



**Public Service  
of New Hampshire**

The Northeast Utilities System

**nhsaves@work**  
large business retrofit

# 2009 Lighting Rebate

## Section A: CUSTOMER INFORMATION

Customer Name <i>City of Dover - Public Library</i>	Electric Account Number <i>561354 01073</i>	Rate	Application Number
Facility Address <i>73 Locust St.</i>	City <i>Dover</i>	State <i>NH</i>	Zip Code <i>03820</i>
Service Location Identification <i>Public Library</i>			
Mailing Address (if different from above)	City	State	Zip Code
Contact Person/Title <i>Rick Jones CD Coordinator</i>	Telephone Number <i>(603) 516-6008</i>	Incorporated? (Check one.) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Exempt	
Federal Tax Identification Number <i>02-6000230</i>	Rebate Payment Preference (Check one.) <input checked="" type="checkbox"/> Check <input type="checkbox"/> Bill Credit <input type="checkbox"/> Pay Contractor	Please Assign Payment to Contractor. Customer Signature:	

## Section B: CONTRACTOR INFORMATION

Contractor Name <i>Johnson Controls</i>	Contact Person/Title (Print) <i>Kevin Strongren Project Manager</i>	Contact Person Signature <i>Kevin P. Strongren</i>	
Mailing Address <i>39 Salem Street</i>	City <i>Lynnfield</i>	State <i>MA</i>	Zip Code <i>01940</i>
Federal Tax Identification Number <i>39-0380010</i>	Incorporated? (Check one.) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Exempt	Telephone Number <i>860-335-6341</i>	

## Section C: DOCUMENT APPROVALS

### PRE-INSTALLATION INSPECTION

Utility Signature	Date
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### PRE-APPROVAL OFFER

Technical Review - Utility Signature	Date		
Utility Signature	Date	Amount of Rebate Offer (\$)	Completion Date

By signing and dating below, customer accepts this rebate offer and agrees to the Utility Terms and Conditions attached hereto. Pursuant to a Commission order, customer also agrees that the utility will capture all kW and kWh savings and to forgo applying directly or indirectly for any ISO-NE capacity payments resulting from this energy efficiency project. This agreement is contingent upon continued approval and authorization by the Commission to recover said amounts from the System Benefits Charge. The rebate amount cannot exceed the total project costs.

Customer Signature: <i>[Signature]</i>	Date: <i>12/2/09</i>
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### POST-INSTALLATION INSPECTION

Utility Signature	Date	Total Project Cost (\$)	Amount of Rebate (\$)
Customer Signature	Date		

### MANAGEMENT APPROVAL

Utility Signature	Date
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Public Service of New Hampshire  
2009 Lighting Rebate

PROJECT NAME: City of Dover, - Dover Library - Dover, NH

RETROFIT LIGHTING REBATE WORKSHEET											
Existing Lighting					New Lighting						
Item	Existing Fixture Code	Fixture Description	Quantity	Annual Hours of Operation	Measure Code	Retrofit Fixture Code	Fixture Description	Quantity of Fixtures	Per Unit Rebate (\$)	Total Rebate (\$)	
1	2F32SSE	2L4' T8/ELIG		5	3175	10	1F32EEE	1L4' T8EE/ELEE	5	\$ 20.00	\$ 100.00
2	2F32SSE	2L4' T8/ELIG		24	2000	11	1F32EEE	1L4' T8EE/ELEE	24	\$ 12.50	\$ 300.00
3	2F32SSE	2L4' T8/ELIG		3	3175	41	1F32EEE	1L4' T8EE/ELEE	3	\$ 30.00	\$ 90.00
4	2F32SSE	2L4' T8/ELIG		12	3175	42	1F32EEE	1L4' T8EE/ELEE	12	\$ 15.00	\$ 180.00
5	2F32SSE	2L4' T8/ELIG		8	8760	41	1F32EEL	1L4' T8EE/ELEE LBF	8	\$ 30.00	\$ 240.00
6	2F32SSE	2L4' T8/ELIG		10	3175	42	1F32EEL	1L4' T8EE/ELEE LBF	10	\$ 15.00	\$ 150.00
7	2F32SSE	2L4' T8/ELIG		8	8760	42	1F32EEL	1L4' T8EE/ELEE LBF	8	\$ 15.00	\$ 120.00
8		2LT12UTubeEEMAC		1	3175	10	2F17EEE	2L2' T8EE/ELEE	1	\$ 20.00	\$ 20.00
9		2LT12UTubeEEMAC		2	1000	10	2F17EEE	2L2' T8EE/ELEE	2	\$ 20.00	\$ 40.00
10		2LT12UTubeEEMAC		4	2000	10	2F17EEE	2L2' T8EE/ELEE	4	\$ 20.00	\$ 80.00
11		2LT12UTubeEEMAC		19	3175	10	2F17EEE	2L2' T8EE/ELEE	19	\$ 20.00	\$ 380.00
12	4F32SSE	4L4' T8/ELIG		1	1000	41	2F32EEL	2L4' T8EE/ELEE LBF	1	\$ 30.00	\$ 30.00
13	4F32SSE	4L4' T8/ELIG		2	2000	41	2F32EEL	2L4' T8EE/ELEE LBF	2	\$ 30.00	\$ 60.00
14	4F32SSE	4L4' T8/ELIG		2	3175	41	2F32EEL	2L4' T8EE/ELEE LBF	2	\$ 30.00	\$ 60.00
15	4F32SSE	4L4' T8/ELIG		6	3175	42	2F32EEL	2L4' T8EE/ELEE LBF	6	\$ 15.00	\$ 90.00
16		2LT8UTube/ELIG		56	3175	10	3F17EEL	3L2' T8EE/ELEE LBF	56	\$ 20.00	\$ 1,120.00
17											\$ -
18											\$ -
19											\$ -
20											\$ -
21											\$ -
22											\$ -
23											\$ -
24											\$ -
25											\$ -
									\$ -		\$ -
											\$ 3,060.00

LIGHTING CONTROLS REBATE WORKSHEET									
Item	Lighting Control Measure Code	Lighting Code Description	Quantity	Lighting Fixture Code	Quantity of Fixtures	Annual Hours of Reduction	Per Unit Rebate (\$)	Total Rebate (\$)	
12	61	Ceiling Mount Occupancy Sensor	1	2F32EEE	3	1588	\$ 55.00	\$ 55.00	
14	61	Ceiling Mount Occupancy Sensor	1	2F32EEE	6	1000	\$ 55.00	\$ 55.00	
17	64	Wall Mount Occupancy Sensor	1	2F32EEE	1	1270	\$ 25.00	\$ 25.00	
17	64	Wall Mount Occupancy Sensor		2F32EEL	2	1270		\$ -	
19	64	Wall Mount Occupancy Sensor	1	2F32EEL	2	1000	\$ 25.00	\$ 25.00	
21	64	Wall Mount Occupancy Sensor	1	2F32EEL	2	1270	\$ 25.00	\$ 25.00	
23	64	Wall Mount Occupancy Sensor	1	2F32EEL	1	600	\$ 25.00	\$ 25.00	
32	64	Fixture Mount Occupancy Sensor	17	2F32SSE	17	2540	\$ 25.00	\$ 425.00	
40	61	Ceiling Mount Occupancy Sensor	1	110075	4	800	\$ 55.00	\$ 55.00	
40	61	Ceiling Mount Occupancy Sensor	1	2F17EEE	4	800		\$ -	
42	64	Wall Mount Occupancy Sensor	1	2F17EEE	2	500	\$ 25.00	\$ 25.00	
44	64	Wall Mount Occupancy Sensor	1	2F17EEE	2	2381	\$ 25.00	\$ 25.00	
46	64	Wall Mount Occupancy Sensor	1	2F17EEE	2	2381	\$ 25.00	\$ 25.00	
49	61	Ceiling Mount Occupancy Sensor	2	3F17EEL	8	1588	\$ 55.00	\$ 110.00	
52	61	Ceiling Mount Occupancy Sensor	1	3F17EEL	11	1588	\$ 55.00	\$ 55.00	
54	61	Ceiling Mount Occupancy Sensor	1	3F17EEL	9	953	\$ 55.00	\$ 55.00	
57	64	Wall Mount Occupancy Sensor	1	3F17EEL	1	1905	\$ 25.00	\$ 25.00	
57	64	Wall Mount Occupancy Sensor		1F32SSE	1	1905		\$ -	
60	64	Fixture Mount Occupancy Sensor	5	1F32EEL	5	4380	\$ 25.00	\$ 125.00	
63	64	Fixture Mount Occupancy Sensor	8	1F32EEL	8	4380	\$ 25.00	\$ 200.00	



# 2009 Lighting Rebate Table C: Lighting Systems Inventory

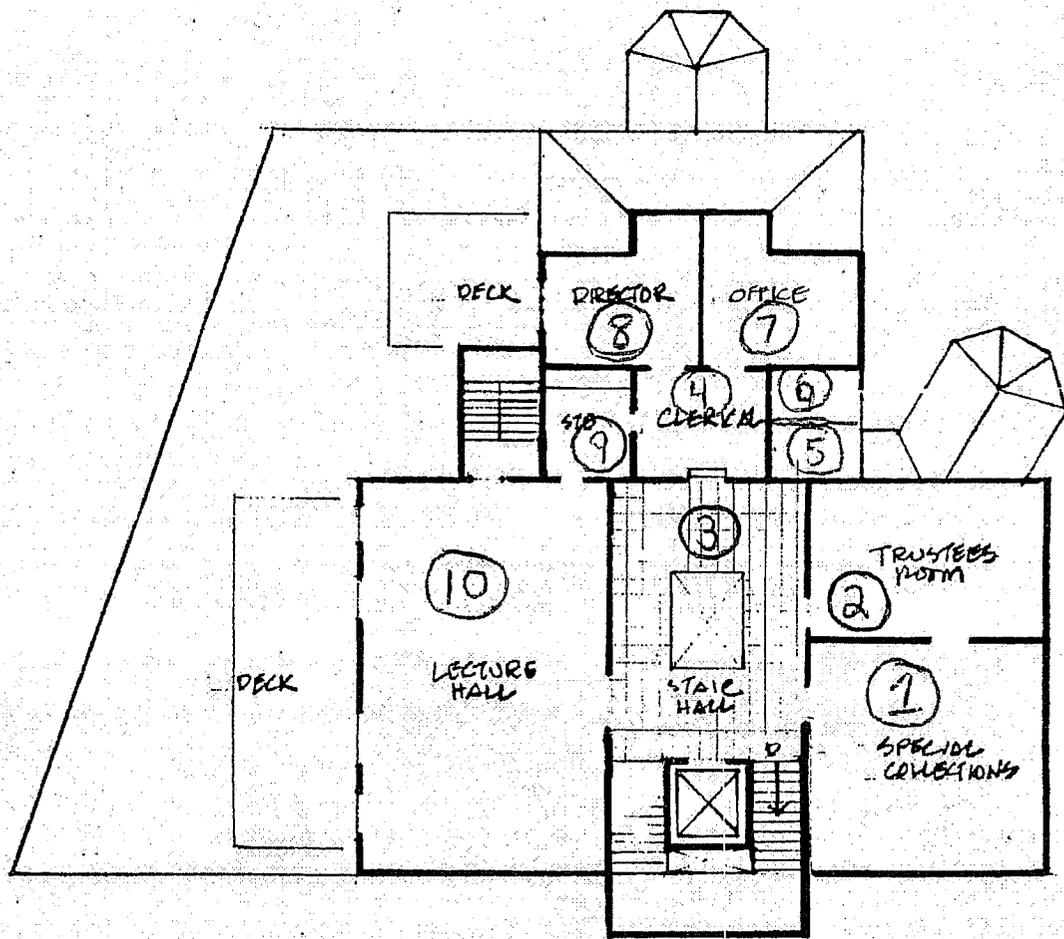
This table or similar document must be completed by the Customer/Contractor/Vendor. Attach additional sheets as necessary. Each room or area in which lighting changes are proposed should be listed separately. When completed, submit this form or similar document to your Utility Representative along with manufacturer cut sheets showing photometrics.

Customer/Facility Name: **City of Dover, Dover Library, Dover, NH** Project Description: **Lighting** Date: \_\_\_\_\_

Existing Lighting System										Proposed Lighting System									
Room/Area	Qty	Description of Fixture	Fixture Code	Watts	Annual Hours of Operation	Qty	Description of Fixture	Fixture Code	Watts	Measure Code	Annual Hrs	Watts	Reduction						
Map #1 2nd Fl Historical Room	15	2L4' T8EE/ELEE	2F32EEE	55	3175	15	2L4' T8EE/ELEE	2F32EEE	55	61	3175	55	3175						
Map #1 2nd Fl Historical Room	1			55	3175	1	Ceiling Sensor		55		1588	55	1588						
Map #2 2nd Fl Trustees Room	6	2L4' T8EE/ELEE	2F32EEE	55	2000	6	2L4' T8EE/ELEE	2F32EEE	55	61	2000	55	2000						
Map #2 2nd Fl Trustees Room	1			55	2000	1	Ceiling Sensor		55		1000	55	1000						
Map #4 Clerical Area	1	2L4' T8EE/ELEE	2F32EEE	55	3175	1	2L4' T8EE/ELEE	2F32EEE	55	42	3175	55	3175						
Map #4 Clerical Area	2	4L4' T8/ELIG	4F32SSE	112	3175	2	2L4' T8EE/ELEE LBF	2F32EEL	48	64	3175	48	3175						
Map #4 Clerical Area	1			151	3175	1	Wall Sensor		151		1270	151	1270						
Map #7 Learning Center	2	4L4' T8/ELIG	4F32SSE	112	2000	2	2L4' T8EE/ELEE LBF	2F32EEL	41	64	2000	48	2000						
Map #7 Learning Center	1			48	2000	1	Wall Sensor		48		1000	48	1000						
Map #8 Library Director's Office	2	4L4' T8/ELIG	4F32SSE	112	3175	2	2L4' T8EE/ELEE LBF	2F32EEL	41	64	3175	48	3175						
Map #8 Library Director's Office	1			48	3175	1	Wall Sensor		48		1270	48	1270						
Map #9 Kitchenette Area	1	4L4' T8/ELIG	4F32SSE	112	1000	2	2L4' T8EE/ELEE LBF	2F32EEL	41	64	1000	48	1000						
Map #9 Kitchenette Area	1			48	1000	1	Wall Sensor		48		600	48	600						
Map #10 Lecture Hall	24	2L4' T8/ELIG	2F32SSE	60	2000	24	1L4' T8EE/ELEE	1F32EEE	11	28	2000	28	2000						
Map #16 Reading Area	27	2LT8UTube/ELIG	2F32SSE	60	3175	27	3L2' T8EE/ELEE LBF	3F17EEL	10	40	3175	40	3175						
Map #16 Reading Area	4	4L4' T8/ELIG	4F32SSE	112	3175	4	2L4' T8EE/ELEE LBF	2F32EEL	42	48	3175	48	3175						
Map #16.1 Reading Area Near Sitting	8	2L4' T8/ELIG	2F32SSE	60	3175	8	1L4' T8EE/ELEE LBF	1F32EEL	25	30	3175	30	3175						
Map #16.3 Reading Area Atrium Area	1	2LT12UTube/EE/Mag		70	3175	1	2L2' T8EE/ELEE	2F17EEE	10	28	3175	28	3175						
Map #19 Assistant Director's Area	1	2L4' T8/ELIG	2F32SSE	60	3175	1	1L4' T8EE/ELEE	1F32EEE	41	28	3175	28	3175						
Map #20 2nd Fl Stack Area	8	3LT8UTube/ELIG	2F32SSE	60	3175	8	2L2' T8EE/ELEE	2F17EEE	10	30	3175	30	3175						
Map #21 Ground FL - Staff Only Stack Area	17	2L4' T8/ELIG	2F32SSE	60	3175	17	2L4' T8/ELIG	2F32SSE	60	60	3175	60	3175						
Map #21 Ground FL - Staff Only Stack Area	17			60	3175	1	Fixture Sensor		60		2540	60	2540						
Map #23 Custodial Area	5	2L4' T8/ELIG	2F32SSE	60	3175	5	1L4' T8EE/ELEE	1F32EEE	10	28	3175	28	3175						
Map #24 Tech Room	2	2L4' T8/ELIG	2F32SSE	60	3175	2	1L4' T8EE/ELEE	1F32EEE	41	28	3175	28	3175						
Map #24 Tech Room	2	3L4' T8/ELIG	3F32SSE	88	3175	2	1L4' T8EE/ELEE	1F32EEE	42	28	3175	28	3175						
Map #25 Processing Room	8	2L4' T8/ELIG	2F32SSE	60	3175	8	1L4' T8EE/ELEE	1F32EEE	42	28	3175	28	3175						
Map #26 Hallway/Elevator Alcove	7	2LT8UTube/ELIG		60	3175	7	2L2' T8EE/ELEE	2F17EEE	10	30	3175	30	3175						
Map #31 Craft Room	4	2LT8UTube/ELIG		60	2000	4	2L2' T8EE/ELEE	2F17EEE	10	30	2,000	30	2,000						
Map #31 Craft Room	4	75W Inc.	110075	75	2000	4	20W CF Screw In		20		2,000	20	2,000						
Map #31 Craft Room	1			540	2000	1	Ceiling Sensor		540	61	800	540	800						
Map #32 Craft Storage	2	2LT8UTube/ELIG		60	1000	2	2L2' T8EE/ELEE	2F17EEE	10	30	1,000	30	1,000						
Map #32 Craft Storage	1			30	1000	1	Wall Sensor		30	64	500	30	500						
Map #33 Men's Room	2	2LT8UTube/ELIG		60	3175	2	2L2' T8EE/ELEE	2F17EEE	10	30	3,175	30	3,175						
Map #33 Men's Room	1			30	3175	1	Wall Sensor		30	64	2,381	30	2,381						

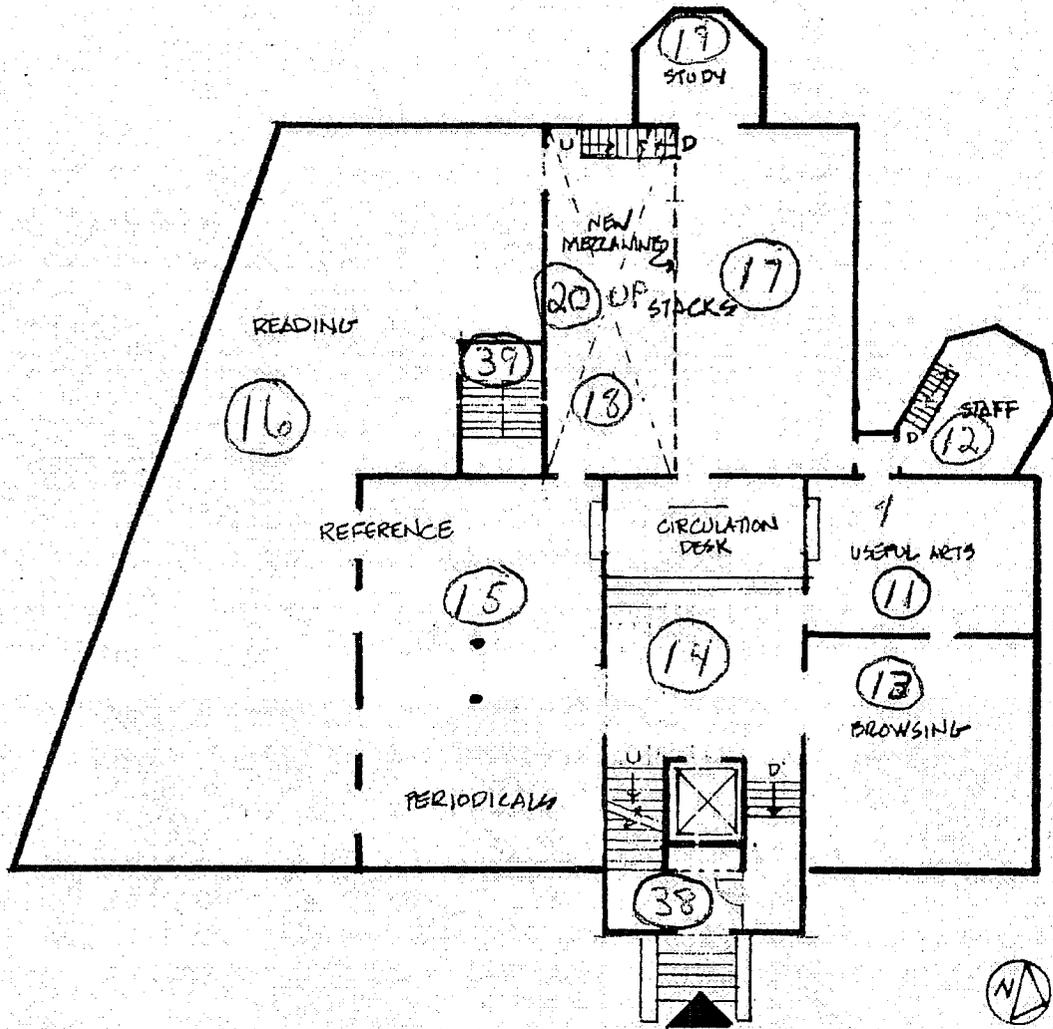


# DOVER LIBRARY

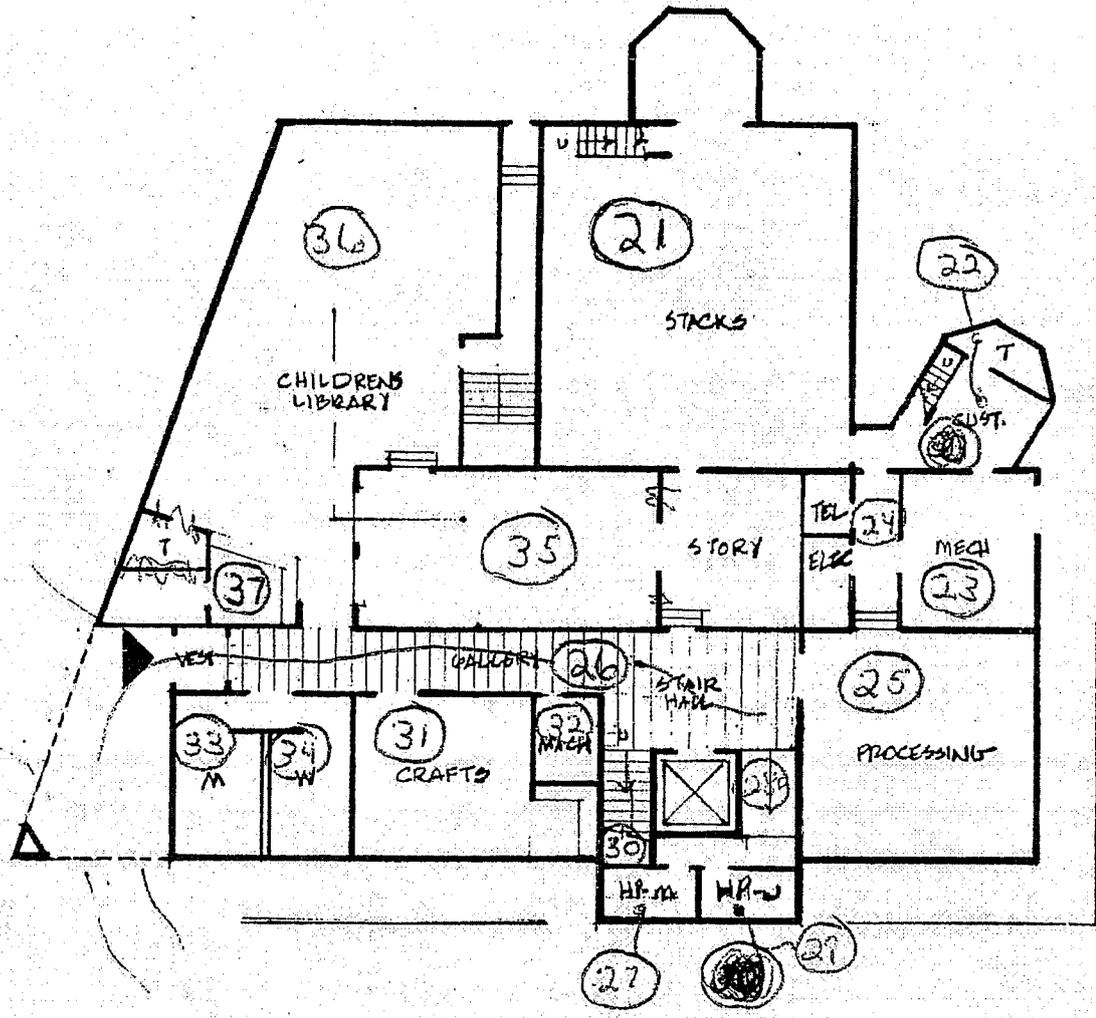


SECOND FLOOR PLAN  
STUDY "B" 1"=20'

# DOVER LIBRARY



FIRST FLOOR PLAN  
STUDY 'B' 1 1/2" x 20"



GROUND FLOOR PLAN  
 STUDY 'B' 1" x 2.0'

