SECTION 16511 - INTERIOR LIGHTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes interior lighting fixtures, lighting fixtures mounted on exterior building surfaces, lamps, ballasts, emergency lighting units, and accessories.

B. Related Sections include the following:

1. Division 16 Section "Lighting Control Equipment" for programmable lighting control systems, time switches, additional photoelectric relays, power relays, and contactors.

1.03 SUBMITTALS

A. Product Data: For each type of lighting fixture indicated, arranged in order of fixture designation. Include data on features, accessories, and the following:

1. Dimensions of fixtures.

B. Shop Drawings: Show details of nonstandard or custom fixtures. Indicate dimensions, weights, method of field assembly, components, features, and accessories.

1. Wiring Diagrams: Detail wiring for fixtures and differentiate between manufacturer-installed and field-installed wiring.

C. Coordination Drawings: Reflected ceiling plans and sections drawn to scale and coordinating fixture installation with ceiling grid, ceiling-mounted items, and other components in the vicinity. Include work of all trades that is to be installed near lighting equipment.

D. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

E. Maintenance Data: For lighting fixtures to include in maintenance manuals specified in Division 1 and in Section 16010.

1.04 QUALITY ASSURANCE

A. Fixtures, Emergency Lighting Units, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

B. Comply with NFPA 70.

C. FM Compliance: Fixtures for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM.

D. NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

1.05 COORDINATION

A. Fixtures, Mounting Hardware, and Trim: Coordinate layout and installation of lighting fixtures with ceiling system and other construction.

1.06 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide the products indicated for each designation in the Lighting Fixture Schedule on the drawings.

B. Alternate Manufacturers:

1. Columbia
2. Day-Brite
3. Halo
4. Dual-Lite
5. Prescolite
6. Design Galleries
7. Day-O-Lite
8. Vantage
9. Carolina High Mast
10. Spaulding
11. Gels
12. Emergi-Lite
13. Linear

2.02 FIXTURES AND FIXTURE COMPONENTS, GENERAL

A. Metal Parts: Free from burrs, sharp corners, and edges.

B. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit relamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position.

D. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.
4. Laminated Silver Metallized Film: 90 percent.

E. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or annealed crystal glass, unless otherwise indicated.

1. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and ultra-violet radiation.
2. Lens Thickness: 0.125 inch (3 mm) minimum, unless greater thickness is indicated.

2.03 FLUORESCENT LAMP BALLASTS

A. General Requirements: Unless otherwise indicated, features include the following:

1. Designed for type and quantity of lamps indicated at full light output.
2. Total Harmonic Distortion Rating: Less than 20 percent.

B. Electronic Ballasts for Linear Lamps: Unless otherwise indicated, features include the following, besides those in "General Requirements" Paragraph above:

1. Certified Ballast Manufacturer Certification: Indicated by label.
2. Encapsulation: Without voids in potting compound.
3. Parallel Lamp Circuits: Multiple lamp ballasts connected to maintain full light output on surviving lamps if one or more lamps fail.

C. Ballasts for Compact Lamps in Recessed Fixtures: Electronic.

1. Type: Electronic or electromagnetic, fully encapsulated in potting compound.
2. Power Factor: 90 percent, minimum.
3. Operating Frequency: 20 kHz or higher.
4. Flicker: Less than 5 percent.
5. Lamp Current Crest Factor: Less than 1.7.
6. Transient Protection: Comply with IEEE C62.41 for Category A1 locations.
7. Less than 20% total harmonic distortion.

D. Ballasts for Low-Temperature Environments: As follows:

1. Temperatures 0 Deg F (Minus 17 Deg C) and Above: Electronic or electromagnetic type rated for 0 deg F (minus 17 deg C) starting temperature.
2. Temperatures Minus 20 Deg F (Minus 29 Deg C) and Above: Electromagnetic type designed for use with high-output lamps.

E. Ballasts for Low Electromagnetic Interference Environments: Comply with 47 CFR, Chapter 1, Part 18, Subpart C for limitations on electromagnetic and radio-frequency interference for consumer equipment.

2.04 HIGH-INTENSITY-DISCHARGE LAMP BALLASTS

A. General: Comply with ANSI C82.4. Unless otherwise indicated, features include the following:

1. Type: Constant wattage autotransformer or regulating high-power-factor type, unless otherwise indicated.
2. Operating Voltage: Match system voltage.
3. Minimum Starting Temperature: Minus 22 deg F (Minus 30 deg C) for single lamp ballasts.
4. Normal Ambient Operating Temperature: 104 deg F (40 deg C).
5. Open-circuit operation that will not reduce average life.
6. Auxiliary, Instant-on, Quartz System: Automatically switches quartz lamp on when fixture is initially energized and when momentary power outages occur. Automatically turns quartz lamp off when high-intensity-discharge lamp reaches approximately 60 percent light output.

B. Encapsulation: Manufacturer's standard epoxy-encapsulated model designed to minimize audible fixture noise.

2.05 EXIT SIGNS

A. General Requirements: Comply with UL 924 and the following:

1. Sign Colors and Lettering Size: Comply with authorities having jurisdiction.

B. Internally Lighted Signs: As follows:

1. Lamps for AC Operation: Light-emitting diodes, 70,000 hours minimum rated lamp life.

C. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.

1. Battery: Sealed, maintenance-free, lead-calcium type with special warranty.
2. Charger: Fully automatic, solid-state type with sealed transfer relay.
3. Operation: Relay automatically energizes lamp from unit when circuit voltage drops to 80 percent of nominal or below. When normal voltage is restored, relay disconnects lamps, and battery is automatically recharged and floated on charger.

2.06 EMERGENCY LIGHTING UNITS

A. General Requirements: Self-contained units. Comply with UL 924. Units include the following features:

1. Battery: Sealed, maintenance-free, lead-calcium type with minimum 10-year nominal life and special warranty.
2. Charger: Fully automatic, solid-state type with sealed transfer relay.
3. Operation: Relay automatically turns lamp on when supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps, and battery is automatically recharged and floated on charger.
4. Integral Time-Delay Relay: Arranged to hold unit on for fixed interval after restoring power after an outage. Provides adequate time delay to permit high-intensity-discharge lamps to restrike and develop adequate output.

