QUADRA/SCA

GARAGE LIGHTING

GARDCO
LIGHTING

GARAGE LIGHTING

In the Quadra, a durable, die cast upper housing is paired with an acrylic lens and lower housing. Combined with innovative purpose-built optics, they make Quadra the most efficient, most economical garage luminaire available.

Garages are among the most challenging of lighting tasks. Vehicles and pedestrians move in confined spaces and in close proximity. Maintenance of facilities and lighting is further challenged by exhaust fumes and other dirt and pollutants. There is ever-present danger and exposure to acts of vandalism that can create threats to personal safety.

To meet these challenges Gardco has engineered two luminaires that satisfy the prerequisites of illumination and durability. In the pages that follow, the Gardco Quadra and SCA are thoroughly detailed with respect to construction and application. Specifiers should note that these are very different luminaires… optical systems and resulting distributions are different – construction materials are distinct – all aluminum for the SCA and marriage of die cast and impact resistant acrylic for the Quadra. Complete photometric and construction details are provided for each luminaire.

Rugged extruded aluminum construction and the flexibility of five sharp cutoff optical distributions enable illumination to be precisely tailored to garage layouts.

DESIGN ESSENTIALS

VISIBILITY AND ECONOMY,
THE ESSENTIALS OF GARAGE ILLUMINATION.

The objectives of garage illumination are straightforward:

- clear visibility in the driving lane
- freedom from disabling glare
- a bright, safe pedestrian environment

Meeting these goals at minimum initial and long term operating costs completes what may appear to be an obvious lighting specification. However, the physical constraints imposed by low, coffered ceilings, low-reflective surfaces and inconsistent maintenance complicate the designer's choice of luminaire. Careful analysis of the performance of the Gardco luminaires demonstrates that they are the clear choice for garage applications.

LIGHT LEVELS

Outdoors at night, the eye is dark-adapted with pupils wide open. Inside a parking garage, glaring luminaires and reflections cause pupils to involuntarily contract. Light levels are therefore perceived to be lower than they actually are. (Gardco Lighting recommends a minimum of 5 footcandles average maintained.)

GLARE CONTROL

Glare control is of paramount importance. Bright light directed in the line of sight can be both discomforting and disabling, making it difficult to avoid obstacles and pedestrians and to interpret visual clues correctly. Unfortunately, garages limit the mounting height of luminaires, frequently placing them in the line of sight. Gardco's sharp cutoff optical systems eliminate glare even at low mounting heights.

LIGHT SOURCE

Gardco luminaires accept all HID lamp types and wattages up to 200 watts. The lamps and optical assemblies are in sealed housings that provide superior protection against dirt, pollution and breakage. Both fluorescent and refractor-type HID units have surfaces where dirt readily collects and reduces light levels. Fluorescent lamps are especially vulnerable to damage and are normally not designed for exterior application. At ambient temperatures below 40°F, a reduction in output of 40% to 60% is probable with fluorescent lamps. The average daily low temperature in January is below 40°F in most of the US.

UNIFORMITY

Visitors to parking garages, whether driving or walking, should not be subjected to uncomfortable zones of darkness. Gardco optical systems provide this recommended light level with max to min uniformity ratios not exceeding 10:1, creating a uniform pavement luminance free from bright and dark spots, streaks and striations.

QUADRA

THE RIGHT LUMINAIRE. THE RIGHT OPTICAL SYSTEM.

The heart of the Quadra luminaire is the first optical system designed expressly for parking structures, the Type 1R. Because the distribution is square at the edges and elongated, required light levels can be achieved with fewer fixtures... providing both first cost and long term operating savings.

Through the combination of the new Type 1R rectangular distribution pattern and exceptional sharp cutoff of light in glare zones, Quadra luminaires establish a new standard for visibility and efficiency.

LASTING PERFORMANCE

Meticulous design and conscientious choice of materials promise long term, low maintenance operation. To resist corrosion and vandalism, the lower housing is made of heavy gauge acrylic. The canopy section, which houses the electrical components, is rugged die cast aluminum. Precision optical components are completely sealed against moisture and dirt to assure long term maintenance of specified lighting levels.

SHARP CUTOFF. GLARE CONTROL

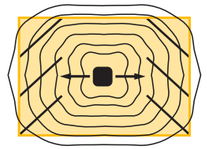
Downlight with minimal glare makes Quadra ideal in both one and two-per-bay luminaire spacing. Peak candlepower exists only in the corners, and there is sharp cutoff above the 75° angle.

UPLIGHT

To eliminate dark ceilings and walls, uplight is provided from a 360° window. Vertical flutes enhance the uniformity of uplight and reduce overall brightness.

UNIFORMITY OF ILLUMINATION

The Quadra optical system is designed to ensure uniform appearance of pavement luminance... a garage free of ominous light and dark zones.



RECTANGULAR DISTRIBUTION

Peak candlepower at the corners from Quadra's rectangular pattern means higher light levels, fewer dark zones, minimum wasteful pattern overlap and generally, the better visibility that accompanies uniform lighting. The Type 1R optical system often allows the lighting criteria to be achieved or surpassed with fewer fixtures than other systems.

LIFE CYCLE ECONOMY

Superior illumination from fewer lighting fixtures translates into lower initial cost, reduced energy consumption, lower maintenance and perhaps most important, a safer facility with less exposure to liability. Quadra offers owners, operators and users specific and important advantages in lighting quality and safety, as well as initial cost and on-going operating savings.

DESIGN & CONSTRUCTION

Application-specific design and construction create a luminaire perfectly suited to the challenges and demands of parking structures.

A rugged die cast aluminum upper chamber houses electrical components.

High power factor magnetic ballasts are suitable for starting to -20°F and are 100% factory tested.

The high strength, one-piece acrylic housing with a translucent uplight window features vertical flutes to enhance evenness of the uplight distribution and to reduce brightness. Opaque lower side sections assure sharp cutoff to the lamp and lamp images at normal viewing angles.

Silicone gaskets permanently exclude moisture, dirt, insects and pollutants.

Semi-specular metalized aluminum downlight reflector facets are precisely positioned to provide the highly efficient Type 1R (rectangular) lighting distribution.

The hydroformed and anodized aluminum uplight reflector provides illumination on ceiling surfaces and vertical beams – eliminating the dark ceilings and increasing floor illumination. It is easily removed for ballast access.

The UV-resistant clear acrylic lens is retained with captive Phillips® head fasteners. The lens hinges down for relamping and is gasketed to the housing.

Mounting plates are affixed to j-boxes.

Hanging from the tab, luminaire is wired…

…and secured to the j-box assembly with a very secure lift, shift and click motion.

Lens hinges, self-supporting during lamping.

APPLICATION

A LESSON IN SIMPLE GEOMETRY.

The typical 60' parking bay, with coffered ceilings at 7' to 8', is no place for a traditional Type 5 distribution... where the rounded corners of the Type 5 leave corners dark, light falls off quickly and the symmetric peak candlepower can interfere with driving lane visibility. Overcoming the limitations of the round distribution requires costly additional lighting fixtures with overlaps that create uneven light levels across the visual field.

The perfect optical system is the one invented for parking bays, the rectangular Type 1R. Quadra provides maximum candlepower at the corners of the distribution, eliminating brightness in the driving lane and providing comforting fill-in at the corners. Importantly, fewer lighting fixtures are required to accomplish a superior lighting design.

