for measurement. If a tool has more than one tooth, then you use the incremental function to ascertain the tool data in reference to the master tooth as well.

### Data interfaces

You use the data interfaces to transmit the tool data and to load and save settings, compensation values and saved tools. The RS-232-C/V.24 serial interface enables communication with a PC. You can connect printers or memory media to the USB port.

### Measuring radii and angles

You probe several points with the crosshairs in order to measure the radius. The digital readout calculates the radius and any form error from this. In order to measure a cutting edge angle, probe the two sides of the angle at two points each. The results are the intersection of the two lines as well as the inside angle "A".

T	L_00	mm
⊖ Ctr X		4.769
Ctr Z		0.111
	r 0.145	F 0.000
Actual	Center	C Max

### Label printing

You can connect various label printers via the USB port. The control commands necessary for this are already set, and can be called via the menu function.

Print		mm
About	Auto Label	Yes
Display	Auto Report	No
Encoders	Label Format	Metronics1
Hot Keys	Pre Line	
Print	Post Line	10 13
Form Chars	Pre Form	
Ports	Label Lines	5
Supervisor	Skip Lines	0
Squareness	Label Indent	0
LEC		
▼		
List		

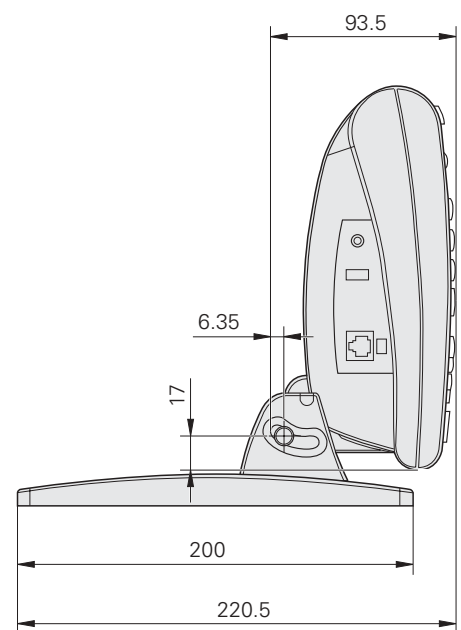
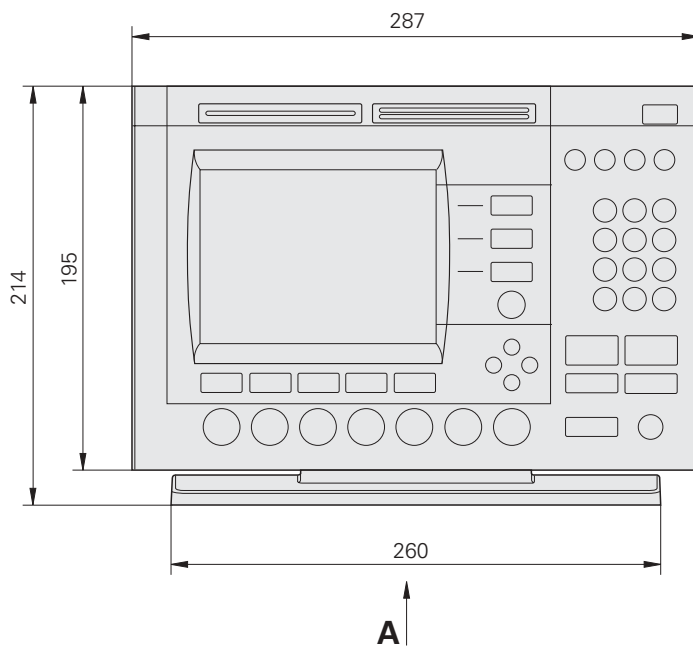
### Tool list

You can also store the data of all measured and numbered tools, and even print this data in a clearly structured list. Use the menu to determine which information is included in the list.