**Material Purchasing**

**City of Dover - Library - S1**

Bldg Name	Component	PO Order Total	Vendor	Mfg Name	Mfg #	Notes
Library	Ballast 1 lamp Electronic UNV QHEN Super Saver	5	WESCO	Advance	IOP-1P32-SC	
Library	Ballast 2 lamp Electronic UNV QHEN Super Saver	30	WESCO	Advance	IOP-2P32-SC	
Library	Ballast 3 lamp Electronic UNV QHEL Super Saver	55	WESCO	Advance	IOP-3P32-LW-SC	
Library	Ballast 3 lamp Electronic UNV QHEN Super Saver	9	WESCO	Advance	IOP-3P32-SC	
Library	Reflector Kit 2x2 Miro-4 2-Lamp	18	EPA	EPA	RTR2202T817ENLSS	
Library	Reflector Kit 2x2 Miro-4 3 Lamp	36	EPA	EPA	RTR2203T817ENLSS	
Library	Reflector Kit 2x2 Miro-4 3 Lamp	28	EPA	EPA	RTR2203T817ENLSS	
Library	Reflector Kit 4' 1 lamp Miro-4	29	EPA	EPA	RST1401T832ENCCLSLST	
Library	PLATE - please buy me!! Thanks Rebeccal	1		Labor to Purchase	Wall Sensor Plates	
Library	CF 20 Watt Lamp w/ Ballast Screw In	1	WESCO	Philips	SLS20/ALTO	
Library	CF 20 watt quad flood lamp (refl) SLR30 Dimmable	18	WESCO	Philips	137075 EL/A R30 16 DIMM REFLECTOR	
Library	CF SL523 Compact Fluorescent	1	WESCO	Philips	SLS25/ALTO	
Library	CF20 watt Dimmable quad flood lamp (refl)SLSR40	15	WESCO	Philips	137075 EL/A R30 16 DIMM REFLECTOR	
Library	Lamp 2' T8 XPS 841	228	WESCO	Philips	F17T8ADV841ALTO	
Library	Lamp 4' T8 XP/Advantage 841	5	WESCO	Philips	F32T8/ADV841ALTO	
Library	Lamp 4' T8 XPS Super Saver 841	87	WESCO	Philips	F32T8/ADV841ALTO	
Library	New Fixture 4' 2 lamp wide wrap w/refl UNV QHEL	5	Re-Nova	Re-Nova	ECS-MPW4-MN-232-UNV-2L-IOP	
Library	New Fixture 8' 4 lamp wide wrap w/refl UNV QHEL	1	Re-Nova	Re-Nova	ECS-MPW8-MN-432-UNV-4L-IOP	
Library	New Fixture 4'1 lamp wrap UNV QHEL with reflector	3	Re-Nova	Re-Nova	ECS-NPW4-MN-132-UNV-1L-IOP	
Library	New Fixture 4'1 lamp wrap UNV QHEN with reflector	3	Re-Nova	Re-Nova	ECS-NPW4-MN-132-UNV-1N-IOP	
Library	New Fixture 8' 2 lamp wrap UNV QHEN with ref	4	Re-Nova	Re-Nova	ECS-NPW8-MN-232-UNV-2N-IOP	
Library	New Fixture 8' 2 lamp wrap UNV QHEL Vanity Ref	6	Re-Nova	Re-Nova	ECS-SBW-8-M-N-232-UNV-2L-IOP	
Library	New Fixture 8' 2 lamp wrap UNV QHEN Vanity Ref	1	Re-Nova	Re-Nova	ECS-SBW-8-M-N-232-UNV-2N-IOP	
Library	New Fixture 8' 4L Vanity UNV QHEL w/reflector	2	Re-Nova	Re-Nova	ECS-SBW8-MN-432-UNV-4L-IOP	
Library	Ceiling mounted occupancy sensor	2	MUNRO	Sensor Switch	CM-9	
Library	Fixture Mounted Occupancy Sensor Separate from Fixture	17	MUNRO	Sensor Switch	CM-9	
Library	Ceiling mounted occupancy sensor	2	MUNRO	Sensor Switch	CM-PDT-9	
Library	Power Pack for Ceiling or Hallway Sensor	7	MUNRO	Sensor Switch	MP-20	
Library	Photocell	1	MUNRO	Sensor Switch	K4251	
Library	Wall switch occupancy sensor SensorSwitch	6	MUNRO	Sensor Switch	WSD-1	

**Material Purchasing  
City of Dover - Library - S1**

Bldg Name	Component	PO Order Total	Vendor	Mfg Name	Mfg #	Notes
Library	Wall switch occupancy sensor Dual Tech SensorSwitch	2	MUNRO	Sensor Switch	WSD-PDT-1	
Library	New Fixture 4'1L Stairwell UNV QHEL refl (1)9CF Sensor	5	MUNRO	Speclight	FCW4-1-32-120-GEB1OPSL-1CF9-SNUTZW	
Library	New Fixture 82L Stairwell UNV QHEL refl (1)9CF Sens	4	MUNRO	Speclight	FCW8-2-32-120-GEB1OPSL-1CF9-SNUTZW	
Library	New Fix 2x42W Schoolhouse Globe	1	MUNRO	SPECTRUM	SS1610CF326EX/CP15/HM36"WH	
Library	New Fix 2x42W Schoolhouse Globe	2	MUNRO	Sylvania	SYL VF42DT/E/IN/841	
Library	Ceiling mounted occupancy sensor	3	MUNRO	Sensor Switch	WV-PDT-16	



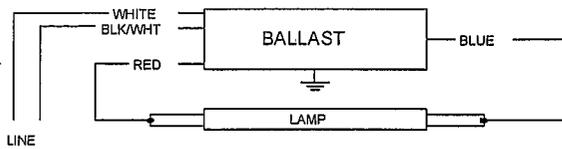


<b>IOP-1P32-SC@120V</b>	
Brand Name	OPTANIUM 2.0
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

### Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
* F17T8	1	17	-20/-29	0.14	16	0.90	10	0.99	1.5	5.63
F25T8	1	25	-20/-29	0.20	23	0.88	10	0.99	1.5	3.83
F32T8	1	32	-20/-29	0.25	28	0.87	10	0.99	1.5	3.11
F32T8/ES (25W)	1	25	60/16	0.20	23	0.87	10	0.99	1.5	3.78
F32T8/ES (28W)	1	28	60/16	0.22	25	0.87	10	0.99	1.5	3.48
F32T8/ES (30W)	1	30	60/16	0.23	27	0.87	10	0.99	1.5	3.22

### Wiring Diagram

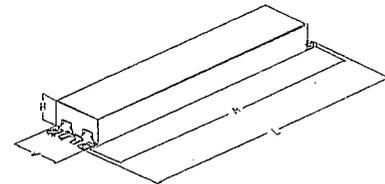


Diag. 63

The wiring diagram that appears above is for the lamp type denoted by the asterisk (\*)

### Standard Lead Length (inches)

### Enclosure



### Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.50 "	1.7 "	1.18 "	8.90 "
9 1/2	1 7/10	1 9/50	8 9/10
24.1 cm	4.3 cm	3 cm	22.6 cm

Revised 08/02/2005



Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

### ADVANCE TRANSFORMER CO.

O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018  
 Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071  
 Corporate Offices: Phone: 800-322-2086



<b>IOP-1P32-SC@120V</b>	
Brand Name	OPTANIUM 2.0
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

## Electrical Specifications

### Notes:

#### Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

#### Section II - Performance Requirements

- 2.1 Ballast shall be \_\_\_\_\_ (Instant or Programmed) Start.
- 2.2 Instant start ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail. Programmed Start ballast shall provide semi-independent lamp operation.
- 2.3 Instant start ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.4 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz through 52 kHz to avoid interference with infrared devices and eliminate visible flicker and avoid Article Surveillance System, such as anti-theft devices.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.77 or 0.71 for Low Watt, 0.87 or 0.88 for Normal Light Output, and 1.18 for High Light.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of -20F (-29C) Instant Start IntelliVolt or 0F (-18C) Programmed Start IntelliVolt for standard T8 lamps and 60F (16C) for energy-saving T8 lamps.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.13 Ballast shall contain an anti-striation circuitry to prevent striation on energy savings lamps.
- 2.14 Programmed start ballasts shall provide lamp EOL protection circuitry.
- 2.15 Instant Start Ballasts - Remote or tandem wiring allowed to a maximum of 20 feet between ballast and lamp holder. For tandem wiring, any lamp can be remote mounted.  
 Programmed Start 2-lamp (normal and LW) - Tandem wiring allowed to a maximum of 20 feet between ballast and lamp holder for standard T8 lamps and 10 feet between ballast and lamp holder for energy saving lamps.  
 Programmed Start 3&4-lamp (normal light) - Tandem wiring allowed to a maximum of 20 feet between ballast and lamp holder for standard T8 lamps and 10 feet between ballast and lamp holder for energy saving lamps. RED and YELLOW must be in the same fixture as the ballast.  
 Programmed Start 3&4-lamp (LW) - Tandem wiring allowed to a maximum of 10 feet between ballast and lamp holder for standard T8 lamps and energy saving lamps. RED and YELLOW must be in the same fixture as the ballast.

#### Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with UL Type CC rating.

3.7 Ballast shall meet NEMA/CEE High Performance T8 Lighting System Specifications.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001:2000 Quality System Standards.

4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a 90 C designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90 C.

4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

Note: Consult lamp manufacturers for applications with Ballast Factor > 1.2

Revised 08/02/2005



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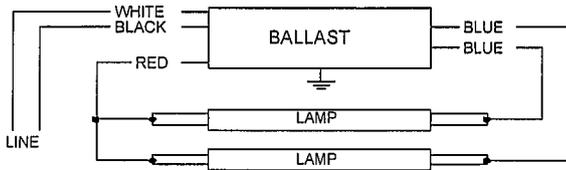


<b>IOP-2P32-SC@120V</b>	
Brand Name	OPTANIUM 2.0
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

### Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F32T8/ES (25W)	1	25	60/16	0.23	27	1.05	10	0.99	1.6	3.89
* F32T8/ES (25W)	2	25	60/16	0.37	44	0.87	10	0.99	1.6	1.98

### Wiring Diagram

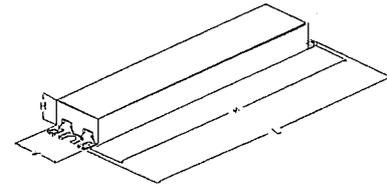


Diag. 64

The wiring diagram that appears above is for the lamp type denoted by the asterisk (\*)

### Standard Lead Length (inches)

### Enclosure



### Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.50 "	1.7 "	1.18 "	8.90 "
9 1/2	1 7/10	1 9/50	8 9/10
24.1 cm	4.3 cm	3 cm	22.6 cm

Revised 08/03/2005



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### ADVANCE TRANSFORMER CO.

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 Corporate Offices: Phone: 800-322-2086



<b>IOP-2P32-SC@120V</b>	
Brand Name	OPTANIUM 2.0
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

## Electrical Specifications

### Notes:

#### Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

#### Section II - Performance Requirements

- 2.1 Ballast shall be \_\_\_\_\_ (Instant or Programmed) Start.
- 2.2 Instant start ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail. Programmed Start ballast shall provide semi-independent lamp operation.
- 2.3 Instant start ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.4 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz through 52 kHz to avoid interference with infrared devices and eliminate visible flicker and avoid Article Surveillance System, such as anti-theft devices.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.77 or 0.71 for Low Watt, 0.87 or 0.88 for Normal Light Output, and 1.18 for High Light.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of -20F (-29C) Instant Start IntelliVolt or 0F (-18C) Programmed Start IntelliVolt for standard T8 lamps and 60F (16C) for energy-saving T8 lamps.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.13 Ballast shall contain an anti-striation circuitry to prevent striation on energy savings lamps.
- 2.14 Programmed start ballasts shall provide lamp EOL protection circuitry.
- 2.15 Instant Start Ballasts - Remote or tandem wiring allowed to a maximum of 20 feet between ballast and lamp holder. For tandem wiring, any lamp can be remote mounted.  
 Programmed Start 2-lamp (normal and LW) - Tandem wiring allowed to a maximum of 20 feet between ballast and lamp holder for standard T8 lamps and 10 feet between ballast and lamp holder for energy saving lamps.  
 Programmed Start 3&4-lamp (normal light) - Tandem wiring allowed to a maximum of 20 feet between ballast and lamp holder for standard T8 lamps and 10 feet between ballast and lamp holder for energy saving lamps. RED and YELLOW must be in the same fixture as the ballast.  
 Programmed Start 3&4-lamp (LW) - Tandem wiring allowed to a maximum of 10 feet between ballast and lamp holder for standard T8 lamps and energy saving lamps. RED and YELLOW must be in the same fixture as the ballast.

#### Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with UL Type CC rating.

3.7 Ballast shall meet NEMA/CEE High Performance T8 Lighting System Specifications.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001:2000 Quality System Standards.

4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a 90 C designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90 C.

4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

Note: Consult lamp manufacturers for applications with Ballast Factor > 1.2

Revised 08/03/2005



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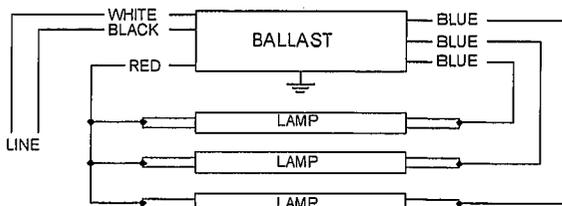
# PHILIPS ADVANCE

<b>IOP3P32LWSC@120V</b>	
Brand Name	OPTANIUM 2.0
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

## Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F25T8	2	25	-20/-29	0.36	43	0.86	10	0.99	1.6	2.00
* F25T8	3	25	-20/-29	0.48	57	0.79	10	0.99	1.6	1.39

## Wiring Diagram



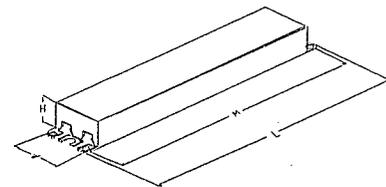
Diag. 65

The wiring diagram that appears above is for the lamp type denoted by the asterisk (\*)

## Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	25	63.5	Yellow/Blue		0
White	25	63.5	Blue/White		0
Blue	31	78.7	Brown		0
Red	37	94	Orange		0
Yellow		0	Orange/Black		0
Gray		0	Black/White		0
Violet		0	Red/White		0

## Enclosure



## Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.50 "	1.7 "	1.18 "	8.90 "
9 1/2	1 7/10	1 9/50	8 9/10
24.1 cm	4.3 cm	3 cm	22.6 cm

Revised 08/23/2006



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# PHILIPS ADVANCE

<b>IOP3P32LWSC@120V</b>	
Brand Name	OPTANIUM 2.0
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

## Electrical Specifications

### Notes:

#### Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

#### Section II - Performance Requirements

- 2.1 Ballast shall be \_\_\_\_\_ (Instant or Programmed) Start.
- 2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
- 2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.4 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52 kHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance System, such as anti-theft devices.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.77 for Low Watt, 0.87 for Normal Light Output, and 1.18 for High Light for Instant Start ballasts or 0.71 for Low Watt and 0.88 for Normal Light Output for Programmed Start ballasts.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of -20F (-29C) on Instant Start Ballasts or 0F (-18C) Programmed Start ballasts for standard T8 lamps and 60F (16C) for energy-saving T8 lamps. Consult lamp manufacturer for temperature versus light output characteristics.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.13 Ballast shall contain an anti-striation circuitry to reduce striation on energy-saving T8 lamps.
- 2.14 Programmed Start ballasts shall provide lamp EOL protection circuitry.
- 2.15 Ballast can be Remote or Tandem wired as follows:  
Instant Start ballasts - Remote or Tandem wiring allowed to a maximum of 20 feet between ballast and lamp socket. For Tandem wiring, any lamp can be remote mounted.  
Programmed Start 2-lamp ballast - Remote or Tandem wiring allowed to a maximum of 10 feet between ballast and lamp socket for energy-saving T8 lamps or 20 feet for standard T8 lamps. For Tandem wiring, BLUE lamp must be in same fixture as the ballast.  
Programmed Start 3 & 4-lamp (Normal Light) ballast - Remote or Tandem wiring allowed to a maximum of 10 feet between ballast and lamp socket for energy-saving T8 lamps or 20 feet for standard T8 lamps. For Tandem wiring, RED and YELLOW lamps must be in the same fixture as the ballast.  
Programmed Start 3 & 4-lamp (Low Watt) ballast - Remote or Tandem wiring allowed to a maximum of 10 feet between ballast and lamp socket for all T8 lamps. For Tandem wiring, RED and YELLOW lamps must be in the same fixture as the ballast.

#### Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18,

Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with UL Type CC rating (with the exception of IOPA models).

3.7 Ballast shall meet NEMA/CEE High Performance T8 Lighting System Specifications.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.

4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a 90 C designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90 C.

4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Advance part # \_\_\_\_\_ or approved equal.

NOTE: The use of Optanium IOP and ICN-2P32-N models is recommended to reduce striation in energy-saving T8 lamps (25W, 28W or 30W). Remote or tandem wiring of energy-saving T8 lamps (25W, 28W or 30W) is only recommended for Optanium 2.0 (IOP) models.

Consult lamp manufacturer for applications with Ballast Factor > 1.2

Revised 08/23/2006



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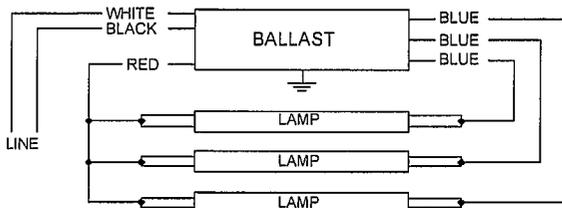
# PHILIPS ADVANCE

<b>IOP-3P32-SC@120V</b>	
Brand Name	OPTANIUM 2.0
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

## Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F32T8/ES (28W)	2	28	60/16	0.46	55	1.00	10	0.99	1.6	1.82
* F32T8/ES (28W)	3	28	60/16	0.61	72	0.87	10	0.99	1.6	1.21

## Wiring Diagram



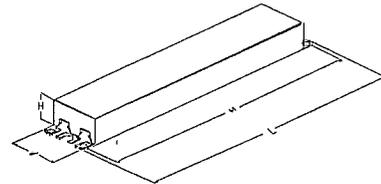
Diag. 65

The wiring diagram that appears above is for the lamp type denoted by the asterisk (\*)

## Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	25	63.5	Yellow/Blue		0
White	25	63.5	Blue/White		0
Blue	31	78.7	Brown		0
Red	37	94	Orange		0
Yellow		0	Orange/Black		0
Gray		0	Black/White		0
Violet		0	Red/White		0

## Enclosure



## Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.50 "	1.7 "	1.18 "	8.90 "
9 1/2	1 7/10	1 9/50	8 9/10
24.1 cm	4.3 cm	3 cm	22.6 cm

Revised 08/23/2006



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# PHILIPS ADVANCE

IOP-3P32-SC@120V	
Brand Name	OPTANIUM 2.0
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Parallel
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

## Electrical Specifications

### Notes:

#### Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

#### Section II - Performance Requirements

- 2.1 Ballast shall be \_\_\_\_\_ (Instant or Programmed) Start.
- 2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
- 2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.4 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52 kHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance System, such as anti-theft devices.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.77 for Low Watt, 0.87 for Normal Light Output, and 1.18 for High Light for Instant Start ballasts or 0.71 for Low Watt and 0.88 for Normal Light Output for Programmed Start ballasts.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of -20F (-29C) on Instant Start Ballasts or 0F (-18C) Programmed Start ballasts for standard T8 lamps and 60F (16C) for energy-saving T8 lamps. Consult lamp manufacturer for temperature versus light output characteristics.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.13 Ballast shall contain an anti-striation circuitry to reduce striation on energy-saving T8 lamps.
- 2.14 Programmed Start ballasts shall provide lamp EOL protection circuitry.
- 2.15 Ballast can be Remote or Tandem wired as follows:  
Instant Start ballasts - Remote or Tandem wiring allowed to a maximum of 20 feet between ballast and lamp socket. For Tandem wiring, any lamp can be remote mounted.  
Programmed Start 2-lamp ballast - Remote or Tandem wiring allowed to a maximum of 10 feet between ballast and lamp socket for energy-saving T8 lamps or 20 feet for standard T8 lamps. For Tandem wiring, BLUE lamp must be in same fixture as the ballast.  
Programmed Start 3 & 4-lamp (Normal Light) ballast - Remote or Tandem wiring allowed to a maximum of 10 feet between ballast and lamp socket for energy-saving T8 lamps or 20 feet for standard T8 lamps. For Tandem wiring, RED and YELLOW lamps must be in the same fixture as the ballast.  
Programmed Start 3 & 4-lamp (Low Watt) ballast - Remote or Tandem wiring allowed to a maximum of 10 feet between ballast and lamp socket for all T8 lamps. For Tandem wiring, RED and YELLOW lamps must be in the same fixture as the ballast.

#### Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18,

Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with UL Type CC rating (with the exception of IOPA models).

3.7 Ballast shall meet NEMA/CEE High Performance T8 Lighting System Specifications.

#### Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.

4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a 90 C designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90 C.

4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Advance part # \_\_\_\_\_ or approved equal.

NOTE: The use of Optanium IOP and ICN-2P32-N models is recommended to reduce striation in energy-saving T8 lamps (25W, 28W or 30W). Remote or tandem wiring of energy-saving T8 lamps (25W, 28W or 30W) is only recommended for Optanium 2.0 (IOP) models.

Consult lamp manufacturer for applications with Ballast Factor > 1.2

Revised 08/23/2006



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# enviro

ENERGY PLANNING ASSOCIATES

## RTR TROFFER REFLECTOR KIT

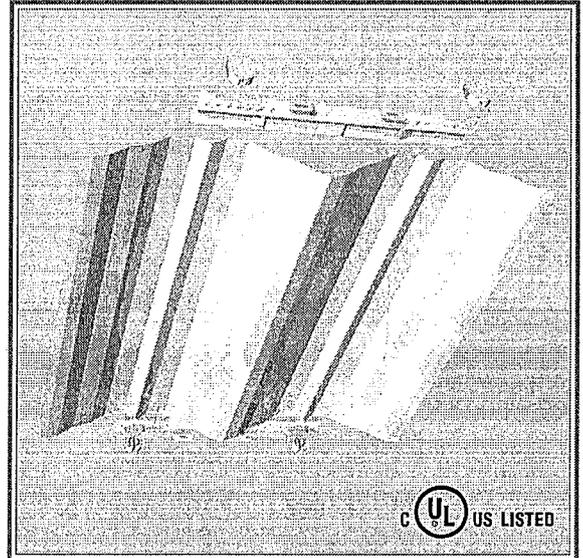
2x2 Troffer Fixture Retrofit Kit

### Description

Envirobrite's® RTR Troffer Reflector kits dramatically enhance existing fixture efficiencies creating substantial energy savings with excellent return on investment. All Envirobrite® kits have four different specialized material options which offer various light distributions with minimal up-front investments. These kits, in conjunction with numerous ballast and lamp configurations, can easily produce ideal IES recommended light levels with minimized energy consumption. Envirobrite® kits will continue to provide consistent fixture performance and repeat annual energy savings for up to 25 years.

### Application

Since 1994, millions of 2x2 lensed troffers and 18 cell parabolic louvers have been successfully de-lamped with Envirobrite® troffer kits. These kits are recognized worldwide as the industry leading retrofit kit for the majority of all commercial 2x2 fixtures. It's ideal optics, universal fit configuration and flexible stamped bracketing system allows proper fit in office spaces, classrooms, hospitals, and many other commercial locations.



### Design

Envirobrite® kits are designed by our expert in house lighting engineers for ideal photometry and trouble-free installation. Every Envirobrite kit is designed to meet UL 1570 specifications for safety. Integral to ideal kit functionality is the combination of our bracketing system which centers the lamps specifically to the optics of the reflector design. Envirobrite® reflectors are fabricated with Energy Planning Associates custom-made multi-stage progressive roll forming machinery. Our unique high speed equipment consistently produces multi-faceted linear fluorescent reflectors within precise quality tolerance. Our process enables us to add additional facets for superior reflector performance significantly reducing production cost and improving lead times. Our rigid, light weight bracketing systems are produced with custom designed stamping dies and are very easy to install. As with all Envirobrite® products Cost-A-Mized solutions are available to meet every customer's needs.

