Public Service of New Hampshire

The Northeast Utilities System

nhsaves@work
large business retrofit

2009 Lighting Rebate

Section A: CUSTOMER INFORMATION

Customer Name	Electric Account Number	Rate	Application Number
City of Dover - Butterfield Gym	8000 619-02-9-4		
Facility Address	**City**	**State**	**Zip Code**
9 Henry Law Ave	Dover	NH	03820
Service Location Identification			
Butterfield Gym			
Mailing Address (if different from above)	**City**	**State**	**Zip Code**
Contact Person/Title	**Telephone Number**	**Incorporated? (Check one.)**	
Rick Jones CD Coordinator	(603) 516-6008	☑ Yes ☐ No ☐ Exempt	
Federal Tax Identification Number	**Rebate Payment Preference (Check one.)**	**Please Assign Payment to Contractor.**	
02-6000230	☒ Check ☐ Bill Credit ☐ Pay Contractor	Customer Signature:	

Section B: CONTRACTOR INFORMATION

Contractor Name	Contact Person/Title (Print)	Contact Person Signature	
Johnson Controls	Kevin Stromgren Project Manager		
Mailing Address	**City**	**State**	**Zip Code**
39 Salem Street	Lynnfield	MA	01940
Federal Tax Identification Number	**Incorporated? (Check one.)**	**Telephone Number**	
39-0380010	☐ Yes ☐ No ☐ Exempt	860-335-6341	

Section C: DOCUMENT APPROVALS

PRE-INSTALLATION INSPECTION

Utility Signature	Date

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: Date: 12/1/09

POST-INSTALLATION INSPECTION

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

MANAGEMENT APPROVAL

Utility Signature	Date

Public Service of New Hampshire

2009 Lighting Rebate

PROJECT NAME: **City of Dover, - Butterfield Gym Indoor Pool - 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	2F32SSM	2L4' T8/EEMAG	2	5100	41	1F32EEE	1L4'T8EE/ELEE	2	$ 30.00	$ 60.00
2	3F32SSM	3L4'T8/EEMAG	5	5100	41	1F32EEE	1L4'T8EE/ELEE	5	$ 30.00	$ 150.00
3		2LT8UTube/ELIG	1	1000	10	2F17SSE	2L2' T8/ELIG	1	$ 20.00	$ 20.00
4		2LT8UTube/ELIG	2	1600	10	2F17SSE	2L2' T8/ELIG	2	$ 20.00	$ 40.00
5		2LT8UTube/ELIG	2	3000	10	2F17SSE	2L2' T8/ELIG	2	$ 20.00	$ 40.00
6		2LT8UTube/ELIG	1	5100	10	2F17SSE	2L2' T8/ELIG	1	$ 20.00	$ 20.00
7	4F32SSE	4L4' T8/ELIG	1	1600	10	2F32EEE	2L4' T8EE/ELEE	1	$ 20.00	$ 20.00
8	4F32SSE	4L4' T8/ELIG	32	3000	10	2F32EEE	2L4' T8EE/ELEE	32	$ 20.00	$ 640.00
9	4F32SSE	4L4' T8/ELIG	1	5100	10	2F32EEE	2L4' T8EE/ELEE	1	$ 20.00	$ 20.00
10	3F32SSM	3L4'T8/EEMAG	5	1600	41	2F32EEL	2L4' T8EE/ELEE LBF	5	$ 30.00	$ 150.00
11	3F32SSM	3L4'T8/EEMAG	6	5100	41	2F32EEL	2L4' T8EE/ELEE LBF	6	$ 30.00	$ 180.00
12	4F32SSE	4L4' T8/ELIG	1	5100	10	2F32EEL	2L4' T8EE/ELEE LBF	1	$ 20.00	$ 20.00
									$ -	$ -
										$ 1,360.00

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 ($)	Total Rebate ($)
1	64	Wall Mount Occupancy Sensor	1	2F32EEE	1	3060	$ 25.00	$ 25.00
1	64	Wall Mount Occupancy Sensor		2F17SSE	1	3060		$ -
								$ -
								$ -
								$ -
								$ 25.00

TOTAL COST OF PROPOSED PROJECT

Type of Measure		Equipment Costs	Labor Costs	Requested Incentive
Lighting Systems				$ 1,360.00
Lighting Controls				$ 25.00
TOTALS		**$ -**	**$ -**	**$ 1,385.00**

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: Butterfield Gym Indoor Pool, 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	Measure Code	Watts	Annual Hrs	Watts Reduction
Map #3 Stairwell	5	3L4'T8/EEMAG	3F32SSM	107	1600	5	2L4' T8EE/ELEE LBF	2F32EEL	41	48	1600	59
Map #4 Women's Locker Rm	16	4L4' T8/ELIG	4F32SSE	112	3000	16	2L4' T8EE/ELEE	2F32EEE	10	55	3000	57
Map #5 Men's Locker Rm	16	4L4' T8/ELIG	4F32SSE	112	3000	16	2L4' T8EE/ELEE	2F32EEE	10	55	3000	57
Map #5 Men's Locker Rm	2	2LT8UTube/ELIG		60	3000	2	2L2' T8/ELIG	2F17SSE	10	37	3000	23
Map #6 Men's Room	1			85	5100	1	WALL SENSOR		64	85	5100	-
Map #6 Men's Room	1	4L4' T8/ELIG	4F32SSE	112	5100	1	2L4' T8EE/ELEE	2F32EEE	10	55	5100	57
Map #6 Men's Room	1	2LT8UTube/ELIG		60	5100	1	2L2' T8/ELIG	2F17SSE	10	37	5100	23
Map #7 Hallway to Pool Area	5	3L4'T8/EEMAG	3F32SSM	107	5100	5	1L4'T8EE/ELEE	1F32EEE	41	28	5100	79
Map #8 Family Changing Rm	1	4L4' T8/ELIG	4F32SSE	112	1600	1	2L4' T8EE/ELEE	2F32EEE	10	55	1600	57
Map #8 Family Changing Rm	2	2LT8UTube/ELIG		60	1600	2	2L2' T8/ELIG	2F17SSE	10	37	1600	23
Map #9 Changing Rm	1	2LT8UTube/ELIG		60	1000	1	2L2' T8/ELIG	2F17SSE	10	37	1000	23
Map #10 Registration Area	6	3L4'T8/EEMAG	3F32SSM	107	5100	6	2L4' T8EE/ELEE LBF	2F32EEL	41	48	5100	59
Map #10 Registration Area	1	4L4' T8/ELIG	4F32SSE	112	5100	1	2L4' T8EE/ELEE LBF	2F32EEL	10	48	5100	64
Map #11 Pool Office	2	2L4' T8/EEMAG	2F32SSM	70	5100	2	1L4'T8EE/ELEE	1F32EEE	41	28	5100	42
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Energy Savings Analysis
City of Dover - Butterfield Gym-Indoor Pool - S1
Dover, NH

