



GLASS EXPANSION

Quality By Design

Guardian Probe Resource Guide

Issue 1



INS-0717

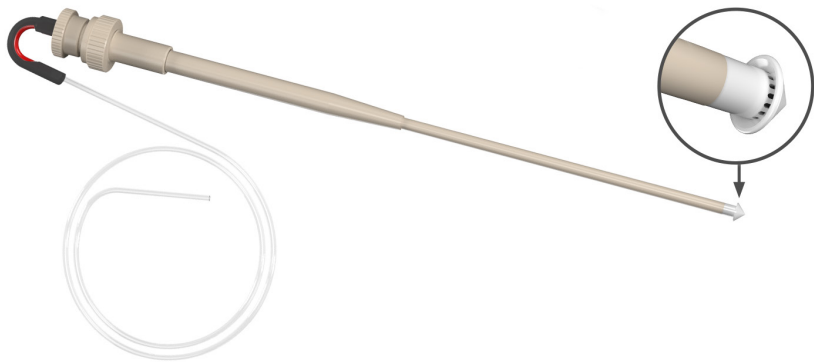
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The **Guardian™ Autosampler Probe** is a next-generation accessory engineered specifically for the most commonly used ICP-OES and ICP-MS autosamplers, refer to the Compatibility Table on page 7 for a complete list. At the heart of its innovation is a specially engineered, cone-shaped **ceramic tip**. The ceramic tip consists of a ring of precision formed apertures at the base of the probe (see image below), which holds back particulates before they reach the capillary line. This helps prevent blockages in the sample line, switching valves, and nebulizer, improving reliability when handling samples containing higher levels of particulates. The ceramic cone tip effectively acts as a permanent filter.

Constructed entirely from chemically inert materials — **Ceramic, PEEK, and PTFE** — the Guardian Probe offers exceptional resistance to strong acids and solvents. The Guardian probe body features a robust PEEK outer tube, providing durability and long service life, while an internal PTFE tube provides a smooth, inert pathway for efficient sample transport.

Cross-contamination is reduced through the novel cone-shaped tip design, which helps prevent drips from clinging to the tip. The flared collar skirt captures any residual sample running down the probe's length, ensuring cleanliness as it moves across other sample vials. The pointed cone-tip helps guide the probe into vial openings under minor misalignment, reducing the risk of crushed tip or damaged probe.

The probe features **interchangeable UniFit™ sample lines** (3000 mm) made from PTFE available in multiple internal diameters (0.3, 0.5, 0.75 and 1.0 mm). Designed to seamlessly integrate with the world's leading autosampler brands, it minimizes downtime, reduces re-analysis, and improves overall analytical accuracy.



Guardian™ Autosampler Probe — Ceramic tip detail inset

Application	ICP-OES and ICP-MS
Materials	Ceramic, PEEK, PTFE (fully inert)
Sample Line Length	3000 mm (UniFit™)
Available IDS	0.3 mm, 0.5 mm, 0.75 mm, 1.0 mm
Sample Types	Aqueous solutions, oils, viscous samples, organic matrices, and HF

Key Features of the Guardian™ Autosampler Probe

Proprietary Mechanical Finish

Improves wetting characteristics ensuring consistent and reproducible sample uptake with every analysis cycle.

Robust Cone-Shaped Ceramic Tip

The specially engineered ceramic cone tip resists crushing and damage from arm misalignment, ensuring long-term durability and reliable performance.

Drip-Resistant Design

Minimizes cross-contamination and sample carryover, particularly critical when working with oils, high-viscosity matrices, or high-throughput switching valves.

Integrated Inbuilt Particle Filtering

The unique ceramic filter built directly into the probe tip prevents particulates from entering capillary tubing, nebulizers, and high-throughput switching valves.

Optimised Ceramic Filter Tip

Carefully engineered to maintain optimal fluid flow while simultaneously filtering particles and resisting dripping.

Fully Inert Construction (Ceramic, PEEK, PTFE)

Every component in contact with your sample is manufactured from chemically inert materials, providing outstanding resistance to strong acids and organic solvents.

Interchangeable UniFit™ Sample Lines

3000 mm lines available in four internal diameters — 0.3, 0.5, 0.75, and 1.0 mm — color-coded for easy identification and optimization for different applications. For use with a high-throughput OEM valve system, use 1.0 mm. For most common ICP-OES applications, choose 0.75 mm, and for most common ICP-MS applications, choose 0.5 mm. For sample flow rates of 0.2 mL/min or lower, 0.3 mm is ideal.

With standard PTFE encapsulated probes, the capillary tubing is permanently attached to the probe. The Guardian design and UniFit Sample Line provide simple, tool-free, and low-cost replacement in seconds.

