



**ENTECH**  
INSTRUMENTS

*See What's Really There™*



# 2022 CATALOG

Solutions for Chemical Monitoring & Analysis

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## President's Letter



Entech Instruments is continuing its tradition of providing the most advanced and accurate sample preparations systems available for headspace and gas sample analysis by GC and GCMS. Our new Multi-Capillary Column Trapping Systems (MCCTS) are transforming the way that gas phase sample preconcentration is performed prior to GC injection, all without the use of liquid nitrogen or even electronic cooling systems. These "fan cooled", extremely robust and reliable multi-stage capillary column traps manage water and CO<sub>2</sub> hundreds of times better than any packed trap system. This means much faster release for better chromatography, supporting "faster" GC methods, while also demonstrating far better immunity to contamination when exposed to high concentration

samples. Our MCCTS traps have been implemented in a full cryogen free TO15 solution with much faster GC injections and shorter run times than other TO15 systems on the market. Other applications using this revolutionary capillary trapping technology will also soon be announced.

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Entech's patent pending Sorbent Pen™ technology takes SPME to the next level by providing enhanced sensitivity, improved quantitation, and greater robustness than its fiber-based predecessor. Sorbent Pens utilize a unique flow through cartridge that forms a seal on a vial allowing a vacuum to be created within the vial. This new technique called VASE (Vacuum Assisted Sorbent Extraction) has been demonstrated to cover the entire range of analytes from the lightest volatile compounds (Freon 12/Vinyl Chloride and others) to very heavy 5-6 ring PAH compounds, while remaining in the headspace to avoid actual contact with the sample matrix. With 50-150x higher phase loading and the use of traditional adsorbents with thousands of times more surface area than SPME, the Sorbent Pen™ can fully extract difficult compounds from complex matrices providing superior sensitivity and reproducibility. Sorbent Pens are also available for performing Diffusive and Active air monitoring, making the Sorbent Pen technique extremely versatile. Our newly released SPR40 -Sample Preparation Rail promises to be a game changer for headspace sample preparation and general thermal desorption methods. Rather than desorbing a TD tube into a completely different instrument with separate traps, transfer lines, and rotary valves to have to clean and maintain, the SPR40 allows thermal desorption of Sorbent Pens directly into a GC or GCMS to allow dramatically improved recovery, consistency, and easy of maintenance. Watch for a new wave of applications coming out in 2019-2020 using the SPR40 Robotic inlet.

Our unmatched Silonite™ surface coatings continue to be perfected, resulting in the most consistent, durable, and inert coatings available for GC inlet systems and for mercury vapor handling without surface interactions. Silonite™ surface treatments play a vital role in achieving our ultimate goal; to provide our customers with complete solutions for "analytical grade" VOC and SVOC handling and inlet systems that can sample, store, and recover virtually all GCMS compatible compounds.

Finally, for US EPA Method TO-15 and China HJ-759, Entech is proud to be the only supplier that manufacturers and supports the complete solution for sampling and analysis of airborne contaminants using Silonite™ coated stainless steel canisters. Entech has assembled an extraordinary and talented team of Chemists and Service Engineers with a combined knowledge of over 200 years of laboratory and field experience – to provide our clients with premier customer service and on-site support. To our valued customers we would like to say thank you for your patronage through the years and we look forward to servicing your analytical needs for many years to come.

Sincerely,  
Daniel B. Cardin – President



Entech Instruments is a leading developer and manufacturer of analytical instrumentation that supports professionals around the world in the Environmental, Industrial Hygiene, Food & Beverage, Product Testing, Forensics, and Clinical Analysis markets.

To provide solutions for such a diverse set of industry applications, Entech has assembled an extraordinary and talented team – a combined knowledge of over 200 years of laboratory and field experience – to provide our clients with premier customer service and on-site support. We invite you to share your application challenges and requirements so we can create a customized solution just for you.

~ The Entech Team



4700 Precision Diluter

## 4700 Precision Diluter

The most precise, flexible, and efficient standard preparation system on the market.

The 6 Channel 4700 Precision Diluter represents the next generation in accurate canister standards preparation. Utilizing a combination of precise gas flow control, exact pressure measurements, and an ultra-inert flow path, the 4700 is capable of performing multistage dilutions for achieving standards ranging from part-per-billion to low part-per-trillion. The 4700 works with canisters and Bottle-Vacs™ to create dilutions up to 100x, and then allows a second dilution of up to another 100x to yield a total 2 step dilution of up to 10,000x. The 4700 uses precise pressure control, rather than mass flow controllers to meter in the standard. This approach has several advantages. First, very little of the standard mix is used in making a standard. This allows the original cylinder to last longer, keeping cylinder pressures higher where contents are more stable. Secondly, the mixing region required in a dynamic diluter is eliminated, substantially reducing surface area and carryover.

With the 4700, small 110L cylinders at 1PPM will allow over 15,000 6L canisters to be filled to atmospheric pressure with a 1PPB mixture by first making a 20PPB working standard that can be further diluted into each canister to be tested. This results in just pennies worth of standard being consumed when performing inertness testing of canisters every 1-2 years. By contrast, typical dynamic diluters that must balance flows and pressures can typically only fill 50–100 6L canisters per high concentration cylinder, making field canister inertness testing prohibitively expensive. Low pressure standards or even samples can be further diluted using inlet #6 which is conveniently located on the front of the 4700. Easily perform up to a 100x dilution into a 6L canister, or up to a 40x dilution into a Bottle-Vac™ to obtain working concentrations that are more acceptable to GCMS inlet systems.

