operating and maintenance instructions

ECOMET® IV GRINDER/POLISHER
EUROMET™ I POWER HEAD

MA60-5000

BUEHLER
APPARATUS FOR MICROSTRUCTURAL ANALYSIS
41 WAUKEGAN ROAD • LAKE BLUFF, ILLINOIS USA 60044

WARRANTY

This unit is guaranteed against defective material and workmanship for a period of two (2) years from date of receipt by customer. Warranty is void if inspection shows evidence of abuse, misuse or unauthorized repair. Warranty covers only replacement of defective materials.

If, for any reason, this unit must be returned to our plant for warranty service, please apply for prior authorization with shipping instructions, and include the following information: Customer Purchase Order Number; Buehler Ltd. Invoice Number and Date; Serial Number; and reason for return.

ECOMET® IV GRINDER/POLISHER
EUROMET™ I POWER HEAD

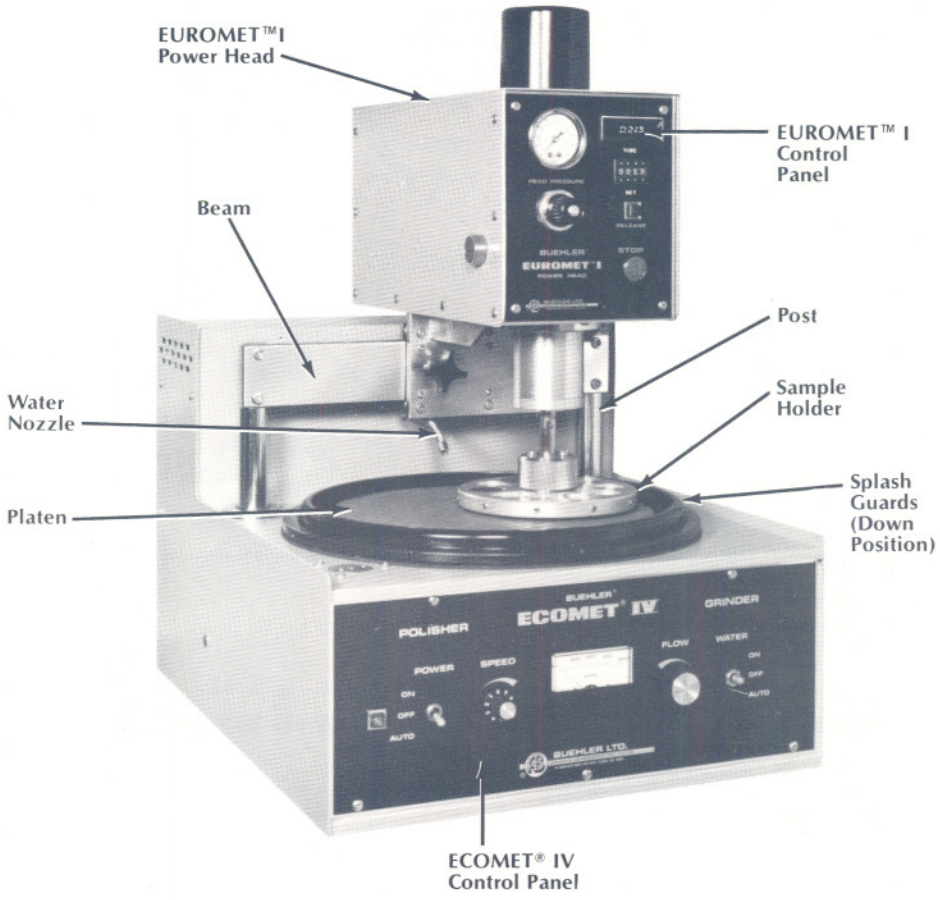


Figure 1. ECOMET® IV GRINDER/POLISHER WITH EUROMET™ I POWER HEAD

UNPACKING:

Carefully unpack and check contents. If any components are missing or damaged, save the packing list and material and advise the carrier and Buehler Ltd. of the discrepancy. For your warranty protection and our permanent file, please complete and return the enclosed Equipment Registration Card.

Two persons are required to safely lift the ECOMET® IV from the shipping carton. Open areas, provided at the corners of the carton, permit access to the machine base. Remove the three 5/16" bolts securing the ECOMET® IV to the plywood base.

ASSEMBLY:

The ECOMET® IV Grinder/Polisher is shipped fully assembled except for the Polishing Platen with Cloth and Paper Holding Bands. The EUROMET™ I Power Head, packed in a separate box is also fully assembled. Interconnection of the two Units is described under Installation. Also included is a packet containing samples of PSA backed Polishing Cloth and CARBIMET® Abrasive Paper Discs.

INSTALLATION OF THE ECOMET® IV GRINDER/POLISHER:

The ECOMET® IV Base Unit should be placed on a BUEHLER® TECH-MET® Table or other sturdy table located convenient to electric power, water, drain and compressed air. Installation should be performed as illustrated in Figure 2 and described below.

Electrical

The unit can either be plugged into an existing outlet or hard wired to an electrical source rated for the voltage and frequency indicated on the Specification Plate.

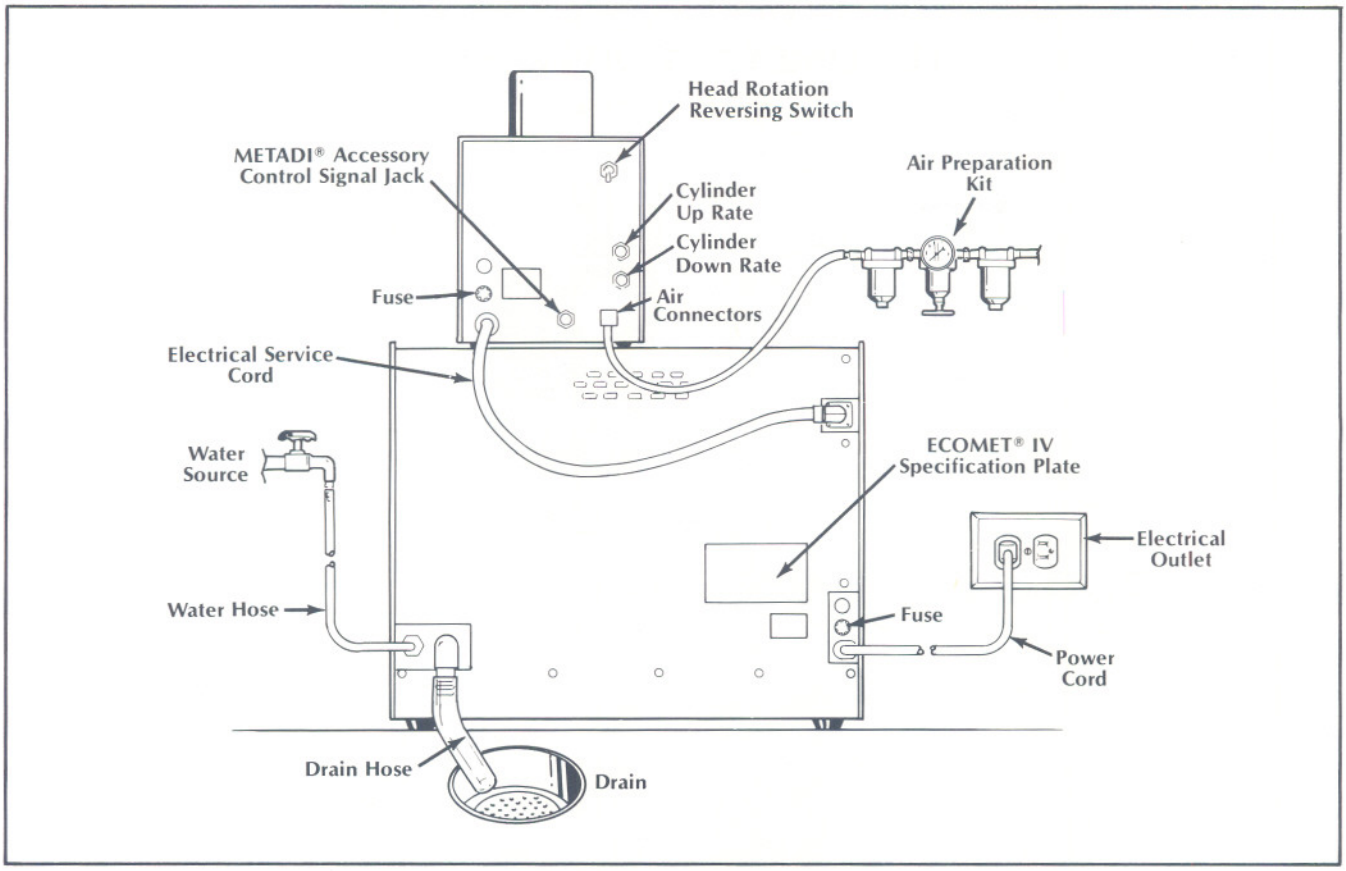


Figure 2. INSTALLATION OF ECOMET® IV AND EUROMET™ I

Plumbing

Coolant water is supplied to the ECOMET® IV Base Unit by connecting one end of a male ¼" NPT fitting to the Water Outlet Fitting located on the Rear Panel of the Unit. The other end should be connected to a water source, equipped with a separate shut-off valve.

