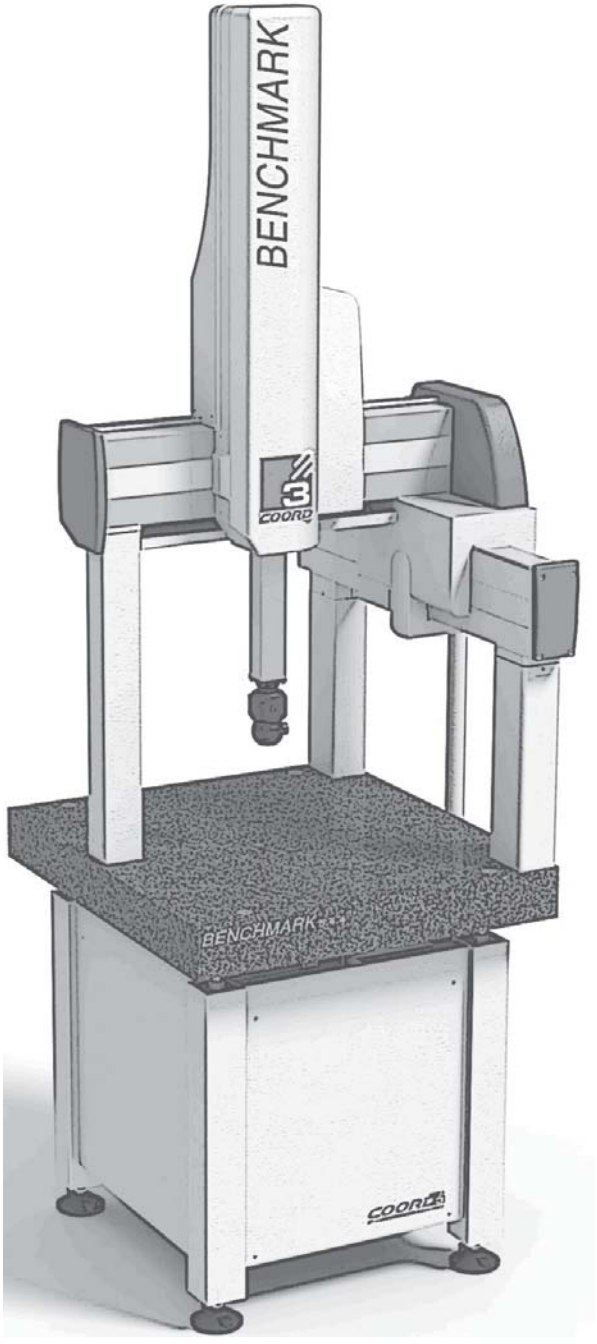
BENCHMARK™

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 (0,1µm) 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			
	[1] $E_{L,MPE}$	[2] $R_{0,MPL}$	[1] $E_{L,MPE}$	[2] $R_{0,MPL}$	[1] $E_{L,MPE}$	[2] $R_{0,MPL}$	MOT only	
	[µm]		[µm]		[µm]		[mm/s]	[mm/s²]
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 Ø 4 mm x Stylus length 10 mm
- L = measuring length in mm
- Ambient temperature Range:
T: 18 ÷ 22 °C; Max. Gradients : 0,5 °K/h - 2,0 °K/24h - 0,5 °K/m

