APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

ISOKINETIC EQUIPMENT CATALOG

Website: www.apexinst.com
Contact: info@apexinst.com

919-557-7300 or 800-882-3214
Fax: 919-557-7110

Apex Instruments, Inc.
204 Technology Park Lane
Fuquay-Varina, N.C. 27526, U.S.A.

Your Solution for Source Sampling Equipment.

Welcome to Apex Instruments!

Dear Valued Customer,

Over the last 25 years it's been our mission to bring high quality equipment to the source testing industry at competitive prices.

This commitment has driven us to continually improve our products and develop solutions for our customers to compete in an ever changing regulatory landscape.

I'd like to take this opportunity to thank all our customers for their support and let you know that the entire Apex Instruments team looks forward to our continued partnership by providing innovative products and exceptional service for many years to come.

William H. Howe
President
Apex Instruments

Apex Instruments has been providing solutions for the source sampling industry for over 25 years. Our equipment is designed and manufactured by a team of experienced stack testers who understand your needs and as a result have developed our equipment to be versatile, user friendly and durable. Our diverse range of products include iso-kinetic, mercury, gas and flow sampling equipment, as well as a wide range of accessories, replacement parts and consumable goods. Our expert sales and production teams can also help design and fabricate any customized equipment you might need and our service department is always available to provide fast and friendly repair and calibration services as well as technical support.

Website: www.apexinst.com

Please visit our website for additional product information, new product releases, updated materials, manuals, reference data and valuable links.

APEX INSTRUMENTS, INC.

Apex Instruments is the innovation leader in the manufacture, design and distribution of source sampling equipment. Our equipment is designed in accordance with US EPA guidelines using only the highest quality materials and user friendly designs. We are located only a short drive from the US EPA in Research Triangle Park, North Carolina. If you happen to be in the greater Raleigh area, please stop by, take a tour and learn more about the products and services we offer.

TECHNICAL SERVICES

Our knowledgeable service staff includes skilled industry professionals, stack testers and chemists ready to help you with your technical service needs. From basic trouble shooting to full equipment overhauls and repairs our technical service team can help. Toll Free 877- 7263-919 or (919) 346-5754 e-mail: service@apexinst.com.

CALIBRATION SERVICES

Apex Instruments offers dedicated, climate controlled precision calibration services for a variety of measuring instruments to help keep all your equipment up to date and within US EPA calibration requirements. Please contact the service department or a sales representative for more details on our calibration services. Certification of calibration available upon request.

CUSTOM FABRICATION & ASSEMBLY

Have a need for specially designed source sampling equipment? Apex Instruments can help. We can design and build almost any custom equipment through our in-house engineering, welding and production departments. Contact our sales department to learn more about custom fabrication services.

MOBILE EMISSIONS LABORATORIES (TRAILERS & VANS)

Apex Instruments has a dedicated team of experienced trailer outfitters that build custom made solutions for our customers. With over 25 years of experience, our trailer team can design, build, and customize both trailers and vans to suit your particular needs. Please contact our sales staff at sales@apexinst.com to learn more about our mobile emissions laboratories fabrication services.

At Apex Instruments Our Number One Goal is Your Experience!

Ordering Options and Information

Order by phone: Call our friendly & knowledgable sales staff anytime to place an order at 800-882-3214 or 919-557-7300 Monday-Friday, 8:00 a.m. to 5:00 p.m. (Eastern Time).

Shop on-line: Submit a quote request online or send us an email and we will get back to you as soon as possible. www.apexinst.com.

Order by fax: 919-557-7110.

Payment Options: Apex Instruments, Inc. accepts Master-Card, VISA, American Express and wire transfers. Installment and credit plans are available upon approval.

Please feel free to contact our friendly sales staff today!

Sales Contacts:

Mick Zulpo
International Sales and Business Development
mzulpo@apexinst.com
919-346-5032

Ben Rogers
Domestic Sales and Business Development
ben@apexinst.com
919-346-5745

Doug Bernhardt
Sales & Customer Service
dbernhardt@apexinst.com
919-346-5027

Contact our Technical Services Group for Technical Support, Calibrations and Repairs at 877-726-3919 or 919-346-5754
email at: support@apexinst.com

Shipping Information

Same day shipping available on all instock items when your order is placed by 2:00 PM EST. Please allow extra time for custom orders. If you have questions about your shipment please email our shipping department at *shipping@apexinst.com*.

Date Published: 9/7/2018

ISOKINETIC SOURCE SAMPLING EQUIPMENT

VERSATILE SYSTEM FOR MULTIPLE METHODS

Apex Instruments Inc. offers an extensive line of equipment and supplies for sampling stationary source emissions for pollutants in accordance with US EPA Reference Methods. The majority of the methods are generally classified as either Isokinetic or Gaseous Sampling Methods. This section includes the Apex Instrument line of Isokinetic equipment and accessories. Isokinetic sampling requires the sample to be withdrawn from the gas stream at the same rate it is moving through the stack or duct.

Apex Isokinetic Source Sampler systems allow the operator to monitor gas velocities, temperatures, pressures and sample flow rates for maintaining isokinetic sampling conditions. The Isokinetic Source Sampler system is easily adapted to test for a wide range of pollutants from stationary sources, such as dust including particle size distributions, metals, polychlorinated biphenyls (PCBs), dioxins/furans, polycyclic aromatic hydrocarbons (PAHs) and an ever increasing group of pollutants tested for with adaptations of this basic isokinetic test method.

Our Isokinetic equipment is designed to be modular, where you choose your meter console, pump and components of choice to meet your particular needs.

The Apex Method 5 Isokinetic Sampler System provides a reliable and versatile foundation for performing most isokinetic testing methods. Contact our friendly, knowledgeable sales staff for assistance in selecting a system to meet your needs

Flexible Arrangement

Method 5 Sampling Train

Method Links

Isokinetic Methods

Method 5	EPA Link	Store
Method 5I	EPA Link	Store
Method 7C and 7D	EPA Link	Store
Method 8	EPA Link	Store
Conditional Test Method 13	EPA Link	Store
Method 17	EPA Link	Store
Method 23	EPA Link	Store
Method 26A	EPA Link	Store
Method 29	EPA Link	Store
Method 201A	EPA Link	Store
Method 202	EPA Link	Store
Method 0061	EPA Link	Store
Method ASTM D6784-02	EPA Link	Store

Flow Methods

Method 1	EPA Link	Store
Method 2	EPA Link	Store
Method 2G and 2F	EPA Link	Store

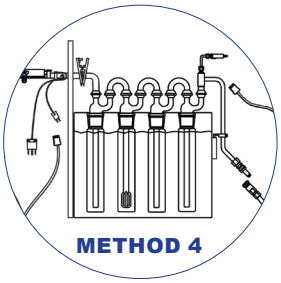
Mercury Methods

Method 30B	EPA Link	Store
Performance Specification 12B	EPA Link	Store

Gas Analysis Methods

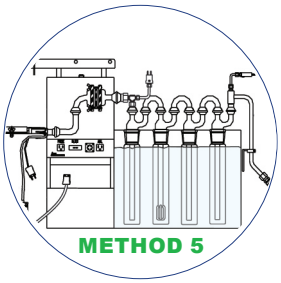
Method 3	EPA Link	Store
Method 4	EPA Link	Store
Method 6	EPA Link	Store
Method 7	EPA Link	Store
Method 18	EPA Link	Store
Method 26	EPA Link	Store
Method 0030	EPA Link	Store
Method 0031	EPA Link	Store
Method 0040	EPA Link	Store

METHOD SPECIFIC SAMPLING KITS



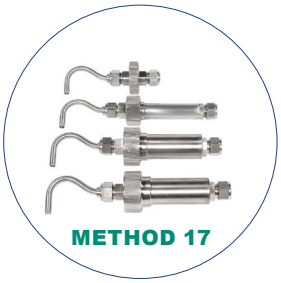
METHOD 4 (page 45)

Moisture Content - Method 4 Determination of the Moisture Content of Stack Gas Summary: Stack gas is extracted at constant rate (less than 21lpm) and a minimum volume of 600 liters. Water vapor is condensed from the sample stream, and measured volumetrically or gravimetrically. The Method 4 kit includes a probe, glassware, u-cord and parts to be able to build both the rigid and flexible arrangements.



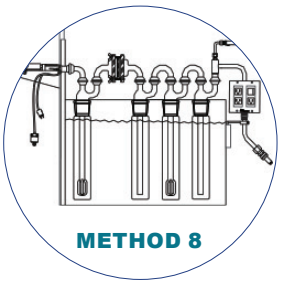
METHOD 5 (page 46-48)

Particulate Emissions from Stationary Sources - The professional source sampling company must be prepared for a wide variety of conditions and locations. Apex recommends the “Deluxe Plus” system, which can be used in both rigid and flexible configurations. Even with the classic rigid arrangement, the additional glassware allows you to have pre-measured and filled impingers, pre-weighed filter assemblies, and minimum turnaround time between runs.



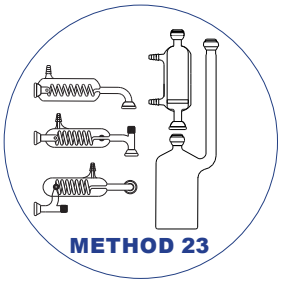
METHOD 17 (page 51)

Particulate Emissions by In-Stack Filtration - Add an in-stack filter assembly and longer pitot tip to a Method 5 system. The Apex Instruments Method 17 Sampling Kit is a convenient package for sampling particulate matter.



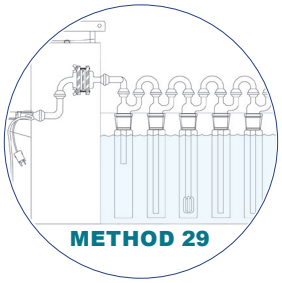
METHOD 8 (page 49)

Sulfuric Acid Mist - The Method 8 Sampling Kit is used with either the XC-522 or XC-572 Meter Console and an external sample pump for the determination of sulfuric acid mist and sulfur dioxide emissions from stationary sources. U.S. EPA Reference Method 8 was originally developed to test emissions from sulfuric acid plants but has been adapted to sample emissions from many sulfur dioxide sources.



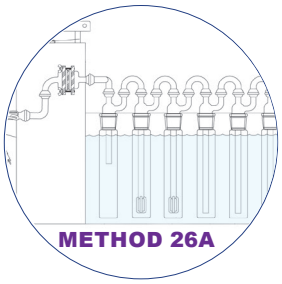
METHOD 23 (page 53)

Dioxins / Furans - The Apex Instruments Method 23 (Modified Method 5) Source Sampler Kit is used for determination of dioxins and furans (D/F’s) in accordance with Method 23 and/or Determination of Semi-Volatile Organic Compounds as M0010. This train adds a water-cooled glass condenser, an XAD adsorbent module, and a large capacity knockout impinger to the Method 5 system.



METHOD 29 (Multiple Metals) (page 55)

Metal Emissions - Add up to three impingers, the SB-4 impinger case, glass nozzles, probe liners and non-metallic union to a Method 5 train. The method has been validated for the collection of 17 different metals.

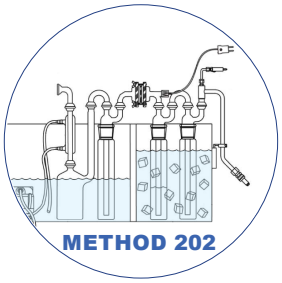


METHOD 26A (HCl) (page 54)

Hydrogen Halide & Halogen Emissions - the M26A kit adds impingers, reagents, and PTFE coated glass filters to a Method 5 train. The Apex Instruments Method 26A Sampling Train is used for determination of hydrogen halide and halogen emissions. Method 26A is the isokinetic alternative to Method 26. This method is particularly suited for sampling sources controlled by wet scrubbers emitting acid droplets.

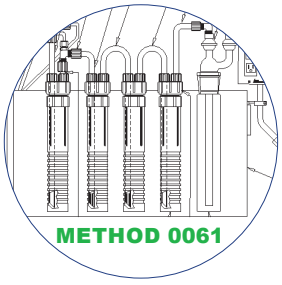
METHOD 201A (page 57-59)

Particle Sizing - Add cyclones to a Method 5 system. The purpose of Method 201A is to measure particulate matter emissions equal to or less than given nominal aerodynamic diameter(s). In general, a gas sample is extracted from a stationary combustion source at a predetermined constant flow rate through in-stack sizing devices. As amended, Method 201A now combines the existing method (PM10) with a PM2.5 cyclone to create a sampling train that includes a total of two cyclones.



METHOD 202 (page 62)

Condensable Particulate Matter (CPM), Dry Impinger Method - This isokinetic method is used to measure Condensable Particulate Matter (CPM) from stationary source emissions after particulate matter has been removed by a heated filter, such as in Method 5, 17 or 201A. The CPM is collected in dry impingers maintained at 80°F.



METHOD 0061 (page 63)

Hexavalent Chromium Emissions - Method 0061 determines hexavalent chromium emissions from hazardous waste incinerators, municipal waste incinerators, municipal waste combustors and sewage sludge incinerators. Isokinetically collected with a train where the impinger reagent is recirculated continuously. Samples are analyzed with an ion chromatograph. Method 0061H Hexavalent Chromium High Temperature Source Sampling Kit is used as an alternative for temperatures above 150°C (300° F).

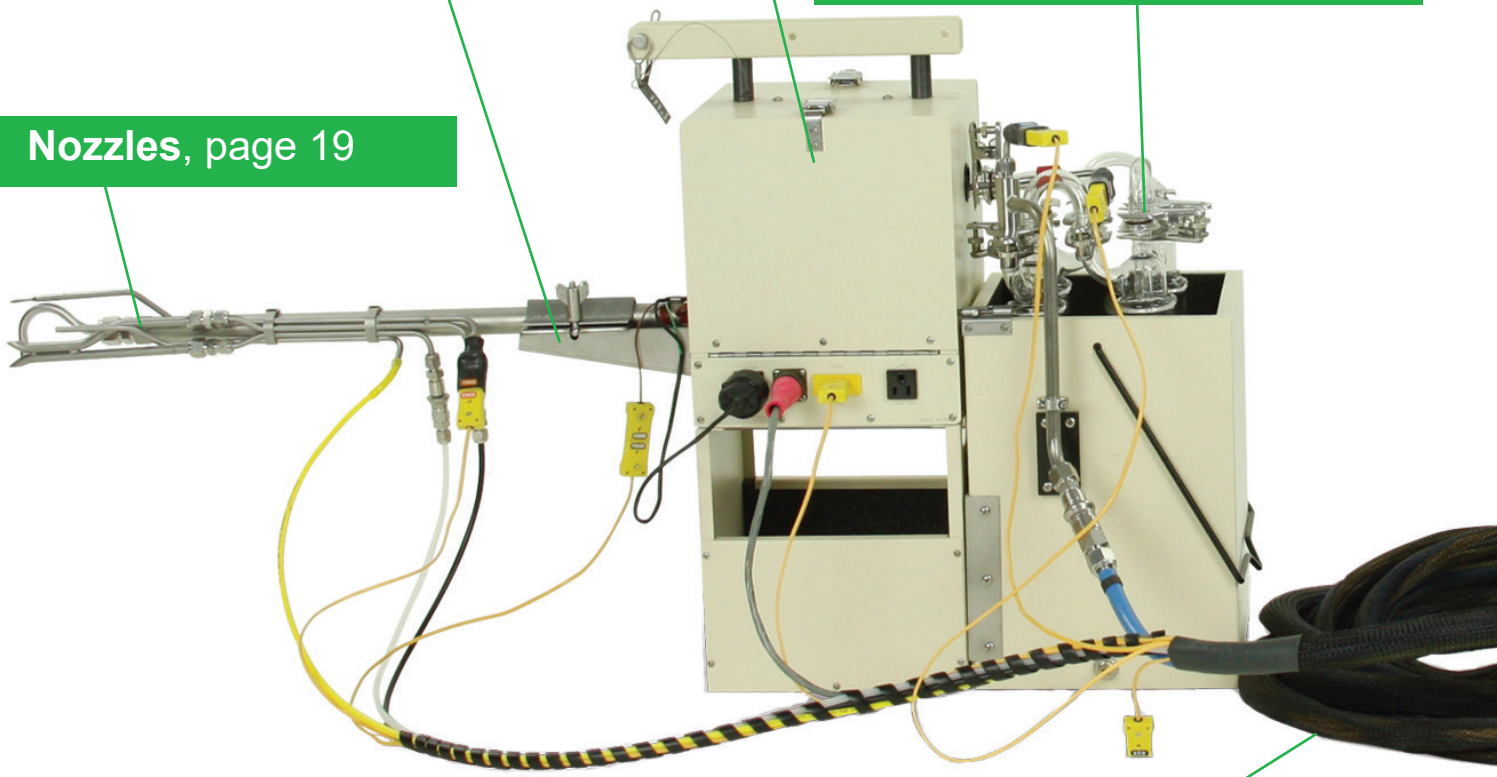
Isokinetic
Source Sampling Equipment

Modular Sample Cases, page 27

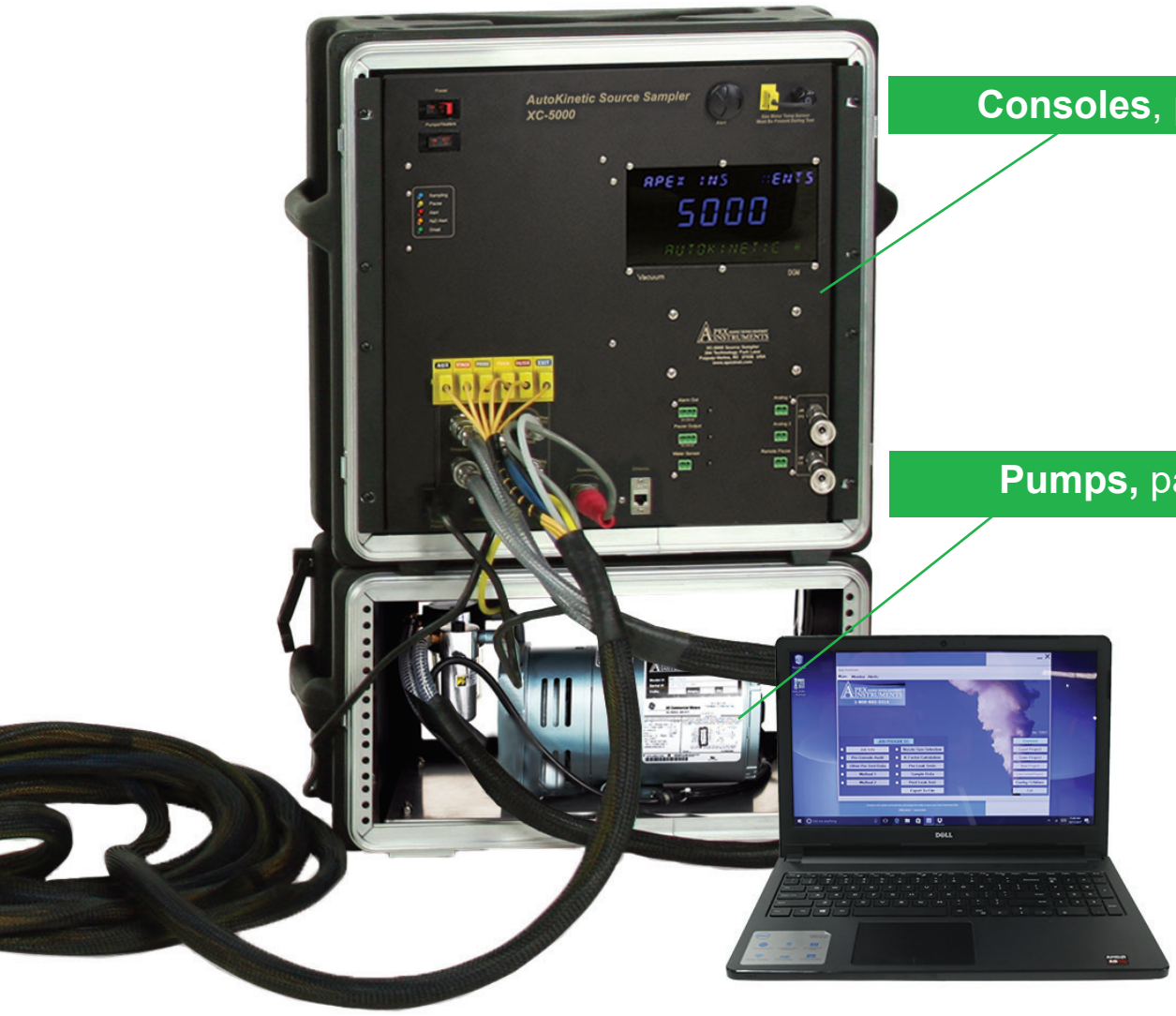
Probes and Liners, page 22

Glassware, page 32

Nozzles, page 19



Umbilicals, page 41



Consoles, page 10

Pumps, page 18

Apex Instruments Isokinetic Source Sampling Systems are rugged, versatile equipment designed for extracting a representative sample of flue gas. The sample is used to determine particulate & toxic emissions in accordance with U.S. EPA Reference Methods as published in CFR 40 Part 60 Appendix A. Choose between automated or manual systems.

XC-5000 AUTOKINETIC SAMPLING CONSOLE

Our **XC-5000 AutoKinetic™ Series** is designed for conducting US EPA Method 5 and associated isokinetic methods. Take the worry out of isokinetic sampling and the human error out of manual data entries and calculations. The XC-5000 Series is compatible with your existing Method 5 stack sampling components. Report preparation is streamlined with accurate data downloadable to files for easy report preparation.

Features and Benefits:

- Automates isokinetic sampling and data storage
- Improves precision and provides quality measurements
- Windows-based interface guides operator through the sampling process
- Calculates traverse points, ideal nozzle diameter, K-Factor and isokinetic rate
- Accepts standard Apex Instruments sample train components probes, nozzles, heated filter boxes, impinger boxes, umbilical, etc.
- Software assisted pre-leak and post-leak checks
- Optional automatic pause function
- Alerts operator to move probe a point and/or change
- Stores sampling profiles and data
- English or metric units
- Multilingual language editor
- Sunlight readable LED display

XC-5000 Isokinetic Source Sampler Console

Model	Description
XC-5000	AutoKinetic Sampler Console, 110V
XC-5000-V	AutoKinetic Sampler Console, 240V

Specifications

Gas Meter: Precision DGM, 0.7 liters per revolution, Digital Encoder, 2cc resolution.

Temperature Control: Integrated temperature control via the Control and Data Acquisition Board, probe and oven with solid state relays.

Thermocouple Display: 7 temperatures displayed simultaneously on the PC User Interface, °F or °C, Probe, Stack, Oven, Filter, Exit, AUX and DGM.

Digital Pressure Transducers: For ΔH, and ΔP (Bi-Directional), Barometric.

Pitot ΔP	+/- 2.5” +/- 63mm	0.001” resolution 0.01 mm resolution
Orifice ΔH	0”-5” 0mm-127mm	0.01” resolutions 0.1mm resolution
Barometric resolution	17.7 inHg – 32.5 inHg 450 mmHg – 825 mmHg	0.01 inHg 0.1m mmHg
Vacuum Sensor	0 to 30” Hg, 0 to 101 kPa, 2% accuracy	

Umbilical Connections:
Electrical: 4 conductor circular connector with grounded shell.
Sample line: Stainless Steel 1/2” Quick Connector.
Pitot Line: Stainless Steel 1/4” Quick Connectors (optional 3/8”).
External pump: Stainless Steel 3/8” Quick Connect.
Thermocouples: Type-K standard size.

Communication:
Ethernet.

Dimensions:
H23” x W21” x D12” (58 cm x 53 cm x 30.5 cm).

Weight: 39 lbs. (17.7 kg).

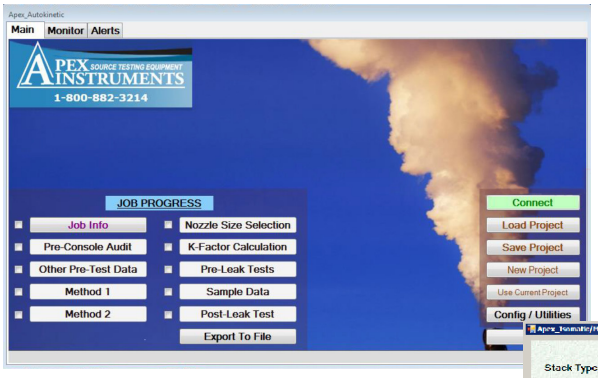
Optional:
4 channel analog input module for logging external data (4-20ma, 0-10V, 1-5V).

Power: 120V / 60 Hz. 240V / 50 Hz (optional).

Console Power Requirements:
15amp max.

AUTOKINETIC SOFTWARE (Compatible Only with XC-5000 Console)

The AutoKinetic proprietary software is designed to be intuitive and user friendly. The stepwise functionality of the windows based program guides the user through creating a test profile ensuring all test parameters are met, increasing data integrity. The software also allows for easy data export for report generation.

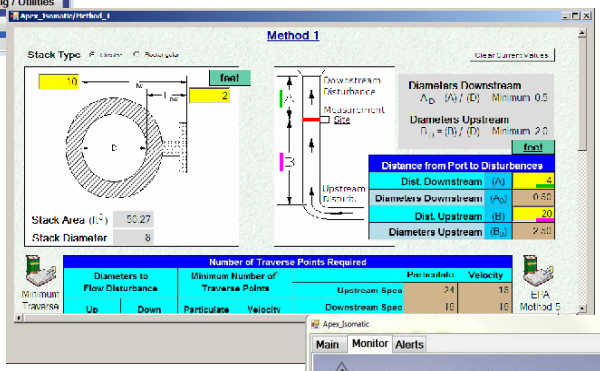


Main Screen

- Access system functions
- Progress status
- Simple user-interface
- Tabs to toggle between main, monitor & alert set-up screens

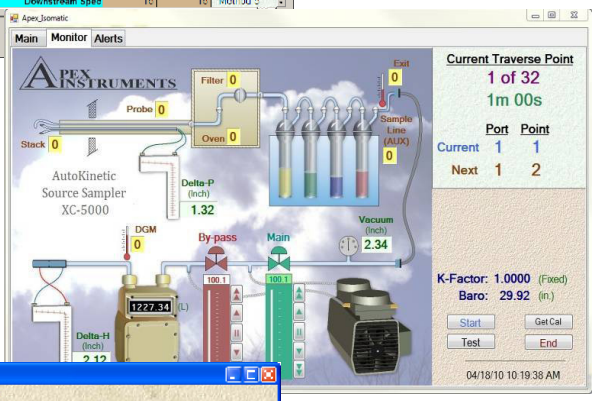
Pre-Test Screens

- Calculates:
  - Stack diameter & traverse points
  - Stack velocity & molecular weight
  - Ideal nozzle size & k-factor



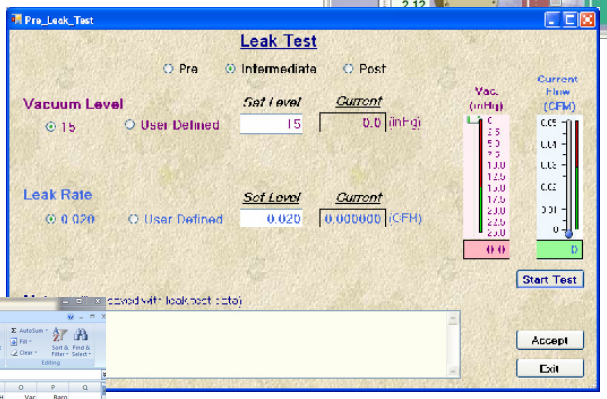
Test Run Screen

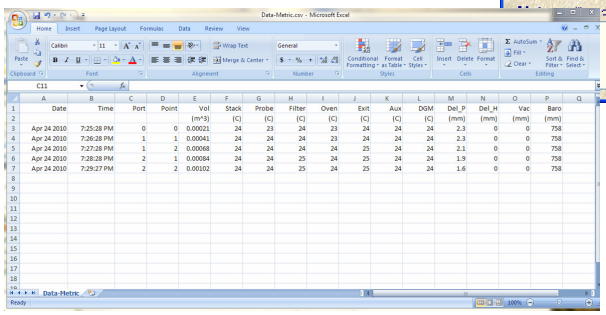
- Monitor current temperature & pressure values
- Displays current sampling conditions



Leak Test Screen

- Aids in pre, intermediate & post leak checks
- Automatically controls vacuum
- Pass or fail indicator



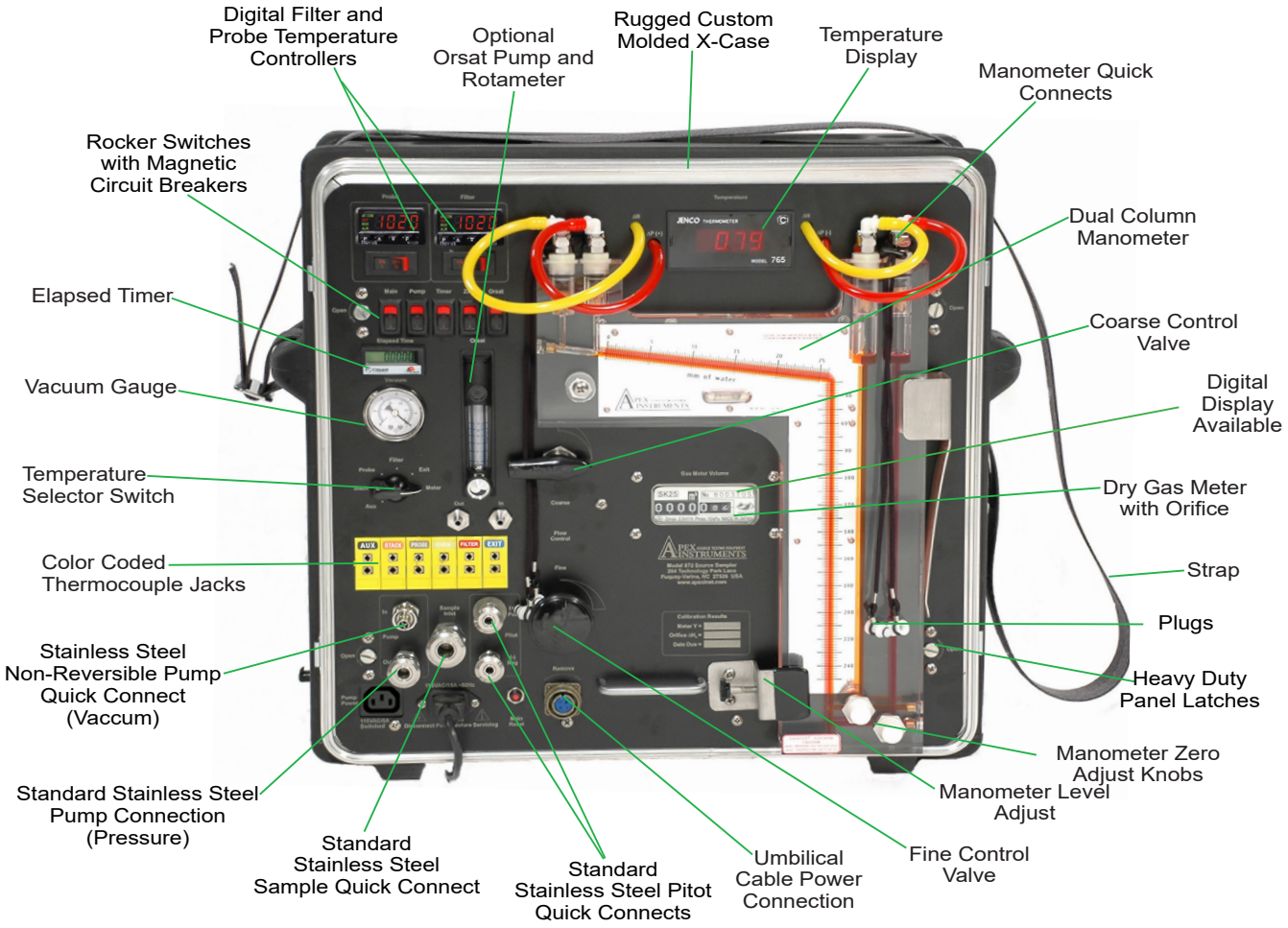


Test Data & Reporting

- Exports
  - Test run data
  - Leak check data
  - Logged events
  - Console audit data
- Data exported in single CSV file
- Data displayed in both summarized & detailed format
- Export file automatically named with project name and date

XC-500 SERIES ISOKINETIC SOURCE SAMPLING CONSOLE - MANUAL

The XC-500 Series Sampling Console is a rugged, lightweight metering console used to extract gas samples in accordance with US EPA Method 5 for determining source emissions for dust and fumes. The Apex Isokinetic Source Sampler allows the operator to monitor gas velocities, temperatures, pressures and adjust sample flow rates to maintain isokinetic sampling conditions. Comes with choice of digital or mechanical gas meter totalizer, digital temperature controllers and display, liquid manometer and external pump connections. Stainless steel fittings and quick connects are standard. Units in the XC-500 Series are available in Standard or Metric units, 110V or 220VAC, optional internal orsat pump.

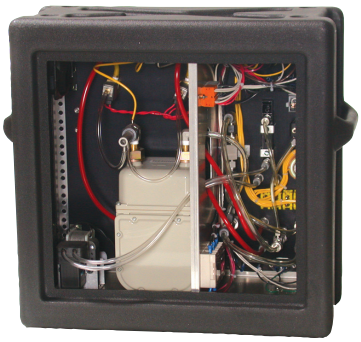


Slide Out Front Panel

Slide-out front panel for easy access while servicing console.

