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Data Sheet

TIGO SF

05.06.05


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Technology Inside

scan PILOT

Guiding the CMM through the unknown

Scanning of unknown paths can often be challenging and time-consuming. The advanced firmware algorithms of Scan Pilot offer greater motion control capabilities that ensure robust scanning performance however complex the geometry or abrupt the surface changes.

fly2 MODE

Gliding smoothly through the measurements

Fly2 Mode further optimises machine motion and minimises idle times so that the machine glides smoothly through its movement trajectories. As a result, program execution times are decreased considerably.

eco MODE

Save energy, sustain the environment

Eco Mode was implemented to reduce the operating cost of CMMs by decreasing energy consumption, and to help protect and sustain the environment. Eco Mode automatically powers down the machine when it stands idle for a set period, preventing energy wastage but keeping the machine ready to go as soon as a part-program is launched or any movement is activated through the jog box.

XT 40 °C

Extended temperature

A network of thermal sensors combined with enhanced structural machine temperature compensation, ensures optimum machine performance in harsh environments even at high temperatures and gradients.

TIGO SF specifications

Articulating head with scanning probe HP-S-X1S, Scanning probe heads HP-S- X1C

Max. Permissible Error MPE (µm) and Max. Permissible Limit MPL (µm) according to ISO 10360-2:2009		Temperature Range T1	Temperature Range T2	Temperature Range T3	Temperature Range T4 - XT option	Temperature Range T5 - XT option
Volumetric length measuring error [1]	MPE(E0/E60)	2.2 + L/300	2.5 + L/250	2.7 + L/200	3.7 + L/100	3.7 + L/80
Repeatability range	MPL(R0)	1.6				
Max. Permissible Error MPE (µm) according to ISO 10360-5:2010						
Single stylus form error	MPE(PFTU)	2.2				
Max. Permissible Error MPE (µm) and Max. Permissible Time MPT (s) according to ISO 10360-4:2000						
Single stylus form error, scanning [2]	MPE(THP)/MPT(τ)	3.5/50				

Articulating head with HP-THDe trigger probe

Max. Permissible Error MPE (µm) and Max. Permissible Limit MPL (µm) according to ISO 10360-2:2009		Temperature Range T1	Temperature Range T2	Temperature Range T3	Temperature Range T4 - XT option	Temperature Range T5 - XT option
Volumetric length measuring error [1]	MPE(E0/E60)	2.4 + L/300	2.7 + L/250	2.9 + L/200	3.9 + L/100	3.9 + L/80
Repeatability range	MPL(R0)	1.8				
Max. Permissible Error MPE (µm) according to ISO 10360-5:2010						
Single stylus form error	MPE(PFTU)	2.4				

Articulating head with HP-TMe trigger probe

Max. Permissible Error MPE (µm) and Max. Permissible Limit MPL (µm) according to ISO 10360-2:2009		Temperature Range T1	Temperature Range T2	Temperature Range T3	Temperature Range T4 - XT option	Temperature Range T5 - XT option
Volumetric length measuring error [1]	MPE(E0/E60)	2.6 + L/300	2.9 + L/250	3.1 + L/200	4.1 + L/100	4.1 + L/80
Repeatability range	MPL(RO)	2.0				
Max. Permissible Error MPE (µm) according to ISO 10360-5:2010						
Single stylus form error	MPE(PFTU)	2.6				

