LED PRODUCT

TORNADO™ BOLLARD

PATENTS PENDING

U.S. ARCHITECTURAL LIGHTING

Day

Tornado Bollard

Unlike any bollard available in today's specification pallet, Tornado offers a new form and character for pedestrian scale lighting. Tornado adds an "exclamation point" to its surrounding architecture and hardscape because of its unique inverted shape that is sculptural, dynamic, and functional. The Tornado Bollard will bring uniqueness and originality to any architectural site.

Night

Tornado Bollard

Optics for the Tornado Bollard have been concealed from any view above horizontal. Therefore, Tornado provides glare free illumination to enhance safety and security for pedestrian traffic. In addition, surface reflections from surrounding paving softly delineate the fixture. Furthermore, the angled face glows, establishing visual direction or perimeter boundaries as defined by the bollard locations.

Selection Guide

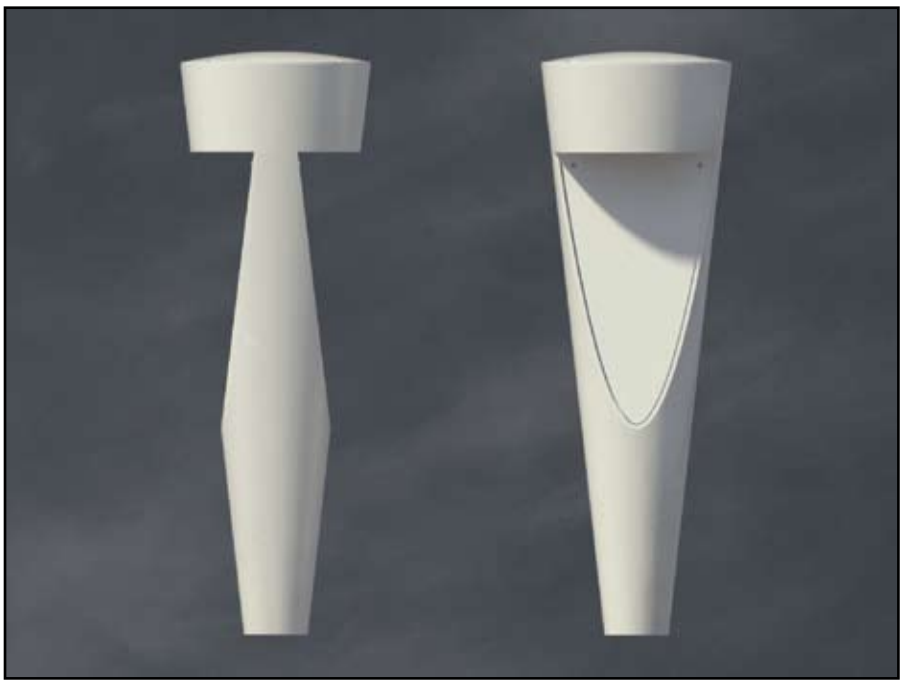
Form

TNA

The TNA produces an asymmetric light distribution which is clearly expressed by its outward appearance. This model is ideal for pathways and driveways where illumination is desired from the perimeters, the actual bollards define visual direction and boundaries for both people and vehicles.

TNS

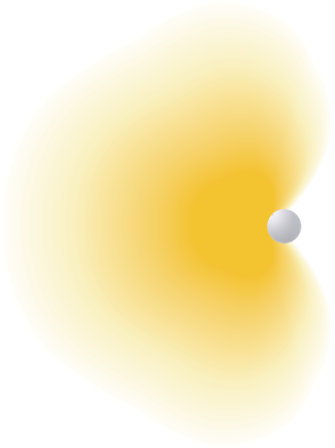
The TNS generates a symmetric light pattern for open pedestrian areas where illumination is required on all sides of the bollard. Its design is complementary to the TNA as both models are typically used together on projects. Even when located on perimeters, the TNS can illuminate both hardscape on one side and landscape on the opposite side.



