



CMM BRIDGE **UNIVERSAL**

07.07 - 09.08 - 10.08

10.09 - 10.10 - 12.10 - 15.10 - 15.13

BRIDGE TYPE CNC COORDINATE
MEASURING MACHINE



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STRUCTURE

CNC Bridge Type Coordinate Measuring Machine with alloy bridge frame on granite base.

Surface plate in monolithic granite table with **integral guide-ways** and isostatic support with flatness to **DIN876/III** and **M8** threaded insert grid.

Guideways

X axis: guideways integral dovetail machined into granite table

Y/Z axes: guideways micro-machined and hard anodized alloy extrusions

Drive systems: CNC drive via DC motors with toothed drive belts to all axes

Bearing system: isostatic system of air bearings to all axes

Measuring system: high resolution (0.1µm) free floating linear scales mounted in carriers.

Counterbalance: adjustable pneumatic on Z ram

Thermal compensation: NTC sensors for lines and pieces

OPTION

Active vibration insulation system (AVM)

Basement side skirts

Perimetral safety system with SAFE MODE operation

Multi-wire cable

POWER SUPPLY

Power supply voltage:

230 V $\pm$ 10%; 50 Hz $\pm$ 2% single phase

115 V $\pm$ 10%; 60 Hz $\pm$ 2% single phase

AIR SUPPLY

Air consumption:

250 NI/min

Minimum air supply:

5 Bar (71 PSI)

PROBING SYSTEM

Manual probe head:

MIH, MH20, MH20i

Motorized indexable probe head:

PH10T, PH10M, PH10MQ

Motorized continuous probe head:

PH20, REVO

Point-to-point trigger probe:

TP20, TP200

Analog contact probe:

SP600, SP25M, SP80

Stylus and probe changer:

Fully automated stylus and probe changers

ENVIRONMENT

Temperature range for metrological specification:

T₁: Ambient temperature range: 18 $\div$ 22 °C

Max. gradient per hour: 1,0 °K/h

Max. gradient per day: 2,0 °K/24h

Max. gradient in space: 1,0 °K/m

T₂: Ambient temperature range: 16 $\div$ 26 °C

Max. gradient per hour: 1,0 °K/h

Max. gradient per day: 5,0 °K/24h

Max. gradient in space: 1,0 °K/m

Operating temperature:

15 $\div$ 35 °C

Relative humidity:

40 $\div$ 80 % (non condensing)

Acceptable vibrations

(Vibration acceleration between peaks)

30 mm/s² tra 1 e 10 Hz

15 mm/s² tra 10 e 20 Hz

50 mm/s² tra 20 e 100 Hz

PERFORMANCE

Models	T ₁ : 18÷22 °C											Max. 3D Pos. Speed	Max. 3D Accel.
	PH10M/MQ/T/PH20-TP20			PH10M/MQ/T-TP200			PH10M/PH10MQ-SP25M-REVO-SP80						
	MPE _{EO/150} ⁽¹⁾	MPL _{RO} ⁽²⁾	MPE(PFTU) ⁽³⁾	MPE _{EO/150} ⁽¹⁾	MPL _{RO} ⁽²⁾	MPE(PFTU) ⁽³⁾	MPE _{EO/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]		
xx.07.07	1,9 + 3,0 L/1000	1,9	2,0	1,8 + 3,0 L/1000	1,7	1,8	1,7 + 3,0 L/1000	1,4	1,7	3,0	90	866	2000
xx.09.08	1,9 + 3,0 L/1000	1,9	2,0	1,8 + 3,0 L/1000	1,7	1,8	1,7 + 3,0 L/1000	1,4	1,7	3,0	90	866	2000
xx.10.08	2,0 + 3,0 L/1000	2,0	2,1	1,9 + 3,0 L/1000	1,8	1,9	1,7 + 3,0 L/1000	1,6	1,7	3,4	90	866	2000
xx.10.09	2,2 + 3,0 L/1000	2,2	2,2	2,0 + 3,0 L/1000	1,9	2,0	1,9 + 3,0 L/1000	1,8	1,9	4,0	90	866	1500
xx.10.10	2,5 + 3,0 L/1000	2,5	2,5	2,4 + 3,0 L/1000	2,3	2,4	2,4 + 3,0 L/1000	2,3	2,4	4,8	90	866	1200
xx.12.10	2,7 + 3,0 L/1000	2,7	2,7	2,5 + 3,0 L/1000	2,4	2,5	2,4 + 3,0 L/1000	2,3	2,4	4,8	90	866	1200
xx.15.10	2,8 + 3,5 L/1000	2,8	2,8	2,6 + 3,5 L/1000	2,5	2,6	2,5 + 3,5 L/1000	2,4	2,5	5,0	90	866	1000
xx.15.13	3,5 + 3,5 L/1000	3,5	3,5	3,0 + 3,5 L/1000	2,9	3,0	3,0 + 3,5 L/1000	2,8	3,0	5,8	90	800	900