### Primary Features & Benefits

- Proudly Designed, Made and Assembled in the USA
- Qualifies for maximum \$.60 square foot EPACT tax deduction
- Significant reduction in maintenance costs
- Reinforced multi function universal bracketing system
- Aluminum components generate a rust-free approach to less maintenance and lasting appeal
- Utility rebate friendly throughout the U.S.
- 25 facet optical design for maximum performance
- Superior lighting directly to the work plane
- Flexibility for tandem wiring applications

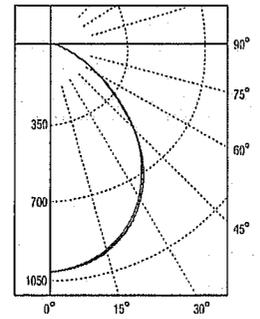
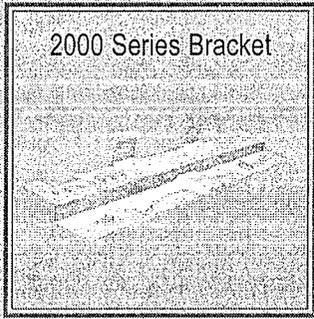
### Quick, Safe and Labor Efficient Installation

- Variable tek screw slot locations for multiple mounting options
- Unique bracket design UL approved for no wire guard requirement
- Lance and form bracket design for easy pinch in reflector installation
- Snap-in lamp holders won't fall out during overhead installation
- Streamlined packaging for easy job site material management
- With 1/3 the weight of steel aluminum components permit reduced shipping cost and simpler installation
- 25 facet reflectors for added rigidity and a sturdy fit
- Less than 2" reflector depth to fit shallow fixtures
- Toolless ballast access for simple maintenance
- Rounded-edged brackets to avoid injury during installation
- Slots, instead of holes are provided for easy alignment and centering

*For added efficiency include high quality T5 or T8 lamps with either instant or programmed start ballasts. Adding an Envirobrite® approved motion sensor system to your retrofit project will further enhance energy savings and create an even faster payback.*

envirobrite

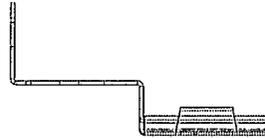
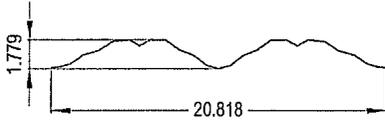




Side View

Side View

0° — Candela Plot  
45° — 2 Lamp T8  
90° —

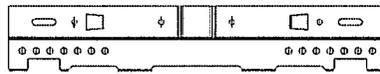
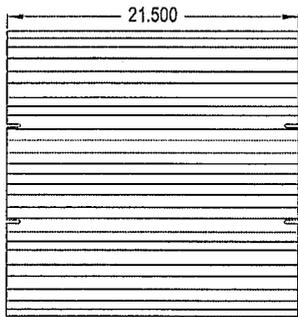


Zonal Lumen Summary

Top View

Top View

Zone Lumens % Lamp Fixture



Zone	Lumens	% Lamp	Fixture
0-30	759	27.1	35.7
0-40	11952	42.7	56.2
0-60	1850	66.1	87.1
0-90	2125	75.9	100.0

**RTR2202T817ENLSS used for test**  
Total Luminaire Optical Efficiency = 75.9%

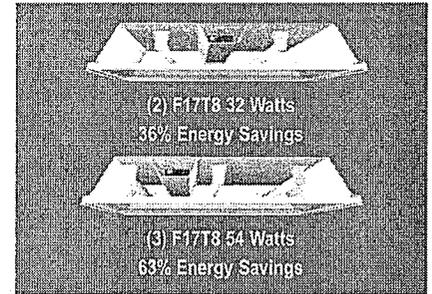
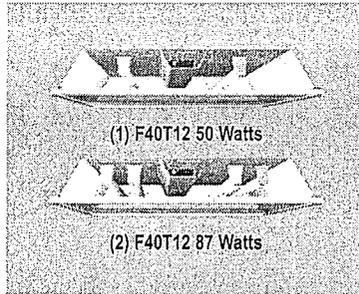
Luminaire Spacing Criterion

0 deg - 1.2                      90 deg - 1.1

Call factory for full photometric report

**2x2 Kit includes**

- (1 qty) 2200 series aluminum reflector made from your choice of specified material (95% Enhanced Miro4, 93% Micro Matte, 91% White-painted or 87% Anodized Aluminum)
- (2 qty) 2000 series white-painted stamped aluminum brackets
- (4, 6 or 8 qty) specified shunted or unshunted high quality chemical resistant thermoplastic body UL approved lamp holders
- (5 qty) tek screws



Ordering Information

Sample number: RTR2202T817ENLSS

TYPE	DIMENSION	LAMPS	LAMP TYPE	REFLECTOR
○ RTR=Troffer Reflector Kit	○ 22=2x2	○ 02=2 Lamp	○ T817=17W	○ EN=95% MIRO 4 Enhanced
		○ 03=3 Lamp		○ MN=93% Micro Matte
		○ 04=4 Lamp		○ WN=91% White Aluminum
				○ AN=87% Anodized Aluminum

LAMP HOLDER TYPE	INSERTION METHOD
○ LS= Shunted	○ S=T8 Short Twist Lock (Standard)
○ LU= Unshunted	○ N=T8 Short Snap In Twist Lock
	○ P=T5 Plunger Socket

# enviro

ENERGY PLANNING ASSOCIATES

## RTR TROFFER REFLECTOR KIT

1x4 Troffer Fixture Retrofit Kit

### Description

Envirobrite's® RTR Troffer Reflector kits dramatically enhance existing fixture efficiencies creating substantial energy savings with excellent return on investment. All Envirobrite® kits have four different specialized material options which offer various light distributions with minimal up-front investments. These kits, in conjunction with numerous ballast and lamp configurations, can easily produce ideal IES recommended light levels with minimized energy consumption. Envirobrite® kits will continue to provide consistent fixture performance and repeat annual energy savings for up to 25 years.

### Application

Since 1994, thousands of 1x4 lensed troffers and 8-cell parabolic louvers have been successfully de-lamped with Envirobrite® troffer kits. These kits are recognized worldwide as the industry leading retrofit kit for the majority of all commercial 1x4 fixtures. It's ideal optics and flexible bracketing systems utilizing our Cost-A-Mized program will allow proper fit in office spaces, classrooms, hospitals, and many other commercial locations.



### Design

Envirobrite® kits are designed by our expert in house lighting engineers for ideal photometry and trouble-free installation. Every Envirobrite® kit is designed to meet UL 1570 specifications for safety. Integral to ideal kit functionality is the combination of our bracketing system which centers the lamps specifically to the optics of the reflector design. Envirobrite® reflectors are fabricated with Energy Planning Associates custom-made multi-stage progressive roll forming machinery. Our unique high speed equipment consistently produces multi-faceted linear fluorescent reflectors within precise quality tolerance. As with other Envirobrite® bracketing systems we have designed a variety of bracketing solutions for ease of installation and proper fit for the wide variety of 1 x 4 troffer applications. These fixture types offer a unique retrofit challenge compared to 2 x 4 and 2 x 2 troffers and a universal fit approach is not typical. From our extensive retrofit experience we suggest approaching each retrofit with our Cost-a-Mized approach and test installations.

*\* Envirobrite's® Cost-A-Mized program is an ideal solution that allows our product to be modified from our standard line and ensure an ideal fit.*

### Primary Features & Benefits

- Proudly Designed, Made and Assembled in the USA
- Qualifies for EPACT tax deduction
- Significant reduction in maintenance costs
- Aluminum components generate a rust-free approach to less maintenance and lasting appeal
- Utility rebate friendly throughout the U.S.
- Multi-facet optical design for maximum performance
- Superior lighting directly to the work plane
- Flexibility for tandem wiring applications

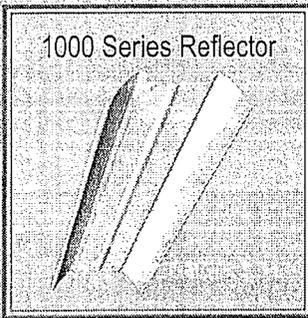
### Quick, Safe and Labor Efficient Installation

- Multi-facet reflectors for added rigidity and a sturdy fit
- Snap-in lamp holders won't fall out during overhead installation
- Streamlined packaging for easy job site material management
- Easy access quarter turn reflector installation
- Toolless ballast access for simple maintenance
- With 1/3 the weight of steel aluminum components permit

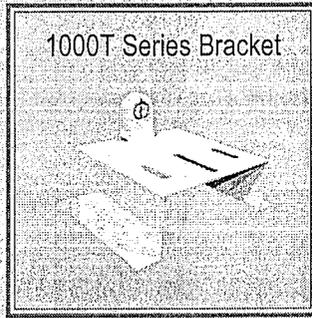
*For added efficiency include high quality T5 or T8 lamps with either instant or programmed start ballasts. Adding an Envirobrite® approved motion sensor system to your retrofit project will further enhance energy savings and create an even faster payback.*

envirobrite

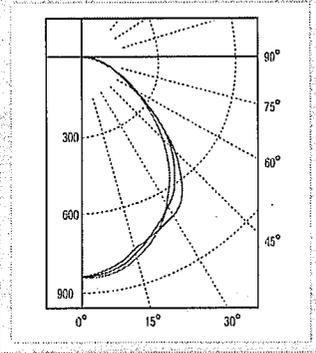




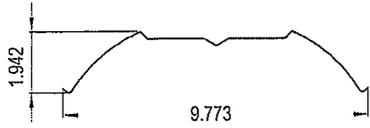
Side View



Front View



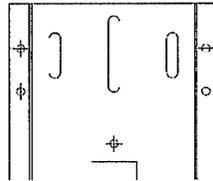
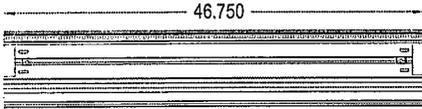
0°  
45°  
90° Candela Plot  
1 Lamp T8



Top View



Top View



Zonal Lumen Summary

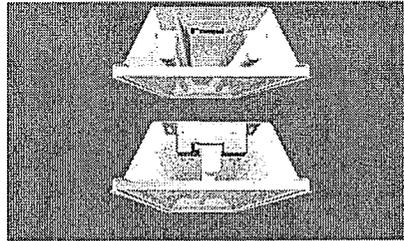
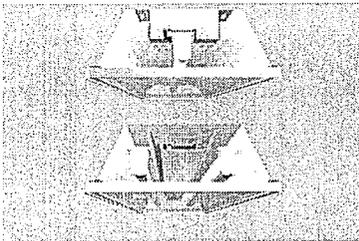
Zone	Lumens	% Lamp	Fixture
0-30	759	27.1	35.7
0-40	11952	42.7	56.2
0-60	1850	66.1	87.1
0-90	2125	75.9	100.0

1x4 Kit includes

- (1) 1400T series aluminum reflector made from your choice of specified material (95% Enhanced Miro4, 93% Micro Matte, 91% White-painted or 87% Anodized Aluminum)
- (2) 1000T series white-painted stamped aluminum brackets
- (2, 4 or 6) specified shunted or unshunted high quality chemical resistant thermoplastic body UL approved lamp holders
- (2) Quarter turns
- (5) tek screws

RTR1401T832LSS used for test  
Total Luminaire Optical Efficiency = 64.9%

Luminaire Spacing Criterion  
0 deg - 1.2      90 deg - 1.3  
Call factory for full photometric report



**"SAVINGS"**  
32% Energy Savings  
66% Energy Savings

Ordering Information  
Sample number: RTR1402T832ENLSS

TYPE	DIMENSION	LAMPS	LAMP TYPE	REFLECTOR
○ RTR=Troffer Reflector Kit (1000 series)	○ 14=1x4	○ 01=1 Lamp	○ T832=32W	○ EN=95% MIRO 4 Enhanced
		○ 02=2 Lamp	○ T554=54W	○ MN=93% Micro Matte
		○ 03=3 Lamp		○ WN=91% White Aluminum
				○ AN=87% Anodized Aluminum

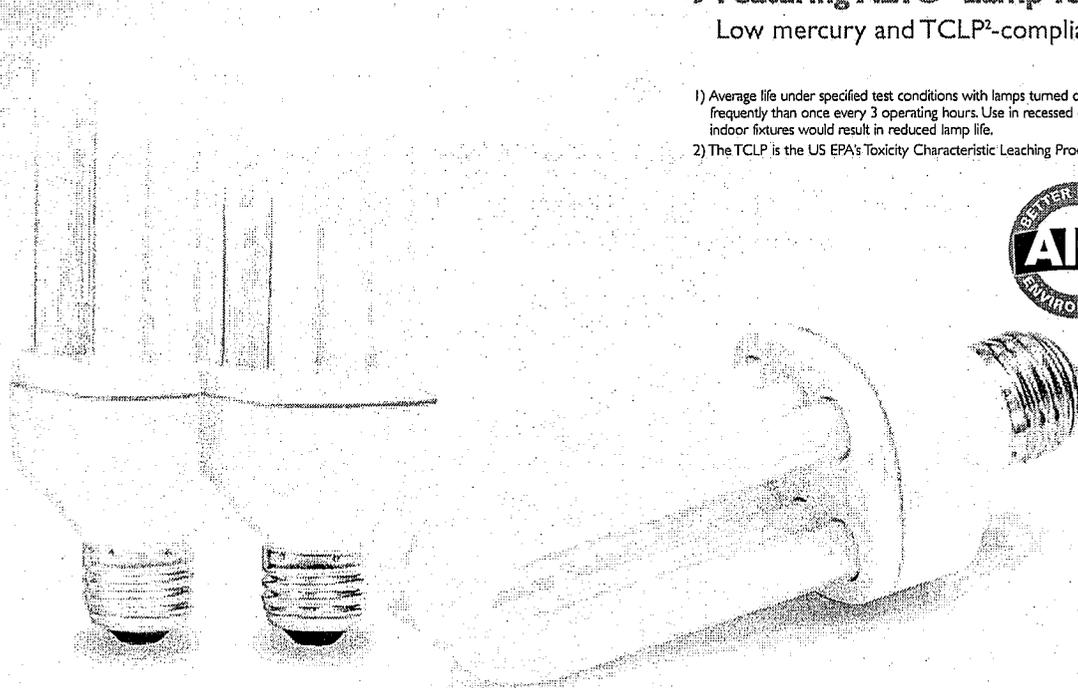
LAMPHOLDER TYPE	INSERTION METHOD
○ LS= Shunted	OS=T8 Short Twist Lock (Standard)
○ LU= Unshunted	ON=T8 Short Snap In Twist Lock
	OP=T5 Plunger Socket

# Philips Marathon® Energy Saver Universal Family

featuring ALTO® Lamp Technology



*Ideal for table lamps, wall sconces,  
ceiling fixtures, surface mounted  
light fixtures and hanging lamps*



## ▶ Extensive Range of Uses

Available in 60/75/100 watt incandescent lamp equivalents for use in a variety of applications

## ▶ Provides Soft, White Light

## ▶ Amalgam Technology

Provides stable light output over a broad range of temperatures

## ▶ Super Long Life

—The 20 and 25W Universal have 15,000 hours rated average life!<sup>1</sup> The longest lasting Marathon® Compact Fluorescent  
—The 14W Universal has 12,000 hours rated average life<sup>1</sup>

## ▶ Energy Savings

Saves up to 75% in electricity costs compared to standard incandescent lamps

## ▶ Featuring ALTO® Lamp Technology

Low mercury and TCLP<sup>2</sup>-compliant

<sup>1</sup>) Average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. Use in recessed cans or totally enclosed indoor fixtures would result in reduced lamp life.

<sup>2</sup>) The TCLP is the US EPA's Toxicity Characteristic Leaching Procedure.



# PHILIPS

**Philips Lighting Company**  
**200 Franklin Square Drive**  
**P.O. Box 6800**  
**Somerset, NJ 08875-6800**  
**1-800-555-0050**

[www.philips.com](http://www.philips.com)

**Philips Lighting**  
**281 Hillmount Road**  
**Markham, Ontario**  
**Canada L6C 2S3**  
**1-800-555-0050**  
 A Division of Philips Electronics Ltd.

A Division of Philips Electronics North America Corporation  
 Printed in USA 6/05 P-3754-C

## Philips Marathon® Energy Saver Universal

Electrical, Technical and Ordering Data (Subject to change without notice)

Product Number	Description	Volts	Nom. Watts	Approx. Incand. Equiv. Base	Color Temp. (Kelvin)	CRI	Approx. Initial Lumens <sup>1</sup>	MOL (In.)	Rated Avg. Life (Hrs.) <sup>2</sup>	Lamp Current (mAmps)	Power Factor	Min. Starting Temp. <sup>3</sup>	Max. Ambient Temp.	
Box 14691-0	Universal SLS 14 ALTO	120	14	60A19	Med	2700	82	860	4.9	12,000	230	.50-.60	-22F/-30C	60F/140F
13077-3	Universal SLS 20 ALTO	120	20	75A19	Med	2700	82	1200	5.6	15,000	285	.50-.60	-22F/-30C	60F/140F
13574-9	Universal SLS 25 ALTO	120	25	100A19	Med	2700	82	1750	6.2	15,000	335	.50-.60	-22F/-30C	60F/140F

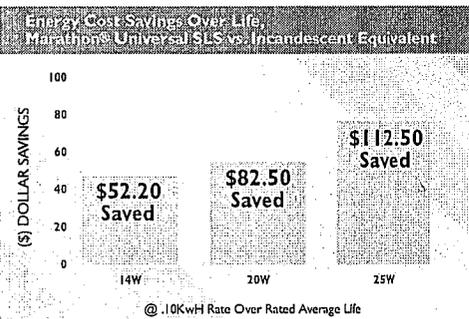
### Shipping Data (Subject to change without notice)

Product Number	SKU UPC (0-46677)	Outer Bar Code (5-00-46677)	Case Qty.	Case Weight (lbs.)	Case Cube (cu. ft.)	Pallet Qty.	SKUs Per Layer	Layers High	SKU Dimensions (WxDxH) (In.)	Case Dimensions (WxDxH) (In.)	Pallet Dimensions (WxDxH) (In.)
Box 14691-0	13075-6	13075-1	6	2	0.17	2016	336	6	2.2 x 2.2 x 5.3	7.0 x 5.0 x 6.0	42.4 x 38.5 x 42.0
13077-3	13077-0	13077-5	6	2	0.20	2016	336	6	2.2 x 2.2 x 6.0	7.0 x 5.0 x 7.0	42.4 x 38.5 x 47.3
13574-9	13574-4	13574-9	6	2	0.8	2016	336	6	2.2 x 2.2 x 6.5	7.0 x 5.0 x 7.3	49.4 x 38.5 x 47.9

- 1) Approximate initial lumens. The lamp lumen output is based upon lamp performance after 100 hours of operating life under standard laboratory conditions.
- 2) Average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. Use in recessed cans or totally enclosed indoor fixtures could result in reduced lamp life.
- 3) Suitable for indoor or outdoor use down to -22° F. UL listed for damp locations. Outdoor use requires an enclosed or weather-protected fixture.

Bulb Type	Wattage Comparison*	Table/Floor Lamp	Outdoor Postlight	Wall Sconce	Surface Mount	Reading Lamp	Border Lights	Recessed Fixture	O Har
Mini Disco Twister	11-150	•		•		•			•
Disco Twister	12-150	•		•		•			•
Circline Adapter	13-120-24-120	•							•
R20 Reflector	14-50						•		•
PAR16 Reflector	14-65-20-65						•		•
PAR38 Reflector	14-26-75						•		•
56 White Flux	14-60-20-75	•	•	•		•			•
Bug-A-Way	14-60-20-100		•	•					•
Disco Candabra	15-60			•		•			•
Disco Medium Base	15-60			•		•			•
Vanity Globe	15-60								•
Decor Globe	16-60-20-100								•
3-Way	17-60-18-150-100-50	•							•
Outdoor	17-60-18-75-50		•						•

\*Chart comparison shows Marathon wattages and their equivalent to standard incandescent bulb wattages (\$).  
 • This product utilizes ALTO® Lamp Technology.



### Lamp Dimensions

	SLS 14	SLS 20	SLS 25
MOL A	4.9"	5.6"	6.2"
Max. Diameter B	2.3"	2.3"	2.3"
Weight	3.6 oz.	3.9 oz.	4.2 oz.
Lamp Harp Fit	7"	8"	9"

**CAUTION:** Risk of electric shock—do not use where directly exposed to water, rain or snow. Do not use with dimmers.  
 Before using this product with electronic timing or photocell devices, check to determine whether device is compatible with electronic compact fluorescent lamps. Use with incompatible devices will cause premature lamp failure.

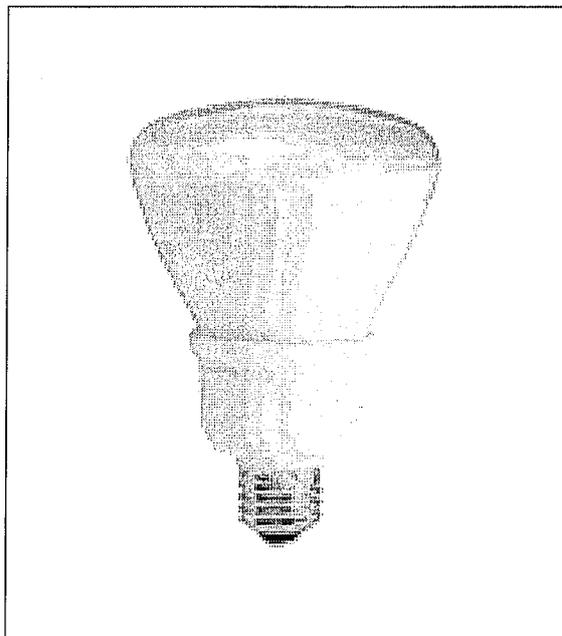
This product complies with Part 18 of the FCC rules. These products may cause interference with radios, cordless telephones, and remote control devices. Interference may cease after a brief 90 second lamp warm-up period. If interference continues, relocate the lamp away from the device or plug into a different outlet.

\*\*These lamps are better for the environment because of their reduced mercury content. All Philips ALTO® Lamps give you end-of-life options which can simplify and reduce your lamp disposal costs depending on your state and local regulations.



A

B



## 16W Med EL/A R30 Dim ALTO 1CT

### Product family description

Dimmable – User control of light levels down to 10% which allows flexibility in lighting design.

Provides soft, white light.

Amalgam Technology – Provides stable light over a broad range of temperatures and operating positions for indoor and outdoor applications.

Super Long Life – Lasts 6 years, based on 3–4 hours average daily usage, 7 days per week.

Energy Savings – Saves up to 70% in electricity costs compared to incandescent reflectors.

### Applications

- Ideal for sockets controlled by standard incandescent dimmers, timers, or sensors.

### Notes

- The use of Amalgam Technology results in relatively stable light output across a broad range of ambient temperatures and operating positions. (216)
- Lamp is designed for use with most standard incandescent dimmers. (232)
- All Marathon™ lamps are suitable for indoor or outdoor use down to –10°F. Outdoor use requires a weather-protected fixture. All these products comply with part 18 of the FCC rules. These products may cause interference with AM radios, cordless telephones, and remote control devices. Interference may be caused after a brief 90-second lamp warm-up period. If interference continues, relocate the lamp away from the device or plug into a different outlet. (217)
- All lamps are electronically ballasted and designed for 120 volt operation. Lamps operated in extreme environments will have reduced life (ie. recessed or enclosed lighting fixtures with elevated line voltage). Caution: except for lamps marked dimmable, do not use with dimmers. Before using these lamps with electronic timing or photocell devices, check to determine whether the device is compatible with compact fluorescent lamps. Use with incompatible devices will result in premature lamp failure. These products are UL listed. (218)
- Average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. (230)
- Approximate initial lumens. The lamp lumen output is based upon lamp performance after 100 hours of operating life under standard laboratory conditions. (231)
- Exclusive to Philips Lighting Company.

### Product data

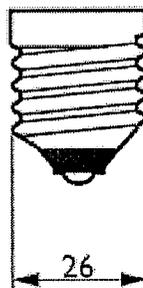
Product Number	137075
Full product name	16W Med EL/A R30 Dim ALTO 1CT
Ordering Code	EL/A R30 16W DIMM REFLECTOR
Pack type	1 Lamp in a Folding Carton
Pieces per Sku	1
Skus/Case	6
Pack UPC	046677137076

# PHILIPS

Product data	
EAN2US	
Case Bar Code	50046677137071
Successor Product number	
Base	Medium [Single Contact Medium Screw]
Bulb	EL/A R30
Packing Type	1CT [1 Lamp in a Folding Carton]
Packing Configuration	6
Feature	Dimmable ALTO®
Rated Avg. Life [3 hr Start]	8000 hr
Ordering Code	EL/A R30 16W DIMM REFLECTOR
Pack UPC	046677137076
Case Bar Code	50046677137071
Energy Saving	Energy Saving
Watts	16W
Color Rendering Index	82 Ra8
Color Temperature	2700 K
Initial Lumens	630 Lm
Max Overall Length (MOL) - C	5.39 in
Product Number	137075



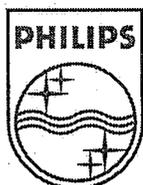
CI RefID Medium EL/A R30

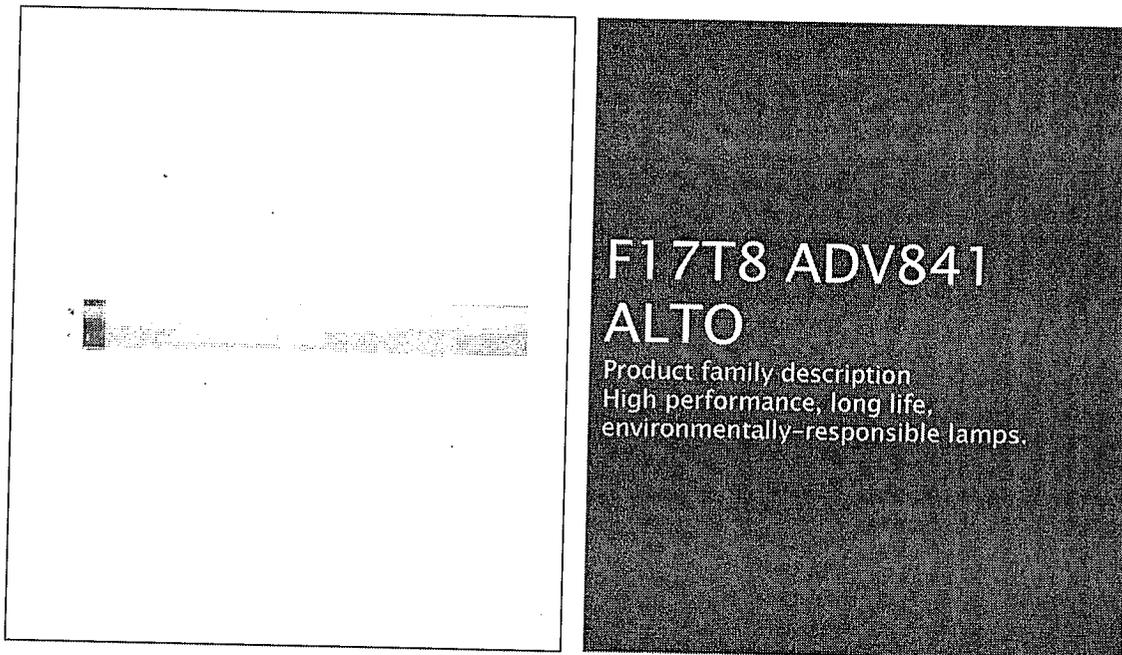


Base Medium



Energy Saving Energy Saving





#### Features/Benefits

- 3100 lumens is 10% more than standard T8 lamps.
- Low mercury: TCLP\* compliant.
- Sustainable lighting solutions; Less mercury and fewer lamps in landfills, combined with energy efficiency and long life reduces the impact on the environment.
- HI-VISION® Phosphor combined with Philips exclusive cathode guard delivers: 95% lumen maintenance; reduced lamp-end blackening.
- Our Green End-Caps mean you are using environmentally-responsible lamps.
- 85 CRI.
- Higher lumens enables multiple system options to maximize energy saving and reduce lighting costs.
- Fully dimmable without burn-in.

