Installation Manual for Energy Focus
Models LEDRFK-DW-VFL-SM, LEDRFK-DW-VFL-MD and LEDWP-656VFL-RFK
US Patent #7182484 B2

Important Product Statement:

This LED retrofit kit is designed to replace or upgrade the original light source and electronics to drive said light source for many different existing fixture types including, but not limited to, wall packs, shoebox style, canopy and more similar to those shown in the drawings at the end of this instruction packet, where the volume is greater than or equal to 467 in^3. It is the responsibility of the installer to verify proper application and maintain the original manufacturer's wet location / IP rating for the enclosure or fixture. This kit may not be used if it requires extensive modification to the enclosure that includes drilling through the exterior and/or exposing a pathway for outdoor elements to enter the fixture.

WARNING – Risk of fire or electric shock. Install this kit only in the luminaries that have the construction features and dimensions similar to those shown in the photographs and/or drawings found in figure 6 where the input rating of the retrofit kit does not exceed the input rating of the luminaire.

WARNING – Risk of fire or electric shock. Luminaire wiring and electrical parts may be damaged when drilling for installation of LED retrofit kit. Check for enclosed wiring and components.

WARNING – Risk of fire or electric shock. Reflector kit installation requires knowledge of lighting luminary electrical systems. If not qualified, do not attempt installation. Contact a qualified electrician.

WARNING – To prevent wiring damage or abrasion, do not expose wiring to edges of sheet metal or other sharp objects.

WARNING – To prevent damage, clean LED lens cover with a soft cloth. Do not touch LED lens cover with bare hands (see Figure 13 on page 10). Failure to heed this warning will invalidate the warranty.

Only those open holes indicated in the photographs and/or drawings may be made or altered as a result of kit installation. Do not leave any other open holes in an enclosure of wiring or electrical components. Do not make or alter any open holes in an enclosure of wiring or electrical components during kit installation.

Model	**LEDRFK-DW-VFL-SM**	**LEDRFK-DW-VFL-MD**	**LEDWP-656VFL-RFK**
Input Voltage	120-277 VAC	120-277 VAC	120-277 VAC
Input Current	0.208A	0.417A	0.25A
Input Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Nominal LED Array Voltage	30 VDC	24 VDC	16 VDC
Total Power Consumption	25W	50W	30W

Helpful tools to have on hand:

Offset #2 Phillips head driver (new sharp tip)
Short #2 Phillips head screw driver (new sharp tip)
Heavy Duty Tin Snips

Parts List:

Qty.	Description
1	LED Light Engine w/ heat sink and circulation fan w/ polarized connector. (Illustration 1)

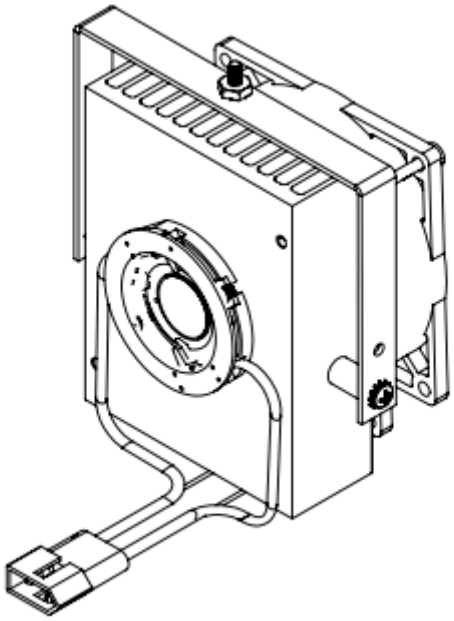
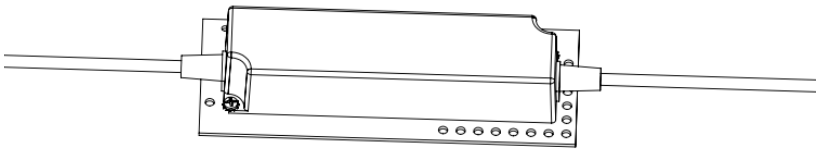
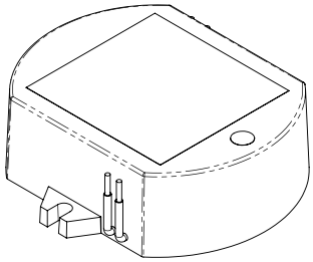