Models	T ₂ : 16 - 26 °C											Max. 3D Pos. Speed	Max. 3D Accel.
	PH10M/MQ/T/PH20-TP20			PH10M/MQ/T-TP200			PH10M/PH10MQ-SP25M-REVO-SP80						
	MPE _{EO/150} ⁽¹⁾	MPL _{RO} ⁽²⁾	MPE(PFTU) ⁽³⁾	MPE _{EO/150} ⁽¹⁾	MPL _{RO} ⁽²⁾	MPE(PFTU) ⁽³⁾	MPE _{EO/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]		
xx.07.07	2,4 + 5,0 L/1000	2,4	2,4	2,2 + 5,0 L/1000	2,2	2,2	2,2 + 5,0 L/1000	2,2	2,2	4,4	90	866	2000
xx.09.08	2,4 + 5,0 L/1000	2,4	2,4	2,2 + 5,0 L/1000	2,2	2,2	2,2 + 5,0 L/1000	2,2	2,2	4,4	90	866	2000
xx.10.08	2,5 + 5,0 L/1000	2,5	2,5	2,3 + 5,0 L/1000	2,3	2,3	2,3 + 5,0 L/1000	2,3	2,3	4,6	90	866	2000
xx.10.09	3,0 + 5,0 L/1000	3,0	3,0	2,8 + 5,0 L/1000	2,8	2,8	2,8 + 5,0 L/1000	2,8	2,8	5,6	90	866	1500
xx.10.10	3,0 + 5,0 L/1000	3,0	3,0	2,8 + 5,0 L/1000	2,8	2,8	2,8 + 5,0 L/1000	2,8	2,8	5,6	90	866	1200
xx.12.10	3,5 + 5,0 L/1000	3,5	3,5	3,3 + 5,0 L/1000	3,3	3,3	3,3 + 5,0 L/1000	3,3	3,3	6,6	90	866	1200
xx.15.10	3,5 + 6,0 L/1000	3,5	3,5	3,3 + 6,0 L/1000	3,3	3,3	3,3 + 6,0 L/1000	3,3	3,3	6,6	90	866	1000
xx.15.13	4,0 + 6,0 L/1000	4,0	4,0	3,7 + 6,0 L/1000	3,7	3,7	3,7 + 6,0 L/1000	3,7	3,7	7,4	90	800	900

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

- MPE_{EO}/MPE(PFTU)/MPL_{RO}: PH10M/PH10MQ/PH10T/PH20/TP20/TP200:
stylus Ø 4 mm, stylus length 10 mm.
SP80: stylus Ø 5 mm, stylus length 50 mm

- MPE_{E150}: PH10M/PH10MQ/TP20/TP200: stylus Ø 4 mm, length 40 mm.
PH20: EM1 STDF, stylus Ø 4 mm, stylus length 20 mm.
PH10T: PEL2, stylus Ø 4 mm, length 10 mm. SP80: SH80 cube,
M5 EXT L100, stylus Ø 5 mm, stylus length 50 mm

- MPE_{EO/150}: PH10MQ/SP25M: SM25-2, stylus Ø 5 mm, stylus length 21 mm.
REVO: RSP2/RSI175 - RSP3-1/SH25-1, stylus Ø 5 mm,
stylus length 21 mm

- L = measuring length (mm)

- Environment temperature conditions:

T₁: 18 ÷ 22 °C; Max. Gradients: 1,0 °C/h - 2,0 °C/24h - 1,0 °C/m

T₂: 16 ÷ 26 °C; Max. Gradients: 1,0 °C/h - 5,0 °C/24h - 1,0 °C/m

⁽¹⁾ Maximum Permissible Error of Length measurement in according
UNI EN ISO 10360-2:2010

⁽²⁾ Maximum Permissible Limit of Repeatability range in according
UNI EN ISO 10360-2:2010

⁽³⁾ Maximum Permissible Single Stylus Form Error in according
UNI EN ISO 10360-5:2010