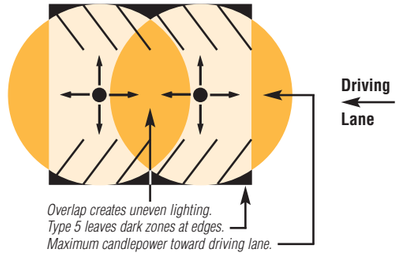
The rectangular distribution is also very well suited for two-per-bay placement. With the round symmetrical Type 5 distributions, a significant amount of light is wasted in overlap or on scalloping lower walls. Here again, wider spacings can be achieved with Quadra's Type 1R distribution.

THE DISTRIBUTION THAT FITS.

Note that when round Type 5 distributions are spaced two-per-bay, the corners remain dark, light levels are uneven and much light energy is wasted. By rotating Type 1R fixtures 90°, a more efficient utilization of light is achieved. Note at right how the Type 1R eliminates energy-wasting overlap and precisely and evenly fills the bay. Higher lumen utilization for the area covered means fewer luminaires are required to completely illuminate the garage to required light levels.

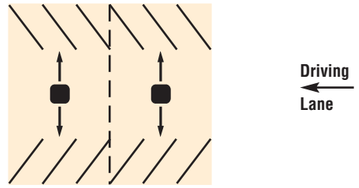
Single Luminaire Per Bay Spacing

Typical round - Type 5 luminaires



Overlap creates uneven lighting.
Type 5 leaves dark zones at edges.
Maximum candlepower toward driving lane.

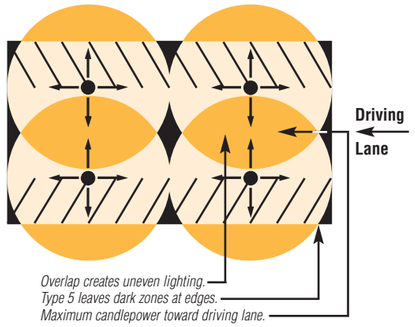
Quadra



Minimal pattern overlap.
Comforting fill-in at corners.
Peak candlepower away from driving lane.

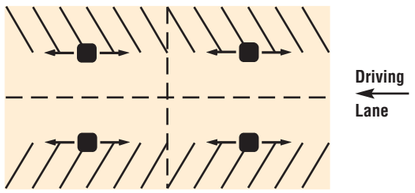
Two Luminaires Per Bay Spacing

Typical round - Type 5 luminaires



Overlap creates uneven lighting.
Type 5 leaves dark zones at edges.
Maximum candlepower toward driving lane.

Quadra



Minimal pattern overlap.
Comforting fill-in at corners.
Peak candlepower not continuously toward driving lane.

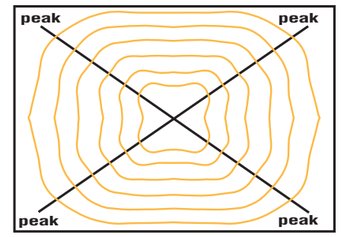
COMPLETE DOWNLIGHT GLARE CONTROL

For users, the most obvious advantage of the Quadra is the luminaire's low glare. Peak candlepower exists only in the corners of the distribution, where it provides fill-in to otherwise dark corners. Sharp cutoff of light above 75° in the driving lane means that motorists will not drive into a zone of brightness... a significant enhancement to the safety of a facility. Even when units are placed two-per-bay, the movement through the peak light output is instantaneous.

UP-LIGHT ILLUMINATION FOR A SAFE, SECURE FACILITY

Illumination of ceilings and walls provides patrons with a sense of comfort and security, especially as motorists leave vehicles and become pedestrians. The Quadra's uplight reflector directs lamp lumens through translucent vertical flutes. The flutes soften the brightness, yet assist light distribution uniformity up and along the ceiling and on walls. The result is a safe, secure, completely lighted space.

Round Type 5 luminaires, whether spaced one or two per bay, place the driver directly in line with the peak candlepower angle of the luminaire. The effect is not only discomforting, but at the low mounting heights typical in garages, may significantly impair the motorist's ability to see vehicles and pedestrians. Quadra eliminates these problems.



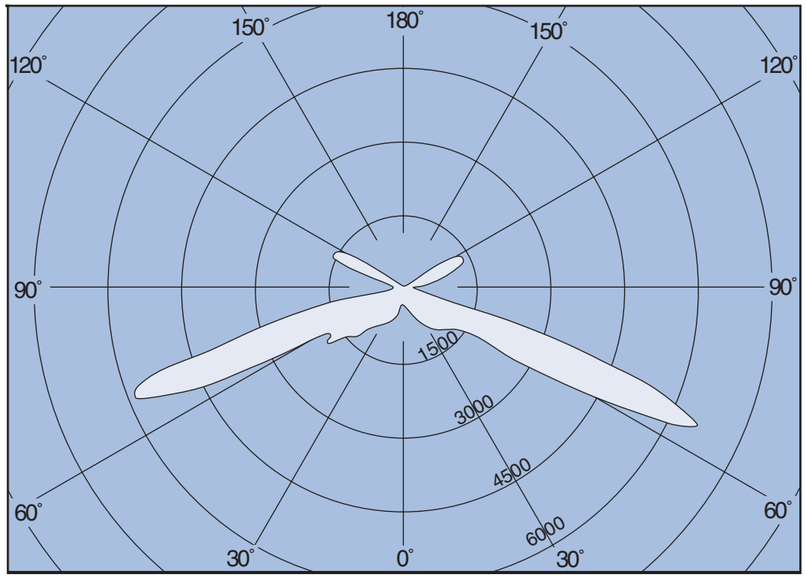
APPLICATION

CANDLEPOWER VALUES

150HPS
16,000 initial lumens

*Towards Parking Stalls *Towards Driving Lane

(Clear E-17 Med.Base)



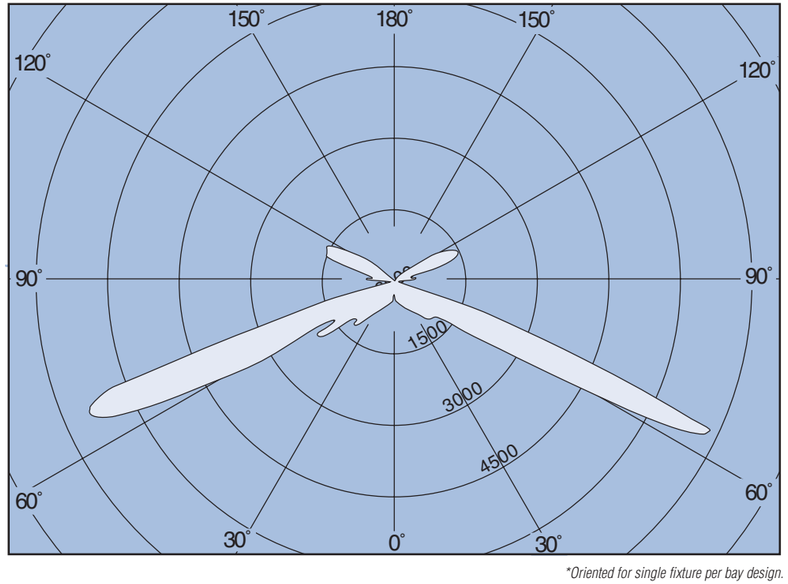
*Oriented for single fixture per bay design.