ESCO CODE	QTY	AVG. ANNUAL HOURS TOTAL	AVG. ANNUAL ON PK HOURS	AVG. ANNUAL OFF PK HOURS	UNIT KW BEFORE	TOTAL KW BEFORE	UNIT KW AFTER	TOTAL KW AFTER	UNIT KW SAVED	TOTAL KW SAVED	ANNUAL ON PK KWH SAVED	ANNUAL OFF PK KWH SAVED	ANNUAL TOTAL KWH SAVED	ON PK SAVINGS @ $0.1000 PER KWH	OFF PK SAVINGS @ $0.1000 PER KWH	DEMAND SAVINGS @ $8.82 PER KW	TOTAL SAVINGS
ADFW/N-T8-QXPS-UNV	2	5,100	5,100	-	0.060	0.12	0.028	0.06	0.032	0.06	326	-	326	33	-	7	39
BDF-T8-QLXPS-UNV	1	5,100	5,100	-	0.112	0.11	0.048	0.05	0.064	0.06	326	-	326	33	-	7	39
BDF-T8-QXPS-UNV	34	3,020	3,020	-	0.112	3.81	0.055	1.87	0.057	1.94	5,853	-	5,853	585	-	205	790
CADFWW/N-T8-QXPS-UNV	5	5,100	5,100	-	0.088	0.44	0.028	0.14	0.060	0.30	1,530	-	1,530	153	-	32	185
CDFWW/N-T8-QLXPS-UNV	11	3,509	3,509	-	0.088	0.97	0.048	0.53	0.040	0.44	1,544	-	1,544	154	-	47	201
NOUPGRADE-13WPL	3	100	100	-	0.015	0.04	0.015	0.04	-	-	-	-	-	-	-	0	-
NOUPGRADE-26WPL	18	100	100	-	0.028	0.50	0.028	0.50	-	-	-	-	-	-	-	0	-
NOUPGRADE-2X13WPL	8	100	100	-	0.030	0.24	0.030	0.24	-	-	-	-	-	-	-	0	-
NOUPGRADE-4'3L32WT8NP	1	100	100	-	0.088	0.09	0.088	0.09	-	-	-	-	-	-	-	0	-
NOUPGRADE-MH400	12	100	100	-	0.455	5.46	0.455	5.46	-	-	-	-	-	-	-	0	-
NOUPGRADE-VENDINGMACHINE	1	8,760	8,760	-	0.400	0.40	0.400	0.40	-	-	-	-	-	-	-	0	-
SLS15-I60-120	1	1,000	1,000	-	0.060	0.06	0.015	0.01	0.045	0.04	45	-	45	4	-	5	9
UDF-T8-QXPS-UNV	6	2,550	2,550	-	0.060	0.36	0.030	0.18	0.030	0.18	459	-	459	46	-	19	65
VSS-120	1	2,891	2,891	-	0.400	0.40	-	-	0.400	0.40	1,156	-	1,156	116	-	42	158
WSS-DT-120	1	3,060	3,060	-	0.085	0.09	-	-	0.085	0.09	260	-	260	26	-	9	35
Total	**105**					**13.09**		**9.57**	**27%**	**3.52**	**11,500**	**-**	**11,500**	**1,150**	**-**	**372**	**1,522**

Fixture Locations

City of Dover - Butterfield Gym-Indoor Pool - S1

Dover, NH

Map	Location	Hours	Qty	Code	Notes
1	2nd Floor - Indoor Pool Conference Area	100	10	NOUPGRADE-26WPL	Existing 1 x 26W CF Recessed Can
1	2nd Floor - Indoor Pool Conference Area	100	8	NOUPGRADE-2X13WPL	Exisitng 2 x 13W CF Wall Sconce
2	2nd Floor Office	100	8	NOUPGRADE-26WPL	Existing 1 x 26W CF Recessed Can
2	2nd Floor Office - Storage Area	100	1	NOUPGRADE-4'3L32WT8NP	Existing 1 x 4 3L T8 Wide Wrap
3	Stairwell	1,600	5	CDFWW/N-T8-QLXPS-UNV	
4	Women's Locker Room	3,000	16	BDF-T8-QXPS-UNV	Sensor in Place
5	Men's Locker Room	3,000	16	BDF-T8-QXPS-UNV	Sensor in Place
5	Men's Locker Room	3,000	2	UDF-T8-QXPS-UNV	Sensor in Place
6	Men's Room	5,100	1	WSS-DT-120	
6	Men's Room	5,100	1	BDF-T8-QXPS-UNV	
6	Men's Room	5,100	1	UDF-T8-QXPS-UNV	
7	Hallway to Pool Area	5,100	5	CADFWW/N-T8-QXPS-UNV	Replacing 3L T8 Wide Wrap: (4) Wall-Mounted; (1) Ceiling Mounted; 8' AFF
8	Family Changing Room	1,600	1	BDF-T8-QXPS-UNV	
8	Family Changing Room	1,600	2	UDF-T8-QXPS-UNV	
9	Changing Room	1,000	1	UDF-T8-QXPS-UNV	
10	Registration Area	5,100	6	CDFWW/N-T8-QLXPS-UNV	
10	Registration Area	5,100	1	BDF-T8-QLXPS-UNV	
10	Registration Area	100	3	NOUPGRADE-13WPL	Existing 13W CF Recessed Can
10.1	Registration Area	8,760	1	NOUPGRADE-VENDINGMACHINE	Dasani Machine
10.1	Registration Area	8,760	1	VSS-120	
11	Pool Office	5,100	2	ADFW/N-T8-QXPS-UNV	
11	Pool Office - Storage Room	1,000	1	SLS15-I60-120	Replacing 60W Incandescent
12	Pool Area	100	12	NOUPGRADE-MH400	Existing 400W Metal Halide Fixtures
Total			105		

Material Purchasing

City of Dover - Butterfield Gym Indoor Pool - S1

Bldg Name	Component	PO Order Total	Vendor	Mfg Name	Mfg #	Notes
Butterfield Gym	Ballast 2 lamp Electronic UNV QHEL Super Saver	1	WESCO	Advance	IOP-2P32-LW-SC	
Butterfield Gym	Ballast 2 lamp Electronic UNV QHEN Super Saver	40	WESCO	Advance	IOP-2P32-SC	
Butterfield Gym	Reflector Kit 2x2 Miro-4 2-Lamp	6	EPA	EPA	RTR2202T817ENLSS	
Butterfield Gym	Reflector Kit 2x4 Miro-4 2-Lamp	35	EPA	EPA	RTR2402T832ENLSS	
Butterfield Gym	CF Philips SLS15 Compact Fluorescent	1	WESCO	Philips	SLS14/ALTO	
Butterfield Gym	Lamp 2' T8 XPS 841	12	WESCO	Philips	F17T8ADV841ALTO	
Butterfield Gym	Lamp 4' T8 XPS Super Saver 841	99	WESCO	Philips	F32T8/ADV841/ALTO	
Butterfield Gym	New Fixture 4'1 lamp wide wrap UNV QHEN with reflector	5	Re-Nova	Re-Nova	ECS-MPW4-MN-132-UNV-1N-IOP	
Butterfield Gym	New Fixture 4' 2 lamp wide wrap w/reflector UNV QHEL	11	Re-Nova	Re-Nova	ECS-MPW4-MN-232-UNV-2L-IOP	
Butterfield Gym	New Fixture 4'1 lamp wrap UNV QHEN with reflector	2	Re-Nova	Re-Nova	ECS-NPW4-MN-132-UNV-1N-IOP	
Butterfield Gym	Vending Machine Miser VM150	1	MUNRO	Vending Miser	VM150	
Butterfield Gym	Wall switch occupancy sensor Dual Tech SensorSwitch	1	MUNRO	Sensor Switch	WSD-PDT-I	