2.07 LAMPS

A. Fluorescent Color Temperature and Minimum Color-Rendering Index: 3500 K and 85 CRI, unless otherwise indicated.

B. Noncompact Fluorescent Lamp Life: Rated average is 20,000 hours at 3 hours per start when used on rapid-start circuits.

C. Metal-Halide Color Temperature and Minimum Color-Rendering Index: 3600 K and 70 CRI, unless otherwise indicated.

2.08 FIXTURE SUPPORT COMPONENTS

A. Comply with Division 16 Section "Basic Electrical Materials and Methods," for channel- and angle-iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch (12-mm) steel tubing with swivel ball fitting and ceiling canopy. Finish same as fixture.

C. Twin-Stem Hangers: Two, 1/2-inch (12-mm) steel tubes with single canopy arranged to mount a single fixture. Finish same as fixture.

D. Rod Hangers: 3/16-inch- (5-mm-) minimum diameter, cadmium-plated, threaded steel rod.

E. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

F. Aircraft Cable Support: Use cable, anchorages, and intermediate supports recommended by fixture manufacturer.

G. Lay in fluorescent lights: shall be independently supported with a minimum of two support wires on opposite corners of the fixture. Additional support wires to the Tee-bar system at each light fixture will be considered adequate and no separate fixture hangers will be required.

2.09 FINISHES

A. Fixtures: Manufacturer's standard, unless otherwise indicated.

1. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.
2. Metallic Finish: Corrosion resistant.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.

B. Support for Fixtures in or on Grid-Type Suspended Ceilings: Use grid for support.

1. Install a minimum of four ceiling support system rods or wires for each fixture. Locate not more than 6 inches (150 mm) from fixture corners.
2. Fixtures of Sizes Less Than Ceiling Grid: Arrange as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.

C. Suspended Fixture Support: As follows:

1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
4. Continuous Rows: Suspend from cable installed according to fixture manufacturer's written instructions and details on Drawings.

3.02 CONNECTIONS

A. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.03 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Advance Notice: Give dates and times for field tests.

C. Provide instruments to make and record test results.

D. Tests: As follows:

1. Verify normal operation of each fixture after installation.
2. Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.
3. Verify normal transfer to battery source and retransfer to normal.
4. Report results in writing.

E. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

F. Corrosive Fixtures: Replace during warranty period.

3.04 CLEANING AND ADJUSTING

A. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.

B. Adjust aimable fixtures to provide required light intensities.

END OF SECTION

LITHONIA LIGHTING

Catalog Number	
2PM3N GB 332 18ND 120 TCAB EL	
Notes	Type A1

FEATURES & SPECIFICATIONS

INTENDED USE

High performance parabolic luminaires for use in open area applications and electronic offices where optical control, visual comfort and light cut-off are important.

ATTRIBUTES

Design optimized for use with T8 lamps and low-profile electronic ballasts.

Choice of diffuse or specular louvers utilizing the latest developments in louver finishing for minimized louver iridescence.

CONSTRUCTION

Black reveal provides floating louver appearance, conceals optional air-supply slots.

Square cornered end plates improve strength and durability.

Integral T-bar safety clips hold fixture to T-bar securely; no fasteners required.

Heavy gauge hinges die-formed for maximum strength; spring action latches concealed in black reveal.

Housing formed from cold-rolled steel. Louver formed from anodized aluminum. No asbestos used in this product.

Overlapping flange and modular ceiling trims available factory installed with swing gate hangers or field convertible with optional trim and hangers.

FINISH

Five-stage iron-phosphate pretreatment ensures superior paint adhesion. Painted parts finished with high-gloss, baked white enamel.

ELECTRICAL SYSTEM

Thermally-protected, resetting, Class P, HPF, non-PCB, UL Listed, CSA certified ballast is standard.

Electronic ballasts are sound rated A.

Fixture conforms to UL1570 and is suitable for damp locations. AWM, TFN or THHN wire used throughout, rated for required temperatures.

LISTING

UL Listed (Standard), CSA Certified or NOM Certified (see Options).

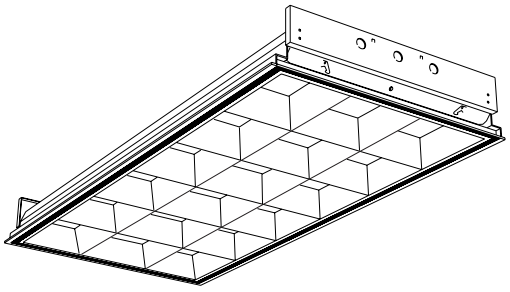
WARRANTY

Guaranteed for one year against mechanical defects in manufacture.

Specifications subject to change without notice.

PARAMAX® Parabolic Troffer

2PM3N 2'x4'



3" Deep Louver

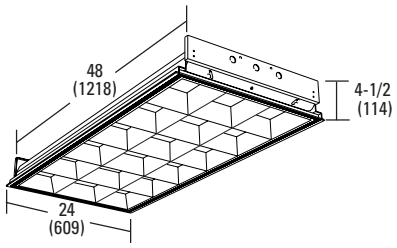
Specifications

Length: 24 (609)

Width: 48 (1218)

Depth: 4-1/2 (114)

Weight: 32 lbs (14.5 kg)



All dimensions are inches (millimeters) unless otherwise specified.

ORDERING INFORMATION

Example: **2PM3N G B 3 32 18LD MVOLT 1/3 GEB10IS**

2PM3N | **G** | **B** | **3** | **32** | **18LD** | **120** | **TCAB EL**

Series

2PM3N Paramax 3" parabolic, 2' wide

Trim type

- **G** Grid
- **F** Overlapping flange
- **MT** Modular fit-in
- **ST** Screw slot

Air function

- **A** Air supply/return (slots in side trim)
- **H** Heat removal (through lamp cavity, dampers available)
- **B** No air function
- **D** Dual function supply/return/removal

Number of lamps

2, 3, 4

Not included.

Lamp type

32 32W T8 (48")

Number of cells

12 , 16 , 18 , 24, 32

Louver finish

- **LD** Low iridescent anodized diffuse silver
- **LS** Low iridescent anodized specular silver

Voltage

120, 277, 347, MVOLT[1]

Others available.

