HEXAGON
MANUFACTURING INTELLIGENCE

DATA SHEET

TIGO SF

05.06.05


QUINDOS

TIGO SF: 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

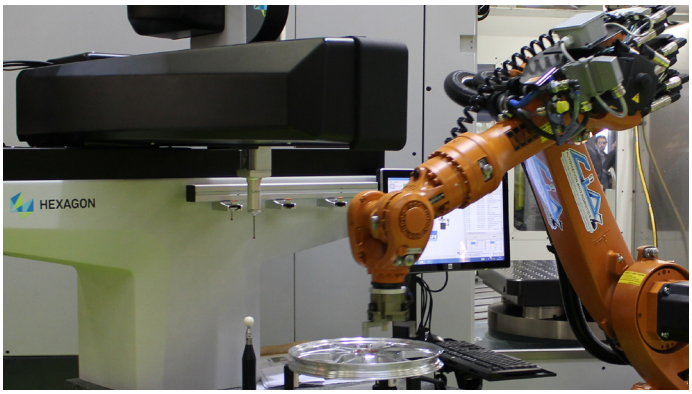
Save energy, sustain the environment

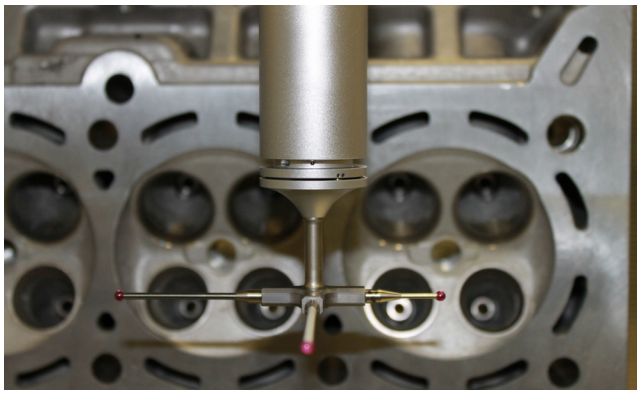
Eco Mode was implemented to reduce the operating cost of CMMs by decreasing energy consumption, and to help protect and sustain the environment. Eco Mode automatically powers down the machine when it stands idle for a set period, preventing energy wastage but keeping the machine ready to go as soon as 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.





SPECIFICATIONS

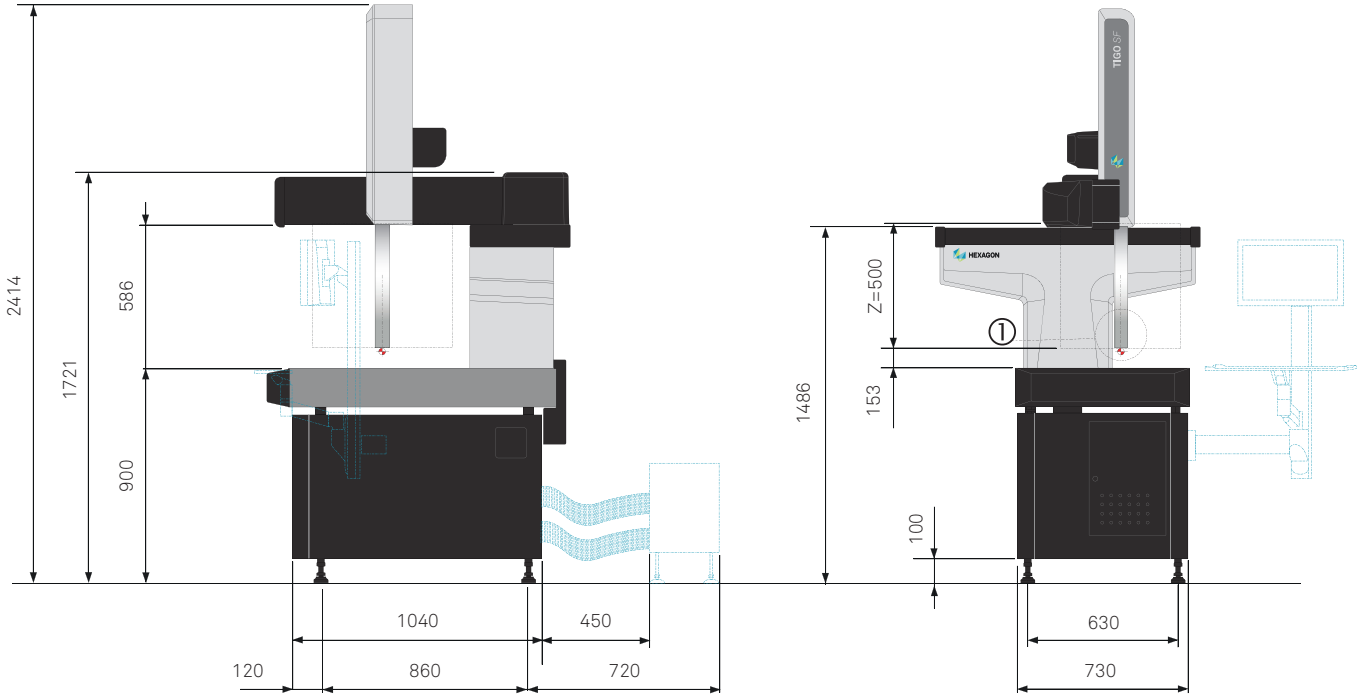
Scanning probe heads HP-S- X1C Max. Permissible Error MPE (µm) and Max. Permissible Limit MPL (µm) according to ISO 10360-2:2009		
Volumetric length measuring error (T1: 18 - 22 °C) [1]	MPE *(E0/E60)*	2.2 + L/300
Volumetric length measuring error (T2: 16 - 26 °C) [1]	MPE *(E0/E60)*	2.5 + L/250
Volumetric length measuring error (T3: 15 - 30 °C) [1]	MPE *(E0/E60)*	2.7 + L/200
Volumetric length measuring error (T4: 15 - 40 °C) [1] - XT option	MPE *(E0/E60)*	3.7+L/100
Volumetric length measuring error (T5: 15 - 40 °C) [1] - XT option	MPE *(E0/E60)*	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-T-MP trigger probe. Max. Permissible Error MPE (µm) and Max. Permissilbe Limit MPL (µm) according to ISO 10360-2:2009		
Volumetric length measuring error (T1: 18 - 22 °C) [1]	MPE *(E0/E60)*	2.6 +L/300
Volumetric length measuring error (T2: 16 - 26 °C) [1]	MPE *(E0/E60)*	2.9+L/250
Volumetric length measuring error (T3: 15 - 30 °C) [1]	MPE *(E0/E60)*	3.1+L/200
Volumetric length measuring error (T4: 15 - 40 °C) [1] - XT option	MPE *(E0/E60)*	4.1 + L/100
Volumetric length measuring error (T5: 15 - 40 °C) [1] - XT option	MPE *(E0/E60)*	4.1 + L/80
Repeatability range	MPL *(R0)*	2.0
Max. Permissible Error MPE (µm) according to ISO 10360-5:2010		
Single stylus form error	MPE *(PFTU)*	2.6

