Film-Tech

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These manual s are designed to facil itate the exchange of information rel ated to cinema projection and film handling, with no warranties nor obligations from the authors, for qualified field service engineers.

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Equipment shipped on the	is order consists of:
1 - LP-1000-1	"XENEX PUP" Lamphouse
1 - L	Xenon Lamp with special Leads L and L
1 - L-765-1	Head Shield & L-785 Gloves
1 - L-1745-2	Zener Diode Controlled Automatic Ignition Kit Installed in Lamphouse - <u>OPTIONAL</u>
1 - <u>M&DRAXAXA_</u> 1 PH.,	Silicon Power Supply 120 V.,1 PH., 230 V.,3 PH., 230 V.
1 - L-1940	Alignment Kit
OTHER: L-744 Reflec	JUR (SPARE)

The equipment has been packed in approved containers to withstand normal handling by any commercial carrier. Exercise care when unpacking. If damage has occurred, call carrier and request inspection report, promptly. Retain all original packing material for carrier's examination. Our responsibility ceases upon acceptance of shipment by transportation company. READ THOROUGHLY BEFORE UNPACKING AND INSTALLING THE XENON LAMP! <u>PUT ON</u> HELMET AND GLOVES BEFORE UNPACKING XENON LAMP.

PREFACE:

The "XENEX PUP" is a reflector type, direct current, projection lamphouse utilizing a horizontal Xenon Lamp as a light source. It is designed to accept 1000 or 1600 Matt Horizontal Xenon Lamps.

The optical system consists of a single 14 inch ellipsoidal, dichroic coated, heat resistant glass reflector which allows infra-red (heat) rays, from the Xenon Lamp, to pass directly through to the rear of the lamphouse. Visible light is projected forward to the film, much cooler than would be obtained from metallic reflectors. Reflector working distance (28 inches) provides excellent screen coverage. The power sources, designed especially for specific ratings of the Xenon Lamps utilized, have high open circuit voltage, a low ripple factor for long lamp life, and sufficient capacitance for easy lamp ignition.

THE STANDARD "XENEX PUP" DESIGN includes:

D.C. Ammeter and Shunt Heavy Duty Igniter Elapsed Time Meter Magnetic Arc Stabilization Pilot Light	Spot Adjustment Manual Douser Blower	Power Switch Manual Ignition Switch Reflector Adjustment Controls
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VENTILATION REQUIREMENTS:

The "XENEX PUP" is designed with a blower located on the "Off-Operator" side of the lamphouse, drawing cool air directly into the lamphouse. An air deflector "splits" the blower output so one-half of the air is exhausted over the Cathode seal of the Xenon Lamp and the other half over the Anode seal. A 6 inch flue adapter is located on the top of the lamphouse. Louvers are provided, directly beneath the lamp, so that cooling air is drawn over the lamp from the projection room exhaust system. This system shall be similar to that shown in FIG. 1.



FIG. 1

Excess temperature, because of limited air flow inside the lamphouse, can result in short lamp life. Excessive ventilation can result in operating the Xenon Lamp too cold, causing a deposit of materials on the lamp Anode, off dead center, resulting in arc instability.

Install 6 inch Flexible Exhaust Tubing to the lamphouse flue adapter and to the projection room exhaust system, after the lamphouses have been positioned on the projector pedestals. An Aluminum Draft Gauge, $7-3/4" \times 3" \times .015"$ thick, is supplied to adjust the draft correctly.

Close the By-pass Dampers at each end of the stack. Place the Draft Gauge over the exhaust port on the inside of the lamphouse. The Bypass Dampers should be adjusted until the Draft Gauge is just held in place. If it "snaps" into place, the draft is too great. Minimize it by opening the By-pass Dampers at each end of the system. If the Gauge fails to remain (barely held), ventilation should be increased with a larger suction fan, larger motor or other means. Correct ventilation will pay dividends in increased lamp life. CHECK BOTH LAMPHOUSES THOROUGHLY!!!