Function

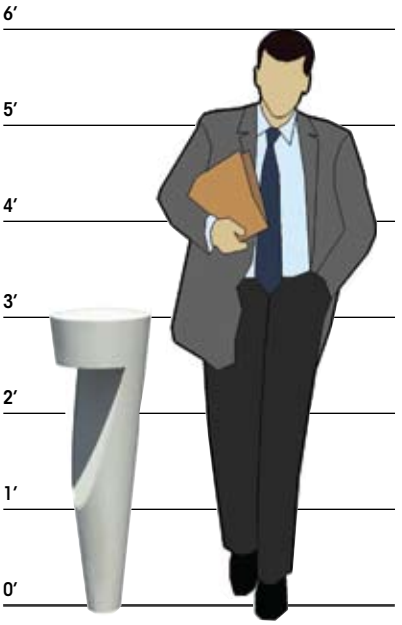
Asymmetric light distribution for bollard placements along perimeters or curbs.

Elevation

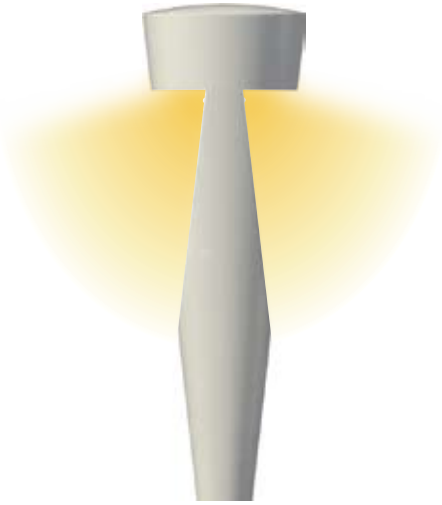


Plan

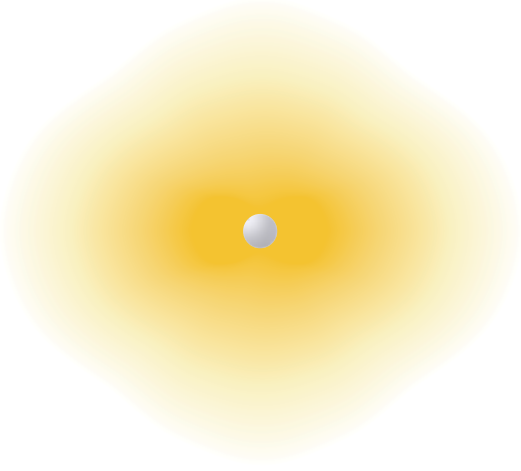
Scale



Symmetric light distribution for bollard placements in open areas.



Elevation



Plan

Mechanical Features

Top Cover is heavy wall cast aluminum, fully gasketed, and domed for water runoff. Retainer screws are stainless steel allen head and are installed in open cavities.

Reflectors are self contained modules accessed through the top cover for lamp replacement. Medium base sockets are used for MH and HPS lamp modes. A GX24q-4 socket is used for compact fluorescent. Exclusive US Architectural Three-Stage LED System is available (consult factory).