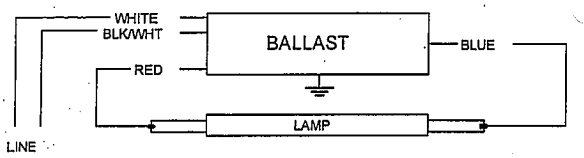
ADVANCE™

Electrical Specifications

IOP-1P32-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

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

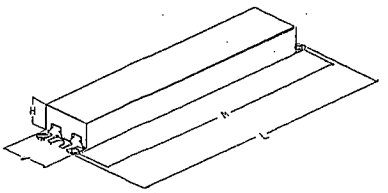


Diag. 63

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

IOP-1P32-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 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

ADVANCE TRANSFORMER CO.
O'HARE INTERNATIONAL CENTER - 10275 WEST HIGGINS ROAD
ROSEMONT, ILLINOIS 60018
TELEPHONE: (847) 390-5000 FAX: (847) 390-5109

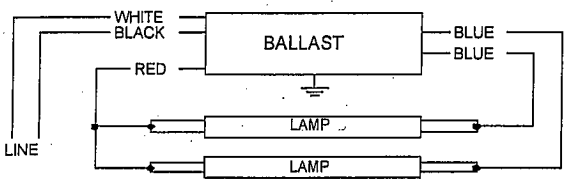
ADVANCE™

Electrical Specifications

IOP2P32LWSC@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

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	0.20	24	0.90	10	0.99	1.6	3.75
* F32T8/ES (25W)	2	25	60/16	0.32	38	0.77	10	0.99	1.6	2.03

Wiring Diagram

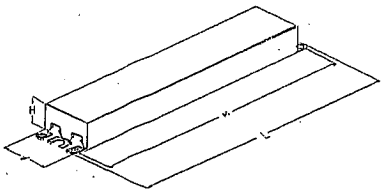


Diag. 64

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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Corporate Offices: Phone: 800-322-2086

ADVANCE™

IOP2P32LWSC@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 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

ADVANCE TRANSFORMER CO.
O'HARE INTERNATIONAL CENTER - 10275 WEST HIGGINS ROAD
ROSEMONT, ILLINOIS 60018
TELEPHONE: (847) 390-5000 FAX: (847) 390-5109

ADVANCE™

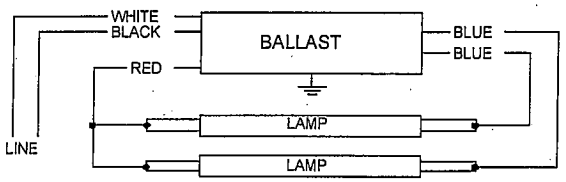
IOP-2P32-SC@120V

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

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

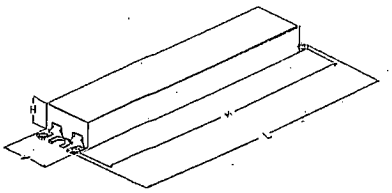


Diag. 64

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

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

IOP-2P32-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

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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

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.

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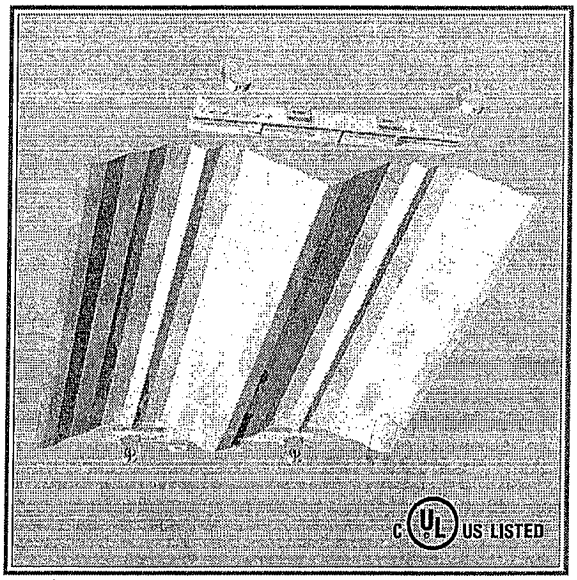
ENERGY PLANNING ASSOCIATES

RTR TROFFER RELECTOR 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.

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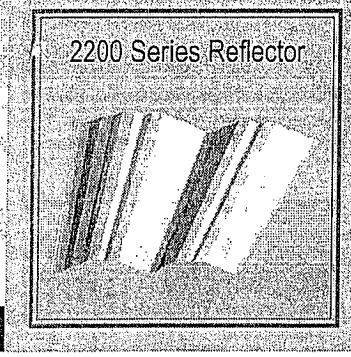
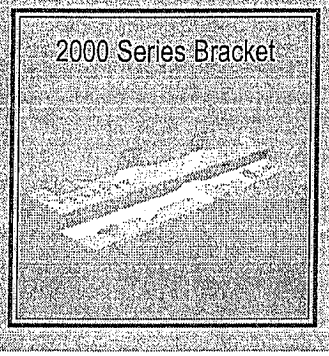
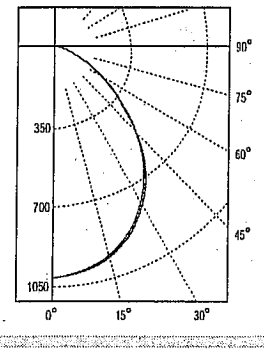
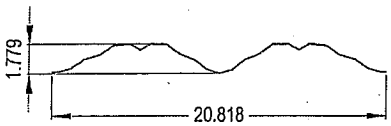


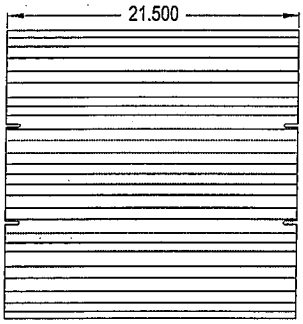




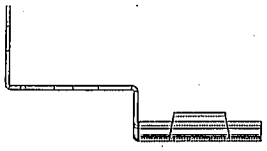
Side View



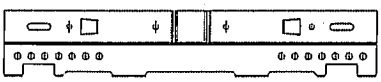
Top View



Side View



Top View



0° — 45° — 90° Candela Plot
2 Lamp T8

Zonal Lumen Summary

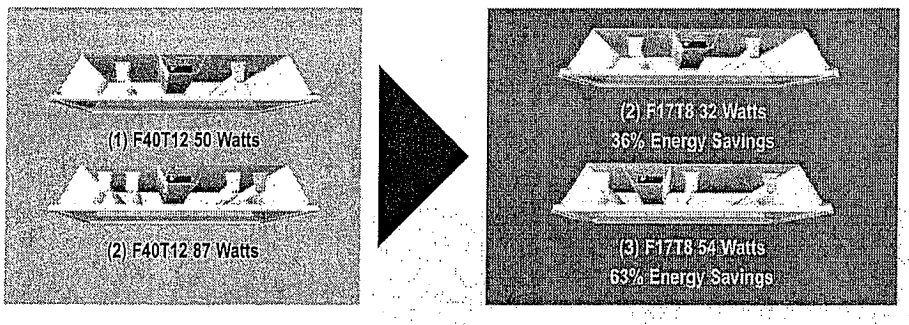
Zone	Lumens	% Lamp	Fixture
0-30	759	27.1	35.7
0-40	11952	42.7	56.2
0-60	1850	66.1	87.1
0-90	2125	75.9	100.0

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

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

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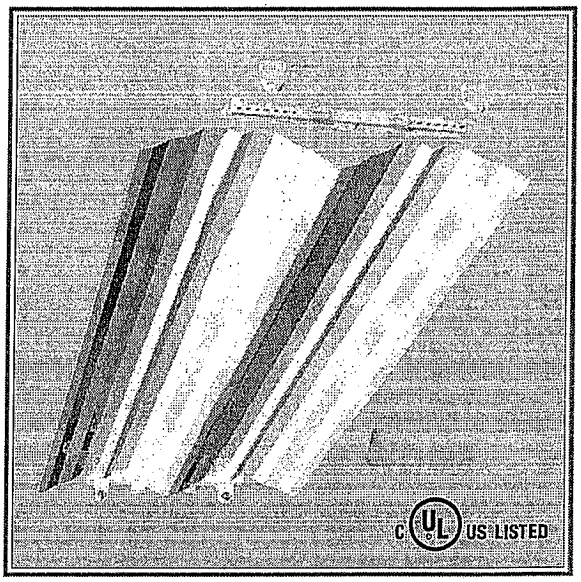
ENERGY PLANNING ASSOCIATES

RTR TROFFER RELECTOR KIT

2x4 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 2x4 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 2x4 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
- Slots, instead of holes, provided for easy end to end bracket to bracket centering
- 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
- 9-3/4" lamp spacing enhances appearance of 18-cell parabolic retrofits

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.

