

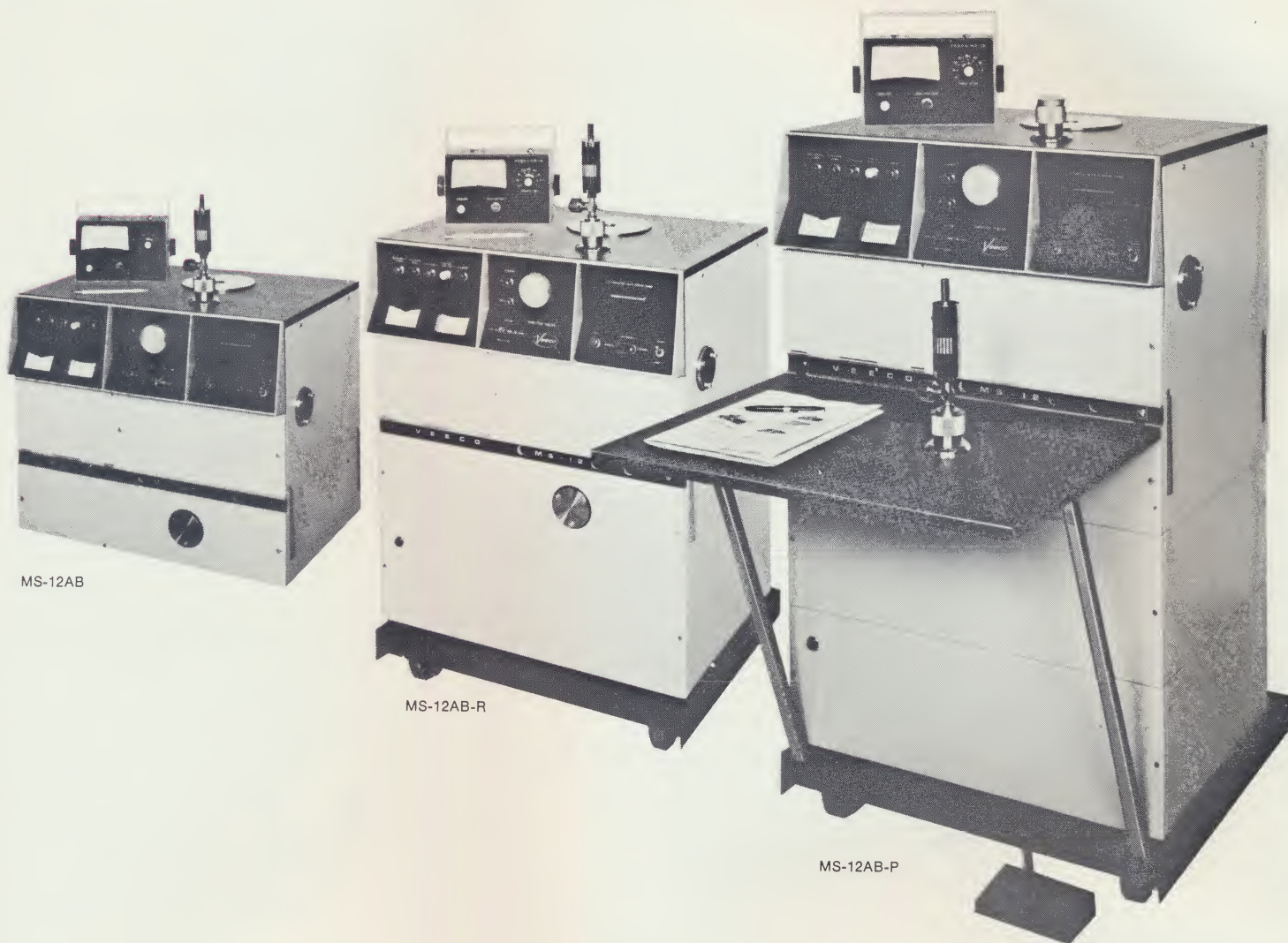


CONDENSED CATALOG

of High Vacuum Equipment
featuring the vacuum industry's
most expanded and up-to-date product line.



LEAK TEST STATIONS



LEAK TEST STATIONS

MS-12 Series

The MS-12 uses a new kind of mass spectrometer tube that sorts the ion beam twice — resulting in the highest sensitivity and fastest testing capabilities currently available in any standard commercial instrument.

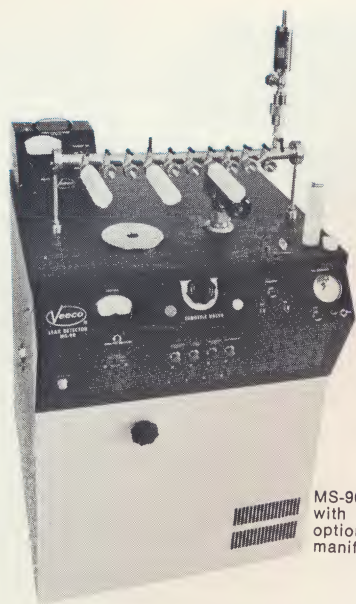
- 5×10^{-12} atm cc/sec Minimum Detectable Leak at full pumping speed, and the pumping speed is *fast*.
- Direct readout in atm-cc/sec.
- Exclusive new Vacguard protects system against atmospheric burst, virtually eliminates "catastrophic failure."
- Completely modular electronics; pull-out circuit board construction.
- Modular vacuum system; entire vacuum system lifts out on its own subframe; mech. pump subframe drops out.
- Capable of detecting one part helium in 100,000,000 parts of air.
- Approx. cycle time — 35 sec for MS-12AB, 12 sec for MS-12AB-R, 7 sec for MS-12AB-P.
- Easy to operate even by non-technical personnel — one toggle or foot switch controls entire operating cycle.
- Exclusive Veeco-patented self-bakeout ion source device keeps source free from harmful deposits, permits reliable operation of MS-12 at full specifications even when used for extended peri-

ods of time without liquid nitrogen.

- Ion source self-bakeout permits you to clean trap not by removal, but simply by operating instrument while cold trap warms up; e.g., overnight.
- Exclusive mass scan switch makes simple mass detune to either side of helium mass to insure an observed deflection is signal and not background, with no retuning operation.
- Double replaceable filaments — second standby filament prevents interruption of testing in event of filament burnout.
- Multiple-port-valved test manifolds available for very high speed production testing of small components.
- Remote START-VENT cycle actuation.
- Manual mode of operation and precisely adjustable throttle valve permits "sniffing" type leak detection and detection of large leaks, with protective interlocks still active.

Available in three models:

- MS-12AB Bench model is the smallest fully automatic self-protected high-sensitivity leak detector available; 26" w x 22" h x 18" d.
- MS-12AB-R Roll-around model offers compact mobility.
- MS-12AB-P "Sit-down" Production model is the fastest, most functional and reliable production leak detector available.
- Ask for detailed 20-page brochure.



MS-90AB
with
optional
manifold

LEAK TEST STATIONS MS-90 Series

A rugged, ultra-reliable, high speed leak test station for general purpose use — the improved version of the Veeco MS-9, the leak test station that outsold all other leak detectors.

- 1×10^{-10} atm-cc/sec Minimum Detectable Leak at full pumping speed.
- Rough pumpdown in less than 7 seconds, high vacuum pumpdown in less than 1 second after that (closed port or small test piece).
- Exclusive Veeco-patented self-bakeout ion source device keeps source free from harmful deposits, permits reliable operation of MS-90 even when used for extended periods of time without cold trap liquid nitrogen.
- Ion source self-bakeout permits you to clean trap not by removal, but simply by operating instrument while cold trap warms up; e.g., overnight.
- Exclusive mass scan switch makes simple one-second mass detuning to either side of helium mass to insure an observed deflection is signal and not background, with no retuning operation.
- Double replaceable filaments — second standby filament prevents interruption of testing in event of filament burnout.
- Multiple-port-valved test manifolds available (shown in photo) for very high speed production testing of small components — helium-filled TO-5 transistors can be tested at rates of 1200 parts/hr at 1×10^{-8} std-cc/sec sensitivity.
- New taut-band leak rate meter.
- New positive action vent valve.
- Manual mode of operation and precisely adjustable throttle valve permits "sniffing" type leak detection and detection of large leaks.
- Four versatile models to select from:
 - MS-90A for use with vacuum systems that have their own roughing pumps.
 - MS-90AB for general purpose lab and production use; contains integral roughing station.
 - MS-90ABC for automatic production use; with backfill apparatus.
 - MS-90ABD for the most highly automatized go/no-go production use.
- Also available in helium hydrogen, A-Ne, and He₃-He₄ versions.
- Request 20-page brochure.



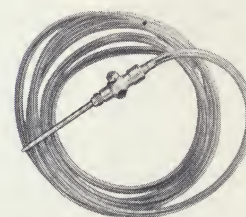
Production Multiple Manifold



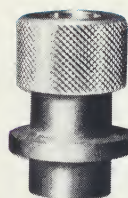
Leak Sensitivity Indicator



Sniffer Kit



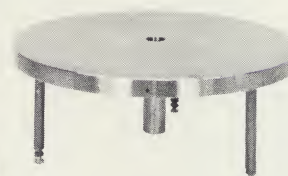
Helium Probe



Quick
Coupling
Reducers



Bell Jars



Baseplate

LEAK TEST STATIONS Accessories

Production Multiple Manifolds for the highest possible speeds in the leak testing of hermetically sealed devices. Presently in use in major production facilities. Variety of standard configurations available.

Audio Leak Indicators produce varying audio tone as well as meter indication. For MS-90, \$250.00; for MS-12, \$350.00.

Leak Sensitivity Calibrators permit a constant check on leak detector accuracy. SC-4, 10^{-8} atm-cc/sec range, \$90.00; SC-5, 10^{-10} atm-cc/sec range, \$135.00.

