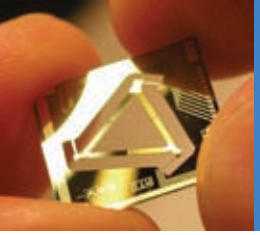


Gannen series

3D tactile scanning probes with nanometer uncertainty

Adding value

- 3D measurements on lenses, micro-gears, moulds, nozzles, etc.
- Low force prevents damaging components

World-class accuracy

- 2 nm repeatability over whole range in any direction
- Scanning with a contact force down to 10 micro Newtons

Ultra precision 3D metrology solutions

XPRESS
Precision Engineering

Products and applications

Higher demands on accuracy and component miniaturization are ongoing trends in many industrial fields, including automotive, medical, aerospace and consumer products. Sound metrology is a key enabler for the success of these products.

For this, Xpress Precision Engineering offers the Gannen series, the most accurate true 3D probes in the world.

The Gannen probes are developed for use in ultra precision (UP) dimensional metrology machines, UP machining centers and other custom UP setups. They will provide you with maximum accuracy when measuring, scanning or detecting:

- 3D features, even on soft materials
- Parts with small radii, undercuts and bores
- Sidewalls and surfaces of freeform objects

Customer focus

Xpress strives to stay a top supplier of ultra precision 3D metrology solutions. To achieve this, world class products are delivered and after sales support is highly valued.

It is possible to receive on-site demonstration and installation. Furthermore, you will get excellent support during and after implementation. This guarantees optimal operation on your machine.

Xpress Precision Engineering

Xpress is a research driven organization. Its employees are highly educated and work mainly in R&D. Profit is invested in new technologies & products, in patent applications and to assist the strong growth of the company.

Research at Xpress is focused on improving the measurement uncertainty of probes and their measurement behavior on small components. For this a close relationship with the Eindhoven University of Technology and other industrial and academic partners is maintained. Several labs and offices are on the university campus and academic standards are kept high by collaborating in projects and funding university research.

We enjoy pushing the boundaries of dimensional metrology every day!

Gannen-XP

The flagship probe of Xpress is developed for ultimate accuracy measurements. XP stands for Xtreme Precision and with a combined uncertainty below 45 nanometer, this is the most accurate 3D probe in the world!

- Nanometer repeatability in all directions
- Excellent stability over time
- Low, identical probing forces in x, y as well as z direction
- Replace spheres and styli within minutes
- Scanning measurements

Gannen-XM

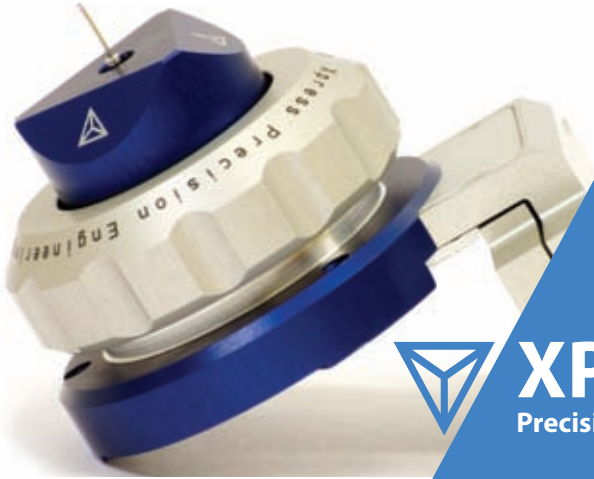
For conducting measurements on micro objects, the Gannen-XM is a perfect choice. To ensure high precision, its core technology originates directly from the XP. Small tips and long styli enable you to conduct true 3D measurements on miniature features or objects.

- Tips as small as 50 micrometer in diameter
- Ultra low probing forces
- Suitable for long styli
- Replace spheres and styli within minutes
- Scanning measurements

Gannen Control Units

The GCU-1 and GCU-2 optimize the signal of the Gannen probes for maximum accuracy. Furthermore, they supply power to the probe and give the possibility to choose from a single or differential output. It is possible to customize a controller towards your wishes.