Illustration 1

1 Isolated Class 2, AC-to-DC power supply (Driver) w/ polarized connector and mounting plate or alternate driver. (Illustration 2)



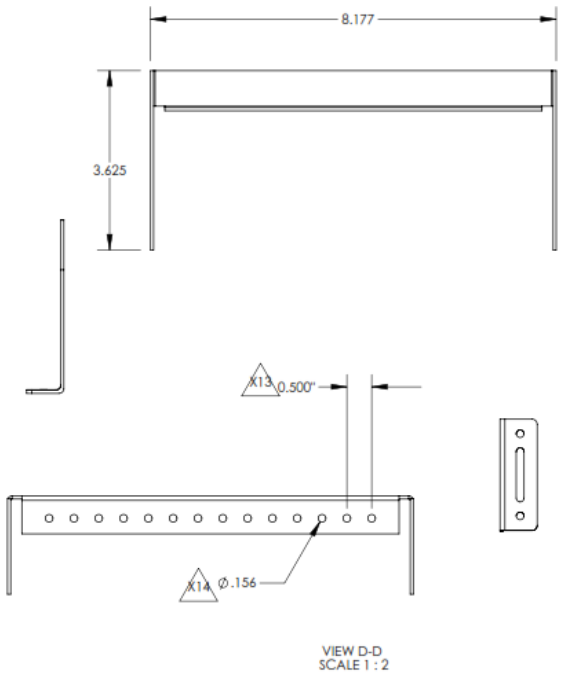
Driver with mounting plate



Alternate driver

Illustration 2

1 Bracket kit (consists of two brackets). (Illustration 3)



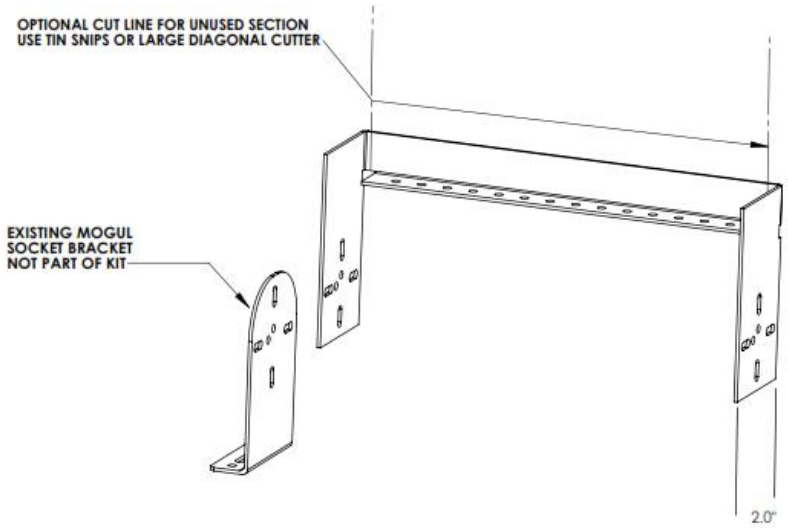


Illustration 3

1 Hardware pack consisting of:
(3) wire connectors
(2) 6-32 x 1/2" screws
(2) 6-32 nuts
(4) star type lock washers (2 smaller, 2 larger sized)
(2) 8-32 x 5/8" self-tapping screws (for mounting driver)

The following are instructions to install an LED retrofit kit in two of the many Wall Pack housings that are available. The procedure required for other Wall Packs may differ from what is described here.

Installation Steps for Wall Pack with a Socket Bracket:

1) Make certain power is OFF before starting the installation process. Failure to do this may lead to electrical shock and injury.

2) Confirm that this LED retrofit product is appropriate for the application and will not disrupt the fixture's original wet / IP rating.