Drain connection is made by attaching one end of a 1" ID plastic or rubber hose to the Drain Outlet Fitting located on the Rear Panel of the ECOMET® IV.

The remaining free end should extend to a nearby sink or other available drain or catch container.

INSTALLATION OF EUROMET™ I POWER HEAD:

The EUROMET™ I Power Head must be installed to an ECOMET® IV Grinder/Polisher, following these simple operations (see Figure 3).

1. Remove the Covers and Gaskets from the two holes in the Deck of the ECOMET® IV Base Unit.
2. Insert one Post into each Hole.
3. Place a flat rubber Gasket on each Post, then slip on the Mounting Flange, with O-Ring facing upward.
4. Position the Beam so it rests on the flat area of both posts with the countersunk holes facing outward. Fasten each end with two Socket Head Screws.
5. Rotate the Nut Collar inside the cabinet to align the screw holes with the Flange and Gasket Holes; insert (4) 6-32 screws through the Flange and Gasket and into the Nut Collar.
6. Repeat the operation described in 5 for the second post and tighten all 8 screws.
7. Remove the Beam from the Posts and slide the Beam into the slot located underneath the EUROMET™ I Head with countersunk side of Beam visible from the front of the machine.
8. Lock the Beam in place with the 2 Locking Knobs.
9. With the assistance of a second person, lift the Head Unit, (attached to the Beam) into position and insert the two socket head screws through the Beam into each Post. Tighten the screws securely.
10. Insert one Set Screw through the hole in each side of the cabinet to lock the Post in place.

Electrical

Connection is made to the ECOMET® IV by plugging the multipinned connector end of the Electrical Service Cord into the Power Receptacle on the rear Panel of the ECOMET® IV.

NOTE: Connector must be inserted in correct orientation determined by guide pin.

Compressed air

Operation of the EUROMET™ I Head requires a compressed air source of 80 psi to obtain the rated cylinder force. An Air Preparation Kit (20-1364) should be installed in the air line to control pressure, and remove dirt and moisture, if the existing air source does not provide this protection.

OPERATION—ECOMET® IV ONLY

To operate ECOMET® IV independent of the EUROMET™ I Power Head, turn the water Flow Knob to minimum flow (furthest counterclockwise position) before actuating Water Switch, then turn the Power and Water Control Switches to the ON position (see Figure 1). In this position, the Machine is operated in the untimed (manual) mode with the full range of speed control. Water flow is fully controlled by adjusting the Water Flow Knob and STOPS automatically when the machine is turned OFF.

OPERATION—ECOMET® IV AND EUROMET™ I:

When the EUROMET™ I Power Head has been correctly connected to the ECOMET® IV, the two Units may be controlled automatically, using the controls on the Front Panel of the EUROMET™ I Power Head (see Figure 4). All control functions should be checked out before a sample holder is attached in place to

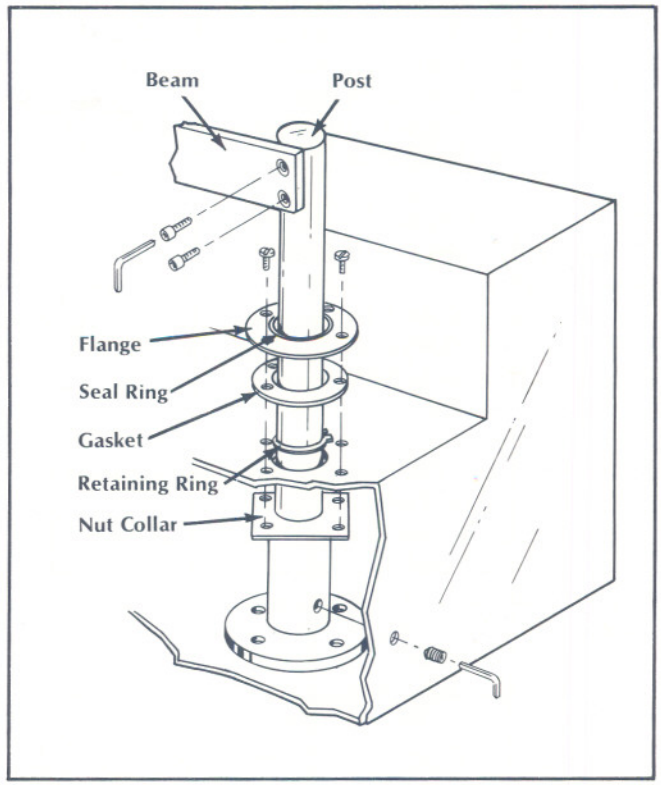


Figure 3. INSTALLATION OF EUROMET™ I POWER HEAD SUPPORT STRUCTURE TO ECOMET® IV GRINDER/POLISHER

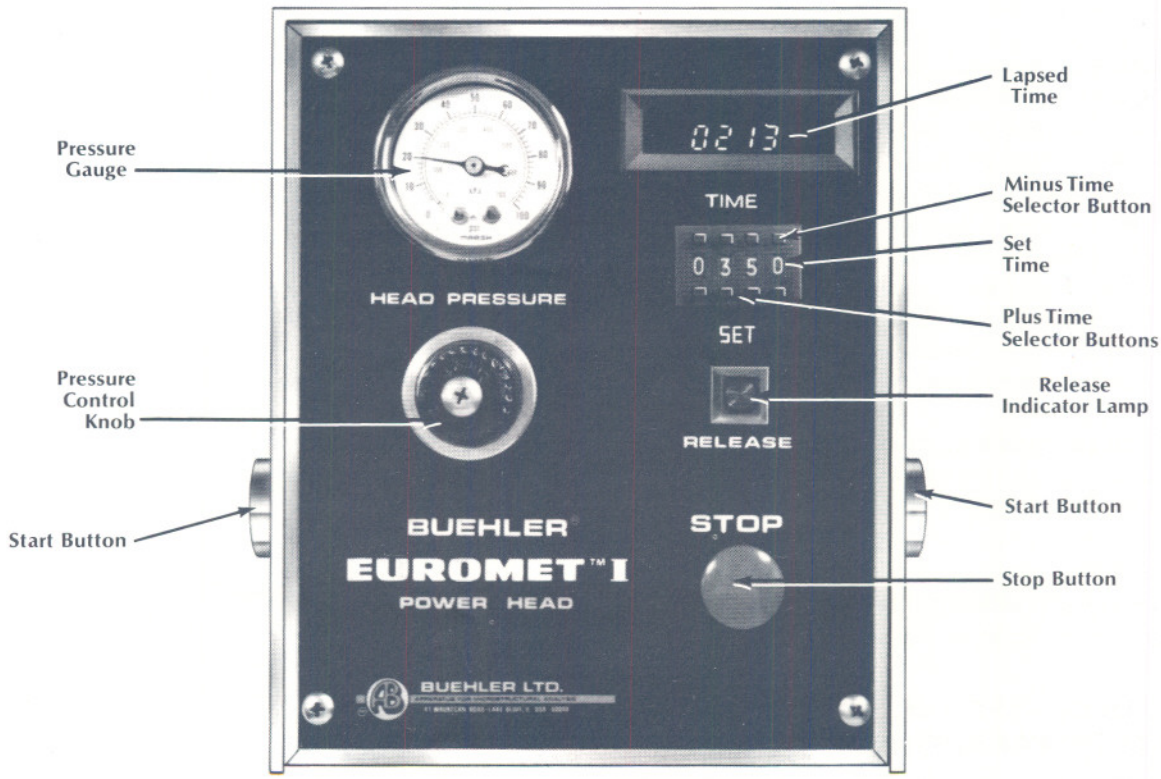


Figure 4. EUROMET™ I POWER HEAD CONTROLS

verify satisfactory operation of the two units. For this mode of operation, both Power Switch and the Water Control Switch must be turned DOWN to AUTO.

