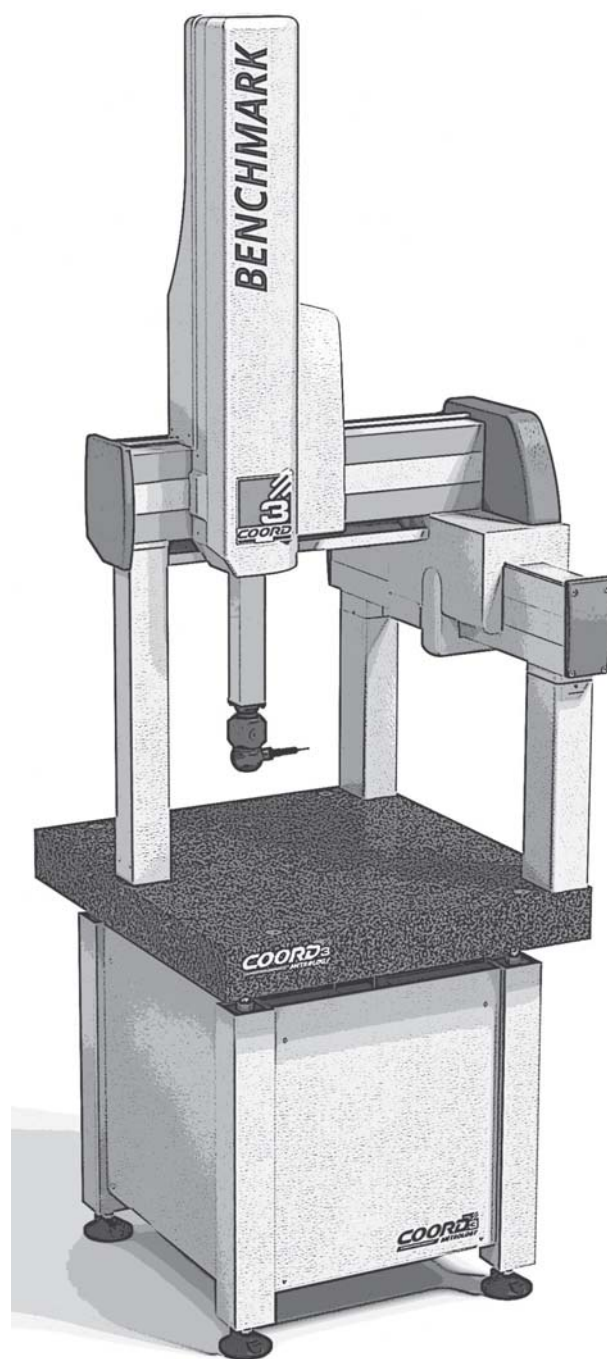


# **BENCHMARK™**

**05.04.04 - 06.05.04**

**HALF-GANTRY TYPE CNC AND MANUAL  
COORDINATE MEASURING MACHINE**



# BENCHMARK



**STRUCTURE:** Coordinate Measuring Machine, CNC or Manual type, with aluminum alloy mobile half-gantry structure on granite table machine base

**SURFACE PLATE:** Granite table with integrated guide-ways with flatness to DIN876/III and M8 threaded insert grid

**GUIDEWAYS:** X axis machined into granite table (left) and micromachined and hard anodized alloy extrusions (right).  
Y axis micro-machined and hard anodized alloy extrusions  
Z axis micro-machined and hard anodized alloy extrusions

**DRIVE METHOD:** NC drive via DC motors (Mot) or Manual Knob for each axis (MAN) with zero hysteresis friction drive on steel bar to all axes

**BEARING SYSTEM:** Air bearings to all axes

**MEASURING SYSTEM:** High resolution (0,1 $\mu$ m) free floating linear scales mounted in carriers

**COUNTERBALANCE:** Adjustable pneumatic on Z ram

**THERMAL COMPENSATION:** C3TCOMP Wireless multi-sensors for measuring scales and part (Optional)

## BENCHMARK: SPECIFICATIONS

Models	Specification according to ISO 10360-2:2009						Max. 3D Pos. Speed	Max. 3D Accel.
	MAN		MOT					
	TPC3/MH20i-TP20		MH20i/PH10T/M/PH20-TP20		PH10T/M-TP200		MOT only	
	<sup>(1)</sup> E <sub>L,MPE</sub>	<sup>(2)</sup> R <sub>0,MPL</sub>	<sup>(1)</sup> E <sub>L,MPE</sub>	<sup>(2)</sup> R <sub>0,MPL</sub>	<sup>(1)</sup> E <sub>L,MPE</sub>	<sup>(2)</sup> R <sub>0,MPL</sub>		
[ $\mu$ m]		[ $\mu$ m]		[ $\mu$ m]		[mm/s]	[mm/s <sup>2</sup> ]	
05.04.04	3,0 + L/300	3,0	2,5 + L/333	2,5	2,3 + L/333	2,3	500	1500
06.05.04	3,2 + L/300	3,2	2,7 + L/333	2,7	2,5 + L/333	2,5	500	1500

