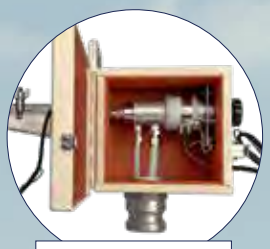
APEX INSTRUMENTS

EQUIPMENT CATALOG

ISOKINETIC

MERCURY

FLOW PRESSURE



GAS ANALYSIS

ACCESSORIES

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.

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 technicians ready to help you with your specific service needs. From basic trouble shooting to full equipment overhauls and repairs our technical service team can help. Toll Free (877) 726-3919 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 and 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 and VANS)

Apex Instruments has a dedicated team of experienced trailer outfitters t hat build custom made solutions for our customers. With over 20 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 a t sales@ apexinst.com to learn more about our mobile emissions laboratories fabrication services.

Apex Instruments has been providing solutions for the source sampling industry for over 30 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 isokinetic, 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.

At Apex Instruments our number one goal is to satisfy your sampling needs!

Ordering Options and Information

Order by phone: Call our friendly and knowleadgable 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!

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ISOKINETIC SAMPLING EQUIPMENT

FLOW MEASUREMENT EQUIPMENT

MERCURY SAMPLING SYSTEMS AND EQUIPMENT

GAS SAMPLING - MANUAL

GAS SAMPLING - INSTRUMENTAL (CEM)

ACCESSORIES

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

Shipping Information

Same day shipping available on all in-stock 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*.

Catalog version: V21.3.10.1555

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 Index

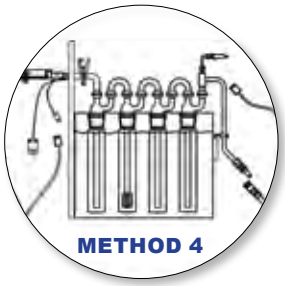
Isokinetic Systems by Method

Flow and Temperature Systems by Method

Mercury Systems by Method

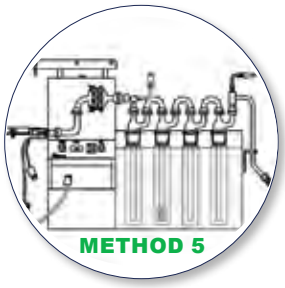
Gas Analysis Products by Methods

Method Specific Sampling Kits



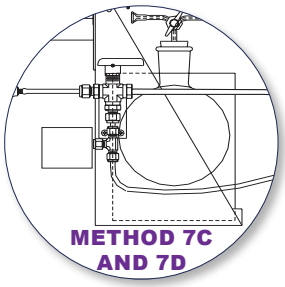
Method 4 (page 45)

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.



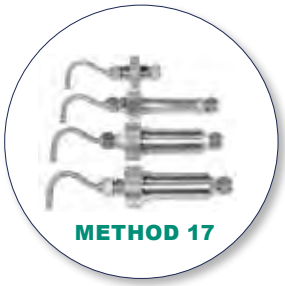
Method 5 (page 46-48)

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.



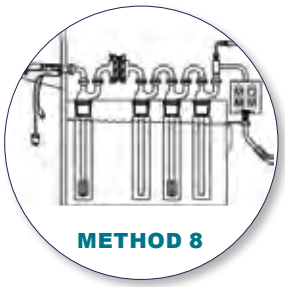
Method 7D and 7D (page 129)

NO_x - In **Method 7C and 7D** a sample is passed through a series of special, full-size orifice impingers that contain an alkaline-potassium permanganate solution. The sample rate is between 400 and 500 cc per minute, normally three one-hour samples are collected per test.



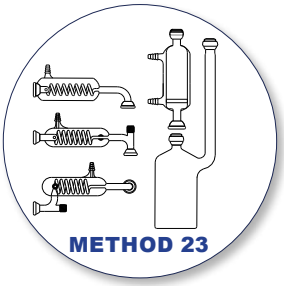
Method 17 (page 51)

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.



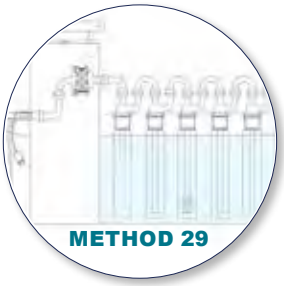
Method 8 (page 49)

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.



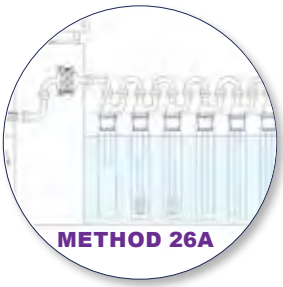
Method 23 (page 53)

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.

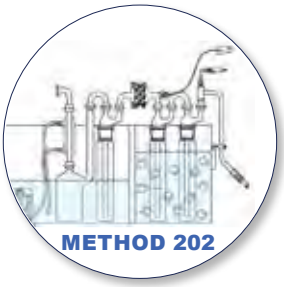


Method 26A (HCl) (page 54)

Hydrogen Halide and 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.

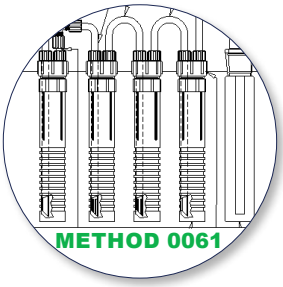
Method 201A (page 57-59)

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).

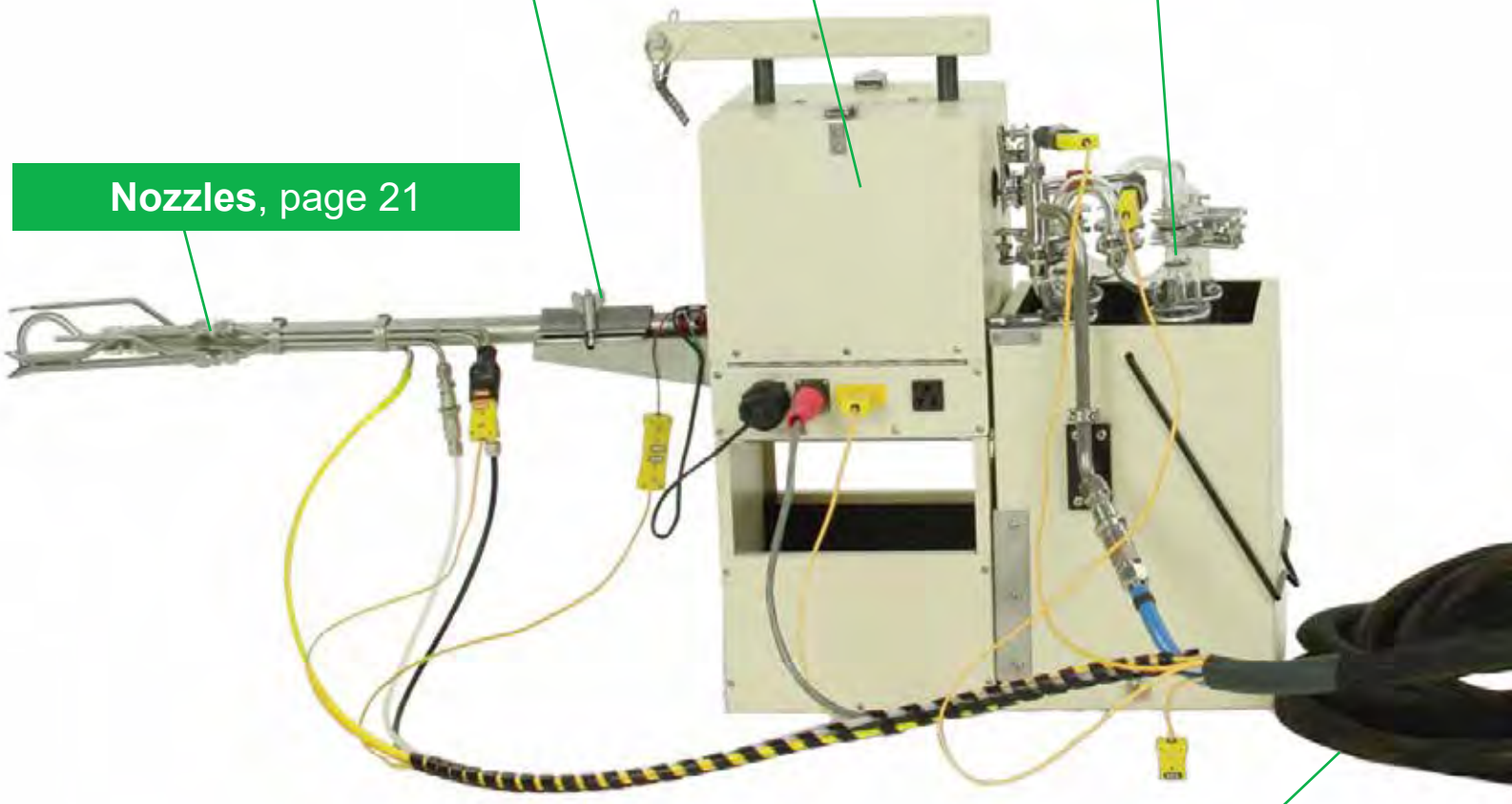
Isokinetic
Source Sampling Equipment

Modular Sample Cases, page 31

Probes and Liners, page 23

Glassware, page 37

Nozzles, page 21



Umbilicals, page 50

Consoles, page 10

Pumps, page 19

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 and 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 that can be downloaded for easy report preparation.

ISOKINETIC SOURCE SAMPLING METER CONSOLE LEGEND

XC-5000 ☐ - ☐ ☐ ☐

Power Output Option:
BLANK = 4 Pin Amphenol (END OF LIFE)
(Size 14S Shell - Female/97 Series)
A = 5 Pin Amphenol
(Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol
(Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol
(Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol
(Size 14S Shell - Male/97 Series)

Calibration Units:
BLANK = Calibrated in Metric/
Temperature in Degrees F
M = Calibrated in Metric/
Temperature in Degrees C

Pitot Quick Connects:
BLANK = 1/4" Instrumental
QS6 = 3/8" Instrumental

Voltage:
BLANK = 120V
V = 240V

MARKETING LEGEND
(rev2 12-29-2020)

Features and Benefits:

- Automates isokinetic sampling and data storage
- Durable roto-molded linear low-density polyethylene (LLDPE/LMDE) case with stainless-steel handles
- 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
- Stores sampling profiles and data
- English or metric units, multilingual language editor
- Sunlight-readable LED display

Specifications

Gas meter: Precision DGM, 0.7 liters per revolution, digital encoder, 2-cc resolution

Temperature control: Integrated temperature control via the control and data acquisition board, probe and oven with solid-state relays

Thermocouple display: seven 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 inches +/- 63mm	0.001-inch resolution 0.01-mm resolution
Orifice ΔH	0 - 5 inches 0 - 127 mm	0.01-inch resolution 0.1-mm resolution
Barometric	17.7 inHg – 32.5 inHg 450 mmHg – 825 mmHg	0.01 inHg 0.1 mmHg
Vacuum sensor	0 - 30 inHg, 0 - 101 kPa, 2% accuracy	

Umbilical connections:
Electrical: 4-conductor circular connector with grounded shell
Sample line: stainless-steel 1/2-inch quick connector
Pitot Line: stainless-steel 1/4-inch quick connectors (optional 3/8-inch)
External pump: stainless-steel 3/8-inch quick connect
Thermocouples: type-K standard size

Communication:
Ethernet

Dimensions:
H23-inch x W21-inch x D12-inch (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:
15 amp max

Autokinetic Software (Compatible Only with XC-5000 Console)

The AutoKinetic proprietary software is designed to be intuitive and user friendly. The step-by-step Windows-based program guides the user through creating a test profile, ensuring that all test parameters are met, and managing the data. 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 and alert set-up screens

Pre-Test Screens

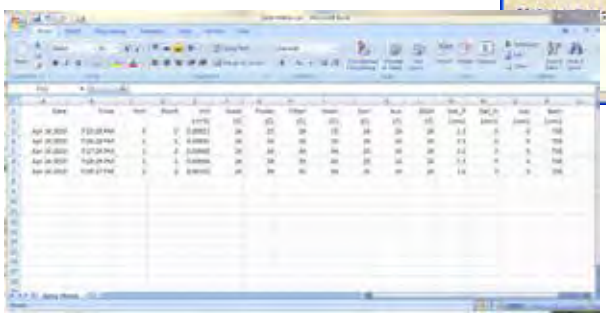
- Calculates:
  - Stack diameter and traverse points
  - Stack velocity and molecular weight
  - Ideal nozzle size and k-factor

Test Run Screen

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

Leak Test Screen

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

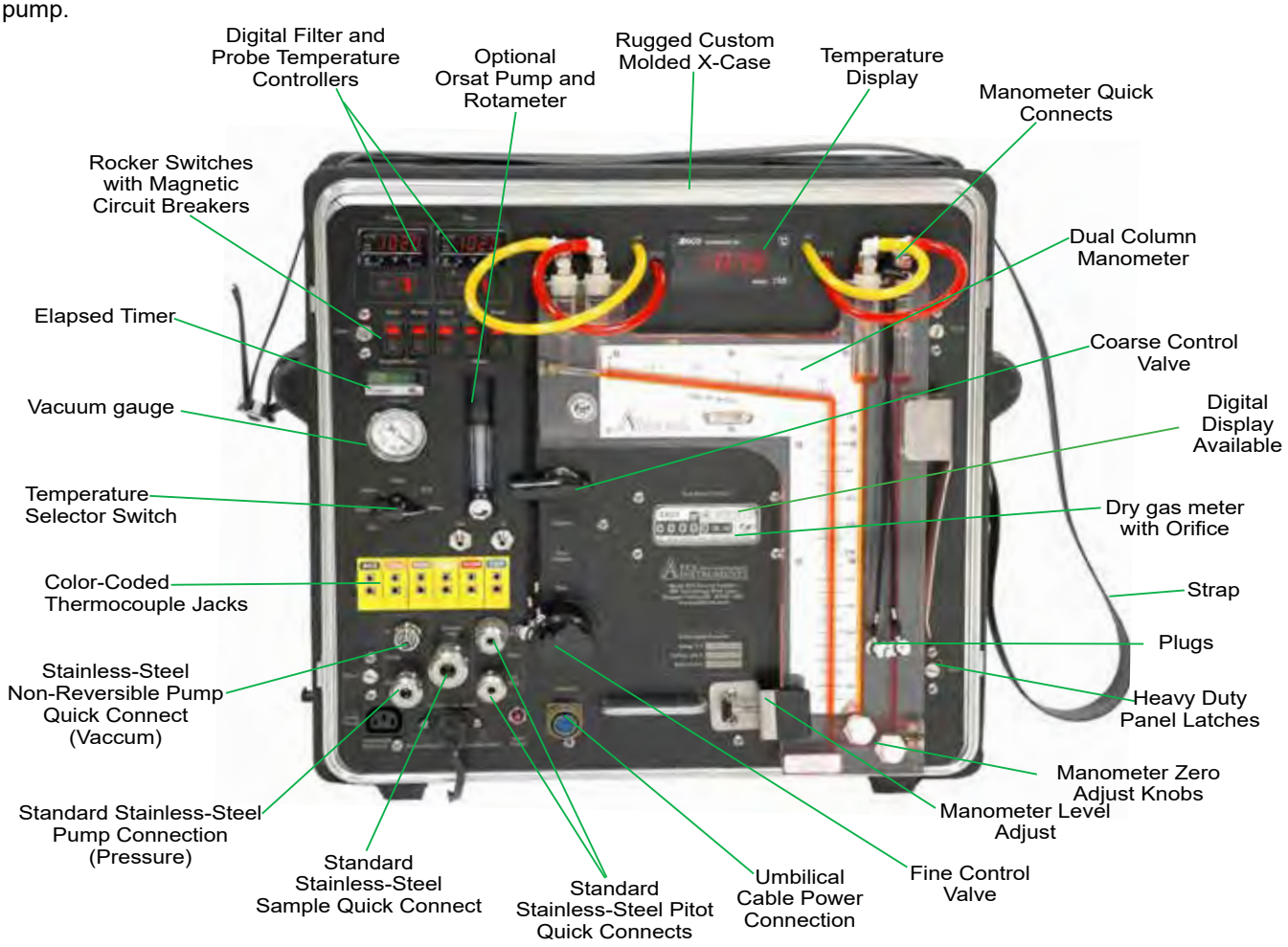


Test Data and Reporting

- Exports
  - Test run data
  - Leak check data
  - Logged events
  - Console audit data
- Data exported in a single CSV file
- Data displayed in both summarized and 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 Instruments source sampler allows the operator to monitor gas velocities, temperatures, and pressures while adjusting sample flow rates to maintain isokinetic sampling conditions. The console comes with a 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. The XC-500 series consoles use standard or metric measurement units, 110V or 220VAC, and an 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, and 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 the 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 encoder module. The components provide precision volume measurement at 1:1 ratio meter-cycle-to-code-wheel resolution. The digital dry gas meter is compact and significantly lighter than other industry standard Method 5 gas meters. The console may be calibrated in English or metric units.

XC-522 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. The totalizer may be configured to English or metric units.

Totalizer

Digital Gas Meter

Model DGM-SK25EX-100. optical encoder sensor assembly with quadrature digital output.

Optional Digital Gas Meter (Option D)

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 Source Sampling Console

The Apex Instruments XC-522 is a full-featured manual meter console. The Apex Instruments 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.

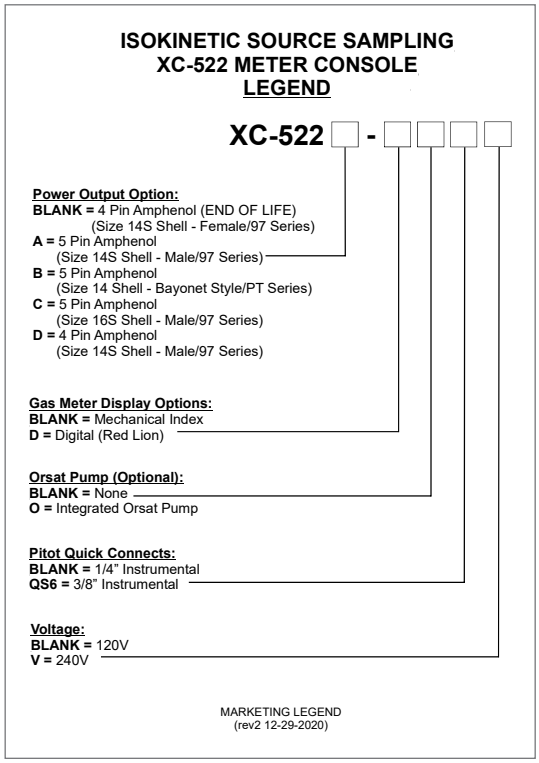
The lightweight X-case and compact design of the XC-522 allows for easy on-site maneuverability.

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
- Durable roto-molded linear low-density polyethylene (LLDPE/LMDE) case with stainless-steel handles
- Removable 19-inch front panel
- Carrying strap for easy transportation
- Non-reversible sample pump connections
- Color-coded thermocouple jacks
- Bright, easy-to-read temperature and volume displays
- Easy-leveling dual-column manometers
- Dry gas meter with bright LED digital volume display
- Stainless-steel quick connects and



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 inH_20 with 0.01 divisions. Vertical range 1-10 inH_2O with 0.1-inch 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: 1/2-inch stainless-steel quick connect
Pitot lines: 1/4-inch (3/8-inch 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 inHg / 0-100kPa.

Sample pump connections: 3/8-inch quick connects, stainless-steel, non-reversible

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

Dimensions: H23-inch x W21-inch x D12-inch (58 x 53 x 30cm) panel 19-inch

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).

The 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 with orifice
- Durable roto-molded linear low-density polyethylene (LLDPE/LMDE) case with stainless-steel handles
- Low-cost manual console
- Easy operation and maintenance
- Rugged, lightweight, and stackable case
- Removable 19-inch front panel
- Carrying 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-connect fittings
- Convenient layout for manual data recording

ISOKINETIC SOURCE SAMPLING
XC-572 METER CONSOLE
LEGEND

XC-572 ☐ - ☐☐☐☐

Power Output Option:
BLANK - 4 Pin Amphenol (END OF LIFE)
(Size 14S Shell - Female/97 Series)
A - 5 Pin Amphenol
(Size 14S Shell - Male/97 Series)
B - 5 Pin Amphenol
(Size 14 Shell - Bayonet Style/PT Series)
C - 5 Pin Amphenol
(Size 16S Shell - Male/97 Series)
D - 4 Pin Amphenol
(Size 14S Shell - Male/97 Series)

Gas Meter Display Options:
BLANK = Mechanical Index
D = Digital (Red Lion)

Orsat Pump (Optional):
BLANK = None
O = Integrated Orsat Pump

Pitot Quick Connects:
BLANK = 1/4" Instrumental
QS6 = 3/8" Instrumental

Voltage:
BLANK = 120V
V = 240V

MARKETING LEGEND
(rev1 5-11-2020)

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_2O 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 pven: 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: 1/2-inch stainless-steel quick connect
Pitot lines: 1/4-inch (3/8-inch 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 inHg / 0-100kPa

Sample pump connections: 3/8-inch quick connects, stainless-steel, non-reversible

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

Dimension: H23-inch x W21-inch x D12-inch (58 x 53 x 30cm)
Panel 19-inch

Weight: 40 lbs (18kg)

XD-502 Isokinetic Sampling Console

Lighter, smaller, and easier.

The new **XD-502** digital source sampling console is the first Method 5 console being offered in our new compact lightweight design.

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

The XD-502 features our new multi-function sunlight-readable transflective display. With quick and easy auditing and calibrating, this digital console is the best choice as 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:

- Durable roto-molded linear low-density polyethylene (LLDPE/LMDE) case with 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:

Dry gas meter:
Model SK25EX, with 100 CPR quadrature encoder, 0.7L/rev., 41 LPM max

Sample pump:
Internal double-head diaphragm, 24VDC, 18 LPM @ 15 inHg and 70 LPM free flow

Display:
4x20 character back-lit transflective liquid crystal display with digital operation of timer, delta P, delta H, DGM volume, vacuum, barometric pressure, and up to 8 temperature channels

Display control:
Six-button long-life membrane keypad for display operation and standard operations.

Flow indicator:
Precision-machined stainless-steel orifice with pressure transducer,
Range 0 - 5 inH_2O (1245 Pa) resolution of 0.01-inch (1 Pa)

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

Digital Pressure transducers:
Ultra-high resolution, temperature-compensated, miniaturized
ΔP +/-1.0" H_2O (+/- 248.8 Pa) range bi-directional with 0.001-inch (1 Pa) resolution
ΔP +/-10.0" H_2O (+/- 2488 Pa) range bi-directional with 0.001-inch (1 Pa) resolution
ΔH +/-5.0" H_2O (+/-1245 Pa) range bi-directional with 0.01-inch (1 Pa) resolution

Vacuum measurement:
PCB-mounted sensor

Umbilical connection:
Sample inlet: 1/2-inch stainless-steel instrumental quick connect (alternate sizes available)
Pitot connections: 1/4-inch stainless-steel instrumental quick connects
Power connector: 4-pin, twist-to-lock, 120V/220V for aux, probe, filter, power
TC Connections: aux, stack, probe oven, filter, exit

Power:
Input power: 120V/15A 60Hz, IEC C-14 inlet.
Pump power: 150W, 24V/6.3A
Display power supply: 15W, 12VDC
Optional enput power: 240V/10A 50Hz, IEC C-14 inlet

Dimensions:
H17-inch x W17-inch x D12-inch (43 cm x 43 cm x 30.5 cm)

Weight:
37 lbs (9.98kg)

XD-502 Console Features

XD-502 LEGEND

XD-502 ☐☐ - ☐☐☐☐☐☐

Pump Options:
BLANK = Internal Pump Only (Standard)
P = Fittings for Additional Pump Installed (Female/Female)
XP = No Internal Pump (Male and Female)

Power Output Option:
BLANK = 4 Pin Amphenol (END OF LIFE) (Size 14S Shell - Female/97 Series)
A = 5 Pin Amphenol (Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol (Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol (Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol (Size 14S Shell - Male/97 Series)

Temperature Controller Option:
BLANK = English
M = Metric

Analyzer Output Option:
BLANK = None
A = 1/4" Valved Female Quick Connect

Pitot Quick Connects:
BLANK = 1/4" Instrumental
QS6 = 3/8" Instrumental

Spare TC Option:
BLANK = Case Temperature
I = DGM Inlet Temperature

Voltage:
BLANK = 120V
V = 240V

MARKETING LEGEND
(rev2 12-29-2020)

XD-502 Software (optional)

Our XD-502 software was specifically designed to complement and enhance the productivity of isokinetic stack sampling. Though helpful in performing a sampling test, the software is not necessary. Using this intuitive and reliable software, the stack tester will be able to:

- Export the data collection to an easily readable Excel file
- Perform all necessary stack sampling functions
- Observe all stack testing measurements in one place
- Tune calibrations as needed according to regulations
- Quick and easy sampling train calibrations

Main Operation Screen

XC-502-XP Option: 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 inHg
- **Maximum vacuum**: 25.5 inHg
- **Weight**: 16 lbs, (7.25kg)

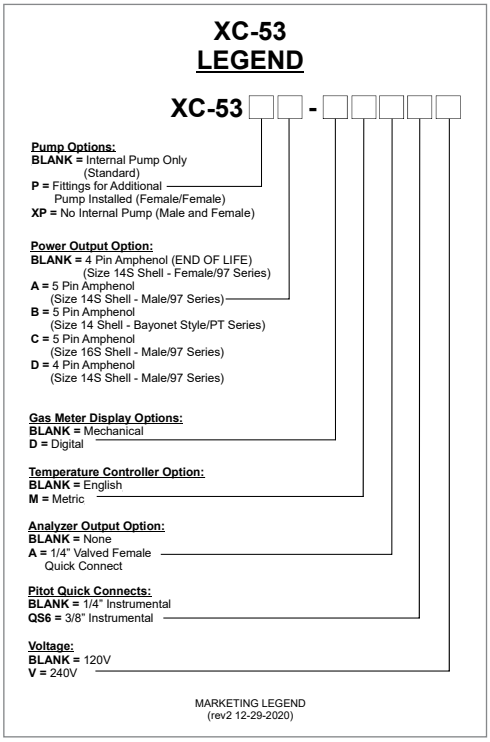
XC-53 Source Sampling Console

The new **XC-53** from Apex Instruments is designed as a cost-effective entry-level metering console for isokinetic sampling. The console features our advanced Peak 32 microcontroller module (MCM) for measuring and displaying stable pressures and temperatures. The transflective LCD screen displays the elapsed time, the pitot velocity pressure (ΔP), the venturi sample flow pressure (ΔH) and the temperature of the selected thermocouple. The rotary switch monitors up to 6 different temperatures. The sample volume is displayed via the mechanical totalizer. The coarse and fine valves are used to control the sample flow rate and to adjust the vacuum during leak checks. The quick-connects provide convenient connections for the sample vacuum line and the pitot tubes.

The **XC-53** isokinetic source sampler console allows the operator to monitor gas velocities, temperatures, pressures, sample flow rates and volumes for maintaining isokinetic sampling conditions. The Source Sampler system is easily adapted to test for a wide range of pollutants from stationary sources, such as particulate matter including PM 2.5 and PM10 fractions, metals, polychlorinated biphenyls (PCBs), dioxins/furans, polycyclic aromatic hydrocarbons (PAHs) and many more pollutants with adaptations of this basic isokinetic test method.

The **Peak 32** microcontroller module utilizes a backlit, sunlight readable screen, an easy-to-use 4-button keypad, and sensors for measuring temperatures and pressures. The Peak 32 MCM also allows for user-adjustable damping for stable display of the ΔP and ΔH values. A USB interface is used for sensor calibration and firmware updates.

Model XC-53P Console



Features:

- Durable roto-molded linear low-density polyethylene (LLDPE/LMDE) case with stainless-steel handles
- Precision Dry gas meter
- Internal sampling pump
- Peak 32 microcontroller module
- Booster pump (optional)

Specifications:

Dry gas meter (DGM): SK25EX, measurement principle - gas displacement, easy-to-read numeric index with leak-check wheel, Qmax 41 LPM at 150 Pa., Qmin 0.26 LPM.; totalizer capacity 9999 cubic meter, resolution 0.2 liter; cyclic volume 0.7 liters; type-K thermocouple for exit temperature

Display: 4x20 character back-lit transflective liquid-crystal display, viewing area 74 mm x 45 mm, operating temperature -20 to 70ºC

Flow meter: Precision stainless-steel venturi

Internal sample pump: Dual-head diaphragm, 70 LPM free flow, 21 LPM @ -50kPa, max vacuum -85 kPa, 24 VDC brushless motor

Temperature measurement: Cold-junction compensated, type-K thermocouple-to-digital converter °C/°F selectable, -200°C to 1372°C range (-328°F to 2502°F); 6-channel rotary switch, up to 5 addition type-K thermocouple inputs, standard-size jacks

Probe and oven temperature control: Fuji PXR3 compact, 1/32 DIN self-tuning PID temperature controller with 3-button keypad, SSR Driver for 25-amp solid-state relay; type-K thermocouple jack for input

Digital pressure transducers:
- ΔP Low +/- 1.0" (+/-249 Pa) range bi-directional with 0.001" (0.1 Pa) resolution
- ΔP High +/- 10.0" (+/-2491 Pa) range bi-directional with 0.01" (1 Pa) resolution
- ΔH 5.0" (1245 Pa) range with 0.01" (1 Pa) resolution

(ΔP automatically selects appropriate transducer for current flow)

Vacuum gauge: Bourdon tube, dual-scale, 0 to -30 inHg, 0 to -100kPa

Umbilical connection: Electrical multi-conductor circular connector; instrumental grade stainless-steel quick-connects; sample inlet: 1/2-inch, pitot connections: 1/4-inch; type-K thermocouples inputs: aux, stack, probe, oven exit

Power: Supply 120VAC/60 Hz 15 amps max. or 240VAC 50 Hz 10 amps max., IEC C-13 inlet

Dimensions: H17-inch x W17-inch x D12-inch (43 cm x 43 cm x 30.5 cm); weight: 40 lbs

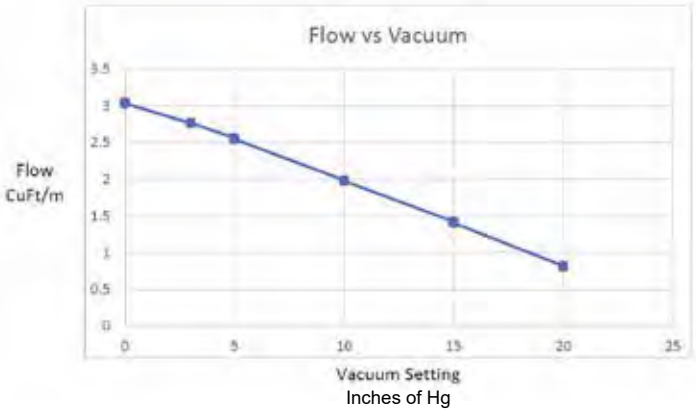
Method 5 Pump Assemblies

Lubricated Rotary Vane Pump (0523)

The lubricated rotary vane pump includes a 4-foot power cord and two kink-free hoses with nonreversible stainless-steel quick connects. The pump is mounted in our standard, durable, and 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: 1/4 hp, 120/240V 60/50 Hz 4.6/2.3 amp., RPM 1725/1425
- Measured flow: 3.1 CFM at 1 inHg; 1.5 CFM at 15 inches Hg
- Maximum vacuum: 25.5 inHg
- 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 4-foot power cord and kink-free hoses with nonreversible stainless-steel quick connects mounted in an open aluminum enclosure.
Option “V” added for 240V.

E-0523 Open-frame Pump

Ei-838 Sampling Pump

Ei-838 External Diaphragm Sampling Pump

- German-engineered 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 inHg
- **Maximum vacuum**: 25.5 inHg
- **Weight**: 16 lbs, (7.25 kg)

Nozzles for Isokinetic Sampling

Apex Instruments offers button-hook nozzles in various materials and sizes. Isokinetic sampling requires the nozzle size to match the stack gas velocity. The material required is dependent upon the stack temperature and the sampling method.

The most popular nozzles are available in our standard set. We also offer large and oversize nozzle sets. Nozzle sizes are based on 1/32 inch increments, up to two inches.

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-inch 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.

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-inch 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-inch 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-inch 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

NOZZLE SET LEGEND

N ☐ **-SET-** ☐ **-** ☐

Nozzle Material:
G = Glass
Q = Quartz
S = Stainless Steel
SIL = SilcoNert 2000 Coated Stainless Steel
ST = PTFE/FEP Duplex Coated Stainless Steel
I = Alloy 600 (Inconel)

Nozzle Sizes:
BLANK = Even Sizes (4,6,8,10,12,14,16)
ODD = Odd Sizes (5,7,9,11,13,15,17)
S = All Sizes 4 Through 10
L = All Sizes 11 Through 17

Option:
LP = Low Profile

ENGINEERING & MARKETING LEGEND
(rev1 6-9-2020)

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.

NS-TH-SET

Nozzle Options

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

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

NOZZLE LEGEND

N □ - □ □ □ □

Nozzle Material:
G = Glass
Q = Quartz
S = Stainless Steel
SIL = SilcoNert 2000 Coated Stainless Steel
ST = PTFE/FEP Duplex Coated Stainless Steel
I = Alloy 600 (Inconel)

Thread Options:
BLANK = Non-Threaded
TH= Threaded/Oversized Stainless Steel/Inconel Nozzles

Nozzle Size:

Glass, Quartz, Stainless Steel, Alloy 600 (Inconel), FEP Lined Inconel, Silco Coated Nozzle Size (NOMINAL)

	Metal / Alloy			Glass / Quartz		
	Inch	Decimal	MM	Inch	Decimal	MM
4 =	1/8	.120	3.1	1/8	.125	3.2
5 =	5/32	.152	3.9	5/32	.156	4.0
6 =	3/16	.180	4.6	3/16	.180	4.8
7 =	7/32	.209	5.3	7/32	.209	5.3
8 =	1/4	.245	6.2	1/4	.250	6.4
9 =	9/32	.277	7.1	9/32	.281	7.1
10 =	5/16	.305	7.8	5/16	.312	7.9
11 =	11/32	.334	8.5	11/32	.343	8.7
12 =	3/8	.370	9.4	3/8	.375	9.5
13 =	13/32	.402	10.2	13/32	.406	10.3
14 =	7/16	.430	10.9	7/16	.437	11.1
15 =	15/32	.459	11.7	15/32	.468	11.7
16 =	1/2	.495	12.6	1/2	.500	12.7
17 =	17/32	.527	13.4	17/32	.531	13.5
18 =	9/16	.568	14.4	9/16	.558	14.2

***Larger Sizes Available in Glass and Quartz by Request**

Threaded Oversized (Stainless Steel and Inconel) Nozzle Size (NOMINAL) (Component Part N[S or I]-THB Needed)

20 =	5/8	.620	15.8
22 =	11/16	.680	17.4
24 =	3/4	.750	19.0
26 =	13/16	.810	20.6
28 =	7/8	.870	22.2
30 =	15/16	.090	23.8
32 =	1	1.000	25.4

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

Option:
NF = Without Machined Ferrules

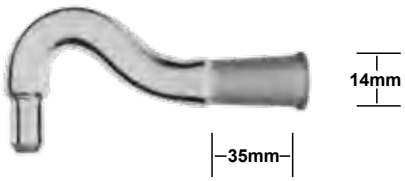
ENGINEERING LEGEND
(rev2 6-9-2020)

Dual Probe w/ Nozzles Installed

Nozzle w/ Machined Ferrule

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

Glass/Quartz Nozzle



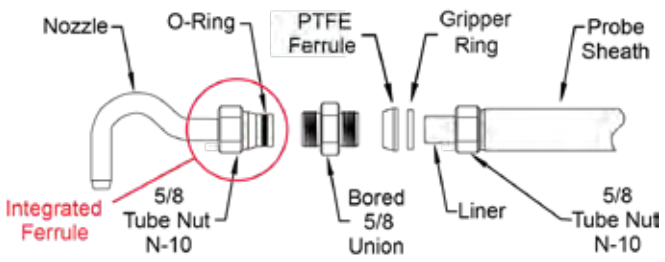
14/35 Tapered Glass/Quartz Nozzle

Recommended Maximum Temperature

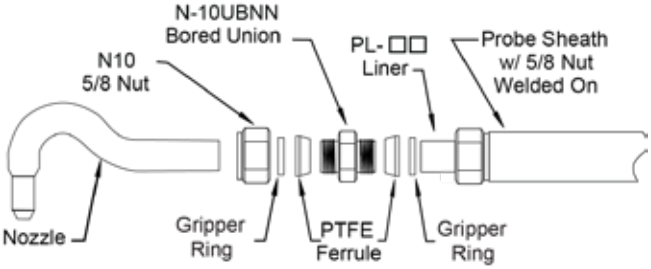
Material	Maximum Temperature	
Stainless steel	650°C	(1200°F)
TPFA/PTFE fitting	177°C	(350°F)
Borosilicate glass	480°C	(900°F)
Alloy 600	871°C	(1600°F)
Quartz	900°C	(1650°F)
Viton O-rings	260°C	(500°F)
Graphite ferrules	930°C	(1800°F)
Glass-filled PTFE	260°C	(500°F)*

*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-inch stainless-steel ferrules, includes one front and one back ferrule
10FFB-I	Set of 5/8-inch 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-inch diameter

NB-5 5/16-inch diameter

NB-8 1/2-inch diameter

Vinyl Caps

Part #	Description
VPC-4-16	Vinyl cap, size 1/4-inch ID, 1-inch height, fits nozzle sizes 4-6
VPC-6-16	Vinyl cap, size 3/8-inch ID, 1-inch height, fits nozzle sizes 7-10
VPC-8-16	Vinyl cap, size 1/2-inch ID, 1-inch height, fits nozzle sizes 11-14
VPC-10-16	Vinyl cap, size 5/8-inch ID, 1-inch 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-inch
N-10UBNN	Union, 5/8 body only, SS, bored
NTG-10FF (6)	Ferrule, 5/8 Single, TFE/glass
NSIL-10BF (6)	5/8-inch back ferrule, gripper ring

PK-SP

Contact us about our complete line of brushes.

PTFE Nozzle Brush (NBT-1/2)

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

PBX-S Probe Brush Set

Stainless-steel probe brush kit with two 5/8-inch 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-inch overall diameter

PBX-☐ T Brush Extension

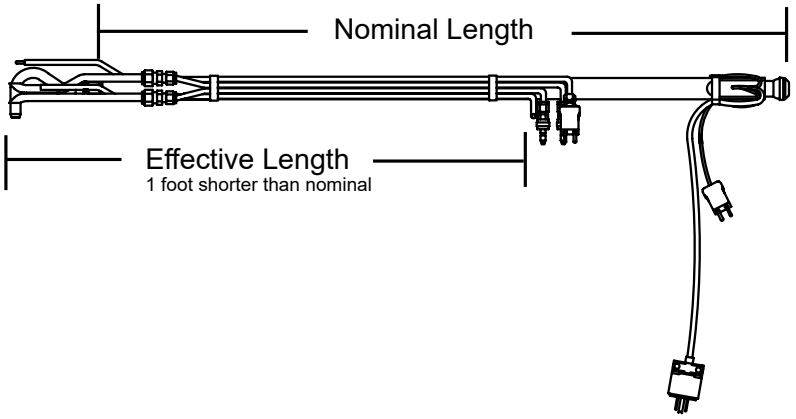
Flexible TFE brush extension
Specify length in feet
Brush not included

Isokinetic Probes

Standard Method 5 Heated Probes

The Apex Instruments standard Method 5 heated probe features a 1-inch diameter sheath constructed from corrosion-resistant stainless steel, modular 3/8-inch pitot tip, 1/4-inch stainless-steel quick connects, type-K thermocouples for stack and probe temperature, probe heater, orsat line, and a 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 SHEATH LEGEND

PS- ☐ - ☐☐☐☐☐☐

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

Alloy:
BLANK = Stainless Steel
A = Alloy 600 (Inconel) *Non-Modular
C = Alloy C22/C276 (Hastelloy)
D = 253MA *Non-Modular

Heater:
BLANK = No Heater
H = Heater

Over Sheath Options:
BLANK = No Over Sheath
O2 = 2" Over Sheath

Pitot Quick Connect:
BLANK = 1/4" Instrumental QC
QS6 = 3/8" Instrumental QC

Voltage/Power Plug Options: BLANK = 120V (5-15) (Domestic) **C14 =** 120V (International)
C14V = 240V (International)

ENGINEERING LEGEND
(rev3 6-4-2020)

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-inch oversheath packing gland, 2-inch 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 sampling. 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.

Method 5 air-cooled probes now come standard with modular pitots and an Inconel reducing union.

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

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

Glass and quartz liners not recommended due to breakage.

Blowers

Blower assembly for APS probes (for non-continuous sampling) SBR-93CFM, 93 cfm. 120VAC, variable-speed controller blower hose not included.

SBR-93CFM
SBR-93CFM-V

Blower Hose

2.5-foot blower hose assembly for use with blowers. 1-1/2-inch vacuum hose with cam-lock.

HGBH-2.5
HGBH-5

Note: Using a hose that is more than 5 feet in length can reduce the airflow through the air-cooled probe.

Plant Air Coupler

Adapter assembly used with air-cooled probe connecting to plant air, includes: 1.5-inch SS sanitary cap, 1.5-inch Q-clamp, and 1/2-inch FNPT SS half coupling.

ACP-PAA.5

AIR COOLED PROBE LEGEND

APS - □ □ - □ □

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.
8 = 8 ft. (Longest recommended length)

Liner Option:
BLANK = No Liner
A = Alloy 600 Inconel Liner (Recommended)

Pitot Quick Connects:
BLANK = 1/4" Stainless Steel Instrumental Quick Connects
QS6 = 3/8" Stainless Steel Instrumental Quick Connects

Welded Nut and Small Parts Kit:
BLANK = Included
N = Not Included

Standard Probe and Materials:
Outer Sheath - 253MA
Middle Sheath - Stainless Steel
Inner Sheath - 253MA
Pitot Tubes and Orsat - Inconel
Welded Nut and Small Parts Kit
Quartz Liner Also Available (Sold Separately)

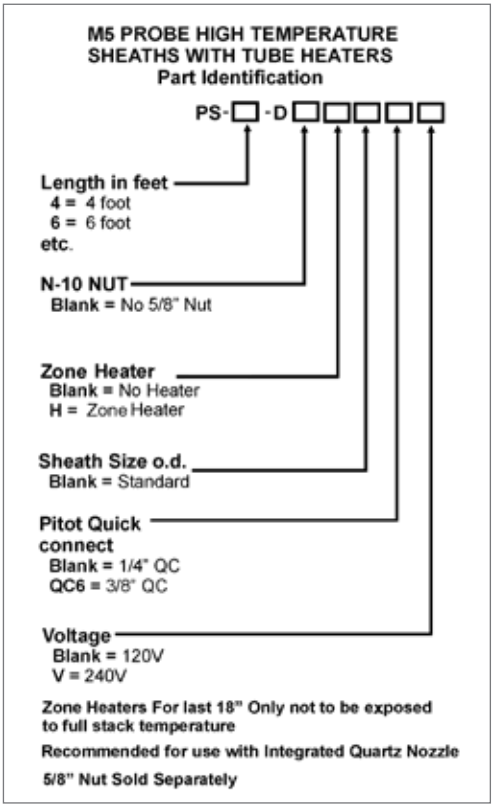
MARKETING LEGEND
(rev1 10-21-2020)

High-Temperature Alloy Method 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-inch pitot, 1/4-inch stainless-steel quick connects, stack temperature thermocouple with magnesium oxide insulation, and orsat lines are secured to the sheath and 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.



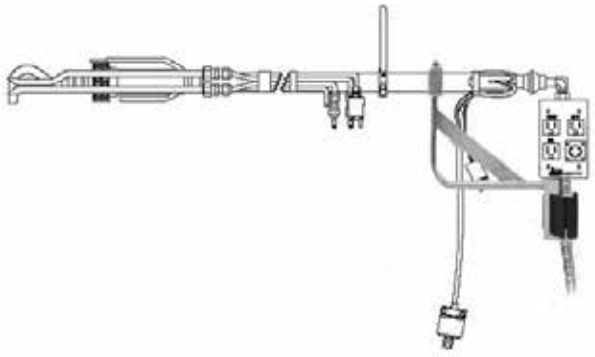
3/8-inch Quick-connects available upon request.

Method 17 and 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-inch-diameter sheath constructed from corrosion-resistant stainless steel, modular offset 3/8-inch pitot tip, 1/4-inch stainless-steel quick connects, type-K thermocouples for stack and probe temperature, probe heater, orsat line, and a 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



GA-111 Strain Relief Adapter

This strain relief adapter connects the probe to a flexible sample line.

Part#	Description
GA-111-S	1-inch aluminum clamp to velcro

M17-201A PROBE SHEATH LEGEND

PS- ☐ - ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

Alloy:
BLANK = Stainless Steel
A = Alloy 600 (Inconel) *Non-Modular
C = Alloy C22/C276 (Hastelloy)
D = 253MA *Non-Modular

Heater:
BLANK = No Heater
H = Heater

Over Sheath Options:
BLANK = No Over Sheath
O2 = 2" Over Sheath

Pitot Length:
M#### = MPT Length (in Millimeters)

Pitot Length Chart

Product	Standard Pitot Length (mm)	Probe w/ 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

Pitot Quick Connect:
BLANK = 1/4" Instrumental QC
QS6 = 3/8" Instrumental QC

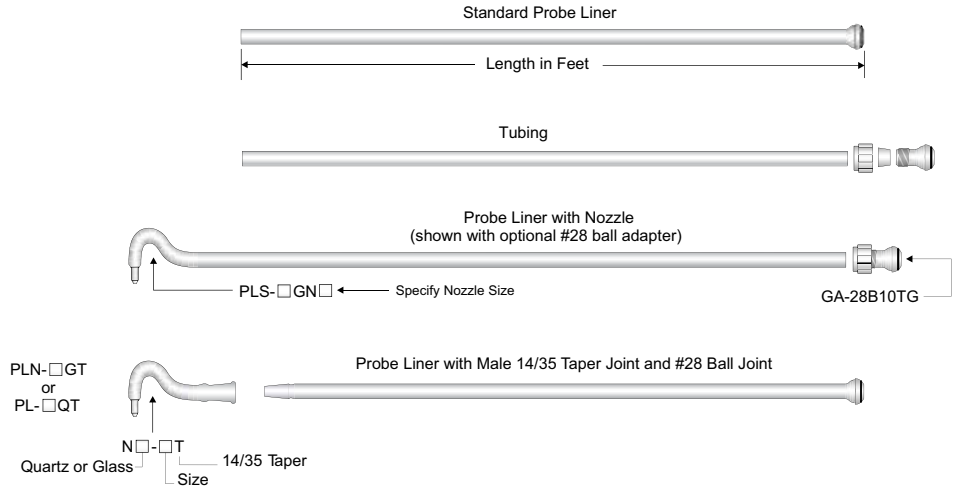
Voltage/Power Plug Options:
BLANK = 120V (5-15) (Domestic)
C14 = 120V (International)
C14V = 240V (International)

ENGINEERING LEGEND
(rev3 6-4-2020)

Probe Liners

Our standard probe liners are constructed from 5/8-inch diameter tubing and have a #28 ball joint attached. Liners are available in borosilicate glass, quartz, stainless steel, alloy 600, C276 alloy and glass-filled PTFE. Liners with integrated nozzles require a ball joint adapter. Glass and quartz liners with male 14/35-inch taper joint are available for attaching to the nozzle, eliminating the need for the 5/8-inch union.

Stainless steel probe liner
#28 ball joint



STAINLESS STEEL PROBE LINER LEGEND

PL ☐ - ☐ S

Joint Options:
BLANK = #28 Grooved Ball
S = Plain Ends
F4 = 1/4" Full Flow Quick Connect
F6 = 3/8" Full Flow Quick Connect

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

ENGINEERING & MARKETING LEGEND
(rev0 3-6-2020)

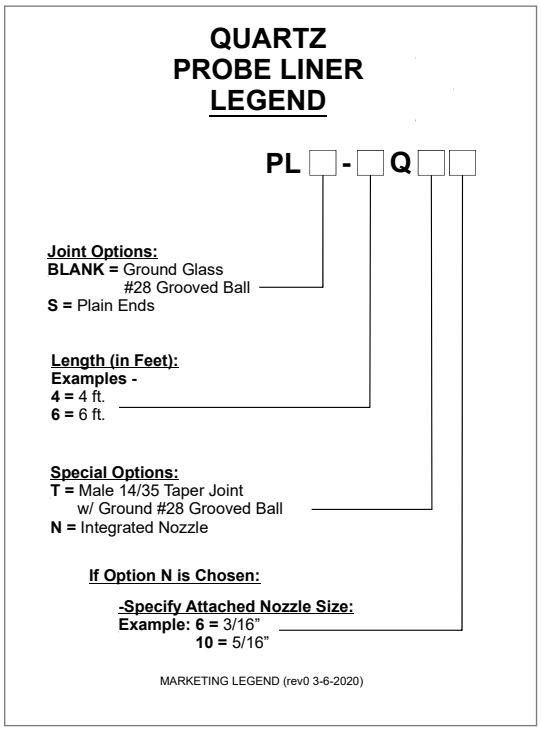
ALLOY 600 PROBE LINER LEGEND

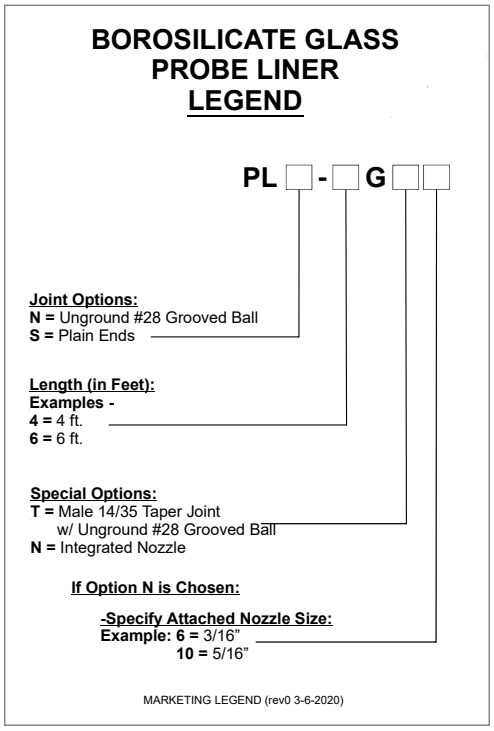
PL ☐ - ☐ A

Joint Options:
BLANK = Stainless Steel #28 Grooved Ball
S = Plain Ends

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

MARKETING LEGEND (rev0 3-6-2020)





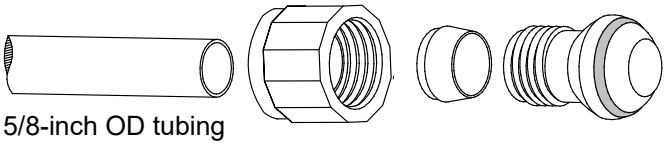
Ball Adapters

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-inch OD x .035-inch wall
TI10-035S	Seamless alloy 600 tubing, 5/8-inch OD x .035-inch wall
TC276-10-049W	Seamless C276 alloy tubing, 5/8-inch OD x .049-inch wall

Tubing sold by the foot



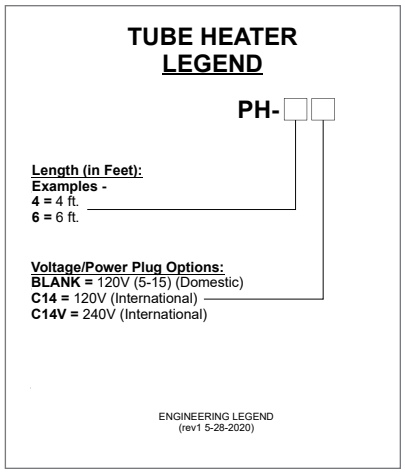
5/8-inch OD tubing

Replacement Tube Heaters

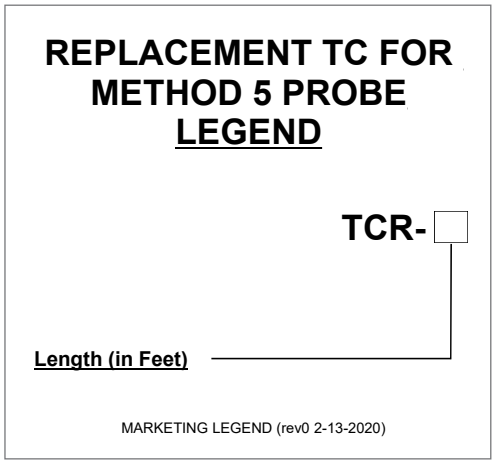
Method 5 Probe (Tube) Heaters

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-inch less than liner length.

Apex Instruments 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 Thermocouple

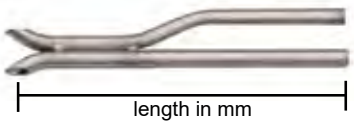


Replacement Pitot Tips

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.



MODULAR PITOT TIPS LEGEND

MPT ☐ - ☐ - ☐ - ☐ - ☐

Material:
BLANK = Stainless Steel
I = Alloy 600 (Inconel)

Tube O.D.
Examples: 4 = 1/4"
6 = 3/8"

Length
Measured in millimeters

Offset
OFF

Wind Tunnel Calibration
WC

Pitot Length Chart

Product	Standard Pitot Length (mm)	Probe w/ 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

ENGINEERING & MARKETING LEGEND
(rev0 1-31-2020)

3/8-inch stainless-steel modular S-type 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

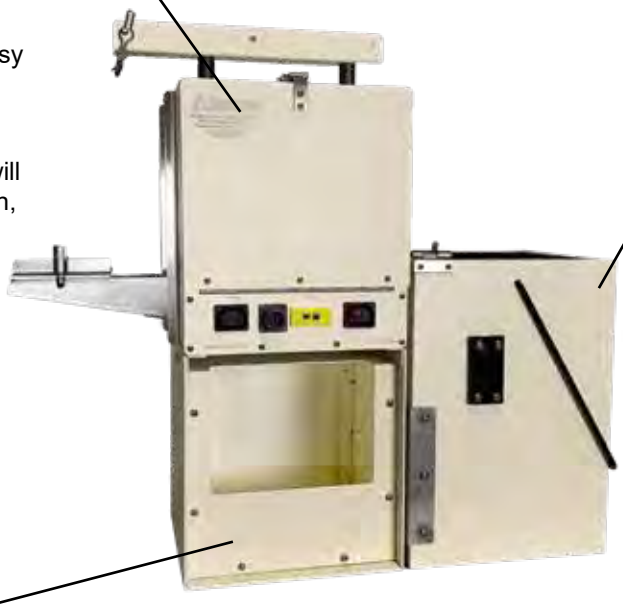
NOTE: Wind tunnel calibration required for Method 201A.

Modular Sample Case Assemblies

The interchangeable design of the Apex Instruments modular sample case assemblies allows the user to arrange our filter ovens, risers and impinger cases in various 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-inch probe clamp can be replaced with alternative probe clamps. All single probe filter Ovens will accept standard 2-inch, 3-inch, and 5-inch filter assemblies.