NOTE: The Water Switch is set to "AUTO" position only if coolant water is needed during automatic operation.

To operate both ECOMET® IV and EUROMET™ I:

Timer—set to the desired number of minutes and seconds. This is accomplished by repeatedly depressing the appropriate buttons under the appropriate Window until the desired value appears (refer to Figure 4). The Left two digits indicate up to 59 minutes and the Right two read up to 59 seconds.

Pressure—set to the pressure desired using the Pressure Knob and observing the response on the Pressure Gauge. Pressure may have to be adjusted after the samples contact the rotating platen. The applied force is determined by multiplying the Pressure Gauge value by 1.2.

Dual Start Buttons—depress simultaneously to commence operation. This is a safety feature which prevents accidental contact with moving parts. Maintain pressure on the Start Switches until the Release Light is illuminated, then release. Preset water flow begins when the system is started.

Stop Button—if problems are encountered during operation, the large, convenient Stop Button will instantly stop all operations.

Head Rotation Reversal Switch—this two-position Switch, located on the rear panel of the Power Head, determines the rotational direction of the Power Head Drive Shaft. In the UP position, the shaft (and the sample holder) will rotate in a direction counter to the rotation of the platen. This is the most common condition of rotation. To obtain the opposite direction of rotation (same direction as the platen), the Switch should be turned to the DOWN position.

NOTE: The Power Head should be turned OFF when the rotation direction is changed.

Ascend and Descend Rate Controls—these two metering controls are in the lower right face of the rear panel of the EUROMET™ I Head (Figure 2) and control the rate at which the Drive Shaft rises and lowers. The UPPER Knob controls the ascent and the LOWER Knob controls the descent. The shaft should descend to its limit in 2-3 seconds and ascend in ½ second.

OPERATION—SETTING UP FOR SAMPLE PREPARATION:

The ECOMET® IV/EUROMET™ I combination offers a wide range of operating parameters to solve the most difficult polishing problems.

- Platen Speed (variable)—0-600 rpm
- Head Pressure (ram force)—0-100 lbs. force
- Timer Range (variable)—59 minutes
  59 seconds

Abrasive options are:

- ZIRMET® Abrasive Discs for coarse material removal
- Silicon Carbide Grinding Discs for rough or fine grinding
- Free lapping using the Conditioning Rings and dead weights
- Power Lapping using METADI® Diamond Power Lapping Accessory (see Accessories, Pages 10-12)
- Rough and Final Polishing cloths on blank platens

To aid in selecting the most effective abrasive operation, refer to Tables on Page 10.

OPERATION—TIPS FOR SMOOTH OPERATION

1. Platen installation is achieved by inserting the four lugs on the bottom side of each platen into the matching holes in the Drive Plate. A mechanical groove in the Drive Plate acts as a guide to locate the holes. Simply rotate the Platen in either direction until it engages the hole, then rotate the Platen in the clockwise direction while holding the Mounting Wheel in a fixed position.

2. Sample Holders have been designed to accept a wide variety of samples; loading of samples is accomplished using a Loading Plate.

3. No. 60-5450 MAXI-LOK™ Chuck Assembly provides a positive attachment of the sample holder to the EUROMET™ I Drive Shaft. The MAXI-LOK™ may be removed from one sample holder and attached to another holder with ease. To operate, rotate the knurled outer Ring in a clockwise direction against the spring force. Slide holder and lock into the drive shaft as far as possible and release the outer ring. Test for adequate connection by pulling down on the Sample Holder.

4. Splash protection is provided by a two-position Splash Ring that fits against the inside surface of the Polishing Bowl. To obtain maximum protection, lift the Splash Ring upward and rotate to the detent position. The Ring should remain in the high position. To lower, reverse this procedure. The Splash Ring may also be removed for maximum access to the Polishing Bowl and for maximum clearance when changing Platens.

5. Sample Preparation Procedures selected will

depend on the material to be prepared. Some guidelines for preparing various material are provided in Tables on Page 10.

OPERATION IN THE AUTO MODE

A Simplified Operation Sequence

1. Determine the desired preparation sequence required for the specific material to be prepared (refer to Page 10).

2. Load samples into a suitable holder selected from Page 14.

3. Apply the recommended Platen Cover abrasive and lubricant, when applicable. Make sure the Platen surface is clean and free of residues from previous operations. Adhesive residues may be removed with a chlorinated solvent.

4. For ECOMET® IV/EUROMET™ I operation, make sure the Power Switch is in the "AUTO" position. If water is needed for grinding operations, set the Water Switch to the AUTO position also. The Water Flow Knob should be open so that water will flow as soon as the system is started. Once the desired Water Flow setting is achieved, it will be maintained if the Flow Knob is not disturbed.

5. Set the desired Time as described on Page 4.

6. Set the required pressure using the Pressure Control Knob and the Pressure Gauge. The rate of Drive Shaft ascent and descent is adjustable by two valves located on the rear panel of the EUROMET™ I Power Head.

7. Attach the loaded Sample Holder to the Drive Shaft.

8. Press the Dual Start Buttons and release when the Release Light has illuminated.

DIAMOND POWER LAPPING

This technique is recommended in many of the procedures listed on Page 10, and provides the following distinct advantages over conventional Abrasive Fine Grinding.

1. Four Fine Grinding steps are replaced by one efficient Diamond Power Lapping step.

2. The surface finish achieved is always finer and flatter than can be obtained using conventional fine grinding.

3. Considerable savings in time and labor are realized, particularly when preparing harder and more difficult samples. In many cases this will also result in a definite cost savings because of the more efficient operation and the elimination of repetitious steps often required with fine grinding abrasive papers.

Diamond Power Lapping uses a copper composite Lap Plate onto which a liquid slurry of Diamond Abrasive is precisely charged. Application of the diamond slurry is carefully controlled through the use of a Slurry Pump which controls the frequency and duration of spray that is applied to the Lapping Platen. By means of this Control, precise operating conditions may be established and repeated. Wasteful over-application of diamond slurry is also prevented. Certain extreme sample preparation conditions or prolonged use may cause the METADI® Lapping Platen to become out-of-flat. To restore the platen to its flat condition dressing may be required. Consult the Instruction Manual for the METADI® Lapping Platen for complete instructions.

MAINTENANCE

- **Daily:**
  Wipe polishing residues off all exposed surfaces, using a soft, moist cloth. Wipe dry.

- **Daily:**
  Remove accumulations of grinding and polishing residues from the Bowl. This is accomplished by removing the Splash Guard and any Platen which may be in place. If the accumulation is heavy, remove the bulk amount with a soft scraper and dispose of the residue in an approved manner. Remaining fine residues may then be washed into the Bowl Drain by turning on the coolant water and directing the flow into the Bowl. If only fine accumulations are present, water flushing alone may be adequate.

- ECOMET® IV Polisher/Grinder Motor and Drive Spindle are permanently lubricated and, therefore, no additional attention is required.

- **Annually:**
  Check the Belt of the ECOMET® IV annually to make sure it is taut and that no cuts or other defects have developed. Replace the belt if such defects are observed.

- **Semi-annually:**
  EUROMET™ I Head Spindle Column requires lubrication every 6 months. Pry off the Black Plastic Cover, located immediately behind the Black Round Housing on the top of the EUROMET™ I Head. Apply 3 drops of 10 W or 20 W machine oil to the Oil Port. The Head Motor is permanently lubricated and requires no maintenance.