3) Start the conversion process by removing all electrical components inside the fixture (including the lamp socket, which is typically ceramic and removed by 2 short screws), *except the bracket the socket was connected to; it will need to remain.* Be sure to keep as much of the hot and neutral supply line wires accessible as possible because the LED retrofit product will need to be connected to them. The grounding line to the enclosure needs to be maintained, not removed. Figures 1-5

When removing the socket base make sure all lead wires to the socket base have been removed.

4) Reflectors may or may not need to be removed if they do not interfere with the LED light engine or closing and sealing of the fixture. Figures 1-2

5) Due to the issue of unknown hole and interior configurations, a mounting plate may need to be attached to the driver (Illustration 2 on page 2). Most enclosures have blind hole sockets and/or threaded stand-off locations as well as recently vacated screw sockets for interior component mounting. Choose a location at the back (building wall side) of the enclosure as low as practical to mount the power supply (driver). Use the self-threading 8-32 screws and lock washers to mount into open hole socket(s). Using both screws (one at each end of the driver or mounting plate) is preferable but mounting with only one screw is acceptable. The screw(s) must be securely mounted to the interior of the enclosure without penetrating any exterior walls. Figure 6. (There are multiple driver configurations; Figure 6 shows one example. All drivers are mounted in the same fashion.)

6) Use the supplied wire connectors to connect the input of the power supply to the source line voltage wires. The black wire of the power supply connects to the line or hot wire. The white wire of the power supply connects to the neutral wire of the source line. (Illustration 4)

