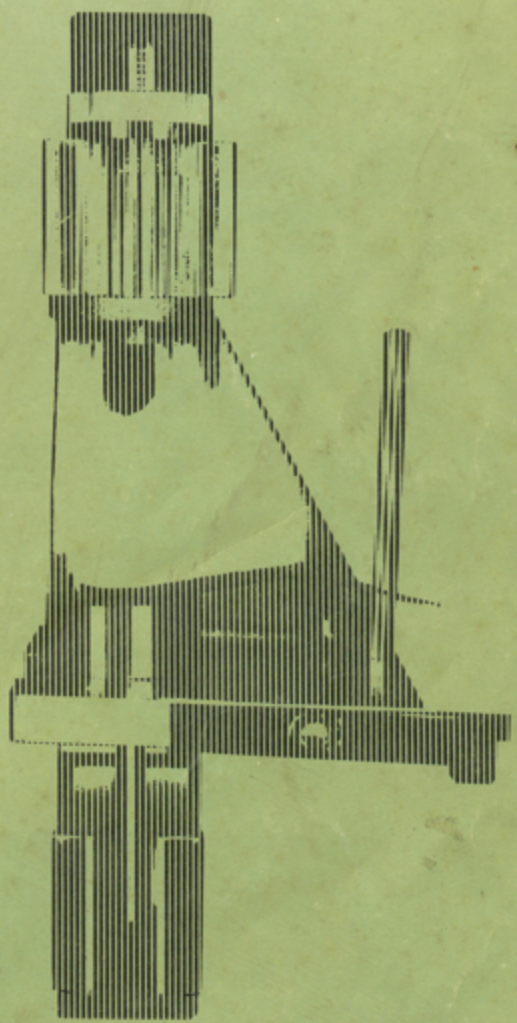
19-300/311

THE SPECTROSCOPISTS'

arc stand

DESIGNED BY SPECTROSCOPISTS
for spectroscopists

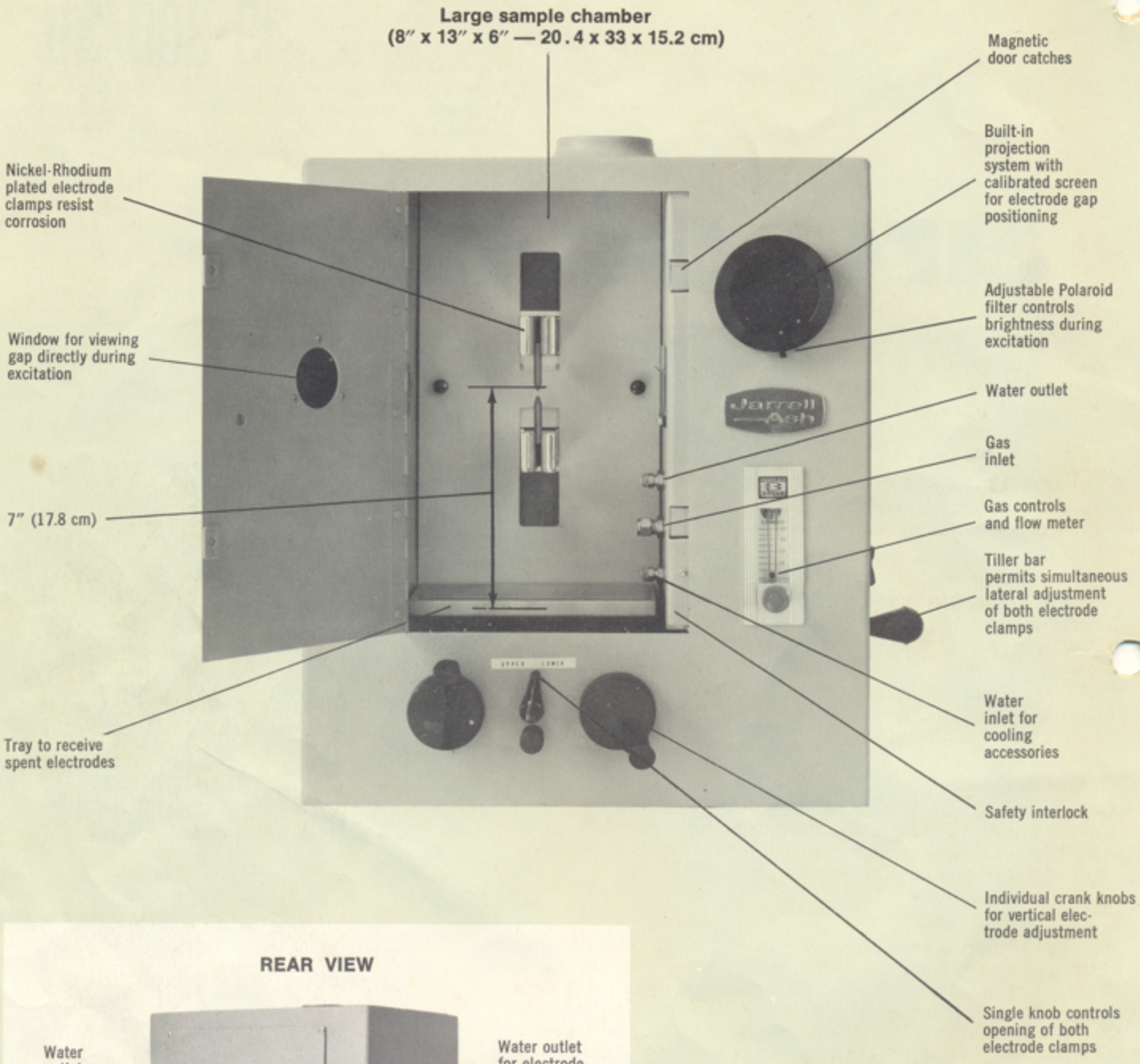
- Rugged, uncluttered design
- Minimum of easily accessible controls permits rapid installation and accurate positioning of electrodes and samples
- Extra large sample chamber
- Complete range of snap-in accessories
- Unexcelled accuracy
- Adaptable for virtually all analytical procedures