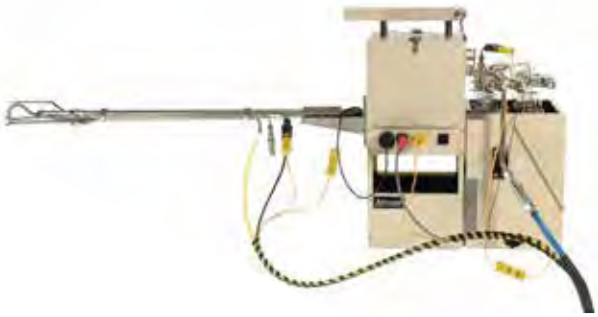
Impinger Cases

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. Risers are available with various features such as temperature controllers and a blower for use with air-cooled probes.

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

SB-2M

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

HEATED FILTER OVEN LEGEND

SB-2M ☐ - ☐ ☐

Filter Options:
BLANK = Single (Standard)
D = Dual

Amphenol Connection Options:
BLANK = 4 Pin Amphenol (END OF LIFE)
(Size 14S Shell - Female/97 Series)
A = 5 Pin Amphenol
(Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol
(Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol
(Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol
(Size 14S Shell - Male/97 Series)

Voltage Options:
BLANK = 120V (5-15) (Domestic)
C13 = 120V (International)
C13V = 240V (International)

MARKETING LEGEND
(rev3 12-29-2020)

Strain Reliefs for SB-2M

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

GA-107-12 1/2-inch clamp

(all sizes are inside diameter)
Strap recommended for larger sizes.

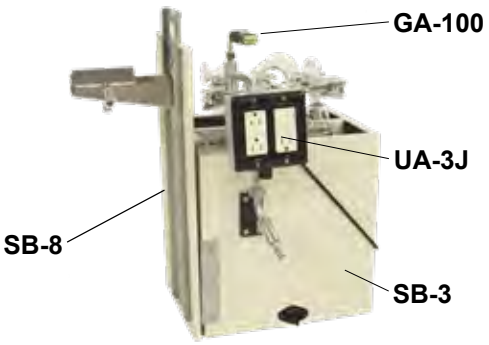
The **GA-113** strain relief is used specifically for heated sample lines for the SB-2M during flexible Method 5 sampling. Includes bracket that attaches to the SB-2M and an adjustable Velcro® strap to grip-heated sample lines.

GA-113

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 a stainless-steel probe clamp and impinger case slides.

SB-8



SB-8
LEGEND

SB-8- ☐

Probe Mounting Options:
BLANK = 1" Probe Clamp
CL32 = 2" Cam-Lock
AS = Strain Relief w/ Adjustable Strap
PP = 1" Probe Clamp w/ 120V Peristaltic Pump
PPV = 1" Probe Clamp w/ 240V Peristaltic Pump

MARKETING LEGEND
(rev0 4-22-2020)

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-inch 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 for SB-2M, impinger box adapter, 10-inch riser with reservoir

Model	Description	Dimensions (HxWxD)
SBR-10	10-inch riser	9.5-inch x 9.5-inch x 10-inch (24.1 cm x 24.1 cm x 25.4 cm)
SBR-93CFM	10-inch riser with blower	Blower assembly for APS probes, 120VAC, variable-speed controller blower hose not included.
SBR-10-XR2	10-inch riser with temp control	Riser assembly with two built-in temperature controllers

SBR-10

SBR-93CFM

SBR-10-XR2

SBR-10
BLOWER
LEGEND

SBR-93CFM- ☐

Voltage Options:
BLANK = 120V
V = 240V

ENGINEERING & MARKETING LEGEND
(rev1 3-26-2020)

SBR-10
TEMPERATURE CONTROLLER
LEGEND

SBR-XR ☐☐ **-** ☐

Number of Temperature Controllers:
1 = One Controller
2 = Two Controllers

Temperature Units of Measurement:
F = Fahrenheit
C = Celsius

Power Output:
BLANK = 4 Pin Amphenol (END OF LIFE)
(Size 14S Shell - Female/97 Series)
A = 5 Pin Amphenol
(Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol
(Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol
(Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol
(Size 14S Shell - Male/97 Series)
515 = #5-15 120V 15A (N.Amer)
C13 = IEC 15A (N.Amer)/10A (Int.)
C13V = IEC 240V 15A (N.Amer)/10A (Int.)

MARKETING LEGEND
(rev1 12-29-2020)

Impingers Cases

Apex Instruments offers 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. These cases 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-inch x 9.5-inch x 13.5-inch (24.1 cm x 24.1 cm x 34.3 cm)	5 lbs (2.3 kg)
SB-4	6	12.5-inch x 9.5-inch x 13.5-inch (31.8 cm x 24.1 cm x 34.3 cm)	6 lbs (2.7 kg)
SB-4SD	2 + 2	12.5-inch x 9.5-inch x 13.5-inch (31.8 cm x 24.1 cm x 34.3 cm)	6 lbs (2.7 kg)
SB-4SDM2	4 + 2	12.5-inch x 9.5-inch x 13.5-inch (31.8 cm x 24.1 cm x 34.3 cm)	6 lbs (2.7 kg)
SB-5	8	16-inch x 9.5-inch x 13.5-inch (40.6 cm x 24.1 cm x 34.3 cm)	7 lbs (3.2 kg)
SB-6	5	20-inch x 10-inch x 13.5-inch (50.8 cm x 25.4 cm x 34.3 cm)	11.2 lbs (5 kg)

SB-6

Impinger Strain Relief

The GA-109 strain relief is used with sample lines at the impinger box when performing flexible method 5 sampling. Includes a bracket that attaches to the impinger box and a standard mount with a 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-inch stainless-steel male quick connect. Mounts on impinger box.

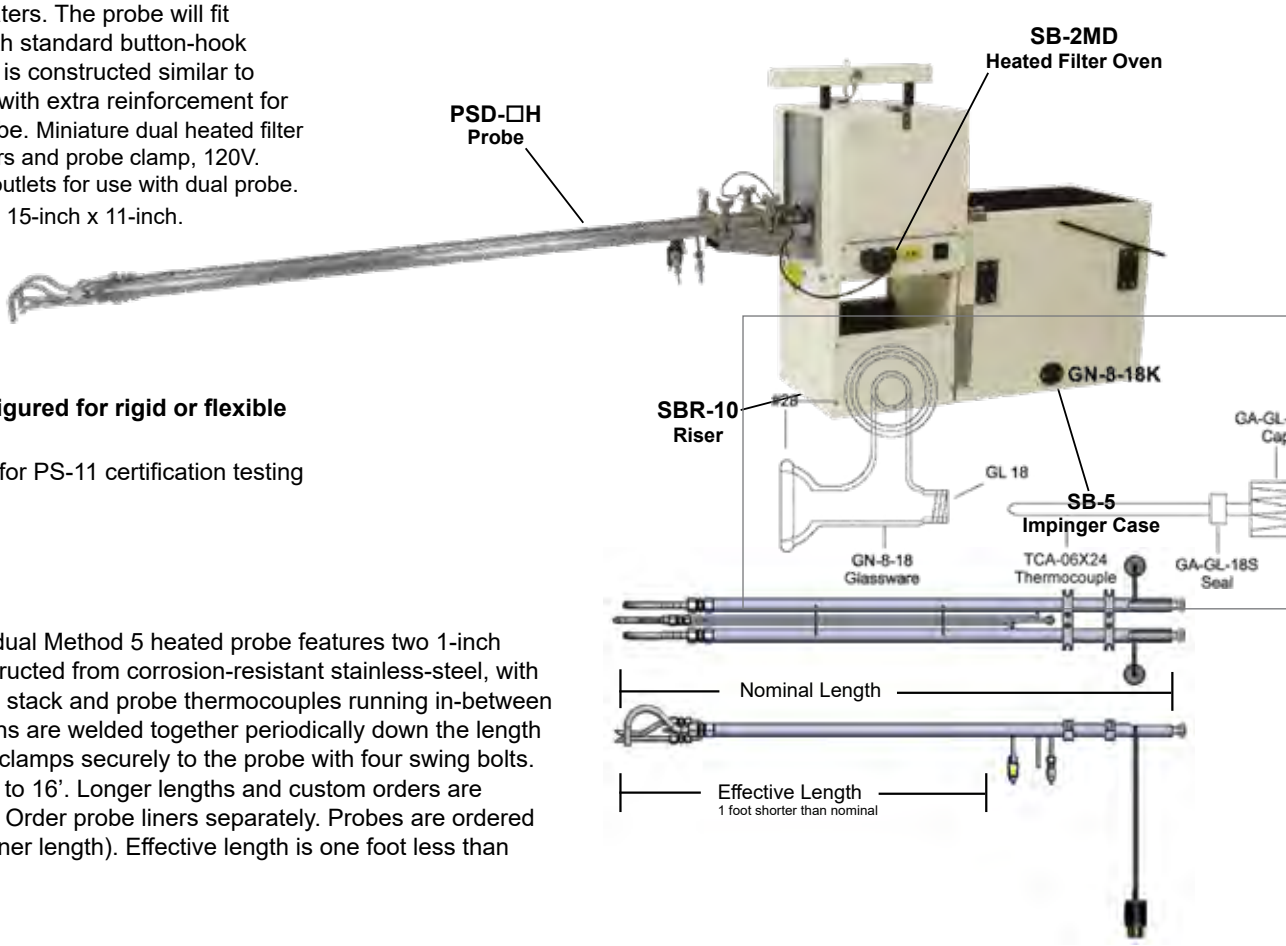
GA-100

GA-100

Dual Filter Oven

Improve precision and save time with our dual modular sample cases and probes for paired sampling. The filter oven accepts two standard 3-inch 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 two access doors and probe clamp, 120V. Modified with two inlets/outlets for use with dual probe. Dimensions: 9-5/8-inch x 15-inch x 11-inch.

SB-2MD



The oven can be configured for rigid or flexible arrangements.

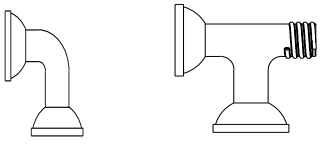
- Highly recommended for PS-11 certification testing
- Method 5I and 26A

Dual Probe

The Apex Instruments dual Method 5 heated probe features two 1-inch diameter sheaths constructed from corrosion-resistant stainless-steel, with the pitot, orsat line, and stack and 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 four 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.

Special Glassware for Dual Oven

Part #	Description
GN-8D	Glass "L" adapter, #28 unground sockets
GN-8D-18	Glass "L" adapter, #28 unground sockets, and #18 thread for TC
GN-8D-18K	Double "L" Adapter with 6-inch Type-K Thermocouple Assembly with 24-inch TC wire. Includes cap and seal



GN-8D

GN-8D-18

M5 DUAL PROBE SHEATH LEGEND

PSD- ☐ - ☐☐☐☐☐

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

Alloy:
(All Alloy Probes are Non-Modular Pitot)
BLANK = Stainless Steel
A = Alloy 600 (Inconel)

Heater:
BLANK = No Heater
H = Heater

Pitot Quick Connect:
BLANK = 1/4" Instrumental QC
QS6 = 3/8" Instrumental QC

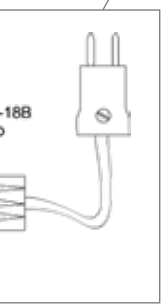
Voltage/Power Plug Options:
BLANK = 120V (5-15) (Domestic)
C14 = 120V (International)
C14V = 240V (International)

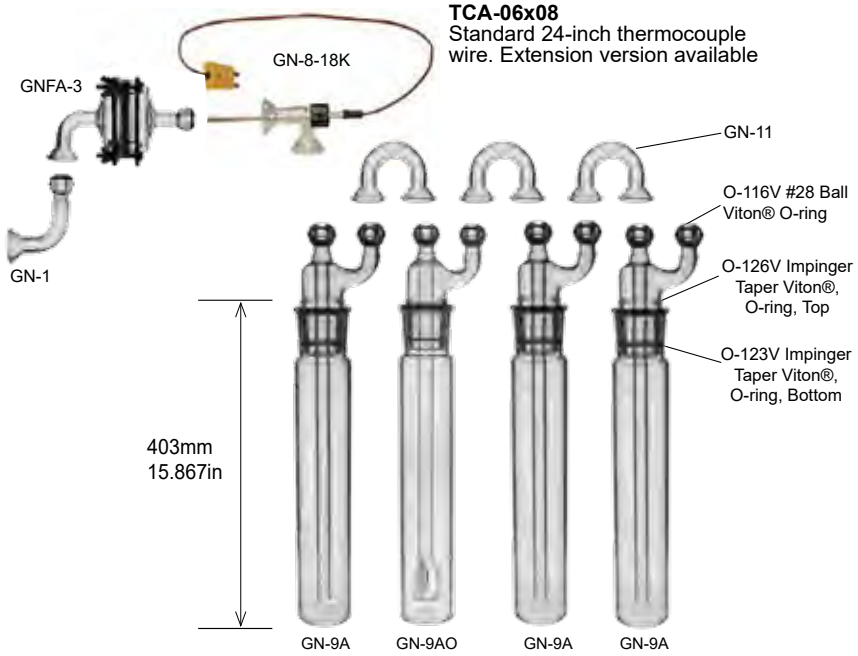
ENGINEERING LEGEND
(rev1 6-4-2020)

Isokinetic Glassware Sets

Basic Glassware Sets

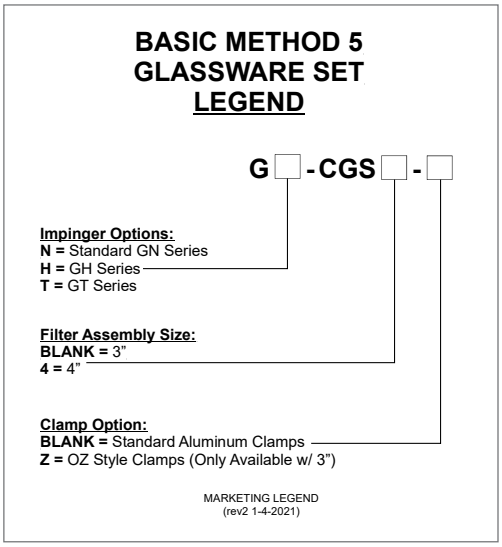
Apex Instruments offers a complete line of glassware. Our standard glassware features extra heavy borosilicate glass with unground #28 ball and socket joints with O-ring seals. Cost-effective unground joints are more durable than ground joints and the O-rings provide a tight, leak-free seal without grease. This set includes all the glassware necessary for one train.





Basic Method 5 Glassware Sets

Model	Description
GN-CGS	***with 3-inch filter assembly***
GN-CGS-Z	***with 3-inch filter assembly*** with OZ style clamps
GN-CGS4	***with 4-inch filter assembly***



Hybrid Impinger - The Safer Impinger

Our new impinger series allow the user to safely remove the glassware insert.

The design uses a silicone gasket and a threaded cap to create a greaseless, high-vacuum seal and an inner taper to hold the glass insert steady.

Hybrid Series impinger features:

- Safe removal of impinger insert
- Easily removes stuck insert
- Dramatically reduces risk of breaking glass during removal
- Easier recovery of reagents through side arm
- More reliable seal between impinger and insert
- Interchangeable with current GN Series impingers

Insert removal tool for GH Series impingers

Replacement Parts:

- Impinger cap: GA-GL-45BB
- Silicone gasket: GA-GL-45/32S
- Ball and socket O-rings: O-116V
- Insert removal tool: GH-SEP

GH series impinger

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 and spares for a full test series. Four filter assemblies cover three sampling runs plus a spare one. 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-inch filter assembly
GN-DGS-Z	w/ 3-inch filter assembly and OZ style clamps
GN-DGS4	w/ 4-inch filter assembly

Transport Case

Case dimensions:
25-inch (63.5 cm) x 19-inch (48.2 cm) x 23-inch (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 SET LEGEND

G ☐ - DGS ☐ - ☐

Impinger Options:
N = Standard GN Series
H = GH Series
T = GT Series

Filter Assembly Size:
BLANK = 3”
4 = 4”

Clamp Option:
BLANK = Standard Aluminum Clamps
Z = OZ Style Clamps (Only Available w/ 3”)

MARKETING LEGEND
(rev2 1-4-2021)

Glassware Filter Assemblies and Components

2-inch Filter Components (55mm)

Model	Description
GN-2S	2-inch glass filter Inlet, #28 unground socket, 90° bend
GN-2B	2-inch glass filter outlet, #28 unground O-ring ball
GA-2CA	2-inch aluminum filter clamp, open plate style
GA-2T	2-inch 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-inch nylon filter tripod
GN-2S-18	2-inch glass filter inlet, #28 unground socket, 90° bend

3-inch Filter Components (82.6mm)

Model	Description
GN-3S	3-inch glass filter Inlet, #28 unground socket, 90° bend
GN-3SS	3-inch glass filter Inlet, straight with #28 unground socket
GN-3S-18	3-inch glass filter Inlet, #28 unground socket, 90° bend #18 screw joint for thermocouple
GN-3B	3-inch glass filter outlet, #28 unground O-ring ball
GA-3CA	3-inch aluminum filter clamp, open plate style
GA-3CZ	3-inch single thread filter clamp assembly, OZ style
GA-3T	3-inch PTFE filter support with Viton® O-rings
GA-3SS	3-inch 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-inch glass filter disk with rubberized edge
GA-3P	3-inch nylon filter tripod

4-inch Filter Components (110mm)

Model	Description
GN-4S	4-inch glass filter inlet, #28 unground socket, 90° bend
GN-4B	4-inch glass filter outlet, #28 unground O-ring ball
GA-4CA	4-inch aluminum filter clamp, open-plate style
GA-4T	4-inch 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-inch nylon filter tripod

2-inch unground glass, PTFE filter support, open-style aluminum clamp.
GNFA-2

2-inch u-style unground glass, with 90° inlet and outlet, PTFE filter support, open-style aluminum clamp.
GNFA-2U

3-inch unground glass, PTFE filter support, open-style aluminum clamp.
GNFA-3

3-inch 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

Filter PTFE disk with viton O-rings.
GA-□T

Stainless-steel filter support disk.
GA-□SS

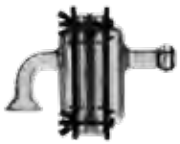
Glass filter disk with rubberized edge.
GA-□G

GA-3T New Design

New GA-3T design: On the side that touches the filter, the O-ring and the groove have a larger inner diameter and are closer to the edge of the disk. This positioning creates more space in the center of the filter support, making it easier to prevent the filter from sticking to the O-ring.

3-inch unground glass, PTFE filter support, open-style aluminum clamp, straight-through style.
GNFA-3-STR

4-inch unground glass, PTFE filter support, open-style aluminum clamp.
GNFA-4



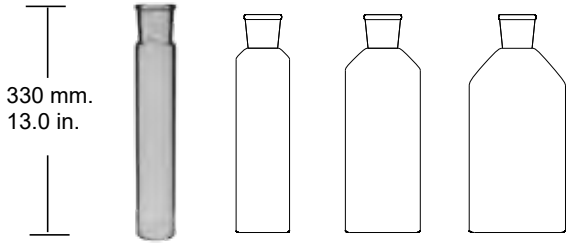
4-inch filter assembly, unground glass, poly donut spacer with TC assembly, dual PTFE frits, open-style aluminum clamp.
GNFA-4-5G

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 and leak-free seal without grease. Standard GN Series glassware includes unground O-ring joints and double O-ring 45/50 taper joints.

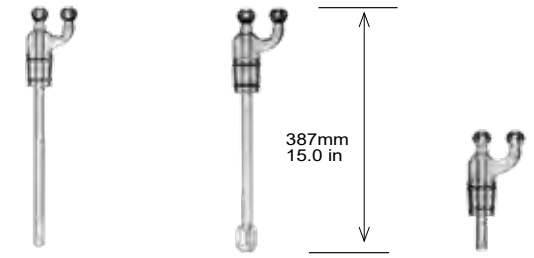
Bottles

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



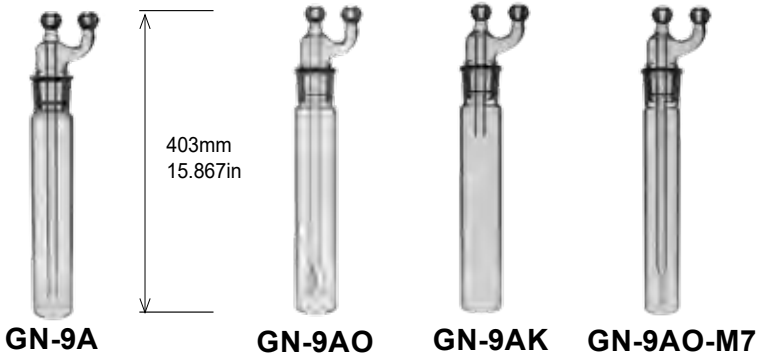
Inserts

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-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" with type-K thermocouple assembly, cap and silicone seal and sensor
GN-11	U-tube, #28 unground sockets
GN-13	Filter by-pass, #28 unground socket and O-ring ball


GN-1


GN-8


GN-8-18


GN-11


GN-13

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 inserting cartridge heater, #28 socket both ends, water jacket with hose barbs, TC-well


GFA-2590N-CCS


GFA-2590B-CC


GFA-2590N-CC


GN-HCCH

Filter Bells - Ins and Outs

Model	Description
GN-2S	2-inch glass filter inlet, #28 unground socket, 90° bend
GN-2B	2-inch glass filter outlet, #28 unground O-ring ball
GN-2S-18	2-inch glass filter inlet, #28 unground socket, 90° bend and #18 thread
GN-3S	3-inch glass filter inlet, #28 unground socket, 90° bend
GN-3SS	3-inch glass filter inlet straight with #28 unground socket
GN-3S-18	3-inch glass filter outlet, #28 unground socket, 90° bend and #18 thread
GN-3B	3-inch glass filter outlet, #28 unground O-ring ball
GN-4S	4-inch glass filter inlet, #28 unground socket, 90° bend
GN-4B	4-inch glass filter outlet, #28 unground O-ring ball


GN-3B


GN-3S


GN-3S-18


GN-4B


GN-4S

#28 Unground Adapters

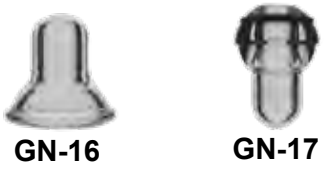
Model	Description
GN-18	Socket to hose barb
GN-18B	Ball to hose barb
GN-19	Ball to #22 thread
GN-20B4	Ball to 1/4-inch tube
GN-20B6	Ball to 3/8-inch tube
GN-20B8	Ball to 1/2-inch tube
GN-20B10	Ball to 5/8-inch tube
GN-20S4	Socket to 1/4-inch tube.
GN-20S6	Socket to 3/8-inch tube
GN-20S8	Socket to 1/2-inch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

GFA-2590N GFA-2590B

47mm glass filter inlet with integrated nozzle

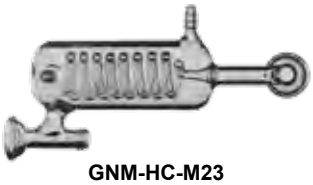
Product	Description
G-47N-4	Nozzle I.D.1/8-inch
G-47N-5	Nozzle I.D. 5/32-inch
G-47N-6	Nozzle I.D. 3/16-inch
G-47N-7	Nozzle I.D. 7/32-inch
G-47N 8	Nozzle I.D. 1/4-inch
G-47N-9	Nozzle I.D. 9/32-inch
G-47N-10	Nozzle I.D. 5/16-inch
G-47N-12	Nozzle I.D. 3/8-inch
G-47N-14	Nozzle I.D. 7/16-inch
G-47N-16	Nozzle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

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 monitoring filter and condenser outlet temperature, water jacket with hose barbs.
GNM-T	XAD trap, #28 unground socket and O-ring ball (top), water jacket hose barbs.

GNM-HC-M23 (Side view)



GNM-HC-M23 (Top view)

GNM-T

GN-9AKS

NOTE: THERMOCOUPLE MUST BE SECURED TO GLASSWARE VIA TAPE

Method 202 Glassware

Product	Description
GN-VCHM-M202	Water-jacketed coil (Graham) condenser for Method 202, #28 socket both ends water jacket hose barbs, overall length 8.25 inches (210 mm)
GN-VC-M202	Liebig 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 Horizontal MM5)
GN-3S-18	3-inch glass filter outlet, #28 unground socket, 90° 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

Glassware Accessories

GL Caps and 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-18S6	#18 silicone seal ring, 6mm 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 9mm to 11mm tubing

Ball Joint Clamps

Product	Description
BS28WS	#28 stainless-steel ball joint clamp
KBS-29	Keck clip, #29, plastic ball joint clamp

SVL Caps and Seals

Product	Description
GA-15B	Bored cap, #15 threads
GA-15C	Solid cap, #15 threads with seal
GA-22B	Bored cap, #22 threads
GA-22C	Solid cap, #22 threads with seal
GA-30B	Bored cap, #30 threads
GA-30C	Solid cap, #30 threads with seal
GA-15/6S	Silicone seal for 1/4-inch tubing, #15 threads, 6-mm hole diameter
GA-15S	Silicone seal ring, #15 threads, 8-mm hole diameter
GA-15T6	TFE seal ring, #15 threads, 6-mm hole diameter
GA-15T8	TFE seal ring, #15 threads, 8-mm hole diameter
GA-15WT	TFE washer for GA-15/6S
GA-22S	Silicone seal ring, #22 threads
GA-22T	TFE seal ring, #22 threads
GA-30S	Silicone seal ring, #30 threads
GA-30T	TFE seal ring, #30 threads

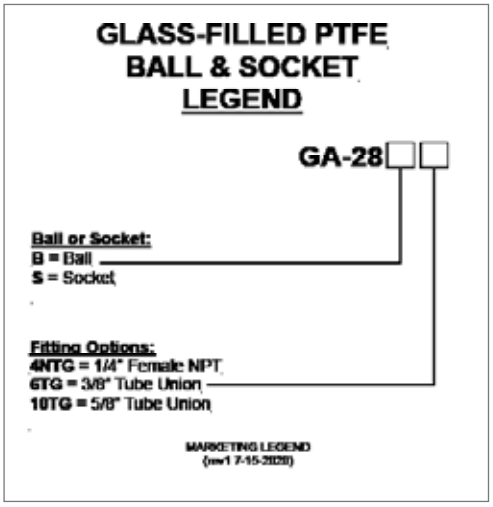
Ball Joint Seals

Product	Description
O-011V	Viton® O-ring for grooved #12/5 ball
O-116S	Silicone O-ring for grooved #28 ball
O-116T	TFE-encapsulated silicone O-ring for grooved #28 ball
O-116V	Viton® O-ring for grooved #28 ball
O-123V	Viton® O-ring for bottom groove in impinger stem joint
O-126V	Viton® O-ring for top groove in impinger stem joint
O-127T	TFE-encapsulated O-ring for impinger stem joint bottom groove
O-129T	TFE-encapsulated O-ring for impinger stem joint top groove
59344	Ground joint grease, high-vacuum, 5.3 oz
O-129T	TFE-encapsulated O-ring for impinger stem joint top groove
59344	Ground joint grease, high-vacuum, 5.3 oz

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-inch FNPT
GA-28B4NTG

Glass-filled PTFE
#28 socket to 1/4-inch FNPT
GA-28S4NTG

Glass-filled PTFE
#28 socket to 3/8-inch tube fitting
(Includes nylon nut and PTFE Ferrule)
GA-28S6TG

Glass-filled PTFE
#28 ball-to-5/8-inch-tube fitting
(Includes nut, ferrule and Viton® O-ring)
GA-28B10TG

5/8-INCH Liner Material

PFA Fittings

Apex offers both straight and elbow PFA fittings with male 1/4-inch NPT for 1/4-inch, 3/8-inch and 1/2-inch tubing. PFA (Perfluoro-alkoxy) fittings are chemically inert and highly corrosive-resistant. PFA has higher mechanical strength than PTFE at elevated temperatures (to 500˚).

PFA Straight Connectors:

4MSC4N-PFA	1/4-inch tube fitting
6MSC4N-PFA	3/8-inch tube fitting
8MSC4N-PFA	1/2-inch tube fitting to 1/4-inch MNPT

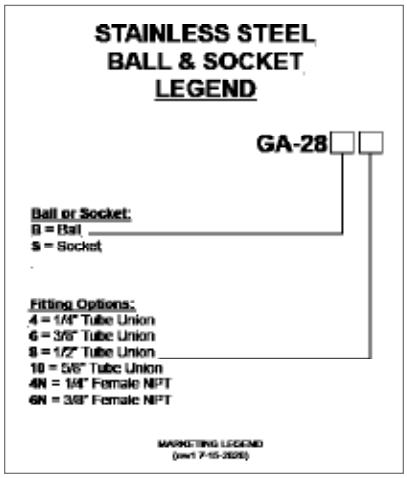
PFA Elbow Connectors:

4MSEL2N-PFA	1/4-inch tube fitting to 1/8-inch MNPT
4MSEL4N-PFA	1/4-inch tube fitting
6MSEL4N-PFA	3/8-inch tube fitting
8MSEL4N-PFA	1/2-inch tube fitting to 1/4-inch 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).

GA-28B4	1/4" Ball to Tube Union
GA-28B6	3/8" Ball to Tube Union
GA-28B8	1/2" Ball to Tube Union
GA-28B10	5/8" Ball to Tube Union
GA-28B4N	#28 Ball to 1/4” FNPT
GA-28B6N	#28 Ball to 3/8” FNPT
GA-28S4	#28 Socket to 1/4” Tube Fitting
GA-28S6	#28 Socket to 3/8” Tube Fitting
GA-28S8	#28 Socket to 1/2” Tube Fitting
GA-28S10	#28 Socket to 5/8” Tube Fitting
GA-28S4N	Adapter, #28 Socket to 1/4” FNPT
GA-28S6N	Adapter, #28 Socket to 3/8” FNPT



Stainless-Steel Male Elbow Connector

4MSEL4N-S	1/4-inch tube fitting to 1/4-inch MNPT
6MSEL4N-S	3/8-inch tube fitting to 1/4-inch MNPT
8MSEL4N-S	1/2-inch tube fitting to 1/4-inch MNPT
8MSEL6N-S	1/2-inch tube fitting to 3/8-inch MNPT
10MSEL6N-S	5/8-inch tube fitting to 3/8-inch MNPT

Stainless-Steel Straight Adapter

4MSC4N-S	1/4-inch tube fitting to 1/4-inch MNPT
6MSC4N-S	3/8-inch tube fitting to 1/4-inch MNPT
8MSC4N-S	1/2-inch tube fitting to 1/4-inch MNPT
8MSC6N-S	1/2-inch tube fitting to 3/8-inch MNPT
10MSC6N-S	5/8-inch tube fitting to 3/8-inch MNPT

Stainless-Steel Impinger Set and Accessories

The stainless-steel impinger set features stainless-steel sport bottles with precision-fabricated press-in insert. Impingers are manufactured with #28 ball and sockets, 2-3/4-inch 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-5CREVA	Stainless-steel impinger assembly, #28 socket and ball, the set contains three SN-9AREVA, one SN-9AOREVA, three SN-11, one SN-8-4, twelve BS28WS clamps.

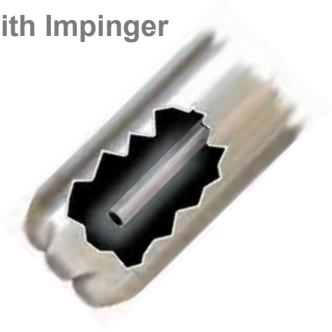
SN-5CREVA

Individual Stainless-Steel Impingers and Connectors

Stainless-Steel Greenburg Smith Impinger

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

SN-9AREVA



Impinger tip inside SN-9AREVA

Stainless-Steel Impinger Bottle

Impinger, bottle only, 750ml capacity, stainless-steel

SN-9BREVA

Stainless-Steel Orifice Impinger

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

SN-9AOREVA

Orifice impinger tip inside SN-9AOREVA

Stainless-Steel Double "L"Connector

Double "L" with #28 sockets and 1/4-inch union for thermocouple (TCA-6X24).

SN-8-4

Stainless-Steel Socket and Elbow Adapter

#28 socket 3/8-inch elbow tube fitting and 1/4-inch union

GA-28S4EL6

#28 socket 1/4-inch elbow tube fitting and 1/4-inch union

GA-28S4EL4

Stainless-Steel U-Tube Connector

U-tube connector with #28 sockets.

SN-11

Split-Back Umbilical Cable

Split-back umbilical cables replace standard umbilical Cords for added versatility. They are constructed in the same way as the standard Method 5 umbilicals with the sample line and exit thermocouple split to 10 feet. Split-back umbilicals are useful in flexible systems when the filter compartment is separated from the impinger box with a flexible sample line such as in 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.

SPLIT UMBILICAL LEGEND

US- ☐☐ - ☐☐

Length (in Feet):
30 = 30 ft.
60 = 60 ft.
90 = 90 ft.
NOTE: Alternative Lengths Up to 300 ft. Available by Request

Power Connection:
BLANK = 4 Pin Amphenol (END OF LIFE) (Size 14S Shell - Female/ 97 Series)
A = 5 Pin Amphenol (Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol (Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol (Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol (Size 14S Shell - Male/97 Series)

Split Length (in Feet):
5 = 5 ft.
10 = 10 ft. (Standard)
15 = 15 ft.
20 = 20 ft.

Optional Pitot Connections:
BLANK = Standard (1/4" Male and 1/4" Female QC)
QS6 = 3/8" Male and 3/8" Female QC
QS6/4 = 1/4" Male and 3/8" Female QC

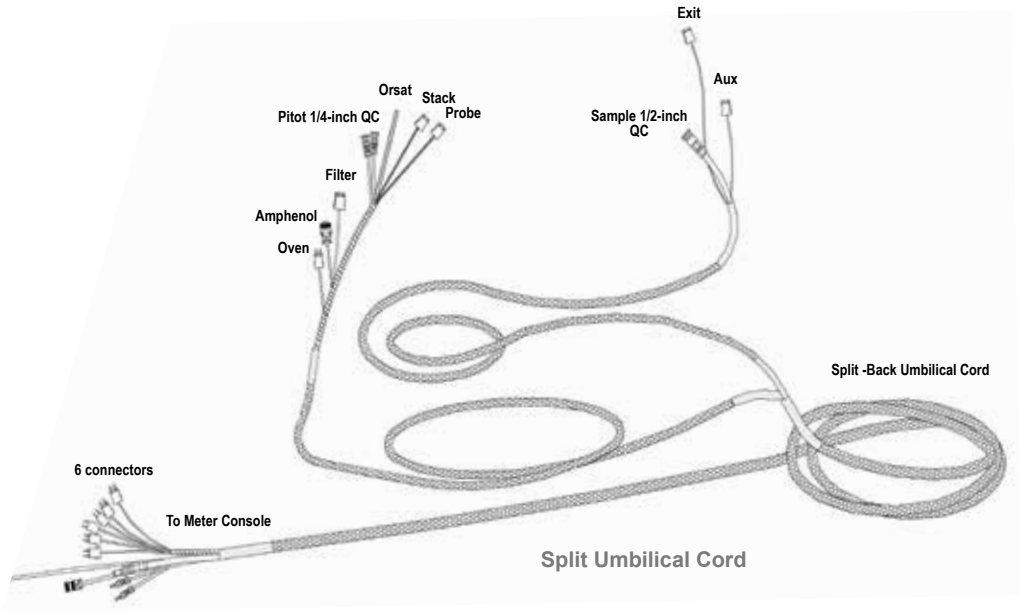
MARKETING LEGEND
(rev2 12-23-2020)

Split Umbilical Cables

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

**Stocked

Free bag included with umbilical.



Split Umbilical Cord

Umbilical Adapters

Power Box Adapter (UA-3J)

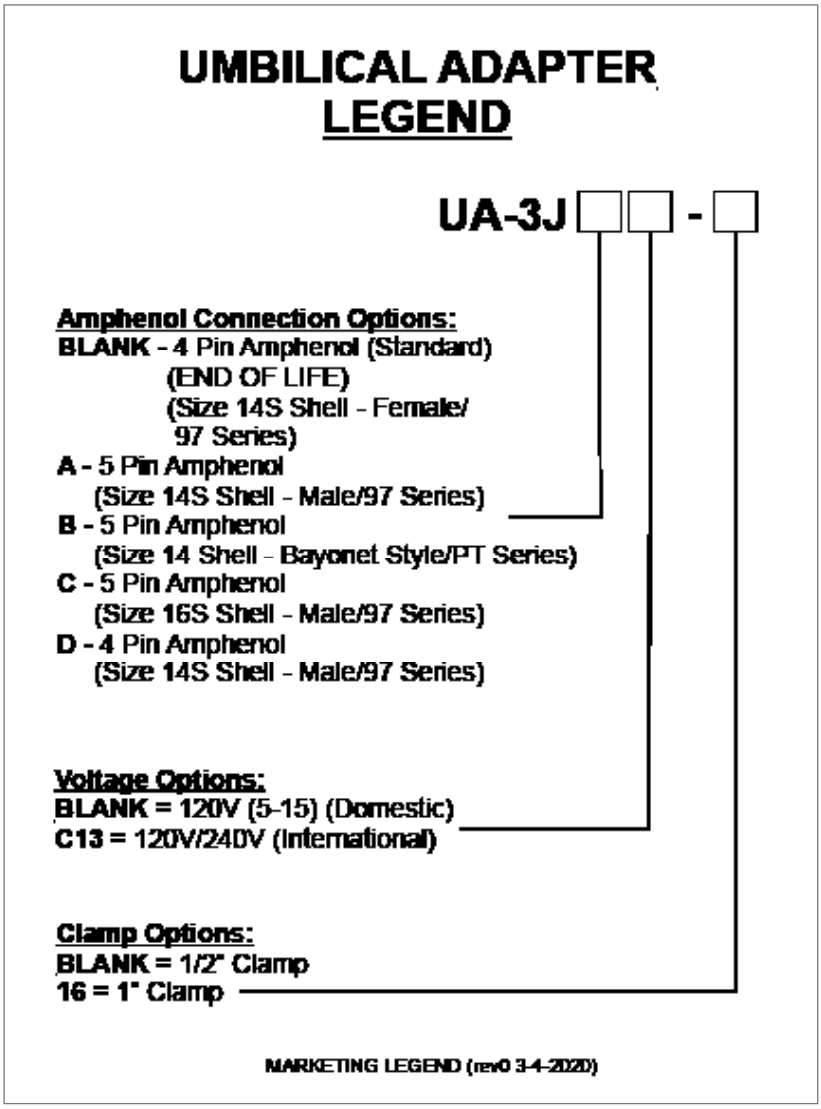
Connects to umbilical 4-pin circular connector and converts to three straight-blade receptacles. Clamps to 1/2-inch sample line or GA-100 adapter. Used in compact Method 5, Method 8, Method17 and in other sampling situations to provide probe power in the absence of a heated filter box.

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 on one end, and two (2) male standard 120V plugs on the other end.

UA-FP-2

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-inch, ID
GA-107-12	1/2-inch ID
GA-107-32	1-1/4-inch, ID
GA-107-50	2-inch, ID
GA-107-57	2-1/4-inch, 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

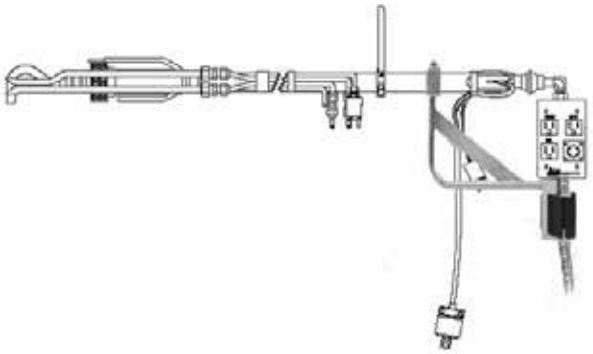
GA-113

GA-111 Strain Relief Adapter

Strain relief adapter that connects the probe to the flexible sample line.

Part#	Description
GA-111-S	1-inch Aluminum Clamp to Velcro
GA-111-12	1-inch Aluminum Clamp to 1/2-inch 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-inch PFA tubing and are also available in 1/4-inch 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 on to the sampling receptacles or quick connects.

Self-Regulated Heated Sample Lines (Jumpers)

Part#	Length (feet)
HSRLB-6-6	6
HSRLB-6-10	10
HSRLB-6-20	20
HSRLB-6-25	25

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

SELF REGULATED HEATED SAMPLE LINE LEGEND

HSRLB-☐ / ☐ / ☐ / ☐ - ☐☐☐☐☐☐ - ☐

Sample Line Tubing:
(Create Part Number from Largest to Smallest Tubing Size)
4 = 1/4" O.D. (.047" Wall/PFA)
4H = 1/4" O.D.(.062" Wall/PFA)
6 = 3/8" O.D. (.062" Wall/PFA)
8 = 1/2" O.D. (.062" Wall/PFA)
10 = 5/8" O.D. (.062" Wall/PFA)
***NOTE: Multiple Line Combinations Available**
EXAMPLES: 4/4, 6/4, 8/4, 8/6, 8/8

Length (in Feet)

Passthrough Power:
BLANK = None
A = 5 Pin Amphenol
(Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol
(Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol
(Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol
(Size 14S Shell - Male/97 Series)
E = 5-15
F = C13/C14
G = 4 Pin Ecomate Amphenol
S = 4 Pin Amphenol (END OF LIFE)
(Size 14S Shell - Female/97 Series)

If Pass Through Power is Selected
Number of Pass Through Power Lines:
1-3

Pass Through TC:
BLANK = None
T = TC

If Pass Through TC is Selected
Number of Pass Through TC Lines:
1-6

Voltage/Power Plug:
BLANK = 120V *Uses 5-15 (Standard) (15 amps)
C14 = 120V (15 amps)
C14V = 240V (10 amps)
C20 = 120V (20 amps)
C20V = 240V (16 amps)
520 = 120V (20 amps)
L520 = 120V (20 amps/Locking)
620V = 240V (20 amps)
L620V = 240V (20 amps/Locking)

Strain Relief Options:
BLANK = No Strain Relief
CL32 = 2" Cam Lock
CES = 4S Cable Entry System

ENGINEERING & MARKETING LEGEND
(rev3 12-28-2020)

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-inch 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 LEGEND

USL- □ - □

Length (in Feet):
Examples:
10 = 10 feet
15 = 15 feet

Options for Inlet/Outlet:
SS = #28 Socket Elbow on Both Ends
SST = #28 Socket Elbow on One End and #28 Socket Elbow w/ TC on the Other End
QST = #28 Socket Elbow on One End and 3/8" Full Flow QC Elbow w/ TC on the Other End
F6S = #28 Socket Elbow on One End and 3/8" Full Flow QC Elbow on the Other End

MARKETING LEGEND
(rev2 9-15-2020)

Unheated Multi-Bundle Sample Line

The lightweight umbilical cable includes (4) TPFA lines for attachment to dilution probe. Covered in heavy-duty braided nylon sleeving. Additional options and variations can be configured. See legend below. Call for details.

UNHEATED MULTI-BUNDLE LINE LEGEND

UDL- □ / □ / □ / □ - □ □ □ □ □ □

Sample Line Tubing:
(Create Part Number from Largest to Smallest Tubing Size)
4 = 1/4" O.D. (.047" Wall/PFA)
4H = 1/4" O.D.(.062" Wall/PFA)
6 = 3/8" O.D. (.062" Wall/PFA)
8 = 1/2" O.D. (.062" Wall/PFA)
10 = 5/8" O.D. (.062" Wall/PFA)
***NOTE: Multiple Line Combinations Available**
EXAMPLES: 4/4, 6/4, 8/4, 8/6, 8/8

Length (in Feet)

Pass Through Power:
BLANK = None
A = 5 Pin Amphenol (Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol (Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol (Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol (Size 14S Shell - Male/97 Series)
E = 5-15
F = C14
S = 4 Pin Amphenol (END OF LIFE) (Size 14S Shell - Female/97 Series)

If Pass Through Power is Selected
Number of Pass Through Power Lines:
1-3

Pass Through TC:
BLANK = None
T = TC

If Pass Through TC is Selected
Number of Pass Through TC Lines:
1-6

MARKETING LEGEND
(rev2 12-29-2020)

Method Specific Sampling Kits

Apex Instruments method sampling kits are designed to take the guesswork 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 method. Please keep in mind that some of our method kits only consist of components to be combined with other kits.

Particulate Emissions

METHOD 5 Flexible

Particulate Emissions

METHOD 5 Compact

Particulate Emissions

METHOD 5

Particulate Emissions

METHOD 17

Particulate Emissions

METHOD 202

Dioxins / Furans

METHOD 5 Flexible

Multiple Metals Emissions

METHOD 5 Compact

Particulate Emissions

METHOD 5

Hydrogen Halide and Halogen Emissions

METHOD 17

Particulate Emissions PM_{10} / $PM_{2.5}$

METHOD 202

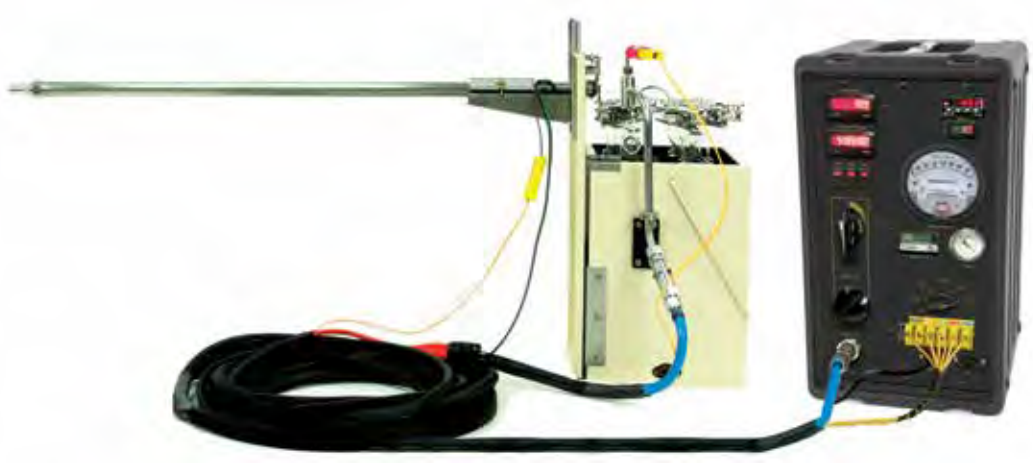
Method 4 Sampling Kit

Method 4 - determination of the moisture content of stack gases. Stack gas is extracted at a constant rate (less than 21 LPM) and a minimum volume of 600 liters. Water vapor is condensed from the sample stream, and is measured volumetrically or gravimetrically.

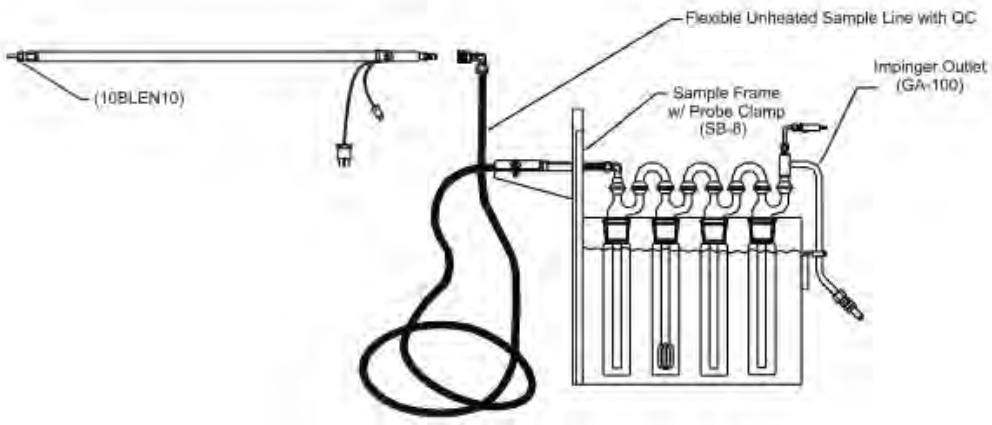
The Method 4 kit includes a probe, glassware, u-cord, and parts to be able to build both rigid and flexible arrangements.

SK-M4

SK-M4-V



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 Instruments 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 own and give you additional equipment you might for any applicable methods. Our equipment conforms to industry standards and is compatible with almost all competitors' products.

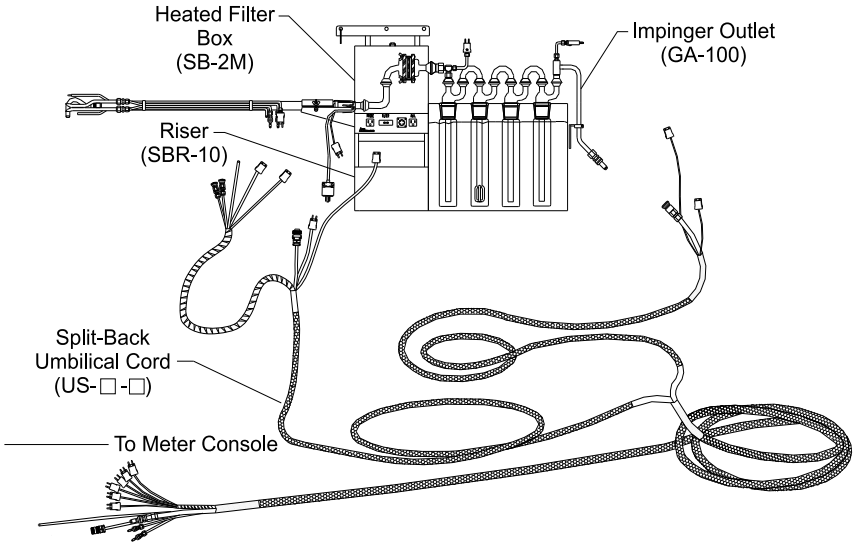
Add "V" to end of part number for 240V option at no additional cost.

SK-M5BP Basic kit

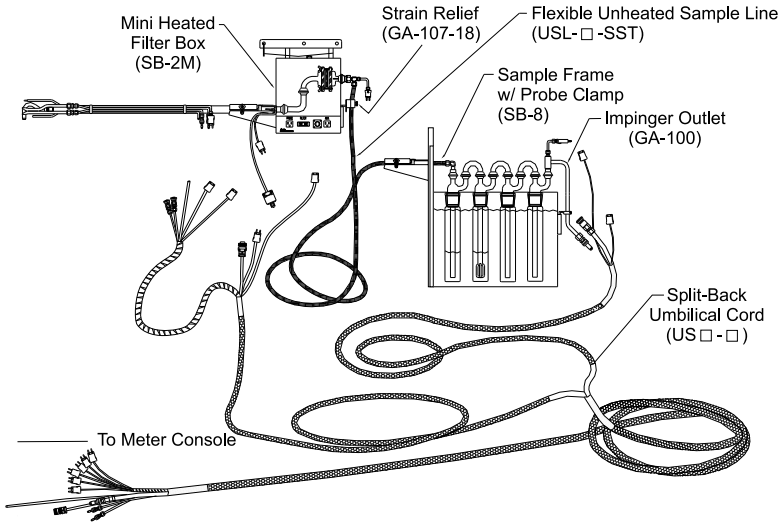
SK-M5BP-V 240V version

SK-M5DP Deluxe kit

SK-M5DP-V 240V version



Schematic of Method 5 rigid sampling train



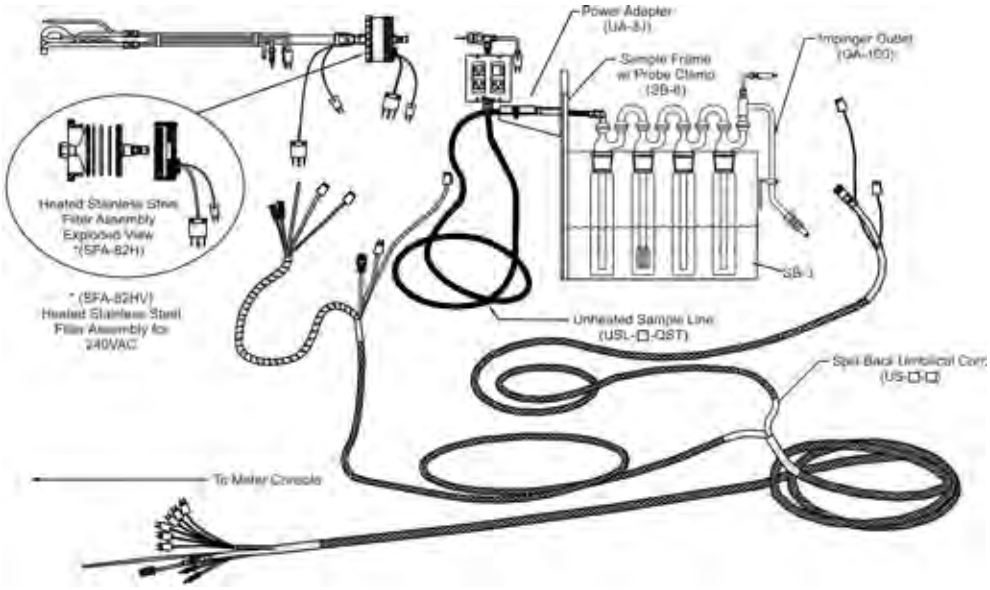
Schematic of Method 5 flexible sampling train

Compact Method 5

The Apex Instruments compact Method 5 sampling kit features an independently heated stainless-steel filter assembly (SFA-82H) that connects directly to a standard method 5 probe. The compact method 5 system utilizes a flexible sample line and a split umbilical cord with a power adapter to allow sampling in space-limited areas: this system does not require a separate heated filter compartment. 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 turnaround 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 stainless-steel heated 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 82.6mm filter and prevents sample bypass. The filter assembly has stainless-steel inlet and outlet and a PTFE filter support-screen (GA-3T). The inlet plate comes with a 5/8-inch tube union for swaging directly to a 5/8-inch probe liner. The outlet plate has 3/8-inch female NPT connection and a male 3/8-inch 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 82mm stainless-steel filter assembly, inlet: 5/8-inch tube union, outlet: 3/8-inch FNPT and full-flow male quick connect

SFA-82H
Heated 82mm stainless-steel filter assembly, inlet: 5/8-inch tube union, outlet: 3/8-inch FNPT and full-flow male quick connect, insulated blanket, 300 watts, 120V

SFA-82HV (240V)

Outlet adapter for SFA-82, full-flow QC to 3/8-inch tube fitting, includes filter outlet thermocouple

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

SFA-82H
(Blanket included)

SFA-82-BKT

Male or female type-K thermocouple standard

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 a 4-inch filter assembly, unground glass #28 ball and socket, poly donut spacer with thermocouple assembly, dual-PTFE-filter supports and an open-style aluminum clamp.