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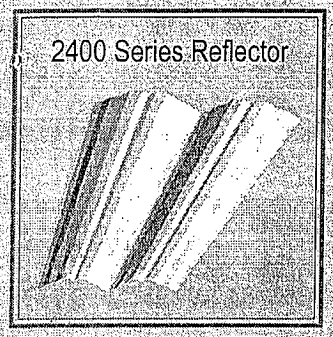
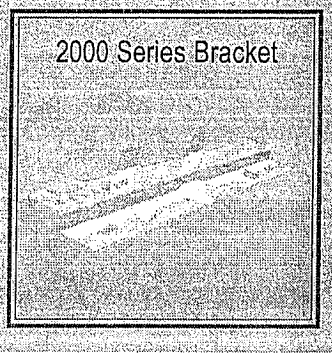
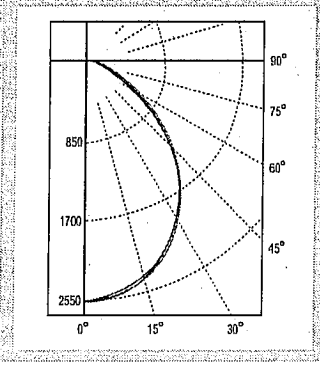
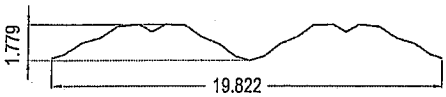


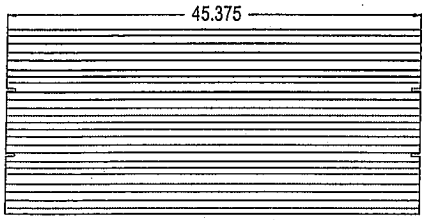




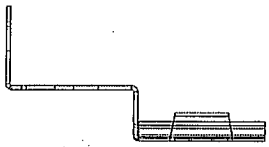
Side View



Top View



Side View



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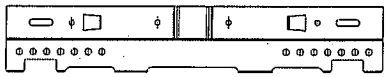


0° — 45° — 90° Candela Plot
2 Lamp T8

Zonal Lumen Summary

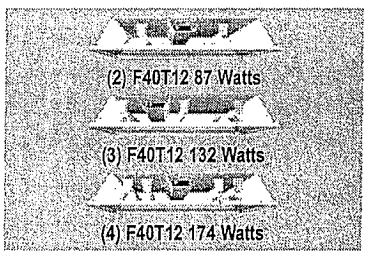
Zone	Lumens	% Lamp	Fixture
0-30	1895	31.1	35.3
0-40	2987	49.0	55.7
0-60	4630	75.9	86.3
0-90	5364	87.9	100.0

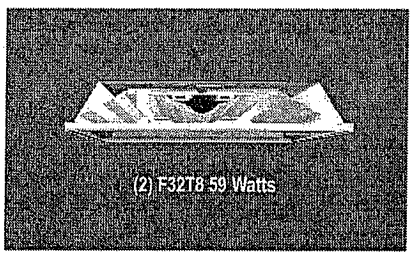
RTR2402T832ENLSS used for test
Total Luminaire Optical Efficiency = **87.9%**

Luminaire Spacing Criterion
0 deg - 1.2 90 deg - 1.1
Call factory for full photometric report

2x4 Kit includes

- **(1 qty)** 2400 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





"SAVINGS"
32% Energy Savings
55%Energy Savings
66%Energy Savings

Ordering Information
Sample number: **RTR2402T832ENLSS**

TYPE	DIMENSION	LAMPS	LAMP TYPE	REFLECTOR
O RTR=Troffer Reflector Kit	O 24=2x4	O 02=2 Lamp	O T832=32W	O EN=95% MIRO 4 Enhanced
		O 03=3 Lamp	O T554=54W	O MN=93% Micro Matte
		O 04=4 Lamp		O WN=91% White Aluminum
				O AN=87% Anodized Aluminum

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

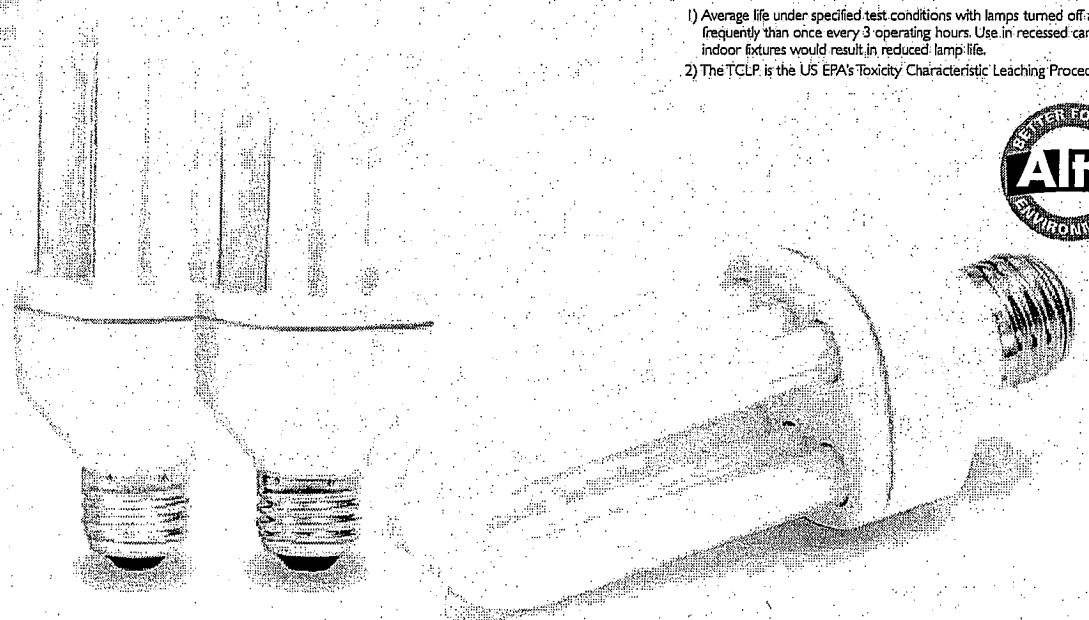
Philips Marathon® Energy Saver Universal Family

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[1]! The longest lasting Marathon® Compact Fluorescent
  –The 14W Universal has 12,000 hours rated average life[1]
- **Energy Savings**
  Saves up to 75% in electricity costs compared to standard incandescent lamps
- **Featuring ALTO® Lamp Technology**
  Low mercury and TCLP[2]-compliant

1) 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.
2) The TCLP is the US EPA's Toxicity Characteristic Leaching Procedure.