Options[2]

1/3	One 3-lamp ballast
1/4	One 4-lamp ballast
GEB	Electronic ballast, ≤20% THD
GEB10IS	Electronic ballast, ≤10% THD, Instant Start
GEB10RS	Electronic ballast, ≤10% THD, Rapid Start
EL	Emergency battery pack (nominal 300 lumens; see Fluorescent Battery Packs tab)
LST	Tandem fixture pairs (shared ballasts)
PWS1836	6' prewire, 3/8" dia., 18-gauge, 3 wires
GLR	Internal fast-blow fuse[4]
GMF	Internal slow-blow fuse[4]
LP__	Lamped; specify lamp type and color
CRE	Flanged trim for continuous row mounting (end)
CRM	Flanged trim for continuous row mounting (middle)
ACS	Air closure strips (A and D models only)
HRD	Heat-removal dampers
APB	Air-pattern control blades (A and D models only)
PAF	Painted after fabrication (white enamel)
2R	Two reflector channel covers[3]
JP	Palletized and stretch-wrapped (G and MT trim only)
CSA	CSA Certified
NOM	NOM Certified

NOTES:

1 MVOLT standard for 120V and 277V applications. Some options require voltage specified.

2 Some options increase fixture depth. Consult factory if plenum space is a concern.

3 Available with 3-lamp 18 or 24 cell only.

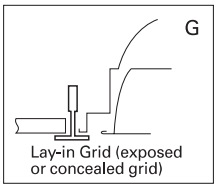
4 Must specify voltage.

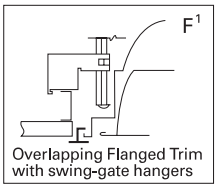
2PM3N 2'x4' 3" Louver Family

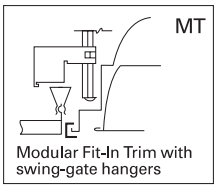
MOUNTING DATA

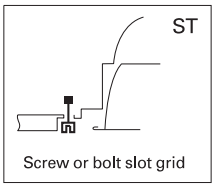
Continuous row mounting of flanged units requires CRE and CRM trim options (see options).

Ceiling Type	Appropriate Trim Type
Exposed grid tee	G
Concealed grid tee	G, ST
Concealed Z-spline	F, MT
Metal pan (consult factory)	MT
Screw slot (consult factory)	ST
Acoustical tile, plaster or plasterboard on rigid support parallel to lamps	F





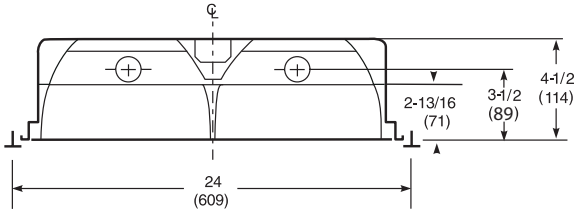


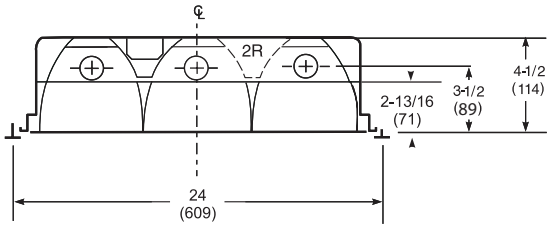


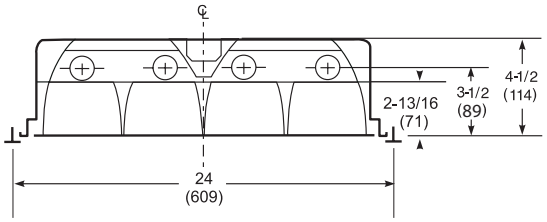
NOTE:

1 Recommended rough-in dimensions for F trim fixtures 24"x48" (Tolerance is +1/4", -0"). Swing-gate range 1-7/16" to 3-7/16", span 23-1/2" to 26-7/16".

DIMENSIONS







PHOTOMETRICS

Calculated using the zonal cavity method in accordance with IESNA LM41 procedures. Floor reflectances are 20%. Lamp configurations shown are typical. Full photometric data on these and other configurations available upon request.

Energy (Calculated in accordance with NEMA standard LE-5)

LER.FP	ANNUAL ENERGY COST*	LAMP DESCRIPTION	LAMP LUMENS	BALLAST FACTOR	WATTS
65 (LD louver)	$3.69	(2) 32WT8	2850	.88	59
66 (LD louver)	$3.64	(3) 32WT8	2850	.88	85
59 (LD louver)	$4.07	(4) 32WT8	2850	.88	112

* Comparative yearly lighting energy cost per 1000 lumens.

TEST NO: LTL14496
2PM3N G B 2 32 12LD GEB
LUMENS PER LAMP: 2850
LAMPS PER LUMINAIRE: 2

Coefficients of Utilization

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	91	91	91	89	89	89	85	85	85
1	82	79	76	80	77	75	77	75	73
2	72	67	63	71	66	63	68	64	61
3	64	58	53	62	57	53	60	56	52
4	56	50	45	55	49	45	53	48	44
5	50	44	39	49	43	38	48	42	38
6	45	38	34	44	38	33	43	37	33
7	41	34	29	40	34	29	39	33	29
8	37	31	26	36	30	26	35	30	26
9	34	28	23	33	27	23	32	27	23
10	31	25	21	31	25	21	30	25	21

RCR

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	1177.9	20.7	26.9
0° - 40°	2015.8	35.4	46.1
0° - 60°	3919.0	68.8	89.6
0° - 90°	4372.0	76.7	100.0
90° - 180°	0.0	0.0	0.0
0° - 180°	4372.0	76.7	100.0

TEST NO: LTL14671
2PM3N G B 3 32 18LD 1/3 GEB
LUMENS PER LAMP: 2850
LAMPS PER LUMINAIRE: 3

Coefficients of Utilization

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	89	89	89	87	87	87	83	83	83
1	80	78	75	79	76	74	76	74	72
2	71	67	63	70	66	63	67	64	61
3	64	58	54	62	57	53	60	56	53
4	57	51	46	56	50	46	54	49	45
5	51	45	40	50	44	40	49	44	40
6	46	40	35	45	39	35	44	39	35
7	42	36	31	41	35	31	40	35	31
8	38	32	28	38	32	28	37	31	28
9	35	29	25	34	29	25	34	28	25
10	32	26	23	32	26	23	31	26	22

