CMM BRIDGE
ARES NT/NT-L

BRIDGE TYPE CNC COORDINATE MEASURING MACHINE

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STRUCTURE

Coordinate Measuring Machine, CNC type, with aluminium alloy mobile bridge structure on granite table machine base. Single-block granite surface plate with integral tracks, planarity according to DIN 876/III and insert grid with M8x1.25 threaded holes.

Guideway:
X axis: dovetail guideways machined into the granite table
Y axis: micromachined anodized light alloy extrusion
Z axis: micromachined anodized light alloy extrusion (NT-L) or Silicon Carbide (NT)

Drive Method:
X axis (longitudinal): zero hysteresis friction drive on steel bar
Y axis(transversal): zero hysteresis friction drive on steel bar
Z axis (vertical): zero hysteresis friction drive on steel bar

Sliding System:
Air bearings on all axes

Motion Control:
DC servomotor on all axes

Thermal Compensation:
Multi-sensors temperature compensation system (total 4 sensor) in Option.

Measuring System:
High resolution (0,1um) free floating linear scales mounted in carriers

OPTION

Passive vibration insulating system
Active vibration insulation system (AVM)
Multi-wire cable

POWER SUPPLY

Power Supply Voltage:
230 V ± 10%; 50 Hz ± 2% single phase
115 V ±10%; 60 Hz ± 2% single phase

AIR SUPPLY

Air Consumption:
100 Nl/min

Minimum Air Supply:
5 Bar (71 PSI)

ENVIRONMENT

Temperature Range for Metrological Specification:
Temperature Range: 18 ÷ 22 °C
Max. gradient per hour: 0,5 °K/h
Max. gradient per day: 2,0 °K/24h
Max. gradient in space: 0,5 °K/m

Operating Temperature:
15 ÷ 35 °C

Relative Humidity:
40 ÷ 80 % (non condensante)

Acceptable Vibrations
(vibration acceleration between peaks)
30 mm/s² from 1 to 10 Hz
15 mm/s² from 10 to 20 Hz
50 mm/s² from 20 to 100 Hz

Optional
-Metrology Room or CMM protection system

PROBING SYSTEM

Manual Probe Head:
TPC3, MIH, MH20, MH20i, MH8, RTP20, PH6M

Motorized Probe Head:
PH10T, PH10M, PH20

Point-to-point Trigger Probe:
TP20, TP200, TP200B

Analog Contact Probe:
SP25M

Stylus and Probe Changer:
Fully automated stylus and probe changers

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07.05 / 07.07 SPECIFICATIONS

Models	T_1: 18 - 22 °C											Max. 3D Pos. Speed	Max. 3D Accel.
	PH10M/T/PH20-TP20			PH10M/T-TP200			PH10M/PH6M-SP25M						
	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	MPE_{Tij} (4)	MPT_{Tij} (5)		
	[µm]	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[sec]*	*[mm/sec]*	*[mm/sec²]*
xx.07.05	2,1 + 3,0 L/1000	2,0	2,1	1,9 + 3,0 L/1000	1,8	1,9	1,9 + 3,0 L/1000	1,8	1,9	4,0	120	500	1500
xx.07.07	2,5 + 3,3 L/1000	2,4	2,5	2,3 + 3,3 L/1000	2,2	2,3	2,3 + 3,3 L/1000	2,2	2,3	4,5	120	500	1500

Models	T_2: 16 - 26 °C											Max. 3D Pos. Speed	Max. 3D Accel.
	PH10M/T/PH20-TP20			PH10M/T-TP200			PH10M/PH6M-SP25M						
	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	MPE_{Tij} (4)	MPT_{Tij} (5)		
	[µm]	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[sec]*	*[mm/sec]*	*[mm/sec2]*
xx.07.05	2,1 + 4,0 L/1000	2,0	2,1	1,9 + 4,0 L/1000	1,8	1,9	1,9 + 4,0 L/1000	1,8	1,9	4,0	120	500	1500
xx.07.07	2,5 + 5,0 L/1000	2,4	2,5	2,3 + 5,0 L/1000	2,2	2,3	2,3 + 5,0 L/1000	2,2	2,3	4,5	120	500	1500