⁽⁴⁾ Maximum Permissible Scanning Probing Error in according UNI EN ISO
10360-4:2005, applicable to the SP25M/SP80 probes only, reference sphere
Ø 25 mm - REVO RSP3-1

⁽⁵⁾ Maximum Permissible Time for Scanning test in according UNI EN ISO
10360-4:2005, applicable to the SP25M/SP80 probes only, reference sphere
Ø 25 mm - REVO RSP3-1

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

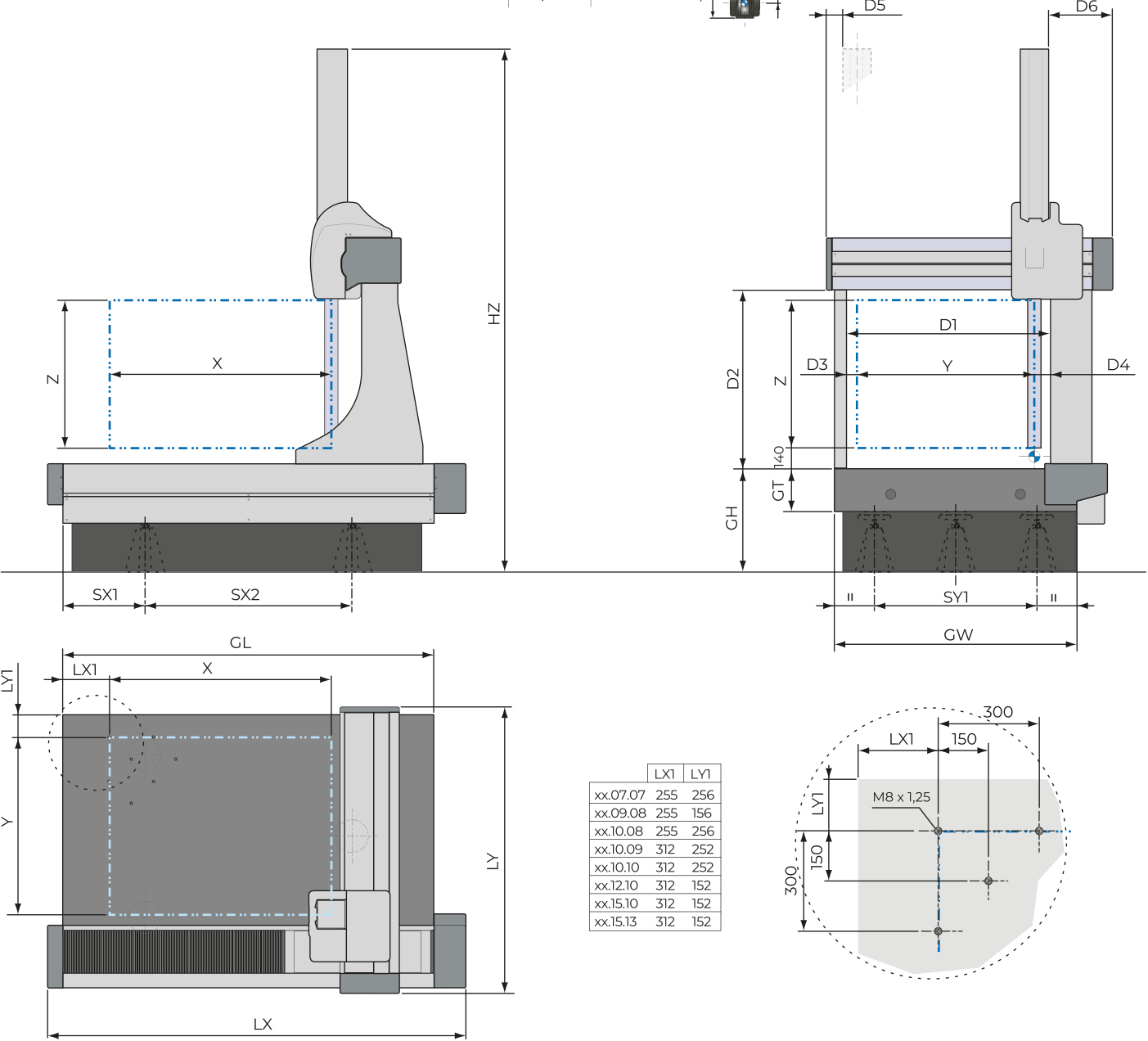
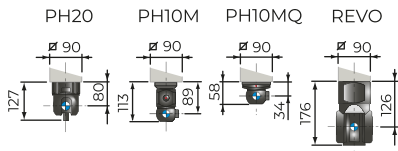
A reference sphere is measured with 25 equally distributed probings, estimate of the deviation in the shape of the sphere, obtained as a dispersion band of the 25 polar rays. The probing performance shall be verified in one position, placed in the middle of the CMM measure volume. Calculation of the 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*).