Rear View

Removable back panel allows for quick audits.

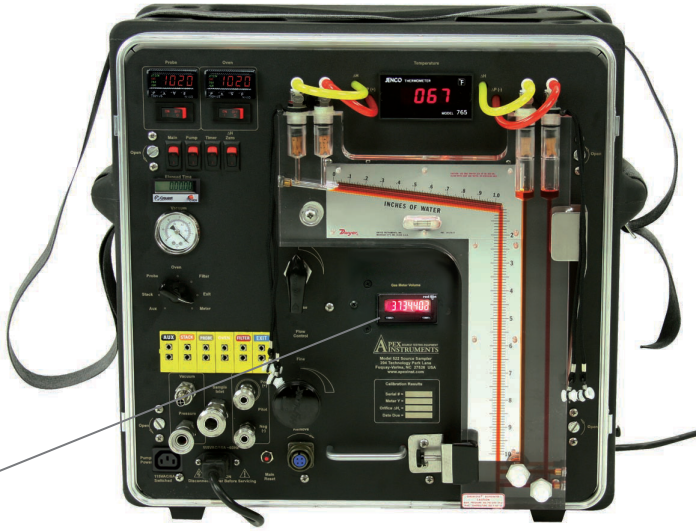


Console Enclosure

Features a light-weight molded, rugged X-case with side handles and convenient shoulder strap. (Case is not intended for shipping.)

500 SERIES DIGITAL ISOKINETIC SOURCE SAMPLING CONSOLE

Apex instruments now offers its 500 Series Method 5 Isokinetic Sampling Consoles with a digital dry gas meter and digital volume display. At the core of the digital option is Apex Instrument's custom manufactured DGM-SK25EX-100 digital dry gas meter. The meter contains two internal digital transmissive components- the rotary codewheel and the optical endoder module. The components provide precision volume measurement at 1:1 ratio meter cycle to code wheel resolution. The dital dry gas meter is compact and offers significant weight savings over other industyr standard Method 5 gas meters. It may be calibrated in English or Metric units.



XC-522-D Digital Console

Digital Display

The panel-mounted totalizer is back lit with a highly visible LCD, is resettable and provides a resolution to 8 digits. It may be configured in English or Metric units.

Totalizer

ISOKINETIC SOURCE SAMPLING
500 SERIES METER CONSOLE OPTIONS

XC -□□□-□□□□

Model Number
522 (English Units)
572 (Metric Units Only)

Display
Blank = Mechanical display
D = Digital gas meter display

Orsat Pump(Optional)
Blank = None
O = Integrated Orsat Pump

Quick Connects
Blank = 1/4" Pitot
QC6 = 3/8" Pitot

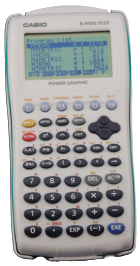
Voltage
Blank = 120V/60Hz
V = 240V/50Hz

Isokinetic Calculator

The Casio Graphic Scientific Calculator comes pre-programmed with valuable Isokinetic stack sampling calculations making field calculations quick and easy. Programmed in English and metric units.

Programs Include:
- Traverse points location
- Stack gas velocity and volumetric flow rate
- Stack gas moisture content
- Ideal nozzle size and k-factor with H Loop
- Post-test isokinetics

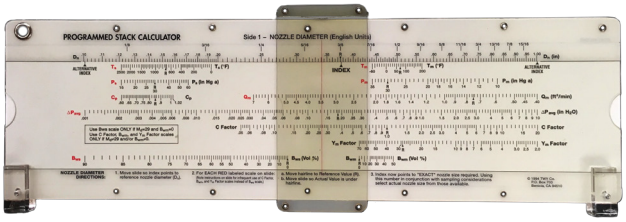
M5A-C



Isokinetic Slide Rule

Performs Isokinetic Stack Sampling Calculations, such as nozzle size and sampling rate. Provides new H settings at a glance.

M5A-1.....English Units
M5A-1M...Metric Units



XC-522-D SOURCE SAMPLING CONSOLE

The Apex Instruments Model XC-522-D is a full featured manual meter console. The Apex Isokinetic Source Sampling Console allows the operator to monitor gas velocities, temperatures, pressures and adjust sample flow rates to maintain isokinetic sampling conditions. Designed conveniently for manual data recording.

The lightweight X-case and compact design of the XC-522-D allows for easy onsite manuverability.

The Apex Instruments Isokinetic Source Sampling Consoles are manufactured to conform to the construction design criteria and specifications cited in U.S. EPA Method 5, Code of Federal Regulations (40 CFR Part 60) and APTD-0581 documents.

XC-522-D Source Sampler

Features:

- Low Cost - Manual Console
- Easy to Operate and Maintain
- Rugged, Lightweight, Stackable Case
- Removable 19” Front Panel
- Carry Strap for Easy Transportation
- Non-Reversible Sample Pump Connections
- Color Coded Thermocouple Jacks
- Bright, Easy-to-Read Temperature & Volume Displays
- Easy-Leveling Dual Column Manometers
- Dry Gas Meter with Bright LED Digital Volume Display
- Stainless Steel Quick Connects & Fittings

XC-522-D English Units (Cubic Feet, °F)

Model	Description
XC-522	English Meter Console, 120 V/60 Hz w/ S110 DGM
Options	
O	Integrated Orsat Pump Assembly
QC6	3/8” Quick Connects
V	240 V/50 Hz
D	Digital Display and DGM Option

To order options, add option letter to end of the console model number. See legend on page 11 for options letter sequence.

ATTENTION:

Contact your Apex Sales representative for the availability of the Standard Console (XC-522) which comes with the model S110 gas meter (DGM-110).

Specifications

Gas Meter: For Model ‘D’: Model SK25EX, 0.7/rev., digital gas volume totalizer, with Quadrature Encoder, 8 digit LCD Display, 0.0001 cu. ft. resolution.
Contact Sales for the 110 Rockwell DGM availability.

Manometer: Dual Inclined/Vertical Manometer for determining stack velocity and sample flow rate. Inclined Range 0-1.0” H_20 with 0.01 divisions. Vertical Range 1-10” H_2O with 0.1” divisions. Fabricated from solid acrylic, precision bored, accurate to +/- 1%. Convenient self-sealing chrome plated brass quick-connects with Viton® O-Rings. Supplied with plastic plugs for positive secondary seal.

Temperature Display: Type-K. Transmissive Red Digital Display. -328°F to 2502°F range.

Volume Display: Panel Mount, bright red LED display totalizer, resettable, quadrature.

Temperature Controllers for Probe and Oven: 1/32 DIN bright red LED display, indicating temperature controllers with separate 25 amp solid state relay, auto-tuning. Standard Type-K jack for input.

Umbilical Connections: Sample Inlet: ½” Stainless Steel Quick-Connect; Pitot Lines: 1/4” (3/8” optional) stainless steel Quick Connect; Electrical: 4 conductor circular connector; Thermocouples: 6 Type K inputs, standard size.

Vacuum Gauge: Dual Scale Vacuum Gauge, 0-30” Hg / 0-100kPa.

Sample Pump Connections: 3/8” Quick Connects, Stainless Steel, non-reversible.

Power: 120V/60Hz standard; 240V/50Hz optional

Dimensions: H23” x W21” x D12” (58 x 53 x 30cm) Panel 19”

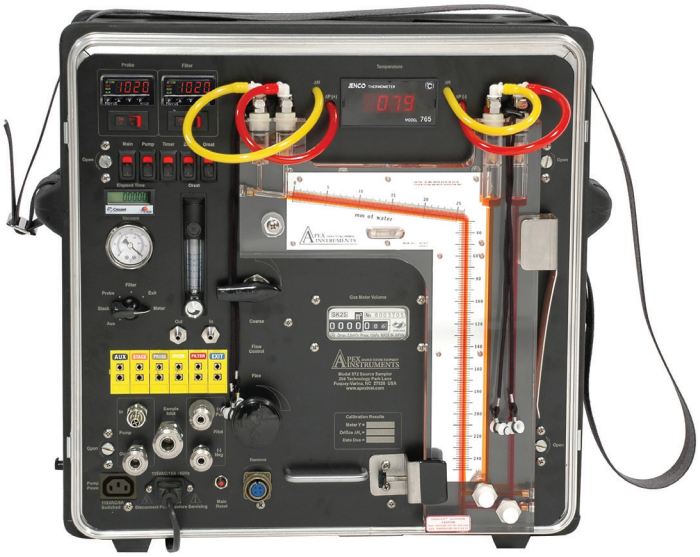
Weight: 43 lbs (19.5kg)

XC-572 SOURCE SAMPLING CONSOLE

The XC-572 Source Sampling Console is the metric version of the XC-522. It is a full featured, compact, and lightweight Isokinetic Source Sampler. It has all the great features you want and the reliability you need. Field set up is easy with non-reversible external pump connections and the industry standard 4-pin electrical connector. (External sample pump sold separately).

Console allows operators to monitor gas velocities, temperatures, pressures, and sample flow rates for maintaining isokinetic sampling conditions.

Apex Instruments Isokinetic Source Sampling Consoles are manufactured to conform to the construction design criteria and specifications cited in U.S. EPA Method 5, Code of Federal Regulations (40 CFR Part 60) and APTD-0581 documents.



XC-572 Source Sampler

Features:

- Precision Gas Meter and w/ Orifice
- Low Cost - Manual Console
- Easy Operation and Maintenance
- Rugged, Lightweight, Stackable Case
- Removable 19” Front Panel
- Carry Strap for Easy Transportation
- Non-Reversible Sample Pump Connections
- Color Coded Thermocouple Jacks
- Bright, Easy-to-Read Temperature Displays
- Easy-Leveling Dual Column Manometer
- Stainless Steel Quick Connects & Fittings
- Convenient Layout for Manual Data Recording

XC-572 Metric Units

Model	Description
XC-572	Metric Meter Console, 120 V/60 Hz
Options	
D	Digital Gas Meter Display
O	Integrated Orsat Pump Assembly
QC6	3/8” Quick Connects
S	S-110 Dry Gas Meter
V	240 V/50 Hz

To order options, add option letter to end of the console model number. See legend on page 11 for option letter sequence.

Specifications

Gas Meter: SK25EX easy to read numeric index with leak check wheel, low pressure drop, rated 42 lpm at 15mm H_2O, maximum capacity approx. 70 lpm. “D” Option Totalizer capacity 9999.9999 cubic meter, resolution 0.002 Liter.

Manometer: Dual Inclined/Vertical Manometer for determining stack velocity and sample flow rate. Inclined Range of 0-26mm H_20 with resolution of .2mm. Vertical Range of 26-250mm H_2O with 2mm resolution. Fabricated from solid acrylic, precision bored, accurate to +/- 1%. Convenient self-sealing chrome plated brass quick-connects with Viton® O-Rings. Supplied with plastic plugs for positive secondary seal.

Temperature Display: Type-K. Transmissive LCD with 5 Digit LED Backlight (°C is standard for export). °C/°F selectable, -200°C to 1372°C.

Volume Display: Mechanical Gas Meter to .001 m^3. “D” Option bright red LED display totalizer, resettable, quadrature.

Temperature Controllers for Probe and Oven: 1/32 DIN bright red LED display, indicating temperature controllers with separate 25 amp solid state relay, auto-tuning. Standard Type-K jack for input.

Umbilical Connections: Sample Inlet: ½” Stainless Steel Quick-connect; Pitot Lines: 1/4” (3/8” optional) Stainless Steel Quick Connect; Electrical: 4 conductor circular connector; Thermocouples: 6 Type K inputs, standard size.

Vacuum Gauge: Dual Scale Vacuum Gauge, 0-30” Hg / 0-100kPa.

Sample Pump Connections: 3/8” Quick Connects, Stainless Steel, non-reversible.

Power: 120V/60Hz standard; 240V/50Hz optional.

Dimension: H23” x W21” x D12” (58 x 53 x 30cm) Panel 19”.

Weight: 40 lbs (18kg)

XD-502 ISOKINETIC SAMPLING CONSOLE

Lighter. Smaller. Easier.

The new **XD-502 Digital Source Sampling Console** is the first Method 5 console being offered in our new compact light weight design.

The console uses an internal diaphragm pump, reducing the weight of the console and pump portion of the train to 37lbs, from 81 lbs (more than 50% reduction).

Additionally, we're including our new multi-function sunlight-readable transflective display. With quick and easy auditing and calibrating, this digital console is the best choice for a portable and easy-to-use alternative to the traditional Method 5 Console.

No more manometer fluid headaches! No more breaking your back carrying a big console and a heavy pump all the way up the stack!

Model XD-502

Features:

- Rugged lightweight case with 3 Heavy Duty Stainless Steel handles.
- Sunlight Readable Digital Display with Backlight for Indoor Use
- SK-25 Precision Dry Gas Meter with Digital Optical Encoder.
- Digital Vacuum Gauge.
- Digital Temperature Display with 6 Type-K Inputs plus DGM and internal.
- All Stainless Steel Fittings and Control Valves (Brass fittings and valves available).
- Digital PID Temperature Controllers for Probe and Oven.
- Digital Elapsed Timer (hr:min:sec).
- Easy Access for Service (Mounted in case)
- USB Data Export - streaming or batch downloads.

Specifications:

Display: 4x20 Character Back-lit Transflective Liquid Crystal Display

Gas Meter: Model SK25EX, with 100 CPR Quadrature Encoder, 0.7L/rev., 41 lpm max.

Flow Indicator:
Precision Machined Stainless Steel Orifice with Pressure Transducer, Range 0 - 5" H2O (1245 Pa) resolution of 0.01" (1 Pa).

Temperature Measurement:
8 channel individually isolated Type-K thermocouple meter, °C/°F selectable, -200°C to 1372°C range. (-328°F to 2502°F).

Probe Temperature Control: Compact, 1/32 DIN auto-tuning indicating temperature controller with separate 25 amp solid state relay. Type-K jack for input.

Digital Pressure Transducers:
ΔP +/- 1.0" (+/-249 Pa) and +/- 10.0" (+/-2491 Pa) Range Bi-Directional with 0.001" (1 Pa) Resolution.
ΔH +/-5.0" (+/-1245 Pa) Range Bi-Directional with 0.01" (1 Pa) Resolution.
(ΔP automatically selects appropriate transducer for current flow)

Data Export: Usb or wireless, data streaming or batch downloads

Vacuum Gauge: Digital Scale, 0 to 30" Hg or 0 to 100kPa.

Umbilical Connection:
Electrical: 4 conductor circular connector with grounded shell
Sample Inlet: 1/2" Stainless Steel Instrumental Quick-Connect (alt. sizes available).
Pitot Connections: 1/4" Stainless Steel Instrumental Quick-Connects
Thermocouples: AUX, STACK, PROBE, OVEN, FILTER, EXIT

Power: Supply 120V, 150W, 24V/6.3A, IEC C-14 Inlet.

Dimensions: H17" x W17" x D12" (43 cm x 43 cm x 30.5 cm).

Weight: 40 lbs (18 kg).

XC-170 METHOD 17 SAMPLING CONSOLE

Reliable. Easy to Use. Affordable.

The new **XC-170 Digital Source Sampling Console** is the first Method 17 console being offered in our new *compact light weight design*. This console is manufactured in the United States and meets US EPA Method 17, CFR 40 part 60 standards.

The XC-170 combines the reliability of our manual consoles with the convenience of *digital components*.

The console uses an *internal diaphragm pump*, reducing the weight of the console and pump portion of the train to 37lbs.

The *new Digital Display* is backlit, sunlight readable and transflective. The unit contains two high resolution, digital low pressure sensors. The displays allows for easy zeroing, dampening adjustment, input power filtering, and measurement unit selection.

The XC-170 will assure you ease of use and accurate results, giving you extra confidence during your sampling test.

Model XCF-170
(Full Flow Quick Connects displayed)

Features:

- Smaller and Lighter Console
- Rugged Durable Case
- No messy manometer fluid headaches
- Reliable, Accurate Results
- Precision Gas Meter with Mechanical Index
- Easily replaceable Dual Pressure Transducers
- Sunlight Readable Display
- Option to Select between Metric or Imperial
- Digital Display for TC Temperatures, ΔP, ΔH, and Gas Meter Volume
- Carrying Strap and 3 Handles on Case
- Internal Diaphragm Sampling Pump

Specifications:

Display:
4x20 Character Back-lit Transflective Liquid Crystal Display with digital operation of timer, ΔP, ΔH and Temperature

Display Control:
Momentary push button switch control for display operation and setup.

Gas Meter:
Model SK25EX, with 100 CPR Quadrature Encoder, 0.7L/rev., 41 lpm max.

Flow Indicator:
Precision Machined Stainless Steel Orifice with Pressure Transducer, Range 0 - 5" H2O (0 - 1245 Pa) resolution of 0.01" (1 Pa).

Temperature Measurement:
5 channel individually isolated Type-K thermocouple meter, °C/°F selectable, -200°C to 1372°C range. (-328°F to 2502°F).

Digital Pressure Transducers:
ΔP +/-5.0" (+/- 1245 Pa) Range Bi-Directional with 0.001" (1 Pa) Resolution
ΔH +/-5.0" (+/-1245 Pa) Range Bi-Directional with 0.01" (1 Pa) Resolution

Vacuum Gauge:
Dual Scale, 0 to 30" Hg and 0 to 100kPa.

Umbilical Connection:
Sample Inlet: 1/4" Stainless Steel Full Flow Quick-Connect (alternate sizes available).
Pitot Connections: 1/8" Stainless Steel Full Flow Quick-Connects
TC Connections: AUX, STACK, PROBE,EXIT

Power:
Pump Power Supply: 110V, 150W, 24V/6.3A, IEC C-14 Inlet.
Display Power Supply: 15W, 12VDC

Dimensions: H17" x W17" x D12" (57 cm x 33.5 cm x 61 cm).

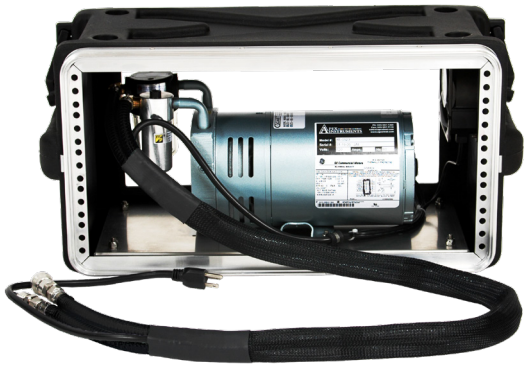
Weight: 37 lbs (9.98kg)

METHOD 5 PUMP ASSEMBLIES

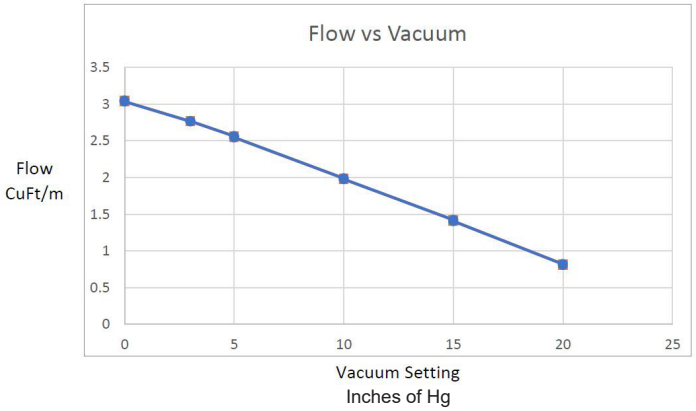
Lubricated Rotary Vane Pump (0523)

The Lubricated Rotary Vane Pump includes a 5' power cord and two kink-free hoses with nonreversible stainless steel quick connects. The pump is mounted in our standard durable, rugged X-Case with removable covers providing easy access for service. The wick style lubricator requires less maintenance than other lubricator systems.
Option "V" added for 240V.

XE-0523 Rotary Vane Pumps



XE-0523 Pump



Specifications

- Motor: 1/4hp, 120/240V 60/50Hz 4.6/2.3 Amp., RPM 1725/1425
- Measured Flow: 3.1 cfm@ 1 inch Hg; 1.5 cfm@ 15 inches Hg
- Maximum Vacuum: 25.5" Hg
- Weight: 35 lbs., (16kg)
- Lubricator - wick style, bronze

E-0523 FRAME Pump with Open Frame

Lubricated Rotary Vane Pump (0523)

The Lubricated Rotary Vane Pump includes a 5' power cord and kink-free hoses with nonreversible stainless steel quick connects mounted in an Open Aluminum Enclosure. With Lubricator, 5ft Pwr Cord & Hoses, SS Quick Connects Standard.
Option "V" added for 240V.

E-0523 Open Frame Pump

Ei-838 External Diaphragm Sampling Pump

- German-made diaphragm pump.
- Lightweight and compact design.
- Compatible with all Apex Instruments Sampling Equipment.
- Easy to attach, self sealing EPDM tubing.
- Fast and knuckle-friendly durable polypropylene shell.

Specifications:

- **Motor**: 24dc BLDC (Brushless DC) KNF 838 Motor
- **Measured Flow**: 70 lpm (2.5 cfm) at free flow | 21 lpm (.75 cfm) at 15 inch Hg
- **Maximum Vacuum**: 25.5" Hg
- **Weight**: 16 lbs., (7.25kg)

NOZZLES FOR ISOKINETIC SAMPLING

Apex Instruments offers Button-Hook Nozzles in a multitude of materials and sizes. Isokinetic sampling requires the nozzle size to match the stack gas velocity. The material required is dependent upon stack temperature and sampling method.

The most popular nozzles are available in our standard set. We also offer large and oversize nozzle sets.

The most popular nozzles are constructed from seamless 316 stainless steel and can be coated with PTFE/FEP duplex or SilcoNert 2000®. Other nozzle materials include Borosilicate Glass, Alloy 600 and Quartz. Standard sampling nozzles are 4 inches long with a 5/8" OD shank. The stainless steel and alloy 600 nozzles have an integrated ferrule and o-ring to minimize leaks.

Alternative lengths and shank diameters are available upon request.

Nozzle Set Part Identification

N☐-SET-☐

Material
G = Glass
Q = Quartz
S = Stainless Steel
I = Alloy 600
ST = Stainless Steel, PTFE/FEP
SL = Stainless Steel, Silco

Nozzle Sizes
S = Sizes 4 through 10
L= Sizes 11 through 17

NS-SET-S

Isokinetic Nozzle Sets

Part #	Description
NS-SET-S	Stainless Steel Set of 7 Nozzles- 4, 5, 6, 7, 8, 9, 10 Includes four 5/8" tube nuts and pre-swaged ferrules.
NG-SET-S	Glass Set of 7 Nozzles- 4, 5, 6, 7, 8, 9, 10 Includes three PTFE filled ferrules.
NI-SET-S	Alloy 600 Set of 7 Nozzles- 4, 5, 6, 7, 8, 9, 10 Includes pre-swaged stainless steel ferrules.
NQ-SET-S	Quartz Glass Set of 7 Nozzles- 4, 5, 6, 7, 8, 9, 10 Order ferrules separately
NS-SET-L	Stainless Steel Set of 7 Nozzles- 11,12,13,14,15,16,17 Includes four 5/8" tube nuts and pre-swaged ferrules.
NG-SET-L	Glass Set of 7 Nozzles- 11,12,13,14,15,16,17 Includes three PTFE filled ferrules.
NI-SET-L	Alloy 600 Set of 7 Nozzles- 11,12,13,14,15,16,17 Includes four 5/8" tube nuts and pre-swaged ferrules.
NQ-SET-S	Quartz Glass Set of 7 Nozzles- 11,12,13,14,15,16,17 Order ferrules separately

NG-SET-S

Threaded Nozzle Set (NS-TH-SET)

Features the larger ID nozzles for low stack gas velocity and a Button-Hook Nozzle Blank (NS-THB) with a tapered fitting. The set includes 7 Stainless Steel Nozzle Tips which thread onto the Nozzle Blank.

Threaded Oversize Nozzle Options

N☐-☐-TH-☐

Nozzle Material
S = Stainless Steel
I = Alloy 600

Coating
T= PTFE/FEP Duplex (for Stainless Steel Only)
L= Silco Coated (for Stainless Steel Only)

Nozzle Size

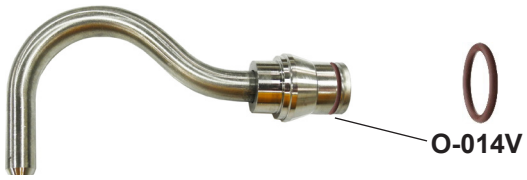
Threaded Oversized Stainless Steel Nozzle Size

	Inch	Decimal	MM
20	5/8	.63	16.0
22	11/16	.69	17.5
24	3/4	.75	19.0
26	13/16	.81	20.6
28	7/8	.88	22.2
30	15/16	.94	23.8
32	1	1.00	25.4

NOZZLE OPTIONS

To meet your special needs we offer a variety of individual nozzles in different sizes and materials up to 1 inch in diameter.

Please contact us for availability and pricing on special order nozzles.



Nozzle w/ Machined Ferrule

Note: (P/N: N10UB Bored Union is required when using nozzles with an O-ring

Standard Size Nozzle Options

N ☐ - ☐ - ☐ - ☐

Nozzle Material
G = Glass
Q = Quartz
S = Stainless Steel
I = Alloy 600

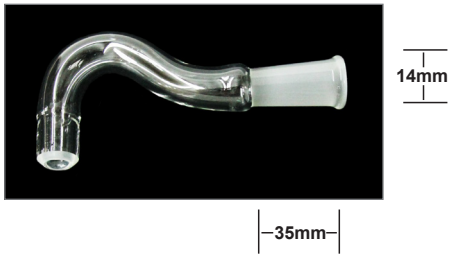
Coating
T= PTFE/FEP Duplex (for Stainless Steel Only)
L= Silco Coated (for Stainless Steel Only)

Nozzle Size

	Metal / Alloy			Glass / Quartz		
	Inch	*Decimal*	*MM*	*Inch*	*Decimal*	*MM*
4	1/8	.13	3.2	1/8	.13	3.2
5	5/32	.16	4.0	5/32	.15	4.0
6	3/16	.19	4.8	3/16	.18	4.8
7	7/32	.22	5.6	7/32	.21	5.3
8	1/4	.25	6.4	1/4	.25	6.4
9	9/32	.28	7.1	9/32	.28	7.1
10	5/16	.31	8.0	5/16	.31	7.9
11	11/32	.34	8.7	11/32	.34	8.7
12	3/8	.38	9.5	3/8	.38	9.5
13	13/32	.41	10.3	13/32	.41	10.3
14	7/16	.44	11.1	7/16	.44	11.1
15	15/32	.47	11.9	15/32	.47	11.7
16	1/2	.50	12.7	½	.50	12.7
17	17/32	.53	13.5	17/32	.53	13.5
18	9/16	.56	14.3	9/16	.56	14.2

Options
T = Taper (Glass or Quartz Nozzle with 14/35 Taper)

Glass/Quartz Nozzle



14/35 Tapered Glass/Quartz Nozzle

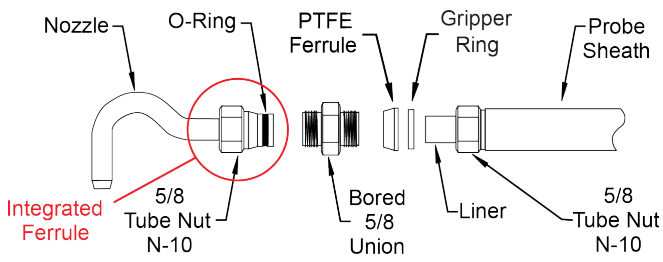
Dual Probe w/ Nozzles Installed

Recommended Maximum Temperature

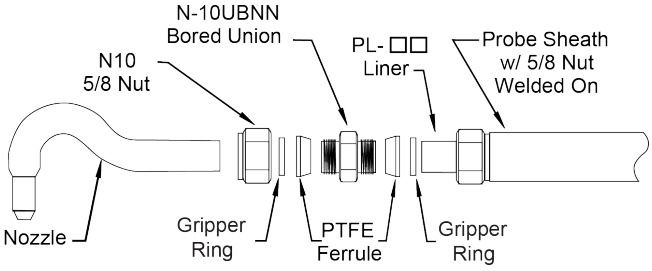
Material	Maximum Temperature	
Stainless Steel	650°C	(1200°F)
TPFA/PTFE Fitting	177°C	(350°F)
Borosilicate Glass	480°C	(900°F)
Alloy 600	871°C	(1600°F)
Quartz	900°C	(1650°F)
Viton O-Rings	260°C	(500°F)
Graphite Ferrules	930°C	(1800°F)
Glass-Filled PTFE	260°C	(500°F)*

*Intermittent up to +600°F

Nozzle Installation for Steel Alloys



Nozzle Installation for Glass and Quartz



NOZZLE AND PROBE ACCESSORIES

Ferrules

Single Ferrules

Part #	Description
10F-GR	5/8 Inch Graphite, Single Ferrule, High Temp
NTG-10F	5/8 Inch Glass Filled Single Ferrule
NT-10F	5/8 Inch PTFE Single Ferrule

Front/Back Ferrules

Part #	Description
10FFB-S	Set of 5/8" Stainless Steel Ferrules, includes one front and one back ferrule
10FFB-I	Set of 5/8" Alloy 600 Ferrules, includes one front and one back ferrule

Seals

Part #	Description
O-113V	5/8 Inch Viton O-Ring to Seal Liner or Glass Nozzle (Use with N-10BR)
O-014V	5/8 Inch Viton O-Ring to Seal Nozzles
N-10BR	5/8 Inch Thrust Backer Ring for 5/8 Inch O-Ring Seal, Stainless Steel
NP-1/16	Packaging Braid, 1/16 inch Braided Glass, (3 foot piece), Max Temperature 1200°F
NP-1/16H	Packaging Braid, 1/16 inch Ceramic Braid, Ultra-High-Temp, Max Temperature 2650°F

Nozzle Brush Set (NB-SET)

Includes 1 each of 3 popular sizes in a convenient carrying tube.

NB-3 3/16” Diameter

NB-5 5/16” Diameter

NB-8 1/2” Diameter

Vinyl Caps

Part #	Description
VPC-4-16	Vinyl Cap, Size 1/4” ID, 1” Height Fits Nozzle Sizes 4-6
VPC-6-16	Vinyl Cap, Size 3/8” ID, 1” Height Fits Nozzle Sizes 7-10
VPC-8-16	Vinyl Cap, Size 1/2” ID, 1” Height Fits Nozzle Sizes 11-14
VPC-10-16	Vinyl Cap, Size 5/8” ID, 1” Height Fits Nozzle Size 16

NOTE: Colors May Vary

Nozzle Case

Part #	Description
SH-NZ	Nozzle Case with Foam Line to Hold Set of 7 Nozzles

Unions

Part #	Description
N-10UB	5/8 Inch Stainless Steel Union, Bored Out, with Nuts and Ferrules
N-10US	5/8 Inch Stainless Steel Union, Bored Straight Through, with Nuts and Ferrules
N-10UBT	5/8 Inch Stainless Steel Union, Bored Out, PTFE Coated, No Nuts or Ferrules
N-10UST	5/8 Inch Stainless Steel Union, Bored Straight Through, PTFE Coated No Nuts or Ferrules
NI-10UB	5/8 Inch Alloy 600 Tube Union, Bored Out, with Nuts and Ferrules
NI-10US	5/8 Inch Alloy 600 Tube Union, Bored Straight Through, with Nuts and Ferrules
NTG-10UNN	5/8 Inch Glass Filled PTFE Union Body. No Nuts or Ferrules
NTG-10U	5/8 inch Glass-Filled PTFE Union Complete with Nuts and Ferrules

N-10UB

NTG-10UNN

Tube Nuts

Part #	Description
N-10	5/8 Inch Stainless Steel Tube Nut
NI-10N	5/8 Inch Alloy 600 Tube Nut
N-10TG	5/8 Inch NTG Nut

Small Parts Kit (PK-SP)

Part #	Description
N-10	Nut, 5/8 Tube, SS 5/8 in
N-10UBNN	Union, 5/8 Body Only, SS, Bored
NTG-10FF (6)	Ferrule, 5/8 Single, TFE/Glass
NSIL-10BF (6)	5/8” Back Ferrule, Gripper Ring

Contact us about our complete line of brushes.