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

- MH20i/PH10T/M/PH20-TP20/TP200: SF Module, Tip diameter  $\varnothing$  4 mm x Stylus length 10 mm
- L = measuring length in mm
- Ambient temperature Range:  
T: 18  $\div$  22  $^{\circ}$ C; Max. Gradients : 0,5  $^{\circ}$ K/h - 2,0  $^{\circ}$ K/24h - 0,5  $^{\circ}$ K/m

<sup>(1)</sup> Maximum permissible Error for size measurements according ISO 10360 2:2009

<sup>(2)</sup> Maximum limit for repeatability range according ISO 10360 2:2009

## PERFORMANCE VERIFICATION

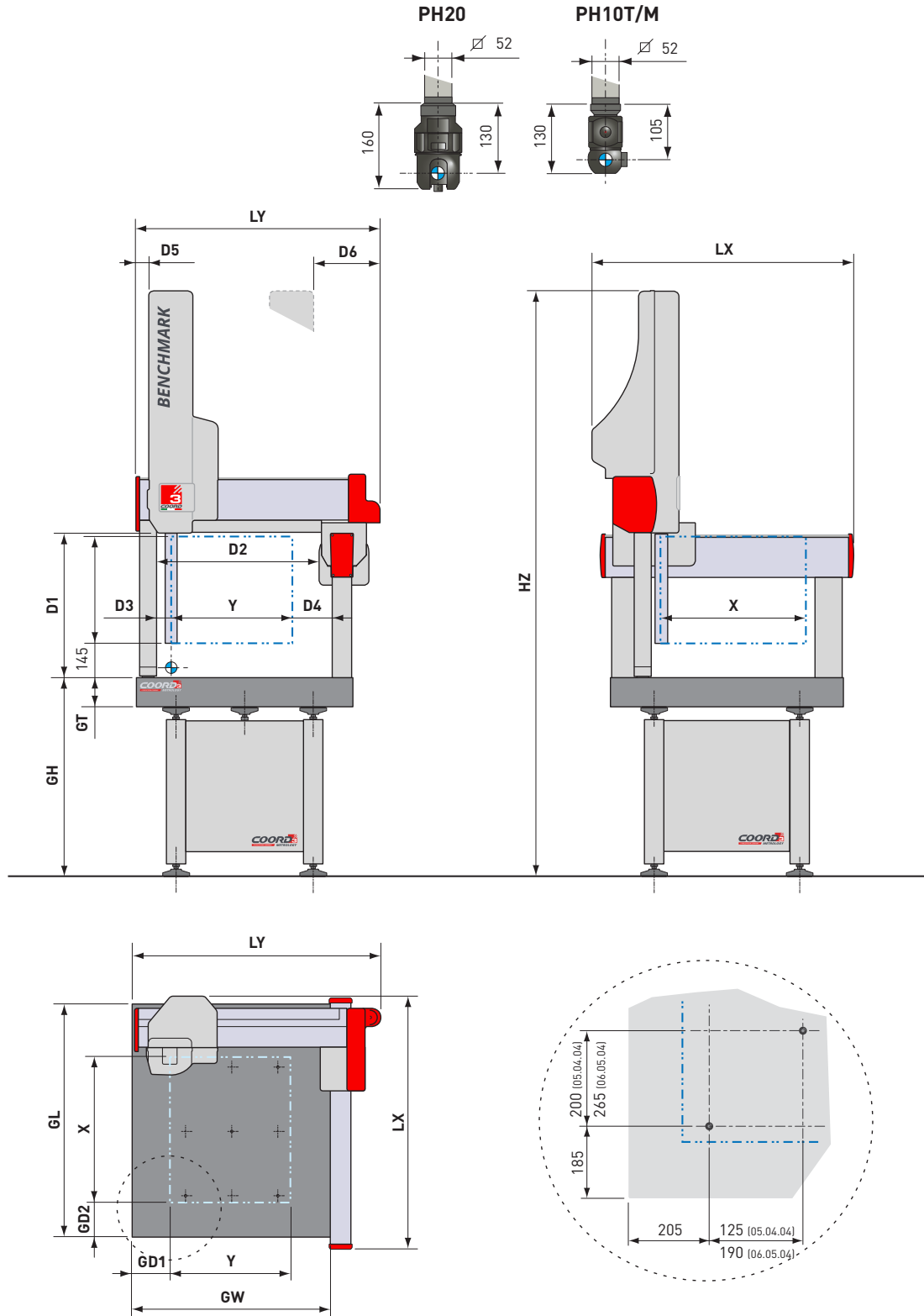
**E<sub>L,MPE</sub>** : Maximum permissible Error for size measurements