PHILIPS

Philips Lighting Company
200 Franklin Square Drive
P.O. Box 6800
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1-800-555-0050
A Division of Philips Electronics North America Corporation

Printed in USA 6/05 P-3754-C

www.philips.com

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

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[1]	MOL (In.)	Rated Avg. Life (Hrs.)[2]	Lamp Current (mAmps)	Power Factor	Min. Starting Temp.[3]	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
Box	13077-3	Universal SLS 20 ALTO	120	20	75A19	Med	2700	82	1200	5.6	15,000	285	.50-.60	-22F/-30C	60F/140F
Box	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 (W x D x H) (In.)	Case Dimensions (W x D x H) (In.)	Pallet Dimensions (W x D x H) (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
Box	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
Box	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.

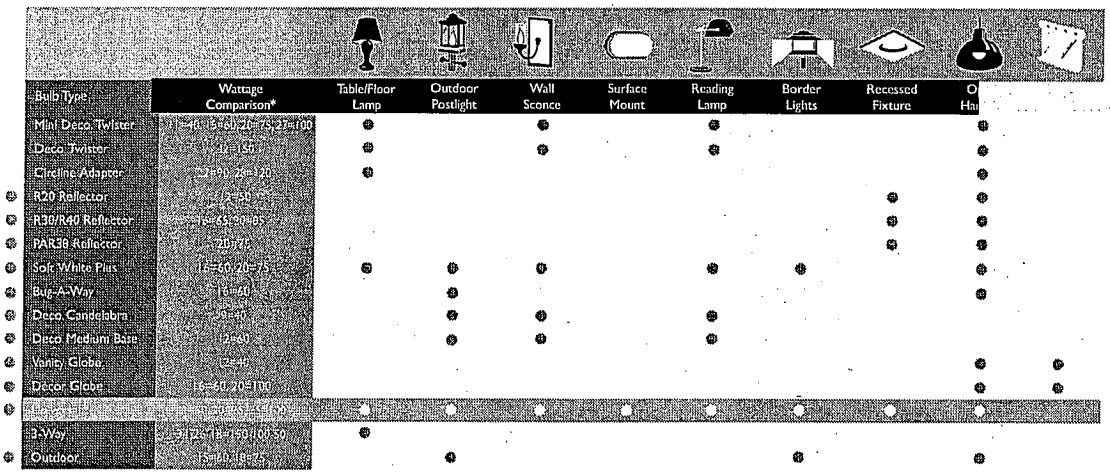
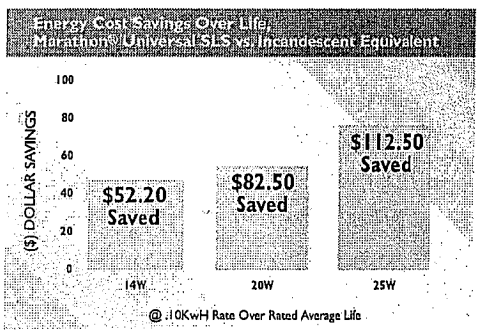


*Chart comparison shows Marathon wattages and their equivalent to standard incandescent bulb wattages(s).
® This product utilizes ALTO® Lamp Technology.



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"

A

CAUTION: Risk of electric shock—do not use where directly exposed to water, rain or snow. Do not use with dimmers.

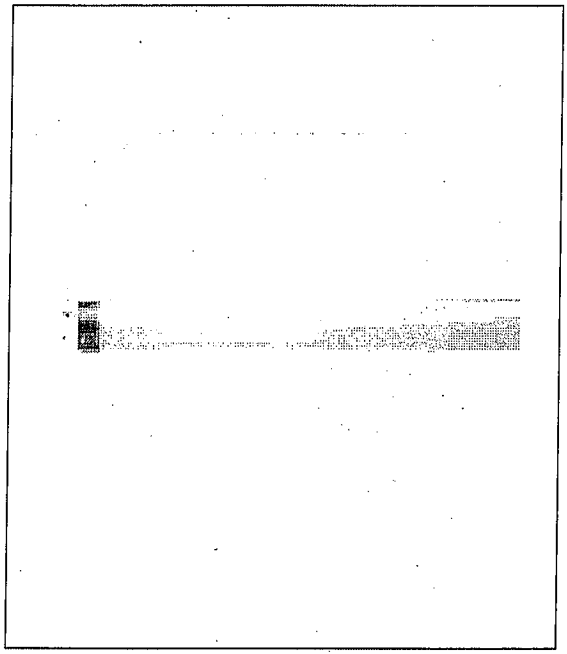
Before using this product with electronic timing or photocell devices, check to determine whether device is compatible with electronic compact fluorescent lamps. Use with incompatible devices will cause premature lamp failure.

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.

B

**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.

6/8/2007



F17T8 ADV841 ALTO

Product family description
High performance, long life, environmentally-responsible lamps.

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 withouth burn-in.

Applications

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

Notes

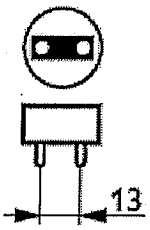
- Rated average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. Lamp life is appreciably longer if lamps are started less frequently. (202)
- Average life under engineering data with lamps turned off and restarted once every 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

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

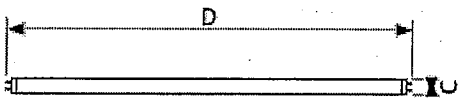
PHILIPS

F-T8-Adv Med Bipin/GB

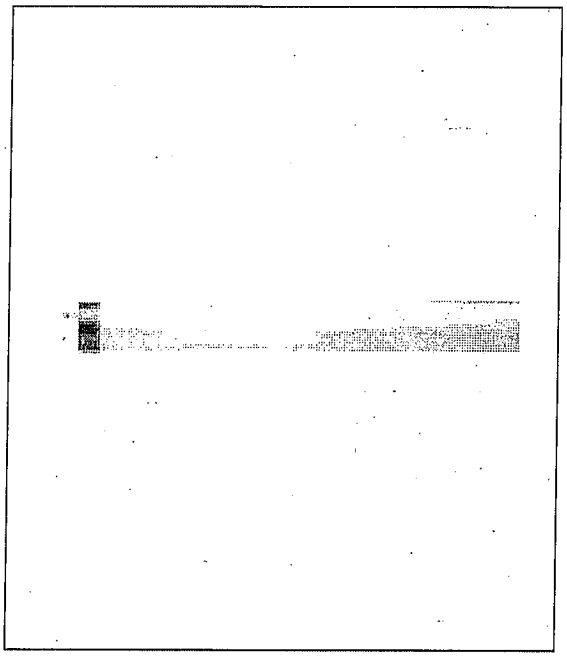


Base Medium Bi-Pin

Energy Saving Product Energy Saving



F-T8-Adv Med Bipin



F32T8 ADV841 ALTO

Product family description
High performance, extra low mercury

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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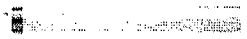
- Design lumens rated at 3 hours per start on Instant Start ballast. (239)
- Exclusive to Philips Lighting Company.