Sniffer Kit for leak probing when test object is backfilled with helium tracer, \$80.00.

Helium Probe for general leak testing of objects where precise point of leak must be known, \$19.00.

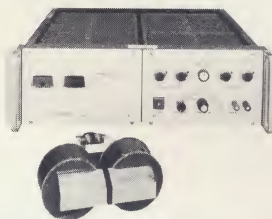
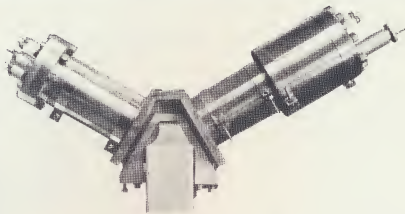
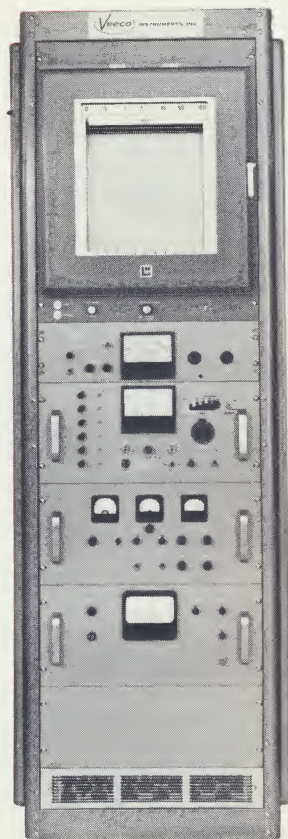
Quick Coupling Reducers to convert the standard $1\frac{1}{8}$ " Veeco leak detector port to smaller sizes; $\frac{1}{32}$, $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1", \$19.00 each.

Baseplate with tubulation for leak detector port and legs for support, for use with bell jars or special jigs and fixtures; BP-1-14-LD, 14" dia x $\frac{3}{4}$ " thick, 304 S.S., \$225.00.

Bell Jars in a variety of heights and diameters, for testing pinched-off devices, soaked-batch testing, and special purposes.



RESIDUAL GAS ANALYZERS



ELECTROMAGNET AND CONTROL

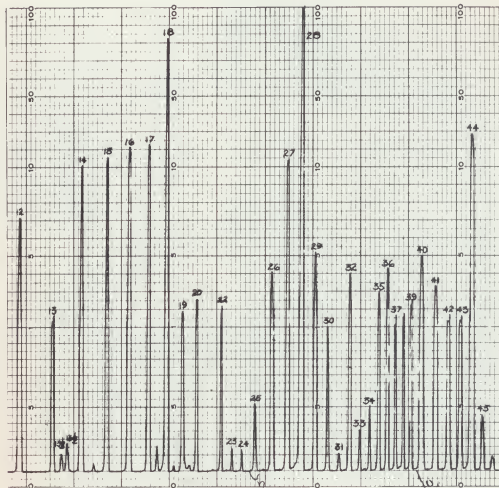
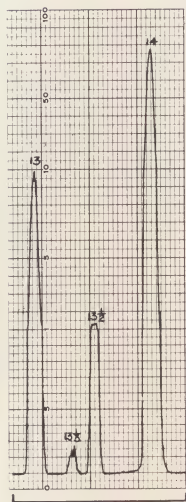
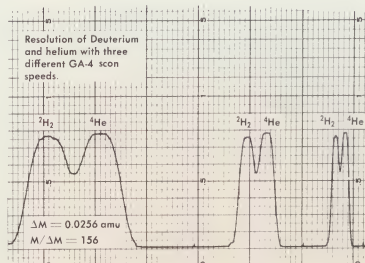


Illustration of excellent resolution of GA-4 in defining fractional masses, which is important in analysis of scans. Here, the GA-4 resolves triply-ionized argon (mass $13\frac{1}{3}$) from a multiply-ionized hydrocarbon (mass $13\frac{1}{2}$). Mass difference between these completely resolved peaks is 0.167 mass unit. Four peaks at left above are expansion of appropriate region of scan to right.

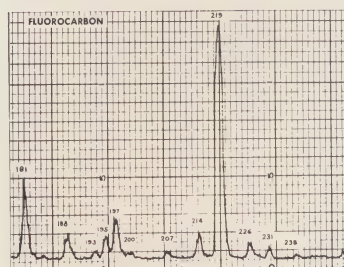
RESIDUAL GAS ANALYZERS GA-4R Sector Instrument

The most solid and reliable high-performance residual gas analyzer on the market—the medium-priced answer to your most difficult low-mass-resolution analysis needs.

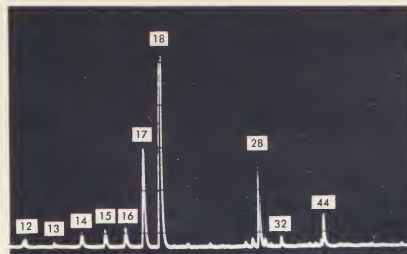
- Mass range 1-760 a.m.u. with electromagnet; 2-300 a.m.u. with permanent magnet.
- Resolution of 100 (10% valley definition). Adjacent peaks can be resolved at 150 a.m.u.
- Helium (4.0026) and deuterium (4.0282) can be resolved with a 60% valley.
- Provision for external sweep for slow, highly detailed scans or for fast 40 ms scope scanning to monitor dynamic conditions.
- Stable single peak monitoring.
- Self-aligning permanent magnet or compact self-aligning electromagnet — 12 lbs., $4\frac{3}{4}$ " x $3\frac{1}{2}$ " x $7\frac{1}{2}$ ", 0-6100 gauss, 0-12 amps, bakeable to at least 350°C.
- Optional 10" four-speed chart recorder displays three linear decades, eliminates constant range switching.
- Reliable, repeatable measurements down to partial pressures as low as 1×10^{-13} torr.
- Bakeable (400°C) stainless steel mass spectrometer tube with flanged, self-aligning magnet and source and collector assemblies, and self-aligning non-warping easily-removed tungsten filament (rhenium and thorium oxide filaments also available).
- Readout versatility unmatched even by many analytical lab instruments.
- The most capable residual gas analyzer on the market.
- New modularity permits purchase of basic model at new low price.
- Request 20-page brochure, with 28 scans so that you can judge for yourself.



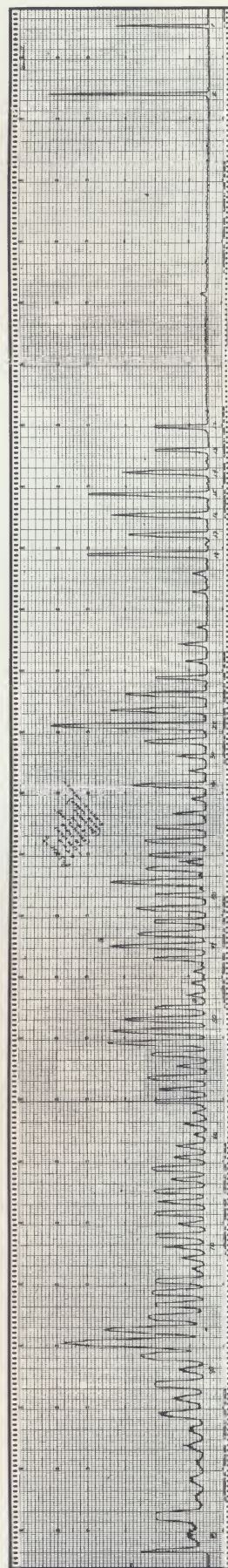
Scan above shows system into which equal parts deuterium and helium were inlet. Scans were made on standard GA-4 with no special tuning or other operations.



Scan above shows resolution and ability to expand portions of range



Fast scope scan (100 ms) of evaporation system at 3×10^{-8} torr.



Scan taken on GA-4 using electromagnet scanning. High masses are automatically expanded, entire mass range is covered without shunts, mass range is 1-760, and mass one can be seen; 3×10^{-9} torr total pressure.

NEW!



Control



RF Head

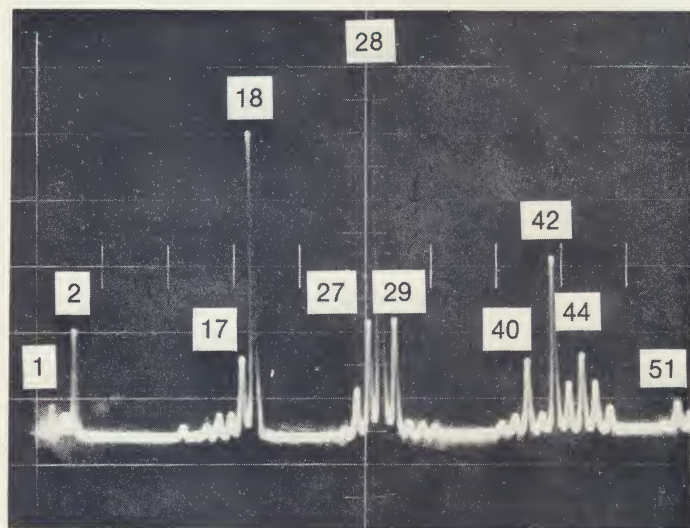


Tube

RESIDUAL GAS ANALYZERS SPI-10 Single Pole Instrument

The first versatile, high-performance residual gas analyzer within the means of every vacuum facility.