GNFA-4-5G

GNFA-4-5G

Method 5I

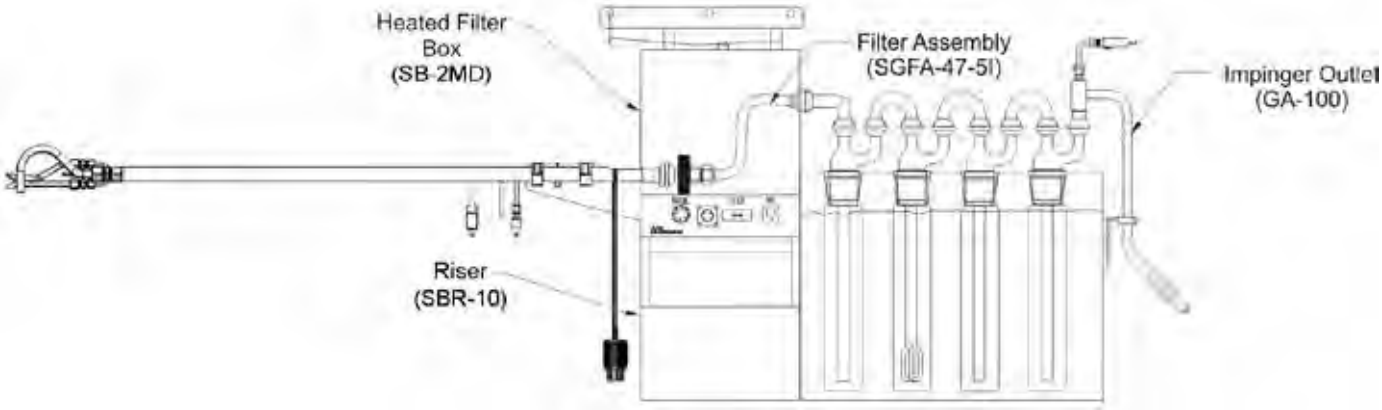
Method 5I sampling is similar to basic Method 5 but it replaces the filter with the 5I holder (SGFA-47-5I) and is designed for the determination of low-level particulate matter (PM) emissions from stationary sources. Method 5I is most effective for PM catches less than 50 mg and is valid for performing 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 sampling console and an external sample pump in conjunction with a Method 5 kit, simply add an SGFA-47-5I Method 5I holder to complete the needed parts to perform 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, to provide a positive seal against leakage. Method 5I 47-mm filter assembly with glass inlet and stainless-steel outlet has two 90º bends.

SGFA-47-5I

SGFA-47-5I

SB-2MD



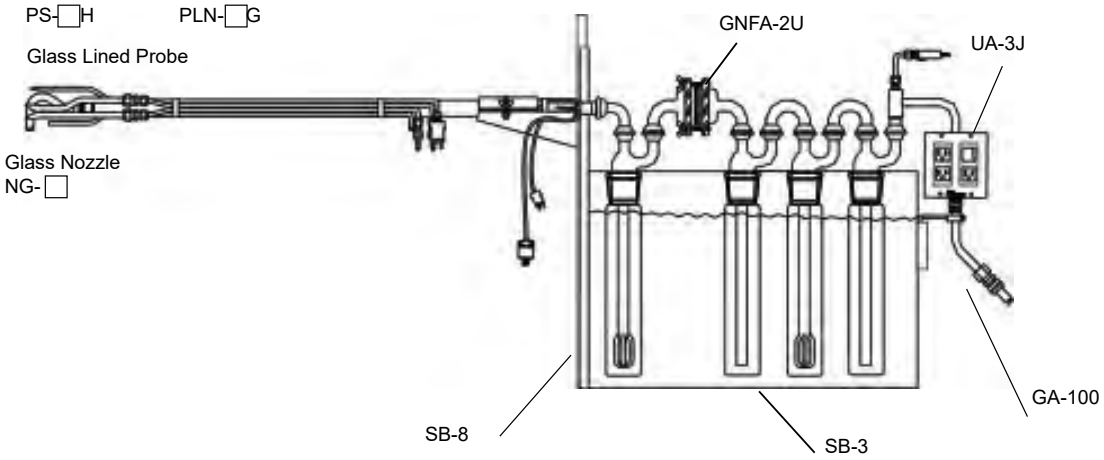
Method 8

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-inch filter assembly, unground glass with 90° inlet and outlet, open-style aluminum clamp



Schematic of EPA Method 8 Sampling Train

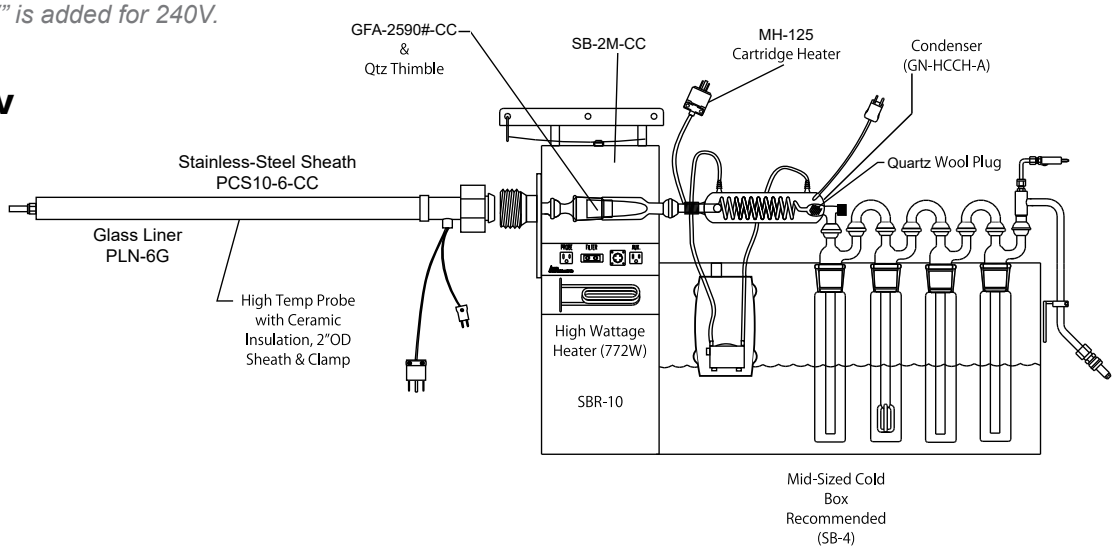
Controlled Condensate

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 the difference in dew points: 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 on 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 and reproducible SO_3 and SO_2 values with minimal interference from high concentrations of SO_2. 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 with hose barbs, TC-well and # 15 solid cap.

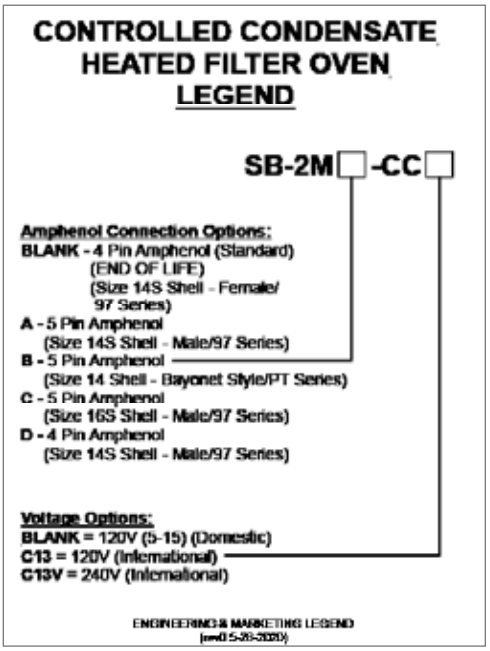
GN-HCCH-A

Model	Description
GN-HCCH	Horizontal condenser for controlled condensate
7506-02	3/8-inch 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-inch diameter cartridge heater for GN-HCCH, 6-inch length
TCA-24T	24-inch flexible, type-K thermocouple assembly

Controlled Condensate Heated Filter Oven

Heated filter box with two access doors, 2-inch probe clamp, and impinger box sides, with high-Watt heater (770 Watt) for Controlled Condensate sampling.

SB-2M-CC

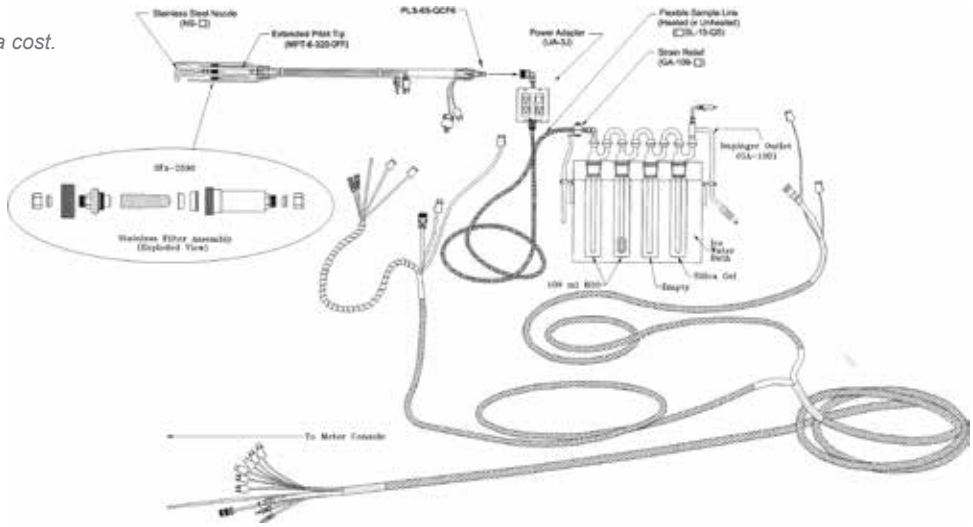


Method 17 Plus (Rigid and Flexible)

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-inch tube union, uses a 47mm-diameter filter element.
SFA-47 (Stainless steel)

In-stack filter assembly, 5/8-inch tube union, uses a 47-mm-diameter filter element.
SFA-47-INCO (Alloy 600)

In-stack filter assembly, 5/8-inch TU, uses 25mm x 90mm thimble filter element.
SFA-2590

In-stack filter assembly, 5/8-inch tube union, uses 30mm x 100mm 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

SFA-47

SFA-2590

SFA-300

(Nozzles not included)

See page 26 for modular pitot tip options.

SFA-2590 enhanced cutout design

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) filters and requires an 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 47-mm 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 and filter media with a support, O-ring, and PTFE Tape. The kit includes the standard array of seven nozzle sizes from 1/8-inch to 1/2-inch.

SGFA-47NK

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

Filter inlet 47mm 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 the 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, ranging from 1/8-inch to 1/2-inch, 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-inch 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-inch 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

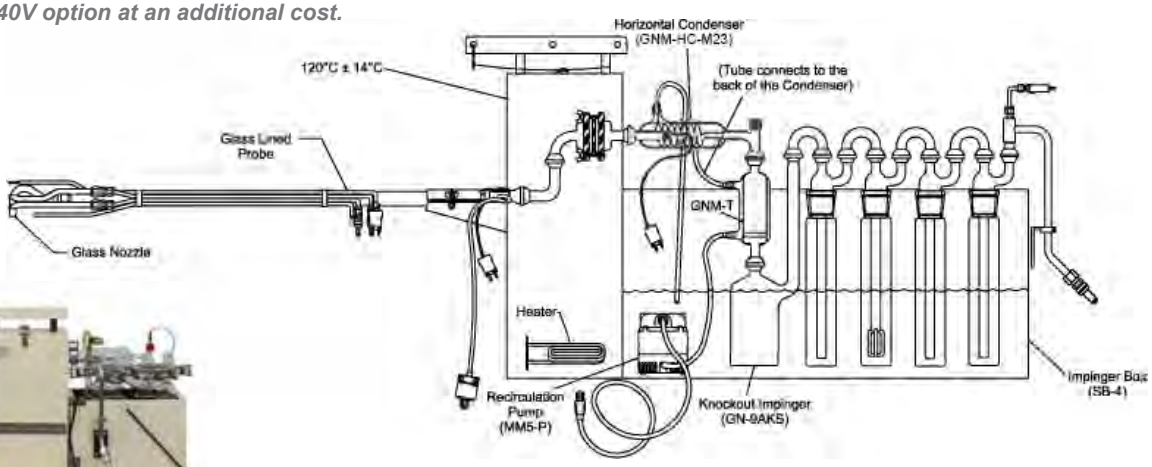
The Apex Instruments Method 23 (Modified Method 5) source sampler kit is utilized for Method 23 determination of dioxins and furans (D/F's) and/or Method 0010 determination of semi-volatile organic compounds. The sampling train is identical to the standard Method 5 system with the addition of a water-cooled 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 method 23 sampling, then method 23 kit.

Add "V" to part number for 240V option at an additional cost.

SK-M23DP

SK-M23DP-V

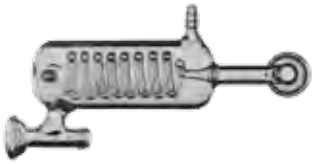


Schematic of Method 23 sampling train

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 monitoring filter and condenser outlet temperature, water jacket with hose barbs.
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

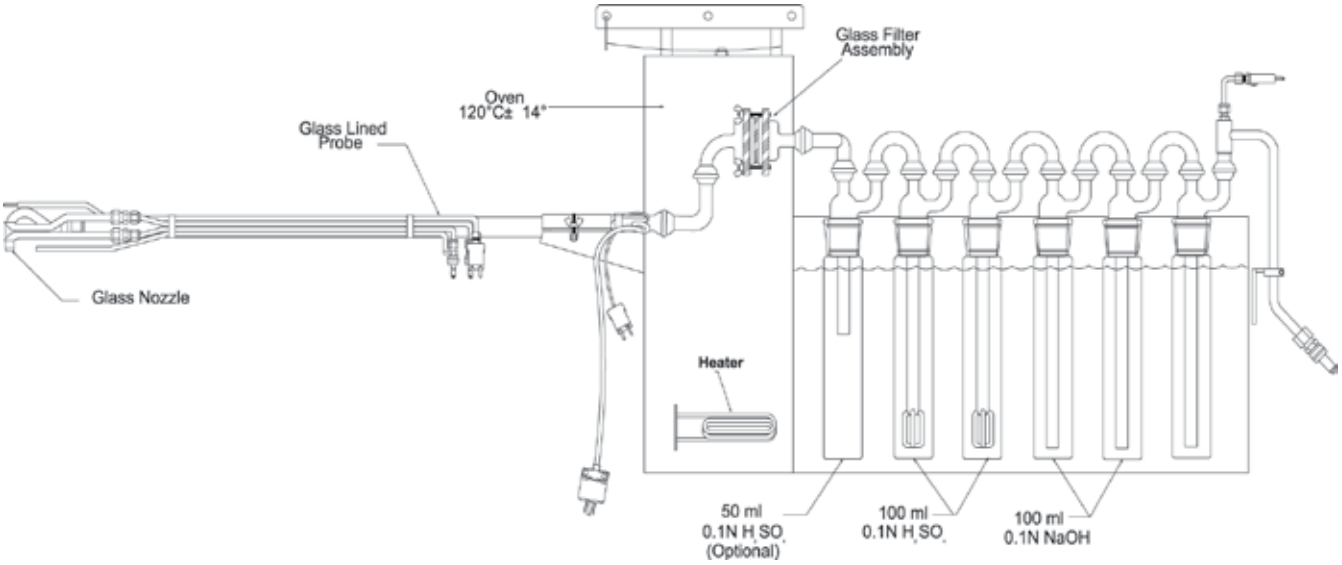
Product	Description
MM5-P	Submersible coolant pump, 110V (Product end-of-life expected)
MM5-PM	Submersible coolant pump, 110V (miniature version)
MM5-P220	Submersible coolant pump, 220V

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

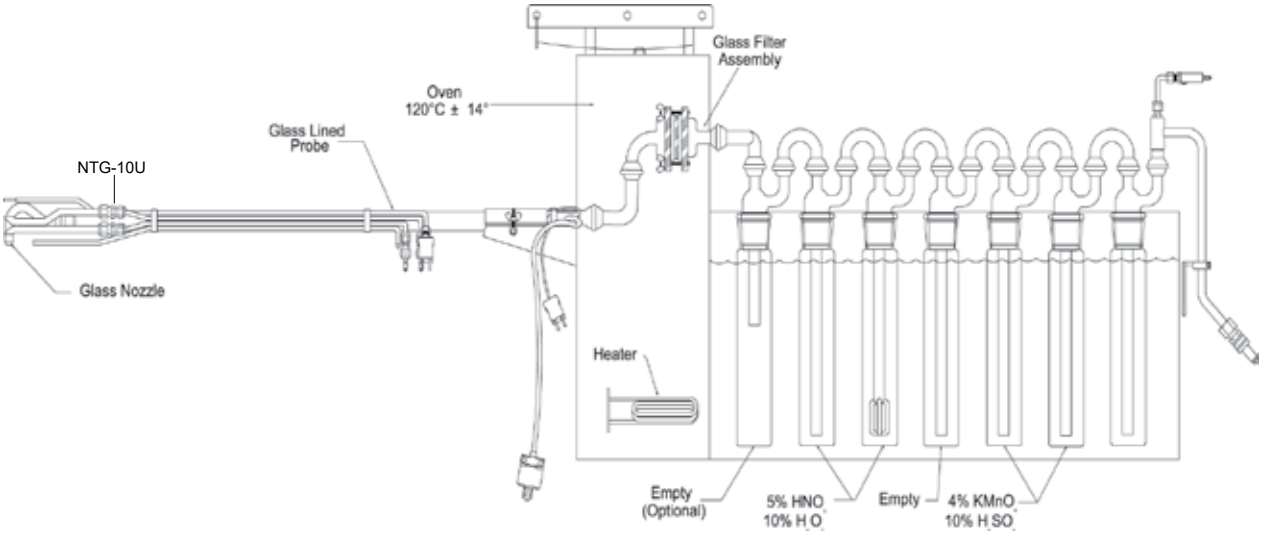
Method 26A Recommended Accessories

Product	Conversion accessories
NG-SET-S	Set of 7 glass nozzles - sizes 4, 5, 6, 7, 8, 9 and 10, includes case and three 5/8-inch glass-filled PTFE ferrules (spares recommended)
NTG-10U	5/8-inch glass-filled PTFE union complete with nuts and ferrules
SB-4	Impinger box/insulated coolant reservoir, holds eight 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 and plate, 500 ml, unground O-ring joints, Greenburg-Smith (2 required for method, 1 spare recommended)
GN-9A	Impinger assembly, plain stem, modified Greenberg-Smith, unground 500 ml (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-inch 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 that of Method 5 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 and 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

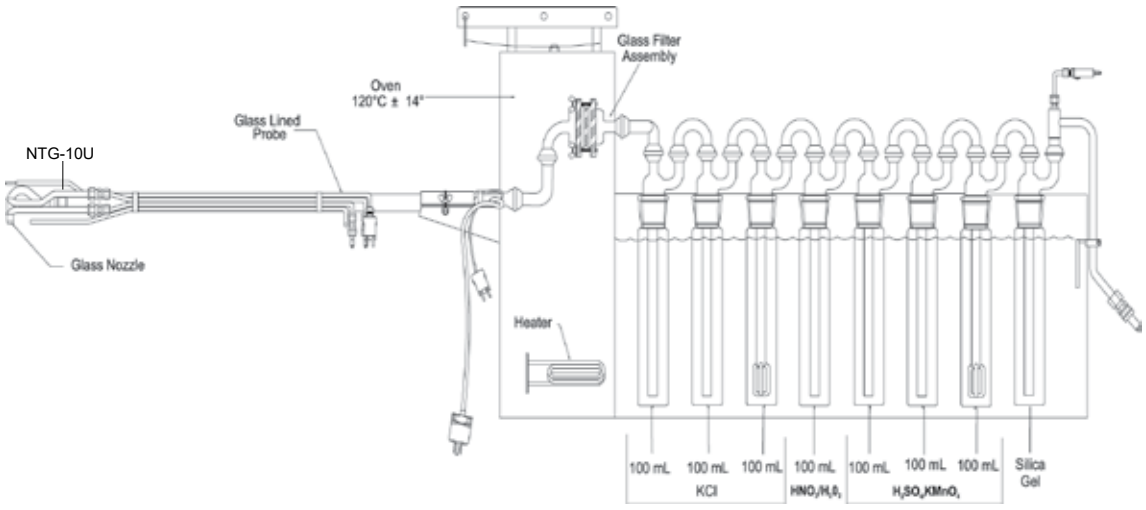
Method 29 Recommended Accessories

Product	Conversion Accessories
NG-SET-S	Set of 7 glass nozzles - sizes 4, 5, 6, 7, 8, 9 and 10, includes case and three 5/8-inch glass-filled PTFE ferrules (spares recommended)
NTG-10U	5/8-inch glass-filled PTFE union complete with nuts and ferrules
SB-4	Impinger box/insulated coolant reservoir, holds 8 impingers
GF-3QH	3-inch quartz fiber heat-treated filters (25/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 and 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)
PBT-5/8	PTFE probe brush, extension, 10-foot flexible (brush not included)
PBX-10T	PTFE probe brush, 5/8-inch diameter, 4-inch 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 the probe/filter system, maintained at 120°C (250°F) or at the flue gas temperature, whichever is greater, and is then passed through 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 µg/dscm. The sample train configuration is similar to EPA Method 5.



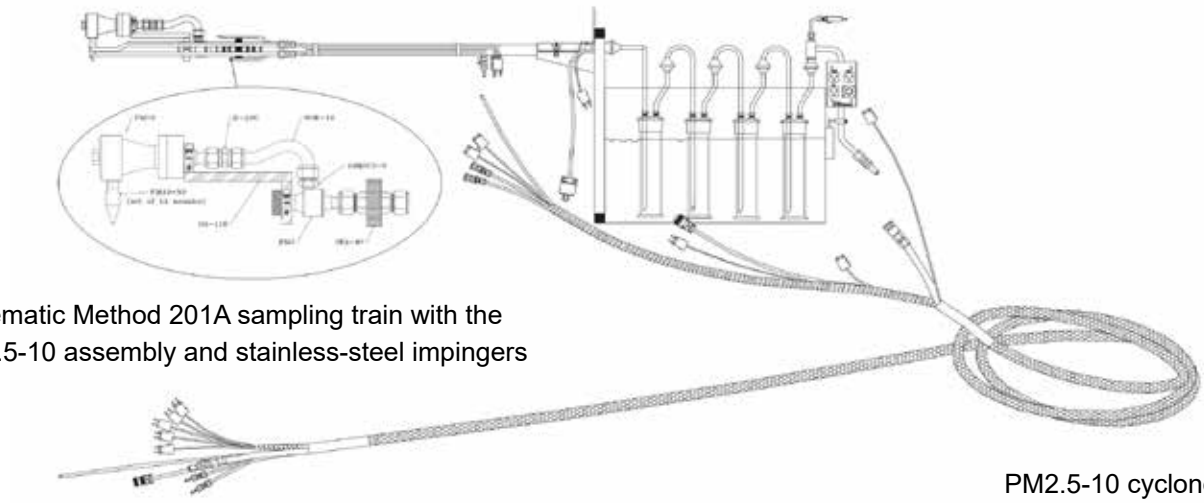
Schematic of Ontario-Hydro Method sampling train

Ontario-Hydro Recommended Accessories

Product	Conversion accessories
NG-SET-S	Set of 7 glass nozzles - sizes 4, 5, 6, 7, 8, 9 and 10, includes case and three 5/8-inch glass-filled PTFE ferrules (spares recommended)
NTG-10U	5/8-inch glass-filled PTFE union complete with nuts and ferrules
SB-4	Impinger box/insulated coolant reservoir model 150, holds 8 impingers
GF-3Q	3-inch quartz fiber filters (25 per 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 spares recommended)
GN-9AO	Impinger assembly, stem with orifice and 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 (PM_{10}, $PM_{2.5}$, or Pm_{10} and $PM_{2.5}$)

Cyclones are designed for in-stack particle sizing applications. The advantage 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 less reloading 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

PM2.5-10 cyclone, PM10 cyclone, PM2 cyclone, PM1 cyclone and cascade impactor

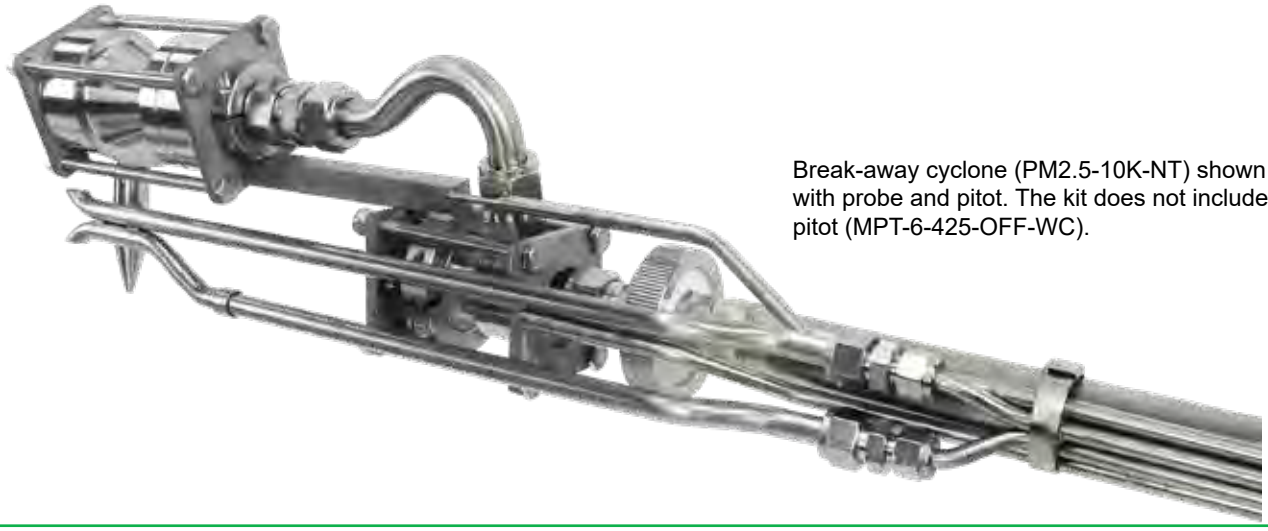
Cyclones available for Particle Sizing:

Cyclone kit case and nozzles

PM2.5-10K

PM10-NT-K

PM2-K



Break-away 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 ($PM_{2.5}$) 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 PM_{10} and greater than $PM_{2.5}$. The in-line filter collects PM less than $PM_{2.5}$.

Break-away style assembly (PM2.5-10K-NT) is bolted together rather than screwed 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.

The method can be used at temperatures up to 871 ºC (1600 ºF) using specially constructed high-temperature stainless-steel alloy (alloy 600).

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

PM2.5-10K **(2 cyclone bodies, 2 cups, 2 caps, Viton O-rings, and adapter set)**
PM2.5-10K-INCO

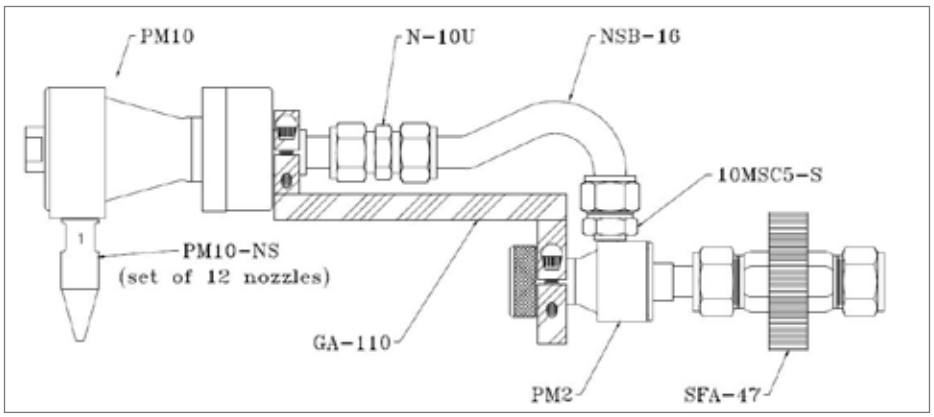
KITS:

PM2.5-10K **(Threaded stainless steel)**
PM2.5-10K-INCO **(Threaded alloy 600)**
Cyclone lit 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)	871 ºC (1600 ºF)
Alloy 600 break-away (PM2.5-10-K-NT-INCO)	871 ºC (1600 ºF)



All PM2.5-10K cyclones require a 6-inch port.

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-inch 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 a 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.

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-inch 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

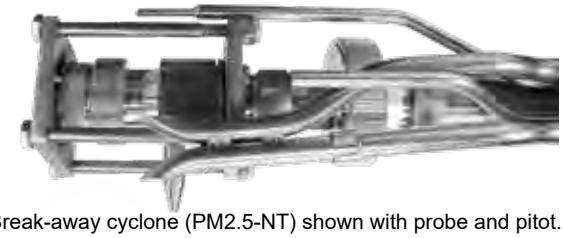
Kits:

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.

All PM10 and PM2.5 Cyclones require a 4-inch port.

PM10-K PM10-NT-K



Break-away 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 and 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-inch 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 fiber 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 PM2.5 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 47mm 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-K

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.

All PM1 cyclones require a 4-inch port.

PM1 Replacement Parts and Accessories

PM1	PM1 cyclone only, stainless steel, Viton® O-rings
O-017V	Viton® 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-NI □	SET OF 12

Wind Tunnel Calibrations

Apex Instruments offers pitot wind tunnel calibration services for EPA Methods 2, 2F, 2G, 201 and 5.

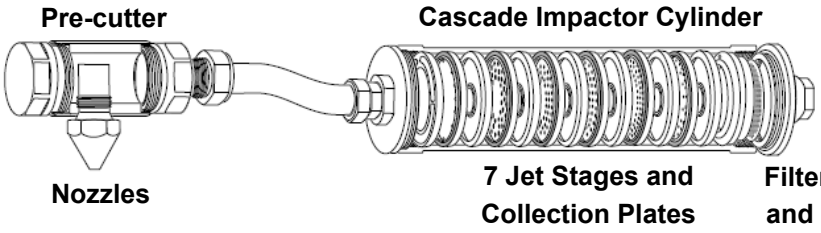
Method 5 - probe calibration of A side only
Method 2 - S-type pitot calibration of A and B sides and standard 2C
Method 2G - calibration of 3-hole pitot
Method 2F - calibration of 5-hole pitot including specified pitch angles
Method 201 - calibration of Method 5 probe with cyclone attached
A side only 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-inch, 3/16-inch, 1/4-inch, 5/16-inch, 3/8-inch, and 1/2-inch) to ensure correct flow rates.

CI-701K cascade impactor kit includes the 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-inch
PRA-N6	Pre-cutter nozzle, stainless-steel, size 6, 3/16-inch
PRA-N8	Pre-cutter nozzle, stainless-steel, size 8, 1/4-inch
PRA-N10	Pre-cutter nozzle, stainless-steel, size 10, 5/16-inch
PRA-N12	Pre-Cutter Nozzle, stainless-steel, size 12, 3/8-inch
PRA-N16	Pre-Cutter Nozzle, stainless-steel, size 16, 1/2-inch

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)

Note:
Use quartz filters if reactive stack gases are present.

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)

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.

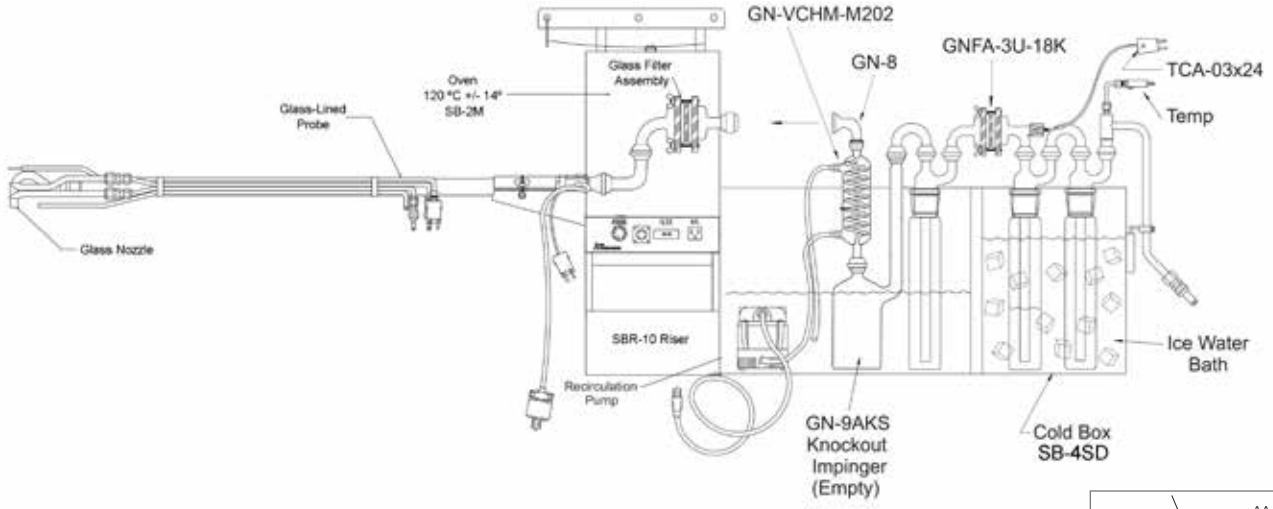
Functions

- 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.

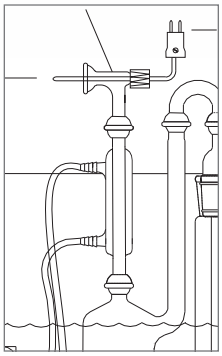
WINCIDRS

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 (N_2) immediately after sample collection to remove dissolved sulfur dioxide (SO_2) 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.



GN-VC-M202



Condenser option for Method 202 glassware without coils

Method 202 Sampling Accessories

Product	Description
SB-4SD	Two-section 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-9AKS	Glass knock-out impinger assembly, unground, (for Horizontal MM5) includes long/short stem
GNFA-3U-18K	CPM 3-inch 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 (for Method 201A Probe option)
GNFA-BKT	Insulation blanket for GNFA-3U-18K assembly

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

Method 202 Purge Accessories

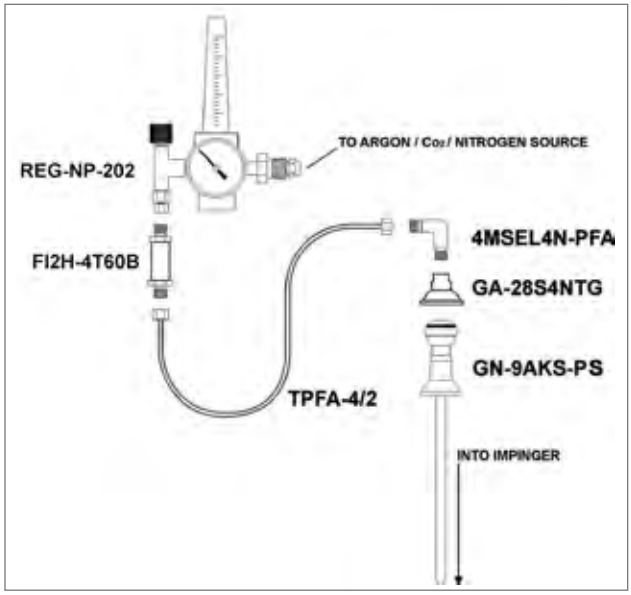
Purge Regulator Assembly

Regulate argon, carbon dioxide, and nitrogen gases up to 25 liters per minute. Brass-bodied regulator features 0 - 250 psi 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-inch tube union
4MSEL4N-PFA	1/4 inch PFA tube fitting to 1/4-inch MNPT, elbow connector 3/16-inch
GA-29S4NTG	PTFE adapter glass-filled, 28mm socket to 1/4-inch female NPT
GN-9AKS-PS	Glassware stem for REG-NPA-202
TPFA-4/2	PFA tubing, 1/8-inch ID by 1/4-inch OD by 0.062-inch wall



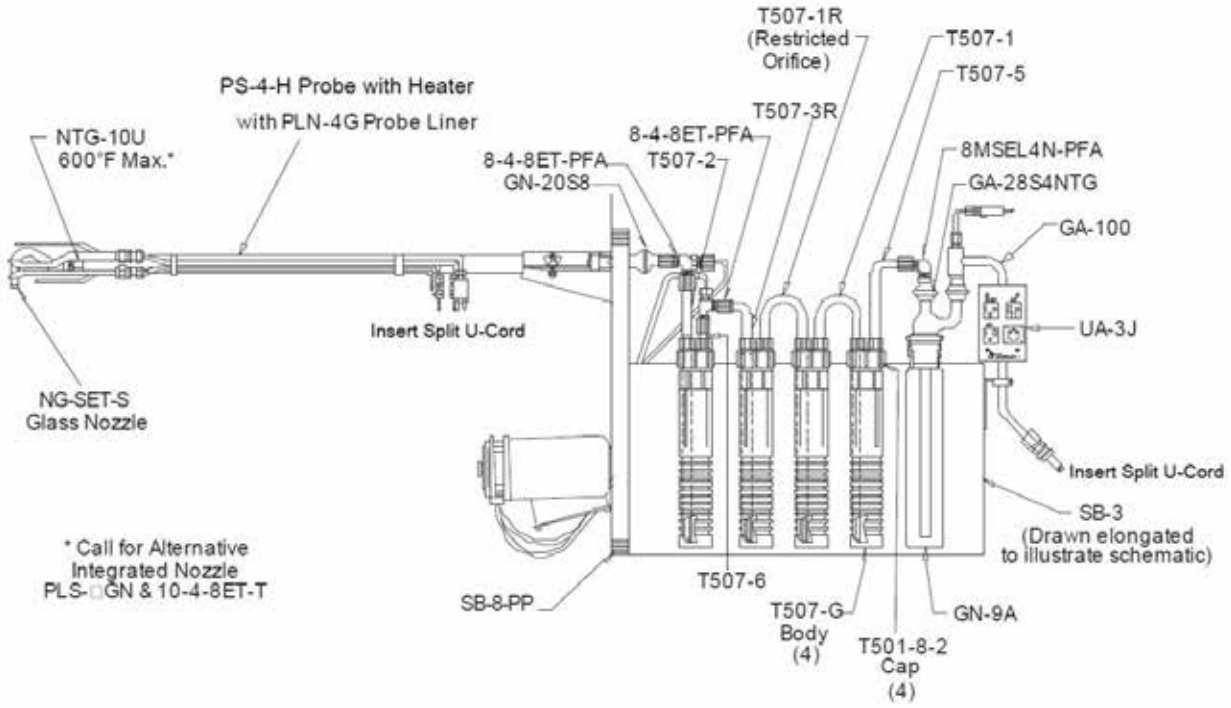
REG-NPA-202

Method 0061 Hexavalent Chromium PFA Impinger Trains and 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

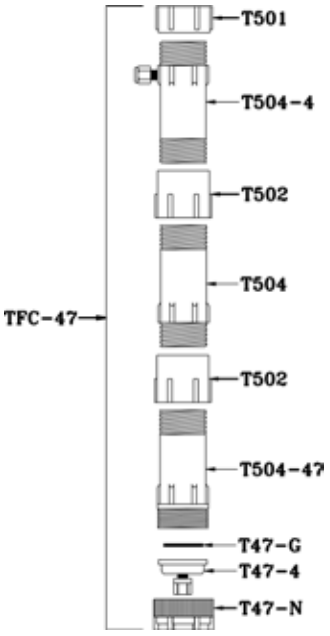
SK-0061H-V



PFA 47 mm 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 a standard 47mm filter holder. The filter is acetate membrane, or equivalent, with a 0.45 micrometer or smaller pore size to remove insoluble material.

GF-47MMAT - filter (included with SK-0061H kit)



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 stocks. 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 and handled without loss of fibers. Specifically recommended for Method 26, PM_{10} and $PM_{2.5}$ sampling. Great for especially low-loading rates and low absorption of acid gases such as SO_X or NO_X 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”/82.6 mm	50
GF-4TPG	4”/110 mm	50

Quartz Fiber Filters

Quartz fiber filters are manufactured from pure quartz without a binder and are ideal for ultra-low metal analyses, acidic gases (except Hydrofluoric) and aerosols, stacks and flue gas monitoring. Filters are preheated to reduce organic contaminates. 99.998% DOP retention efficiency (0.3µm DOP).

Quartz Fiber Filters

Model	Diameter	Count/box
GF-45QH	45mm	25
GF-47QH	47mm	100
GF-2QH	2”/55mm	100
GF-3QH	3”/82.6mm	25
GF-4QH	4”/110mm	100
GFDNQ	2.25-in-ch/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

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 of 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 pre-fired 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

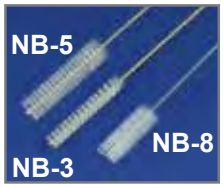
Model	Description
GF-2590T	25mmx90mm PTFE fiber thimble filter, non-tapered, 10/box, grade 89

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-inch diameter
NB-5	5/16-inch diameter
NB-8	1/2-inch 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-inch diameter shaft with 1/2-inch long soft PTFE bristles.

NBT-1/2

PTFE Probe Brush

All PTFE construction. The PBT-5/8 inch diameter with four spiral rows of black PTFE bristles. Over all length is 2 inches. The shaft is 1/4-inch 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-inch 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-inch.

B-3

Flask Brush

Flask brush with stainless-steel handle and nylon bristles.

B-2

Policeman

Rubber policeman with 18-inch Delrin® handle.

B-4

Sample Recovery Kit

Includes the following components:

PBX-6T
6-foot flexible TFE probe brush extension, brush not included
1 each

250ML-CYL-PMP
Plastic graduated cylinder, 250mL
1 each

TW-1
Nylon tweezers
1 each

30255
Funnel, polypropylene, top diameter 108mm
2 each

NB-SET
Nozzle brush set (sizes 3, 5, and 8) in carrying tube
1 each

B-2
Flask brush, stainless-steel handle and nylon bristles
1 each

B-1
Impinger bottle brush with plastic handle and nylon bristles
1 each

WB-5P
Wash bottle, 500 mL, plastic
2 each

WB-4P
Polyethylene sample bottle with polypropylene cap, 16oz, wide mouth 500 ml
8 each

25373-1100
Petri dish 100x15mm (for 3 inch Filters), 25/pack , polystyrene
3 each

SR-KIT

Sample Recovery Accessories

Aluminum Weighing Dishes

70 ml
100/pack.

25433-085

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 inch x 250 feet.

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 with wide mouth, with cap

WB-2P
HDPE, 250 mL with cap

WB-2PW
HDPE, 250 mL with wide mouth

WB-4P
HDPE, 16oz./500 mL with wide mouth

WB-10P
HDPE, 1000mL with wide mouth

WB-1000PW
HDPE 1000 mL with wide mouth

Glass Sample Bottle

250mL glass sample
Bottle with PFA-lined lid.
Case of 12.

GSB-250

FEP Wash Bottle

WB-250FEP
250mL wash bottles, FEP

WB-500FEP
500mL wash bottles, FEP

Plastic Wash Bottles

WB-5P
Plastic wash bottle
500mL
Blank label

WB-5P-ACE
Plastic wash bottle
500mL
Acetone label

WB-5P-DI
Plastic wash bottle
500mL
Distilled water label

WARNING! Not Recommended for Solvents.

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 15% 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-3/5B**
25lbs	**SG-3/5B-25**

Silica Gel Kit

Indicating orange or blue silica beads
Case of 12, 250 mL bottles
SG-KIT-O (Orange)
SG-KIT-B (Blue)

SG-KIT-O

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
14005	Drierite®, non-indicating 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.*

Features

- Patented, sealed construction is airtight, free of dust and moisture.
- 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, 13.5 lbs, 0.75 cubic feet
DES-31000	Secador 3.0 desiccator cabinet, 16.4 x 13.4 x 16.3 inches with three shelves and gasketed door, stackable up to three high, built-in hygrometer, 22 lbs
DES-40000	Secador 4.0 Desiccator Cabinet, Horizontal Profile, 13.4 x 20.4 x 16.3 inches with 2 shelves and 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 desiccant every 20 minutes, ensuring that your humidity-sensitive content keep dry.

Model	Specifications
DES-21115	Desiccator cabinet, 12.4 x 13.4 x 16.3 inches with gasketed door, built-in hygrometer, two removable shelves. 15.9lbs, 1.17 cubic feet
DES-21115V	Desiccator cabinet, 12.4 x 13.4 x16.3 inches with two shelves and gasketed door, built-in hygrometer, 15.9 lbs (7.2 kg), 1.17 cubic feet, 220V fan
DES-31115	Desiccator cabinet, 16.4 x 13.4 x 16.3 inches with 3 shelves and gasketed door, stackable up to 3 high, built-in hygrometer, 24 lbs, 110V fan
DES-31115V	Desiccator cabinet, 16.4 x 13.4 x 16.3 inches with three shelves and gasketed door, stackable up to three high, built-in hygrometer, 24 lbs, 220V fan
DES-41220	Desiccator cabinet, 20.4 x 13.4 x 16.3 inches with thee-shelves and gasketed door, stackable up to three high, built-in hygrometer, 24 lbs, 220V

Balances and Portable Balances

EJ-Series

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 inches
- Check-weighing capacity
- 5-year warranty

Ideal for weighing silica gel and reagents.

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

HR Series Analytical Balances

The HR series compact analytical balance has a shatterproof 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-HR120-C	120g x 0.1mg with RS-232C	3.3 inch
BAL-HR200-C	210g x 0.1mg with RS-232C	3.3 inch
BAL-HR202i*	220/51g x 0.1mg/0.01mg with RS-232C	3.6 inch

*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.

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 dry gas meter, 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 LEGEND

DGMC-☐-☐☐

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

Flow Rate:
HF = Range Between 10 to 35 lpm
MF = Range Between 5 to 25 lpm
LFA = Range Between .25 to .90 lpm
LFB = Range Between .25 to 2.20 lpm
LFC = Range Between .25 to 4 lpm
CF = Custom Flow Rate

Dual DGM Option:
2 = Dual DGM Models

MARKETING LEGEND (rev0 1-31-2020)

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 LEGEND

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 = Method 5 Probe w/ 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 (Feet per Second):
A = 50 fps (Std. for Method 5, 2 and 201A)
B = 60 and 90 fps
C = 30, 60 and 90 fps
D = Custom (Specify)

ENGINEERING & MARKETING LEGEND
(rev0 2-7-2020)

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.

The best standard for calibration of dry gas meters.

The regular version, previously sold as model A, is no longer available. Only model B, the corrosion-resistant version, is available to be purchased.

W-NK

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 inches, 0-150 mm direct inch-to-mm conversion.

M5C-3D

Pitot Audit Equipment and 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 inH_2O) 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 display digital manometer, Method 2, handheld, 0-10 inH_2O selectable range, English or 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-inch 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-inch quick connects and software. Recalibration 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-inch male QC
M5CO-48	Calibration critical orifice, size 48, flow rate ~.46cfm (~13.0 LPM) with 1/2-inch QC
M5CO-55	Calibration critical orifice, size 55, flow rate ~.61cfm (~17.3 LPM) with 1/2-inch QC
M5CO-63	Calibration critical orifice, size 63, flow rate ~.79cfm (~22.4 LPM) with 1/2-inch QC
M5CO-73	Calibration critical orifice, size 73, flow rate ~1.1cfm (~31.14 LPM) with 1/2-inch 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 is fitted with an optical encoder and digital display.

A 15-point calibration is sold separately.

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.

DGM REFERENCE METER LEGEND

DGM-SK25R ☐ - ☐ ☐

Calibration Units:
BLANK = No Calibration
I = Imperial
M = Metric

Connector Type:
QS4 = 1/4” Instrumental Quick Connect
QS8 = 1/2” Instrumental Quick Connect
QF4 = 1/4” Full Flow Quick Connect
TU4 = 1/4” Tube Union w/ Nut

Calibration Flow Rates:
H = 0.35-1.24 CFM (Imperial)/
10-35 LPM (Metric)
A = 0.25-0.90 LPM (Metric Only)
B = 0.25-2.20 LPM (Metric Only)

Dry Gas Meter Calibration

Secondary Reference Meter

DGM-SK25RM-QS4
Metric calibration. 1/4-inch quick connect. 0.3 LPM to 2.5 LPM range
Call and ask for calibration services for this meter.

DGM-SK25R-QS8
English calibration. 1/2-inch quick connect. 0.35 cfm to 1.24 cfm range
Calibration service for this meter is: DGMC-15A-HF

DGM-SK25RM-QS8
English calibration. 1/2-inch quick connect. 10 LPM to 35 LPM range
Calibration Service for this meter is: DGMC-15A-HF

DGM-SK25RM-QF4
Metric calibration. 1/4-inch full-flow connect. 10 LPM to 35 LPM range
Call and ask for calibration services for this meter.

DGM CALIBRATION LEGEND

DGMC-□-□□

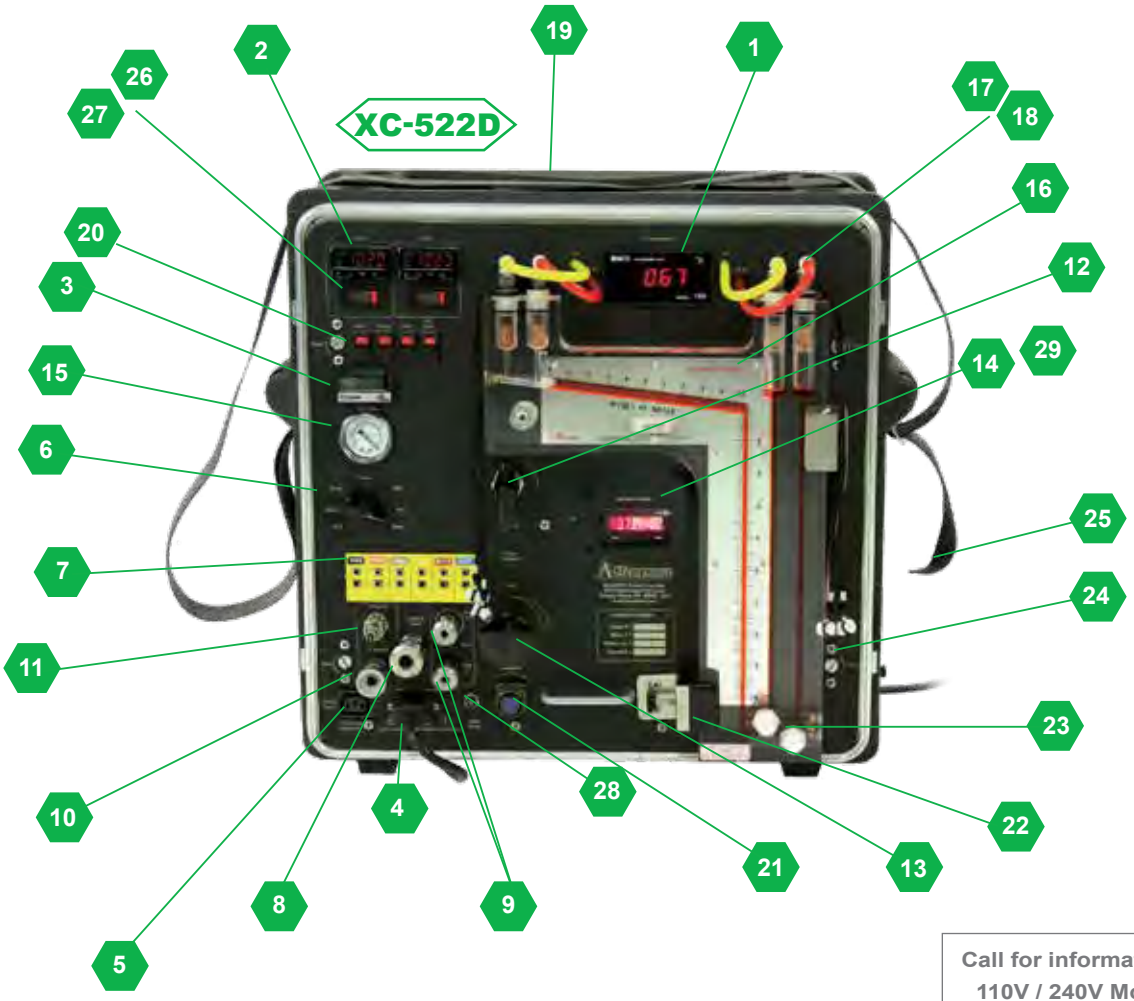
Points Callibrated:
2A = Two Points
3A = Three Points
5A = Five Points
6A = Six Points
15A = Fifteen Points

Flow Rate:
HF = Range Between 10 to 35 lpm
MF = Range Between 5 to 25 lpm
LFA = Range Between .25 to .90 lpm
LFB = Range Between .25 to 2.20 lpm
LFC = Range Between .25 to 4 lpm
CF = Custom Flow Rate

Dual DGM Option:
2 = Dual DGM Models

MARKETING LEGEND (rev0 1-31-2020)

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-PXR3-F	Controller, temp, 48 x 24
3	MC-T7511	Timer, MC
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
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-inch, black nylon
26	M-CBR10A-M	Magnetic type circuit breaker rocker switch, 10-amp, 120V
27	M-CBR5A-M	Magnetic type circuit breaker rocker switch, 5-Amp, 240V
28	M-CBP15A-M	Magnetic type circuit breaker, 15-amp push/pull switch, used in 120V consoles as main breaker
29	TOT4-36X72BL	Back-lit 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)

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

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	2.66×10^6
Parts-per-million(ppm) SO_2	Pounds/Std Cubic Foot (lb/scf) SO_2	1.660×10^{-7}
Parts-per-million(ppm) NO_x	Nanogram/Std Cubic Meter (ng/scm) NO_x	1.912×10^6
Parts-per-million(ppm) NO_x	Pounds/Std Cubic Foot (lb/scf) NO_x	1.194×10^{-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

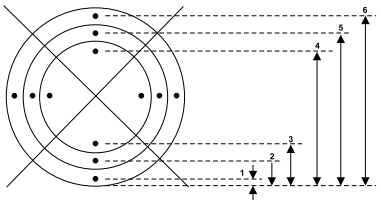
IRM EQUIPMENT

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

Location of Sampling Points
Circular Stack

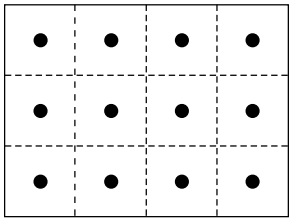
Example showing circular stack cross section divided into 12 equal areas with location of traverse points indicated.

Location of Traverse Points in Circular Stacks						
Traverse Point Number	(Fraction of Stack Diameter from Inside Wall to Traverse Point) Number of Traverse Points on a Diameter					
	2	4	**6**	8	**10**	12
1	**.146**	.067	**.044**	.032	**.026**	.021
2	**.854**	.250	**.146**	.105	**.082**	.067
3		.750	**.296**	.194	**.146**	.118
4		.933	**.704**	.323	**.226**	.177
5			**.854**	.677	**.342**	.250
6			**.956**	.806	**.658**	.356
7				.895	**.774**	.644
8				.968	**.854**	.750
9					**.918**	.823
10					**.974**	.882
11						.933
12						.979



Traverse Point	Distance % of diameter
1	4.4
2	14.7
3	29.5
4	70.5
5	85.3
6	95.6

Location of Sampling Points
Rectangular Stack



Example showing a three by four rectangular stack cross section with location of traverse points indicated.

