

4



# CITY OF SACRAMENTO

## DEPARTMENT OF GENERAL SERVICES

OFFICE OF THE DIRECTOR

September 12, 1985  
SS:Admin:FM:RA:JJ:MW:bb

FACILITY MAINTENANCE DIVISION  
FLEET MANAGEMENT DIVISION  
RISK MANAGEMENT & INS. DIVISION  
SUPPORT SERVICES DIVISION

CITY MANAGER'S OFFICE  
**RECEIVED**  
SEP 11 1985

City Council  
Sacramento, California

**APPROVED**  
BY THE CITY COUNCIL

Honorable Members in Session:

SEP 17 1985

SUBJECT: Recommendation of Award

OFFICE OF THE  
CITY CLERK

### SUMMARY

Attached are tabulations of sealed proposals received by the City Clerk for furnishing equipment and materials in accordance with specifications adopted by the City Council.

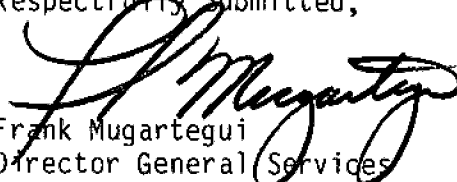
### RECOMMENDATION

It is recommended that the City Council accept the lowest responsive and responsible proposals submitted as follows:

<u>Bid No.</u>	<u>Bidder</u>	<u>Items Awarded</u>	<u>Contract Amount</u>
863 - Replacement Parts for OMC and Engines and Cushman's (Attachment #1)	Golden Bear Equipment Co. 3309 Longview Drive North Highlands, CA 95660 <u>(P.O. #60113)</u>	All	\$10,667.23
850 - Carpeting of Community Center Activities Building and Theater (Attachment #2)	Western Contract Furnishers 11455 Folsom Blvd. Rancho Cordova, CA 95670 <u>(P.O. #60114)</u>	1B	\$62,906.00
853 - Parking Garage Luminaires (Attachment #3)	General Electric Supply Co. 1001 Fee Drive Sacramento, CA 95815 <u>(P.O. #60115)</u>	All	\$70,067.69


Sufficient funds are available to award the contracts.

Respectfully Submitted,



Frank Mugartegui  
Director General Services

Recommendation Approved:



Walter J. Slipe  
City Manager

3 Attachments

ATTACHMENT #1

BID NO. 863 - REPLACEMENT PARTS FOR OMC ENGINES AND CUSHMANS

(Total Amount Includes 6% Sales Tax)

<u>Bidder</u>	<u>Amount of Bid</u>
Golden Bear Equipment Co.	<u>\$10,667.23</u>
Perin Co.	\$10,869.22
Duke Equipment & Irrigation	No Bid
Gerlinger Motor Parts Sales	No Bid
Bearings Supply Co., Inc.	No Bid

Total Award of Contract To: Golden Bear Equipment Co.  
 3309 Longview Drive  
 North Highlands, CA 95660

Total Amount of Contract: \$10,667.23\*

Original Estimated Cost: \$20,000.00

User: Fleet Management Division

Due Date: August 27, 1985

\*Bid was based on estimated quantities.  
 Fleet Management would prefer to  
 have this contract approved for "Not  
 to Exceed" \$20,000.00 to cover unfore-  
 seen repairs.

ATTACHMENT #2

BID NO. 850 - CARPETING OF COMMUNITY CENTER ACTIVITIES  
BUILDING AND THEATER

<u>Bidder</u>	<u>Item #1A</u>	<u>Item #1B</u>	<u>Prompt Payment Discount</u>
Western Contract Furnishers	\$104,054.00	<u>\$62,906.00</u>	2%
Owens-Corning Fiberglas Corp.	\$102,974.00	\$66,232.00	0
Timberline	No Bid	No Bid	
B. T. Mancini Co. Inc.	No Bid	No Bid	
Campbell's Carpet Inc.	No Bid	No Bid	

NOTE: Due to the received responsible bids exceeding the funded allocation, it is determined to be in the best interest of the City of Sacramento to only award item 1B (Activities Building). Item 1A will be funded and submitted for bid at a later date.

Total Award of Contract To: Western Contract Furnishers  
11455 Folsom Blvd.  
Rancho Cordova, CA 95670

Total Amount of Contract: \$62,906.00

Original Estimated Cost: \$110,000.00

User: Community Center

Due Date: August 6, 1985

ATTACHMENT #3

BID NO. 853 - PARKING GARAGE LUMINAIRES

<u>Bidder</u>	<u>Amount of Bid</u>	<u>Cash Discount</u>
Light Sales	\$60,337.62 <sup>1</sup>	2% 20 days
Pacific Electrical Supply (Alternate Bid)	\$70,744.67 \$75,935.50	Net 30 days Net 30 days
Graybar Electric	\$70,570.61	Net 30 days
Westinghouse Electric Supply (Alternate Bid)	\$70,004.03 \$75,112.51	Net 30 days Net 30 days
General Electric Supply Co.	<u>\$70,067.69</u> <sup>2</sup>	2% 20 days

<sup>1</sup> The lamps offered by Light Sales do not meet the specifications.

<sup>2</sup> This amount represents the lowest responsible bidder after the cash discount.

Total Award of Contract To: General Electric Supply Co.  
1001 Fee Drive  
Sacramento, CA 95815

Total Amount of Contract: \$70,067.69

Original Estimated Cost: \$75,000.00

User: Facility Management

Due Date: August 27, 1985

ATTACHMENT #1

BID NO. 863 - REPLACEMENT PARTS FOR OMC ENGINES AND CUSHMANS

(Total Amount Includes 6% Sales Tax)

<u>Bidder</u>	<u>Amount of Bid</u>
Golden Bear Equipment Co.	<u>\$10,667.23</u>
Perin Co.	\$10,869.22
Duke Equipment & Irrigation	No Bid
Gerlinger Motor Parts Sales	No Bid
Bearings Supply Co., Inc.	No Bid

9-17-85  
#4A

Total Award of Contract To: Golden Bear Equipment Co.  
3309 Longview Drive  
North Highlands, CA 95660

Total Amount of Contract: \$10,667.23\*

Original Estimated Cost: \$20,000.00

User: Fleet Management Division

Due Date: August 27, 1985

\*Bid was based on estimated quantities. Fleet Management would prefer to have this contract approved for "Not to Exceed" \$20,000.00 to cover unforeseen repairs.



**DUKE EQUIPMENT  
& IRRIGATION, INC.**

2344 AUBURN BOULEVARD • SACRAMENTO, CALIF. 95821 • PHONE (916) 488-3490

August 26, 1985

**FILED**

**AUG 27 1985**

**BY THE CITY CLERK  
OFFICE OF THE  
CITY CLERK**

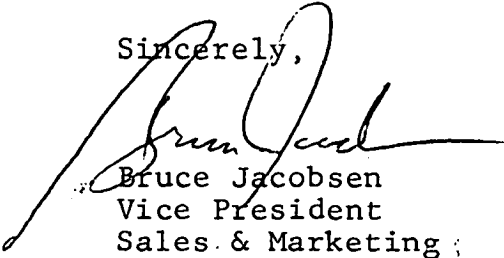
Sacramento City Council  
c/o City Clerk, Room 203  
City Hall, 915 I Street  
Sacramento, CA 95814

Gentlemen:

Thank you for the opportunity to bid on OMC parts needs. As a major supplier in the area for OMC parts, we would be happy to be able to supply the City of Sacramento with their OMC parts. However, we find that we are not able to comply with several of the items in your "Specifications for Replacement OMC Engines and Cushman Parts."

OMC parts price list reflects several different discount schedules. It is not possible to offer the same discount on all items shown on the price list. We would also have a problem in filling all backorders within five (5) working days. OMC is located in Lincoln, Nebraska, and we find that they cannot supply all the backorders in five (5) days.

Sincerely,



Bruce Jacobsen  
Vice President  
Sales & Marketing

BJ:cr

Enclosure

AUG 9 1985



# CITY OF SACRAMENTO

DEPARTMENT OF GENERAL SERVICES  
SUPPORT SERVICES DIVISION

## CONTRACT SPECIFICATIONS FOR:

REPLACEMENT PARTS FOR OMC ENGINES AND CUSHMANS

**FILED**

**AUG 27 1985**

**BY THE CITY CLERK  
OFFICE OF THE  
CITY CLERK**

PROPOSAL NO: 863

PROPOSALS MUST BE RECEIVED

PRIOR TO: 10:30 a.m., August 27, 1985

AT: CITY CLERK

915 I St. RM. 203

SACRAMENTO, CA. 95814

PRE-BID CONFERENCE: N/A



1952

1953

1954

September 23, 1985

Owens/Corning Fiberglas Corp.  
4340 Roseville Road  
North Highlands, CA 95660

Gentlemen:

On September 17, 1985, the Sacramento City Council accepted the bid of Western Contract Furnishers for Item 1B in the amount of \$62,906.00 for Bid No. 850 - Carpeting of Community Center Activities Building and Theater.

It is the policy of the City to hold the bid security of the three lowest bidders until a finalized contract has been received by this office.

Upon receipt of the finalized contract your bid security will be returned.

Sincerely,

Lorraine Magana  
City Clerk

Janice Beaman  
Deputy City Clerk

JB/dah/4

2017-18

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November 25, 1985

Owens/Corning Fiberglas  
P. O. Box 13966-A  
Sacramento, CA 95853-3966

Gentlemen:

We are in receipt of the finalized contract for Bid No. 850 -  
Carpeting of the Sacramento Community Center Activities Building  
and Theater Building, which was approved by the Sacramento City  
Council on September 17, 1985.

Returned herewith is your Bid Bond in the amount of ten percent  
which was submitted for the above bid.

Sincerely,

Lorraine Magana  
City Clerk

Janice Beaman  
Deputy City Clerk

JB/dah/4

Enclosure: Bid Bond Issued by Aetna Casualty and Surety Company

September 23, 1985

Wesco  
P. O. Box 1708  
Sacramento, CA 95808

Gentlemen:

This is to inform you that you were not the successful bidder for Bid No. 853 - Parking Garage Luminaires. The said bid having been awarded by the City Council at the regular meeting of September 17, 1985, to General Electric Supply Co. in the amount of \$70,067.69.

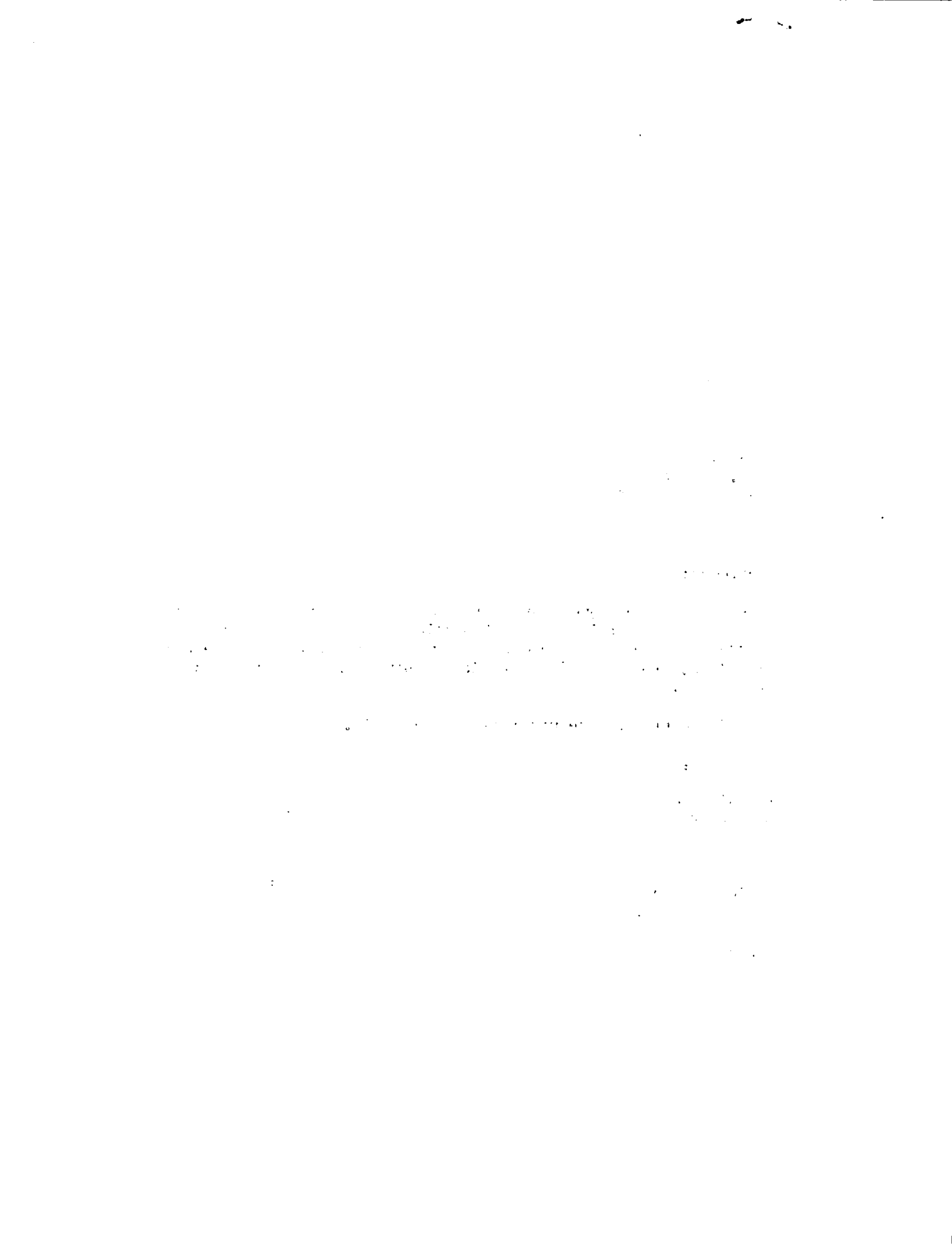
No bid security was required on the above bid.

Sincerely,

Lorraine Magana  
City Clerk

Janice Beaman  
Deputy City Clerk

JB/dah/4



September 23, 1985

Graybar Electric Co., Inc.  
1211 Fee Drive  
Sacramento, CA 95813

Gentlemen:

This is to inform you that you were not the successful bidder for Bid No. 853 - Parking Garage Luminaires. The said bid having been awarded by the City Council at the regular meeting of September 17, 1985, to General Electric Supply Co. in the amount of \$70,067.69.

No bid security was required on the above bid.

Sincerely,

Lorraine Magana  
City Clerk

Janice Beaman  
Deputy City Clerk

JB/dah/4

September 23, 1985

Pacific Electric Supply of Sacramento  
731 North Market Boulevard  
Sacramento, CA 95834

Gentlemen:

This is to inform you that you were not the successful bidder for Bid No. 853 - Parking Garage Luminaires. The said bid having been awarded by the City Council at the regular meeting of September 17, 1985, to General Electric Supply Co. in the amount of \$70,067.69.

No bid security was required on the above bid.

Sincerely,

Lorraine Magana  
City Clerk

Janice Beaman  
Deputy City Clerk

JB/dah/4



1950

1951

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September 23, 1985

Light Sales Co.  
1021 Fee Drive  
Sacramento, CA 95815

Gentlemen:

This is to inform you that you were not the successful bidder for Bid No. 853 - Parking Garage Luminaires. The said bid having been awarded by the City Council at the regular meeting of September 17, 1985, to General Electric Supply Co. in the amount of \$70,067.69.

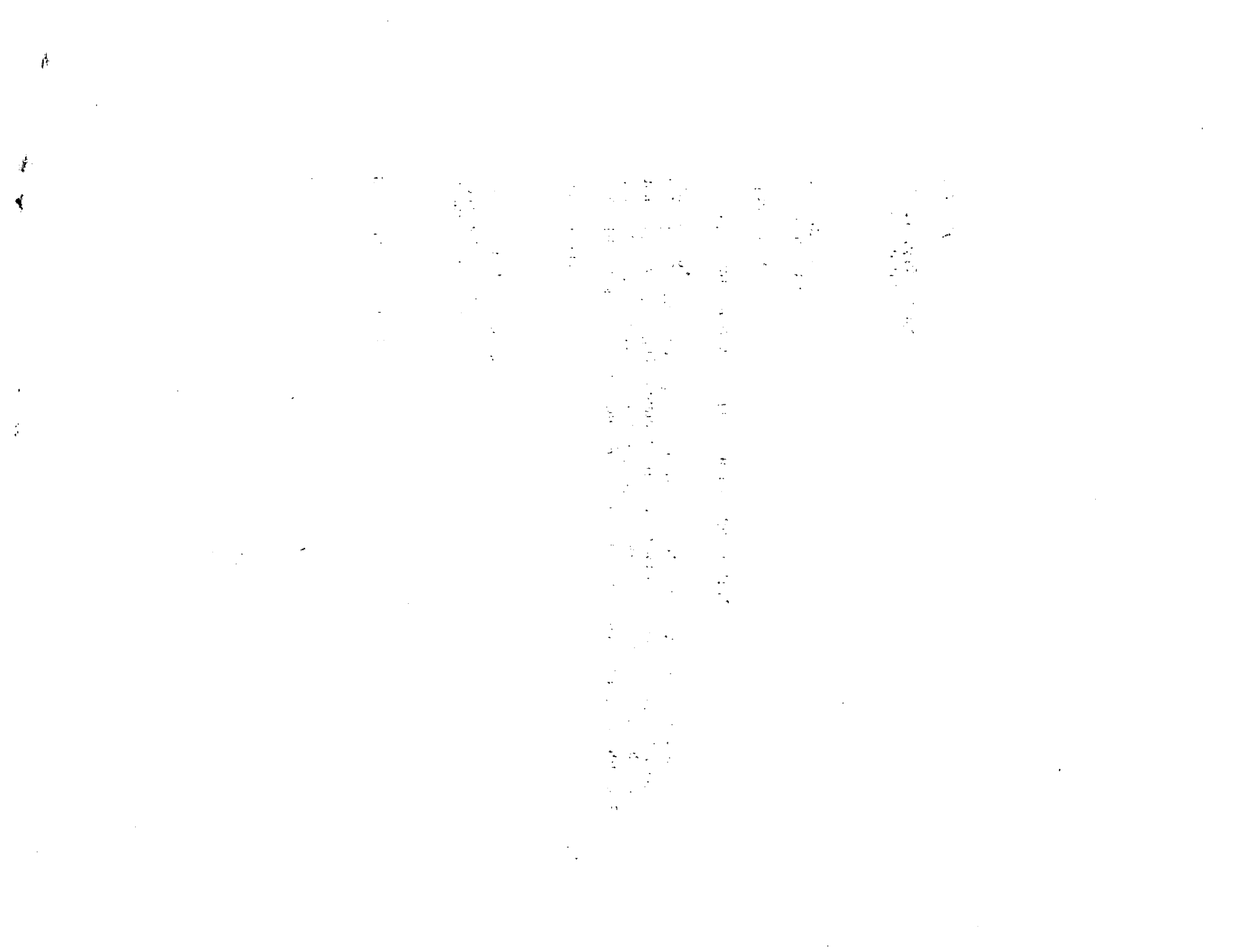
No bid security was required on the above bid.