- Resonant-ion, non-magnetic, RF mass spectrometer tube.
- 1-50 and 1-200 a.m.u. mass ranges.
- Resolves adjacent peaks one mass unit apart to 10% valley throughout 1-50 mass range.
- Minimum Detectable Partial Pressure of 1×10^{-10} torr (S/N=1).
- Operates over 1×10^{-10} to 1×10^{-4} torr pressure range.
- State-of-the-art electronics — MOS-FET picometer.
- Nude source.
- Easily replaceable dual tungsten-rhenium-alloy filaments.
- Tube is bakeable to 350°C.
- UHV materials used throughout.
- Readout on integral 5" scope, meter, or optional chart recorder.
- Automatic, repetitive scan; speed continuously adjustable 3 milliseconds to five minutes (nom.).
- Any part of spectrum (down to a single mass) in the 1-50 a.m.u. range may be selected, monitored, or repetitively scanned.
- Control mounts in standard 19" rack, only 7" high x 17" deep, 70 lbs. Tube with RF head weighs only 15 lbs, uses standard 4½" O.D. copper-gasketed flange. Tube alone weighs only four lb.
- Only \$2995.00 (including integral scope).



SPI-10 scope scan of same system as below

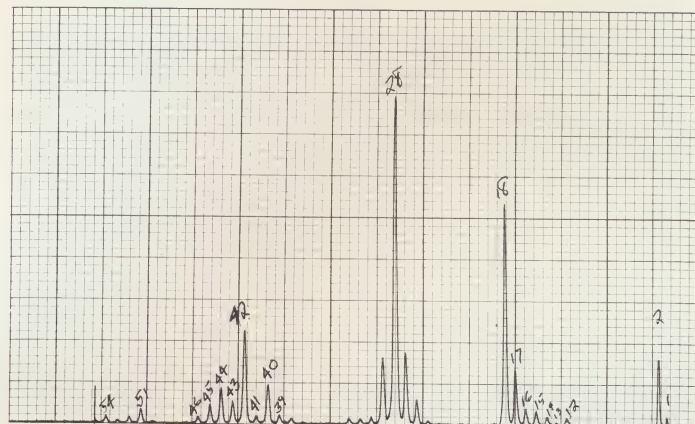
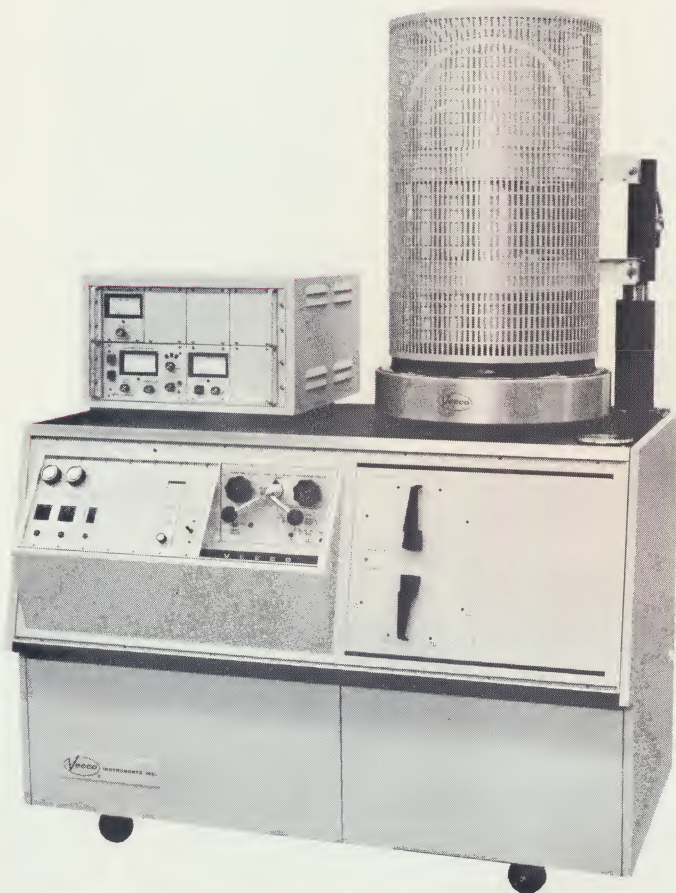


Chart recorder scan of 1×10^{-5} torr diffusion-pumped system (degas was on) on SPI-10; 1 sec major division.



HIGH VACUUM SYSTEMS AND EVAPORATORS

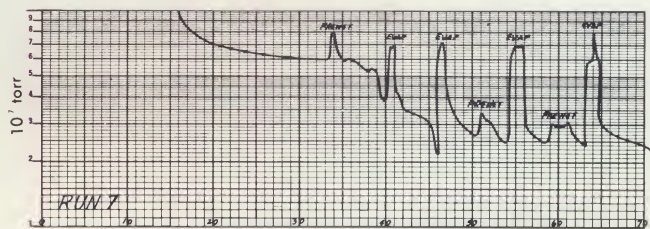
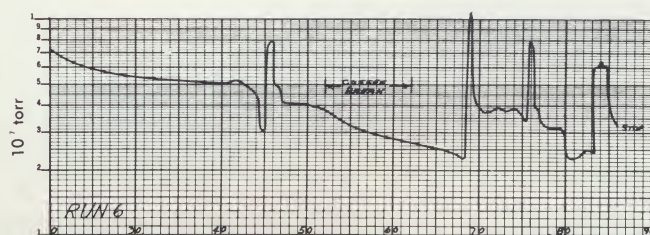
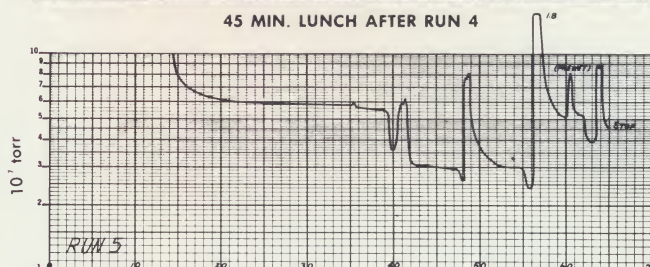
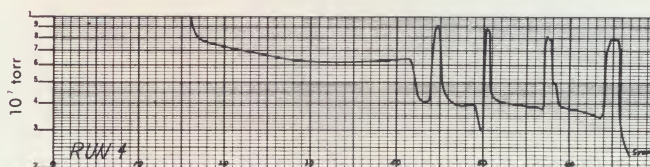
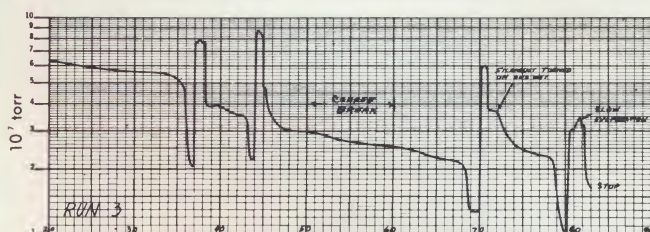
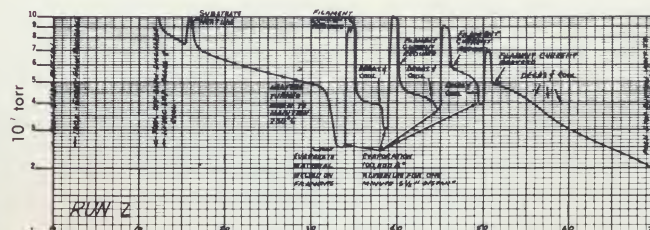
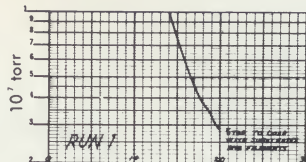


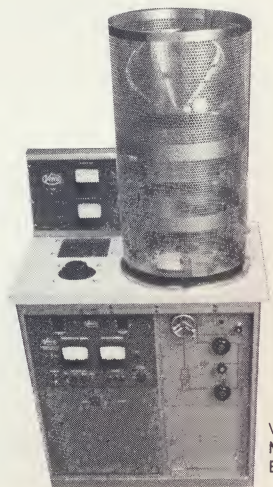
HIGH VACUUM SYSTEMS AND EVAPORATORS 776 Series

A fast, dependable evaporator that produces higher yields of thin films with consistent characteristics in production applications, dependable, repeatable experiments in lab applications — a result of the cleanest vacuum system available — now faster and cleaner in this improved version of the popular, field-proven 775 Series.

- New very low impedance (only 1½" thick), full 7¾" full port positive-sealing butterfly valve.
- Ultimate pressure, in bell jar and without bakeout, in 10^{-8} torr range.
- Stainless steel high vacuum system (no gassy cast parts).
- High efficiency 15-chevron water baffle as well as a big 14-chevron double-reservoir cold trap for ultra-cleanliness.
- Fast over-550 l/s system, with larger 7¾" port, 7¾" diffusion pump, oversize baffle and trap, and full 7¾" port valve.
- In actual use in production line after many months, cycles to 10^{-6} torr scale in 15 minutes on 18" x 30" bell jar, stays on 10^{-7} scale during continuous heavy aluminum evaporations made every 10 or 15 minutes all day long.
- Outstanding cleanliness and high gas handling capability of 776 has resulted in unusually high yields and uniform, consistent thin-film characteristics.
- Wide choice of basic models, options, and accessories.
- Economical manual and completely automatic models available.
- Vacuum pumping systems available separately or in conveniently packaged stations.
- Ask for brochure on the 776.

Log of actual field performance of 776 type system during one day's operation at a thin-film production facility of an international electronics firm.



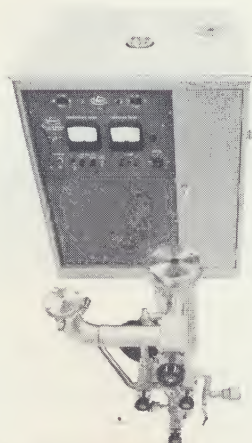


VE-400
Manual
Evaporator

HIGH VACUUM SYSTEMS AND EVAPORATORS 400/401 Series

The thousands in current use and the continuing volume of new and repeat purchases are an indication of their performance, reliability, and application success all over the world. These are the cleanest, most reliable four-inch systems available.