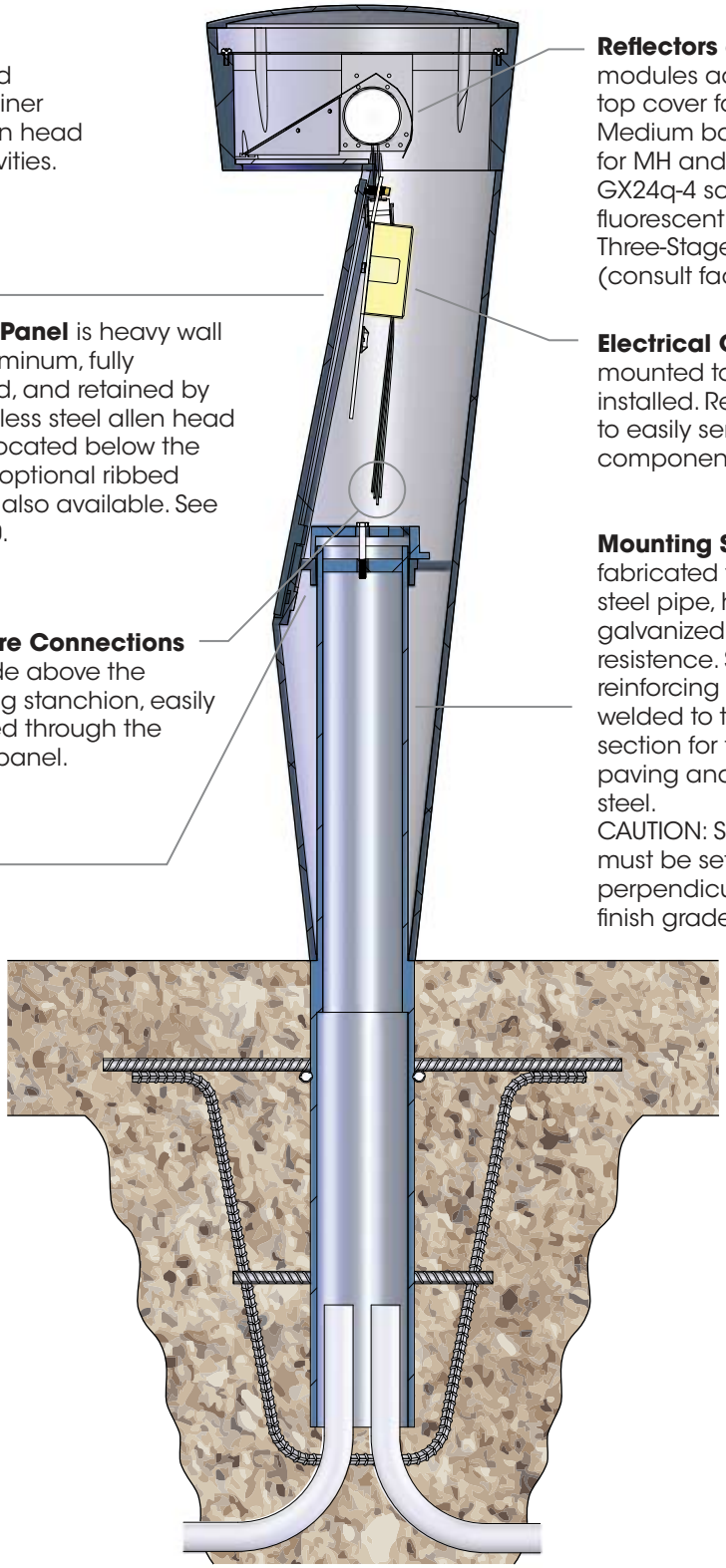
Access Panel is heavy wall cast aluminum, fully gasketed, and retained by (2) stainless steel allen head screws located below the lens. An optional ribbed panel is also available. See page 10.

Electrical Components are mounted to a harness and shipped installed. Remove access panel to easily service electrical components.

Field Wire Connections are made above the mounting stanchion, easily accessed through the access panel.

Mounting Stanchion is fabricated from SCH40 steel pipe, hot dipped galvanized for corrosion resistence. Steel reinforcing bars are welded to the lower section for tie-in to the paving and footing steel.
CAUTION: Stanchion must be set perpendicular to finish grade.

Body Lock is made at the stanchion top for maximum strength and rigidity. A single bolt tightens and centers the body onto the stanchion.



Concrete deck, footing, reinforcing steel and conduit runs by others per local codes.

Optical Features

Low Brightness

The Tornado Bollard has been designed so that the lamp and lens are never seen from normal viewing angles. This results in very low fixture brightness for increased pedestrian visibility and safety. In addition, bollards need to be visible at night because they delineate boundaries and direction for pedestrian traffic. Because of its reverse taper, Tornado is nicely illuminated by surface reflections from surrounding pavement allowing the unique form to be visible at night.

(TNS model shown)

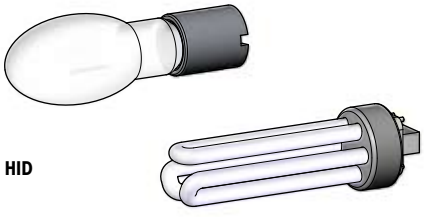
Smooth Illumination

The lighting effect from Tornado can best be described as soft, meaning that it is void of streaks, shadows and hard edges so common with other bollards. Tornado accomplishes this through the use of a special Micro-Prism lens that softens and spreads the light. Tornado invites the pedestrian to travel from bollard to bollard by creating pools of diffuse illumination.