Number of traverse points	Matrix layout
9	3x3
12	4x3
16	4x4
20	5x4
25	5x5
30	6x5
36	6x6
42	7x6
49	7x7

FEDERAL REFERENCE METHOD 2
Determination of Stack Gas Velocity and Volumetric Flow Rate
(Type S Pitot Tube)

INPUT PARAMETERS

Area of stack (m^2) or (ft^2) = pr^2 or $p\ (D/2)^2$ or L x W = A_s = _____

Pitot tube coefficient = C_p = _____

Stack gas temperature (K) or (°R) = T_s = _____

Average of square root of velocity head (mm. H_2O)$^{1/2}$ or (in. H_2O)$^{1/2}$ = = _____

Barometric pressure (mm. Hg) or (in. Hg) = P_{bar} = _____

Stack gas static pressure (mm. H_2O) or (in. H_2O) = P_g = _____

Absolute stack gas pressure (mm. Hg) or (in. Hg) = P_s = _____

Note: $P_s = P_{bar} + P_g$ (mm. H_2O)/13.6 or (in. H_2O)/13.6

Stack gas moisture (fraction) = B_{ws} = _____

Stack gas dry molecular weight (g/g-mole) or (lb/lb-mole) = M_d = _____

Stack gas wet molecular weight (g/g-mole) or(lb/lb-mole) = M_s = _____

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

CALCULATIONS

v_s = Stack gas velocity, m/s or ft... /s

= _____m/s (ft... /s)

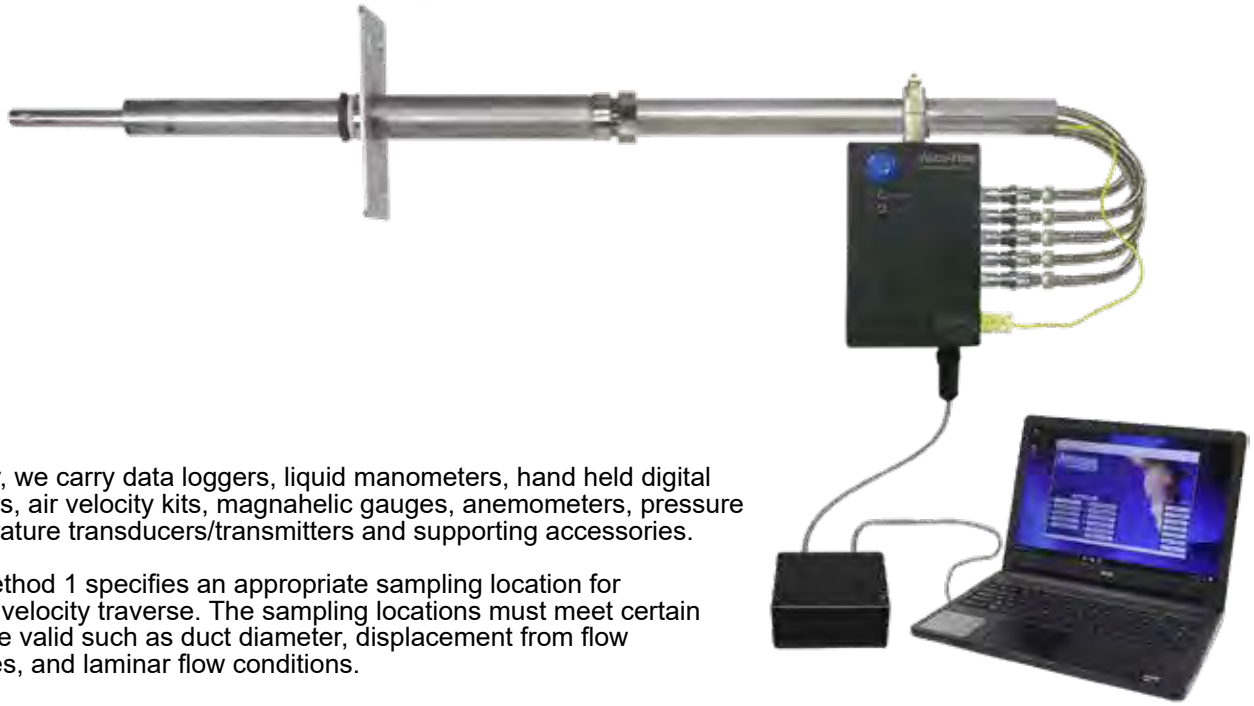
K_p = Velocity equation constant (34.97 metric, 85.49 English)

C_p = Pitot tube coefficient (0.84 baseline coefficient, else use wind tunnel calibration)

Flow and Pressure Measurement Equipment

Apex Instruments offers a variety of flow, pressure and temperature measurement equipment to meet US EPA Method 2 sampling criteria.

We offer our automated Accu-Flow and the manual 3D flow measurement systems as well as pitot tubes, modular pitots, standard pitots, cam-locks, flanges, port adapters and packing glands.

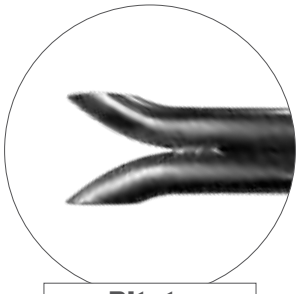


Additionally, we carry data loggers, liquid manometers, hand held digital manometers, air velocity kits, magnahelic gauges, anemometers, pressure and temperature transducers/transmitters and supporting accessories.

US EPA Method 1 specifies an appropriate sampling location for conducting velocity traverse. The sampling locations must meet certain criteria to be valid such as duct diameter, displacement from flow disturbances, and laminar flow conditions.

US EPA Method 2 is performed to determine the average stack gas velocity from measurement of the gas density and average velocity head using Type-S (Stausscheibe or reverse type) pitot tube. Apex Instruments manufactures and guarantees Type-S pitot tubes in accordance with the Method 2 design specifications. Calibration is available with purchase of pitot tubes. Apex Instruments offers calibration equipment and services. A variety of materials, sizes and configurations are available. The most common are constructed from either 1/4-inch or 3/8-inch OD stainless-steel or alloy 600 tubing.

Accu-Flow

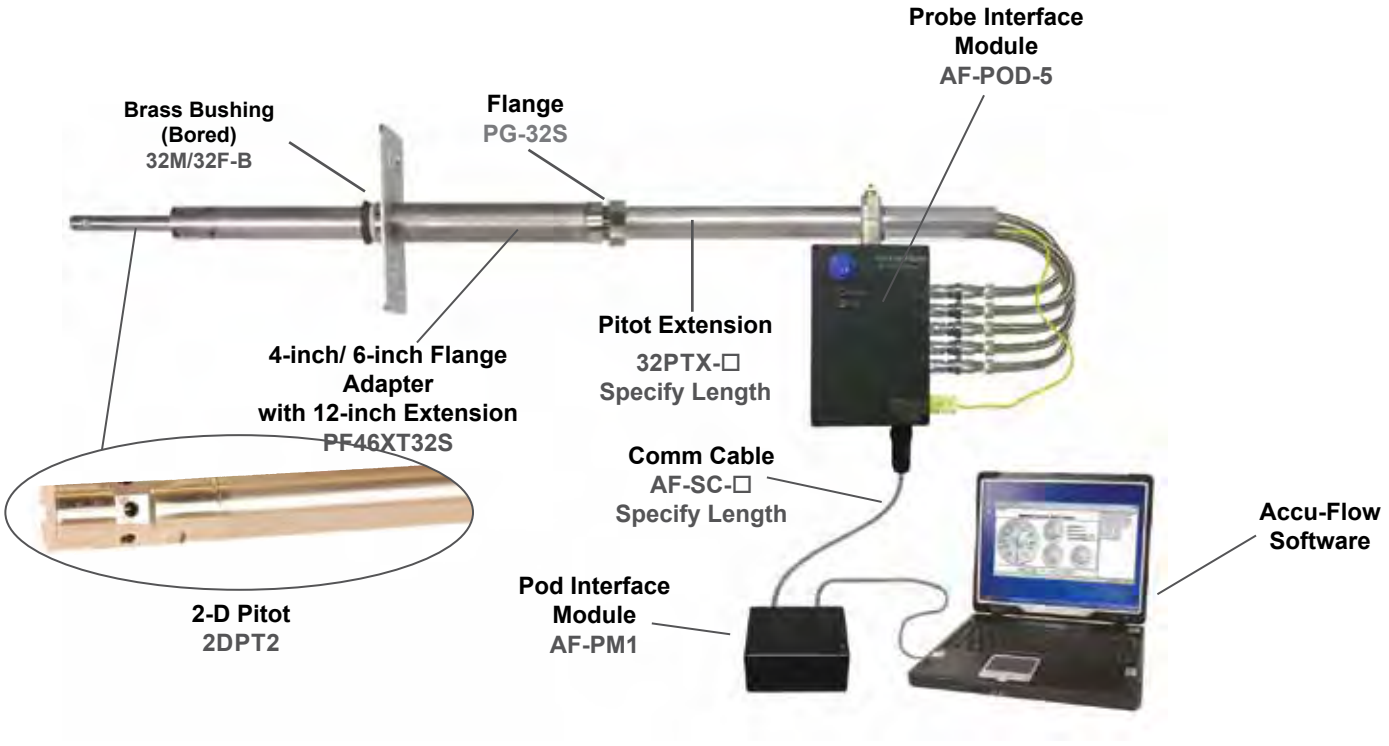


Pitots

Accessories

Accu-Flow Measurement System

The Accu-Flow Measurement System is configured to use a standard S-Type pitot, a two-dimensional three-hole prism-shaped probe or a three-dimensional five-hole prism-shaped probe to accurately measure angular non-axial flow rates for Methods 2, 2F and 2G. This system provides a way for testers to improve the measurement of volumetric flow rate under cyclonic flow conditions found in some stacks and ducts. Multiple probes reduce the time for the flow audits, therefore saving money by not operating at undesirable loads. Oversized sensor ports reduce plugging. The 1/4-inch pressure lines have quicker response and are less likely to leak than standard 1/8-inch lines.



Key Advantage for the Source:

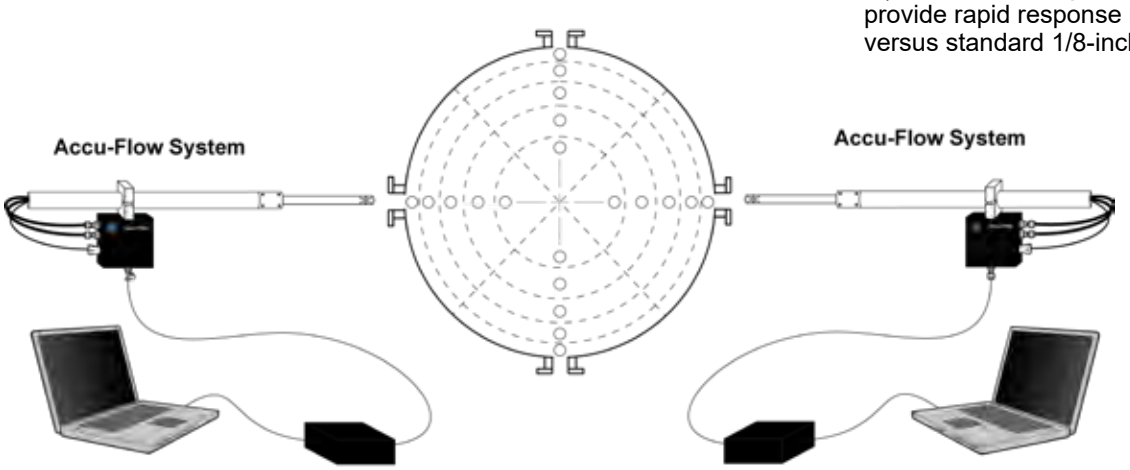
1.) Reduce operating costs
2.) Operate at more-desirable loads
3.) Report lower emission
4.) Save time by using automated system

Key Advantage for the Tester:

1.) Easy-to-use, rotate to null and record the yaw angle and ΔP
2.) Variant of EPA Method 2
3.) Simple calibration, similar to S-Type
4.) Automated calculations and data records
5.) Easy-to-use intuitive software for your laptop
6.) Decrease test time and minimize errors

Key Features:

1.) All sensors are enclosed within the pod enclosure
2.) Pod is securely mounted directly to the probe extension
3.) Results are immediate, stable and accurate
4.) Larger pitot ports reduce potential plugging
5.) 1/4-inch PTFE pressure lines provide rapid response rates versus standard 1/8-inch lines.



Apex Accu-Flow will save time and money as well as provide more accurate certifiable results.

Easy-To-Use, Intuitive Software

The operation software, hosted on a portable laptop computer, will allow the user to perform Method 2G (2-D) testing.

Software includes:

- Number of probes used
- Number of ports
- Total number of traverse points to be sampled
- Record differential pressure, flow yaw angle, stack temperature, static pressure and barometric pressure.

Accu-Flow Software
(Included in 2G-pod)

Probe Interface Module

Method 2G POD contains:
2 x 5-inch pressure transducers,
1 x 10-inch pressure transducer,
1 digital inclinometer, type-K TC transmitter, barometric pressure sensor plus umbilical connector, 2-inch tube clamp, 5 barb connectors, 1 TC jack.

AF-POD-5

Pod Interface Module

AF-PM1

2-D Calibration

Apex Instruments 2-D pitot tube must be calibrated before initial use. Recalibration is also required either within 12 months of its first field use or after 10 field tests, whichever occurs later. Additionally the 2D pitot shall be recalibrated before it is used again. Method 2G, 2-D pitot calibration (wind tunnel), 60 and 90 fps, yaw angle offset determination.

PT-CAL-W2G☐☐

Protractor / Inclinometer

The M5C-4 protractor/inclinometer is an ideal tool for measuring cyclonic yaw angles in accordance with Method 2. The machined aluminum frame and integral baseplate provide a light, rigid and ultra-precise platform allowing the state-of-the-art sensor to provide unsurpassed accuracy throughout the 360° range. The inclinometer can be securely attached to a probe with one of the following mounting brackets.

M5C-4

Bracket for M5C-4 with 2-inch aluminum clamp.

M5C-4-32

Mounting Brackets for M5C-4

Bracket for M5C-4 with 1-inch aluminum clamp.

M5C-4-16

Optional Accessories:

Magnehelic bracket:

Magnehelic mounting bracket.

MAG-2D-BK

Magnehelic gauge:

Magnehelic gauge, +-.5 INWC differential.

MAG-2301

Sample Method 2F flow modular system components

Product	Description
2DPT2	2-D pitot, two-hole prism-shaped tip with 1' sheath supplied with type-K thermocouple, 1/4-inch tube unions, 34-inch long
PT-CAL-W2G☐☐	Method 2G, 2-D pitot calibration (wind tunnel), specify velocities, yaw angle offsets determination
32PTX-6	2-D pitot extension, 6-foot long, 2-inch diameter sheath, split collar clamp with 1-inch ID
32PTX-8	2-D pitot extension, 8-foot long, 2-inch diameter sheath, split collar clamp with 1-inch ID
AF-SC-30	30' 2G cable with 7-pin, circular connectors
AF-SC-60	60' 2G cable with 7-pin, circular connectors
AF-SC-90	90' 2G cable with 7-pin, circular connectors
AF-POD-5	Method 2G POD contains 2 x 5-inch pressure transducers,1 x 10-inch pressure transducer, 1 digital inclinometer, type-K TC transmitter, barometric pressure sensor plus umbilical connector, 2-inch tube clamp, 5 barb Connectors, 1 TC jack. Also includes Accu-Flow software, connects to laptop via USB, AF-POD-5 power and transmits data over current-loop connection
AF-PM1	Single POD interface module contains USB HUB and current-loop transmitter for connecting AF-POD-5 to a single laptop

3-D Flow Measurement Console

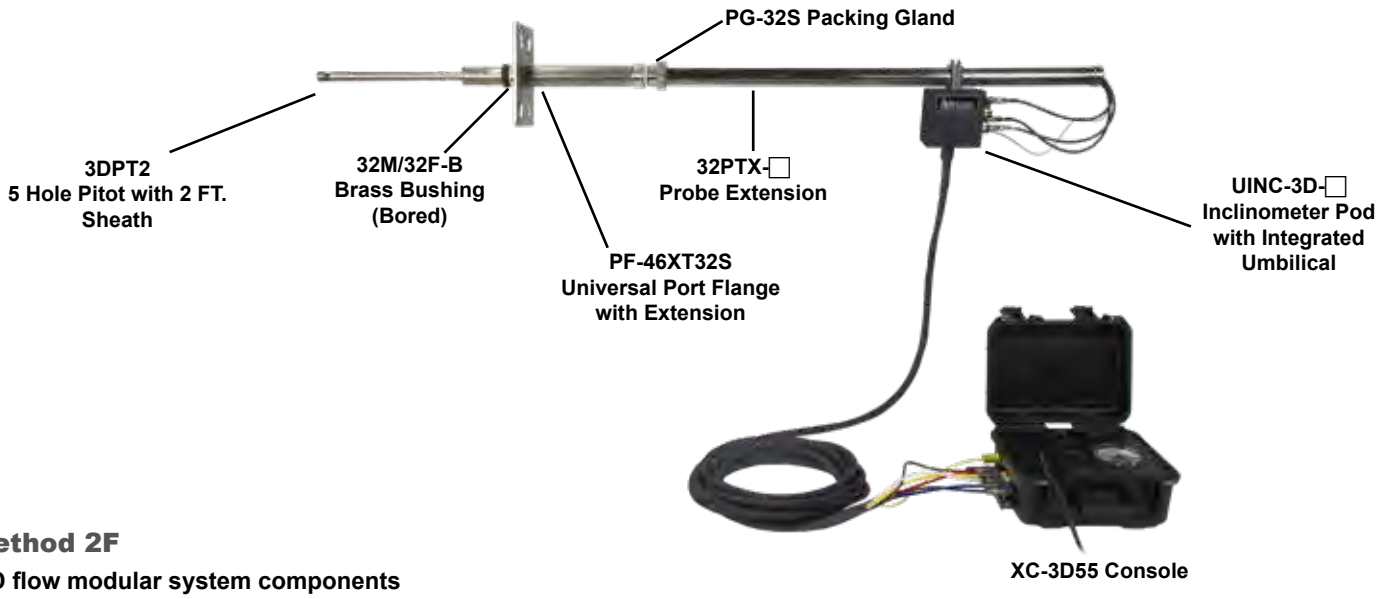
The Apex Instruments XC-3D55 3-D flow measurement console is used in conjunction with various pitots to determine velocity pressure, yaw angle and pitch angle of the flow velocity vector in a stack or duct according to U.S. EPA Method 2, 2F or 2G (the determination of stack gas velocity and volumetric flow rate with three-dimensional probes).

The XC-3D55 console easily interfaces with the UINC-3D-☐ umbilical/inclinometer assembly through a series of 1/4-inch quick-connects, a 4-pin circular connector and a type-K thermocouple jack. Readings for stack temperature, velocity pressure, pitch pressure and yaw angle are displayed respectively through a display, process meters, and a totalizer. The null angle is displayed through a magnehelic.

XC-3D55

Meter Console Specifications (XC-3D55):
Stack temperature: type-K thermocouple
Velocity pressure: (P1-P2) range ±5 inH_2O
Yaw null: bidirectional (P2-P3) range ±5 inH_2O 5 bi
Pitch range: bidirectional (P4-P5) range ±5 inH_2O 5 Bi
Yaw angle range: 180° (static >360°). +/-.01°
Breaker switch: magnetic-type circuit breaker rocker switch

Method 2F 3D System



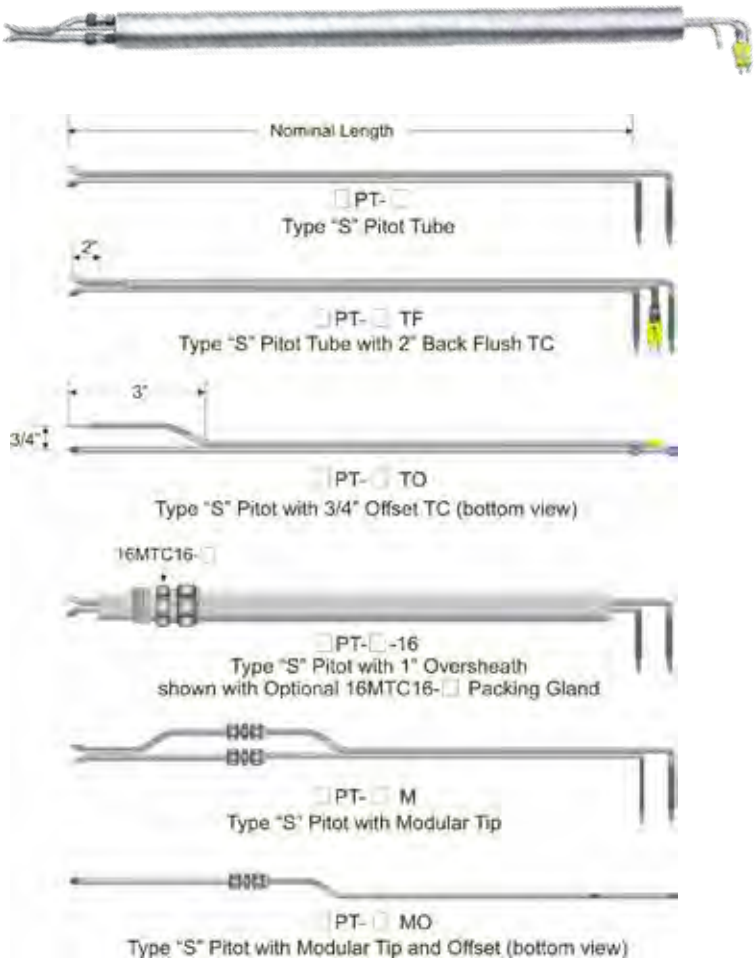
Method 2F

3-D flow modular system components

Product	Description
XC-3D55	Digital 3-D flow measurement console, digital displays for temperature, velocity pressure, pitch pressure, yaw angle
3DPT2	3-D Pitot, five-hole prism-shaped tip with 2' sheath supplied with five 1/8-inch to 1/4-inch tube unions
32PTX-☐	Probe extension, 2-inch diameter sheath, split collar clamp with 1-inch ID, specify length
PF-46XT32S	Port flange with extension, flange fits, 4- and 6-inch ports
32M/32B-B	2-inch bored brass bushing, 2-inch MNPT with 2.035 inch bore
PG-32S	2-inch packing gland, stainless-steel body and nut, 2-inch MNPT, PTFE ferrule included
PT-CAL-W2F ☐☐	3-D pitot calibration (wind tunnel), specify pitch angles and velocities
UINC-3D-☐	3-D inclinometer pod and umbilical cord, specify umbilical cord length in feet
U-PTX-☐☐☐☐☐	2-inch diameter pitot sheath extension, see legend above for specifics
AK-M2	Audit kit

Pitot Tubes

Type-S pitott tubes are used to measure gas velocities. When the pitot is faced into the gas stream, the pressure difference between the two ports can be used to calculate the velocity pressure. This differential velocity pressure is measured with liquid manometers or electronic pressure transducers.
Baseline coefficient value is 0.84. Wind tunnel calibration services are available upon request.



U.S. EPA Method 1 specifies appropriate sampling locations for conducting a velocity or particulate traverse. The sampling locations must meet certain criteria to be valid. (i.e. duct diameter and the sampling location, relative to flow disturbance locations to ensure laminar, non-cyclonic, flow in the stack.) Apex Instruments manufactures Type-S pitot tubes in accordance with the Method 2 design specifications. A wide variety of materials, sizes and configurations are available. The most common are constructed from either 1/4-inch or 3/8-inch OD stainless steel or alloy 600 tubing.

Type-S Pitot Tube Design Advantages:

- Large openings resist plugging
- Compact design fits easily in sampling ports.
- Maintains calibration in harsh environments.
- Suitable for determining cyclonic flow
- Suitable for measuring yaw angle of the velocity vector
- Economically priced

Type-S Pitot Disadvantages:

- Reads high
- Potential for misalignment

TYPE "S" PITOT TUBES
LEGEND

☐ PT- ☐ - ☐☐☐☐☐☐☐☐

Tube O.D:
3 = 3/16"
4 = 1/4"
5 = 5/16"
6 = 3/8"

Length (in Feet)

Alloy:
BLANK = Stainless Steel
A = Alloy 600 (Inconel)
B = Alloy 310 (Stainless Steel)
C = Alloy C276 (Hastelloy)

TC Options:
BLANK = No TC
TF = Stack TC 2" Back Flush
TO = Stack TC w/ 3/4" Offset
TW = Stack TC Well
NOTE: TW is standard for "A" option

Orsat Option:
BLANK = No Orsat
R = 1/4" Gas Sample Line (ORSAT)

Over Sheath Options:
BLANK = No Over Sheath
8 = 1/2" Over Sheath (Only Available with 3/16" ORSAT)
10 = 5/8" Over Sheath (3/16" Sample Lines Must be Used to Fit an ORSAT Larger Than 3/16")
12 = 3/4" Over Sheath
16 = 1" Over Sheath
32 = 2" Over Sheath
253 = 253MA (3/4" Pipe) Over Sheath (High Temp)

Scribed Option:
BLANK = No Scribe
S = Scribed Sheath (Available for 16 & 32 Over Sheaths)

Pitot Options:
M = Modular Pitot Tips
MS = Pitot w/ Staggered Ends (Lower Profile)
MO = Modular Pitot Tip w/ Offset

Termination Options:
BLANK = Pistol Grip
H = H Back

Tube OD Option
If Tube OD 3 is selected 3/16 tubing will be used 2X the length of the Pitot
If Tube OD 4 is selected 1/4 tubing will be used 2X the length of the Pitot
If Tube OD 5 is selected 5/16 tubing will be used 2X the length of the Pitot
If Tube OD 6 is selected 3/8 tubing will be used 2x the length of the Pitot

Length is in feet

Alloy
If Alloy option is blank Stainless Steel is used
For tube option 3 TS3-028 is used 2X the length of the Pitot
For tube option 4 TS4-035 is used 2X the length of the Pitot
For tube option 5 TS5-035 is used 2X the length of the Pitot
For tube option 6 TS6-049 is used 2X the length of the Pitot

If Alloy option A is selected 600 inconel is used (only available with Tube OD 4 and OD 6).
For tube OD 4 TI4-035S is used 2X the length of the Pitot
For tube OD 6 TI6-065S is used 2Xthe length of the Pitot

If Alloy option B is selected 310 Stainless is used (only available with Tube OD 6)
For tube OD 6 T310S-6-049 is used 2X the length of the Pitot

If Alloy option C is selected C276 Hastelloy is used (only available with Tube OD 4 and OD 6)
For tube OD 4 TC276-4-035 is used 2X the length of the Pitot
For tube OD 6 TC276-6-035 is used 2X the length of the Pitot

Length is in feet

TC Option Stainless Steel
If TC option is blank no TC is added
If TF Or TO option is selected TS4-035 is added 1X the length of the Pitot

TC Option with Alloy selected
TC with Alloy option A selected TI4-035S is added 1X the length of the Pitot
TC with Alloy option B selected TS4-035 is added 1X the length of the Pitot
TC with Alloy option C selected TC276-4-035 is added 1X the length of the Pitot

ORSAT Option Stainless Steel
If ORSAT option is blank no ORSAT line is added
If ORSAT option is selected TS4-035 is added 1X the length of the Pitot
If oversheath 8 is selected TS3-028 is added 1X the length of the Pitot for the ORSAT line

ORSAT Option with Alloy selected
ORSAT option with Alloy option A selected TI4-035S is added 1X the length of the Pitot
ORSAT option with Alloy option B selected T310S-4-035 is added 1X the length of the Pitot
ORSAT option with Alloy option C selected TC276-4-035 is added 1X the length of the Pitot

Oversheath Option Stainless Steel
If Tube OD 3 is selected 8,10,12,16,24,32 is available
If Tube OD 4 is selected 12,16,24,32 is available
If Tube OD 5 is selected 16,24,32 is available
If Tube OD 6 Is selected 16,24,32 is available
If 8 is selected TS8-035 is added 1X the length of the Pitot
If 10 is selected TS10-035 is added 1X the length of the Pitot
If 12 is selected TS12-035 is added 1X the length of the Pitot
If 16 is selected TS16-035 is added 1X the length of the Pitot
If 32 is selected TS32-049 is added 1X the length of the Pitot

Oversheath Alloy A
If Tube OD 4 is selected 12,16,24,32 is available
If Tube OD 6 is selected 16,24,32 is available
If 12 is selected TI12-035S is added 1X the length of the Pitot
If 16 is selected TI16-035S is added 1X the length of the Pitot
If 32 is selected TI32-049 is added 1X the length of the Pitot

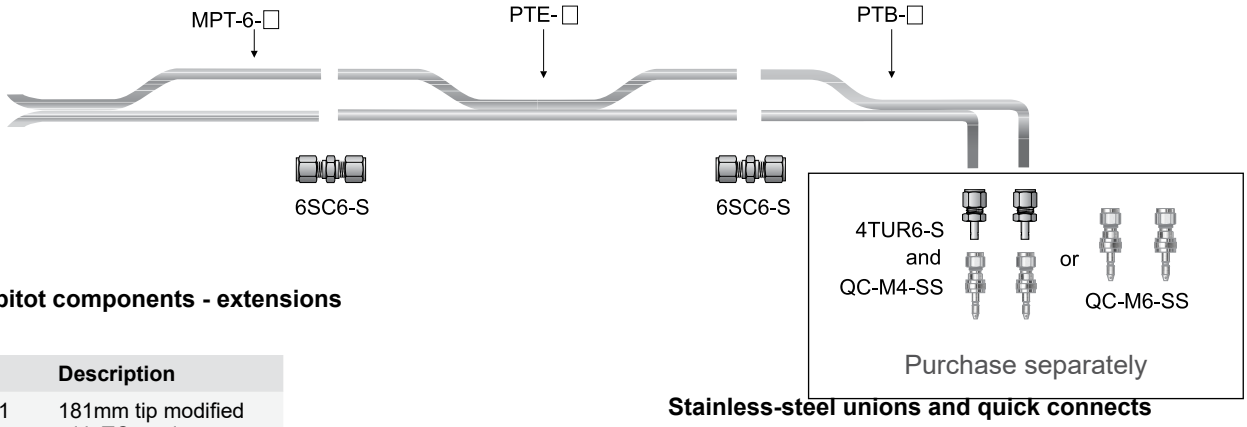
Oversheath Alloy B
If Tube OD 6 is selected 16,24,32 is available
If 16 is selected T310S-6-049 is added 1X the length of the Pitott
If 32 is selected T310S-32-049 is added 1X the length of the Pitot

Oversheath Alloy C
If Tube OD 4 is selected 12,16,32 is available
If Tube OD 6 is selected 16,32 is available
If 12 is selected TC267-12-049 is added 1X the length of the Pitot
If 16 is selected TC276-16-035 is added 1X the length of the Pitot
If 32 is selected TC276-32-049 is added 1X the length of the Pitot

Modular Pitot option (Not available with Tube OD 3
If no oversheath add a MPT-6-181
If oversheath add a MPT-6-133

MARKETING LEGEND
(rev5 8-12-2020)

Modular Pitots



Modular pitot components - extensions

Product	Description
MPT-6-181	181mm tip modified with TC retainer
PTB-3	3-foot body
PTE-2	2-foot extension
PTE-3	3-foot extension
PTE-4	4-foot extension

Modular pitot components - pitot tips

Product	Description
MPT-6-181-OFF	Replacement pitot tip, 3/8-inch, stainless-steel, offset for use with 47mm filter holder and PM2.5 cyclone **
MPT-6-181-OFF-WC	Replacement pitot tip, 3/8-inch, stainless-steel, offset for use with 47mm filter holder and PM2.5 cyclone **
MPT-6-181	Replacement pitot tip for standard Method 5 probe assemblies, 181mm in length **
MPT-6-225-OFF	Offset replacement pitot tip, 3/8-inch, stainless-steel, extended for use with Method 5 nozzle and SFA-47 in-stack filter **
MPT-6-255-OFF	Offset extended pitot tip for PM10 cyclone with 47mm filter assembly **
MPT-6-255-OFF-WC	Offset extended pitot tip for PM10 cyclone with 47mm filter assembly **
MPT-6-320	Replacement pitot tip, 3/8-inch, stainless-steel, extended for use with standard Method 5 nozzle and SFA-190, SFA-300, or SFA-2590 in-stack filters **
MPT-6-320-OFF	Offset replacement pitot tip, 3/8-inch, stainless-steel, extended for use with standard Method 5 nozzle and SFA-190, SFA-300, or SFA-2590 in-stack filters **
MPT-6-425	Replacement pitot tip, 3/8-inch, stainless-steel, extended for use with PM10 cyclone and 47mm in-stack filter **
MPT-6-425-OFF	Offset replacement pitot tip, 3/8-inch, stainless-steel, offset for use with 47mm Filter holder and PM2.5-10 cyclone combo kit **
MPT-6-425-OFF-WC	Offset replacement pitot tip, 3/8-inch, stainless-steel, offset for use with 47mm filter holder and PM2.5-10 cyclone combo kit ***

*** Includes geometric pitot calibrations*
*** Includes geometric pitot calibration and wind calibration*

Stainless-steel unions and quick connects

Product	Description
4SC4-S	Stainless-steel tube union, 1/4-inch
4TUR6-S	Stainless-steel tube end reducer; 3/8-inch tube union to 1/4-inch tube stub
6RU4-S	Stainless-steel reducing tube union; 3/8-inch to 1/4-inch
6SC6-S	Stainless-steel tube union, 3/8-inch
QC-M4-SS	1/4-inch quick connects
QC-M6-SS	3/8-inch quick connects

Order unions and quick connects separately.

MODULAR PITOT TIPS LEGEND

MPT □ - □ - □ - □ - □

Material:
BLANK = Stainless Steel
I = Alloy 600 (Inconel)

Tube O.D.
Examples: 4 = 1/4"
6 = 3/8"

Length
Measured in millimeters

Offset
OFF

Wind Tunnel Calibration
WC

Pitot Length Chart

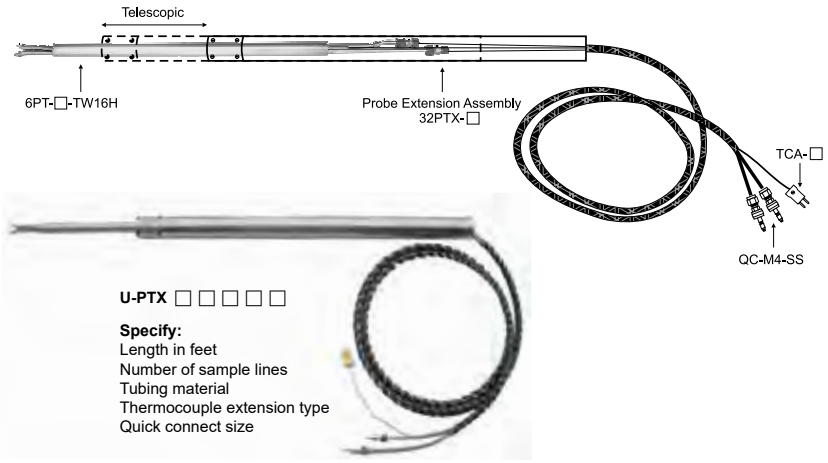
Product	Standard Pitot Length (mm)	Probe w/ Oversheath Pitot Length (mm)	Application
Probe Base	181	133	Method 5
SFA-47 Filter	225 (Offset)	177 (Offset)	Method 17
SFA-300	320 (Offset)	272 (Offset)	Method 17
SFA-2590	308	260	Method 17
PM2.5	181 (Offset)	133	Method 201A
PM10	255 (Offset)	207 (Offset)	Method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

ENGINEERING & MARKETING LEGEND
(rev0 1-31-2020)

Pitot Tube Extensions Telescopic Type-S Pitot

Apex Instruments Telescoping Pitot Probe allows the versatility of traversing larger stacks with optional telescoping ranges while providing the ability to package this probe in a more compact container. The design incorporates a pitot tube with 1-inch OD oversheath connected to a 2-inch OD extension with adjustable clamp. Rigid or flexible tubing connections are available. 1/4-inch ID PTFE with stainless-steel overbraid is recommended. PFA or glass insulated type-K thermocouples with overbraid are available.

Varying pitot tube lengths are available. Please call for details.



TELESCOPIC PITOT UMBILICAL CORD LEGEND

U-PTX- □□□□□□

Length (in Feet)

Lines:
A = Two Lines and One TC
B = Three Lines and One TC
C = Five Lines and One TC

Tubing Material:
PFA - Heavy Wall
4 = 1/4" O.D.
6 = 3/8" O.D.
PFA - w/ SS Over-Braid
TO4 = 1/4" I.D.
TO6 = 3/8" I.D.
SS - 316
TS4 = 1/4" SS
TS6 = 3/8" SS

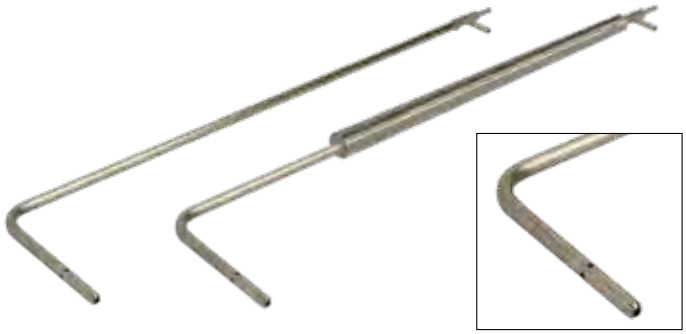
TCE (Thermocouple Extension) Type:
BLANK = WK-PP-24S - Stranded Wire Yellow Polyvinyl Sleeve
T = WK-TT-24 - Stranded Wire Brown PFA Sleeve
H = WK-HH-24 - High Temperature Glass Insulated Stranded Wire
TS = WK-TT-24S-SB - Stranded Wire Brown PFA Sleeve w/ SS Over-Braid
HS = WK-GG-24S-SB - High Temperature Glass Insulated Stranded Wire w/ SS Over-Braid

Fittings:
BLANK = No Fittings
QS4 = 1/4" Quick Connects
QS6 = 3/8" Quick Connects

ENGINEERING & MARKETING LEGEND
(rev1 3-11-2020)

Standard Pitot Tube for Method 2C

This pitot tube is custom made to specifications outlined in US EPA Method 2C. Modified hemispherical-nosed pitot of Method 2C features a shortened stem and enlarged impact and static pressure holes. This pitot is useful for saturated gas streams when “back-purging” is ineffective. Pitot coefficient: 0.99 unless calibrated by wind tunnel.



Stainless-Steel Pitot

Product	Length
PT2C-24	24-inch
PT2C-36	36-inch
PT2C-48	48-inch
PT2C-60	60-inch

METHOD 2C STANDARD PITOT TUBE LEGEND

PT2C- ☐ **-** ☐

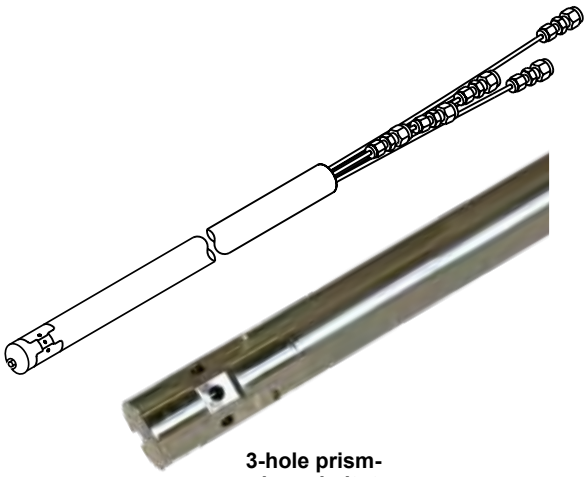
Length (in Inches)

Oversheath Option:
BLANK = No Over Sheath
16 = 1” Over Sheath
(Used w/ Any Probe Between 6’ and 10’)
32 = 2” Over Sheath
(Used w/ Any Probe Over 10’)

ENGINEERING & MARKETING LEGEND
(rev2 6-3-2020)

2-Dimensional Probe (3-hole pitot)

The Apex Instruments 2-dimensional probe is used in Method 2G for the determination of stack gas velocity and volumetric flow rate with two-dimensional proves. The rear-axial velocity of the stack gas accounts for the yaw, but not the pitch component of flow. The average gas volumetric flow rate in the stack or duct is then determined from the average near-axial velocity. The inclinometer is used for determination of the calibrated yaw offset. The pitot is designed to be inserted into our 2-inch diameter probe extension. The pitot tube must be calibrated in accordance with Method 2G prior to use.



3-hole prism-shaped pitot

2DPT2

3-D Pitot (5-hole pitot)

The Apex Instruments 3-D pitot is capable of measuring yaw and pitch of nonuniform flows. The yaw angle is determined directly by rotating the pitot to null the pressure across a pair of symmetrically placed ports on the pitot head. The yaw angle is measured with a remote inclinometer attached to the probe extension and digitally displayed on the console.
The pitch angle is calculated using probe specific calibration curves. The average gas volumetric flow rate in the stack or duct is then determined from the average axial velocity.

5-hole prism-shaped pitot

3DPT2

3-d Pitot calibration (PT-CAL-3D)

All 3-D pitot tubes must be calibrated before use. Re-calibration is also required either within 12 months of its first field use after its most recent calibration or after 10 field tests, whichever occurs later. In addition, whenever there is visible damage to the 3-D head, the pitot should be re-calibrated before it is used again.

Inclinometers

Protractor / Inclinometer

The M5C-4 protractor/inclinometer is an ideal tool for measuring cyclonic yaw angles in accordance with Method 2. The machined aluminum frame and integral baseplate provide a light, rigid and ultra-precise platform allowing the state-of-the-art sensor to provide unsurpassed accuracy throughout the 360° range. The inclinometer can be securely attached to a probe with one of the following mounting brackets.

M5C-4

Mounting Brackets for M5C-4

Bracket for M5C-4 with 1-inch aluminum clamp.
M5C-4-16

Bracket for M5C-4 with 2-inch aluminum clamp.
M5C-4-32

Pendulum Style Inclinometer

Easy-to-use, handheld pendulum-style inclinometer.
1-degree accuracy.
2.6-inch diameter dial with vernier divisions of 1 degree.
Height: 3.6-inch
Weight: 8.6 oz.

M5C-1
M5C-1-16 (Bracket for M5C-1 with 1-inch aluminum clamp)
M5C-1-32 (Bracket for M5C-1 with 2-inch aluminum clamp)

Additional Pitot Calibration Equipment

Bull's eye level, 1/2-inch diameter
M5C-2

Dial caliper, 0-6 inch, 0.001-inch increments, English only
M5C-3

Dial caliper, 0-6 inch/150mm direct inch/metric conversion
M5C-3D

Velocity Measurement

Deluxe Method 2 Pretest Survey Kit

The deluxe Method 2 pretest survey kit contains a modular pitot tip and extension for stacks up to 12', a digital handheld manometer, thermocouple thermometer, tubing, reducers, unions and flexible thermocouples. The kit is packaged in a sturdy, foam-lined case that is 45 inches long, 15.25 inches wide and 9.5 inches deep. Custom kits available. Alternative manometer options available upon request.

SK-DM2D

SK-DM2D Survey Kit

Deluxe Method 2 Magnehelic Kit

Includes all items of the SK-DM2D (listed above) with 4 magnehelic gauges:
0 to 0.25 inH_2O, 0 to 2 inH_2O, 0 to 5 inH_2O
0 to 10 inH_2O in the place of a digital manometer (English units).

SK-DM2

Deluxe Method 2 Metric Magnehelic Kit

Includes all items of the SK-DM2D (listed above) with 4 magnehelic gauges:
0-.25cm H_2O, 0-6mm H_2O, 0-50mm H_2O, and 0-100mm H_2O in the place of a digital manometer (metric units).

SK-DM2M

Pressure and Temperature Display

Features:

- Lightweight and sturdy transport case with handle
- Bright backlit red LED digital temperature and pressure displays
- Utilizes 120VAC/15aamp power with IEC male receptacle
- 12VDC, 25-watt power supply
- 15-amp panel-mounted breaker switch
- Temperature-compensated pressure transducer with +/-5 inH_2O range
- Operating range of 0-70°C
- Relative humidity operating range of 0-95%
- 1/4-inch female quick-connects
- Type-K female thermocouple jack, range -157 to 1999°F
- 4.5 lbs without power cord, 5 lbs with power cord

DPT-B5

Air Velocity Kit

The M-115AV air velocity kit includes an inclined portable manometer with a range of -.05 to 0.25 inH_2O with 0 to 0.5 inch minor scale divisions, standard 12-inch pitot, hoses and a case. The low-flow air velocity manometer can be ordered separately. Custom kits available.

M-115AV

Manometer

M-115G (English units)

M-115M (metric units)

Pitot

166-12

Features:

- 1-inch thick acrylic plastic body
- Drilled bore accurate to ±.0002 inches
- Selected gauge oil
- Adjustable reflective chrome finish
- Parallax-free reading
- Screw-type leveling adjustment

Dual-Scale Portable Inclined-Vertical Manometer

The M-400K air velocity kit includes dual-scale portable inclined-vertical manometer (M-400G) with an inclined range of 0-1.0 inH_2O with .01-inch minor divisions and vertical range of 1 to 10 inH_2O with 0.10 inch minor divisions, 18-inch standard pitot, 160-12 pitot, hoses and case (M-400G manometer can be ordered separately).

M-400K

Manometer
M-400G

Pitot
160-12

Features:

- 1 1/4-inch thick acrylic plastic body
- 3/16-inch bores, accurate to ±.0002-inch
- Selected gauge oil
- Ground-glass bubble level
- Parallax-free reading
- O-ring sealed fluid level plunger adjustment

Transducers/Transmitters

M-DP Transducers / Transmitters

Features:

- Temperature-compensated pressure transducers
- Built into 4.4 x 2.4 x1.1-inch enclosure with terminal blocks
- Accessible hose barbs for pressure connections (barbs OD=.174 -.190)
- Built-in ESD protection
- 12 VDC power required from separate source
- Operating range of 0-70°C
- Relative humidity operating range of 0-95%
- Ratio metric 4VDC span output (exact output value is sensor dependent)
- On-board regulated reference supply for pressure sensors

DIFFERENTIAL PRESSURE TRANSDUCER/TRANSMITTER LEGEND

SINGLE DUAL

M-DP- ☐☐ / ☐☐

Transducer Type:
BLANK = Unidirectional (Gauge = "G")
B = Bi-directional (Differential = "D")

H20 Range:
.25 = .25"
1 = 1.0"
2 = 2.5" (SP-2.5IN-D-4V ONLY)*
5 = 5" (Both D and G)*
10 = 10" (SP-10IN-G-4V ONLY)*
20 = 20" (SP-20IN-G-4V ONLY)*

Transducer Type:
BLANK = Unidirectional
B = Bi-directional

H20 Range:
.25 = .25"
1 = 1.0"
2 = 2.5" (SP-2.5IN-D-4V ONLY)*
5 = 5" (Both D and G)*
10 = 10" (SP-10IN-G-4V ONLY)*
20 = 20" (SP-20IN-G-4V ONLY)*

*** Indicates transducers in stock**

MARKETING LEGEND (rev0 1-31-2020)

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

Roll-Up Manometer

Roll-up manometer, range 18-0-18 inches, quick shut off hose barb connections.

M1211-36

M1211-36

Hand Held Digital Manometers

DHM28-10 Digital Handheld Manometer

The DHM28-10 is a precision instrument designed to measure a wide range of pressures to a very high accuracy. Features include: measurement in all common pressure ranges, display resolution to .001, differential or relative measurement, two-line liquid crystal display, and adjustable auto power off to conserve battery. A certificate of calibration is included with the unit at no additional cost. The DHM28-10 can be used as a secondary calibration standard for your other pressure instrumentation.

DHM28-10

Features:

- Microprocessor-based
- Differential gauge, or absolute
- High-accuracy, 0.2%, 0.1%, or 0.5% with calibration certificate
- Selectable scales
- Resolution to 0.000 of selected unit
- Accuracy, ±0.20% full scale ±1 digit
- Hold function
- Programmable display
- Memory for up to 964 readings
- Output for optional printer or computer interface
- Input range; US 0-10 inH_2O, metric 0-2.5 kPa, overpressure 12.5 kPa (50 inH_2O)

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 inH_2O) 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

Features:

- Calculates and displays air velocity and volumetric air flow
- Rugged aluminum case protects instrument from damage during transport/use
- 9 selectable English and metric engineering units
- Large, easy-to-read display with backlight for use in dark areas
- Stores up to 40 readings with minimum, maximum and average statistics

Digital Barometer

A traceable digital barometer is the perfect unit where there is a need to monitor conditions of environmental air parameters. A four-line LCD continuously and simultaneously shows barometric pressure, temperature, relative humidity, barometric pressure trend and time-of-day. Minimum\maximum readings for barometric pressure, temperature and relative humidity are stored every hour for the last 24 hours and are available for recall at the touch of a button. HI/LO alarms can be set for barometric pressure, temperature, and relative humidity.

Barometric pressure range from 500 to 1030 millibars (mbar) with a resolution of 1 mbar. Accuracy is ±4 mbar. Barometric pressure trend shows in bar-chart format the current and past 1-, 3-, 6-, 12-, and 24-hour readings. Switching permits viewing in millibars (mbar), inches of mercury (inHg), or hectopascals (hPa). Altitude compensation is -100 to 2500 meters.

Temperature range is 32 to 131ºF and 0 to 55ºC. Resolution is 0.1° and accuracy is ±0.4°C. Relative humidity range is 5 to 95%. Resolution is 1% RH and accuracy is ±3% RH between 5 to 75%, otherwise ±5% RH.

BAR-6530

Temperature Thermometers and Transmitters

Waterproof Thermometer

The waterproof thermometer has membrane switches, ABS body, and a stainless-steel probe. This thermometer is good for use in labs, plants, wash-down areas, and the field. Unit eliminates the dangers inherent in breakable glass and toxic mercury thermometers. It displays minimum and maximum readings over any period. Unique holder allows probe to be positioned at any height while attached to beakers, stainless cylinders, or vats. Probe guard snaps to handle to extend overall length to 10.75 inches. Readings are updated every second. Supplied with probe holder, key chain, and lanyard. Operates continuously for 1.5 years on supplied replaceable silver-oxide battery.

DPT-168-NIST

Specifications:

Range: -58 to 572°F and -50 to 300°C.
Resolution: is 0.1° from -20 to 200° (1° otherwise).
Accuracy: ±0.4°C or ±1.5°C.

Dimensions: stem length is 3.25 inches; stem diameter is 0.14 inches; overall length is 7.25 inches. Weight is 1 oz.

Model VA710 (V&A instruments) Thermocouple Simulator

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

Workhorse Thermometer

Type-K Workhorse™ thermometer provides a sharp readout in dim and very bright light, long battery life (150 to 200 continuous hours), high accuracy, wide temperature range, and a new chip design for an ultra-low price. Recessed front panel adjustable offset allows user to adjust thermometer exactly to a specific temperature, in-house calibration, or a particular sensor for increased accuracy. HOLD button freezes display to capture current reading. Supplied with bench stand. It is compatible with all type-K probes. Supplied with fast response type-K probe, bench stand, 9-volt battery, and carrying case. Cable length of 40 inches.

TC-4425

Specifications:

Range: -58.0 to 2372°F and -50.0 to 1300°C
Accuracy:
±(1°C + .75%) between 0 to 500°C;
±(1°C + 1%) 500 to 750°C;
±(1°C + 2%) 750 to 1000°C;
± (3°C + 4%) 1000 to 1200°C;
±2°C at -20; ±3°C at -40; and ±4°C at –50)

Resolution: 0.1° between -50.0 to 200.0 and 1° elsewhere
Probe dimensions: 5-inch long with 0.175-inch diameter
Thermometer dimensions: 2.75-inch x 5.5-inch x 1.25-inch (cm x cm x cm); 6 oz (kg).

Thermocouple

Type-K stainless-steel probe, triple purpose (liquid, air/gas, semi-solids)
Temperature range -45° to 230°C, probe length is 5 inches with 30-inch cable

TPK-8595

Humidity

Sling Psychrometer

Red-spirit-filled thermometer with a range of 20° to 120°F. It is fast and accurate with no assembly required. Impact-resistant plastic.

B12-7012

Dew-Point/Wet-Bulb/Humidity/Thermometer

Monitor shows current, minimum, and maximum displays and includes a high/low alarm setting for all four readings (dew-point, wet-bulb, humidity, temperature). Supplied with two AA alkaline batteries for continuous, 1-year "always on" monitoring, and Traceable® Certificate. LCD digits are 1 inch high. Case is high-impact, chemical-resistant ABS plastic.

HUM-4410

Specifications:
Temperature range: –40 to 70 °C and –40 to 158°F
Resolution: 0.1° (below 100)
Accuracy: ±1°C
Relative humidity range: 1 to 99%
Resolution: 0.1%RH
Accuracy: ±4% between 20 to 80%
Dimensions: HxWxD 4.125 x 4.125 x 1 inches. Weight is 4.25 ounces

Dial Hygrometer/Thermometer:

Features:
Precision hygrometer with temperature gauge
Temperature from -40 ºF to 122 ºF (-40 ºC to 50 ºC)
Resolution is 1 % RH and 1
Accurate within 2.5% RH at 50% RH and 1.5 ºC
Relative humidity from 0% to 100%
6-inch diameter by 1 inch - 8 oz.

HUM-4186

Thermocouple Plugs/Jacks

Apex Instruments temperature plugs and jacks feature a glass-filled thermoplastic body which provides high strength at temperatures up to 218°C (425°F) as well as low moisture absorption and good dielectric constant.

Thermocouple Plugs

TC-PJK

TC-PJU

TC-PJR

TC-PJ-MK

Part Number	Description
TC-PJK	Thermocouple snap-in jack, type-K, standard size
TC-PJU	Panel jack, universal
TC-PJR	Panel jack, round, threaded mount
TC-PJ-MK	Mini panel jack, type-K

Rubber Bushings

TC-RB

TC-MRB

Part Number	Description
TC-RB	Bushing, rubber cord, standard size
TC-MRB	Bushing, rubber cord, mini

Thermocouple Jacks

TC-LPS-K

TC-LJ-K

TC-SP-K

TC-MJ-K

Part Number	Description
TC-LPS-K	Connector, type-K, female, cord, standard size
TC-LJ-K	Connector, type-K, male, cord, standard size
TC-SP-K	Connector, type-K, female, cord, mini
TC-MJ-K	Connector, type-K, male, cord, mini

Thermocouple Adapters

Thermocouple adapter assembly

TA-125

TA-188

TA-250

Part Number	Description
TA-125	Adapter, 1/8-inch tube union, stainless-steel
TA-188	Adapter, 188-mm tube union, stainless-steel
TA-250	Adapter, 1/4-inch tube union, stainless-steel

Magnehelic Gauges

Easy-to-read 4-inch dials indicate gas pressures; positive, negative or differential. The gauges have a ±2% full scale accuracy and include simple, frictionless magnehelic magnetic movement. They are highly resistant to shock, vibration and overpressure.

MAG-2000-00
(Shown with A-369 stand)

Standard measure

MAG-2000-00	0-1/4 inH_2O
MAG-2000-0	0-1/2 inH_2O
MAG-2001	0-1 inH_2O
MAG-2002	0-2 inH_2O
MAG-2005	0-5 inH_2O
MAG-2010	0-10 inH_2O
A-369	Stand, aluminum, 5.5-inch tall

Metric measure

MAG-2000-6MM	0 to 6 mm H_2O
MAG-2000-25MM	0 to 25 mm H_2O
MAG-2000-50MM	0 to 50 mm H_2O
MAG-2000-100MM	0 to 100 mm H_2O

Magnehelic Gauge Mounting Assembly:

Magnehelic gauge, +-.5 INWC differential
MAG-2301-BK

Optional Accessories:

Magnehelic Gauge:

Magnehelic gauge, +-.5 INWC differential
MAG-2301

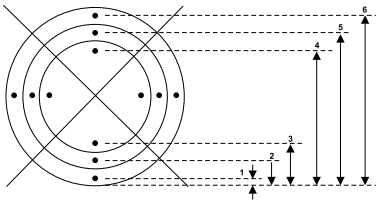
Magnehelic Bracket:

Magnehelic mounting bracket
MAG-2D-BK

Location of Sampling Points
Circular Stack

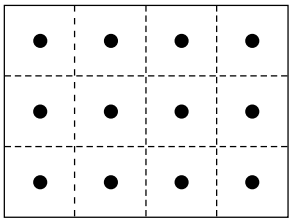
Example showing circular stack cross section divided into 12 equal areas with location of traverse points indicated.