#### Applications

- Ideal for T8 applications requiring maximum light output and long life. Ideal for light harvesting.

#### Notes

- Rated average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. Lamp life is appreciably longer if lamps are started less frequently. (202)
- Average life under engineering data with lamps turned off and restarted once every 12 operating hours. (241)
- Approximate Initial Lumens. The lamp lumen output is based upon lamp performance after 100 hours of operating life, when the output is measured during operation on a reference ballast under standard laboratory conditions. (203)
- For expected lamp lumen output, commercial ballast manufacturers can advise the appropriate Ballast Factor for each of their ballasts when they are informed of the designated lamp. The Ballast Factor is a multiplier applied to the designated lamp lumen output. (204)
- Design Lumens are the approximate lamp lumen output at 40% of the lamp's Rated Average Life. This output is based upon measurements obtained during lamp operation on a reference ballast under standard laboratory conditions. (208)
- Design lumens rated at 3 hours per start on Instant Start ballast. (239)
- Exclusive to Philips Lighting Company.

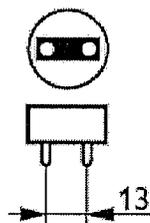
# PHILIPS

6/8/2007

Product data	
Product Number	204859
Full product name	F17T8 ADV841 ALTO
Ordering Code	F17T8/ADV841 ALTO
Pack type	1 Lamp
Pieces per Sku	1
Skus/Case	25
Pack UPC	046677204853
EAN2US	
Case Bar Code	50046677204858
Successor Product number	
Base	Medium Bi-Pin [Medium Bi-Pin Fluorescent]
Base Information	Green Base
Bulb	T8
Packing Type	1LP [1 Lamp]
Packing Configuration	25
Name Type	F17T8
Feature	ALTO®
Ordering Code	F17T8/ADV841 ALTO
Pack UPC	046677204853
Case Bar Code	50046677204858
Energy Saving Product	Energy Saving
Rated Avg Life [12-Hr Prog St]	36000 hr
Rated Avg Life [12-Hr Inst St]	30000 hr
Rated Avg Life [3-Hr Prog St]	30000 hr
Rated Avg Life [3-Hr Inst St]	24000 hr
Watts	17W
Mercury (Hg) Content	3.5 mg
Color Code	Advantage 841 [CCT of 4100K]
Color Rendering Index	85 Ra8
Color Designation	Advantage 841
Color Temperature	4100 K
Initial Lumens	1500 Lm
Design Mean Lumens	1455 Lm
Nominal Length [inch]	24
Product Number	204859



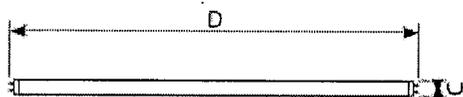
F-T8-Adv Med Bi-pin/GB



Base Medium Bi-Pin

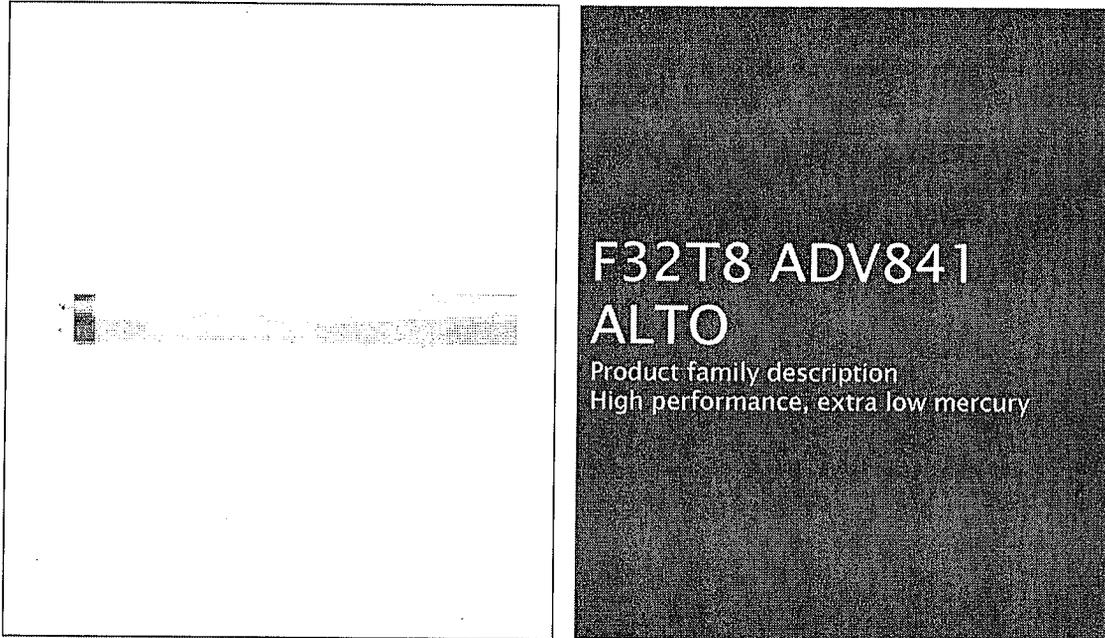


Energy Saving Product Energy Saving



F-T8-Adv Med Bi-pin





#### Features/Benefits

- Ultimate System solution
- High lumens enable multiple system options to maximize energy savings and reduce lighting costs.
- Fully dimmable without burn-in.
- Better for the environment
- Only 1.7mg of mercury with ALTO II™ Technology
- Reduced impact on the environment without sacrificing performance
- Warranty period: 36 months

#### Applications

- Ideal for applications requiring maximum light output.

#### Notes

- Rated average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. Lamp life is appreciably longer if lamps are started less frequently. (202)
- Average life under engineering data with lamps turned off and restarted once every 12 operating hours. (241)
- Approximate Initial Lumens. The lamp lumen output is based upon lamp performance after 100 hours of operating life, when the output is measured during operation on a reference ballast under standard laboratory conditions. (203)
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- Design lumens rated at 3 hours per start on Instant Start ballast. (239)
- Exclusive to Philips Lighting Company.

Product data	
Product Number	139899
Full product name	F32T8 ADV841 ALTO

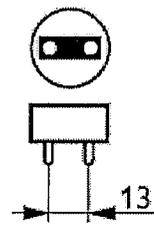
# PHILIPS

Product data	
Ordering Code	F32T8/ADV841 /ALTO
Pack type	1 Lamp
Pieces per Sku	1
Skus/Case	25
Pack UPC	046677139896
EAN2US	
Case Bar Code	50046677139891
Successor Product number	
Base	Medium Bi-Pin [Medium Bi-Pin Fluorescent]
Base Information	Green Base
Bulb	T8
Packing Type	1LP [1 Lamp]
Packing Configuration	25
Type	F32T8
Feature	ALTO II™
Ordering Code	F32T8/ADV841 /ALTO
Pack UPC	046677139896
Case Bar Code	50046677139891
Energy Saving	Energy Saving
Rated Avg Life [12-Hr Prog St]	36000 hr
Rated Avg Life [12-Hr Inst St]	30000 hr
Rated Avg Life [3-Hr Prog St]	30000 hr
Rated Avg Life [3-Hr Inst St]	24000 hr
Watts	32W
Mercury (Hg) Content	1.7 mg
Picogram per Lumen Hour	24 p/LuHr
Color Code	Advantage 841 [CCT of 4100K]
Color Rendering Index	85 Ra8
Color Designation	Advantage 841
Color Temperature	4100 K
Initial Lumens	3100 Lm
Design Mean Lumens	3000 Lm
Nominal Length [inch]	48
Product Number	139899

# PHILIPS



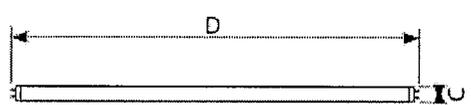
F-T8-Adv Med Bipin/GB



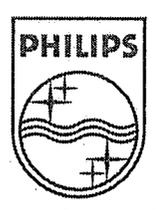
Base Medium Bi-Pin



Energy Saving Energy Saving



F-T8-Adv Med Bipin



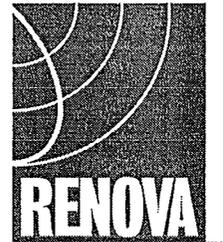
Category: ECS  
Energy  
Conservation  
Series

Prefix:  
**MPW**

Fixture Series (Name):  
**Medium Profile Wrap**



GE Lighting North America



renovat ve L ght ng deas  
Energy Eff c ent So ut ons

## Medium Profile Wrap Series general purpose fluorescent luminaire

### GENERAL DESCRIPTION

The Medium Profile Wrap (MPW) Series has been developed for general illumination for surface or pendant mounted applications. This series utilizes computer designed reflector technology for optimal fixture efficiency, reduction of energy consumption and improved quality of light. It also provides instant-on operation and offers many other energy saving options.

Typical applications for this type of product are interior spaces where finished ceilings exist. Applications include:

- Corporate / Office Buildings
- Hospitals, Government Facilities and Military Bases
- Retail and Industrial Facilities
- Schools, Colleges and Universities

### DESIGN FEATURES / SPECIFICATIONS

#### CONSTRUCTION

- Precision die formed from 22 ga. cold rolled steel.
- Mechanically fastened or resistance welded depending on model.
- Heavy gauge steel (CRS) may be custom ordered.
- Finish to be pre-painted gloss white polyester powder coat.
- Post-painted polyester powder coat finishes are available. Consult factory for all special colors and finishes.
- Heavy gauge steel (NYC) and heavy gauge aluminum are available as alternate materials.

#### REFLECTOR

- Precision die formed optics which has been designed for maximum efficiency and photometric properties using the latest CAD software.
- Choice of optics includes focused, normal and spread beam distribution. Consult factory for custom optics design and spacing criteria options.
- Choice of materials include:
  - Alanod Miro4® Enhanced Specular Aluminum, 95% total reflectance, 25 year warranty.
  - Enhanced Specular Aluminum, 92% total (min.) reflectance, 25 year warranty.
  - High Reflectance White Powder Coated Aluminum, 91% total reflectance, 10 year warranty.
  - Polished Aluminum, 87% total (min.) reflectance, 25 year warranty.
- Consult factory for availability of all other material choices.

#### LAMP HOLDERS

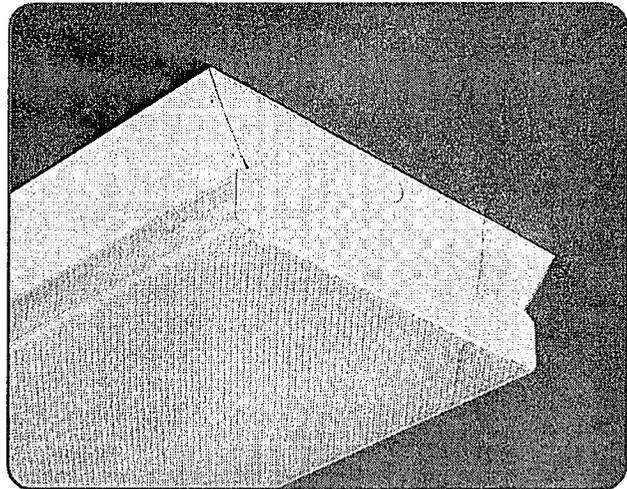
- Vossloh-Schwabe® premium type featuring:
  - Anti-vibration internal lamp locking design
  - High temperature resistant ("T" marking).
  - Heat and UV blocking shield to prevent degradation of material.
  - Multi-point contact design for optimum lamp pin contact.
  - Produced in accordance with DIN ISO 9001 and IEC standards.

#### BALLASTS

- All standard ballasts are electronic, energy saving, thermally protected, Class-P, non-PCB, Sound Rated "A", 0 degree (Type 1 Outdoor). Verify with factory for latest information regarding High Temperature (HT) or Extreme Low Temperature (XLT) rated ballast options.
- UL/CSA certified, where applicable. Compliant with Federal Ballast Law (Public Law 100-357, 1988).
- Choice of ballast factors. L=Low, N=Normal, H=High.
- Choice of dedicated, universal or special voltage - Consult factory for available options.
- Warranted by ballast manufacturer. Typical ballast warranty is for 5 years (120-277v) and 3-years (347-480v). Consult factory for latest warranty information.

#### LAMPS

- Supplied by others unless otherwise specified.
- Factory installed if required - Consult factory.
- Lamp type, CRI ratings, temperature colors, lamp life ratings are all viable options which can be supplied - Consult factory for information.



#### LENS (Diffuser)

- Extruded profile for precision fit.
- 100% virgin clear acrylic resin (for max. optical clarity).
- Linear prisms extruded into sides of lens.
- Pattern 12 prisms embossed into bottom of lens
- 30% "DR" additive (standard) to resist breakage (50% "DR" additive optional).
- Consult factory for all available lens options.

#### MOUNTING

- The luminaire may be surface mounted or may be suspended by pendant, threaded rod, hook, chain or cable. (Mounting hardware supplied by others unless otherwise specified).

#### ELECTRICAL

- Luminaire is bi-national listed and labeled (UL 1598 and CSA C22.2 No. 250.0-00) and is suitable for damp locations.
- Product includes luminaire disconnect as specified in NEC 410.73(G), 2005 Edition, and CEC part I, rule 30-308(4), 2006 Edition.

#### QUALITY CONTROL

- All fixtures and retrofit kits are designed, fabricated, assembled and tested at RENOVA's manufacturing facility. All fixtures are 100% lamp tested, inspected and labeled prior to shipment.

#### GUARANTEE

- RENOVA warrants all fixtures to be free of defects in manufacturing and workmanship for a period of (1) year from date of purchase. This warranty excludes damage of any kind resulting from improper installation, misuse, abuse, accidents, mis-application, or natural disasters. Please refer to the "Terms and Conditions" section of the RENOVA website for additional information.

Note: RENOVA products are constantly being improved; therefore, the information shown is subject to change without notice. Always consult your lighting representative or RENOVA Lighting Systems, Inc. for the latest information.

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RLS-4940A-3

Category: ECS  
Energy Conservation Series

Prefix:  
**MPW**

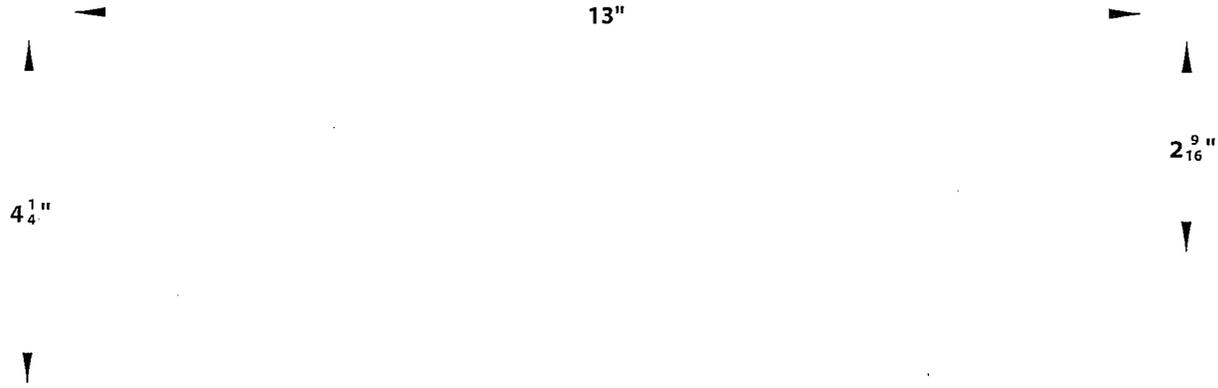
Fixture Series (Name):  
**Medium Profile Wrap**



renovat ve L ght ng deas  
Energy Eff c ent So ut ons



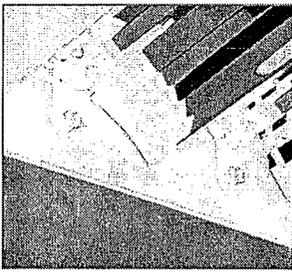
**2-Lamp T8 Medium Profile Wrap Cross Section Shown**



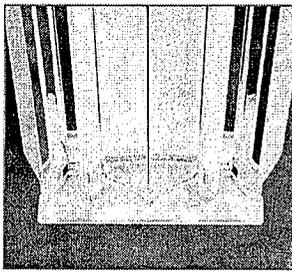
ORDERING GUIDE											
CATEGORY	SERIES	SIZE	REFLECTOR MATERIAL	REFLECTOR PHOTOMETRY	NUMBER OF LAMPS	LAMP TYPE (WATTAGE)	BALLAST VOLTAGE	NUMBER OF BALLASTS	LAMPS PER BALLAST	BALLAST FACTOR	OPTIONS
<b>ECS</b>	<b>MPW</b>	<b>4</b>	<b>M</b>	<b>N</b>	<b>2</b>	<b>32</b>	<b>UNV</b>	<b>1</b>	<b>2</b>	<b>N</b>	
Energy Conservation Series	MPW - MEDIUM PROFILE WRAP	2 - 24" 3 - 36" 4 - 48" 6 - 72" 8 - 96"	M - MIRO4 (95% TR) E - ENHANCED ALUMINUM (92% TR min.) W - WHITE (91% TR) A - ALUMINUM (87% TR min.) B - BALLAST COVER (White) (83% TR min.) R - MIRO4 MICRO-MATT (95% TR)	F - FOCUSED N - NORMAL S - SPREAD C - CUSTOM OPTICS  *N - NORMAL IS STANDARD (BLANK)=N *C - CUSTOM OPTICS ARE DESCRIBED IN OPTIONS BOX	1 - 1L 2 - 2L 3 - 3L  2 - 2L 4 - 4L 6 - 6L	17 17w T8 25 25w T8 32 32w T8  14 14w T5 21 21w T5 28 28w T5  24 24w TSHO 39 39w TSHO 54 54w TSHO	120 - 120v, 60 Hz 277 - 277v, 60 Hz 347 - 347v, 60 Hz UNV - 120v - 277v, 60 Hz 480 - 480v, 60 Hz xxx - Less Ballast	S - SLAVE (BLANK) - 1 2 - 2 3 - 3 4 - 4	(BLANK) - 0 1 - 1 2 - 2 3 - 3 4 - 4	L - Low N - Normal H - High	

Photometric data, IES files and all other information is available upon request.

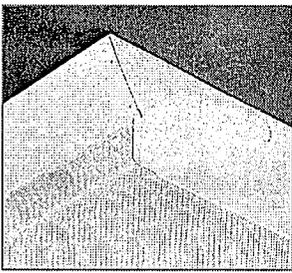
**\*ADDITIONAL OPTIONS**  
(See "Options" sheet for all available options)



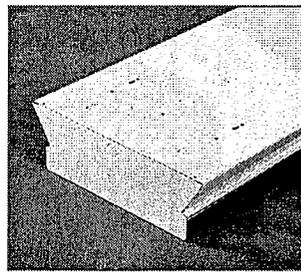
Vossloh Locking Lampholders (Standard)



Multi-Faceted Reflector (Designed for Maximum Efficiency)



Standard Lens (Bottom: Pattern 12 Prismatic Embossment) (Side: Linear Prisms)



Mounting Details (Included in all Housings)

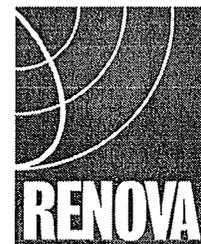
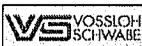
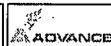
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Category: ECS  
Energy  
Conservation  
Series

Prefix:  
**NPW**

Fixture Series (Name):  
**Narrow Profile Wrap**



renovat ve L ght ng deas  
Energy Eff c ent So ut ons

## Narrow Profile Wrap Series general purpose fluorescent luminaire

### GENERAL DESCRIPTION

The Narrow Profile Wrap (NPW) Series has been developed for general illumination for surface or pendant mounted applications. This series utilizes computer designed reflector technology for optimal fixture efficiency, reduction of energy consumption and improved quality of light. It also provides instant-on operation and offers many other energy saving options.

Typical applications for this type of product are interior spaces where finished ceilings exist. Applications include:

- Corporate / Office Buildings
- Hospitals, Government Facilities and Military Bases
- Retail and Industrial Facilities
- Schools, Colleges and Universities

### DESIGN FEATURES / SPECIFICATIONS

#### CONSTRUCTION

- Precision die formed from 22 ga. cold rolled steel.
- Mechanically fastened or resistance welded depending on model.
- Heavy gauge steel (CRS) may be custom ordered.
- Finish to be pre-painted gloss white polyester powder coat.
- Post-painted polyester powder coat finishes are available. Consult factory for all special colors and finishes.
- Heavy guage steel (NYC) and heavy guage aluminum are available as alternate materials.

#### REFLECTOR

- Precision die formed optics which has been designed for maximum efficiency and photometric properties using the latest CAD software.
- Choice of optics includes focused, normal and spread beam distribution. Consult factory for custom optics design and spacing criteria options.
- Choice of materials include:
  - Alanod Miro4® Enhanced Specular Aluminum, 95% total reflectance, 25 year warranty.
  - Enhanced Specular Aluminum, 92% total (min.) reflectance, 25 year warranty.
  - High Reflectance White Powder Coated Aluminum, 91% total reflectance, 10 year warranty.
  - Polished Aluminum, 87% total (min.) reflectance, 25 year warranty.
- Consult factory for availability of all other material choices.

#### LAMP HOLDERS

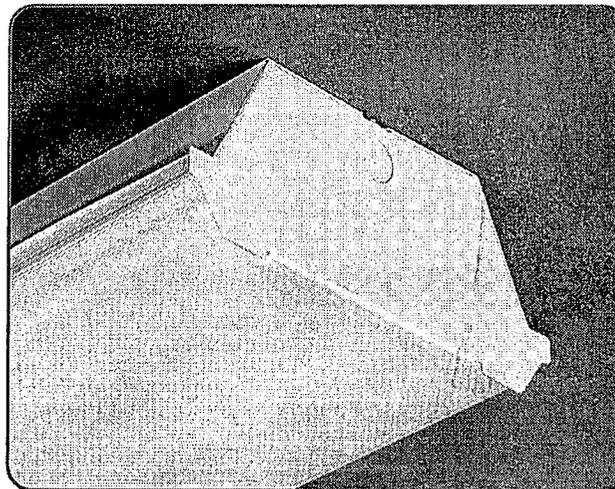
- Vossloh-Schwabe® premium type featuring:
  - Anti-vibration internal lamp locking design
  - High temperature resistant ("T" marking)
  - Heat and UV blocking shield to prevent degradation of material.
  - Multi-point contact design for optimum lamp pin contact.
  - Produced in accordance with DIN ISO 9001 and IEC standards.

#### BALLASTS

- All standard ballasts are electronic, energy saving, thermally protected, Class-P, non-PCB, Sound Rated "A", 0 degree (Type 1 Outdoor). Verify with factory for latest information regarding High Temperature (HT) or Extreme Low Temperature (XLT) rated ballast options.
- UL/CSA certified, where applicable. Compliant with Federal Ballast Law (Public Law 100-357, 1988).
- Choice of ballast factors. L=Low, N=Normal, H=High.
- Choice of dedicated, universal or special voltage - Consult factory for available options.
- Warranted by ballast manufacturer. Typical ballast warranty is for 5 years (120-277v) and 3-years (347-480v). Consult factory for latest warranty information.