RCR

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	1982.1	23.2	30.9
0° - 40°	3413.2	39.9	53.1
0° - 60°	5866.8	68.6	91.4
0° - 90°	6422.1	75.1	100.0
90° - 180°	0.0	0.0	0.0
0° - 180°	6422.1	75.1	100.0

TEST NO: LTL14541
2PM3N G B 4 32 32LD 1/4 GEB
LUMENS PER LAMP: 2850
LAMPS PER LUMINAIRE: 4

Coefficients of Utilization

pf	20%								
pc	80%			70%			50%		
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%
0	79	79	79	77	77	77	74	74	74
1	71	69	67	70	68	66	67	65	64
2	64	60	57	63	59	56	60	57	55
3	57	53	49	56	52	48	54	51	48
4	51	46	42	50	46	42	49	45	42
5	46	41	37	46	41	37	44	40	37
6	42	37	33	41	36	33	40	36	32
7	38	33	29	38	33	29	37	32	29
8	35	30	26	35	30	26	34	29	26
9	32	27	24	32	27	24	31	27	23
10	30	25	22	29	25	21	29	24	21

RCR

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Fixture
0° - 30°	2650.0	23.2	35.1
0° - 40°	4348.4	38.1	57.6
0° - 60°	7076.5	62.1	93.7
0° - 90°	7551.8	66.2	100.0
90° - 180°	0.0	0.0	0.0
0° - 180°	7551.8	66.2	100.0

LITHONIA LIGHTING
An AcuityBrands Company

Sheet #: PM3N-2x4

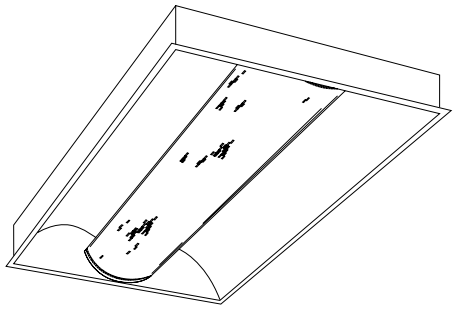
Lithonia Lighting
Acuity Lighting Group, Inc.
Fluorescent
One Lithonia Way, Conyers, GA 30012
Phone: 800-858-7763 Fax: 770-929-8789
In Canada: 160 avenue Labrosse, Pointe-Claire, P.Q., H9R 1A1
www.lithonia.com

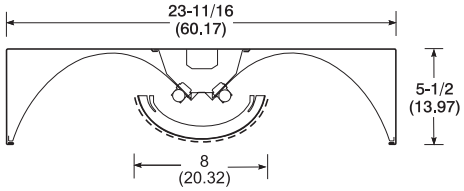
Catalog Number	Type
2PM3N GB 332 18ND 120 TCAB EL	A1

Direct/Indirect General Lighting System

AV 2'x4'

T8, T5 or T5HO
1 or 2 lamp
Compact Fluorescent
1 lamp in cross section





FEATURES

OPTICAL SYSTEM

- Twin matte white polyester powder paint finished reflectors provide uniform light distribution. Optional diffuse aluminum stepped reflectors available.
- All diffusers control direct light distribution and glare by shieding lamps from direct view.
- All shieldings snap into place by pivoting on light trap for easy lamp access.
- Injection molded light traps prevent light leaks between shielding and endplates.

SHIELDING OPTIONS

- Metal Diffuser staggered Round holes (MDR) 52% open perforated metal with .075" diameter holes backed with white acrylic diffuser.
- Straight Blade Louver (SBL) sides of perforated metal with staggered round holes and solid blade louvered center. Sides and louver backed with white acrylic diffuser.
- Metal Diffuser aligned Mini slots (MDM) 46% open perforated metal backed with white acrylic diffuser.
- Acrylic Diffuser Prismatic lens (ADP) extruded acrylic lens backed with white acrylic diffuser.
- Metal Diffuser staggered Linear slots (MDL) 45% open perforated metal backed with white acrylic diffuser.

ELECTRICAL SYSTEM

- Class P, Thermally protected, resetting, HPF, Non-PCB, UL Listed, CSA-certified electromagnetic ballast is standard. Energy saving and electronic ballast are sound rated A. Standard combinations are CBM approved and conform to UL 935.

HOUSING

- Housing is powder painted cold rolled steel. All edges hemmed or rounded.
- Trims available for standard 1" tee bar, mini-tee bar, screw slot grids.
- Drywall ceiling adapters available.
- Fixtures can be row mounted end to end.

LISTING

- UL listed and labeled. Listed and labeled to comply with Canadian and Mexican Standards (see options).

Specifications subject to change without notice.

Avante
Recessed Direct/Indirect Lighting

ORDERING INFORMATION

Example: **2AV G 2 32 MDR 120 GEB TCAB EL**

2AV | **G** | **B** | **3** | | **120** | **TCAB EL**

Series

- **2AV** 2' wide symmetric distribution
- **T2AV** 2' wide CF lamps in tandem (T).

Trim Type

- **G** Grid trim
- **ST** Screw slot

Lamps in Cross Section

1, 2, 3

Lamp Type

- **32** 32W T8 (48")
- **28T5** 28W T5 (46")
- **54HOT5** 54W T5 HO (46")
- **CF40** 40W TT5 (24")[1]
- **CF50** 50W TT5 (24")[1]
- **CF55** 55W TT5 (24")[1]

Diffuser

- **MDR** Metal diffuser, round holes.
- **SBL** Straight blade louver, round holes.
- **MDM** Metal diffuser, mini slots.
- **ADP** Acrylic diffuser, linear prismatic lens.
- **MDL** Metal diffuser, staggered linear slots.

Voltage

120, 277, 347
Others available

Options

- **GEB** Electronic ballast, <20% THD.
- **GEB10IS** Electronic ballast, ≤10% THD, Instant Start.
- **GEB10RS** Electronic ballast, ≤10% THD, Rapid Start.
- **ADEZ** Advance Mark X two-wire dimming ballast. (T8 only)
- **EL** Emergency battery pack (nominal 300 lumens, see Life Safety section).
- **GLR** Internal fast-blow fuse.
- **GMF** Internal slow-blow fuse.
- **LP** Lamped. Specify lamp type and color.
- **PWS1836** 6' prewire, 3/8" dia., 18-gauge, 3 wires.
- **RIF** Radio interference filter.
- **HTC** T-bar safety clips (snap-on).
- **LATC** T-bar safety clips (screw-on).
- **CSA** Listed and labeled to comply with Canadian Standards.
- **NOM** Listed and labeled to comply with Mexican Standards.