Tool list: Temp										
TOOL-#	SG	POT	Z-ACT.	X-ACT.	Z-NOM.	X-NOM.	Z-DEV.	X-DEV.	R/D	I/MM
10	01	4	100.1000	28.1000	0.0000	0.0000	100.1000	28.1000	D	mm
20	01	5	100.1400	29.9400	0.0000	0.0000	100.1400	29.9400	D	mm
30	01	6	99.9400	29.4600	0.0000	0.0000	99.9400	29.4600	D	mm
40	01	7	100.1200	29.8000	0.0000	0.0000	100.1200	29.8000	D	mm
50	01	8	100.1500	29.5600	0.0000	0.0000	100.1500	29.5600	D	mm
60	01	10	99.8800	30.2000	0.0000	0.0000	99.8800	30.2000	D	mm

# Mounting

## Dimensions of ND 1000/ND 2000



Dimensions in mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm:  $\pm 0.2$  mm

# Mounting and Protection

## Mounting

The ND 1000 and ND 2000 display units were conceived as upright units. There are several possible mounting configurations:

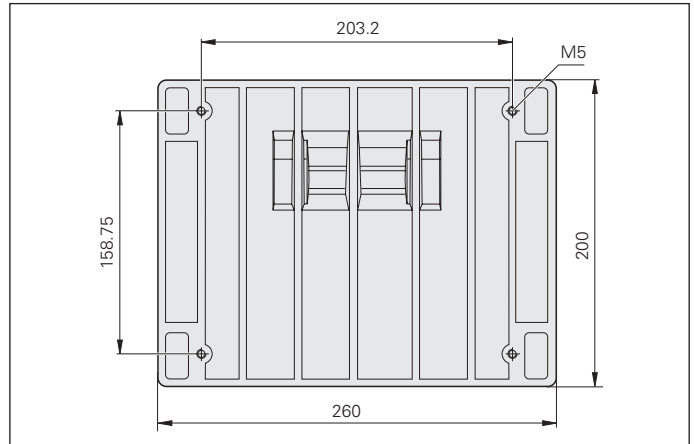
- Tilting base
- Mounting base

## Tilting base

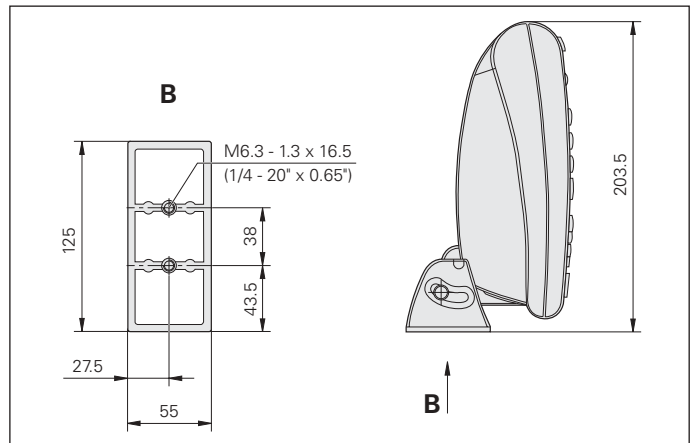
The tilting base is included in delivery. It can be used to tilt the display forward and backward by up to 20°. It can be attached with M5 screws.

## Mounting base (accessory)

With the aid of a mounting base you can set up the ND 1000 and ND 2000 either on the machine or on a mounting arm.



ID 682419-01



## Protective cover (accessory)

Protective covers are available accessories in order to protect the keyboard and screen of the ND 1000/ND 2000 from becoming soiled. The display can still be easily read through the transparent protective covers. They fit themselves optimally to the front of the unit, without impairing the ease of operation.

ND 11xx; 1/2 axes	ID 681051-02
ND 11xx; 3/4 axes	ID 681051-03
ND 12xx	ID 681051-01
ND 21xx	ID 681051-04



# Interfaces

## Digital Readouts

The digital readouts feature interfaces for encoders, for communication and for external components.



	ND 1102 ND 1103 ND 1104	ND 1202	ND 1203 ND 1204	ND 1302 ND 1303 ND 1304		ND 1404	ND 1202 T	ND 2104 G ND 2108 G
<b>Encoders</b>	1 V <sub>PP</sub> or TTL							
<b>Touch probe</b>	● <sup>1)</sup>	–	–	–	–	● <sup>1)</sup>	–	● <sup>2)</sup>
<b>Video</b>	–	–	–	● <sup>3)</sup>	–	–	–	–
<b>Fiber-optic cable</b> Optical edge detector	–	Option	Upon request	–	●	–	–	–
<b>Data</b>	RS-232-C/V.24 and USB type A							
<b>Light control</b>	–	–	–	Option	–	–	–	–
<b>Zoom</b>	–	–	–	Option	–	–	–	–
<b>CNC outputs</b>	–	–	–	Option	Option	–	–	–
<b>Foot switch</b>	●	●	●	●	●	●	●	●
<b>Remote keypad</b>	●	●	●	●	●	–	●	●
<b>Switching outputs</b>	–	–	–	–	–	–	–	12 TTL
<b>Switching inputs</b>	–	–	–	–	–	–	–	5 TTL

● = Available

– = Not available

<sup>1)</sup> HEIDENHAIN touch probe or Renishaw touch probe

<sup>2)</sup> Connection for two relay outputs or HEIDENHAIN touch probe or Renishaw touch probe

<sup>3)</sup> S-Video and composite

# IK 5000



Connections to the IK 5000 are made via its D-sub connectors. Depending on the version, further connections are made through one or two additional slot covers.