Sincerely,

Lorraine Magana  
City Clerk

Janice Beaman  
Deputy City Clerk

JB/dah/4



Manville  
7901 Stoneridge Drive, Suite 202  
P.O. Box 9008  
Pleasanton, California 94566  
415 460-0414

Manville

FILED

AUG 27 1985

BY THE CITY CLERK  
OFFICE OF THE  
CITY CLERK

August 26, 1985

City of Sacramento  
City Clerk, Room 203  
City Hall  
Saramento, California

Reference: PARKING GARAGE LUMINAIRES  
Bid #853

TABLE OF CONTENTS

1. Partial list of luminaire installations.
2. Luminaire descriptive literature.
3. Ballast specification
4. Wiring Diagram
5. Illumination data and iso-foot candle chart.
6. Current published list price of lumianire  
replacement parts.
7. Three (3) year warranty.

**Manville**  
7901 Stoneridge Drive, Suite 202  
P.O. Box 9008  
Pleasanton, California 94566  
415 460-0414

**Manville**

August 26, 1985

City of Sacramento  
City Clerk, Room 203  
City Hall  
Sacramento, California

Reference: PARKING GARAGE LUMINAIRES  
Bid #853

Partial List of Holophane Petrolux Luminaire  
Parking Garage Installations

1. Los Angeles International Airport - Los Angeles, CA  
Used in several parking garage structures.
2. University of California - Los Angeles, CA  
Used in underground and street level parking structures.
3. University of Southern California - Los Angeles, CA  
Used in several parking garage structures.
4. Port of Los Angeles Building - Los Angeles, CA  
Used in underground parking area.

Johns-Manville

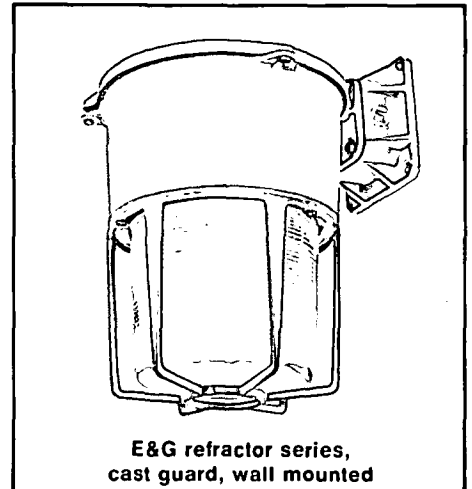
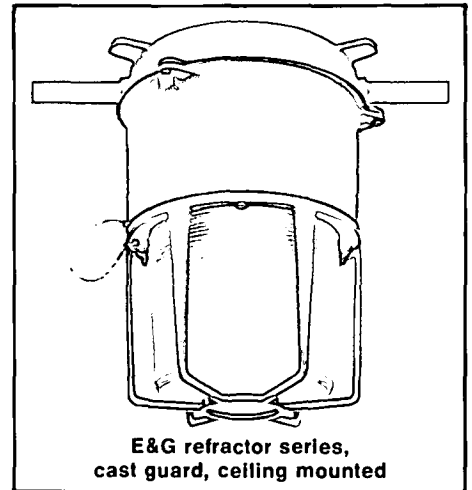
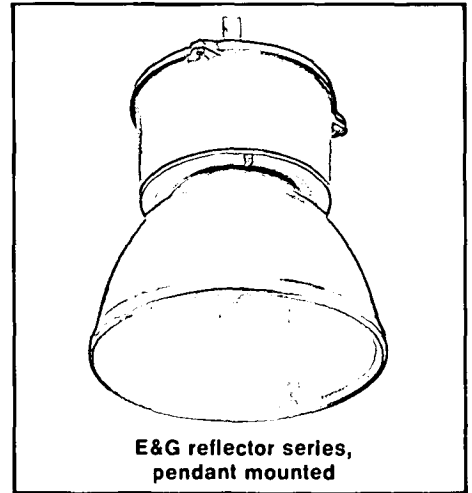
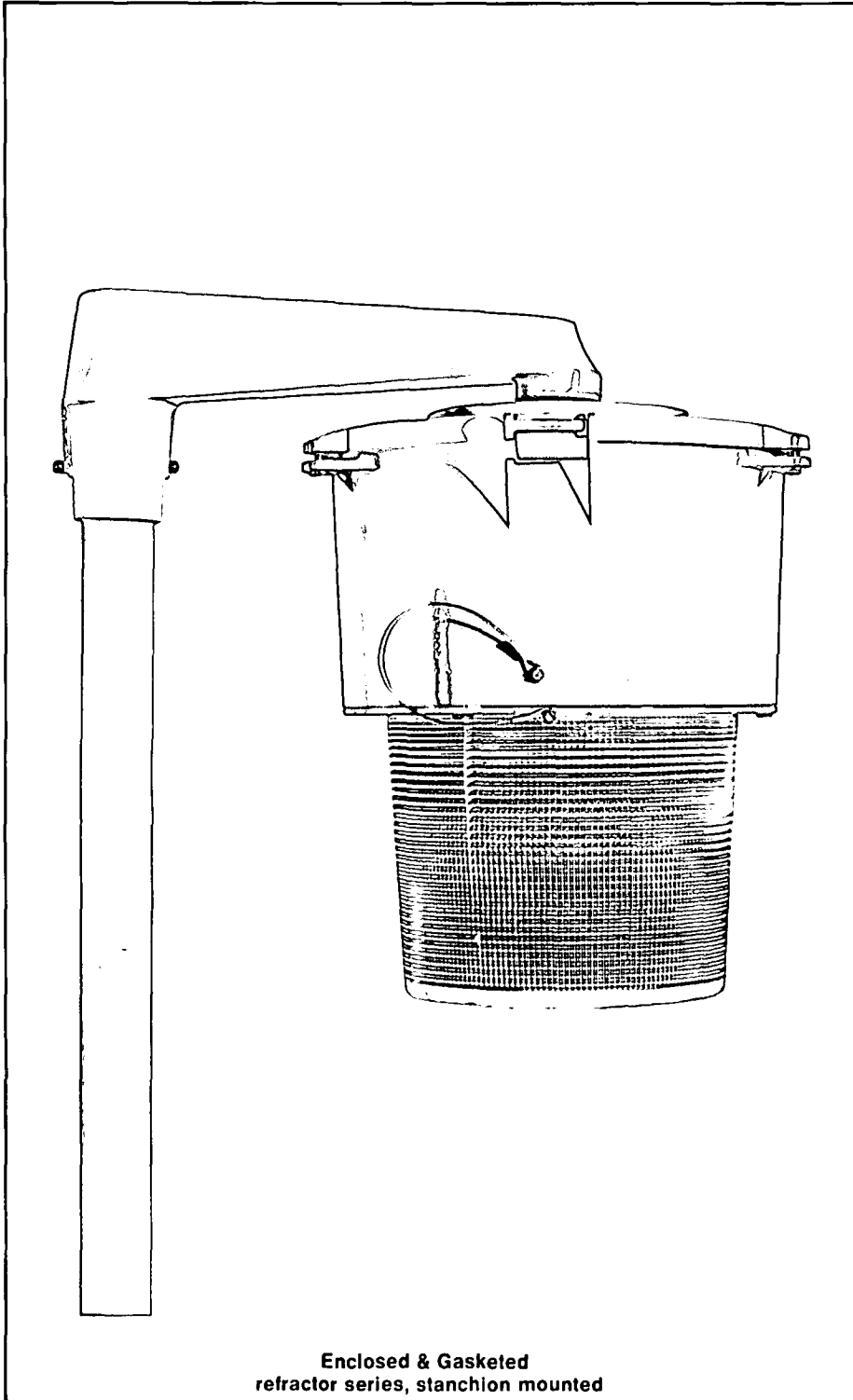


Holophane®  
Petrolux®  
indoor/outdoor  
luminaires.

General area lighting.

Hazardous area lighting:  
Class I, Div. 2;  
Class II, Div. 1, 2; Class III;  
UL standard 844.

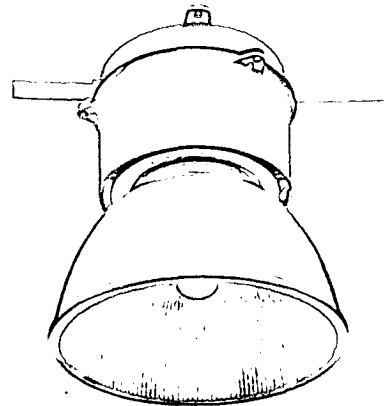
HPS, metal halide,  
mercury.



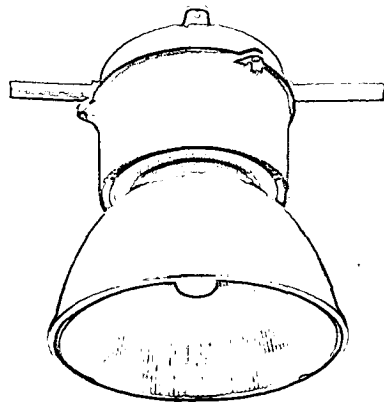
**Choice of reflectors  
and refractors  
for precise lighting  
solutions.**



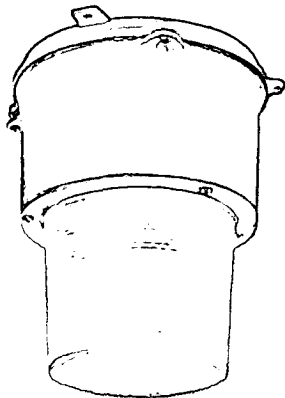
**Open ventilated reflector series,  
pendant mounted**



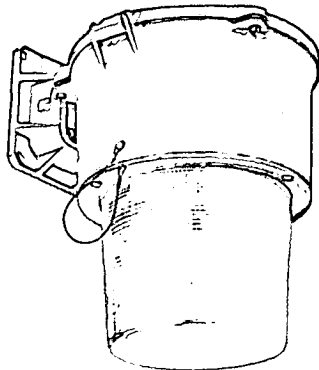
**Open reflector series,  
ceiling mounted**



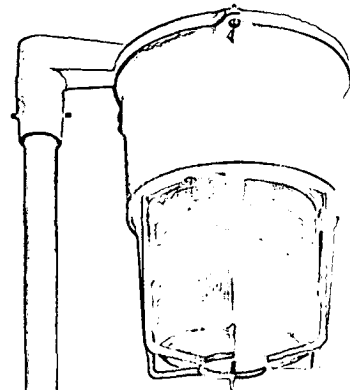
**Open ELB reflector series,  
ceiling mounted**



**E&G refractor series, box cover  
mounted over recessed outlet box**



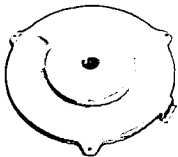
**E&G refractor series,  
wall mounted**



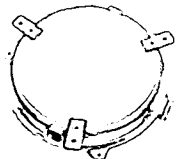
**E&G refractor series,  
cast guard, stanchion mounted**

**Choice of matched  
luminaire components  
for any application.**

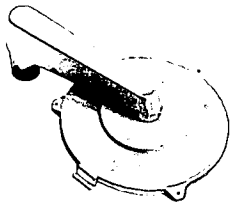
**Choice of mounting.**



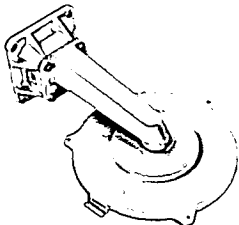
Pendant (-PD)



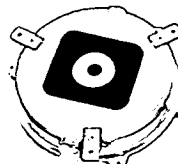
Ceiling, through-mount (-CE)



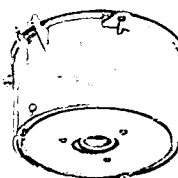
Stanchion (-ST)



Wall (-WL)

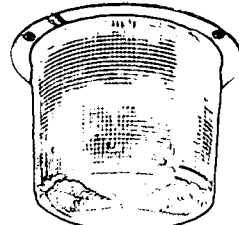


Box cover (-BC)



Universal socket housing

**Choice of  
optical systems.**



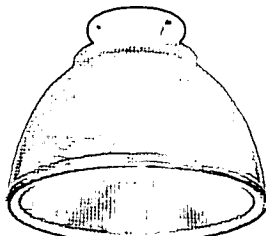
Refractor, asymmetrical (192)



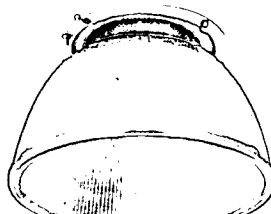
Refractor, symmetrical (197)



Reflector, open (190)

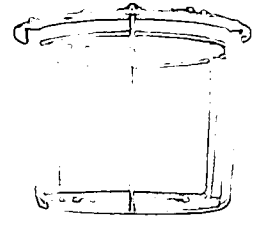


Reflector, open ventilated (198)

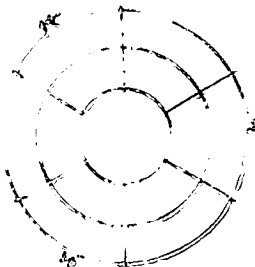


Reflector, E&G (193)

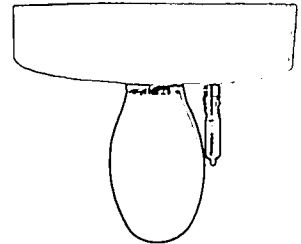
**Choice of  
options & accessories.**



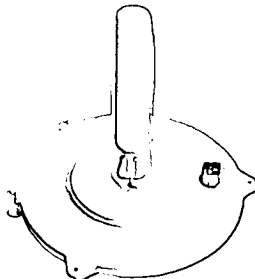
Cast guard (-CG)



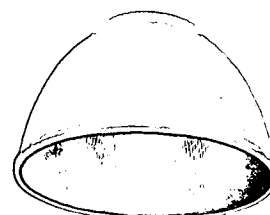
Wire guard (-WG)



Emergency standby light (-EM)



Photocontrol (-PR)



Low brightness reflector (-ELB)



## Petrolux enclosed and gasketed refractor series.

UL "Suitable for Wet Locations."

Optimum light control.

### Choice of light distributions.

Asymmetrical refractor series is designed for lighting narrow areas, such as walkways, loading platforms and parking structures. It allows spacing up to 2½ times as far apart as clear globe units. Two versions are available – with offset distribution where stanchion or wall mounting is preferred, or with long and narrow distribution for lighting from the center of a walkway.

Symmetrical refractor series is ideal for lighting general areas such as open storage. The refractor directs more light downward and outward, reducing the number of luminaires required to achieve a given light level by as much as one-third.

With either refractor, this means lower luminaire cost, lower installation cost, lower maintenance cost and less power consumption.

### Choice of mounting.

- PD – pendant mount
- FP – flexible pendant mount for balanced hanging
- ST – stanchion mount
- CE – ceiling mount
- WL – wall mount
- BC – box cover mount over recessed outlet box (not available for classified areas)

### Choice of lamp type and wattage.

- 70, 100, 150W HPS
- 100, 175, 250W mercury
- 175W metal halide

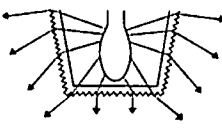
### Hazardous locations.

Available for use in Class I, Div. 2; Class II, Div. 1 & 2; Class III hazardous locations. Units tested and approved in elevated ambients and specially labelled (UL Std. 844, File #E12267).

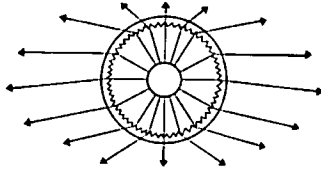
Also available in totally enclosed reflector luminaires, see page 8.