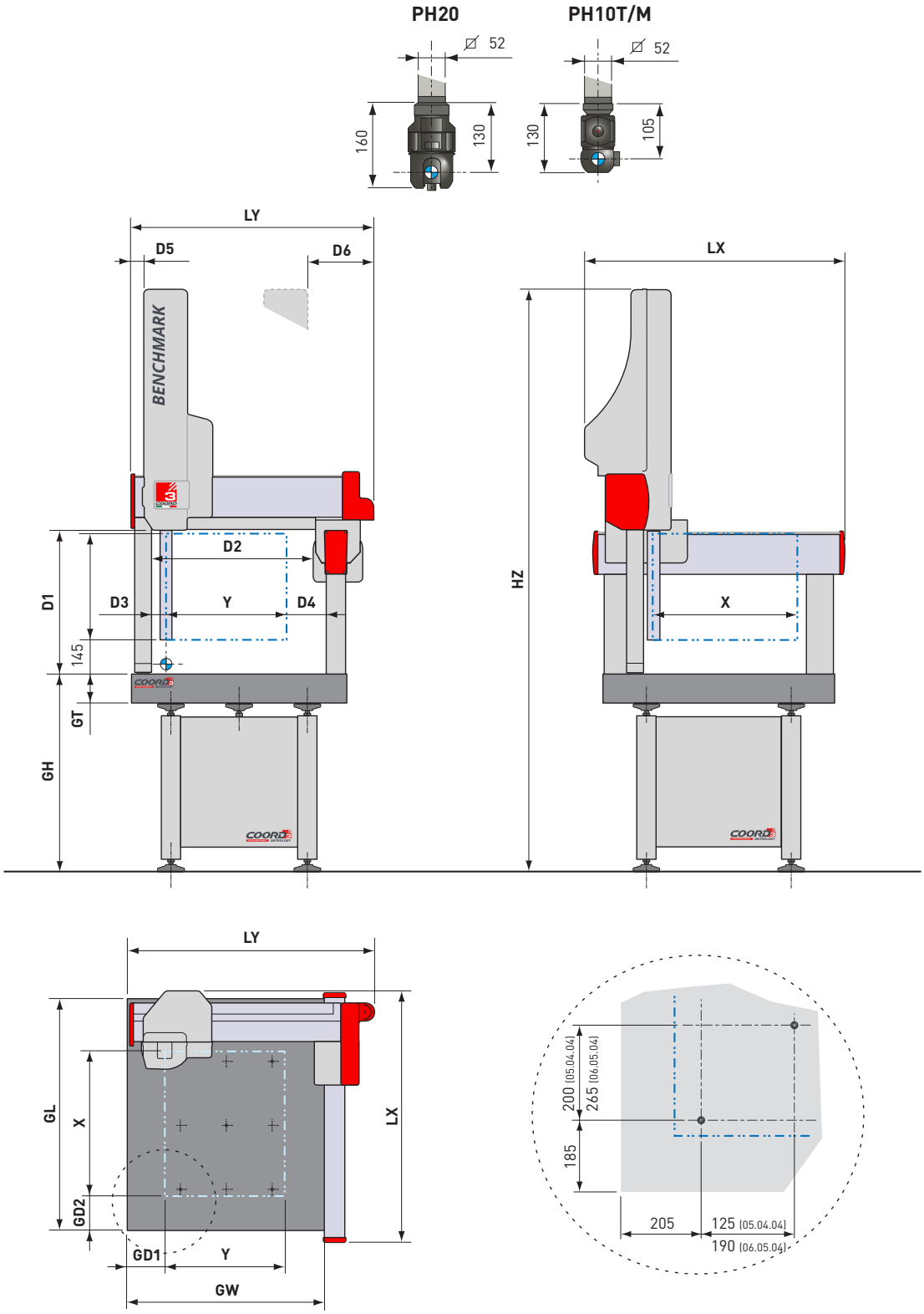
[1] Maximum permissible Error for size measurements according ISO 10360 2:2009
[2] Maximum limit for repeatability range according ISO 10360 2:2009

PERFORMANCE VERIFICATION

$E_{L,MPE}$: 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_L measurements. All 105 measurements must be within the limit of tolerance $E_{L,MPE}$.

$R_{0,MPL}$: 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_0 has to be less than the maximum limit $R_{0,MPL}$.

STROKES, DIMENSIONS, WEIGHTS



Models	Measuring Strokes			Overall Dimensions			Surface Plate						Daylights						Weights	
							Height	Thickness	Length	Width	Holes								Max. Part Weight	Machine Weight
	X	Y	Z [1]	LX	LY	HZ	GH [1]	GT	GL	GW	GD1	GD2	D1	D2	D3	D4	D5	D6		
	[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

[1] *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^2 from 1 to 10 Hz
15 mm/s^2 from 10 to 20 Hz
50 mm/s^2 from 20 to 100 Hz

AIR SUPPLY

Air Consumption:
90 Nl/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 consuption may vary according PC/peripherals connected to the Controller)

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