PTFE Nozzle Brush (NBT-1/2)

Constructed of pure PTFE featuring a 1/8” diameter shaft with 1/2” long soft PTFE bristles

PBX-S Probe Brush Set

Stainless Steel Probe Brush Kit with two 5/8 brushes, two 2 ft. and three 3 ft. extensions

PBT-5/8 TFE Probe Brush Tip

Constructed with TFE Barrel and TFE Bristles. 5/8 “ Overall Diameter

PBX-☐ T Brush Extension

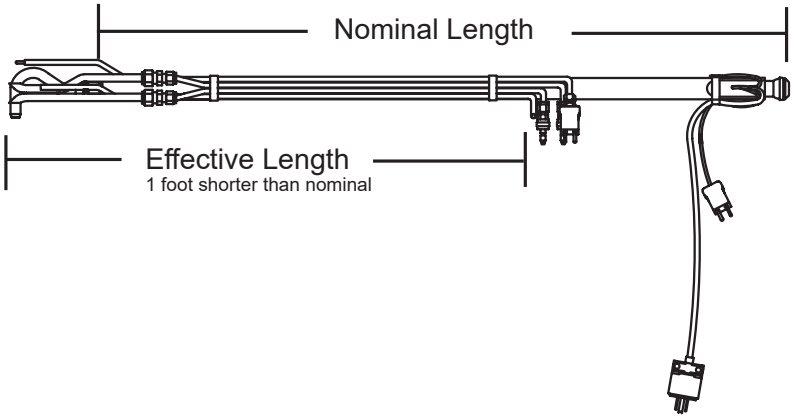
Flexible TFE Brush Extension
Specify Length in Feet
Brush not Included

ISOKINETIC PROBES

STANDARD METHOD 5 HEATED PROBES

The Apex Instruments Standard Method 5 Heated Probe features a 1” diameter sheath constructed from corrosion resistant stainless steel, modular 3/8” pitot tip, 1/4” stainless steel quick connects, Type-K thermocouples for stack & probe temperature, probe heater, orsat line, and small parts package. Standard lengths are 3’ to 16’. Longer lengths and custom orders are available by request. Probes are ordered according to nominal (liner length). Effective length is one foot less than nominal length. Order probe liners separately.

Standard Method 5 Probe



M5 PROBE STAINLESS STEEL SHEATHS WITH TUBE HEATERS
Part Identification

PS- ☐ - ☐☐☐☐

Length in feet
4 = 4 foot
6 = 6 foot
etc.

Heater
Blank = No Heater
H = Heater

Sheath Size o.d.
Blank = Standard
O2 = 2” OverSheath

Pitot Quick connect
Blank = 1/4” QC

Voltage
Blank = 120V
V = 240V

3/8" Quick Connects Available upon request.

Method 5 Probe with Optional Oversheath

Call for alternative probe designs (Controlled Condensate, Method 17, or 201A).
Add “V” to end of part number for 240V option at no extra cost.
See page 23 for replacement heaters and Pitot tips

Packing Gland (Optional)

2” Oversheath Packing Gland, 2” NPT Threads, Stainless Steel with PTFE Ferrule. **Must be Specified at time of order.**

PG-32S

PG-32S

AIR COOLED METHOD 5 PROBES

Air Cooled Method 5 Probes up to 8' in length, are applicable for high temperature sources. Concentric tubular design allows the cooling air to return and exhaust out of the stack. The probe sheath is constructed from stainless steel tubing while the pitot, thermocouple, nozzle union and liner are made from Alloy 600. A variable speed high capacity blower is needed for cooling. ***Order blower, blower hose and nozzle separately. It is recommended that an Alloy 600 liner is used with air cooled probes.***

Part Number	Nominal Length (feet)
APS-4I	4
APS-6I	6
APS-8I	8

Glass and Quartz liners not recommended due to breakage.

Probe heater for air-cooled probes available and is ordered separately.

Blowers

Blower Assembly for APS Probes (for non continuous sampling) SBR010 fram, 93 cfm. 120VAC, Variable Speed Controller
Blower Hose Not Included

HBG-93CFM
HBG-93CFM-V

Plant Air Coupler

Adapter Assembly used with Air Cooled Probe Connecting to Plant Air, Includes: 1.5" SS sanitary cap, 1.5" Q-clamp, and 1/2" FNPT SS Half Coupling

ACP-PAA.5

Blower Hose

5 Foot Blower hose assembly for use with HGB series blowers. 1-1/2" vacuum hose with cam-lock

HGBH-5 **HGBH-15**
HGBH-10 **HGBH-20**

HIGH TEMPERATURE ALLOY METHOD 5 PROBES

Our Custom Alloy Method 5 Probes are designed for hot corrosive gases. Alloy probes are built to order from a choice of alloy materials dependent on availability. The 3/8" pitot, 1/4" stainless steel quick connects, stack temperature thermocouple with magnesium oxide insulation, and orsat lines are secured to the sheath, but are designed to allow for differences in thermal expansion rates. The pitot is made of one piece construction as modular tips are not recommended in high temperature applications. Order liners separately.

- Recommended for High Temperature Applications
- Highly Corrosion Resistant

Call for current pricing and alloy availability.

M5 PROBE HIGH TEMPERATURE SHEATHS WITH TUBE HEATERS
Part Identification

PS-☐-D☐☐☐☐☐

Length in feet
4 = 4 foot
6 = 6 foot
etc.

N-10 NUT
Blank = No 5/8" Nut

Zone Heater
Blank = No Heater
H = Zone Heater

Sheath Size o.d.
Blank = Standard

Pitot Quick connect
Blank = 1/4" QC
QC6 = 3/8" QC

Voltage
Blank = 120V
V = 240V

Zone Heaters For last 18" Only not to be exposed to full stack temperature

Recommended for use with Integrated Quartz Nozzle

5/8" Nut Sold Separately

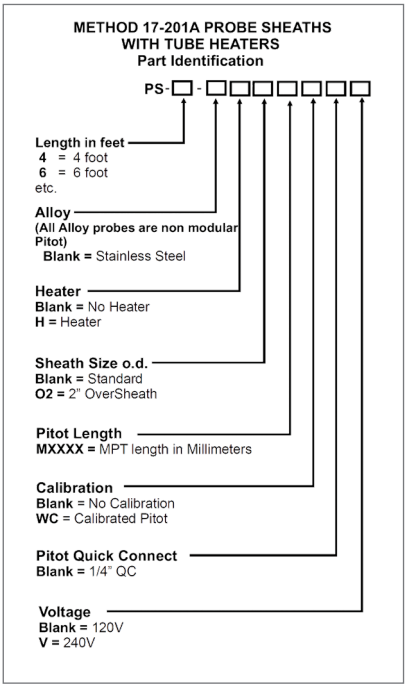
3/8" Quick Connects Available upon request.

METHOD 17 & 201A PROBES

The Apex Instruments Standard Method 17 and 201A Heated Probe for sampling particulate matter. Multiple fitting arrangements and filter assemblies are available with an in-stack filter. Features a 1" diameter sheath constructed from corrosion resistant stainless steel, modular offset 3/8" pitot tip, 1/4" stainless steel quick connects, Type-K thermocouples for stack & probe temperature, probe heater, orsat line, and small parts package. Standard lengths are 3' to 16'. Longer lengths and custom orders are available by request. Probes are ordered according to nominal (liner length). Effective length is one foot less than nominal length. Order probe liners separately.

Pitot Length Chart

Product	Standard Pitot Length (mm)	Probe with Oversheath Pitot Length (mm)	Application
Probe Base	***181***	***133***	Method 5
SFA-47 Filter	***225 (Offset)***	***177 (Offset)***	Method 17
SFA-300	***320 (Offset)***	***272 (Offset)***	Method 17
SFA-2590	***308***	***260***	Method 17
PM2.5	***181 (Offset)***	***133***	Method 201A
PM10	***255 (Offset)***	***207 (Offset)***	Method 201A
PM2.5 / 10	***425 (Offset)***	***377 (Offset)***	Method 201A

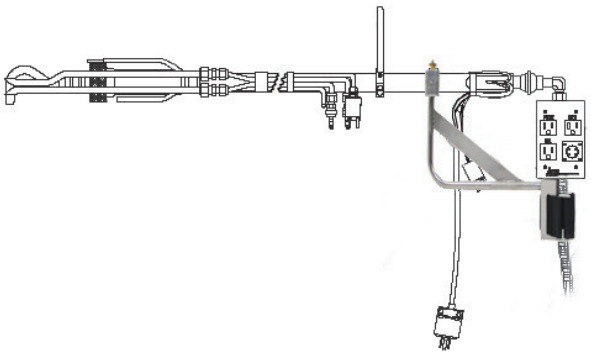


3/8" Quick Connects Available upon request.

GA-111 Strain Relief Adapter

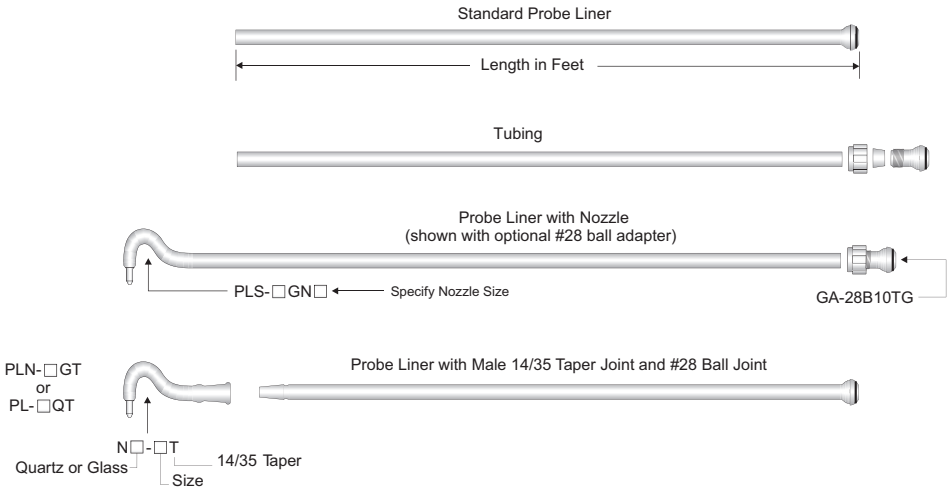
Probe to flexible sample line strain relief adapter.

Part#	Description
GA-111-S	1" Aluminum Clamp to Velcro
GA-111-12	1" Aluminum Clamp to 1/2" ID Clamp



PROBE LINERS

Our Standard Probe Liners are constructed from 5/8" diameter tubing and have #28 ball joint attached. Liners are available in borosilicate glass, quartz, stainless steel, Alloy 600, Hastelloy Alloy and PTFE Glass-filled; liners with integrated nozzles require a ball joint adapter. Glass and quartz liners with male 14/35" taper joint are available for attaching to the nozzle, eliminating the need for the 5/8" union.



Stainless Steel Probe Liner
28 ball Joint

Probe Liner Part Identification

PL□ - □ □ □-□

Joint Options
Blank = #28 O-Ring Groove
N = Unground #28 Ball Joint with O-Ring
S = Plain, No Ball Joint (Glass and Quartz Only)

Length In Feet
4 = 4 foot
6 = 6 foot
etc.

Liner Material
G = Borosilicate Glass
S = Stainless Steel
Q = Quartz
A = Inconel
C = Hastelloy

Special Options
T = Liner with Male tapper, 14/35
***N =**Liner with attached nozzle

Full Flow QC
Blank = No QC
QCF6 = 3/8Mx3/8MNPT Full Flow QC

Note:
Teflon and stainless Steel sold by the foot

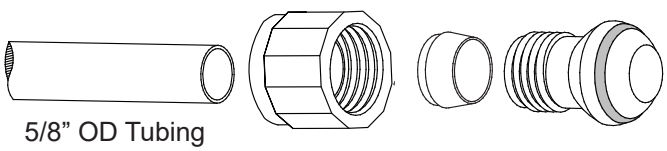
Ball Adapters

Part Number	Description
GA-28B10TG	PTFE Adapter Glass filled, 28mm Ball to 5/8 inch Tube Fitting, Straight Probe Liner Ball Adapter. Includes PTFE/glass nut, ferrule and Viton® O-Ring
GN-19	Glass Adapter, #28 Unground O-ring Ball to #22 Thread

Liner Tubing - Seamless, for use as probe liner (plain ends)

Part Number	Description
TPFA-10/6	Tubing PFA, 3/8 ID x 5/8 OD Heavy Wall
TS10-035S	Seamless 316 Stainless Steel Tubing, 5/8" OD x .035" Wall
TI10-035S	Seamless Alloy 600 Tubing, 5/8" OD x .035" Wall
TC276-10-049W	Seamless Hastelloy Alloy Tubing, 5/8" OD x .049" Wall

Tubing sold by the foot



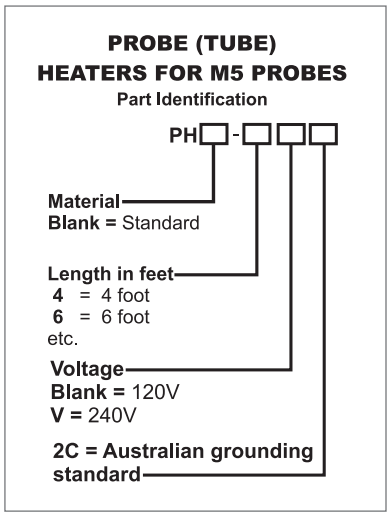
5/8" OD Tubing

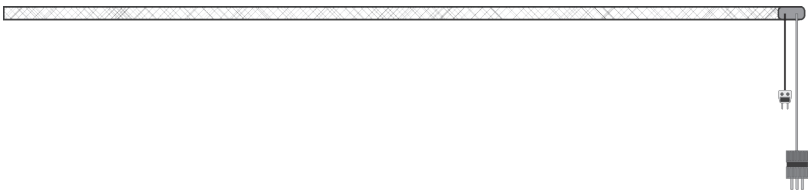
REPLACEMENT TUBE HEATERS

Method 5 Probe (Tube) Heaters

Features a tightly wound heating element around a rigid tube. The rigid tube design allows liner replacement without removing the heating element. Actual tube length is 2-3/8" less than liner length.

Apex probe heaters are designed to maintain the Method 5 specified temperature of 248°F (+/-25 Degree F). The maximum recommended exposure temperature is (260°C).High temperature (500°F) sources may require replacement of the standard heater with a shorter heater.





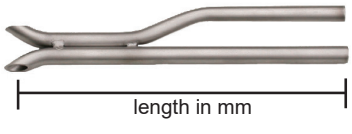
REPLACEMENT PITOT TIPS

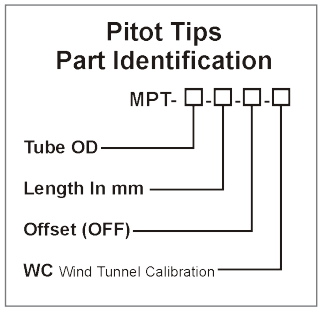
The unique design of the Apex Modular Pitot Tip reduces the collection of water droplets in the pitot lines. The lower tube is self-draining while the offset in the upper tube acts as a water trap.

'S' type pitots manufactured in accordance with U.S. EPA Reference Method 2 may be assigned a baseline coefficient of 0.84.

Includes Geometric inspection and documentation.

Wind tunnel calibrations are required per Method 201A.





3/8" Stainless Steel Modular Type S Pitot Tips

Pitot Length Chart

Product	Standard Pitot Length (mm)	Probe with Oversheath Pitot Length (mm)	Application
Probe Base	***181***	***133***	Method 5
SFA-47 Filter	***225 (Offset)***	***177 (Offset)***	Method 17
SFA-300	***320 (Offset)***	***272 (Offset)***	Method 17
SFA-2590	***308***	***260***	Method 17
PM2.5	***181 (Offset)***	***133***	Method 201A
PM10	***255 (Offset)***	***207 (Offset)***	Method 201A
PM2.5 / 10	***425 (Offset)***	***377 (Offset)***	Method 201A

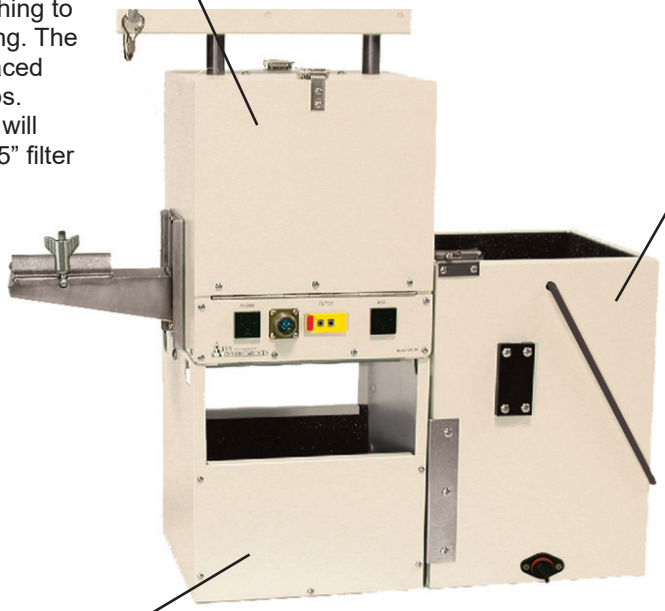
NOTE: Wind Tunnel Calibration Required for Method 201A

MODULAR SAMPLE CASE ASSEMBLIES

Apex Instruments Modular Sample Case Assemblies interchangeable design allows for the user to assemble any of our filter ovens, risers and impinger cases and configure them in a variety of configurations to suit the user's needs.

HEATED FILTER OVENS

Constructed of lightweight, powder-coated aluminum with insulated aluminum panels. Stainless steel hardware. Internal reinforcements reduce flexing when testing with long probes. Front and rear doors provide greater accessibility. The handle is designed for attaching to a monorail for easy traversing. The 1" probe clamp can be replaced with alternative probe clamps. All single probe filter Ovens will accept standard 2", 3", and 5" filter assemblies.

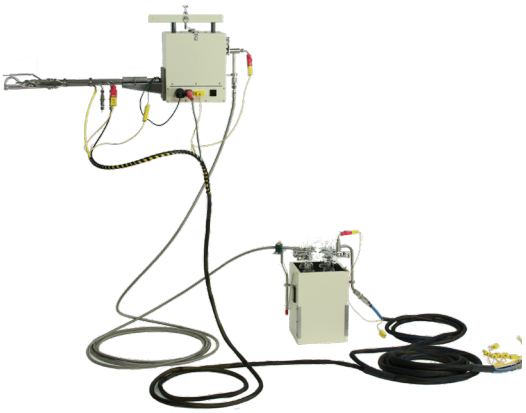


IMPINGER CASES

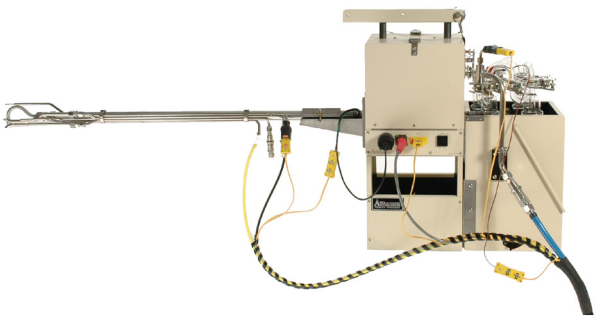
Impinger Cases are constructed from thicker aluminum (to reduce cracking), durable polyethylene foam insulation, and a pre-punched foam insert for holding the impinger bottles in place. There is a fold down handle with a rope centering guide and high strength brackets for mounting strain reliefs. The cases slide on and off the heated filter box for easy changing of the impingers between test runs. All cases are equipped with a spring-loaded latch to prevent accidental slippage.

RISERS

Sample Case Risers attach to the base of the filter oven for test methods requiring extra height between the filter outlet and the first impinger. The SBR-10 Riser is required for attaching the impinger case to the SB-2M for rigid arrangements.



Flexible Method 5 Configuration



HEATED FILTER OVENS

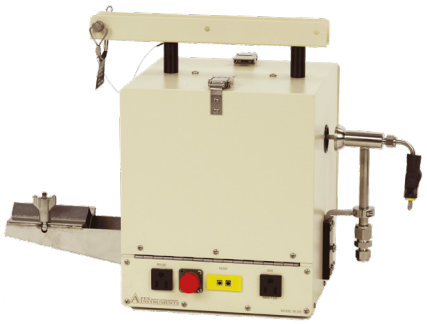
SB-2M MINIATURE HEATED FILTER OVEN

The SB-2M Miniature Oven and SB-2 Filter Oven will accept standard 2”, 3”, and 4” filter assemblies. SB-2M has two access doors and probe clamp; 120V/60 Hz standard. Dimensions: 13.5” x 9.5” x 9.5”, (34.3 x 24 x 24 cm), Weight: 10 lbs (4.5 kg). 500 Watt heater (750 watt option available)

SB-2M

SB-2M-V

Add “-V” to end of part number for 240V/50 at no extra cost.



SB-2M

Shown with GA-104 Strain Relief. *(Order Separately)*

STRAIN RELIEFS FOR SB-2M

The **GA-104** connects a 3/8” sample line to the filter exit of the SB-2M oven. Standard comes with #28 socket, thermocouple, and 1/2” to 3/8” reducing union.

GA-104

The **GA-107** strain relief is used for sample lines for the SB-2M during Flexible Method 5 sampling. Includes bracket that attaches to the SB-2M and standard mount with clamp.

GA-107- 9 3/8” Clamp

GA-107- 12 1/2” Clamp

(all sizes are Inside Diameter)
Strap recommended for larger sizes.

The **GA-113** strain relief is used specifically for heated sample lines for the SB-2M during Flexible Method 5 sampling. Includes bracket that attaches to the SB-2M and an adjustable Velcro® strap to grip heated sample lines.

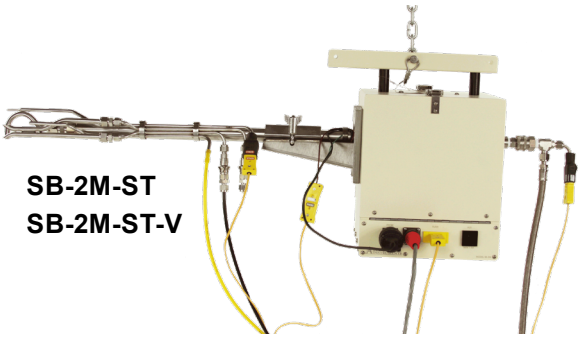
GA-113

SB-2M-ST STRAIGHT THROUGH HEATED FILTER OVEN

SB-2M-ST has two access doors and probe clamp.
The Apex SB-2M-ST is the SB-2M with the probe clamp raised so an in-line filter assembly can be used without the need for the cyclone bypass. In addition #28 Stainless Steel Socket with a 3/8” full flow quick-connect can be installed on the outlet. Accepts filter assembly GNFA-3-STR.
Dimensions: 13.5” x 9.5” x 9.5”, (34.3 x 24 x 24 cm), Weight: 10 lbs (4.5 kg) 120V/60 Hz standard.
500 Watt heater (750 watt option available)

SB-2M-ST

SB-2M-ST-V



SB-2M-ST
SB-2M-ST-V

STRAIN RELIEFS FOR SB-2M-ST

Stainless Steel #28 **Socket Adapter** with Full Flow 3/8” quick connect and Mounting Bracket, Used on SB-2M Straight Thru To Attach Sample Line.

GA-108

CLASSIC, FULL-SIZE HEATED FILTER OVEN

SB-2 has 2 access doors, probe clamp and has extra room for cyclone.
Dimensions: 23.5” x 9.5” x 9.5”, (60 x 24 x 24 cm),
Weight: 16 lbs (7.3 kg). 500 Watt heater (750 watt option available)

SB-2

SB-2-V

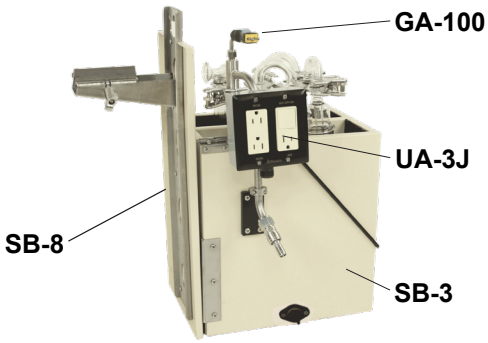
Add “-V” to end of part number for 240V/50 at no extra cost.

SB-2

MODULAR SAMPLE CASE FRAME

The Modular Sample Frame (SB-8) with Probe Clamp is an ideal addition for sampling methods that require no heated filter compartment such as Method 8, Method 306 and in-stack filtration methods. The SB-8 secures the probe and impinger case in a rigid manner. The sample frame is made of durable powder coated aluminum with stainless steel probe clamp and impinger case slides.

SB-8



POWER BOX ADAPTER

The UA-3J connects to umbilical 4-pin circular connector and provides power to three straight blade receptacles. Clamps to 1/2" sample line or GA-100 adapter. The UA-3J is used in conjunction with the Compact Method 5, Method 8, Method 17 and in other sampling situations in which power for the probe is not available due to the absence of a heated filter box.

UA-3J

UA-3J

UA-3J-V Adapter, Power, U-Cord, 3 receptacles, 220V Power Box Adapter, Includes 1/2 inch Mounting Clamp and 4 Pin Amphenol to 3 Receptacles.

UA-3J-V

UA-3J-V

PROBE CLAMPS

Model	Description
PC-1	Probe Clamp for 1 inch OD Probe Assemblies
PC-1-SB2M	Probe Clamp for 1 inch OD probe using a SB-2M Sample Box
PC-1VU	Vertical Probe Clamp for Up-Traverses, 1 inch Clamp
PC-1VD	Probe Clamp for Down-Traverse, 1 inch Clamp

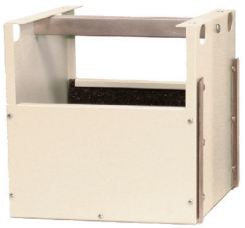
PC-1VD

PC-1-SB2M

RISERS

SBR-10 · Sample Box Riser. Riser for SB-2M, Impinger Box Adapter, 10” Riser with Insulated Reservoir

Model	Description	Dimensions (HxWxD)
SBR-10	10” riser	9.5” x 9.5” x 10” (24.1 cm x 24.1 cm x 25.4 cm)



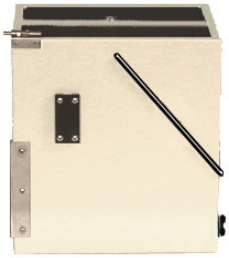
SBR-10

IMPINGERS CASES

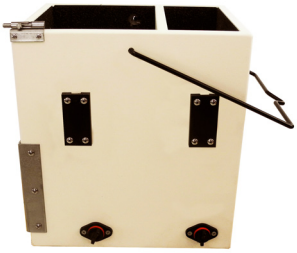
Apex offers four different removable Sample Box Impinger Cases (SB-3, SB-4, SB-4SD, SB-4SDM2 and SB-5). These cases are constructed from a thicker aluminum to reduce cracking, durable polyethylene foam insulation, and pre-punched foam insert for holding the impinger bottles in place, and have a fold down handle with a rope centering guide and two high strength brackets for mounting strain relief. The cases slide on and off the heated filter box for easy changing of the impingers between test runs. All cases are equipped with a spring-loaded latch to prevent accidental slippage

SB-3

SB-4



SB-4SD



SB-4SDM2

SB-5

Model	Impingers Held	Dimensions (HxWxD)	Weight
SB-3	4	9.5” x 9.5” x 13.5” (24.1 cm x 24.1 cm x 34.3 cm)	5 lbs (2.3 kg)
SB-4	6	12.5” x 9.5” x 13.5” (31.8 cm x 24.1 cm x 34.3 cm)	6 lbs (2.7 kg)
SB-4SD	2 + 2	12.5” x 9.5” x 13.5” (31.8 cm x 24.1 cm x 34.3 cm)	6 lbs (2.7 kg)
SB-4SDM2	4 + 2	12.5” x 9.5” x 13.5” (31.8 cm x 24.1 cm x 34.3 cm)	6 lbs (2.7 kg)
SB-5	8	16” x 9.5” x 13.5” (40.6 cm x 24.1 cm x 34.3 cm)	7 lbs (3.2 kg)

IMPINGER STRAIN RELIEF

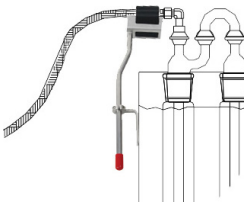
The GA-109 strain relief is used with sample lines at the impinger box when performing Flexible Method 5 sampling. Includes bracket that attaches to the impinger box and standard mount with sample line clamp (specify size).

GA-109-12

GA-109-S

GA-109-12

GA-109-S



UMBILICAL (GOOSENECK) ADAPTER

The GA-100 connects the final impinger outlet to the umbilical cable. Standard with #28 socket, thermocouple and 1/2” stainless steel male quick connect. Mounts on Impinger box.

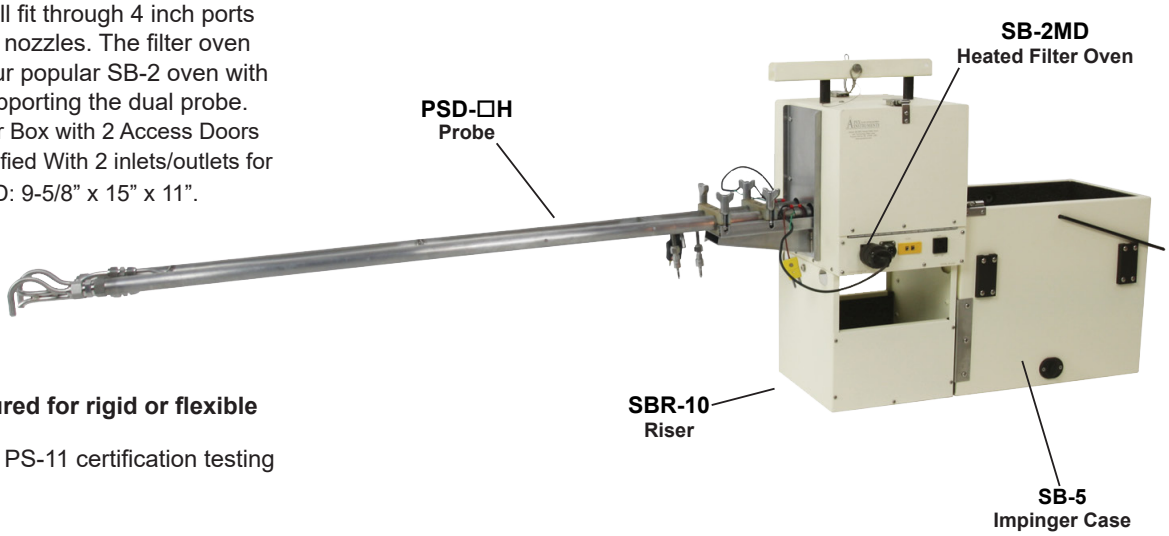
GA-100

GA-100

DUAL FILTER OVEN & DUAL PROBE

Improve precision and save time with our new Dual Modular Sample Cases and Probes for paired sampling. The filter oven accepts two standard 3” filter assemblies and the probe accepts standard liners and heaters. The probe will fit through 4 inch ports with standard button-hook nozzles. The filter oven is constructed similar to our popular SB-2 oven with extra reinforcement for supporting the dual probe. Miniature Dual Heated Filter Box with 2 Access Doors & Probe Clamp, 120V. Modified With 2 inlets/outlets for use with dual-probe. WxHxD: 9-5/8” x 15” x 11”.

SB-2MD

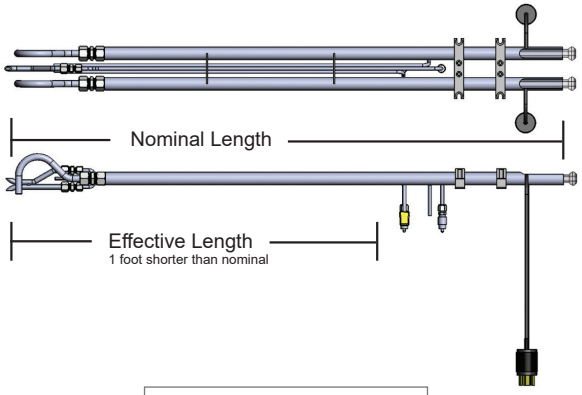


The oven can be configured for rigid or flexible arrangements.

- Highly recommended for PS-11 certification testing
- Method 5I and 26A

DUAL PROBE

The Apex Instruments Dual Method 5 Heated Probe features two 1” diameter sheaths constructed from corrosion resistant stainless steel, with the pitot, orsat line, stack & probe thermocouples running in-between the sheaths. The sheaths are welded together periodically down the length of the probe. The oven clamps securely to the probe with 4 swing bolts. Standard lengths are 3’ to 16’. Longer lengths and custom orders are available upon request. Order probe liners separately. Probes are ordered according to nominal (liner length). Effective length is one foot less than nominal length.



M5 Dual Probe Part Identification

PSD- ☐ - ☐ ☐ ☐ ☐

Length in Feet
4 = 4 feet
6 = 6 feet
etc.