### Enclosed and gasketed.

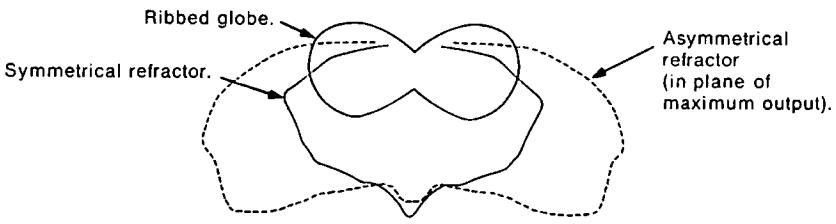
Designed for almost any application. Listed by Underwriters' Laboratories, Inc., "Suitable for Wet Locations." Ideal for areas which will be washed down, or any area requiring enclosed fixtures.



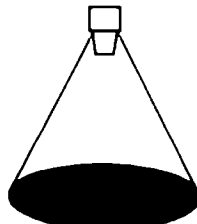
**Precise refractor prisms direct light downward and outward, for greater efficiency.**



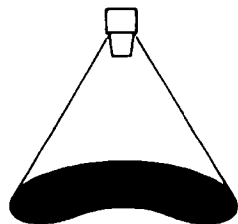
**Plan view section of asymmetrical refractor shows how long, narrow light pattern is achieved.**



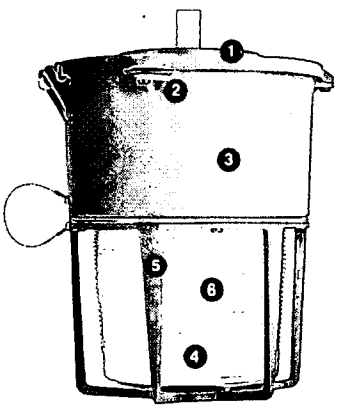
**More light.**  
Comparative vertical candlepower distribution curves demonstrate the increased output achieved by refractor luminaires.



(a)



(b)



- 1 Pendant top with integral ballast, for ¾" threaded rigid conduit entry (or flexible pendant, balanced for use on swivel hanger)
- 2 Hinged socket housing with three locking points assures uniform 360° compression
- 3 Heavy duty, cast aluminum, polyester powder painted housing (for hazardous applications, ballast assembly is completely anodized before painting)
- 4 Rugged prismatic glass refractors provide symmetrical, asymmetrical or long and narrow distribution
- 5 Cast aluminum guard for added protection
- 6 Choice of lamps and wattages

# Definitions of hazardous locations.

The definitions below are taken from the National Electric Code 1975 (NFPA No. 70-1975). These definitions are included here to clarify the Underwriters' Laboratories, Inc. listings for Holophane Hazardous Atmosphere luminaires, Petrolux.

## Class I, Division 2:

A Class I, Division 2 location is a location: (1) in which volatile flammable liquids or flammable gases are handled, processed, or used, but in which hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or (2) in which hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation, but which might become hazardous through failure or abnormal operation of the ventilating equipment; or (3) that is adjacent to a Class I Division 1 location, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

## Class II, Division 1:

A Class II, Division 1 location is a location: (1) in which combustible dust is or may be in suspension in the air continuously, intermittently, or periodically under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures; or (2) where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electrical equipment, operation of protection devices, or from other causes; or (3) in which combustible dusts of an electrically conductive nature may be present.

## Class II, Division 2:

A Class II, Division 2 location is a location in which combustible dust will not normally be in suspension in the air or will not be likely to be thrown into suspension by the normal operation of equipment or apparatus in quantities sufficient to produce explosive or ignitable mixtures, but: (1) where deposits or accumulations of such combustible dust may be sufficient to interfere with the safe dissipation of heat from electrical equipment or apparatus; or (2) where such

deposits or accumulations of dust on, in, or in the vicinity of electrical equipment might be ignited by arcs, sparks, or burning material from such equipment.

## Class III, Division 1 & 2:

Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings, but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures.

## Summary of Hazardous Atmospheres.

Class	Division	Group	Typical atmosphere/ignition temps.	Temperature measured
I Gases, vapors	2 Not normally hazardous	A	Acetylene (300°C, 572°F)	Maximum interior temperature in 40°C ambient
		B	Hydrogen (585°C, 1085°F) manufactured gas; and equivalent.	
		C	Ethyl-ether vapors (180°C, 356°F); ethylene (450°C, 842°F) cyclopropane (498°C, 928°F);	
		D	Acetone (538°C, 1000°F); alcohol (343°-428°C, 650°-802°F); benzine (288°C, 550°F); benzol (526°C, 979°F); butane (405°C, 761°F); gasoline (280°C, 536°F); hexane (261°C, 502°F); naptha (232°C, 450°F); propane (466°C, 871°F); lacquer solvents; natural gas.	
II Combustible dusts	1 Normally hazardous	E	Metal dust, including aluminum, magnesium, and their commercial alloys, and other metals of similarly hazardous characteristics.	Max. exterior surface temp. in 40°C ambient with a dust blanket
		F	Carbon black, coal, coke dust.	
		G	Flour, starch, grain dusts.	
	2 Not normally hazardous		Same as Division 1	Max. exterior surface temp. under normal conditions of use
III Easily ignitable fibers and flyings	1, 2		Textile mills, combustible fibers, rayon, cotton, etc.	Same as Class II, Div. 2

# Petrolux meets NEC requirements.

## Petrolux "C1" Fixtures Class I, Division 2 Groups A, B, C, D Hazardous Locations.

UL Standard 844  
File No. E12267  
70, 100, 150W HPS  
175W Metal Halide  
100, 175, 250W Mercury

Petrolux "C1" fixtures are UL listed for use in Class I, Division 2 Hazardous Locations. They have been designed and tested in accordance with UL Standard

**Table 1. Temperature range identification numbers.**

Maximum Temperature		
Degrees C	Degrees F	Identification Number
450	842	T1
300	572	T2
280	536	T2A
260	500	T2B
230	446	T2C
215	419	T2D
200	392	T3
180	356	T3A
165	329	T3B
160	320	T3C
135	275	T4
120	248	T4A
100	212	T5
85	185	T6

844. Therefore, they are in compliance with Article 501-9 (b) (2) of the N.E.C., specifically, "tested and found incapable of igniting the gas or vapor if the ignition temperature is not exceeded."

Table 2 lists the UL maximum operating temperatures for the lamp type and wattage in the indicated mounting assembly and optical assembly, based on operation in a 40°C ambient, for which it is approved. The actual luminaire operating temperature is lower, but falls within the range indicated. Refer to the maximum operating temperature range in Table 500-2 (b) of the N.E.C., and shown here as Table 1.

## Petrolux "C2" Fixtures Class II, Division 1 & 2 Groups E, F, G Hazardous Locations.

UL Standard 844  
File No. E12267  
70, 100, 150W HPS  
175W Metal Halide  
100, 175, 250W Mercury

Petrolux "C2" fixtures are UL listed for use in Class II, Division 1 & 2 Hazardous Locations. They have been designed and tested in accordance with UL Standard 844, which in Class II applications means "dust-ignition-proof."

Fixtures will exclude dust from the inside of the enclosure, and will function at full

rating without developing surface temperatures high enough to cause excessive dehydration or gradual carbonization of any organic dust deposits that may build up. Maximum surface temperatures will not exceed 165°C (329°F) under normal conditions of use.

Each fixture is marked to indicate the maximum wattage of the lamp for which it is approved.

## Class III, Division 1 & 2 Hazardous Locations.

UL Standard 844  
File No. E12267  
70, 100, 150W HPS  
175W Metal Halide  
100, 175, 250W Mercury

Petrolux "C2" fixtures are UL listed for use in Class III, Division 1 & 2 Hazardous Locations. They have been designed and tested in accordance with UL Standard 844.

Fixtures will exclude fibers or flyings from the inside of the enclosure, and will function at full rating without developing surface temperatures high enough to cause excessive dehydration or gradual carbonization of accumulated fibers or flyings. The maximum surface temperature will not exceed 165°C (329°F) under normal conditions of use.

Each fixture is marked to indicate the maximum wattage of the lamp for which it is approved.

**Table 2. Petrolux Temperature Classification for Class I, Division 2 Hazardous Locations.**

Lamp Type & Wattage	Mounting Assembly							
	Pendant		Stanchion		Wall		Ceiling	
	Refractor	Reflector	Refractor	Reflector	Refractor	Reflector	Refractor	Reflector
70W HPS	180°C - T3A	165°C - T3B	160°C - T3C	165°C - T3B	160°C - T3C	165°C - T3B	165°C - T3B	165°C - T3B
100W HPS	200°C - T3	200°C - T3	200°C - T3	215°C - T2D	200°C - T3	200°C - T3	200°C - T3	215°C - T2D
150W (55V) HPS	230°C - T2C	260°C - T2B	230°C - T2C	260°C - T2B	230°C - T2C	260°C - T2B	230°C - T2C	260°C - T2B
150W (100V) HPS	215°C - T2D	215°C - T2D	215°C - T2D	215°C - T2D	215°C - T2D	215°C - T2D	215°C - T2D	215°C - T2D
175W Metal Halide	230°C - T2C	260°C - T2B	260°C - T2B	260°C - T2B	260°C - T2B	260°C - T2B	260°C - T2B	260°C - T2B
100W Mercury	215°C - T2D	230°C - T2C	215°C - T2D	230°C - T2C	215°C - T2D	230°C - T2C	215°C - T2D	230°C - T2C
175W Mercury	280°C - T2A	280°C - T2A	260°C - T2B	260°C - T2B	260°C - T2B	260°C - T2B	260°C - T2B	280°C - T2A
250W Mercury	325°C	325°C	300°C - T2	325°C	325°C	325°C	325°C	325°C
200W Incand.	200°C - T3	215°C - T2D	200°C - T3	215°C - T2D	200°C - T3	215°C - T2D	200°C - T3	215°C - T2D
300W Incand.	260°C - T2B	280°C - T2A	260°C - T2B	280°C - T2A	260°C - T2B	280°C - T2A	260°C - T2B	280°C - T2A

# Easy footcandle calculations.

Initial horizontal point-by-point footcandles for one luminaire plotted as a function of distance from fixture.

## Asymmetrical distribution.

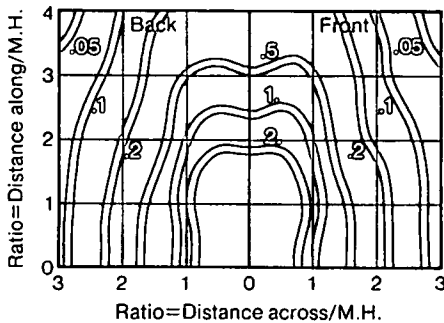
By showing the footcandles at any specific point, these graphs enable the most accurate – yet quick – evaluation of spacing requirements necessary to achieve a given light level or to achieve specific footcandles and uniformity with a fixed spacing arrangement.

The grid of each graph is based on ratios of the distance from luminaire to the mounting height. Graphs are for a 10' mounting above work plane. For other heights, apply the multiplying factor shown below to the footcandles read.

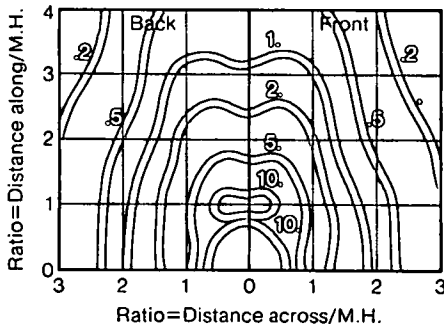
As an example, the illumination from one #1917 unit at an 8' mounting, 16' along a walk and 8' in front is  $1.0 \times 1.56 = 1.56$  footcandles. Contributions from other luminaires in the area must be added to determine actual footcandles at any point.

Mtg. Height (ft.)	8	10	12	14	16
Mult. Factor	1.56	1.00	.69	.51	.39

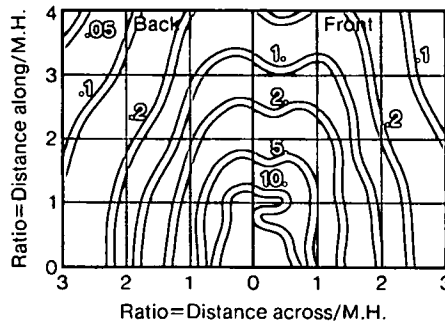
**No. 1917, Long & Narrow Distribution  
70W HPS, 5800 Lumens**



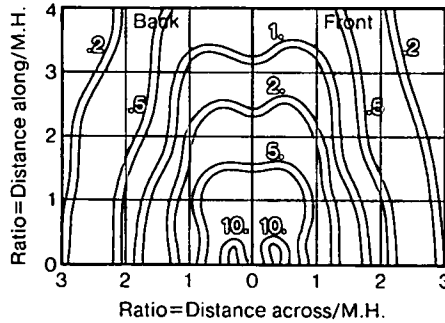
**No. 1918, Long & Narrow Distribution  
150W HPS, 16000 Lumens**



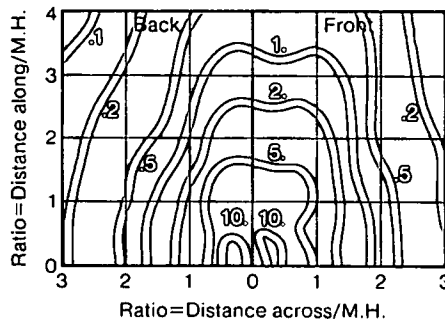
**No. 1928, Asymmetric Distribution  
150W HPS, 16000 Lumens**



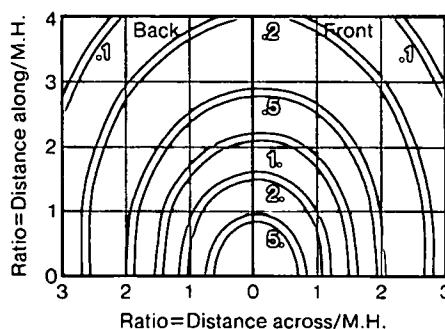
**No. 1915, Long & Narrow Distribution  
175W Clear Metal Halide, 14000 Lumens**



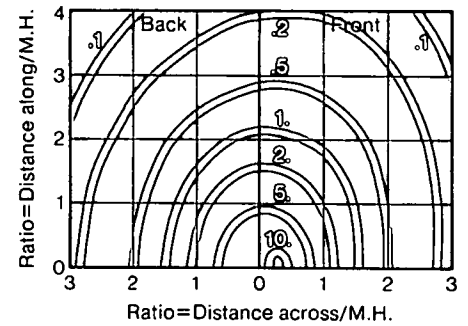
**No. 1925, Asymmetric Distribution  
175W Clear Metal Halide, 14000 Lumens**



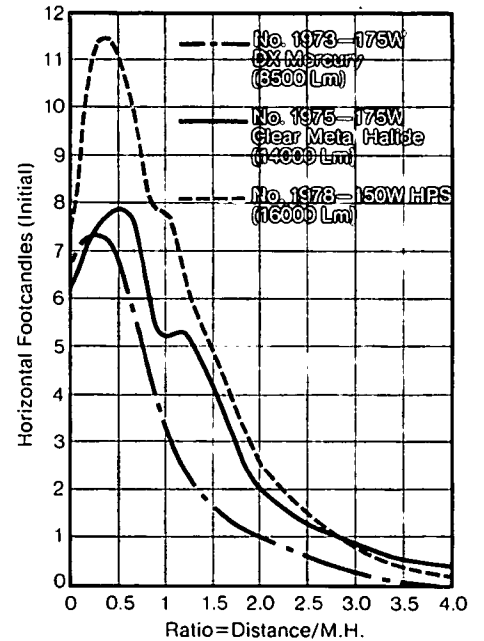
**No. 1913, Long & Narrow Distribution  
175W Deluxe Mercury, 8500 Lumens**



**No. 1923, Asymmetric Distribution  
175W Deluxe Mercury, 8500 Lumens**



## Symmetrical distribution.



To calculate approximate footcandle values for other wattages, multiply values for #1978 by .6 for 100W HPS (#1970), or .35 for 70W HPS (#1977).

Multiply #1973 by .5 for 100W mercury (#1971), or 1.5 for 250W mercury (#1972).

Other isofootcandle data upon request.

## Petrolux prismatic glass reflector series.

Ideal for low  
mounting heights.

Optimum  
brightness control.