- Stainless steel 4" high vacuum system, including high vacuum valve.
- Guaranteed 5×10^{-7} torr capability; achieves 5×10^{-6} torr in less than 35 seconds blanked port, in $3\frac{1}{2}$ minutes with bell jar (18" x 30").
- The only standard four-inch system with a water baffle as well as a cold trap for maximum cleanliness.
- Differentially pumped, non-rising stem on stainless steel high vacuum valve.
- Thousands in successful use around the world.
- Very reliable and trouble-free system.
- Manual (400) or automatic (401) versions available, Basic systems and stations also available. A variety of options and accessories available for all models.
- Ask for detailed brochure.



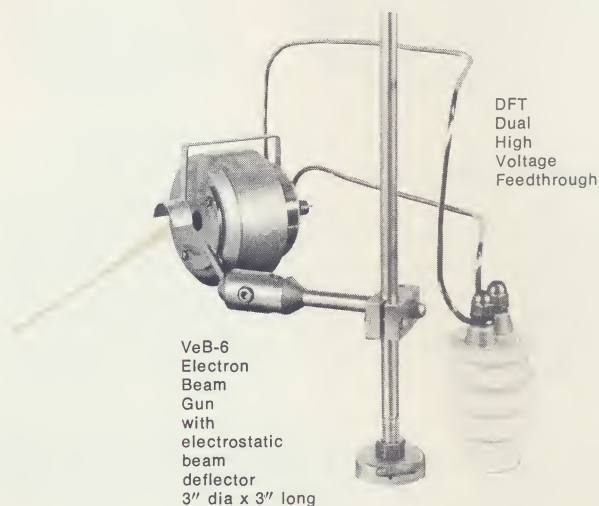
VS-200
High Vacuum
Station

VP-200
High Vacuum
Systems

HIGH VACUUM SYSTEMS 200 Series

The system that won't stop. Probably the most adaptable and long-lived vacuum equipment ever built.

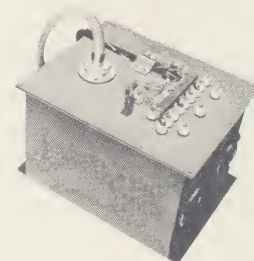
- Fast 2" system with 90 l/s diffusion pump.
- Plug-in air-cooled version or water-cooled version.
- Ultra-reliable, ultra versatile — just plug it in and forget it.
- Low cost.
- Available as basic systems or in completely packaged mobile station.
- Reaches 10^{-8} torr scale, operates in 10^{-6} or 10^{-7} scale.
- Request 8-page brochure.



VeB-6
Electron
Beam
Gun
with
electrostatic
beam
deflector
3" dia x 3" long

Power Supply
14" h x 19" w x 25" d

Control
8 $\frac{3}{4}$ " h x 19" w x 10 $\frac{1}{2}$ " d



VeB-6 Electron Beam Gun System

A compact electron gun furnishing its high power very uniformly distributed across the $\frac{1}{8}$ " beam width for the most even, regular evaporation of metals, alloys, and insulators you can achieve by any high-deposition-rate device or technique.

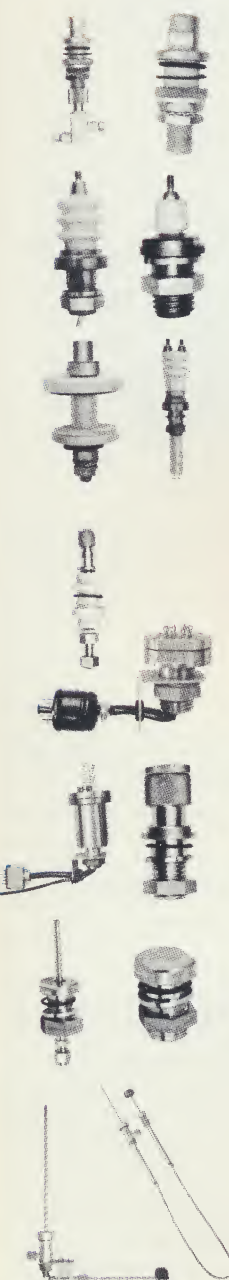
- Very compact — $2\frac{1}{4}$ " dia. x 3" long.
- No water cooling
- Fits anywhere in bell jar.
- One knob controls power density of $\frac{1}{8}$ " spot without changing spot size, power uniformity across it, or depth of focus.
- Gun weighs only 8 ounces.
- 2" depth of focus.
- Up to 6 kw beam power.
- Evaporates tungsten, moly, SiO_2 , all known materials.
- Self-accelerated.
- Electrostatic focusing; no magnets.
- Electrostatic deflection included.
- 500-hour bifilar tungsten filament is easily replaced.
- Focusing insensitive to beam voltage or current.
- Designed for UHV and bakeable to 400°C .
- Most economical (\$/kw) system available.
- Request detailed 12-page brochure.

Custom Equipment

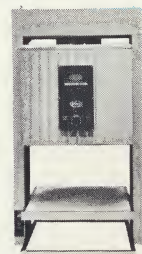
Special automatic high speed leak detection systems, vacuum manifolds, mass spectrometer inlet systems, automatic thin film deposition systems, and other special equipment is available. Consult your nearest Veeco field engineer (see back cover).

Baseplate Feedthroughs

The most rigorously designed high vacuum feedthroughs made. Veeco was FIRST to use differential pumping on all motion feedthroughs, FIRST to manufacture feedthroughs with only internal O-ring seals and no threaded feedthrough holes, FIRST to relieve all internal threaded parts. All Veeco feedthroughs fit 1" hole for complete interchangeability. All threads and tapped holes are relieved to avoid virtual leaks. Viton O-rings.



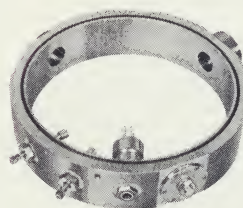
- CFT Water-Cooled High Current Feedthrough, OFHC copper, 50 V, 500 A continuous, 1000 A for one min., \$95.00.
- AFT Ambient-Cooled High Current Feedthrough, OFHC copper, 50 V, 400 A cont., 800 A one min., \$65.00.
- HVT High Voltage Feedthrough, 20 KV, 1 A, \$55.00
- GDP Glow Discharge Post, 5 KV, 2 A, \$45.00.
- HFT Resistance Heater Feedthrough, 220 V, 50 A, OFHC copper, \$65.00.
- DFT Dual High Voltage Feedthrough, 24 KV, 30 A, \$195.00.
- HFF High Frequency (Induction Heater) Feedthrough, aluminum, \$60.00.
- OCT Octal Header Feedthrough, aluminum body, nickel-plated copper pins, 115 V between pins, 5 A per pin, \$50.00.
- IGN Nude Ionization Gauge Tube Feedthrough, aluminum body, replaceable double tungsten filament, \$235.00
- QCF Quick Coupling Feedthrough, aluminum, 1/8, 1/4, 3/8, 1/2, 3/4", \$50.00 each.
- LNF Liquid Nitrogen Feedthrough, stainless steel, special long thermal path and vacuum-insulated to prevent o-ring freezing and consequent leakage, 3/8" dia. tubulation, \$85.00.
- BPF Blank Plug Feedthrough, aluminum, \$15.00
- DDR Direct Drive Rotary, 10 3/8" stainless steel rod, aluminum body, unlimited rotation angle, \$175.00.
- PPR Push-Pull Rotary, stainless steel rod, aluminum body, 3" shaft travel, 8 3/8" fully extended, unlimited rotation, differentially pumped shaft seal, \$195.00.



FH High Temperature Ovens

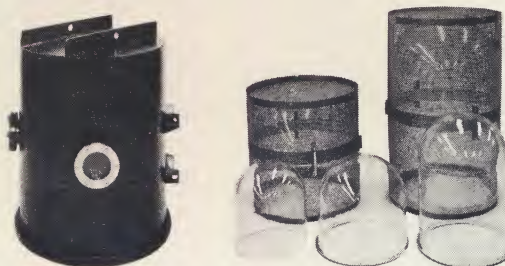
These complete oven assemblies with controls and automatic motor-driven lift fit on your existing vacuum stations, ideal for bakeouts and other processing 50° to 550°C.

- 3 1/2" insulation; inner and outer shell of stainless steel, angle iron steel framework, internal circulation fan, unstinting care of design throughout; the best oven you can buy.
- FH-2 (\$2485.00) reaches 550°C in 110 minutes, features interlocking circuit for external heater control. Fits Veeco VS-200 and UHV-200 vacuum system; mounts on 30 1/4" square base.



FTC Feedthrough Collars

Scratch resistant all stainless steel feedthrough collars with feedthroughs and holes located to suit your requirements at standard prices. FTC-18 is 20" OD, 17 1/4" ID, FTC-24 26" OD, 24" ID, both 4 1/2" high. See Veeco Accessories brochure for complete ordering information.