- Electrical outputs according to your needs
- Specially shielded cables for optimal stability
- Adjustable trigger function for contact detection
- Optimal signal processing



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Specifications

General

	Gannen XP	Gannen XM
Repeatability *	2 nm	4 nm
Measuring probe	Yes	Yes
Suitable for scanning	Yes	Yes
Available tip diameters	120, 300 and 500 µm	50, 120, 300 and 500 µm

Probe uncertainty

3D probe uncertainty (3σ)	10 nm	24 nm
Thermal deviations (ΔT < 0,1 K)	< 10 nm	< 20 nm
Tip and work piece deformation	< 10 nm	< 10 nm
Calibration of tip and probe **	40 nm	150 nm
Other deviations	< 10 nm	< 30 nm
Combined 3D uncertainty	**45 nm**	**156 nm**

Contact forces

Colliding mass in probe tip	50 mg	50 mg
Stiffness at probe tip	400 N/m (isotropic)	≥ 10 Nm (XY); ≥ 50 Nm (Z) ***
Typical contact force @ 1 µm	0.4 mN	≥ 0.01 mN ***

Range

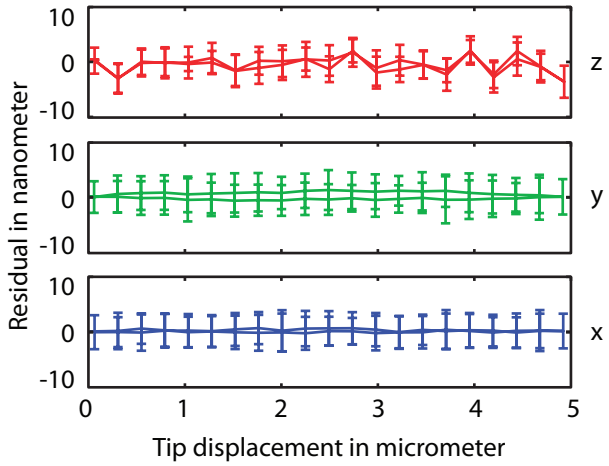
Measurement range	30 µm	30 µm
Linear measurement range	10 µm	10 µm

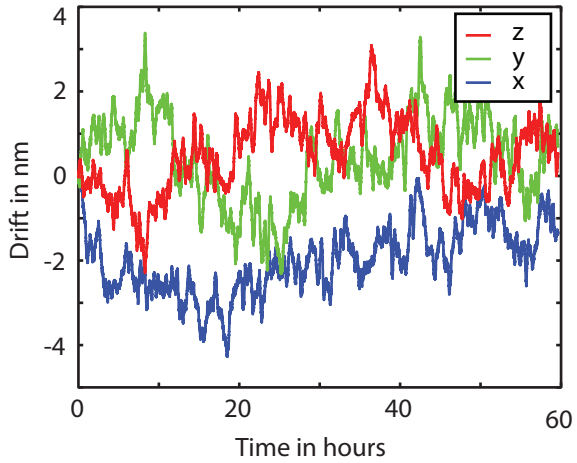
* standard deviation over whole measurement range and in any direction, confirmed by independent publications

** the stated value is mainly determined by machine uncertainty and calibration method

*** depends on stylus, for a stylus diameter ≥ 200 µm the stiffness is 160 N/m in XY- and 400 N/m in Z-direction

Data presented in this sheet is with reservation, future developments may influence specifications and design.





Repeatability is determined by simultaneously measuring the displacement of a work piece using the Gannen XP probe and a planar differential laser interferometer setup (see www.xpresspe.com). The difference (residual) is measured repeatedly over a 6 hour period at 21 positions over a 5 micrometer displacement. The **average value** and **95% confidence** interval is shown in the left graph for both the back and forth movement. The standard deviation in **repeatability** is **2 nm** for any position. Also, **hysteresis**, back lash and creep is below **1 nm** for any direction and no second-order effects are observed, showing probe **linearity**. In the second graph the drift of the probe chip and electronics is shown as measured over a 60 hour time frame in a stable environment. The typical **drift** in this graph is **1 nm** over a 20 minute interval.

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