Product data	
Product Number	139899
Full product name	F32T8 ADV841 ALTO

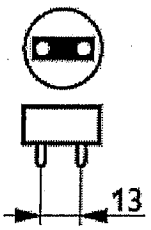
PHILIPS

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

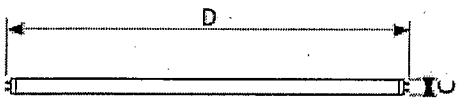


F-T8-Adv Med Bipin/GB



Base Medium Bi-Pin

Energy Saving Energy Saving



F-T8-Adv Med Bipin

Category: ECS
Energy Conservation Series

Prefix:
MPW

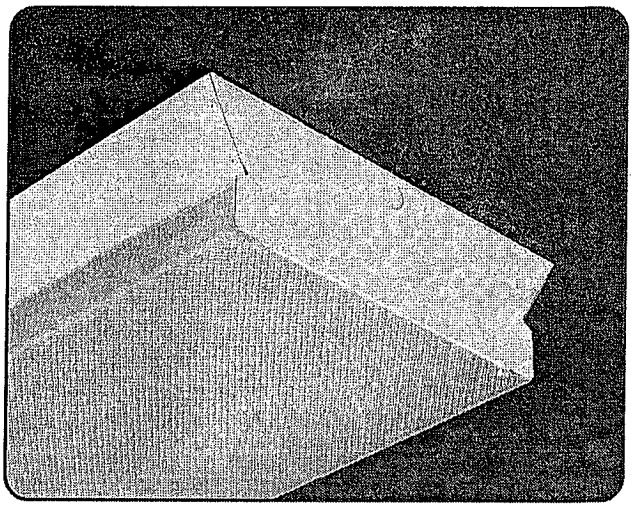
Fixture Series (Name):
Medium Profile Wrap

RENOVA™
nnovat 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 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.

LAMPHOLDERS
- 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.

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

Category: ECS
Energy Conservation Series

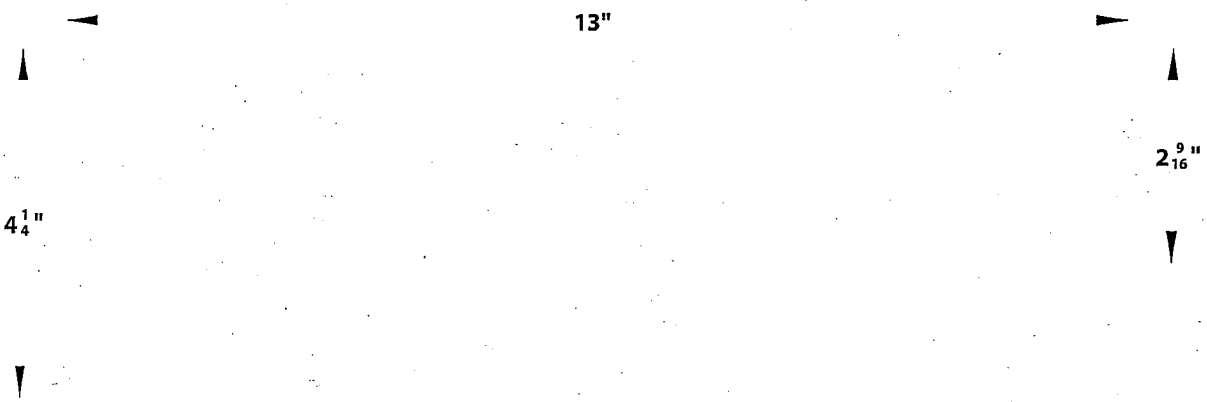
Prefix:
MPW

Fixture Series (Name):
Medium Profile Wrap

Universal Lighting Technologies | GE Lighting North America | ADVANCE | PHILIPS sense and simplicity | SYLVANIA | alanod | VS VOSSLOH SCHWABE

RENOVA™
nnovat 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
ECS -	MPW -	4 -	M	N	- 2	32	- UNV	- 1	2	N	-

CATEGORY: ECS - Energy Conservation Series

SERIES: MPW - MEDIUM PROFILE WRAP

SIZE: 2 - 24" | 3 - 36" | 4 - 48" | 6 - 72" | 8 - 96"

REFLECTOR MATERIAL: 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)

REFLECTOR PHOTOMETRY: F - FOCUSED | N - NORMAL | S - SPREAD | C - CUSTOM OPTICS

*N - NORMAL IS STANDARD *(BLANK)=N

*C - CUSTOM OPTICS ARE DESCRIBED IN OPTIONS BOX

NUMBER OF LAMPS:
2' - 4' HSG: 1 - 1L | 2 - 2L | 3 - 3L
6' & 8' HSG: 2 - 2L | 4 - 4L | 6 - 6L

LAMP TYPE (WATTAGE):
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

BALLAST VOLTAGE: 120 - 120v, 60 Hz | 277 - 277v, 60 Hz | 347 - 347v, 60 Hz | UNV - 120v - 277v, 60 Hz | 480 - 480v, 60 Hz | xxx - Less Ballast

NUMBER OF BALLASTS: S - SLAVE | (BLANK) - 1 | 2 - 2 | 3 - 3 | 4 - 4

LAMPS PER BALLAST: (BLANK) - 0 | 1 - 1 | 2 - 2 | 3 - 3 | 4 - 4
*Use Suffix "M" for Master (Example: 4M)

BALLAST FACTOR: L - Low | N - Normal | H - High

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

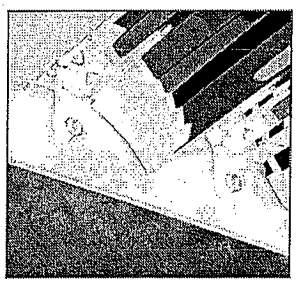
ES SUSTAINING MEMBER

MADE IN THE USA

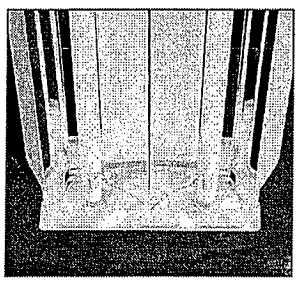
c UL us LISTED

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

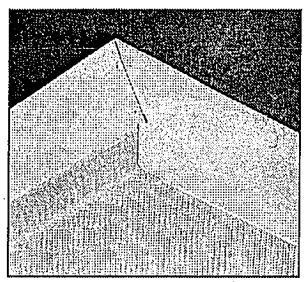
Veteran OWNED AND OPERATED



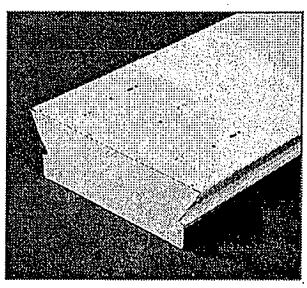
Vossloh Locking Lampholders
(Standard)



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

Category: ECS
Energy Conservation Series

Prefix:
NPW

Fixture Series (Name):
Narrow Profile Wrap

RENOVA™
nnovat ve L ght ng deas
Energy Eff c ent So ut ons

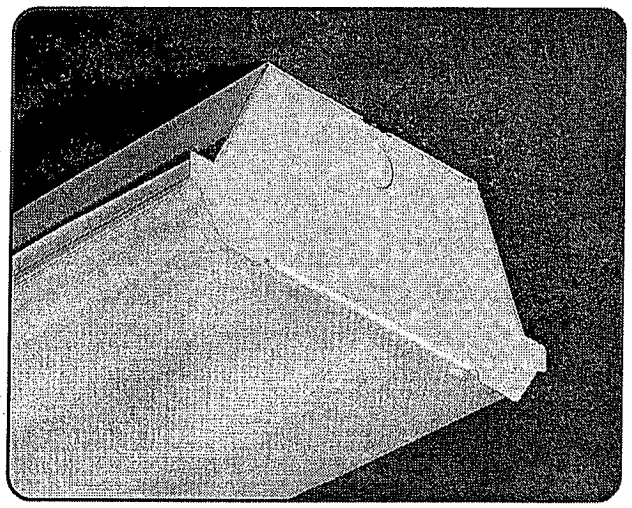
Narrow Profile Wrap Series general purpose fluorescent luminaire

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.