Location of Traverse Points in Circular Stacks						
Traverse Point Number	(Fraction of Stack Diameter from Inside Wall to Traverse Point)					
	Number of Traverse Points on a Diameter					
	2	4	**6**	8	**10**	12
1	**.146**	.067	**.044**	.032	**.026**	.021
2	**.854**	.250	**.146**	.105	**.082**	.067
3		.750	**.296**	.194	**.146**	.118
4		.933	**.704**	.323	**.226**	.177
5			**.854**	.677	**.342**	.250
6			**.956**	.806	**.658**	.356
7				.895	**.774**	.644
8				.968	**.854**	.750
9					**.918**	.823
10					**.974**	.882
11						.933
12						.979



Traverse Point	Distance % of diameter
1	4.4
2	14.7
3	29.5
4	70.5
5	85.3
6	95.6

Location of Sampling Points
Rectangular Stack



Example showing a three by four rectangular stack cross section with location of traverse points indicated.

Number of traverse points	Matrix layout
9	3x3
12	4x3
16	4x4
20	5x4
25	5x5
30	6x5
36	6x6
42	7x6
49	7x7

FEDERAL REFERENCE METHOD 2
Determination of Stack Gas Velocity and Volumetric Flow Rate
(Type S Pitot Tube)

INPUT PARAMETERS

Area of stack (m^2) or (ft^2) = pr^2 or $p\ (D/2)^2$ or L x W = A_s = _____

Pitot tube coefficient = C_p = _____

Stack gas temperature (K) or (°R) = T_s = _____

Average of square root of velocity head (mm. H_2O)$^{1/2}$ or (in. H_2O)$^{1/2}$ = = _____

Barometric pressure (mm. Hg) or (in. Hg) = P_{bar} = _____

Stack gas static pressure (mm. H_2O) or (in. H_2O) = P_g = _____

Absolute stack gas pressure (mm. Hg) or (in. Hg) = P_s = _____

Note: $P_s = P_{bar} + P_g$ (mm. H_2O)/13.6 or (in. H_2O)/13.6

Stack gas moisture (fraction) = B_{ws} = _____

Stack gas dry molecular weight (g/g-mole) or (lb/lb-mole) = M_d = _____

Stack gas wet molecular weight (g/g-mole) or(lb/lb-mole) = M_s = _____

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

CALCULATIONS

v_s = Stack gas velocity, m/s or ft... /s

= _____m/s (ft... /s)

K_p = Velocity equation constant (34.97 metric, 85.49 English)

C_p = Pitot tube coefficient (0.84 baseline coefficient, else use wind tunnel calibration)

Mercury Sampling Equipment

Sorbent trap monitoring systems for mercury (STM) are designed for continuous dual sampling of vapor-phase mercury emissions from stationary combustion sources and are designed specifically to satisfy the US EPA mandated compliance for MATs reporting. All Apex mercury products are manufactured in accordance with the U.S. EPA MATS published in 40 CFR, Part 60 and 63, Appendix A, Subpart UUUUU.

Apex Instruments offers several STM systems to meet your mercury testing needs.

Automated STM systems:
XC-6000EM for Method PS-12B
STM-12B STM for Method -12B
XC-30B STM for Method 30B

Manual STM system:
XC-260 for Method 30B

The AK-STM-12B mercury audit kit is manufactured to perform PS-12B-mandated audits of both the XC-6000 STM system and the XC-30B/XC-260 method 30B RATA systems.

Apex Instruments also offers a variety of mercury sorbent traps for use in the XC-6000 and XC-30B systems as well as R&D traps. All traps can be manufactured for special stack conditions such as high temps, acid gases or wet stack applications.

Method PS-12B

XC-6000EM

Method 30B

XC-30B

Sorbent Trap applications

SORBENT TRAPS

MercSampler

Sorbent Trap Monitoring System

The automated STM-12B MercSampler for sorbent trap monitoring systems is designed for continuous dual sampling of vapor-phase mercury emissions from stationary combustion sources, in accordance with the U.S. EPA MATS published in 40 CFR, Part 60-63, Appendix A, Subpart UUUUU and Performance Specification 12B.

Sorbent Traps

HVAC Unit

Advantages of Sorbent Trap Monitoring

- Simple to install and operate
- Highly accurate
- Very low detection levels <0.5 ng/m^3
- Sample captured directly in the stack
- Suitable for long-term sampling
- NIST-traceable SRM for QA/QC
- No calibration gas required
- Traps are non-hazardous, easy to ship to lab

MercSampler Firmware and Software

The MercSampler automated software works with a windows-based platform and allows the operator to quickly set up test profiles, perform sample runs, sensor and gas meter calibrations, run quarterly audits, and download test data at any time. The intuitive interface can be run from a local PC, touch screen, or remote network connection.

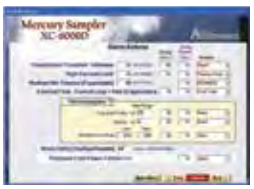
The Apex-Instruments-engineered firmware has been designed to allow the unit to operate autonomously, while simultaneously receiving operating data from both analog and Modbus signal inputs.

Test Profile/ Configuration Set-up
Customize test setup with the user-defined profiles and configurations.

Calibration:
This application provides electronic documentation that is stored with each test run.

Leak Test:
Automated pre-test leak check with variable vacuum and an automated post-test leak check.

Active Test Data:
Real-time test screen to see instantaneous data.



Alarm:

- Proportional tolerance
- High vacuum
- External flow signal loss
- MODBUS idle time out
- Thermocouple (trap, probe, chiller)
- Return from power failure

STM-12B MercSampler System Features:

Sampling unit

- Fully automated paired sampling
- Proportional flow control
- Customer-configured alarms
- Dual gas meters with optical encoders (1cc resolution)
- External inputs: stack flow, remote pause, moisture analyzer

The thermoelectric cooler is a robust, closed, dual-channel gas conditioning system.

- Cools gas to constant dew point
- Removes moisture and acid gases
- Uses acid-scrubbing sorbent

Heated sample probe

- Dual-trap probe
- Dual zone heater
- Insulated junction box
- Stack, trap and probe thermocouples
- C276 alloy
- Cam-lock port connector

Heated Umbilical/Sample Line

- Heavy-duty, lightweight
- Self-regulated
- Replaceable sample lines
- Flexible, robust construction with high-temperature jacket

Cabinets

- Powder-coated aluminum
- Easy access doors
- Durable compact design
- Optional heating and cooling system

Mercury Sorbent Trap Sampling Unit

The Apex Instruments STM-12B MercSampler simplifies most sampling requirements by automating data acquisition, sample flow adjustments, leak checks, calculations, temperature control, and calibrations. Data is easily transferred to a Windows-based PC through ethernet, USB or an optional wireless interface. The STM-12B MercSampler™ captures all data necessary for paired sorbent trap sampling in accordance with PS 12B. The sample flow rate is controlled proportionally to the stack flow rate and determines the standardized volume extracted through each sorbent trap. To collect the samples, two diaphragm vacuum pumps, which work with the proportional valves and mass flow sensors, pull the samples through sorbent traps.

Sampling unit available with either a touch screen interface or gas meter digital display. Both options have ethernet connectivity to a laptop and site DAS system connectivity through modbus.

Condensation bottles that collect knockout moisture from the stack sample allow for accurate Method 4 to be performed without additional testing.

Specifications

Dry gas meters:

- Positive displacement type
- 0.7 liter per revolution
- Optical encoder sensor with quadrature pulse output
- 8-digit LCD display, 2cc resolution

Sample pumps:

- BTC diaphragm, brushless motor - 12 VDC, 20 inHg vacuum, 10,000-hour MTBF, 3900 RPM, max. PSIG 24-inch

Sample flow control:

- Stainless-steel sample manifolds fitted with mass flow sensors, vacuum sensors, and proportional valves
- Proportional or constant flow sampling
- Mass air flow: proportional flow control, 100 to 2000 ccm, port style, manifold mount
- Proportional valve: Voltage Sensitive Orifice (VSO®), 12 VDC

Data acquisition control board (DAC):

- Enhanced flash 16-bit RISC based microcontrollers; main and digital signal processing (DS). Real-time clock with auto backup and write protection to external SRAM
- High-speed 14bit A/D convertor with parallel DSP interface
- SD memory card for data storage – stores up to 99 tests (30 day test runs). Embedded ethernet port with full TCP/IP protocol and 256-bit encryption

Thermocouple multiplexer:

- Accepts type-K thermocouple inputs; input protection includes gas discharge tubes for ESD and surge protection
- 11 pic microcontrollers, 1 for each channel and MUX circuitry
- MUX circuitry to receive multiple inputs and transmit selected output
- 10 microcontrollers, one for each optically isolated channel

Integrated temperature control:

- Designed into DAC for probe/trap heat control output via 25-amp solid-state relay

Barometric pressure: 600 to1100 mbar, 17.7 to 32.4 inHg, temperature-compensated, amplified output

Vacuum: 0 to 30 inHg, 0 to 101 kPa, 2% accuracy

Communications:

- PC user interface via ethernet, USB, or optional wireless router
- Remote access and control via onboard configurable router to owner's network computer
- TCP/IP Modbus (ASCII or RTU) communications to the DAHS
- Interface to DAHS system via TCP/IP Modbus

Dimensions: HxWxD 40-inch x 24-inch x 14.5-inch (35.6 cm x 48.3 cm x 39.4 cm)

HVAC unit offers protection for electronic components against extreme ambient temperatures

New thinner design for easier installation and wall mounting applications that is only 14.5-inch deep

NEMA enclosure to protect against environmental elements

Optional stand

Designed with easy access to internal components for field service and maintenance.

Pinnacle Cooling Unit

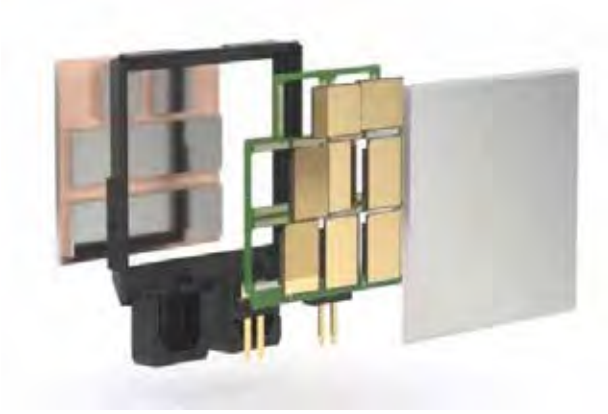
The TEC-4000Hg uses the Apex state-of-the-art Pinnacle Heat Pump for cooling the sample gas to remove moisture from the sample. The Pinnacle solid-state heat pump is housed in a rugged package that is easy to service and designed to withstand harsh manufacturing environments.

- Extremely reliable solid-state heat pump with long life span
- Low-resistance heat exchanger with copper base and heat pipes with high thermal conductivity

The Pinnacle heat pump unit includes an aluminum block fitted with two Hastelloy condensers, a thermoelectric module, a high-efficiency heat exchanger, an exhaust fan, and a PID temperature controller.

Moisture is removed by condensation through the reduction of the dew point, which happens when the gas is cooled so that the water vapor is less than 1% by volume. Water vapor and acid gases are condensed to prevent corrosion in the system.

The heat pump uses an extremely reliable rugged solid-state thermoelectric module (TEC) and low-resistance heat exchanger with a copper base and heat pipes with high thermal conductivity for removing heat from the hot side of the TEC and dispersing the heat to the surrounding environment via the exhaust fan.



For maximum performance, the thermoelectric module is coupled with a highly efficient heat exchanger for removing the heat from the hot-side of the module to the ambient air. The heat exchanger includes a copper base fitted with six U-tube heat pipes with coated fins and a high-volume corrosion-resistant fan.

We chose the Phononic thermoelectric modules because we believe that they offer the most advanced and innovative thermoelectric modules on the market.

XC-6000EM MercSampler Sorbent Trap Sampling Console

The Apex Instruments XC-6000EM MercSampler simplifies most sampling requirements by automating data acquisition, sample flow adjustments, leak checks, calculations, temperature control, and calibrations. Data is easily transferred to a Windows-based PC through ethernet and can be monitored remotely through modbus connectivity. The XC-6000EM MercSampler meter console captures all data necessary for paired sorbent trap sampling in accordance with PS 12B. The meter console controls the sample flow rate proportional to the stack flow rate and determines the standardized volume extracted through each sorbent trap. The XC-6000 firmware (embedded software) has been designed to utilize the technical features of the RISC-based microchip microcontrollers which provide decision making as well as precise 'autonomous' control of the console while the laptop or PC is not connected.

XC-6000EM shown with SGC-4000HG in CR-20U cabinet

XC-6000EM Console

Model	Description
XC-6000EM	120V/60Hz
XC-6000EM-V	240V/50Hz

Installation: *19-inch standard rack mount, available 8U transport case, shock mount, rack or weather-resistant aluminum cabinet configurations.*

Features

- Customer-friendly software and firmware
- Easy data export (text and CSV files)
- Configurable system alarms (dry contact closure/piezo alert)
- Quarterly audit calibration Check (optional audit/cal kit)
- Remote input for external test pause and resume

XC-6000EM Laptop

The MercSampler console interfaces with intuitive software, utilizing a Windows-based PC or Laptop.

Specifications

Dry gas meters:
- Model SK25EX series, positive displacement type
- 0.7 liter per revolution
- Optical encoder sensor with quadrature pulse output
- 8-digit LCD display, 2cc resolution

Sample pumps:
- BTC diaphragm, brushless motor - 12 VDC, 20 inHg vacuum, 10,000-hour MTBF, 3900 RPM, max. PSIG 24-inch.

Sample flow control:
- Stainless-steel sample manifolds fitted with mass flow sensors, vacuum sensors, and proportional valves
- Proportional or constant flow sampling
- Mass air flow: proportional flow control, 100 to 2000 ccm, port style, manifold mount
- Proportional valve: voltage sensitive orifice (VSO), 12 VDC

Data acquisition control board (DAC):
- Enhanced flash 16-bit RISC-based microcontrollers; main and digital signal processing (DS). Real-time clock with auto backup and write protection to external SRAM
- High-speed 14-bit A/D converter with parallel DSP interface
- SD memory card for data storage – stores up to 99 tests (30-day test runs). Embedded ethernet port with full TCP/IP protocol and 256-bit encryption
- USB 2.0 comm input connection

Thermocouple multiplexer:
- Accepts type-K thermocouple inputs; input protection includes gas discharge tubes for ESD and surge protection
- 11 pic microcontrollers, 1 for each channel and MUX circuitry
- MUX circuitry to receive multiple inputs and transmit selected output
- 10 microcontrollers, one for each optically isolated channel

Integrated temperature control:
- Designed into DAC for probe/trap heat control output via 25-amp solid-state relay

Barometric pressure: 600 to1100 mbar, 17.7 to 32.4 inHg, temperature-compensated, amplified output

Vacuum: 0 to 30 inHg, 0 to 101 kPa, 2% accuracy

Communications:
- PC user interface via ethernet
- Remote access and control via onboard configurable router to owner's network computer
- Optional TCP/IP modbus (ASCII or RTU) Communications to the DAS
- Optional interface to DAS system via TCP/IP modbus

Weight: 34 lbs (15.5 Kg)

Dimensions: HxWxD 14-inch x 19-inch x 15.5-inch (35.56 cm x 48.26 cm x 39.37 cm)

XC-30B Automated MercSampler Console

The XC-30B MercSampler Console, designed for performing Method 30B, the determination of total vapor-phase mercury emissions from coal-fired combustion sources using carbon sorbent traps. The XC-30B simplifies sampling requirements by automating data acquisition, sample flow adjustments, leak checks, calculations, temperature control, and calibrations. Data is easily transferred to a Windows-based PC through USB interface. The XC-30B MercSampler performs dual sorbent trap sampling at flow rates up to 2.5 LPM. It can be operated with your choice of probes and gas conditioning systems, including our popular SGC-4000HGP stirling gas conditioner.

The XC-30B system can also be used to perform RATA testing on both the XC-6000 STM and CEMs systems.

Features

- Fully automated for paired sampling
- Durable roto-molded linear low-density polyethylene (LLDPE/LMDE) case with stainless-steel handles
- Dual dry gas meters and mass flow sensors
- Simple data export
- Compact, portable system
- USB interface
- Easily configured with Windows-based PC

XC-30B Consoles

Model	Description
XC-30B	Source sampler flow rates up to 2.5 LPM (120 or 240VAC)

Specifications

Dry gas meters:
- Dual dry gas meters with integrated optical encoders, resolution to 2cc
- Model SK25EX positive displacement type
- 0.7 liter per revolution
- Optical encoder sensor with quadrature pulse output

Sample flow control:
- Stainless-steel sample manifolds fitted with mass flow sensors, vacuum sensors, and proportional valves
- Constant flow sampling <250 ccm
- Mass air flow: flow control, 300 to 2500 ccm
- Proportional valve: Voltage Sensitive Orifice (VSO®)

Data acquisition control board (DAC):
- Enhanced flash 16-bit RISC-based microcontrollers; main and digital signal processing (DS). Real-time clock with auto backup and write protection to external SRAM
- High-speed 14-bit A/D convertor with parallel DSP interface

Data acquisition control board (DAC):
- Memory card for data storage – stores up to 99 tests
- USB 2.0 comm input connection.

Communications:
- PC user interface via USB

Thermocouple multiplexer:
- Accepts type-K thermocouple inputs; input protection includes gas discharge tubes for ESD and surge protection
- 11 pic microcontrollers, 1 for each channel and MUX circuitry
- MUX circuitry to receive multiple inputs and transmit selected output
- 10 microcontrollers, one for each optically -isolated channel

Sample pumps:
- Dual head miniature diaphragm pumps with 12 VDC motors, max vac. 22 inHg

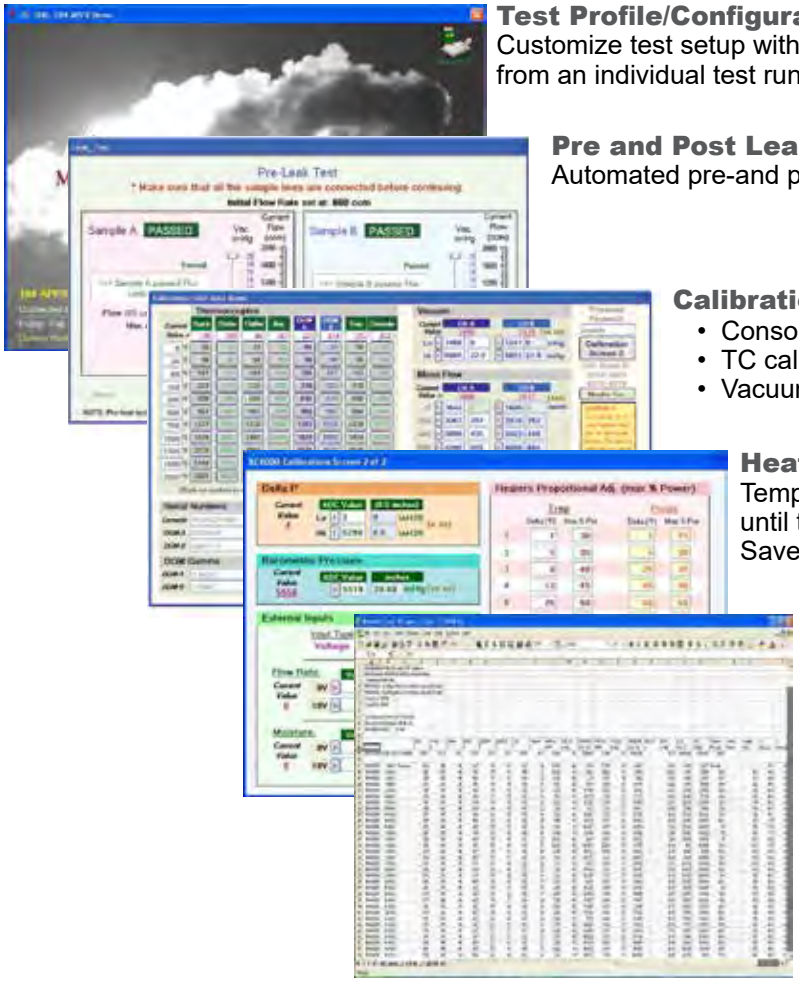
Integrated temperature control:
- Designed into DAC for single probe/trap heater control output via 25-amp solid-state relay

Barometric Pressure
- 600 to1100 mbar, 17.7 to 32.4 inHg, temperature-compensated, amplified output

Vacuum
- 0 to 30 inHg, 0 to 101 kPa, 2% accuracy
- **Durable UHMW polyethylene case:** Built-in handles (size 10U) 19-inch rack mount panel
- **AC Power:** 120 vac 60Hz. / 220 vac 50Hz
- **Dimensions:** 23in x 21in x 12in (58cm x 53cm x 30.5cm)
- **Weight:** 39 lbs (17.7kg)

XC-30B MercSampler Software

XC-30B MercSampler automated software works with a Windows-based platform. It allows the operator to quickly set up test profiles, perform sample runs, sensor calibration, DGM calibration, run quarterly audits and download test data at any time during or after a test run. The software can be purchased separately for use with customer supplied computer. Intuitive Windows-based operator interface may be run from local PC or remote network connection.



Test Profile/Configuration Set-up

Customize test setup with the user-defined profiles containing all of information from an individual test run. Once created or loaded a profile may be edited.

Pre and Post Leak Test

Automated pre-and post-test leak check.

Calibration Screen

- Console information
- TC calibration
- Vacuum calibration
- Mass flow calibration
- Load and save cal. files
- Manual pump/valve control

Heater Profile

Temperature fine tuning, and delaying runs until the traps have reached their set point. Save and load heater profiles as needed.

Data Export

- Temperatures
- Profile name
- Logged events
- Averages
- Standard volumes
- Pre- and post-leak check
- Flow rate
- Vacuum
- Start, stop and event times
- Test configuration

Portable Thermoelectric Gas Cooler For Method 30B

The TEC-4000HgP thermoelectric gas cooler and conditioner is a portable unit that comes with a top handle for easy transport and a durable UHMW polyethylene 6U case. Cooler comes with condensate collection bottles for use with the XC-30B mercury sorbent trap sampling system.

Dimensions: HxWxD: 22-inch x 13-inch x 23-inch.
55.88 cm x 33.02 cm x 58.42 cm

Weight: 32 lbs (14.5 kg).

TEC-4000HgP

Portable Unit TEC-4000HgP

TEC-4000HgP (110V)
TEC-4000HgP-V (240V)

XC-260 Source Sampler console for Method 30B

The Apex **XC-260** source sampler is a low-price, portable, field-proven meter console that is easy to use and ideal for sampling mercury emissions based on CFR 40, Part 60, Method 30B. The heart of the Apex Instruments manual mercury sampling system is the **XC-260** source sampler, a precision meter console used for collecting Hg emissions. The average mercury concentration for the sampling period is determined by using the sample volumes measured by the dry gas meters and the results of the sorbent trap analysis. Two flow rate configurations are offered; 0.2 to 2.4 liters per minute or 100-1000 cubic centimeters per minute.

XC-260 Manual Source Sampler Console

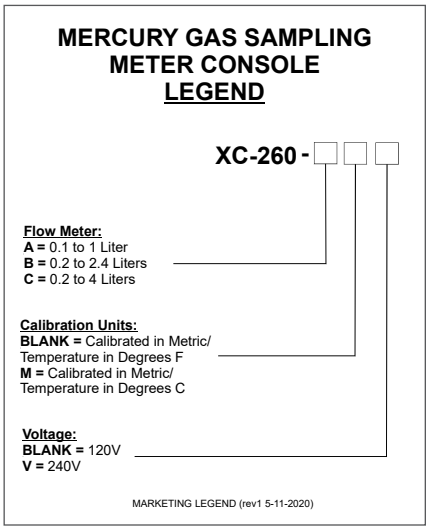
Sampler also ideal for Method 18.

Features

- Dual independent flow paths
- Dual dry gas meters with digital displays
- Coarse and fine valves for precise flow and vacuum control
- Stainless-steel valves and fittings
- Stainless-steel 1/4-inch quick connects
- Digital temperature controller for probe heater
- Elapsed digital timers
- Dual-scale vacuum gauges
- Durable roto-molded linear low-density polyethylene (LLDPE/LMDE) case with stainless-steel handles (size 10U)

Consoles

Model	Description
XC-260	Source sampler 0.2-2.4 LPM flow rate (120 VAC)
Options	
A	100-1000 cc per min. flow rate
B	100-2500 cc per min. flow rate
C	100-4000 cc per min. flow rate
V	240 VAC



Specifications

Dry gas meters: model 25 series, positive displacement diaphragm type, 0.7 liters per revolution, optical encoder sensor with quadrature pulse output, gas volume totalizer with an eight-digit LCD display, 2 cc resolution (*standard*)

Dual diaphragm sample pumps (2): 12 VDC motors, max vac. 20 inHg

Probe Temperature Control: Compact, 1/32 DIN auto tuning indicating temperature controller with external 25-amp solid-state relay. 115 VAC outlet 5-15R, Standard type-K jack for input

Digital temperature display: 3.5-digit display °F (-157°F to 1999°F), display and controller are resettable for °C upon request (^{O}C is standard for export)

Thermocouple inputs: Five external type-K inputs plus two type-K internal gas meter connections

Flowmeters: Solid-machined acrylic (0.2 - 2.4 LPM)

**Optional 100-1000 ccm (XC-260A)*

AC power: 120 V/60 Hz or optional 220 V/50 Hz

Dimensions: 23-inch x 21-inch x 12-inch (58 cm x 53 cm x 30.5 cm)

Weight: 39 lbs (17.7 kg)

GAS CONDITIONER FOR METHOD 30B

Model	Description
SC-30B	2 AlumaSorb cartridges, 2 in-line filters with drains and disposable filter elements in enclosure with sample line inputs/sample outputs, dual-stream, designed for use with XC-30B system

TEC-4000Hg Themoelectric Gas Cooler

The Apex Instruments TEC-4000Hg Thermoelectric Gas Cooler is a 19-inch rack-mounted gas cooler designed to be used in conjunction with the XC-6000EM MercSampler Console Sorbent Trap Mercury Monitoring (STM) System.

The sample gas is cooled for the purpose of condensing the water vapor and water-soluble acids prior to measurement with the metering console. The condensate is collected in plastic-coated reagent bottles connected to the bottom of the condensers. The condensate freely drains into the bottles without the need of a pump. Dry acid-free sample gas is crucial for protecting the sample pumps and measurement devices.

The bottles are sized for collecting up to one week of condensate from a source with 20% moisture when sampling at 500 ccm.

The condensate can be measured for determining the approximate percent water vapor in accordance with EPA Method 4.

Gases are drawn through a dry sorbet scrubber for removing residual water vapor and corrosive gases.

TEC-4000Hg (front view)

TEC-4000Hg (back view)

TEC-4000Hg
TEC-4000HgP (Portable Version)

The TEC-4000Hg Cooler with our Pinnacle Technology

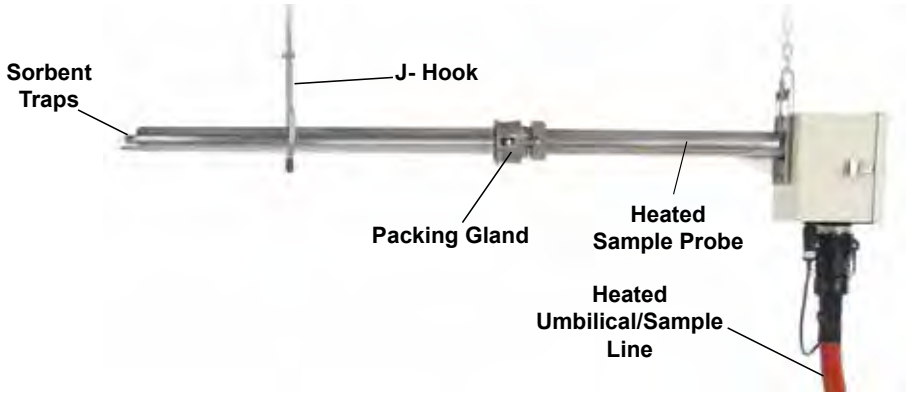
Pinnacle Cooling Unit

The TEC-4000Hg uses the Apex state-of-the-art Pinnacle Heat Pump for cooling the sample gas to remove moisture from the sample. The Pinnacle solid-state heat pump is housed in a rugged package that is easy to service and designed to withstand harsh manufacturing environments.

- Extremely reliable solid-state heat pump with long life span
- Low-resistance heat exchanger with copper base and heat pipes with high thermal conductivity

Dual Heater Hastelloy Mercury Probe

Apex Instruments mercury sorbent trap probes are designed for use with the Apex range of mercury sorbent trap sampling systems. Manufactured using C276 for long-term or high-corrosive sampling applications like PS-12B, the mercury probes perform paired sampling using 10mm OD sorbent traps. Optional stainless-steel construction is available for short-term sampling such as 30B or RATA testing.



The sorbent traps are placed at the probe inlet to prevent Hg transportation losses during sampling. The traps are sealed in place with compression fittings using glass-filled PTFE ferrules. C276 alloy is recommended for the XC-6000 applications. Stainless-steel probes are available for short-term testing such as 30B or RATA applications.

Mercury probes come in both single and dual heater configurations to keep the sample gas above the dew point and prevent condensation forming in the sample and on the sorbent traps. Dual-heater configurations are recommended for PS-12B or other long-term sampling applications where one heater heats the traps and the second heats the external portion of the probe outside of the stack. In short-term sampling applications such as 30B and RATA sampling, single-heater probes utilizing only the trap section heater may be used.

Standard lengths are available from 4 to 12 feet. Custom lengths are available upon request.

All probes come with type-K thermocouples and insulated junction enclosures.

MERCURY PROBE LEGEND

HGP ☐ - ☐ -H ☐☐☐

Probe Type:
BLANK = Non Air Cooled
A = Air Cooled
(Available ONLY w/ Single Heater Option)

Length (in Feet):
2 = 2 ft.
3 = 3 ft.
4 = 4 ft.
5 = 5 ft.
6 = 6 ft.
8 = 8 ft.
9 = 9 ft.
10 = 10 ft.
12 = 12 ft.
16 = 16 ft.

Alloy:
BLANK = Stainless Steel
C = Alloy C22/C276 (Hastelloy)

Heater:
S = Single Heater
D = Dual Heater

Voltage:
BLANK = 120V
V = 240V

ENGINEERING & MARKETING LEGEND
(rev2 6-15-2020)

Hastelloy Probes

Model:	Length (feet)
HGP-4-HCD	4
HGP-6-HCD	6
HGP-9-HCD	9
HGP-12-HCD	12

Add a 'V' to the end of the part number for 240V option.

Stainless Steel Probes

Model:	Length (feet)
HGP-4-HD	4
HGP-6-HD	6
HGP-9-HD	9
HGP-12-HD	12

Add a 'V' to the end of the part number for 240V option.

Stainless-steel probes are available for short-term testing such as 30B or RATA applications.

Durable Heated Umbilical Lines for XC-6000EM MercSampler Sorbent Trap Sampling System

Heavy-duty heated umbilicals with replaceable sample lines are designed to provide years of trouble-free service.

Heavy-duty, heated umbilicals include the replaceable self-regulating heater cable, thermocouples, and a flexible conduit with two replaceable 1/4-inch PFA sample lines, and pass-through power for the probe. The braided design provides extreme flexibility and strength.

The heated core is insulated with several layers of braided lightweight Pyron OPF yarn that will not burn or conduct electricity. Braided design provides extreme flexibility, strength, and protects the heater cable by minimizing movement (kinking and twisting). The ends are fitted with cam-and-groove fittings for easy installation and strain relief.

Heated Umbilical Line Features

- Heavy-duty for permanent or portable installation
- Lightweight, self-regulated
- Replaceable sample lines
- Braided construction with High-temperature Jacket

STM MERCURY HEATED UMBILICAL/SAMPLE LINES

Part Number	Length (feet)
HGUB-15HD	15’
HGUB-30HD	30’
HGUB-60HD	60’
HGUB-90HD	90’

***Add a ‘V’ to the end of the part number for 240V option.**

MERCURY BRAIDED HEATED LINES LEGEND

HGUB ☐ - ☐ HD ☐

Configuration:
BLANK = 20U Enclosure
S = Portable Configuration

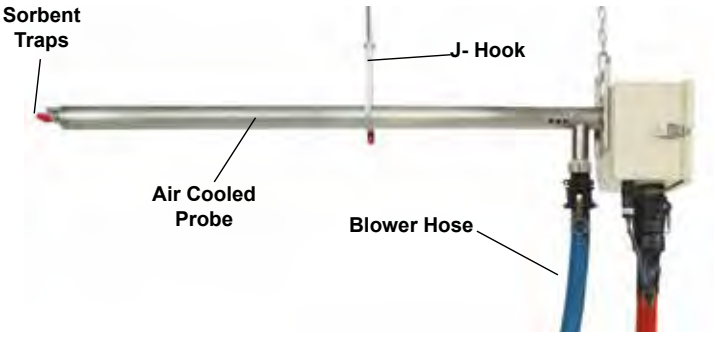
Length (in Feet)

Voltage/Power Plug Options:
BLANK = 120V
V = 240V

ENGINEERING & MARKETING LEGEND
(rev1 10-1-2020)

Heated Mercury Sorbent Trap Probes for Mercury

Apex heated mercury sorbent trap probes are designed to accept a pair of standard 10 mm O.D. sorbent traps. The sorbent traps are placed at the probe inlet to prevent Hg transport losses during sampling. The traps are sealed in place with compression fittings using glass-filled PTFE ferrules. The probe is constructed from corrosion-resistant tubing; the outer sheath is 2-inch O.D. and the inner liners are 1/2 inch. C276 alloy is recommended for XC-6000 applications due the constant possible exposure to corrosive stack environments. Stainless-steel probes are available for short-term testing such as method 30B applications. The probe is fitted with two heaters: one to heat the traps and the second for heating the portion outside of the stack. Standard lengths are available from 4 to 12 feet long. Alternate lengths are available upon request.



Blower and blower hose sold separately. See XC-6000EM probe accessories section for details.

Air-Cooled Probes

For use in high-temperature stack gas environments, Apex Instruments HGPA air-cooled probes feature a 2-inch stainless-steel or C276 alloy outer sheath as standard, individually controlled heat zones and integrated stack, trap and probe thermocouples.

AIR COOLED MERCURY PROBE ACCESSORIES

Part Number	HG, air-cooled heated probe, stainless-steel with single heaters
HGPA-AI6	Air inlet for plant air, 3/8 fnpt, sanitary cap with pipe thread

MERCURY PROBE LEGEND

HGP ☐ - ☐ -H ☐ ☐ ☐ ☐

Probe Type:
BLANK = Non Air Cooled
A = Air Cooled
(Available ONLY w/ Single Heater Option)

Length (in Feet):
2 = 2 ft.
3 = 3 ft.
4 = 4 ft.
5 = 5 ft.
6 = 6 ft.
8 = 8 ft.
9 = 9 ft.
10 = 10 ft.
12 = 12 ft.
16 = 16 ft.

Alloy:
BLANK = Stainless Steel
C = Alloy C22/C276 (Hastelloy)

Heater:
S = Single Heater
D = Dual Heater

Voltage:
BLANK = 120V
V = 240V

ENGINEERING & MARKETING LEGEND
(rev2 6-15-2020)

Apex Air-Cooled Mercury Sorbent Trap Probe

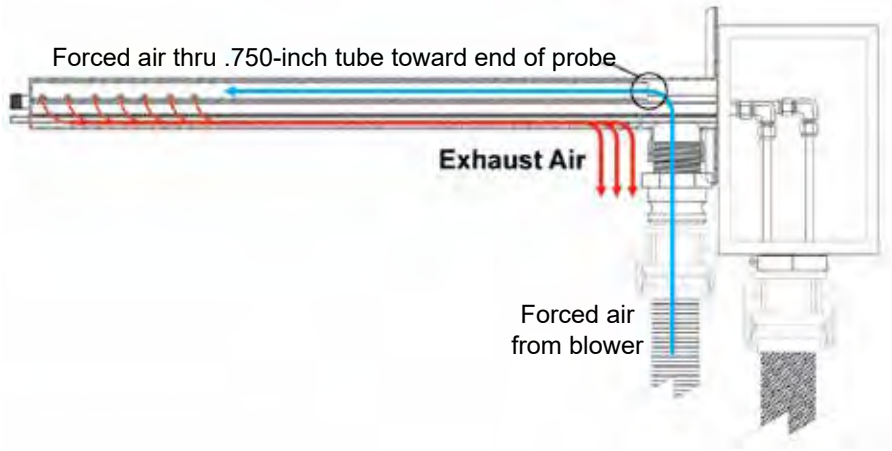
Air-cooled mercury sorbent trap probes are designed for speciated mercury and for total vapor-phase mercury sampling where flue gas temperatures exceed 400 ºF. Air is directed to the trap location at inlet end of the probe. A tubular heater maintains temperature above dew point to prevent condensation.

Tip: To allow for greater cooling prior to the sorbent (for speciated mercury sampling) use longer traps.

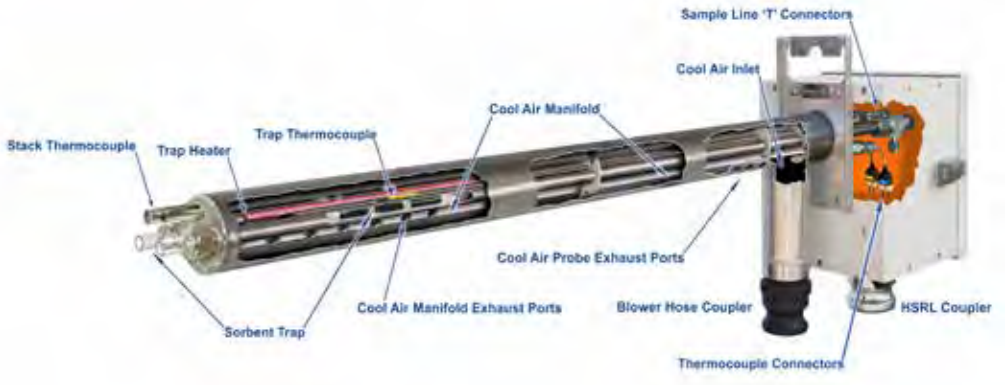
Air-Cooled Probes in High Temperature Stack Gas Environments

- 2-inch diameter stainless-steel or C275 alloy outer sheath
- Air-cooled probe with single heater
- Integrated stack and trap thermocouples
- Blower and hose optional

Air-Cooled Probe
HGPA-☐-H☐☐☐



Reliable and easy to use with quick set-up time



Components diagram

Blower Assembly for Mercury Air-Cooled Probes

Apex offers a blower for mercury air-cooled probes used in continuous sampling for sorbent trap monitoring. The high-volume **HGB-93CFM** brush blower can be mounted in an aluminum enclosure with a convenient handle and cam-lock connector for quick set-up.

HGB-93CFM Brush blower shown with air hose assembly*** (1-1/2-inch vacuum hose with cam-lock fittings.)

Mercury air-cool probes require blower assembly and air hose.
Air hose sold separately.

Blower Hose

Blower hose assembly for mercury air-cooled probes.
1.5-inch vacuum hose with cam-lock fittings.

BLOWER HOSE

Part Number	Description
HGBH-5	5-foot hose
HGBH-10	10-foot hose
HGBH-15	15-foot hose

PAA-ACP

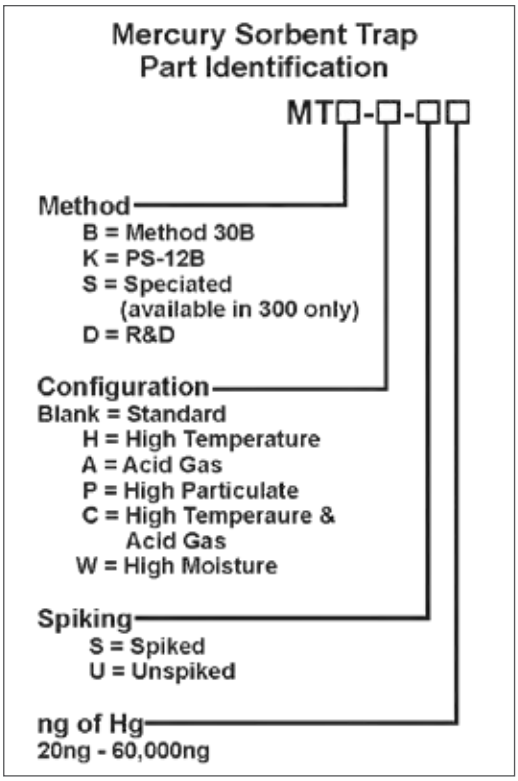
Plant Air Adapter

An alternative option is to use the air system that is already installed on a test location. For this option we offer the plant air adapter for a mercury air-cooled probe.
PAA-ACP

Sorbent Traps

As part of your total mercury sampling solution for MATS and MACT regulations, Apex Instruments provides high-quality, reliable sorbent traps and trap analysis services from our in-house mercury lab. Utilizing premium carbon which is chemically treated for optimum mercury adsorption and retention, Apex Instruments is able to provide any trap configuration for your unique sampling conditions, including challenges with high temperature, high-acid gasses, high particulate or high moisture in the sample gas stream. All sorbent media goes through rigorous QA/QC procedures to ensure the finest sorbent media is available and spiking levels are accurate to meet monitoring requirements.

Apex Instruments has performed extensive field testing and conducted lab carbon screening studies in extreme environments of high SO_2, particulate, moisture, and high-temperature stack conditions to demonstrate the Apex Instruments sorbent's durable performance and reliable analytical results. Apex Instruments can also implement unique acid gas-scrubbing media in high SO_2/SO_3 applications, which minimizes breakthrough issues and ensures successful mercury sampling results.



Applications:

Method PS 12B traps
Traps typically used for long-term compliance sampling.
240mm trap length

Method 30B/RATA traps
Used in conjunction with PS-12B traps for performing method 30B RATA testing or Low Emission Emitter testing (LEE).
240mm trap length

Speciated Traps
Used for species evaluation and research.
300mm trap length

R&D Traps
Used for base line testing.

Any trap can be customized for special stack conditions.

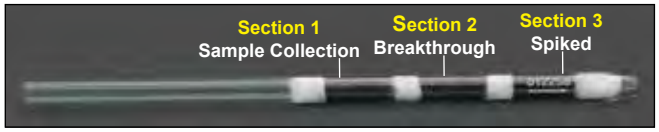
Apex Sorbent Trap Features:

- High-capacity impregnated carbon
- Low-mercury background levels
- Custom spiking available
- Variable testing duration
- Textured, easy-grip caps
- Accurate leak checking
- Durable glass tubes
- Protective transport tubes
- Chain of custody included
- Long-term storage

Legend Configuration Key

Condition	Stack Temp	SO2 Level	Trap Size
Blank= Standard	200-400°F	<500PPM	10mm OD x 240mm L
H= High Temp	>400°F	-	10mm OD x 240mm L
A= Acid Gases	200-400°F	>500PPM	10mm OD x 240mm L
P= High Particulate	ALL	-	10mm OD x 240mm L
C=High Temp and Acid Gas	>400°F	>500PPM	10mm OD x 240mm L
W= High Moisture	<200°F	-	10mm OD x 300mm L Optional: 10mm OD x 400mm L

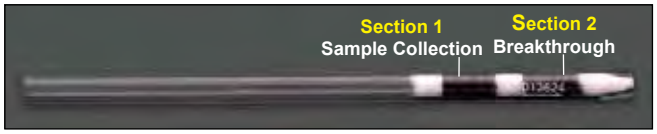
Sorbent Traps



PS 12B (10mm O.D. x 240mm L)

Part Number	Stack Condition	# of Sections	Pre Section	Section 1	Section 2	Section 3***
MTK-S☐	Standard***	3 Sections	-	.5g Carbon	.5g Carbon	.5g Carbon***
MTK-H-S☐	High temp.***	3 Sections	-	.7g Carbon	.5g Carbon	.5g Carbon***
MTK-A-S☐	Acid gases***	4 Sections	.5g Sorbent	.5g Carbon	.5g Carbon	.5g Carbon***
MTK-P-S☐	High particulate ***	4 Sections	Inert pre-filter	.5g Carbon	.5g Carbon	.5g Carbon***

***- Section 3 is Spiked. Indicate spike level ng. Standard Spike Levels Range from 1,000ng to 20,000ng. **Custom Levels Available.**



EPA Reference (Method 30B) (10mm O.D. x 240mm L)

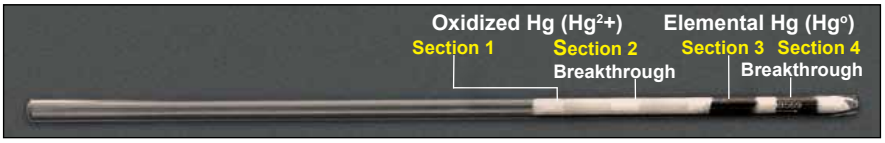
Part Number	Stack Condition	# of Sections	Pre Section	Section 1***	Section 2
MTB-U	Standard, unspiked	2 Sections	-	.3g Carbon	.3g Carbon
MTB-H-U	High temp., unspiked	2 Sections	-	.5g Carbon	.3g Carbon
MTB-C-U	High temp./acid gas, unspiked	3 Sections	.5g Sorbent	.5g Carbon	.3g Carbon
MTB-S☐	Standard, section 1 spiked***	2 Sections	-	.3g Carbon***	.3g Carbon
MTB-H-S☐	High temp., section 1 spiked***	2 Sections	-	.5g Carbon***	.3g Carbon
MTB-A-S☐	Acid gases, section 1 spiked***	3 Sections	.5g Sorbent	.3g Carbon***	.3g Carbon
MTB-C-S☐	High temp./acid cases, section 1 spiked***	3 Sections	.5g Sorbent	.5g Carbon***	.3g Carbon

***- Section 1 is spiked. Indicate spike level ng. Standard spike levels range from 50ng to 500ng. **Custom levels available.**

R&D Traps for Research and Baseline Testing

Speciated Mercury Traps

(10mm O.D. x 300mm L)
Speciated mercury measurement of flue gas requires use of air-cooled probes.



Evaluation and research

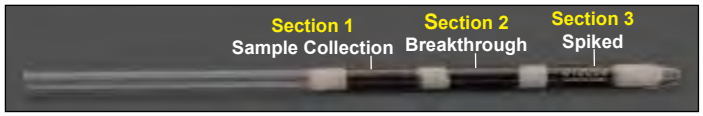
Part #	Stack Condition	# of Sections	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6
MTB-S-U	Speciated, Unspiked	6 Sections	Quartz Wool	.3g Na_2CO_3	1.0g KCl	.7g KCl	.3g Carbon	.3g Carbon

Flue gas Oxidized Hg (Hg^{2+}) species are adsorbed by potassium chloride (KCl). After passing through the KCl sorbent, Elemental Hg (Hg°) is collected by iodated carbon sorbent. Total Hg (Hg_t) is determined by summation of species.

Proper temperature maintenance is critical (between 110°C-120°C) for accurate speciation results. Sorbent trap shields are used to prevent buildup of particulate, which can potentially oxidize mercury creating a bias.

Mercury Traps R&D (10mm O.D. x 240mm L)

Research or baseline testing



Part Number	Stack Condition	# of Sections	Section 1	Section 2	Section 3
MTK-U	Standard, unspiked	3 Sections	.5g Carbon	.5g Carbon	.5g Carbon

Mercury Traps R&D (10mm O.D. x 240mm L)

Research or Baseline Testing

Part Number	Stack Condition	# of Sections	Section 1	Section 2	Section 3	Section 4
MTD-U	Standard, unspiked	4 Sections	.3g Carbon	.3g Carbon	.3g Carbon	.3g Carbon

Trap suitability study – recognizing that every source has different conditions (NO_X, SO_2, moisture content, etc.), our Analysis Division can develop R&D traps configured for your stack condition. Call for more information.

XC-6000EM Mercury Probe Accessories

Flanges

2.5-inch cam is standard.

Product	Description
PF-4/40CLS	4-inch 150 lb. pattern
PF-6/40CLS	6-inch 150 lb. Pattern
PF-4/6UCLS	fits 4-inch or 6

PF-6/40CLS

PF-4/6UCLS

PACKING GLAND

2-inch packing gland, steel body, PTFE packing (for use with PF-40CLS flange) with size 40 cam-and-groove connector.

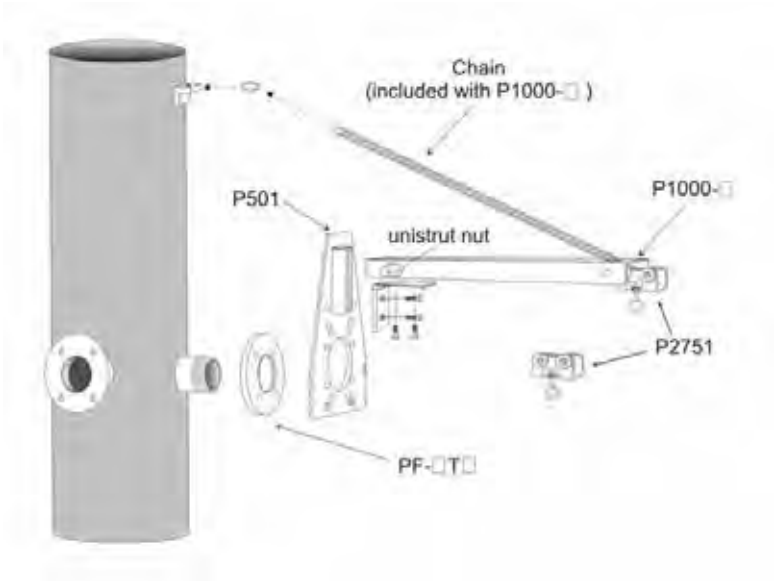
PG-32/40CL

MONORAIL WITH CHAIN

Heavy-duty steel monorail with chain, L-bracket and hardware (for use with probes).

Product	Length (in feet)
P1000-6	6’
P1000-7	7’
P1000-8	8’
P1000-9	9’
P1000-10	10’
P1000-12	12’

PART #	Trolley and Monorail Support Bracket
P2751	Monorail, trolley - swivel-frame trolley with eyebolt, 1-foot chain and snap-hook
HGP-1SJ	Mercury probe support - "J" hook, attaches to standard monorail
P1001-10	10’ heavy-duty channel with chain, L-bracket and hardware, for use with lengths over 6’ Longer lengths are available.



MercSampler Cabinet Configurations

CR-20U MercSampler rack mount cabinet

CR-20U-AC

CR-20U Specs

Dimensions:

H 41-inch x **W** 31-inch x **D** 25-inch (104.1 cm x 78.7 cm x 63.5 cm); (CR-20U enclosure with AC unit).

Weight empty: 137 lbs (62 kg)
Weight with MercSampler console and Stirling chiller: 139 lbs (63 kg)
Weight with AC unit: 174 lbs (79 kg)

4-plug receptacle for electrical - standard 115V, 220V option.

CR-20U...

CR-20U-AC
(Optional 4x A/C Unit).

Cabinet Features

- Internal 19-inch rack mount for mercury meter console and stirling gas conditioner
- Available rain/sun shield protects in the harshest weather and environments
- Uni-strut vertical instrument rails with horizontal sliding equipment mounts

XC-8U Transport Case

The XC-8U transport case has a tough exterior for durability. The case protects valuable products from a fall, tumble, or rough landing.
Dimensions: HxWxD: 18-inch x 22-inch x 20-inch (45.7 cm x 55.9 cm x 50.8 cm);
Empty Weight: 21 lbs (9.5 Kg).

XC-8U

XC-8U
Transport Case

Shown with rack-mounted ***XC-6000EPC MercSampler™*** *meter console installed.*

10U Roto-Molded Rack Mounted Case

The unique molded in unbendable valance and steel threaded rails with self tapping screws make the US Series racks convenient to use and the most durable.
Outside Dimensions: H 20.5-inch x **W** 23.75-inch x **D** 22-inch (52.07 cm x 60.32 cm x 55.88 cm). **Weight: 20.46** lbs (9.28 kg).

XC-10UD

Features

- Roto-molded linear low-density polyethylene (LLDPE/LMDE) case
- Threaded steel rails
- Rear rails included
- Interlocking X pattern for solid stackability
- Front and rear full-size lids
- Recessed latches
- Molded-in handles
- Shock absorbing feet

Adsorbent Housings Assemblies

1/4-inch fittings both on bottom

Empty	**SCM-11**	
Pre-filled	**SCM-11A**	
Empty	**SCM-18**	**(for STM-12B)**
Pre-Filled	**SCM-18A**	**(for STM-12B)**

1/4-inch fittings top and bottom.

Empty	**AH-610-PAC**
Pre-filled	**AH-610-CACR-4TU**

Glassware and Sorbent Cartridges For SGC-4000HGP

Model	Description
GSB-1000SC	Sample bottle, clear glass, GL-45 threaded, 1000 mL, safety-coated for condensate collection. Requires: GA-GL-45B cap and GA-GL-25S seal
GSB-500SC	Safety-coated sample bottle, 500 mL
GA-GL-45S	Silicone ring seal, #45 thread, O.D. 1.677-inch, I.D. 1.000-inch
GA-GL-45B	Red bored cap, #45 threads.

GSB-1000SC
GSB-500SC

GA-GL-45B
and GA-GL-45S

MercSampler Audit Kit For PS-12B

The AK-STM-12B is specifically designed for reliably auditing and calibrating mercury consoles in accordance with EPA Method30B and Performance Standard 12B.

Its high-quality components and adherence to CFR section 40 help ensure that testing meets and exceeds EPA requirements. The Audit Kit features the DGM-SK25R-QS4 reference dry gas meter, the PIE 520B Thermocouple Calibrator, and includes all accessories required for auditing and calibration.

Digital Vacuum Gauge
DPGA-00TU4-NIST

Handheld Waterproof Thermometer
DPT-168-NIST

Thermocouple Ice Bath
AK-6TH16

The complete list of the audit kit components follows:

Dry gas reference meter: DGM-SK25R-QS4

PIE 520B thermocouple calibrator: MSC-520

Digital vacuum gauge: DPGA-00TU4-NIST

Thermocouple ice bath: AK-6TH16

Handheld waterproof thermometer: DPT-168-NIST

36-inch thermocouple type-K: TCA 36HG

NIST-traceable handheld barometer: BAR-6530

The DGM-SK25R Secondary Reference Meter

The DGM-SK25R secondary reference meter is NIST-traceable and used for calibrating low-flow consoles.

The console is calibrated .3 LPM to 2.20 LPM, making it idea for auditing and calibrating mercury consoles. A 15-point calibration in triplicate runs at 5 flow rates is performed before shipping to ensure the unit adheres to regulations and application.

It's full metering capabilities range from .25 LPM to 2.00 LPM. The unit connects to the console via an integrated hose that includes a 1/4" stainless steel male quick connect and a thermocouple for monitoring meter exit temperature.

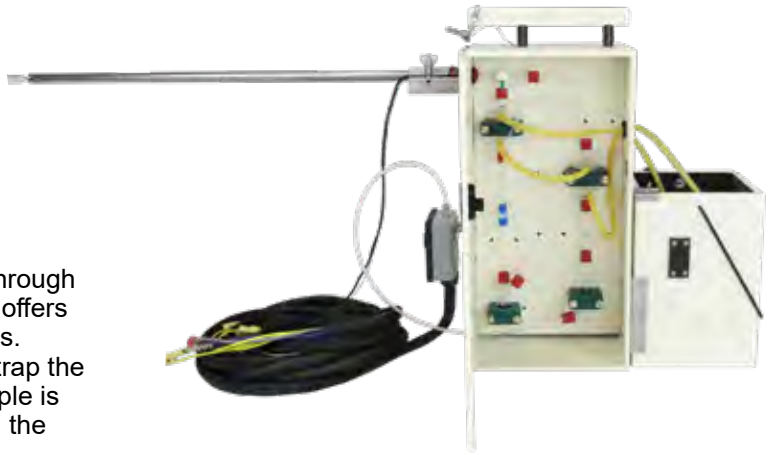
The meter's compact case provides dependable protection from rough handling and the elements. It is fitted with a digital encoder that totalizes and accurately presents the volume metered on an easy-to-read, back lit display. The DGM-SK25R can be configured to calibrate most consoles within a range of flow rates.

