3D-Coordinate Measuring Machine (CMM) LH 65
STANDARD / PREMIUM / PREMIUM-SELECT

Technical Data
Short description

• CNC-bridge design measuring machine capable for touch-trigger and scanning probes; for optical or continuous and indexing probe systems
• Dynamic and high precision series with air bearings in all axis
• All granite guideways accurately hand-lapped
• Compact design. Operator workstation with integrated controller and computer
• CMM available in multiple sizes for the optimal selection of the required measurement volume

Application areas

• In production, quality control, process and production control; in reverse engineering and model making
• Geometric and free-form components
• Both series and individual measurements
• Palletized operation possible

Features

• The Y-axis guideway is machined directly in the base plate, providing optimal long-term stability
• Pre-stressed, encompassing air bearings in all axes
• Passive vibration dampers
• Active pneumatic vibration damping optionally available and field retrofittable
• Compact control panel with central, logarithmic joystick, “mouse function” and context-sensitive function buttons. Selectable joystick’s axis assignment. Wireless version optionally available.
• The X- and Y-guideways feature bellows protections against contamination
• High-speed-dynamic servo drives with position monitoring, combined friction power transmission
• Three-axis contouring controller with intelligent “lookahead” function for application-optimized trajectory
• Manual temperature compensation in Standard version
• Premium- and Premium-Select version with automatic temperature compensation on all axes and work piece
• Two-stage speed selection and variable speed adjustment (override 0-100%) in all operation modes, resulting in sensitive movement via joystick or in CNC mode

Probe systems

• PH10M / PH10T motorized indexing head
• TP200 touch-trigger probe, highly precise and suitable for stylus up to 100 mm in length. Styli can be changed via optional tool changer
• Touch-trigger probe TP20, Stylus module changeable via optional tool changer
• PH10M motorized indexing head
• SP25M scanning and single-point probe, precise and flexible for stylus lengths of up to 400 mm. Probe module and stylus can be changed via optional tool changer.
• Shapetracer: 3D Line Scanner to report and handle point clouds
• SP80 scanning probe head, highly precise for larger probe lengths. For scanning and single-point probing. Stylus combinations can be changed via optional tool changer
• PH20™: Continuous 5-axis touch-trigger system with “head touch”
### Technical Data LH 65 STANDARD / PREMIUM / PREMIUM-SELECT

#### Measuring Ranges, Weights

<table>
<thead>
<tr>
<th>Machine Type</th>
<th>LH 65 Standard</th>
<th>LH 65 Premium</th>
<th>LH 65 Premium-Select</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring ranges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X [mm]</td>
<td>650</td>
<td>650</td>
<td>650</td>
</tr>
<tr>
<td>Y* [mm]</td>
<td>750</td>
<td>1200</td>
<td>750</td>
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<tr>
<td></td>
<td>750</td>
<td>1200</td>
<td>750</td>
</tr>
<tr>
<td>Z [mm]</td>
<td>500</td>
<td>500</td>
<td>500</td>
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<tr>
<td>Machine weight [kg]</td>
<td>1340</td>
<td>1895</td>
<td>1340</td>
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<tr>
<td>Permissible part weight [kg]</td>
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<td>700</td>
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</tbody>
</table>

#### General Requirements

- **Electric**: Single-phase AC 1P+N+PE, 115/230 V ± 10 %, 50/60 Hz, max. 1000 VA, acc. to EN 60204/1
- **Compressed air**: Supply pressure 6-10 bar, pre-filtered, quality according to ISO 8573-1: Class 4 or better

**Air consumption**
- Passive: $\varnothing 35 \text{ m}^3/\text{min}$ (max.)
- Active: $\varnothing 56 \text{ m}^3/\text{min}$ (max.)

#### Measuring Accuracy

- **Measurement system**: Photoelectric scale system, optical division 20 µm

**Resolution [µm]**
- 0.1: TP20, TP200, SP25/80
- 0.05: TP20, TP200, SP25/80

**Probing uncertainty**
- MPEg [µm]: TP20 2.5, TP200 2.1, SP25/80 1.8, TP200 1.7, SP25/80 1.5, SP25/80 1.4

**Volumetric length measuring uncertainty**
- MPEl [µm]: TP20 2.5+L/300, TP200 2.1+L/300, SP25/80 1.8+L/300, TP200 1.7+L/350, SP25/80 1.5+L/350, SP25/80 1.4+L/450

**Scanning probe uncertainty**
- MPEh [µm]: SP25/80 2.4, SP25/80 2.1, SP25/80 2.0

**Total measuring time for THP**
- MPTHP [sec]: 72, 72, 72

#### Operating Environment

- **Operating temperature [°C]**: 15-30
- **Temperature range for MPEg**:
  - (Standard/Premium): 18-22 °C, $\Delta T$: 1 $^\circ$K/h, 1 $^\circ$K/m, 2 $^\circ$K/d
  - (Premium-Select): 19-21 °C, $\Delta T$: 0,5 $^\circ$K/h, 0,5 $^\circ$K/m, 1 $^\circ$K/d
- **Relative humidity [%]**: 40-70

#### Dynamics

- **Joystick operation**
  - $v_{\text{max}}$ [mm/s]: 0-20 (creep mode), 0-100 (normal)
- **CNC mode**
  - $v_{\text{max}}$ [mm/s]: 400 axial, 690 volumetric
  - $a_{\text{max}}$ [mm/s²]: 1200 axial, 2000 volumetric

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1. According to DIN EN ISO 10360-2 / Maximum Permissible Error MPEg
   - SP25A with Module SM25-1 and Styli $\varnothing 4 \times 21$ mm
   - TP20 with Standard Force Module and Styli $\varnothing 4 \times 21$ mm
   - TP20 with Standard Force Module and Styli $\varnothing 4 \times 10$ mm

2. According to DIN EN ISO 10360-2 / Maximum Permissible Error MPEl
   - SP25A with Module SM25-1 and Styli $\varnothing 4 \times 21$ mm
   - TP20 with Standard Force Module and Styli $\varnothing 4 \times 21$ mm
   - TP20 with Standard Force Module and Styli $\varnothing 4 \times 10$ mm

3. According to DIN EN ISO 10360-4 / Maximum Permissible Error MPEe
   - SP25A with Module SM25-1 and Styli $\varnothing 4 \times 21$ mm
   - SP25A with Module SM25-1 and Styli $\varnothing 8 \times 21$ mm

* More Y-measuring ranges on request

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### Overall Dimensions [mm]

<table>
<thead>
<tr>
<th>Dimension</th>
<th>X</th>
<th>Y*</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring ranges</td>
<td>650</td>
<td>750</td>
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<tr>
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<tr>
<td>Inspection room dimension</td>
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</tbody>
</table>

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