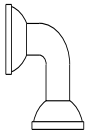
Alloy
(All Alloy Probes are non-modular Pitot)
Blank = Stainless Steel
A = Alloy 600 (Inconel)
B = Alloy 310 (Stainless Steel)
C = Alloy C276 (Hastelloy)

Heater
Blank = No Heater
H = Heater

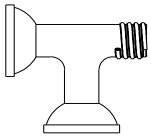
Pitot Quick Connect
Blank = 1/4” QC
QC6 = 3/8” QC

SPECIAL GLASSWARE FOR DUAL OVEN

Part #	Description
GN-8D	Glass “L” Adapter, #28 Unground Sockets
GN-8D-18	Glass “L” Adapter, #28 Unground Sockets, & #18 Thread for TC
GN-8D-18K	Double “L” Adapter with 6” Type K Thermocouple Assembly with 24” TC wire. Includes cap and seal



GN-8D

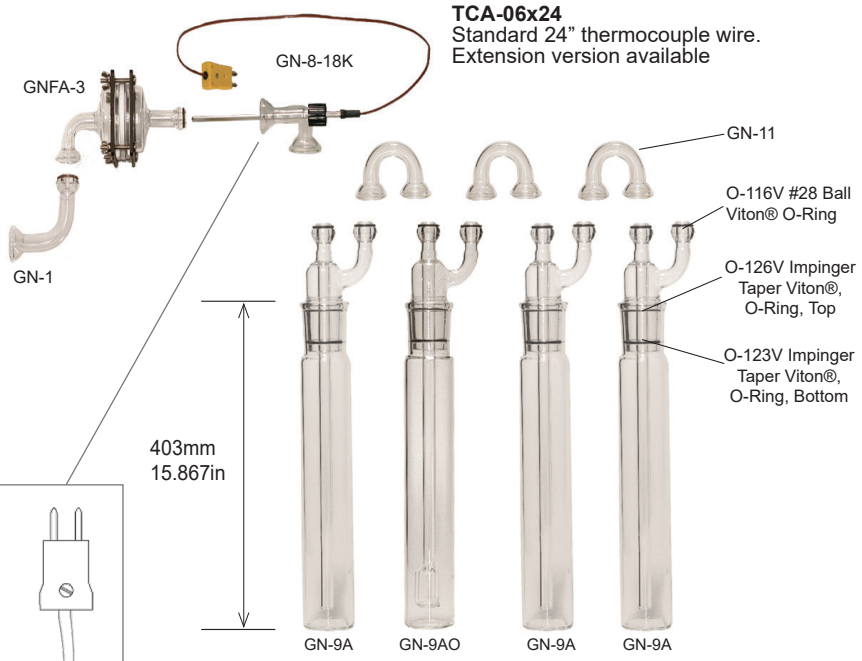


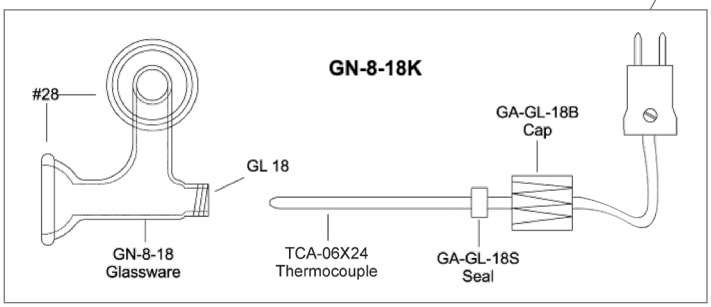
GN-8D-18

ISOKINETIC GLASSWARE SETS

BASIC GLASSWARE SETS

Apex Instruments offers a complete line of glassware. Our Standard Glassware features extra heavy borosilicate glass with unground #28 Ball and Socket Joints with O-Ring Seals. Cost effective unground joints are more durable than ground joints and the O-Rings provide a tight, leak-free seal without grease. This set includes all the glassware necessary for one train.





BASIC METHOD 5 GLASSWARE SETS

Model	Description
GN-CGS	***w/3" Filter Assembly***
GN-CGS-Z	***w/3" Filter Assembly*** w/OZ style Clamps
GN-CGS4	***w/4" Filter Assembly***

Basic
Method 5 Glassware

GN - CGS □ - □

Filter Assembly Size
Blank = 3 inch
4 = 4 inch

Clamp Option
Z = OZ Style Clamp

DELUXE METHOD 5 GLASSWARE SET WITH TRANSPORT CASE

DELUXE METHOD 5 GLASSWARE SET

The **Deluxe Method 5 Glassware Set with Transport Case (GN-DGS)** contains all the glassware plus spares for a full test series. Four filter assemblies cover three sampling runs plus one as a spare. Two full sets of impingers and U-Tubes permit a second run to be ready before recovering the first run results. The deluxe glassware set includes spare impingers, U-tubes and Double "L" adapters. The glassware set fits protectively into foam-lined custom pockets. The sturdy transport case is lockable for secure chain-of-custody.

Deluxe Method 5 Glassware Set

Model	Description
GN-DGS	w/ 3" Filter Assembly
GN-DGS-Z	w/ 3" Filter Assembly and OZ style clamps
GN-DGS4	w/ 4" Filter Assembly

Transport Case

Case Dimensions:
25" (63.5 cm) x 19" (48.2 cm) x 23" (58.4 cm)
Full Weight: 63 lbs. (29 kg.)
Empty Weight: 39 lbs. (18 kg.)

TC-GW2.5

Additional Glassware Transport Cases

Model	Can carry:
TC-10IMP	10 Impingers
TC-GW-F	4 Filters and accessories
TC-GWM202	M202 Glassware
TC-GW20I	20 Impingers

Deluxe Method 5 Glassware

GN - DGS ☐ - ☐

Filter Assembly Size
Blank = 3 inch
4 = 4 inch

Options
Z = OZ Style Filter Clamp

GLASSWARE FILTER ASSEMBLIES & COMPONENTS

2” FILTER COMPONENTS (55mm)

Model	Description
GN-2S	2” Glass Filter Inlet, #28 Unground Socket, 90 Degree Bend
GN-2B	2” Glass Filter Outlet, #28 Unground O-Ring Ball
GA-2CA	2” Aluminum Filter Clamp, Open Plate Style
GA-2T	2” PTFE Filter Support with Viton® O-Rings
O-138T	FEP Encapsulated O-Ring for GA-2T
O-138V	Viton® O-Ring for GA-2T
GA-2P	2” Nylon Filter Tripod
GN-2S-18	2” Glass Filter Inlet, #28 Unground Socket,90 Degree Bend

3” FILTER COMPONENTS (82.6mm)

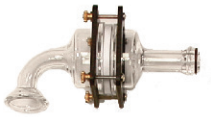
Model	Description
GN-3S	3” Glass Filter Inlet, #28 Unground Socket, 90 Degree Bend
GN-3SS	3” Glass Filter Inlet, Straight with #28 Unground Socket
GN-3S-18	3” Glass Filter Inlet, #28 Unground Socket, 90 Degree Bend #18 screw joint for Thermocouple
GN-3B	3” Glass Filter Outlet, #28 Unground O-Ring Ball
GA-3CA	3” Aluminum Filter Clamp, Open Plate Style
GA-3CZ	3” Single Thread Filter Clamp Assembly, OZ Style
GA-3T	3” PTFE Filter Support with Viton® O-Rings
GA-3SS	3” Machined Stainless Steel Filter Support Disk with Viton® O-rings, Accepts 82.6 mm filter
O-152T	FEP Encapsulated O-Ring for GA-3T
O-152V	Viton® O-Ring for GA-3T
GA-3G	3” Glass Filter Disk with Rubberized Edge
GA-3P	3” Nylon Filter Tripod

4” FILTER COMPONENTS (110mm)

Model	Description
GN-4S	4” Glass Filter Inlet, #28 Unground Socket, 90 Degree Bend
GN-4B	4” Glass Filter Outlet, #28 Unground O-Ring Ball
GA-4CA	4” Aluminum Filter Clamp, Open Plate Style
GA-4T	4” FEP Filter Support with Viton® O-Rings
O-156T	FEP Encapsulated O-Ring for GA-4T with Hollow Silicone Core
O-156V	Viton® O-Ring for GA-4T
GA-4P	4” Nylon Filter Tripod

2” Unground Glass, PTFE Filter Support, Open Style Aluminum Clamp.

GNFA-2

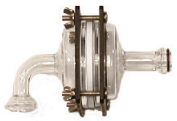


2” U-Style Unground Glass, with 90° inlet & outlet, PTFE Filter Support, Open Style Aluminum Clamp.

GNFA-2U

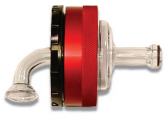
3” Unground Glass, PTFE Filter Support, Open Style Aluminum Clamp.

GNFA-3



3” Unground Glass Filter Support, OZ Style Threaded Filter Clamp.

GNFA-3Z

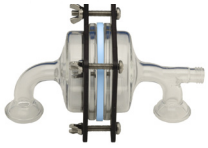


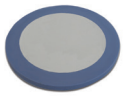
Open Style Aluminum Clamp, U-Style with 90° inlet and outlet, and #18 threaded joint.

GNFA-3U-18

Kit with Thermocouple Assembly.

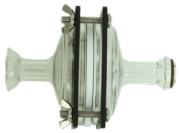
GNFA-3U-18K





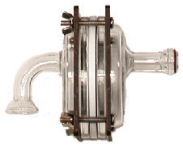
3” Unground Glass, PTFE Filter Support, Open Style Aluminum Clamp, Straight Through Style.

GNFA-3-STR



4” Unground Glass, PTFE Filter Support, Open Style Aluminum Clamp.

GNFA-4



4 inch Filter Assembly, Unground Glass, Poly Donut Spacer with TC assembly, Dual PTFE Frits, Open Style Aluminum Clamp.

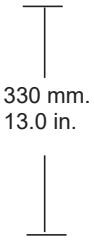
GNFA-4-5G

INDIVIDUAL GLASSWARE AND ACCESSORIES

Apex Instruments offers a complete line of glassware featuring Extra Heavy Borosilicate Glass with unground #28 ball and socket joints with O-Ring seals. Unground joints are more durable and price effective than ground joints and the O-Rings provide a tight, leak-free seal without grease. Standard GN-Series Glassware includes Unground O-Ring joints and double O-Ring 45/50 taper joints.

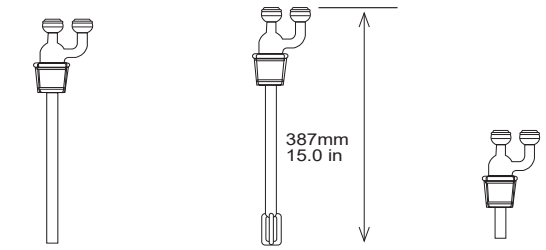
BOTTLES

Model	Description
GN-9B	0.5 liter, 330 mm x 57 mm
GN-9B-1	1.0 liter, 330 mm x 75 mm
GN-9B-1.5	1.5 liter, 330 mm x 100 mm
GN-9B-2	2 liter, 330 mm x 110 mm
GN-9B-4	4 liter, 330 mm x 140 mm
GN-9B-M7	Method 7 Bottle, 250 ml, accepts GN-9I. 330 mm x 38 mm



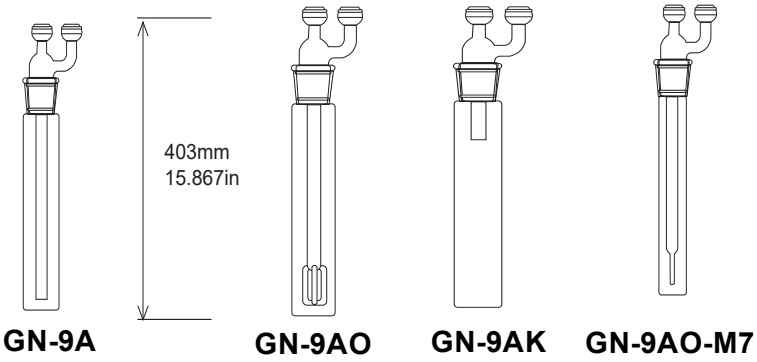
INSERTS

Model	Description
GN-9I	Modified Greensburg-Smith O-Ring balls (plain stem), unground taper joint with double O-Ring seals
GN-9IO	Greenburg-Smith (orifice stem), O-Ring ball, unground taper joint with double O-Ring seals
GN-9IK	Knock-out stem, O-Ring balls, unground taper joint with double O-Ring seals



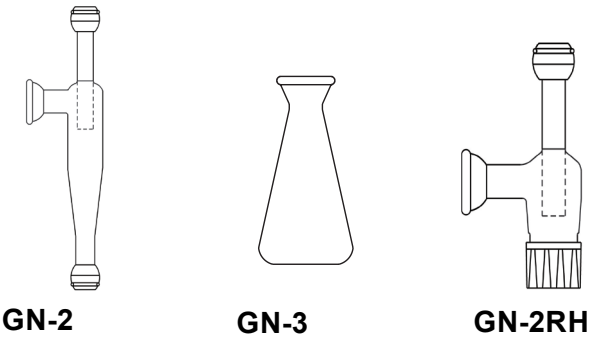
IMPINGER ASSEMBLIES (BOTTLES WITH INSERTS)

Model	Description
GN-9A	Modified Greenburg-Smith (plain stem), 500 ml
GN-9AO	Greenburg-Smith (stem with orifice and plate), 500 ml
GN-9AK	Knock-out (short stem), 500 ml
GN-9AO-M7	Method 7 (stem with restricted orifice), 250 ml



CYCLONES

Model	Description
GN-2	Cyclone Body, #28, unground socket and O-Ring ball
GN-3	Cyclone Flask, #28 unground sockets
GN-2RH-NC	Cyclone for Mini Hot Box, Reduced Height, includes PTFE-lined

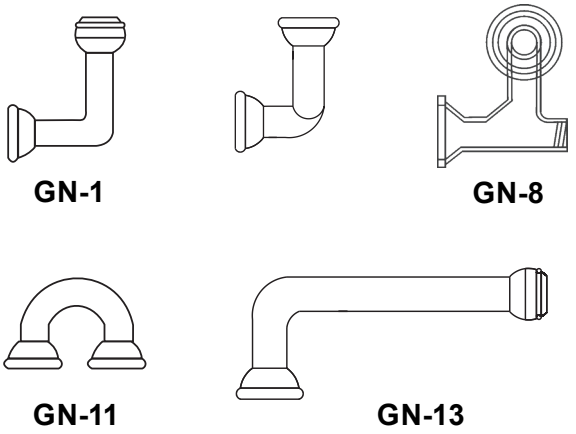


INDIVIDUAL GLASSWARE AND ACCESSORIES

All glassware is #28 unground with Viton O-rings, unless otherwise specified

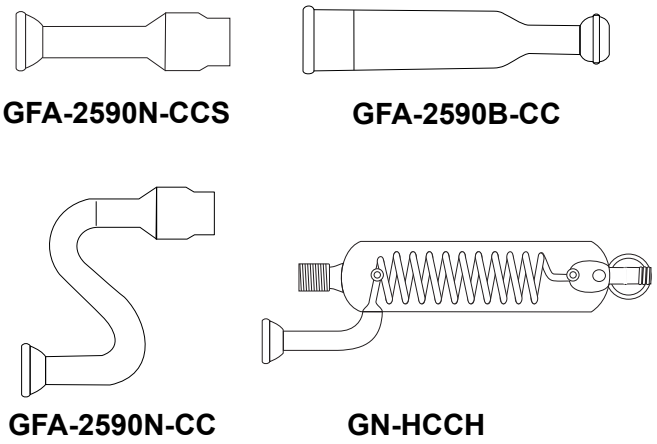
Connectors

Model	Description
GN-1	Cyclone Bypass, #28 unground socket and O-Ring Ball
GN-1-18	#18 Thread for TC (no cap or TC) (not shown)
GN-8	Double "L" cyclone bypass.
GN-8-18	Double "L" with #18 Thread for TC. Order cap and seal separately
GN-8-18K	Double "L" withType-K TC assembly, cap and silicone seal & sensor
GN-11	U-Tube, #28 unground sockets
GN-13	Filter By-Pass, #28 unground socket and O-Ring ball



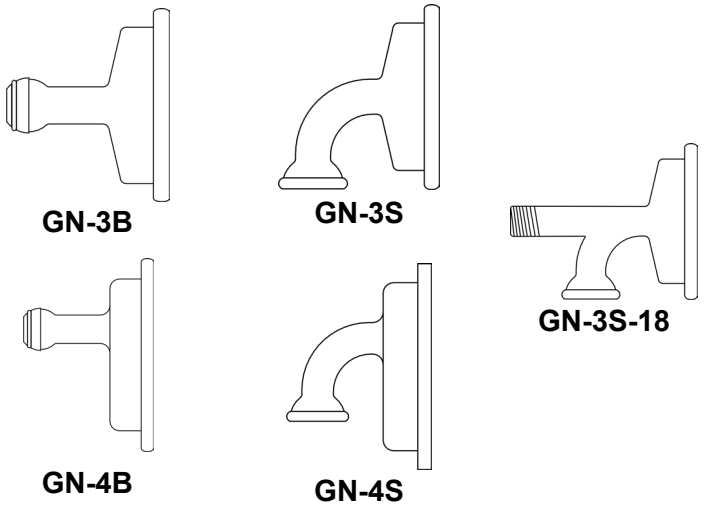
Controlled Condensate Glassware

Product	Description
GFA-2590N-CCS	GFA-2590 Insert Straight-Thru with Unground #28 Socket to Male Taper Joint, Connects directly to probe. Linear distance socket to taper start 2.5 inches
GFA-2590B-CC	Body for Controlled Condensate Method with ground #28 Ball on outlet.
GFA-2590N-CC	Insert with "S" Offset, Unground #28 Socket.
GN-HCCH	Horizontal Condenser for Controlled Condensate Sampling with #11 port for instering cartridge heater, #28 socket both ends, water jacket w/hose barbs, TC-well



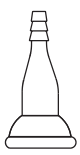
Filter Bells - Ins and Outs

Model	Description
GN-2S	2" Glass Filter Inlet, #28 Unground Socket, 90º bend
GN-2B	2" Glass Filter Outlet, #28 Unground O-ring Ball
GN-2S-18	2" Glass Filter Inlet, #28 Unground Socket, 90º Bend and #18 Thread
GN-3S	3" Glass Filter Inlet, #28 Unground Socket, 90º bend
GN-3SS	3" Glass Filter Inlet straight with #28 Unground Socket
GN-3S-18	3" Glass Filter Outlet, #28 Unground Socket, 90º Bend and #18 Thread
GN-3B	3" Glass Filter Outlet, #28 Unground O-ring Ball
GN-4S	4" Glass Filter Inlet, #28 Unground Socket, 90º bend
GN-4B	4" Glass Filter Outlet, #28 Unground O-ring Ball

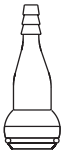


#28 Unground Adapters

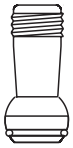
Model	Description
GN-18	socket to hose barb
GN-18B	Ball to hose barb
GN-19	Ball to #22 thread
GN-20B4	Ball to 1/4" tube
GN-20B6	Ball to 3/8" tube
GN-20B8	Ball to 1/2" tube
GN-20B10	Ball to 5/8" tube
GN-20S4	socket to 1/4" tube.
GN-20S6	socket to 3/8" tube
GN-20S8	socket to 1/2" tube
GN-20S10	socket to 5/8" tube



GN-18

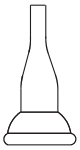


GN-18B



GN-19

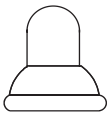
GN-20B☐



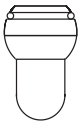
GN-20S☐

Plugs and Caps

Model	Description
GN-16	Cap (socket)
GN-17	Plug (ball)



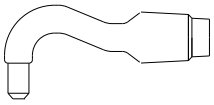
GN-16



GN-17

Method 17 Glassware - Instack Filter Assemblies

Product	Description
GFA-2590N☐	Nozzle Insert, Glass for GFA-2590 In-Stack Filter Assembly, Specify Nozzle Size (4 thru 20)
GFA-2590B	Filter Body, Glass, for GFA-2590 Filter Assembly, 5/8" shank



GFA-2590N

GFA-2590B

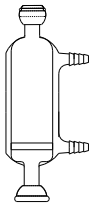
47mm glass filter inlet with integrated nozzle

Product	Description
G-47N-4	Nozzle I.D.1/8"
G-47N-5	Nozzle I.D. 5/32"
G-47N-6	Nozzle I.D. 3/16"
G-47N-7	Nozzle I.D. 7/32"
G-47N 8	Nozzle I.D. 1/4"
G-47N-9	Nozzle I.D. 9/32"
G-47N-10	Nozzle I.D. 5/16"
G-47N-12	Nozzle I.D. 3/8"
G-47N-14	Nozzle I.D. 7/16"
G-47N-16	Nozzle I.D. 1/2"

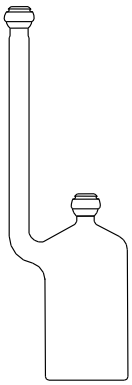
G-47N-☐

Method 23 Glassware

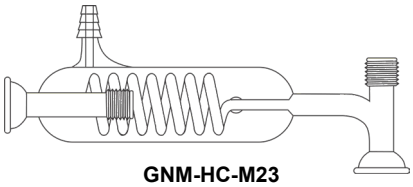
Product	Description
GN-9AKS	Knock-Out Impinger Assembly, Short Unground (for Horizontal MM5)
GNM-HC-M23	Horizontal Condenser, #28 Socket both ends, Water Jacket with Hose Barbs with two #18 GL joints for minotirng condenser inlet and outlet temperature.
GNM-T	XAD Trap, #28 Unground Socket & O-Ring Ball (Top), Water Jacket Hose Barbs.



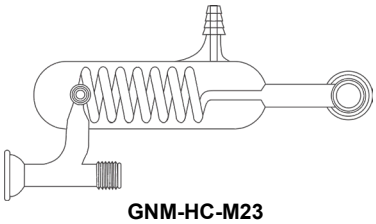
GNM-T



GN-9AKS



GNM-HC-M23
(Side View)

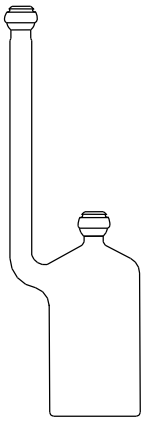


GNM-HC-M23
(Top View)

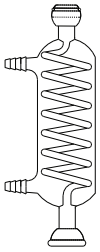
NOTE: THERMOCOUPLE MUST BE SECURED TO GLASSWARE VIA TAPE

Method 202 Glassware

Product	Description
GN-VCHM-M202	M202 Spiral Condenser, #28 Socket both ends Water Jacket Hose Barbs, High Moisture sources above 15%
GN-VC-M202	Vertical Condenser, #28 Socket and # 28 Ball, Water Jacket Hose Barbs, 5/8 Inner Cooler Core.
GN-9AKS	Knock-out Impinger Assembly, Short Body Long Arm, Unground, (for HorizMM5)
GN-3S-18	3 inch Glass Filter Outlet, #28 Unground Socket, 90 Degree Bend and #18 screw joint for TC
GN-9AKSA	Knockout Impinger Assembly - 24/40 Taper Unground (for Horizontal MM5) Included with Long Short Stems.



GN-9AKS



GN-VCHM-M202

GN-9AKS-PS

See Page 62 for Method 202 System and Accessories

GLASSWARE ACCESSORIES

Caps & Seals

Product	Description
GA-GL-18B	Bored Cap with hole, #18 threads
GA-GL-18C	Solid Cap without hole, #18 threads -PTFE Liner
GA-GL-18S	#18 Silicone Seal Ring, 6.5mm Hole Diameter
GA-GL-18T6	#18 Silicone Seal Ring- PTFE washer, fits 5.5mm to 6.5mm tubing
GA-GL-18T8	#18 Silicone Seal Ring - PTFE washer, fits 7.5mm to 8.5mm tubing
GA-GL-18/9	#18 Silicone Seal Ring, PTFE washer, fits 9 mm to 11 mm tubing

Ball Joint Clamps

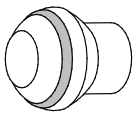
Product	Description
BS28WS	#28 Stainless steel ball joint clamp
KBS-29	Keck Clip, #29, plastic ball joint clamp

BALL AND SOCKET JOINT ADAPTERS

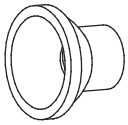
Glass-Filled PTFE

Apex offers Glass-Filled PTFE #28 Ball and Socket Adapters. Glass fiber filler is added to Virgin PTFE to improve the mechanical properties. Adapters are resistant to deformation under a heavy load and will significantly improve the performance of the seal during use.

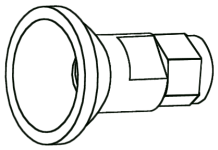
Glass-Filled PTFE #28 Ball to 1/4" FNPT
GA-28B4NTG



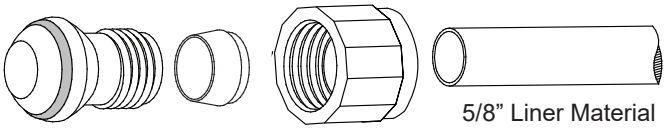
Glass-Filled PTFE #28 Socket to 1/4" FNPT
GA-28S4NTG



Glass-Filled PTFE #28 Socket to 3/8" Tube Fitting (Includes Nylon Nut & PTFE Ferrule)
GA-28S6TG



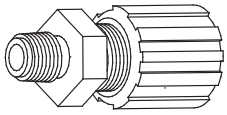
Glass-Filled PTFE #28 Ball to 5/8" Tube Fitting (Includes Nut, Ferrule and Viton® O-Ring)
GA-28B10TG



5/8" Liner Material

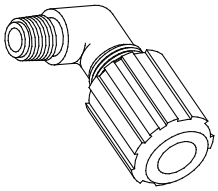
PFA Fittings

Apex offers both Straight and Elbow PFA Fittings with male 1/4" NPT for 1/4", 3/8" and 1/2" tubing. PFA (Perfluoro-alkoxy) fittings are chemically inert and highly corrosive resistant. Higher mechanical strength than PTFE at elevated temperatures (to 500°).



PFA Straight Connectors:

4MSC4N-PFA	1/4" Tube Fitting
6MSC4N-PFA	3/8" Tube Fitting
8MSC4N-PFA	1/2" Tube Fitting to 1/4" MNPT



PFA Elbow Connectors:

4MSEL4N-PFA	1/4" Tube Fitting
6MSEL4N-PFA	3/8" Tube Fitting
8MSEL4N-PFA	1/2" Tube Fitting to 1/4" MNPT

STAINLESS STEEL BALL AND SOCKET JOINT ADAPTERS

Apex Instruments offers Stainless Steel #28 Ball and Socket Adapters in a variety of sizes, used for connecting to rigid or flexible arrangements. The #28 Ball includes O-Ring (O-116V).

#28 Ball to 1/4" FNPT
GA-28B4N

Adapter, #28 Socket to 1/4" FNPT
GA-28S4N

Adapter, #28 Socket to 3/8" FNPT
GA-28S6N

#28 Socket to 3/8" Tube Fitting
GA-28S6

Custom sizes available upon request.

Stainless Steel Straight Adapter

4MSC4N-S	1/4" Tube Fitting to 1/4" NPT
6MSC4N-S	3/8" Tube Fitting to 1/4" NPT
8MSC4N-S	1/2" Tube Fitting to 1/4" NPT
10MSC6N-S	5/8" Tube Fitting to 3/8" MNPT

Stainless Steel Male Elbow Connector

4MSEL4N-S	1/4" Tube Fitting to 1/4" NPT
6MSEL4N-S	3/8" Tube Fitting to 1/4" NPT
8MSEL4N-S	1/2" Tube Fitting to 1/4" NPT
10MSEL6N-S	5/8" Tube fitting to 3/8" MNPT

STAINLESS STEEL IMPINGER SET AND ACCESSORIES

Stainless Steel Impinger Set feature stainless steel sport bottle with precision or custom fabricated press-in insert. Impingers are manufactured with #28 Ball and Sockets, 2-3/4" diameter and a 750ml capacity. Stainless Steel Impingers are interchangeable with glass impingers for many applications. This new design makes it easier to add ice to your impinger case.

Stainless Steel Impinger Set

Model	Description
SN-5C	Stainless Steel Impinger Assembly, #28 Socket & Ball, **Includes: Three** SN-9A, **One** SN-9AO, **Three** SN-11, **One** SN-8-4, **Twelve** BS28WS clamps**, Four** KST-45 Keck Clips.

Individual Stainless Steel Impingers & Connectors

Stainless Steel Greenburg Smith Impinger

Impinger assy, insert (304 ss) with bottle, straight stem, #28 balls (2), machined cap, #45 red keck clip, 750

SN-9A

Impinger tip inside SN-9A

Stainless Steel Orifice Impinger

SS impinger assy, insert (304 ss) with bottle, orifice stem, #28 balls (2), machined cap, #45 red keck clip, 750 ml capacity max

SN-9AO

Orifice impinger tip inside SN-9AO

Stainless Steel Impinger Bottle

Impinger, Bottle Only, 750ml, Stainless Steel

SN-9B

Stainless Steel Double "L" Connector

Double "L" with #28 Sockets and 1/4" Union for Thermocouple (TCA-6X24).

SN-8-4

Stainless Steel Socket & Elbow Adapter

#28 Socket 3/8" Elbow Tube Fitting and 1/4" Union

GA-28S4EL6

#28 Socket 1/4" Elbow Tube Fitting and 1/4" Union

GA-28S4EL4

Stainless Steel U-Tube Connector

U-Tube connector with #28 Sockets.

SN-11

SPLIT-BACK UMBILICAL CABLE

Split Umbilical Cables replace Standard Umbilical Cords for added versatility. They are constructed the same way as the Standard Method 5 umbilicals with the sample line and exit thermocouple split to 10 feet. Split umbilicals are useful in flexible systems when the filter compartment is separated from impinger box with a flexible sample line such as Method 17, Flexible Method 5 set-ups and Compact Method 5. The umbilical lengths are specified according to overall length and all have a 10 foot split. Stainless steel quick connects are standard.

Free Bag Included with Umbilical

Split Umbilical Cables

Model	Length
US-30-10	30' **
US-60-10	60' **
US-90-10	90' **

**Stocked

UMBILICAL CORD
Part Identification

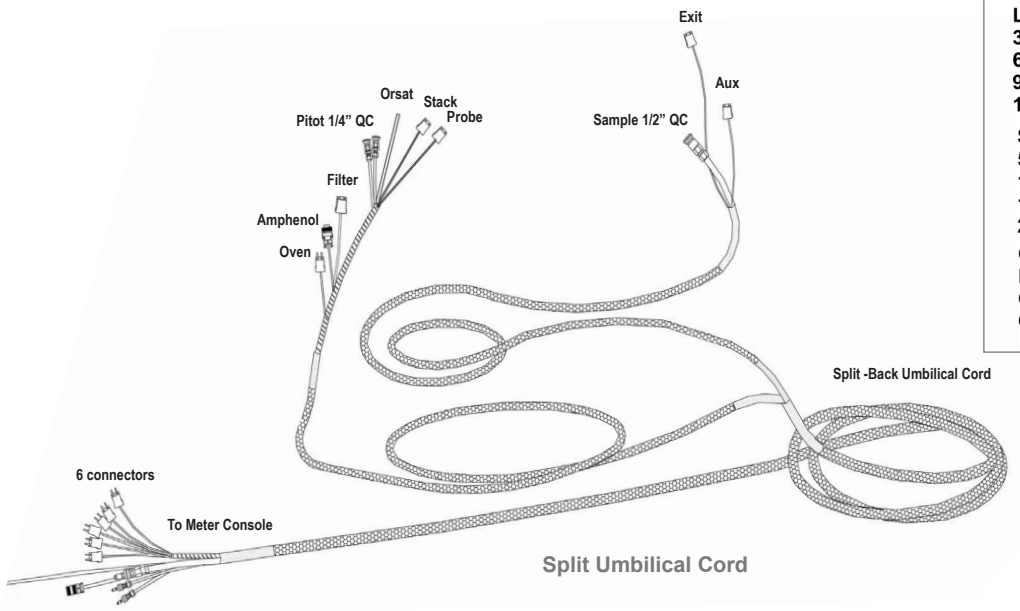
U□ - □ - □□

Design
Blank = Standard
S = Split

Length (ft.)
30ft
60ft
90ft
150ft

Split Length (ft.)
5ft
10ft (Standard)
15ft
20ft

Optional Pitot Connections
Blank = Standard (1/4" M&F QC)
QS6 = 3/8" Male & Female QC
QS6/4 = 3/8" Female 1/4" male



Split Umbilical Cord

UMBILICAL ADAPTERS

Power Box Adapter (UA-3J)

Connects to umbilical 4-pin circular connector and converts to three straight blade receptacles. Clamps to 1/2 inch sample line or GA-100 adapter. Used in Compact Method 5, Method 8, Method17 and in other sampling situations to provide probe power due to the absence of a heated filter box.

UA-3J

UA-3J-V

UA-3J

UA-3J-V

UMBILICAL ADAPTERS

Heated Filter Box Power Adapter (UA-FP)

Connects with male plug to the 4-pin circular connector on the filter oven and allows the oven to connect to a standard receptacle.

UA-FP

Heated Filter Box Power Adapter (UA-FP2)

Heated Filter Box Power Adapter, Includes one (1) 4 Socket Amphenol to two (2) Male Standard 120V Plugs.

UA-FP2

Probe Power Adapter (UA-HJ)

Connects to umbilical 4-pin circular connector and converts to a single female receptacle for the probe power.

UA-HJ

C14 to 5-15R

Power Cord Adapter, 16AWG, IEC male to 3 prong female. 1 foot.

M-C14-515R

C13 to 5-15P

Power Cord Adapter, 16AWG, IEC female to 3 prong male. 1 foot

M-C13-515P

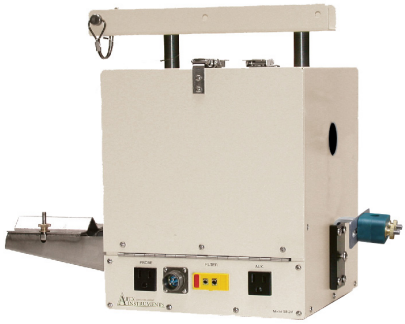
STRAIN RELIEFS

Mini Heated Filter Box Sample Line Strain Relief

The GA-107 strain relief is used with sample lines at the SB-2M during Flexible Method 5 sampling. Includes bracket that attaches to the SB-2M and standard mount with sample line clamp (specify size).