Three Lamp Modes

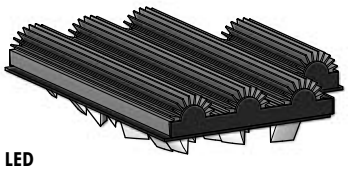
Tornado is available in HID (39-100W), Compact Fluorescent (26-57W) and LED.

Consult factory for specifications on US Architectural's exclusive new 3-Stage LED system. Patent Pending.



HID

CFL



LED

Specifications

Housing Durable corrosion resistant low copper cast aluminum alloy A356 (<0.2% Cu) having a minimum wall thickness of ¼". Body secures to Mounting Stanchion by means of a cast aluminum wedge lock secured by a single stainless steel bolt and accessed through the access panel.

Top Cover Durable corrosion resistant low copper cast aluminum alloy A356 (<0.2% Cu) having a minimum wall thickness of ¼". Top is crowned for water run off, and retainer screw cavities are open for drainage. Top is fully gasketed and secured by (4) stainless steel allen screws.

Access Panel(s) Durable corrosion resistant low copper cast aluminum alloy A356 (<0.2% Cu) having a minimum wall thickness of ¼". Panel(s) is fully gasketed and retained by (2) stainless steel allen screws located below the lens.

Lens Tempered Micro-Prism glass, fully gasketed, and retained by aluminum clips.

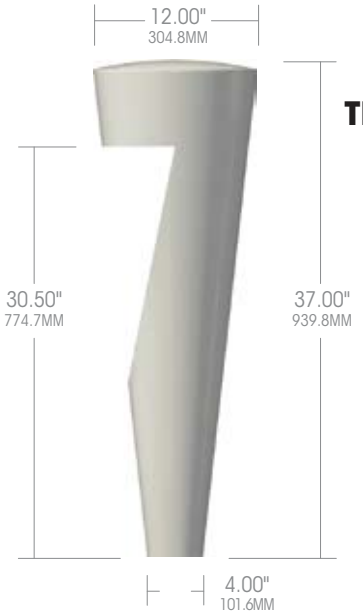
Reflector Assembly Fabricated from pre-finished reflector material, and includes a 4KV medium base or G12 socket for HID lamp modes. Fluorescent socket is universal for 26W, 32W, or 42W PL-T lamps. GX24-q5 base supplied for 57W PL-T lamp. Reflector assembly connects to ballast assembly via quick-disconnect plugs.

Mounting Stanchion 3½" SCH40 steel pipe (below grade) welded to 3" SCH 40 steel pipe (above grade). (4) sections of reinforcing bar welded to lower pipe for tie-in to paving and footing steel by others. Entire assembly is hot dipped galvanized.

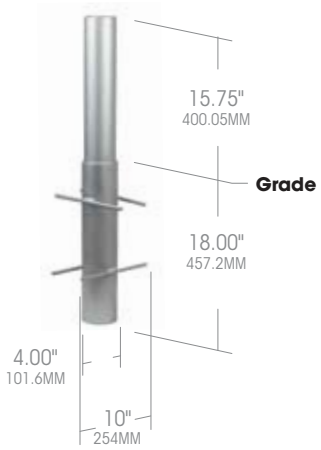
Electrical Components All electrical components are UL recognized. **Electronic MH ballasts** are high power factor, -20F starting, 120-277V, 50Hz/60Hz. 347V option utilizes a step down transformer to the electronic ballast. **Magnetic MH ballasts** are high power factor, -20F starting, multi-tap 120-277V, 60Hz. All **HPS ballasts** are core and coil, reactor-style, high power factor, -40F starting, 120V. **Compact Fluorescent ballast** is electronic, 120-277V, 50Hz/60Hz. Electrical components are mounted to a unitized ballast tray inside the body, and factory installed. Ballast assembly connects to reflector assembly via quick disconnects. (Consult factory for LED electrical specifications).