Measurement of a set of 5 different sizes, measured through two different probing points on two nominal parallel planes. The set of 5 sizes are placed in 7 different position aligned along the 3 linear axes and along 4 volumetric diagonal directions. Each size is measured 3 times for a total of 105 E<sub>L,MPE</sub> measurements. All 105 measurements must be within the limit of tolerance E<sub>L,MPE</sub>.

**R<sub>0,MPL</sub>** : Maximum limit for repeatability range

Evaluation of 35 repeatability values calculated as the maximum value minus the minimum value of 3 different measured size for each of 5 sizes for each of 7 positions. Each of these 35 values R<sub>0</sub> has to be less than the maximum limit R<sub>0,MPL</sub>.

# STROKES, DIMENSIONS, WEIGHTS



Models	Measuring Strokes			Overall Dimensions			Surface Plate						Daylights						Weights	
	X	Y	Z <sup>(1)</sup>	LX	LY	HZ	Height	Thickness	Length	Width	Holes		D1	D2	D3	D4	D5	D6	Max. Part Weight	Machine Weight
							GH <sup>(1)</sup>	GT	GL	GW	GD1	GD2								
	[mm]			[mm]			[mm]						[mm]						[kg]	
05.04.04	500	400	440	929	888	2411	830	100	830	673	135	135	598	537	49	141	53	252	300	300
06.05.04	600	500	440	1044	1018	2411	830	100	960	803	150	150	598	670	64	156	68	267	300	390

<sup>(1)</sup> With PH20 Probe Head Z Measuring stroke will be reduced to 410 mm

# TECHNICAL CHARACTERISTICS

## STRUCTURE

Coordinate Measuring Machine, CNC or Manual type, with aluminum alloy mobile half-gantry structure on granite table machine base

### Guideways:

X axis machined into granite table (left) and micromachined and hard anodized alloy extrusions (right)

Y axis micro-machined and hard anodized alloy extrusions

Z axis micro-machined and hard anodized alloy extrusions

### Drive Method:

X axis: zero hysteresis friction drive on steel bar

Y axis: zero hysteresis friction drive on steel bar

Z axis: zero hysteresis friction drive on steel bar

### Sliding System:

Air bearings on all axes

### Motion Control:

DC servomotor on all axes (MOT)

Manual Knob for each axis (MAN)

### Thermal Compensation:

Multi-sensors temperature compensation system (total 4 sensors) in Option.

### Measuring System:

High resolution (0,1µm) free floating linear scales mounted in carriers

## PROBING SYSTEM

### Manual Probe Head:

TPC3, MIH, MH20, MH20i, MH8, RTP20

### Motorized Probe Head (MOT version only):

PH10T, PH10M, PH20

### Point-to-point Trigger Probe:

TP20, TP200, TP200B

### Stylus and Probe Changer:

Fully automated stylus and probe changers

## OPTION

Passive vibration insulating system

Active vibration insulation system (AVM)

Multi-wire cable

## ENVIRONMENT

### Temperature Range for Metrological Specification:

Ambient 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 condensing)

### Acceptable Vibrations:

(vibration acceleration between peaks)

30 mm/s<sup>2</sup> from 1 to 10 Hz

15 mm/s<sup>2</sup> from 10 to 20 Hz

50 mm/s<sup>2</sup> from 20 to 100 Hz

## AIR SUPPLY

### Air Consumption:

90 NI/min

### Minimum Air Supply:

5 Bar (71PSI)

## POWER SUPPLY

### Power Supply Voltage:

230 V ± 10%; 50 Hz ± 2% (single phase) - 15 A

115 V ± 10%; 60 Hz ± 2% (single phase)

(Power consumption may vary according PC/peripherals connected to the Controller)

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