[Click here to visit the Guardian Autosampler Probe landing page.](#)

The Guardian™ Probe delivers measurable, tangible benefits across a wide range of laboratory workflows:

Reduced Re-Analysis Time	Dripping between samples, a common cause of failed calibration curves, and QC samples is eliminated. Laboratories report reclaiming hours of previously lost instrument time each week.
Fewer Nebulizer Failures	By intercepting particulates before they reach the nebulizer, the Guardian Probe extends service life and significantly reduces unplanned maintenance.
Fewer Switching Valve Replacements	By intercepting particulates before they reach the switching valve, the Guardian Probe helps extend valve service life and significantly reduces unplanned maintenance. When particulates enter the valve, the repeated back-and-forth rotation of the valve can cause particles to score the internal surfaces of the flow path. Over time, this can lead to leakage, cross-contamination and carryover problems.
Enhanced Robustness Across Sample Types	From dilute aqueous standards to viscous semi-refined oil matrices, the Guardian Probe performs consistently across all sample campaigns.
Improved Data Integrity	By preventing cross-contamination and carryover, the Guardian Probe safeguards the integrity of every data point.
Easy Integration	Designed as a direct drop-in replacement on the most popular autosampler platforms, no modifications, no special tools, no downtime for installation.
Lower Total Cost of Ownership	Fewer nebulizer replacements, less re-analysis, and reduced downtime translate directly to lower operating costs and higher laboratory throughput.

The Guardian™ Probe has been independently tested against standard PTFE-encapsulated carbon fibre probes across two key application types. In every case, the Guardian Probe demonstrated superior performance.

Aqueous Applications

A 2% HNO₃ solution with added dye tracer was used to visualise wetting and drip behaviour. The Guardian Probe demonstrated **uniform wetting**, and **zero dripping** between sample wells.

- No visible droplet formation on the ceramic tip between samples.
- Consistent, repeatable sample uptake with each aspiration cycle.
- Contamination risk reduced to near-zero in back-to-back high/low concentration sequences.



[Click here to view video demonstration.](#)

Oil & High-Viscosity Applications

For laboratories running used oil analysis, lubricant testing, or organic matrix digests, the Guardian Probe's drip-resistant ceramic tip prevents viscous fluids from clinging and dripping between vials.

- No residual oil transfer between sample vials.
- Particulate matter in used-oil matrices is restricted from entering the sample flow path by the integrated filter.
- Nebulizer remained blockage-free across extended analytical runs.
- Significant reduction in flush time between high-matrix and low-matrix samples.



[Click here to view video demonstration.](#)

Nebulizer Compatibility & Selection Guide

Application / Matrix	Recommended Nebulizer(s)	Notes
Aqueous — No HF	SeaSpray, MicroMist	High-efficiency nebulization for standard aqueous matrices.
Solutions Containing HF	OpalMist, DuraMist	Fully inert construction for corrosive acid matrices.
Organic Solvents / Oils	Slurry	Wide-bore concentric, ideal for slurries and samples with undissolved particulates.
High Matrix / Viscous	MicroMist, SeaSpray (high-flow)	Combine with Guardian In-Line Filters for maximum protection.

When performing self-aspiration, the Guardian™ probe can be paired with the Nexus™ Universal Connection Kit to create a high-pressure direct connection to a Glass Expansion nebulizer for the most stable sample uptake and delivery, while preventing blockages and cross-contamination.

Nexus™ Universal Nebulizer Connection Kit

Nexus Universal Nebulizer Connection Kit (Suitable for DuraMist & OpalMist nebulizers)

[FT-16-8-X](#)

Nexus Universal Nebulizer Connection Kit (Suitable for all glass & quartz UniFit concentric nebulizers)

[FT-16-8](#)



Nexus Universal Nebulizer Connection Kit

[Click here to view the Nexus Universal Nebulizer Connection Kit landing page.](#)

For the complete nebulizer selection guide refer to the [Glass Expansion Nebulizer Resource Guide](#).

Compatible Autosampler Platforms

Manufacturer	Compatible Models
Teledyne Cetac®	ASX-112FR, ASX-200, ASX-500, ASX-800 Series, ASX-7400, ASX-7600 Series
Agilent®	SPS3, SPS4, SPS6
PerkinElmer®	S20, S10, AS93
Shimadzu®	AS-20 (with Arm Assembly), AS-10
Thermo Fisher Scientific™	iSC-65
Brooks (Aim Lab)	AIM3200, 3300, 3600, and 4000
Elemental Scientific®	ESI SC-DX Series

The Guardian™ Probe is available in dedicated configurations for each supported autosampler platform. The following sections are organized by autosampler manufacturer and where applicable, an OEM cross-reference part number is provided as a compatibility reference.

With the Guardian probe, you have the option to purchase the complete Guardian probe with a 0.75mm ID UniFit™ probe connecting line included as the default configuration. You may also purchase the Guardian Probe Assembly “Probe Only” and UniFit™ connecting lines separately. This allows you to choose your desired ID connecting line best suited for your application and setup. All UniFit™ probe connecting lines are supplied in a 3,000 mm length that should be trimmed to your required length.