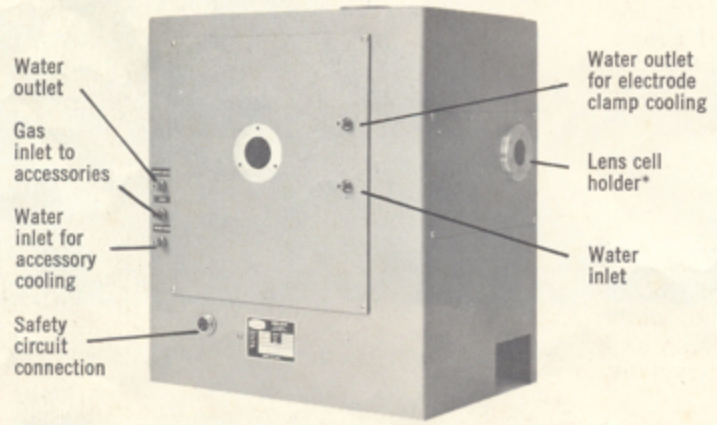
Bulletin No. 33

Jarrell—Ash

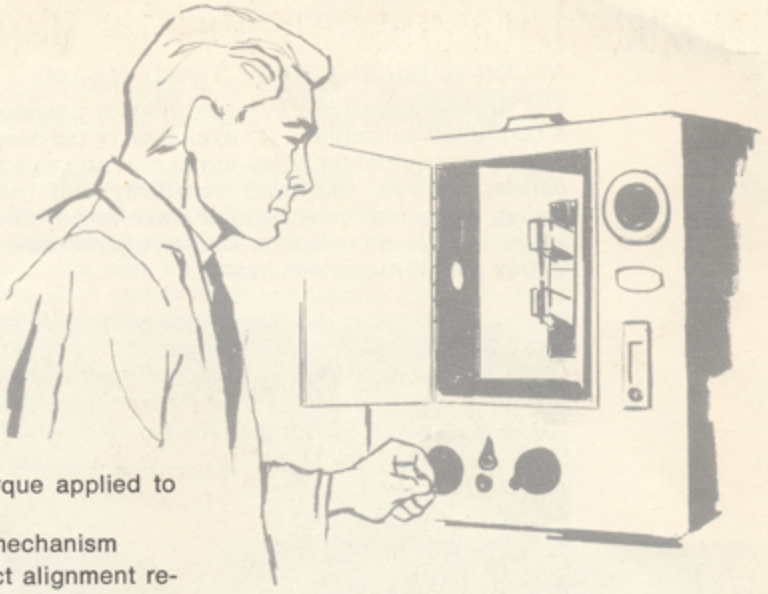
many special features provided for utmost convenience



REAR VIEW



*An opening directly opposite the lens cell holder allows illumination from a Laser, Plasma Torch or other source to pass directly through the 19-300 without the need to remove it.