Part#	Description
GA-107-9	3/8", ID
GA-107-12	1/2" ID
GA-107-32	1-1/4", ID
GA-107-50	2", ID
GA-107-57	2-1/4", ID

GA-107-☐

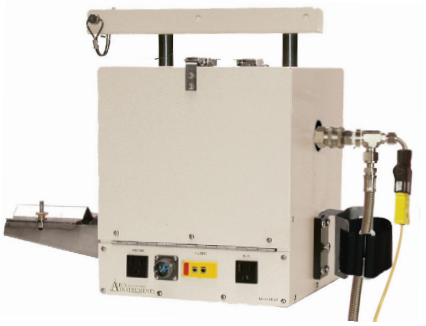


GA-113 Strain Relief Adapter

The GA-113 strain relief is used specifically with heated sample lines at the SB-2M during Flexible Method 5 sampling. Includes bracket that attaches to the SB-2M and an adjustable Velcro® strap to hold heated sample lines.

GA-113

GA-113

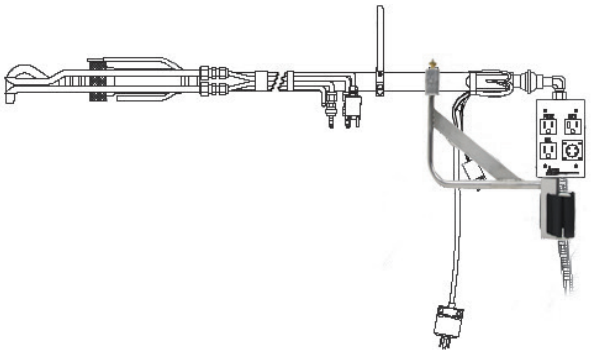


GA-111 Strain Relief Adapter

Probe to flexible sample line strain relief adapter.

Part#	Description
GA-111-S	1" Aluminum Clamp to Velcro
GA-111-12	1" Aluminum Clamp to 1/2" ID Clamp

GA-111-S



SELF-REGULATING HEATED SAMPLE LINES (JUMPERS)

Heavy Duty Self-Regulating Heated Sample Lines (HSL) are custom manufactured to be rugged, lightweight and flexible. The heater cable is self-regulating and can maintain a constant temperature of approximately 120°C over the entire length of the line. The sample lines comprise of replaceable 3/8" PFA tubing and are also available in 1/4" configuration. The heated core is insulated with inner braided sheathing. The bundle is protected by a tough high temperature silicone coated fiberglass sleeving. The outer sheath acts as a conduit for the inner tubing, allowing for easy and fast replacement of the sample lines and heater cable. The sample line will be swage locked onto sampling receptacles or quick connects.

HSRLB-□-□-□

HSRLB-□-□-□

Self-Regulated Heated Sample Lines (Jumpers)

Part#	Length
HSRLB-6-6	6 Ft.
HSRLB-6-10	10 Ft.
HSRLB-6-20	20 Ft.
HSRLB-6-25	25 Ft.

Add "-V" to end of Part Number for 240V Power

SELF REGULATING HEATED SAMPLE LINE
Part Identification

HSRLB - □ - □

Tubing Core Information
4 = 1/4 Inch
6 = 3/8 Inch
8 = 1/2 Inch
64 = 3/8 Inch & 1/4 Inch

Custom Configurations Are Available

Length in Feet

UNHEATED SAMPLE LINES

Unheated Sample Line jumpers are used between the filter and the first impinger in "flexible" sampling arrangements. Jumpers are available in various lengths and configurations. Stainless steel overbraid 3/8" ID PFA tubing is standard.

Part#	Length (feet)
USL-10-SST	10'
USL-15-SST	15'
USL-25-SST	25'

USL-□-SST
Connects to the SB-2M

Part#	Length (feet)
USL-10-QST	10'
USL-15-QST	15'
USL-25-QST	25'

USL-□-QST
Connects to the SFA-82H

Part#	Length (feet)
USL-10-SS	10'
USL-15-SS	15'

USL-□-SS
Connects Probe Liner to Impinger

UNHEATED SAMPLE LINE
Part Identification

USL-□□

Length in feet
10 = 10 foot
15 = 15 foot
etc.

Options For Inlet
SS = GA-28SEL6
(#28 Socket Elbow Both Ends)
SST= GA-28S4EL6
(#28 Socket Elbow one End and #28 Socket Elbow with TC)
QST = SFA-82-QCF6
(#28 Socket Elbow one End and Full Flow QC with TC

METHOD SPECIFIC SAMPLING KITS

Apex Instruments Method Sampling Kits are designed to take the guess work out of assembling all the components you need to perform method specific sampling. Method specific kits do not include your meter console or pump which must be chosen separately. Your method specific kit can then be added to these components to create an entire sampling system for any specific method. Please keep in mind that some of our method kits only consist of attachments that need to be added to other kits to convert it to a sampling kit for a different method

To select your METER CONSOLE (see page 10-17)
To select your SAMPLE PUMP (see page 18)

Method 5
Particulate Emissions from Stationary Sources

Method 5I
Determination of Low-Level Particulate Matter Emissions from Stationary Sources

Method 8
Determination of Sulfuric Acid Mist and Sulfur Dioxide

CTM-13
Controlled Condensate Alternative to Method 8

Method 17
Particulate Emissions by In Stack Filtration

Method 23
Determination of Dioxins and Furans from Stationary Sources

Method 26A
Hydrogen Halide and Halogen Emissions

Method 29
Metal Emissions (Multiple Metals)

Method 201A
Particle Sizing

Method 202
Condensable Particulate

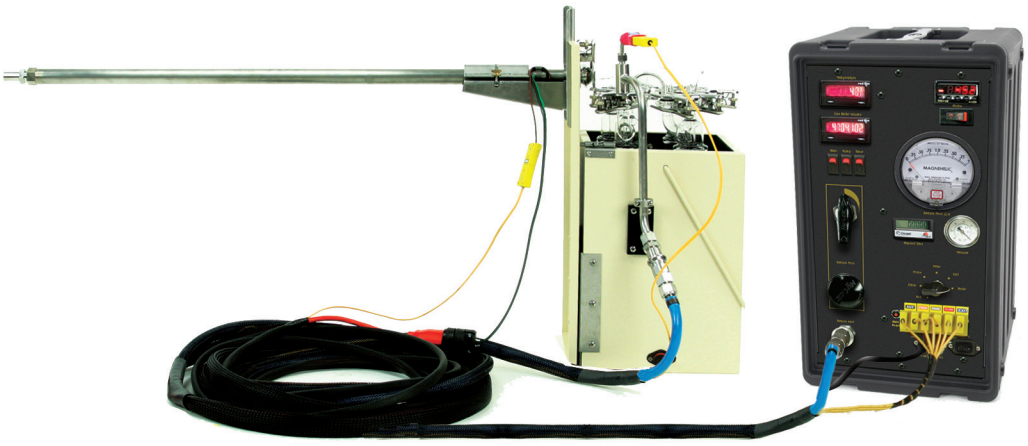
METHOD 4 SAMPLING KIT

Method 4 Determination of the Moisture Content of Stack Gas Summary: Stack gas is extracted at constant rate (less than 21lpm) and a minimum volume of 600 liters. Water vapor is condensed from the sample stream, and measured volumetrically or gravimetrically.

The Method 4 kit includes a probe, glassware, u-cord and parts to be able to build both the rigid and flexible arrangements.

SK-M4

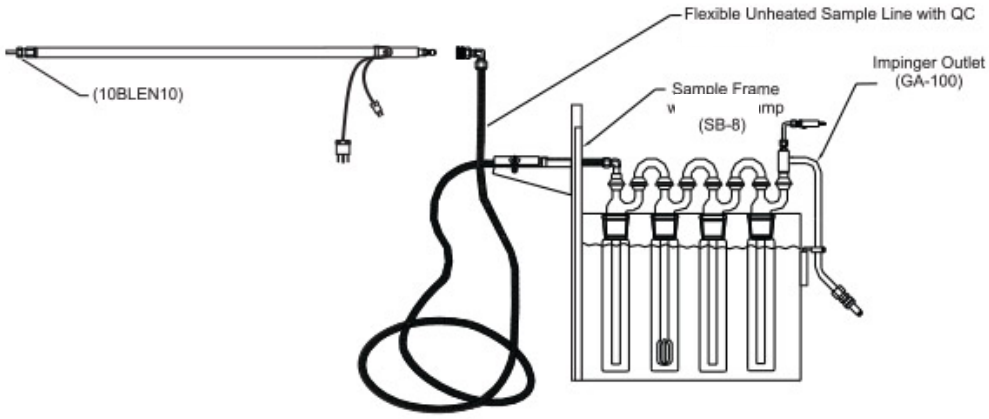
SK-M4-V



XC-41

XC-41

METHOD 4 SAMPLING KIT



Flexible Method 4 Arrangement

METHOD 5 SAMPLING TRAIN

To get started sampling for particulates (U.S. EPA Reference Method 5), Apex recommends a combination of equipment that can be configured for both rigid and flexible set-ups. We have the knowledge and experience to help you build a kit that will best suit your needs.

We can build a kit around equipment you already own and will give you everything you need for all applicable methods. Our equipment conforms to industry standards and is compatible with almost all competitors' products.

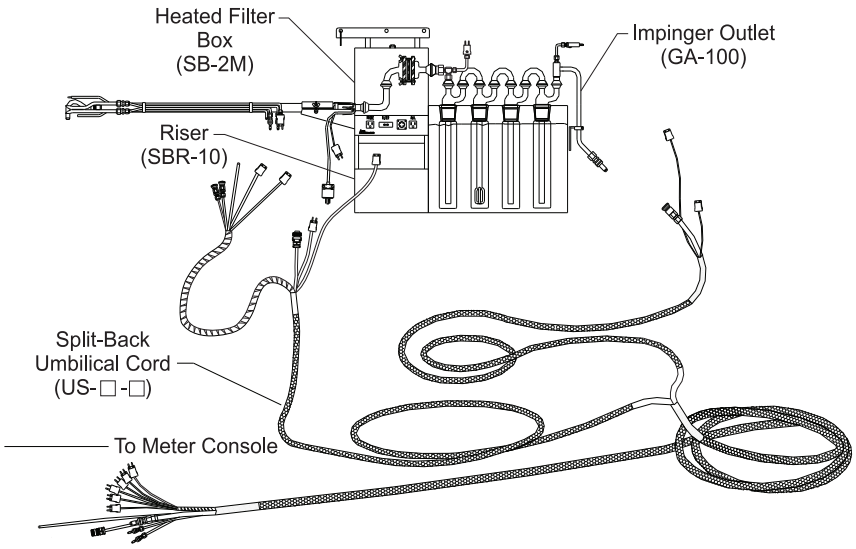
Add "-V" to end of part number for 240V option at no additional cost.

SK-M5BP Basic Kit

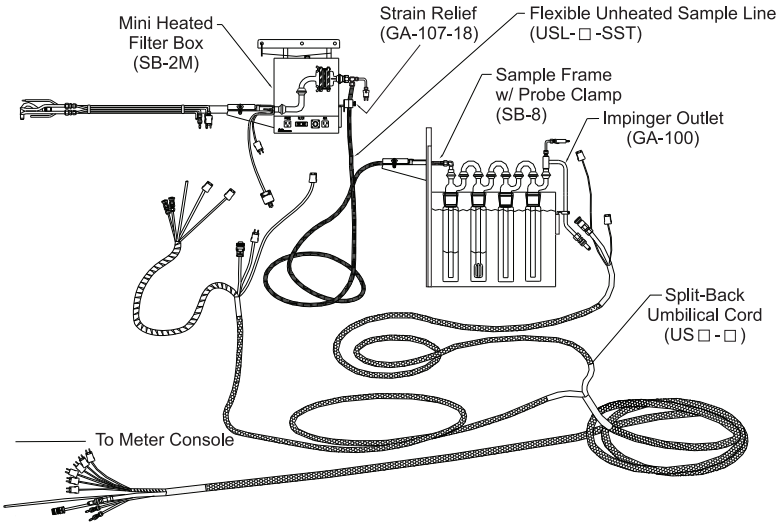
SK-M5BP-V 240V Version

SK-M5DP Deluxe Kit

SK-M5DP-V 240V Version



Schematic of Method 5 Rigid Sampling Train



Schematic of Method 5 Flexible Sampling Train

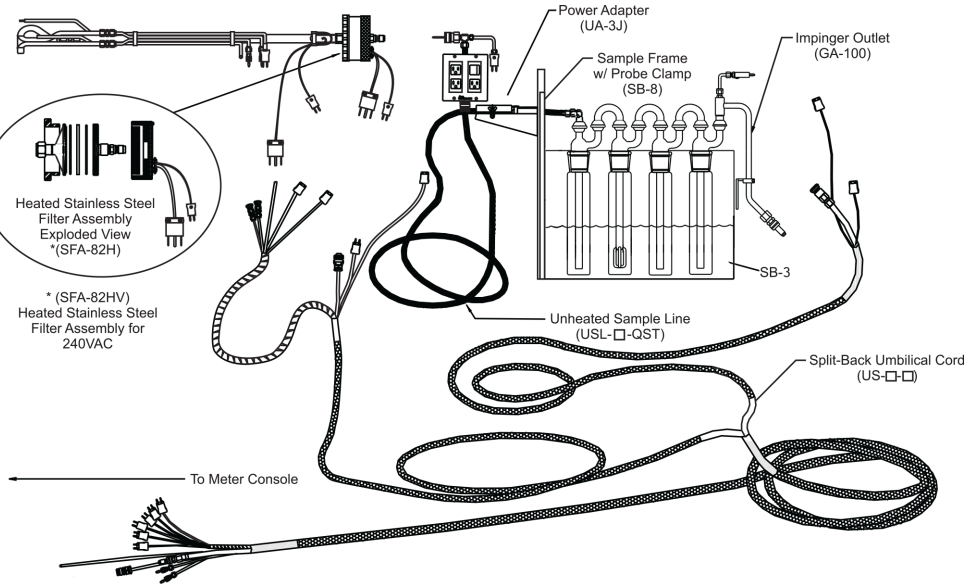
COMPACT METHOD 5

The Apex Compact Method 5 Sampler Kit features an independently Heated Stainless Steel Filter Assembly (SFA-82H) that connects directly to a standard Method 5 probe. It does not require a separate heated filter compartment, and utilizes a flexible sample line, and a split umbilical cord with power adapter, to allow sampling in space-limited areas. The standard glass impingers have been replaced with Stainless Steel Impingers (SN-5C) to eliminate the possibility of glass breakage. Three filter assemblies are recommended to speed up the turn around time between consecutive runs.

Add "-V" to end of part number for 240V option at no additional cost.

SK-CM5

SK-CM5-V



Schematic of U.S. EPA Method 5 Compact Sampling Train

STAINLESS STEEL HEATED FILTER ASSEMBLY

The Apex Instruments Heated Stainless Filter Assembly (SFA-82H) is for sampling particulates from space-limited industrial sources. The filter assembly has a two piece threaded clamping ring with an integral 300 watt ring heater . A Viton® O-Ring seals the 82.6 mm filter and prevents sample bypass. It has stainless steel inlet & outlet, with a PTFE filter support screen (GA-3T). The inlet plate comes with a 5/8" tube union for swaging directly to a 5/8" probe liner. The outlet plate has 3/8" female NPT connection and a male 3/8" full flow quick connect. The mating female quick connects with the thermocouple, which is supplied with the Unheated Sample Line (USL-□-QST) or may be ordered separately (SFA-82-QCF6). There is a thermal insulating blanket supplied with each unit. An unheated version is also available without the integral heater and blanket.

Add "V" to end of part number for 240V at no extra cost.

SFA-82 (unheated)
Unheated 82 mm Stainless Steel Filter Assembly, Inlet: 5/8" Tube Union, Outlet: 3/8" FNPT and Full Flow Male Quick Connect

SFA-82H
Heated 82 mm Stainless Steel Filter Assembly, Inlet: 5/8" Tube Union, Outlet: 3/8" FNPT and Full Flow Male Quick Connect, Insulated Blanket, 300 watts/ 120V

SFA-82HV (240V)

SFA-82-QCF6
Outlet Adapter for SFA-82. Full Flow QC to 3/8in Tube Fitting. Includes Filter Outlet Thermocouple

SFA-82-BKT (replacement)
Insulated Blanket, 300 watts/120V

Male or Female Type K Thermocouple Standard

SFA-82H
(Blanket Included)

SFA-82-BKT

SFA-82-QCF6

METHOD 5G

Method 5G Determination of Particulate Matter Emissions from Wood Heaters (Dilution Tunnel Sampling Location). The exhaust from a wood heater is collected with a total collection hood, and is combined with ambient dilution air. Particulate matter is withdrawn proportionally from a single point in a sampling tunnel and is collected on two glass fiber filters in series. **Components Include:** 4" Filter Assembly, Unground Glass #28 Ball/Socket, Poly Donut Spacer with Thermocouple Assembly, Dual PTFE Filter Supports and Open Style Aluminum Clamp.

GNFA-4-5G

GNFA-4-5G

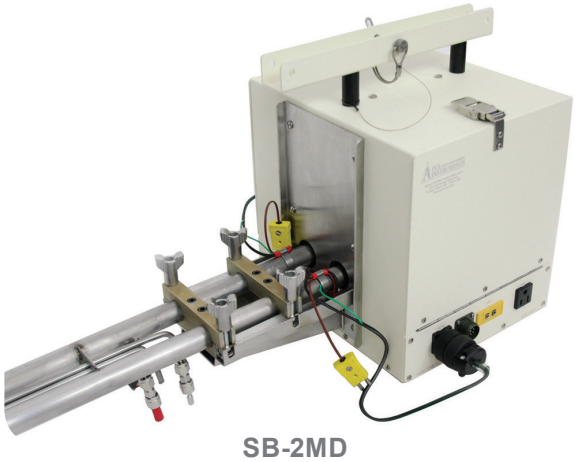
METHOD 5I

Method 5I Sampling is similar to Basic Method 5, but it replaces the filter with the 5I Holder (SGFA-47-5I) and is designed for the determination of low-level particulate matter (PM) emissions from stationary sources. Method 5I is most effective for PM catches less than 50 mg and is valid for performing correlation of manual PM measurements to PM continuous emission monitors or determining PM emissions from low-level sources such as turbines. After selecting a Method 5 Meter Console and an external sample pump in conjunction with a Method 5 kit, simply add a SGFA-47-5I Method 5I Holder to complete the needed parts to peform Method 5I.

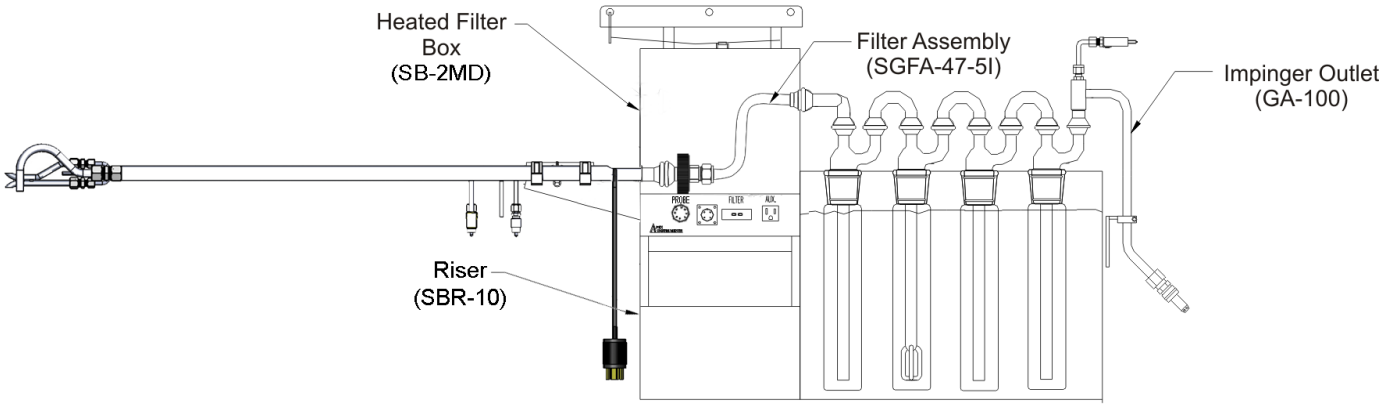
The 5I Filter Holder inlet is constructed of Borosilicate Glass to hold a 47mm glass fiber filter with a wafer-thin stainless steel filter support and a Viton® O-Ring. The assembly is wrapped with PTFE tape for weighing, averaging less than 35 grams, providing a positive seal against leakage. Method 5I 47mm Filter Assembly with Glass Inlet & SS Outlet, has two 90 degree bends.

SGFA-47-5I

SGFA-47-5I

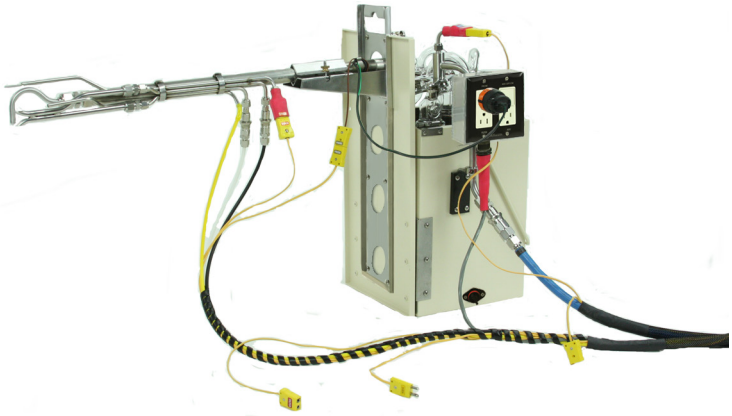


SB-2MD



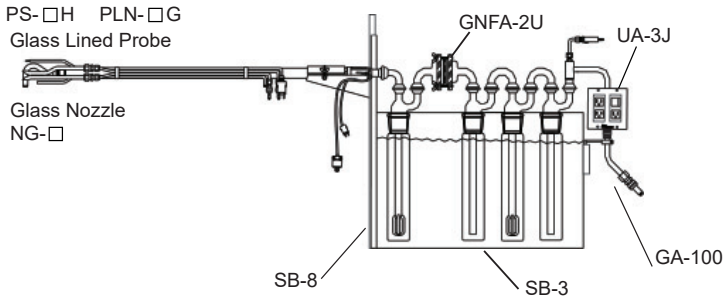
METHOD 8

The Method 8 Sampling Kit is used with either the XC-522 or XC-572 Meter Console and an external sample pump for the determination of sulfuric acid mist and sulfur dioxide emissions from stationary sources. U.S. EPA Reference Method 8 was originally developed to test emissions from sulfuric acid plants but has been adapted to sample emissions from many sulfur dioxide sources. *Call for details on Flexible Arrangements. Add "V" to end of part number for 240V at no extra cost.*



ADD FOLLOWING ITEMS TO EXISTING METHOD 5 SYSTEM TO PERFORM METHOD 8

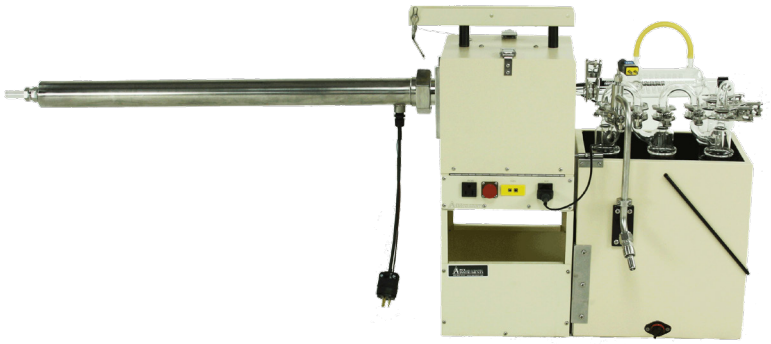
Part	Description
SB-8	Sample Frame with Probe Clamp
UA-3J	Power Box Adapter
GNFA-2U	2" Filter Assembly, Unground Glass with 90° Inlet and Outlet, Open Style Alum Clamp



Schematic of EPA Method 8 Sampling Train

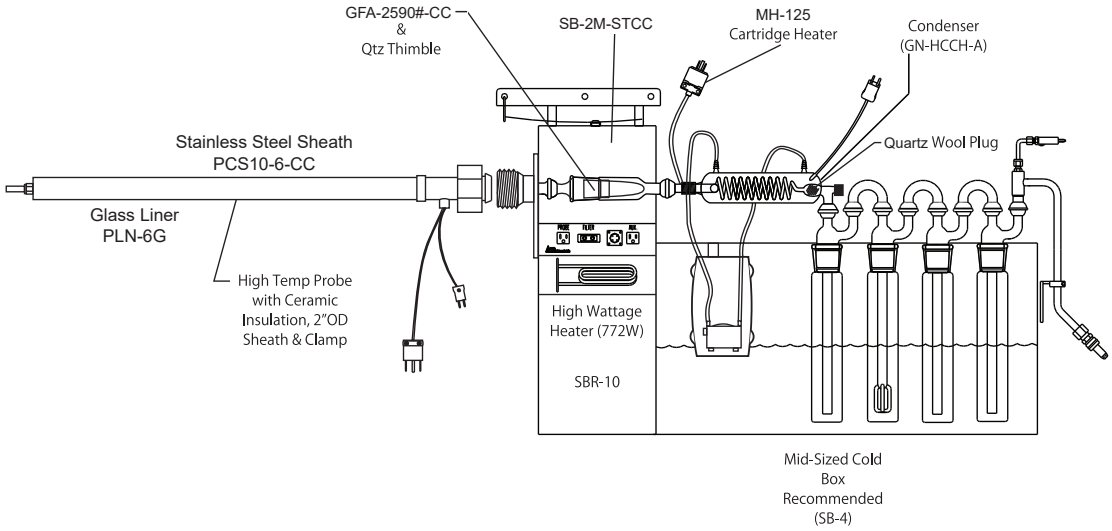
CONTROLLED CONDENSATE

Conditional Test Method CTM-13



Controlled Condensate is an alternative to EPA Method 8 for determining sulfuric acid emissions. Sulfuric acid vapor or mist and the sulfur dioxide are separated by controlling the condensation based on difference in dew points, and both fractions are measured separately by the barium-thorin titration method. Controlled condensation method is the primary sampling and analytical tool for quantifying sulfuric acid emissions from stationary sources. The method is based upon the selective condensation of sulfuric acid from a gas stream by means of a water cooled condenser. The major advantage of the condensation method is that it provides reliable reproducible SO3 and SO2 values with minimal interference from high SO2 concentrations. There are several versions of the method.
Option "-V" is added for 240V.

SK-CC
SK-CC-V



Horizontal Condenser CCS Assembly

Horizontal Condenser, CCS, Assembly #28 Controlled Condensate Sampling with #11 port for cartridge heater, with Heater and TC assembly, #28 Socket both ends, Water Jacket w/Hose Barbs, TC-well and # 15 Solid Cap.

GN-HCCH-A

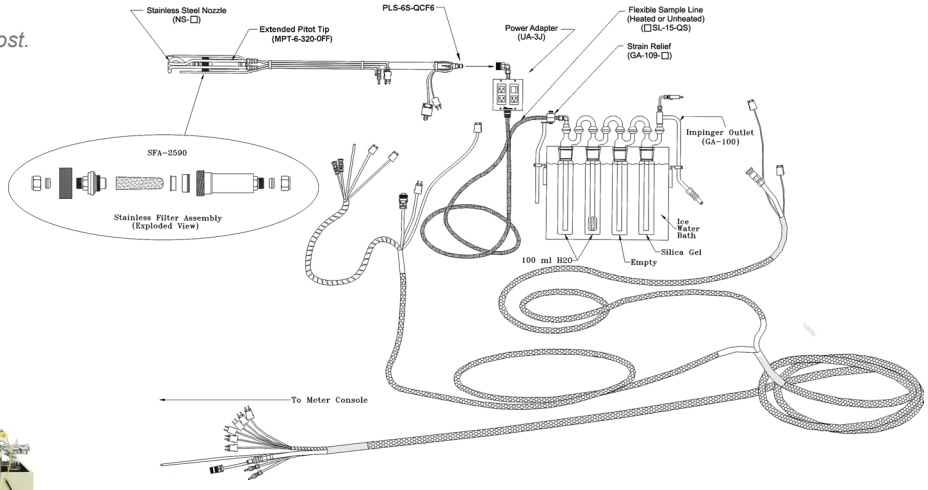
Model	Description
GN-HCCH	Horizontal Condenser for Controlled Condensate
7506-02	3/8" ID Bushing with ACE#11 Thread and O-Ring
11710-11	9.5mm PTFE Ferrule with ACE#11 Thread
GA-15C	Solid Screw Cap with #15 Threads and Seal
MH-125	3/8" Diameter Cartridge Heater for GN-HCCH, 6" Length
TCA-24T	24" Flexible, Type K Thermocouple Assembly

METHOD 17 PLUS (RIGID & FLEXIBLE)

The Apex Instruments Method 17 Sampling Kit is a convenient package for sampling particulate matter. Multiple fitting arrangements and filter assemblies are available with an in-stack filter.

Add "-V" to end of part number for 240V at no extra cost.

SK-M17
SK-M17-V



METHOD 17 IN-STACK FILTER ASSEMBLIES

In-Stack Filter Assembly, 5/8" Tube Union, uses a 47mm Diameter Filter Element. SS
SFA-47 (Stainless Steel)

In-Stack Filter Assembly, 5/8" Tube Union, uses a 47mm Diameter Filter Element.
SFA-47INCO (Alloy 600)

In-Stack Filter Assembly, 5/8" TU, uses 25mm x 90mm Thimble Filter Element.
SFA-2590

In-Stack Filter Assembly, 5/8" Tube Union, uses 30mm x 100 mm Thimble Filter Element.
SFA-300

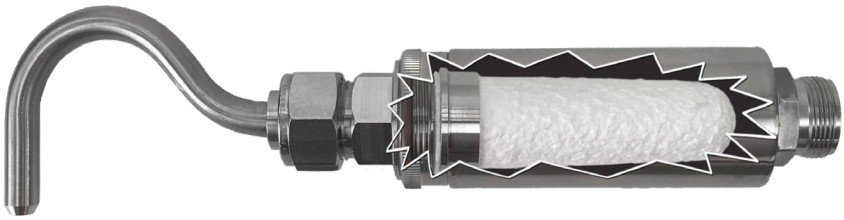
Replacement Seals

Part	Description
O-128V	Viton® O-Ring for SFA-2590 (450 °F)
O-324S	Silicone O-Ring for SFA-300 (500 °F)
O-324G	Graphite O-Ring for SFA-300 (1000 °F)
O-324V	Viton® O-Ring for SFA-300 (500 °F)
O-223V	Viton® O-Ring, 47 mm for SFA-47 (450 °F)
O-223H	High Temperature Stainless Steel O-Ring for SFA -47
SF-TT20	PTFE Thrust Ring for SFA-47 Filter Assembly
SFA-47SS	Screen, Filter Support, 47mm Stainless Steel
SFA-47RFG	Filter Ring Guard

(Nozzles not included)

See Page 26 for Modular Pitot Tip Options

SFA-2590 Enhanced Design Cutout



Compared to the original, the enhanced SFA-2590 model is 50% lighter and has a reduced diameter which means less blockage of the stack by about 2 square inches per traverse point. The enhanced model accepts PTFE (GF-2590T), Quartz Silica (GF-2590Q) or Borosilicate Micro-Fiber (GF-2590) filter and requires a MPT-6-308 pitot tube.

INTEGRATED IN-STACK FILTER ASSEMBLY KIT

The SGFA-47NK In-Stack Filter assembly kit features the unique design combination of borosilicate glass 47mm filter inlet with integrated nozzle, allowing the option to weigh the glass fiber filter media individually for Method 17 or very similar to Method 5I by weighing the combined nozzle & filter media with a support, O-Ring and PTFE Tape. The kit includes the standard array of seven nozzle sizes from 1/8” to 1/2”.

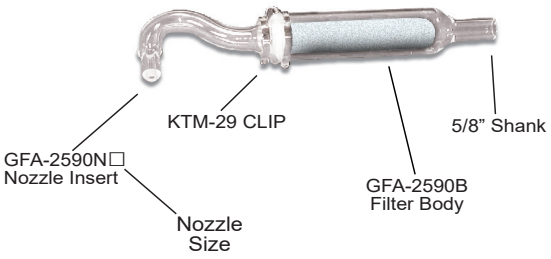
SGFA-47NK

Product	Nozzle I.D.
G-47N-4	1/8”
G-47N-5	5/32”
G-47N-6	3/16”
G-47N-7	7/32”
G-47N-8	1/4”
G-47N-10	5/16”
G-47N-12	3/8”
G-47N-14	7/16”
G-47N-16	1/2”

Filter Inlet 47 mm Glass Filter Inlet with Integrated Nozzle.
Replace □ with nozzle diameter.

GLASS IN-STACK FILTER ASSEMBLIES

The Apex Instruments GFA-2590 Thimble Holder is constructed completely from borosilicate glass for use with Conditional Method for Ammonia (CTM-027) and accepts tapered 25 x 90mm thimbles, specifically manufactured for stack sampling. Does not require O-Rings or grease, for testing at higher temperatures. The borosilicate glass withstands temperatures up to 480°C (900°F).