Bell Jars

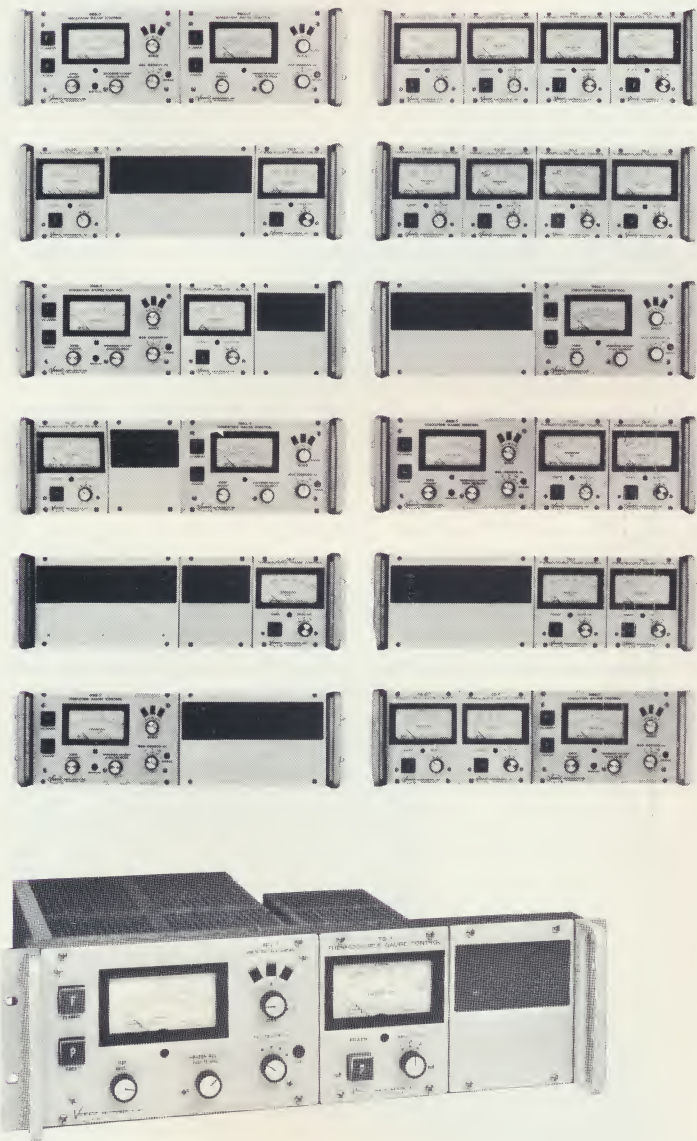
Veeco supplies a wide variety of bell jars, both stainless steel and pyrex, from 10"x12" to 24"x30", ambient or water-cooled, with Veeco quality control. See Veeco Accessories brochure for complete listing.



Stainless Steel Baseplates

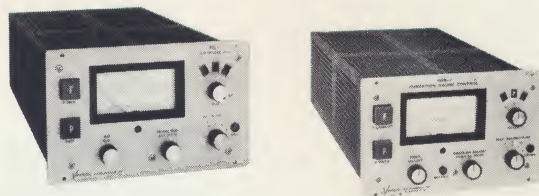
A complete line of Veeco baseplates is available, with holes located to suit your needs. From 14 to 26" dia., rear port or center port, 1", 2", 4", 7", and 7 3/4" ports. See Veeco Accessories brochure for details and for low-priced standard-hole-locations.

Twenty years of specialization in high performance vacuum instrumentation has given Veeco its enviable reputation in the high vacuum field.



The new RG-7/TG-7 family of gauge controls stand on their own as the finest high performance instruments you can buy. They also package together into the finest high performance gauging systems you can buy. All fit a 5¼" high, standard 19" wide rack. The ionization gauge controls are half racks, the thermocouple gauge controls quarter racks.

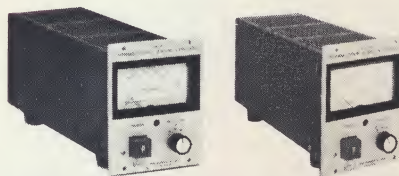
- RGLL-7/TG-7 Combination Log-Linear Ion Gauge, Thermocouple Gauge, LRA-2 Rack Mount, one ion gauge cable and two thermocouple gauge cables; shipped disassembled, \$695.00.
- RGS-7/TG-7 Combination Automatic-Switching Ion Gauge, Thermocouple Gauge, LRA-2 Rack Mount, one ion gauge cable, and two thermocouple gauge cables; shipped disassembled, \$735.00.
- Two position switching attachment for monitoring two ion gauge tubes, mounted in separate ¼-rack module with interconnecting cables and one RG-75cc cable, \$127.00.



RG-7 Ionization Gauge Controls

New Veeco Ion Gauge Controls feature linearity to 10 microns, reliable all silicon design, and versatile half-rack size.

- The new Veeco Ion Gauge Controls are available in two models. The RGLL-7 features a seven-decade logarithmic scale for continuous pressure indication, and controller circuits for protection or automation of external devices, as well as a manually switched 9-decade linear scale. The RGS-7 features automatic range switching of linear decades to automatically respond to system condition.
- Covering the ten-decade range from 1×10^{-2} to 2×10^{-12} torr range.
- RGLL-7 (\$545.00) features single log scale covering seven decades as well as linear scale for precise measurement in each decade.
- RGLL-7 also has automatic controller function which controls external circuits at any two operator-preset pressures in the seven-decade range.
- RGS-7 (\$585.00) features linear scale with automatic range changing.
- Units are conveniently compact and lightweight for bench and production use.
- Units are convenient half-rack size; two units fit standard 5¼" x 19" rack.
- Pressure is indicated during degassing.
- Decade in use is displayed on illuminated screens.
- Connections provided for recorder.
- Very high stability — drift less than 1% in 50 hours.
- Electrometer accuracy $\pm 5\%$ of full scale on all ranges.
- Adjustable emission current $10\mu\text{a}$ to 10 ma.
- Modular all-silicon solid state electronics and the most advanced fabrication techniques to assure maximum reliability.
- Automatic filament protection prevents gauge tube burnout.
- Highest performance and finest quality gauge control in the industry.
- Supplied 115V 60Hz; changes to 220V with simple wiring change.
- Units fit rack mount LRA-1 (\$60.00) or rack adaptor LRA-2 (\$25.00).
- Blank quarter (\$5.00) and half rack (\$10.00) panels available.



TG-7 Thermocouple Gauge Controls

A three-input thermocouple gauge control for rack or bench. Versatile, compact quarter-rack size, compatible with Veeco RG-7 ion gauge controls.

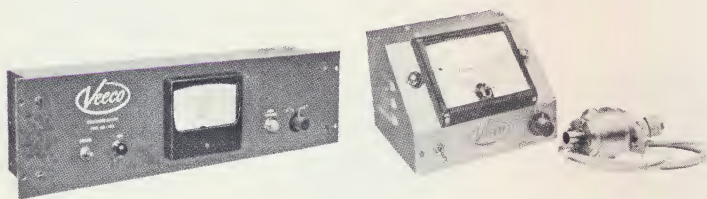
- TG-7 (\$150.00) covers 10^{-3} to 1 torr.
- TG-27 (\$150.00) covers 0 to 20 torr.
- Veeco DV-1M (\$12.00) gauge tube is matched to TG-7, DV-4AM (\$25.00) to TG-27.
- Accommodates up to three (3) thermocouple gauge tubes.
- Control-tube cable, 8 ft, \$6.50.
- Supplied 115V 60Hz; changes to 220V with simple wiring change.



RG-31X and RG-21X Ion Gauge Controls

Ultra-reliable design, functionally improved and extensively field-proven — your best choice where high performance and reliability are required, but the compactness, logarithmic presentation, process control, or automatic range switching of the RG-7 is not essential.

- Workhorse of the industry; thousands in use; trouble-free.
- RG-31X Combination Ionization Gauge and Thermocouple Gauge Control (\$595.00) covers 1 to 2×10^{-11} torr.
- RG-21X Ionization Gauge Control (\$490.00) covers 1×10^{-3} to 2×10^{-11} torr.
- RG-31X-2T (\$645.00) is RG-31X with installed two-position switch for monitoring two ion gauge tubes; includes extra set of cables.



DG-2-10 Discharge Gauge Control

Your most economical and practical buy for monitoring 1×10^{-2} to 5×10^{-6} torr with one gauge tube.

- Easy to use; versatile; reliable — no amplifier.
- Bench model DG-2-10 (\$140.00) or Rack model DG-2-AR (\$150.00), not including gauge tube.
- Unbreakable all-metal gauge tube; just replace low cost gauge tube liner when it gets dirty.
- Flanged construction for easy (5-10 minutes) replacement of liner.
- DG gauge tube withstands atmospheric pressure while operating.
- DG-2-11 Discharge Gauge Tube with cable, \$165.00.



DG-2-2T Discharge/Thermocouple Gauge Control

Cover 1 torr to 5×10^{-6} torr in one instrument, with multiple-system switch-selectable monitoring capability — two thermocouple gauges, one discharge gauge. Extremely rugged, reliable and economical.

- TC and DG gauge tubes withstand atmospheric pressure while operating.
- \$430.00 includes control, three gauge cables, two TC gauges, one DG gauge.



TC-9 Thermocouple Gauge Controller

Control four external circuits (such as valves and bakeout ovens) between two variable control points and measure pressure 1 torr to 10^{-3} torr on one continuous scale.

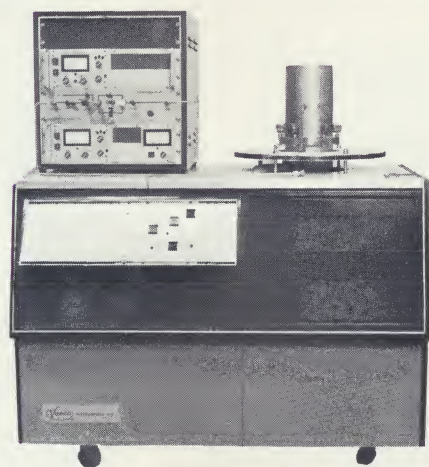
- Two independent externally adjustable vacuum control points switch up to four 5-amp 110 volt AC loads.
- Solid state regulated power supply.
- Meter operates independently of control function, providing uninterrupted reading through two control points.
- \$450.00 includes control, tube, cable.