Reflector Option

- **ASR** Aluminum stepped reflector.

Accessories

Order as separate catalog number.

DGA24[2] Flanged grid to drywall adapter, unit installation.

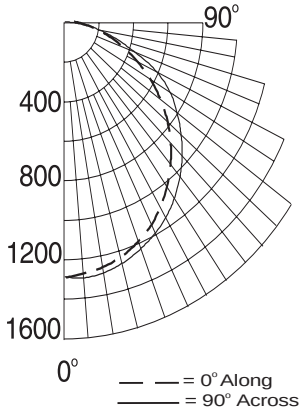
Notes:

1 1 lamp in cross section, 2 lamps end to end in fixture.

2 Use G trim plus DGA accessory for fixture trim flange and fixture support in plaster or plasterboard ceilings.

2AV 2x4 Direct/Indirect General Lighting

2AV G 2 32 MDR 120, (2) F32 T8 lamps, 2900 lumens per lamp, s/m (along) = 1.2, s/m (across) = 1.3, test no. LTL6960



CANDLEPOWER SUMMARY

Angle	0	45	90
0	1312	1312	1312
5	1293	1307	1321
15	1247	1267	1287
25	1160	1189	1217
35	1027	1074	1115
45	860	923	973
55	657	741	800
65	429	533	583
75	214	283	287
85	47	59	63
90	0	0	0

COEFFICIENT OF UTILIZATION %

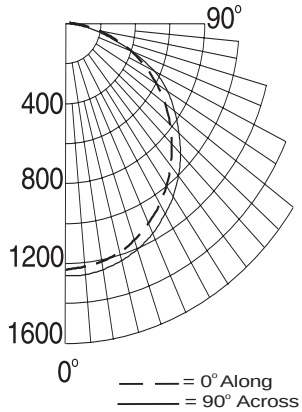
Floor		20			
Ceiling		80	70	50	0
Wall		70 50 30	70 50 30	50 30 10	0
RCR	0	81 81 81	79 79 79	75 75 75	68
	1	74 70 67	72 69 66	66 64 62	57
	2	67 61 56	65 60 55	57 54 51	47
	3	61 53 48	59 52 47	50 46 42	39
	4	56 47 41	54 46 41	45 40 36	33
	5	51 42 36	50 41 36	40 35 31	29
	6	47 38 32	46 37 31	36 31 27	25
	7	44 34 28	42 34 28	33 27 24	22
	8	41 31 25	39 31 25	30 25 21	20
	9	38 29 23	37 28 23	27 22 19	18
	10	35 26 21	35 26 21	25 21 17	16

ZONAL LUMEN SUMMARY

Zone	Lumens	% Lamp	% Fixture
0-30º	1030	17.8	26.2
0-40º	1701	29.3	43.2
0-60º	3067	52.9	78.0
60-90º	866	14.9	22.0
0-90º	3933	67.8	100.0
90º-180º	0	0.0	0.0
0-180º	3933	67.8	100.0

Efficiency = 67.8%

2AV G 2 32 MDM 120, (2) F32 T8 lamps, 2900 lumens per lamp, s/m (along) = 1.3, s/m (across) = 1.3, test no. LTL7096



CANDLEPOWER SUMMARY

Angle	0	45	90
0	1238	1238	1238
5	1228	1234	1240
15	1194	1200	1209
25	1118	1133	1148
35	1010	1032	1053
45	867	899	921
55	698	731	756
65	498	538	556
75	269	303	255
85	59	62	53
90	0	0	0

COEFFICIENT OF UTILIZATION %

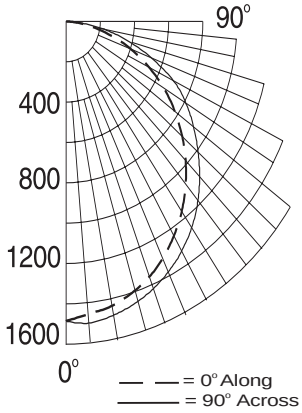
Floor		20			
Ceiling		80	70	50	0
Wall		70 50 30	70 50 30	50 30 10	0
RCR	0	79 79 79	78 78 78	74 74 74	67
	1	72 69 66	70 67 65	65 62 60	55
	2	65 60 55	64 58 54	56 52 49	46
	3	59 52 47	58 51 46	49 45 41	38
	4	54 46 40	53 45 39	43 39 35	32
	5	50 41 35	48 40 34	39 34 30	28
	6	46 37 31	45 36 30	35 30 26	24
	7	42 33 27	41 33 27	32 27 23	21
	8	39 30 24	38 30 24	29 24 20	19
	9	37 28 22	36 27 22	27 22 18	17
	10	35 26 20	34 25 20	25 20 16	16

ZONAL LUMEN SUMMARY

Zone	Lumens	% Lamp	% Fixture
0-30º	979	16.9	25.3
0-40º	1625	28.0	42.0
0-60º	2969	51.2	76.8
60-90º	897	15.5	23.2
0-90º	3866	66.7	100.0
90º-180º	0	0.0	0.0
0-180º	3866	66.7	100.0

Efficiency = 66.7%

2AV G 2 32 ADP GEB, (2) F32 T8 lamps, 2900 lumens per lamp, s/m (along) = 1.2, s/m (across) = 1.3, test no. LTL6962



CANDLEPOWER SUMMARY

Angle	0	45	90
0	1485	1485	1485
5	1457	1479	1500
15	1407	1431	1458
25	1313	1348	1381
35	1171	1215	1265
45	990	1048	1101
55	777	846	908
65	534	623	690
75	272	377	378
85	61	96	101
90	0	0	0