Vertical Angle	Toward Parking Stall	Toward Driving Lane
180	0	0
155	40	19
145	59	59
135	40	40
130	99	138
125	770	789
120	1322	1262
115	1421	1381
110	1085	1106
105	552	414
100	374	374
95	336	336
90	178	178
85	158	138
80	277	277
75	2446	1163
70	5603	4379
65	4814	6352
60	2131	4163
55	1854	1914
50	1381	1400
45	1262	1222
35	947	947
25	710	691
15	552	514
5	315	355
0	286	286

150MH
13,500 initial lumens

*Towards Parking Stalls *Towards Driving Lane

(Clear ED-17 Med.Base)



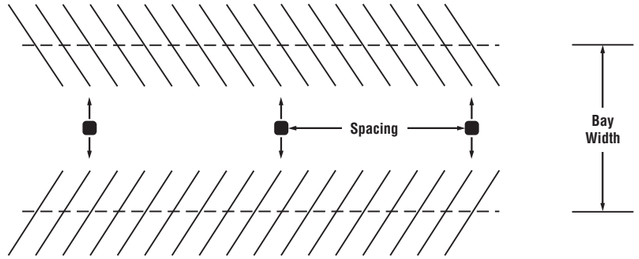
*Oriented for single fixture per bay design.

Vertical Angle	Toward Parking Stall	Toward Driving Lane
180	0	0
155	0	0
145	36	36
135	36	36
130	36	36
125	760	705
120	1299	1150
115	1335	1261
110	1299	1112
105	520	371
100	537	427
95	537	408
90	241	204
85	130	130
80	223	167
75	686	537
70	5322	2337
65	5582	6120
60	1762	3319
55	1762	1724
50	1150	1076
45	1112	964
35	760	741
25	520	537
15	408	427
5	333	371
0	292	292

- Multi-Bay Construction
- One Luminaire Per Bay

ILLUMINATION LEVELS

- Maintained Footcandles
- Calculations include contribution from adjacent bays.



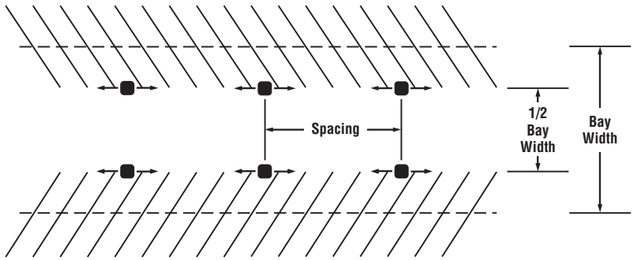
Calculations considering interreflections with 40% ceiling and floor reflectances.

Calculations per IES recommended practice with no interreflections considered.

Lamp	Bay Width	Mounting Height To Fixture Aperture	Typical Spacings	Avg. F.C.	Min. F.C.	Avg/ Min.	Max./ Min.	Typical Spacings	Avg. F.C.	Min. F.C.	Avg./ Min.	Max./ Min.
150W HPS E-17 Clear Med. Base 16,000 Initial Lumens Maintenance Factor .81	55'	7'	20'	10.2	4.2	2.5	5.1	20'	7.7	1.8	4.4	10.5
			34'	6.1	2.3	2.7	5.8	34'	4.6	1.0	4.5	12.7
			40'	5.1	1.7	3.0	7.7	40'	3.9	0.8	4.7	12.8
		8'	20'	10.1	5.2	1.9	3.7	20'	7.7	3.3	2.3	4.9
			34'	6.0	3.0	2.0	4.1	34'	4.5	2.0	2.3	7.1
			40'	5.1	2.3	2.2	4.5	40'	3.9	1.5	2.5	6.0
	60'	7'	20'	9.5	3.1	3.1	7.1	20'	7.11	0.9	7.6	20.0
			34'	5.5	1.7	3.2	7.6	34'	4.2	0.5	8.5	27.0
			40'	4.8	1.3	3.6	9.8	40'	3.6	0.5	7.7	23.6
		8'	20'	9.5	4.0	2.4	5.0	20'	7.1	2.0	3.5	8.0
			34'	5.5	2.4	2.3	5.3	34'	4.2	1.2	3.5	12.1
			40'	4.8	1.8	2.6	5.9	40'	3.6	1.0	3.6	9.6
150W MH ED-17 Clear Med. Base 13,500 Initial Lumens Maintenance Factor .80	55'	7'	20'	8.7	2.4	3.5	7.0	20'	6.7	0.7	10.3	25.4
			34'	5.2	1.4	3.6	7.9	34'	3.9	0.6	10.3	29.7
			40'	4.4	1.2	3.7	9.2	40'	3.3	0.3	11.4	35.3
		8'	20'	8.6	3.8	2.3	4.2	20'	6.7	1.6	4.2	8.5
			34'	5.2	2.1	2.5	6.0	34'	3.9	0.8	4.5	16.5
			40'	4.3	1.5	2.8	5.9	40'	3.3	0.8	4.6	11.6
	60'	7'	20'	8.1	1.6	5.0	11.2	20'	6.1	0.4	16.6	45.6
			34'	4.7	0.9	4.8	11.8	34'	3.6	0.2	16.8	54.0
			40'	4.1	0.8	4.9	13.3	40'	3.1	0.2	17.6	60.2
		8'	20'	8.1	2.6	3.1	6.2	20'	6.1	0.8	8.0	17.9
			34'	4.7	1.5	3.1	8.3	34'	3.5	0.4	8.7	35.4
			40'	4.1	1.2	3.3	7.2	40'	3.0	0.4	8.2	22.9

APPLICATION

- Multi-Bay Construction
- Two Luminaires Per Bay



ILLUMINATION LEVELS

- Maintained Footcandles
- Calculations include contribution from adjacent bays.

Calculations considering interreflections with 40% ceiling and floor reflectances.

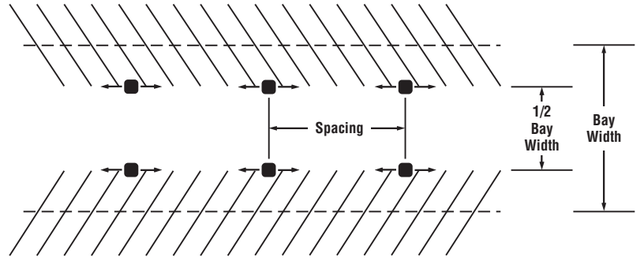
Calculations per IES recommended practice with no interreflections considered.

Lamp	Bay Width	Mounting Height To Fixture Aperture	Typical Spacings	Avg. F.C.	Min. F.C.	Avg/ Min.	Max./ Min.	Typical Spacings	Avg. F.C.	Min. F.C.	Avg./ Min.	Max./ Min.	Max.* Spacing Recommd.
150W HPS E-17 Clear Med. Base 16,000 Initial Lumens Maintenance Factor .81	55'	7'	20'	20.7	16.3	1.3	1.6	20'	15.7	11.0	1.4	2.5	
			34'	12.5	9.9	1.3	2.0	34'	9.2	5.7	1.6	3.6	53'
			40'	10.5	7.2	1.5	2.6	40'	7.9	4.4	1.8	4.6	
		8'	20'	20.5	16.1	1.3	1.6	20'	15.7	11.4	1.4	1.8	
			34'	12.3	10.1	1.2	1.7	34'	9.3	5.4	1.7	2.5	61'
			40'	10.4	8.1	1.3	2.0	40'	7.9	4.9	1.6	2.6	
	60'	7'	20'	19.2	14.7	1.3	1.6	20'	14.5	10.6	1.4	2.3	
			34'	11.3	8.6	1.3	2.0	34'	8.5	5.8	1.5	3.2	53'
			40'	9.8	6.6	1.5	2.5	40'	7.3	4.3	1.7	4.3	
		8'	20'	19.1	14.8	1.3	1.6	20'	14.5	10.4	1.4	2.2	
			34'	11.3	9.0	1.3	1.8	34'	8.5	5.1	1.7	3.2	57'
			40'	9.8	7.6	1.3	2.1	40'	7.3	4.7	1.6	3.4	