TC-DG-9 Thermocouple/Discharge Gauge Controller

The only automatic controller available covering both the rough and high vacuum ranges, 1 torr to 5×10^{-6} torr. Program pumpdown cycle from atmosphere to high vacuum, then initiate process (such as thin film deposition) when preset high vacuum level is attained — use pressure rather than time to initiate your process.

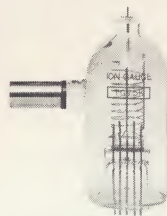
- Four independent control points controlling up to eight loads.
- Separate meters for thermocouple and discharge gauges, both with two pairs of controller set points.
- Solid state circuit.
- \$985.00, including control, tubes, cables.



CS-776 Gauge Calibration System

The determination of system speed is an essential part of gauge calibration. With the Veeco CS-776, speed is measured at the gauges, not just calculated at the orifice as with other gauge calibration systems. The result is an accuracy figure that means what it says.

- $\pm 5\%$ accuracy across range.
- 2×10^{-4} to 4×10^{-7} torr calibrating range.
- Up to 5 gauges tested in 5½ hours.
- $\pm 2\%$ test-to-test repeatability.
- Bakeout oven included.
- Permits calibration of gauges in accordance with ASTM Document No. E297-66T.
- Easy to use.
- Clean, reliable double-trapped stainless steel high speed 7¾" vacuum system that can be used for many other laboratory purposes when not used with gauge calibration head and precision flowmeter apparatus.
- Only \$9750 for complete system with VS-776, \$2950.00 for calibration apparatus without vacuum system.
- Write for detailed descriptive literature.



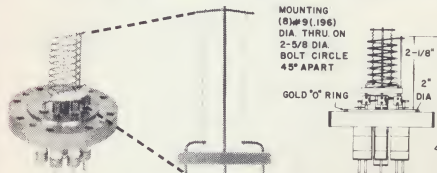
Ionization Gauge Tubes

Veeco is now offering substantial quantity discounts on RG-75 and TG-75 Ionization Gauge Tubes for purchases of five or more. Order a supply now.

- RG-75 features non-burnout thoria-coated iridium filament which withstands repeated exposure to atmosphere while hot.
- TG-75 features double tungsten filament; standby filament prevents interruption of operation in case of burnout.
- Linear from 10^{-10} up to 10^{-2} torr.
- Inverted Bayard-Alpert design.
- ¾" inlet tubulation.
- Tubulation of Pyrex, Nonex, or Kovar.
- Special glass skirts with metal shields on lead-ins prevent lowered interelectrode resistance due to undersired depositions.
- RG-75 has 750-hour or 6-month (whichever comes first) warranty.

CAT. NO.	PART NO.	UNIT PRICE/QUANTITIES		
		1-4	5-20	20-100
RG-75-N	5010-000	\$39.00	\$31.20	\$28.10
RG-75-P	5020-000	43.00	34.40	31.00
RG-75-K	5030-000	48.00	38.40	34.60
RG-75-S	4990-000	75.00	75.00	75.00
TG-75-N	5050-000	39.00	31.20	28.10
TG-75-P	5060-000	43.00	34.40	31.00
TG-75-K	5070-000	48.00	38.40	34.60

Suffixes: "N" indicates Nonex tubulation, "P" for Pyrex, "K" for Kovar, "S" for sealed tubulation (control testing tube).



BGT-75 Nude Ion Gauge Tube

Eliminate possible errors due to tubulation conductance and still have a replaceable double filament for dependable, lifetime use of tube.

- Nude structure permits direct mounting of the gauge in the vacuum chamber, minimizing effects of ionic pumping and restrictive tubulation.
- Replaceable double tungsten filament.
- Repeatedly bakeable at 400°C.
- Available with gold O-ring stainless steel flange or with conflat flange (special order).
- \$185.00 including filament assembly, wrench, gold O-ring.
- Mating flange (Veeco gold seal type) for above, \$55.00.



DV Thermocouple Gauge Tubes

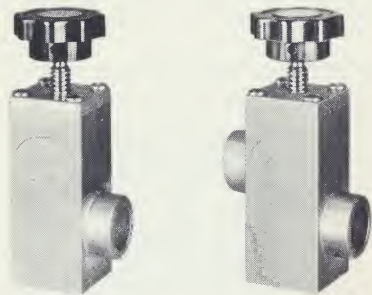
Reliable low-cost tubes matched to specific heater current.

- With ½" IPS male pipe thread for system mounting.
- DV-1M, 1×10^{-3} to 1 torr, \$12.00.
- DV-4AM, 0 to 20 torr, \$25.00.

VALVES

All Veeco valves feature the long-life leak-tight dependability that has made Veeco the leader in high vacuum valve engineering since Veeco first introduced the bellows-sealed valve to the vacuum industry in 1948.

All Veeco valves are 100% leak tested with Veeco Mass Spectrometer Leak Test Stations. Stock delivery is available on most Veeco valves.



Forged Brass Valves

Disc Seal:	FR Right Angle
	FL In-Line
O Ring Seal:	SR Right Angle
	SL In-Line

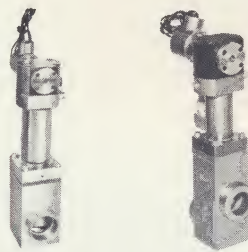
Disc-seal valves for sure, long-life sealing, low permeability low outgassing, available with Viton, Teflon, or lead seals (please specify). O-ring valves for lower outgassing.

- Compact — 1" unit shown measures only 2" square by 3 1/4".
- Acme stem thread opens and closes valve fast, yet precisely.
- Replaceable bellows-stem assemblies remove with only four screws.
- Quantity discount schedules are available on request.
- One-piece forged construction eliminates possible port leakage after brazing to your system.

MODEL	SIZE	PORT	PRICE VITON	PRICE LEAD	PRICE TEFLON
FL12P	1/8	Pipe	28.00	36.00	29.00
FL25P	1/4	"	28.00	36.00	29.00
FL62P	5/8	"	34.00	42.00	35.00
FL100P	1	"	44.00	52.00	46.00
FL150P	1 1/2	"	57.00	65.00	59.50
FL38S	3/8	Solder	28.00	36.00	29.00
FL50S	1/2	"	28.00	36.00	29.00
FL62S	5/8	"	34.00	42.00	35.00
FL100S	1	"	44.00	52.00	46.00
FL150S	1 1/2	"	57.00	65.00	59.50
FR12P	1/8	Pipe	25.50	33.50	26.50
FR25P	1/4	"	25.50	33.50	26.50
FR62P	5/8	"	31.00	39.00	32.00
FR100P	1	"	38.00	46.00	40.00
FR150P	1 1/2	"	51.00	59.00	53.50
FR38S	3/8	Solder	25.50	33.50	26.50
FR50S	1/2	"	25.50	33.50	26.50
FR62S	5/8	"	31.00	39.00	32.00
FR100S	1	"	38.00	46.00	40.00
FR150S	1 1/2	"	51.00	59.00	53.50
SL38S	3/8	Solder	29.00		
SL50S	1/2	"	29.00		
SR62S	5/8	"	35.00		
SL100S	1	"	45.00		
SL150S	1 1/2	"	58.00		
SR38S	3/8	Solder	26.50		
SR50S	1/2	"	26.50		
SR62S	5/8	"	32.00		
SR100S	1	"	39.00		
SR150S	1 1/2	"	52.00		

NOT AVAILABLE

NOT AVAILABLE



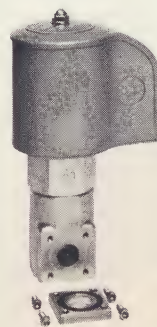
Pneumatic Valves

FPL In-Line Viton Disc Seal
FPR Rt-Angle

Simplify and protect your system with these reliable automatic valves.

- Forged brass.
- Remote operation.
- Over 100,000 cycles without maintenance.
- Electrically operated, pneumatically actuated.
- 115 VAC, 10 W, 80 psig (nom.).
- Horizontal or vertical mounting.
- PVK Kit converts FR or FL valves to pneumatic operation.
- Two air flow screws on pneumatic head permit wide adjustment of opening and closing times independently.
- Available normally closed, easily changed to normally open in field.

MODEL	SIZE	PORT	PRICE
FPL62S	5/8	Solder	180.00
FPL100S	1	"	195.00
FPL150S	1 1/2	"	215.00
FPR62S	5/8	Solder	180.00
FPR100S	1	"	195.00
FPR150S	1 1/2	"	215.00
FPL62P	5/8	Pipe	180.00
FPL100P	1	"	195.00
FPL150P	1 1/2	"	215.00
FPR62P	5/8	Pipe	180.00
FPR100P	1	"	195.00
FPR150P	1 1/2	"	215.00
PVK-62	5/8	—	164.00
PVK-100	1	—	173.00
PVK-150	1 1/2	—	185.00



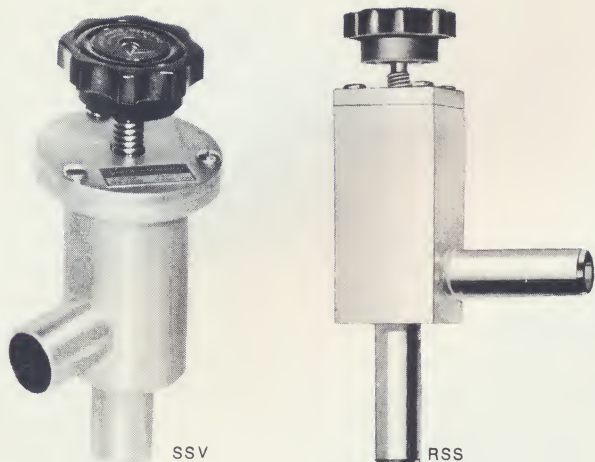
Solenoid Valve

SV Forged Brass
Straight-Through; O-Ring Seal

For economical fail-safe automatization and protection of your vacuum system.