COEFFICIENT OF UTILIZATION %

Floor		20			
Ceiling		80	70	50	0
Wall		70 50 30	70 50 30	50 30 10	0
RCR	0	94 94 94	92 92 92	88 88 88	79
	1	85 81 78	83 80 76	76 73 71	65
	2	77 70 65	75 69 64	66 62 58	54
	3	70 62 55	68 60 54	58 53 48	45
	4	64 54 47	62 53 47	51 45 41	38
	5	59 48 41	57 47 41	46 40 35	33
	6	54 43 36	53 43 36	41 35 31	28
	7	50 39 32	49 39 32	37 31 27	25
	8	47 36 29	45 35 29	34 28 24	22
	9	44 33 26	42 32 26	31 26 22	20
	10	41 30 24	40 30 24	29 23 20	18

ZONAL LUMEN SUMMARY

Zone	Lumens	% Lamp	% Fixture
0-30º	1165	20.1	25.5
0-40º	1925	33.2	42.1
0-60º	3487	60.1	76.3
60-90º	1086	18.7	23.7
0-90º	4573	78.8	100.0
90º-180º	0	0.0	0.0
0-180º	4573	78.8	100.0

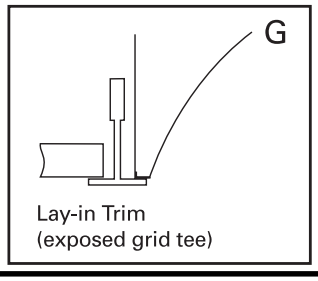
Efficiency = 78.8%

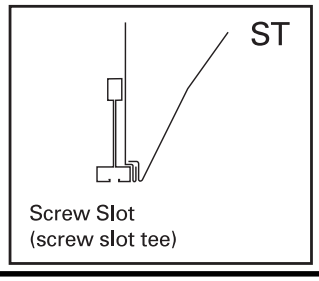
For additional photometric information, visit our website at 'lithonia.com'.

MOUNTING DATA

Mounting Data Ceiling Type	Appropriate Trim Type
Exposed grid tee	**G**
Concealed grid tee	**G**
Screw slot	**ST**
Plaster or plasterboard	**G***

*DGA accessory available to provide ceiling trim flange and fixture support for plaster or plasterboard ceiling. Recommended rough-in dimensions for DGA installation is 24-3/4" x 48-3/4" (Tolerance is +1/8", -0").





AV 2x4

AV2X4.p65

LITHONIA LIGHTING
ARCHITECTURAL INDOOR LIGHTING
P.O. BOX A, CONYERS, GEORGIA 30012, TELEPHONE 770-922-9000, FAX 770-860-3106
IN CANADA: 1100 50TH AVE., LACHINE, QUEBEC H8T 2V3, www.lithonia.com

Type: CA

Catalog number: AFV 2/26DTT 6AR 120 T CAB

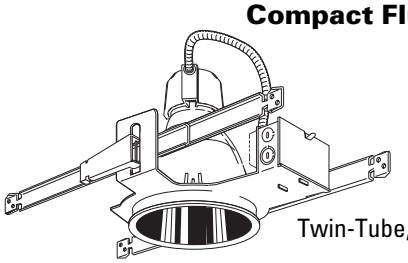
A1

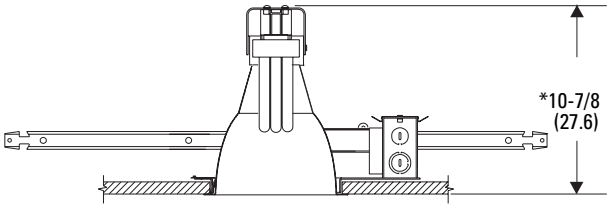
Compact Fluorescent Downlights

6" AFV

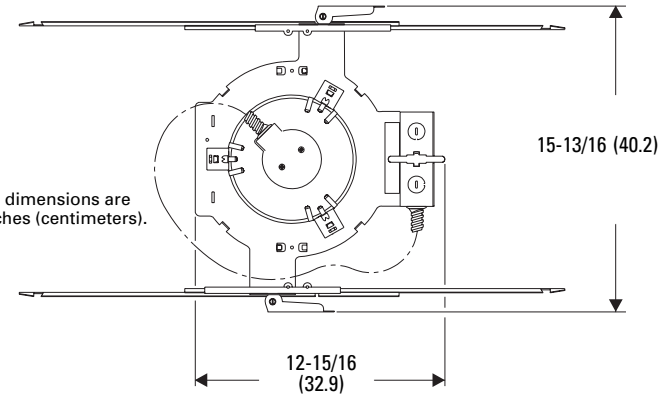
Open Reflector

Vertical Lamp
Twin-Tube, Double Twin-Tube or Tri-Tube





Aperture: 6-1/4 (15.9)
Ceiling opening: 6-3/4 (17.1)
Overlap trim: 7-1/2 (19.1)



All dimensions are inches (centimeters).

*Maximum height depends on lamp wattage/type, dimensions range from 9-1/16 to to 10-7/8

FEATURES

OPTICAL

- Reflector – Self-flanged, specular clear or semi-diffuse reflector. Bounding Ray Optical Principle design provides lamp before lamp image and smooth transition from top of reflector to bottom. Minimum flange matches reflector finish. White painted flange optional. (Vertisys optical system patented – US Patent #5,800,050)
- Baffle– Specular clear upper reflector. Microgroove baffle with white painted flange.

MECHANICAL

- 16-gauge galvanized steel mounting/plaster frame with friction support springs to retain optical system. Accommodates up to 7/8" thick ceiling standard. See Accessories for increased ceiling thickness capability.
- Mounting bars are 16-gauge galvanized steel with continuous 4" vertical adjustment, held in place with tool-less, cam-action locking system. Post installation adjustment possible without the use of tools from above or below the ceiling. Shipped pre-installed.
- Galvanized steel junction box with bottom-hinged access covers and spring latches. Two combination ½"-3/4" and three ½" knockouts for straight-through conduit runs. Capacity: 8 (4 in, 4 out) No. 12 AWG conductors rated for 90°C.

ELECTRICAL SYSTEM

- Rugged aluminum lampholder housing designed for positive lamp positioning.
- Vertically mounted, positive-latch thermoplastic socket.
- Class P, thermally-protected, high power factor ballast mounted to the junction box.

LISTING

- Fixtures are UL Listed for thru-branch wiring, recessed mounting and damp locations. Listed and labeled to comply with Canadian Standards (see Options).