Lamp	Bay Width	Mounting Height To Fixture Aperture	Typical Spacings	Avg. F.C.	Min. F.C.	Avg/ Min.	Max./ Min.	Typical Spacings	Avg. F.C.	Min. F.C.	Avg./ Min.	Max./ Min.	Max.* Spacing Recommd.
100W HPS E-17 Clear Med. Base 9,500 Initial Lumens Maintenance Factor .81	55'	7'	20'	12.1	8.1	1.5	2.1	20'	9.1	5.3	1.6	3.0	
			34'	7.3	4.9	1.5	2.7	34'	5.4	3.1	1.7	4.3	36'
			40'	6.2	4.0	1.5	3.2	40'	4.6	2.3	2.0	6.0	
		8'	20'	12.0	8.6	1.4	1.9	20'	9.2	6.0	1.5	2.4	
			34'	7.2	5.3	1.4	2.0	34'	5.4	2.8	1.9	3.2	36'
			40'	6.1	4.0	1.5	2.6	40'	4.6	2.5	1.8	3.5	
	60'	7'	20'	11.3	7.3	1.6	2.0	20'	8.5	5.4	1.6	2.7	
			34'	6.6	4.2	1.6	2.7	34'	5.0	3.0	1.7	4.0	33'
			40'	5.8	3.5	1.7	3.2	40'	4.2	2.2	2.0	5.5	
		8'	20'	11.2	7.7	1.5	2.1	20'	8.5	5.5	1.5	2.8	
			34'	6.6	4.7	1.4	2.3	34'	5.0	2.7	1.8	3.9	33'
			40'	5.8	3.7	1.6	2.9	40'	4.2	2.3	1.8	4.6	

** Spacings beyond maximum recommended distances will result in illumination or uniformity levels below IES recommended minimums: 5 average footcandles maintained and 4 to 1 average to minimum uniformity.*

- Multi-Bay Construction
- Two Luminaires Per Bay



ILLUMINATION LEVELS

- Maintained Footcandles
- Calculations include contribution from adjacent bays.

Calculations considering interreflections with 40% ceiling and floor reflectances.

Calculations per IES recommended practice with no interreflections considered.

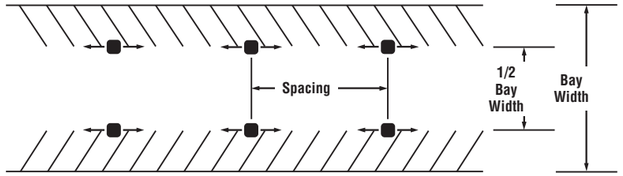
Lamp	Bay Width	Mounting Height To Fixture Aperture	Typical Spacings	Avg. F.C.	Min. F.C.	Avg/ Min.	Max./ Min.	Typical Spacings	Avg. F.C.	Min. F.C.	Avg./ Min.	Max./ Min.	Max.* Spacing Recommd.
150W MH ED-17 Clear Med. Base 13,500 Initial Lumens Maintenance Factor .80	55'	7'	20'	17.3	12.2	1.4	2.0	20'	13.1	8.8	1.5	2.8	
			34'	10.5	7.5	1.4	2.4	34'	7.7	4.7	1.6	4.2	47'
			40'	8.8	5.9	1.5	3.1	40'	6.6	3.5	1.9	5.6	
		8'	20'	17.1	13.0	1.3	1.8	20'	13.2	8.7	1.5	2.4	
			34'	10.3	8.2	1.3	1.8	34'	7.8	4.7	1.7	2.6	53'
			40'	8.7	5.9	1.5	2.4	40'	6.6	3.7	1.8	3.3	
	60'	7'	20'	16.1	11.4	1.4	1.9	20'	12.2	8.3	1.5	2.8	
			34'	9.5	6.6	1.5	2.5	34'	7.1	4.2	1.7	4.4	47'
			40'	8.3	5.0	1.7	3.2	40'	6.1	3.5	1.8	5.4	
		8'	20'	16.0	11.7	1.4	1.9	20'	12.2	8.2	1.5	2.7	
			34'	9.4	7.1	1.3	2.1	34'	7.1	4.4	1.6	3.3	48'
			40'	8.3	5.5	1.5	2.6	40'	6.1	3.4	1.8	4.2	

Lamp	Bay Width	Mounting Height To Fixture Aperture	Typical Spacings	Avg. F.C.	Min. F.C.	Avg/ Min.	Max./ Min.	Typical Spacings	Avg. F.C.	Min. F.C.	Avg./ Min.	Max./ Min.	Max.* Spacing Recommd.
100W MH ED-17 Clear Med. Base 8,500 Initial Lumens Maintenance Factor .72	55'	7'	20'	9.7	7.4	1.3	2.1	20'	7.4	4.8	1.5	3.0	
			34'	5.9	4.2	1.4	2.8	34'	4.4	2.4	1.8	4.5	29'
			40'	5.0	3.0	1.7	3.8	40'	3.7	1.8	2.0	5.9	
		8'	20'	9.6	7.7	1.3	1.7	20'	7.5	5.1	1.5	2.5	
			34'	5.8	3.8	1.6	2.2	34'	4.4	2.4	1.8	3.0	29'
			40'	5.0	3.3	1.5	2.5	40'	3.8	1.9	2.0	3.7	
	60'	7'	20'	9.0	6.6	1.4	2.2	20'	6.9	4.3	1.6	3.6	
			34'	5.4	3.7	1.5	3.3	34'	4.1	2.3	1.8	5.6	27'
			40'	4.7	2.9	1.6	4.2	40'	3.5	1.7	2.1	7.6	
		8'	20'	9.0	7.2	1.3	1.9	20'	6.9	4.4	1.6	2.7	
			34'	5.3	3.7	1.5	2.4	34'	4.1	2.3	1.8	3.3	27'
			40'	4.7	3.1	1.5	2.8	40'	3.5	1.8	1.9	4.1	

**Spacings beyond maximum recommended distances will result in illumination or uniformity levels below IES recommended minimums: 5 average footcandles maintained and 4 to 1 average to minimum uniformity.*

APPLICATION

- Single Bay Construction
- Two Luminaires Per Bay



ILLUMINATION LEVELS

- Maintained Footcandles

Calculations considering interreflections with 40% ceiling, floor reflectances and 0% wall.

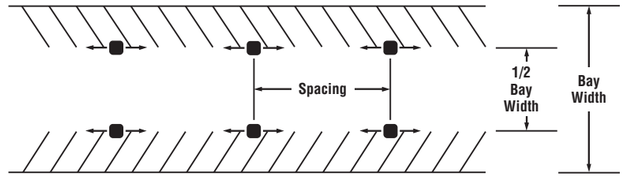
Calculations per IES recommended practice with no interreflections considered.