LOCATING THE LAMPHOUSE ON THE PROJECTOR PEDESTAL:

The "XENEX PUP" is equipped with two rails, on the base of the lamphouse, which fit into the ways of the projector pedestal. Set the lamphouse into the pedestal ways. Open the door which is secured by two #6 Sheetmetal Screws, one at each end. A "Swing Latch" is provided on the <u>upper</u> <u>right hand corner</u> of the housing. Swing the Latch over the edge of the door and it will remain open. Slide the lamphouse ahead, on the pedestal, until the distance from the edge of the Reflector Frame, to the film line, is 24 inches. Since the Reflector is 4 inches deep, the vortex of the reflector will then be 28 inches from the film line. Four 5/16-18" threaded holes are provided, in the Lamphouse Rails, for securing the Hex Head Cap Screws and Mashers supplied. It will not be tightened firmly until the lamphouse alignment has been checked.

REFLECTOR INSTALLATION:

The Reflector is shipped with the Lamp Mounting Hardware installed in the vortex of the Reflector. The Lamp Mounting Stud, (wrapped in corrugated paper for shipping purposes) is completely assembled and rests in the 2-1/4" diameter hole in the Reflector Frame Support. Remove the corrugated paper. An Air Deflector is mounted on the "Off-Operator" side of the lamphouse, over the Blower Exhaust Hole. Remove the two 8-32 Hex Nuts, which secure it to the Heat Shield. Lay the Air Deflector aside until the Reflector has been installed. Loosen the single screw that holds the Arc Stabilizing Magnet upright and swing it to the left side of the Lamphouse. The Reflector Bushing MUST go over the Lamp Mounting Stud in a perfectly straight line. The Air Deflector, as it is installed at the factory, will not permit this. Three Reflector Clips are provided on the Reflector Frame secured by three 6-32 X 1/4" Binding Head Screws. Loosen them. Swing the Clips to the outside of the Frame, to permit the Reflector to enter the Frame. Slide the Reflector, and the already mounted Reflector Bushing, straight back over the Lamp Mounting Stud, until it enters the Frame. Swing the Reflector Clips down and secure them. Reinstall the Air Deflector, and the Arc Stabilizing Magnet. BE-SURE-THAT-THE COLLED FOCUSING SPRING IS PROPERLY INSTALLED AS SHOWN IN FIG. 0, PAGE

INSTALLATION AND OPERATION OF THE LP-1000 AND LP-1600 INSTRUCTIONS: "XENEX PUP" LAMPHOUSES



FIG. 2

L-1940 ALIGNMENT KIT:

ALIGNMENT OF THE LAMPHOUSE AND PROJECTOR MECHANISM IS OF GREAT IMPORTANCE TO OBTAIN MAXIMUM EFFICIENCY OF THE "XENEX PUP". Be certain alignment is correct before operating the lamphouse!

The Alignment Kit consists of:

- Alignment Stud with Alignment String 1 - L-1933
- 1 L-782-3 Alignment Plug for the Projection Lens Barrel

REFER TO FIG. 2 AND PROCEED WITH ALIGNMENT AS FOLLOWS:

- Install the 5/16-18 Threaded Stud, to which the Lacing Cord is 1. attached in the Lamp Mounting Stud.
- Feed the Alignment String (lacing cord) through the Lamphouse Nose 2. Cone, the aperture of the Projector and the Projection Lens Barrel Holder which is 2-25/32" in diameter.
- Pass the String through the small hole in the L-782-3 Alignment (Lens) 3. Plug and insert the Plug into the Lens Barrel Holder.
- Draw the Alignment String taut. Wrap it around the 1/4-20 X 1" Round 4. Head Screw affixed to the Lens Plug, several times to hold it in this position.
- When the lamphouse is correctly aligned, the taut string will be 5. exactly in the center of the aperture, in the vertical and the horizontal position.
- Most projector pedestals have provisions for horizontal and vertical 6. adjustment of the lamphouse. IF VERTICAL ADJUSTMENT IS NOT PROVIDED, THE LAMPHOUSE WILL HAVE TO BE SHIMMED.
- When this condition has been achieved, tighten the Cap Screws which 7. secure the lamphouse to the pedestal. Remove the Alignment Kit. Page 4 of 11



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XENON LAMP INSTALLATION: IMPORTANT!! FOR YOUR PROTECTION, PUT ON THE HEAD SHIELD AND GLOVES SUPPLIED WITH THE LAMPHOUSE. UNPACK THE XENON LAMP CAREFULLY.