LAMPHOLDERS
- 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.

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

Category: ECS
Energy Conservation Series

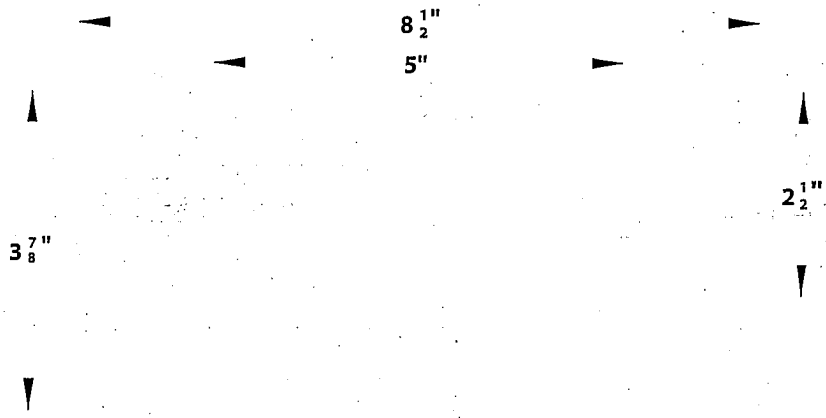
Prefix:
NPW

Fixture Series (Name):
Narrow Profile Wrap

Universal Lighting Technologies | GE Lighting North America | ADVANCE | PHILIPS sense and simplicity | SYLVANIA | alanod | VS VOSSLOH SCHWABE

RENOVA™
nnovat ve L ght ng deas
Energy Eff c ent So ut ons

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
ECS	- NPW	4	- M	N	- 2	32	- UNV	- 1	2	N	-

CATEGORY
Energy Conservation Series

SERIES
NPW - NARROW PROFILE WRAP

SIZE
2 - 24"
3 - 36"
4 - 48"
6 - 72"
8 - 96"

REFLECTOR MATERIAL
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)

REFLECTOR PHOTOMETRY
F - FOCUSED
N - NORMAL
S - SPREAD
C - CUSTOM OPTICS
*N - NORMAL IS STANDARD *(BLANK)=N
*C - CUSTOM OPTICS ARE DESCRIBED IN OPTIONS BOX

NUMBER OF LAMPS
2' - 4' HSG: 1 - 1L, 2 - 2L, 3 - 3L
6' & 8' HSG: 2 - 2L, 4 - 4L, 6 - 6L

LAMP TYPE (WATTAGE)
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

BALLAST VOLTAGE
120 - 120v, 60 Hz
277 - 277v, 60 Hz
347 - 347v, 60 Hz
UNV - 120v - 277v, 60 Hz
480 - 480v, 60 Hz
xxx - Less Ballast

NUMBER OF BALLASTS
S - SLAVE
(BLANK) - 1
2 - 2
3 - 3
4 - 4

LAMPS PER BALLAST
(BLANK) - 0
1 - 1
2 - 2
3 - 3
4 - 4
*Use Suffix "M" for Master (Example: 4M)

BALLAST FACTOR
L - Low
N - Normal
H - High

OPTIONS

IES SUSTAINING MEMBER

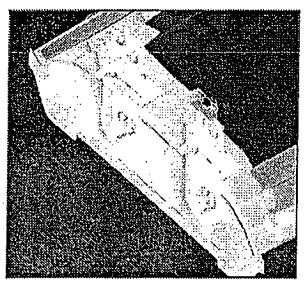
MADE IN THE USA

c UL us LISTED

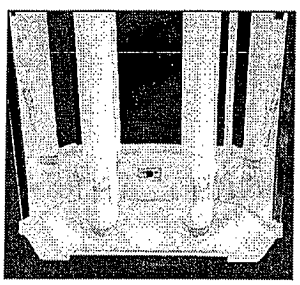
Photometric data, IES files and all other information is available upon request.

Veteran
OWNED AND OPERATED

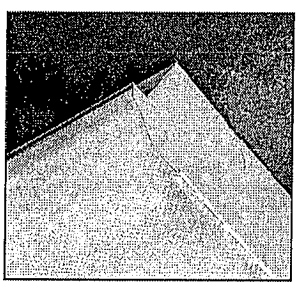
*ADDITIONAL OPTIONS
(See "Options" sheet for all available options)



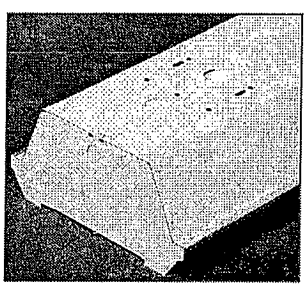
Vossloh Locking Lampholders (Standard)



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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VendingMISER

Reduce energy costs

The Miser family is a line of occupancy-based energy control products. The VendingMiser® patented technology represents a breakthrough in the power control of cold beverage vending machines. It reduces energy consumption by an average of 46% and decreases per machine maintenance by $40-$80 per year. All while maintaining the temperature of the vended product. VendingMiser® typically has a short average payback of between one and two years.*

How the VendingMiser reduces energy consumption

Utilizing a Passive Infrared (PIR) Sensor, VendingMiser® powers down a vending machine when the area surrounding it is vacant. VendingMiser® also monitors the room's temperature, and automatically re-powers the vending machine at one to three hour intervals, independent of occupancy, to ensure that the vended product stays cold.

VendingMiser's® electrical current sensor will never power down a vending machine while the compressor is running, eliminating compressor short cycling. In addition, when the vending machine is powered up, the cooling cycle is allowed to run to completion before again powering down. For a series of up to 4 machines, VendingMiser® can utilize its unique embedded Sensor Repeater, which allows it to be controlled from the PIR sensor of any other Miser in the bank.

Beyond cold drink vending

Other cooled product vending machines, such as refrigerated candy machines, can also be controlled by VendingMiser®. Non-cooled product machines can be controlled to reduce energy costs by our companion product, SnackMiser™. VendingMiser® is made in the USA.

VENDINGMISERS® BENEFIT THE ENVIRONMENT AND REDUCE ENERGY COSTS

One VendingMiser® reduces greenhouse gas emissions by 2200 lbs. of CO_2 and 3600 grams of NOx each year.**

The average annual energy costs for a cold drink vending machine is $300 per year. With the VendingMiser® you can save an average of $150 per year, per machine.***

* Based on electric rate and occupancy.

** Based on occupancy and the Energy Information Administration's national average of greenhouse gas emissions and electricity generation.

*** Based on our current customers.

For more information about the VendingMiser® by USA Technologies
800-770-8539 • www.usatech.com

Frequently Asked Questions

Will VendingMiser® keep my drinks cold?
Absolutely - VendingMiser® has been tested and accepted for use by both major bottlers.

Is the VendingMiser® easy to install?
Yes! VendingMiser® is a simple external plug-and-play product. The VendingMiser® can be installed on the wall with simple hand tools or it can be attached to the vending machine without tools using the new Easy-Install system. The Easy-Install System allows quick installation in 5 minutes.

Is VendingMiser® safe for all machines?
Yes! VendingMiser® is compatible with all types of cold drink vending machines. In fact, by reducing run time of the machines, VendingMiser® reduces maintenance costs.