CMM ARES NT-L

07.05 SPECIFICATIONS

Models	T_1: 18 - 22 °C											Max. 3D Pos. Speed	Max. 3D Accel.
	PH10M/T/PH20-TP20			PH10M/T-TP200			PH10M/PH6M-SP25M						
	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	MPE_{Tij} (4)	MPT_{Tij} (5)		
	[µm]	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[sec]*	*[mm/sec]*	*[mm/sec2]*
xx.07.05	2,5 + 3,3 L/1000	2,4	2,5	2,3 + 3,3 L/1000	2,2	2,3	2,3 + 3,3 L/1000	2,2	2,3	4,6	120	500	1500

Models	T_2: 16 - 26 °C											Max. 3D Pos. Speed	Max. 3D Accel.
	PH10M/T/PH20-TP20			PH10M/T-TP200			PH10M/PH6M-SP25M						
	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	$MPE_{E0/150}$ (1)	MPL_{RO} (2)	MPE(PFTU) (3)	MPE_{Tij} (4)	MPT_{Tij} (5)		
	[µm]	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[µm]*	*[sec]*	*[mm/sec]*	*[mm/sec2]*
xx.07.05	2,5 + 5,0 L/1000	2,4	2,5	2,3 + 5,0 L/1000	2,2	2,3	2,3 + 5,0 L/1000	2,2	2,3	4,6	120	500	1500

Performance data are only valid if the following specifications are met:

- MPE_{E0}/MPE(PFTU)/MPL_{R0}: PH10M/PH10T/PH20-TP20/TP200: tip diameter Ø 4 mm, stylus length 10 mm.
- MPE_{E150}: PH10M-TP20/TP200: tip diameter Ø 4 mm, stylus length 40 mm. PH20: EM1 STDF, tip diameter Ø 4 mm, stylus length 20 mm.

  PH10T: PEL2, tip diameter Ø 4 mm, stylus length 10 mm
- $MPE_{E0/150}$: PH10MQ/SP25M: SM25-2, tip diameter Ø 5 mm, stylus length 21 mm.

- L = measuring length in mm
- Ambient temperature Range:

T_1: 18 ÷ 22 °C; Max. Gradients: 1,0 °C/h - 2,0 °C/24h - 1,0 °C/m

T_2: 16 ÷ 26 °C; Max. Gradients: 1,0 °C/h - 5,0 °C/24h - 1,0 °C/m

(1) Maximum Permissible Error of indication for size measurement according UNI EN ISO 10360-2:2010

(2) Maximum Permissible Probing Error according UNI EN ISO 10360-2:2010

(3) Maximum Permissible Shape error with single stylus according UNI EN ISO 10360-5:2010

(4) Maximum Permissible Scanning Probing Error according UNI EN ISO 10360-4:2005, applicable to the SP25M probes only.

(5) Maximum Permissible Scanning Probing Time UNI EN ISO 10360-4:2005, applicable to the SP25M probes only, tip diameter Ø 25 mm

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PERFORMANCE VERIFICATION

MPE_{E0}: Maximum Permissible Error on length measurement with standard probe OFFSET

Measurement of a set of 5 sizes, taken through two opposite probing points on two nominally parallel planes. The sizes are positioned with direction on the 4 volume diagonals and in 3 different positions chosen by the customer (or along the axes according to the standard) in the measurement volume. Each size is measured 3 times for a total of 105 measurements. All 105 measurements (100%) must be within the specified MPE_{E0}.

MPE_{E150}: Maximum Permissible Error on length measurement with probe OFFSET 150mm.