#### LAMPS

- Supplied by others unless otherwise specified.
- Factory installed if required - Consult factory.
- Lamp type, CRI ratings, temperature colors, lamp life ratings are all viable options which can be supplied - Consult factory for information.



#### LENS (Diffuser)

- Extruded profile for precision fit.
- 100% virgin clear acrylic resin (for max. optical clarity).
- Linear prisms extruded into sides of lens.
- Pattern 12 prisms embossed into bottom of lens
- 30% "DR" additive (standard) to resist breakage (50% "DR" additive optional).
- Consult factory for all available lens options.

#### MOUNTING

- The luminaire may be surface mounted or may be suspended by pendant, threaded rod, hook, chain or cable. (Mounting hardware supplied by others unless otherwise specified).

#### ELECTRICAL

- Luminaire is bi-national listed and labeled (UL 1598 and CSA C22.2 No. 250.0-00) and is suitable for damp locations.
- Product includes luminaire disconnect as specified in NEC 410.73(G), 2005 Edition, and CEC part I, rule 30-308(4), 2006 Edition.

#### QUALITY CONTROL

- All fixtures and retrofit kits are designed, fabricated, assembled and tested at RENOVA's manufacturing facility. All fixtures are 100% lamp tested, inspected and labeled prior to shipment.

#### GUARANTEE

- RENOVA warrants all fixtures to be free of defects in manufacturing and workmanship for a period of (1) year from date of purchase. This warranty excludes damage of any kind resulting from improper installation, misuse, abuse, accidents, mis-application, or natural disasters. Please refer to the "Terms and Conditions" section of the RENOVA website for additional information.

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RLS-5015A-3

Category: ECS  
Energy  
Conservation  
Series

Prefix:  
**NPW**

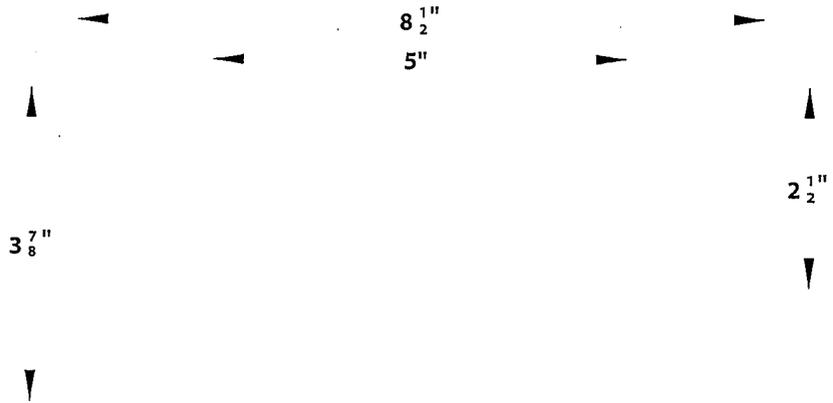
Fixture Series (Name):  
**Narrow Profile Wrap**



Renovate Lighting Ideas  
Energy Efficient Solutions



**2-Lamp T8 Narrow Profile Wrap Cross Section Shown**



**ORDERING GUIDE**

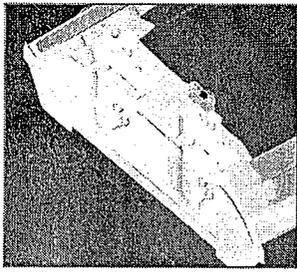
CATEGORY	SERIES	SIZE	REFLECTOR MATERIAL	REFLECTOR PHOTOMETRY	NUMBER OF LAMPS	LAMP TYPE (WATTAGE)	BALLAST VOLTAGE	NUMBER OF BALLASTS	LAMPS PER BALLAST	BALLAST FACTOR	OPTIONS
<b>ECS</b>	<b>NPW</b>	<b>4</b>	<b>M</b>	<b>N</b>	<b>2</b>	<b>32</b>	<b>UNV</b>	<b>1</b>	<b>2</b>	<b>N</b>	
Energy Conservation Series	NPW - NARROW PROFILE WRAP	2 - 24" 3 - 36" 4 - 48" 6 - 72" 8 - 96"	M - MIRO4 (95% TR) E - ENHANCED ALUMINUM (92% TR min.) W - WHITE (91% TR) A - ALUMINUM (87% TR min.) B - BALLAST COVER (White) (83% TR min.) R - MIRO4 MICRO-MATT (95% TR)	F - FOCUSED N - NORMAL S - SPREAD C - CUSTOM OPTICS  *N - NORMAL IS STANDARD *(BLANK)=N *C - CUSTOM OPTICS ARE DESCRIBED IN OPTIONS BOX	1 - 1L HSG 2 - 2L 3 - 3L  2 - 4" HSG 4 - 4L 6 - 6L	17 17w T8 25 25w T8 32 32w T8  14 14w T5 21 21w T5 28 28w T5  24 24w T5HO 39 39w T5HO 54 54w T5HO	120 - 120v, 60 Hz 277 - 277v, 60 Hz 347 - 347v, 60 Hz UNV - 120v - 277v, 60 Hz 480 - 480v, 60 Hz xxx - Less Ballast	S - SLAVE (BLANK) - 1 2 - 2 3 - 3 4 - 4	(BLANK) - 0 1 - 1 2 - 2 3 - 3 4 - 4	L - Low N - Normal H - High	



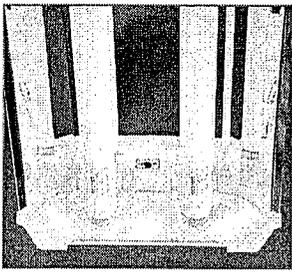
Photometric data, IES files and all other information is available upon request.



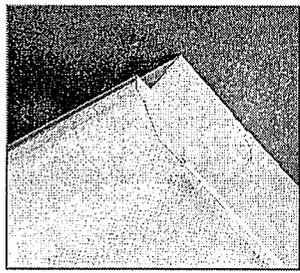
**\*ADDITIONAL OPTIONS**  
(See "Options" sheet for all available options)



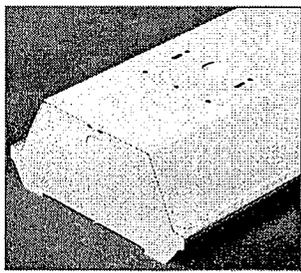
Vossloh Locking Lampholders (Standard)



Multi-Faceted Reflector (Designed for Maximum Efficiency)



Standard Lens (Bottom: Pattern 12 Prismatic Embossment) (Side: Linear Prisms)



Mounting Details (Included in all Housings)

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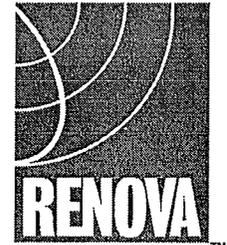
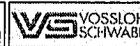
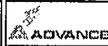
Category: ECS  
Energy  
Conservation  
Series

Prefix:  
**SBW**

Fixture Series (Name):  
**Standard Box Wrap**



GE Lighting North America



renovat ve L ght ng deas  
Energy Eff c ent So ut ons

## Standard Box Wrap Series general purpose fluorescent luminaire

### GENERAL DESCRIPTION

The Standard Box Wrap (SBW) Series has been developed for general illumination for surface (wall or ceiling) or pendant mounted applications. This series utilizes computer designed reflector technology for optimal fixture efficiency, reduction of energy consumption and improved quality of light. It also provides instant-on operation and offers many other energy saving options.

Typical applications for this type of product are interior spaces where finished ceilings and walls exist. Applications include:

- Corridors and Stairwells in Corporate / Office Buildings
- Hospitals, Government Facilities and Military Bases
- Public Areas, Bathrooms and Lavatories
- Schools, Colleges and Universities

### DESIGN FEATURES / SPECIFICATIONS

#### CONSTRUCTION

- Precision die formed from 22 ga. cold rolled steel.
- Mechanically fastened or resistance welded depending on model.
- Heavy gauge steel (CRS) may be custom ordered.
- Finish to be pre-painted gloss white polyester powder coat.
- Post-painted polyester powder coat finishes are available. Consult factory for all special colors and finishes.
- Heavy guage steel (NYC) and heavy guage aluminum are available as alternate materials.

#### REFLECTOR

- Precision die formed optics which has been designed for maximum efficiency and photometric properties using the latest CAD software.
- Choice of optics includes focused, normal and spread beam distribution. Consult factory for custom optics design and spacing criteria options.
- Choice of materials include:
  - Alanod Miro4® Enhanced Specular Aluminum, 95% total reflectance, 25 year warranty.
  - Enhanced Specular Aluminum, 92% total (min.) reflectance, 25 year warranty.
  - High Reflectance White Powder Coated Aluminum, 91% total reflectance, 10 year warranty.
  - Polished Aluminum, 87% total (min.) reflectance, 25 year warranty.
- Consult factory for availability of all other material choices.

#### LAMP HOLDERS

- Vossloh-Schwabe® premium type featuring:
  - Anti-vibration internal lamp locking design
  - High temperature resistant ("T" marking).
  - Heat and UV blocking shield to prevent degradation of material.
  - Multi-point contact design for optimum lamp pin contact.
  - Produced in accordance with DIN ISO 9001 and IEC standards.

#### BALLASTS

- All standard ballasts are electronic, energy saving, thermally protected, Class-P, non-PCB, Sound Rated "A", 0 degree (Type 1 Outdoor). Verify with factory for latest information regarding High Temperature (HT) or Extreme Low Temperature (XLT) rated ballast options.
- UL/CSA certified, where applicable. Compliant with Federal Ballast Law (Public Law 100-357, 1988).
- Choice of ballast factors. L=Low, N=Normal, H=High.
- Choice of dedicated, universal or special voltage - Consult factory for available options.
- Warranted by ballast manufacturer. Typical ballast warranty is for 5 years (120-277v) and 3-years (347-480v). Consult factory for latest warranty information.

#### LAMPS

- Supplied by others unless otherwise specified.
- Factory installed if required - Consult factory.
- Lamp type, CRI ratings, temperature colors, lamp life ratings are all viable options which can be supplied - Consult factory for information.

#### LENS (Diffuser)

- Extruded profile for precision fit.
- 100% virgin clear acrylic resin (for max. optical clarity).
- Linear prisms extruded into sides of lens.
- Pattern 12 prisms embossed into bottom of lens
- 30% "DR" additive (standard) to resist breakage (50% "DR" additive optional).
- Consult factory for all available lens options (materials & prism patterns).

#### MOUNTING

- The luminaire may be surface mounted or may be suspended by pendant, threaded rod, hook, chain or cable. (Mounting hardware supplied by others unless otherwise specified).
- Custom mounting options / accessories are available - Consult factory.

#### ELECTRICAL

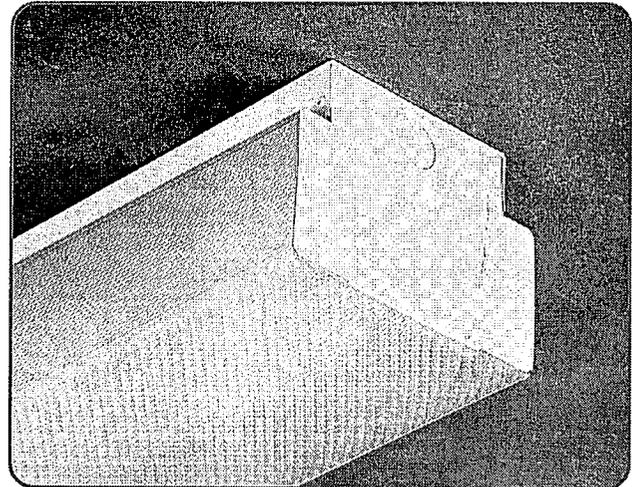
- Luminaire is bi-national listed and labeled (UL 1598 and CSA C22.2 No. 250.0-00) and is suitable for damp locations.
- Product includes luminaire disconnect as specified in NEC 410.73(G), 2005 Edition, and CEC part I, rule 30-308(4), 2006 Edition.

#### QUALITY CONTROL

- All fixtures and retrofit kits are designed, fabricated, assembled and tested at RENOVA's manufacturing facility. All fixtures are 100% lamp tested, inspected and labeled prior to shipment.

#### GUARANTEE

- RENOVA warrants all fixtures to be free of defects in manufacturing and workmanship for a period of (1) year from date of purchase. This warranty excludes damage of any kind resulting from improper installation, misuse, abuse, accidents,



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RLS-5090A-3

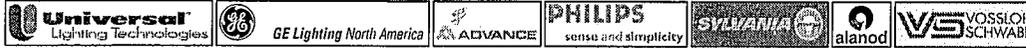
Category: ECS  
Energy  
Conservation  
Series

Prefix:  
**SBW**

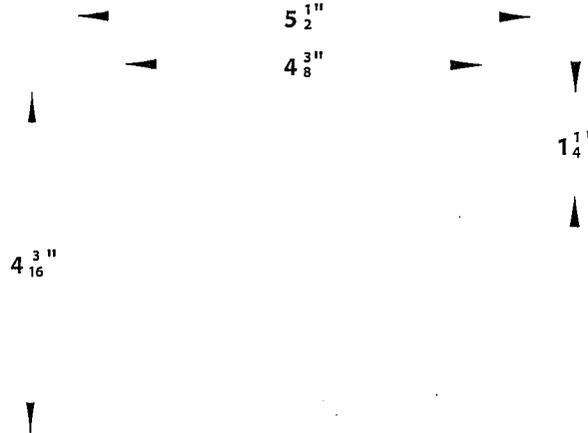
Fixture Series (Name):  
**Standard Box Wrap**



Renovate Lighting Ideas  
Energy Efficient Solutions

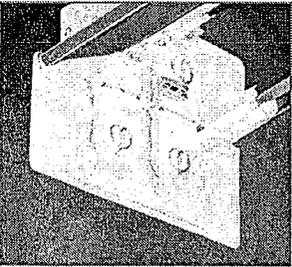


**2-Lamp T8 Standard Box Wrap Cross Section Shown**

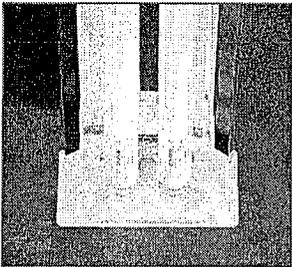


**ORDERING GUIDE**

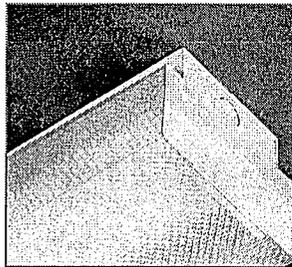
CATEGORY	SERIES	SIZE	REFLECTOR MATERIAL	REFLECTOR PHOTOMETRY	NUMBER OF LAMPS	LAMP TYPE (WATTAGE)	BALLAST VOLTAGE	NUMBER OF BALLASTS	LAMPS PER BALLAST	BALLAST FACTOR	OPTIONS
<b>ECS</b>	<b>SBW</b>	<b>4</b>	<b>M</b>	<b>N</b>	<b>2</b>	<b>32</b>	<b>UNV</b>	<b>1</b>	<b>2</b>	<b>N</b>	
Energy Conservation Series	SBW - STANDARD BOX WRAP	2 - 24" 3 - 36" 4 - 48" 6 - 72" 8 - 96"	M - MIRO4 (95% TR) E - ENHANCED ALUMINUM (92% TR min.) W - WHITE (91% TR) A - ALUMINUM (87% TR min.) B - BALLAST COVER (White) (83% TR min.) R - MIRO4 MICRO-MATT (95% TR)	F - FOCUSED N - NORMAL S - SPREAD C - CUSTOM OPTICS  *N - NORMAL IS STANDARD (BLANK)=N *C - CUSTOM OPTICS ARE DESCRIBED IN OPTIONS BOX	1 - 1L 2 - 2L 3 - 3L  2 - 2L 4 - 4L 6 - 6L	17 17w T8 25 25w T8 32 32w T8  14 14w T5 21 21w T5 28 28w T5  24 24w TSHO 39 39w TSHO 54 54w TSHO	120 - 120v, 60 Hz 277 - 277v, 60 Hz 347 - 347v, 60 Hz UNV - 120v - 277v, 60 Hz 480 - 480v, 60 Hz xxx - Less Ballast	S - SLAVE (BLANK) - 1 2 - 2 3 - 3 4 - 4	(BLANK) - 0 1 - 1 2 - 2 3 - 3 4 - 4	L - Low N - Normal H - High	<p>Photometric data, IES-files and all other information is available upon request.</p> <p><b>Veteran</b> OWNED AND OPERATED</p> <p><b>*ADDITIONAL OPTIONS</b> (See "Options" sheet for all available options)</p>



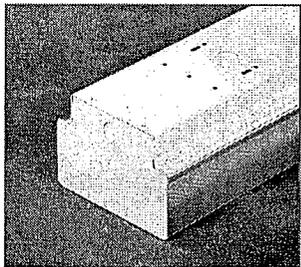
Vossloh Locking Lampholders (Standard)



Multi-Faceted Reflector (Designed for Maximum Efficiency)



Standard Lens (Bottom: Pattern 12 Prismatic Embossment) (Side: Linear Prisms)



Mounting Details (Included in all Housings)

Note: RENOVA products are constantly being improved; therefore, the information shown is subject to change without notice. Always consult your lighting representative or RENOVA Lighting Systems, Inc. for the latest information.

**RENOVA Lighting Systems, Inc.** 300 Highpoint Avenue Portsmouth, RI 02871 (800) 635-6682 www.renova.com

### TECHNICAL DATA

#### TYPICAL APPLICATIONS

- Private Offices
- Storage Closet
- Conference Room
- Restroom w/o stalls

#### FEATURES

- PIR Occupancy Detection
- Communicates with Other Sensors
- Time Delay: 30 sec. to 20 minutes, selectable in 2.5 min increments
- Green LED Activity Indicator
- 100 Hr. Burn-in Timer Mode

#### AVAILABLE OPTIONS

- Isolated Low Voltage Relay (-R)
- Photocell Daylight Override (-P)
- Automatic Dimming Control (-ADC)
- Low Temp/Hi Humidity (-LT)

#### SPECIFICATIONS

- Size: Circular, 4.55" Dia., 1.55" Deep (11.56 cm Dia., 3.94 cm Deep)
- Sensor Weight: 5 Ounces
- Sensor Color: White
- Mounting: Ceiling Tile Surface, Round Fixture or Junction Box
- Relative Humidity: 20 to 90% non-condensing
- Operating Temp: 14° to 160° F (-10° to 71° C)
- Storage Temp: -14° to 160° F (-26° to 71° C)
- UL and CUL Listed
- 5 Year Warranty
- Made in U.S.A.

#### LOW TEMP/HI HUMIDITY(-LT)

- Conformally coated Circuit Board is corrosion resistant from moisture
- Operates down to -40° F (-40° C)

### CM-9 SERIES

*w/ Enhanced Photocell  
& Dimming Options!*



The *CM-9 Series* sensor offers amazing performance and sensitivity to small motions for a standard Passive Infrared (PIR) Ceiling Mount Sensor. Ideal for small rooms with drop ceilings and areas without obstructions, the *CM-9* is a snap to install. Its light weight allows surface mounting to drop ceilings or a ceiling grid. The *CM-9* sensor can cover entire private offices or smaller rooms by itself, however it is also the ideal lead sensor for odd shaped rooms. For example a *CM-9* in a restroom vestibule can communicate with a *CM-PDT* Dual Technology sensor in a main stall area. Another application is a *CM-9* controlling an entrance hall to a classroom and communicating with a *WV-PDT* controlling the main room. In both cases the lights would be activated "On" by the *CM-9*. For mounting above 15 feet, see the *CM-6* Technical Data Sheet.

#### SENSOR OPERATIONS

The sensor detects changes in the infrared energy given off by occupants as they move within the field-of-view. When occupancy is detected, a DC output goes high and can drive up to 200 mA of connected load. The sensor is powered with 12 to 24 VAC/VDC and typically operates with a *PP-20* or *MP-20* Power Pack; enabling complete 20 Amp circuits to be controlled. An internal timer, factory set at 10 minutes, keeps the lights "On" during brief periods of no activity. This timer is selectable at 2.5 minute increments from 30 seconds to 20 minutes, and is reset every time occupancy is re-detected. This state-of-the-art design requires no manual field adjustments.

#### PHOTOCELL DAYLIGHT OVERRIDE / DIMMING OPTIONS

This series offers a Photocell (-P) option for spaces with abundant daylight and an Automatic Dimming Control (-ADC) option for use with dimmable ballasts. These options are ideal for public spaces with windows like vestibules, corridors, or bathrooms. As the daylight levels change in the room, both options insure that an adequate light level is maintained according to a programmable set-point value. The Photocell option provides two modes of operation; one simply inhibits the lights from turning on, while the other has full On/Off control of the lights. The -ADC option allows the sensor to control a dimmable ballast. It also provides a secondary dim time-out that enables the lights to go to a dim setting after one time-out and then turn fully off after a second time-out. For more detailed information on the operation of Photocell control and/or dimming, see the *CM-PC-ADC* Technical Data Sheet.

#### INTERNAL LOW VOLTAGE RELAY OPTION (CM-9-R)

To enable a sensor to interface with a building management system, the -R option provides dry contact closure via a SPDT, 1 Amp, 40 Volt relay. The relay coil is energized and changes state when ALL connected sensors register "Unoccupied". When using multiple sensors, only one sensor per zone needs to have a relay.

**Note:** Sensor must have power at all times for the relay to function.

### CATALOG INFORMATION

MODEL #	DESCRIPTION	TEMPERATURE	OP. VOLTAGE	CURRENT
CM-9	Passive Infrared Ceiling Mount Sensor	14° to 160° F	12 to 24 VAC/VDC	4 mA
Add suffix				
-R	SPDT Relay, 1 Amp			16 mA
-P	Photocell Daylight Override			4 mA
-RP	Relay & Photocell			16 mA
-ADC	Automatic Dimming Control			4 mA
-LT	Low Temp/High Humidity	-40° to 160° F		

**WIRING INSTRUCTIONS**

Wire lead connections are Class II, 18 to 22 AWG.

**STANDARD CM-9**

RED - 12 to 24 VAC/VDC

BLACK - Common

WHITE - Output (HI DC for Occupancy)

**RELAY OPTION (-R)**

GRAY / BROWN - Connected during Occupied state

VIOLET / BROWN - Connected during Unoccupied state

Note: Relay is energized during Unoccupied state

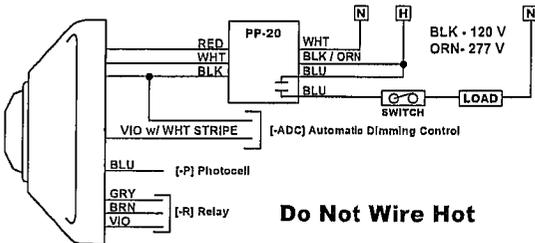
**PHOTOCELL OPTION (-P)**

BLUE - Photocell output (High: Occupied & Low Light)

Use Blue wire from sensor in place of White wire. For multi-level control, use 2 Power Packs and connect White to primary load and Blue to daylight load.

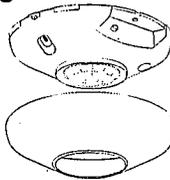
**AUTOMATIC DIMMING CONTROL (-ADC)**

VIOLET/WHITE striped - Connect to Violet wire from 0-10 VDC dimmable ballast. Also connect ballast Gray wire to sensor Black wire. (Note: -ADC option disables Photocell inhibit mode of -P option.)



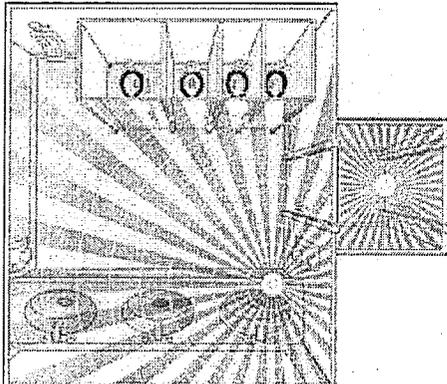
**MOUNTING CONSIDERATIONS**

The CM-9 is provided with 2 self tapping mounting screws. The sensor typically mounts directly to the ceiling tile or metallic grid. If desired, the mounting holes are slotted to line up with a standard round or rectangular box (screws not provided).



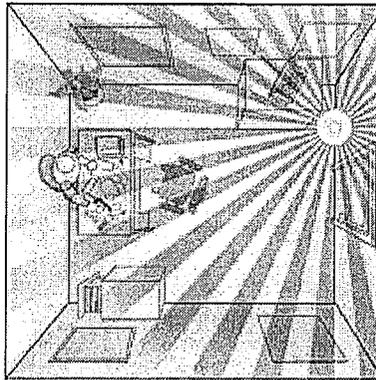
**INSTALLATION CONSIDERATION**

In smaller spaces like 12' x 12' (3.66 x 3.66 m) private offices, it is best to locate the CM-9 along the entrance wall so that the occupant breaks the collector beams upon entrance, while passersby do not falsely trip the unit (see field-of-view diagram). The discrete outer beams used for initial detection can be aligned for maximum coverage.