STABILITY

- Rugged base casting
- Controls located on base of stand eliminate torque applied to optical bar that may cause misalignment
- Free non-binding, positive electrode positioning mechanism
- Bilateral opening electrode clamps insure perfect alignment regardless of electrode diameter
- Spring loaded electrode clamps provide positive gripping action

SAFETY

- Safety interlock circuit on excitation chamber door
- Internal safety gap prevents arcing or sparking to the case in the event of starting excitation without electrodes in the clamps

ORDER BY CATALOG NUMBER

Two standard models of the Arc Stand are offered as listed below. Each of the two Arc Stands is provided as illustrated on Page 2, but without any of the accessories described in the following pages.

19-300 Arc Stand — Offered for use on photographic instruments.

19-311 Arc Stand — Offered for direct reading instruments.

COMPLETE RANGE OF SNAP-IN INTERCHANGEABLE ACCESSORIES

Several accessories, permitting the 19-300 Arc/Spark Stand to handle virtually all analytical problems, are available from Jarrell-Ash. All accessories can be installed in the arc stand with minimum effort and easy optical alignment.

PETREY STAND (19-310)

The 19-310 Petrey Stand accessory (Fig. 1) is recommended when working with flat samples. Utilizing the point-to-plane technique, direct excitation of large or irregular samples with one flat surface may be accomplished easily. An attached spacer swings into position to set accurately the analytical gap. The standard spacer width is 3 mm; various other widths can be supplied. A spring-clip secures the sample on the petrey table providing positive electrical connection.

Maximum size Petrey sample:
4⅝″ x 5″ x 2 7/16″ (11.7 x 12.7 x 6.2 cm)

ROTATING PETREY STAND (19-350)

The 19-350 (Fig. 2) is similar to the regular Petrey Stand with one exception. A low R.P.M. motor, mounted in the arc stand, rotates the Petrey table and sample via an insulated shaft. Rotation of the sample provides improved sensitivity for samples exhibiting high oxidation or rapid burnout characteristics. Improved precision may also be obtain for non-homogenous samples.

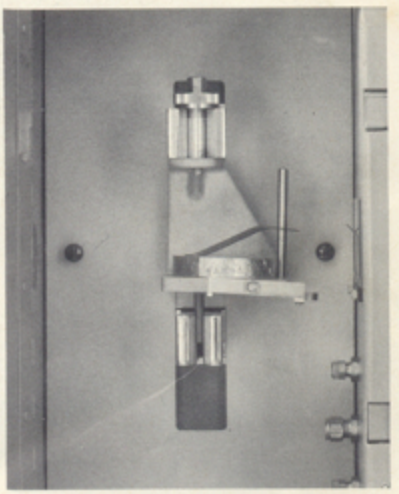


Fig. 1 — Petrey Stand (19-310)