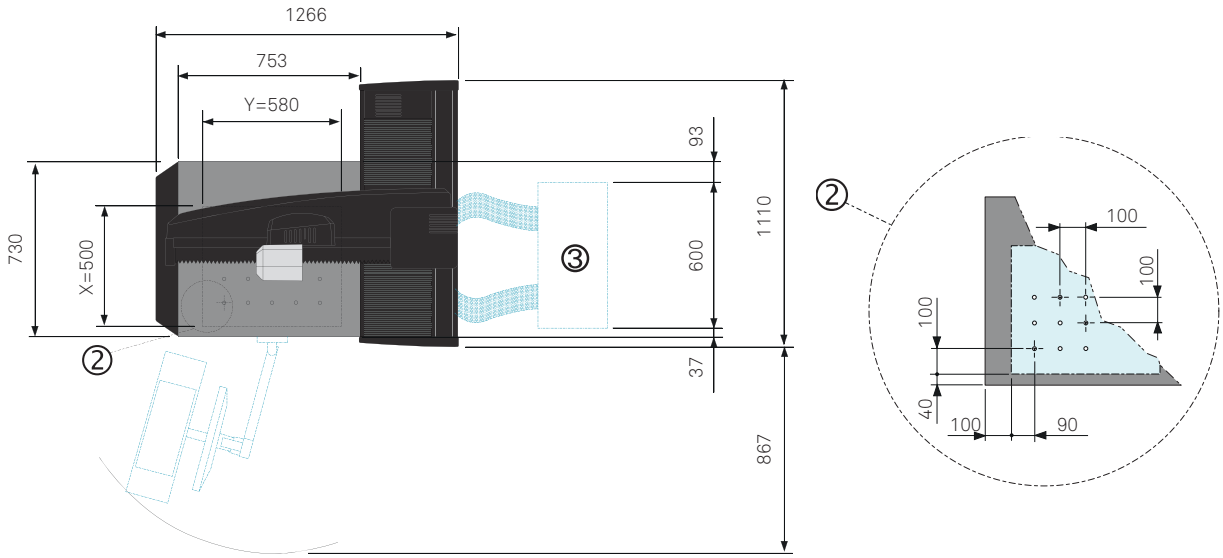
Dynamics	
Max. 3D Speed	520 mm/s
Max. 3D Acceleration	1750 mm/s^2
Max. Scanning Speed	300 mm/s