		IK 5293	IK 5294	IK 5394-EG	IK 5394-2D	IK 5493	IK 5494-2D	IK 5494-3D	IK 5594
	Slots <sup>1)</sup>	2	2	2	3	3	3	3	3
	Location								
<b>Encoders for X, Y, Z</b>	IK	1 V <sub>PP</sub> or TTL							
<b>CNC outputs</b>	IK	–	–	–	–	●	●	●	●
<b>Foot switch</b>	IK	●	●	●	●	●	●	●	●
<b>Fiber-optic cable</b>	Slot L	–	–	● <sup>2)</sup>	–	● <sup>2)</sup>	–	–	–
<b>Touch probe</b>	Slot 1	● <sup>3)</sup>	–	–	–	–	–	● <sup>3)</sup>	TP 200
<b>Light control</b>	Slot 1	–	–	–	●	–	●	●	●
<b>Zoom</b>	Slot 2	–	–	–	●	–	●	●	●
<b>Encoder for Q axis</b>	Slot 2	–	1 V <sub>PP</sub> or TTL						
<b>Video</b>	PC	–	–	–	USB camera <sup>4)</sup>	–	USB camera <sup>4)</sup>	USB camera <sup>4)</sup>	USB camera <sup>4)</sup>

● = Available

– = Not available

<sup>1)</sup> Including IK

<sup>2)</sup> Connected directly to the IK PCB, special slot cover with cable guide included in delivery

<sup>3)</sup> HEIDENHAIN touch probe or Renishaw touch probe

<sup>4)</sup> Connected to the USB port of the PC

Please order the adapter cables necessary between the individual components separately.

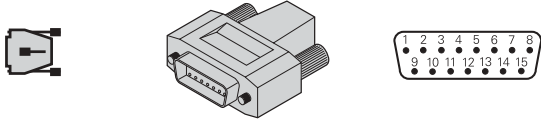
# Interfaces


## Encoders

Depending on the versions, the digital readouts and the PC board are designed for encoders with 1 V<sub>PP</sub> or TTL interface. Other interfaces are available upon request. A distribution cable is necessary in order to attach the encoders to the IK 5000.

### Pin layout $\sim 1 V_{PP}$

Mating connector:  
**15-pin D-sub connector (male)**



	Power supply				Incremental signals						Others
	<b>4</b>	<b>12</b>	<b>2</b>	<b>10</b>	<b>1</b>	<b>9</b>	<b>3</b>	<b>11</b>	<b>14</b>	<b>7</b>	<b>5/6/8/ 13/15</b>
$\sim 1 V_{PP}$	<b>U<sub>P</sub></b>	<b>Sensor U<sub>P</sub></b>	<b>0V</b>	<b>Sensor 0V</b>	<b>A+</b>	<b>A-</b>	<b>B+</b>	<b>B-</b>	<b>R+</b>	<b>R-</b>	<b>/</b>

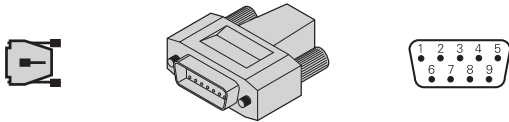
**Shield** on housing; **U<sub>P</sub>** = Power supply voltage


**Sensor:** The sensor line is connected in the encoder with the corresponding power line.

Vacant pins or wires must not be used!

### Pin layout $\square$ TTL

Mating connector:  
**9-pin D-sub connector (male)**



	Power supply			Incremental signals					
	<b>7</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>8</b>	<b>9</b>
$\square$ TTL	<b>U<sub>P</sub></b>	<b>0V</b>	<b>0V</b>	<b>U<sub>a1</sub></b>	<b><math>\overline{U}_{a1}</math></b>	<b>U<sub>a2</sub></b>	<b><math>\overline{U}_{a2}</math></b>	<b>U<sub>a0</sub></b>	<b><math>\overline{U}_{a0}</math></b>

**Shield** on housing; **U<sub>P</sub>** = Power supply voltage

Vacant pins or wires must not be used!