### Choice of three optical assemblies.

Open – for general usage

Open ventilated – for general usage  
where uplight is desired

Enclosed & gasketed – for sealed unit  
applications

### Choice of mounting.

PD – pendant mount

FP – flexible pendant mount for  
balanced hanging

ST – stanchion mount

CE – ceiling mount

WL – wall mount

BC – box cover mount over recessed  
outlet box

### Choice of lamp type and wattage.

70,100, 150W HPS

100, 175, 250W mercury

175W metal halide

### Engineered for durability.

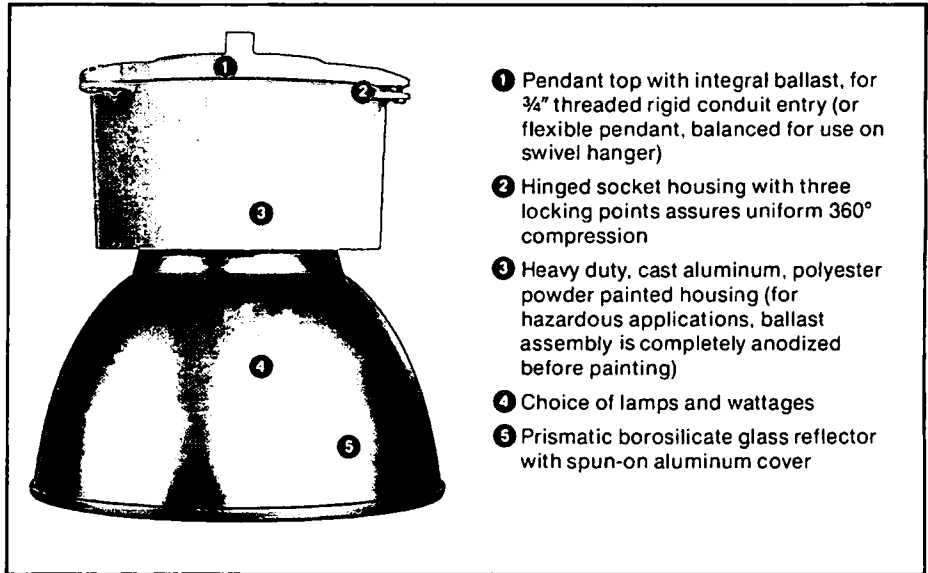
Petrolux features a prismatic glass  
reflector with an integral ballast assembly.  
The glass reflector is virtually impervious  
to industrial fumes, easy to clean.

Cast aluminum housing and top assembly.

Stainless steel screws.

### Enclosed and gasketed.

Provided with spun-on tempered glass  
roundel. Designed for indoor and  
outdoor areas requiring enclosed fixtures  
with optimum brightness control.  
Listed by UL, "Suitable for Wet  
Locations."



① Pendant top with integral ballast, for  
3/4" threaded rigid conduit entry (or  
flexible pendant, balanced for use on  
swivel hanger)

② Hinged socket housing with three  
locking points assures uniform 360°  
compression

③ Heavy duty, cast aluminum, polyester  
powder painted housing (for  
hazardous applications, ballast  
assembly is completely anodized  
before painting)

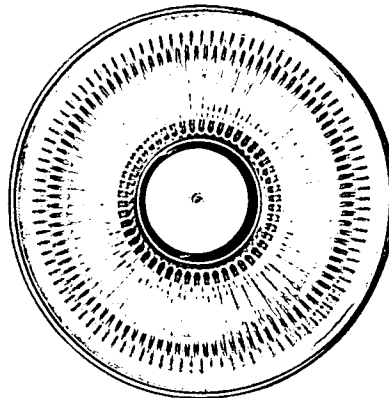
④ Choice of lamps and wattages

⑤ Prismatic borosilicate glass reflector  
with spun-on aluminum cover

### Hazardous locations.

E&G units are available for use in Class  
I, Div. 2; Class II, Div. 1 & 2; Class III  
hazardous locations. Units tested and  
approved in elevated ambients and specially  
labelled (UL Std. 844, File #E12267).

Also available in totally enclosed refractor  
luminaires, see page 4.



### High performance.

The economical operation of Petrolux is  
due to its prismatic glass reflector,  
designed specifically for optimum control  
of the newer low wattage short-arc  
lamps. The smooth inner surface of  
the reflector can be easily wiped clean  
to maintain maximum efficiency.

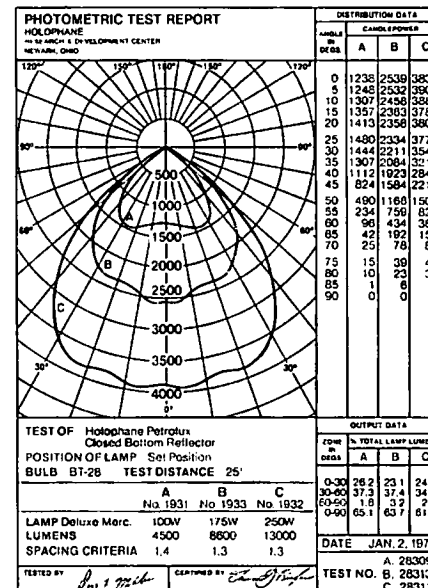
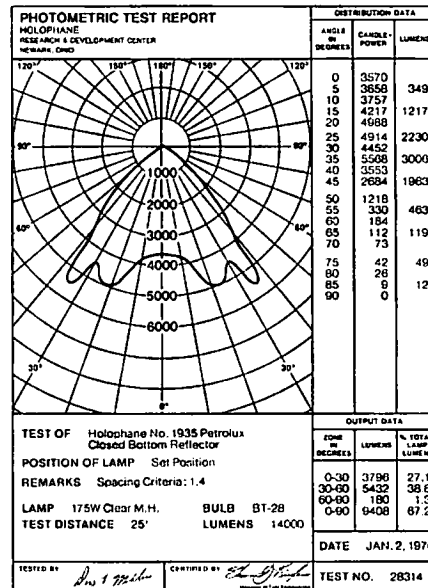
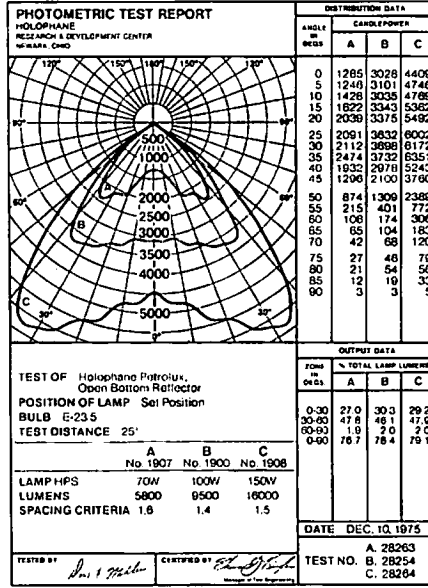
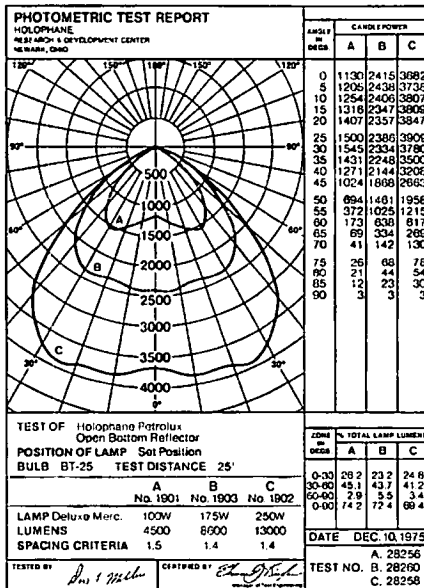
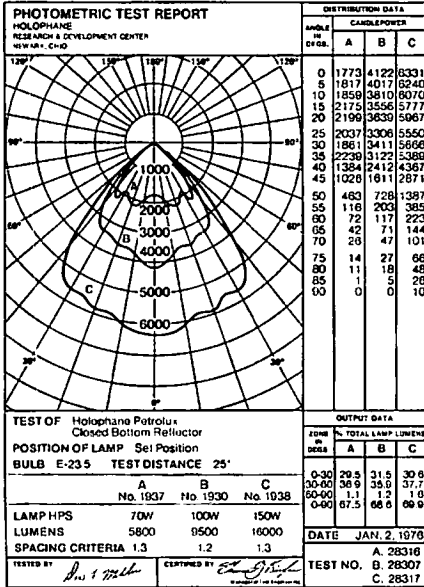
### Petrolux offers many benefits over fluorescents.

Low temperature starting capability to  
-20°F.

Maximum light output at all  
temperatures.

Deep reflector provides excellent lamp  
cutoff for increased visual comfort.

# Choice of light distributions.



## Coefficients of Utilization, Zonal Cavity Method.

Cat. No. 1908

RCR	$\rho$ c							
	70%				20%			
	$\rho$ c	70%	30%	10%	50%	30%	10%	0%
	$\rho$ w	50%	30%	10%	50%	30%	10%	0%
1	.85	.83	.81	.78	.77	.76	.72	
2	.78	.75	.72	.73	.71	.69	.66	
3	.72	.68	.65	.68	.66	.63	.61	
4	.66	.62	.58	.63	.60	.57	.55	
5	.61	.56	.52	.58	.54	.51	.50	
6	.56	.51	.47	.54	.49	.46	.45	
7	.51	.46	.42	.49	.45	.42	.40	
8	.46	.41	.37	.45	.40	.38	.36	
9	.42	.37	.33	.41	.36	.33	.31	
10	.36	.31	.27	.35	.30	.27	.25	

Cat. No. 1938

RCR	$\rho$ c							
	70%				20%			
	$\rho$ c	70%	30%	10%	50%	30%	10%	0%
	$\rho$ w	50%	30%	10%	50%	30%	10%	0%
1	.75	.74	.72	.70	.69	.68	.65	
2	.70	.67	.65	.66	.64	.62	.60	
3	.65	.62	.60	.62	.60	.58	.56	
4	.61	.57	.54	.58	.55	.53	.51	
5	.56	.52	.49	.54	.51	.48	.47	
6	.52	.48	.45	.50	.47	.44	.43	
7	.48	.44	.41	.46	.43	.40	.39	
8	.44	.40	.37	.43	.39	.37	.36	
9	.41	.37	.34	.40	.36	.33	.32	
10	.36	.31	.28	.35	.31	.28	.27	

Cat. No. 1935

RCR	$\rho$ c							
	70%				20%			
	$\rho$ c	70%	30%	10%	50%	30%	10%	0%
	$\rho$ w	50%	30%	10%	50%	30%	10%	0%
1	.72	.71	.69	.67	.66	.65	.62	
2	.67	.65	.62	.63	.61	.60	.57	
3	.62	.59	.57	.59	.57	.55	.53	
4	.58	.54	.51	.55	.52	.50	.48	
5	.53	.49	.46	.51	.48	.45	.44	
6	.49	.45	.42	.47	.44	.41	.40	
7	.45	.41	.38	.43	.40	.37	.36	
8	.41	.37	.34	.40	.36	.34	.32	
9	.38	.33	.30	.36	.33	.30	.29	
10	.33	.28	.25	.31	.27	.25	.24	

Cat. No. 1903

RCR	$\rho$ c							
	70%				20%			
	$\rho$ c	70%	30%	10%	50%	30%	10%	0%
	$\rho$ w	50%	30%	10%	50%	30%	10%	0%
1	.77	.74	.72	.71	.69	.68	.65	
2	.70	.66	.63	.65	.63	.61	.58	
3	.64	.59	.56	.60	.57	.54	.52	
4	.58	.53	.49	.54	.51	.48	.46	
5	.52	.47	.43	.49	.46	.43	.41	
6	.47	.42	.38	.45	.41	.38	.36	
7	.43	.38	.34	.41	.37	.33	.32	
8	.39	.34	.30	.37	.33	.30	.28	
9	.35	.30	.27	.34	.29	.26	.25	
10	.31	.26	.22	.29	.25	.22	.20	

Cat. No. 1933

RCR	$\rho$ c							
	70%				20%			
	$\rho$ c	70%	30%	10%	50%	30%	10%	0%
	$\rho$ w	50%	30%	10%	50%	30%	10%	0%
1	.68	.66	.65	.63	.62	.61	.58	
2	.62	.60	.57	.58	.56	.55	.52	
3	.57	.54	.51	.54	.52	.49	.48	
4	.52	.48	.45	.49	.47	.44	.43	
5	.48	.44	.41	.45	.42	.40	.38	
6	.44	.39	.36	.42	.38	.36	.34	
7	.40	.36	.32	.38	.35	.32	.31	
8	.36	.32	.29	.35	.31	.29	.27	
9	.33	.29	.26	.32	.28	.26	.24	
10	.29	.25	.21	.28	.24	.21	.20	

Other illumination data upon request.

# Performance specifications.

## Hazardous locations.

- Class I, Division 2**
- Class II, Division 1 & 2**
- Class III, Division 1 & 2**

Complete luminaire shall be Holophane Petrolux Catalog No. \_\_\_\_\_. The luminaire shall consist of three sub-assemblies – a \_\_\_\_\_ top, containing the electrical components; the socket assembly housing; and the enclosed and gasketed optical assembly.

### Housing.

All castings shall be corrosion resistant aluminum alloy. Castings shall be protected against severe corrosive environments by a polyester powder paint. All screws shall be stainless steel and captive.

The luminaire gasketing shall be of a special plant fiber type, mechanically held in place.

The hinged socket assembly housing shall be attached to the top assembly by means of three captive stainless steel screws at 120° intervals to maintain uniform 360° compression.

### Reflector optical characteristics.

The reflector shall be spun prismatic borosilicate glass with 1/8" minimum wall thickness with an aluminum cover.

The enclosed and gasketed series shall utilize a tempered glass roundel secured to the reflector by the aluminum cover.

The reflector series, when attached to the socket housing by three thumbscrews shall provide a totally enclosed and gasketed optical assembly. The output shall be \_\_\_\_\_% in the 0°-60° zone, and not more than \_\_\_\_\_% in the 60°-90° zone, and produce a \_\_\_\_\_ spacing ratio distribution.

### Refractor optical characteristics.

The prismatic refractor shall be of a borosilicate glass 8 5/8" in diameter and 7-3/16" deep with precisely formed prisms producing a \_\_\_\_\_ distribution (long & narrow, asymmetrical or symmetrical).

The refractor when secured to the socket housing by means of three captive stainless steel screws in the refractor door assembly shall provide an enclosed and gasketed optical assembly.

### Class I, Division 2

Complete luminaire shall be UL listed for use in Class I, Division 2 hazardous areas with maximum operating temperature range of \_\_\_\_\_°C with a \_\_\_\_\_ watt \_\_\_\_\_ lamp, based on operation in an elevated ambient for which it is approved.

### Class II, Division 1 & 2 Class III, Division 1 & 2

Complete luminaire shall be UL listed for use in Class II, Division 1 & 2 and Class III, Division 1 & 2. The luminaire shall be marked to indicate the maximum wattage of the lamp that shall be permitted without exceeding an exposed surface temperature of 165°C (320°F) under normal conditions of use.

## General usage.

Complete luminaire shall be Holophane Petrolux Catalog No. \_\_\_\_\_. Luminaire shall consist of three sub-assemblies – a \_\_\_\_\_ top, containing the electrical components; the socket assembly housing; and the enclosed and gasketed or open reflector optical assembly.

### Housing.

All castings shall be corrosion resistant aluminum alloy. Castings shall be protected against severe corrosive environments by a polyester powder paint.

All screws shall be stainless steel and captive. The hinged socket assembly shall be attached to the top assembly by means of three captive stainless steel screws at 120° intervals to maintain uniform 360° compression.

### Reflector optical characteristics.

The reflector shall be spun prismatic borosilicate glass with 1/8" minimum wall thickness with an aluminum cover. The enclosed and gasketed series shall utilize a tempered glass roundel secured to the reflector by the aluminum cover and shall be attached to the housing with three captive thumbscrews.

The open bottom reflector shall be attached to the socket housing by the stainless steel screws.

The open bottom ventilated reflector shall be attached to housing by three stainless steel screws to provide upright and ventilating action.

The light output shall be \_\_\_\_\_% in the 0°-60° zone, and not more than \_\_\_\_\_% in the 60°-90° zone, and produce a \_\_\_\_\_ spacing ratio distribution.

### Refractor optical characteristics.

The prismatic refractor shall be of a borosilicate glass 8 5/8" in diameter and 7-3/16" deep, with precisely formed prisms producing a \_\_\_\_\_ distribution (long & narrow, asymmetrical or symmetrical).

The refractor when secured to the socket housing by means of three captive stainless steel screws in the refractor door assembly shall provide an enclosed and gasketed optical assembly.

The enclosed and gasketed series shall carry the UL combination label, "Electric/Suitable for Wet Locations."

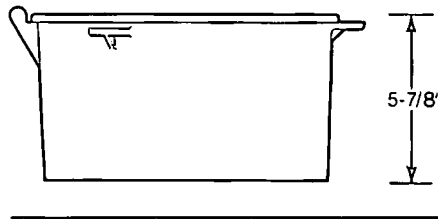
## General area luminaires are UL listed for the following elevated ambients.

Petrolux general area luminaires are UL listed for elevated ambient temperature applications. This table indicates UL listed temperatures with the associated wattage and mounting assemblies.

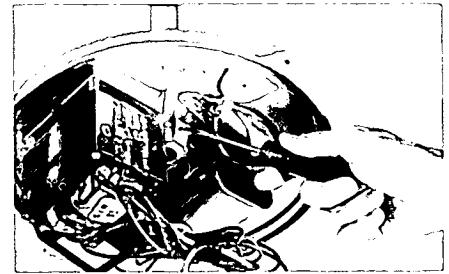
Lamp type & wattage	Mounting assembly			
	Pendant	Stanchion	Wall	Ceiling
70W HPS	65°C	65°C	65°C	40°C
100W HPS	55°C	55°C	55°C	40°C
150W 55V HPS	55°C	55°C	55°C	40°C
150W 100V HPS	55°C	55°C	55°C	40°C
175W metal halide	55°C	55°C	55°C	40°C
100W mercury	65°C	65°C	65°C	40°C
175W mercury	55°C	55°C	55°C	40°C
250W mercury	40°C	40°C	40°C	40°C

# Luminaire component dimensions & mounting instructions.

## Universal socket housing.

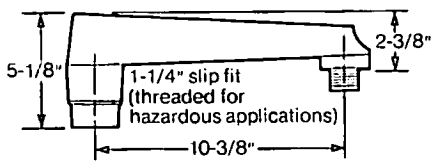


## Mounting instructions.

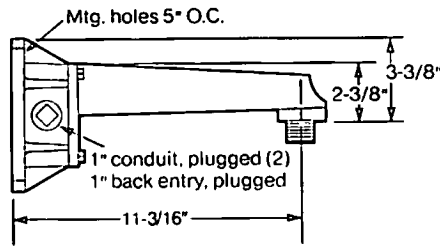


Thread pendant mount top onto conduit and tighten set screw as shown to lock fixture to conduit.