MPET_{ij}: 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 calculated 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	Measuring strokes			Overall dimensions			Surface Plate							Daylights						Weights	
	X	Y	Z ⁽¹⁾	LX	LY	HZ	Height	Thick.	Lenght	Width	Supports			D1	D2	D3	D4	D5	D6	Max part weight	CMM weight
	[mm]			[mm]			[mm]				[mm]			[mm]						[kg]	
07.07.07	700	700	700	1852	1324	2843	670	200	1530	1110	316	900	700	873	909	73	100	67	365	650	1200
10.07.07	1000	700	700	2152	1324	2843	670	200	1830	1110	415	1000	700	873	909	73	100	67	365	900	1380
12.09.08	1200	900	800	2352	1524	3073	700	250	2030	1310	455	1120	880	1073	1009	73	100	67	365	1300	2125
15.09.08	1500	900	800	2652	1524	3073	700	250	2330	1310	540	1250	880	1073	1009	73	100	67	365	1500	2400
20.09.08	2000	900	800	3152	1524	3073	700	250	2830	1310	665	1500	880	1073	1009	73	100	67	365	1800	2860
12.10.08	1200	1000	800	2352	1624	3073	700	250	2030	1410	455	1120	980	1173	1009	73	100	67	365	1400	2270
15.10.08	1500	1000	800	2652	1624	3073	700	250	2330	1410	540	1250	980	1173	1009	73	100	67	365	1600	2570
20.10.08	2000	1000	800	3152	1624	3073	700	250	2830	1410	665	1500	980	1173	1009	73	100	67	365	1900	3070
15.10.09	1500	1000	900	2832	1737	3339	700	250	2510	1440	555	1400	960	1180,5	1111	70,5	110	109,5	435,5	1500	2890
20.10.09	2000	1000	900	3332	1737	3339	700	290	3010	1440	655	1700	960	1180,5	1111	70,5	110	109,5	435,5	1600	3890
15.10.10	1500	1000	1000	2832	1737	3539	700	250	2510	1440	555	1400	960	1180,5	1211	70,5	110	109,5	435,5	1500	2890
20.10.10	2000	1000	1000	3332	1737	3539	700	290	3010	1440	655	1700	960	1180,5	1211	70,5	110	109,5	435,5	1600	3900
15.12.10	1500	1200	1000	2832	1937	3539	700	290	2510	1640	555	1400	1100	1380,5	1211	70,5	110	109,5	435,5	1800	3730
20.12.10	2000	1200	1000	3332	1937	3539	700	340	3010	1640	655	1700	1100	1380,5	1211	70,5	110	109,5	435,5	2300	5100
25.12.10	2500	1200	1000	3832	1937	3539	700	360	3510	1640	780	1950	1110	1380,5	1211	70,5	110	109,5	435,5	2400	6210
20.15.10	2000	1500	1000	3332	2237	3539	700	360	3010	1940	655	1700	1300	1680,5	1211	70,5	110	109,5	435,5	3600	6330
25.15.10	2500	1500	1000	3832	2237	3539	700	400	3510	1940	780	1950	1300	1680,5	1211	70,5	110	109,5	435,5	4000	8080
30.15.10	3000	1500	1000	4332	2237	3539	700	420	4010	1940	895	2220	1300	1680,5	1211	70,5	110	109,5	435,5	4000	9650
20.15.13	2000	1500	1300	3332	2237	4139	700	360	3010	1940	655	1700	1300	1680,5	1511	70,5	110	109,5	435,5	3600	6650
25.15.13	2500	1500	1300	3832	2237	4139	700	400	3510	1940	780	1950	1300	1680,5	1511	70,5	110	109,5	435,5	4000	8300
30.15.13	3000	1500	1300	4332	2237	4139	700	420	4010	1940	895	2220	1300	1680,5	1511	70,5	110	109,5	435,5	4000	9850

⁽¹⁾ With REVO Z measuring strokes will be reduced of 48 mm



TouchDMIS