The UniFit™ probe connecting lines are available in 1.0, 0.75, 0.50 and 0.30 mm ID, each color-coded for easy ID identification:

- For use with high-throughput OEM valve system (high uptake rates), use 1.0mm.
- For most common ICP-OES applications, choose 0.75mm.
- For most common ICP-MS applications, choose 0.50mm.
- For sample flow rates of 0.2mL/min or lower, 0.3mm is ideal.

We also have dedicated connection options to make it easier for you to connect the UniFit™ probe connecting line directly to your peristaltic pump tubing or a high throughput switching valve. If you are connecting the UniFit™ probe connecting line directly to a high-throughput switch valve we recommend using our Ratchet Connector ([70-803-1350](#)) and 1/16 ferrule ([70-803-0749](#)). Although not required, for easier connection to peristaltic pump tubing, you can combine our Barb Connector ([70-803-1859](#)) with [70-803-1350](#) and [70-803-0749](#). The barb connector is made from PEEK and is more rigid than capillary tubing, which prevents crimping and makes it easier to connect to small-bore peristaltic pump tubing. Glass Expansion also recommends the use of ProLok™ Contour Flared End pump tubing for this purpose. It can often be quite difficult to insert the sample tube into the peristaltic pump tube. This is particularly so if the peristaltic pump tube has a small internal diameter (ID).

UniFit™ Probe Connecting Line Color Reference



Green | 1.0 mm ID
[P/N 70-803-1721](#)



Red | 0.75 mm ID
[P/N 70-803-1714](#)



Blue | 0.5 mm ID
[P/N 70-803-1852](#)



Black | 0.3 mm ID
[P/N 70-803-1853](#)

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)

Optional Fittings



[P/N 70-803-0749](#)



[P/N 70-803-1350](#)



[P/N 70-803-1859](#)

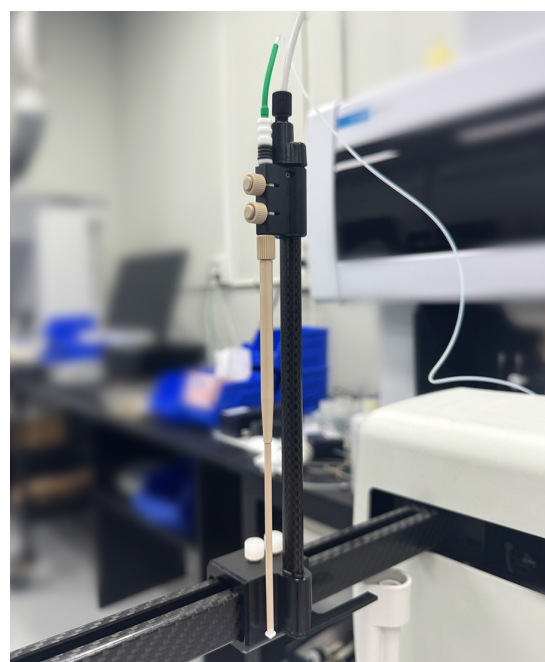
GE Part Number	Description
70-803-0749	Ferrule 1/16 (PKT 10)
70-803-1350	Ratchet Connector
70-803-1859	Barb Connector 1/4-28 F to 1/8

ASX-200, ASX-500 & ASX-800 Series



P/N 70-803-1803 — Guardian Probe + Red Connecting Line (0.75 mm)

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)



P/N 70-803-1787 and 70-803-1721 installed on Teledyne Cetac® Autosampler

GE Part Number	Description
70-803-1803	Guardian Probe + Red Connecting Line (0.75 mm) —ASX-200/500/800
70-803-1787	Guardian Probe Assembly Only — ASX-200/500/800

OEM Cross-Ref P/N	Order GE Part Numbers
SP6013N or SP6013C	70-803-1787 and 70-803-1721
SP5796N or SP5796C	70-803-1803
SP5800N or SP5800C	70-803-1787 and 70-803-1852
SP5799C	70-803-1787 and 70-803-1853

ASX-7400 & ASX-7600 Series



P/N 70-803-2940 — Guardian Probe + Red Connecting Line (0.75 mm)

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)

GE Part Number	Description
70-803-2940	Guardian Probe Cetac ASX-7400, 7600 Series, 0.75mm
70-803-2937	Guardian Probe Assembly for Cetac ASX-7400, 7600 Series

OEM Cross-Ref P/N	Order GE Part Numbers
SP6013C	70-803-2937 and 70-803-1721
SP5796C	70-803-2940
SP5800C	70-803-2937 and 70-803-1852
SP7604	70-803-2937 and 70-803-1852 and 70-803-1721