In-Stack Thimble Holder Kit - Includes a selection of the seven most commonly used nozzle inserts from 1/8” to 1/2” and one housing. Kit is conveniently packaged in a foam-lined carrying case for protection. The thimble holder connects directly to the end of the probe with a 5/8” tube union and soft ferrules.

GFA-2590K

Nozzle Insert - Replace □ with nozzle diameter. (Sizes 4-16). Call for additional sizes

GFA-2590N□

Filter Body - 5/8” Glass Filter Body

GFA-2590B

Metal Taper Joint Clamp - A durable nickel plated steel clip that securely holds the conical joint under pressure to withstand temperatures of up to 500°C (932°F).

KTM-29

Call for Pricing of Quartz Components

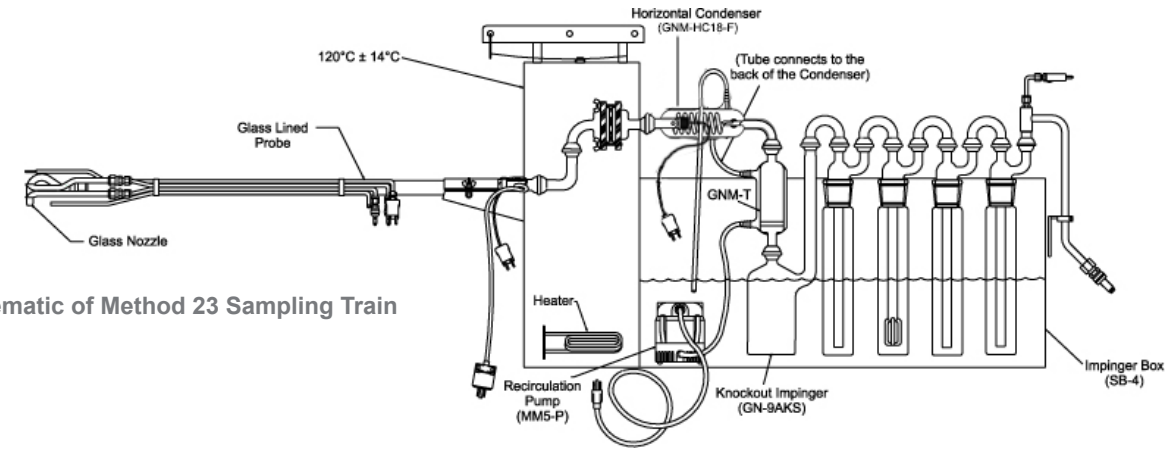
METHOD 23 DELUXE PLUS

The Apex Instruments Method 23 (Modified Method 5) Source Sampler Kit is utilized for Method 23 determination of dioxins and furans (D/F's) and/or Method 0010 Determination of Semi-Volatile Organic Compounds. The sampling train is identical to the standard Method 5 system with the addition of a water-cooled glass condenser and an XAD absorbent module followed by a knockout impinger. *Additional glassware configurations are available. Please call for information.*

Select Meter Console and External Pump for M23 then add a kit.
Add "-V" to part number for 240V option at an additional cost.

SK-M23DP

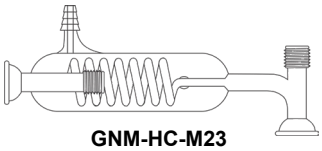
SK-M23DP-V



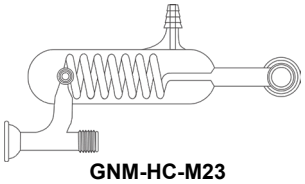
Schematic of Method 23 Sampling Train

Method 23 Glassware

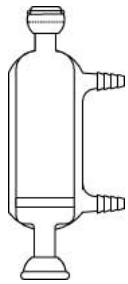
Product	Description
GNM-HC-M23	Horizontal Condenser, #28 Socket both ends, Water Jacket with Hose Barbs with two #18 GL joints for minotirng condenser inlet and outlet temperature.
GNM-T	XAD Trap, #28 Unground Socket and O-Ring Ball (Top), Water, Jacket Hose Barbs
GN-9AKS	Knock-Out Impinger Assembly, Unground (for Horizontal MM5)



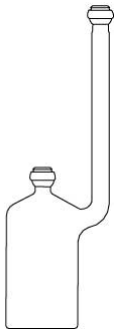
GNM-HC-M23 (Side View)



GNM-HC-M23 (Top View)



GNM-T



GN-9AKS

Method 23 Individual Accessories

Product	Conversion Accessories
SB-4	Impinger Box/Insulated Coolant Reservoir, Holds 8 Impingers
TL-7/5	Latex Tubing, 7/16 OD, 5/16 ID, Natural Color, Per Foot

Note:
- Borosilicate glass or quartz nozzles and probe liners are recommended
- Wrap XAD sorbent module with aluminum foil to shield from radiant heat and ultraviolet rays that dechlorinate the D/F isomers
- Sealing greases are not allowed. FEP encapsulated O-ring seals are available and may be required by some agencies.
- Flexible train requires heated flexible sample lines

Coolant Pump Options

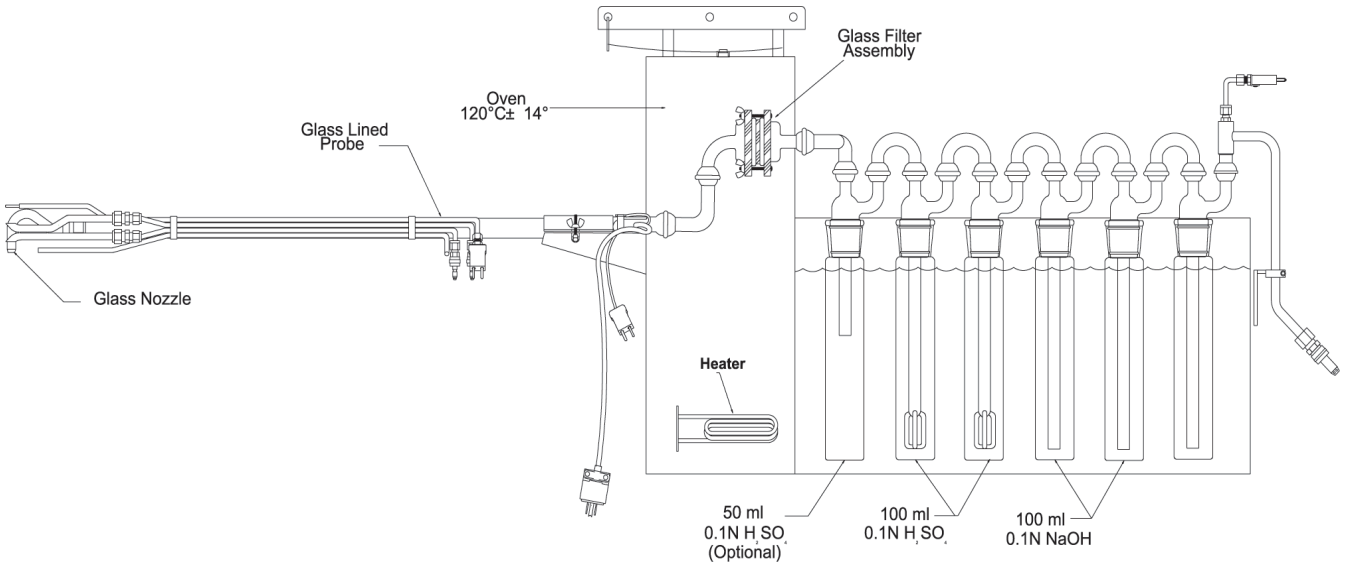
Product	Description
MM5-P	Submersible Coolant Pump, 110V (Product End of Line Expected)
MM5-PM	Submersible Coolant Pump, 110V (Miniature Version)
MM5-P220	Submersible Coolant Pump, 220V

MM5-P

MM5-PM

METHOD 26A – HCl

The Apex Instruments Method 26A Sampling Train is used for determination of hydrogen halide and halogen emissions. Method 26A is the isokinetic alternative to Method 26. This method is particularly suited for sampling sources controlled by wet scrubbers emitting acid droplets. The method requires a Method 5 sampling train with the use of additional impingers, reagents and PTFE coated glass fiber filter media. *Please call for more information.*



Schematic of Method 26A Sampling Train

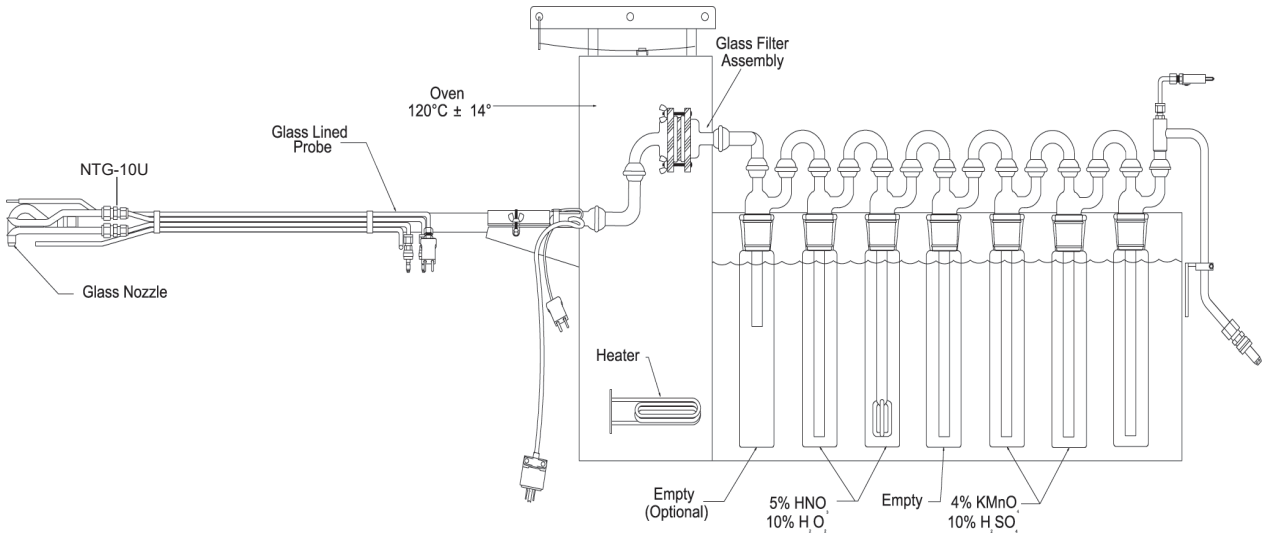
Method 26A Recommended Accessories

Product	Conversion Accessories
NG-SET-S	Set of 7 Glass Nozzles - Sizes 4 ,5, 6, 7, 8, 9 & 10, Includes Case and Three 5/8” Glass Filled PTFE Ferrules (spares recommended)
NTG-10U	5/8" Glass-Filled PTFE Union Complete with Nuts and Ferrules
SB-4	Impinger Box/Insulated Coolant Reservoir Model 150, Holds 8 Impingers
GF-3TPG	3 inch PTFE coated glass fiber filters (100/box)
BS28WS	#28 Ball and Socket Joint Clamp (Generic), Stainless Steel (13 total required)
GN-9AK	Knock-Out Impinger, Short Stem, 500ml, Unground O-Ring Joints (1 required for method, 1 spare recommended)
GN-9AO	Impinger Assembly, Stem with Orifice & Plate, 500ml, Unground O-Ring Joints, Greenburg-Smith (2 required for method, 1 spare recommended)
GN-9A	Impinger Assembly, plain stem, Modified Greenberg-Smith, Unground 500ml (3 required for method, 1 spare recommended)
GN-11	U-Tube, #28 Unground Sockets (5 total required, 1 spare recommended)
NBT-1/2	Nozzle Brush, 1/2” diameter, PTFE Bristles
PBX-10T	10 foot Flexible PFA Probe Brush Extension, Brush not Included (other lengths available)
PBT-5/8	PTFE Probe Brush Tip (PTFE Barrel and Bristles), 5/8 inch Bristle Diameter

When stack temperatures exceed 210°C (410°F) a one-piece glass nozzle/liner assembly is recommended.

METHOD 29 – MULTIPLE METALS

The METHOD 29 determination of metal emissions from hazardous waste incinerators involves a modification of the Method 5 train. The sampling train is the same as a Method 5 particulate train with the addition of up to three impingers to enhance the collection of metals of interest. The impinger train requires the SB-4 impinger case, glass nozzle & probe liner, and a non-metallic union. The method has been validated for the collection of 17 different metals.



Schematic of Method 29 Sampling Train

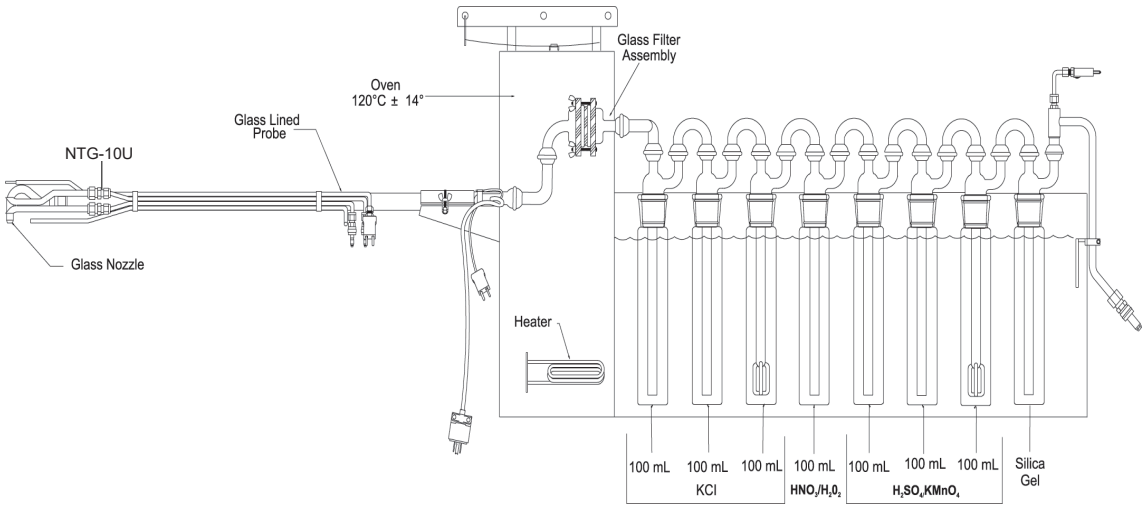
Method 29 Recommended Accessories

Product	Conversion Accessories
NG-SET-S	Set of 7 Glass Nozzles - Sizes 4 ,5, 6, 7, 8, 9 & 10, Includes Case and Three 5/8” Glass Filled PTFE Ferrules (spares recommended)
NTG-10U	5/8" Glass-Filled PTFE Union Complete with Nuts and Ferrules
SB-4	Impinger Box/Insulated Coolant Reservoir Model 150, Holds 8 Impingers
GF-3QH	3 inch Quartz Fiber Heat Treated Filters-100/box
BS28WS	#28 Ball and Socket Joint Clamp (Generic), Stainless Steel (15 required total)
GN-9AK	Knock-Out Impinger, Short Stem, 500ml, Unground O-Ring Joints (1 required for method, 1 spare recommended)
GN-9AO	Impinger Assembly, Stem with Orifice & Plate, 500ml, Unground O-Ring Joints, Greenburg-Smith (1 required for method, 1 spare recommended)
GN-9A	Impinger Assembly, plain stem, Modified Greenberg-Smith, Unground 500ml (5 required for method, 1 spare recommended)
GN-11	U-Tube, #28 Unground Sockets (6 total required, 1 spare recommended)
PBT-5/8	PTFE Probe Brush, Extension, 10 Foot Flexible (Brush Not Included)
PBX-10T	PTFE Probe Brush, 5/8” diameter, 4” length, 8-32 thread
NBT-1/2	Nozzle Brush, PTFE, 1/2 inch

The standard glass filters are replaced with low background quartz filters. The impinger solutions are specific for different metals. Recovered samples are digested and appropriate fractions are analyzed by various means; inductively coupled argon plasma emission spectroscopy (ICPES), atomic absorption spectroscopy (AAS) or graphite furnace AAS, depending upon sensitivity required or the matrix effects on the specific analyte.

ONTARIO-HYDRO – METHOD (ASTM D6784-02) MERCURY

In the Ontario-Hydro Method (ASTM D6784-02) a sample is withdrawn from the flue gas stream isokinetically through probe/filter system, maintained at 120°C (250°F) or the flue gas temperature (whichever is greater), followed by a series of impingers in an ice bath. Particle-bound mercury is collected in the front half of the sampling train. Oxidized mercury is collected in impingers containing a chilled aqueous potassium chloride solution. Elemental mercury is collected in subsequent impingers (one impinger containing chilled aqueous acidic solution of hydrogen peroxide and three impingers containing chilled aqueous solutions of potassium permanganate). Samples are recovered, digested, and then analyzed for mercury using cold-vapor atomic absorption (CVAAS) or fluorescence spectroscopy (CVAFS). The scope of the method applies to determination of elemental, oxidized, particle-bound and total mercury emissions from coal-fired stationary sources with concentrations ranging from approximately .05 to 100 ug/dscm. The sample train configuration is similar to EPA Method 5.



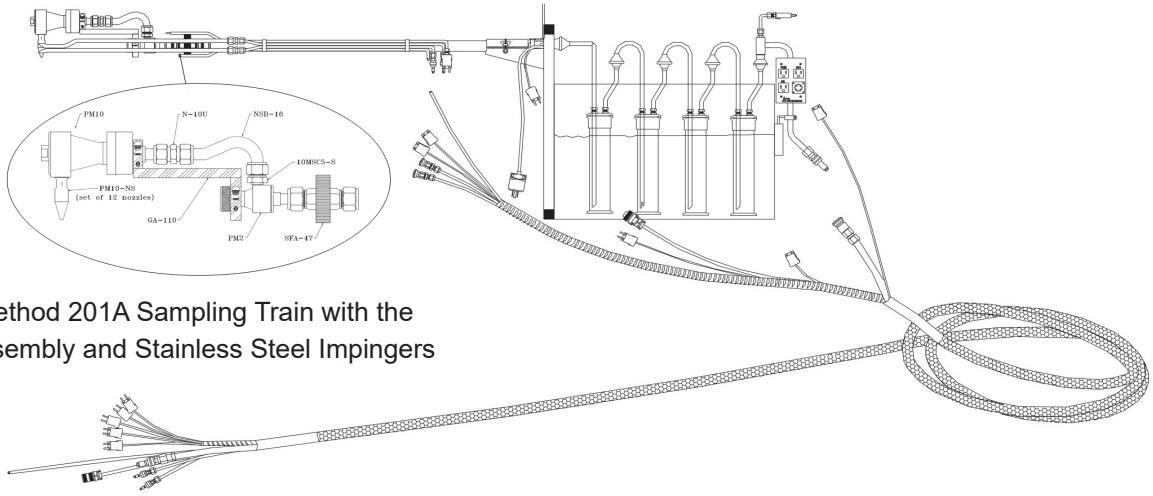
Schematic of Ontario-Hydro Method Sampling Train

Ontario-Hydro Recommended Accessories

Product	Conversion Accessories
NG-SET	Set of 7 Glass Nozzles - Sizes 4,6,8,10,12,14&16, Includes Case and Three 5/8" Glass Filled PTFE Ferrules (spares recommended)
NTG-10U	5/8" Glass-Filled PTFE Union Complete with Nuts and Ferrules
SB-4	Impinger Box / Insulated Coolant Reservoir, holds up to 8 Impingers
GF-3Q	3" Quartz Fiber Filters, 25/Box
BS28WS	#28 Ball and Socket Joint Clamp (Generic), Stainless Steel (17 required total)
GN-9A	Greenburg-Smith Impinger (with orifice), Unground (6 required for method, 2 spare recommended)
GN-9AO	Impinger Assembly, Stem with Orifice & Plate, 500ml, Unground O-Ring Joints, Greenburg-Smith (2 required for method, 1 spare recommended)
GN-11	U-Tube, #28 Unground Sockets (7 total required, 1 spare recommended)
NBT-1/2	Nozzle Brush, 1/2 inch diameter, PTFE Bristles
PBX-10T	10 foot Flexible PTFE Probe Brush Extension, Brush not Included
PBT-5/8	PTFE Probe Brush Tip (PTFE Barrel AND PTFE Bristles), 5/8 inch Bristle Diameter

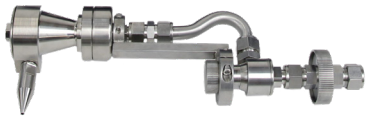
METHOD 201A - DETERMINATION OF PARTICLE SIZING (PM10, PM2.5, OR PM10 & PM2.5)

Cyclones are designed for in-stack particle sizing applications. The advantages of using cyclones over a cascade impactor is that cyclones have an extremely high particulate collection capacity-up to 10 grams per stage resulting in a bigger sample for accurate gravimetric and chemical analysis, longer sampling times for better averaging and avoids re-loading for each sampling point. Apex recommends cascade impactors for doing particle size research testing.

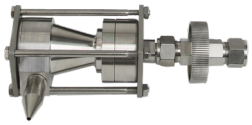


Schematic Method 201A Sampling Train with the PM2.5-10 assembly and Stainless Steel Impingers

CYCLONES AVAILABLE FOR PARTICLE SIZING: PM2.5-10 Cyclone, PM10 Cyclone, PM2 Cyclone, PM1 Cyclone and Cascade Impactor



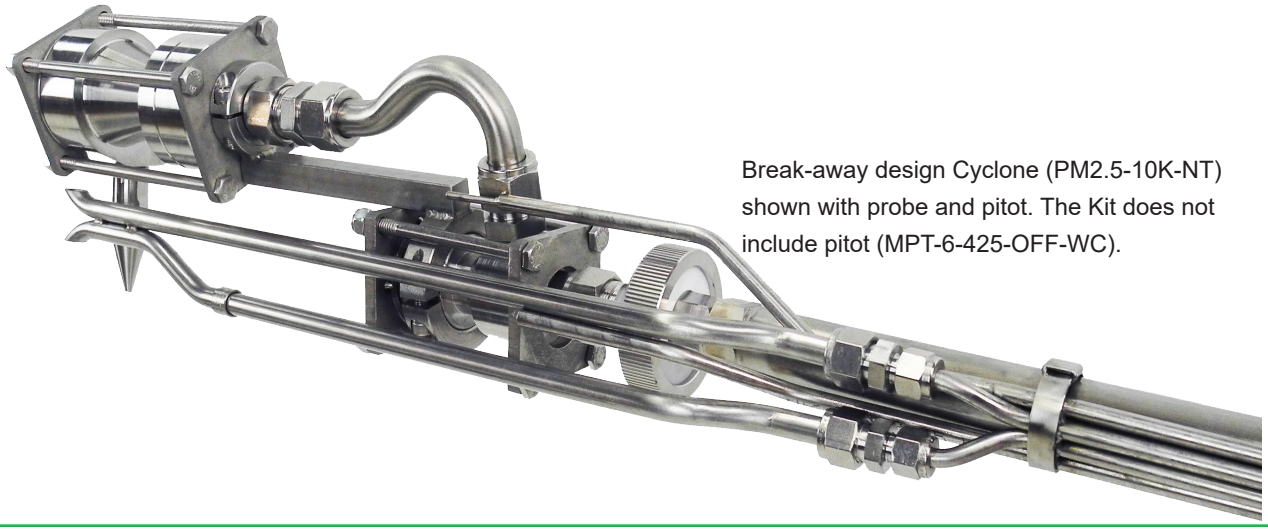
PM2.5-10K



PM10-NT-K

PM2-K

Cyclone Kit Case and Nozzles



Break-away design Cyclone (PM2.5-10K-NT) shown with probe and pitot. The Kit does not include pitot (MPT-6-425-OFF-WC).

PM2.5-10K CYCLONE KIT

PM10/PM2.5 Set combines the in-stack measurement of particulate matter (PM) equal to or less than an aerodynamic diameter of nominally 10 (PM_{10}) and 2.5 (PM2.5) microns from stationary sources. The sampling train and operation are identical to Method 201A except that the PM2.5 cyclone is inserted between the PM10 cyclone and the 47mm filter. The PM10 cyclone collects particulate matter greater than PM10 while the PM2.5 collects PM less than PM10 and greater than PM2.5. The in-line filter collects PM less than PM2.5.

Break-away style assembly (PM2.5-10K-NT) is constructed with bolt-together rather than screw-together and is used for temperatures up to 538 ºC (1000 ºF). The Break-away uses expendable stainless steel bolts that can be over-torqued and broken if necessary to release cyclone closures, thus allowing you to recover PM without damaging the cyclone flanges or contaminating the samples.

PM2.5-10K **PM2.5-10K-NT**

The method can be used at temperatures up to 1,371 ºC (2,500 ºF) using specially constructed high temperature stainless steel alloys (Alloy 600) with bolt-together closures using break-away

PM2.5-10K (2 Cyclone Bodies, 2 cups, 2 caps, Viton O-rings, and Adapter set)
PM2.5-10K-INCO

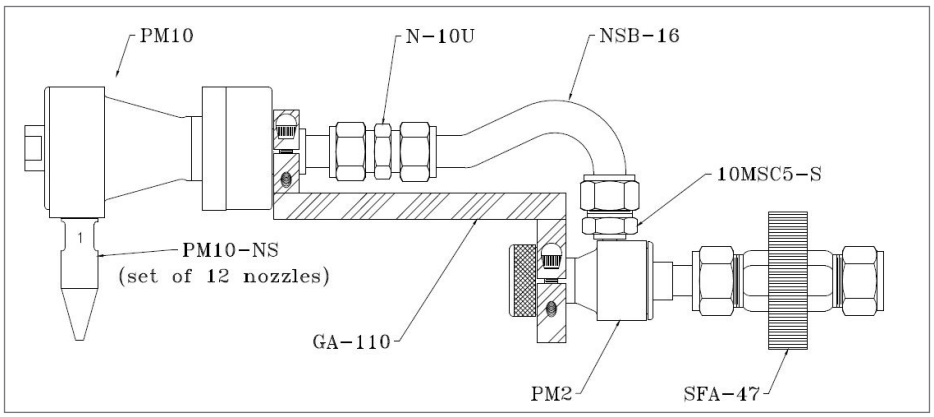
KITS:

PM2.5-10K (Threaded Stainless Steel)
PM2.5-10K-INCO (Threaded Alloy 600)
Cyclone Kit with 12 Nozzles (PM10-NS), 47mm filter holder (SFA-47), anti-seize and case.

PM2.5-10K-NT (Non-Threaded Stainless Steel)
PM2.5-10K-NT-INCO (Non-Threaded Alloy 600)
Non-Threaded PM2.5-10 Cyclone Kit with Break-Away Bolts and Clamp, 12 Nozzles (PM10-NS) 47mm filter holder (SFA-47), anti-seize and case.

Maximum Temperature

Cyclone Kit	Max Temp
Threaded (PM2.5-10K)	260 ºC (500 ºF)
Break-away (PM2.5-10K-NT)	538 ºC (1000 ºF)
Alloy 600 Threaded (PM2.5-10-K-INCO)	980 ºC (1800 ºF)
Alloy 600 Break-away (PM2.5-10-K-NT-INCO)	1371 ºC (2500 ºF)



CYCLONE AND CYCLONE ACCESSORIES

PM10 Cyclone and Kits

PM10 is used for Method 201A testing and is designed for in-stack measurement of particulate matter equal to or less than 10 microns. The shank has a 5/8" outer diameter for easy adaptation to in stack 47mm SFA or Probe. The PM10 Cyclone kit includes cyclone assembly, PM10 nozzle set, 47mm Filter assembly and carry case. Kits are available in Stainless Steel or Alloy 600, threaded or not threaded.

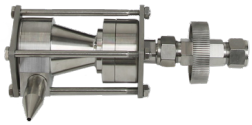
PM10 (Stainless Steel Cyclone Body and Cap with Viton O-rings)
PM10-INCO

KITS:

PM10-K (Threaded Stainless Steel)
PM10-K (Threaded Stainless Steel)
Cyclone Kit with 12 Nozzles (PM10-NS), 47mm filter holder (SFA-47), anti-seize and case.

PM10-NT-K (Threaded Stainless Steel)
PM10-NT-K-INCO (Non-Threaded Alloy 600)
Non-Threaded PM10 Cyclone Kit with Break-Away Bolts and Clamp, 12 Nozzles (PM10-NS) 47mm filter holder (SFA-47), anti-seize and case.

PM10-K



PM10-NT-K

PM2.5 Cyclone and Kits

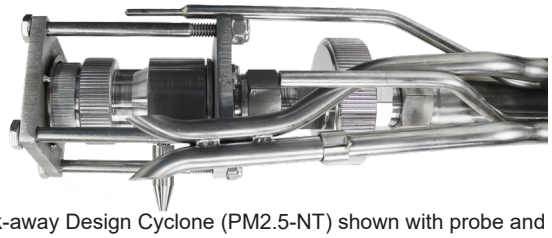
The PM2.5 Cyclone is used for in-stack measurement of particulate matter equal to or less than 2.5 microns. The shank has a 5/8" outer diameter for easy adaptation to the Method 5 Probe Assemblies. The PM2.5 kit is enclosed in a sturdy plastic case and includes the cyclone body, 12 nozzles, filter and o-rings. Kits are available in stainless steel or Alloy 600, threaded or not threaded.

PM2 (Stainless Steel Cyclone Body and Cap with Viton O-rings)
PM2-INCO

KITS:

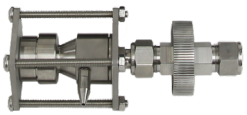
PM2-K (Threaded Stainless Steel)
PM2-K-INCO (Threaded Alloy 600)
Cyclone Kit with 12 Nozzles (PM2-NS), 47mm filter holder (SFA-47) and case.

PM2.5-NT-K (Non-Threaded Stainless Steel)
PM2.5-NT-K-INCO (Threaded Alloy 600)
Non-Threaded PM2.5 Cyclone Kit with Break-Away Bolts and Clamp, 12 Nozzles (PM2-NS), 47mm filter holder (SFA-47), anti-seize and case.



Break-away Design Cyclone (PM2.5-NT) shown with probe and pitot. The Kit does not include pitot (MPT-6-425-OFF-WC).

PM2-K



PM2.5-NT-K

PM2.5 and PM10 Replacement Parts & Accessories

Modular Pitot Tips

MPT-6-181OFF-WC	Extended Offset Pitot Tip for PM2.5, Wind Calibrated
MPT-6-255OFF-WC	Extended Offset Pitot Tip for PM10, Wind Calibrated
MPT-6-425OFF-WC	Extended Offset Pitot Tip for Multiple Cyclones, PM2.5 and PM10, Wind Calibrated

Filter Assembly and Holders

SFA-47	Filter Assembly, 47mm, 5/8" TU, Stainless Steel, Viton O-Rings
SFA-47SS	Screen, Filter Support, 47mm, Stainless Steel
SFA-47RFG	Filter Ring Guard, Stainless Steel
SF-TT20	Thrust Ring for SFA-47 Filter

Filters

GF-47Q	Filters, Quartz Fiber, 47mm, 25 per Box
GF-47	47mm Glass Fiber Filter for SFA-47
GF-47T	PFA/Glass Filber Filter for SFA-47

O-Rings

O-024V	Viton O-Ring for PM2.5 Cyclone, (2 per cyclone)
O-024H	High Temperature O-Ring for PM2.5 Cyclone, Stainless Steel
O-032V	Viton O-Rings for PM10 Cyclone, (2 per cyclone)
O-032H	High Temperature O-Ring for PM10 Cyclone, Stainless Steel
O-223V	Viton O-Ring for SFA-47 Filter, (260°C/500°F)
O-223H	High Temperature O-Ring for SFA-47 Filter, (650°C/1200°F)

AZNI-4	Anti-Seize, .25 oz. Tube, Premium Grade Anti-seize, Nickel Based, -65F to 2600F
PM-2.5-10C	Software, Particle Sizing for PM2.5 and PM10 Cyclones

CYCLONE AND CYCLONE ACCESSORIES

PM1 CYCLONE KIT

The cyclone is based on the cyclone "V" from the Multi-stage cyclone system designed and calibrated by Southern Research Institute under contract for the EPA. The design has been modified to accept the nozzles from the PM 2.5 cyclone, which has been expanded to a set of 12 different size nozzles. The sample flow rate must be maintained, in which the constant rate determines the actual "D_{50}" cut-point. The cyclone is followed by a 47 mm filter assembly. Quartz or PTFE coated glass fiber filters should be used to minimize reactivity with the flue gas. The cyclone and nozzles are constructed from grade 316 stainless steel with Viton o-rings.

PM1 **(PM1 Body Only)**
PM1-K **(Threaded Stainless Steel)**
PM1-K-INCO **(Threaded Stainless Steel)**
Cyclone Kit with 12 Nozzles (PM1-NS), 47mm filter holder (SFA-47), anti-seize and case.

