Product Information

POSITIP 8016
Digital Readout for Manually Operated Machine Tools
The POSITIP 8016 digital readouts are well suited for manual milling machines, drilling machines, boring machines, and lathes with up to six axes. Integrated switching inputs and outputs enable interaction with the machine, thereby allowing for the implementation of simple automated tasks.

The POSITIP 8016 Active version makes it possible to configure and control up to three NC axes in addition to a spindle. Simultaneous multi-axis motion and machine safety functions are not supported.

**Design**
The POSITIP 8016 digital readouts are designed to withstand harsh shop conditions. They feature a sturdy aluminum housing equipped with touchscreen operation.

Thanks its intuitive, user-friendly graphical interface, the POSITIP 8016 is particularly easy to operate. The 12-inch screen clearly displays all of the information you need for machining your workpiece.

The POSITIP 8016 Active version makes it possible to configure and control up to three NC axes in addition to a spindle. Simultaneous multi-axis motion and machine safety functions are not supported.

**Functions**
The POSITIP 8016 offers many useful functions for machining with manually operated machine tools. Self-explanatory operating elements and language-sensitive information in plain language permit context-sensitive operation.

The distance-to-go display comes to your aid during positioning tasks. With it, you can arrive at the next position quickly and reliably by simply moving the axes until the display reads zero. This feature is particularly useful during the execution of programs.

Of course, the POSITIP 8016 also provides special functionality for milling and turning operations, including the following functions:
- Hole patterns (linear, circular)
- Radius/diameter switching
- Sum display for the top slide

Presets can be acquired quickly and accurately with an edge finder. The POSITIP PT 8016 also supports you with its special probing functions.

You can customize the display of the POSITIP 8016 and save your settings in the user administration area.

**Data interface**
A USB port allows you to import and output configuration files and programs. The Ethernet interface allows programs to be saved or imported via a network.
Axes
Up to 6 axes (4 axes in the standard version; 2 additional axes available as an option)

Encoder inputs
\[ \sim 1 \text{ V}_{\text{pp}}, \sim 11 \mu\text{A}_{\text{pp}}, \text{EnDat 2.2} \]

Display step \(^1\)
Linear axis: 1 mm to 0.00001 mm

Display
12-inch screen for touchscreen operation; resolution: 1280 x 800 pixels for position values, dialog messages, data input, and graphic functions

Functions
- Creation and execution of programs
- User administration and data management
- 100 presets, 100 tools
- Reference mark evaluation for distance-coded and single reference marks
- Distance-to-go mode with nominal position input in absolute or incremental values
- Graphic positioning aid
- Scaling factor, mirror image, magnifying function

For milling/drilling/boring
- Calculation of positions for hole patterns (bolt circles, linear hole patterns)
- Tool radius compensation
- Cutting data calculator
- Probing functions for preset acquisition (edge, centerline, and circle)

- Control of up to 3 NC axes and a spindle; switching functions

For turning
- Measurement of tool dimensions
- Sum display of axes in the top slide
- Taper calculator

- Control of up to 3 NC axes and a spindle; constant surface speed; switching functions

Error compensation
Linear and segmented linear

Data interface
2x Ethernet 100 Mbit / 1 Gbit (RJ45); 4x USB 2.0 (Type A)

Accessories
Single-Pos/Duo-Pos/Multi-Pos stands, Multi-Pos holder, power cable, adapter connector

Power connection
AC 100 V (–10 %) to 240 V (+5 %), 50 Hz to 60 Hz (±5 %)
\[ PT \, 8016 \, \text{Active:} \leq 79 \text{ W}; \, PT \, 8016: \leq 38 \text{ W} \]

Operating temperature
0 °C to +45 °C (storage temperature: −20 °C to +70 °C)

Protection
EN 60529 IP65, back panel IP40

Mounting
Single-Pos/Duo-Pos/Multi-Pos stands, Multi-Pos holder, and other mounting systems with a 100 mm x 100 mm hole pattern

Mass
\begin{align*}
\text{Device alone} &= 3.50 \text{ kg} \\
\text{Device with Single-Pos stand} &= 3.60 \text{ kg} \\
\text{Device with Duo-Pos stand} &= 3.80 \text{ kg} \\
\text{Device with Multi-Pos stand} &= 4.50 \text{ kg} \\
\text{Device with Multi-Pos holder} &= 3.85 \text{ kg}
\end{align*}

\(^1\) Depends on the signal period or line count of the connected encoder
Mounting and accessories

Types of mounting

The POSITIP 8016 and POSITIP 8016 Active can be set up with versatility on the Single-Pos stand (included in delivery). With the Multi-Pos or Duo-Pos stands, the digital readouts can be flexibly set up at various angles of inclination. For mounting on the machine, the Multi-Pos holder or other mounting systems with a 100 mm x 100 mm hole pattern are suitable.