Lamp	Bay Width	Mounting Height To Fixture Aperture	Typical Spacings	Avg. F.C.	Min. F.C.	Avg/ Min.	Max./ Min.	Typical Spacings	Avg. F.C.	Min. F.C.	Avg./ Min.	Max./ Min.	Max.* Spacing
150W HPS E-17 Clear Med. Base 16,000 Initial Lumens Maintenance Factor .81	55'	7'	20'	17.5	11.1	1.6	2.3	20'	13.5	8.4	1.6	3.1	
			34'	10.5	6.1	1.7	3.1	34'	8.0	4.7	1.7	4.4	49'
			40'	9.0	4.1	2.2	4.5	40'	6.8	3.6	1.9	5.6	
		8'	20'	16.5	9.9	1.7	2.5	20'	12.8	7.6	1.7	2.8	
			34'	10.0	6.0	1.7	2.8	34'	7.5	4.6	1.6	2.9	50'
			40'	8.6	4.9	1.7	3.2	40'	6.4	3.4	1.9	3.7	
	60'	7'	20'	16.5	10.3	1.6	2.2	20'	12.9	8.4	1.5	2.9	
			34'	9.9	5.2	1.9	3.2	34'	7.6	4.3	1.8	4.4	49'
			40'	8.5	3.5	2.4	4.7	40'	6.5	3.1	2.1	6.0	
		8'	20'	15.7	9.8	1.6	2.4	20'	12.2	7.5	1.6	3.1	
			34'	9.5	6.0	1.6	2.7	34'	7.2	4.6	1.6	3.5	48'
			40'	8.1	4.5	1.8	3.4	40'	6.1	3.4	1.8	4.6	

Lamp	Bay Width	Mounting Height To Fixture Aperture	Typical Spacings	Avg. F.C.	Min. F.C.	Avg/ Min.	Max./ Min.	Typical Spacings	Avg. F.C.	Min. F.C.	Avg./ Min.	Max./ Min.	Max.* Spacing
100W HPS ED-17 Clear Med. Base 9,500 Initial Lumens Maintenance Factor .81	55'	7'	20'	10.4	5.4	1.9	3.0	20'	8.1	4.6	1.8	3.8	
			34'	6.2	3.2	2.0	4.0	34'	4.8	2.4	2.0	5.5	32'
			40'	5.3	2.3	2.3	5.4	40'	4.1	2.0	2.1	6.9	
		8'	20'	9.8	5.0	2.0	3.2	20'	7.6	4.2	1.8	3.5	
			34'	5.9	3.0	2.0	3.5	34'	4.5	2.5	1.8	3.5	30'
			40'	5.1	2.3	2.2	4.4	40'	3.8	1.8	2.2	5.0	
	60'	7'	20'	9.9	5.5	1.8	2.6	20'	7.8	4.6	1.7	3.2	
			34'	5.9	3.1	1.9	3.5	34'	4.6	2.4	1.9	4.8	31'
			40'	5.1	1.9	2.7	5.8	40'	3.9	1.7	2.3	7.0	
		8'	20'	9.4	5.1	1.8	3.0	20'	7.3	4.2	1.8	3.8	
			34'	5.6	3.0	1.9	3.5	34'	4.3	2.5	1.8	4.3	29'
			40'	4.8	2.3	2.1	4.5	40'	3.7	1.7	2.1	6.1	

** Spacings beyond maximum recommended distances will result in illumination or uniformity levels below IES recommended minimums: 5 average footcandles maintained and 4 to 1 average to minimum uniformity.*

- Single Bay Construction
- Two Luminaires Per Bay



ILLUMINATION LEVELS

- Maintained Footcandles

Calculations considering interreflections with 40% ceiling, floor reflectances and 0% wall.

Calculations per IES recommended practice with no interreflections considered.

Lamp	Bay Width	Mounting Height To Fixture Aperture	Typical Spacings	Avg. F.C.	Min. F.C.	Avg/ Min.	Max./ Min.	Typical Spacings	Avg. F.C.	Min. F.C.	Avg./ Min.	Max./ Min.	Max.* Spacing
150W MH ED-17 Clear Med. Base 13,500 Initial Lumens Maintenance Factor .80	55'	7'	20'	14.8	8.2	1.8	2.8	20'	11.6	6.7	1.7	3.7	
			34'	9.0	5.1	1.8	3.5	34'	6.8	3.5	2.0	5.7	45'
			40'	7.7	3.5	2.2	5.1	40'	5.9	3.0	2.0	6.6	
		8'	20'	14.0	7.4	1.9	3.0	20'	11.0	5.8	1.9	3.5	
			34'	8.4	4.3	2.0	3.2	34'	6.5	3.5	1.9	3.5	46'
			40'	7.3	3.8	2.0	3.7	40'	5.5	2.5	2.2	4.7	
	60'	7'	20'	14.1	8.3	1.7	2.5	20'	11.3	6.7	1.7	3.4	
			34'	8.5	4.7	1.8	3.4	34'	6.6	3.5	1.9	5.3	44'
			40'	7.5	2.7	2.7	5.8	40'	5.6	2.4	2.3	7.6	
		8'	20'	13.4	7.4	1.8	3.0	20'	10.5	5.9	1.8	3.7	
			34'	8.1	4.4	1.8	3.3	34'	6.2	3.5	1.8	4.2	44'
			40'	6.9	3.8	1.9	3.8	40'	5.3	2.5	2.1	5.7	

Lamp	Bay Width	Mounting Height To Fixture Aperture	Typical Spacings	Avg. F.C.	Min. F.C.	Avg/ Min.	Max./ Min.	Typical Spacings	Avg. F.C.	Min. F.C.	Avg./ Min.	Max./ Min.	Max.* Spacing
100W MH ED-17 Clear Med. Base 8,500 Initial Lumens Maintenance Factor .72	55'	7'	20'	8.2	4.6	1.8	3.1	20'	6.5	3.4	1.9	4.2	
			34'	5.0	2.5	2.0	4.4	34'	3.8	1.8	2.1	5.9	26'
			40'	4.3	2.0	2.2	5.7	40'	3.3	1.4	2.3	7.7	
		8'	20'	7.8	4.2	1.9	3.0	20'	6.2	2.9	2.1	4.3	
			34'	4.7	1.9	2.5	4.1	34'	3.7	1.7	2.2	4.2	24'
			40'	4.1	1.8	2.3	4.2	40'	3.1	1.3	2.4	5.4	
	60'	7'	20'	7.9	4.6	1.7	3.1	20'	6.3	3.5	1.9	4.6	
			34'	4.8	2.6	1.8	4.5	34'	3.7	1.8	2.1	7.1	25'
			40'	4.1	1.6	2.6	7.4	40'	3.2	1.4	2.2	9.0	
		8'	20'	7.4	4.2	1.8	3.0	20'	5.9	2.9	2.0	4.1	
			34'	4.5	2.0	2.3	4.3	34'	3.5	1.7	2.1	4.4	23'
			40'	3.9	1.8	2.1	4.5	40'	3.0	1.3	2.3	5.5	

** Spacings beyond maximum recommended distances will result in illumination or uniformity levels below IES recommended minimums: 5 average footcandles maintained and 4 to 1 average to minimum uniformity.*

SPECIFICATIONS

GENERAL
The Gardco GP1 is a cutoff garage luminaire utilizing medium base HID lamps to 200W. Each luminaire features a die cast electrical canopy, an acrylic housing with an uplight window, a vacuum metalized faceted downlight reflector system and an acrylic lens. Units are totally sealed and suitable for damp and wet locations.

QUICK MOUNT PLATE
A die formed 14 ga. galvanized steel plate is supplied for mounting to a recessed, surface or rigid pendant hung 4" j-box (standard j-box and rigid pendant by others). An integral hanger tab on the plate supports the luminaire during wiring.

UPPER ELECTRICAL CANOPY
The die cast aluminum canopy houses the ballast and wiring splices. After wiring, the canopy swings up and snaps securely to the quick mount plate without tools.

HOUSING
The housing consists of a one-piece acrylic housing with prismatic uplight window and opaque lower side section. The housing is fully gasketed to the upper canopy.

DOWNLIGHT REFLECTOR
Semi-specular metalized aluminum facets are precisely positioned to provide highly efficient Type 1R (rectangular) lighting distributions and sharp cut-off of source brightness at normal viewing angles.