- a) Each Xenon Lamp is specially packed, one to a carton, as shipped from the factory.
- b) Remove the lamp from the carton and remove the outer "air pac" wrapping. Allow the inner wrapper to remain until the lamp is in place.
- c) The Cathode End (Negative) of the lamp is equipped with a 5/16-18 Threaded Stud. Insert it in the Lamp Mounting Stud, located inside the Reflector Bushing. <u>TIGHTEN</u> IT SNUGLY, BY GRASPING THE CATHODE HARDWARE ADJACENT TO THE REFLECTOR. DO NOT TIGHTEN FROM THE ANODE END! YOU CAN DAMAGE THE ANODE SEAL!
- d) Refer to the line drawing attached. Install the L-945 Hardware Kit on the Anode Hardware as shown. Adjust the Socket Head Cap Screw until about 1/4" exists at the open end of the mounting hardware, or just enough so it will straddle the flex-board insulator which mounts to the focusing spring arm, secured to the top of the lamphouse. You will have to move this assembly, against the focusing spring, by pushing it to the right until the hole in the flex-board aligns itself with the hole in the Anode Hardware, then insert the 1/4-20 X 1" Hex Head Cap Screw from the rear and secure it with the wing nut supplied. The split bushing, surrounding the Anode Hardware may still be loose enough to allow the lamp to slide in the hardware. An Allen Wrench is supplied to tighten the Socket Head Cap Screw. Tighten it just enough to prevent the lamp from sliding in the holder.
- e) Install the Anode Lead, which is shipped connected to the Ignition Device. Tighten the 8-32 X 1/4" Socket Head Set Screw, in the Anode Lead fitting, <u>firmly</u>, <u>to prevent</u> arcing.
- f) <u>Remove the remaining wrapper from the lamp</u>. If gloves were worn, while installing the lamp, no finger prints will appear on the lamp envelope. Should marks occur, they <u>must</u> be removed. Use a soft cloth and methylalcohol. EXERCISE CAUTION!
- THIS COMPLETES THE LAMPHOUSE AND XENON LAMP INSTALLATION. PROCEED WITH THE POWER SUPPLY CONNECTION. (SEE POWER SUPPLY INSTRUCTIONS).
 - a) Once the Power Supply is positioned, and the input wiring is installed, only three connections are required:
 - 1. The "Positive" Lead, from the Power Supply, connects to the terminal, on the Lamphouse Terminal Board, marked "Positive".
 - 2. The "Negative" Lead, from the Power Supply, connects to the Ammeter Shunt, in the lamphouse, on the end opposite the lead going to the Cathode Conducting Plate.
 - 3. A five foot rubber covered cord (part of the lamphouse assembly), should be plugged into a 120 Volt A.C. single phase, <u>wall receptacle</u>.

THE ENTIRE SYSTEM IS NOW READY TO OPERATE.

L-1745-2 AUTOMATIC IGNITION KIT:

REFER TO GENERAL SPECIFICATION SHEET, ATTACHED, FOR CONNECTIONS:

If an L-1745-2 Zener Diode Controlled Automatic Ignition Kit is installed in the "XENEX PUP", the Xenon Lamp will ignite when the Power Switch is turned "ON". No adjustment is necessary. This 7ener Diode Controlled Automatic Ignition Device is designed in such a manner that when the Power Supply D.C. voltage, open circuit, reaches a pre-determined value, the Zener Diode avalanches, supplying the relay with <u>sufficient power to</u> <u>close a set of contacts</u>. The moment the Xenon Lamp ignites, the Power Supply voltage <u>falls</u> to a value much lower than that required, to make the Zener Diode carry current, and the <u>contacts open</u>. The Zener Diode Assembly consisting of the Diode, a protective Capacitor across the Diode, Spade Type Terminals for rapid replacement of the assembly, and a sensitive D.C. Relay. Two long, Slotted Nuts secure it to the total assembly.

If the Zener Diode should fail, back each screw off, two turns, and the Diode Assembly will fall out. Install new assembly in reverse manner, making sure the Spade Terminals are separated, otherwise, the diode would be shorted.

The Automatic Ignition Kit is also designed with a "Muting Switch" (blue and yellow leads). Should you experience unusual noise in the sound system, at the moment of ignition, these leads can be used to "short out" the voice coils in the speaker system, so that a "blast" cannot be heard in the auditorium. Consult your sound engineer about the correct way to make these connections.