**PIR used with PDT**

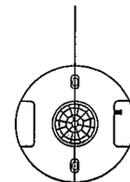
- CM-9 PIR in vestibule initiating the light "On"
- Microphonics™ in CM-PDT is activated by the CM-9.
- CM-PDT detects occupants in stalls



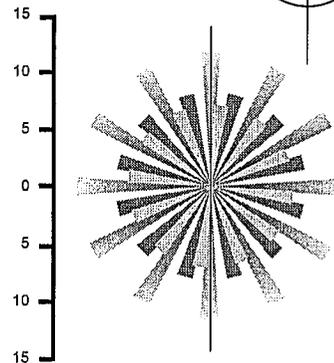
**Small Office**

- Mount sensor near entrance wall viewing entire room without seeing out doorway
- Low Voltage sensors provide easiest installation in drop Ceilings.

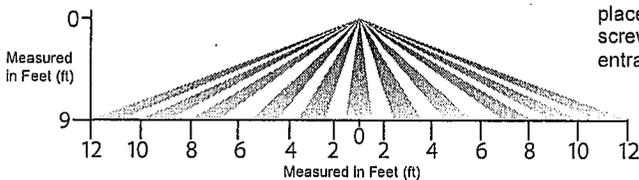
**Note:** Heat producing sources controlled by the sensor must not be in the view pattern of the sensor. Symptom: Sensor cycles or appears to continually stay "On". Solution: Move sensor or mask lens segments that view the source.



**TOP VIEW**



**SIDE VIEW**



**Note:** For maximum distance place the sensor so that the screw axis is aligned with the entrance axis.

**WARRANTY:** Sensor Switch, Inc. warrants these products to be free of defects in manufacture and workmanship for a period of sixty months. Sensor Switch, Inc., upon prompt notice of such defect will, at its option, provide a Returned Material Authorization number and a replacement product. **LIMITATIONS AND EXCLUSIONS:** This Warranty is in full lieu of all other representation and expressed and implied warranties (including the implied warranties of merchantability and fitness for use) and under no circumstances shall Sensor Switch, Inc. be liable for any incidental or consequential property damages or losses.



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 www.sensorswitch.com

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# sensorswitch

## CM PDT 9

### STANDARD RANGE 360° SENSOR CEILING MOUNT • LOW VOLTAGE • DUAL TECHNOLOGY (PDT)

#### SPECIFICATIONS

##### FEATURES

- Patented Dual Technology with PIR / Microphonics Detection
- 360° Coverage
- Push-Button Programmable Adjustable Time Delay
- 100 Hr Lamp Burn-in Timer
- Green LED Indicator

##### PHYSICAL SPECS

- SIZE 4.55" Dia. (11.56 cm)
- 1.55" Deep (3.94 cm)

WEIGHT 6 oz

##### MOUNTING

- Ceiling Tile Surface
  - 3.5" Octagon Box
  - Single Gang Handy Box
- COLOR White

##### ELECTRICAL SPECS

OPERATING VOLTAGE

12-24 VAC/VDC

CURRENT DRAW

Standard, 4 mA

w/ R option, 16 mA

DIMMING LOAD

Sinks / Sources < 20mA;

~40 Ballasts @ .5mA each

RECOMMENDED POWER PACK

PP20

##### ENVIRONMENTAL SPECS

OPERATING TEMP

14° to 160° F (-10° to 71° C)

STORAGE TEMP

-14° to 160° F (-26° to 71° C)

RELATIVE HUMIDITY

20 to 90% non-condensing

##### OTHER

- UL and CUL Listed
- Title 24 Compliant
- 5 Year Warranty
- Made in the U.S.A.

Open area office lighting control is made cost-effective with the use of the CM PDT 9 Series Standard Range 360° occupancy sensor. This small yet powerful sensor provides line-of-sight PIR detection of small motion in a circular pattern, and combines overlapping Microphonics™ coverage for detection of occupants working in their cubical space. By installing multiple CM PDT 9s on 30 ft (9.14 m) centers, large control zones are created (typically one per circuit of lighting). The lighting is then controlled in blocks similar to manual switching. Restrooms with stalls, large storage areas with shelving, and libraries with study carrels are also easily and cost-effectively controlled by the CM PDT 9.

##### SENSOR OPERATION

The sensor has Passive Dual Technology (PDT), which first sees motion using Passive Infrared (PIR), and then engages Microphonics™ to hear sounds that indicate continued occupancy. This patented technology uses Automatic Gain Control (AGC) to dynamically self-adapt the sensor to its environment by filtering out constant background noise and detecting only noises typical of human activity. When occupancy is detected, a DC output goes high and can drive up to 200 mA of connected load. The sensor is powered with 12-24 VAC/VDC and typically operates with a PP20 or MP20 power pack, enabling complete 20 Amp circuits to be controlled. An internal timer, factory set at 10 minutes, keeps the lights on during brief periods of inactivity. This timer is push-button programmable from 30 seconds to 20 minutes, and is reset every time occupancy is re-detected. This state-of-the-art sensor requires no field calibration or adjustment.

#### OPTIONS

##### LOW VOLTAGE RELAY (R)

- Enables sensors to interface with other systems (e.g., BMS, lighting panels)
- Provides dry contact closure via a SPDT, 1 Amp, 40 Volt relay
- Only one relay needed per zone
- Changes state when all connected sensors register unoccupied
- Relay requires sensor power to function

##### OCCUPANCY CONTROLLED DIMMING (D)

- Provides dimming output to control 0-10 VDC dimmable ballasts
- Provides a second occupancy time-out period that enables the lights to go to a dim setting before turning off
- Adjustable max/min dim setting

##### PHOTOCELL (P)

- Auto set-point calibration
- Two selectable modes of operation
- On/Off mode: Photocell has full control during periods of occupancy
- Inhibit mode: Photocell can prevent lights from turning on if adequate daylight is available, but cannot turn lights off

##### PHOTOCELL W/ DIMMING (ADC)

- Photocell within sensor maintains total room light level by controlling levels of 0-10 VDC dimmable ballasts
- Photocell also has full on/off control during periods of occupancy
- Provides a second occupancy time-out period that enables the lights to go to a dim setting before turning off

##### LOW TEMP/HIGH HUMIDITY (LT)

- Sensor is corrosion resistant to moisture
- Operates down to -4° F / 20° C

#### ORDERING INFO CM PDT 9 [RELAY] [DIMMING/PHOTOCELL] [TEMP/HUMIDITY]

##### RELAY

- Blank = None
- R = Low Voltage Relay

##### DIMMING / PHOTOCELL CHOOSE ONE ONLY

- Blank = None
- D = Occupancy Controlled Dimming
- P = Photocell
- ADC = Photocell w/ Dimming

##### TEMP/HUMIDITY

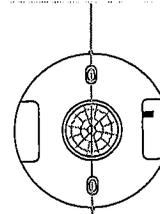
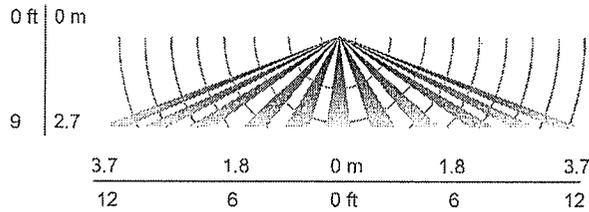
- Blank = Standard
- LT = Low Temp

## COVERAGE PATTERN

### 9 STANDARD RANGE 360° LENS WITH MICROPHONICS™

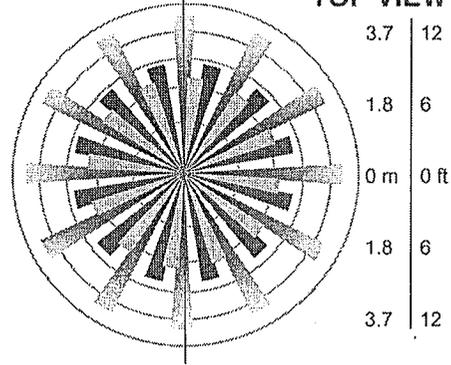
- Best choice for small motion (e.g. hand movements) detection
- Viewing angle of 56° in a 360° conical shaped pattern
- Provides 12 ft (3.66 m) radial coverage when mounted to standard 9 ft (2.74 m) ceiling
- 8 to 15 ft (2.44 to 4.57 m) mounting heights provide 10 to 20 ft (3.05 to 6.10 m) radial coverage
- Microphonics™ provides overlapping detection of human activity over the complete PIR coverage area. Advanced filtering is also utilized to prevent non-occupant noises from keeping the lights on.

#### SIDE VIEW



Note: Screw axis is aligned with a long detection segment

#### TOP VIEW



## WIRING (DO NOT WIRE HOT)

#### STANDARD WIRING

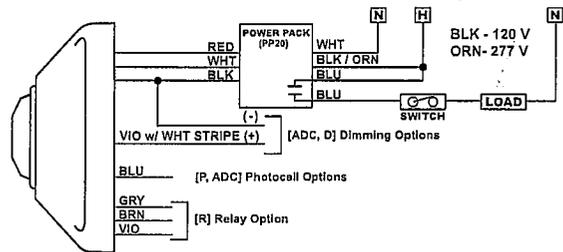
- RED - Power Input (12-24 VAC/VDC)
- BLACK - Common
- WHITE - Output (high VDC for occupancy)

#### RELAY OPTION (R)

- GRAY / BROWN - Connected during occupied state
  - VIOLET / BROWN - Connected during unoccupied state
- Note: Relay is energized during unoccupied state

#### DIMMING OPTIONS (D, ADC)

- VIOLET w/ WHITE STRIPE - Connect to Violet control wire from 0-10 VDC dimmable ballast
- GRAY from Ballast - Connect to sensor Black wire

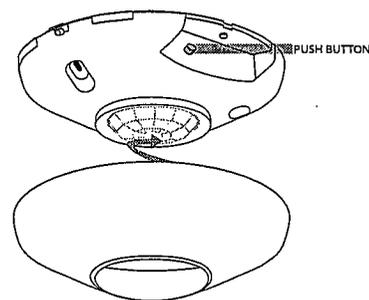


#### PHOTOCELL OPTIONS (P, ADC)

- BLUE - Use in place of White output wire. Photocell output is high VDC with occupancy & low light. For multi-level control, use two power packs and connect White to primary load and Blue to daylight load.

## INSTALLATION

- Mount sensor directly to a ceiling tile or a metallic grid (two self-tapping screws provided)
- Sensor's mounting holes also align with 3.5" octagon or single gang handy box (screws not provided)
- Sensor will detect motions crossing segments more effectively than motions parallel to beams
- For optimal detection, position sensor such that segments are crossed upon entrance and unable to view outside the space
- For maximum Microphonics™ sensitivity avoid locating sensor near HVAC air diffusers.



#### PROGRAMMING

Refer to included instruction card for default settings and directions on programming the sensor via the push-button.

**sensorswitch**

An AcuityBrands Company

**WARRANTY:** Sensor Switch, Inc. warrants these products to be free of defects in manufacture and workmanship for a period of 60 months. Sensor Switch, Inc., upon prompt notice of such defect, will, at its option, provide a Returned Material Authorization number and repair or replace returned product.

**LIMITATIONS AND EXCLUSIONS:** This Warranty is in full lieu of all other representation and expressed and implied warranties (including the implied warranties of merchantability and fitness for use) and under no circumstances shall Sensor Switch, Inc. be liable for any incidental or consequential property damages or losses.

T010-004-P

### TECHNICAL DATA

#### TYPICAL APPLICATIONS

- Used with Low Voltage Sensors
- Multiple Sensors
- Multiple Loads

#### POWER PACK HIGHLIGHTS

- Dual Voltage Transformer
- Self-Contained Relay
- Powers up to 14 sensors

#### SPECIFICATIONS

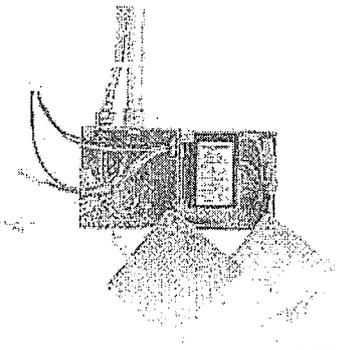
- Size: (1/2" inch chase nipple not inc.)
- MP-20 & MSP-20: 4 1/8" x 3" x 1 1/8"
- Mounting: 1/2" inch chase nipple
- Operating Voltage: 120, 240, or 277 VAC
- Each Relay: 20 Amps
- 1 HP Motor Load
- Output Voltage: 15 VDC, 150 mA
- Class II 18 AWG, up to 2,000 ft.
- Plenum Rated
- Relative Humidity: 20 to 90% non-condensing
- Operating Temp: 14° to 160° F
- Storage Temp: -14° to 160° F
- UL and CUL Listed
- 5 Year Warranty
- Made in U.S.A.

#### LOW TEMP/HI HUMIDITY(-LT)

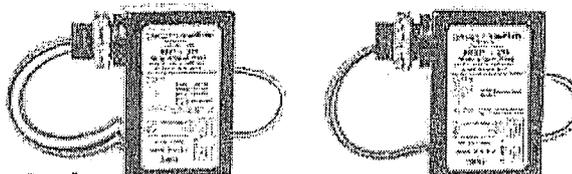
- Conformally Coated PCB
- Operates down to -40° F
- Corrosion resistant from moisture

#### PLENUM CONSIDERATIONS

Most local codes allow for small plastic controls in Return Air Plenums; Some Do Not! To meet local code, the Power Pack can be mounted inside an adjacent (Deep) junction box as shown below.



### MP-20 MSP-20



#### Plenum Rated

Mini Power Packs are the heart of the Low Voltage Sensor System. The MP-20 transforms 120, 240 or 277 Volts to class II 15 VDC to power the remote sensors. Although Plenum Rated, the elongated mounting nipple allows for the MP-20 to be mounted either directly thru a 1/2" inch knockout in a junction box, or to be located inside an adjacent box for specific local code requirements. Up to 14 sensors may be connected to one MP-20. Multi-circuit control can be handled by multiple MP-20's and Slave Packs (MSP-20) may be configured. MP-20's can be wired continuously hot (line side), or on the switch leg (load side) without nuisance delays upon turn "On".

#### MINI POWER PACK OPERATION

The Mini Power Pack consists of a transformer and a relay. The transformer has a dual primary high voltage input, accepting 120, 240, or 277 VAC. The secondary voltage provides power to Sensor Switch low voltage heads. When the sensor head detects motion, they electronically signal the power pack to close the relay(s) connected to the lighting system.

#### LOW VOLTAGE OPERATION AND TEST

The Low Voltage Wires are color coded Red (15 VDC), Black (Common), and White (Occupancy Signal). With no sensors connected, touch the Red wire to the White. The lights should turn "On". Remove the connection and the lights should turn "Off". With the sensors connected, the Red and Black wires provide DC power to the remote sensors, and when there is occupancy detected, the White wire produces a 15 VDC signal from the sensor to the power pack initiating the lights to "On". Upon initial power up, the Sensors automatically send an "On" signal until the sensors have stabilized and "Timed Out".

#### SIZING OF THE SYSTEM - VARIOUS COMBINATIONS

Combining Power Packs provides for additional power to drive remote devices. Maximum numbers of remote sensors are shown below based on the Power Pack/ Slave Pack being used. *Maximum number of "Relays" is 30.*

	Sensors	Sensors with Relay
1 MP-20	14	8
1 MP-20 with MSP-20	7	6
2 MP-20	26	16

**Note 1:** Only three relays may be controlled with one Mini Power Pack. If more than three circuits are required, multiple Mini Power Packs must be used.

**Note 2:** Only one "Sensor with Relay" is required in most cases. See Technical Data on Low Voltage Sensors and SPDT EMS Interface Option.

#### SYSTEMS CONSIDERATIONS

The local override switch may be upstream or downstream of an MP-20. However, if an MSP-20 Auxiliary Relay controller is being used, the switch(es) should be downstream on the load side of the relay. If power is disconnected to the Power Pack all subsequent relays will open, turning off all of the loads. If wiring the local switches before the Power Pack and Slave Pack, use multiple MP-20's, one for each circuit. This will allow for one circuit to remain powered, keeping the system operational when the other is turned off. When controlling a dimming circuit, MP-20 must be wired before dimmer, or MSP-20 may be wired after dimmer.

#### CATALOG INFORMATION

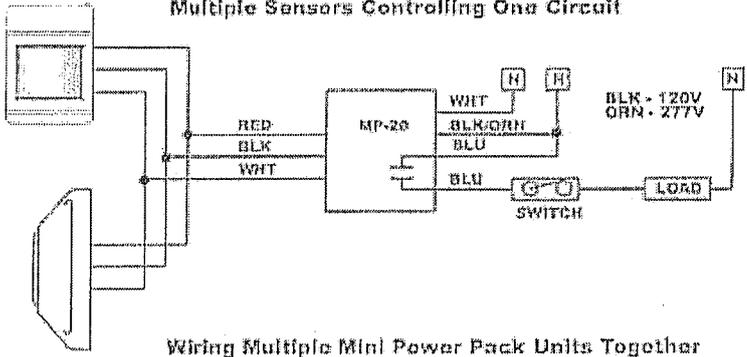
MODEL#	DESCRIPTION	OUTPUT VOLTAGE	OUTPUT CURRENT
MP-20	Power Pack with 20 Amp Relays	15 to 24 VDC	70 to 110 mA
MSP-20	Slave Pack with 20 Amp Relays	N/A	40 mA (consumption)

\*Add suffix -LT for Low Temp/HI Humidity

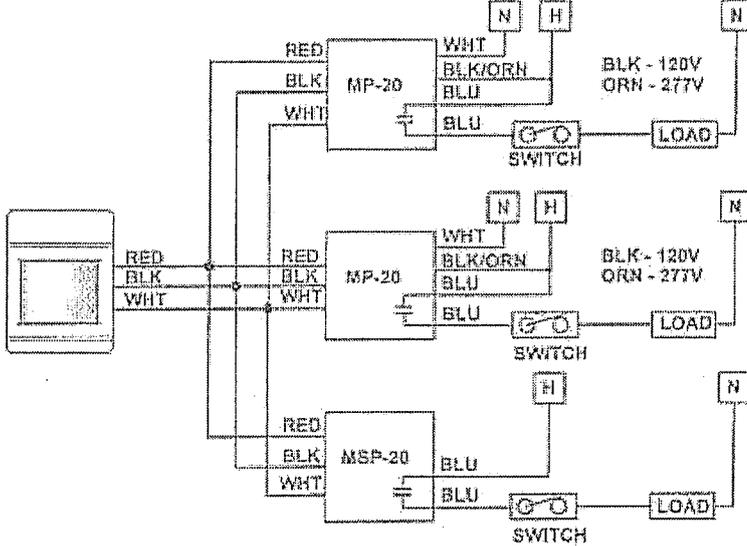
**TYPICAL WIRING DIAGRAMS - DO NOT WIRE HOT**

**NOTE:** The Power Pack must be connected to a single phase Hot and Neutral System. For 120 VAC, connect the Black wire to Hot, White wire to Neutral, and Cap off the Orange wire. For 240-277 VAC, connect the Orange to Hot, White to Neutral, and Cap off the Black wire. Never connect both the Black and Orange wires! Low Voltage wire can be 18 to 22 AWG; shielding is not necessary.

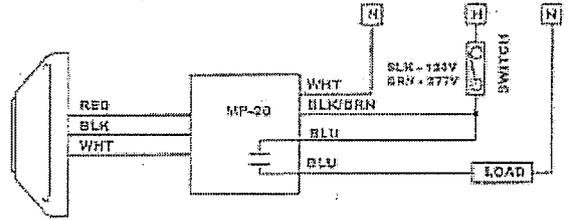
**Multiple Sensors Controlling One Circuit**



**Wiring Multiple Mini Power Pack Units Together**



**One Sensor Controlling One Circuit**



**WARRANTY:** Sensor Switch, Inc. warrants these products to be free of defects in manufacture and workmanship for a period of sixty months. Sensor Switch, Inc. upon prompt notice of such defect will at its option, provide a Returned Material Authorization number and a replacement product.  
**LIMITATIONS AND EXCLUSIONS:** This Warranty is in full lieu of all other representation and expressed and implied warranties (including the implied warranties of merchantability and fitness for use) and under no circumstances shall Sensor Switch, Inc. be liable for any incidental or consequential property damages or losses.



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 www.sensorswitch.com

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### TYPICAL APPLICATIONS

- Private Offices
- Conference Rooms
- Individual Bathrooms w/o stalls
- Janitor Closets
- Hallways & Stairwells

### FEATURES

- PIR Occupancy Detection
- Self Contained Relay, no Power Pack needed
- Patented Bi-Polar Wiring: Interchangeable Hot & Load wires
- Small Motion Detection up to 20 ft.
- Intrinsically Grounded
- No Minimum Load
- Push-Button Programmable
- Time Delay: 30 sec. to 20 minutes
- Three-Way & Multi-Level Switching
- Green LED Status Indicator

### AVAILABLE OPTIONS

- Vandal-Resistant Lens (-V)
- Photozell Daylight Override (-P)
- Low Temp/Hi Humidity (-LT)

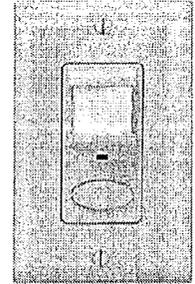
### SPECIFICATIONS

- Size: 4.2"H x 1.8"W x 1.5"D (10.67cm x 4.57cm x 3.81cm)
- Sensor Weight: 5 Ounces
- Colors: Ivory, White, Gray, Almond
- Mounting Height: 30 to 48 inches
- Relative Humidity: 20 to 90% non-condensing
- Operating Temp: 14° to 85° F (-10° to 29° C)
- Storage Temp: -14° to 160° F (-26° to 71° C)
- Load Rating (1 phase only):  
120 VAC @ 800 W  
277 VAC @ 1200 W  
347 VAC @ 1500 W
- Frequency: 50/60 Hz (Timers are 1.2 x for 50 Hz)
- UL, CUL, & CSA Listed
- CA Title 24 Compliant
- 5 Year Warranty
- Made in U.S.A

### LOW TEMP/HI HUMIDITY (-LT)

- Conformally coated Circuit Board is corrosion resistant from moisture
- Operates down to -40° F (-40° C)

## WSD SERIES Programmable Edition!



The *WSD Series* is a stylish, easy to install, and simple to use Wall Switch Decorator style Passive Infrared (PIR) sensor. It is ideal for private offices, copy rooms, closets, or any small enclosed space without obstructions. A user programmable time delay ensures that once the room is vacated the sensor will time out and turn off the lights. Additionally, the *WSD Series* sensors have several On Modes and Switch Modes that can be programmed using the front push-button. For rooms with obstructions the WSD-PDT should be considered.

### SENSOR OPERATIONS

The sensor detects changes in the infrared energy given off by occupants as they move within the field-of-view. When occupancy is detected, a self-contained relay switches the lighting "On". The sensor is line powered and can switch line voltage (see specifications). An internal timer, factory set at 10 minutes, keeps the lights "On" during brief periods of no activity. This timer is push-button programmable from 30 seconds to 20 minutes, and is reset every time occupancy is re-detected. This state-of-the-art sensor requires no manual sensitivity adjustments.

### OPERATIONAL MODES

#### On Modes (\*Default)

**Automatic On\*** - The sensor automatically turns the lights on when the sensor detects occupancy.

**Reduced Turn-On** - The sensor is set to initially only detect large motions, effectively ignoring any reflected PIR signals while still sensing occupants when they enter the room. Once on, the sensor returns to maximum sensitivity.

#### Switch Modes (\*Default)

**Predictive Off\*** - Pressing the switch overrides the lights off and temporarily disables the occupancy detection. After an exit time delay (default 10 seconds) the occupancy detection reactivates and monitors for an additional grace period time (default 5 seconds). If no occupancy is detected during this period, the sensor will revert to Automatic On operation. If occupancy is detected, the sensor will remain in Permanent Off mode requiring the switch to be pressed again in order to restore the sensor to Automatic On.

**Permanent Off** - Pressing the push-button switch will turn the lights off. The lights will remain off regardless of occupancy until the switch is pressed again, restoring the sensor to Automatic On mode.

**Switch Disable** - Prevents user from manually turning off the lights via the push-button.

### PHOTOCELL DAYLIGHT OVERRIDE OPTION (WSD-P)

The *WSD* offers a Photozell Daylight Override option (-P) for spaces with abundant natural light. Ideal for public places with windows like vestibules, corridors, or bathrooms; this option inhibits the lights from turning on if there is sufficient daylight available. Once the lights turn on, however, the photocell function is disabled until the sensor's occupancy timer expires and turns the lights off. For more information on daylighting control, see the CM-PC-ADC technical datasheet.