The single type K thermocouple calibrator PIE 520B is cold junction compensated for changes in ambient temperature thereby providing accurate and precise temperatures for inputs.

The kit also includes all necessary connectors, fittings, tubing, and transport case.

Gas Sampling - Manual

Gases in most stacks or ducts often are comprised of small amounts of volatile and potentially toxic compounds in addition to major gas components such as nitrogen, oxygen, and carbon dioxide. At parts per million levels, most compounds with boiling points below that of water exist in a vapor state. Because gases generally are considered to be well mixed, sampling for constituents in the vapor phase usually is done through a simple probe from a single point of average gas velocity in the stack.



Gas sampling requires an understanding of Methods 1 through 3, these are basic methods of collecting a sample. Apex offers source sampling solutions to complete your testing needs. Apex Instruments consoles are designed to extract and trap the samples needed to test for harmful gases. After the sample is collected there are many types of analysis depending on the compound(s) of interest.

A glass wool plug or filter is often necessary to screen out particulate matter from the gas stream, prior to collection in the vessel.

Method 3	Gas Analysis for the Determination of Dry Molecular Weight
Method 3B	Gas Analysis for the Determination of Emissions Rate Correction Factor of Excess Air
Method 4	Determination of Moisture in Stack Gases
Method 6	Determination of Sulfur Dioxide Emissions from Stationary Sources
Method 7	Determination of Nitrogen Oxide Emissions from Stationary Sources
Method 18	Integrated Bag Sampling for Organic Compounds
Method 26	Determination of Hydrogen Chloride, Halides, and Halogens
Method 0030	Volatile Organic Compounds (VOST)
Method 0031	Volatile Organic Compounds (SMVOC or SuperVOST)
Method 0040	Principle Organic Hazardous Constituents (POHCs) using Teldar Bags
Method 0051	Hydrogen Chloride and Chlorine

XC-260

XC-623

VOC EQUIPMENT

XC-623 Sampling Console

The XC-623 Source Sampling Console is our newest console for performing US EPA Method 6. Utilizing different configurations of sampling trains, the XC-623 console can also be used to perform other EPA Methods.

Applicable US EPA Methods:

- Method 4: Determination of Moisture Content in Stack Gases
- Method 6: Determination of Sulfur Dioxide Emissions From Stationary Sources
- Method 6A: Determination of Sulfur Dioxide, Moisture, and Carbon Dioxide From Fossil Fuel Combustion Sources
- Method 26: Determination of Hydrogen Chloride, Halides and Halogens Emissions from Stationary Sources Non-Isokinetic
- Method 0030: Volatile Orga-nic Compounds (VOST)

Specifications:

Dry gas meter:
Model SK25EX, measurement principal-gas displacement, digitally encoded volume display, Qmax 41 LPM at 150 Pa., Qmin 0.26 LPM. Volume readout capacity 9999 cubic meter, resolution 0.1L. cyclic volume 0.7L. type-K thermocouple for exit temperature

Sample pump:
Brushless 12V DC BLDC motor, double-headed, free flow 8.0 LPM, maximum vacuum 23 inHg

Display:
4x20-character back-lit transflective liquid-crystal display with digital operation of timer, DGM Volume, P_m and 1 of 6 thermocouple readings, viewing area 74 mm x 45 mm, operating temperature -20 to 70ºC

Display control:
Four-button long-life membrane keypad for display operation. Display controls the timer and menu operations. Ability to zero the meter pressure transducer and DGM volume, as well as reset the timer

Flow indicator:
Rotameter with option of flow rate range (A: 0.1=1.0L, B: 0.1-2.5L, C: 0.1-4.0L)

Temperature measurement:
Display of 1 of 6 channels controlled by 6-way rotary switch

Digital pressure transducer:
High-resolution digital sensor, factory-calibrated, and temperature-compensated -20°C to 70°C Proof pressure 49 kPa, accuracy better than 0.25%, fuji PXR3 compact, 1/32 DIN self-tuning PID temperature controller with 3-button keypad, solid-state relay driver for 25-A solid state relay, type-K thermocouple jack for input
P_m +/-5.0 inH_2O (+/-1245 Pa) range bi-directional with 0.01-inch (1 Pa) Resolution

Vacuum measurement:
Bourdon tube, dual-scale, 0 to -30 inHg, 0 to -100kPa

Umbilical connection:
Electrical multi-conductor circular connector, instrumental-grade stainless-steel quick-connects

Sample inlet: 1/2-inch, pitot connections: 1/4-inch

Type-K thermocouples inputs: aux, stack, probe, oven, exit

Power:
Input power: 120V/15A 60Hz, IEC C-14 Inlet
Pump power: 150W, 12VDC
Display power supply: 15W, 12VDC
Optional input power: 240V/10A 50Hz, IEC C-14 Inlet

Dimensions:H17-inch x W17-inch x D12-inch (43 cm x 43 cm x 30.5 cm)

Weight:29.6 lbs (13.4kg) base configuration.

GAS SAMPLING METER CONSOLE LEGEND

XC-623 ☐ - ☐ ☐ ☐

Power Output Option:
BLANK = 4 Pin Amphenol (END OF LIFE) (Size 14S Shell - Female/97 Series)
A = 5 Pin Amphenol (Size 14S - Shell Male/97 Series)
B = 5 Pin Amphenol (Size 14 Shell/Bayonet Style/PT Series)
C = 5 Pin Amphenol (Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol (Size 14S Shell - Male/97 Series)

Flow Meter:
A = 0.1 to 1 Liter
B = 0.2 to 2.4 Liters
C = 0.2 to 4 Liters

Calibration Units:
BLANK = Calibrated in Metric/ Temperature in Degrees F
M = Calibrated in Metric/ Temperature in Degrees C

Voltage:
BLANK = 120V
V = 240V

ENGINEERING & MARKETING LEGEND
(rev2 12-29-2020)

XC-260 Source Sampler Console

The Apex XC-260 source sampler is a low-price, portable, field-proven meter console that is easy to use and ideal for sampling mercury emissions based on CFR 40, Part 60, Method 30B. The heart of the Apex Instruments manual sampling system is the XC-260 source sampler, a precision meter console used for collecting Hg emissions. The average mercury concentration for the sampling period is determined by using the sample volumes measured by the dry gas meters and the results of the sorbent trap analysis. Three flow rates are offered for the two flow meters:

A - 0 to 1 liter **B - 0 to 2.5 liters** **C - 0 to 4 liters**

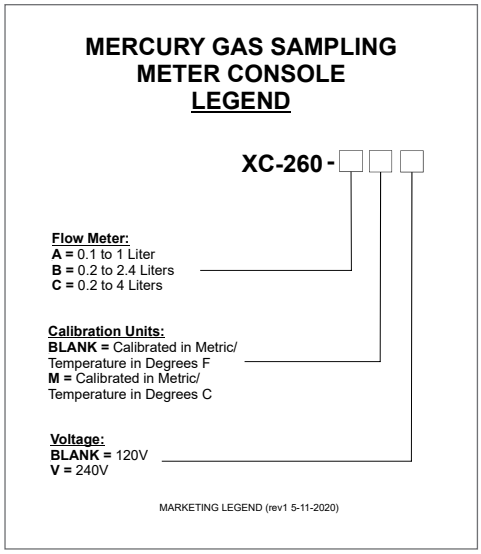
Flow meters are also available in centimeter calibration units. See chart under the graphic.

XC-260 Manual Source Sampler Console

Sampler also ideal for Method 18

Features

- Dual independent flow paths
- Dual dry gas meters with digital displays
- Coarse and fine valves for precise flow and vacuum control
- Stainless-steel valves and fittings
- Stainless-steel 1/4-inch quick connects
- Digital temperature controller for probe heater
- Elapsed digital timers
- Dual-scale vacuum gauges
- Durable roto-molded linear low-density polyethylene (LLDPE/LMDE) case with built-in handles (size 10U)



Specifications:

Dry gas meters: Model 25 Series, positive displacement diaphragm type, 0.7 liters per revolution, optical encoder sensor with quadrature pulse output, gas volume totalizer with an eight-digit LCD display, 1 cc resolution (*standard*)

Dual diaphragm sample pumps (2): 12 VDC motors, max Vac. 20 inHg

Probe temperature control: Compact, 1/32 DIN auto tuning indicating temperature controller with external 25-amp solid-state relay. 115 VAC outlet 5-15R, standard type-K jack for input

Digital temperature display: 3.5-digit display °F (-157°F to 1999°F), display and controller are resettable for °C upon request (^{O}C is standard for export).

Thermocouple inputs: Five external type-K inputs plus two type-K internal gas meter connections

Flowmeters: Solid-machined acrylic (0.2 - 2.4 LPM)

**Optional 100-1000 ccm (XC-260A)*

AC Power: 120V/60 Hz (optional 220V/50 Hz)

Dimensions: 23-inch x 21-inch x 12-inch (58 cm x 53 cm x 30.5 cm)

Weight: 39 lbs (17.7 kg)

XC-6 Gas Sampling Console

The XC-6 gas sampling console is a small, lightweight, and economical sampling unit designed for measuring dry gas sample volumes when no temperature control is needed. The XC-6 has a sampling pump, a precision dry gas meter with mechanical totalizing index and leak check wheel, a leak-free pump, a vacuum gauge, flow control valves and a rotameter for monitoring the gas flow rate.

Minimum recommended sample volume is 20 liters. The flow range is dependent on the selected rotameter.

Features

- Precision dry gas meter with mechanical display
- Durable roto-molded linear low-density polyethylene (LLDPE/LMDE) case with stainless-steel handles
- Digital thermometer and temperature display
- Precision needle valve for precise flow control
- Stainless-steel quick connect
- Digital elapsed timer
- Dual-scale vacuum gauge

Specifications:

Gas meter: DGM-SK25EX, .7 liters per rotation, easy-to-read index with leak-check wheel, low-pressure drop, rated 42 LPM at 15mm H_2O, maximum capacity approximately 70 LPM, totalizer capacity 9999.9999 cubic meter

Sample pump: Model KNF UN86KNI pump, diaphragm vacuum pump, IP00 protection class motor, 12VDC. max unrestricted flow 6 LPM, maximum vacuum range 0-3 inHg

Temperature display: 3-digit LED display (-55°F to 199°F)

Vacuum gauge: Dual-scale, 0-30 inHg/0-100kPa

Sample inlet: 1/4-inch stainless-steel quick connect

Power: 115 VAC/60 Hz ; 240 VAC/50 Hz (optional)

Dimensions: H17-inch x W17-inch x D12-inch (43 cm x 43 cm x 30.5 cm)

Weight: 27 lbs (12.3 kg)

GAS SAMPLING METER CONSOLE LEGEND

XC-6- ☐ ☐ ☐ ☐

Flow Meter:
A = 0.1 to 1 Liter
B = 0.2 to 2.4 Liters
C = 0.2 to 4 Liters

Calibration Units:
BLANK = Calibrated in Metric/ Temperature in Degrees F
M = Calibrated in Metric/ Temperature in Degrees C

Gas Meter Display Options:
BLANK = Mechanical Index
D = Digital (Red Lion)
***In Addition to Standard Mechanical Index**

Voltage:
BLANK = 120V
V = 240V

MARKETING LEGEND (rev1 5-11-2020)

XC-11 Method 11 Sampling Console

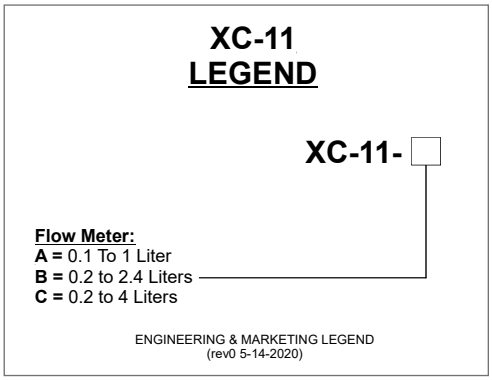
The XC-11 source sampler is a simple, compact flow-through meter console designed to meet US EPA Method 11 sampling of hydrogen sulfide from fuel gas streams. The console contains a precision dry gas meter securely mounted to the front panel. The meter indicates sample volume through the DGM mechanical display on the front panel. The meter also includes a 5-point low-flow calibration meeting EPA Method 6 specifications.

Sample gas enters the console via a 1/4-inch stainless-steel quick-connect sample inlet. Sample gas flow is easily controlled by means of a panel-mounted needle valve with a round phenolic control knob and is displayed through an acrylic plastic rotameter mounted to the front panel. Two dial thermometers, one mounted to the meter inlet and one mounted to the meter outlet, measure the sample gas temperature entering and exiting the meter.

Sample gas exits the console via a 1/4-inch stainless-steel tube stub. All components are packaged neatly into a compact, durable, light-weight transport case. The system is similar to a Method 6 console with the exception of having no internal pump. An external pump is used to purge the train after sampling.

Console must be used in this vertical position.

XC-11 Source Sampler



Specifications:

Dry gas meter: DGM-SK25EX, .7 liters per rotation

DGM calibration: 5-point low-flow cal, range: .05 to 2.5 LPM

Part Number: DGMC-5A-LFB

Inlet quick-connect: 1/4-inch female quick-connect, stainless-steel

DGM thermometers: dial type, inlet: 20°F to 130°F, exhaust: 20°F to 130°F

Rotameter: 0 to 2.5 LPM

Flow control: Panel-mounted needle valve

Outlet: 1/4-inch stainless-steel tube stub

Transport case: 14.5-inch H x 11.5-inch W x 7.25-inch D, 37cm H x 29cm W x 18.5 D

Weight: 12 lbs (5.4 kg)

Recommended Accessories:

TBP-102-A
Gas sampling pump unit with mini diaphragm pump, flow meter 0.1-1.2 LPM, stainless-steel fitting, male and female quick connects, 110V

A-350
Squeeze bulb, aspirator pump

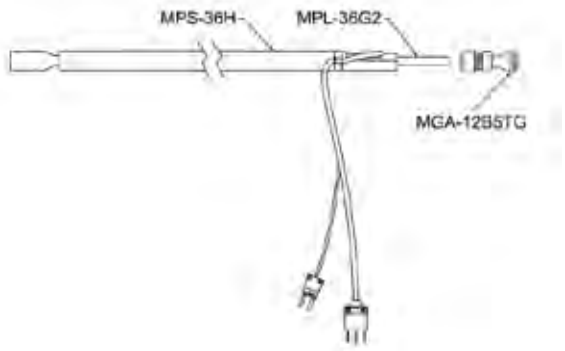
Miniature Probe

Miniature Probe Assemblies and Liners

Miniature Probe Assemblies

Model	Description
MPS-36H	36-inch miniature heated probe sheath, 3/4-inch OD sheath, 120 VAC (liner not included)
MPS-48H	48-inch miniature heated probe sheath, 3/4-inch OD sheath, 120 VAC (liner not included)
MPS-60H	58-inch miniature heated probe sheath, 3/4-inch OD sheath, 120 VAC (liner not Included)

Miniature Probe Assembly



Miniature Liners

MINI GAS SAMPLING PROBE SHEATH LEGEND

MPS- ☐ ☐ ☐

Length (in Inches)

Heater Option:
BLANK = Not Heated
H = Heated

Voltage/Power Plug Options:
BLANK = 120V (5-15) (Domestic)
C14 = 120V (International)
C14V = 240V (International)

ENGINEERING & MARKETING LEGEND
(rev0 6-15-2020)

PTFE Adapters

12mm socket to 5/16-inch, glass-filled PTFE adapter tube fitting, MPL probe liner adapter

MGA-12S5TG

12mm ball to 5/16-inch, glass-filled PTFE adapter tube fitting, MPL probe liner adapter

MGA-12B5TG

VercsaCase

VersaCase products are sturdy, reliable items for use in many U.S. EPA methods. Apex Instruments has an array of Versacase products available for any source testing need.

VSB2 Versacase

The **VSB2 VersaCase** is a lightweight portable lab frame ideal for supporting complex glassware setups. Originally designed to complement the model 623 source sampler console for volatile organic sampling (VOST). Unit features a pre-punched panel with a combination handle/monorail bracket, coolant reservoir brackets (accommodates standard modular impinger cases), and removable front and rear doors. Interchangeable probe clamps for 3/4-inch and 1-inch sheaths are available. *Call for details on customized kits for other testing methods.*

Dimensions: HxWxD: 24-inch x 12-inch x 11-inch (61 cm x 30.5 cm x 27.9 cm).

VSB2

VSB2
(shown open with internal clamps)

VSB2
(shown closed with probe clamp attached)

VSB5 Versacase

The **VSB5 VersaCase** with hinged, removable doors. Includes PC-3/4E probe clamp.
Inside cabinet dimensions:
H x W x D 11.8 x 11.2 x 8.9-inch
(30 cm x 28.5 cm x 22.5 cm)

SK-626 Method 6 Train with VSB5 Versacase

VSB5
(exterior)

VSB Clamp Replacements

Model	Description
PC-3/4	Stainless-steel hinged probe clamp (for 3/4-inch OD Probe)
PC-3/4E	Extended stainless-steel hinged probe clamp (accepts MFH-25CA)

PC-3/4

PC-3/4E

VersaCase Umbilical

The VersaCase umbilical cable (VU-) includes four type-K thermocouple extensions, 1/4-inch quick connects, a sample line and three plug-in jacks terminating in a sturdy aluminum junction box. Standard with stainless-steel fittings and quick connects. Other lengths available upon request.

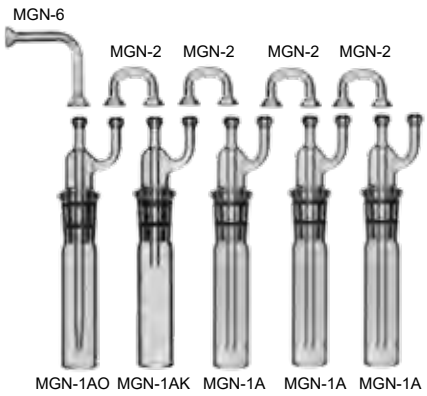
Add "V" to end of product number for 240 VAC/50 Hz option.

VersaCase umbilical with connection box, 1/4-inch stainless-steel quick connect.

VU-30
VU-60
VU-90

Midget Glassware and Accessories

Midget glass impingers feature unground double O-ring 24/40 taper joint and 12/5 O-ring ball joints. Bottle capacity is 40ml. The insulated sample tray can hold a **Midget Glassware Set (MGN-CGS)** and two nontoxic ice packs (ICE-20). The ice packs allow a quick turnaround. At the end of the run simply remove the ice packs and drain the water before purging. Set includes impingers (plain and orifice), U-tubes, connectors, clamps and the MSB-2 drain tray assembly.



MGN-CGS Midget Glassware Set

Midget glassware set (Includes):

- **4 midget impingers (3 MGN-1A, 1 MGN-1AO)**
- **3 midget U-tubes (MGN-2)**
- **1 L-connectors with 12/5 sockets (MGN-6)**
- **10 #12 ball joint pinch clamps (BS12)**
- **MSB-2 drain tray with drain valve, foam and ice packs**

MGN-CGS

The Apex Instruments Method 6 and Method 26 sampling kits are normally used in conjunction with the XC-60 or model 623 source sampler console or alternative metering devices. The midget impingers can be used for many methods, including NIOSH and OSHA methods. The Method 6 sampling kit (SK-606) can be modified for U.S. EPA Method 26 with the addition of the SK-626 Kit.

Tray with ice packs
MSB-2

MSB-2

MSB-2 with Midget Glassware Set (Method 6)

Midget Glassware

Midget impinger assembly
Midget impinger assembly with plain stem (#12/5 unground O-ring ball joints).
MGN-1A

Midget impinger assembly
Midget impinger assembly with orifice stem (#12/5 unground O-ring ball joints).
MGN-1AO

Midget impinger Insert
Midget impinger insert with plain stem (#12/5 unground O-ring ball joints).
MGN-1I

Midget impinger insert
Midget impinger insert with orifice stem (#12/5 Unground O-ring ball joints).
MGN-1IO

Midget knockout Impinger assembly
Midget knock-out impinger Assembly (#12/5 unground O-ring ball joints).
MGN-1AK

Midget impinger bottle
Midget impinger bottle with unground taper joint.
MGN-1B

Midget connector
L-connector with #12/5 sockets.
MGN-6

Midget U-tube
Midget U-tube with #12/5 unground socket joints.
MGN-2

Midget Glassware and Accessories

Glass 3-way valve

Glass 3-way valve with #12/5 unground socket joints.

MGN-3

Glass 3-way valve with #12/5 unground socket joints, inlet and outlet, ball joint purge.

MGN-3SB

Glass Adapters

Glass adapter, #12/5 socket to #18 thread.

MGNS-12S/18

Ungrounded glass adapter, #12/5 ball to #18 thread.

MGNS-12B/18

Glass adapter, #12/5 unground O-ring ball to 1/4-inch tube.

MGN-12B4

Glass adapter, #12/5 unground socket to 1/4-inch tube.

MGN-12S4

GL #18 Cap and Seals

Model	Description
GA-GL-18B	Bored cap, GL #18 threads
GA-GL-18S6	Silicone seal ring, 6-mm hole diameter
GA-GL-18T6	PTFE seal ring, 6-mm hole Diameter
GA-GL-18T8	PTFE seal ring, 8-mm hole Diameter

Midget Accessories

O-rings

Viton O-ring for grooved #12/5 ball.

O-011V

Pinch clamps

Keck clip
Plastic keck clip, size 13, for #12/5 ball joints.

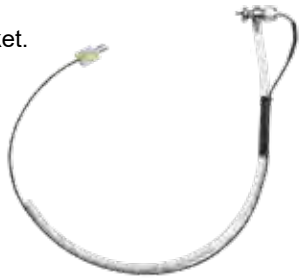
KBS-13

Ball joint clamp
Stainless-steel #12/5 ball joint clamp.

BS12

Impinger outlet with thermocouple and tubing, #12/5 stainless-steel socket. For use with midget glass impinger (MGN-1A).

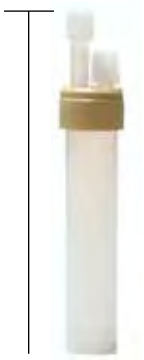
MGA-101



Midget PFA impinger

PFA impingers

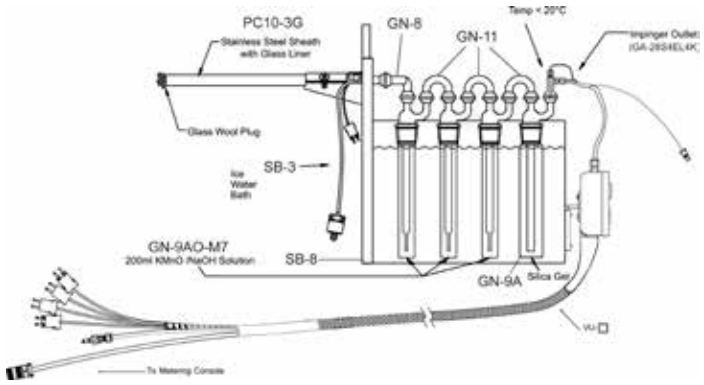
Model	Description
MGT-1	Midget PFA impinger with two 1/4-inch tube unions, 60 ml volume
MGS-2T6	PTFE U-stem (1/4-inch OD)
MGS-3T6	PTFE L-stem (1/4-inch OD)
4SC4-PFA	PFA tube union, 1/4-inch



Method 7C and 7D

In Method 7C and 7D, a sample is passed through a series of special, full-size orifice impingers that contain an alkaline-potassium permanganate solution. The sample rate is between 400 and 500 cc per minute, normally three one-hour samples are collected per test. The XC-623 is the consoles of choice. The sample is analyzed colorimetrically for Method 7C and by ion chromatography for Method 7D.
Please inquire for additional details. Add "V" for 220VAC option.

Method 7C/7D conversion kit CK-M7CD



Method 7 Accessories

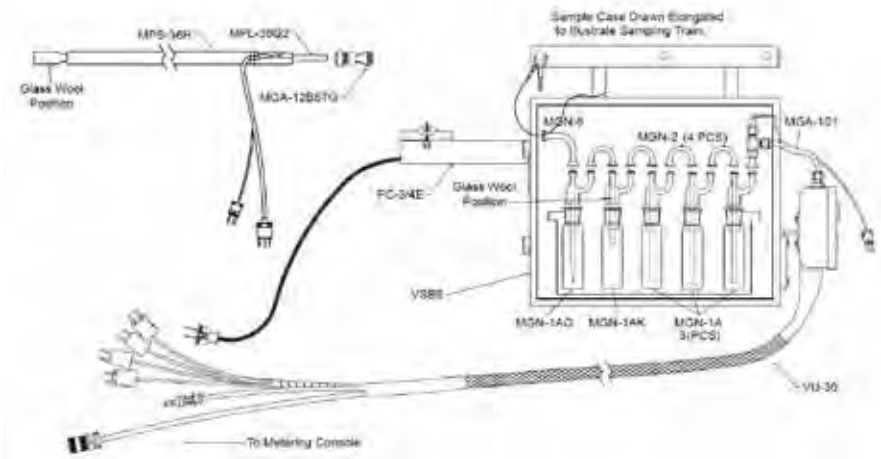
Model	Description
PC10-3G	3-foot CEM probe assembly, 5/8-inch glass liner, 110 VAC
PLN-3G	3-foot glass probe liner, 5/8-inch OD with unground #28 grooved ball
GN-8	Double "L" adapter, #28 unground sockets
GN-11	U-tube, #28 unground sockets
GN-9AO-M7	Impinger assembly, stem with orifice, 250 mL, unground O-ring joints
GN-9A	Impinger assembly, plain stem, 500 mL, unground O-ring joints, modified Greenburg-Smith
GA-100	Umbilical adapter (gooseneck) , #28 socket with thermocouple, mounting bracket, 1/2-inch male quick-connects
SB-3	Impinger box/insulated coolant reservoir model 100, holds 4 impingers
SB-8	Modular sample frame with probe clamp and impinger box slides

Sampling kit for Versa Case (SK-606)

Method 6 (SO_2)

The Method 6 source sampling kit for VersaCase (SK-606) features the miniature VersaCase. Method 6 measures sulfur dioxide (SO_2) emissions from stationary sources. A gas sample is taken from the stack and separated from the mist.

SK-606
SK-606-V



Kit Includes

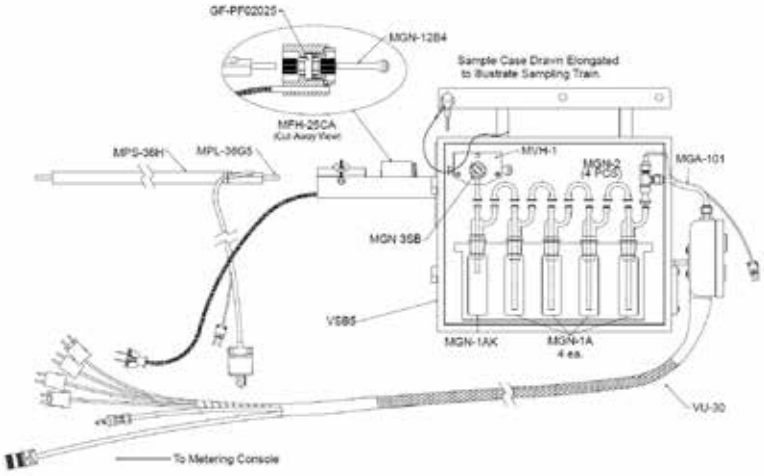
- Extended VersaCase probe clamp
- Additional impingers
- Liners
- Filters, PTFE membranes
- Adapter

Method 26 (Hydrogen Halides, Halogens)

The Method 26 extension kit for VersaCase (SK-626) is required for modification of the Method 6 source sampling kit (SK-606) in order to perform Method 26. The sample is passed through a pre-purged heated probe and filter into dilute sulfuric acid then dilute sodium hydroxide solutions which collect all the gaseous hydrogen halides and halogens, respectively. The PTFE filter collects particulate matter including halide salts but is not routinely recovered and analyzed. The separate solutions are analyzed by ion chromatography.

SK-626
SK-626V

Sampling kit for VersaCase (SK-626)



Kit includes:

- Extended VersaCase probe clamp
- Additional impingers
- Liners
- Heated filter assembly
- Filters, PTFE membranes
- Adapter
- Heater assembly
- Three-way heated assembly valve

SK-626 is for use in addition to SK-606 Method 6 kit.

Method 26 Accessories

Model	Description
MGN-3SB	Glass 3-way valve with 12/5 unground socket joints inlet and outlet, ball joint purge
TFA-25B	25mm PTFE filter replacement body only with 1/4-inch tube union, no clamp
MH-50	Firerod heater sub-assembly with power cord and TC, 50-watt, 120VAC, for MFH-25 filter clamp
GF-PF02025	PTFE membrane, 25mm, 30-60 micron, 10/pack
PC-3/4E	Extended 3/4-inch probe clamp (accepts MFH-25CA)
MGN-12B4	Glass ball adapter, unground 12/5 ball to 1/4-inch tube w/ O-ring
MFH-25CA	Filter clamp, threaded, aluminum, for 25mm filter assembly

3-way valve heaters

Heater

3-way valve heater assembly, aluminum body with 30-watt heater and thermocouple. *Shown here with valve.*

MVH-1
MVH-1V

Heated filter assembly with clamp

Heated filter assembly with clamp (MFH-25C), 25-mm filter body (TFA-25B) and heater (MH-50).

MFH-25CA
MFH-25CAV

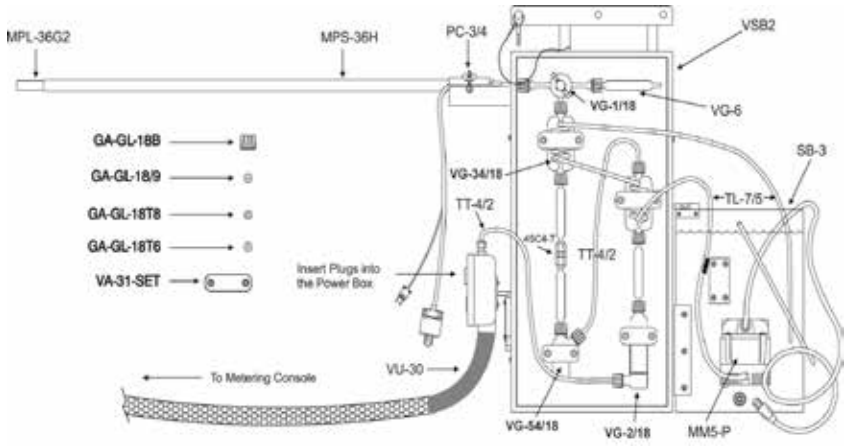
SuperVOST Sampling Equipment

The Apex Instruments SuperVOST sampling kit includes the multifunctional VersaCase2 cabinet with a redesigned mounting panel, glass-lined probe assembly, VOST glassware with clamps, insulated coolant reservoir with submersible pump and VU-cord. The VU-cord can be used for connection directly to the XC-623 Meter Console or to model XC-572 with the VUA orifice flow adapter.

SuperVost sampling kit

SK-0031 SuperVost source sampling kit
For VersaCase2 with 110V pump: VSB2, PC3/4, V31-CGS, VC31-SET, MPS-36H, MPL-36G2 (3x), VU-30, MM5-P, SB-3.
SK-0031

SK-0031-V SuperVost source sampling kit
For Method 0031, with 240V pump.
SK-0031-V



VOST Sampling Individual Glassware

3-Way Valve with PFA Valve Plug, # 18 Threads Inlet and Purge, 8mm Outlet
VG-1/18

Knock-out Flask, 125mL with #18 Threads with External Water jacket 2 in outer diameter
VG-125/18WJ

SuperVOST Coil Condenser, 2 inch Diameter, with #18 Threads and Water Jacket Hose Barbs
VG-34/18

VOST Charcoal Trap, Glass with #15 Threads and Glass Frit
VG-2/18

SuperVOST Water Trap, #18 Threads, 45° Offset Exit
VG-54/18

Knock-out Flask, 125mL with #18 Threads
VG-125/18

VOST Adsorption Cartridge, 1/4 inch Ends
VG-6

Gas Sampling Bag Sampling Equipment for VOC's

The M180 VacBag sampler system allows you to take an integrated gas sample in accordance with the U.S. EPA Method 18 by evacuating the stainless-steel airtight container that is fitted with a gas sampling bag. This arrangement prevents the sample from coming into contact with the sample pump and possible cross contamination. The TBE enclosures come standard with clear Lexan® lid, a 1/4-inch-valved female quick connect and a 1/4-inch male quick connect.

SK-M180-6G
SK-M180-6G-V

Kit includes:

- 6-gallon airtight stainless-steel enclosure
- 3 gas sampling bags
- Sample pump
- PFA tubing
- Stainless-steel unions and tubing
- 1/4-inch quick-connects
- Squeeze bulb pump
- Black rubber tubing
- 4- and 10-gallon enclosures also available

Tedlar and Multi-Layer Foil Gas Sampling Bags

Gas sampling bags are the first choice for collecting a variety of gaseous compounds. Gas sampling bags are referenced for many U.S. EPA Methods including 3,18 and 0040. Bags fabricated from film are inert to most gases, resist gas permeation and can be reused for most applications after proper cleaning. The bags are flexible and strong. The use of a rigid container ensures a longer life and convenience during transporting. Gas sampling bags are fabricated from transparent 2-ml film or can be special ordered fabricated from opaque black for photosensitive compounds. Custom sizes available upon request.

Recommended Gas Sampling Bag Configurations

Part Number	Description
TB-6-P	Tedlar® sampling bag, 6 x 6 inch, 0.6 liter with push-pull poly valve.
TB-7-P	Tedlar® sampling bag, 7 x 7 inch, 1.0 liter with push-pull poly valve.
TB-9-P	Tedlar® sampling bag, 9 x 9 inch, 2.0 liter with push-pull poly valve.
TB-10-P	Tedlar® sampling bag, 10 x10 inch, 3.0 liter with push-pull poly valve.
TB-12-P	Tedlar® sampling bag, 12 x 12 inch, 5.0 liter with push-pull poly valve.
TB-12-R	Tedlar® sampling bag, 12 x 12 inch, 5.0 liter with Halkey-Roberts Valve.
TB-12X19-P	Tedlar® sampling bag, 12 x 19 inch, 10.0 liter with push-pull poly valve.
TB-12X21-P	Tedlar® sampling bag, 12 x 21 inch, 12.0 liter with push-pull poly valve.
TB-15-P	Tedlar® sampling bag, 15 x 15 inch, 10.0 liter with push-pull poly valve.
TB-18X24-P	Tedlar® sampling bag, 18 x 24 inch, 25.0 liter with push-pull poly valve.
TB-18X36-P	Tedlar® sampling bag, 18 x 36 inch, 45.0 liter with push-pull poly valve.
TB-30-P	Tedlar® sampling bag, 30 x 30 inch, 80.0 liter with push-pull poly valve.
TB-30x36-P	Tedlar® sampling bag, 30 x 36 inch, 100.0 liter with push-pull poly valve.

TEDLAR bags are recommended for most VOCs if analyzed within 48 hours and for many sulfer compounds if analyzed within 24 hours.

Multi-layer foil bags are recommended for methane (CH_4), hydrogen sulfide (H_2S), carbon monoxide (CO), and carbon dioxide (CO_2), if analyzed within 48 hours. Multi-layer foil bags can be used to sample most VOCs but are not recommended for collecting low ppm to high ppb VOCs due to background levels from bag materials.

Gas Sampling Bag Sampling Equipment for VOC's

Bag Stainless-Steel Enclosures

4-gallon stainless-steel bag enclosure with 1/4-inch stainless-steel quick connects. Accepts TB-18-P.

TBE-4G

6-gallon stainless-steel bag enclosure with 1/4-inch stainless-steel quick connects. Accepts TB-18 x 24-P.

TBE-6G

10-gallon stainless-steel bag enclosure, with 1/4-inch stainless-steel quick connects. Accepts TB-18 x 36-P.

TBE-10G

Accessories

Model	Description
O-452N50	12-inch O-ring seal, nitrile for TBE-4G, 6G, and 10G
QC-M4-SS	1/4-inch stainless-steel male quick connect
QC-F4-SS	1/4-inch stainless-steel female quick connect

Drum heater

For heated gas bag sampling up to 150°C (300°F), Apex Instruments offers a thermostatically controlled flexible silicone rubber drum heater and thermal blanket. The heater is easily attached with quick-acting spring latches and the quilted thermal blanket is attached with snap buttons.

Flexible silicone drum heater 4-gallon (up to 10-gallon) with thermostat, 300 watts/240 V adj. 50 to 425°F, 110 VAC.

TBE-HEATER

Flexible silicone drum heater 4-gallon (up to 10-gallon) with thermostat, 300 Watts/240 V adj. 50 to 425°F, 220 VAC.

TBE-HEATER-V

Attention:
Heater temperatures should be closely monitored during initial use. Thermostat requires several cycles to break in. Calibrate the thermostat while installed before initial use.

Caution:
The heater temperature will rise rapidly since the drum is virtually empty. Start with the thermostat set at the lowest temperature setting. Do not use in hazardous locations.

Insulated blanket, fits the TBE-4G.

TBE-4G-BKT

Insulated blanket, fits the TBE-6G.

TBE-6G-BKT

Insulated blanket, fits the TBE-10G.

TBE-10G-BKT

Sampling Pump Modules

The compact gas sampling pump incorporates a diaphragm pump with a maximum vacuum of 25 inHg and open flow of 6 LPM. The polyethylene terephthalate (PET) pump is constructed with a silicone valve and neoprene diaphragm. Pumps feature direct-read rotameter, nonreversible male and female quick connects, stainless-steel fittings and needle valve, a vacuum gauge, timer, and folding handle.

Dimensions: HxWxD 6-inch x 7-inch x 8.5-inch
(15.2 cm x 17.8 cm x 21.6 cm)
Weight: 8 lbs (3.5 kg)
Power: 120 VAC/50-60 Hz.

TBP-102- ☐

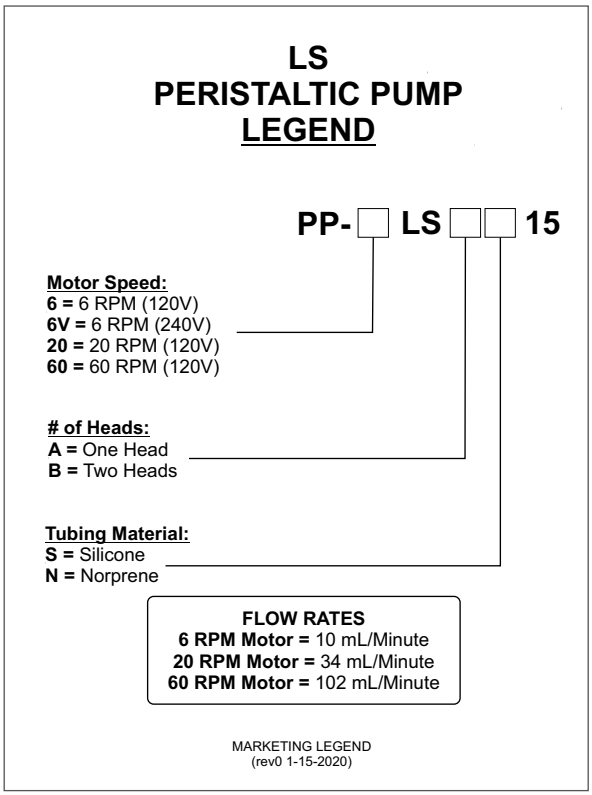
Sampling Pumps

Model	Description
TBP-102-A	Gas sampling pump unit (0.1-1.2 LPM)
TBP-102-B	Gas sampling pump unit (0.2-2.5 LPM)
TBP-102-C	Gas sampling pump unit (0.4-5.0 LPM)

Peristaltic Pumps

The LS Series is our most durable and long-term peristaltic pump option. The pump motor comes in three different speeds and one or two heads can be used simultaneusly.

See legend for a detailed list of ordering options and flowrates.



LS Series Peristaltic Pump

A double-headed single-speed peristaltic pump is ideal for removal of condensate from glass and stainless steel condensers.

The MiniFlex peristaltic pump features a head with two tube slots and an easy-load function. The MiniFlex offers three different motor speeds and is capable of holding two different tube sizes.

See legend for a detailed list of ordering options and flowrates.

MF
PERISTALTIC PUMP
LEGEND

PP-☐ MFB☐☐

Motor Speed:
6 = 6 RPM (120V)
6V = 6 RPM (240V)
20 = 20 RPM (120V) (Standard)
60 = 60 RPM (120V)

Tubing Material:
S = Silicone
N = Norprene

Tubing Size:
14 = Size 14 (0.14 mL/rev)
16 = Size 16 (0.55 mL/rev)

Motor Speed	Tubing Size	
	14	16
6	0.8 mL/min	3.3 mL/min
20	2.8 mL/min	11 mL/min
60	8.4 mL/min	33 mL/min

MARKETING LEGEND (rev0 1-15-2020)

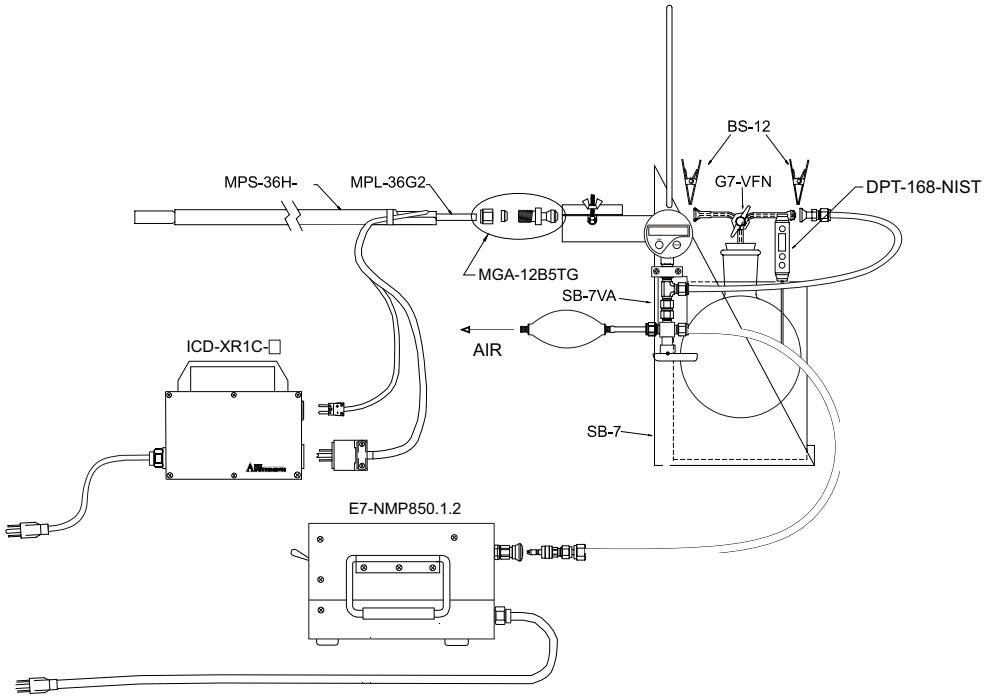
MiniFlex Peristaltic Pump

- Two-channel heads lets you pump two channels without stacking heads; automatic retention holds tubing securely in place with no manual adjustment
- Two-channel head lets you pump two synchronous flow channels (proper retention requires the use of the same size tubing in each channel)
- Improved occlusion bed geometry lengthens tubing life
- Easy-load head for quick and easy tube loading

Method 7 - Nitrogen Oxides Sampling Equipment

Apex Instruments offers two different options to sample for nitrogen oxide emissions. The Method 7 source sampling kit is available for Methods 7, 7A and 7B. The system grabs and collects the sample in an evacuated 2-liter flask containing a dilute solution of sulfuric acid and hydrogen peroxide. Method 7 normally requires the collection of multiple samples at 15-minute intervals.

CK-7A9
CK-7A9-V (220V)



Kit includes:

- Clamps
- Flasks
- Sample frame caddy with probe clamp
- Probe assembly
- Liners
- Valve assembly with squeeze bulb
- Adapters
- Evacuation pump
- Vacuum gauge
- Temperature controller
- Thermometer
- Transport case (not shown)

Method 0040 Sampling Equipment

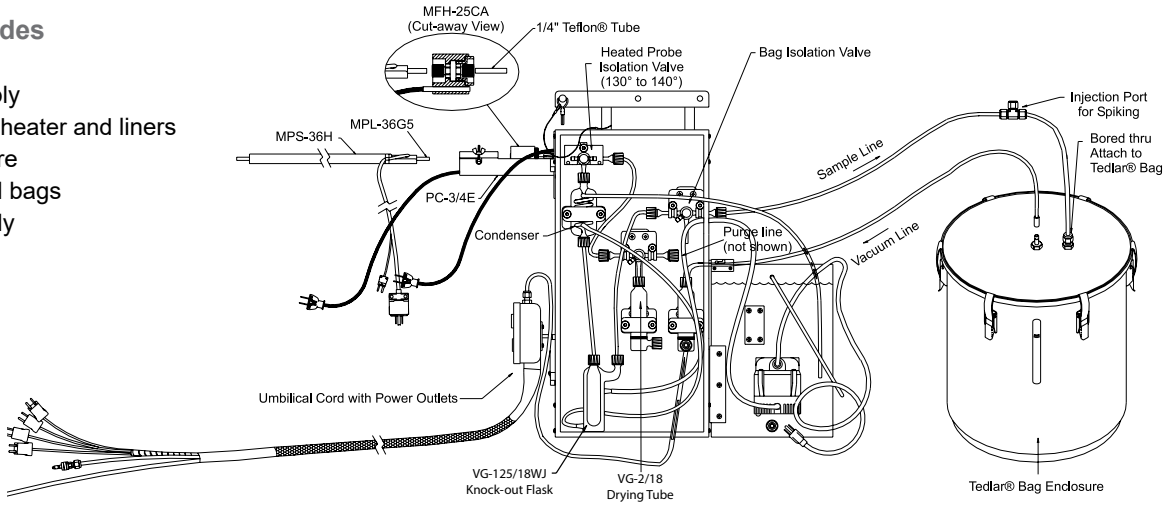
Method 0040 is designed, using gas sampling bags, for sampling principal organic hazardous constituents from combustion sources like hazardous waste incinerators. This non-isokinetic method uses a constant or proportional sampling rate dependent upon the extent and variability of the emission flow rate (Method 2). The Apex Instruments **Method 0040 Kit (SK-0040)** utilizes the VSB2 VersaCase cabinet, glass-lined probe assembly, glassware, coolant reservoir with submersible pump, bag enclosure and umbilical cord for connection to the XC-6230 source sampler console.

SK-0040
SK-0040-V

Sampling Kit for VersaCase (SK-0040)

Method 0040 kit includes

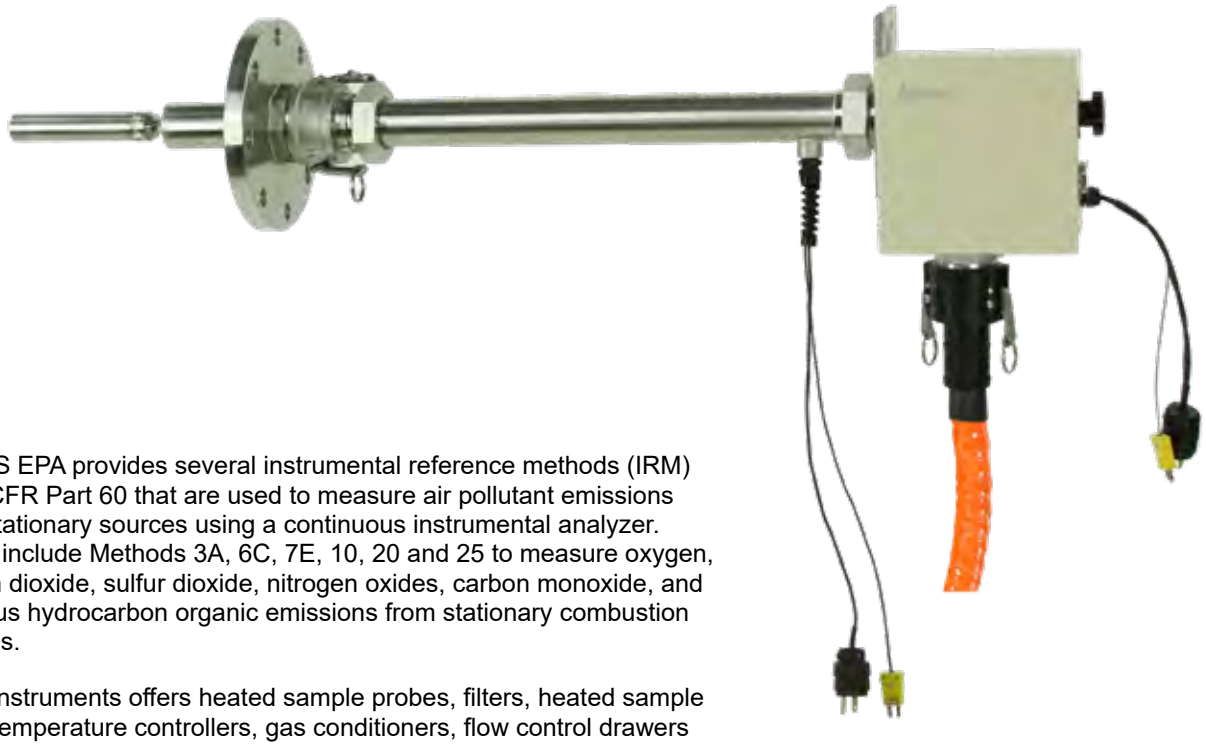
- VersaCase 2
- Probe clamp assembly
- Probe assembly with heater and liners
- Tedlar® bag enclosure (6 gallon/25 liter) and bags
- Heated filter assembly
- Glassware
- Clamps
- Three-way valve
- Cold box
- Submersible coolant pump
- Umbilical cable



Method 0040 Glassware

Qty.	Model	Description
	VG40-CGS	**Method 0040 glassware set**
		Set includes:
3	VG-1/18	3-way valve with #18 threads, inlet and purge, 8mm outlet
1	VG-34/18	SuperVOST coil condenser, 2-inch diameter #18 threads
1	VG-125/18WJ	Knock-out flask, 125 ml with #18 threads with water jacket
2	VG-2/18	Drying tube, charcoal trap with glass grit, #18 threads
13	GA-GL-18B	Bored cap, #18 threads
3	GA-GL-18T8	PTFE seal ring, #18/8, 8-mm hole diameter
10	GA-GL-18T6	PTFE Seal Ring, #18/6, 6-mm hole diameter
18	TPFA-4-047W	PFA tubing, 1/4-inch OD, 1/8-inch ID, per foot
7	TL-7/5	Surgical tubing, 7/16-inch OD, 15/16-inch ID, per foot
1	GA-GL-18C	Solid screw cap, #18
1	4ET4-PFA	Union tee, 1/4-inch tube PFA

Gas Sampling and Analysis - Instrumental



The US EPA provides several instrumental reference methods (IRM) in 40 CFR Part 60 that are used to measure air pollutant emissions from stationary sources using a continuous instrumental analyzer. These include Methods 3A, 6C, 7E, 10, 20 and 25 to measure oxygen, carbon dioxide, sulfur dioxide, nitrogen oxides, carbon monoxide, and gaseous hydrocarbon organic emissions from stationary combustion sources.

Apex Instruments offers heated sample probes, filters, heated sample lines, temperature controllers, gas conditioners, flow control drawers and data acquisition equipment as well as supporting accessories.

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 7E	Determination of Nitrogen Oxide 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

Filters

Conditioner

Flow Drawer

Gas Sampling Probe

Gas Sampling Probes are used for Intrumental Reference Methods. They incorporate the popular heater design from the Method 5 probes so that liners can be changed in seconds without disturbing the heater. The separate heater tube provides an even heat distribution and isolate the electrical elements from the liner. The probe sheaths are constructed with a 2-inch stainless-steel outersheath with a tube nut welded to the end for attachment to a porous filter or a bored cap. Probes are available in any length from 2' to 20'. The probes are manufactured to accommodate standard wattages or customized for hotter conditions. Add "V" to end of part number for 240 VAC.

All IRM probe assemblies are available with 1-inch or 2-inch OD stainless-steel sheath with a heater and a liner made from stainless steel, Inconel, quartz or glass (120 VAC/60 Hz).

IRM stainless-steel probe assemblies with stainless-steel liner

	1-inch Sheath	2-inch Sheath
Length	**Part Number**	**Part Number**
3'	PC6-3S	PC6-3S-O2
4'	PC6-4S	PC6-4S-O2
6'	PC6-6S	PC6-6S-O2
8'	PC6-8S	PC6-8S-O2
10'	PC6-10S	PC6-10S-O2
12'	PC6-12S	PC6-12S-O2

GA-111
Strain Relief

GAS SAMPLING PROBE (HEATER INCLUDED) LEGEND

PC ☐ - ☐☐ - ☐☐☐

Liner Diameter:
4 = 1/4"
6 = 3/8"
8 = 1/2"
10 = 5/8"

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

Material:
S = Stainless Steel
A = Alloy 600 (Inconel)
C = Alloy C22/C276 (Hastelloy)

High Temperature Option:
253 = Alloy 600 (Inconel) w/ 253MA 3/4" Pipe Sheath

Sheath Size:
BLANK = 1" (Standard)
O2 = 2" (Requires 2" Probe Clamp)

Voltage/Power Plug Options:
BLANK = 120V (5-15) (Domestic)
C14 = 120V (International)
C14V = 240V (International)
H3 = 120V HMC Connector
H3V = 240V HMC Connector (International)

ENGINEERING & MARKETING LEGEND
(rev4 7-28-2020)

Legend for Gas Sampling Probe with Heater

GAS SAMPLING PROBE SHEATH LEGEND

PCS ☐ - ☐☐ - ☐

Liner Diameter:
4 = 1/4"
6 = 3/8"
8 = 1/2"
10 = 5/8"

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

Sheath Material:
S = Stainless Steel
A = Alloy 600 (Inconel)
C = Alloy C22/C276 (Hastelloy)
D = 253MA (3/4" Pipe)

Sheath Option:
H3 = HMC Connector

ENGINEERING & MARKETING LEGEND
(rev3 7-28-2020)

Legend for Gas Sampling Probe without Heater

GAS SAMPLING PROBE FOR CONTROLLED CONDENSATE (HEATER INCLUDED) LEGEND

PC ☐ - ☐ - **CC** ☐

Liner Diameter:
4 = 1/4"
6 = 3/8"
8 = 1/2"
10 = 5/8"

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

Voltage/Power Plug Options:
BLANK = 120V (5-15) (Domestic)
C14 = 120V (International)
C14V = 240V (International)

ENGINEERING & MARKETING LEGEND
(rev1 6-11-2020)

Legend for Controlled Condensate Gas Sampling Probe with Heater

GAS SAMPLING PROBE SHEATH FOR CONTROLLED CONDENSATE LEGEND

PCS10- ☐ **-CC**

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

ENGINEERING & MARKETING LEGEND
(rev1 6-11-2020)

Legend for Controlled Condensate Gas Sampling Probe without Heater

Gas Sampling Probe Liner and Heater

Our gas sampling probe liners are constructed from 5/8-inch diameter tubing and have a #28 ball joint attached. Liners are available in stainless steel, alloy 600, C276 alloy, and glass.