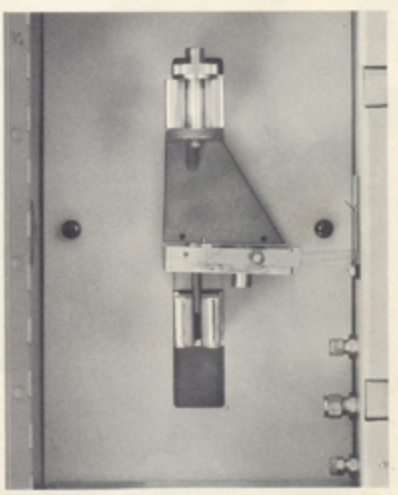
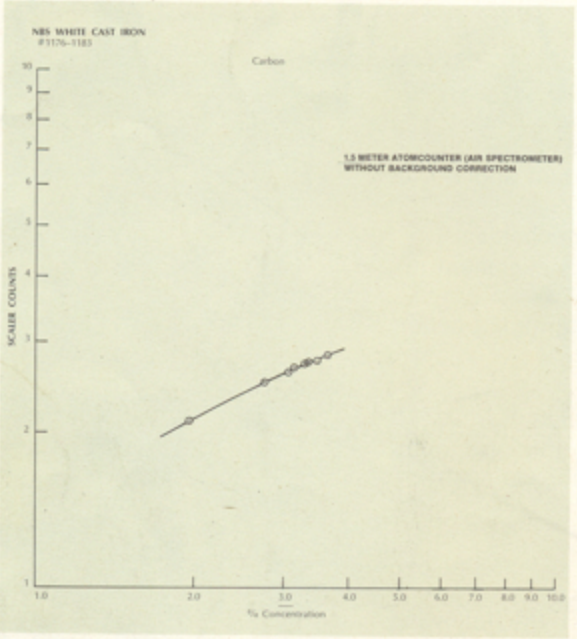
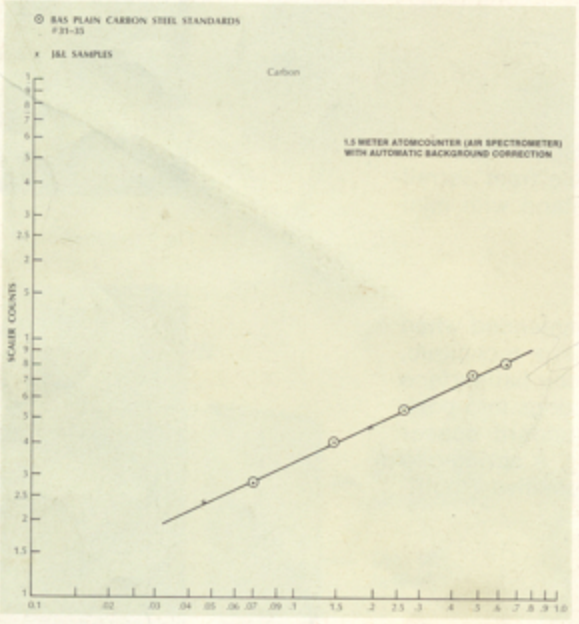


Fig. 2 — Rotating Petrey Stand (19-350)

ARGON-FLUSHED PETREY STAND (19-318)

The Argon-Flushed Petrey Stand (Fig. 3) provides a controlled atmosphere for excitation of flat samples. It is required for pulse-arc excitation used in carbon analysis. Improved sensitivity and precision, as well as extended low wave length coverage, is obtained using the 19-318 Argon-Flushed Petrey Stand (see curves below).





CONTROLLED ATMOSPHERE CHAMBER WITH WATER COOLING (19-309)

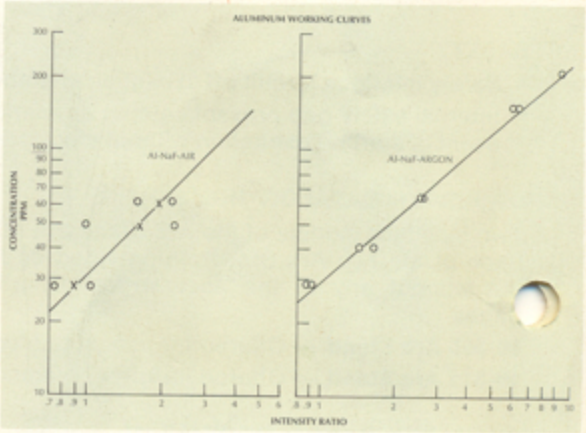
By surrounding an arc with selected atmospheres the 19-309 (Fig. 4) improves sensitivity and precision in many analyses. Altering the atmosphere enables one to reduce background and in some cases eliminate the cyanogen bands. It is useful for work with cup and coated electrodes and general dc arc excitation.

STALLWOOD JET FOR ¼" ELECTRODES (19-320)

The principal advantage of a Stallwood jet (Fig. 5) is to cool and stabilize a dc arc. Depending on the atmosphere used, the background and cyanogen bands may be reduced. Arc wandering is reduced resulting in greater reproducibility. Electrode adjustment is independent of the jet allowing analytical gap spacing to be maintained during excitation.