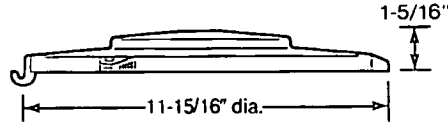
## Mounting assemblies.



Stanchion (-ST)



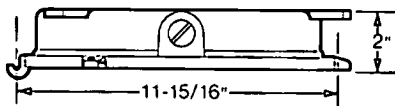
Wall (-WL)



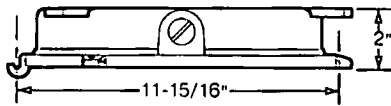
Pendant (-PD)



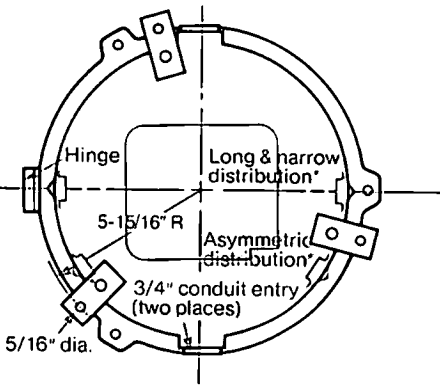
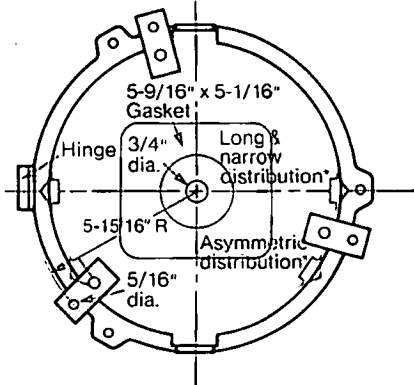
Connect primary wires to circuit leads, suspend socket housing section over hinge on pendant top. Connect ballast secondary to socket with prewired push-on connector.



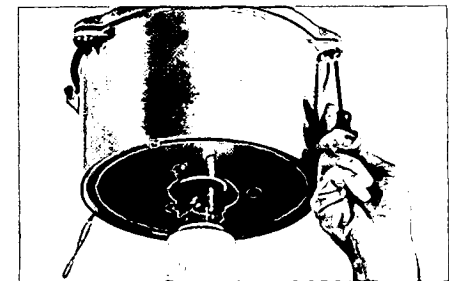
Box cover (-BC)



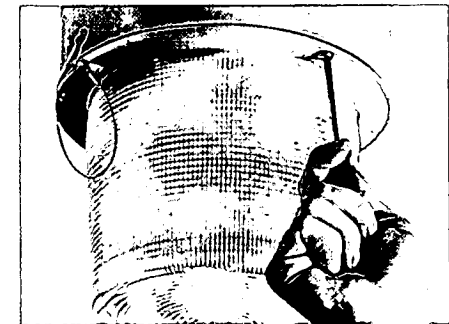
Ceiling, through-mount (-CE)



\*Alignment for beam positioning.

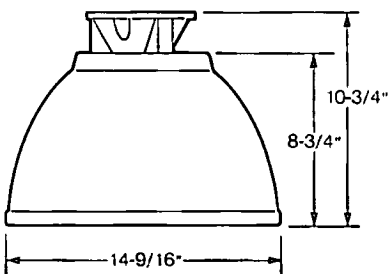


Secure housing to pendant top with three captive screws. Screw in lamp.

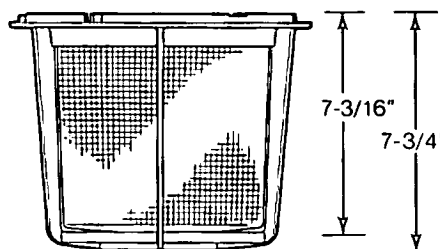


Mount refractor to housing with 3 captive screws. On open reflector series, housing and refractor are shipped attached.

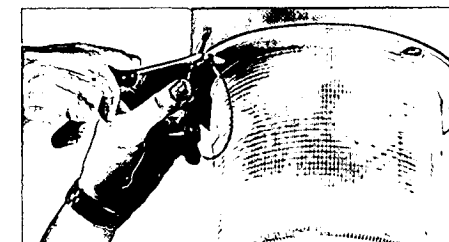
## Optical assemblies.



Reflectors (190, 193, 198)



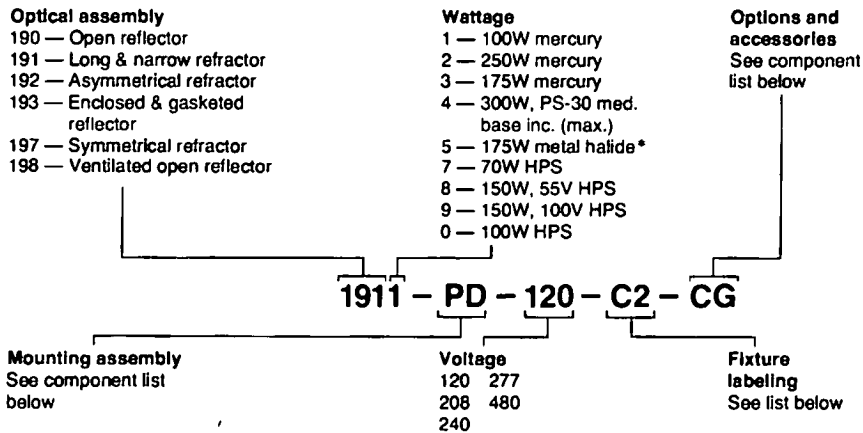
Reflectors (191, 192, 197),  
Cast guard (-CG)



On enclosed units, attach safety cable to refractor door.



## Ordering data.



**Example:**  
 1911-PD-120-C2-CG is a Petrolux E&G refractor unit with long & narrow light distribution, 100W mercury, for pendant mounting, 120 volt, provided with fixture label "UL listed for Class II, Div. 1 & 2, and Class III, Div. 1 & 2," with cast guard.

\*Not available for open-bottom fixtures.

## General area use component list.

<b>Mounting assemblies</b> -PD Pendant mount -FP Flexible pendant mount for balanced hanging -ST Stanchion mount -CE Ceiling mount -WL Wall mount -BC Box cover mount over recessed outlet box	<b>Options and accessories</b> -F Single fuse for 120, 240 and 277 volts -FF Double fuse for 208, 240 and 480 volts -CG Cast guard for refractor -WG Wire guard for open and closed reflectors -LG Louver guard for open reflector	-ELMR 150W quartz emergency standby light system, less relay, not available on ventilated reflector series "198" -EM 150W quartz emergency standby light system, not available on ventilated reflector series "198" -PR Photocontrol (except on "-CE" and "-BC") -ELB Low brightness reflector -CH Safety chain -ALCP Polycarbonate bottom closure for reflector
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## Hazardous location use component list.

<b>Mounting assemblies</b> -PD Pendant mount -FP Flexible pendant mount for balanced hanging -ST Stanchion mount -CE Ceiling mount -WL Wall mount	<b>Options and accessories</b> -F Single fuse for 120, 240 and 277 volts ("C2" only) -FF Double fuse for 208, 240 and 480 volts ("C2" only) -CG Cast guard for refractor -WG Wire guard for reflector -EMR HID fixture with EM relay wired to a 300W inc. max. fixture (not quartz lamp, "C2" only)	<b>Fixture labeling</b> -C1 UL listed for Class I, Division 2 -C2 UL listed for Class II, Division 1 & 2 UL listed for Class III, Division 1 & 2
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**Note** Ungrounded power distribution systems may carry high transient line voltages under fault conditions. Because high transients can cause premature ballast failure, possible with ballasts of any manufacturer's design, it is not recommended that luminaires be operated on 480V ungrounded systems.

The physical properties of the Holophane Petrolux series luminaires represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Check your local Holophane sales representative to assure current information. Holophane is a division of Johns-Manville Sales Corporation.

**Electrical characteristics** For complete electrical data, see tables of electrical characteristics in the Holophane Ballast Handbook publication HL-301.

**Warranty** Refer to the Holophane limited 1 year material warranty on this product, which is published in the "Terms and Conditions" section of the current price schedule, and is available from your local Holophane sales representative.

Contact your local Holophane lighting sales representative for more information, application assistance, computer-aided design and cost studies, and sample units for trial installation. For information on other J-M products and systems, call the Product Information Center at 303-979-1000.



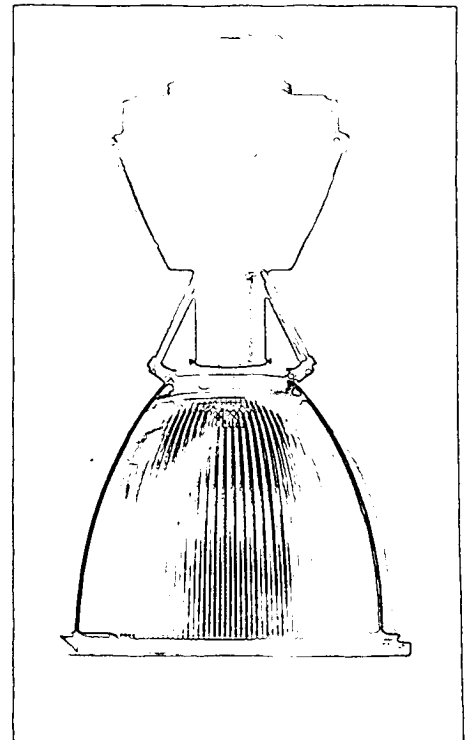
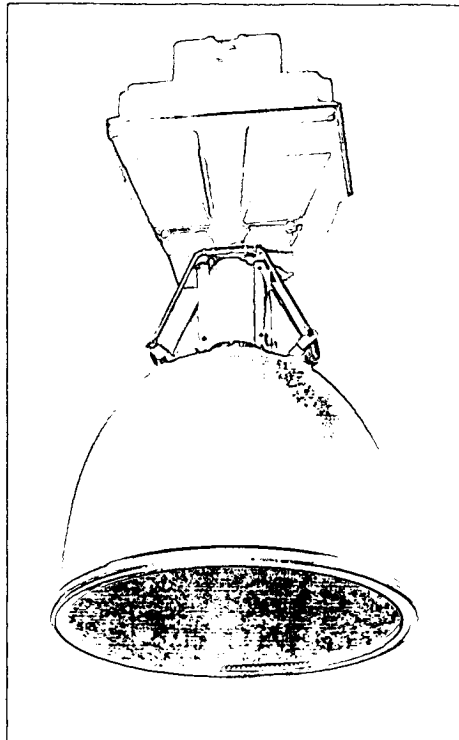
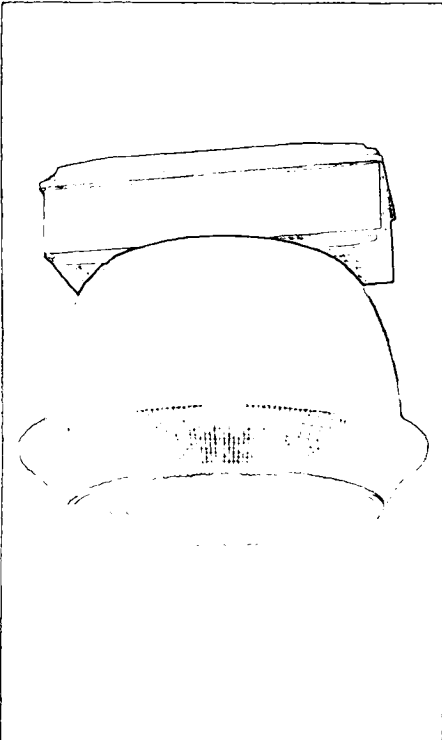
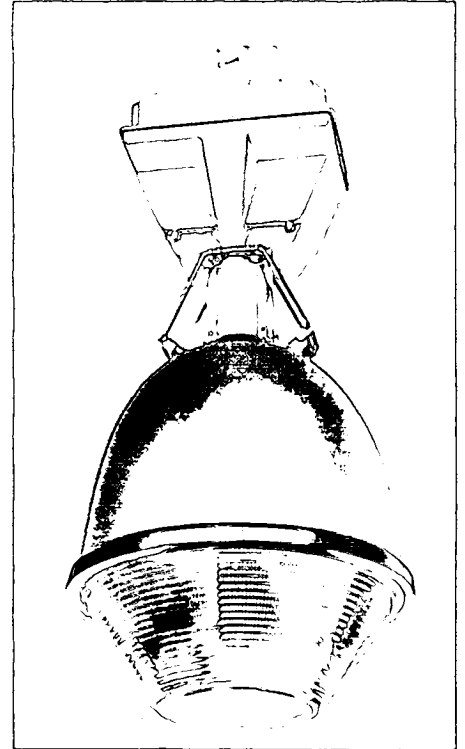
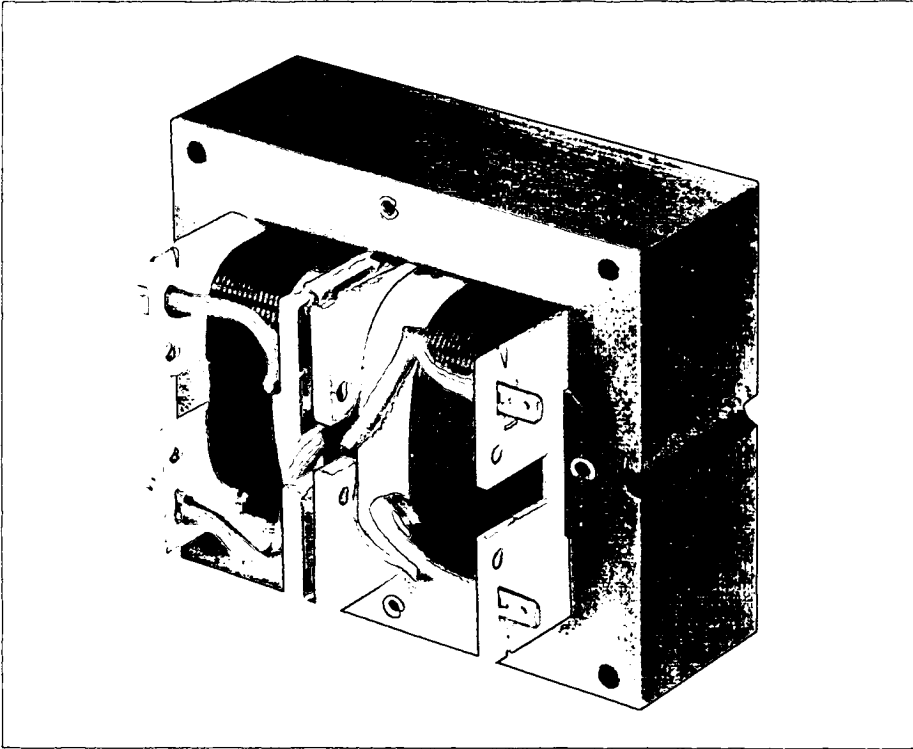
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**HOLOPHANE®**

**Ballast  
handbook.**

Basic reference manual plus  
HPS, metal halide and mercury  
integral ballast electrical  
characteristics and  
performance data. For  
Holophane industrial, outdoor  
and commercial luminaires.





# Ballast primer.

## Why use ballasts?

The high intensity discharge lamps—high pressure sodium, metal halide and mercury—are gaseous discharge devices. They produce light when an arc discharge occurs through a gas or vapor under controlled pressure.

One of the properties of arc-discharge lamps is that they operate with negative resistance. If a current were to continue flowing under this condition, it would quickly increase until the lamp burned out.

In order to control this current flow, a positive impedance must be added to the circuit. Thus, the fundamental purpose of the ballast is to control the flow of current.

Another property of the HID lamp is that an arc discharge can be initiated only if a minimum specific voltage is available at the electrodes. This is provided by the open circuit voltage of the ballast. So, the second purpose of the ballast is to provide an open circuit voltage of sufficient value to initiate and sustain the arc discharge.

**The importance of ballast regulation.** Several types of ballast circuits have been designed to operate these lamps. The better the degree of regulation available from the ballast, the higher the cost of the ballast.

The effect of variations in line voltage and the resultant change in lamp wattage is indicated in the section on ballast types. With mercury and high pressure sodium lamps, the lumen output change is comparable to the wattage change. But with metal halide lamps, the wattage and light output variation are proportional only up to a maximum change of  $\pm 10\%$ . When line voltage drops below 10%, the arc temperature may be reduced enough to result in one or more of the additive metals being de-ionized, causing a significant reduction in light output as well as a change in color.