MANUAL IGNITION:

- a) Close the Lamphouse Douser. An "On-Off" Switch is located on the side of the lamphouse, immediately under the door. Turn the Power Switch to the "On" position. If all wiring is in order, the "Pilot Lamp", located on rear of the Lamphouse, will come "ON" and the Blowers in the Power Supply and Lamphouse will run.
- b) The Manual Ignition Switch (Fomentary Contact) is located immediately ahead of the power switch, on the side of the lamphouse. Depress this Switch Button, quickly. Release it, <u>instantly</u>, after the lamp ignites. Only a short "jab" should be required to light the lamp.

INSTRUCTIONS FOR CURRENT ADJUSTMENT WILL BE FOUND IN THE POWER SUPPLY OPERATING INSTRUCTIONS.

MAGNETIC ARC STABILIZATION:

The Xenon Arc is magnetically stabilized, by an Alnico Magnet, located directly beneath the arc, so the tail flame of the Xenon Lamp envelopes the Anode face uniformly. It prevents the tail flame from reaching upward and contacting the quartz envelope of the lamp, which causes envelope blackening. It also deters localized devitrification of the quartz envelope which can lead to explosion.

ADJUSTING THE MAGNETIC STABILIZATION:

After correct current has been established, examine the Xenon arc through the STAINED GLASS WINDOW in the lamphouse door. The arc stream should be in the exact center of the Anode, as shown in "B", <u>FIG. 4</u>, below.



INSUFFICIENT FLUX

CORRECT FLUX

EXCESSIVE FLUX

FIG. 4

The Magnet is correctly set when the lamphouse is tested at the factory. Different lamps, however, might require different adjustments. If the arc is not centered as in "B", FIG. 4, above:

a) loosen the Wing Nut, on the Magnet Assembly and adjust it, <u>upward</u>, or <u>downward</u>, until the arc is centered. The flame should <u>never</u> be above or below center, as in "A" or "C".

FOCUSING:

Open the Douser with the projector running. Examine the projected "spot" at the film line. The screw, located on the rear of the Lamphouse, marked "FOCUS" will permit spot size adjustment. Two Control Rods extend out the rear of the Lamphouse for <u>horizontal</u> and <u>vertical reflector</u>. <u>adjustment</u>. Socket Head Set Screws are located in the <u>end of each Rod</u>. <u>A Set Screw Wrench is furnished for adjustment</u>. It <u>should be removed</u>, <u>after adjustment is completed</u>, to prevent tampering.

THE EQUIPMENT IS NOW READY FOR PROJECTION.

DO NOT OPEN THE LAMPHOUSE DOOR WHILE THE XENON LAMP IS HOT!!! READ LAMP HANDLING INSTRUCTIONS, ATTACHED, THOROUGHLY. TAKE NOTE OF LAMP GUARANTEES.

LAMP ROTATION:

To prevent excessive blackening of the quartz envelope, the Xenon Lamp should be rotated 90° each quarter of its guaranteed life. The "XENEX PUP" is designed with a simple device for doing this.

- a) Behind the Reflector Frame Support, you will find a nickle-plated Octal Plate having four holes at 90° to each other. Loosen Set Screw in the Anode Lead Fitting, so the Anode Lead does not turn with the lamp as it is rotated.
- b) Remove the 1/4-20 X 3/8" Hex Head Cap Screw and Nut, which secures the Cathode Lead coming from the Ammeter Shunt, rotate the plate 90° to the next hole, and secure the lead. <u>Tighten the Anode Fitting</u> Screw, <u>firmly</u>. This practice should be repeated three times during the guaranteed life of the lamp.

DOUSER TENSION ADJUSTMENT:

The Douser is designed with a tensioning device. Should it become loose, remove the Douser Handle by loosening the 1/4-20 Hex Nut which secures it. A 1/4-20 X 1/4 inch Socket Head Set Screw is located directly beneath it. Loosen it, and tighten the 8-32 X 1/2" Socket Head Cap Screw, located on the shaft end, <u>clockwise</u>, until the correct tension is obtained. Tighten the 1/4-20 X 1/4 inch Socket Head **Set** Screw. Replace the Douser Handle.

REFLECTOR WARRANTY:

Should the reflector coating deteriorate, because of faulty coating, reducing screen light appreciably, adjustment will be made as follows:

- 1. A new reflector will be shipped and billed at price in effect at time of shipment.
- Faulty reflector must be packed carefully and returned to THE KNEISLEY ELECTRIC COMPANY for examination and adjustment as follows: Failure:
 - a) In first six months after shipment from our factory, credit will be issued for full purchase price of reflector which failed.
 - b) In second six months of service, 75% credit will be issued.
 - c) In third six months of service, 50% credit will be issued.
 - d) In fourth six months of service, 25% credit will be issued.