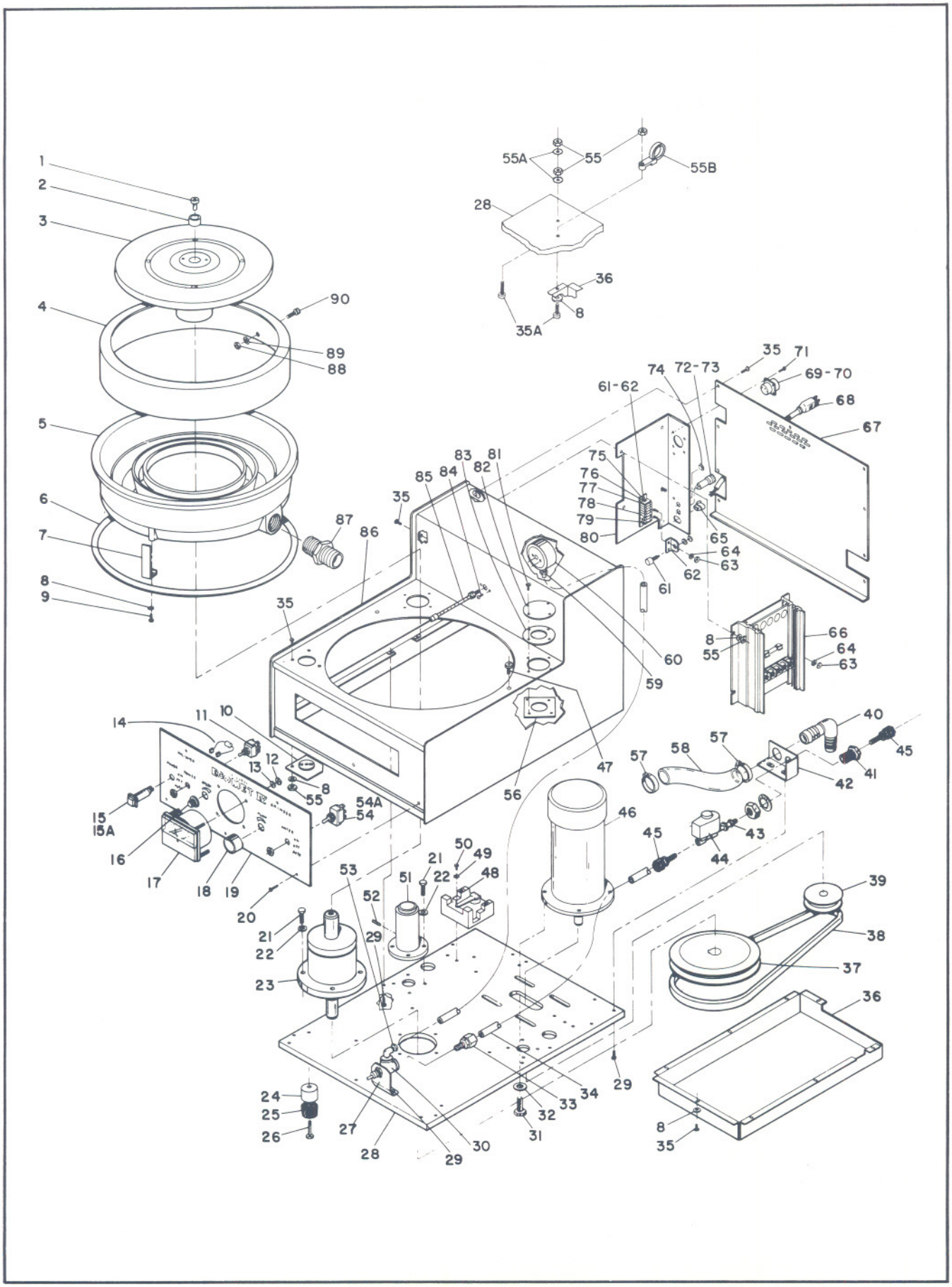


Figure 5. ECOMET® IV GRINDER/POLISHER ASSEMBLY DETAIL

ECOMET® IV GRINDER/POLISHER PARTS LIST

(Details of design subject to change without notice.)

REF. NO.	PART NO.	NO. REQ.	DESCRIPTION
1	R-0984	1	Screw, 1/4-20 × 5/8" Skt Hd SS
2	1670-S027	1	Pilot Bushing—Mtg Wheel
3	1670-S012	1	Mounting Wheel
4	1670-S056	1	Splash Guard
5	1670-S034	1	Bowl, Plastic 12"
6	1670-S058	1	Bowl Gasket
7	1670-S040	4	Bowl Clamp
8	R-0611W	18	Washer #10 SS
9	R-7894	4	Screw, 10 × 3/4" Hex W Hd HI-LO
10	1670-S041	1	Post Plate Assy.
11	R-7890	1	Switch, 3PDT Toggle
12	R-0603	4	Nut, 4-40 Hex SS
13	R-0603W	4	Washer, #4 SS
14	1670-S069	1	Lamp Resistor Assy.
15	1723-S9	1	Pilot Light, Red 115V
	1507-S38	1	Pilot Light, Red 220V
15A	1180-S136	1	Anchor Nut
16	R-7028	1	Knob
17	1670-S011	1	Tachometer, 800 RPM
18	1330-S71	1	Knob
19	1670-S001	1	Nameplate
20	R-7850	5	Screw, 8-32 × 3/8" Cr Pan Hd SS
21	R-2275	12	Screw, 5/16-18 × 1" Hex Hd
22	R-0617LW	12	Lock Washer, 5/16"
23	1670-S037	1	Spindle Assy.
24	1670-S031	4	Foot Spacer
25	R-7886	4	Rubber Bumper
26	R-2261	4	Screw, 1/4-20 × 2-1/2" Hex Hd
27	1670-S035	1	Water Valve Bracket
28	1670-S002	1	Baseplate
29	R-7565	16	Screw, 10-32 × 5/8" Cr Pan Hd, SS
30	1600-S044	1	Valve
31	R-2296	4	Screw, 3/8 × 1-1/4" Hex Hd SS
32	R-0620W	4	Washer, 3/8"
33	R-4512	1	Connector, 1/4" tube—1/4" NPT
34	R-2886	42"	Nylon Tube, 1/4" O.D.
35	R-7519	25	Screw, 10-32 × 3/8" Cr Pan Hd SS
35A	R-7937	3	Screw, 10-32 × 3/4" Cr Pan Hd SS
36	1670-S051	1	Belt Guard
37	1670-S009	1	Pulley, 8.00" × 5/8"
38	1670-S010	1	V-Belt
39	1110-S056	1	Pulley, 2.80" × 5/8"
40	R-7887	1	Elbow, 1" × 90°
41	R-7742	1	Anchor Connector, 1/4" NPT
42	1670-S017	1	Rear Water Bracket
43	R-7888	1	Nipple, 1/4" NPT, Close brass
44	1670-S019	1	Water Valve—Solenoid 115V
	1670-S020	1	Water Valve—Solenoid 220V
45	R-4562	2	Connector, 1/4" Tube × 1/8" NPT
46	1670-S004	1	Motor, 3/4 HP 90 VDC 11V
	1670-S005	1	Motor, 3/4 HP 180 VDC 22V
47	R-7758	2	Screw, 1/4-20 × 3/8" Cr Pan Hd SS
48	1330-S22A	1	Relay 115V
	1330-S22B	1	Relay 220V
49	R-7485	2	Washer, #10 Nylon
50	R-7844	2	Screw, 8-32 × 3/4" Cr Pan Hd SS
51	1670-S021	2	Powerhead Post Socket
52	R-7895	2	Set Screw, 1/4—20 × 1/2"
53	R-4510	1	Male Elbow, 1/4" Tube—1/8" NPT
54	R-7889	1	Switch, IP DT Toggle
54A	R-0564	2	Boot, Switch Handle
55	R-0612	10	Nut, 10-32, Hex SS
55A	R-0612LWE	2	Lock Washer #10 External
55B	R-7747	2	Tie Strap
56	1670-S028	2	Post Hole Nut Collar
57	R-2744	2	Hose Clamp, H-16 SS
58	R-2892	9.5"	PVC Clear Tubing
59	R-7726	1	Male Connector, Barb 1/8" NPT
60	1670-S048	1	90° Bulkhead Fitting
61	R-7893	1	Potentiometer
62	1670-S054	1	Trimpot Bracket
63	R-0605	5	Nut, #6 Hex, SS
64	R-7072	5	Lock Washer
65	R-4536	1	Cord Bushing 115V
	R-4535	1	Cord Bushing 220V
66	1670-S006	1	3/4 HP Control 115V
	1670-S007	1	3/4 HP Control 220V
67	1670-S015	1	Rear Panel
68	R-0497A	1	Cord and Plub 14-3 SJO 115V
	R-0496B	72"	Cable, 3 Wire European 220V
69	R-7289	1	Connector Body
70	R-7509	1	Connector Insert—5 pin
71	R-1603	4	Screw, 4-40 × 1/4" Slt Rd Hd SS
72	1305-S17	1 or 2	Fuse Post
73	R-7927	1	Fuse, 10A 250V-115V
	R-7764	2	Fuse, 5A 250V-220V
74	R-2789	1	Snap Cap, 1/2" 115V
75	1670-S055	1	Channel—T Strip
76	4000-S334	2	End Clamp
77	4000-S333	2	Barrier End
78	4000-S332	7	Terminal
79	R-7891	1	Resistor, 110K 115V
	R-7892	1	Resistor, 220K 220V
80	1670-S016	1	Electrical Panel
81	R-2106	8	Screw, 6-32 × 5/8" Slt Rd Hd SS
82	1670-S030	2	Post Hole Cover
83	1670-S029	2	Gasket—Post Hole
84	R-7847	1	Screw, 6-32 × 5/16" Cr Tr Hd SS
85	1670-S039	1	Water Nozzle
86	1670-S003	1	Cabinet
87	R-2891	1	Male Insert Adapter
88	R-0609	4	Nut, 8-32 Hex, SS
89	R-0609LWE	4	Lock Washer, #8 External Tooth
90	R-7853	4	Screw, 8-32 × 1/4" Skt Hd SS