### Model Numbering System: WSD-[LENS]-[PHOTOCELL]-[VOLTAGE]-[COLOR\*]-[TEMP/HUMIDITY]

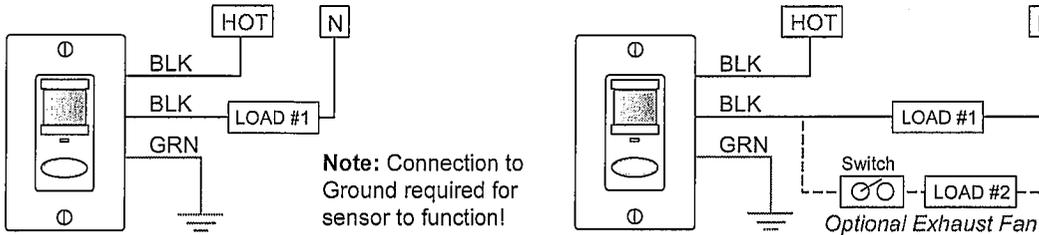
SERIES #	LENS	PHOTOCELL	VOLTAGE	COLOR	TEMP/HUMIDITY
WSD	Blank = Standard -V = Vandal Resistant	Blank = No Photocell -P = w/Photocell	Blank = 120-277 VAC -3 = 347 VAC**	-I = Ivory -W = White -G = Gray -A = Almond	Blank = 14° to 85° F -LT = -40° to 85° F

\*\*347 VAC: Plate not provided

\*Must specify color

T059-003-P

**TYPICAL WIRING DIAGRAM (DO NOT WIRE HOT)**



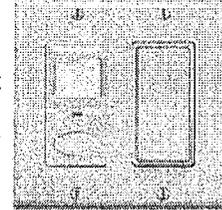
**Note:** Connection to Ground required for sensor to function!

**Note:** Black wires are replaced with Red wires for 347 VAC.

**WIRING TO A LIGHT AND A FAN**

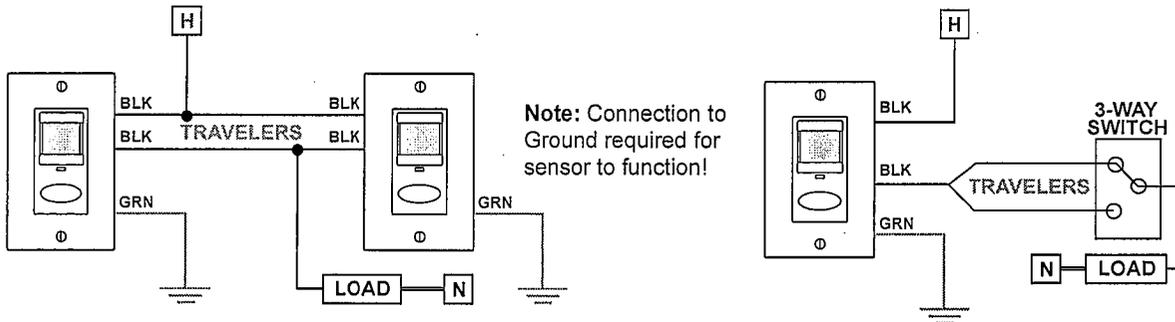
One of the sensor's Black wires connects to the Hot (Line) power feed. The sensor's other Black wire connects to the Light and the Toggle Switch controlling the Exhaust Fan. The sensor's Green wire connects to Ground. When the sensor is in the Occupied Mode, the Exhaust Fan may be overridden "Off" by the Toggle Switch.

**Note:** Standard 2-gang plate not included



**WIRING FOR 3-WAY SWITCHING**

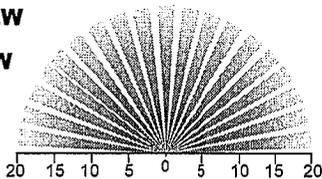
Travelers are used to wire sensors in parallel. If only one sensor is needed to view space, 3-way switch is non-functional.



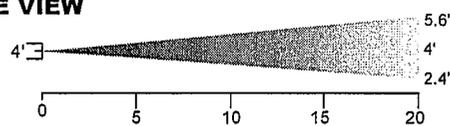
**Note:** Connection to Ground required for sensor to function!

**FIELD OF VIEW**

**TOP VIEW**



**SIDE VIEW**



**STANDARD vs. VANDAL RESISTANT LENS**

The Standard lens provides maximum PIR detection sensing small movements up to 20 feet, and large motions up to 50 feet. This lens should be used in typical offices or rooms where occupants work for extended periods of time. The Vandal Resistant lens should be used in high abuse or public areas (copy rooms, small public restrooms, storage closets), where occupants simply come and go and make larger types of motions. A sensor with a Vandal Resistant lens will have its PIR detection range reduced by 50%.

**WARNING**

**Fire Hazard Caution:** Maximum Lamps 1500 Watts, Type 347 VAC.

**Attention:** Risque d'incendie : Puissance Maximales Des Lampes 1500 Watts, Type 347 VAC.

**Warning:** The units are intended to be installed by a qualified person with properly rated branch circuit protectors as per applicable local and national regulations (CEC, NEC).

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### TYPICAL APPLICATIONS

- Private Offices where occupant turns back to sensor
- Restroom with Stalls
- Storage rooms with shelving

### FEATURES

- Patented Dual Technology with PIR/Microphonics™ Detection
- Self Contained Relay, no Power Pack needed
- Patented Bi-Polar Wiring: Interchangeable hot & load wires
- Intrinsically Grounded
- No Minimum Load
- Time Delay: 30 sec. to 20 minutes
- Push-Button Programmable
- Three-Way & Multi-Level Switching
- Green LED Activity Indicator

### AVAILABLE OPTIONS

- Vandal-Resistant Lens (-V)
- Photocell Daylight Override (-P)
- Low Temp/Hi Humidity (-LT)

### SPECIFICATIONS

- Size: 4.2" H x 1.8" W x 1.5" D (10.67cm x 4.57cm x 3.81cm)
- Sensor Weight: 5 Ounces
- Colors: Ivory, White, Gray, Almond
- Mounting Height: 30 to 48 inches
- Relative Humidity: 20 to 90% non-condensing
- Operating Temp: 14° to 85° F (-10° to 29° C)
- Storage Temp: -14° to 160° F (-26° to 71° C)
- Load Rating (1 phase only):  
120 VAC @ 800 W  
277 VAC @ 1200 W  
347 VAC @ 1500 W
- Frequency: 50/60 Hz (Timers are 1.2 x for 50 Hz)
- UL, CUL, & CSA Listed
- CA Title 24 Compliant
- 5 Year Warranty
- Made in U.S.A.

### LOW TEMP/HI HUMIDITY(-LT)

- Conformally coated Circuit Board is corrosion resistant from moisture
- Operates down to -4° F (-20°C)

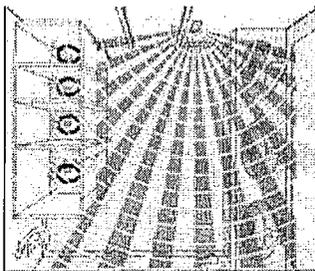
## WSD-PDT Series Programmable Edition!

Dual Technology in a Wall Switch Sensor! The *WSD-PDT Series* is by far the most powerful Decorator occupancy sensor ever invented. The combination of Passive Infrared and patented Microphonics™ detection, allows this sensor to literally "See & Hear" its occupants. The *WSD-PDT* is the ideal solution for restrooms with stalls, private offices where the occupant turns his back to the sensor, or storage rooms with obstructions. Additionally, the WSD Series sensors have several On Modes and Switch Modes that can be programmed using the front push-button.



### SENSOR OPERATIONS

Sensors with Passive Dual Technology (PDT) first "See" motion using Passive Infrared (PIR) and then engage Microphonics™ to "Hear" sounds that indicate continued occupancy. This patented technology uses Automatic Gain Control (AGC) to dynamically self adapt a sensor to its environment by filtering out constant background noise and detecting only noises typical of human activity. When occupancy is detected, a self-contained relay switches the lighting "On". The sensor is line powered and can switch line voltage (see specifications). An internal timer, factory set at 10 minutes, keeps the lights "On" during brief periods of no activity. This timer is push-button programmable from 30 seconds to 20 minutes, and is reset every time occupancy is re-detected. If needed, a 10 second grace period also allows the lights to be voice reactivated after shutting off.



### Bathrooms (WSD-PDT-V)

- Senses partitioned spaces
- Most inexpensive sensor approach
- Voice sound activation prevents lights out condition

### OPERATIONAL MODES

#### On Modes (\*Default)

**Automatic On\*** - The sensor automatically turns the lights on when the sensor detects occupancy.

**Reduced Turn-On** - The sensor is set to initially only detect large motions, effectively ignoring any reflected PIR signals while still sensing occupants when they enter the room. Once on, the sensor returns to maximum sensitivity.

#### Switch Modes (\*Default)

**Predictive Off\*** - Pressing the switch overrides the lights off and temporarily disables the occupancy detection. After an exit time delay (default 10 seconds) the occupancy detection reactivates and monitors for an additional grace period time (default 5 seconds). If no occupancy is detected during this period, the sensor will revert to Automatic On operation. If occupancy is detected, the sensor will remain in Permanent Off mode requiring the switch to be pressed again in order to restore the sensor to Automatic On.

**Permanent Off** - Pressing the push-button switch will turn the lights off. The lights will remain off regardless of occupancy until the switch is pressed again, restoring the sensor to Automatic On mode.

**Switch Disable** - Prevents user from manually turning off the lights via the push-button.

**Model Numbering System: WSD-PDT-[LENS]-[PHOTOCELL]-[VOLTAGE]-[COLOR\*]-[TEMP/HUMIDITY]**

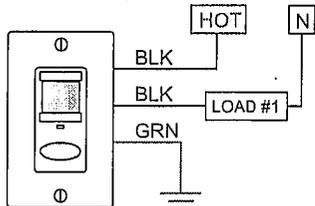
SERIES #	LENS	PHOTOCELL	VOLTAGE	COLOR	TEMP/HUMIDITY
WSD-PDT	Blank = Standard -V = Vandal Resistant	Blank = No Photocell -P = w/Photocell	Blank = 120-277 VAC -3 = 347 VAC**	-I = Ivory -W = White -G = Gray -A = Almond	Blank = 14° to 85° F -LT = -4° to 85° F

\*\*347 VAC: Plate not provided

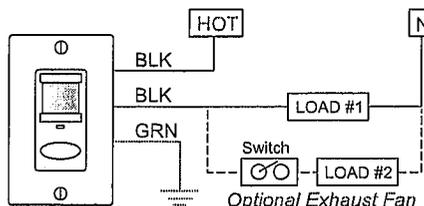
\*Must specify color

T065-003-P

**TYPICAL WIRING DIAGRAM (DO NOT WIRE HOT)**



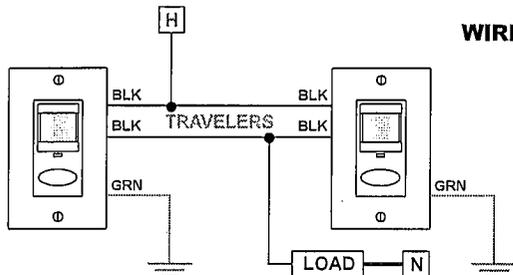
**Note:** Connection to Ground required for sensor to function!



**Note:** Black wires are replaced with Red wires for 347 VAC.

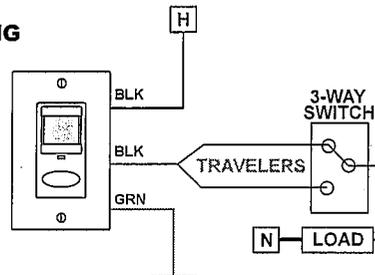
**WIRING TO A LIGHT AND A FAN**

One of the sensor's Black wires connects to the Hot (Line) power feed. The sensor's other Black wire connects to the Light and the Toggle Switch controlling the Exhaust Fan. The sensor's Green wire connects to Ground. When the sensor is in the Occupied Mode, the Exhaust Fan may be overridden Off by the Toggle Switch.



**WIRING FOR 3-WAY SWITCHING**

Travelers are used to wire sensors in parallel. If only one sensor is needed to view space, 3-way switch is non-functional.



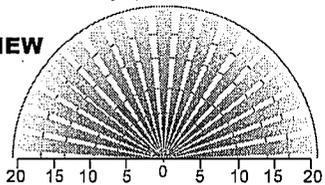
**PHOTOCELL DAYLIGHT OVERRIDE OPTION (WSD-PDT-P)**

The WSD-PDT offers a Photocell Daylight Override option (-P) for spaces with abundant natural light. Ideal for public places with windows like vestibules, corridors, or bathrooms; this option inhibits the lights from turning on if there is sufficient daylight available. Once the lights turn on, however, the photocell function is disabled until the sensor's occupancy timer expires and turns the lights off.

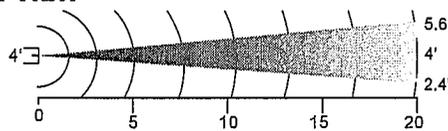
**AREA OF COVERAGE**

The PIR collector beams view out horizontally in a wall-to-wall pattern. The beams will see out to 50 feet, however, their effectiveness in the Standard product is 20 feet for small hand or body motions and 10 feet for the Vandal Resistant products. The Microphonics™ will detect normal human activity up to 20 feet, but will detect greater distances in spaces with hard floors or very quiet rooms with little or no background noise.

**TOP VIEW**



**SIDE VIEW**



**STANDARD vs. VANDAL RESISTANT LENS**

The Standard lens provides maximum PIR detection sensing small movements up to 20 feet, and large motions up to 50 feet. This lens should be used in typical offices or rooms where occupants work for extended periods of time. The Vandal Resistant lens should be used in high abuse or public areas, where occupants simply come and go and make larger types of motions. Copy rooms, small public restrooms, storage or janitor's closets are ideal applications. A sensor with a Vandal Resistant lens will have its PIR detection range reduced by 50%, however the Microphonics™ range is not affected.

**WARNING**

**Fire Hazard Caution:** Maximum Lamps 1500 Watts, Type 347 VAC.

**Attention:** Risque d'incendie : Puissance Maximales Des Lampes 1500 Watts, Type 347 VAC.

**Warning:** The units are intended to be installed by a qualified person with properly rated branch circuit protectors as per applicable local and national regulations (CEC, NEC).

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### TECHNICAL DATA

#### TYPICAL APPLICATIONS

- Classrooms
- Large Storage Rooms
- Large Conference Rooms
- Hallways

#### SENSOR HIGHLIGHTS

- Corner Mount Dual Technology
- 120° by 40ft. PIR Coverage for Small Motions
- Patented PIR/Microphonics™
- Optional Photocell Daylight Override
- Optional Photocell On/Off
- Optional Isolated SPDT Relay

#### FEATURES

- Time Delay: 30 sec. to 20 minutes selectable in 2.5 min. increments
- Green LED Indicator
- Programable w/o removing cover

#### SPECIFICATIONS

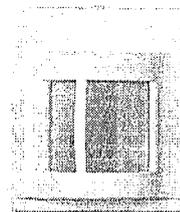
- Size: Rectangular, 3.0" x 3.6" x 1.75"
- Sensor Weight: 6 Ounces
- Sensor Color: White
- Mounting Height: 8 to 10 Feet
- Relative Humidity: 20 to 90% non-condensing
- Operating Temp: 14° to 85° F
- Storage Temp: -14° to 160° F
- UL and CUL Listed
- 5 Year Warranty
- Made in U.S.A.

#### LOW TEMP/HI HUMIDITY(-LT)

- Conformally Coated PCB
- Operates down to -4° F
- Corrosion resistant from moisture

## WV-PDT SERIES

### WV-BR (Bracket)



### Programmable Edition!

Classrooms are the ideal application for the *WV-PDT* Dual Technology Wide View Sensor. Installed in the corner of the room along the entrance wall, this inconspicuous sensor provides line of sight PIR detection of small movements up to 40 feet away, and combines overlapping Microphonic™ detection around obstructions. Many classrooms are filled with shelving, projects, or lab benches. Total coverage of the room is always maintained no matter how cluttered the space becomes! The *WV-PDT* is also used in corridors due to its ability to view up to 70 feet for walking motions, or large open storage areas where obstructions may block the PIR's ability to view. For large lecture halls, multiple *WV-PDTs* may be wired together, or along with any other low voltage sensors.

#### SENSOR OPERATIONS

The *WV-PDT* combines PIR (Passive Infrared) with Microphonics™ technology to literally "See & Hear" the occupant. The PIR first detects motion, initiating the lights to an "On" condition. The Microphonics™ then engages, detecting occupant "noise". Automatic Gain Control (AGC) allows the sensor to self adapt by ignoring constant background noise, and then detect only noise changes typical of human activity. An internal timer, factory set at 10 minutes, keeps the lights "On" during brief periods of no activity. This timer is selectable at 2.5 minute increments from 30 seconds to 20 minutes, and is reset every time occupancy is detected. Once the lights turn "Off", a 10 second grace period allows for the occupant to voice re-activate the lights back "On" if needed. This state-of-the-art design allows the sensor to adapt to its environment, eliminating the need for manual field adjustments. The *WV-PDT* is powered with 12 to 24 volts AC or DC (Red & Black wire inputs), and has one DC output (White wire). When occupancy is detected, this output goes high and can drive up to 200 mA of connected load. The *WV-PDT* typically operates with a PP-20 or MP-20 Power Pack enabling complete 20 Amp circuits to be controlled.

#### PHOTOCELL OPTIONS (WV-16-P and WV-16-PF)

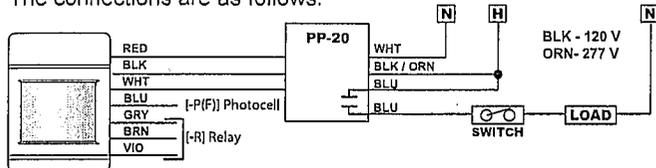
The *WV-PDT* offers two Photocell options for spaces with abundant natural light. It is ideal for public spaces with windows like vestibules, corridors, or bathrooms; however it is not recommended for work spaces where occupants set light levels manually. Each photocell option utilizes a set-point value that is programmable by the user via a digital push button sequence. The **Photocell Daylight Override (-P)** option simply inhibits the lights from turning on, however once the lights are on, the photocell function is disabled until the sensor times out. The **Photocell On/Off (-PF)** option has full control of the lights; turning them on when the level is below the set-point and off when adequate ambient light is present. For more specific information on the operation of Photocell On/Off control and/or dimming, see the CM-PC-ADC Technical Data Sheet information.

#### CATALOG INFORMATION

MODEL #	DESCRIPTION	TEMPERATURE	OP. VOLTAGE	CURRENT
WV-PDT	Passive Dual Technology Wide View	14° to 160° F	12 to 24 VAC/VDC	3 mA
Add suffix				
-R	SPDT Relay, 1 Amp		12 to 24 VAC/VDC	13 mA
-P(F)	Photocell - Daylight Override (On/Off)		12 to 24 VAC/VDC	3 mA
-RP(F)	Relay & Override Photocell (On/Off)		12 to 24 VAC/VDC	13 mA
-LT	Low Temp/High Humidity	-4° to 160° F		
Accessory				
WV-BR	Ceiling Mount Bracket			

**INPUT/OUTPUT**

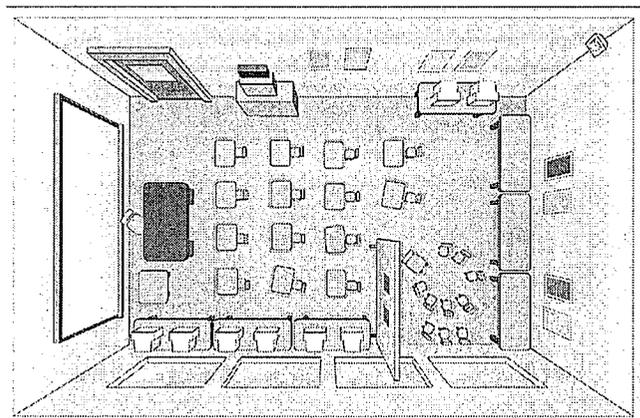
Wire lead connections are Class II, 18 to 22 AWG. The WV-PDT uses 3 leads (Red, Black, and White); the Photocell option adds a Blue lead, and the Relay Option adds 3 leads (Brown, Gray, and Violet). The connections are as follows:



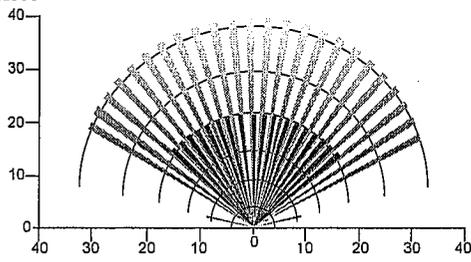
**Do Not Wire Hot**

**INSTALLATION CONSIDERATION**

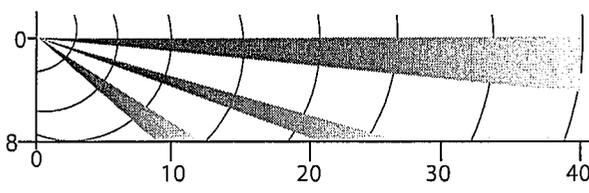
The WV-PDT's rear enclosure is beveled so as to be corner mounted at 8 to 10 feet (see tilt settings). Ideally, the sensor should mount, as shown below, in the corner above the entrance door or in the corner along the same wall as the entrance. If the room is large and multiple sensors are needed, mount the second sensor in the opposite corner, however tilt sensor forward to ensure that the PIR collector beams are not viewing out the door. For mounting heights above 10 feet, use the WV-BR and mount sensor to angled side to provide an initial 30° lookdown. The PDT line of sensors, unlike any other occupancy sensor, self adjusts to its environment. The Automatic Gain Control (AGC) feature allows the sensor to tune out constant background noise. However, changing noise signals like talking, shuffling of papers, and general human activities are readily detected. Avoid locating the sensor near Wall Clocks that make "Clicking Noises" every minute.



**TOP VIEW**



**SIDE VIEW**



**STANDARD WV-PDT**

- RED - 12 to 24 VAC/VDC
- BLACK - Common
- WHITE - Output (HI DC for Occupancy)

**RELAY OPTION WV-PDT-R**

- BROWN - Center tap of relay(SPDT)
- GRAY - Contacts Closed during Occupancy
- VIOLET - Contacts Open during Occupancy

**PHOTOCELL OPTION WV-PDT-P(F)**

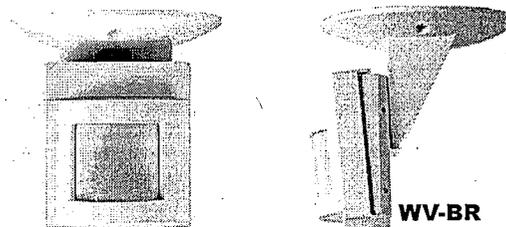
BLUE - Photocell Output (High: Occ/Low Light)  
Use Blue wire from sensor in place of White Wire. For multi-level control, use 2 Power Packs and connect White to primary, and Blue to Daylight Load.

**INTERNAL LOW VOLTAGE RELAY OPTION**

Dry Contact Closure (-R) is provided through a SPDT, 1 Amp, 40 volt relay. The relay coil is energized and changes state when ALL connected sensors register "Unoccupied". Only one sensor per zone (if multiple sensors) needs to have this relay. Sensor must be powered from either a Power Pack, or Class 2 transformer.

**CEILING MOUNT BRACKET (WV-BR)**

The WV-BR Ceiling Mount Bracket allows the WV-PDT to be mounted from the ceiling in rooms where mounting to the wall is not possible.



**TILT ADJUSTMENT**

Mt. Ht.	Position
7' - 8'	Vertical
8' - 9'	Center
9' - 10'	Forward
Above 10'	Use WV-BR



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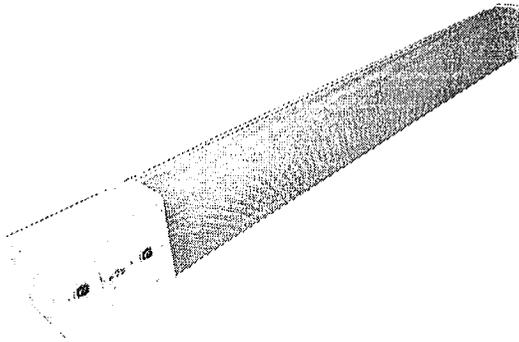
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Catalog Number:

Type:

# FCW Surface Mount Corridor & Stairwell Fixture



## Surface Mount Corridor and Stairwell Fixture

### Specifications

**Construction** - Channel, ends and socket brackets are manufactured from 22-gauge cold rolled steel. Optional 20 gauge construction.

**Finish** - Standard paint after fabrication premium polyester powder coat finish, utilizing a 7-stage pretreatment process of iron phosphate, a non-chromium sealer and a de-ionized water rinse to provide superior adhesion and corrosion resistance.

**Ballasts** - All standard ballasts are electronic, energy saving, thermally protected, Class-P, HPF, non-PCB, Sound Rated A, UL/CSA certified where applicable and comply with © Federal Ballast Law (Public Law 100-357, 1988). Default ballast configuration for two-lamp ballasts.

**Electrical** - UL listed wire, rated for required temperatures, used throughout. Lamps are secured with rotary locking lamp sockets for ease of relamping and to reduce lamps disconnecting due to vibration or incidental contact and is suitable for damp locations.

**Lamp Shielding** - Acrylic prismatic diffuser.

**Mounting** - Designed for ceiling or wall surface mount.

**Warranty** - Standard 1-year warranty for the fixture. Ballasts carry manufacturer warranties of 3-5 years, depending on the application.