Measurement of 1 set of 5 different sizes in 2 diagonal positions on the XZ or YZ plane with a probe OFFSET of 150mm. All 30 measurements must be less than the Maximum Permissible Error MPE_{E150}

MPL_{R0}: Maximum Permissible Repeatability Limit

Evaluation of the 35 repeatability values calculated from the difference between the maximum and minimum values of the three different measurements made on the same length size on each of the 5 samples in each of the 7 positions. Each of these 35 R_0 value must be less than the maximum permissible limit MPL_{R0}

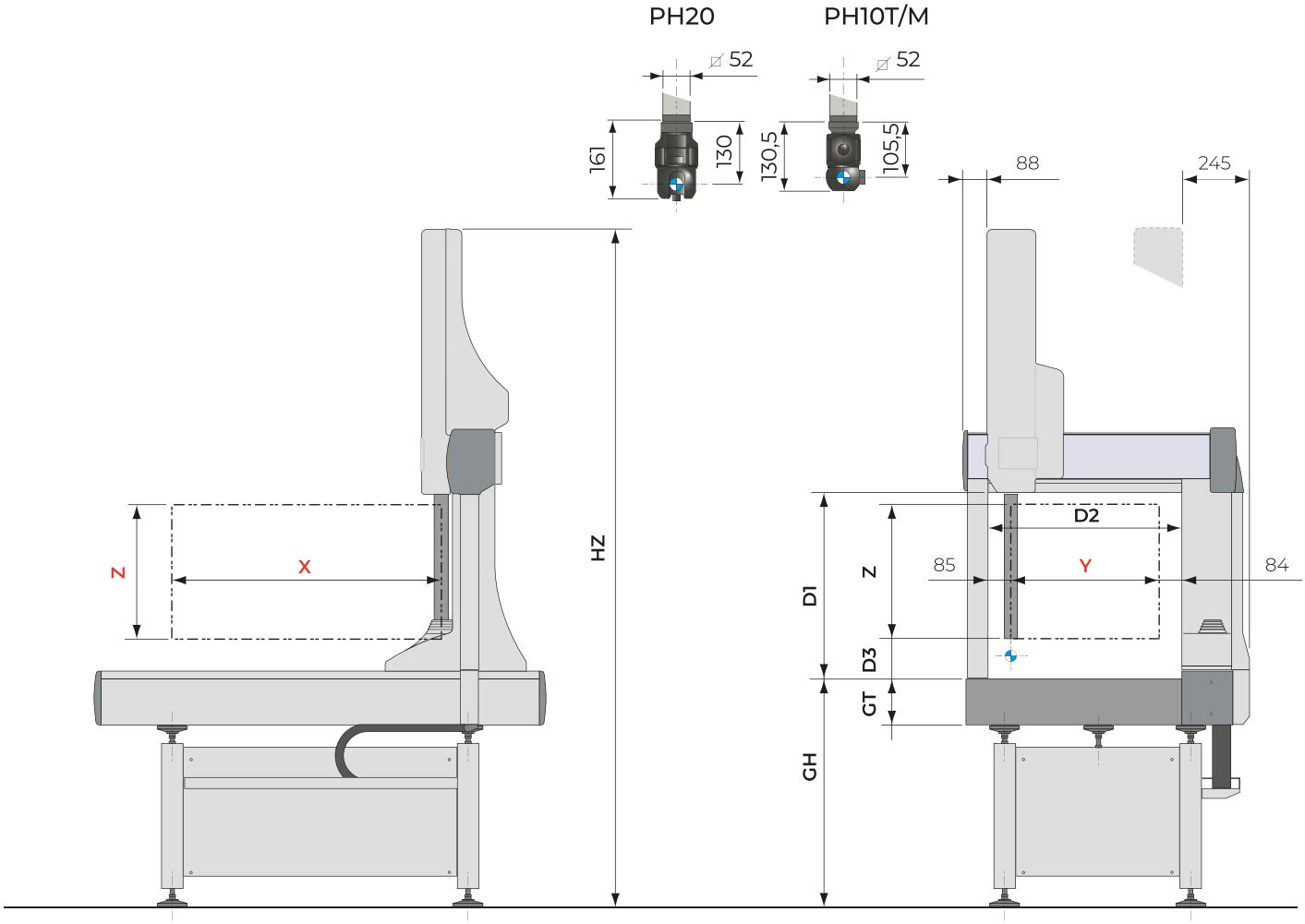
MPE (PFTU): Maximum Permissible Single Stylus Form Error