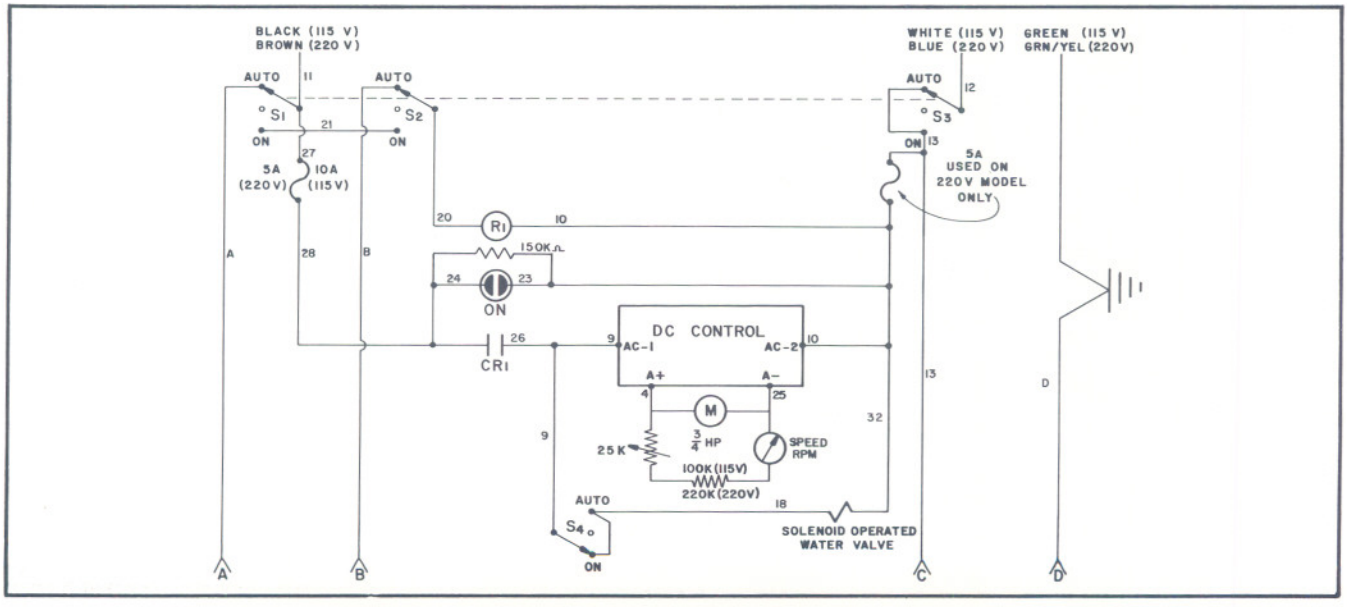


Figure 6. ECOMET® IV ELECTRICAL SCHEMATIC

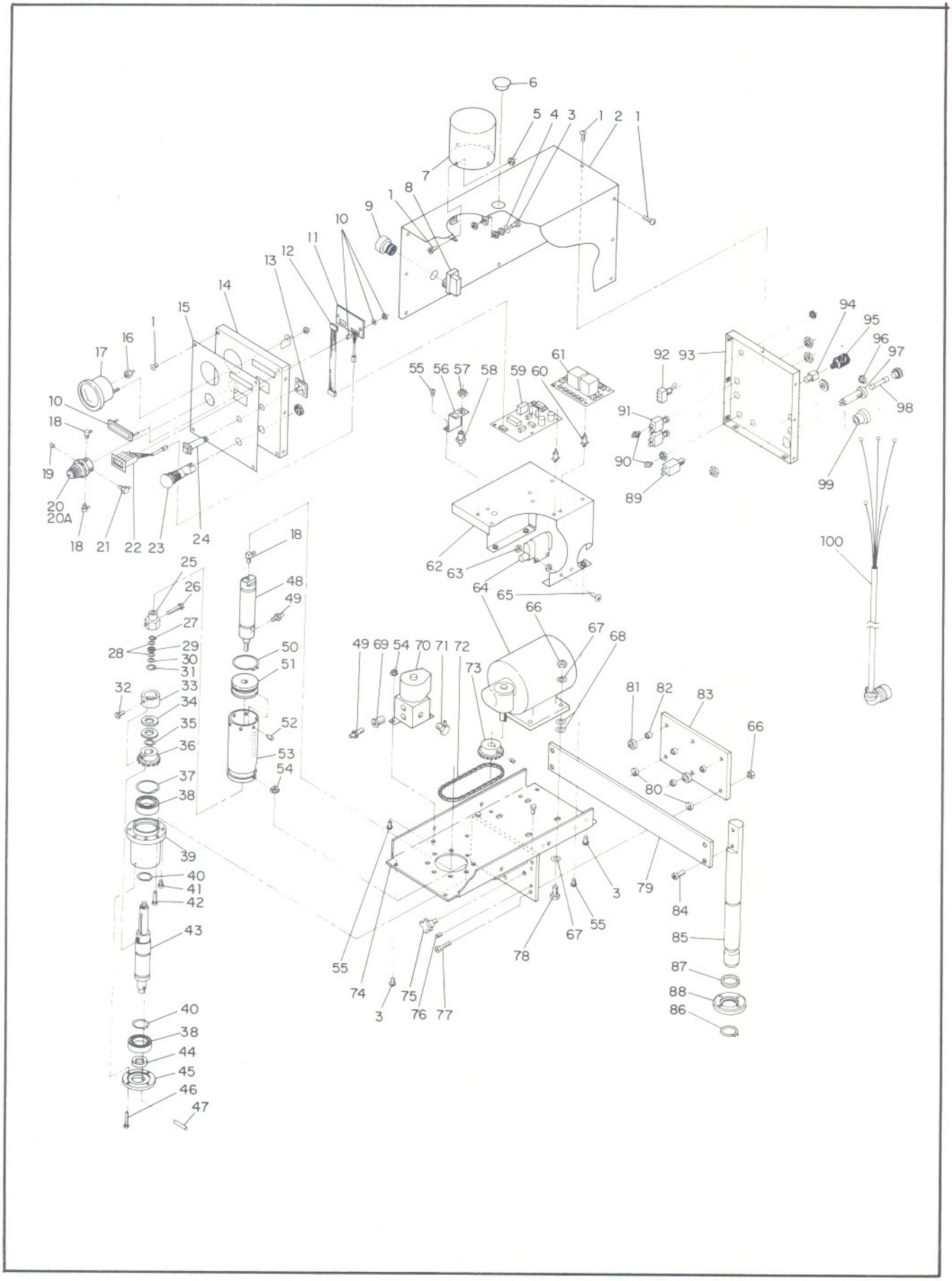


Figure 7. EUROMET™ I POWER HEAD ASSEMBLY DETAIL

EUROMET™ I POWER HEAD PARTS LIST

(Details of design subject to change without notice.)