**Single-Pos stand**

Included in delivery. For setup on and fastening to a surface (20° tilt)

ID 1089230-01

**Multi-Pos stand**

For setup on and fastening to a surface; freely adjustable (90° tilting range)

ID 1089230-03
**Multi-Pos holder**  
For attachment to an arm;  
freely adjustable (90° tilting range)  
ID 1089230-04

**Duo-Pos stand**  
For setup on and fastening to a surface,  
at two possible angles (20° or 45° tilt)  
ID 1089230-02

**Mounting arm**  
For attachment to a machine

**Mounting arm, offset**  
ID 382929-01

**Mounting arm, straight**  
ID 382939-01

**Accessories**

**Adapter connector**  
For pin layout conversion for replacement  
of the PT 880 with the PT 8016  
ID 1089214-01

**PC trial software**  
Visit [www.heidenhain.de/de_EN/software/](http://www.heidenhain.de/de_EN/software/)  
» Digital Readouts » POSITIP 8000 »  
Software DEMO.
Switching outputs

Switching functions
One or more switching ranges or switching points can be defined for each axis. 
**Switch-off ranges** are located asymmetrically relative to any given switching point. For **switching points**, a digital output switches at the programmed position.

Switching points can be referenced to the following:
- Machine coordinate system
- Preset
- Target position
- Tool tip

Four types of switching are available
- Edge from LOW to HIGH
- Edge from HIGH to LOW
- Interval from LOW to HIGH
- Interval from HIGH to LOW

Switching inputs

Zero reset
In milling mode, each axis can be set to the display value “0” via an external signal.

Detection of gear stages
In turning mode, four switching inputs are available for the detection of gear stages.
Connectivity comparison between POSITIP 8016 and POSITIP 8016 Active

<table>
<thead>
<tr>
<th>Encoder interfaces</th>
<th>PT 8016</th>
<th>PT 8016 Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>(11 µA, 1 Vpp, EnDat 2.2-22)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2 additional ones as option</td>
<td>2 additional ones as option</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digital inputs</th>
<th>PT 8016</th>
<th>PT 8016 Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTL 0 V to 5 V</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>High DC 11 V to 30 V; 2.1 mA to 6.0 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low DC 3 V to 2.2 V; 0.43 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 additional ones as option</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digital outputs</th>
<th>PT 8016</th>
<th>PT 8016 Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTL 0 V to +5 V; maximum load = 1 kΩ</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>DC 24 V (20.4 V to 28.8 V; max. 150 mA per channel)</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relay outputs</th>
<th>PT 8016</th>
<th>PT 8016 Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. switching voltage AC/DC 30 V; max. 0.5 A; max. 15 W; max. continuous current 0.5 A</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analog inputs</th>
<th>PT 8016</th>
<th>PT 8016 Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage range DC 0 V to 5 V</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Resistance range 100 Ω ≤ R ≤ 50 kΩ</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analog outputs</th>
<th>PT 8016</th>
<th>PT 8016 Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage range DC –10 to +10 V</td>
<td></td>
<td>4 (option)</td>
</tr>
<tr>
<td>Maximum load 1 kΩ</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5 V voltage outputs</th>
<th>PT 8016</th>
<th>PT 8016 Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage tolerance ±5 %; maximum current 100 mA</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Further information:
POSITIP 8016
Installation Instructions  ID 1251619-90

<table>
<thead>
<tr>
<th>Type</th>
<th>Function</th>
<th>PT 8016</th>
<th>PT 8016 Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logo</td>
<td>Pulling up of operating instructions or OEM service information</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Programming</td>
<td>–</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Spindle speed</td>
<td>Preassignment of spindle speeds (radio buttons)</td>
<td></td>
<td>Can be configured, but without functionality</td>
</tr>
<tr>
<td>M function</td>
<td>Freely definable functions</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Direction of spindle rotation</td>
<td>–</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Coolant during spindle operation</td>
<td>–</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Axis clamping</td>
<td>–</td>
<td>Only with NC option</td>
</tr>
<tr>
<td></td>
<td>Coolant</td>
<td>–</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Tool-axis zeroing</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Document</td>
<td>Display of tables (e.g., thread tables, cutting speeds)</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
This Product Information document supersedes all previous editions, which thereby become invalid. The basis for ordering from HEIDENHAIN is always the Product Information document edition valid when the order is made.

Further information:
Comply with the requirements described in the following documents to ensure the correct operation:
- Operating Instructions ID 1244208-xx
- Installation Instructions ID 1244207-xx

Pin layout

15-pin D-sub flange socket (female)

<table>
<thead>
<tr>
<th></th>
<th>Power supply</th>
<th>Incremental signals</th>
<th>Serial data transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>~ 1 Vpp</td>
<td>U_p</td>
<td>Sensor</td>
<td>0 V</td>
</tr>
<tr>
<td>~ 11 µApp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EnDat</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Shield on housing; U_p = Power supply voltage
Sensor: the sense line is connected in the encoder with the corresponding power line
Vacant pins or wires must not be used!