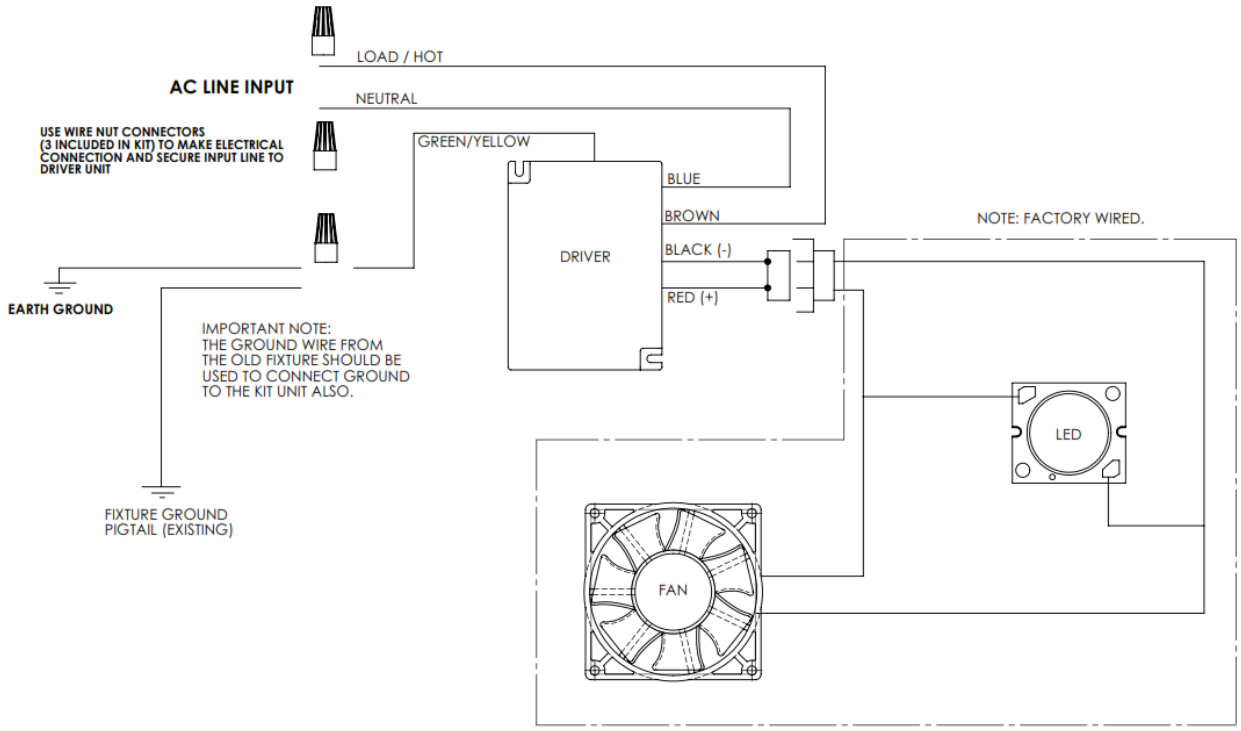


Illustration 4

7) The LED light engine bracket is designed to fit in many different configurations from either left or right sides and in rotation by 90 degree in most cases. Based on the location of the original lamp socket and proximity of the fixture lens, mount the bracket in the appropriate position for that fixture (experimentation may be necessary to find the best position). Use the two supplied 6-32 x 0.5" machine screws, lock washers, and nuts to securely mount the light engine bracket to the original lamp socket bracket. Figure 7

8) Choose a yoke mounting hole on the main bracket that is the most centered within the fixture. If it is necessary to mount the LED light engine near the end of the bracket (Figure 8), the unused end of the main bracket at the dashed line may be removed with a pair of heavy duty tin snips. (Illustration 5) Use the remaining 6-32 x 0.5" screw, locking washers, and nut to securely mount the LED light engine yoke to the main bracket.

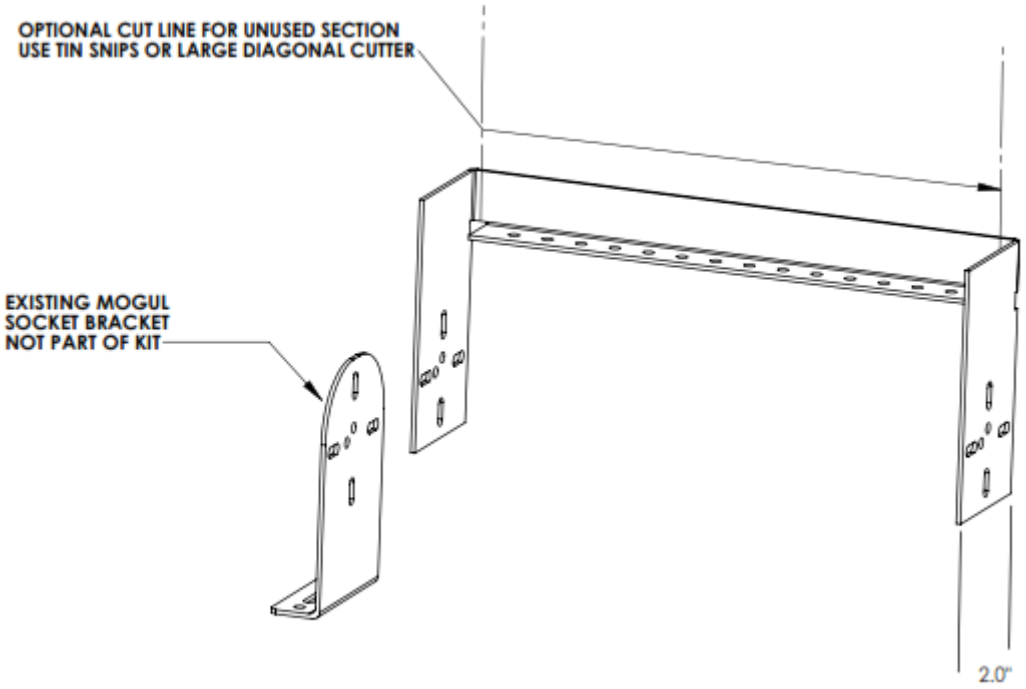


Illustration 5

9) Align/aim the tilt of the LED light engine to the desired angle and tighten the yoke screws on it. Ensure that all brackets and screws are firm – take care to not over tighten. Figure 8

10) Connect the LED light engine to the power supply via the polarized, 2-pin connector. Close and seal the fixture, re-apply power to the circuit and test for function and aim. Aiming adjustments may give different lighting results; test for best output per application. Figure 8