REF. NO.	PART NO.	NO. REQ.	DESCRIPTION
1	R-1625TPH	25	Screw, 6-32 × 3/8", Cr Tr Hd SS
2	5000-S043	1	Hood
3	R-7306	5	Screw, 6-32 × 1/2", Cr Tr Hd SS
4	R-0604WL	1	Washer, #6 Brass
5	1180-S72	6	Nut, 6-32, Kep
6	R-7949	1	Hole Plug, 7/8"
7	5000-S045	1	Housing, Round
8	4000-S349	2	Mounting Base, Switch
9	4000-S348	2	Switch Head
10	5000-S065	1	Bezel, Timer
11	5000-S070	1	PC Board, Timer Display
12	R-7918	1	Ribbon Connector
13	1180-S136	1	Anchor Nut
14	5000-S042	1	Housing, Front
15	5000-S001	1	Nameplate
16	R-7789	1	Fitting, Fem, 1/8"NPT, 1/8"OD
17	4000-S413	1	Air Gauge, Pressure
18	R-7724	4	Male Elbow, Barb, 1/8"NPT, 1/4"OD
19	R-0361	1	Pipe Plug, 1/8"NPT Hex Skt
20	4000-S412	1	Regulator, Pressure
20A	R-7716	1	Nut, Regulator
21	R-7788	1	Fitting, 1/8"NPT × 90°, 1/8"OD
22	5000-S064	1	Switch, Pushwheel
23	R-7911	1	Switch, Stop
24	1723-S9	1	Pilot Light, Red 115V
	1507-S38	1	Pilot Light, Red 220V
25	5000-S016	1	Thrust Nut
26	R-7757	1	Screw, 10-32 × 1-1/2" Cr Pan Hd
27	R-7903	1	Retaining Ring, Ext. 5/16"
28	5000-S022	2	Washer, Thrust 5/16"
29	5000-S021	1	Thrust Bearing, 5/16" ID
30	R-7904	1	Washer, Ring Support, 5/8"
31	R-7897	1	Retaining Ring, Int. 7/8"
32	R-7846	2	Screw, 6-32 × 1/4" Cr Pan Hd SS
33	5000-S014	1	Wiper Cup
34	5000-S013	2	Washer, Felt, 5/8"ID
35	R-7449	1	Retaining Ring, Ext. 7/8"
36	5000-S011	1	Sprocket, Driven
37	R-7901	1	Retaining Ring, Int. 1.85"
38	5000-S028	2	Ball Bearing, 25mm
39	5000-S004	1	Housing, Head Bearing
40	R-7898	2	Retaining Ring, Ext. 0.98"
41	R-0962	1	Screw, 10-32 × 3/8" Skt Hd Cap SS
42	R-0965	7	Screw, 10-32 × 3/4" Skt Hd Cap SS
43	5000-S062	1	Shaft and Sleeve Assy
44	5000-S010	1	Seal, 5/8" Shaft
45	5000-S007	1	Bearing Cap
46	R-7919	4	Screw, 10-24 × 3/4" Skt Hd Cap SS
47	5000-S034	1	Dowel Pin, 1/4" × 1-1/4"
48	5000-S006	1	Air Cylinder
49	R-7923	3	Male Conn. 18"NPT, 1/4" tube
50	R-7900	1	Retaining Ring, Ext., 2-1/2"
51	5000-S017	1	Mounting Cap, Cyl.
52	R-7920	6	Set Screw, 10-24 × 1/2" Cone Pt SS
53	5000-S018	1	Standoff Cylinder
54	R-7908	9	Nut, 10-32, Keps
55	R-16666PPH	10	Screw, 10-32 × 1/2", Cr Pan Hd SS
56	5000-S015	1	Bracket, Oil Tube
57	R-7261	1	Nut, 1/8"NPT
58	R-7922	1	Male Conn, 1/8"NPT, 1/8"OD
59	5000-S066	1	PCB, Timer, 115V
	5000-S067	1	PCB, Timer, 220V
60	R-7456	8	Standoff, PCB
61	5000-S019	1	PCB, Time Delay, 115V
	5000-S072	1	PCB, Time Delat, 220V
62	5000-S071	1	Shelf, PCB Mounting
63	R-0609	4	Nut, 8-32 Hex
64	5000-S005	1	Gearmotor, 115V, w/Capacitor
	5000-S057	1	Gearmotor, 220V, w/Capacitor
65	R-1646	2	Screw, 8-32 × 1/2", Slt Rd Hd SS
66	R-0615	10	Nut 1/4-20, Hex SS
67	R-0615LW	8	Lockwasher, 1/4" SS
68	R-7926	8	Washer, Brass, 1/4"
69	R-0371	2	Bushing, Reducing, 1/4"-1/8"
70	5000-S035	1	Air Valve, 4 Way, 115V
	5000-S032	1	Air Valve, 4 Way, 220V
71	R-7729	1	Male Elbow, Barb, 1/4"NPT, 1/4"OD
72	5000-S054	1	Chain Assy.
73	5000-S047	1	Sprocket, Driver, 5/8"
74	5000-S036	1	Bracket, Head Support
75	5000-S029	2	Knob and Stud Assy.
76	R-7909	4	Set Screw, 1/4-28 × 7/16" Skt Hd, Nylon Tip
77	R-0989	6	Screw, 1/4-20 × 1-1/4" Skt Hd Cap SS
78	R-7628	4	Screw, 1/4-20 × 1-1/4" Hex SS
79	5000-S037	1	Beam, Head Mount
80	5000-S040	2	Offset Spacer
81	5000-S063	2	Sleeve Bearing
82	5000-S039	4	Spacer 1/4"ID
83	5000-S038	1	Back Plate, Head Mount
84	R-7929	4	Screw, 5/16-18 × 1" Skt Hd Cap SS
85	5000-S002	2	Post, Head Mount
86	R-7902	2	Retaining Ring, Ext, 1-1/8"
87	R-7907	2	Seal Ring, Square
88	5000-S003	2	Flange, Mounting Post
89	R-7281	1	Jack, Isolated
90	R-7738	5	Connector, Male, 10-32 1/4"OD
91	5000-S020	2	Valve, Air Flow Control
92	5000-S084	1	Rev. Switch Harness Assy.
93	5000-S041	1	Housing Rear
94	R-7912	1	Bulkhead Conn, 1/8"NPT, 10-32

