

3D-Coordinate Measuring Machine (CMM) LH 87

STANDARD / PREMIUM / PREMIUM-SELECT

Technical Data



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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-guide-ways 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 styli 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
- PH20TM: Continuous 5-axis touch-trigger system with „head touch“
- REVO: 5-axis head and probe system for scanning of complex contours and high throughput

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Machine Type			LH 87 Standard			LH 87 Premium			LH 87 Premium- Select		
Measuring Ranges, Weights											
Measuring ranges with PH10M probe	X	[mm]	800			800			800		
	Y*	[mm]	1000	1500	2000	1000	1500	2000	1000	1500	2000
	Z	[mm]	700			700			700		
Machine weight		[kg]	2275	3210	4340	2275	3210	4340	2275	3210	4340
Permissible part weight		[kg]	800	1000	1200	800	1000	1200	800	1000	1200
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	[^{Nl} /min]	Ø 52			71 (max.)					
	active	[^{Nl} /min]	Ø 76			120 (max.)					
Measuring Accuracy**											
Measurement system		Photoelectric scale system, optical division 20 µm									
Resolution		[µm]	0,1						0,02		
Single-stylus probing uncertainty ¹	P _{FTU, MPE} [µm]		TP20 2,2	TP200 2,0	SP25/80 1,7	REVO 1,7	PH20 2,1	TP200 1,7	SP25/80 1,4	REVO 1,4	SP25/80 1,2
Repeatability range uncertainty ²	R _{0, MPL} [µm]		TP20 2,2	TP200 2,0	SP25/80 1,7	REVO 1,7	PH20 2,1	TP200 1,7	SP25/80 1,4	REVO 1,4	SP25/80 1,2
Volumetric length measuring uncertainty ²	E _{0, MPE} / E _{150, MPE} [µm]		TP20 2,2+L/300	TP200 2,0+L/300	SP25/80 1,7+L/300	REVO 1,7+L/300	PH20 2,1+L/300	TP200 1,7+L/350	SP25/80 1,4+L/350	REVO 1,4+L/350	SP25/80 1,2+L/400
Scanning probe uncertainty ³	MPE _{THP} [µm]		SP25/80 2,3		REVO 2,3		SP25/80 2,0		REVO 2,0		SP25/80 1,8
Total measuring time for THP	MPT _{THP} [sec]		72			72			72		
Operating Environment											
Operating temperature		[°C]	15-30								
Temperature range for E _{L, MPE} (Standard/Premium)		20 °C ± 2 K, ΔT: 1 K/h, 1 K/m, 2 K/d									
Temperature range for E _{L, MPE} (Premium-Select)		20 °C ± 1 K, ΔT: 0,5 K/h, 0,5 K/m, 1 K/d									
Relative humidity		[%]	40-70								
Dynamics***											
Joystick operation		v _{max} [^{mm} /s]	0-20 (creep mode), 0-100 (normal)								
CNC mode		v _{max} [^{mm} /s]	400 axial, 690 volumetric							300 axial, 520 volumetric	
CNC mode		a _{max} [^{mm} /s²]	1200 axial, 2000 volumetric								

1: According to DIN EN ISO 10360-5 / Maximum Permissible Error $P_{\text{FTU, MPE}}$

- SP25M with Module SM25-1 and Styli $\varnothing$ 4 x < 30 mm
- SP80 and Styli $\varnothing$ 5 x 50 mm
- TP200 with Standard Force Module and Styli $\varnothing$ 4 x < 30 mm
- TP20 with Standard Force Module and Styli $\varnothing$ 4 x 10 mm
- REVO with RSP3-3 and Styli $\varnothing$ 4 x 10 mm
- PH20 with Standard Force Module and Styli $\varnothing$ 4 x < 10 mm

2: According to DIN EN ISO 10360-2 / Maximum Permissible Error $E_{\text{L, MPE}}$

- SP25M with Module SM25-1 and Styli $\varnothing$ 4 x < 30 mm
- SP80 and Styli $\varnothing$ 5 x 50 mm
- TP200 with Standard Force Module and Styli $\varnothing$ 4 x < 30 mm
- TP20 with Standard Force Module and Styli $\varnothing$ 4 x < 30 mm
- REVO with RSP3-3 and Styli $\varnothing$ 4 x < 30 mm
- PH20 with Standard Force Module and Styli $\varnothing$ 4 x < 30 mm