## The meaning of temperature ratings.

The ballast generates heat, and this combined with the lamp heat plus general ambient conditions increases the temperature of the core and coil and the capacitor(s) in the enclosure. All Holophane ballasts utilize a core and coil with U.L. listed Class "H" 180°C rated wire and other insulation. The use of Class "H" insulation, plus positioning of the core and coil against the housing for heat sinking, and location of the capacitors away from maximum heat areas result in many units being suitable for high temperature usage; 40°C and 55°C+ capabilities.

Underwriters' Laboratories conducts tests at specific ambient temperatures (example: 25°C, 40°C, 55°C, 65°C) and will list a product for use at that temperature. This assures that rated component life will be achieved if the ambient temperature does not exceed that level. The operation of luminaires at lower temperatures results in longer ballast component life. (See Figure 2, page 4.)

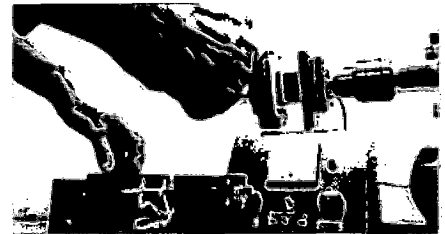
Many luminaires carrying a U.L. listing at a specific temperature may actually be suitable for higher temperatures. (As an example, a unit may be suitable for 52°C but still carry only a 40°C U.L. listing since the next "Listed" step is 55°C.)

Outdoor luminaires are generally tested at 25°C (77°F), as they are not normally subjected to high temperatures during the evening hours. Operation in higher ambients for prolonged periods of time will shorten component life.

Commercial recessed HID luminaires may be tested and approved for use in suspended ceiling or solid plaster ceiling applications. On units which are listed by U.L. as "Suitable for Use in Suspended Ceilings," the minimum distance between units and the minimum plenum depth are indicated on the luminaire. These distance limitations help keep ballast temperatures within rated limits.

## What is crest factor?

Crest factor in an AC circuit is the ratio of the peak value of current to its effective value (root mean square). As an example, the crest factor of a true sine wave is 1.41. While the input voltage to a ballast is a sine wave, the secondary voltage wave shape in the inductive and capacitive type ballasts is distorted resulting in a crest factor higher than 1.41.



Ballast design techniques are developed in this special manufacturing design laboratory. Engineers determine production procedures and make prototypes for ballasts manufactured at the Pataskala, Ohio plant.

Constant wattage autotransformer (CWA) and constant wattage (CW), ballasts have crest factors of about 1.8, whereas metal halide and high pressure sodium ballasts are closer to 1.65. Some lamp manufacturers' tests have indicated an increase in lumen depreciation of mercury lamps when operated on higher crest factor type ballasts. Data on metal halide and HPS has not been documented.

Published lumen maintenance data by major lamp manufacturers is based on lamps operated on a standard reactor (1.41 C.F.) ballast in the laboratory.

Thus, other ballast types with higher crest factor may result in a poorer lumen output. Refer to lamp manufacturers' data for specific depreciation values.

## Noise.

All magnetic elements in a ballast circuit will have an inherent hum. The degree of hum or noise generated is dependent on the ballast design, load

## Ballast types.

characteristics, component mounting within the housing, luminaire mounting, and general accoustical characteristics of the area in which luminaires are used. A sound level evaluation should be considered when any HID luminaires are to be used in a noise-sensitive application.

### Manufacturing tolerances.

The American National Standards Institute (ANSI) has established allowable production tolerances in the manufacturing of ballasts and lamps. Ballast tolerances permitted in output watts are  $\pm 7\frac{1}{2}\%$  for HPS and mercury,  $\pm 5\%$  for metal halide.

Lamps manufactured within ANSI standards may vary  $\pm 10\%$  in arc-voltage characteristics which can result in about  $\pm 10\%$  variation in operating current and watts, with corresponding changes in lamp lumen output.

Theoretically, a variation of  $\pm 17\frac{1}{2}\%$  is possible with the combined tolerances indicated above. However, lamps and ballasts are normally manufactured with less variation resulting in representative lamp output values closer to rated.

The CW and CWA ballast starting current is always less than the operating current. Lag type (reactor) ballasts have a considerably higher starting current. This starting current—which is “nominal”—may vary as much as  $+30\%$  depending on line voltage variation and ballast circuit characteristics.

### Ballast fusing option.

Some ballast faults result in high primary current. Fuses—single for 120V, 240V or 277V; double for 208V, 240V or 480V—are rated to protect the branch circuit by removing a defective ballast before it opens the line circuit breaker. The fuses are designed, however, to carry the momentary high inrush current of the ballast. The choice of the proper fuse (type and rating) to accept this inrush current and yet protect the branch circuit is an exact science and manufacturer's recommendations should be followed.

### Mercury.

**Constant Wattage Autotransformer (CWA)** The most popular design for general use is the constant wattage autotransformer ballast. It supplies a reasonable degree of regulation, high power factor, low line extinguishing voltage, and line starting current that is lower than or equal to the operating current. A  $\pm 10\%$  line voltage variation will result in a  $\pm 5\%$  variation in wattage output. Lamp extinguishing voltage is approximately 60% of the line voltage.

**Constant Wattage (CW)** The conventional constant wattage ballast is built as an isolation transformer. It also produces high power factor, low line extinguishing voltage and low line starting current. A  $\pm 13\%$  line voltage variation results in only a  $\pm 3\%$  change in wattage.

### Modified Constant Wattage (MCW)

Basic circuitry includes isolated secondary as with a CW circuit. However, regulation is similar to a CWA ballast.

**Autotransformer** In the autotransformer ballast, the line starting current is greater than operating current, requiring that circuits be designed to accept the higher current needed during the warmup period. Voltage variations of  $\pm 5\%$  result in  $\pm 10\%$  wattage variation. These ballasts are generally normal power factor (NPF) which is 50% but can be corrected to 90% high power factor (HPF) by the addition of a capacitor.

**Reactor** This is a simpler ballast design which can be used when the open circuit voltage necessary to strike the lamp arc is approximately the same as the line voltage. Reactor ballasts have the same regulation characteristics as the autotransformer. They also have 50% power factor rating which can be corrected with the addition of a capacitor.

**Two Lamp, MCW** For operating two 400W lamps in series, an isolation transformer provides an open circuit voltage high enough to initiate an arc

across both lamps which are connected in series. The socket shells are grounded, thus N.E.C. limits of 300 volts to ground are assured. Starting current is less than operating, and lamp regulation is similar to standard CWA.

### Metal Halide

**Peak Lead** Metal halide lamps require a higher peak voltage and a different wave shape than mercury for satisfactory starting. The ballast utilizes an isolation transformer. Starting current is lower than operating, and regulation is similar to CWA. The two-lamp version utilizes an isolated secondary.

**Peak Lead Autotransformer** Using autotransformer windings, this series produces good voltage regulation with high power factor.

### High Pressure Sodium

All high pressure sodium ballasts require both a magnetic circuit to produce the proper open circuit voltage and control the current, and a special electronic starting circuit. This circuit applies a high pulse voltage required to arc the lamp, minimum 2500 volts for 400W and below, 3000 volts for 1000W. The pulse repeats each half cycle for reliable lamp starting. The pulsing circuit is de-energized after the lamp arc is established.

**Lead** The starting current in this circuit is lower than operating current. A  $\pm 10\%$  line voltage variation will result in a  $\pm 10\text{--}12\%$  variation in wattage. Power factor is above 90%.

**High Power Factor (HPF) Autotransformer** Line starting current is greater than operating current and power factor is above 90%.

**HPS ballast operation with defective lamp** When the lamp and ballast are operating normally, lamp life should be at least 20,000 hours, and the ballast with its components approximately 100,000 hours. It is recommended that a defective lamp be replaced as soon as possible.

**Trapazoid Definition** (Refer to Fig. 1) The high pressure sodium (HPS) lamp has been commercially available since 1965. The most widely used ballasts fall into two general categories. The high reactance ballast (autotransformer or reactor) is used with lower wattage lamps designed for 52-55 volt operation. The lead type ballast is used with higher wattage lamps designed for 100-250 volt operation.

The maximum wattage line is determined as a value which will result in reduced life if a lamp is operated at this value for more than 25% of the time.

The minimum line is determined by the lowest acceptable lumen output and lamp warm-up requirements.

The trapazoid is closed by the characteristic curves of the minimum and maximum lamp voltage allowed for all operating conditions.

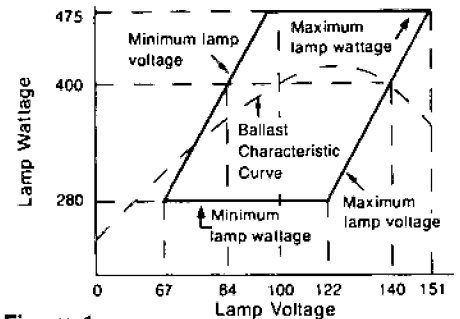
The ballast characteristics curve must intersect both of the lamp voltage limit lines between the two wattage limit lines and remain between the wattage limit lines throughout the full range of lamp voltage.

The maximum voltage limit defines the lower limit to which the ballast must be able to sustain the lamp as the lamp voltage rises throughout its life.

HPS lamps increase in lamp voltage throughout life at a rate of 1 to 3 volts per 1,000 hours of operation and the ballast curve defines the lamp wattage variation during the life of the lamp.

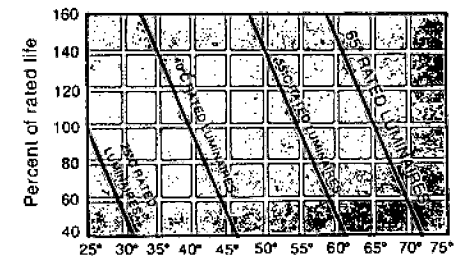
Figure 1, is a typical characteristic curve, for a nominal input line voltage. As the input line voltage is increased or decreased, new ballast characteristic curve, will be produced essentially parallel to the curve shown except intersecting at different points depending on the line voltage change.

**Typical trapazoid diagram  
400W HPS lamp**



**Figure 1**

**Ambient temperature vs. rated life for  
integrally ballasted luminaires**



**Figure 2**

## Lamp Operating Characteristics.

### High Pressure Sodium†

Wattage	ANSI Code	LC Length (Inches)	Start-up Time <sup>1</sup> (minutes)	Restrike Time <sup>2</sup> (minutes)	Initial Lumens <sup>3</sup>	Mean Lumens <sup>4</sup>	Lamp Lumen Depreciation <sup>5</sup>	Average Rated Life (hrs.) <sup>6</sup>
35 med.	S76	3 7/16	3-4	1	2,250	2,025	.90	16,000
35/D med.	S76	3 7/16	3-4	1	2,150	1,935	.90	16,000
50	S68	5	3-4	1	4,000	3,600	.90	24,000
50/D	S68	5	3-4	1	3,800	3,420	.90	24,000
70	S62	5	3-4	1	5,800	5,220	.90	24,000
70/D	S62	5	3-4	1	5,400	4,860	.90	24,000
100	S54	5	3-4	1	9,500	8,550	.90	24,000
100/D	S54	5	3-4	1	8,800	7,920	.90	24,000
150/55	S55	5	3-4	1	16,000	14,400	.90	24,000
150/55/D	S55	5	3-4	1	15,000	13,500	.90	24,000
150/100	S56	5	3-4	1	15,000	13,500	.90	24,000
200	S66	5 3/4	3-4	1	22,000	19,800	.90	24,000
250	S50	5 3/4	3-4	1	27,500	24,750	.90	24,000
250/D	S50	5	3-4	1	26,000	23,400	.90	24,000
250/S	S50	5 3/4	3-4	1	30,000	27,000	.90	24,000
250/DX	S50	5 3/4	3-4	1	22,500	20,700	.90	10,000
310	S67	5 3/4	3-4	1	37,000	33,300	.90	24,000
400	S51	5 3/4	3-4	1	50,000	45,000	.90	24,000
400/D	S51	7	3-4	1	47,500	42,750	.90	24,000
1000	S52	8 3/4	3-4	1	140,000	126,000	.90	24,000

## Lamp Operating Characteristics.

### Metal Halide—Clear†

Wattage	ANSI Code	LC Length (inches)	Start-up Time (minutes)	Restrike Time (minutes)	Initial Lumens	Mean Lumens	Lamp Lumen Depreciation	Average Rated Life (hrs.)
175/BU*	M57	5	2	10	16,600	13,300	.75	10,000
175/BD*	M57	5	2	10	16,600	13,300	.75	10,000
175/U*	M57	5	2	10	14,000V	10,350V	.74	10,000
					12,000H	8,300H	.69	6,000
250/U*	M58	5	2	10	20,500V	17,000V	.83	10,000
					19,500H	14,000H	.64	10,000
400/U	M59	7	2	10	34,000V	25,600V	.75	20,000
					32,000H	22,600H	.74	15,000
400/VBU	M59	7	2	10	40,000	32,000	.75	20,000
400/VBD	M59	7	2	10	40,000	32,000	.72	20,000
1000/U	M47	9 3/8	4	10-15	110,000V	88,000V	.80	12,000
					107,800H	86,240H	.80	12,000
1000/VBU	M47	9 1/2	4	10-15	115,000	92,000	.80	12,000
1000/VBD	M47	9 1/2	4	10-15	115,000	92,000	.80	12,000
1500/HBU*	M48	9 3/8	5	10-15	155,000V	140,000V	.90	3,000
					150,000H	135,000H	.90	3,000
1500/HBD*	M48	9 3/8	5	10-15	155,000V	140,000V	.90	3,000
					150,000H	135,000	.90	3,000

\*Use in enclosed fixtures only

### Metal Halide—Phosphor†

Wattage	ANSI Code	LC Length (inches)	Start-up Time (minutes)	Restrike Time (minutes)	Initial Lumens	Mean Lumens	Lamp Lumen Depreciation	Average Rated Life (hrs.)
175/C/U*	M57	5	2	10	14,000V	9,950	.71	10,000
					12,000H	7,800H	.65	6,000
250/C/U*	M58	5	2	10	20,500V	16,000V	.78	10,000
					19,500H	13,500H	.69	6,000
400/C/U	M59	7	2	10	36,000V	27,700V	.72	20,000
					32,000H	17,600H	.71	15,000
400/C/VBU	M59	7	2	10	40,000	31,000	.72	20,000
400/C/VBD	M59	7	2	10	40,000	31,000	.72	20,000
1000/C/U	M47	9 1/2	4	10-15	105,000V	79,800V	.76	12,000
					100,000H	76,000H	.76	12,000

\*Use in enclosed fixtures only.

### Mercury—Deluxe White†

Wattage	ANSI Code	LC Length (inches)	Start-up Time (minutes)	Restrike Time (minutes)	Initial Lumens	Mean Lumens	Lamp Lumen Depreciation	Average Rated Life (hrs.)
100DX	H38	5	5-7	3-6	4,200	3,650	.84	24,000+
175DX	H39	5	5-7	3-6	8,600	7,200	.89	24,000+
250DX	H37	5	5-7	3-6	12,100	9,800	.86	24,000+
400DX	H33	7	5-7	3-6	23,000	20,100	.85	24,000+
1000DX	H36	9 3/8	5-7	3-6	63,000	48,500	.75	24,000+

\*Mercury Lamp Lumen Depreciation based on 16,000 hours of operation

1. Start-up time to reach 80% light output.
2. Time to restrike after momentary power interruption.
3. Initial lumen output values after 100 hours with lamp operated at rated watts.
4. Approximate mean lumens during rated average life.
5. Percentage of initial light output at mean lumens.
6. Average rated life at 10 hours per start.

† Check lamp manufacturers data for latest specific ratings.