Note: Consult factory for CFL battery back-up specifications.

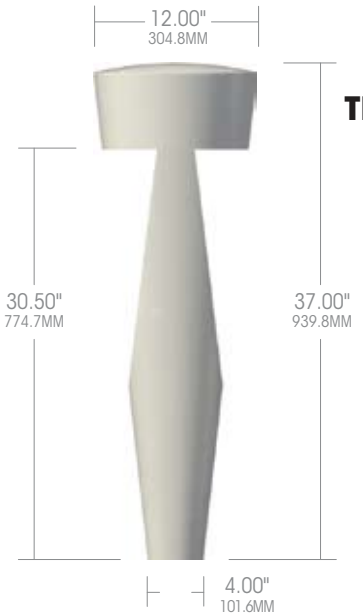
Finish Electrostatically applied TGIC Polyester Powder Coat on substrate prepared with 20 PSI power wash at 140°F. Four step iron phosphate pretreatment for protection and paint adhesion. 400°F bake for maximum hardness and durability.



TNA



Mounting Stanchion
Supplied with each Bollard



TNS

Lamp / Electrical Guide

LAMP WATTS	LAMP TYPE	BULB TYPE	INITIAL LUMENS	LIFE (HOURS)	ANSI CODE	STARTING TEMP.	CIRCUIT TYPE	SYSTEM WATTS	VOLTS	MAX INPUT AMPS	MIN. FUSE AMPS
PULSE START METAL HALIDE											
39	PSMH	Clear, T6, G12 Base	3,300	12,000	M130	-20°F	Electronic	45	120	0.38	2
								44	277	0.16	2
50	PSMH	Clear, ED17, Med Base	3.750	20,000	M110	-20°F	Electronic	55	120	0.47	2
								56	277	0.20	2
					M148		HX-HPF	67	120	1.20	3
								67	208	.68	3
								67	240	.59	2
								67	277	.51	2
70	PSMH	Clear, ED17, Med Base	5,900	24,000	M98	-20°F	Electronic	82	120	0.68	2
		Clear, T6, G12 Base	6,600	12,000	M139			81	277	0.31	2
					M143		HX-HPF	90	120	1.90	4
								90	208	1.00	3
								90	240	0.90	2
								90	277	0.80	2
								90	347	0.70	2
					M139			94	347	0.65	2
100	PSMH	Clear, ED17, Med Base	9,000	24,000	M90	-20°F	Electronic	115	120	0.96	3
								113	277	0.42	3
					M140		HX-HPF	129	120	2.30	6
								129	208	1.40	4
								129	240	1.20	3
								129	277	1.00	3
HIGH PRESSURE SODIUM											
50	HPS	Clear, ED17, Med Base	4,000	24,000	S68	-40°F	R-HPF	62	120	1.00	3
70	HPS	Clear, ED17, Med Base	6,300	24,000	S62	-40°F	R-HPF	86	120	1.30	3
100	HPS	Clear, ED17, Med Base	9,500	24,000	S54	-40°F	R-HPF	115	120	1.80	5
COMPACT FLUORESCENT											
42	CFL	Coated, GX24q-4 Base	3,200	16,000		0°F		46	120	0.38	2
									208	0.23	2
									240	0.20	2
									277	0.17	2
57	CFL	Coated, GX24q-5 Base	4,300	16,000				59	120	0.50	2
									208	0.28	2
									240	0.25	2
									277	0.21	2

NOTES:

① U.S. Architectural Lighting's Lamp and Electrical Guide is for reference only. ALWAYS consult lamp manufacturer's data for exact technical specifications.

② All Initial Lumen values shown are approximate and may vary from one manufacturer to another.

WARNING: All fixtures must be installed in accordance with local codes or the National Electrical Code. Failure to do so may result in serious personal injury.

U.L. Listed for wet location **IP65**

Photometrics

Metal Halide

	Wattage	Lamp	Initial Lumens
A	50W MH	ED17 med. base, clear	3500
B	70W MH	ED17 med. base, clear	6200
C	100W MH	ED17 med. base, clear	8500
D	50W HPS	ED17 med. base, clear	4000
E	70W HPS	ED17 med. base, clear	6300
F	100W HPS	ED17 med. base, clear	9500

Note: A, C, D, E and F column numbers prorated from 70w MH ED17.