ASX-112FR



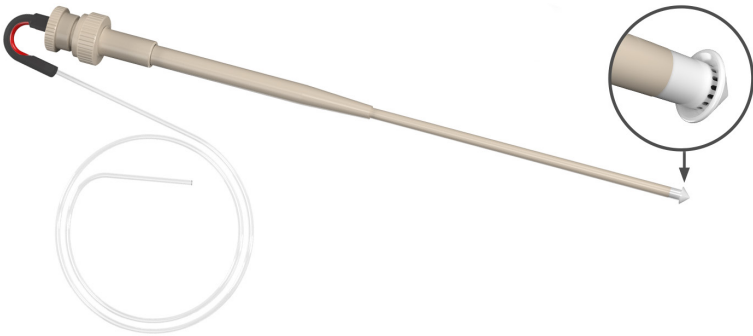
P/N 70-803-2029 — Guardian Probe Assembly for Cetac ASX-112FR

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)
70-803-2030	Probe Connecting Line 0.25mm ID (Black)
70-803-2085	Probe Connecting Line 0.18mm ID with EzyFit (Green/Black)

GE Part Number	Description
70-803-2029	Guardian Probe Assembly for Cetac ASX-112FR

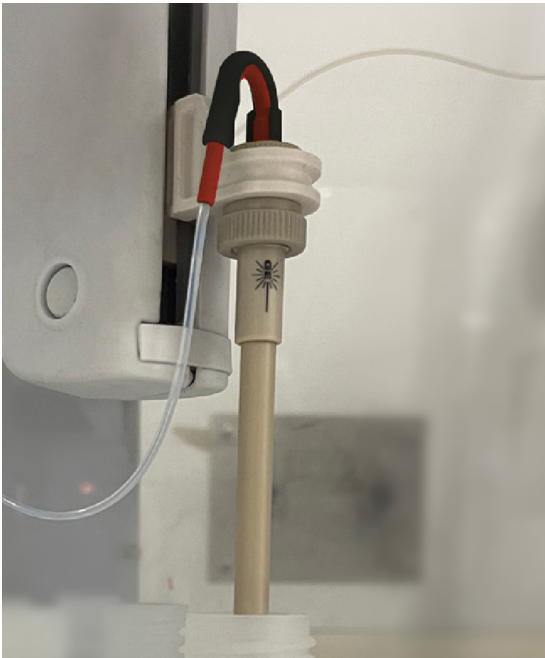
OEM Cross-Ref P/N	Order GE Part Numbers
SP6329	70-803-2029 and 70-803-1721
SP6397	70-803-2029 and 70-803-1852
SP6328	70-803-2029 and 70-803-1853

SPS3, SPS4 & SPS6

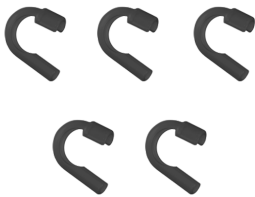


P/N 70-803-1957 — Guardian Probe + Red Connecting Line (0.75 mm)

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)



P/N 70-803-2008 installed on Agilent® SPS4 Autosampler



A single sample tube former is included with [70-803-1957](#) and [70-803-2008](#). Replacements can be purchased as [70-803-2869](#), sold in PKT 5. The Sample Tube Former helps maintain the shape and proper positioning of the probe's connecting line, preventing kinking and interference with the probe arm's movement.

P/N 70-803-2869

GE Part Number	Description
70-803-1957	Guardian Probe for Agilent SPS3, SPS4, SPS6, & AIMS, 0.75mm
70-803-2008	Guardian Probe Assembly for Agilent SPS3, SPS4, SPS6, & AIMS

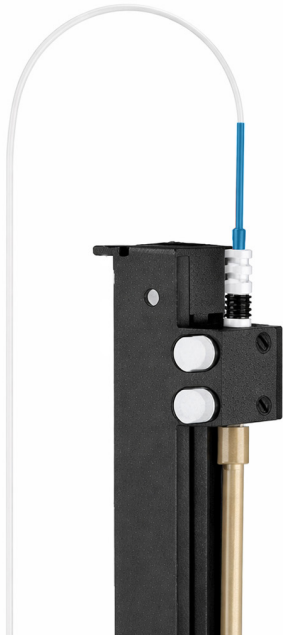
OEM Cross-Ref P/N	Order GE Part Numbers
G8410-80103 or G8009-64803	70-803-2008 and 70-803-1721
G8410-80102 or G8009-64802	70-803-1957
G8410-80101 or G8009-64801	70-803-2008 and 70-803-1852
G8410-80100 or G8009-64800	70-803-2008 and 70-803-1853

S20 Series



P/N 70-803-2097 — Guardian Probe + Red Connecting Line (0.75 mm)

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)



P/N 70-803-2754 installed on PerkinElmer® S23 Autosampler

GE Part Number	Description
70-803-2097	Guardian Probe for PerkinElmer S20 Series, 0.75mm
70-803-2754	Guardian Probe Assembly for PerkinElmer S20 Series