PM1-K

PM1 Replacement Parts & Accessories

PM1	PM1 Cyclone Only, Stainless Steel with Viton® O-Rings
O-017V	Viton® O-Ring for PM1 Cyclone
O-017H	High Temperature Stainless Steel O-Ring for PM1, Cyclone
MPT-6-181	Extended Pitot Tip for PM1, Designate Length in mm

Individual PM2.5 and PM10 Cyclone Nozzles

PM2.5 Stainless Steel	
Product	Size
PM2-N1	.120
PM2-N2	.138
PM2-N3	.156
PM2-N4	.172
PM2-N5	.188
PM2-N6	.200
PM2-N7	.216
PM2-N8	.234
PM2-N9	.253
PM2-N10	.274
PM2-N11	.296
PM2-N12	.320
PM2-NS	SET OF 12

PM2.5 Alloy 600	
Product	Size
PM2-N1-INCO	.120
PM2-N2-INCO	.138
PM2-N3-INCO	.156
PM2-N4-INCO	.172
PM2-N5-INCO	.188
PM2-N6-INCO	.200
PM2-N7-INCO	.216
PM2-N8-INCO	.234
PM2-N9-INCO	.253
PM2-N10-INCO	.274
PM2-N11-INCO	.296
PM2-N12-INCO	.320
PM2-NS-INCO	SET OF 12

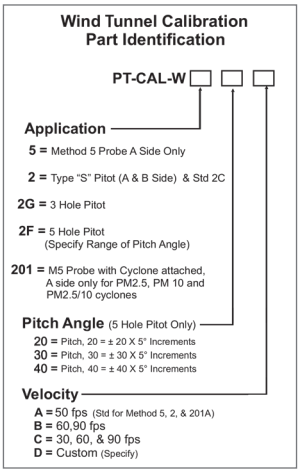
PM10 Stainless Steel	
Product	Size
PM10-N0	.125
PM10-N1	.136
PM10-N2	.150
PM10-N3	.164
PM10-N4	.180
PM10-N5	.197
PM10-N6	.215
PM10-N7	.233
PM10-N8	.264
PM10-N9	.300
PM10-N10	.342
PM10-N11	.390
PM10-NS	SET OF 12

PM10 Alloy 600	
Product	Size
PM10-N0-INCO	.125
PM10-N1-INCO	.136
PM10-N2-INCO	.150
PM10-N3-INCO	.156
PM10-N4-INCO	.180
PM10-N5-INCO	.197
PM10-N6-INCO	.215
PM10-N7-INCO	.233
PM10-N8-INCO	.264
PM10-N9-INCO	.300
PM10-N10-INCO	.324
PM10-N11-INCO	.390
PM10-NS-INCO	SET OF 12

Wind Tunnel Calibrations

Apex Instruments offers Pitot Wind Tunnel Calibration Services for EPA Methods 2, 2F, 2G, 201 and 5.

Method 5 Probe- calibration of A side only.
Method 2 Type "S" Pitot- calibration of A & B sides and Standard 2C.
Method 2G- calibration of 3 Hole Pitot
Method 2F- calibration of 5 Hole Pitot including specified pitch angles
Method 201- calibration of Method 5 Probe with Cyclone attached
A side only for PM2.5, PM10 and PM2.5/10 Cyclones
All Calibrations are performed in accordance to US EPA specifications
Custom velocities may be specified

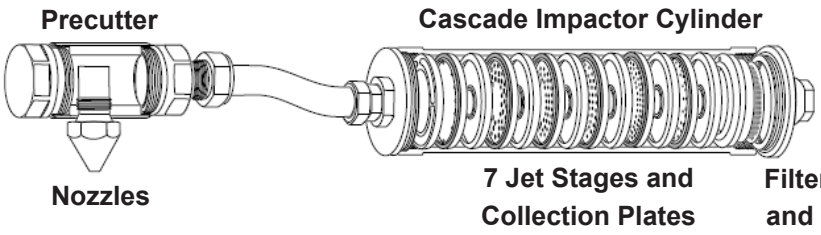


CASCADE IMPACTOR KIT

The Cascade Impactor is a seven stage jet filter assembly that removes particles by diameter. It is able to filter from 17 to 0.2 microns in eight size classifications. The pre-cutter assembly allows the cascade impactor to be used horizontally, meaning it can attach to nearly any standard assembly. The pre-cutter includes six nozzles (1/8", 3/16", 1/4", 5/16", 3/8", and 1/2") to ensure correct flow rates.

CI-701K Cascade Impactor Kit includes 7 stage impactor, a PRA-K pre-cutter, nozzles, interconnecting tube, glass fiber filters (45 mm, 47 mm and GFDN filters) and foil collection plate.

CI-701-K



Pre Cutter Assembly Kit

Pre Cutter Assembly kit, including body cap, outlet cap with union, nuts, ferrules and set of 6 nozzles

PRA-K

Stainless Steel Pre-Collector Nozzles

Model	Description
PRA-NS	Set of 6 Pre-Collector Nozzles, Sizes 4-16
PRA-N4	Pre-Cutter Nozzle, Stainless Steel, Size 4, 1/8"
PRA-N6	Pre-Cutter Nozzle, Stainless Steel, Size 6, 3/16"
PRA-N8	Pre-Cutter Nozzle, Stainless Steel, Size 8, 1/4"
PRA-N10	Pre-Cutter Nozzle, Stainless Steel, Size 10, 5/16"
PRA-N12	Pre-Cutter Nozzle, Stainless Steel, Size 12, 3/8"
PRA-N16	Pre-Cutter Nozzle, Stainless Steel, Size 16, 1/2"

Set of 7 lightweight stainless steel foil collection plate inserts

CI-FP

Glass Fiber Filters

Part #	Description
GFDN	5.72cm 934AH Glass Filter, Doughnut Style (100 / Box)
GF-45	45mm 934AH Glass Filter (100 / Box)
GF-47	47mm 934AH Glass Filter (100 / Box)

Quartz Fiber Filters

Part #	Description
GFDNQ	5.72cm Quartz Filter, Doughnut Style (100 / Box)
GF-45Q	45mm 934AH Quartz Filter (100 / Box)
GF-47Q	47mm 934AH Quartz Filter (100 / Box)

NOTE:
USE QUARTZ FILTERS IF REACTIVE STACK GASES ARE PRESENT

PARTICLE SIZING DATA REDUCTION SOFTWARE

Windows-based Cascade Impactor Data Reduction System (WINCIDRS) calculates particle size distribution of stack particulate matter (PM) taken with the Cascade Impactor, as well as particle-sizing cyclones. Developed by stack particle analysis experts, this software reduces the time and chances of error involved with reducing particle sizing data.

Functions

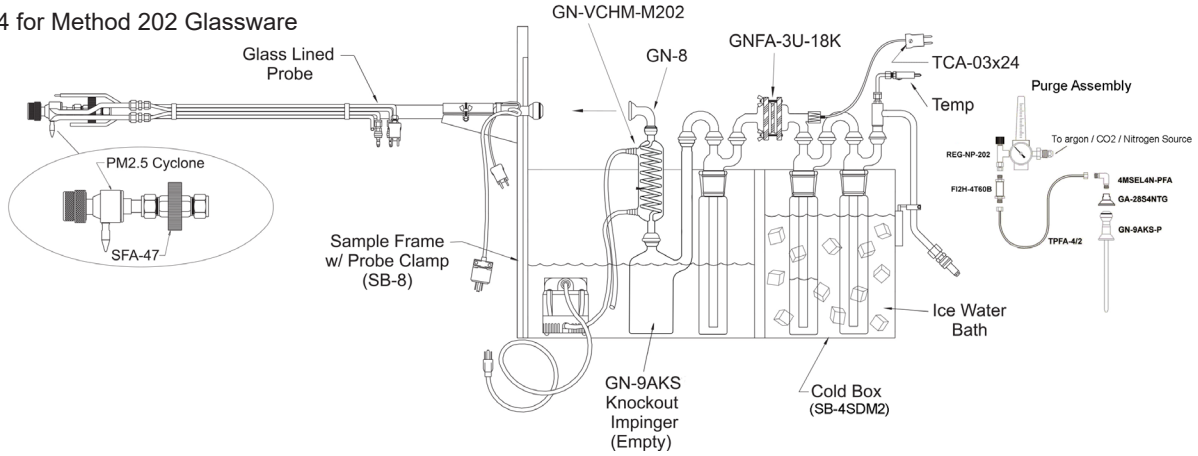
- Calculates each stage's aerodynamic cut point and DP_{50}, needed to reduce particle size data.
- Calculates and Stores ancillary data, such as dry gas composition and moisture content.
- Reduces velocity traverse data.
- Aids in selection of sample flow rates and ideal nozzle size.
- Calculates flow rates and dwell times required for PM_{10} and $PM_{2.5}$ sampling traverses.
- Calculates fractional efficiencies of control devices from samples obtained at inlets and outlets.

WINCIDRS

METHOD 202 (DRY IMPINGER METHOD)

This isokinetic method is used to measure Condensable Particulate Matter (CPM) from stationary source emissions after particulate matter has been removed by a heated filter, such as in Method 5, 17 or 201A. The CPM is collected in dry impingers. The impinger contents are purged with nitrogen (N2) immediately after sample collection to remove dissolved sulfur dioxide (SO2) gases from the impinger. The organic and aqueous fractions are dried and the residues are weighed. The total of the aqueous and organic fractions represents the CPM.

See Page 34 for Method 202 Glassware



METHOD 202 SAMPLING ACCESSORIES

Product	Description
SB-4SDM2	Two Section Divided Impinger Box
GN-VCHM-M202	Vertical Condenser #28 Socket to M202 Spiral Condenser, #28 Socket both ends Water Jacket Hose Barbs, High Moisture Source above 15%.
GN-9AKSA	Glass Knock-out Impinger Assembly, Unground, (for HorizMM5) included with Long / Short Stem
GNFA-3U-18K	CPM 3" Filter Assembly including Flexible TC
GF-3TM	PTFE Membrane Filters with Support, 1 Micron Pore Size, 50/Box
MM5-P	MM5-P Submersible Coolant Pump, 110V
MM5-PM	Mini Submersible Coolant Pump, 110V
SB-8	Sample Frame with Probe Clamp
GNFA-BKT	Insulation blanket for GNFA-3U-18K Assembly

GNFA-3U-18K Assembly with GNFA-BKT Insulation Blanket

METHOD 202 PURGE ACCESSORIES

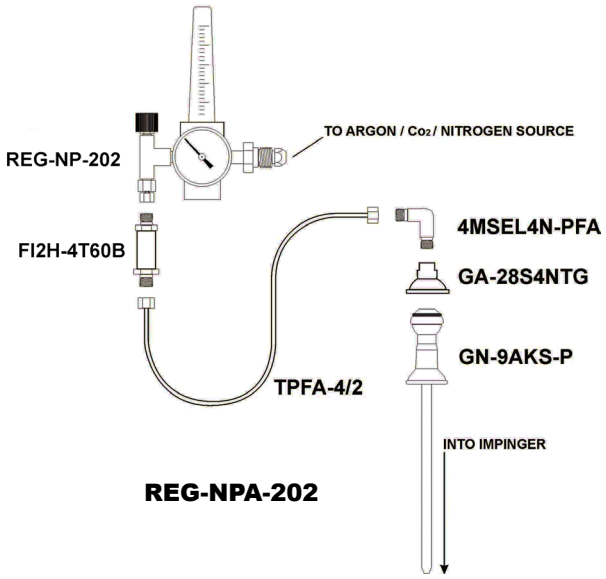
PURGE REGULATOR ASSEMBLY

Regulate Argon, Carbon Dioxide and Nitrogen gases up to 25 liters per minute. Brass bodied regulator features 0-250psi pressure gauge, 0-25lpm flow meter, horizontal fitting for gas source and vertical fitting to attach filter, TPFA line, elbow socket and purge stem.

REG-NPA-202

Purge Regulator Assembly

Model	Description
REG-NP-202	Argon, CO2, Nitrogen Flow Meter Regulator, CGA580 Connection
FI2H-4T60B	60u Inline Brass Filter, 1/4" Tube Union
4MSEL4N-PFA	1/4 inch PFA Tube Fitting to 1/4 inch MNPT, Elbow Connector 3/16"
GA-29S4NTG	PTFE Adapter Glass filled, 28mm Socket to 1/4" female NPT
GN-9AKS-P	Glassware Stem for REG-NPA-202
TPFA-4/2	PFA Tubing, 1/8" ID X 1/4" OD X .062" Wall



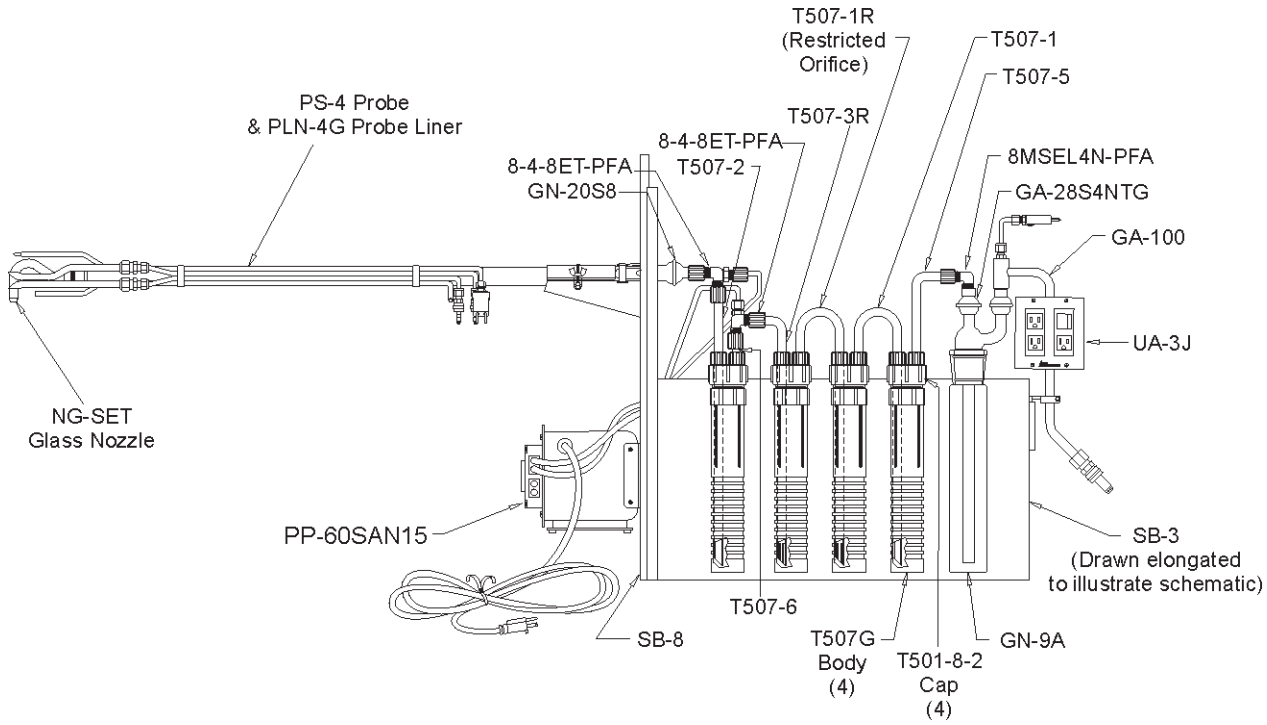
REG-NPA-202

METHOD 0061 HEXAVALENT CHROMIUM PFA IMPINGER TRAINS & ACCESSORIES

Method 0061 Hexavalent Chromium Emissions from Stationary Sources determines hexavalent chromium emissions from hazardous waste incinerators, municipal waste incinerators, municipal waste combustors and sewage sludge incinerators. Isokinetically collected with a train where the impinger reagent is recirculated continuously. Samples are analyzed with an ion chromatograph. Method 0061H Hexavalent Chromium High Temperature Source Sampling Kit is used as an alternative for temperatures above 150°C (300° F). ***Option "-V" is added for 240 V.***

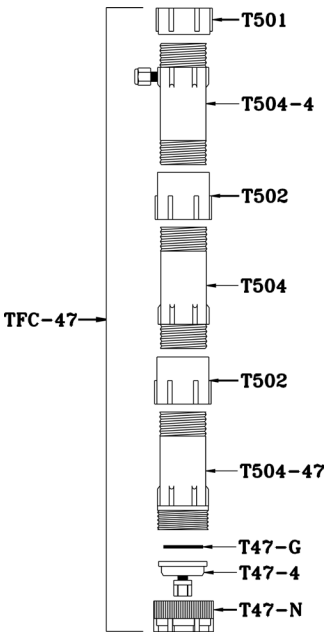
SK-0061H

SK-0061H-V



PFA 47mm Filter Column (TFC-47)

The TFC-47 is for the filtration of hexavalent chromium samples prior to analysis. The Column accepts standard 1/4 inch OD tubing and comes with one extra inlet for converting unit to standard 47mm filter holder.



FILTER MEDIA

Apex Instruments offers a wide range of filter media to meet most sampling requirements. Listed below are the standard media and sizes that Apex Instruments normally stock. Additional materials and sizes are available upon request.

GLASS FIBER FILTERS

Glass Fiber Filters are most the commonly used filters for particulate sampling. All of the glass fiber filters are binder free and exhibit at least 99.95% efficiency for 0.3 µm dioctyl phthalate (DOP) smoke particles. 934AH is available. Not recommended for metals analysis.

934AH Glass Fiber Filters

Model	Diameter	Count/box
GF-25	25 mm	100
GF-45	45 mm	100
GF-47	47 mm	100
GF-2	2”/55mm	100
GF-3	3”/82.6mm	100
GF-4	4”/110mm	100

PTFE COATED GLASS FIBER FILTERS

PTFE Coated Glass Fiber Filters are constructed from borosilicate microfibers and bonded with PTFE. The filters can be folded & handled without loss of fibers. Specifically recommended for Method 26, PM_{10} & $PM_{2.5}$ sampling. Great for especially low loading rates and low absorption of acid gases such as SOX or NOX with at least 99.95% retention efficiency (0.3 µm DOP).

PTFE Coated Glass Fiber Filters

Model	Diameter	Count/Box
GF-25TPG	25 mm	100
GF-47TPG	47 mm	100
GF-3TPG	3”/82.6mm	50
GF-4TPG	4”/110mm	50

QUARTZ FIBER FILTERS

Quartz Fiber Filters are manufactured from pure quartz without a binder and are frequently used for high temperature air sampling applications. Ideal for acidic gases (except Hydrofluoric) and aerosols, stacks and flue gas monitoring. 99.998% DOP retention efficiency (0.3µm DOP)

Quartz Fiber Filters

Model	Diameter	Countbox
GF-45QH	45mm	100
GF-47QH	47mm	100
GF-2QH	2”/55mm	100
GF-3QH	3”/82.6mm	100
GF-4QH	4”/110mm	100
GFDNQ	2.25”/57mm	100

PTFE FILTER MEMBRANES

PTFE Filter Membranes are produced of pure PTFE resins. They withstand the most severely corrosive conditions at temperatures as high as 500°F (260°C). The membrane is hydrophobic and maintains its strength in both wet and dry environments. PTFE filter media provides durability for hostile acid aerosol monitoring. 1.0µm pore size membrane.

PTFE Filter Membranes

Model	Description	Quantity
GF-3TM	3 inch (82.6mm) PTFE Membrane Filters	50/box
GF-3TMIW	3 inch (82.6mm) PTFE Membrane Filters	25/box

ACETATE FILTER

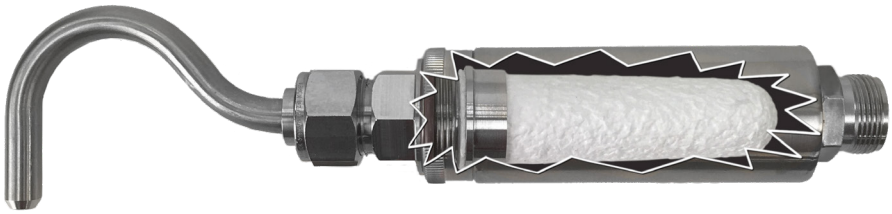
This filter is used in the Hexavalent Chromium SK-0061H system for filtering after sampling. Low static charge and high strength composition. Good resistance to heat and low molecular weight alcohols.

Acetate Filter

Model	Description	Quantity
GF-47MMAT	47mm .45 pore	100/box

IN-STACK THIMBLES AND ACCESSORIES

Apex Instruments stocks a variety of Thimbles for in-stack particulate sampling. The thimbles are seamless, high purity filters and available from a choice of two different types of fibers: Borosilicate glass and quartz. The gas collection efficiency of the thimbles is 99.95% (0.3 micron DOP). The 25 x 90mm thimbles are specifically manufactured for stack sampling and tapered for ease in loading. Cellulose thimbles are available upon request.



SFA-2590 Filter Assembly

GLASS FIBER FILTER THIMBLES

Borosilicate Glass Fiber Thimbles are acid washed to reduce the trace metal content to an absolute minimum.

Glass Fiber Filter Thimbles

Model	Description
GF-300	30x100mm Glass Fiber Filter Thimble 25/box (For SFA-300) Grade 86R
GF-2590	25x90mm Tapered Glass Fiber Thimble 10/box (For SFA-2590) Grade 86R

QUARTZ FIBER THIMBLES

Quartz Fiber Thimbles are strengthened with alumina and are prefired at 900°C for 2 hours during manufacturing to stabilize the weight prior to use.

Quartz Fiber Filter Thimbles

Model	Description
GF-300Q	30x100mm Quartz Fiber Filter Thimble 25/box (For SFA-300) Grade 88R
GF-2590Q	25x90mm Tapered Quartz Fiber Thimble 10/box (For SFA-2590) Grade 88R

ALUNDUM® THIMBLES (CERAMIC)

Alundum® Thimbles are used for in-stack filtration for process engineering studies when a large sample is needed for analyses. These thimbles are made from fused alumina oxide and remain very constant in weight and can be re-used an infinite number of times. There are two different porosity thimbles that can be used in the SFA-300 thimble holder. The medium porosity retain particles 5 micron and larger and the coarse retain particles 20 micron and larger.

Alundum® Thimbles (Ceramic)

Model	Description
GF-300C	Alundum Thimble, medium porosity, 5+ micron retention, 34x100ml, round bottom, fits SFA-300 use with additional O-ring, O-123V.
GF-300C-C	Alundum Thimble, COARSE porosity, 20 micron retention, 34x100ml, round bottom, fits SFA-300 use with additional O-ring, O-123V.

PTFE FIBER THIMBLES

PTFE Fiber Thimbles use pure fibrotic hydrophobic PTFE that offers superior handling compared to glass or quartz filters. No absorption of acid gases. Max temperature 260ºC.

Quartz Fiber Filter Thimbles

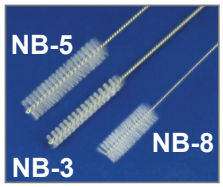
Model	Description
GF-2590T	25mmx90mm PTFE Fiber Thimble Filter, (non-tapered), 10/box Grade 89

SAMPLE RECOVERY

Nozzle Brushes

Apex Instruments Nozzle Brushes are flexible and are used for cleaning button hook nozzles. Featuring a stainless steel handle, nylon bristles and an eye tip to reduce scarring of nozzles.

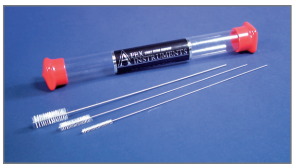
Model	Description
NB-3	3/16" diameter
NB-5	5/16" diameter
NB-8	1/2" diameter



Nozzle Brush Set

The NB-SET Nozzle Brush Set includes one each of the three most popular sizes in a convenient carrying tube. (#3,#5,#8)

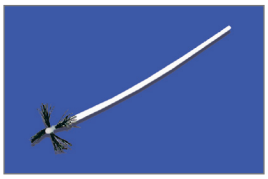
NB-SET



PTFE Nozzle Brush

Nozzle Brush NBT-1/2 is constructed of pure PTFE featuring a 1/8" diameter shaft with 1/2" long soft PTFE bristles.

NBT-1/2



PTFE Probe Brush

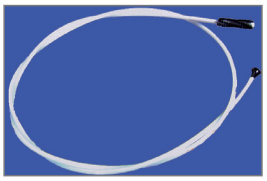
All PTFE construction. The PBT-5/8" diameter with four spiral rows of black PTFE bristles. Over all length is 2". The shaft is 1/4" diameter with 8-32 female threads. PTFE Barrel and PTFE Bristles.

PBT-5/8

PFA Probe Brush Extensions

The flexible PFA Probe Brush Extension attaches to the PBT-5/8 or PB-5/8. Made with 8/32 threads with a phenolic knob. Please specify length.

Model	Description
PBX-4T	4' PFA Probe Brush Extension
PBX-6T	6' PFA Probe Brush Extension
PBX-8T	8' PFA Probe Brush Extension
PBX-10T	10' PFA Probe Brush Extension
PBX-12T	12' PFA Probe Brush Extension



Brush Sold Separately

Modular Probe Brush Set

The PBX-S Modular Probe Brush Set contains two 5/8" stainless steel twisted wire brushes with nylon bristles and several stainless steel extensions. Capped plastic container included.

PBX-S

Impinger Bottle Brush

Impinger Bottle Brush with Plastic Handle and Nylon Bristles.

B-1

Filter Recovery Brush

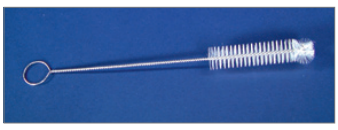
Filter Brush with Stainless Steel Handle and Nylon Bristles, 5/16".

B-3

Flask Brush

Flask Brush with Stainless Steel Handle and Nylon Bristles.

B-2



Policeman

Rubber Policeman with 18" Delrin® Handle.

B-4

SAMPLE RECOVERY KIT

Includes the following components:

PBX-6T EXTNSN, PRB BRUSH,FLX,TFE 6FT
6 foot Flexible TFE Probe Brush Extension, Brush not Included
1 EA

250ML-CYL-PMP CYL, GRADUATED, 250ML, PLASTIC Graduated Cylinder, 250ml, Plastic
1 EA

TW-1
TWEEZERS, NYL Tweezers, Nylon
1 EA

30255 FUNNEL, TRANSFER, PLASTIC Funnel, Polypropylene, Top Diameter 108mm
2 EA

NB-SET BRUSH, SET, NOZZLE, NO. 3,5,8
Nozzle Brush Set (sizes 3, 5, & 8) in Carrying Tube.
1 EA

B-2 BRUSH, FLASK, SS HNDL, NYL BR Flask Brush, SS handle & nylon bristles
1 EA

B-1 BRUSH, IMP. BOTTLE Impinger Bottle Brush with Plastic Handle & Nylon Bristles
1 EA

WB-5P BOTTLE, PLASTIC, 500 ml, WASH
Wash Bottle, 500 mL, plastic
2 EA

WB-4P BOTTLE, SAMPLE,POLY,16OZ,W/CAP
Polyethylene Sample Bottle with Polypropylene Cap, 16oz, Wide Mouth 500 ml
8 EA

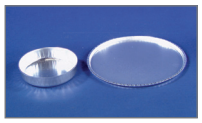
25373-1100 DISH, PETRI, 100x15mm PL 25PK
Petri Dish 100x15mm (for 3 inch Filters), 25/pack , Polystyrene
3 EA

SR-KIT

Aluminum Weighing Dishes

70 ml
100/pack.

25433-062



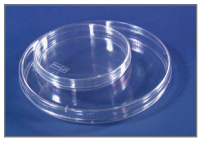
12.1 cm
100 Pack

12175-001

Petri Dish

100x15mm PL 25/pack (for 3-inch filters), Polystyrene.

25373-1100



150x15mm PL 10/pack
(for 4-inch filters), Polystyrene.

25373-187

Graduated Cylinder

250ml, Plastic

250ML-CYL-PMP

250ml, Glass

250ML-CYL

Funnel

Polypropylene Funnel
Top Diameter 108mm.

30255

Nylon Tweezers

TW-1

Parafilm

M, Laboratory Sealing Film,
Roll is 2" x 250 ft.

PARA-2X250

SAMPLE RECOVERY BOTTLES

Recover liquid samples in easy to pour and easy to fill wide mouth HDPE sample recovery bottles.

Available in a variety of sizes.

WB-1W
HDPE, 125 mL w/Wide Mouth, w/Cap

WB-2P
HDPE, 250 mL w/Cap

WB-2PW
HDPE, 250 mL w/Wide Mouth

WB-4P
HDPE, 16oz./500 mL w/Wide Mouth

WB-10P
HDPE, 1000mL w/Wide Mouth

WB-1000PW
HDPE 1000 mL w/Wide Mouth

FEP WASH BOTTLE

WB-250FEP
250mL Wash Bottles, FEP

WB-500FEP
500mL Wash Bottles, FEP.

PLASTIC WASH BOTTLE

WB-5P
500mL Plastic Wash Bottle

WARNING!
Not Recommended for Solvents.

GLASS SAMPLE BOTTLE

250mL Glass Sample
Bottle with PFA-Lined Lid.
Case of 12.

GSB-250

SILICA GEL

Silica Gel is used for drying sample gas prior to measurement. It can adsorb over 30% moisture by weight. The silica gel will change colors after it has adsorbed 6% of its weight in moisture. Silica can be recharged through oven baking.

Indicating Orange Silica (Beads)- Heavy Metals Free

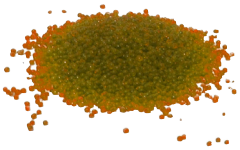
2-4mm beads

Orange

5lbs.	**SG-2/4O**
25lbs.	**SG-2/4O-25**

Blue

5lbs.	**SG-2/4B**
25lbs.	**SG-2/4B-25**



Silica Gel Kit
Indicating Orange Silica (Beads)
Heavy Metals Free
Case of 12, 250ml Bottles
SG-KIT

SG-KIT

PURAFIL

Purafil is primarily used for acid removal, gas-phase air filtration.

PURAFIL is a strong oxidizing agent and is ideal for removal of contaminants in multiple gases. 5 Lb. Container.

Purafil-SPC5

ACTIVATED CARBON

Activated Carbon is primarily used for gas purification and mercury scrubbing.

Activated Carbon 4 lbs. 4-8 Mesh.

AC-4X8C4

DRIERITE® DESICCANTS

Apex Instruments carries both non indicating and indicating DRIERITE®. (anhydrous calcium sulfate) Economical to use, it can be regenerated repeatedly. The indicating DRIERITE® is impregnated with cobalt chloride: blue when dry and changes to pink upon absorption of moisture.

Part #	Description
13005	DRIERITE®, Nonindicating 8 Mesh, 5 Lbs. (2.3 kg)
14005	DRIERITE®, Nonindicating 10-20 Mesh, 5 Lbs. (2.3 kg)
23005	DRIERITE®, Indicating 8 Mesh, 5 Lbs. (2.3 kg)
24005	DRIERITE®, Indicating 10-20 Mesh, 5 Lbs. (2.3 kg)

DESICCATOR

Acrylic Desiccator Cabinets feature adjustable shelves with grooves for positioning, removable lip tray, door gasket, built-in hygrometer. *Cabinets do not include Desiccant, order separately (pg. 61).*

Features

- Patented Sealed Construction is Airtight, Dust and Moisture Free.
- Portable and Stackable with a Small Footprint.
- Embedded UV Protection and Superior Chemical Resistance.
- Built-in Hygrometer for Quick Check on RH Levels.
- Rugged Construction with Sturdy Latches and Lock Provisions.

Model	Specifications
DES-10000	Secador 1.0 Desiccator Cabinet, 8.4 x 13.4 x 16.3 inches with gasketed door, built in hygrometer, 13.5lbs., .75 cubic feet
DES-21000	Secador 2.0 Desiccator Cabinet, 12.4 x 13.4 x 16.3 inches with gasketed door, built in hygrometer, 2 removable shelves. 15.9lbs., 1.17 cubic feet
DES-31000	Secador 3.0 Desiccator Cabinet, 16.4 x 13.4 x 16.3 inches with 3 shelves & gasketed door, stackable up to 3 high, built in hygrometer, 22lbs
DES-40000	Secador 4.0 Desiccator Cabinet, Horizontal Profile, 13.4 x 20.4 x 16.3 inches with 2 shelves & gasketed door, built in hygrometer, 24.4lbs., 1.9 cubic feet., horizontal Profile

AUTO-DESICCATOR

The Auto-desiccator improves upon the standard desiccator with a built-in regeneration module that recharges the dessicant every 20 minutes, ensuring that your humidity-sensitive contents keep dry,

Model	Specifications
DES-21115	Desiccator Cabinet, 12.4 x 1 3.4 x16.3 inches with gasketed door, built in hygrometer, 2 removable shelves. 15.9lbs., 1.17 cubic feet
DES-21115V	Desiccator Cabinet, 12.4 x 13.4 x16.3 inches with 2 shelves & gasketed door, built in hygrometer, 15.9lbs (7.2Kg), 1.17, cubic feet, 220 Volt fan
DES-31115	Desiccator Cabinet, 16.4 x13.4 x 16.3 inches with 3 shelves & gasketed door, stackable up to 3 high, built in hygrometer, 24lbs., 110V fan
DES-31115V	Desiccator Cabinet, 16.4 x 13.4 x 16.3 inches with 3 shelves & gasketed door, stackable up to 3 high, built in hygrometer, 24lbs., 220V fan
DES-41115	Desiccator Cabinet, 20.4 x 13.4 x 16.3 inches with 3 shelves & gasketed door, stackable up to 3 high, built in hygrometer, 23.9lbs., 1.17 cubic feet
DES-41220	Desiccator Cabinet, 20.4 x 13.4 x 16.3 inches with 3 shelves & gasketed door, stackable up to 3 high, built in hygrometer, 24lbs., 220 Volt

BALANCES & PORTABLE BALANCES

EJ-SERIES

A&D Weighing
...Clearly a Better Value

EJ Series is precision compact balance with a rich feature set. The Newton provides the performance that users have come to expect from A&D at a value price.