# Electrical characteristics.

## High Pressure Sodium.

Lamp	50W		70W						
	NPF Reactor	HPF Reactor	NPF Reactor	HPF Reactor	HPF Auto/MT				
Ballast type circuit diagram*†									
Nominal primary voltage (volts)	120	120	120	120	120	208	240	277	480
Starting line current (amps) •	1.48	.56	2.0	.78	-.95	.55/.57	.48	.40	.24
Operating line current (amps)	1.18	.52	1.6	.73	-.84	.46/.46	.40/.40	.35/.35	.20
Primary lamp extinguishing voltage (volts)	95	95	95	95	-.90	156	180	206	360
Input wattage (watts)	60	60	83	83	-.91	88/93	88/94	88/95	90
Secondary open circuit voltage (volts)	120	120	120	120	130/128				
Power Factor	42	96	43	95	over 90%				
Lamp wattage regulation at ± 10% line voltage variation ± 5%	± 12%	± 12%	± 12%	± 12%	± 12%				
Minimum ambient starting temperature	-40°F	-40°F	-40°F	-40°F	-40°F				

Lamp	100W								
	NPF Reactor	HPF Reactor	HPF Auto/MT						
Ballast type circuit diagram*†									
Nominal primary voltage (volts)	120	120	120	208	240	277	480		
Starting line current (amps) •	2.9	1.18	-.88	.75/.50	.65/.44	.56/.38	.33		
Operating line current (amps)	2.1	1.06	-.1.15	.66/.66	.58/.58	.50/.50	.29		
Primary lamp extinguishing voltage (volts)	95	95	-.90	156/175	180/205	206/235	360		
Input wattage (watts)	117	117	128/128					130	
Secondary open circuit voltage (volts)	120	120	130/129						
Power Factor	46	92	over 90%						
Lamp wattage regulation at ± 10% line voltage variation ± 5%	± 12%	± 12%	± 12%						
Minimum ambient starting temperature	-40°F	-40°F	-40°F						

Lamp	150W 55V								
	NPF Reactor	HPF Reactor	HPF Auto/MT						
Ballast type circuit diagram*†									
Nominal primary voltage (volts)	120	120	120	208	240	277	480		
Starting line current (amps) •	4.0	1.6	-.1.8	1.1/1.15	.95/.90	.82/.80	.48		
Operating line current (amps)	3.3	1.5	-.1.65	.95/1.05	.83/.84	.72/.73	.42		
Primary lamp extinguishing voltage (volts)	95	95	-.90	156	180	208	360		
Input wattage (watts)	170	170	185/188					188	
Secondary open circuit voltage (volts)	120	120	128/129						
Power Factor	43	94	over 90%						
Lamp wattage regulation at ± 10% line voltage variation ± 5%	± 12%	± 12%	± 12%						
Minimum ambient starting temperature	-40°F	-40°F	-40°F						

Lamp	150W 100V					200W				
	HPF Auto/MT					Lead/MT				
Ballast type circuit diagram*†										
Nominal primary voltage (volts)	120	208	240	277	480	120	208	240	277	480
Starting line current (amps) •	1.84/2.05	1.07/1.3	.93/1.05	.80/.95	.46	Less than operating				
Operating line current (amps)	1.62/1.70	.94/1.0	.81/.85	.70/.74	.41	2.1/2.1	1.2/1.2	1.05/1.05	.90/.90	.52
Primary lamp extinguishing voltage (volts)	90/95	156/170	180/185	208/225	360	85/85	145/145	165/165	195/195	330
Input wattage (watts)	180/185				185	237/238	237/237	237/240	238/238	241
Secondary open circuit voltage (volts)	240					210				
Power Factor	over 90%					over 90%				
Lamp wattage regulation at ± 10% line voltage variation ± 5%	± 12%					line voltage @ ± 10% @ ± 10%				
Minimum ambient starting temperature	-40°F					-40°F				



# Electrical Characteristics.

Lamp	250W					Low Loss 250W				
	Lead/MT					Lead/MT				
Ballast type circuit diagram*†										
Nominal primary voltage (volts)	120	208	240	277	480	120	208	240	277	480
Starting line current (amps) •	Less than operating					Less than operating				
Operating line current (amps)	2.6/2.6	1.5/1.5	1.3/1.3	1.13/1.1	.65	2.5/2.5	1.44/1.45	1.2/1.2	1.1/1.1	.63
Primary lamp extinguishing voltage (volts)	75/75	130/130	150/150	170/170	305	85/85	148/148	170/170	195/195	340
Input wattage (watts)	295/305	298/305	300/305	305/305	308	286/289	287/290	288/290	291/291	295
Secondary open circuit voltage (volts)	200/225					205/207				
Power Factor	over 90%					over 90%				
Lamp wattage regulation at ± 10% line voltage variation	± 10%					± 10%				
Minimum ambient starting temperature	- 40°F					- 40°F				

Lamp	400W					Low Loss 400W				
	Lead/MT					Lead/MT				
Ballast type circuit diagram*†										
Nominal primary voltage (volts)	120	208	240	277	480	120	208	240	277	480
Starting line current (amps) •	Less than operating					Less than operating				
Operating line current (amps)	3.9/3.8	2.3/2.3	2.0/1.9	1.7/1.7	1.0	3.83/3.94	2.22/2.3	1.93/1.97	1.68/1.7	.98
Primary lamp extinguishing voltage (volts)	75/85	130/150	150/173	170/200	300	80/85	130/140	150/163	180/190	325
Input wattage (watts)	452/455	455/460	455/465	460/465	468	441/445	444/448	445/450	448/453	455
Secondary open circuit voltage (volts)	200/220					203/205				
Power Factor	over 90%					over 90%				
Lamp wattage regulation at ± 10% line voltage variation	± 10%					± 10%				
Minimum ambient starting temperature	- 40°F					- 40°F				

Lamp	1000W				
	Lead				
Ballast type circuit diagram*†					
Nominal primary voltage (volts)	120	208	240	277	480
Starting line current (amps) •	Less than operating				
Operating line current (amps)	9.0/9.1	5.1/5.2	4.5/4.55	3.9/3.95	2.30
Primary lamp extinguishing voltage (volts)	100/100	160/160	170/170	240/240	375
Input wattage (watts)	1060/1065	1062/1068	1062/1068	1065/1068	1070
Secondary open circuit voltage (volts)	400				
Power Factor	over 90%				
Lamp wattage regulation at ± 10% line voltage variation	± 13%				
Minimum ambient starting temperature	- 40°F				

## Metal Halide.

Lamp	175W					250W				
	Peak Lead Autotransformer/MT					Peak Lead Autotransformer/MT				
Ballast type circuit diagram*†										
Nominal primary voltage (volts)	120	208	240	277	480	120	208	240	277	480
Starting line current (amps) •	Less than operating					Less than operating				
Operating line current (amps)	1.8/1.9	1.0/1.1	.95/.95	.80/.84	.45	2.55/2.6	1.5/1.5	1.28/1.3	1.10/1.12	.64
Primary lamp extinguishing voltage (volts)	65/55	115/100	132/115	152/135	264	50/50	80/85	105/105	110/110	190
Input wattage (watts)	210/211	211/212	211/213	212/214	213	280/283	282/284	282/284	283/285	285
Secondary open circuit voltage (volts)	305/310					325				
Power Factor	over 90%					over 90%				
Lamp wattage regulation at ± 10% line voltage variation	± 7%					± 7%				
Minimum ambient starting temperature	- 20°F					- 20°F				

Lamp	400W					Two 400W				
Ballast type circuit diagram*†	Peak Lead Autotransformer/MT					Peak Lead (Isolated Secondary)				
Nominal primary voltage (volts)	120	208	240	277	480	120	208	240	277	480
Starting line current (amps) •	Less than operating					Less than operating				
Operating line current (amps)	3.85/3.9	2.2/2.25	1.9/1.95	1.65/1.7	.98	7.8	4.5	3.9	3.4	2.0
Primary lamp extinguishing voltage (volts)	55/50	90/90	110/105	120/120	200	60	104	120	140	240
Input wattage (watts)	438/438	440/440	442/442	443/443	444	875				
Secondary open circuit voltage (volts)	305					610				
Power Factor	over 90%					over 90%				
Lamp wattage regulation at ± 10% line voltage variation	± 8%					± 8%				
Minimum ambient starting temperature	-20°F					-0°F				

Lamp	1000W					1500W				
Ballast type circuit diagram*†	Peak Lead Autotransformer/MT					Peak Lead Autotransformer				
Nominal primary voltage (volts)	120	208	240	277	480	120	208	240	277	480
Starting line current (amps) •	Less than operating					Less than operating				
Operating line current (amps)	9.1/9.0	5.2/5.1	4.5/4.5	3.9/3.85	2.3	14.5	8.4	7.2	6.3	3.6
Primary lamp extinguishing voltage (volts)	70/70	125/125	145/150	165/160	305	75	130	150	173	300
Input wattage (watts)	1063/1065	1063/1065	1063/1065	1065/1065	1070	1610				
Secondary open circuit voltage (volts)	420					415				
Power Factor	over 90%					over 90%				
Lamp wattage regulation at ± 10% line voltage variation	± 10%					± 10%				
Minimum ambient starting temperature	-20°F					-20°F				

### Mercury.

Lamp	100W					175W				
Ballast type circuit diagram*†	CWA/MT					CWA/MT				
Nominal primary voltage (volts)	120	208	240	277	480	120	208	240	277	480
Starting line current (amps) •	Less than operating					Less than operating				
Operating line current (amps)	1.05/1.0	.60/.60	.52/.55	.45/.45	.27	1.8/1.7	1.0/1.0	.9/.85	.8/.74	.5
Primary lamp extinguishing voltage (volts)	65	115	130	150	260	65	115	130	150	260
Input wattage (watts)	120					200	200	202	202	202
Secondary open circuit voltage (volts)	245/255					250/245				
Power Factor	over 90%					over 90%				
Lamp wattage regulation at ± 10% line voltage variation	± 5%					± 5%				
Minimum ambient starting temperature	-20°F					-20°F				

Lamp	250W					400W				
Ballast type circuit diagram*†	CWA					CWA				MCW
Nominal primary voltage (volts)	120	208	240	277	480	120	208	240	277	480
Starting line current (amps) •	Less than operating					Less than operating				
Operating line current (amps)	2.4	1.4	1.2	1.1	.65	3.8	2.2	1.9	1.7	1.0
Primary lamp extinguishing voltage (volts)	65	115	130	150	260	65	115	135	150	260
Input wattage (watts)	290					445				460
Secondary open circuit voltage (volts)	240					245				250
Power Factor	over 90%					over 95%				98%
Lamp wattage regulation at ± 10% line voltage variation	± 5%					± 5% @ ± 10%				
Minimum ambient starting temperature	-20°F					-20°F				

# Electrical Characteristics.

Lamp	1000W				
Ballast type circuit diagram*†	CWA				
Nominal primary voltage (volts)	120	208	240	277	480
Starting line current (amps) ●	Less than operating				
Operating line current (amps)	9.1	5.9	4.6	4.0	2.3
Primary lamp extinguishing voltage (volts)	75	130	145	170	290
Input wattage (watts)	1075				
Secondary open circuit voltage (volts)	460				
Power Factor	over 95%				
Lamp wattage regulation at ±10% line voltage variation	±5%				
Minimum ambient starting temperature	-20°F				

\*Circuit diagrams are shown on page 11.

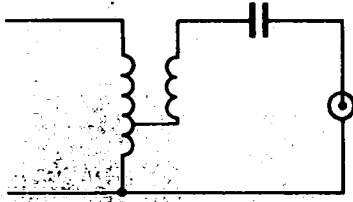
†Ballast type shown as HPF Auto/MT indicate the operating characteristic with standard ballast/multi-tap characteristic.

●Note: Where two values are given, ie: .55/.57, left hand value is for single input voltage ballast, right hand value is for multi-tap ballast. (MT)

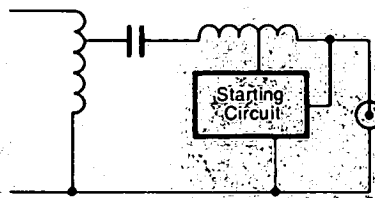
\*Premium low loss ballasts standard on Prismpack IV, available as an option on Prismpack II.

# Ballast circuits.

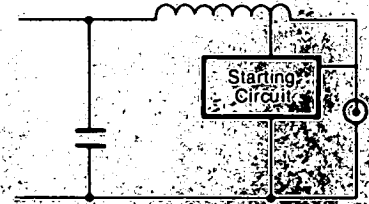
1. CWA, Peak Lead Autotransformer



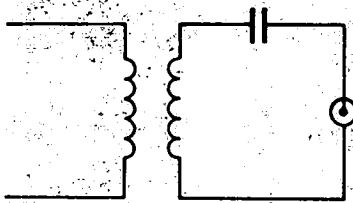
4. Lead



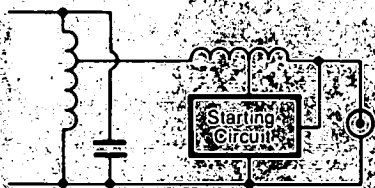
7. HPF Reactor



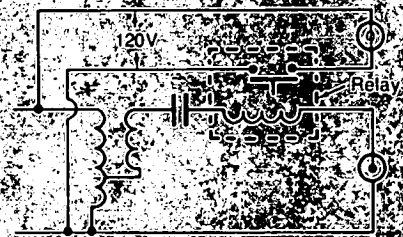
2. CW, MCW, Peak Lead



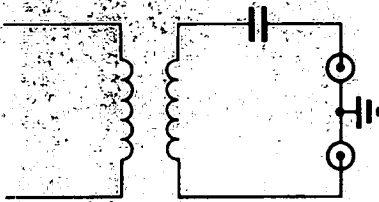
5. HPF Autotransformer



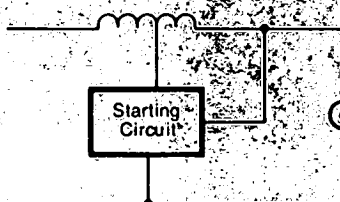
8. Standby ("EM") Option



3. MCW, Peak Lead



6. NPF Reactor



all primary is above 120V, ballast is supplied with 120V tap

**Caution** Replacing of any fixture system components; i.e., lamp holders, ballasts, fixture components, mounting or connections with other than the originally approved components may void the UL listing for the fixture.

**Warranty** Refer to the Holophane limited 1 year material warranty and limitation of liability on this product, which are published in the "Terms and Conditions" section of the current price schedule, and is available from your local Holophane sales representative.

## UL Listed

**Note:** Ungrounded power distribution systems may carry high transient line voltage under fault conditions. Because high transients can cause premature ballast failure, possible with ballasts of any manufacturer's design, it is not recommended that luminaires be operated on 480V ungrounded systems, or any other ungrounded systems.

The physical properties of Holophane integral ballasts represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Check your local Holophane sales representative to assure current information.



## **Manville**

### **Holophane Division**

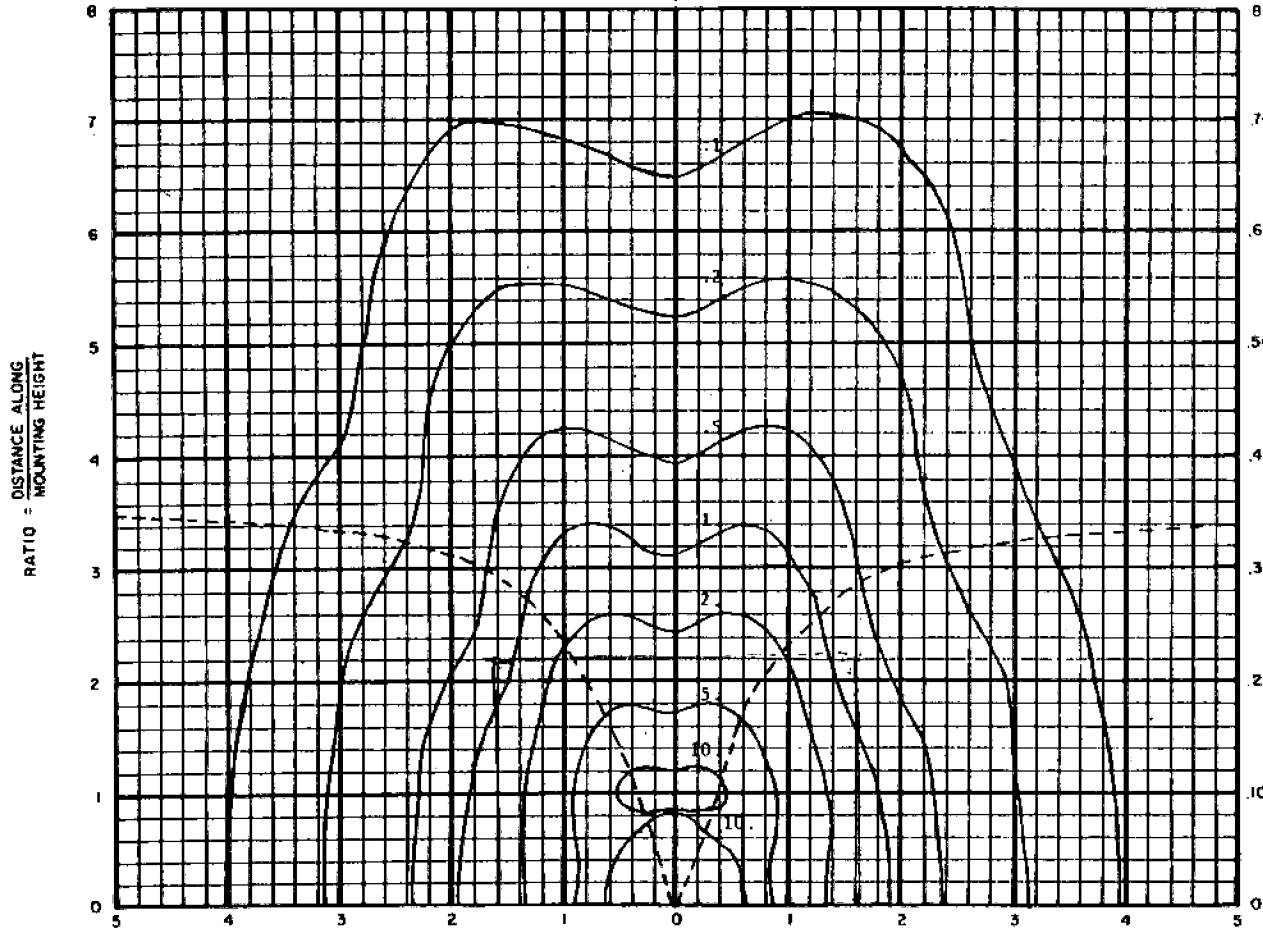
Holophane, Ken-Caryl Ranch, P.O. Box 5108, Denver, CO 80217/Holophane Canada, Brampton, Ont. and St. Hyacinthe, Que., Canada/Holophane Europe Limited, Bond Ave., Milton Keynes MK1 1JG, England/Holophane S.A. de C.V., Apartado Postal 75-415, Mexico 14, D.F. Mexico

Contact your local Holophane sales representative for application assistance. For information on other Manville products and systems, call the Product Information Center at (303) 978-4900.