No credit will be issued after two years from date of factory shipment. No warranty is made with respect to breakage or normal wear.

NOTE: All Reflectors are subject to manufacturer's inspection. All adjustments are processed through the theatre supply dealer.

LAMP WARRANTY:

Kneisley Xenon Lamp Marranty is pro-rated, as follows, unless mis-used or abused. Our Guarantee Control Card must be completed and returned to us at time of lamp installation. Operate lamps within specified ratings:

PART		LAMP RATING		PRO-RATED	
NUMBER	WATTAGE	AMPS	VOLTS	LIFE	
L-1925	1000	50	20 ± 2	1500 Hours	
L-1930	1600	65/70	24 ± 2	1500 Hours	

*If lamp fails within the first half of its warranteed life, under normal operating conditions, it will be replaced at no charge.

If failure occurs <u>after</u> the first half of warranteed life, the warranty is pro-rated over total hours used, but not beyond the stated pro-rated total life. All lamps returned, for pro-rated credit, are subject to examination. We require specific information pertaining to operation time, operating current and voltage, and so forth. Refer to the warranty sheet which accompanies each Xenon Lamp. <u>Complete this form and return it to us when an inoperative lamp is returned</u>. <u>Lack of this</u> information will VOID the warranty.

NOTE: PLEASE DO NOT RETURN ANY EQUIPMENT WITHOUT FACTORY AUTHORIZATION. PREPAY TRANSPORTATION ON RETURNED EQUIPMENT.

MAINTENANCE OF THE "XENEX PUP":

Clean the interior of the lamphouse, at regular intervals, to remove dust and any accumulation of dirt, depending upon conditions at location. Every six months place three drops of high grade oil in the bearing holes located on top of the blower motor.

NOTE: DO NOT FINGER-MARK REFLECTOR OR LAMP. HANDLE WITH CLEAN GLOVED HANDS. GLOVES AND A PROTECTIVE FACE MASK ARE FURNISHED. USE THEM!!!

CLEANING REFLECTOR AND XENON LAMP WHEN THEY ARE COLD:

Any residue should be removed, from the <u>lamp</u>, with cotton and methylalcohol. Hipe lamp dry! See Page 11 for general "Xenon Lamp Handling Instructions".

Clean Reflector with "Windex", or any liquid, non-abrasive, wax-free, glass cleaner, and <u>soft</u>, <u>lint-free cloth</u>. Begin to wipe dry while cleaning agent is wet, to avoid streaking.

CHECKING CONNECTIONS:

All electrical connections, in power supply and lamphouse, should be checked, periodically, to be certain they are tight, even though equipment is operating satisfactorily.

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FOLLOW XENON LAMP HANDLING INSTRUCTIONS CLOSELY !!!

All Xenon Lamps are sealed under high pressure. For your safety, and the protection of equipment, observe the following:

- 1. ALWAYS PUT ON THE SAFETY HEAD SHIELD AND GLOVES BEFORE OPENING THE LAMPHOUSE DOOR, WHEN HANDLING THE XENON LAMP, OR WHEN WORKING IN AN AREA CLOSE TO AN EXPOSED XENON LAMP. If a Xenon Lamp fails while in operation, allow lamp to cool at least 10 minutes after shutting off power, before opening the door.
- 2. Place plastic wrapper around cool lamp, before attempting removal from the lamphouse.
- 3. Do NOT remove plastic wrapper from new lamp, until installation in lamphouse is complete and Anode Lead connected. <u>CLOSE LAMPHOUSE DOOR</u> IMMEDIATELY. Secure the door with screws provided.
- 4. <u>DO NOT operate the lamp beyond its normal rated life</u>. (See <u>PAGE 10</u> for Lamp Ratings). Quartz devitrifies with age. Continued use, after normal rated life, may result in explosion of the envelope and damage to expensive optics for which we are not responsible. <u>Operation above the maximum current limit will reduce safety and void</u> <u>warranty</u>. If Xenon Lamp is turned 90°, as instructed, lamp life may be prolonged, although manufacturer does not warrant it beyond stated warranty. SEE PAGE 9 for "LAMP ROTATION".
- 5. If the Xenon Lamp is purchased from The Kneisley Electric Company, and fails before it has operated total guaranteed life period, return it to us for examination and pro-rated adjustment. When the lamp is cold, place plastic guard or wrapper around the lamp, and disconnect leads from lamp ends. Pack it, very carefully, in original lamp packing, over-packed. Be certain lamp manufacturer's warranty form is completed and returned with lamp.
- 6. When lamp fails after guarantee expiration, wrap it several times in layers of heavy canvas or other heavy material. Smash it with a hammer, before placing it in a trash container. DO NOT DISCARD THE LAMP WITHOUT SMASHING IT FIRST, IT WOULD BE HAZARDOUS!! IT CAN EXPLODE!
- NOTE: DO NOT RETURN ANY EQUIPMENT WITHOUT AUTHORIZATION. PACK PRODUCT CAREFULLY AND INSURE FOR FULL VALUE.