OEM Cross-Ref P/N	Order GE Part Numbers
N0811956	70-803-2754 and 70-803-1721
N0811953	70-803-2097
N0777547	70-803-2754 and 70-803-1852
N0771529	70-803-2097

S10 Series



P/N 70-803-2851 — Guardian Probe + Red Connecting Line (0.75 mm)

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)



P/N 70-803-2849 installed on PerkinElmer® S10 Autosampler

GE Part Number	Description
70-803-2851	Guardian Probe for PerkinElmer S10, 0.75mm
70-803-2849	Guardian Probe Assembly for PerkinElmer S10

OEM Cross-Ref P/N	Order GE Part Numbers
N8152935	70-803-2851 and 70-803-1350 and 70-803-0749
B3001769	70-803-2849 and 70-803-1721
B3001770	70-803-2849 and 70-803-1852

AS93



P/N 70-803-2836 — Guardian Probe + Red Connecting Line (0.75 mm)

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)

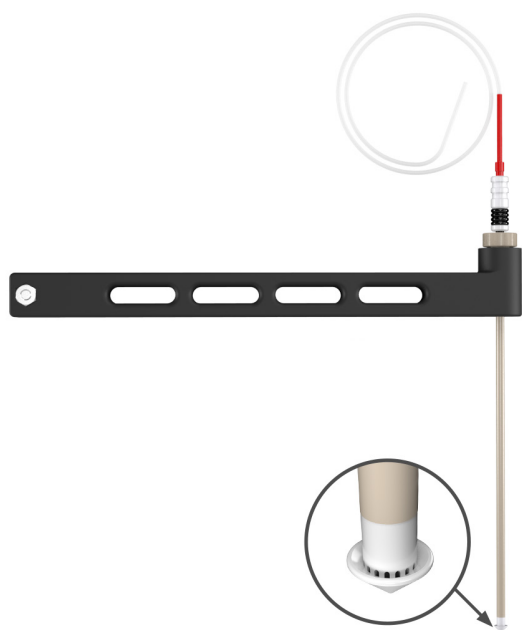


P/N 70-803-2819 installed on PerkinElmer® AS93 Autosampler

GE Part Number	Description
70-803-2836	Guardian Probe for PerkinElmer AS93, 0.75mm
70-803-2819	Guardian Probe Assembly for PerkinElmer AS93

OEM Cross-Ref P/N	Order GE Part Numbers
B3001769	70-803-2819 and 70-803-1721
B3001770	70-803-2819 and 70-803-1852

AS-20 & AS-10



P/N 70-803-2872 — Guardian Probe for Shimadzu® AS-20 & AS-10 with Arm Assembly, 0.75mm



P/N 70-803-2872 installed on Shimadzu® AS-20 Autosampler

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)
70-803-2874	Guardian Probe AS-10, AS-20 Arm
70-803-2796	Socket Head Screw, M4 X 12 (PKT 2), & Allen Key

GE Part Number	Description
70-803-2872	Guardian Probe for Shimadzu AS-10 & AS-20 with Arm Assembly, 0.75mm
70-803-2860	Guardian Probe Assembly for Shimadzu AS-10 & AS-20

OEM Cross-Ref P/N	Order GE Part Numbers
211-97461-41	70-803-2872
206-50290-91	70-803-2872

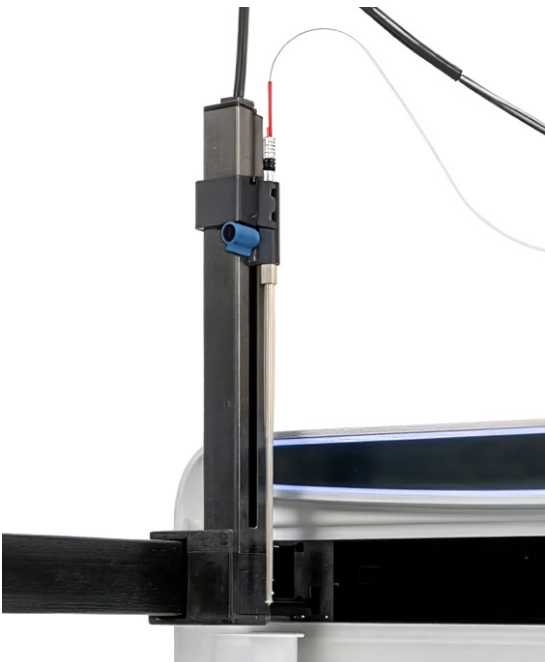
The arm assembly ([70-803-2874](#)) and socket head screw ([70-803-2796](#)) are included with [70-803-2872](#). If ordering [70-803-2860](#), in addition to a suitable probe connecting line, [70-803-2874](#) and [70-803-2796](#) are required for installation.

iSC-65 Series



P/N 70-803-2106 — Guardian Probe + Red Connecting Line (0.75 mm)

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)