GAS SAMPLING PROBE LINER LEGEND

PCL☐ - ☐☐

Liner Diameter:
4 = 1/4”
6 = 3/8”
8 = 1/2”
10 = 5/8”

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

Liner Material:
S = Stainless Steel
A = Alloy 600 (Inconel)
C = Alloy C22/C276 (Hastelloy)
G = Glass

ENGINEERING & MARKETING LEGEND
(rev1 6-11-2020)

GAS SAMPLING PROBE HEATER LEGEND

PCH☐ - ☐☐

Heater Size:
6 = Accepts Up to 3/8” Liner
10 = Accepts Up to 5/8” Liner

Length (in Feet):
Examples -
4 = 4 ft.
6 = 6 ft.

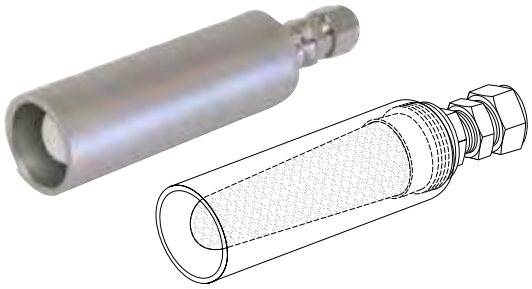
Voltage/Power Plug Options:
BLANK = 120V (5-15) (Domestic)
C14 = 120V (International)
C14V = 240V (International)
H3 = 120V HMC Connector
H3V = 240V HMC Connector (International)

ENGINEERING & MARKETING LEGEND
(rev2 7-29-2020)

Pre-Filters

Stainless-steel IRM filter assembly with replaceable glass fiber filter element that accepts standard 25mm x 90mm tapered filter thimbles. Particulate shroud to deflect large particulate and increase filter lifespan. The modular, threaded shroud design allows for quick and easy replacement of the filter element. Filter retaining ring securely holds filter. Outlet has 1/4-inch female NPT. Optional Silcosteel® coating for low-NO_x applications. Replaceable filter elements sold separately.

SFC-2590



Porous stainless-steel filters are typically used as a pre-filter for IRM in-stack filtration to prevent clogging of filters downstream. Filters have over 18 inches^2 of a 10 micron filtering surface and can be back flushed with compressed air. Apex also offers an optional particulate shroud for extra-heavy-dust loadings. These filter assemblies attach to the stack end of the probe liner.

SSF-64N10-P

Heated Filter Assembly and Oven Enclosure

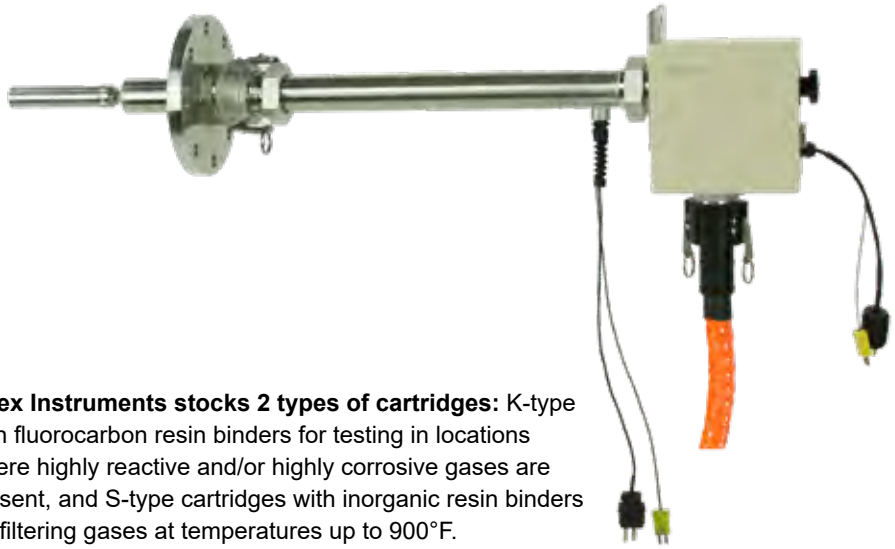
The probe uses a replaceable 3/8-inch stainless-steel liner. The oven features a lightweight construction, with a rugged strip heater, 1/2-inch insulation, high-temperature and stainless-steel hardware. Type-K thermocouple jacks are used for monitoring probe and oven temperature. A dual-channel digital thermometer is recommended.

Heated, 1-inch filter assembly
Accepts 25mm x 64mm filter.
(Does not include probe)

SFA-2564HE-A

Heated, 2-inch filter assembly
Accepts 25 mm x 64 mm filter.
(Does not include probe)

SFA-2564HE-B



Apex Instruments stocks 2 types of cartridges: K-type with fluorocarbon resin binders for testing in locations where highly reactive and/or highly corrosive gases are present, and S-type cartridges with inorganic resin binders for filtering gases at temperatures up to 900°F.

FILTER OVEN SYSTEM LEGEND

SFA-2564HE- ☐☐☐

Probe Clamp Size:
A = 1" Probe Clamp
B = 2" Probe Clamp

Coating Options:
BLANK = No Coating
T = PTFE
S1 = SilcoNert 1000
S2 = SilcoNert 2000
S3 = Silcolloy
DU = Dursan

Voltage/Power Plug Options:
BLANK = 120V (5-15) (Domestic)
C14 = 120V (International)
C14V = 240V (International)

ENGINEERING & MARKETING LEGEND
(rev1 5-28-2020)

Replacement Filter Elements

Product	Description	
GF256470K	Filter cartridge, borosilicate glass microfiber with fluorocarbon resin binder, 25 X 64mm, maximum temperature 300°F -	10/pk
GF256470S	Filter cartridge, borosilicate glass microfiber with fluorocarbon resin binder, 25 X 64mm, maximum temperature 900°F -	10/pk

Filter Housings

6-port filter assembly
- Six 1/8-inch NPT ports
- Accepts 25mm x 64mm filters
- Stainless-steel

(For use in tri-sample probe)

SFA-2564-2N6

3-port filter assembly
- Three 1/4-inch NPT ports
- Accepts 25mm x 64mm filters
- Stainless-steel

SFA-2564-V2

In-line filter assembly
- Accepts 12mm x 32mm filters.
- Stainless-steel

SFA-116IL

Stainless-steel filter assembly
- Accepts 12mm x 32mm filters.
- Stainless-steel

SFA-137G

Nylon filter assembly
- Accepts 25mm x 64mm filters.
- Nylon

GP-765N

GP-760N

DIF-N70

Gas Sample Filter Elements

Apex Instruments stocks two types of Borosilicate Glass Microfiber Cartridges to accommodate all particulate removal needs. For testing in locations where highly reactive and/or highly corrosive gases are present Apex offers the K-Type high-temperature with fluorocarbon resin binders. The S-type has low-temperature cartridges with inorganic resin binders for filtering gases at temperatures up to 480°C. (900°F).

Gas Sample Filter Elements

Borosilicate glass filter elements with inorganic binder are suitable for 300°F - 900°F.

Product	Size (mm)	Max Temp.
GF123270S	12 x 32	480°C (900°F)
GF125770S	12 x 57	480°C (900°F)
GF256470S	25 x 64	480°C (900°F)
GF2517870S	25 x 178	480°C (900°F)

Borosilicate glass filter elements with fluorocarbon binder are suitable up to 300°F and are ideal for corrosive environments.

Product	Size (mm)	Max Temp.
GF123270K	12 x 32	150°C (300°F)
GF125770K	12 x 57	150°C (300°F)
GF256470K	25 x 64	150°C (300°F)
GF2517870K	25 x 178	150°C (300°F)

Quartz filters.

Product	Size (mm)	Max Temp.
GF-2564Q	25 x 64	900°C (1650°F)

Polyethylene filters.

Product	Size (mm)	Max Temp.
GF2564-PEL	25 x 64	100°C (212°F)

Ceramic filters.

Product	Size (mm)	Max Temp.
GF-CE2564	25 x 64	1450°C (2640°F)

PTFE filters.

Product	Size (mm)	Max Temp.
GF1232-PTFE	12 x 32	260°C (500°F)

PMI Dilution Probe

PMI Dilution Probe

For in-situ sampling conditioning of stack gases

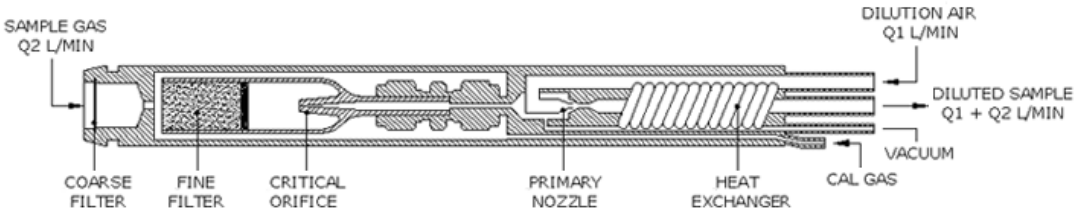
The dilution probe performs four critical functions to prepare the sample from the stack or process, so it can be measured accurately and precisely by the analyzer. The probe uses an air-driven aspirator which extracts the sample from the stack or process. It is then passed consecutively through coarse and fine particulate filters, a pre-selected glass or metal critical orifice, and finally diluted with the air from the aspirator. This process has now reduced the dew point of the sample to below that of the ambient air, preparing the sample to be transported via an unheated line to the analyzer as far as 300 feet away.

There are two models of the dilution probe available, differing only in the type of mounting flange.
Model PMI-3200, equivalent to the EPM 0797.302, has a 1.8-inch flange drilled and tapped with four mounting holes.
Model PMI-3300 (equivalent to EPM 0797.303) has a threaded flange for easy use with extension tubes.

PMI-3200 / PMI-3300 Dilution Probe

DPMI-3200

DPMI-3300



Features:

- Low-cost installation, maintenance and operation
- Low-extractive flow rates, promotes long filter life
- Made of corrosion-resistant materials
- Can be used in explosion-proof areas
- No requirement for heated sample line
- No moving parts anywhere in the system
- Easy dynamic in-situ calibration of dilution system
- Diluted sample is transported at positive pressures
- Can be used with any existing ambient air analyzer
- Manual or optional automatic blow back, back flushes coarse filter PMI-3000 probe

Specifications

A) Material of construction:

- The eductor housing, mantle, filter cap and flange (the "Wetted Parts") are fabricated from Inconel® 600, a corrosion-resistant nickel-chromium alloy
- The heat exchanger and the four inlet/outlet tubes are fabricated from grade 316 stainless steel

B) Maximum operating temperature:

- 750°F (400°C) with standard glass orifice
- 1,100°F (600°C) with special metal orifice – call PMI for details

C) Dimensions:

- Vacuum and calibration lines 0.125-inch OD
- Dilution air and sample out lines 0.25-inch OD
- All lines supplied with 0.25-inch OD tube fitting attached

Apex Instruments Dilution Panel

Features:

- High-accuracy
- High-resolution regulation
- Blow-back control
- Calibration circuit

ADP-007

Specifications:

- Application in-situ type probes
- Remote (dry contract) for cal and blow back
- Sample, bypass and cal gas rotometers
- Precision air pressure regulator
- 4 U (19-inch W x 7-inch H) case rack mountable (20 lbs)
- Front-panel air pressure, vacuum and blow back gauges
- 110 / 220 VAC

Unheated Multi-Bundle Sample Line

The lightweight umbilical cable includes (4) TPFA lines for attachment to dilution probe. Covered in heavy-duty braided nylon sleeving. Additional options and variations can be configured. See legend below. Call for details.

UNHEATED MULTI-BUNDLE LINE LEGEND

UDL-☐ / ☐ / ☐ / ☐ - ☐ ☐ ☐ ☐ ☐

Sample Line Tubing:
(Create Part Number from Largest to Smallest Tubing Size)
4 = 1/4" O.D. (.047" Wall/PFA)
4H = 1/4" O.D.(.062" Wall/PFA)
6 = 3/8" O.D. (.062" Wall/PFA)
8 = 1/2" O.D. (.062" Wall/PFA)
10 = 5/8" O.D. (.062" Wall/PFA)
***NOTE: Multiple Line Combinations Available**
EXAMPLES: 4/4, 6/4, 8/4, 8/6, 8/8

Length (in Feet)

Pass Through Power:
BLANK = None
A = 5 Pin Amphenol
(Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol
(Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol
(Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol
(Size 14S Shell - Male/97 Series)
E = 5-15
F = C14
S = 4 Pin Amphenol (END OF LIFE)
(Size 14S Shell - Female/97 Series)

If Pass Through Power is Selected
Number of Pass Through Power Lines:
1-3

Pass Through TC:
BLANK = None
T = TC

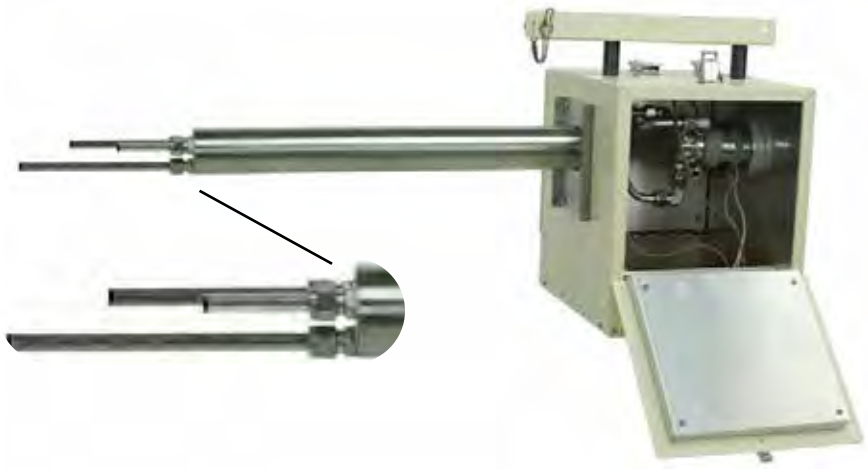
If Pass Through TC is Selected
Number of Pass Through TC Lines:
1-6

MARKETING LEGEND
(rev2 12-29-2020)

Tri-Sample Probe

The Apex Instruments tri-probe allows the simultaneous sampling and monitoring from three distinct sampling points. The manifold and filter unit comes with six holes, for a unique design made for RATA sampling. The user can now extract samples without moving the probe to different traverse points. Traverse points acquire representative samples.

The tri-probe has multiple probe extension options to meet the specifications of any test site.



SFA-T2564-55-☐

18 Inch Tri-Sample Probe
Accepts 25 mm x 64 mm filter.

SFA-T2564-55-18

TRI-PROBE LEGEND

SFA-T2564-☐-☐☐☐

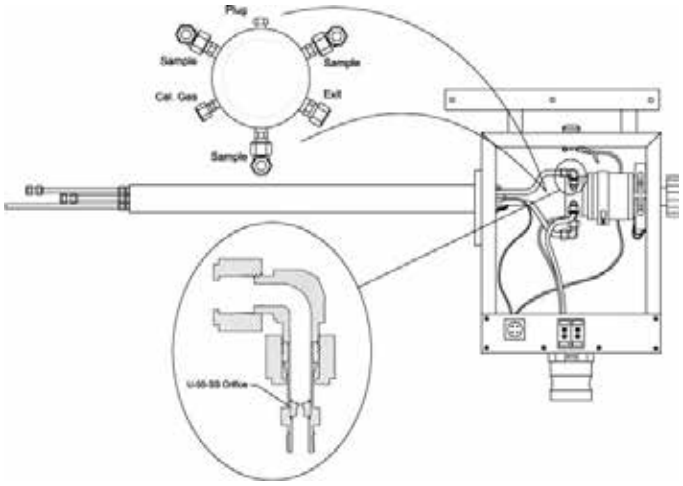
Orifice Tube Options:
35 = .035”
43 = .043”
55 = .055”

Length (in Inches)

Coating Options:
BLANK = No Coating
T = PTFE
S1 = SilcoNert 1000
S2 = SilcoNert 2000
S3 = Silcolloy
DU = Dursan

Voltage:
BLANK = 120V
V = 240V

ENGINEERING & MARKETING LEGEND
(rev2 7-24-2020)



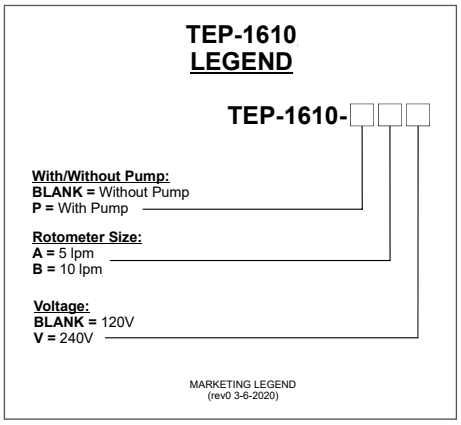
Gas Conditioners

TEP-1610 Thermoelectric Portable Gas Cooler

The TEP-1610 Thermoelectric Portable Gas Cooler removes water vapor from process gas samples prior to gas analysis. The TEP-1610 has an aluminum block containing a single-pass stainless-steel condenser, a sample pump, a peristaltic pump for condensate removal, a coalescing filter, flow meter, and three auxiliary temperature controllers (probe, filter and heated sample line jumper). The rugged and lightweight design allows the chiller to be used on the sampling platform, close to the source.

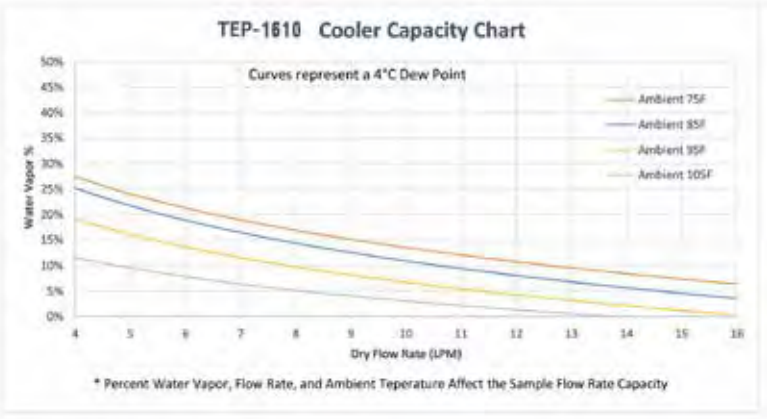
The TEP-1610 is the perfect choice for your portable gas sampling system. We listened and we strive to deliver a fast response that is lightweight, portable, and rugged.

TEP-1610 - Thermoelectric Portable Cooler, fits inside a 19-inch rack.



Features:

- Portable, compact, and lightweight
- Rugged solid-state thermoelectric module
- OLED display with power monitor
- Digital temperature controllers for probe, oven, and line
- IP-rated switching power supply
- Variable DC voltage PID controller for thermoelectric module
- Internal sample pump
- Peristaltic pump with rotameter



TEP-1610 Specifications:

- **Refrigeration**: Pinnacle Heat Pump System: two 50-watt solid-state modules
- **Temperature display**: LED display +/- 0.1 °C/°F
- **Temperature control**: variable DC voltage controller, 3-button keypad
- **Cooling capacity**: 200 BTU per hour
- **Cold block**: insulated aluminum
- **Condenser**: stainless steel, reverse flow condensate separator: alloy 316 stainless steel, various coatings available, 1” OD x 10”
- **Condensate removal**: integrated peristaltic pump, 10 ml/min
- **Radiator**: two low-profile heat sinks with six 6-mm diameter U-tube heat-pipes, coated fins for corrosion resistance, 120-mm axial fans, with encapsulated motor and electronics
- **Rated flow rate**: 10 LPM at 10% moisture
- **Ambient operating temperature**: 32 to 104 °F (0 to 40 °C)
- **Auxiliary temperature controllers**: digital temperature controllers for probe, oven, and heated jumper; type-K thermocouple input
- **Sample pump**: KNF 828 diaphragm pump, 28 LPM free flow
- **Power**: Supply 120VAC/60 Hz 15 amps max. or 240VAC/50 Hz 10 amps max., IEC C-13 inlet
- **Dimensions**: 12.75”x19”x10.5” (32.4 cm x 48.3 cm x 26.7 cm)
- **Weight**: 25 lbs (11.4 kg)

TEC-1610 Thermoelectric Gas Cooler

The Apex Instruments TEC-1610 Thermoelectric Gas Cooler removes moisture from a gas sample and is designed to be used as a stand-alone unit or coupled with our ACC-1610 Air-Cooled Condenser.

The TEC-1610 is a stand-alone and wall/rack-mountable gas cooler. With its robust single-channel gas conditioning system the TEC-1610 removes condensate and delivers dry gas to the analyzer.

Water vapor is removed by cooling the sample gas to a constant dew point with the Apex Pinnacle Heat pump. The Pinnacle assembly in the TEC-1610 utilizes two thermoelectric modules, which operate on the Peltier effect.

The Pinnacle heat pump is housed in a rugged package that is easy to service and designed to withstand harsh environments.

TEC-1610
LEGEND

TEC-1610- □□□

Peristaltic Pump Options:
BLANK = LS Model
AN = AN Model
LS2 = Dual Head LS Model
MF2 = Dual Head MiniFlex

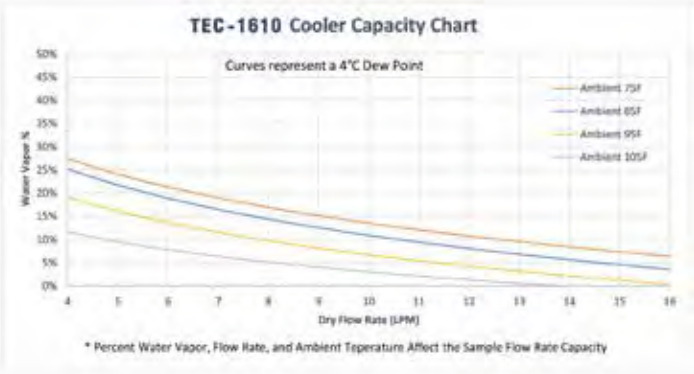
Coating Options for Condensers:
BLANK = No Coating
T = PTFE
S2 = SilcoNert 2000
*Note: Other coating options available by request

Voltage:
BLANK = 120V
V = 240V

MARKETING LEGEND
(rev2 7-20-2020)

The Pinnacle heat pump unit includes a highly conductive aluminum block fitted with two rugged thermoelectric modules, a stainless-steel condenser, a high-efficiency heat exchanger, exhaust fan, and a PID temperature controller.

The heat pump uses an extremely reliable rugged solid-state thermoelectric module (TEC) and a low-resistance heat exchanger with a copper base and heat pipes with high thermal conductivity for removing heat from the hot side of the TEC and dispersing the heat to the surrounding environment via the exhaust fan.



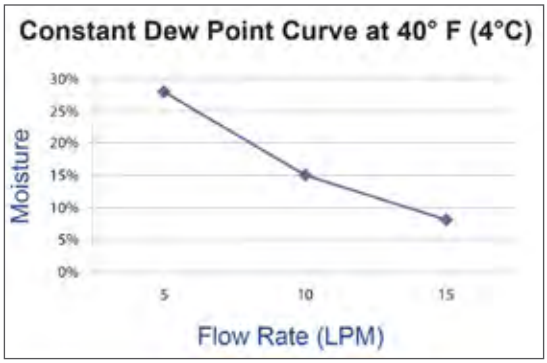
Gas Conditioner Condenser

Condenser Features:

- Low gas absorption
- Easy to maintain
- Integrated heater
- Energy efficient
- Two-stage cooler
- Digital temperature control
- Lightweight
- High-capacity
- Rack-countable
- FPSC

SGC-VCG-9C

Gas Conditioner Flow vs Moisture Chart



Heated Sample Lines for Gas Sampling

Lightweight Heated Sample Line

HSL-CL-6/4-100

Apex Instruments lightweight heated sample lines are designed for the professional stack tester that needs a ruggedized line in a light-weight package. The standard core includes one 3/8-inch PFA tube for the sample and one 1/4-inch tube for introducing calibration gas at the probe.

The line can be regulated at temperatures of 49°C, 60°C, 80°C, 100°C, or 120°C using an external temperature controller utilizing built-in thermocouples. One or two Type-K thermocouples can be used for temperature regulation.

The outer cover is made of TUFF-GUARD, a corrugated polyamide capable of withstanding up to 105°C continuously.

Type-K thermocouple feed-throughs and 3-prong power feed-throughs are available upon request.

HSL-CL-6/4-100

100-foot light-weight heated sample line

Features

- PFA tubing with stainless-steel overbraid
  - Heated sample: 3/8-inch
  - Unheated cal-gas: 1/4-inch
- Two 1/4-inch Nomex® insulation layers
- Internal nylon braid
- Lightweight and flexible
- Bend radius: 10 inches
- Stainless-steel tube stubs
- TUFF-GUARD outer sheath

Specifications

- Spiral-wound heating element for uniform heat distribution
- Supply voltage 120V or 240V
- Maximum temperature rating 400°F(200°C)
- Tube maintenance up to 400°F (200°C) at 25°C
- Type-K thermocouple for the control sensor
- Nominal O.D. 1.75-inch
- Weight 42 lb. for 100 ft.

Apex offers temperature controllers for use with non-self-regulating lines.

Self-Regulated Heated Sample Line for Gas Sampling

Heavy-duty self-regulating heated sample lines 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 (248°F) over the entire length of the line. The sample lines comprise of replaceable 3/8-inch PTFA tubing and are also available in 1/4-inch 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-☐-☐

Popular Lengths

Part Number	Product Description
HSRLB-4-10	10-foot heated 1/4-inch PFA sample line with braided umbilical cable oversleeve, orange extruded jacket, 120VAC
HSRLB-4-15	15-foot heated 1/4-inch PFA sample line with braided umbilical cable oversleeve, orange extruded jacket, 120VAC
HSRLB-4-20	20-foot heated 1/4-inch PFA sample line with braided umbilical cable oversleeve, orange extruded jacket, 120VAC
HSRLB-6-6	6-foot heated 3/8-inch PFA sample line with braided insulation, umbilical cable oversleeve, orange extruded jacket, 120VAC
HSRLB-6-10	10-foot heated 3/8-inch PFA sample line with braided insulation, umbilical cable oversleeve, orange extruded jacket, 120VAC
HSRLB-6-15	15-foot heated 3/8-inch PFA sample line with braided insulation, umbilical cable oversleeve, orange extruded jacket, 120VAC
HSRLB-6-20	20-foot heated 3/8-inch PFA sample line with braided insulation, umbilical cable oversleeve, orange extruded jacket, 120VAC
HSRLB-6-25	25-foot heated 3/8-inch PFA sample line with braided insulation, umbilical cable oversleeve, orange extruded jacket, 120VAC
HSRLB-8-10	10-foot heated 1/2-inch PFA sample line with braided insulation, umbilical cable oversleeve, orange extruded jacket, 120VAC
HSRLB-8-20	20-foot heated 1/2-inch PFA sample line with braided insulation, umbilical cable oversleeve, orange extruded jacket, 120VAC

SELF REGULATED HEATED SAMPLE LINE LEGEND

HSRLB-☐/☐/☐/☐-☐☐☐☐☐☐☐-☐

Sample Line Tubing:
(Create Part Number from Largest to Smallest Tubing Size)
4 = 1/4" O.D. (.047" Wall/PFA)
4H = 1/4" O.D.(.062" Wall/PFA)
6 = 3/8" O.D. (.062" Wall/PFA)
8 = 1/2" O.D. (.062" Wall/PFA)
10 = 5/8" O.D. (.062" Wall/PFA)
***NOTE: Multiple Line Combinations Available**
EXAMPLES: 4/4, 6/4, 8/4, 8/6, 8/8

Length (in Feet)

Passthrough Power:
BLANK = None
A = 5 Pin Amphenol (Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol (Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol (Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol (Size 14S Shell - Male/97 Series)
E = 5-15
F = C13/C14
G = 4 Pin Ecomate Amphenol
S = 4 Pin Amphenol (END OF LIFE) (Size 14S Shell - Female/97 Series)

If Pass Through Power is Selected
Number of Pass Through Power Lines:
1-3

Pass Through TC:
BLANK = None
T = TC

If Pass Through TC is Selected
Number of Pass Through TC Lines:
1-6

Voltage/Power Plug:
BLANK = 120V *Uses 5-15 (Standard) (15 amps)
C14 = 120V (15 amps)
C14V = 240V (10 amps)
C20 = 120V (20 amps)
C20V = 240V (16 amps)
520 = 120V (20 amps)
L520 = 120V (20 amps/Locking)
620V = 240V (20 amps)
L620V = 240V (20 amps/Locking)

Strain Relief Options:
BLANK = No Strain Relief
CL32 = 2" Cam Lock
CES = 4S Cable Entry System

ENGINEERING & MARKETING LEGEND
(rev3 12-28-2020)

Heated Sample Line (Controller Required) for Gas Sampling

The heavy-duty non-regulated heated sample lines are custom manufactured to be rugged, lightweight, and flexible.

The heated core is insulated with braided carbon fiber. 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 can be attached with swage lock style compression fittings or quick connects. The maximum length is 20 feet.

HSLB-☐-☐

Popular Lengths

Part Number	Description
HSLB-4-10	10-foot, 1/4-inch TFE sample line, braided insulation, 120V
HSLB-4-15	15-foot, 1/4-inch TFE sample line, braided insulation, 120V
HSLB-4-20	20-foot, 1/4-inch TFE sample line, braided insulation, 120V
HSLB-6-6	6-foot, 3/8-inch TFE sample line, braided insulation, 120V
HSLB-6-10	10-foot, 3/8-inch TFE sample line, braided insulation, 120V
HSLB-6-15	15-foot, 3/8-inch TFE sample line, braided insulation, 120V
HSLB-6/4-10	10-foot, 1/4-inch 3/8-inch TFE sample line, braided insulation, 120V
HSLB-6/4-20	20-foot, 1/4-inch 3/8-inch TFE sample line, braided insulation, 120V
HSLB-8-15	15-foot, 1/2-inch TFE sample line, braided insulation, 120V
HSLB-8-20	20-foot, 1/2-inch TFE sample line, braided insulation, 120V

CONTROLLER REQUIRED
HEATED SAMPLE LINE
LEGEND

HSLB-☐ / ☐ / ☐ / ☐ - ☐☐☐☐☐☐☐ - ☐

Sample Line Tubing:
(Create Part Number from Largest to Smallest Tubing Size)
4 = 1/4" O.D. (.047" Wall/PFA)
4H = 1/4" O.D.(.062" Wall/PFA)
6 = 3/8" O.D. (.062" Wall/PFA)
8 = 1/2" O.D. (.062" Wall/PFA)
10 = 5/8" O.D. (.062" Wall/PFA)
***NOTE: Multiple Line Combinations Available**
EXAMPLES: 4/4, 6/4, 8/4, 8/6, 8/8

Length (in Feet)

Passthrough Power:
BLANK = None
A = 5 Pin Amphenol (Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol (Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol (Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol (Size 14S Shell - Male/97 Series)
E = 5-15
F = C13/C14
G = 4 Pin Ecomate Amphenol
S = 4 Pin Amphenol (END OF LIFE) (Size 14S Shell - Female/97 Series)

If Pass Through Power is Selected
Number of Pass Through Power Lines:
1-3

Pass Through TC:
BLANK = None
T = TC

If Pass Through TC is Selected
Number of Pass Through TC Lines:
1-6

Voltage/Power Plug:
BLANK = 120V *Uses 5-15 (Standard) (15 amps)
C14 = 120V (15 amps)
C14V = 240V (10 amps)
C20 = 120V (20 amps)
C20V = 240V (16 amps)
520 = 120V (20 amps)
L520 = 120V (20 amps/Locking)
620V = 240V (20 amps)
L620V = 240V (20 amps/Locking)

Strain Relief Options:
BLANK = No Strain Relief
CL32 = 2" Cam Lock
CES = 4S Cable Entry System

ENGINEERING & MARKETING LEGEND
(rev3 12-28-2020)

CEM Temperature Controllers

Apex Instruments offers customizable temperature controllers for CEM applications where there is a need to control temperature. Our temperature controllers are made with a panel-mounted circuit breaker and a separate solid-state output relay for high-output reliability.

The temperature controllers feature the Fuji controller, an advanced 1/32 DIN temperature controller with self-tuning, a large LED display, and an easy-to-use 3-button keypad for temperature input.

The dual-station controllers can be used in configurations that require control of any two heated devices such as the probe/oven combination or the probe/heated sample line.

Benchtop Model - Single Station

Features:

- Compact and lightweight design
- Stackable metal enclosure
- Vertically mounted heatsink
- Solid-state relay
- Customizable
- Dimensions:
  4-inch x 4-inch x 6-inch

BENCHTOP SINGLE STATION TEMPERATURE CONTROLLER LEGEND

ICS -XR1 ☐ - ☐ ☐

Unit Configuration:
F = Fahrenheit
C = Centigrade

Receptacle (Outlet):
515 = 120V/15A (N. Amer)
520 = 120V/20A (N. Amer)
C13 = IEC 120V/15A (N. Amer) 10A (Int.)
C13V = IEC 240V/10A (Export ONLY)
C19 = IEC 120V/20A (N. Amer) 16A (Int.)
C19V = IEC 240V/16A (Export ONLY)
L520 (Locking) = 120V/20A (N. Amer)
L620 (Locking) = 240V/20A (N. Amer)

Handle or Clamp:
BLANK = Neither
H = Handle
P16 = Probe Mount (1" Aluminum Clamps)

MARKETING LEGEND
(rev0 2-3-2020)

Benchtop Model - Dual Station

Features:

- Compact and lightweight design
- Stackable metal enclosure
- Vertically mounted heatsink
- Solid-state relay
- Customizable
- Convenient carrying handle
- Dual temperature control
- Dimensions:
  7-inch x 7.5-inch x 8.5-inch

BENCHTOP DUAL STATION TEMPERATURE CONTROLLER LEGEND

ICS -XR2 ☐ - ☐ ☐

Unit Configuration:
F = Fahrenheit
C = Centigrade

Receptacle (Outlet):
515 = 120V/15A (N. Amer)
520 = 120V/20A (N. Amer)
C13 = IEC 120V/15A (N. Amer) 10A (Int.)
C13V = IEC 240V/10A (Export ONLY)
C19 = IEC 120V/20A (N. Amer) 16A (Int.)
C19V = IEC 240V/16A (Export ONLY)
L520 (Locking) = 120V/20A (N. Amer)
L620 (Locking) = 240V/20A (N. Amer)

Optional Secondary Output:
A = 5 Pin Amphenol (Size 14S Shell - Male/97 Series)
B = 5 Pin Amphenol (Size 14 Shell - Bayonet Style/PT Series)
C = 5 Pin Amphenol (Size 16S Shell - Male/97 Series)
D = 4 Pin Amphenol (Size 14S Shell - Male/97 Series)
E = 4 Pin Ecomate Amphenol (Size 1 Shell - Male/C16-3 Series)
S = 4 Pin Amphenol (END OF LIFE) (Size 14S Shell - Female/97 Series)

CEM Temperature Controllers (continued)

Rugged Model - Single or Dual Station

Features:

- Compact and lightweight design
- Portable, rugged enclosure
- Durable diecast exterior
- Convenient carrying handle option
- Customizable
- Dimensions: 7.5-inch x 6-inch x 3.25-inch

RUGGED TEMPERATURE CONTROLLER LEGEND

ICD-XR ☐☐-☐☐

Number of Stations:
1 = One Station
2 = Two Stations
(*Duplicate Receptacles)

Unit Configuration:
F = Fahrenheit
C = Celsius

Receptacle (Outlet):
515 = 120V/15A (N. Amer)
C13 = IEC 120V/15A (N. Amer) 10A (Int.)
C13V = IEC 240V/10A (Export ONLY)
C19 = IEC 120V/20A (N. Amer) 16A (Int.)
C19V = IEC 240V/16A (Export ONLY)

Handle or Clamp:
Blank = Neither
H = Handle
P16 = Probe Mount (1" Aluminum Clamps)
P12 = Probe Mount (3/4" Aluminum Clamps)

MARKETING LEGEND (rev1 4-28-2020)

Weather-Resistant Model

Features:

- Designed and tested to withstand the effects of any adverse weather
- Rain/moisture-resistant
- Safe to use in hot or cold weather
- Uses stainless-steel guard rails to protect the controller and ensure proper use
- Dimensions: 19-inch x 3.5-inch x 13-inch

WEATHER RESISTANT SINGLE STATION TEMPERATURE CONTROLLER LEGEND

ICW-XR1 ☐-☐

Unit Configuration:
F = Fahrenheit
C = Centigrade

Receptacle (Outlet):
515 = 120V/15A (N. Amer)
520 = 120V/20A (N. Amer)
C13 = IEC 120V/15A (N. Amer) 10A (Int.)
C13V = IEC 240V/10A (Export ONLY)
C19 = IEC 120V/20A (N. Amer) 16A (Int.)
C19V = IEC 240V/16A (Export ONLY)

MARKETING LEGEND (rev0 2-7-2020)

Rack-Mountable Model

Features:

- 19-inch rack-mountable
- 2U rack spacing
- Up to 4 stations
- Custom configurations

RACK MOUNT TEMPERATURE CONTROLLER LEGEND

ICR-XR ☐☐

Number of Temperature Controllers:
1-4 Available

Unit Configuration:
F = Fahrenheit
C = Celcius

NOTE:
All rackmount temperature controllers come standard with a separate 20 amp circuit breaker for each controller
- Power entry via IEC C19 (power cord sold separately)
- Power output via NEMA 5-20 receptacle

CUSTOM CONFIGURATIONS AVAILABLE

ENGINEERING & MARKETING LEGEND (rev0 4-7-2020)

Apex Instruments Flow Drawer

AFD-510

The Apex AFD-510 is designed to be an easy, convenient, and compact way to control the flow of both stack and calibration gases.

This new panel can flow gas to either the analyzer bank (direct calibrations) or the probe (system calibrations), and has both automatic and manual controls.

This unit has been designed with simplicity in mind. It has the same common solenoids and a simplified wiring protocol.

The calibration gas in use is identified by a LED along with which mode you are in and if you are sampling or calibrating. One big benefit of the Apex Instruments AFD-510 is that in sampling mode all solenoids are at "rest" which greatly extends the life of the unit.

AFD-510

AFD-510

Features

- 11 calibration gas channels (including zero and span)
- 5 output or analyzer channels
- 8-valved rotometers for fine flow control and adjustment
  - 5 analyzer rotometers
  - 1 vent rotometer
  - 1 probe calibration
  - 1 sample flow rotometer
- 19-inch rack mountable
- Designed for easy maintenance and repair
- Manual or automatic operation

Specifications:

Input cal-gas channels:

Flow meters standard:	Sample	0-10 LPM
	Vent	0-10 LPM

Output gas channels:

Flow meter: 0.2-2.5 LPM

Voltage: 110.220 VAC at 50/60 Hz

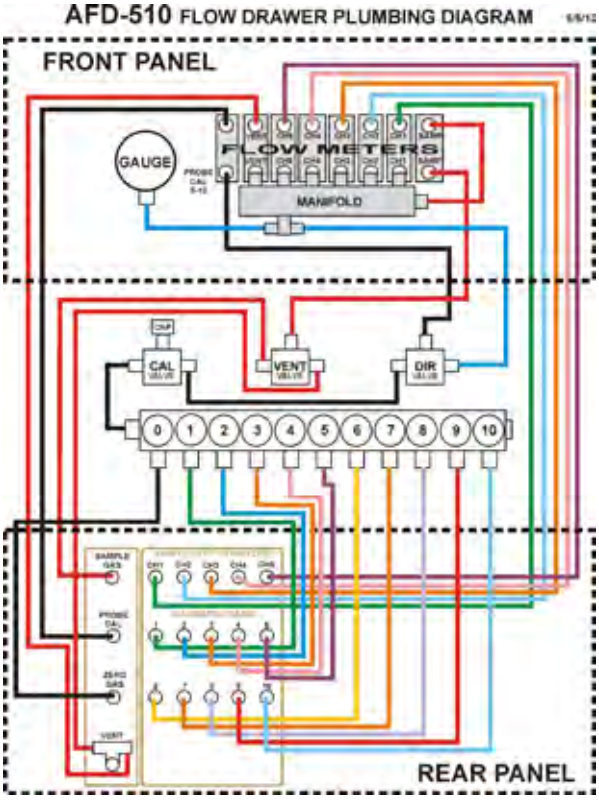
Power: 25 watts

Mounting dimensions: 4U, 19-inch rack mount, 7 inch height x 19 inch width x 18 inch depth

Weight: Approximately 24 lbs

Pressure gauge: 0-15 psi

Connections: 1/4-inch stainless-steel tube union



Web: apexinst.com

Phone: 800-882-3214 / 919-557-7300

APEX INSTRUMENTS

AMETEK Process Instruments

Manufacturer of individual analyzers and turn-key CEM rack systems for dry-basis monitoring of pollutants in flue gases. Analyzers are available for use in new or existing extractive CEM rack systems (or other instrument racks) where the sample gas entering the analyzer is non-condensing at ambient temperatures.

www.ametekpi.com

California Analytical Instruments

California Analytical Instruments, Inc. (CAI) provides quality gas analyzers and systems used in industrial, environmental, process and automotive emissions applications. CAI products include infrared analyzers; chemiluminescence analyzers, oxygen analyzers, flame ionization analyzers, UV fluorescence analyzers, FTIR, integrated systems, specialty products, photoacoustic IR analyzers.

www.gasanalyzers.com

BRAND GAUS

NOx, O_2 and NO_X-O_2 gas analyzers designed for use in continuous emissions monitoring systems (CEMS) for gas turbines; designed for reliability and simple operation; with industrial interfaces for continuous visible diagnostics and intuitive calibration without the use of delicate character displays or complicated menu systems.

www.brandgaus.com

ENVIRONICS Analytics

Known for computerized gas flow instrumentation, especially gas-mixing technology, based on very precise control of thermal mass flow controllers, combined with Environics computerization and calibration results for improved accuracy (to +/- 1%) of setpoint.

www.environics.com

Wöhler

Since their origin in 1932, Wöhler has relied on research, development, and manufacturing made in Germany. Wöhler USA Inc. is part of the global Wöhler group of companies.

Wöhler has been a synonym for quality and progressive innovations in the field of measuring instruments, visual inspection systems, and cleaning equipment for heating, ventilation, facility management, and industrial applications.

www.wohlerusa.com

TELEDYNE INSTRUMENTS (API)

TAPI offers products for continuous emissions monitoring, including: ultraviolet absorption analyzers, paramagnetic analyzers, infrared gas filter correlation analyzers, nondispersive Infrared (NDIR) analyzers, ultraviolet fluorescence analyzers, chemiluminescence analyzers.
www.teledyne-api.com/overview.asp

VIG INDUSTRIES

Offers microprocessor-controlled hydrocarbon analyzers; dual or single channel (FID) flame ionization detector-based (GC) gas chromatography, (VOC) volatile organic compounds, and (THC) total hydrocarbon analyzer systems.
www.vigindustries.com/products.htm

MKS Instruments

Offers pressure measurement and control, flow measurement and control, gas and vapor delivery, gas composition analysis, residual gas analysis, leak detection, control and information technology, ozone generation and delivery, RF and DC power, reactive gas generation, and vacuum technology.
www.mksinst.com

SERVOMEX

Known for paramagnetic sensing technology and the development of zirconia, photometric, thick film and plasma technologies. The result is high-performance, cost-effective gas analysis, delivered through a portfolio of dependable products ranging from portable gas analyzers to complex process solutions.
www.servomex.com/servomex/web/web.nsf/en/servopro-1440

Bacharach

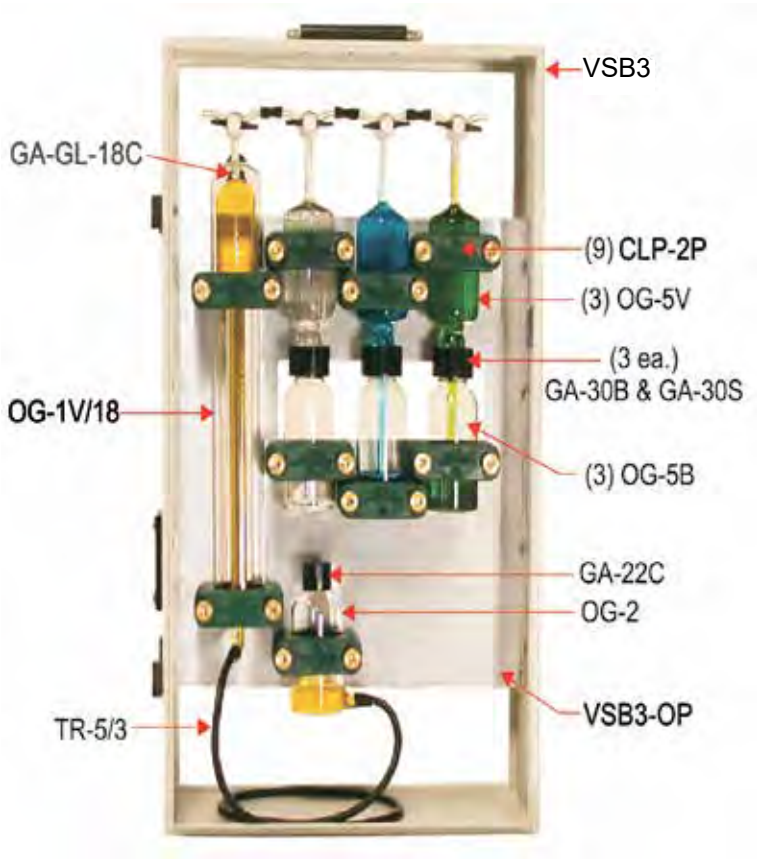
Bacharach, Inc. is a world leader in the design, manufacture, and service of advanced equipment for the measurement and detection of gases and liquids. The company's extensive product line includes instruments that detect, measure, and record combustion and environmental gases, temperature, relative humidity, air velocity, and other air quality and safety parameters. A full line of refrigerant recovery equipment for residential, industrial, and automotive applications further extends Bacharach's family of products.
www.mybacharach.com

Method 3 Orsat Analyzer

Method 3 determines CO_2 and O_2 concentrations and dry molecular weight of a sample from an effluent gas stream. The gas sample is analyzed for CO_2 and O_2 on a gas absorbtion basis; the results are expressed in precentage units. For dry molecular weight determination, either an Orsat or a Fyrite analyzer may be used for the calculations.

The Orsat analyzer train is designed for Method 3: for analysis of integrated bag samples collected in Tedlar® bags. A liquid-filled leveling bottle moves the integrated sample through a graduated glass burette and absorption pipettes containing absorbing reagents. The resulting changes in volume measure percent of O_2, CO_2 and CO. The burette is water-jacketed for temperature stability.

VSC-33



Squeeze Bulb Pump

The heavy-wall rubber squeeze bulb pump with stainless-steel valves and connections can be used for gas sampling, pressure source for calibrations and leak tests, and for conditioning probes and sample lines.

A-350

Orsat Accessories

Model	Description
OG-1V/18	Burette, with 3-way valve and water jacket, PTFE valve body, 100 mL, scale 0-30% x .01
OG-2	Aspirator bottle
OG-5V	Contact pipette, valved, insert only
OG-5B	Pipette bottle with hose barb
GA-GL-18C	Solid cap with #18 threads and seal
GA-30B	Bored cap with #30 threads, 22 mm ID
GA-30S	Silicone seal ring #30 threads, 22 mm ID
TB-3V-P	Tedlar® bag, three-compartment with three poly valves
TR-5/3	Black rubber tubing, 5/16-inch OD x 3/16-inch ID, per foot
CLP-2P	Green plastic clamp, 2-inch ID with knurled brass thumb nuts
VSB3	VersaCase 3, with hinged, removable doors and mounting rail
VSB3-OP	VersaCase mounting plate

Replacement Fluids

Burrell oxsorbent solution for determining oxygen in gas analysis, 8 oz bottles.

B39-710

Burrell cosorbent, solution for determining carbon monoxide in gas analysis, 8 oz bottles.

B39-720

Burrell Disorbent solution for determining carbon dioxide in gas analysis, 16 oz bottles.

B39-730

Domestic delivery only, sold by case (12 bottles per case).

Drop shipped by vendor due to hazardous classification.

Combustion Gas Analyzer

Fyrite® Gas Analyzers

Fyrite® gas analyzers are fast, accurate and easy-to-use instruments for measuring and analyzing carbon dioxide or oxygen. Fyrite® analyzers are available for either CO_2 or O_2 analysis. Fyrite® indicators have a broad range; they may be exposed to ambient temperatures from -34° to 65°C (-30° to 150°F). Gases up to 450°C (850°F) may be tested with standard aspirator sampling equipment. Single analyzers and additional ranges are available along with refill and repair kits. Call for details.

Fyrite® CO^2

Duplex Kits

Model	Description
B10-5020	CO_2 and O_2 Fyrite® gas analyzer, CO_2 range 0-20%, O_2 range 0-21%
B10-5021	CO_2 and O_2 Fyrite® gas analyzer for export only, CO_2 range 0-20%, O_2 range 0-21%

USA Kits
CO_2 Testing

Model	Description
B10-5000	CO_2 Fyrite® gas analyzer, range 0-20%

Export Single Kits
CO_2 Testing

Model	Description
B10-5001	CO_2 Fyrite® gas analyzer, range 0-20%

Repair Kits

Includes a bottle of Fyrite® fluid, valve plunger gasket, top gasket, screws, diagram, and envelope of filtering material.

Model	Description
B11-7052	CO_2 Fyrite® gas analyzer repair kit, range 0-20% + 60%
B11-7054	O_2 Fyrite® gas analyzer repair kit, range 0-20% + 60%

O_2 TESTING

Model	Description
B10-5011	O_2 Fyrite® gas analyzer, range 0-21%

O_2 TESTING

Model	Description
B10-5012	O_2 Fyrite® gas analyzer, range 0-21%

Refill Kits

Includes two bottles of Fyrite® fluid, top gasket, screws, and an envelope of filtering material.

Model	Description
B11-7047	CO_2 Fyrite® gas analyzer refill kit, range 0-20% + 60%
B11-7050	O_2 Fyrite® gas analyzer refill kit, range 0-21% + 60%

Fluids

Model	Description
B10-5057	CO_2 Fyrite® fluid, range 0-20% + 60%, 3 2-oz bottles per case
B10-5060	O_2 Fyrite® fluid, range 0-20% + 60%, 3 2-oz bottles per case

For more information on Bacharach products visit:
www.bacharach-inc.com

Peristaltic Pumps

Peristaltic pumps are useful in a variety of applications. The material to be pumped only comes in contact with the tubing. This is ideal for applications where the product to be moved or pumped should not touch any foreign materials. Also, peristaltic pumps are precision flow rate devices with each revolution of the roller assembly delivering a precise amount of gas. Finally, peristaltic pumps are self-priming and can handle a wide variety of viscosities, from air to gases to heavy slurries.

Apex features three lines of peristaltic pumps for a variety of markets - from laboratory applications to process engineering to heavy-duty production and manufacturing. Our pumps are accurate, durable, and easy to use. Economically priced, fixed-flow peristaltic pumps are available for a wide range of flows.

LS Series Peristaltic Pump

The LS Series is our most durable and long-term peristaltic pump option. The pump motor comes in three different speeds and one or two heads can be used simultaneously.

See legend for a detailed list of ordering options and flowrates.

LS Series Peristaltic Pump

LS
PERISTALTIC PUMP
LEGEND

PP-☐ LS☐☐ 15

Motor Speed:
6 = 6 RPM (120V)
6V = 6 RPM (240V)
20 = 20 RPM (120V)
60 = 60 RPM (120V)

# of Heads:
A = One Head
B = Two Heads

Tubing Material:
S = Silicone
N = Norprene

FLOW RATES
6 RPM Motor = 10 mL/Minute
20 RPM Motor = 34 mL/Minute
60 RPM Motor = 102 mL/Minute

MARKETING LEGEND
(rev0 1-15-2020)

MiniFlex Peristaltic Pump

The MiniFlex peristaltic pump features a head with two tube slots and an easy-load function. The MiniFlex offers three different motor speeds and is capable of holding two different tube sizes.

See legend for a detailed list of ordering options and flowrates.

MF
PERISTALTIC PUMP
LEGEND

PP-☐ MFB☐☐

Motor Speed:
6 = 6 RPM (120V)
6V = 6 RPM (240V)
20 = 20 RPM (120V) (Standard)
60 = 60 RPM (120V)

Tubing Material:
S = Silicone
N = Norprene

Tubing Size:
14 = Size 14 (0.14 mL/rev)
16 = Size 16 (0.55 mL/rev)

Motor Speed	Tubing Size	
	14	16
6	0.8 mL/min	3.3 mL/min
20	2.8 mL/min	11 mL/min
60	8.4 mL/min	33 mL/min

MARKETING LEGEND (rev0 1-15-2020)

MiniFlex Peristaltic Pump

- Two-channel heads lets you pump two channels without stacking heads; automatic retention holds tubing securely in place with no manual adjustment
- Two-channel head lets you pump two synchronous flow channels (proper retention requires the use of the same size tubing in each channel)
- Improved occlusion bed geometry lengthens tubing life
- Easy-load head for quick and easy tube loading

Economy Peristaltic Pump

Economy Peristaltic Pump

The Economy peristaltic pump is our most cost-effective option. This pump comes in two motor speeds and is capable of holding three different tube sizes. The head of this pump can be oriented in any direction for additional flexibility during setup.

See legend for a detailed list of ordering options and flowrates.

AN (Economy)
PERISTALTIC PUMP
LEGEND

PP-☐ AN☐☐

Motor Speed:
14 = 14 RPM (120V)
14V = 14 RPM (240V)
108 = 108 RPM (120V)
108V = 108 RPM (240V)

Tubing Material:
S = Silicone
N = Norprene

Tubing Bore:
2 = 1/8" I.D. (0.87 mL/Rev)
3 = 3/16" I.D. (2.0 mL/Rev)
4 = 1/4" I.D. (3.2 mL/Rev)

Motor Speed	Tubing Size		
	2	3	4
14	12 mL/min	28 mL/min	44 mL/min
108	93 mL/min	216 mL/min	345 mL/min

MARKETING LEGEND (rev0 1-15-2020)

Accessories

Balances

Tubing and

Software

PFA

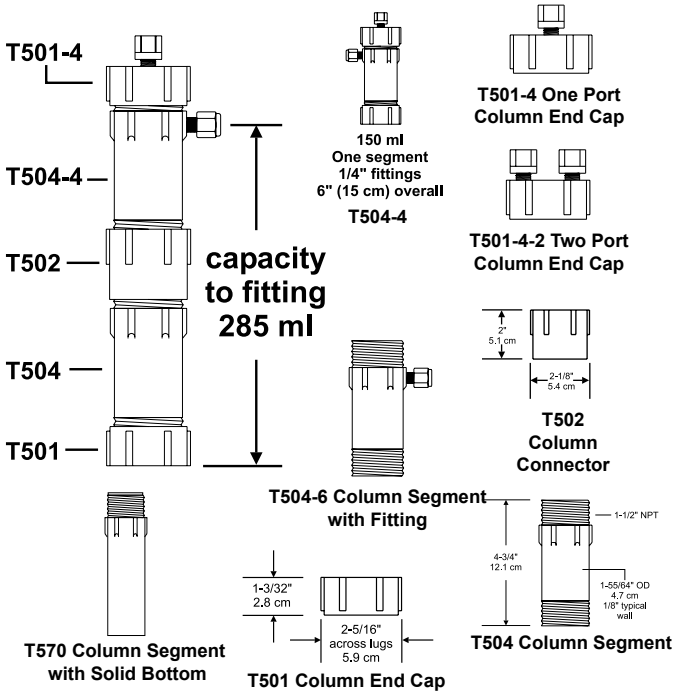
PFA Column Components
PFA column components are PFA fluorocarbon resin and inert to virtually all chemicals. All are usable for a wide variety of temperature ranges from below 32°F to 500°F (0°C to 260°C). The individual components can be assembled for a variety of uses. Components can be purchased separately and assembled according to project specifications.