STALLWOOD JET FOR ⅛" ELECTRODES (19-321)

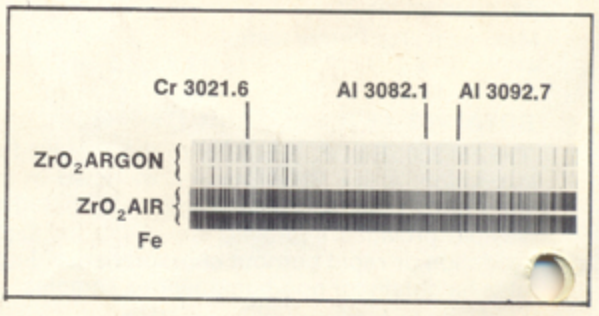
The 19-321 Stallwood Jet is identical to the 19-320 except that it's constructed for ⅛" diameter electrodes.



O'CONNELL JET (19-322)

The O'Connell Jet (Fig. 6) provides a laminar flow for controlled atmosphere work. Improved signal-to-noise ratio is exhibited at low wavelengths. Improved sensitivity and precision are gained for many analyses. The 19-322 is particularly useful for carrier distillation work. See curves above.

The spectrogram below illustrates how a 19-322 O'Connell Jet can be used with an argon atmosphere to eliminate background. In exposures C and D heavy background is evident by exciting the sample in air. Background is eliminated in exposures A and B by using an argon atmosphere.



CONDITIONS
sa e 25mg. ZrO_2 10% Na Fl added
12 amp dc arc
0 pre-burn
80 sec. exposure
20μ ent. slit
exp. A B 6 cfh argon
exp. C D air
30% neutral density filter

BRIQUETTE HOLDER (19-302)

The 19-302 holder (Fig. 7) is utilized for the excitation of ½" briquetted powder samples. It is useful for the analyses of slags, refractories, and ores. The holder has a plunger to eject excited samples, thus facilitating rapid sample changes.

ROTATING DISC ELECTRODE (19-330)

Direct analysis of liquid samples such as oil, water, plating solutions, and various other metal solutions can be accomplished with the 19-330 (Fig. 8). A slowly rotating graphite disc, axis horizontal, carries solution from a "boat" into the discharge for excitation. The disc rotates in the same plane as the entrance slit which greatly reduces discharge wander across the slit and improves precision (10, 20 and 30 R.P.M. motors are available).

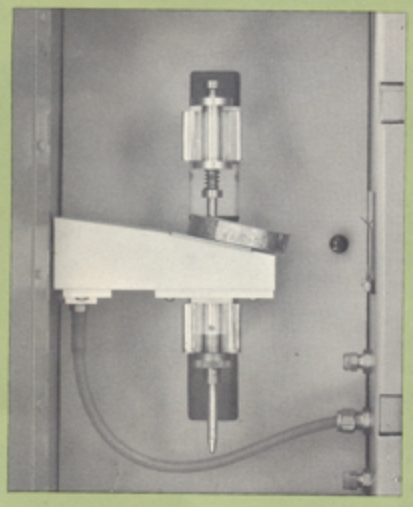


Fig. 3 — Argon Flushed Petrey Stand (19-318)

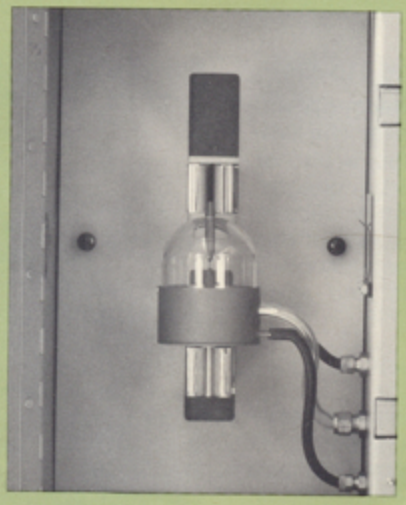


Fig. 4 — Controlled Atmosphere Chamber with Water Cooling (19-309)

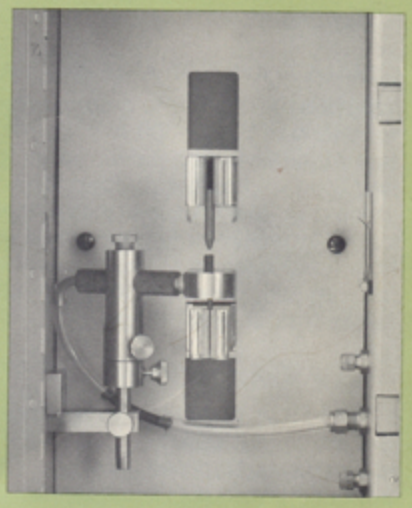


Fig. 5 — Stallwood Jet for ¼" Electrodes (19-320)