### Features

#### 6 Channels Installed and Ready!

The 4700 comes standard with six channels. This enables dedicated internal standards, calibration standards, and serial dilution channels.

#### Performs Dilutions up to 10,000x!

The 4700 Precision Diluter can easily perform 1–100x dilutions (100 PPB to 1PPB), or dilutions up to 10,000x by using a dedicated channel on the front of the system for second stage dilution.

#### Dilutes High Concentrations

High concentration samples such as soil gas can be effortlessly diluted with the 4700.

#### Conserves Cylinder Standards

The 4700 conserves cylinder standards relative to dynamic blending.

#### Ideal for Challenge Standards

The 4700 can create 1PPB challenge standards for 6L canister inertness validation tests. (One 110L Cylinder at 1PPM can fill over 15,000 6L to 1PPB at 1atm)

#### Gravimetric Dilution Validation

An optional digital scale can be used to validate dilution ratios gravimetrically, thus eliminating any need for expensive annual sensor calibrations.

Description	Unit	Part #
<b>4700 Precision Diluter</b> (Includes 6 channels)	EA	4700
4700 Tablet Option	EA	4700-TSC
4-Position 110L Cylinder Holder	EA	40-44911

### Calibration Standards

Description	Unit	Part #
1 PPM TO-14a Standard (110L Cylinder, 1700psig)	EA	40-45010
1 PPM TO-15 Subset Standard (110L Cylinder, 1700psig)	EA	40-45110
1 PPM TO-15 Standard (110L Cylinder, 1700psig)	EA	40-45115
1 PPM 4 Component Internal Standard (110L Cylinder, 1700psig)	EA	40-45210
2–5 PPM Carbonyl Standard (800L Cylinder, 2000psig)	EA	40-45130
4-Position Cylinder Holder (for 102L Standard Cylinders)	EA	40-44911
High Purity Stainless Regulator w/ CGA180	EA	40-02001
Canister Regulator	EA	40-03000



## 4700 Precision Diluter – Operation

### Sample Pressurization

The 4700 uses pressure differentials rather than mass flow controllers to meter in the standard, which has several advantages. First, very little of the standard mix is used in making a dilution. This allows the original cylinder to last longer, keeping cylinder pressures higher where contents are more stable. This now makes it cost effective to create accurate standards into every field canister in a laboratory's inventory to check them for proper recovery once every 2 years.

Even small 110L cylinders at 1PPM will allow over 10,000 6L canisters to be filled to atmospheric pressure with a 1PPB mixture by first making a 20 PPB working standard that can be further diluted into each canister to be tested. This results in just pennies worth of standard being consumed during each inertness test.

By contrast, typical dynamic diluters that must balance flows and pressures can typically only fill 50–100 6L canisters per 102L cylinder, making field canister inertness testing prohibitively expensive. Secondly, now low pressure standards or even samples can be further diluted using inlet #6 which is conveniently located on the front of the 4700. Easily perform up to a 100x dilution into a 6L canister, or up to a 40x dilution into a Bottle-Vac™ to obtain the ideal working concentrations that are much more acceptable to GCMS inlet systems.

The 4700 can perform automated pressurizing of canister field samples to bring them to a positive pressure after receipt by the laboratory. A high accuracy sensor ( $\pm 0.3\%$ ) first measures the initial pressure, then fills the canister to a requested final pressure and calculates the dilution factor. A second operating mode allows dilution by a constant factor of 1.5, 2, or 3x. This conveniently eliminates the need to determine different dilution factors for each sample. Pressurizing samples with a surrogate-containing nitrogen cylinder can add further reliability to the results by validating the actual volume withdrawn from the sample canister during analysis.

### SmartLab™ II Control Interface

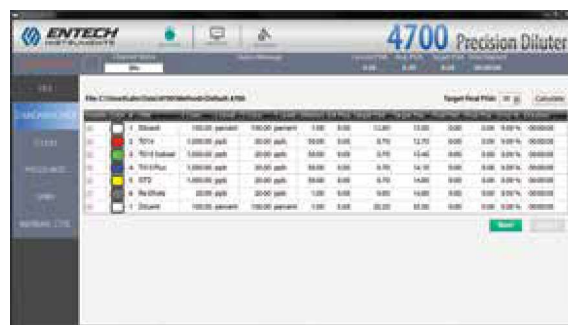
The 4700 is controlled using Entech's SmartLab™ II network. This software allows the defining and running of methods as well as the pressurizing of samples or standards prior to GCMS analysis. An easy to use graphical interface simplifies operation and accelerates user understanding of operation principles.

### Automatic Dilution Calculations

The automatic dilution calculation system, which is integrated throughout the Entech 4700's user interface, makes it very simple and intuitive to specify and describe target concentrations and final concentrations ranging from % and part-per-trillion.

Dilution values may be entered using any convenient unit of measure and all values are automatically converted to a common base within the Entech 4700 software.

**The 4700 Precision Diluter's feature rich software enables full control.**  
Intuitive user interface, Optional touch pad quick entry, Color coding, Status lights, Advanced reports, and much more!



### Cylinder Fittings

Description	Unit	Part #
1/8" x 4'L SC Tubing w/ SS Cap	EA	15-85231
SC MMQT-1/8" Comp Fitting- BLUE	EA	MQT-200L-BLUES
SC MMQT-1/8" Comp Fitting- GREEN	EA	MQT-200L-GREENS
SC MMQT-1/8" Comp Fitting- RED	EA	MQT-200L-REDS
SC MMQT-1/8" Comp Fitting- YELLOW	EA	MQT-200L-YELLS