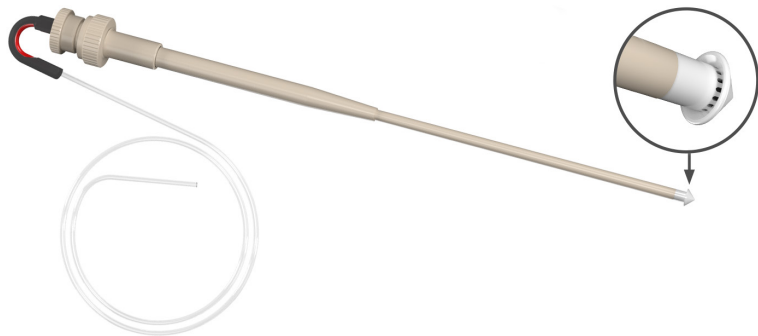


P/N 70-803-2837 installed on Thermo Scientific® iSC-65 Autosampler

GE Part Number	Description
70-803-2106	Guardian Probe for Thermo iSC-65, 0.75mm
70-803-2837	Guardian Probe Assembly for Thermo iSC-65

OEM Cross-Ref P/N	Order GE Part Numbers
BRE0030314	70-803-2837 and 70-803-1721
BRE0030313	70-803-2106
BRE0030312	70-803-2837 and 70-803-1852
BRE0030311	70-803-2837 and 70-803-1853

AIM-3200, 3300, 3600 and 4000

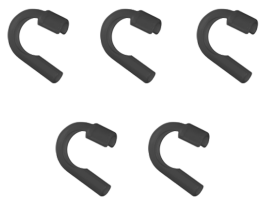


P/N 70-803-1957 — Guardian Probe + Red Connecting Line (0.75 mm)



P/N 70-803-2008 installed

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)



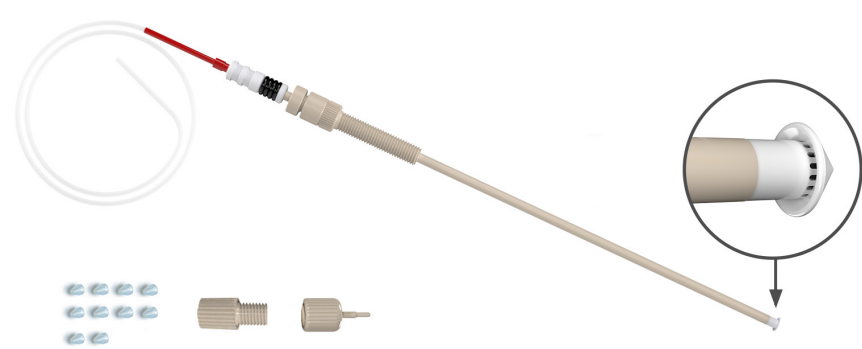
A single sample tube former is included with [70-803-1957](#) and [70-803-2008](#). Replacements can be purchased as [70-803-2869](#), sold in PKT 5. The Sample Tube Former helps maintain the shape and proper positioning of the probe's connecting line, preventing kinking and interference with the probe arm's movement.

P/N 70-803-2869

GE Part Number	Description
70-803-1957	Guardian Probe for Agilent SPS3, SPS4, SPS6, & AIM Series, 0.75mm
70-803-2008	Guardian Probe Assembly for Agilent SPS3, SPS4, SPS6, & AIM Series

OEM Cross-Ref P/N	Order GE Part Numbers
P-U-A208	70-803-1957

ESI SC-DX Series



P/N 70-803-2953 — Guardian Probe + Red Connecting Line (0.75 mm)



P/N 70-803-2953 installed on ESI® SC-DX Autosampler

GE Part Number	Description
70-803-1721	Probe Connecting Line — 1.0 mm ID (Green)
70-803-1714	Probe Connecting Line — 0.75 mm ID (Red)
70-803-1852	Probe Connecting Line — 0.5 mm ID (Blue)
70-803-1853	Probe Connecting Line — 0.3 mm ID (Black)

GE Part Number	Description
70-803-2953	Guardian Probe for ESI SC-DX Series, 0.75mm
70-803-2961	Guardian Probe Assembly for ESI SC-DX Series

OEM Cross-Reference (1.0, 0.8, and 0.5mm ID)	Order GE Part Numbers
PPDX2-10-130, PPDX2-10-150, N8151113	70-803-2961, 70-803-1721, 70-803-1350, 70-803-1859, and 70-803-0749
PPDX2-08-130, PPDX2-08-180	70-803-2953
PPDX2-05-130, PPDX2-05-180	70-803-2961, 70-803-1852, 70-803-1350, 70-803-1859, and 70-803-0749

Proper care of the Guardian™ Probe ensures long service life and consistent analytical performance. Follow the procedures below after each use and as part of your routine instrument maintenance schedule.