Has VendingMiser® been field tested?
Tens of thousands of VendingMisers® are operational in the field. Typical energy savings have been independently documented to be between 35% and 45%. Measurement and verification test results as well as testimonials are available on the website.

Are there any locations not appropriate for VendingMiser®?
VendingMiser's® savings are generated as a result of location vacancy. Therefore, a machine in a location that is occupied 24-hours, 7 days a week will likely generate little savings.

Technical Specifications

ELECTRICAL SPECIFICATIONS

Input Voltage:	115 Volts (230 Volts available)
Input Frequency:	50/60 Hz
Maximum Load:	12 Amps (Steady-State)
Power Consumption:	Less than 1 Watt (Standby)

ENVIRONMENTAL SPECIFICATIONS

Operating Temp:	-15°C to 75°C
Storage Temp:	-40°C to 85°C
Relative Humidity:	95% Maximum (Non-Condensing)

COMPATIBILITY

Vending Machines:	Any machine, except those containing perishable goods such as dairy products.

INACTIVITY TIMEOUTS

Occupancy Timeout:	15 minutes
Auto Repower:	One to three hours, dynamically adjusted, based on ambient temperature

DIMENSIONS

Size:	4.5"W x 1.75"H x 3.25"D
Weight:	2.2 lb. (incl. power cable)

REGULATORY APPROVALS

Safety:	UL/C-UL Listed Information Technology Equipment (ITE) 9T79

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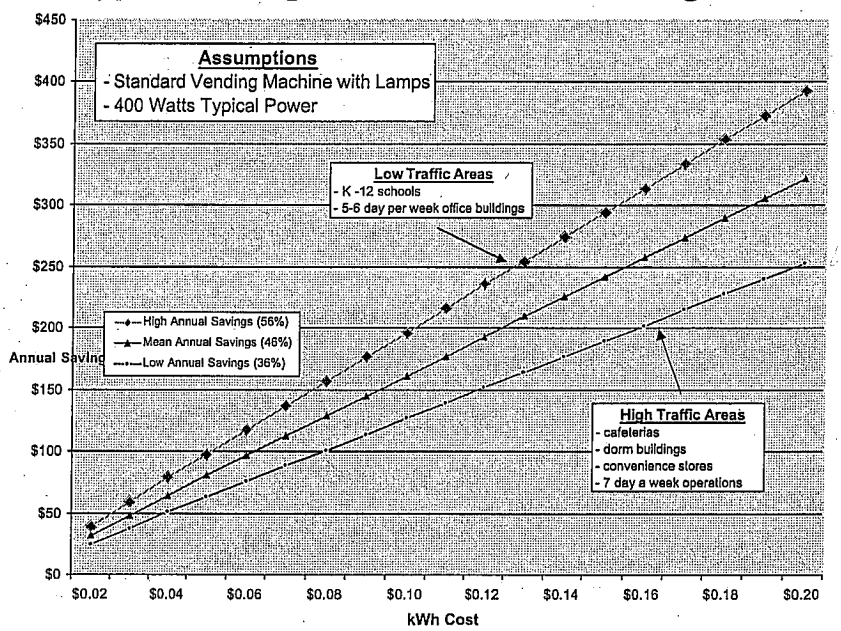
Typical Saving Generated with VendingMiser®



VendingMiser® Products

VM150	VendingMiser® with PIR Sensor
VM151	VendingMiser® only
VM160	Weatherproof VendingMiser® with PIR Sensor
VM161	Weatherproof VendingMiser® only
VM170	Easy-Install VendingMiser® with PIR Sensor
VM171	Easy-Install VendingMiser® only
VM180	Weatherproof Easy-Install VendingMiser w/PIR sensor
VM181	Weatherproof Easy-Install VendingMiser only

For more information about the VendingMiser® by USA Technologies
800-770-8539 • www.usatech.com

sensorswitch

WALL SWITCH DECORATOR SENSOR - DUAL TECHNOLOGY (PDT), LINE VOLTAGE

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

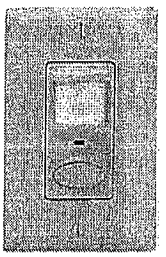
- Size: 4.2" H x 1.8" W x 1.5" D (10.67cm x 4.57cm x 3.81cm)
- Sensor Weight: 5 Ounces
- Colors: Ivory, White, Gray, Almond
- Mounting Height: 30 to 48 inches
- Relative Humidity: 20 to 90% non-condensing
- Operating Temp: 14° to 85° F (-10° to 29° C)
- Storage Temp: -14° to 160° F (-26° to 71° C)
- 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

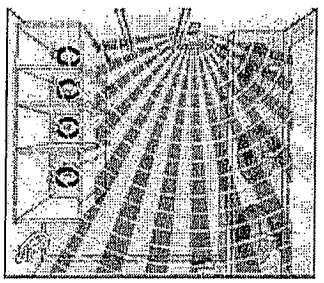
Programmable Edition!



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.

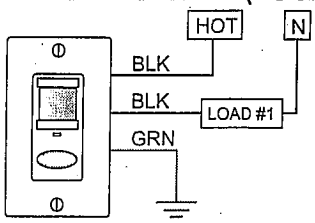
Model Numbering System: WSD-PDT-[LENS]-[PHOTOCELL]-[VOLTAGE]-[COLOR*]-[TEMP/HUMIDITY]

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

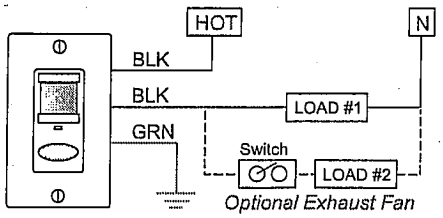
**347 VAC: Plate not provided

*Must specify color

TYPICAL WIRING DIAGRAM (DO NOT WIRE HOT)



Note: Connection to Ground required for sensor to function!

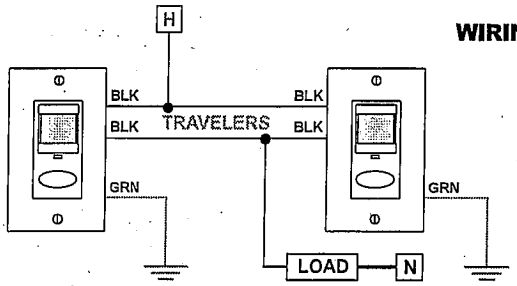


Note: Black wires are replaced with Red wires for 347 VAC.

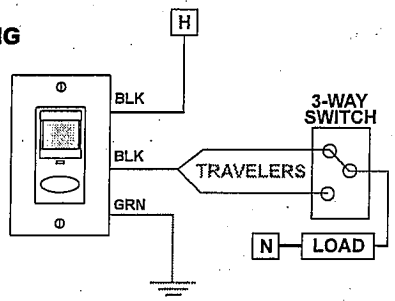
WIRING TO A LIGHT AND A FAN

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.



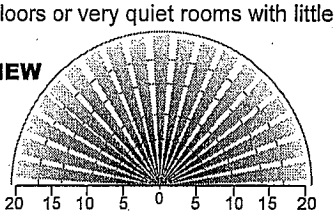
PHOTOCELL DAYLIGHT OVERRIDE OPTION (WSD-PDT-P)

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.

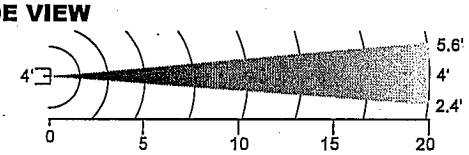
AREA OF COVERAGE

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 Resisitant* 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 : Pauissance 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).

sensorswitch
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