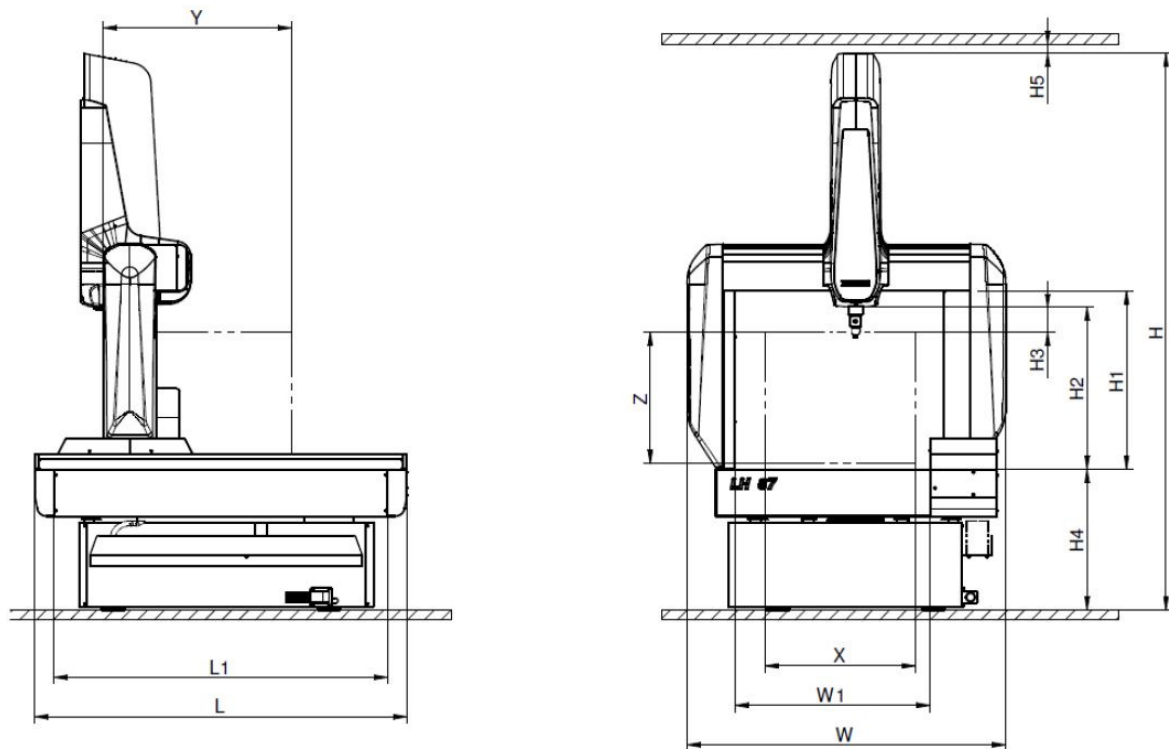
3: According to DIN EN ISO 10360-4 / Maximum Permissible Error MPE_{THP}

- SP25M with Module SM25-1 and Styli $\varnothing$ 4 x < 30 mm
- SP80 and Styli $\varnothing$ 5 x 50 mm
- REVO with RSP3-3 and Styli $\varnothing$ 4 x < 30 mm

* Y-measuring ranges on request up to 7000 mm possible

** Specification of accuracies valid under inclusion of temperature compensation

*** Dependent on used controller



Overall Dimensions [mm]				
Measuring ranges with PH10M probe	X	800		
	Y*	1000	1500	2000
	Z	700		
Overall dimensions	W	1700		
	L	1980	2570	3070
	H	2962		
Workspace dimensions	H1	950		
	H2	860		
	H3** (PH10M)	85		
	H4	750		
	L1	1780	2280	2780
	W1	1040		
Inspection room dimension	H5	50 (min.)		

* Y-measuring ranges on request up to 7000 mm possible

** Measuring ranges dependent on probe system

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