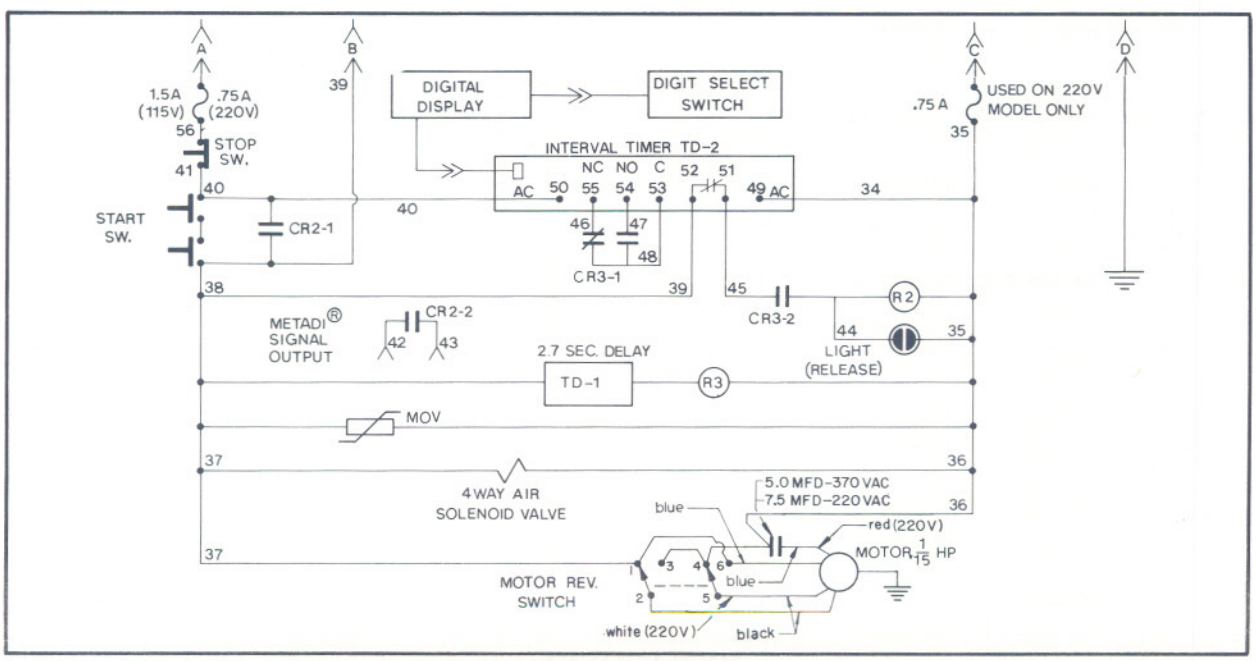


Figure 8. EUROMET™ I POWER HEAD ELECTRICAL SCHEMATIC

Table 1: RECOMMENDED PROCEDURE FOR: COMPLEX COMPOSITES SUCH AS INTEGRATED CIRCUITS AND OTHER SOLID STATE DEVICES

PRE-PREPARATION

ENCAPSULATE IN EPOXIDE RESIN SECTION WITH ISOMET™ SAW

ABRASIVE/SIZE	LAP/WHEEL COVERING	LUBRICANT	LOAD (lbs.)	SPEED (rpm)	TIME (sec.)
		FINE GRINDING			
SiC, 400 Grit	CARBIMET®	Water	40-60	300	30-60
SiC, 600 Grit	CARBIMET®	Water	40-60	300	30-60
		ROUGH POLISHING			
METADI® 6 Micron	TEXMET®	METADI® Fluid	20-40	300	60-120
METADI® 1 Micron	TEXMET®	METADI® Fluid	20-40	300	60- 60
		FINAL POLISHING			
Gamma Alumina 0.05 Micron	MICROCLOTH®	Distilled Water	20-40	150	30-60

Table 2: RECOMMENDED PROCEDURE FOR HIGH ALLOY AND HARDENED STEELS, WHITE IRON, CARBON STEELS, STAINLESS STEEL, MEDIUM HARD CERAMICS, SOME REFRACTORY METAL ALLOYS

ABRASIVE/SIZE	LAP/WHEEL COVERING	LUBRICANT	LOAD (lbs.)	SPEED (rpm)	TIME (sec.)
		GRINDING			
Zr Al_2O_3, 120 Grit	ZIRMET®	Water	80-100	500	30-60
		LAPPING			
Diamond, 9 Micron	METADI® Diamond Power Lap Plate		60-80	150	120-240
		ROUGH POLISHING			
METADI® 3 Micron	TEXMET®	METADI® Fluid	50-70	150	30-60
		FINAL POLISHING			
Gamma Alumina 0.05 Micron	MICROCLOTH®	Distilled Water	40-60	150	30-60

ECOMET® IV/EUROMET™ I APPLICATIONS

Table 3: RECOMMENDED PROCEDURE FOR ALUMINUM, COPPER, BRASS, BRONZE, P.C. BOARDS, SOFT COMPOSITES

ABRASIVE/SIZE	LAP/WHEEL COVERING	LUBRICANT	LOAD (lbs.)	SPEED (rpm)	TIME (sec.)
		FINE GRINDING			
SiC, 320 Grit	CARBIMET®	Water	60-80	400	30
SiC, 600 Grit	CARBIMET®	Water	60-80	400	30
		ROUGH POLISHING			
METADI® 3 Micron	TEXMET®	METADI® Fluid	40-60	150	30-60
		FINAL POLISHING			
Gamma Alumina 0.05 Micron	MICROCLOTH®	Distilled Water	30-50	150	30-60
Colloidal Silica	MASTERMET™		30-50	150	30-60

Table 4: RECOMMENDED PROCEDURE FOR CARBIDES, HARD CERAMICS

ABRASIVE/SIZE	LAP/WHEEL COVERING	LUBRICANT	LOAD (lbs.)	SPEED (rpm)	TIME (sec.)
		GRINDING			
Diamond, 45 Micron	*Metal Bonded Diamond Disc	Water	60-80	300	30-60
		LAPPING			
Diamond, 9 Micron	METADI® Diamond Power Lap Plate		50-70	150	120-240
		ROUGH POLISHING			
Diamond, 3 Micron	TEXMET®	METADI® Fluid	20-40	400	420-630 (7-9 Minutes)
		FINAL POLISHING			
Diamond, 1 Micron	TEXMET®	METADI® Fluid	20-40	400	60-120

*Resin Bonded Diamond Disc for Hard Ceramics

SUPPLIES FOR ECOMET® IV GRINDER/POLISHER AND EUROMET™ I POWER HEAD

POLISHING MATERIALS		POWDERS			LIQUIDS
TYPE	NAME	8 oz. (0.23 Kg)	1 lb. (0.45 Kg)	5 lb. (2.3 Kg)	6 fl. oz. (0.18)
Aluminum Oxide (Al_2O_3)	MICROPOLISH® B 0.05 micron Gamma	40-6301-008	40-6301-016	40-6301-080	
	MICROPOLISH® A 0.3 micron Alpha	40-6305-008	40-6305-016	40-6305-080	
	MICROPOLISH® C 1.0 micron Alpha	40-6310-008	40-6310-016	40-6310-080	
	Levigated Alumina		40-6435-016	40-6435-080	
	Alpha MICROPOLISH® Alumina No. 1 5.0 micron				40-6351-006
	Alpha MICROPOLISH® Alumina No. 1C 1.0 micron				40-6354-006
	Alpha MICROPOLISH® Alumina No. 2A 0.3 micron				40-6352-006
	Gamma MICROPOLISH® Alumina No. 3B 0.05 micron				40-6353-006
New Deagglomerated Aluminum Oxide (Al_2O_3)	MICROPOLISH® II 1.0 micron	40-6321-008	40-6321-016	40-6321-080	
	MICROPOLISH® II 3.0 micron	40-6323-008	40-6323-016	40-6323-080	
	MICROPOLISH® II 0.05 micron	40-6325-008	40-6325-016	40-6325-080	
	MICROPOLISH® II 1.0 micron				40-6361-006
	MICROPOLISH® II 0.3 micron				40-6363-006
	MICROPOLISH® II 0.05 micron				40-6365-006
Cerium Oxide (CeO)	MICROMET® 1.0 micron				40-6355-006
Chromic Oxide (Cr_2O_3)	Chrome Oxide 1-5 micron		40-6480-016.	40-6480-080	
	METPOLISH® No. 1 1.0 micron				40-6481-006
	METPOLISH® 0.5 micron				40-6482-006
Magnesium Oxide (MgO)	MAGOMET®		40-6440-016		
Iron Oxide (Fe_2O_3)	Jewelers Rouge 3.0 micron		40-6445-016	40-6480-080	
Colloidal Silica (SiO_2)	MASTERMET™	Liquid, 0.5 Gal (1.9*l*)			40-6370-064

EXTENDERS FOR METADI®			
Cat. No.	Description	Cat. No.	Description
40-6004	METADI® Fluid 4 oz. (0.12*l*) with appl.	40-8142-032	Polishing Oil 32 oz. (0.95*l*)
40-6014	METADI® Fluid 4 oz. (0.12*l*) Refill	40-8142-128	Polishing Oil 1 gal. (3.8*l*)
40-6016	METADI® Fluid 16 oz. (0.47*l*) Refill	60-3250-006	AUTOMET® Lapping Oil 6 oz. (0.18*l*)
40-6032	METADI® Fluid 32 oz. (0.95*l*) Refill	60-3250-128	AUTOMET® Lapping Oil 1 gal. (3.8*l*)
40-3200	Atomizer Applicator for METADI® Fluid	60-3255	Applicator Bottle 8 oz. (0.24*l*)