ISOFOOTCANDLES

HOUSE SIDE | STREET SIDE

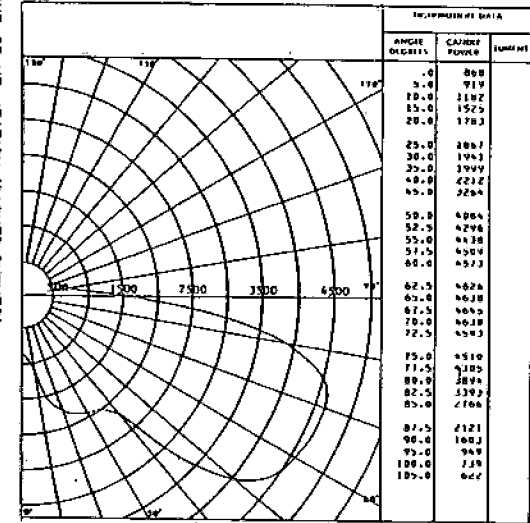


$$\text{RATIO} = \frac{\text{DISTANCE ACROSS}}{\text{MOUNTING HEIGHT}}$$

ILLUMINATION DATA

TYPE Long & Narrow  
 LAMP 150W High Pressure Sodium  
 LUMENS 16000  
 WATTS 150  
 BURNING POSITION Vertical

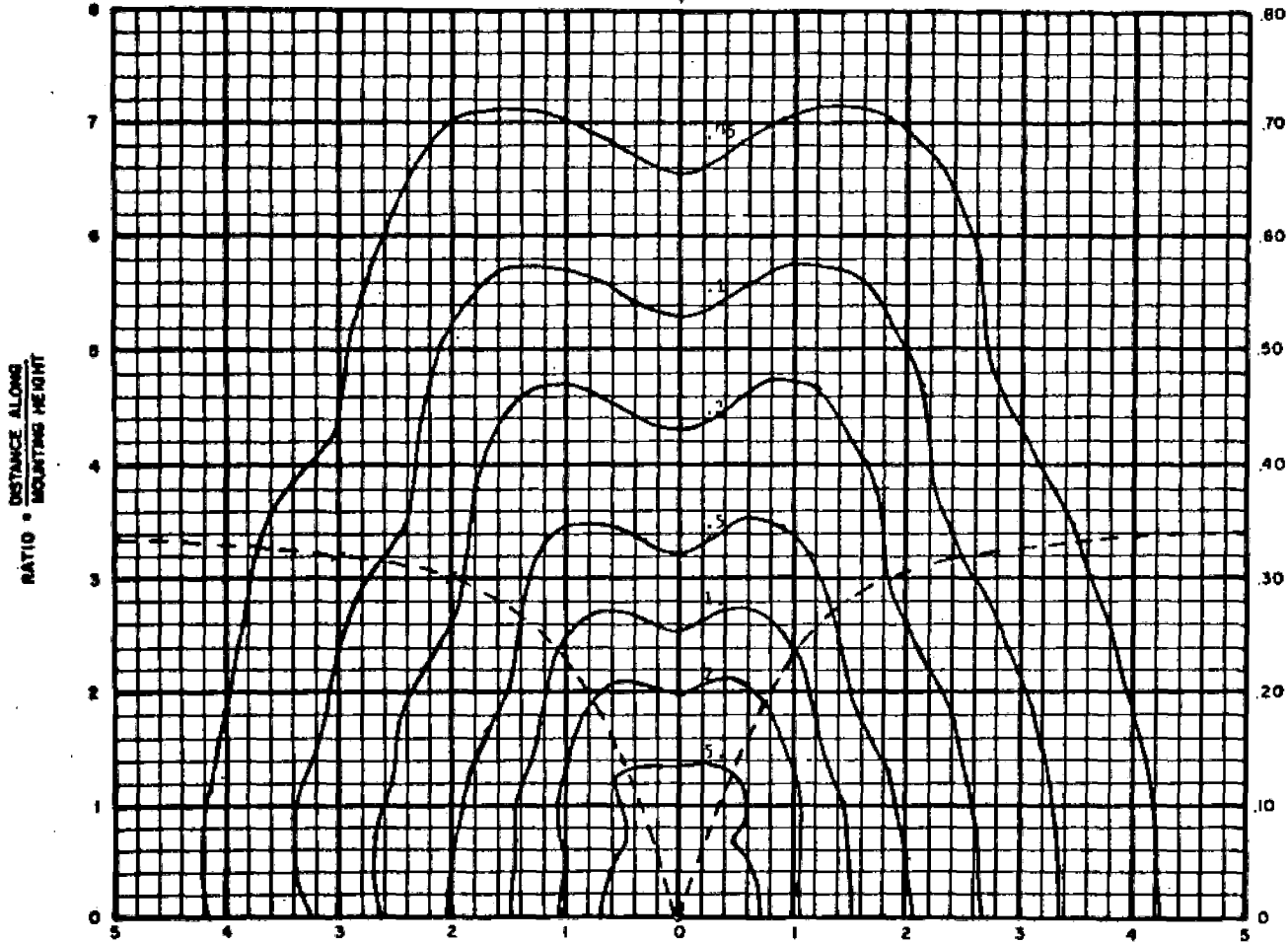
10' MOUNTING HEIGHT





# ISOFOOTCANDLES

HOUSE SIDE | STREET SIDE

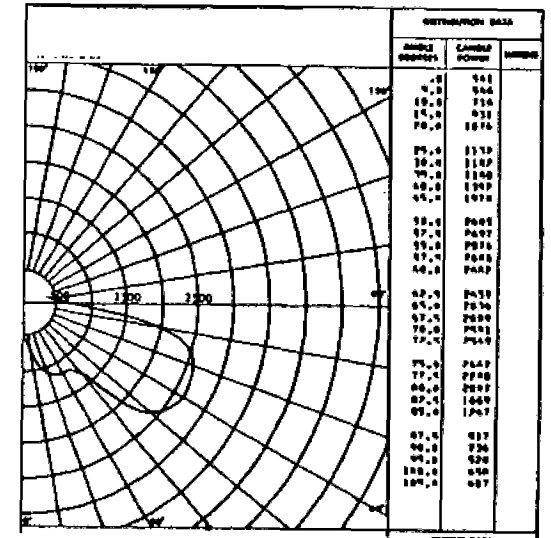


$$\text{RATIO} = \frac{\text{DISTANCE ACROSS}}{\text{MOUNTING HEIGHT}}$$

# OUTDOOR ILLUMINATION DATA

Set Position \_\_\_\_\_  
 TYPE Long & Narrow  
 LAMP 100W High Pressure Sodium  
 LUMENS 9500  
 WATTS 100  
 BURNING POSITION Vertical

10' MOUNTING HEIGHT



UTILIZATION DATA		
ANGLE DEGREE	CANDLE POWER	NUMBER
4.0	541	
6.0	506	
8.0	476	
10.0	451	
15.0	407	
20.0	374	
25.0	347	
30.0	324	
35.0	304	
40.0	287	
45.0	272	
50.0	259	
55.0	248	
60.0	238	
65.0	230	
70.0	223	
75.0	217	
80.0	212	
85.0	207	
90.0	203	
95.0	199	
100.0	195	





PARTS LIST FOR HOLOPHANE PETROLUX LUMINAIRES

1. Holophane Cat. #1918PD-MT
  - a. Cat. #4551 Glass refractor (long & narrow pattern)
  - b. Cat. #CO-699 Top cover
  - c. Cat. #HS-703A Ballast housing only
  - d. Ballast/Capacitor set for #1918PD-MT (consisting of core & coil, capacitor and starter)
  - e. Cat. #08625 Starter only
  - f. Cat. #SO-220 Lamp socket only
  
2. Holophane Cat. #1918PD-MT-IR
  - a. Cat. #4551 Glass refractor (long & narrow pattern)
  - b. Cat. #CO-699 Top cover
  - c. Cat. #HS-703A Ballast housing only
  - d. Ballast & capacitor only for 1918PD-MT (consisting of core & coil and capacitor)
  - e. Cat. #EC-3265 Starter only
  - f. Cat. #SO-220 Lamp socket only
  
3. Holophane Cat. #1910PD-MT
  - a. Cat. #4551 Glass refractor (long & narrow pattern)
  - b. Cat. #CO-699 Top cover
  - c. Cat. #HS-703A Ballast housing only
  - d. Ballast/Capacitor set for 1910PD-MT (consisting of core & coil, capacitor and starter)
  - e. Cat. #08625 Starter only
  - f. Cat. #SO-220 Lamp socket only
  
4. Holophane Cat. #1910PD-MT-IR
  - a. Cat. #4551 Glass refractor (long & narrow pattern)
  - b. Cat. #CO-699 Top cover
  - c. Cat. #HS-703A Ballast housing only
  - d. Ballast & capacitor only for #1910PD-MT (consisting of core & coil and capacitor)
  - e. Cat. #EC-3265 Starter only
  - f. Cat. #SO-220 Lamp socket only

Industrial Luminaires  
Continued

Catalog number	Description	Units per carton	Fixture net wt lbs ea	Suggested trade price ea
	<b>Petrolux</b>			
06758-A	Reflector with tempered glass bottom for 1930 series	1	9	\$58.00
4551	Reflector-asymmetric and long and narrow for 1910 and 1921 series	2	10	26.00
4555	Reflector-symmetric for 1970 series	2	10	26.00
6625-A-AL	Open bottom reflector for 1900 and 1980 series	1	6	on request
SO-2	Socket for all incandescent Petrolux	bulk	1	13.00
SO-220	Socket for all except incandescent Petrolux	bulk	1	4.00
	<b>Enclosed Lobay II</b>			
LBAY10	Narrow (1.3:1) distribution reflector and Refractive Grid lens for 2061, 2062, 2064, 2065, 2066, 2067, 2068-55, 2068-100, 2069, 2071, 2072, 2074, 2075, 2076, 2077, 2078-55, 2078-100, 2079	2	18	49.00
LBAY40	Wide (2.0:1) distribution reflector for 2031, 2032, 2034, 2035, 2036, 2037, 2038-55, 2038-100, 2039	2	18	49.00
LBAY60	Medium-wide (1.8:1) distribution reflector for 2041, 2042, 2044, 2045, 2046, 2047, 2048-55, 2048-100, 2049	2	18	49.00
LBAY80	Medium (1.5:1) distribution reflector for 2051, 2052, 2054, 2055, 2056, 2057, 2058-55, 2058-100, 2059	2	18	49.00
LBAYGD	Refractive Grid lens-door assembly	2	8	50.00
LBAYSQ	Square distribution lens-door assembly	2	10	54.00
MB2A250HP12*	250W high pressure sodium ballast assembly for 2039, 2049, 2059, 2069, 2079	2	24	188.00
MB2A400HP12*	400W high pressure sodium ballast assembly for 2037, 2047, 2057, 2067, 2077	2	26	214.00
MB2A250MH12*	250W metal halide ballast assembly for 2036, 2046, 2056, 2066, 2076	2	23	139.00
MB2A400MH12*	400W metal halide ballast assembly for 2034, 2044, 2054, 2064, 2074	2	23	155.00
MB2A400MV12*	400W mercury ballast assembly for 2031, 2041, 2051, 2061, 2071	2	23	143.00
SO-217	Socket	1	1	4.00
	<b>Prismatite</b>			
7100-C†	Lens assembly for 7200-4	24	8	43.00
7100-D†	Lens assembly for 7200-8; 2 required for 8 foot fixture	24	8	43.00
	<b>Cranelite</b>			
05002	Hood assembly for 694	1	28-¼	105.00
05104&05105	Ring and rods for 679, 694	8	9-¼	63.00
05208	Hood assembly for 679	1	28-½	128.00
0640	Hood assembly for 674	1	10	134.00
6586	Reflector for 674	4	7-½	on request
6690-AL	Reflector for 679, 694	2	20	on request

**Notes**

\* Replacement ballast assemblies are available for 120, 208, 240, 277 or 480 volt at the same price and are suitable for direct replacement only. High pressure sodium ballasts include starter boards. For HPS starter kits only, see page 181. When ordering, specify unit catalog number, any part numbers printed on parts to be replaced, wattage, lamp type and voltage and, if available, original shipping date and Holophane order number. Contact Holophane or your Distributor for prices and availability of ballast conversion kits.

† Order from Holophane, 13500 Saticoy St., Van Nuys, California, 91402.

**Outdoor Luminaires**  
Continued

Catalog number	Description	Units per carton	Fixture net wt lbs ea	Suggested trade price ea
<b>HMST, High Mast System luminaires</b>				
05851	Reflector for 1118, 1119, 1127, 1139, 1171	2	16	\$84.00
4591	Reflector for long and narrow distribution, -LAN series (including 1171-LAN)	4	13	43.00
4592	Reflector for symmetric distribution, -SYM series (excluding 1171-SYM)	4	11	43.00
4593	Reflector for asymmetric distribution, -ASY series (excluding 1171-ASY)	4	11	43.00
4595	Reflector for 1171-SYM	4	13	43.00
4596	Reflector for 1171-ASY	4	13	43.00
HMSTC10F	Reflector for 1110, 1131, 1141, 1170	2	20	126.00
HMST400HP12 <sup>6</sup>	Ballast assembly for 1131, 1137, 1138, 1139	1	37	451.00
HMSTC10HP12 <sup>6</sup>	Ballast assembly for 1170, 1171	1	43	520.00
HMSTC10MH12 <sup>6</sup>	Ballast assembly for 1110, 1118, 1119	1	32	424.00
<b>Prismbeam, Prismaflood and Vectorflood</b>				
06720-120 <sup>6</sup>	Ballast assembly for 1861, 1862, 1895, 1897	1	43	220.00
06722-120 <sup>6</sup>	Ballast assembly for 1844, 1858	1	45	293.00
06723-120 <sup>6</sup>	Ballast assembly for 1845, 1888, 1898	1	55	273.00
06725-120 <sup>6</sup>	Ballast assembly for 1851, 1856, 1884, 1886	1	39	201.00
06726-120	Ballast assembly for 1853, 1854, 1859, 1860	1	40	214.00
08078-120 <sup>6</sup>	Ballast assembly for 1840, 1841, 1842, 1843	1	38	188.00
847	Lens for 250 and 400W asymmetric, Vectorflood only	bulk	2	34.00
849	Lens for 250 and 400W symmetric, Vectorflood only	bulk	2	33.00
857	Lens for 1000W asymmetric Vectorflood, 250-1000W Prismbeam and Prismaflood	bulk	5	53.00
859	Lens for 1000W symmetric Vectorflood, 250-1000W Prismbeam and Prismaflood	bulk	5	46.00
GS-131	Lens for 1000W HPS and all 1500W Prismbeam and Prismaflood	bulk	5	53.00
GS-132	Lens for 1000W HPS and all 1500W Vectorflood	bulk	5	53.00
<b>Ballast/capacitor<sup>6</sup> sets for HID luminaires; for replacement or conversion (Core &amp; coil, capacitor &amp; resistor and starter)</b>				
	70W HPF autotransformer, high pressure sodium	bulk	6	114.00
	100W HPF autotransformer, high pressure sodium	bulk	6	118.00
	150W-55V HPF autotransformer, high pressure sodium (Multi-Tap)	bulk	8	121.00
	150W-100V HPF autotransformer, high pressure sodium	bulk	8	121.00
	250W lead, high pressure sodium	bulk	16	131.00
	400W lead, high pressure sodium	bulk	26	158.00
	1000W lead, high pressure sodium	bulk	32	198.00
	175W lead, metal halide or mercury	bulk	8	100.00
	250W lead, metal halide or mercury	bulk	10	106.00
	400W lead, metal halide or mercury	bulk	23	119.00
	1000W lead, metal halide or mercury	bulk	26	153.00
	1500W lead, metal halide or mercury	bulk	35	258.00
	100W CWA ballast mercury	bulk	8	79.00
	175W CWA ballast mercury	bulk	10	84.00
	250W CWA ballast mercury	bulk	14	95.00
	400W CWA ballast mercury	bulk	18	103.00
<b>High pressure sodium starter kits (includes current starter board, adaptors, installation instructions and wiring diagrams)</b>				
08625	Starter kit for 70, 100, 150W-55V ballasts	bulk	1	28.00
08626	Starter kit for 150W-100V ballasts	bulk	1	28.00
08627	Starter kit for 250, 400W ballasts	bulk	1	28.00

**Notes**

<sup>6</sup> Replacement ballast assemblies are available for 120, 208, 240, 277 or 480 volt at the same price and are suitable for direct replacement only. High pressure sodium ballasts include starter boards. For HPS starter kits only, see page above. When ordering, specify unit catalog number, any part numbers printed on parts to be replaced, wattage, lamp type and voltage and, if available, original shipping date and Holophane order number. Contact Holophane or your Distributor for prices and availability of ballast conversion kits.

Manville  
7901 Stoneridge Drive, Suite 202  
P.O. Box 9008  
Pleasanton, California 94566  
415 460-0414

**Manville**

August 21, 1985

City of Sacramento  
Sacramento, California

Reference: Bid #853  
High Pressure Sodium Luminaires

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Allen R. Espeniller  
Western District Sales Manager  
Holophane Division