UPLIGHT REFLECTOR
The hydroformed and anodized aluminum reflector is designed to generate illumination on the ceiling and vertical surfaces.

DOWNLIGHT LENS
An injection molded UV resistant acrylic lens is retained with captive fasteners. The lens hinges down for relamping. Memory retentive silicone gasketing seals the lens to the housing.

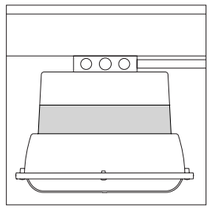
ELECTRICAL
Each high power factor ballast is the separate component type, capable of providing reliable lamp starting down to -20Þ F. Component-to-component wiring within the luminaire will carry no more than 80% of rated current and is listed by UL for use at 600 VAC at 150Þ C or higher. Plug disconnects are listed by UL for use at 600 VAC, 15A or higher.

FINISH
The upper canopy is finished with polyester powdercoat. The opaque housing section is finished with acrylic lacquer. Architectural grey finish is standard.

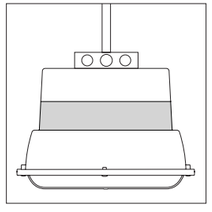
LABELS
All fixtures bear UL or CSA/CUL (where applicable) Wet Location labels.

Gardco Lighting reserves the right to change materials or modify the design of its products without notification as part of the company's continuing product improvement program.

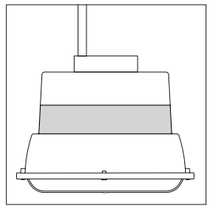
MOUNTING OPTIONS DIMENSIONS



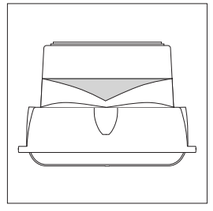
Flush or surface mounting is easily accomplished with a galvanized steel quick mount plate (standard j-box by others).



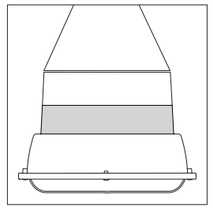
For rigid pendant mounting to conduit (by others), the Gardco quick mount plate is directly attached to a standard 4" j-box, as in surface ceiling mounted applications.



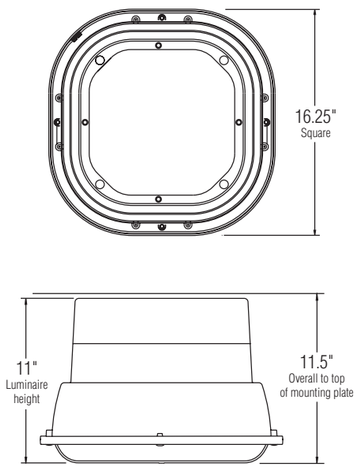
An offset, self-leveling j-box balances the luminaire in those cases where the pendant mount is free swinging. (Swivel ceiling canopy and pendant by others.) For this option specify JB when ordering.



The DR (Downlight Only Reflector) option provides an additional spun aluminum lower reflector which will significantly increase pavement illumination and mask any undesired uplight.



Practical options include a bird excluding shroud which prevents nesting and perching, reducing dirt and maintenance. A 12" minimum pendant length required.



QUADRA ORDERING

	PREFIX	WATTAGE	VOLTAGE[3]	OPTIONS
Example	GP1	175 MH	120	Poly

GP1

70 HPS
100 HPS
150 HPS
70 MH
100 MH
150 MH
175 MH
175 PSMH
200 MH[1]

120
208
240
277
347

MH Metal Halide
PSMH Pulse Start Metal Halide
HPS High Pressure Sodium

1. ANSI #M136
2. The GP1 is available in Industrial Grey only.

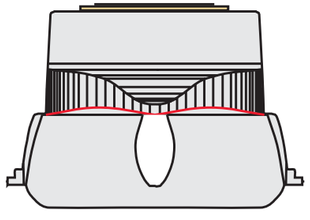
Consult factory for electronic Metal Halide ballast availability.

◄ For rigid pendant mounting to conduit (by others) the Gardco quick mount plate is directly attached to a standard 4" j-box, as in routine ceiling mounted applications.

► An offset, self-leveling j-box balances the luminaire in those cases where the pendant mount is free swinging. Pendant by others. For this option please specify JB when ordering.

◄ Practical options include a bird shroud which prevents nesting and perching, reducing dirt and maintenance. 12" minimum pendant length required. Bird shroud is furnished standard in black.

► Standard GPI Optical system features a set metalized aluminum facets precisely positioned to provide a highly efficient Type 1R distribution. Uplight reflector directs light through uplight window to create illumination on the ceiling and beams.



*The DR (Downlight Only Reflector) option provides an additional spun aluminum lower reflector which will significantly increase pavement illumination and mask, any undesired uplight.

QS
Quartz Standby, DC Bayonet Socket
Automatically activates an internal quartz lamp (100w maximum) following a momentary power interruption. The quartz lamp remains on until the HID lamp restrikes.

QST
Quartz Standby, Timed Bayonet Socket
Automatically activates an internal quartz lamp (100w maximum) following a cold start or a momentary power interruption. The quartz lamp remains on until after the main HID lamp reaches an acceptable intensity level.

Q924
Quartz Emergency Socket only
(100W maximum)

POLY
Polycarbonate Downlight Lens

TP
Spanner Head
Tamper Resistant Screws

F
Fusing

DR
Supplementary Downlight Reflector
(Provides additional area illumination and masks uplight.)

BX
Bird Excluding Shroud
(For pendant mounted units.)

JB
Balanced j-box with offset Knock-out
(For non-rigid sway pendant mount.)

LFI
Lamp factory installed

IRS
Instant Restrike
(HPS only. Contact factory.)

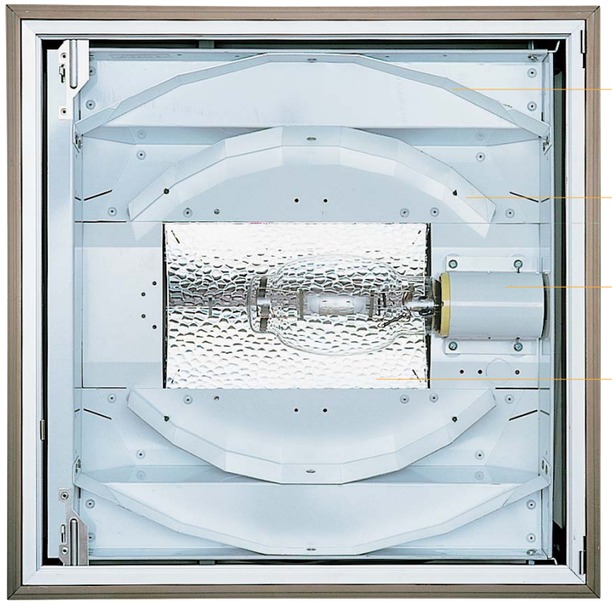
TM
Trunnion Mount

KWR
Kilowatt reduction option (Contact factory.)

THE FORM TEN SCA

The Gardco Form Ten SCA luminaire incorporates outstanding mechanical, electrical and photometric features that make it ideal for lighting parking structures. Six sophisticated sharp cutoff optical assemblies provide glare control with uniform light distribution.

Design, quality of materials and craftsmanship combine to produce a luminaire that is easy to install and service and resists damage and weather. The housing is extruded, anodized aluminum. Corners are precisely mitered and silicone gasketing throughout excludes moisture, dirt and insects.