- Continuous duty rating.
- 115 or 220 V, 50 or 60 cps, AC or DC.
- Vertical mounting.

MODEL	SIZE	PORT	PRICE
SV62SAC	3/4	Solder	95.00
SV62SDC	3/4	"	125.00
SV62PAC	1/2	Pipe	95.00
SV62PDC	1/2	"	125.00



All Stainless Steel Valves

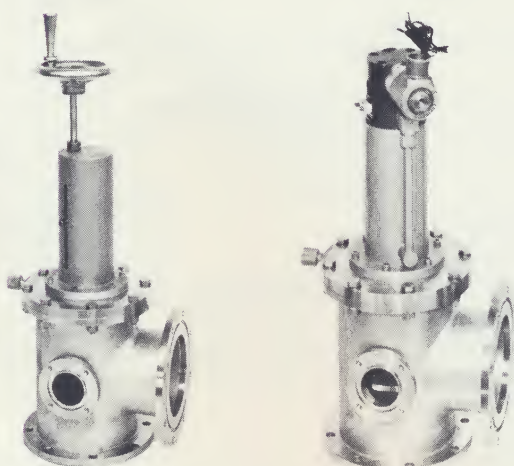
SSV Rt-Angle Viton O-Ring Seal

RSS Rt-Angle Gasket Seal

Don't use metal sealed valves if you don't have to.

- Lowest outgassing.
- Replaceable bellows on SSV.
- Replaceable bellows-stem assembly on RSS.
- One bellows size for all SSV.
- Tough unbreakable stem.
- RSS available with Viton (prices below), Teflon (add \$1.00 for under 1", \$2.00 for 1"), or lead (add \$8.00) seals.

MODEL	SIZE	PORT	PRICE
SSV150	1½	Weld	130.00
SSV150V	1½	Flange	175.00
R25RSS	¼	Weld	64.00
R25PSS	¼	Flange	125.00
R38RSS	¾	Weld	72.00
R50RSS	1	"	77.00



PR-400 4" Valve

A high conductance all stainless steel 4" valve with a built-in roughing port. Used in Veeco 4" systems, of which there are over 1000 in successful use.

- Right angle construction provides baffling effect, simplifies removal without disturbing remainder of vacuum system.
- Manual valve (with non-rising stem), \$495.00.
- Pneumatic valve, \$555.00.

BV-776 7¾" Butterfly Valve

The easiest way to valve a vacuum system — a very high conductance stainless steel 7¾" positive-sealing butterfly valve.

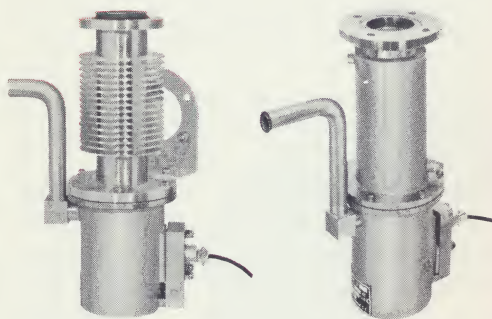
- Lowest exposed surface area of any similar size valve.
- Only 1⅝" thick.
- No gassy cast parts.
- Leak-tight seal against atmosphere in either direction.
- Silent operation.
- Easy to disassemble and clean.
- Few moving parts for maximum life and reliability.
- 90° from full open to fully closed.
- Quick coupling provided for gauge tube.
- Very easy conversion from manual to pneumatic and back again.
- Bakeable to approx. 200°C (limit of Viton).
- 6" ASA bolt circle.
- Manual version \$425.00, pneumatic version \$650.00.



Throttle Valves

Like a "variable leak, but with high full-open conductance, positive shut-off, and unlimited service.

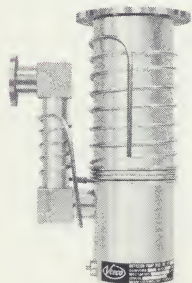
- Forged brass bodies, O-ring seals, bellows sealed.
- High conductance when open, positive shut-off when closed.
- Used in famous MS-9/MS-90 Leak Test Stations to permit throttling of 10⁻⁶ torr systems to atmosphere for "sniffing" operations.
- Flow rate variable from approximately 1 to 3000 atm-cc/min.; replaceable flow rate cylinders.
- R-62ST ⅝" port, solder connection, \$85.00
- R-100ST 1½" port, solder connection, \$125.00.



EP-2 Diffusion Pump

The workhorse of the business — used everywhere, anywhere with "nuts-and-bolts" reliability.

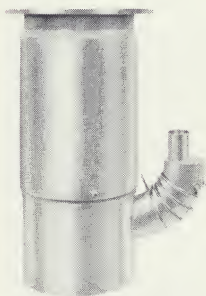
- 2" port.
- 90 1/s speed.
- Low backstreaming.
- Produces 1×10^{-9} torr in properly designed systems.
- Protective thermal switch available.
- Air-cooled EP-2AB (\$280.00 incl. blower; 110 VAC) or water-cooled Stainless steel EP-2W (\$290.00; 110 VAC).



EP-4 Diffusion Pump

Over 1000 have field-proven themselves in one of the most reliable high performance systems ever made.

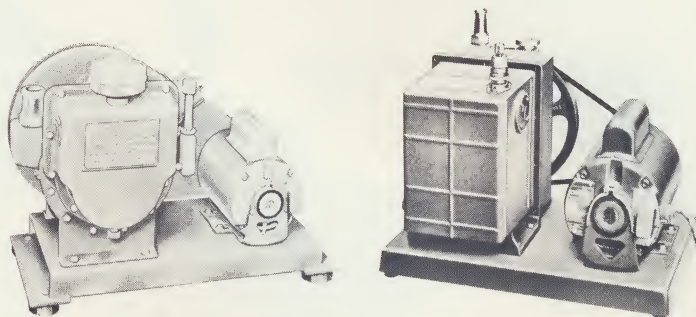
- 4" port.
- 400 liters/sec.
- All stainless steel body and flanges.
- \$425.00; 110 or 220 VAC.



EP-776 Diffusion Pump

A 7 $\frac{3}{4}$ " port with 2000 1/sec speed to go with it, with a standard six-inch A.S.A. flange.

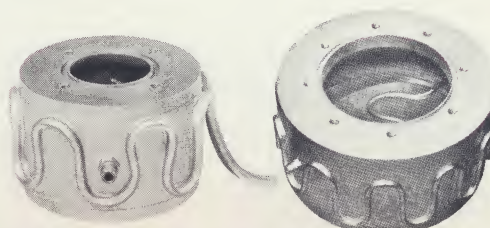
- All stainless steel body.
- Water-jacketed for uniform cooling.
- Cap over jets for reduced backstreaming.
- Easily disassembled for cleaning.
- \$685.00; 220 VAC.



Mechanical Pumps

The mechanical pumps with a sense of responsibility — free of idiosyncrasies — trouble-free — full benefits of Veeco warehousing and service organization. Stock maintained; fast delivery.

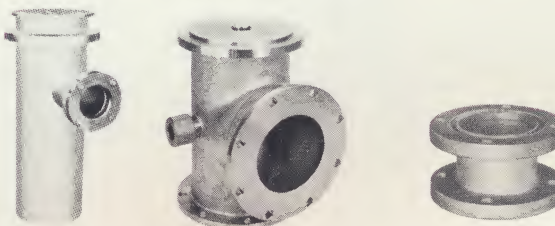
- Two-stage, vented exhaust.
- 1375M-35CFM — \$1300.00.
- 1376B-10CFM — \$540.00.
- 1397B-17.7CFM — \$685.00.
- 1398M3 ϕ -53CFM — \$1665.00.
- 1390M1 ϕ -53CFM — \$1875.00.
- 1400B-0.9CFM — \$162.00.
- 1402B-5.6CFM — \$355.00.
- 1405B-2.1CFM — \$280.00.
- Mechanical pump Duo-Seal oil, one qt., \$1.00.



BAF-200 & BAF-400 Water Baffles

General purpose disc-type water-cooled baffles that combine highest throughput with excellent baffling, low outgassing. Always use a good water baffle with your vacuum system — prevents oil "stealing" from pump by cold trap, keeps oil off LN₂ trap for better trap efficiency.

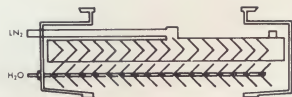
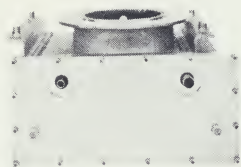
- Good heat conduction insured by solid brass body, copper disc, silver-soldering.
- Nickel-plated for excellent vacuum properties.
- Mate with EP-2 and EP-4 diffusion pumps.
- 2" for \$165.00; 4" for \$195.00



CT-200 & CT-400 Cold Traps

Good general-purpose long cooling-period bucket-type cold traps.

- High conductance.
- 8-10 hours of operation for filling with only 0.8 liters of liquid nitrogen.
- Mate with BAF-200 and BAF-400 water baffles. Mates directly to EP-2, EP-4. ADP-200 Adaptor adapts female lower flange to fit BAF-200.
- CT-200 2" brass cold trap with stainless steel bucket, \$250.00.
- CT-400 4" all stainless steel, \$325.00.



LL-776 7 3/4" Water Baffle and Cold Trap

The cleanest, most efficient baffling and trapping system ever offered commercially.