**Custom Requirements** - Consult with your SpecLight Agent to develop custom solutions for any application.

Fixture Series	
FCW2	2'
FCW4	4'
FCW8	8'
Lamp Configuration	
1	1-lamp profile
2	2-lamp profile
Lamp Type/Wattage	
17	FO17T8
32	FO32T8
Voltage****	
120	120V, 60 Hz
277	277V, 60 Hz
MVOLT	120 - 277V, 60 Hz
HVOLT	247 - 480V, 60 Hz
Ballast Configuration	
(blank)	all 2-lamp ballast
Ballast Type	
GEB10PS	Normal BF, ≤10% THD, PS
GEB10PSH	High BF, ≤10% THD, PS
GEB10PSL	Low BF, ≤10% THD, PS
Night Light	
(blank)	No Night Light
1CF9	9W Compact Fluorescent
Sensing**	
SNUT***	Ultrasonic stairwell, wall sensor
SNR*	360° Infrared ceiling mount
SNS*	360° Infrared ceiling mount

\* SNS for mounting heights above 25', SNR for mounting heights below 25'.  
 \*\* Sensors wired to toggle between night light and normal when used with 1CF9 option, add Z for use with night light.  
 \*\*\* Ultrasonic sensor for wall mount stairwell application  
 \*\*\*\* Specific voltage required for night light.

Other Sensor options available please contact your SpecLight representative for more information.



2011 W. Rundberg Lane • Austin, TX .78758 • 512.832.0025 • FAX 512.873.0797  
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## Applications

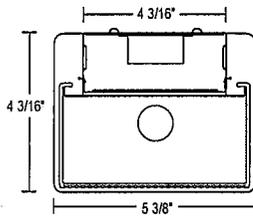
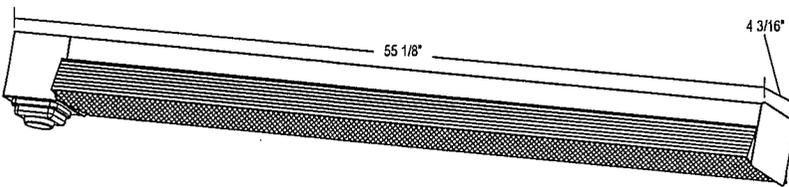
SpecLight's FCW series luminaires are designed for maximum energy efficiency for corridors, stairwells or hospitality environments. The integral motion sensor and compact fluorescent night light option provide greater specification flexibility.

## Features

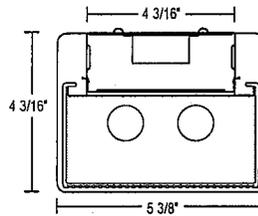
High fixture efficiency and optical control deliver the peak candlepower needed to produce non-glare illumination levels from low mounting heights.

- Improved horizontal and vertical illumination
- Long-life - up to 30,000 hours

## Dimensions



1-lamp profile



2-lamp profile

## Additional Options (installed on fixture)

- Battery Pack
- Sensor
- Night Light
- Pre-installed lamps
- Cord Sets

## Accessories (order separately)

- Chain Hanger, 36", (2 hangers/kit) HC36

## Photometrics

SC Across Definitions:

- Focus (SC < 0.9), i.e. F1X12
- Task (0.9 ≤ SC < 1.2), i.e. T1X12
- Normal (1.2 ≤ SC ≤ 1.4), i.e. N1X12, N1D20
- Spread (1.4 < SC ≤ 1.8), i.e. S1X12
- Broad (1.8 < SC), i.e. B1X12



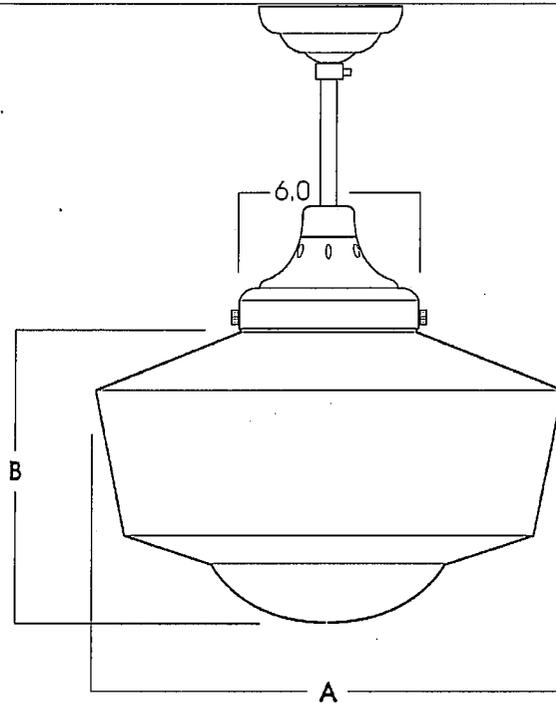
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SL10300.00



**SCHOOLHOUSE PENDANT  
INCANDESCENT/ FLUORESCENT  
AND HID SERIES**

**RLM**  
SERIES



**ORDER OPTIONS (SEE "HOW TO ORDER" PAGES)**

MODEL NO.	A = DIAMETER	B = HEIGHT	INCANDESCENT	FLUORESCENT CP10 Ballast in Canopy	HID Remote Ballast
SP-SS1408	14.0	8.0	150W	1 OR 2 x 13W-42W	35W - 150W
SP-SS1610	16.0	10.0	200W	1 OR 2 x 13W-42W	35W - 150W

**ORDER EXAMPLE:**

SP-SS1610INC/HP24/BR - 16.0 x 10.0 Schoolhouse Pendant with 200 Watt Incandescent, 120 volt electronic/24" Hang Straight Pendant/ Brass Finish.

**PRODUCT INFORMATION**

- Classic opal glass Schoolhouse fixtures.
- Canopy and fitters spun heavy gauge brass or aluminum
- Solid construction with brass hardware
- Various color and finish options on hardware fitters, canopy and polished solid brass and chrome.
- Suitable for use in damp location.
- Manufactured and tested to UL standard No. 1598/ETL Listed.
- Made in U.S.A

**OPTIONS**

- PA = Pipe Mount (see pipe options).
- CM = Ceiling Mount (See Canopy Mounting Options).
- HP = Hang Straight Pendant.

**SUBMITTAL WORKSHEET**

FIXTURE NO.  
JOB NAME  
FIXTURE TYPE



### TYPICAL APPLICATIONS

- Partitioned Cubical Spaces
- Restroom with Stalls
- Library Study Carrels & Stacks

### FEATURES

- Patented Dual Technology with PIR/Microphonics™ Detection
- Communicates with Other Sensors
- Time Delay: 30 sec. to 20 minutes
- Push-Button Programmable
- Green LED Indicator
- 100 Hr. Lamp Burn-in Timer Mode

### AVAILABLE OPTIONS

- Isolated SPDT Relay (-R)
- On/Off Photocell (-P)
- Auto Dimming Cntl. Photocell (-ADC)
- Low Temp/Hi Humidity (-LT)

### SPECIFICATIONS

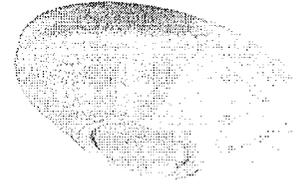
- Size: Circular, 4.55" Dia., 1.55" Deep (11.56 cm Dia., 3.94 cm Deep)
- Sensor Weight: 5 Ounces
- Sensor Color: White
- Mounting: Ceiling Tile Surface, Round Fixture or Junction Box
- Relative Humidity: 20 to 90% non-condensing
- Operating Temp: 14° to 160° F (-10° to 71° C)
- Storage Temp: -14° to 160° F (-26° to 71° C)
- UL, CUL, and Title 24 Compliant
- 5 Year Warranty
- Made in U.S.A.

### LOW TEMP/HI HUMIDITY(-LT)

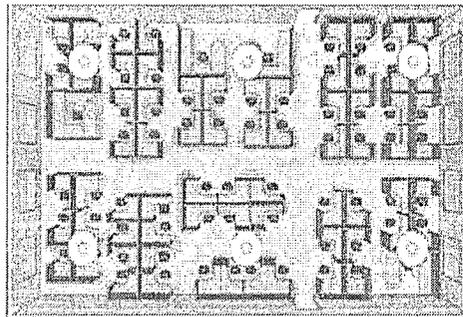
- Conformally coated Circuit Board is corrosion resistant from moisture
- Operates down to -4° F (-20° C)

## CM-PDT SERIES

*w/ Enhanced Daylighting Control Options!*



Open area office lighting control is made cost effective with the use of the *CM-PDT Series* Passive Dual Technology occupancy sensor. This small, yet powerful sensor provides line of sight PIR detection of small motion in a circular pattern and combines overlapping Microphonics™ coverage for detection of occupants working in their cubical space. By installing multiple *CM-PDTs* on 30 foot centers, large zones are created (typically one per circuit of lighting). The lighting is then controlled in blocks similar to manual switching, only no one will ever have to remember to turn off the lights! Restrooms with stalls, large storage areas with shelving, and libraries with study carrels are also easily and cost effectively controlled by the *CM-PDT*.



### SENSOR OPERATIONS

Sensors with Passive Dual Technology (PDT) first "See" motion using Passive Infrared (PIR) and then engage Microphonics™ to "Hear" sounds that indicate continued occupancy. This patented technology uses Automatic Gain Control (AGC) to dynamically self adapt a sensor to its environment by filtering out constant background noise and detecting only noises typical of

human activity. When occupancy is detected, a DC output goes high and can drive up to 200 mA of connected load. The sensor is powered with 12 to 24 VAC/VDC and typically operates with a PP-20 or MP-20 Power Pack; enabling complete 20 Amp circuits to be controlled. An internal timer, factory set at 10 minutes, keeps the lights "On" during brief periods of no activity. This timer is selectable at 2.5 minute increments from 30 seconds to 20 minutes, and is reset every time occupancy is re-detected.

### DAYLIGHTING CONTROL OPTIONS

For spaces with abundant natural light from windows or skylights, this series offers an On/Off Photocell (-P) option and an Automatic Dimming Control (-ADC) Photocell option. The -P option is ideal for public areas like vestibules, corridors, or restrooms;

while the -ADC option is perfect for classrooms and private offices. As the daylight levels change in the room, both options insure that an adequate light level is maintained according to a programmable set-point value. The -P option provides two modes of operation; one simply inhibits the lights from turning on, while the other has full On/Off control of the lights. The -ADC option allows the sensor to control a dimmable ballast. It also provides a secondary dim time-out that enables the lights to go to a dim setting after one time-out and then turn fully off after a second time-out. For more detailed information on these daylighting control features, see the CM-PC-ADC Technical Data Sheet.

### SENSORS vs. LIGHTING PANELS

Lower cost, convenience, reliability, and greater energy savings are all provided by installing *CM-PDTs* rather than computer based lighting control panels. No programming, no confusing overrides, no chance of turning off while the area is still occupied, and no reason for leaving the lights on in "anticipation" of occupants! Real time detection of occupancy always outperforms a pre-programmed time clock. All this at a fraction of the total installed cost of a lighting panel!

### CATALOG INFORMATION

MODEL #	DESCRIPTION	TEMPERATURE	OP. VOLTAGE	CURRENT
CM-PDT	Dual Technology Ceiling Mount Sensor	14° to 160° F	12 to 24 VAC/VDC	4 mA
Add suffix				
-R	SPDT Relay, 1 Amp			16 mA
-P	On/Off Photocell			4 mA
-RP	Relay & On/Off Photocell			16 mA
-ADC	Automatic Dimming Control Photocell			4 mA
-LT	Low Temp/High Humidity	-4° to 160° F		

**WIRING INSTRUCTIONS**

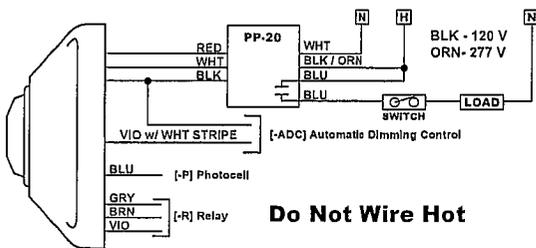
Wire lead connections are Class II, 18 to 22 AWG.

**STANDARD CM-9**

RED - 12 to 24 VAC/VDC

BLACK - Common

WHITE - Output (HI DC for Occupancy)



**RELAY OPTION (-R)**

GRAY / BROWN - Connected during Occupied state

VIOLET / BROWN - Connected during Unoccupied state

Note: Relay is energized during Unoccupied state

**PHOTOCELL OPTION (-P)**

BLUE - Photocell output (High: Occupied & Low Light)

Use Blue wire from sensor in place of White wire. For multi-level control, use 2 Power Packs and connect White to primary load and Blue to daylight load.

**AUTOMATIC DIMMING CONTROL (-ADC)**

VIOLET/WHITE striped - Connect to Violet wire from 0-10 VDC dimmable ballast. Also connect ballast Gray wire to sensor Black wire. Note: If both the -P and the -ADC options are selected the "Inhibit" mode of the -P option is not available.

**INTERNAL LOW VOLTAGE RELAY OPTION**

To enable a sensor to interface with a building management system, the -R option provides dry contact closure via a SPDT, 1 Amp, 40 Volt relay. The relay coil is energized and changes state when ALL connected sensors register "Unoccupied". When using multiple sensors, only one sensor per zone needs to have a relay.

Note: Sensor must have power at all times for the relay to function.

**MOUNTING CONSIDERATIONS**

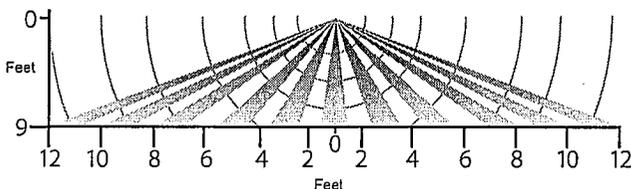
The CM-PDT is provided with 2 self tapping mounting screws. The sensor typically mounts directly to the ceiling tile, or to the metallic grid. However, if desired, the mounting holes are slotted to line up with a standard round or rectangular box (screws not provided).

Note: The ceiling tile provides insulation from stray plenum noises. Only penetrate tile to allow for mounting screws and wires (3 small holes).

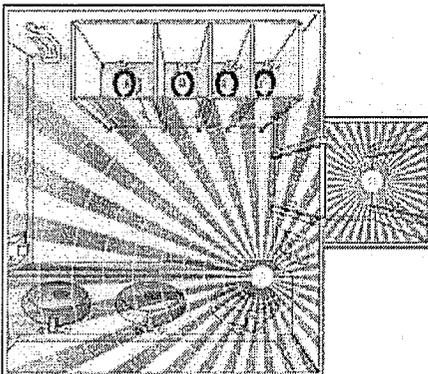
**FIELD OF VIEW**

The CM-PDT's dome lens provides a maximum viewing angle of 56° in a complete 360° conical pattern. The Microphonics™ detects normal human activity up to 20 feet, but will detect greater distances in spaces with hard floors or very quiet rooms with little or no background noise. Place the sensor along the entrance door wall to prevent it from viewing out into the hallway. Avoid locating the sensor near HVAC air diffusers because the "noise" generated from air flow will decrease the sensitivity of the Microphonics™ sensor.

**SIDE VIEW**



**Multi-Stall Restroom w/Vestibule**

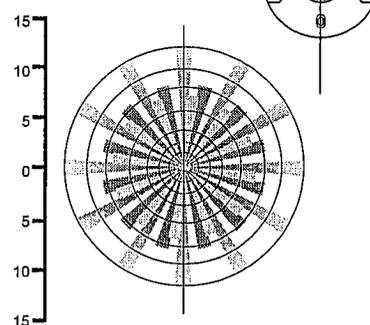


**PIR used with PDT**

- CM-9 PIR in vestibule initiating the light "On"
- Microphonics™ in CM-PDT is activated by the CM-9.
- CM-PDT detects occupants in stalls

Note: For maximum distance place the sensor so that the screw axis is positioned with the entrance axis.

**TOP VIEW**



**WARRANTY:** Sensor Switch, Inc. warrants these products to be free of defects in manufacture and workmanship for a period of sixty months. Sensor Switch, Inc., upon prompt notice of such defect will, at its option, provide a Returned Material Authorization number and a replacement product.  
**LIMITATIONS AND EXCLUSIONS:** This Warranty is in full lieu of all other representation and expressed and implied warranties (including the implied warranties of merchantability and fitness for use) and under no circumstances shall Sensor Switch, Inc. be liable for any incidental or consequential property damages or losses.



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### STANDARD RANGE 360° SENSOR CEILING MOUNT • LOW VOLTAGE • DUAL TECHNOLOGY (PDT)

#### SPECIFICATIONS

##### FEATURES

- Patented Dual Technology with PIR / Microphonics Detection
- 360° Coverage
- Push-Button Programmable Adjustable Time Delay
- 100 Hr Lamp Burn-in Timer
- Green LED Indicator

##### PHYSICAL SPECS

- SIZE 4.55" Dia. (11.56 cm)
- 1.55" Deep (3.94 cm)
- WEIGHT 6 oz
- MOUNTING
  - Ceiling Tile Surface
  - 3.5" Octagon Box
  - Single Gang Handy Box
- COLOR White

##### ELECTRICAL SPECS

- OPERATING VOLTAGE
  - 12-24 VAC/VDC
- CURRENT DRAW
  - Standard, 4 mA
  - w/ R option, 16 mA
- DIMMING LOAD
  - Sinks / Sources < 20mA;
  - ~40 Ballasts @ .5mA each
- RECOMMENDED POWER PACK
  - PP20

##### ENVIRONMENTAL SPECS

- OPERATING TEMP
  - 14° to 160° F (-10° to 71° C)
- STORAGE TEMP
  - 14° to 160° F (-26° to 71° C)
- RELATIVE HUMIDITY
  - 20 to 90% non-condensing

##### OTHER

- UL and CUL Listed
- Title 24 Compliant
- 5 Year Warranty
- Made in the U.S.A.

Open area office lighting control is made cost-effective with the use of the CM PDT 9 Series Standard Range 360° occupancy sensor. This small yet powerful sensor provides line-of-sight PIR detection of small motion in a circular pattern, and combines overlapping Microphonics™ coverage for detection of occupants working in their cubical space. By installing multiple CM PDT 9s on 30 ft (9.14 m) centers, large control zones are created (typically one per circuit of lighting). The lighting is then controlled in blocks similar to manual switching. Restrooms with stalls, large storage areas with shelving, and libraries with study carrels are also easily and cost-effectively controlled by the CM PDT 9.

##### SENSOR OPERATION

The sensor has Passive Dual Technology (PDT), which first sees motion using Passive Infrared (PIR), and then engages Microphonics™ to hear sounds that indicate continued occupancy. This patented technology uses Automatic Gain Control (AGC) to dynamically self-adapt the sensor to its environment by filtering out constant background noise and detecting only noises typical of human activity. When occupancy is detected, a DC output goes high and can drive up to 200 mA of connected load. The sensor is powered with 12-24 VAC/VDC and typically operates with a PP20 or MP20 power pack, enabling complete 20 Amp circuits to be controlled. An internal timer, factory set at 10 minutes, keeps the lights on during brief periods of inactivity. This timer is push-button programmable from 30 seconds to 20 minutes, and is reset every time occupancy is re-detected. This state-of-the-art sensor requires no field calibration or adjustment.

#### OPTIONS

##### LOW VOLTAGE RELAY (R)

- Enables sensors to interface with other systems (e.g., BMS, lighting panels)
- Provides dry contact closure via a SPDT, 1 Amp, 40 Volt relay
- Only one relay needed per zone
- Changes state when all connected sensors register unoccupied
- Relay requires sensor power to function

##### OCCUPANCY CONTROLLED DIMMING (D)

- Provides dimming output to control 0-10 VDC dimmable ballasts
- Provides a second occupancy time-out period that enables the lights to go to a dim setting before turning off
- Adjustable max/min dim setting

##### PHOTOCELL (P)

- Auto set-point calibration
- Two selectable modes of operation.
- On/Off mode: Photocell has full control during periods of occupancy
- Inhibit mode: Photocell can prevent lights from turning on if adequate daylight is available, but cannot turn lights off

##### PHOTOCELL W/ DIMMING (ADC)

- Photocell within sensor maintains total room light level by controlling levels of 0-10 VDC dimmable ballasts
- Photocell also has full on/off control during periods of occupancy
- Provides a second occupancy time-out period that enables the lights to go to a dim setting before turning off

##### LOW TEMP/HIGH HUMIDITY (LT)

- Sensor is corrosion resistant to moisture
- Operates down to -4° F/ 20° C

#### ORDERING INFO CM PDT 9 [RELAY] [DIMMING/PHOTOCELL] [TEMP/HUMIDITY]

##### RELAY

- Blank = None
- R = Low Voltage Relay

##### DIMMING / PHOTOCELL CHOOSE ONE ONLY

- Blank = None
- D = Occupancy Controlled Dimming
- P = Photocell
- ADC = Photocell w/ Dimming

##### TEMP/HUMIDITY

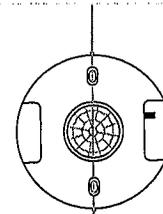
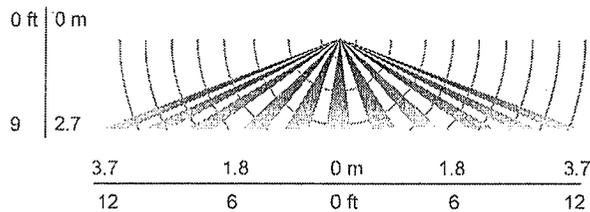
- Blank = Standard
- LT = Low Temp

## COVERAGE PATTERN

### 9 STANDARD RANGE 360° LENS WITH MICROPHONICS™

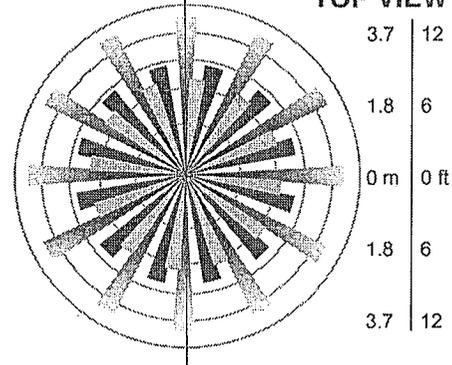
- Best choice for small motion (e.g. hand movements) detection
- Viewing angle of 56° in a 360° conical shaped pattern
- Provides 12 ft (3.66 m) radial coverage when mounted to standard 9 ft (2.74 m) ceiling
- 8 to 15 ft (2.44 to 4.57 m) mounting heights provide 10 to 20 ft (3.05 to 6.10 m) radial coverage
- Microphonics™ provides overlapping detection of human activity over the complete PIR coverage area. Advanced filtering is also utilized to prevent non-occupant noises from keeping the lights on.

#### SIDE VIEW



Note: Screw axis is aligned with a long detection segment

#### TOP VIEW



## WIRING (DO NOT WIRE HOT)

### STANDARD WIRING

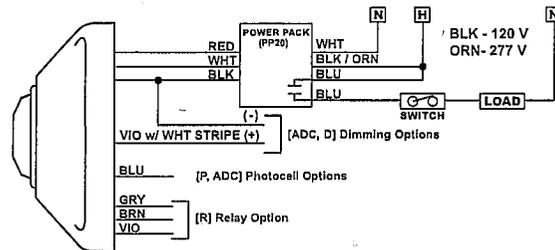
- RED - Power Input (12-24 VAC/VDC)
- BLACK - Common
- WHITE - Output (high VDC for occupancy)

### RELAY OPTION (R)

- GRAY / BROWN - Connected during occupied state
  - VIOLET / BROWN - Connected during unoccupied state
- Note: Relay is energized during unoccupied state

### DIMMING OPTIONS (D, ADC)

- VIOLET w/ WHITE STRIPE - Connect to Violet control wire from 0-10 VDC dimmable ballast
- GRAY from Ballast - Connect to sensor Black wire

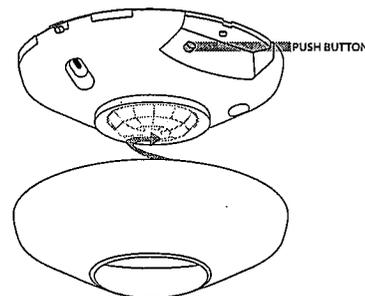


### PHOTOCELL OPTIONS (P, ADC)

- BLUE - Use in place of White output wire. Photocell output is high VDC with occupancy & low light. For multi-level control, use two power packs and connect White to primary load and Blue to daylight load.

## INSTALLATION

- Mount sensor directly to a ceiling tile or a metallic grid (two self-tapping screws provided)
- Sensor's mounting holes also align with 3.5" octagon or single gang handy box (screws not provided)
- Sensor will detect motions crossing segments more effectively than motions parallel to beams
- For optimal detection, position sensor such that segments are crossed upon entrance and unable to view outside the space
- For maximum Microphonics™ sensitivity avoid locating sensor near HVAC air diffusers.



### PROGRAMMING

Refer to included instruction card for default settings and directions on programming the sensor via the push-button.

**sensorswitch**

An Acuity Brands Company

**WARRANTY:** Sensor Switch, Inc. warrants these products to be free of defects in manufacture and workmanship for a period of 60 months. Sensor Switch, Inc., upon prompt notice of such defect, will, at its option, provide a Returned Material Authorization number and repair or replace returned product.

**LIMITATIONS AND EXCLUSIONS:** This Warranty is in full lieu of all other representation and expressed and implied warranties (including the implied warranties of merchantability and fitness for use) and under no circumstances shall Sensor Switch, Inc. be liable for any incidental or consequential property damages or losses.

TS10-004-P