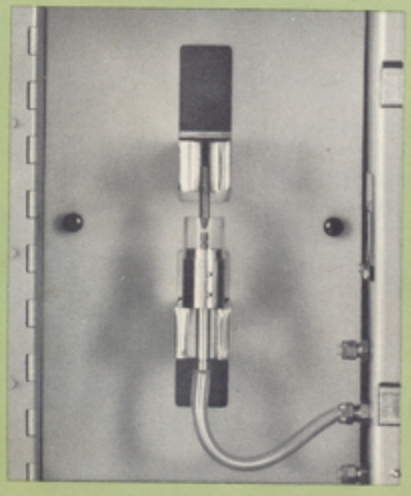


Fig. 6 — O'Connell Jet (19-322)

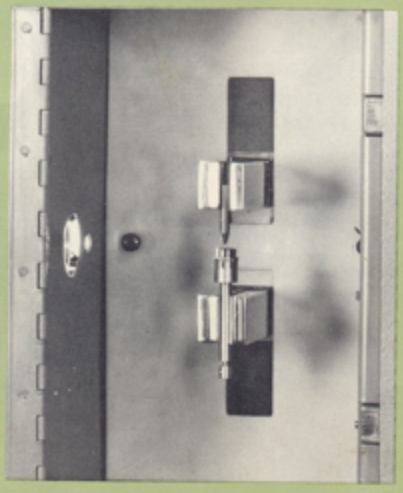


Fig. 7 — Briquette Holder (19-302)

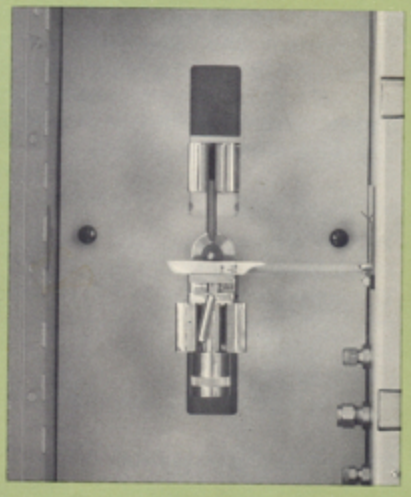


Fig. 8 — Rotating Disc Electrode (19-330)

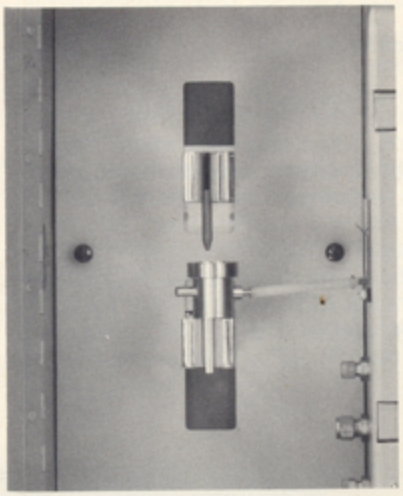


Fig. 9 — Rotating Platform Assembly (19-340A)

ROTATING PLATFORM ASSEMBLY (19-340A)

The rotating platrode (Fig. 9) permits analysis of solutions or non-conductive samples. By means of the solution residue method or by the use of various ashing procedures, samples deposited on the rotating platrode may be easily analyzed. Sensitivity is improved by concentrating as in the solution residue technique or by increasing the amount of samples introduced into the gap. The rotating platform is also useful for materials exhibiting rapid burnout characteristics.

EXHAUST SYSTEM AND AIR GAUGE (19-510)

The 19-510 (Fig. 10) is a complete exhaust system for use with the 19-300 Arc/Spark Stand. The system includes a flap-valve, an air gauge, a blower and 6′ of 4″ flexible ducting. The draft gauge enables the draft to be maintained at a chosen value, thus eliminating variables in the rate of gas flow across the arc. The system is recommended for removing excitation by-products and toxic fumes from the laboratory.