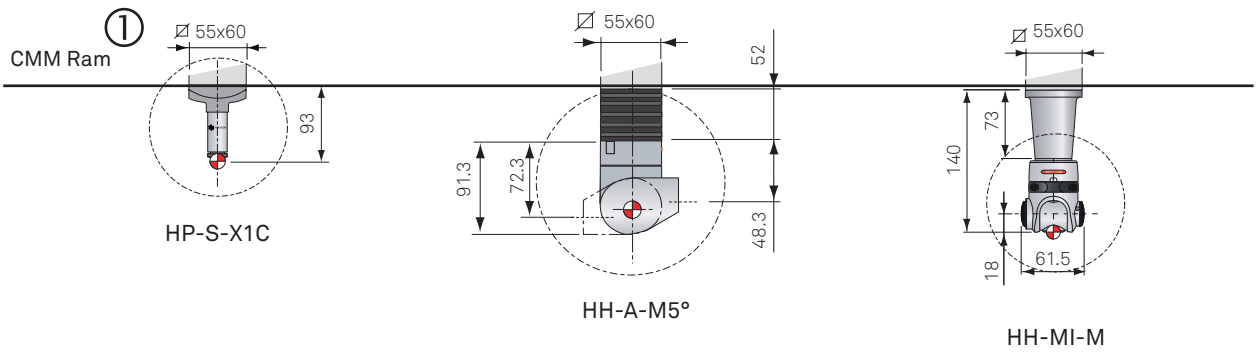
Performance test according to the following specifications	Temperature Range T1	Temperature Range T2	Temperature Range T3	Temperature Range T4	Temperature Range T5
Ambient temperature	18 ÷ 22 °C	16 ÷ 26 °C	15 ÷ 30 °C	15 ÷ 40 °C	15 ÷ 40 °C
Max. air temperature var	1 K/h - 2 K/24h	1 K/h - 5 K/24h	2 K/h - 5 K/24h	2 K/h - 5 K/24h	2 K/h - 10 K/24h
Max. gradient in space	1 K/m	1 K/m	1 K/m	1 K/m	1 K/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(t): test sphere placed in the centre of measuring volume

TIGO SF: MEASURING RANGE AND DIMENSIONS







③ XT option

PROBE HEADS AND SENSORS

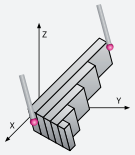
Technical Characteristics	HP-S-X1C
Overtravel range	± 2 mm in all axes
Stylus joint	M3
Max. stylus weight	33 g
Max. stylus length	Vertical: up to 225 mm Horizontal: up to 100 mm

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

Technical Characteristics	HH-MI-M Manual Probe Head
Angular rotation	A: 0° – 90°; B: +/- 180°
Angular rotation step	15°
Axis clamping	Manual, by two buttons on the probe head
Extensions	M8/M8, Max. length 50 mm

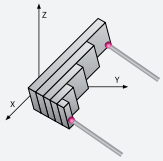
PERFORMANCE VERIFICATION

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



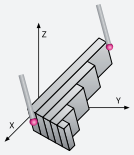
5 gauges have to be measured 3 times with one probing at each end, in 7 different directions. All measuring results must be within MPE*(E0)*.

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



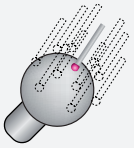
5 length gauges have to be measured 3 times in the YZ- or XZ plane with opposite styli, mounted 150 mm off the Z spindle axis. All measuring results must be within MPE*(E150)*.

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



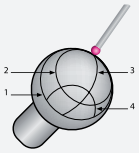
Extreme value of the repeatability range of the length measurement error, calculated by three repeated measurements on each size for a total of 35 values. The 35 repeatability range results must be within MPL*(R0)*.

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



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

Probe Configuration for performance test:

- HP-S-X1C: stylus length 46 mm, tip diameter 8 mm and stylus length 20 mm, tip diameter 5 mm
- HP-TM: Standard Force Module, stylus length 10 mm, tip diameter 4 mm

NOTE: ISO 10360-2 test with maximum part weight performed as an option upon request only.

TECHNICAL CHARACTERISTICS

Guideway:	X: T Frame made of welded steel; Y carriage: made in steel; Z axis: Micromachined steel extrusion
Surface Plate:	Material: Granite; Part Locking: Threaded inserts M8x1.25; Flatness: According to DIN 876/III
Weight:	Max. Part Weight: 150 kg; CMM Weight approx.: 800 kg
Sliding System:	Dual linear guide with recirculating ball bearings on all axes
Measuring System:	METALLUR® linear scales. System Resolution: 0.039 µm
Temperature Compensation:	Multisensor Temperature Compensation Technology
Ram Counterbalance:	Steel spring
Controller:	DC241 (protection IP 54)
Customer Supply:	Power :100/120/230/240 V+/-10%-50/60Hz- 2,5KVA (+ 0,7 KVA - XT option)
Air Supply:	No air required
Consumption:	Power: 0.4 KVAh (+ 0.55 KVAh - XT option)
Environment:	Metrological specification temperature range: 18 ÷ 22 °C; 16 ÷ 26 °C; 15 ÷ 30 °C; 15 ÷ 40 °C Operating Temperature: 10 ÷ 40 °C; Relative humidity: 20% - 90 % non condensing

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MANUFACTURING INTELLIGENCE

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