ENERGY

LER.DOH	Annual Energy Cost	Lamps	Lamp Lumens	Ballast Factor	Input Watts
40	$6.02	(1)26TRT	1800	.98	27

Calculated in accordance with NEMA standard LE-5.

ORDERING INFORMATION

Example: AFV 1/26DTT 6AR 120 GEB10 WLP

Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog numbers (shipped separately).

AFV | **G** | **B** | **3** | **18LD** | **120** | **TCAB EL**

Series

AFV

Wattage/lamp

9TT[1]	One 9W twin-tube
13TT[1]	One 13W twin-tube
13DTT	One 13W double twin-tube
18DTT	One 18W double twin-tube
26DTT	One 26W double twin-tube
18TRT[2]	One 18W tri-tube
26TRT[2]	One 26W tri-tube
32TRT[2]	One 32W tri-tube

Reflector Type

6AR	Clear
6PR	Pewter
6UBR	Umber
6WTR	Wheat
6CR[3]	Champagne Gold
6GR[3]	Gold
6MB[4]	Black Baffle
6WR[4]	Clear
6WB[4]	Pewter

Lens Type

(blank)	no lens
CGL	Safety glass (w/lamp-holder for enclosed metal halide lamp).
CAL	Clear acrylic lens
PCL	Clear polycarbonate lens
T73	Tempered prismatic lens
A12	Prismatic acrylic lens
PPC	Prismatic polycarbonate lens

Finish

(blank)	Specular low iridescent
LD	Semi-diffuse low iridescent

Voltage

120
277
347

Ballast[6]

EMB	Electromagnetic ballast.
GEB10	Electronic ballast.
DMHL	Lutron Hi-lume® electronic dimming ballast, 120V or 277V, 18DTT, 26DTT, 26TRT and 32TRT only.
ADEZ	Advance Mark X electronic dimming ballast. (120V or 277V; 26DTT, 26TRT and 32TRT only.)

Options

WLP	With 35°K lamp (shipped separately).
TRW	White painted flange (standard on 6MB). 6WR and 6WB.
LRC[6]	Provides compatibility with Lithonia Reloc System.
GMF	Single slow-blow fuse.
RIF	Radio interference filter.
ELR	Emergency battery pack. Access above ceiling required. Remote test switch provided. (Consult factory for dimensional changes.)
GSKT	1/8" x 3/8" foam gasketing.
QDS[7]	Quick-disconnect for easy ballast replacement.
CSA	Listed and labeled to comply with Canadian Standards.

NOTES:
1 Available with magnetic ballast only.
2 Available with electronic ballast only.
3 Not recommended for use with compact fluorescent lamp; consult factory.
4 Not available with finishes.
5 Refer to options and accessories tab for additional ballast types.
6 For compatible Reloc systems, refer to options and accessories tab.
7 Not available wtih ELR option.

Accessories

Order as separate catalog numbers.

SC6	Sloped ceiling adaptor. Degree of slope must be specified (10D, 15D, 20D, 25D, 30D). Example: SC6 10D.
CTA6	Ceiling thickness adaptor. (Extends mounting frame to accommodate ceiling thickness up to 2".)

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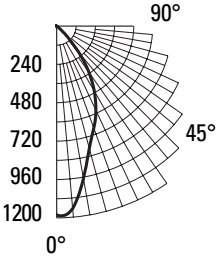
6" AFV Open Reflector

Distribution curve | Distribution data | Output data | Coefficient of utilization | Illuminance Data at 30" Above Floor for a Single Luminaire

AFV 26DTT 6AR, (1) PL-C 26W/27/4P lamp, 1800 rated lumens, 0.7 s/mh, test no. 2196102901



From 0°	cp.	Lumens
0°	1179	
5°	1145	106
15°	790	228
25°	582	267
35°	353	222
45°	97	83
55°	0	1
65°	0	1
75°	0	1
85°	0	1
90°	0	

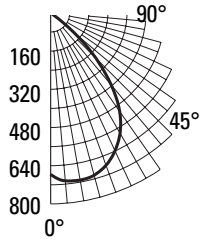
Zone	Lumens	%lamp
0°-30°	600	33.4
0°-40°	834	45.6
0°-60°	904	50.2
0°-90°	904	50.2
90°-180°	0	0.0
0°-180°	904	50.2*

*Efficiency

ρf	20%					
ρc	80%		70%		50%	
ρw	50%	30%	50%	30%	50%	30%
1	56	55	55	54	53	52
2	53	51	52	51	51	49
3	50	48	49	48	48	47
4	47	45	47	45	46	44
5	45	42	44	42	43	41
6	43	40	42	40	41	39
7	40	37	40	37	39	37
8	38	35	37	35	37	35
9	36	33	35	33	35	33
10	34	31	33	31	33	31

Mount height	Initial fc at beam center	50% beam angle 37.5° Beam diameter	50% beam angle 37.5° fc at beam edge	10% beam angle 78.2° Beam diameter	10% beam angle 78.2° fc at beam edge
8'	39.0	3.7'	19.5	8.9'	3.9
10'	21.0	5.1'	10.5	12.2'	2.1
12'	13.1	6.5'	6.5	15.4'	1.3
14'	8.9	7.8'	4.5	18.7'	0.9
16'	6.5	9.2'	3.2	21.9'	0.6

AFV 26TRT 6AR, (1) PL-T 26W/30/4P lamp, 1800 rated lumens, 1.3 s/mh, test no. 2194021501



From 0°	cp.	Lumens
0°	676	
5°	706	68
15°	704	200
25°	638	293
35°	505	315
45°	269	201
55°	4	22
65°	0	1
75°	0	0
85°	0	0
90°	0	

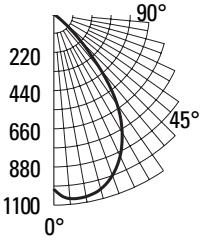
Zone	Lumens	%lamp
0°-30°	560	31.1
0°-40°	874	48.6
0°-60°	1096	61.0
0°-90°	1097	61.0
90°-180°	0	0.0
0°-180°	1097	61.0*