Daily Care

- Always start and end your analysis with an appropriate rinse solution for 5 to 10 minutes, followed by thoroughly rinsing with deionised water for an additional 5 to 10 minutes.
- Inspect the ceramic tip visually for cracks, chips, or deposits.

Recommended Cleaning Procedure - Guardian Probe Tip

- Step 1:** Disconnect the Probe Connecting Line from the Guardian Probe.
- Step 2:** Place the Guardian Probe into a zip-lock bag filled with the bath solution and seal the bag securely. Then place the sealed bag into the ultrasonic bath for cleaning.
- Step 3:** Clean in the ultrasonic bath for 5 minutes.
- Step 4:** Remove the probe and rinse thoroughly with DI water.
- Step 5:** Avoid harsh abrasive materials or brushes that could damage the proprietary mechanical finish on the ceramic tip.

Complementary Products for Extended Protection

Guardian In-Line Particle Filters	Provides a second layer of particle protection before the sample reaches the nebulizer. Strongly recommended for high-particulate matrices.
Elegra Argon Humidifier	Reduces solvent vapour load entering the plasma, extending torch and injector service life.
Eluo Nebulizer Cleaning Tool	Precision-engineered for safe, effective maintenance of all Glass Expansion nebulizer types without risk of capillary damage.
Magnifier Inspection Tool	10X Magnification Tool to regularly inspect your nebulizer tip, capillary tubing, and ICP-MS interface cones for wear and tear.

Troubleshooting Guide for Guardian Probe

Symptom/Issue:	Air bubbles in uptake line
Potential cause (s):	Poor connection of the UniFit probe connecting line to the Guardian Probe assembly. The UniFit probe connecting line could be crimped or pinched. The connection of the UniFit probe connecting line to the peristaltic pump tubing could be loose. The autosampler rinse station could be empty.
Corrective action (s):	Ensure that the UniFit probe connecting line is fully seated onto the Guardian Probe assembly. Check the entire length of the UniFit probe capillary tubing for kinks. For easier insertion into peristaltic pump tubing use ProLok flared-end tubing or the barb connector, 70-803-1859 , listed on page 8. Ensure that your autosampler rinse station is properly filling at an adequate speed to ensure it can keep up with your rinsing rate.

Symptom/Issue:	Sample flow is cavitating
Potential cause (s):	The ID of the UniFit probe connecting line is either too small or the length of capillary tubing is too long. The peristaltic pump RPM or vacuum pump is set too high.
Corrective action (s):	A range of UniFit probe connecting line IDs are available, if you are using a Fast valve with a vacuum pump, it is recommended that a 1.0 mm ID is used due to the high uptake rates used. For setups without a Fast system, 0.75mm ID is most commonly used for ICP-OES and 0.5mm ID is most commonly used for ICP-MS. The UniFit probe connecting lines are all 3,000 mm in length, they are meant to be cut to the shortest length allowable. If cavitation continues, the uptake speed will need to be lowered.

Symptom/Issue:	Carryover or high blank readings
Potential cause (s):	If the carryover or high blank has been isolated to the probe, the autosampler rinse station could be contaminated or the Guardian Probe assembly or UniFit probe connecting line is dirty.
Corrective action (s):	Try making a fresh rinse solution and by-pass the autosampler rinse station by directly analyzing the fresh rinse solution. If the background issue goes away, this confirms a contamination in the rinse station or rinse container. The Guardian probe can be cleaned by reverse pumping a cleaning solution such as a dilute acid or laboratory cleaning reagent like Fluka RBS-25 (available from Sigma Aldrich). When reverse pumping, removing the Guardian Probe from the autosampler and place it in a container to collect the cleaning solution. The Guardian Probe connecting line can also be replaced.

Troubleshooting Guide for Guardian Probe

Symptom/Issue:	Backflow or air bubbles in sample tube
Potential cause (s):	Blockage or partial blockage
Corrective action (s):	The Guardian probe can be cleaned by reverse pumping a cleaning solution such as a dilute acid or laboratory cleaning reagent like Fluka RBS-25 (available from Sigma Aldrich). When reverse pumping, removing the Guardian Probe from the autosampler and place it in a container to collect the cleaning solution. The Guardian Probe connecting line can also be replaced. The nebulizer may also need to be cleaned, refer to your nebulizer manufacturer for the recommended care and cleaning procedure.

Symptom/Issue:	Can't install on Cetac ASX-500 and 520 Series Autosampler
Potential cause (s):	Guardian Probe tip won't fit through guide plate opening
Corrective action (s):	The guide plate is not necessary with the Guardian Probe. It can be removed using the set screw underneath the Z-Axis Drive Assembly.

Symptom/Issue:	Since installing the Guardian Probe my rinse time has increased
Potential cause (s):	UniFit Connector may not be fully seated on top of probe, and/or the length of the sample path may have increased.
Corrective action (s):	Ensure the UniFit connector is fully seated on the top of the probe to eliminate any dead-volume. Always keep the sample path from the tip of the probe to the nebulizer as short as possible, but ensure there is enough slack for the autosampler to move to its farthest positions.