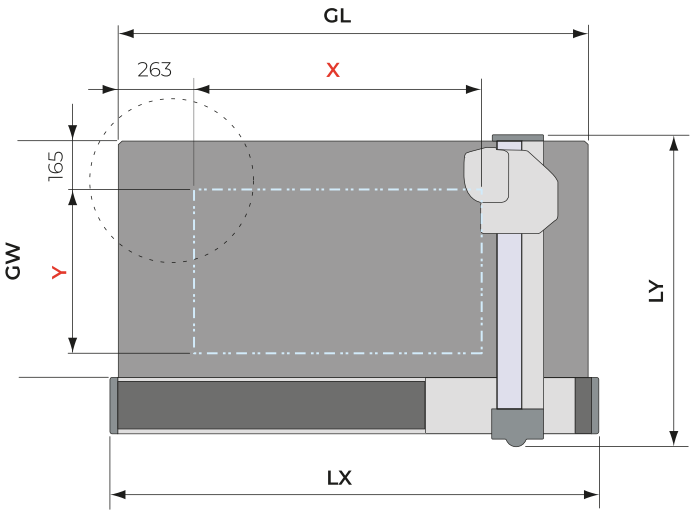
A reference sphere is measured with 25 equally distributed probings, estimate of the deviation in the shape of the sphere, obtained as a dispersion band of the 25 polar rays. The probing performance shall be verified in one position, placed in the middle of the CMM measure volume. Calculation of the Gaussian sphere using the 25 measures. Calculation of the radial distances R, for each of the 25 measured points. Calculation of the *PFTU* point gripping error, as dispersion band of the 25 radial distances, Rmax-Rmin. The PFTU error must be within the MPE*(PFTU)*.

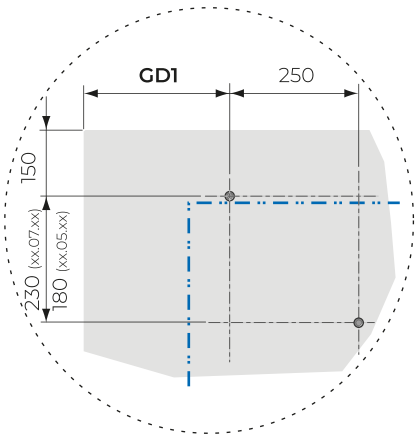
MPETij: Maximum Permissible Scanning Probing Error

MPE_{Tij} is the Maximum Permissible Scanning Probing Error of the range of all measured sphere radii (sphere form error), with high point density and predefined path scanning, where MPT_{Tij} indicates the maximum useful time (seconds) to perform the verification test. The performance of the scanning probing is verified in only one position, placed in the middle of the CMM measure volume. The size's sphere is measured along 4 defined sections. The scanning probing error *Tij*, is calculeted as the range of sphere radii between the measured centre and all of the valued scan points. The scanning probing error (*Tij*) and the time taken for verification(*Tij*) must be within the value of MPE_{Tij} and MPT_{Tij}

STROKES, DIMENSIONS, WEIGHTS







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Models	NT	NT-L	Measuring strokes			Overall dimensions			Surface plate					Daylights				Weight	
									Height	Thickness	Lenght	Width	Holes					Max. part weight	Machine weight
			X	Y	Z	LX	LY	HZ	GH	GT	GL	GW	GD1	D1	D2	D3 NT	D3 NT-L		
			[mm]			[mm]			[mm]					[mm]				[kg]	
07.07.05	●	●	700	650	500	1380	1160	2429	750	170	1330	899	350	688	819	172,5	177,5	650	775
10.07.05	●	●	1000	650	500	1680	1160	2429	750	170	1630	899	350	688	819	172,5	177,5	700	925
12.07.05	●	●	1200	650	500	1880	1160	2429	750	170	1830	899	300	688	819	172,5	177,5	700	990
07.07.07	●		700	650	650	1380	1160	2734	750	170	1330	899	350	838	819	172,5	177,5	650	800
10.07.07	●		1000	650	650	1680	1160	2734	750	170	1630	899	350	838	819	172,5	177,5	700	950
12.07.07	●		1200	650	650	1880	1160	2734	750	170	1830	899	300	838	819	172,5	177,5	700	1015

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