ADDRESS PARCELS TO: THE KNEISLEY ELECTRIC COMPANY 2501-9 Lagrange Street Toledo, Ohio 43608

ADDRESS LETTER MAIL TO:

THE KNEISLEY ELECTRIC COMPANY	P.O. BOX 4692	TOLEDO, OHIO 43620
Printed 1/30/79	Form N	PUP" Gen. Spec. Sheet. Io. LP-1000/LP-1600 GS. Supply Instructions.

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GENERAL KNEISLEY "XENEX PUP" LADPHOUSE FOR 1000 AND 1600 SPECIFICATIONS: MATT HORIZONTAL XENON LAMPS

1. The "XENEX PUP" was designed to fill the need of many indoor theatres for a compact, inexpensive, practical Xenon Lamphouse which will, adequately, light indoor screens ranging from 20 to 36 feet. Recommendations are:

MODEL NO.	LAMP NO.	OUTPUT	SCREEN WIDTH
LP-1000	*0SRAH XB0-10001/HS OFR *XL-1000 HSF	9,200	20 to 28 Feet
LP-1600	*OSRAM XBO-1600H/HS OFR *XL-1600 HSF	14,100	30 to 36 Feet

*Other manufacturers' lamps may be used, providing Cathode end has 5/16-18 Thread. Anode end should be limm.

FEATURES:

a) WORKING DISTANCE: 28 inches.

OPTICS: Our L-744 Dichroic Coated, 14 inch Glass Reflector as used in standard "XENEX" Lamphouse. Infra-red (heat) rays pass through the reflector, reducing heat at the Xenon Lamp. Alignment Kit is provided.

- b) ADJUSTABLE MAGNET ASSEMBLY for stabilizing arc centering it directly between Lamp Cathode and Anode.
- c) HEAVY DUTY IGNITER is mounted on bottom (front) of lamphouse for easy access. Anode lead is affixed to igniter at time of shipment.
- d) Xenon Bulb screws into Cathode Mount, eliminating Cathode Lead. Bulb rotating means is provided.
- e) Blower, with deflector, mounted on "off-operator" side divides air to cool bulb hardware. Six inch flue adapter, on top, allows for "stacking" into lamphouse exhaust system.
- f) L-1745-2 Automatic Ignition optional. Easy to install in the field, if not ordered with lamphouse originally. With Automatic Ignition, Xenon Lamp ignites when power switch is turned "on". Standard Lamphouse includes manual douser and manual ignition.

POWER SUPPLIES:

MODEL NO.	VOLTAGE	WATTAGE	INPUT CURRENT	PHASE	FREQUENCY
M65RAX1X M50RAX2X1 M70RAX2X1 M50RTX2X1 M70RTX2X1	120 230 230 230 230 230	1000/1600 1000 1600 1000 1600	18/25 Amps. 13.0 Amps. 18.0 Amps. 11.0 Amps. 15.0 Amps.	1 1 3 3	50/60 Cycle 50/60 Cycle 50/60 Cycle 50/60 Cycle 50/60 Cycle

THREE PHASE POWER SUPPLIES ALWAYS RECOMMENDED WHEN THREE PHASE IS AVAILABLE.

THE KNEISLEY ELECTRIC COMPANY

P.O. BOX 4692

TOLEDO, OHIO 43520

Printed 8/20/79

Form No. LP-1000/LP-1600 GS-1