VGC-12

Features:

- Unbreakable
- Leak-tight without sealants
- Grooved for heat transfer
- Adaptable for adding recirculation fittings
- Quick connections with preformed tube bends

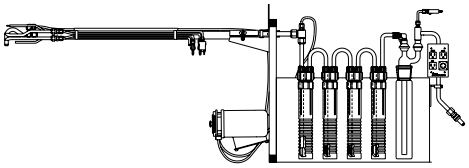
	Segmented PFA column and accessories:
T501	PFA column end cap, solid
T501-4	PFA column end cap with 1/4-inch tube fitting
T501-4-2	PFA column end cap with two 1/4-inch tube fittings
T501-6	PFA column end cap with 3/8-inch tube fitting
T501-6-2	PFA column end cap with two 3/8-inch tube fittings
T502	PFA column connector
T504	PFA column segment
T504-4	PFA column segment with 1/4-inch tube fitting
T504-6	PFA column segment with 3/8-inch tube fitting
T504-47	PFA column segment - adapts to 47mm filter holder
T504S	PFA screen, separator slides into T504
T570	PFA column segment, solid bottom

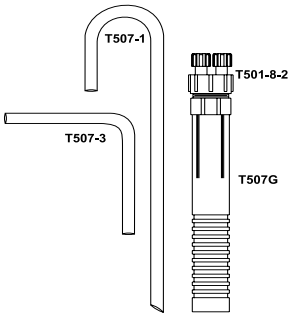


PFA Impingers and Accessories

Although used primarily as SO_2 scrubbers for U.S. EPA Method 16A, determination of total reduced sulfur emissions from stationary sources, the T507G Impinger can be used in other procedures such as Methods 5 and 6 (hexavalent chrome).

Hexavalent Chromium PFA Impinger Trains





PFA Filter Assemblies

Used in Method 26 for HCl emissions. TFA-25 high-temperature PFA clamp nuts are standard, 1/4-inch tube fittings. TFA-47 standard with 1/4-inch tube unions. Also available with 1/4-inch male pipe fittings or 3/8-inch tube fittings.

PFA Impingers, Stems and Fittings

	Grooved vessel
T507G	Impinger single-piece body, 375ml
	PFA L-stems:
T507-3	L-stem, 1/2-inch FEP, full-length
T507-3R	L-stem, 1/2-inch FEP, restricted tip
T507-5	L-tube outlet, 1/2-inch FEP, short ends
	PFA U-stems:
T507-1	U-stem, 1/2-inch FEP, plain tip
T507-1R	U-stem, 1/2-inch FEP, restricted tip
	PFA Straight stems:
T507-2	Straight stem, 1/2-inch FEP, full-length
T507-2R	Straight stem, 1/2-inch FEP, restricted
T507-6	Straight Tube Outlet, Short End

	Fittings:
T501-8-2	PFA impinger cap, two 1/2-inch tube fittings
T55	PFA impinger wrench set
NTG-10U2	5/8-inch glass-filled PTFE union with 1/8-inch FNPT tap (for nozzle recirculation)
NTG-10F	5/8-inch glass-filled PTFE single ferrule
NTG-10F-DZ	5/8-inch glass-filled PTFE single ferrule (dozen)
4MSEL2N-PFA	PFA male elbow, 1/4-inch tube union to 1/8-inch
8-4-10ET-T	PFA jump tee (1/4-inch, 1/2-inch, 5/8-inch tube unions) with nylon nuts and TFE ferrules
10-4-8ET-T	Alternate PFA jump tee (1/4-inch, 1/2-inch, 5/8-inch tube union) with nylon nuts and TFE ferrules
4MSC2N-PFA	PFA union, 1/4-inch tube union to 1/8-inch MNPT
8-4-8ET-PFA	Recirculation Run Tee,1/4-inch, 1/2-inch, 1/4-inch PFA Tube Unions,1/4-inch Tube Union Bore through Recirculation Line

	PFA filter assemblies:
TFA-25	PFA 25mm filter assembly, 1/4-inch tube fittings
TFA-25B	25mm PFA filter replace body only with 1/4-inch TU, no clamp
TFA-47	PFA 47mm filter assembly, 1/4-inch tube fittings
TFA-47-6	PFA 47mm filter assembly, 3/8-inch tube fittings

Cam-Lock, Flanges, Port Adapters and Packing Glands

Pipe Flange

Product	Description
PF-4PG38S	4-inch pipe flange, 150-lb pattern with 2-inch pipe packing gland (for use with probes with pitot option, pipe outersheath), stainless steel
PF-346S	Flange plate with 2.375-inch hole for 2-inch pipe, fits 3-inch, 4-inch and 6-inch ports, stainless steel
PF-46XT32S	2-inch FNPT probe support with extension

PROBE FLANGE CAP

Product	Description
PF-CAP	2.5-inch probe flange cap assembly, consists of 304 stainless-steel bevel seat cap and nut

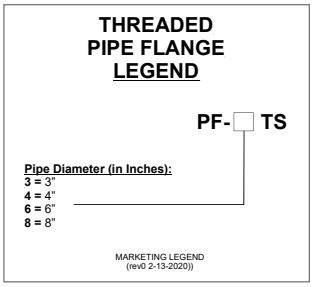
Blind Pipe Flanges

Product	Description
PF-3BLS	3-inch pipe flange, 150-lb pattern, blind, raised face, 7.5-inch OD, 6-inch bolt circle diameter, stainless steel
PF-4BLS	4-inch pipe flange, 150-lb pattern, blind, raised face, 9-inch OD, 7.5-inch bolt circle diameter, stainless steel
PF-6BLS	6-inch blind pipe flange, 150-lb pattern, 11-inch OD, 9.5-inch bolt circle diameter, stainless steel

Bored Pipe Flange

Product	Description
PF-3/40CLS	3-inch bored pipe flange, 150-lb pattern, 2.670 bored diameter, with size 40 cam-lock connector, stainless steel
PF-4B2.670S	4-inch bored pipe flange, 2.67-inch raised face, 150-lbs, pattern, stainless steel
PF-6B2.670S	6-inch bored pipe flange, 150-lb pattern, 2.670 bored diameter, stainless steel
PF-4/40CLS	4-inch bored pipe flange, 150-lb pattern, 2.67 bored diameter welded cam-and-groove connector (for probes without pitot option, with tube outer sheath) with size 40 cam-lock connections, stainless steel
PF-6/40CLS	6-inch bored pipe flange, 150-lb pattern, 2.67 bored diameter welded cam-and-groove connector (for probes without pitot option, with tube outer sheath) with size 40 cam-lock connections, stainless steel
PF-6CLS	6-inch bored pipe flange, 150-lb pattern, 2.670 bored diameter, with cam-lock connector, stainless steel

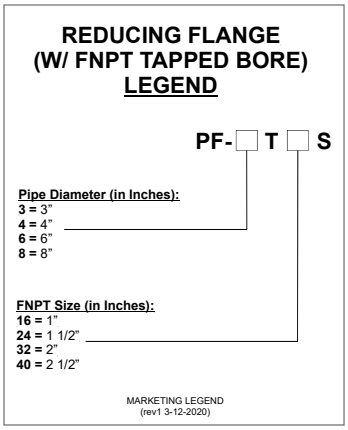
Threaded Pipe Flanges



Threaded Pipe Flanges

Product	Description
PF-2T	2-inch threaded 304 flange, 6-inch OD, 4.75-inch bolt circle diameter carbon steel
PF-3T	3-inch threaded pipe flange, 150-lb pattern, 7.5-inch OD, 6-inch bolt circle diameter, carbon steel
PF-4T	4-inch threaded pipe flange, 150-lb pattern, 9-inch OD, 7.5-inch bolt circle diameter, carbon steel
PF-6T	6-inch threaded pipe flange, 150-lb pattern, 11-inch OD, 9.5-inch bolt circle diameter, carbon steel
PF-3TA	3-inch FNPT threaded pipe flange, 150-lb pattern, 7.5-inch OD, 6-inch bolt circle diameter, cast aluminum
PF-4TS	4-inch FNPT threaded pipe flange, 150-lb pattern, 9-inch OD, 7-1/2-inch bolt circle diameter, stainless steel
PF-6TS	6-inch FNPT threaded pipe flange, 150-lb 11-inch OD, 9.5-inch bolt circle diameter, stainless steel
PF-3T16S	3-inch pipe flange, 1-inch FNPT center cut thread, stainless steel
PF-4T16S	4-inch pipe flange, 1-inch FNPT center cut thread, stainless steel

Flanges and cam-locks



Universal Pipe Flange and Flange Reducers

Product	Description
PF-346T32S	2-inch FNPT, universal pipe flange reducer, fits 3-inch, 4-inch and 6-inch ports, stainless-steel
PF-46XT32S	2-inch FNPT, universal pipe flange reducer with 12-inch extension, reversible, fits 4-inch, 6-inch ports
PF-46T32S	2-inch FNPT, universal pipe flange reducer, fits 4-inch, 6-inch pipe flanges, stainless steel
PF-4/6U32-S	Universal pipe flange with 2-inch FNPT, fits 4-inch and 6-inch p orts
PF-4/6UCLS	Universal Flange, 4-inch/ 6-inch w/ 2-1/2-inch Cam-Lock

Cam-Lock Packing Glands

Packing Glands

Oversheath Packing Glands

PF-4/6UCLS

PG-32/40CL

PF-4/40CLS
PF-6/40CLS

360 Degree Compass Rose Flange

Product	Description
PF-346T32A360	Flange with 360º (0-90 º x4) compass rose laser-engraved; 2-inch half coupling welded; fits 3-inch, 4-inch and 6-inch flanges; includes arrow pointer for 2-inch oversheath probe, stainless steel
PF-346XT32S360	Flange with 360º (0-90º X 4) compass rose laser engraved. 2-inch half coupling welded; fits 3-inch, 4-inch and 6-inch flanges; includes arrow pointer for 2-inch oversheath probe, with bored bushings and 2-inch diameter probe support extension, stainless steel

Packing Glands for Pitots

Product	Description
12MTC12-B	3/4-inch packing gland for pitot with 3/4-inch oversheath, includes nylon and brass ferrules, brass
12MTC12-S	3/4-inch packing gland for pitot with 3/4-inch oversheath, includes nylon and ferrules, stainless steel
16MTC16N-B	1-inch packing gland for pitot with 1-inch oversheath
16MTC16N-S	1-inch packing gland for pitot with 1-inch oversheath, includes stainless-steel ferrule
16MTC16N-ST	1-inch packing gland, for pitot with 1-inch oversheath, (does not include nylon ferrule), steel
16MTC16N-SF	1-inch packing gland for pitot with 1-inch oversheath, includes nylon ferrules, stainless steel, and 16MTC16-S
12F-GR	3/4-inch graphite ferrule, alternative packing for 16MTC16
16F-GR	1-inch graphite ferrule, alternative packing for 16MTC16

Packing Gland Flange

Product	Description
PF-346PG38	Packing gland flange fits 3-inch, 4-inch, 6-inch, includes packing gland for 2-inch pipe, stainless steel

Bored Bushings

Product	Description
32M/16B-B	Bored bushing, 2-inch MNPT X 1.035-inch bore, brass
32M/24B-B	Bored bushing, 2-inch MNPT X 1.535-inch bore, brass
32M/32B-B	Bored bushing, 2-inch MNPT X 2.035-inch bore, brass

Oversheath Packing Glands

Product	Description
PG-24T	1.5 inch oversheath packing gland, steel body, 1.5 inch MNPT, PTFE packing
PG-32S	2-inch oversheath packing gland, steel body, 2-inch MNPT, PTFE ferrule included
PG-32/40CL	2-inch oversheath packing gland, steel body, PTFE packing (for use with PF-40CLS flange) with size 40 cam-and-groove connector
PG-38/48CL	3-inch oversheath packing gland, stainless-steel body, cam-lock, for use with pitot version mercury probes with pipe oversheath

Packing Gland Accessories

Product	Description
PG-32F	2-inch adapter, threaded bevel seat, #21-2, custom bore, 2.125-inch ID, used in PG-32S, stainless steel, Note: Does not include nut or ferrule.
PG-32NT	2-inch adapter, bevel seat, #21-2, custom bore, 2.125-inch ID, welded to PF-XXX flange assembly, extension, or PC-XXX. Note: Does not include nut or ferrule.
PG-38RT	Thrust ring, 2.435 ID X 2.875 OD, for PG-38-3Q packing gland, stainless steel

Reducing Couplings

Product	Description
64RUC32-CS	Coupling, reducer, 4-inch x 2-inch FNPT, carbon steel
48RUC32-CS	Coupling, reducer, 3-inch x 2-inch FNPT, carbon steel

Reducing Bushings

Product	Description
64M/32F-CS	Reducing bushing, 4-inch MNPT-2-inch FNPT, carbon steel
48M/32F-CS	Reducing bushing, 3-inch MNPT-2-inch FNPT, carbon steel
32M/16F-B	Reducing bushing, 2-inch MNPT-1-inch FNPT, brass

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 dry gas meter, 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

Dry gas meter, Pitot and Orifice Calibration Services

DGM Calibration Service Part Numbers

DGM CALIBRATION LEGEND

DGMC-□-□□

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

Flow Rate:
HF = Range Between 10 to 35 lpm
MF = Range Between 5 to 25 lpm
LFA = Range Between .25 to .90 lpm
LFB = Range Between .25 to 2.20 lpm
LFC = Range Between .25 to 4 lpm
CF = Custom Flow Rate

Dual DGM Option:
2 = Dual DGM Models

MARKETING LEGEND (rev0 1-31-2020)

Pitot Calibration Services

Geometric of type-S pitot tube to Method 2.

PT-CAL-G

Critical Orifice Calibrations

Apex performs both calibrations using a wet test meter and and also the bell-prover primary standard. Calibration services are available from Apex Instruments on a fee per console basis. Extra charge for low flow.

CAL-ORF

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 is fitted with an optical encoder and a digital display. Calibrations are sold separately.

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

DGM REFERENCE METER LEGEND

DGM-SK25R ☐ - ☐☐

Calibration Units:
BLANK = No Calibration
I = Imperial
M = Metric

Connector Type:
QS4 = 1/4" Instrumental Quick Connect
QS8 = 1/2" Instrumental Quick Connect
QF4 = 1/4" Full Flow Quick Connect
TU4 = 1/4" Tube Union w/ Nut

Calibration Flow Rates:
H = 0.35-1.24 CFM (Imperial)/ 10-35 LPM (Metric)
A = 0.25-0.90 LPM (Metric Only)
B = 0.25-2.20 LPM (Metric Only)
C = 0.25-4.00 LPM (Metric Only)

MARKETING LEGEND
(rev0 10-7-2020)

Wind Tunnel calibration

Wind tunnel of type-S pitot tube to Method 2.
PT-CAL-W☐☐☐

WIND TUNNEL CALIBRATION LEGEND

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 = Method 5 Probe w/ 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 (Feet per Second):
A = 50 fps (Std. for Method 5, 2 and 201A)
B = 60 and 90 fps
C = 30, 60 and 90 fps
D = Custom (Specify)

ENGINEERING & MARKETING LEGEND
(rev0 2-7-2020)

Tubing

PTFE Tubing

PTFE resin is supplied in powdered form; PTFE resin is extruded into a paste and then finally tubing and is translucent white in color. The minimum and maximum temperature ranges are <-170°C to 260°C (-275°F to 500°F). Tensile strength is 3200 psi.

Product	Description
TPFA-☐/ ☐	PFA (Perfluoralkoxy) combines the attributes of PTFE and FEP; the working temperature is 500ºF (260ºC); color is clear with a light blue tint; highest resistance to chemical, pharmaceutical grade, less likely to kink
PTFE-☐/ ☐	PTFE (Tetrafluoroethylne) possess the lowest coefficient of friction of any known solid and is used widely because of its anti-stick properties, which allow easy cleaning; PTFE has chemical-resistant qualities and is unaffected; working temperature is 500ºF (260ºC); color is milky white
TF-☐/ ☐	FEP (Fluorinated Ethylene Propylene) is one of the clearest plastics on the market and can be supplied in long continuous lengths; it can also be welded and tubes can be sealed by melting; FEP has good transmission of ultraviolet rays and visible rays; working temperature is 400ºF (204ºC); color is clear

Product	Description
TT-2/1	1/8-inch OD, 1/16-inch ID, natural PTFE heavy-wall tubing
TT-4/2	1/4-inch OD, 1/8-inch ID, natural PTFE heavy-wall tubing
TT-6/4	3/8-inch OD, 1/4-inch ID, natural PTFE heavy-wall tubing
TT-8/6	1/2-inch OD, 3/8-inch ID, natural PTFE heavy-wall tubing
TT-10/8	5/8-inch OD, 1/2-inch ID, natural PTFE heavy-wall tubing

PFA Tubing

PFA Resin is translucent white in color.

TPFA-10/8	Tubing, PFA, 1/2-inch ID x 5/8-inch OD x .062 wall
TPFA-4-047W	Tubing, PFA, 5/32-inch ID x 1/4-inch OD x .047 wall
TPFA-4/2	Tubing, PFA, 1/8-inch ID x 1/4-inch OD x .062 wall
TPFA-6/4	Tubing, PFA, 1/4-inch ID x 3/8-inch OD x .062 wall
TPFA-8/6	Tubing, PFA, 3/8-inch ID x 1/2-inch OD x .062 wall

FEP tubing is available.

PFA Tubing with Stainless Steel Overbraid

Tubing constructed of an extruded innercore of virgin PFA with a 304 stainless-steel braid reinforcement. The innercore is non-aging and has a long flex-life, it is weather resistant and the nonstick surface makes cleaning an ease. The braid acts as both a carrier of pressure and a protective covering. Requires tube stub crimps (6TS6C-S) for each end (per foot).

TTO- ☐	- ☐ (Nominal)
TTO-4	PTFE tubing with stainless-steel overbraid, nom.1/4-inch requires tube stub crimps (4TS4C-S) each end, per foot
4TS4C-S	Tube stub crimp,1/4-inch one used on each end of stainless-steel overbraid, PTFE tubing
TTO-6	PTFE Tubing with SS Overbraid, nom. 3/8-inch requires tube stub crimps (6TS6C-S) each end, per foot
6TS6C-S	Tube stub crimp, 3/8-inch one used on each end of stainless-steel overbraid, PTFE tubing
TTG-10/6	PTFE Probe Liner Material, 5/8-inch OD, 3/8-inch ID, Price Per Ft.

Polyurethane Tubing

Polyurethane tubing offers an excellent resistance to kinking, abrasion, hydrolysis, oxidation, and ozone. It also offers high resilience, good energy absorption and good at over all chemical resistance. It is excellent in applications requiring superior toughness and resistance to tear, abrasion, fungus, and humidity.

TU-☐ / ☐	-☐ (Tube OD) / ☐ (Tube ID)
TU-4/2	Polyurethane, 1/4-inch OD, .17-inch ID (per foot)
TU-6/4	Polyurethane, 3/8-inch OD, 1/4-inch ID (Per Foot)

Polyolefin and Polyethylene Tubing

Polyolefin elastomer (POE) resin is highly flexible, chemical resistant, highly durable and ideal for low pressure applications. Low-density linear extruded polyethylene resin tubing is tough, flexible, chemical and moisture resistant.

TPOE-☐ / ☐ ☐	-☐ (Tube OD) /☐ (Tube ID) ☐(Color; BK= black, BL=blue, NA=natural, OR=orange, YW=Yellow)
TPOE-4/2BK	Polyolefin, 1/4-inch OD, black (per foot)
TPOE-4/2NA	Polyolefin, 1/4-inch OD, natural (per foot)
TPOE-4/2OR	Polyolefin, 1/4-inch OD, orange (per foot)
TPOE-4/2YW	Polyolefin, 1/4-inch OD, yellow (per foot)
TP-6/4BK	Polyethylene, 3/8-inch OD, black (per foot)
TP-6/4NA	Polyethylene, 3/8-inch OD, natural (per foot)

Tubing (Rigid)

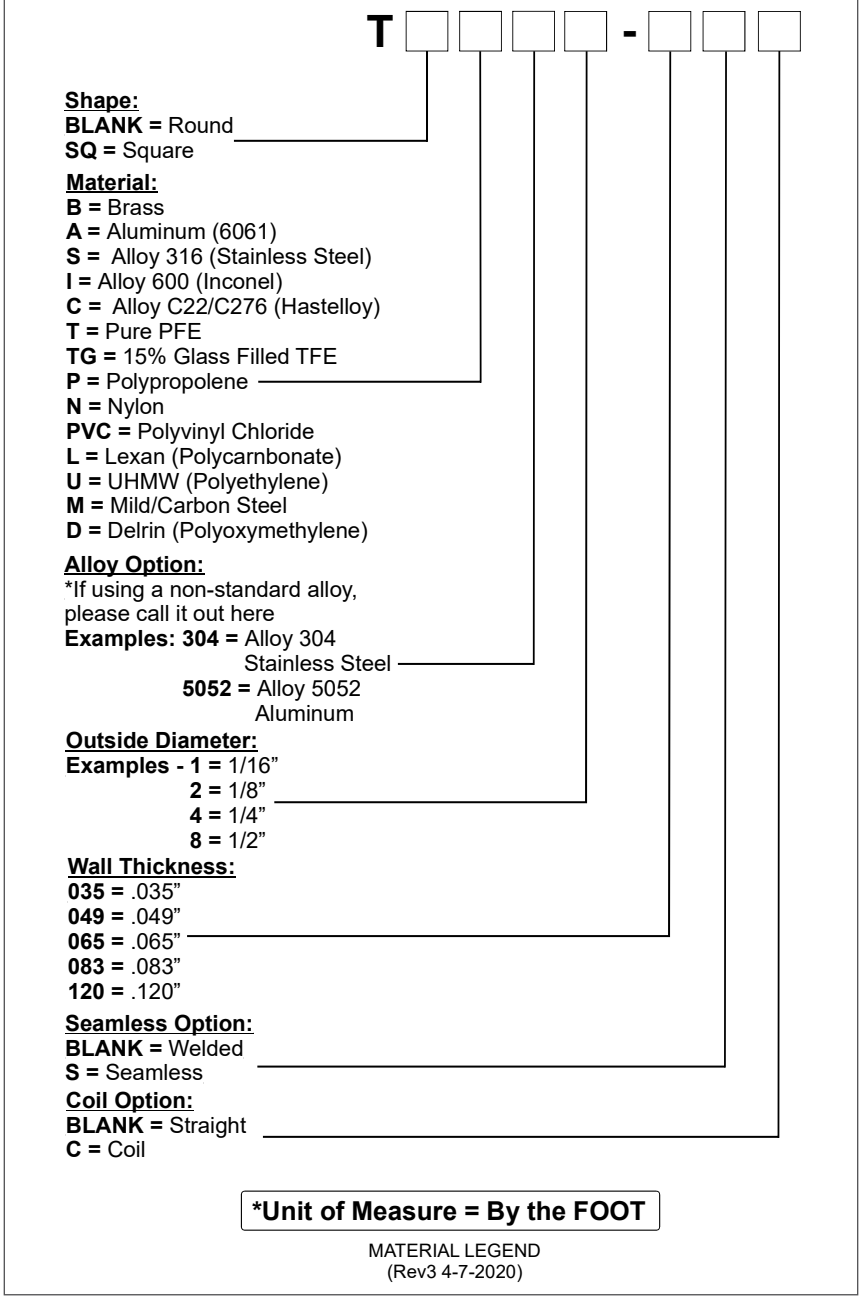
Stainless-Steel Tubing

Used for precise flow and miniature applications. It is hard-tempered for excellent machinability and has high tensil strength. Temperature range is -250°C to 315°C (-425°F to 600°F). *Call for pricing.*

Inconel Tubing

Apex Instruments Inconel tubing is made from a nickel-chromium alloy with excellent oxidation resistance against cracking or breaking at higher temperatures. Our Inconel tubing is corrosion resistant to stress caused by caustic substances and is often used for thermocouple protection tubing. The temperature range is -132°C to 650°C (-205°F to 1200°F). Be sure to use with compression fittings. Call for pricing.

RIGID TUBING
MATERIAL LEGEND



***Unit of Measure = By the FOOT**

MATERIAL LEGEND
(Rev3 4-7-2020)

Tubing

Vinyl (PVC) Tubing

Plasticized from nontoxic flexible vinyl PVC, this tubing offers a wide range of chemical resistance which makes it an ideal choice for a variety of industrial piping problems involving the handling of corrosive, pure, or sensitive solutions.

TV- ☐/ ☐ ☐	- ☐ (Tube OD) / ☐ (Tube ID) ☐ (Color; R=red, Y=yellow)
TV-4/2	Vinyl, 1/4-inch OD, 18-inch ID, (per foot)
TV-5/3	Vinyl, 5/16-inch OD, 3/16-inch ID, clear (per foot)
TV-5/3RD	Vinyl, 5/16-inch OD, 3/16-inch ID, red (per foot)
TV-5/3YL	Vinyl, 5/16-inch OD, 3/16-inch D, yellow (per foot)

Braided Sleeving

Durable overbraiding for extra protection against abrasion, mildew and aging for cable assemblies. This tubing is designed with an open-weave braided type construction; it offers flexibility and freedom of movement to the sleeving and wiring it covers. This open-weave construction allows complete drainage, preventing any moisture and condensation from causing any permanent damage to the inner wire it covers. Normal operating temperature range is -70°C to 125°C (-94°F to 257°F).

EXP- ☐	- ☐ (Diameter)
EXP-3N	Expanded sleeve, nylon, 3/16-inch diameter relaxed, black
EXP-4N	Expanded sleeve, nylon, 1/4-inch diameter relaxed, black
EXP-5	Expanded sleeve, nylon, 5/16-inch diameter relaxed, black
EXP-8SD	Expanded sleeve, Flexo@ Super Duty, 1/2-inch, diameter, black
EXP-12SD	Expanded sleeve, Flexo@ Super Duty, 5/8-inch, diameter, black
EXP-20SD	Expanded sleeve, 1.25-inch diameter relaxed, black
EXP-30AFT	Expanded sleeve, 2-inch diameter relaxed, black

Heat Shrinkable Tubing.

Air Hose

The Apex Instruments PolyAir hose is constructed of high-quality, flexible PVC compounds that are uniquely blended to make this hose look and feel like comparable rubber hose and stay flexible at low temperatures. Its light weight makes it an ideal hose for air tool applications. It also has a highly abrasion-resistant alloy jacket and has good flexibility over a wide temperature range of -26°C to 65°C (-15°F to 150°F).

H- ☐SP	- ☐ (Diameter)
H4SP	PVC/polyurethane alloy air hose,1/4-inch ID, special purpose, blue (per foot)
H6SP	PVC/polyurethane alloy air hose, 3/8-inch ID, special purpose, blue (per foot)

Dry Gas Meters

DGM-SK25EX DGM-110 DGM-175 DGM-S275

Product	Description
DGM-SK25EX	Metric dry gas meter, used in XD-502, XC-53, XC-572, XC-623, XC-30B, and XC-260
DGM-110	110 Rockwell dry gas meter with 1/2-inch FNPT side ports, used in MC-522
DGM-175	175 Rockwell dry gas meter with top mount spud connectors
DGM-S275	S-275 gas meter with 3/4-inch FNPT side port

	Temperature:
TC-CUB5TCB0	Temperature display, LED, 120/220V, RED LION
M-NOV810	Temperature controller, NOVUS N1020

	Electrical cord sets, plugs and jacks:
EC-C13-515-16-6	Power cord set with 5-15P plug and IEC connector, 16 AWG
L5-15	NEMA 5-15 plug, 15A/125V, 2-pole, 3-wire grounding
L5-30	NEMA 5-30 plug, 30A/125V, 2-pole, 3-wire grounding
L620-##	NEMA 6-20 plug, 20A/250V, 2-pole, 3-wire grounding,
M-SCKT15A	IEC power Inlet, screw mount, 1/4-inch tabs, EAC-311, 15A/240V
M-49BK	Snap-in Receptacle, NEMA 5-15R, Standard NA Type, 3-Pole, 1/4-inch Tabs, 15A/125V

	Fans:
AM-CF110	Cooling fan axial, 120V, 4.7-inch square axial
AM-CF220	Cooling fan axial, 240V, 4.7-inch square axial

	Switches:
M-31302A	7-channel thermocouple switch
M-31302K	7-channel switch knob
M-RA911	Rocker switch (curvette), SPST
M-4X846	Toggle switch (on/off), SPST

	Heaters:
AM-SB500W	Heater element for sample box, 120V, 500 watts
AM-SB500W-220	Heater element for sample Box, 240V, 500 watts
AM-SB750W	Heater element for sample Box, 120V, 750 watts
	Pressure transducers:
LPM1010-6B5	Druck transducer, LPM1010 series, 2 inH_2O, 5 +/- 5 VDC output, +/- .25% accuracy, terminal strip
LPM1010-2B5	Druck transducer, LPM1010 series, 6 inH_2O, 5 +/- 5 VDC output, +/- .25% accuracy, terminal strip

	Solenoids:
M-U8356-120V	ASCO 3-way solenoid, brass, 120V
M-U835B-220V	ASCO 3-way solenoid, brass, 220V
	Solid State Relays:
SSR-AD25-RS	Solid-state relay, 25 amp, 110/240V
SSR-AD50-RS	Solid-state relay, 50 amp, 110/240V

	Replacement manometers and parts:
M-42210	Dual-column panel mount manometer, 0-10 inH_2O
M-42210-M	Dual-column panel mount manometer, 0-250 mm, metric
M-422DS	Manometer displacer with knob
A-316	Manometer bushing,1/8-inch FNPT, NY
DWA101R	Red manometer oil, 1 Oz.
QC-MAN-F3	Manometer quick-connect fitting, 1/8-inch FNPT, chrome-plated brass with valve and Viton® O-ring
QC-MAN-M2	Manometer quick-connect fitting,1/4-inch MHB
PMC30	Manometer quick-connect plug
4T827	Retaining cord, quick-connect plug

Electrical/Electronic Parts

	Thermal circuit breakers:
M-CB15A	Circuit breaker, 15 amp, 120/240V
M-CB10A	Circuit breaker, 10 amp, 120/240V
M-CB3A	Circuit breaker, 3 amp, 120/240V
M-CB5A	Circuit breaker, 5 amp, 120/240V

	Magnetic circuit breakers:
M-CBR15A-M	Circuit breaker, magnetic, rocker switch, 15 amp horizontal mount, 120/240V
M-CBR10A-M	Circuit breaker, magnetic, rocker switch, 10 amp horizontal mount, 120/240V
M-CBR5A-M	Circuit breaker, magnetic, rocker switch, 5 amp horizontal mount, 120/240V
M-CBR3A-M	Circuit breaker, magnetic, rocker switch, 3 amp horizontal mount, 120/240V

	Circular connectors (Amphenol) 4-pin
AM-SBP	Filter box Amphenol wired sub-assembly
AM-MCP	Replacement meter console wired Amphenol sub-assembly
AM3101A-K	Replacement Amphenol connector for Apex u-cords, male, 14S-2 series, 4-pin with external male threads, heat shrink
AM3106B-K	Replacement Amphenol connector for Apex u-cords, female, 14S-2 series, 4-socket with swivel ring, heat shrink
AM3102P	Replacement Amphenol connector for filter box, panel mount
AM3057	Replacement strain relief for Amphenol
AM-SBP5	IsoCalc data collection and reduction spreadsheet (MS Excel workbook), Methods 1-5

DWA101-R
Manometer Oil

PMC30
with 4T827

AMPHENOL CABLE LEGEND

****Begin Part Number Build Starting from the Load****

AC- ☐ ☐ ☐ ☐ ☐

Amphenol Type (Pin End):
A = 5 Pin Amphenol
(Size 14S Shell - 97 Series)
B = 5 Pin Amphenol
(Size 14 Shell -
Bayonet Style/PT Series)
C = 5 Pin Amphenol
(Size 16S Shell - 97 Series)
D = 4 Pin Amphenol
(Size 14S Shell - 97 Series)
S = 4 Pin Amphenol (END OF LIFE)
(Size 14S Shell - 97 Series)

Thread:
BLANK = Female
M = Male

Length (in Feet)

Aphenol Type (Socket End):
A = 5 Pin Amphenol
(Size 14S Shell - 97 Series)
B = 5 Pin Amphenol
(Size 14 Shell -
Bayonet Style/PT Series)
C = 5 Pin Amphenol
(Size 16S Shell - 97 Series)
D = 4 Pin Amphenol
(Size 14S Shell - 97 Series)
S = 4 Pin Amphenol (END OF LIFE)
(Size 14S Shell - 97 Series)

Thread:
BLANK = Female
M = Male

ENGINEERING & MARKETING LEGEND
(rev2 12-28-2020)

POWER CORD LEGEND

EC- ☐ **-** ☐ **-** ☐ **-** ☐

Connector (Female End):
515 = 120V/15A (N. Amer)
C13 = 120V/240V - 15A (N.Amer)**/ 10A** (Int.)
C19 = 120V/240V - 20A (N.Amer)**/ 16A** (Int.)
SL = (Stripped Leads)


515


C13


C19

Plug Style (Male End):
515 = 120V/15A (N. Amer)
520 = 120V/20A (N. Amer)
L530 = 120V/30A/Locking (N.Amer)

C14 = 120V/240V - 15A (N.Amer)**/10A** (Int.)
C20 = 120V/240V - 20A (N.Amer)**/16A** (Int.)

E10 = 240V/10A (CEE 7/7) (Indonesia, France, Belgium, Slovakia and Tunisia)
G10 = 240V/10A (UK, Ireland, Cyprus, Malta, Malaysia, Singapore and Hong Kong)
I10 = 240V/10A (Australia, New Zealand, Papua New Guinea and Argentina)
M10 = 240V/16A (India, South Africa, Swazila and Lesotho)
O10 = 240V/16A (Used exclusively in Thailand)

Conductor Size:
10 = 3 X 10AWG
12 = 3 X 12AWG
14 = 3 X 14AWG
16 = 3 X 16AWG
17 = 3 X 17AWG
18 = 3 X 18AWG

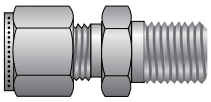
Cord Length (in Feet)

Current Cord Configurations:
EC-C13-515-14-6
EC-C13-515-16-1
EC-C13-515-16-6
EC-C13-E10-17-8
EC-C13-G10-17-8
EC-C13-I10-17-8
EC-C13-M10-17-8
EC-C13-O10-17-8
EC-C19-520-12-6
EC-515-515-12-10
EC-515-515-14-6
EC-515-C14-16-1
EC-520-520-12-3
EC-SL-515-12-6
EC-SL-515-14-6
EC-SL-515-16-6
EC-SL-C14-16-4
EC-SL-L530-10-8

MARKETING LEGEND (rev0 1-31-2020)

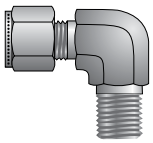
Stainless-Steel Fittings

Tube-To-Male Pipe



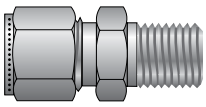
Male connectors

2MSC2N-S 1/8TU-1/8MNPT
4MSC2N-S 1/4TU-1/8MNPT
4MSC4N-S 1/4TU-1/4MNPT
4MSC6N-S 1/4TU-3/8MNPT
6MSC6N-S 3/8TU-3/8MNPT
8MSC6N-S 1/2TU-3/8MNPT
10MSC6N-S 5/8TU-3/8MNPT
10MSC8N-S 5/8TU-1/2MNPT



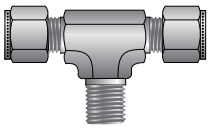
Male elbow

4MSEL2N-S 1/4TU-1/8MNPT
4MSEL4N-S 1/4TU-1/4MNPT
4MSEL6N-S 1/4TU-3/8MNPT
6MSEL4N-S 3/8TU-1/4MNPT
6MSEL6N-S 3/8TU-3/8MNPT
6MSEL8N-S 3/8TU-1/2MNPT
10MSEL6N-S 3/8TU-3/8MNPT
10MSEL8N-S 3/8TU-1/2MNPT



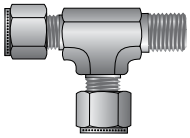
Thermocouple connectors

8MTC8-S 1/2TU-1/2MNPT
16MTC16N-S 1.0TU-1.0MNPT



Male branch tee

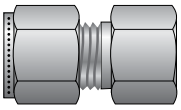
4MBT4N-S 1/4TU-1/4MNPT
6MBT4N-S 3/8TU-1/4MNPT



Male run tee

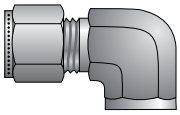
4MRT4N-S 1/4TU-1/4MNPT
6MRT4N-S 3/8TU-1/4MNPT

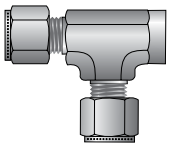
Tube-to-Female Pipe



Female elbow

4FEL2N-S 1/4TU-1/8FNPT

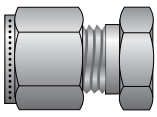




Female run tee

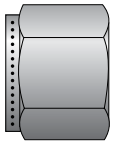
4FRT2N-S 1/4TU-1/8FNPT
6FRT4N-S 3/8TU-1/4FNPT

Other



Cap

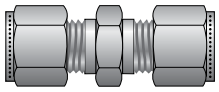
4BLEN4-S 1/4 cap
6BLEN6-S 3/8 cap
8BLEN8-S 1/2 cap
10BLEN10-S 5/8 cap



Tube nut

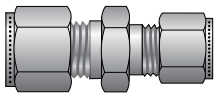
4NU-S 1/4-inch tube nut
6NU-S 3/8-inch tube nut
8NU-S 1/2-inch tube nut
N-10 5/8-inch tube nut
12NU-S 3/4-inch tube nut

Tube-to-Tube Unions



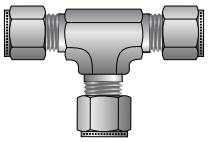
Union

2SC2-S 1/8-inch tube union
4SC4-S 1/4-inch tube union
6SC6-S 3/8-inch tube union
8SC8-S 1/2-inch tube union
N-10UB 5/8-inch tube union



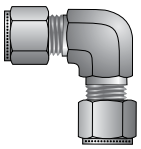
Reducing union

4RU2-S 1/4TU-1/8TU
6RU4-S 3/8TU-1/4TU
8RU6-S 1/2TU-3/8TU



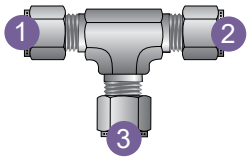
Union tee

4ET4-S 1/4TU
6ET6-S 3/8TU



Union elbow

4EE4-S 1/4TU-1/4TU
6EE6-S 3/8TU-3/8TU
8EE8-S 1/2TU-1/2TU

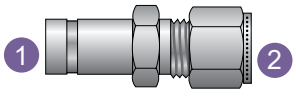


Jump tee

6-6-4ET-S 3/8x1/4x3/8 Jump
8-4-6ET-S 1/2x1/4x3/8 Jump

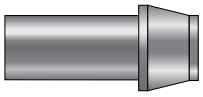
Fitting Sizes in Order Shown in Diagram

Port Connectors



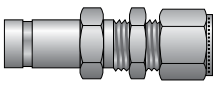
Tube end reducer

4TUR6-S 1/4TU-3/8TU
6TUR4-S 3/8TU-1/4TU
8TUR10-S 5/8TU-1/2TU
8TUR4-S 1/2TU-1/4TU
8TUR6-S 1/2TU-3/8TU
10TUR6-S 5/8TU-3/8TU



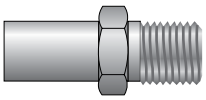
Port connector

4PC4-S 1/4 inch
4PC6-S 1/4-3/8 inch
6PC6-S 3/8 inch
6PC8-S 1/2-3/8 inch



Tube end bulkhead adapter

4TUBC4-S 1/4TU-1/4STUB
8TUBC8-S 1/2TU-1/2STUB



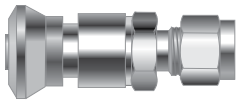
Tube end male adapter

6MA2N-S 3/8MT-1/8MNPT
6MA4N-S 3/8MT-1/4MNPT

Quick Connects

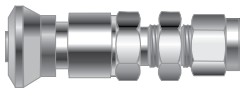
Apex Instruments offers many types of stainless-steel quick connects. *Brass is available for some types, please call for details.*

Instrument Grade Quick Connects



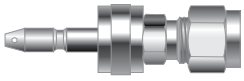
Female tube end

QC-F4-SS	Female, 1/4 inch - 1/4 tube union
QC-F6-SS	Female, 3/8 inch - 3/8 tube union
QC-F8-SS	Female, 1/2 inch - 1/2 tube union



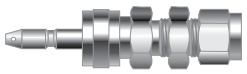
Female bulkhead

QC-BHF4-SS	Female BH, 1/4 inch - 1/4 tube union
QC-BHF6-SS	Female BH, 3/8 inch - 3/8 tube union
QC-BHF8-SS	Female BH, 1/2 inch - 1/2 tube union



Male tube end

QC-M4-SS	Male, 1/4 inch - 1/4 tube union
QC-M6-SS	Male, 3/8 inch - 3/8 tube union
QC-M8-SS	Male, 1/2 inch - 1/2 tube union



Male Bulkhead

QC-BHM4-SS	Male BH, 1/4 inch - 1/4 tube union
QC-BHM6-SS	Male BH, 3/8 inch - 3/8 tube union
QC-BHM8-SS	Male BH, 1/2 inch - 1/2 tube union

Hardware

Cabinet latch
Cabinet spring latch.
M-HC8L

Spring handle
Stainless-steel internal spring handle for source sampler console, 3-hole.
H50032

Safety bail
Safety bail for monorail attachment.
SB-2PIN

Cabinet keepers
Latch keeper, long shank for hot box door.
M-HS14LS

Panel latch
Panel latch, slotted.
L-43144

Handrail hanger
Handrail hanger set for Apex sampling consoles, stainless-steel.
MC-RH

Cabinet keepers
Latch keeper, short shank for source sampling console door.
M-HS83K

Rubber foot
Recessed rubber foot.
9540K59

Nylon bushing
A-316

Manometer QC fitting
Manometer quick-connect fitting, 1/8 FNPT, chrome-plated brass with valve and Viton® O-ring.
QC-MAN-F3

Manometer QC fitting
Manometer quick-connect fitting, 1/4 MHB.
QC-MAN

Displacer knob
M-422DS

Stoppers

GS-13	13mm, 10/pk.
GS-20	20mm, 10pk
GS-30	30mm, 10/pk.
GS-MIX	Kit includes: 10pk. each size

All stoppers are rubber sleeve standard.

Pumps and Accessories

LUBRICATED ROTARY VANE PUMP

Gast Model 0523 Lubricated Vane Replacement Pump (100/240V-50Hz/60Hz).

GP-0523

Diaphragm Pumps

GP-0523	Gast Model Replacement Pump (100/220V-50/60Hz)
GP-DAA-RBK	Rebuild Kit for Gast Model DAA Double Diaphragm Pump
GP-15D1	Gast Model Mini Diaphragm Pump, 6.4 LPM open, 120VAC
GP-15D1-V	Gast Model Mini Diaphragm Pump, 6.4 LPM open, 120VAC, 240V
GP-D713-21-01	Flat Diaphragm Pump, Orsat Option Dual Bearing Brush Motor. Used in the TBP, Orsat Pump in the XC-522 and XC-572.
GP-UN86KNI	KNF Replacement Diaghragm Pump for XC-30B and XC-260 Mercury Meter Consoles. Used in XC-30B, XC-260, XC-623 and XC-60
GP-745N	Nylon Cartridge Style Muffler with 1/4 FNPT. Short Bowl and Head

REPLACEMENT PARTS FOR ROTARY VANE PUMP

GP-745FEL	Muffler Filter, Element, (25-64-60W)
AA404	Muffler Jar Seal, Replacement for Seal in Muffler Assembly (AB609B)
AB609B	Muffler Assembly with 1/4 inch FNPT, for Vane Pump Assembly (GP-0523)
GP-745FEL	Muffler Filter Element, GP-745N (25-64-60W)
AK731	Gast Replacement Vanes for Pump Model GP-0523 (4 Required per Pump)
GP-BL50-2	Miniature Lubricator Assembly with 1/4 inch FNPT, for Vane Pump Assembly (E-0523)
GP-BL50-R	Lubricator Rebuild Kit, Includes Wick, Nut, Grommet and Seal, for GP-BL50-2 Lubricator
GP-VG321L	Vane Pump Oil, 1000mL
O-026N	Lubricator O-ring for BL-50-2. 0.026-inch Diameter
GP-7BDC19	Thomas Diaphragm Pump for XC-40 Console

Equipment Cases

ATA Transport Cases

ATA transport cases protect your equipment and glassware from shipping damage. Each case is made of sturdy 3/8-inch ABS laminated plywood with reinforced edges and corners. A built-in foam liner provides added protection. Call for details on custom cases.

Part #	Dimensions
TC-0523	Console transport case - pump unit
TC-0523C	Console transport case enclosure - pump unit
TC-522	Console transport case - MC-500 series source sampler consoles
TC-522U	Console transport case - MC 500 series source sampler consoles with extra storage
TC-600	Console transport case - MC-170 and MC-623 source sampler consoles
TC-7A9	Method 7 kit transport case
TC-GW2.5	Glassware transport case (holds 2-1/2 sets of Method 5 glassware)
TC-GW20I	ATA glassware transport case (holds 20 impingers)
TC-PITOT	Blow-molded case with convoluted foam, locking metal latches
TC-SB13	Sample case transport case (holds one SB-2 and two SB-3 units)
TC-VSB	VersaCase transport case (holds any VersaCase2 kit method)
TC-X0523	XC pump unit transport case
TC-XC5	XC-500 series console transport case

SKB Cases

Apex Instruments now offers multiple black plastic, stackable SKB Roto Rack cases to protect your equipment from damage. Constructed of a molded polyethylene shell which includes front and rear covers and gasket seals to protect the contents from moisture and dirt. This case offers recessed heavy-duty twist latches, molded in handles and shock absorbing rubber feet. *(optional rear rails available for added stability). Call for pricing.*

XC-8U Transport Case | **XC-10UD Molded Rack Case** | **XC-16US Molded Rack Case**

Part #	Dimensions
XC-5U	Black roto-molded linear low-density polyethylene (LLDPE/LMDE) case, shallow 19-inch; 5 unit, inside HxWxD: 19-inch x 8-inch x 8.75-inch, black polyethylene
XC-6U	Black roto-molded linear low-density polyethylene (LLDPE/LMDE) case 19-inch, 6U, black polyethylene
XC-8U	Black roto-molded linear low-density polyethylene (LLDPE/LMDE) case HxWxD: 18-inch x 22-inch x 20-inch; 21 lbs
XC-10U	Black roto-molded linear low-density polyethylene (LLDPE/LMDE) case shallow 19-inch; 10 unit, inside HxWxD: 19-inch x 17-1/2-inch x 8-inch, UHMW black polyethylene
XC-10UD	Black roto-molded linear low-density polyethylene (LLDPE/LMDE) case outside HxWxD: 20.5-inch x 23.75-inch x 22-inch; 20.46 lbs
XC-16US	Black shock mount rack case HxWxD: 36.25-inch x 29.25-inch x 27.25-inch; 84 lbs
SKB-1916	Rotomolded castorboard, with 3-inch locking wheels for 16U rack case transport

Supplies

PTFE high-density tape
PTFE Tape, high-density, 1/2-inch X 520-inch per roll.

T-TFE8-520

PTFE Tape, high-density, 1-inch X 520-inch per roll.

T-TFE16-520

TFE Tape, high-density, 2-inch X 520-inch per roll.

T-TFE32-520

3M glass electrical tape
3M Glass Electrical Tape, 69, 3/4-inch x 108' per roll.

3M-108

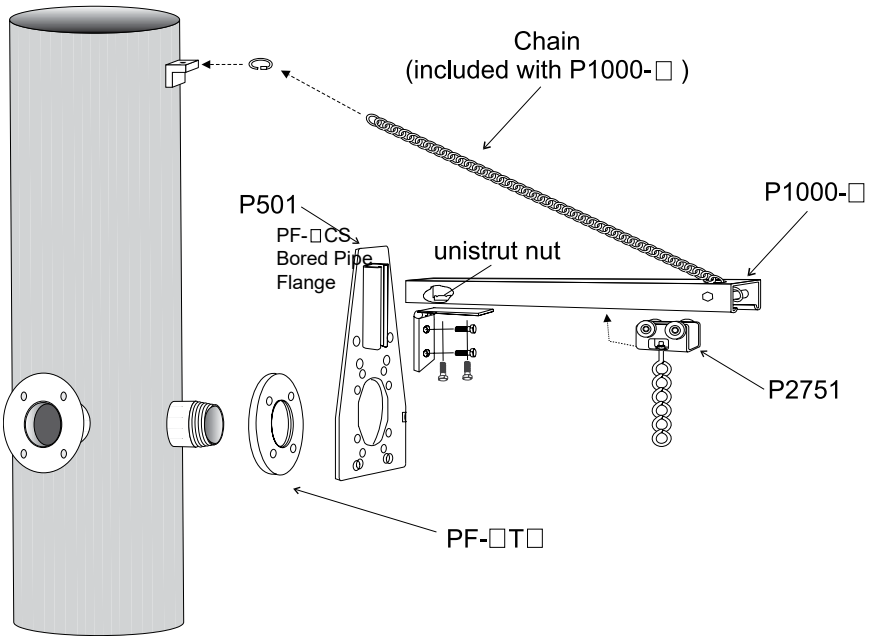
Anti-seize, premium grade nickel-based
Anti-seize, 1/4 oz. tube, -65°F to 2600°F.

AZNI-4

Monorails

Monorail Hardware

(Threaded pipe flanges are available in 3-inch, 4-inch or 6-inch, stainless steel or aluminum.)
Note: The chain must be attached to the stack so that the chain angle to the monorail is no less than 30° (45° is recommended).



Monorail Kit

Monorail kit, 9 feet, includes: 9-foot single-channel monorail, chain, L-bracket with hardware, P501 monomount and P2751 trolley assembly.

P1000-9K

Monorail with Single Channel Chain

Single-channel steel monorail with chain, L-bracket and hardware (for use with probes).

LF	6	7	8	9	10	12
Part #	P1000-6	P1000-7	P1000-8	P1000-9	P1000-10	P1000-12
Probe Size	For use with probes up to 6’	For use with probes up to 7’	For use with probes up to 8’	For use with probes up to 9’	For use with up to 10’	For use with up to 12’

Monorail with Dual Channel Chain

Dual-channel steel monorail, double channel with chain, L-bracket and hardware (for use with probes).

LF	10	12	14	16	17	18
Part #	P1001-10	P1001-12	P1001-14	P1001-16	P1001-17	P1001-18
Probe Size	For use with probes up to 10’	For use with probes up to 12’	For use with probes up to 14’	For use with probes up to 16’	For use with up to 17’	For use with up to 18’

Trolley and Monorail Support Bracket

Item	Trolley monorail	Monomount support monorail
Part #	P2751	P501-S (steel) P501-CS (cold steel)
Description	Swivel-frame trolley with eyebolt, 1-foot chain and snap-hook	Support bracket; fits 3-inch, 4-inch, 6-inch and 8-inch, standard pipe flanges, includes P1354 hinge, (4) P3010 nuts and P371 bolts

Flanges

Size	3-inch	4	6
Part #	PF-3CS	PF-4CS	PF-6CLS
Description	Flange, 150 lb. FF, bored, stainless-steel, with threaded coupling	Flange, 150 lb. FF, bored, threaded, stainless-steel, with threaded coupling	Flange, 150 lb. FF, bored, stainless-steel with cam-lock connector

Size	2-inch	3-inch	4-inch	6-inch	3-inch	4-inch
Part #	PF-2T	PF-3T	PF-4T	PF-6T	PF-3TA	PF-4TS
Description	Threaded 304 flange, 6-inch OD, 4.75-inch bolt circle diameter, carbon steel	Threaded pipe flange, 150-lb pattern, 7.5-inch OD, 6-inch bolt circle diameter, carbon steel	Threaded pipe flange, 150-lb pattern, 9-inch OD, 7.5-inch bolt circle diameter, carbon steel	Threaded pipe flange, 150-lb pattern, 11-inch OD, 9.5-inch bolt circle diameter, carbon steel	FNPT threaded pipe flange, 150-lb pattern, 7.5-inch OD, 6-inch bolt circle diameter, cast aluminum	FNPT threaded pipe flange, 150-lb pattern, 9-inch OD, 7.5-inch bolt circle diameter, stainless steel

See the flanges section in Accessories for different configurations.

Monorails

PART #	Trolley and monorail support bracket
P2751	Monorail, swivel-frame trolley with eyebolt, 1-foot chain and quick link
P501-S	Monomount monorail support bracket; stainless-steel; fits 3, 4, 6 and 8 inch, standard pipe flanges, includes hinge, nuts, and bolts
P501-CS	Monomount monorail support bracket; cold steel; fits 3, 4, 6 and 8 inch, standard pipe flanges, includes hinge, nuts, and bolts

PART #	Flange
PF-3CS	Flange, 3-inch 150 lbs FF, 2.67 bored, stainless-steel
PF-4CS	Flange, 4-inch 150 lbs FF, 2.67 threaded, stainless-steel
PF-6CLS	Flange, 6-inch 150 lbs FF, 2.67 Bored, Stainless Steel with Cam-lock Connector

Manuals and Reference Material

Apex Instruments offers a complete line of Title 40 of the Code of Federal Regulations that pertain to protection of the environment. Title 40 is composed of 28 volumes, 16 of which are Air Programs. The most popular for our customers are Part 60 (60.1-end) Standards of Performance for New Stationary Sources and Part 60 (Appendices) that include only the US EPA Source testing Methods. Please call or check our price list for detailed listing of all Title 40 volumes.

Training Manuals

Part #	Description
40CFR-SET	Set, CFR 40, AIR/RCRA PROGRAMS, 19/Set (1 ea. listed below)
40CFR1-49	CFR 40, Parts 1-49 (Air Programs)
40CFR50-51	CFR 40, Parts 50-51 (Air Programs)
40CFR52A	CFR 40, Parts 52.01-52.1018 (Air Programs)
40CFR52B	CFR 40, Parts 52.1019-52 END (Air Programs)
40CFR53-59	CFR 40, Parts 53-59 (Air Programs)
40CFR60	CFR 40, Parts 60.1-END (Air Programs)
40CFR60APPX	CFR 40, Part 60 APPENDIX (Air Programs)
40CFR61-62	CFR 40, Parts 61-62 (Air Programs)
40CFR63A	CFR 40, Parts 63.1-63.599 (Air Programs)
40CFR63B	CFR 40, Parts 63.600-63.1199 (Air Programs)
40CFR63C	CFR 40, Parts 63.1200-END (Air Programs)
40CFR64-71	CFR 40, Parts 64-71 (Air Programs)
40CFR72-80	CFR 40, Parts 72-80 (Air Programs)
40CFR81-85	CFR 40, Parts 81-85 (Air Programs)
40CFR86A	CFR 40, Parts 86.1-86.599-99 (Air Programs)
40CFR86B	CFR 40, Parts 86.600-END (Air Programs)
40CFR190-259	CFR 40, Parts 190-259 (RCRA)
40CFR260-265	CFR 40, Parts 260-265 (RCRA)
40CFR266-299	CFR 40, Parts 266-299 (RCRA)

Training Manuals

Code of Federal Regulations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