*Efficiency

ρf	20%					
ρc	80%		70%		50%	
ρw	50%	30%	50%	30%	50%	30%
1	68	66	66	65	64	63
2	63	61	62	60	60	58
3	59	56	58	55	56	54
4	55	51	54	51	53	50
5	51	47	50	47	49	46
6	47	44	47	43	46	43
7	44	40	43	40	43	39
8	40	37	40	36	39	36
9	37	33	37	33	36	33
10	34	31	34	31	34	30

Mount height	Initial fc at beam center	50% beam angle 63.7° Beam diameter	50% beam angle 63.7° fc at beam edge	10% beam angle 93.4° Beam diameter	10% beam angle 93.4° fc at beam edge
8'	22.4	6.8'	11.2	11.7'	2.2
10'	12.0	9.3'	6.0	15.9'	1.2
12'	7.5	11.8'	3.7	20.2'	.7
14'	5.1	14.3'	2.6	24.4'	.5
16'	3.7	16.8'	1.9	28.7'	.4

AFV 32TRT 6AR, (1) PL-T 32W/30/4P lamp, 2400 rated lumens, 1.2 s/mh, test no. 2194021002



From 0°	cp.	Lumens
0°	1007	
5°	1067	102
15°	1043	296
25°	903	413
35°	637	396
45°	217	179
55°	2	7
65°	0	1
75°	0	0
85°	0	0
90°	0	

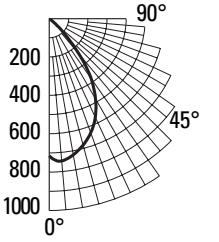
Zone	Lumens	%lamp
0°-30°	809	33.7
0°-40°	1205	50.2
0°-60°	1390	57.9
0°-90°	1390	57.9
90°-180°	0	0.0
0°-180°	1390	57.9*

*Efficiency

ρf	20%					
ρc	80%		70%		50%	
ρw	50%	30%	50%	30%	50%	30%
1	65	63	63	62	61	60
2	61	58	60	58	58	56
3	57	54	56	54	54	52
4	53	50	53	50	51	49
5	50	47	49	46	48	46
6	47	44	46	43	46	43
7	44	40	43	40	43	40
8	41	37	40	37	40	37
9	38	35	38	34	37	34
10	35	32	35	32	35	32

Mount height	Initial fc at beam center	50% beam angle 60.3° Beam diameter	50% beam angle 60.3° fc at beam edge	10% beam angle 88.1° Beam diameter	10% beam angle 88.1° fc at beam edge
8'	33.3	6.4'	16.7	10.6'	3.3
10'	17.9	8.7'	9.0	14.5'	1.8
12'	11.2	11.0'	5.6	18.4'	1.1
14'	7.6	13.3'	3.8	22.2'	.8
16'	5.5	15.7'	2.8	26.1'	.6

AFV 26TRT 6MB, (1) PL-T 26W/30/4P lamp, 1800 rated lumens, 1.1 s/mh, test no. 2196071003



From 0°	cp.	Lumens
0°	714	
5°	744	71
15°	681	195
25°	567	262
35°	379	235
45°	117	96
55°	1	2
65°	0	1
75°	0	1
85°	0	1
90°	0	

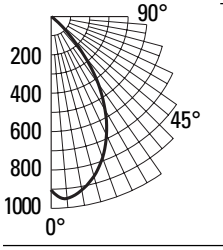
Zone	Lumens	%lamp
0°-30°	526	29.2
0°-40°	760	42.2
0°-60°	857	47.6
0°-90°	857	47.6
90°-180°	0	0.0
0°-180°	857	47.6*

*Efficiency

ρf	20%					
ρc	80%		70%		50%	
ρw	50%	30%	50%	30%	50%	30%
1	53	52	52	51	50	49
2	50	48	49	48	48	46
3	47	45	46	44	45	44
4	44	42	44	42	43	41
5	42	39	41	39	40	38
6	39	37	39	36	38	36
7	37	34	36	34	36	34
8	34	32	34	32	34	31
9	32	29	32	29	31	29
10	30	27	30	27	29	27

Mount height	Initial fc at beam center	50% beam angle 55.6° Beam diameter	50% beam angle 55.6° fc at beam edge	10% beam angle 85.5° Beam diameter	10% beam angle 85.5° fc at beam edge
8'	23.6	5.8'	11.8	10.2'	2.4
10'	12.7	7.9'	6.3	13.9'	1.3
12'	7.9	10.0'	4.0	17.6'	0.8
14'	5.4	12.1'	2.7	21.3'	0.5
16'	3.9	14.2'	2.0	25.0'	0.4

AFV 32TRT 6MB, (1) PL-T 32W/30/4P lamp, 2400 rated lumens, 1.0 s/mh, test no. 2196071001



From 0°	cp.	Lumens
0°	903	
5°	951	90
15°	861	245
25°	682	314
35°	428	267
45°	134	108
55°	0	1
65°	0	1
75°	0	1
85°	0	1
90°	0	

Zone	Lumens	%lamp
0°-30°	647	27.0
0°-40°	913	38.1
0°-60°	1021	42.6
0°-90°	1021	42.6
90°-180°	0	0.0
0°-180°	1021	42.6*

*Efficiency

ρf	20%					
ρc	80%		70%		50%	
ρw	50%	30%	50%	30%	50%	30%
1	48	47	47	46	45	44
2	45	43	44	43	43	42
3	42	40	42	40	41	39
4	40	38	39	38	38	37
5	37	35	37	35	36	34
6	35	33	35	33	34	33
7	33	31	33	31	32	30
8	31	29	31	29	30	28
9	29	27	29	27	29	27
10	27	25	27	25	27	25

Mount height	Initial fc at beam center	50% beam angle 53.7° Beam diameter	50% beam angle 53.7° fc at beam edge	10% beam angle 84.3° Beam diameter	10% beam angle 84.3° fc at beam edge
8'	29.9	5.6'	14.9	10.0'	3.0
10'	16.1	7.6'	8.0	13.6'	1.6
12'	10.0	9.6'	5.0	17.2'	1.0
14'	6.8	11.6'	3.4	20.8'	0.7
16'	5.0	13.7'	2.5	24.4'	0.5

NOTES:
1. For electrical characteristics consult technical data tab.
2. Tested to current IES and NEMA standards under stabilized laboratory conditions. Various operating factors can cause differences between laboratory data and actual field measurements. Dimensions and specifications are based on the most current available data and are subject to change without notice.

gotham
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