- Easy to read LCD Display with Backlight
- USB or RS-232 Interface Optional
- Battery Operated (4 x AA not included)
- AC Adapter Included
- Pan Size: 5” x 5.5”
- Check-Weighing Capacity
- 5 Year Warranty

Part Number	Description
BAL-EJ1500	1500g x 0.1g
BAL-EJ3000	3100g x 0.1 g
BALEJ6100	6100g x 0.1 g
BAL-EJ02	USB Interface
BAL-EJ12	Carrying Case

gents

HR SERIES ANALYTICAL BALANCES

The HR Series Compact Analytical Balance has a shatterpro anti-static draft shield. The rotary doors also give Galaxy balances the smallest footprint ever in an A&D analytical (0.1mg) balance.

- Percentage and Counting Modes.
- Digital Preset Tare.
- One Touch Printing.
- Last Digital Suppression.
- Standard Underhook.
- Optional Rechargeable Battery Pack
- GLP/LIMS/ISO Compliant
- RS-232-C Standard
- 5 Year Warranty

Part Number	Description	Pan Size
BAL-HR60-C	60g x 0.1mg with RS-232C	3.3”
BAL-HR120-C	120g x 0.1mg with RS-232C	3.3”
BAL-HR200-C	210g x 0.1mg with RS-232C	3.3”
BAL-HR202i*	220/51g x 0.1mg/0.01mg with RS-232C	3.6”

*Recommended for particle size analysis when using cascade impactors

CALIBRATION WEIGHTS

MODEL BAL-W1-100

Weight Set - 1mg-100g

Stainless Steel Calibration Weight Set for Lab Use. Set of 9 Weights Plus Fractional Weights in Wooden Storage Box.

Note: Please check with State Department of Weights and Measurements for calibrations.

MODEL	DESCRIPTION	WEIGHT
BAL-W1000ASTM	Weight for Electronic Balance ASTM GRADE 7	1 kg.
BAL-W2000ASTM	Weight for Electronic Balance ASTM SHAPE	2 kg.
BAL-W5000ASTM	Weight for Electronic Balance Class F, meet Tolerances of NIST	5 kg.

COMES WITH CERTIFICATE OF CONFORMANCE

CALIBRATION SERVICES

Calibration services are available from Apex Instruments. Apex performs calibrations using a wet test meter and bell-prover primary standard. All console and dry gas meter calibrations are conducted in accordance with U.S. EPA standards and are NIST traceable. Apex Instruments calibrates source sampler consoles, reference dry gas meters, orifices and pitots.

For additional Information and Pricing for DGM, Pitot and Orifice Calibration Services please contact:

Technical Services Group

Phone: (877) -726-3919 email: support@apexinst.com

Calibration being performed with Wet Test Meter

DGM CALIBRATION SERVICES

Multiple Calibration Points and Flow Rates
Low Flow Options
Single or Dual DGM

DGMC- □ - □□□

See Legend to Right

DGM Calibration Part Identification

DGMC- □ - □ □

Points Calibrated:
2A =Two Point
3A = Three Point
5A = Five Point
6A = Six Point
15A = Fifteen Point

Flow Rate:
HF = Range between (10 to 35 lpm)
MF = Range between (5 to 25 lpm)
LFA = (.300 to .900 lpm)
LFB = (.5 to 2.5 lpm)
LFC= (.5 to 4 lpm)

Dual DGM
2 = Dual DGM Models

PITOT CALIBRATION SERVICES

Geometric of Type-S Pitot Tube to Method 2.

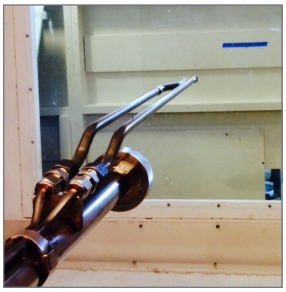
PT-CAL-G

WIND TUNNEL CALIBRATIONS

Method Application
Pitch Angle Calibrations
Velocity Calibrations

PT-CAL-W □□□

See Legend to Right



Wind Tunnel Calibration Part Identification

PT-CAL-W □ □ □

Application
5 = Method 5 Probe A Side Only
2 = Type "S" Pitot (A & B Side) & Std 2C
2G = 3 Hole Pitot
2F = 5 Hole Pitot (Specify Range of Pitch Angle)
201 = M5 Probe with Cyclone attached, A side only for PM2.5, PM 10 and PM2.5/10 cyclones

Pitch Angle (5 Hole Pitot Only)
20 = Pitch, 20 = ± 20 X 5° Increments
30 = Pitch, 30 = ± 30 X 5° Increments
40 = Pitch, 40 = ± 40 X 5° Increments

Velocity
A = 50 fps (Std for Method 5, 2, & 201A)
B = 60,90 fps
C = 30, 60, & 90 fps
D = Custom (Specify)

CRITICAL ORIFICE CALIBRATIONS

Annual Calibration services are available from Apex Instruments on a fee per console basis. Extra charge for low flow.

CAL-ORF

CALIBRATION EQUIPMENT

PRECISION WET TEST METERS

The Model W-NK Wet Gas Meter is a net-volume type integrating flowmeter that employs a drum as the metering element. As the drum is sealed with water or other fluid, the Model W-NK provides the measurement of any gas irrespective of the gas specific gravity and viscosity. Further, since this gas meter permits the measurement of very small flows, exhibits high reproducibility, and offers various other excellent features, it properly serves as a standard as well as a testing instrument.

W-NK

The Best Standard for Calibration of Dry Gas Meters.

Different Models Available:

Model A

Model A	Description:	Weight	Height	Width	Depth
W-NK-10A	Precision Meter, 10 Liter Capacity, 20 to 6000 L/HR	35kg	656	535	380

Model B

Model B	Description: Corrosion resistant	Weight	Height	Width	Depth
W-NK-0.5B	Max Flow 5 LPM, 0.5 Liter per Revolution	4.5kg	420	290	190
W-NK-1B	Max Flow 10 LPM, 1 Liter per Revolution	6.0kg	450	315	210
W-NK-2B	Max Flow 20 LPM, 2 Liter per Revolution	9.0kg	390	350	255
W-NK-2.5B	Precision Meter, 2.5 Liter Capacity, 5 to 1500 L/HR	9.0kg	390	350	255
W-NK-5B	Precision Meter, 5 Liter Capacity, 5 to 3000 L/HR	25kg	575	455	295
W-NK-10B	Precision Meter, 10 Liter Capacity, 20 to 6000 L/HR	35kg	656	535	380

Note: Manometer sold separately. Part number **W-NK-1KPA**.

CALIBRATION EQUIPMENT

THERMOCOUPLE SIMULATOR / CALIBRATOR

The **VA710 Thermocouple Calibrator** is a precision source and measurement tool for calibrating thermocouple instruments. The calibrator measures through a thermocouple jack. Measuring units are °C,°F or MV. The V&A Instrument Model VA710 Thermocouple Simulator simulates a dedicated standard thermocouple curve over the entire industrial temperature range.

M5C-VA710

NOZZLE CALIBRATION

DIAL CALIPERS are used for measuring nozzle diameter and inspection of pitots. Dial Caliper, 0-6”/ 150mm Direct inch/Metric Conversion.

M5C-3D

PITOT AUDIT EQUIPMENT & MANOMETERS

DWYER DIGITAL HANDHELD MANOMETER

The D477AV-0 Dwyer handheld manometer provides pressure, flow, and velocity measurements along with a number of other convenient features.

The D477AV-0 (0-10 inch H20) uses a highly accurate differential pressure sensor to offer ± 0.5% full scale accuracy. The accuracy provided is critical to maintenance personnel and technicians who require a highly accurate standard to check their instrumentation or equipment, to ensure proper performance.

D477AV-0
D477AV-0-FC Factory Certification
D477AV-0-NIST NIST Certification

HANDHELD MANOMETER

LCD DISP., Digital Manometer, Method 2, Hand held, 0-10 inch H2O Selectable Range, English/Metric.

DHM28-10

MANOMETER SOFTWARE

Software and cable for Digital Manometer, HM28 series.

DHM28-1

DIGITAL INCLINOMETER

Digital Inclinometer for measurement and calibration of Yaw Angle

M5C-4

CALIBRATION PUMP

Serves as pressure source to calibrate gages and transmitters or to set pressure switches. Includes volume adjuster enabling fine pressure control and bleed valve. Use with manometer or other pressure standard.

A-396A

BULL’S EYE LEVEL

Bull’s Eye Level is 1/2” diameter and used for pitot calibrations. Comes with thumb screws for clamping to pitot.

M5C-2

CALIBRATION ORIFICE SET

U.S. EPA allows critical orifices to be used as calibration standards. The orifice calibration set contains five of our critical orifices with 1/2" quick connects and software. Re-calibration recommended annually. Calibration Orifice Set, 5 Calibrated Critical Orifices and Spreadsheet for Method 5.

Orifice Set Contains the following:

Model	Description
M5CO-40	Calibration Critical Orifice, Size 40, Flow Rate. ~.31cfm (~8.8 lpm) with 1/2" Male QC
M5CO-48	Calibration Critical Orifice, Size 48, Flow Rate. ~.46cfm (~13.0 lpm) with 1/2" QC
M5CO-55	Calibration Critical Orifice, Size 55, Flow Rate. ~.61cfm (~17.3 lpm) with 1/2" QC
M5CO-63	Calibration Critical Orifice, Size 63, Flow Rate. ~.79cfm (~22.4 lpm) with 1/2" QC
M5CO-73	Calibration Critical Orifice, Size 73, Flow Rate. ~1.1cfm (~31.14 lpm) with 1/2" QC

M5CO-SET

GAS METER CALIBRATION EQUIPMENT

The DGM-SK25R Secondary Reference Meter is designed for calibration of EPA Method 5 or Method 6 source sampling consoles. The unit includes a 15 point calibration and is fitted with an optical encoder and digital display.

The DGM-SK25R Reference Meter may also be used to audit any of our mercury consoles.

The reference meter connects to the console via an integrated hose which includes a thermocouple for monitoring temperature. Vacuum is controlled by means of a panel-mounted ball valve. All components are contained in an easy to carry transport case.

Secondary Reference Meter

DGM-SK25RM-QC4
Metric Calibration. 1/4" Quick Connect. 0.3 lpm to 2.5 lpm Range
Call and ask for calibration services for this Meter.

DGM-SK25R-QC8
English Calibration. 1/2" Quick Connect. 0.35 cfm to 1.24 cfm Range
Calibration Service for this Meter is: DGMC-15A-HF

DGM-SK25RM-QC8
English Calibration. 1/2" Quick Connect. 10 lpm to 35 lpm Range
Calibration Service for this Meter is: DGMC-15A-HF

DGM-SK25RM-QF4
Metric Calibration. 1/4" Full Flow Connect. 10 lpm to 35 lpm Range
Call and ask for calibration services for this Meter.

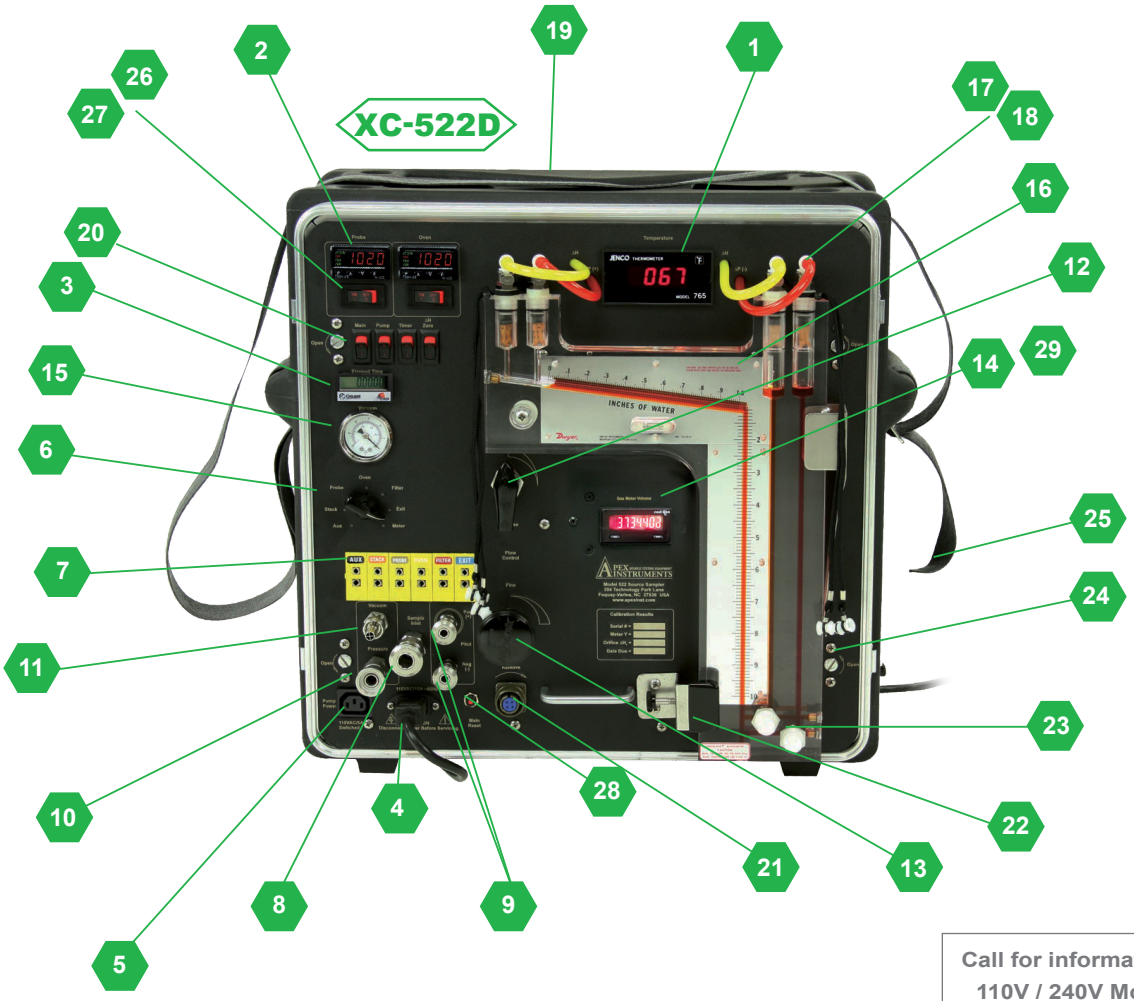
DGM Reference Meter Part Identification

DGM-SK25R ☐ - ☐

Type of Calibration:
Blank = Cubic Feet
M= Metric (Liters)

Connector Type:
QC4 = 1/4" Quick Connect
QC8 = 1/2" Quick Connect
TU4 = 1/4" Tube Union with Nut
QF4 = 1/4" Full Flow Connect

XC-522D SOURCE SAMPLING CONSOLE (ENGLISH)
XC-572D SOURCE SAMPLING CONSOLE (METRIC)



Call for information on 110V / 240V Models.

XC-522D and XC-572D Components List

	Part Number	Description
1	TC-765KF	Display, TC, PNL, LED, 120/220V
2	M-NOV810	Controller, Temp, Novus, 48 x 24
3	MC-T	Timer, MC, Crouzet
4	M-SCKT15A	Conn, Pwr, IEC Inlet 15A/250V
5	M-49BK	Recept, EL, Snap-In, Term
6	M-31302A	Switch, TC. 7 Channel
7	TC-PJK	TC Jack, Type K, PNL, Snap-In
8	QC-BHF8-SS	QC, Blkhd, 1/2IN-1/2TU, F, SS
9	QC-BHF4-SS	QC, Blkhd, 1/4IN-1/4TU, F, SS
10	QC-BHF6-SS	QC, Blkhd, 3/8IN-3/8TU, F, SS
11	QC-BHM6-SS	QC, Blkhd, 3/8IN-3/8TU, M, SS
12	B2VH-6S	Valve, Ball, 3/8TU, SS, PNL, Nut
13	NV3HA-6S	Valve, Needle, Angle, 3/8T-3/8T, SS
14	DGM-SK25EX	Meter, Dry Gas, SK25EX
15	G301U	Gage, Vac, 0-30HG, 1.5IN, PNL
16	M-42210	Manometer, Dual, PNL, 0-10" H2
17	QC-MAN-F3	QC-Manometer, F-1/8MNPT

	Part Number	Description
18	QC-MAN-M2	QC-Manometer, M-1/4HB, Delrin
19	XC-10U	Black RotoRack Shallow Case
20	M-RA911	Switch, Curvette, EC Comp., I-O
21	AM-MCP	Replacement Meter Console Wired Amphenol Sub-Assembly
22	M-422B	Bracket, Manometer, Adjust, Stainless Steel
23	M-422DS	Manometer Displacer Knob
24	L-441160	Latch, Panel, Screw, Large
25	3439T12	Webbing, 2", Black Nylon
26	M-CBR5A-M	Magnetic Type Circuit Breaker Rocker Switch, 5 Amp., 120V
27	M-CBR3A-M	Magnetic Type Circuit Breaker Rocker Switch, 3 Amp., 240V
28	M-CB15A-M	Magnetic Type Circuit Breaker,15 Amp Used in 120V Consoles as Main Breaker
29	TOT4-36X72BL	Back Lighted Totalizer with Quadrature

ATTENTION:
Contact your Apex Sales representative for the availability of the model S110 dry gas meter option.

NOMENCLATURE

A_n	Sampling Nozzle Cross-Sectional Area, mm^2 (in^2)
A_s	Stack Cross-Sectional Area, m^2 (ft^2)
B_{ws}	Percent Moisture in Stack Gas, % H_2O
C_p	Pitot Tube Calibration Coefficient
$C_{p(std)}$	Standard Pitot Tube Calibration Coefficient
c_s	Particulate Concentration in Stack Gas, g/dscm gr/dscm (lb/dscf gr/dscf)
D_e	Equivalent Diameter, m (ft....)
D_n	Sampling Nozzle Diameter, mm (in)
Δp	Stack Gas Velocity Pressure, mm H_2O (in H_2O)
$(\Delta p^{1/2})_{avg}$	Average of the Squareroots of Velocity Pressure, $(mm\ H_2O)^{1/2}$ $(in\ H_2O)^{1/2}$
%EA	Percent Excess Air, %
F_d	F factor for dry effluent, used with percent O_2, dry basis
F_o	Fuel Factor
$\Delta H_@$	Pressure Drop across Orifice Meter for 21.2 lpm (0.75cfm) at Std Conditions, mm H_20 (in H_2O)
ΔH	Pressure Drop across Orifice Meter, mm H_20 (in H_2O)
%I	Isokinetic Sampling Rate, %
K	Isokinetic Rate Constant
K’	Critical Orifice Calibration Factor
K_p	Pitot Tube Constant
L	Length of Duct Cross-Section at Sampling Site, m (ft....)
m	Mass, g (lb)
M_d	Stack Gas Dry Molecular Weight, g/g-mole (lb/lb-mole)
M_s	Stack Gas Wet Molecular Weight, g/g-mole (lb/lb-mole)
pmr	Pollutant Mass Emission Rate, kg/hr (lb/hr)
P_b	Barometric Pressure, mm Hg (in Hg)
P_s	Absolute Stack Pressure, mm Hg (in Hg)
P_{std}	Standard Pressure, 760 mm Hg (29.92 in Hg)
Q_{aw}	Actual Wet Volumetric Flowrate, acmm (acfm)
Q_{sd}	Dry Standard Volumetric Flowrate, dscmm (dscfm)
ρ_w	Density of Water, 0.9982 g/ml
θ	Time (minutes)
T_s	Stack Temperature, °C (°F)
T_{std}	Standard Temperature, 293K (528°R)
T_{amb}	Ambient Temperature, °C (°F)
V_{cr}	Critical Orifice Volume, m^3 (ft^3)
V_m	Dry Gas Meter Volume, m^3 (ft^3)
V_{lc}	Volume or Mass Liquid Collected in Impingers, ml or g
W	Width of Duct Cross-Section at Sampling Site, m (ft....)
Y	Dry Gas Meter Calibration Factor

CONSTANTS

Avogadro’s Number	6.02×10^{23} atoms/g atom
Gas Constants	82.05 atm cm^3/(g-mole * K)
	1.987 cal/(g-mole * K)
	10.731 ft.... lb in^2/(lb-mole * °R)
	0.732 ft^3 atm/(lb-mole * °R)
1 g-mole of Ideal Gas	24.05 Liters at US EPA Standard Conditions

EQUATIONS

Average of Square Roots of Δp_i

$$\left(\sqrt{\Delta p}\right)_{avg} = \frac{\sum_{i=1} \sqrt{p_i}}{n}$$

Average Δp

$$\Delta p_{avg} = \left[\sqrt{\Delta p_{avg}}\right]^2$$

Absolute Stack Pressure

$$P_s = P_b + \frac{P_g}{13.6}$$

Stack Gas Dry Molecular Weight

$$M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2 + \%CO)$$

Stack Gas Wet Molecular Weight

$$M_s = M_d(1 - B_{ws}) + 18.0B_{ws}$$

Stack Gas Velocity

$$v_s = K_p C_p \left(\sqrt{\Delta p}\right)_{avg} \sqrt{\frac{T_{s(avg)}}{P_s M_s}}$$

K_p = 85.48 (English Units)
= 34.96 (Metric Units)

Area of Stack (Circular)

$$A_s = \pi\left(\frac{D_s}{2}\right)^2$$

Area of Stack (Rectangular)

$$A_s = LW$$

Volumetric Flow Rate (acfm)

$$Q_a = 60 v_s A_s$$

Volumetric Flow Rate (scfm)

$$Q_s = K_1 v_s A_s \frac{P_s}{T_s}$$

Volumetric Flow Rate (dscfm)

$$Q_{sd} = K_1(1 - B_{ws}) v_s A_s \frac{P_s}{T_s}$$

Dry Gas Meter Volume

$$V_{m(std)} = K_1 Y \frac{V_m\left(P_{bar} + \frac{\Delta H}{13.6}\right)}{T_m} \quad \text{or} \quad = V_m Y \left(\frac{T_{std}}{P_{std}}\right) \frac{\left(P_{bar} + \frac{\Delta H}{13.6}\right)}{T_m}$$

K_1 = 17.64 (English Units)
= 0.3858 (Metric Units)

Volume of Water Vapor

$$V_{wc(std)} = K_2(V_f - V_i)$$

K_2 = 0.04706 (English Units)
= 0.001333 (Metric Units)

Stack Gas Moisture Fraction

$$B_{ws} = \frac{V_{wc(std)}}{V_{m(std)} + V_{wc(std)}}$$

Pollutant Mass Rate

$$\overline{PMR_S} = c_S Q_S$$

Estimated Nozzle Diameter

$$D_{n(est)} = \sqrt{\frac{K_3 Q_m P_m \sqrt{T_s M_s}}{T_m C_p (1 - B_{ws}) \sqrt{P_s \Delta p_{avg}}}}$$

K_3 = 0.03575 (English Units)
= 0.6071(Metric Units)

K-Factor

$$K = \frac{\Delta H}{\Delta P} = K_6 D_n^4 \Delta H_@ C_p^2 (1 - B_{ws})^2 \frac{M_d T_m P_s}{M_s T_s P_m}$$

K_6 = 846.72 (English Units)
= 8.009×10^{-5} (Metric Units)

Meter Orifice Flowrate

$$\Delta H = K \Delta P$$

US EPA STANDARD CONDITIONS

Standard Temperature (T_{std}) 20°C (68°F)
Standard Pressure (P_{std}) 760mm Hg (29.92in Hg)

GAS CONCENTRATION UNITS

Parts-per-million by volume (ppm_v) to milligrams per dry standard cubic meter (mg/dscm)

$$g\ /dscm = \left[\frac{ppm_v \times M}{24.05 \frac{Liters}{g-mole}} \right]$$

Correct to *x*% O_2

$$C_{s@x\%O_2} = C_s \times \left[\frac{20.9 - x\%O_2}{20.9 - \%O_{2(dryactual)}} \right]$$

Gas Concentration Unit		
To Convert From	***To***	***Multiply By***
Parts-per-million(ppm) SO_2	Nanogram/Std Cubic Meter (ng/scm) SO_2	2.66 x 10^6
Parts-per-million(ppm) SO_2	Pounds/Std Cubic Foot (lb/scf) SO_2	1.660 x 10^{-7}
Parts-per-million(ppm) NO_x	Nanogram/Std Cubic Meter (ng/scm) NO_x	1.912 x 10^6
Parts-per-million(ppm) NO_x	Pounds/Std Cubic Foot (lb/scf) NO_x	1.194 x 10^{-7}

Average Moisture Content

$$B_{ws} = \frac{V_{wc(std)}}{V_{m(std)} + V_{wc(std)}}$$

Isokinetic Rate Percentage

$$\%I = \frac{K_5 T_s V_{m(std)}}{P_s v_s A_n \theta (1 - B_{ws})}$$

K_5 = *0.09450 (English Units)*
= *4.320 (Metric Units)*

Average Standard Flow Rate of Dry Stack Gas

$$Q_{sd(avg)} = 3600(1 - B_{ws(avg)})v_{s(avg)} A_s \left(\frac{T_{std}}{T_{s(avg)}} \right) \left(\frac{P_s}{P_{std}} \right)$$

% Excess Air

$$\%EA = \frac{(\%O_2) + 0.5(\%CO)}{0.0264(\%N_2) - (\%O_2) + 0.5(\%CO)}$$

F_o Factor

$$F_0 = \frac{20.9 - \%O_2}{\%CO_2}$$

CONVERSION FACTORS

Conversion Factors		
To Convert From	**To**	**Multiply By**
Area		
Square Feet (ft^2)	Square Centimeters (cm^2)	929.0304
Square Feet (ft^2)	Square Meter (m^2)	0.09290304
Square Feet (ft^2)	Square Inches (in^2)	144
Square Inches (in^2)	Square Centimeters (cm^2)	6.4516
Length		
Feet (ft....)	Centimeters (cm)	30.48
Feet (ft....)	Meters (m)	0.3048
Feet (ft....)	Inches (in)	12
Inches (in)	Millimeters (mm)	25.4
Inches (in)	Centimeters (cm)	2.54
Mass/Force		
Pounds (lb)	Grains (gr)	7000
Pounds (lb)	Grams (g)	453.59237
Grains (gr)	Grams (g)	0.06479891
Kilograms (kg)	Pounds (lb)	2.2046226
Kilogram-force (kgf)	Newton (N)	9.80665
Pound-Force9 (lbf)	Newton (N)	4.44822
Temperature		
Degrees Celsius (°C)	Kelvin (K)	K = °C + 273.15
Degrees Celsius (°C)	Degrees Fahrenheit (°F)	°F = 9/5 (°C + 32)
Degrees Fahrenheit (°F)	Degrees Rankine (°R)	°R = °F + 459.67 = 1.8k
Degrees Fahrenheit (°F)	Degrees Celsius (°C)	°C = 5/9 (°F -32)
Power, Energy, Heat		
British Thermal Unit per Min. (Btu/min.)	Steam, Pounds per Hour (lb/hr Steam)	1 X 10^3
Horsepower (hp)	Watts (W)	745.7
Horsepower, boiler (hp)	British Thermal Unit Per Hour (Btu/hr)	33445.7
Horsepower, boiler (hp)	Kilowatts (kW)	9.8095
Kilowatts, Hours (kWhr)	British Thermal Unit Per Hour (Btu/hr)	3414.43
British Thermal Unit, mean (Btu)	Kilogram-Calories (kcal)	0.252
British Thermal Unit, mean (Btu)	Watts per Second, Joule (J)	1055.06
Pressure		
Inches of Mercury (in Hg)	Millimeters of Mercury (mm Hg)	25.4
Inches of Mercury (in Hg)	Inches of Water (in H_20)	13.6
Inches of Mercury (in Hg)	Atmospheres (atm)	0.0334211
Inches of Mercury (in Hg)	Kilopascals (kPa)	3.386388
Atmospheres (atm)	Bars (bar)	1.01325
Atmospheres (atm)	Pounds per Square Inch (psi)	14.695949
Pascals (Pa)	Newton per Square Meter (N/m^2)	1.0
Volume		
Cubic Meters (m^3)	Cubic Feet (ft^3)	35.314667
Cubic Feet (ft^3)	Liters (l)	28.136847
Liters (l)	Cubic Centimeters (ccm)	1000

EPA REFERENCE METHODS

MERCURY SAMPLING EQUIPMENT

APPENDIX K	SORBENT TRAP MONITORING
METHOD 30B	SORBENT TRAP RELATIVE ACCURACY TESTING AUDIT (RATA)

ISOKINETIC SAMPLING EQUIPMENT

METHOD 1	DETERMINATION OF SAMPLING LOCATION AND TRAVERSE POINTS
METHOD 2	DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRIC FLOW RATE
METHOD 3	DETERMINATION OF EXCESS AIR AND DRY MOLECULAR WEIGHT
METHOD 4	DETERMINATION OF MOISTURE IN STACK GASES
METHOD 5	DETERMINATION OF PARTICULATE EMISSIONS FROM STATIONARY SOURCES
METHOD 5B	NONSULFURIC ACID PM
METHOD 8	SULFURIC ACID MIST & SO_2
METHOD 12	INORGANIC LEAD (SZL)
METHOD 13A	TOTAL FLUORIDES (SIE)
METHOD 13B	TOTAL FLUORIDES
METHOD 17	PARTICULATE BY IN-STACK FILTRATION
METHOD 23	DIOXINS & FURANS
METHOD 26A	HYDROGEN HALIDES & HALOGENS
METHOD 29	MULTIPLE METALS
METHOD 201A	PM10 EMISSIONS
METHOD 202	CONDENSABLE PARTICULATE MATTER
METHOD 202	CONDENSABLE PARTICULATE MATTER FIGURES
METHOD 206	AMMONIA
METHOD 306	HEXAVALENT CHROMIUM FROM ELECTROPLATING AND ANODIZING OPERATIONS
METHOD 316	FORMALDEHYDE FROM MINERAL WOOL AND WOOL FIBERGLASS NDUSTRIES
METHOD 0010	SEMIVOLATILE ORGANIC COMPOUNDS
METHOD 0011	FORMALDEHYDE, OTHER ALDEHYDES AND KETONES
METHOD 0061	HEXAVALENT CHROMIUM

FLOW, PRESSURE & TEMPERATURE

METHOD 2	DETERMINATION OF STACK GAS VELOCITY AND VOLUMETRICFLOW RATE (TYPE S-PITOT TUBE)

GAS SAMPLING EQUIPMENT

METHOD 4A	STACK GAS MOISTURE (APPROX. METHOD)
METHOD 6	SULFURIC ACID MIST & SO_2
METHOD 6A	SULFURIC DIOXIDE, MOISTURE AND CARBON DIOXIDE
METHOD 6B	SULFUR DIOXIDE AND CARBON DIOXIDE
METHOD 11	HYDROGEN SULFIDE IN PETROLEUM REFINERY FUEL GAS STREAMS
METHOD 15A	TOTAL REDUCED SULFUR FROM PETROLEUM REFINERY SULFUR PLANTS
METHOD 16A	TOTAL REDUCED SULFUR
METHOD 18	INTEGRATED BAG SAMPLING FOR ORGANIC COMPOUNDS
METHOD 26	HYDROGEN HALIDES & HALOGENS
METHOD 106	INTEGRATED BAG SAMPLING FOR VINYL CHLORIDE
METHOD 308	METHANOL
METHOD 0030	VOLATILE ORGANIC COMPOUNDS (VOST)
METHOD 0031	VOLATILE ORGANIC COMPOUNDS (SMVOC OR SUPERVOST)
METHOD 0040	PRINCIPLE ORGANIC HAZARDOUS CONSTITUENTS (POHCS) USING TEDLAR® BAGS
METHOD 0051	HYDROGEN CHLORINE AND CHLORINE

GAS ANALYSIS EQUIPMENT

METHOD 3	GAS ANALYSIS FOR THE DETERMINATION OF DRY MOLECULAR WEIGHT
METHOD 3B	GAS ANALYSIS FOR THE DETERMINATION OF EMISSION RATE CORRECTION FACTOR OR EXCESS AIR
METHOD 7	DETERMINATION OF NITROGEN OXIDE EMISSIONS FROM STATIONARY SOURCES

IRM EQUIPMENT

METHOD 3A	DETERMINATION OF OXYGEN AND CARBON DIOXIDE CONCENTRATIONS IN EMISSIONS FROM STATIONARY SOURCES
METHOD 6C	DETERMINATION OF SULFUR DIOXIDE EMISSIONS FROM STATIONARY SOURCES
METHOD 6C	DETERMINATION OF SULFUR DIOXIDE EMISSIONS FROM STATIONARY SOURCES FIGURES
METHOD 7E	DETERMINATION OF NITROGEN OXIDES EMISSIONS FROM STATIONARY SOURCES
METHOD 10	DETERMINATION OF CARBON MONOXIDE EMISSIONS FROM STATIONARY SOURCES
METHOD 25A	DETERMINATION OF TOTAL GASEOUS ORGANIC CONCENTRATION USING A FLAME IONIZATION ANALYZER

APEX INSTRUMENTS SOURCE TESTING EQUIPMENT

Website: www.apexinst.com
Contact: info@apexinst.com

919-557-7300 or 800-882-3214
Fax: 919-557-7110

Apex Instruments, Inc.
204 Technology Park Lane
Fuquay-Varina, N.C. 27526, U.S.A.

www.apexinst.com