Reflector facets are designed to achieve six distribution patterns.

Two levels of mirror-polished reflector facets are precisely aligned to distribute light in predictable, uniform, glare-free patterns.

The porcelain lampholder has a nickel plated screwshell and spring reinforced center contact for longer life.

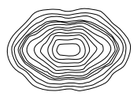
The configured uplight recovery box directs uplight lamp lumens out and away from the area directly below the luminaire, eliminating hot spots.

HIGH PERFORMANCE OPTICAL SYSTEMS

Gardco luminaires outperform competitive products in controlling glare and economically providing illumination of garages with excellent uniformity, regardless of ceiling configuration.

The complex optical assembly eliminates the hot spots, dark spots, streaks and striations generated by many other types of luminaires. Each Gardco optical system is designed to maximize the output of lamp lumens into desired areas. Light is precisely and predictably site-confined and gale at normal viewing angles is eliminated.

Gardco has developed its command of optics into a system of six distribution patterns. The precision of each distribution pattern is remarkable – no competitive system offers the designer as much versatility.



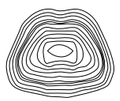
TYPE I (HORIZONTAL LAMP)
A symmetrical pattern with light equally distributed to either side of luminaire. Provides widest spread of light across parking bays while minimizing glare in the direction of driving lanes. Ideally suited to typical parking bay configurations.

TYPE VI (VERTICAL LAMP)
Similar to Type I except with a vertically mounted lamp. This optical system was developed specifically for parking garages where high minimum footcandles are desired. Efficiency and distribution exceed the Type I. With the lamp in the vertical position, glare control is not as precise.

TYPE V (HORIZONTAL LAMP)
A square distribution ideal for essentially grid patterns. The type VQ eliminates the energy wasting overlap of circular patterns.

TYPE VS VERTICAL SQUARE (VERTICAL LAMP)
Designed to provide extremely broad, square distribution of light. A high efficiency reflector for use in higher ceiling applications or where higher minimum footcandle levels are desired. Glare control is not as precise as horizontally mounted lamp designs.

TYPE FM FLOODLIGHT (HORIZONTAL LAMP)
Excellent for wall mounting or anywhere illumination must be sharply confined in one area. Forward throw with sharp "houseside" cutoff makes this reflector ideal for perimeter mounting in open garages where light is to be confined.



TYPE III (HORIZONTAL LAMP)
The Type III is an asymmetrical distribution quite often ideal for entry lanes and near perimeter locations.

Significantly greater luminaire spacings are available with the Gardco SCA than with competitive luminaires because the optical system projects lamp lumens out and away from the lamp. With fewer luminaires, savings in installation, maintenance and energy costs are achieved.

PHOTOMETRICS
Photometric data presented is based on a 150 watt HPS lamp (initial footcandles) at a mounting height of 8'6" from garage floor to bottom of luminaire. For other lamps and mounting heights use the factor tables provided.

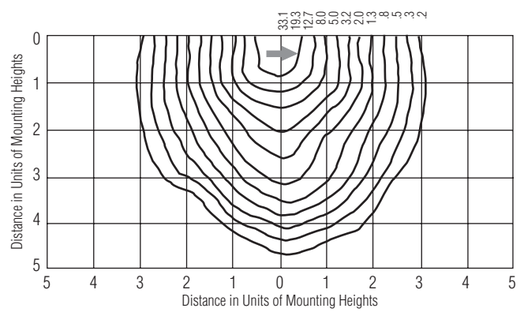
LAMP FACTOR TABLE

Lamp		Lumens	Multiplier
70	HPS	6300	.39
100	HPS	9500	.59
150	HPS	16000	1.00
200	HPS	22000	1.37
100	MH	8500	.53
175	MH	15000	.94

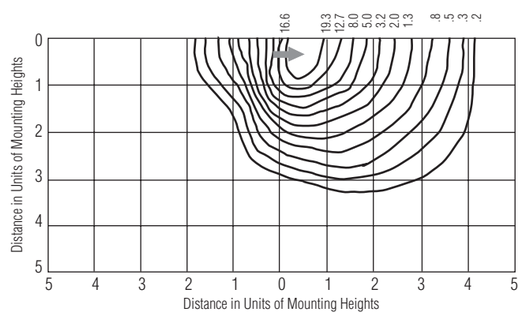
MOUNTING HEIGHT FACTOR TABLE

Mounting Height	Multiplier
7'	1.47
8'	1.13
8'6"	1.00
9'	.89
10'	.72

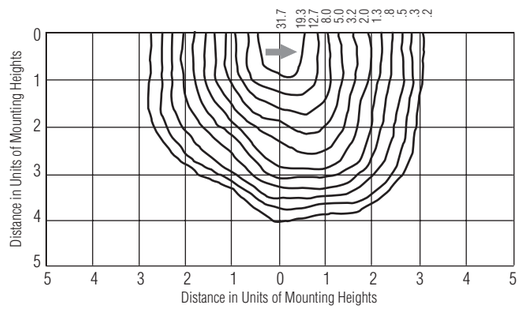
TYPE I (HORIZONTAL LAMP)



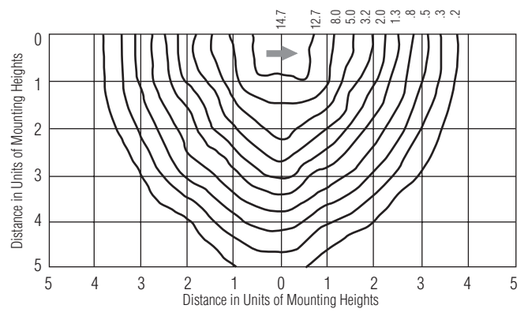
TYPE FM (HORIZONTAL LAMP)



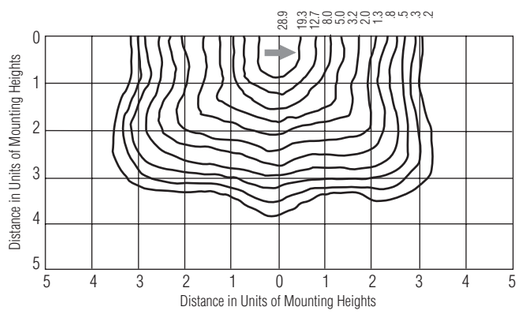
TYPE III (HORIZONTAL LAMP)



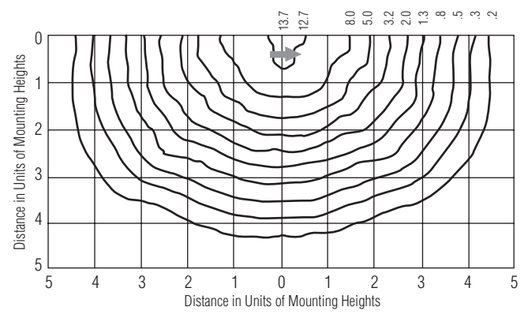
TYPE VI (VERTICAL LAMP)



TYPE V QUADRATE (HORIZONTAL LAMP)



TYPE VS (VERTICAL LAMP)



SCA SPECIFICATIONS

GENERAL DESCRIPTION
Each Gardco SCA style ceiling mounted unit is a rectilinear sharp cutoff luminaire for high intensity discharge lamps. The luminaire is totally enclosed, dust-tight and weather and corrosion resistant.

HOUSING
The sides are composed of precisely mitered, anodized aluminum extrusions. The top pan is press-formed with a returned perimeter flange that interlocks with the housing sides. Pressure injected silicone provides a continuous weathertight seal at all miters and points of material transition.