Compact Fluorescent

	Wattage	Lamp	Initial Lumens
A	26W CFL	GX24q-3 base CFL	1700
B	32W CFL	GX24q-3 base CFL	2200
C	42W CFL	GX24q-4 base CFL	3200
D	57W CFL	GX24q-5 base CFL	4300

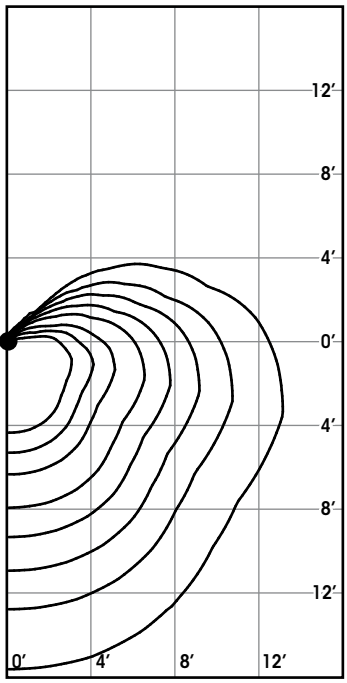
Note: A, B and D column numbers prorated from 42w CFL.

Typical Half

Initial Horizontal Footcandles

TNA

F	E	D	C	B	A
30.65	20.32	12.90	27.42	20	11.29
15.32	10.16	6.45	13.70	10	5.65
7.66	5.08	3.23	6.85	5	2.82
3.06	2.03	1.29	2.74	2	1.13
1.53	1.02	0.65	1.37	1	0.56
0.77	0.51	0.32	0.69	0.50	0.28
0.38	0.25	0.16	0.34	0.25	0.14
0.15	0.01	0.06	0.14	0.10	0.06

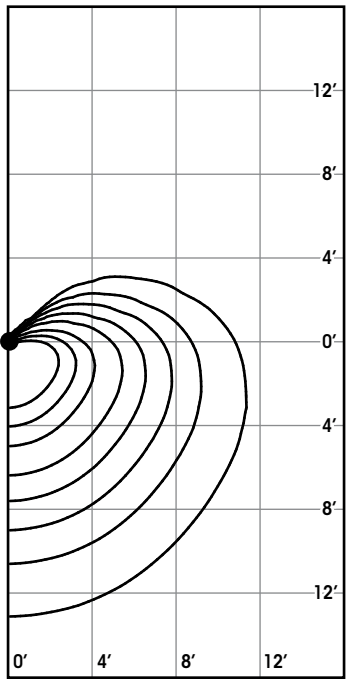


Typical Half

Initial Horizontal Footcandles

TNA

D	C	B	A
26.88	20	13.75	10.63
13.44	10	6.88	5.31
6.72	5	3.44	2.66
2.69	2	1.38	1.06
1.34	1	0.69	0.53
0.67	0.50	0.34	0.27
0.34	0.25	0.17	0.13
0.13	0.10	0.07	0.05

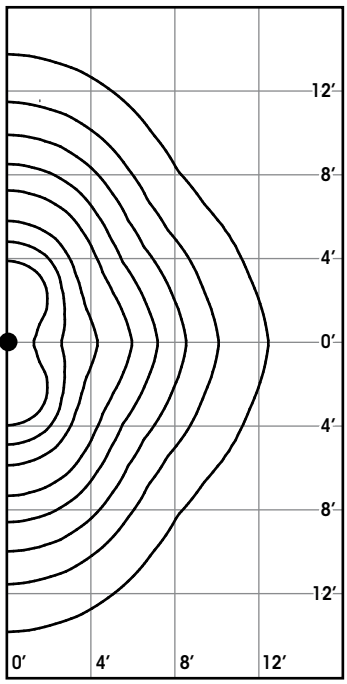


Typical Half

Initial Horizontal Footcandles

TNS

F	E	D	C	B	A
30.65	20.32	12.90	27.42	20	11.29
15.32	10.16	6.45	13.70	10	5.65
7.66	5.08	3.23	6.85	5	2.82
3.06	2.03	1.29	2.74	2	1.13
1.53	1.02	0.65	1.37	1	0.56
0.77	0.51	0.32	0.69	0.50	0.28
0.38	0.25	0.16	0.34	0.25	0.14
0.15	0.01	0.06	0.14	0.10	0.06