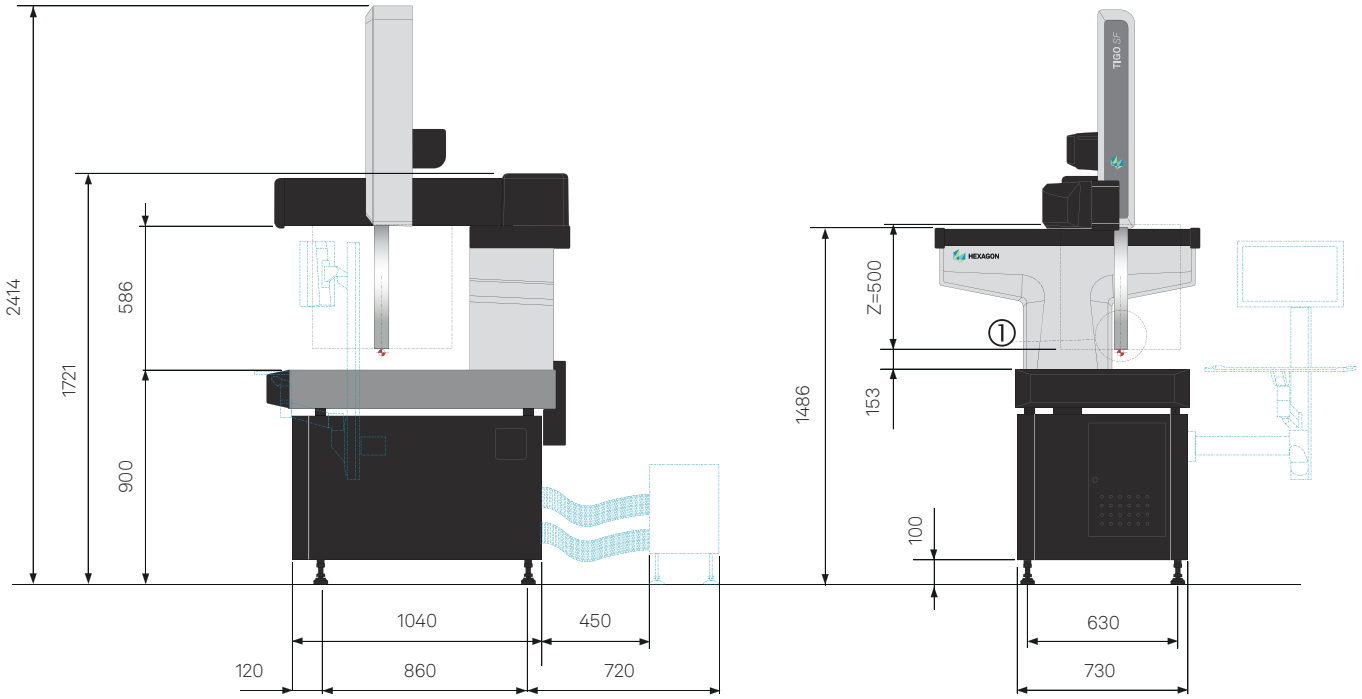
Dynamics	
Max. 3D Speed	520 mm/s
Max. 3D Acceleration	1750 mm/s^2
Max. Scanning Speed	300 mm/s

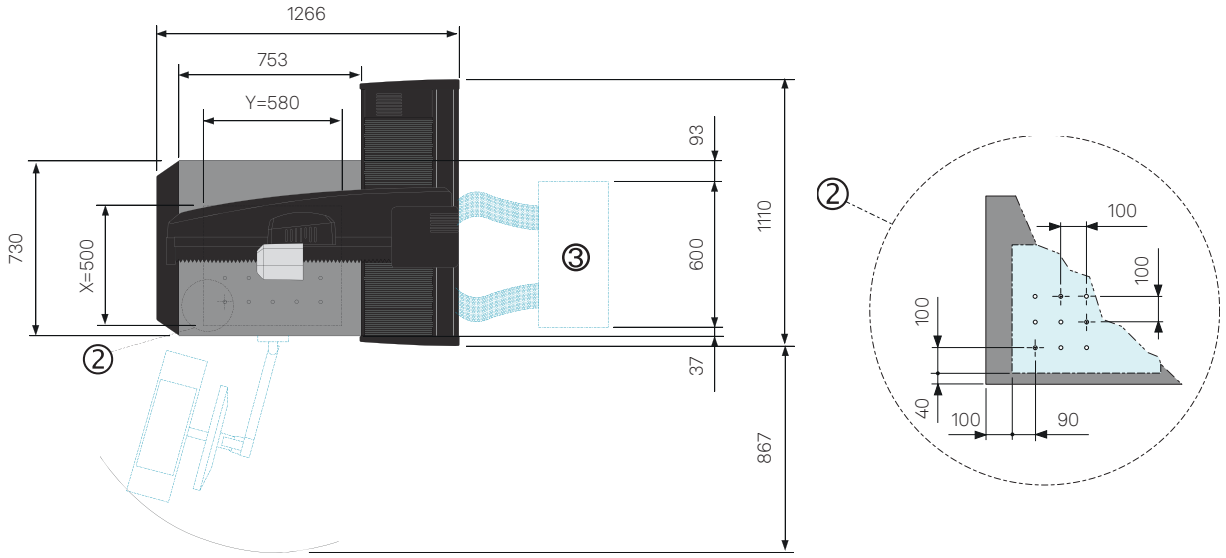
Performance test according to the following specification	Temperature Range T1	Temperature Range T2	Temperature Range T3	Temperature Range T4	Temperature Range T5
Ambient temperature	18 °C ÷ 22 °C	16 °C ÷ 26 °C	15 °C ÷ 30 °C	15 °C ÷ 40 °C	15 °C ÷ 40 °C
Max. air temperature var	1 °C/h - 2 °C/24h	1 °C/h - 5 °C/24h	2 °C/h - 5 °C/24h	2 °C/h - 5 °C/24h	2 °C/h - 10 °C/24h
Max. gradient in space	1 °C/m	1 °C/m	1 °C/m	1 °C/m	1 °C/m