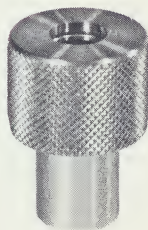
- Two sets of oversize, overlapping in-line chevron arrays for maximum surface and maximum conductance.
- Separate water baffle so LN₂ trap won't steal oil, so hot oil vapor and radiant heat from pump won't impair LN₂ trap efficiency.
- High efficiency S.S. 15-chevron water baffle with cooling along entire length of every chevron and big solid nickel 14-chevron LN₂ cold trap with double LN₂ reservoirs for ultracleanliness of your vacuum system.
- 6" ASA bolt circle flanges top and bottom.
- Adds >2000 l/s cryogenic pumping speed (for H₂O and CO₂) in your chamber.
- \$1050.00.



LGD Liquid Gas Dewars

The safe, easy way to handle liquid gases. As effective as glass dewars, they are unbreakable and have a vented stopper and cap for safe transporting of cryogenic liquids.

- All stainless steel.
- Vacuum insulated.
- One quart size, \$30.00; two quart size, \$40.00.



C Quick Couplings

The most versatile hardware you can put on your vacuum system; provides convenient demountability.

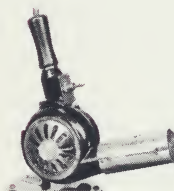
- For easily assembled vacuum-tight (to 10⁻¹⁰ std-cc/sec.) tubing joints.
- Compact and efficient.
- 1/16, 3/32, 1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4" sizes, \$5.00 each; 7/8, 1, 1 1/8" sizes; \$ 8.00 each. For quantities (single or mixed sizes) per order of 5-20, 20% discount; for 21-150, 30% discount.



SCL Standard Leaks

For admitting known leakage of gas.

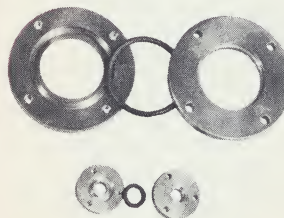
- 3/8" OD x 6" long.
- Leakage in range of 3-25 micron cu ft/hr, \$75.00; 26-50 μcf/h, \$85.00, 51-500 μcf/h, \$85.00.
- Specific leak rates ±20% available at 50% premium.



QD Electric Degassing Guns

A highly efficient means of baking out individual components and small systems.

- Safely speeds up degassing.
- Also for drying or removing solvents from parts, and for shrinking plastic tubing.
- 250°F (\$44.30), 325°F (\$44.30), 500°F (\$49.90), 750°F (400°C) (\$59.95) for 110 volt.
- 250°F (\$51.95), 325°F (\$51.95), 500°F (\$55.25), 750°F (\$74.85) for 220 volt.



BF Brass Flange Sets

Reliable and versatile hand-machined brass flanges for general purpose use.

- O-ring sealed.
- For general purpose vacuum-tight joints — between system sub-assemblies or for attaching gauges, etc.
- 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 1 1/8, 1 1/2, 1 5/8" (\$15.00), 2, 2 1/8" (\$17.00), 2 1/2, 2 5/8" (\$24.00), 3, 3 1/8" (\$31.00), 4, 4 1/8" (\$39.00). Prices includes complete sets.



Vacuum Pump Fluids

- DC-704 Diffusion Pump Fluid, 500 cc, \$27.50.
- DC-705 Diffusion Pump Fluid, 500 cc, \$45.00.
- Octoil Diffusion Pump Fluid, 60 cc, \$5.00.
- Octoil Diffusion Pump Fluid, 100 cc, \$6.00.
- Duo-Seal Mechanical Pump Fluid, 1 qt., \$1.00.

HOW TO ORDER

On Veeco products that are all standard catalog items, indicate quantity, catalog number, name of unit. Order direct simply by sending your purchase order to Order Processing Department, Veeco Instruments Inc., Terminal Drive, Plainview, L.I., N.Y. 11803 for Eastern and Central locations, or West Coast Order Processing, Veeco Instruments Inc., 13425 Wyandotte St., N. Hollywood, California, 91605 for West Coast locations, or to nearest Veeco office below. Systems, feedthrough collars, bell jars, baseplates, etc., generally require a quote based on the specific configuration desired. For this information, and for any other questions, contact your nearest Veeco field engineer listed below.

Prices and availability effective 6/1/68, U.S. and Canada only, F. O. B. Plainview, N.Y., and subject to later change without notice. Prices F.O.B. N. Hollywood, Calif. only for equipment warehoused there. Specifications also subject to change without notice. Minimum order \$10.00.

SALES AND SERVICE OFFICES

DOMESTIC

EASTERN REGION

Regional Office: Plainview, N. Y., 11803, 20 Dupont Street
Tel. 516 681-8300 TWX 510-221-1897
Braintree, Mass., 02184, 182 Forbes Rd., Suite 4
Tel. 617 848-1610
Syracuse, N. Y., Tel. 315 471-0560

MID-ATLANTIC REGION

Regional Office: Rockville, Maryland 20852, 1075R Rockville Pike
Tel. 301 424-2010
Norristown, Pa., Tel. 215 272-7101

WESTERN REGION

Regional Office and West Coast Warehouse:
North Hollywood, Calif., 91605, 13425 Wyandotte St.
Tel. 213 983-0804 or 764-1122 TWX 910-499-2651
Los Altos, Calif. 94022, 4546 El Camino Real, Suite G
Mail Address: P. O. Box 310
Tel. 415 941-3801 TWX 910-370-7964

SOUTHERN REGION

Regional Office: Richardson, Texas 75080, Suite 7E, Central Exch. Bldg.
777 So. Central Expwy.
Tel. 214 231-7191 TWX 910-867-4726
Knoxville, Tenn., Tel. 615 546-4134
W. Palm Beach, Fla. Tel. 305 833-1447
Orlando, Fla., Tel. 305 644-9012
Albuquerque, New Mexico 87111, P. O. Box 11604
Tel. 505 247-4854
Denver, Colorado, Tel. 303 238-0158

MID-WESTERN REGION

Regional Office: Hinsdale, Illinois 60521, 2 Salt Creek Lane
Tel. 312 325-5660, 5661, 5662
Cleveland, Ohio, Tel. 216 381-3610
Dayton, Ohio, Tel. 513 222-6656
Minneapolis, Minn., Tel. 612 332-6714

OVERSEAS

Veeco Instruments Inc., Import-Export Department
Terminal Drive, Plainview, N. Y. 11803
Tel. 516 681-8300, Cable — Veecovac

ENGLAND

Veeco Instruments Ltd., 21 Aston Road, Waterlooville
Portsmouth, Hants, Eng. Phone Waterlooville 51181 & 51182
Cable: Veecovac, Portsmouth

GERMANY

Veeco GmbH, Knorrstrasse 142
8000 Munich 45, W. Germany, Tel. 311-77-60
Cable: Veecovac, Munchen

FRANCE

Veeco SA, Versailles 78, 64 a 70 Rue Des Chantiers
Tel. 951 03-34-951 11-36

SCANDINAVIA

Mulder-Vogem Scandinavia AB
Hagagatan Zg Box 23060 Stockholm 23
Tel. 08-24-72-00 Telex: 10625

CANADA

Radionics Limited, 2182 W. 12th Avenue, Vancouver 9, B. C.
Tel. 604 732-7317
Radionics Limited, 3062 Blvd Quatre-Bourgeois, Quebec 10, Quebec
Tel: 418 651-5845
Radionics Limited, 195 Graveline Street, Montreal 9, Que., Canada
Tel. 514-735-4565 TWX 610-422-3070
Radionics Limited, 505 Eglinton Ave. W, Toronto 12, Ontario
Tel. 416 483-7191
Radionics Limited, 376 Churchill Avenue, Ottawa 3, Ontario
Tel. 613 728-4624

JAPAN

Tokyo Electron Laboratories, Inc., TBS Building
Akasaka, Tokyo, Japan, Tel. 584-5611

AUSTRALIA

N I C Instruments Co., Essendon Airport
N. Essendon W. 6, Tel. 379-1528, Cable: NATINCO

ISRAEL

Elina, Ltd., P.O.B. 1020, 7 Rishonim Street Ramat-Gan, Tel-Aviv
Tel. 720715 Cable: MELINDUS-RAMATGAN

ITALY

Veeco, Via Onerato Vigliani, 11/1, Torino
Tel. 35.21.22

ARGENTINA

Sirex, Libertad 836, Buenos Aires, Argentina
Tel. 42-1927 44-5781
Cable: SIREX

BRAZIL

Cia. Staub de Representações e Comércio
Caixa Postal 30.318, Rua Missionários 102/134 — Santo Amaro
Sao Paulo — Brasil
Tels. 61-1204 — 61-0260 — 61-8950
End. telegráfico: ESTAB SAOPAULO

CHILE

Sirex, San Antonio 427 (OF. 1001), Santiago, Chile
Tel. 39-5752

COSTA RICO

Audrain & Esquivel Ltda., P. O. Box 855, San Jose, Costa Rica
Tel. 21-38-38 21-26-67

PUERTO RICO

Scientific Supply Corp., 1247 F.D. Roosevelt Ave., Puerto Nuevo
Tel. 783-1947

TURKEY

Fenhem Ltd., 19 Karahil Sokak, Ankara
Tel. 12 29 15 — 12 50 46
Cable: FENHEM, ANKARA

Standard Veeco Terms and Conditions of Sales and Warranty apply; request full statement.



INSTRUMENTS INC.

TERMINAL DRIVE, PLAINVIEW, NEW YORK 11803

TEL. 516/681-8300 • TWX 510-221-1897

Specifications subject to change without notice



INSTRUMENTS INC.

®

TERMINAL DRIVE, PLAINVIEW, NEW YORK 11803

BULK RATE
U.S. POSTAGE
PAID
NEW YORK, N. Y.
PERMIT NO. 5434

T. Nelson
Systems Consultant
Box 1546
Poughkeepsie, N. Y. 12603