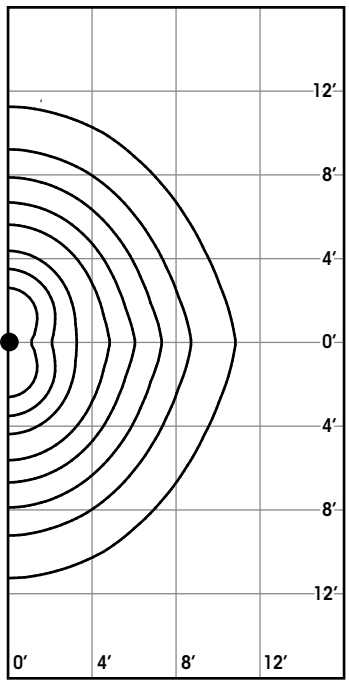


Typical Half

Initial Horizontal Footcandles

TNS

D	C	B	A
26.88	20	13.75	10.63
13.44	10	6.88	5.31
6.72	5	3.44	2.66
2.69	2	1.38	1.06
1.34	1	0.69	0.53
0.67	0.50	0.34	0.27
0.34	0.25	0.17	0.13
0.13	0.10	0.07	0.05



Ordering Information

Ordering Example:

TNA / 70PSMH120 / RAL-7004-T / RAP

Model	Electrical Mode	Finish	Options
1	2	3	4-5

1 Model

TNA
Asymmetric
Light Distribution

TNS
Symmetric
Light Distribution

2 Electrical Mode

Example:

Lamp Watts	Lamp Type	Specific Line Volts
100	**PSMH**	**347**

Pulse Start Metal Halide 1

39PSMH120-T6
39PSMH208-T6
39PSMH240-T6
39PSMH277-T6

50PSMH120
50PSMH208
50PSMH240
50PSMH277

70PSMH120
70PSMH208
70PSMH240
70PSMH277
70PSMH347-M 2

70PSMH120-T6
70PSMH208-T6
70PSMH240-T6
70PSMH277-T6

100PSMH120
100PSMH208
100PSMH240
100PSMH277

High Pressure Sodium

50HPS120

70HPS120

100HPS

Compact Fluorescent 3

42PL120
42PL208
42PL240
42PL270

57PL120
57PL208
57PL240
57PL270

LED

TNA	TNS
24LED120	**28LED120**
24LED208	**28LED208**
24LED240	**28LED240**
24LED277	**28LED277**

Notes:
1. Metal Halide magnetic ballasts available. Add **-M** designation to the above catalog number.
   EXAMPLE: 70PSMH277-M
2. 347V option available only for 70MH magnetic ballast due to size restrictions.
3. 42W, 32W and 26W lamps use the same ballast.

See Specifications for detailed ballast information.

3 Finish

Electrostatically applied TGIC powder coat features a multi-step finishing process to produce a durable weather resistant finish.

Color	Textured	Smooth
Black	**RAL-9005-T**	**RAL-9005**
White	**RAL-9003-T**	**RAL-9003**
Grey	**RAL-7004-T**	**RAL-7004**
Dark Bronze	**RAL-8019-T**	**RAL-8019**
Green	**RAL-6005-T**	**RAL-6005**

Note: Other colors available. Refer to www.usaltg.com/RAL-Colors.html

4 Optional Ribbed Access Panel

RAP
Raised ribs in radiating pattern on Access Panel.

For TNS both Access Panels will be ribbed.

5 Optional Signature Medallion

Logos, medallions and other symbols can be attached to the standard smooth Access Panels.

Consult factory.

TORNADO™ BOLLARD

Product Design by Wayne Compton

MADE IN THE USA

U.S. ARCHITECTURAL LIGHTING

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