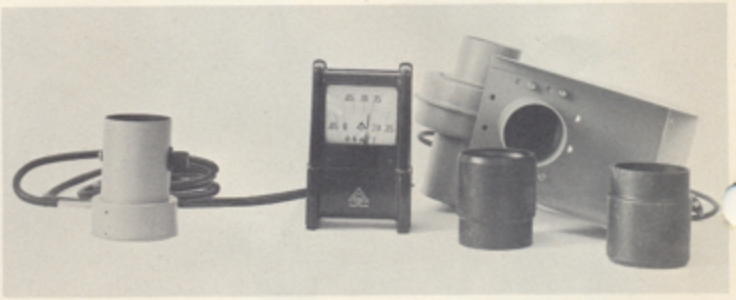


Fig. 10 — Exhaust System and Air Gauge (19-510)

FILTER ASSEMBLY (19-512)

19-513 Filter Assembly is quickly installed between the arc stand and the 19-510 Exhaust system. It is useful in trapping excitation by-products and contaminants. Uses commercial Air-Mase Filters.

CIRCULATING PUMP ASSEMBLY (19-550)

The Circulating Pump Assembly (Fig. 11) provides a closed circuit cooling system for the 19-300. The system when used with a five gallon carboy of distilled water prevents corrosion of the electrode clamps. It also represents a sizeable reduction in the amount of water used for cooling (carboy not included in 19-550).

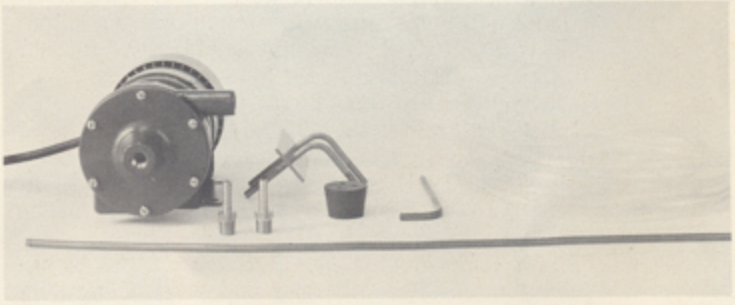


Fig. 11 — Circulating Pump Assembly (19-550)

RF SHIELDING (19-312)

The RF shield (Fig. 12) covers the high voltage leads between the arc stand and the source unit. The shielding reduces RF radiation to negligible amounts, preventing interference with sensitive electronic apparatus in the laboratory. Fittings are included (fitting size 3″ diameter flange; 3 clearance holes for 10-32 binding head screws).

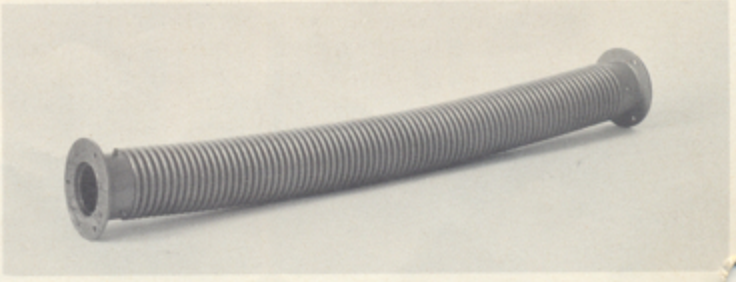


Fig. 12 — RF Shielding (19-312)

RF SHIELDING (19-314)

Same as above, except made to specified length. Fittings are included.

SPECIFICATIONS

Physical Dimensions

Overall	16¾″	(42.5 cm) wide
	12″	(30.5 cm) deep
	20½″	(52.0 cm) high
Excitation Chamber	8″	(20.4 cm) wide
	6″	(15.2 cm) deep
	13″	(33.0 cm) high
Net Weight	70 lbs.	(31.8 Kg)
Shipping Weight	90 lbs.	(40.9 Kg)

Construction

Frame — Rugged Cast Aluminum
Covering — Sheet Aluminum
Electrode Clamps Brass — Nickel and Rhodium Plated
Internal water passages in each clamp jaw

Mechanical

Maximum electrode clamp travel (each) 2⅜″ (6 cm)
Minimum diameter rod or pin sample ⅛″ (3 mm)
Maximum diameter rod or pin sample 1″ (2.5 cm)
Maximum electrode length 6¾″ (17.2 cm)
Tubing for water connections to electrode clamps 11/32″ OD (9.3 mm) ¼″ ID (6.5 mm)
Tubing for gas connection to electrode gap ¼″ ID (6.5 mm)

ACCESSORIES

The following accessories and replaceable parts are available for use with both the 19-300 and the 19-311 Arc/Spark Stands:

18-030 Spherical Quartz Lens — 100 mm focal length, 30 mm diameter, used in either the 19-300 or 19-311 to focus the source on the slit of the 70-300 series 3.4-Meter Ebert Spectrographs with greatest intensity.