DOOR/LENS ASSEMBLY
The anodized extruded aluminum door frame segments retain the optically clear, heat and impact-resistant, tempered flat glass lens in a sealed manner against the housing using hollow section, high compliance, memory retentive extruded silicone gasketing. The door assembly hinges to the housing with concealed stainless steel hinge pins.

OPTICAL SYSTEMS
The segmented optical system is homogeneous sheet aluminum, electro-chemically brightened, anodized and sealed. The segmented reflectors are set in faceted arc image duplicating patterns to achieve IES Type I, (1), III (3), IV (FM) and V (Q, V1, VS) distributions.

ELECTRICAL
Each high power factor ballast is the separate component type, capable of providing reliable lamp starting down to -20Þ F. The ballast is secured within the luminaire, adjacent to the reflector system. Component-to-component wiring within the luminaire will carry no more than 80% of rated current and is listed by UL for use at 600 VAC at 150Þ C or higher. Plug disconnects are listed by UL for use at 600 VAC, 15A or higher.

FINISH
Units are available with Architectural Class I anodized or electrostatically applied, thermally cured polyester TGIC powdercoat finish.

LABELS
All fixtures bear UL or CSA/CUL (where applicable) Damp Location Labels.

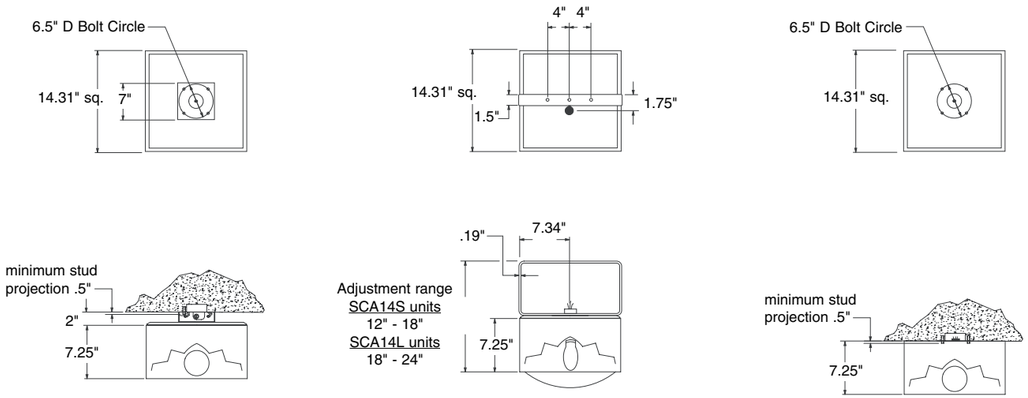
DIMENSIONS

SCA-J STYLE – QUICK MOUNT BOX
Each SCA-J style luminaire is supplied with a 14 gauge galvanized steel junction box with integral slots permitting 90Þ rotation capability for luminaire alignment. This ceiling mounted steel box may attach directly to a 4" octagonal recessed outlet box (by others) or directly to the ceiling 3/8" studs (by others) through (4) 7/16" diameter holes provided. The box is provided with (4) knockouts for 1/2" and 3/4" surface conduit. A 16 gauge galvanized steel mounting bracket attaches to the luminaire top pan and provides hinging slots permitting servicing of unit in a captive manner. Four (4) tamper-proof mounting screws lock the luminaire to the box in a fixed position.

SCA-S & L STYLE – TRUNNION-MOUNTED
All Gardco SCA-S and L style luminaires are designed to mount to a concrete ceiling with a dieformed, anodized aluminum trunnion bracket assembly. The trunnion assembly permits (6) one inch incremental mounting height adjustments. A 1/2" I.P.S. weatherproof diecast aluminum hub with an integral O-ring is located on the top pan for field attachment of rigid or flexible conduit (by others).

TRUNNION BRACKET ASSEMBLY
The upper and lower trunnions bolt together with 1/4-20 carriage bolts and provide vertical height adjustment. The upper trunnion has a central 17/32" diameter hole providing pivotal alignment and (2) 13/32" diameter outboard mounting holes ensuring rigid ceiling attachment.

SCA-D STYLE – FLUSH-MOUNT
Each Gardco SCA-D style luminaire is designed to mount to a concrete ceiling (directly beneath recessed outlet box) with (4) 3/8" mounting studs (by others). The 2 3/4" diameter access hole in the top pan is sealed with a gasketed cover plate providing external wire leads for supply connection.



SCA ORDERING

GENERAL DESCRIPTION: The Gardco Form 10 SCA luminaire incorporates outstanding mechanical, electrical and photometric features that make it ideal for lighting parking structures. Six (6) sophisticated sharp cutoff optical assemblies provide glare control with uniform light distribution. Design, quality of materials and excellence of workmanship combine to produce a luminaire that is easy to install and service, and resists damage and weather. The housing is extruded, anodized or polyester powder coated aluminum. Corners are precisely mitered and silicone gasketing throughout excludes moisture, dirt and insects.

	PREFIX	MOUNTING	DISTRIBUTION	WATTAGE		VOLTAGE	FINISH	OPTIONS
Example	SCA 14	J	3	175MH		120	BRP	POLY
	SCA 14	J Quick Mount Box D Direct to Ceiling (N/A w/FM optics or 200HPS or 250MH lamp) S Trunnion Mounting 12" - 18" L Trunnion Mounting 18" - 24"	**Horizontal** 1[1] Type I 3[1] Type III FM[1] Type IV Forward Throw Q[1] Type V **Vertical** V1[2] Type 1 VS[2] Type V	**Mogul Base** 175MH 200MH 250MH 70HPS 100HPS 150HPS 200HPS	**Medium Base** 100MH 150MH 175MH 200MH[3] 175PSMH[3] 70HPS 100HPS 150HPS	120 208 240 277 QUAD 120/208/240/277 factory tied to 277V	BLA BRA NA BRP BLP NP OC SC	F SH POLY QS QST

MH Metal Halide
PSMH Pulse Start Metal Halide
HPS High Pressure Sodium

1. Mogul Base is supplied standard, except for 100MH.
2. Vertical Lamp optics require medium base lamps and high temperature resisting thermoplastic sag lens (Supplied standard).
3. Vertical Lamp only.

Finish:
- BLA Black Anodized
- BRA Bronze Anodized
- NA Natural Anodized
- BRP Bronze Paint
- BLP Black Paint
- NP Natural Aluminum Paint
- OC Optional Color Paint
  Specify RAL designation as shown in Color Selection Guide. ex: OC-RAL7024
- SC Special Color Paint
  Specify. Must supply color chip

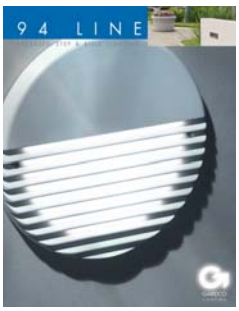
Options:
- F Fusing
- SH Spanner Head Access Screw
- Poly Vandal Resistant Sag Polycarbonate Lens
  (Horizontal Lamps or medium base vertical lamps only)
- QS Quartz Standby, DC Bayonet Socket
  Automatically activates an internal quartz lamp (100W maximum) following a momentary power interruption. The quartz lamp remains on until the HID lamp restrikes.
- QST Quartz Standby, Timed Bayonet Socket
  Automatically activates an internal quartz lamp 100W maximum) following a cold start or a momentary power interruption. The quartz lamp remains on until after the main HID lamp reaches an acceptable intensity level.

Form Ten Round

Gardco Sconce

Floodlight

Step and Aisle Lights



GARDCO
LIGHTING

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