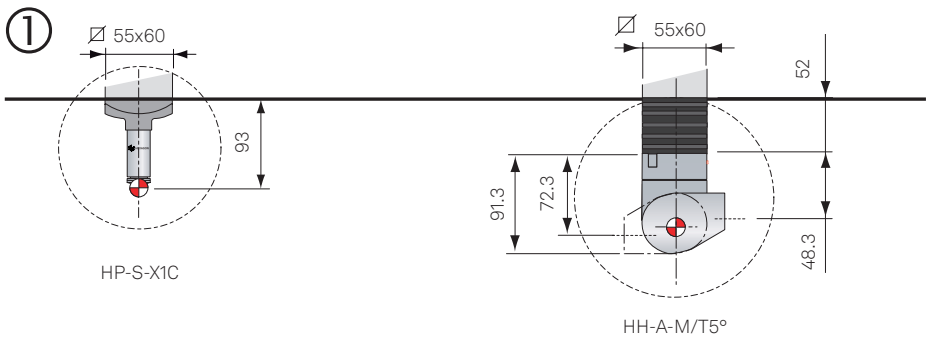
[1] MPE*(E0/E60)* specifications are to be formally understood as MPE*(E0/E60)** for the case where non-normal CTE material calibrated test lengths are used. Length unit measure (L) in mm.

[2] MPE(THP) and MPT(τ): test sphere placed in the centre of measuring volume

TIGO SF: Measuring range and dimensions







③ XT option

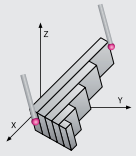
Probe heads and sensors

Technical characteristics	HP-S-X1C
Overtravel range	± 2 mm in all axes
Stylus joint	M3
Max. stylus weight	33 g
Max. stylus length	Vertical: up to 225 mm Horizontal: up to 100 mm

Technical characteristics	HH-A-M5°/ HH-A-T5° Indexable Probe Head
Angular rotation	A axis: +90° / -115° B axis: ±180°
Angular rotation step	5°
Max. applied torque	0.6 Nm
Max. extension length	300 mm

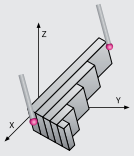
Performance verification

MPE*(E0)* : maximum permissible error of length measurement



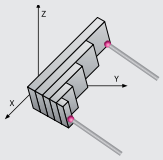
5 gauges have to be measured 3 times with one probing at each end, in 7 different directions. All measuring results must be within MPE***(E0)***.

MPL(*R0*): maximum permissible limit of the repeatability range



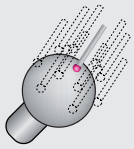
Extreme value of the repeatability range of the length measurement error, calculated by three repeated measurements on each size for a total of 35 values. The 35 repeatability range results must be within MPL***(R0)***.

MPE(*E150*): maximum permissible error of length measurement



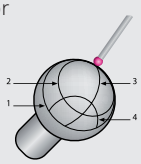
5 length gauges have to be measured 3 times in the YZ- or XZ plane with opposite styli, mounted 150 mm off theZ spindle axis. All measuring results must be within MPE***(E150)***.

MPE*(PFTU)* : maximum permissible single stylus form error



A test sphere has to be measured with 25 probings. PFTU is the range of all radii. The range of all radii must be within MPE***(PFTU)***.

Maximum permissible scanning probing error



MPE*(THP)*/MPT(τ) : A test sphere has to be scanned with 4 defined lines. THP is the range of all radii with the predefined path. The range of all radiiand the scanning time must be within MPE***(THP)*** and MPT*(τ)*.

Probe Configuration:

• HP-S-X1C: stylus length 46 mm, tip diameter 8 mm and stylus length 20 mm, tip diameter 5 mm

HP-S-X1S: stylus length 50 mm, tip diameter 5 mm

• HP-THDe and HP-TMe: Standard Force Module, stylus length 10 mm, tip diameter 4 mm

Technical characteristics

Mechanical frame	X: T Frame made of welded steel; Y carriage: made in steel; Z axis: Micromachined steel extrusion
Surface plate	Material: Granite Flatness: according to DIN 876/III Part Locking: threaded inserts M8 x 1.25
Weight	Max. Part Weight: 150 kg; CMM Weight approx.: 800 kg
Sliding system	Dual lineas guide with recirculating ball bearings on all axes
Measuring system	METALLUR® linear scales. System Resolution: 0.039 µm
Temperature compensation	Multi-sensor temperature compensation technology
Ram counterbalance	Steel spring
Supply Requirements	Power. 100/120/230/240 V ± 10% - 50/60 Hz - 2.5 KVA (+0.7 KVA - XT option) Air. no air required
Consumption	Power. 0.4 KVAh (+0.55 KVAh - XT option)
Operating Specifications	Ambient temperature: 10 - 40 °C Relative humidity: 20% - 90 % non-condensing

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Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

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