18-040 Cylindrical Quartz Lens — 100 mm focal length, 30 mm diameter, used in either the 19-300 or 19-311 to focus the source on the slit of the 70-300 series 3.4-Meter Ebert Spectrographs for even line illumination.

18-160 Cylindrical Quartz Lens — 67 mm focal length, 30 mm diameter, used in either the 19-300 or 19-311 to focus the source on the slit of the 78-000 series 1.5-Meter Wadsworth Spectrographs for even line illumination.

18-170 Spherical Quartz Lens — 67 mm focal length, 30 mm diameter, used in either the 19-300 or 19-311 to focus the source on the slit of the 78-000 series 1.5-Meter Wadsworth Spectrographs with greatest intensity.

18-060 Three Lens Illuminating System — includes a diaphragm, 120 mm focal length, cylindrical quartz lens (18-042) and lens holder. Used to illuminate 70-300 series Ebert Spectrographs. It greatly reduces background. Requires an 18-030 100 mm focal length spherical quartz lens.

NOTE: When used with a 70-300 series Mark IV 3.4-Meter Ebert Spectrograph, a 125 cm accessory bar is required.

When used with a 70-000 series Mark II or Mark III 3.4-Meter Ebert Spectrograph, a 150 cm accessory bar is required.

19-300F Spare Lens Cell — for either the 19-300 or 19-311.

19-300J-05 Replacement Projection Lamp — for either the 19-300 or 19-311.

19-316 Replacement Electrode Clamps — Rhodium-plated for either the 19-300 or 19-311.

19-330-A-27 Spare Spindle Adapter — used so the 19-300 will accept 19-390A-2 shafts.

19-390 Replaceable Shaft Set — ten male shafts, 2 female adapters, for all rotating disc assemblies.

19-340A-9 Spare Electrode Holder — for the 19-340A Rotating Platform assembly.

19-391 Tantalum Spindle — for use with the 19-330 Rotating Disc assembly.

19-390A-2 Replaceable Stainless Steel Shafts — for the 19-330 Rotating Disc assembly. Lot of ten minimum order.

19-330-A-20 Porcelain Boat — for use with the 19-330 Rotating Disc assembly.

19-330A-26 Spare Nylon Drive Shaft — for use with the 19-330 Rotating Disc assembly.

19-340A-12 Spare Nylon Drive Shaft — for use with the 19-340A Rotating Platform assembly.

19-350A-14 Spare Nylon Drive Shaft — for use with the 19-350 Rotating Petrey Stand.

JARRELL-ASH ANALYTICAL LABORATORY

The Jarrell-Ash Analytical Laboratory performs complete spectroscopic analytical service for customers who don't maintain their own lab facility; to assist labs with heavy backlogs; to prepare standards; or to demonstrate new atomic absorption and optical emission equipment and techniques to potential customers.

The lab's experienced staff performs elemental analysis of samples ranging from biological tissue, to high-carbon steel and lubricating oils. Equipment includes a 3.4 meter Ebert spectrograph, 1.5 meter Wadsworth spectrograph, laser microprobe, atomic absorption instruments and precision microphotometers.

For additional information, direct specific inquiries to Miss Genevieve Bonini, Chief of the Jarrell-Ash Analytical Laboratory

SPECTROGRAPHIC SUPPLIES

Jarrell-Ash is known as the world's most complete source for operating supplies for spectrographic laboratories. The product line includes: photographic plates and film; S.Q. powder standards; pure materials; special lab accessories; and . . . of special interest to readers of this bulletin, *electrodes.*

Jarrell-Ash supplies National brand electrodes, pre-forms and powders of the highest purity available: guaranteed 1 ppm maximum total ash content; 2 ppm per element maximum spot inpurity; 6 ppm maximum total spot impurity. To receive full specification and price information write for Bulletin 5A.

WARRANTY

"Jarrell-Ash equipment is guaranteed for one year from the date of invoice for quality of workmanship as well as defects in material, except for those resale items that bear the separate warranty of the particular manufacturer. In keeping with our policy of continuous research and product improvement, the Jarrell-Ash Company reserves the right to alter specifications and prices without prior notice."

Jarrell-Ash

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