Symptom/Issue:	My sample uptake time has increased
Potential cause (s):	The ID or length of the Guardian Probe UniFit Connecting Line might not match your existing OEM probe.
Corrective action (s):	Ensure that the ID of your existing OEM probe matches the ID and length of the Guardian Probe UniFit connecting line. The Guardian Probe UniFit connecting lines are available in 1.0mm (Green), 0.75mm (Red), 0.5mm (Blue), and 0.3mm (Black). Refer to page 8. To further reduce sample uptake delay times, position the autosampler as close as possible to the instrument and cut the UniFit sample line to the shortest allowable length without restricting probe movement.

Troubleshooting Guide for Guardian Probe

Symptom/Issue:	I've reverse pumped the Guardian Probe but it still seems to be the source of contamination or elevated background
Potential cause (s):	Cleaning solutions or the reverse pumping technique may not be enough to thoroughly clean the probe.
Corrective action (s):	Consider what cleaning solutions were tried with reverse pumping. If these cleaners don't match your matrix, they may be insufficient cleaners. Ultrasonic baths can also be used to more thoroughly clean the probe assembly. Start by removing the UniFit connector and placing the Guardian Probe into a zip-lock bag filled with a cleaning solution and seal the bag securely. Then place the sealed bag into the ultrasonic bath for 5 minutes. It is best to use a series of cleaning solutions. For aqueous based analyses start with a 2% detergent (e.g., Citranox, Liquinox), then move to an acid solution (match rinse solution or stronger if needed), and additionally Deionized water. After a thorough rinse with DI water the probe is ready for use. If performing organic based analyses using the sample solvent and rinse solution for 5 minutes each should help clean the Guardian Probe more thoroughly. One last thing to check is the rinse station for any phthalates that could have leached out of old rinse solution supply lines to the rinse station. Phthalates are yellowish oily compounds that can leach out of some tubing over time that create a "sticky" surface and can cause washout issues. Under magnification, inspect capillary tubing from the probe and rinse station uptake tubing for yellowish oily droplets adhering to the inner walls. If you suspect this is the cause, it's time to carefully clean your entire sample introduction system and autosampler rinse station to eliminate these contaminated tubing and components. If these steps don't help, it might just be time to order a new probe.

Symptom/Issue:	The tip of the Guardian Probe is too large to fit through my autosampler probe holder
Potential cause (s):	For most autosampler models, the Guardian Probe should be installed from the bottom of the probe holder.
Corrective action (s):	Refer to the INS document that was included with your Guardian Probe for a detailed step-by-step installation guide. If you do not have a copy of the INS document, contact your regional Glass Expansion office for a copy.

Symptom/Issue:	Incorrect probe depth
Potential cause (s):	You may need to physically adjust the depth of the Guardian Probe.
Corrective action (s):	Refer to the INS document that was included with your Guardian Probe, as the probe depth can be physically adjusted on most Guardian Probe models. There are detailed step-by-step instructions on how to properly adjust the Guardian Probe depth. Before you start adjusting the desired probe depth, note the black circle on the inner body of the probe above the nut. That black circle indicates the default depth of the probe.

The Guardian™ Probe is trusted by leading laboratories around the world. Here is what our customers have to say:

"Overall, the Guardian Probe has been the perfect selection for our applications using ICP-OES. We normally run an organic matrix (1:9 dilutions of semi-refined corn oil samples in kerosene), and the OEMt probe we were using previously had excessive issues with dripping between samples in their SPS4 autosampler system. The Guardian Probe has not had any dripping or leaking issues since its installation, and we are still using the same one we ordered in August. Not only has the probe exceeded performance expectations; it is marginally cheaper than the lesser-performing competition. The time we would spend re-analyzing samples and calibration curves due to dripping has been reclaimed, thanks to the probe."

— ★★★★★ Contract Laboratory — USA

"I've tested the Guardian Probe and I am more than happy. It is easily installed, easily pushed out of its position if it hits a surface, and it reliably falls back into position when the autosampler arm is moved upwards again. Instrument tuning and validation passes as expected when using the probe."

— ★★★★★ ICP Manufacturer — Europe

"We have been utilising the Guardian Probe in our operations for more than six months, and it is with pleasure that we report its remarkable performance. The probe has demonstrated robustness and reliability in handling various sample types. Notably, it remains unclogged even during the analysis of samples containing particulates. To further safeguard the integrity of our nebulizers, we have adopted the use of Guardian In-Line Particle Filters. As a result, we have fewer nebulizer failures compared to previous experiences."

— ★★★★★ Contract Laboratory — Australia

"We are absolutely in love with this probe. The filter in the tip works perfectly."

— ★★★★★ Environmental Laboratory — Denmark



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