SUPPLIES FOR ECOMET® IV GRINDER/POLISHER AND EUROMET™ I POWER HEAD

METADI® DIAMOND COMPOUNDS					METADI® II DIAMOND COMPOUNDS			
PASTE		MICRON	COLOR	AEROSOL SPRAY	MICRON	COLOR	PASTE	
5 Grams	20 Grams			5 oz. (142 g)			5 Grams	20 Grams
40-6112	40-6102	¼ Medium	Gray	40-6260	¼	Gray	40-6241	40-6240
40-6132	40-6122	1 Medium	Blue	40-6264	1	Blue	40-6244	40-6243
40-6138	40-6128	1 Heavy	Blue					
40-6152	40-6142	3 Heavy	Green	40-6268	3	Green	40-6247	40-6246
40-6172	40-6162	6 Medium	Yellow	40-6272	6	Yellow	40-6250	40-6249
40-6192	40-6182	9 Heavy	Deep Red	40-6276	9	Deep Red	40-6253	40-6252
40-6212	40-6202	15 Heavy	Brown	40-6280	15	Brown	40-6256	40-6255
40-6222		30 Medium	Mahogany	40-6284	30	Mahogany	40-6258	
40-6232		45 Medium	Purple	40-6288	45	Purple	40-6259	

ECOMET® IV POLISHING CLOTHS

Cat. No.	DESCRIPTION
40-7062	NYLON 14" (35.5 cm) dia. plain back
40-7072	NYLON 12" (30.5 cm) dia. PSA back
40-7222	MICROCLOTH® 12" (30.5 cm) dia. PSA back
40-7242	MICROCLOTH® 14" (35.5 cm) dia. plain back
40-7412	SELECTED SILK™ 14" (35.5 cm) dia. plain back
40-7622	TEXMET® 12" (30.5) dia. PSA back
40-7642	TEXMET® 12" (30.5) dia. perf. adh. back
40-7742	MASTERTEX™ 12" (30.5) dia. PSA back
40-7912	CHEMOMET® I 14" (35.5) dia. plain back
40-7922	CHEMOMET® I (30.5) dia. PSA back

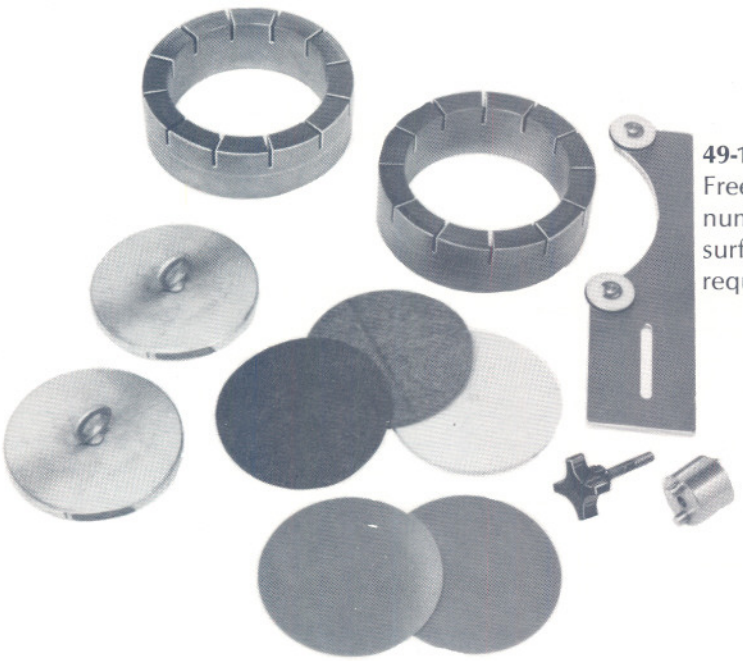
(Packaged 10 per Package)

ECOMET® IV GRINDING DISCS

ZIRMET® 12" (30.5 cm) DIA PSA Back	GRIT	CARBIMET® 12" (30.5 cm) DIA PSA Back
15-5132-060-025	60	15-5112-060-100
15-5132-120-025	120	15-5112-120-100
15-5132-180-025	180	15-5112-180-100
15-5132-220-025	220	
	240	30-5112-240-100
	320	30-5112-320-100
	400	30-5112-400-100
	600	30-5112-600-100
(Packaged 25 per Box)		(Packaged 100 per Box)

49-1680 METADI® DIAMOND POWER LAPPING ACCESSORY

Diamond Power Lapping is a highly recommended substitute for the multi-stage abrasive fine grinding of harder, more difficult sample materials. This accessory produces smoother, flatter surfaces in less time and with less effort than with conventional fine grinding, procedures.



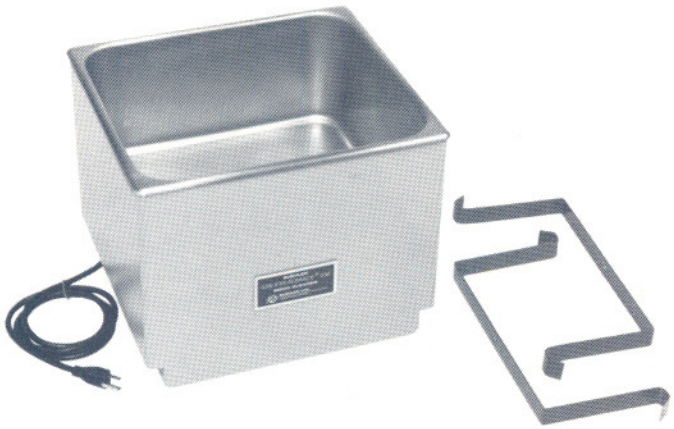
49-1681 ECOMET® IV FREE LAPPING ACCESSORY

Free lapping is recommended for preparing larger numbers of samples having a similar geometry. The surfaces produced are extremely flat and smooth but require longer lapping times than with Power Lapping.

60-5460 EUROMET™ I DRESSING TOOL

This tool is used to true the surface of Metadi Diamond Power Lapping Platens which may become out-of-flat due to unusually heavy service. This tool is also included as part of the 49-1680 METADI® DIAMOND POWER LAPPING ACCESSORY.

ECOMET® IV/EUROMET™ I ACCESSORIES (Continued)



75-1940-115 ULTRAMET® IV SONIC CLEANER
Large (12¾" W x 11¾" D x 6" H ID) ULTRASONIC CLEANER, which effectively loosens entrapped and clinging abrasive and other contaminants to ensure thorough cleaning between various stages of preparations.

75-5010 ULTRAMET® IV SAMPLE HANGERS
Sample Holders are held at a position to assure the best cleaning action.

DIAMOND SLURRY
No. 40-6290 METADI® DIAMOND SLURRY, 9μ, 1 pint (0.47 *l*).
No. 40-6292 METADI® DIAMOND SLURRY, 6μ, 1 pint (0.47 *l*).

PLATENS
No. 49-1676 ALUMINUM PLATEN, 12" (30.5 cm) dia, for use with abrasive paper or polishing cloth, extra.
No. 49-1682 METADI® DIAMOND LAPPING PLATEN, 12" (30.5 cm) dia.

CHUCK AND LOADING PLATES
No. 60-5450 MAXI-LOK™ CHUCK ASSEMBLY, extra, for use with additional specimen holders.
No. 60-5455 SPECIMEN LOADING PLATE, extra.

SPECIMEN HOLDERS

CATALOG NUMBER	NO. SAMPLES	SAMPLE SIZE	SAMPLE TYPE
60-5041	12	1" (25 mm)	Mounted
60-5042	10	1-1/4" (32 mm)	Mounted
60-5043	8	1-1/2" (38 mm)	Mounted
60-5340	5	2" (51 mm)	Mounted
60-5345	5	Rectangular holes	Unmounted
		to 2" x 1.375" (51 x 35 mm)	
60-5350	3	Rectangular holes	Unmounted
		to 3" x 1.375" (76 x 35 mm)	
60-5440	Variable	Mount to plain surface	Unmounted