Figure 1

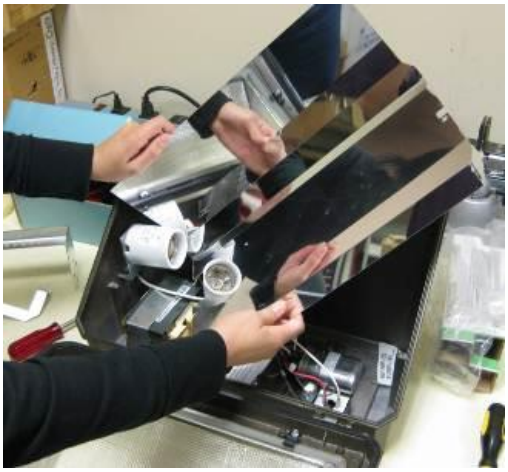


Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

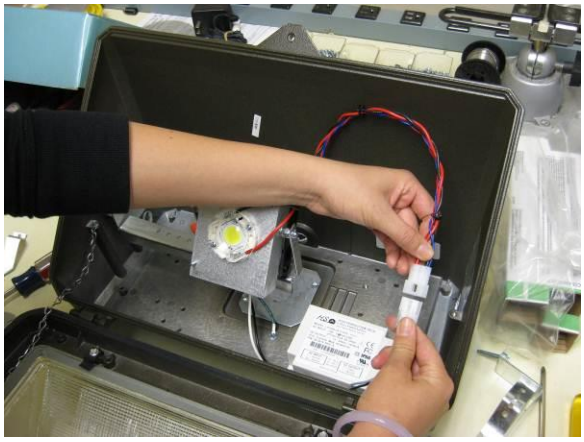


Figure 8

<u>Installation Steps for a Bare Wall Pack Chassis without a Socket Bracket</u>:

1) Make certain power is OFF before starting the installation process. Failure to do this may lead to electrical shock and injury.

2) Confirm that this LED retrofit product is appropriate for the application and will not disrupt the fixture's original wet / IP rating.

3) Remove the metal plate and screws from the housing; do not throw them away. The metal plate will be reattached with the same screws. <u>Figures 9 & 10</u>

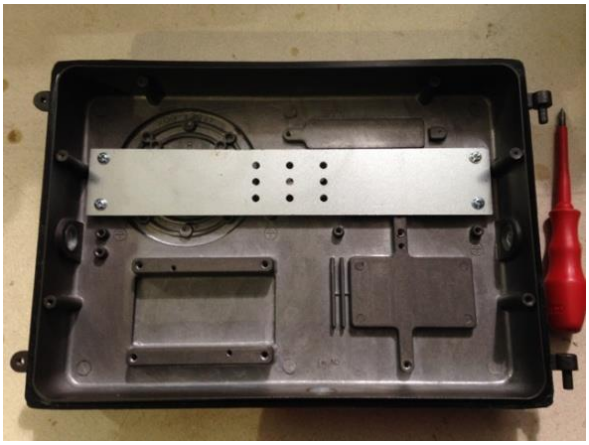


Figure 9

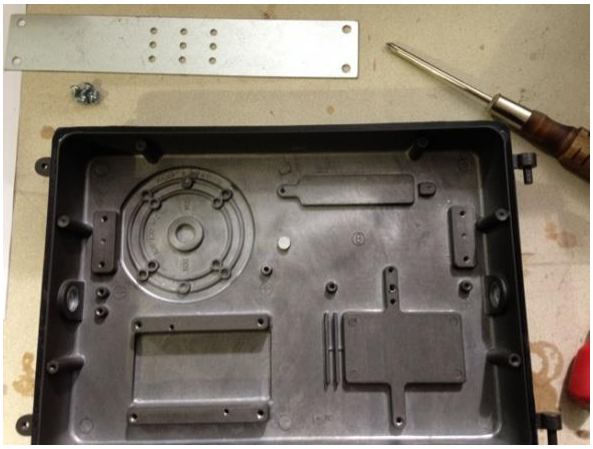


Figure 10

4) Using two of the 6-32 x ½" screws, attach the power supply to the bottom left side of the housing. NOTE: The power supply may need to be placed at an angle to make sure the screw holes line up correctly. Figures 11 & 12

Figure 11

Figure 12

5) Attach a 6-32 nut on top of the existing nut on the LED light engine Yoke. Figure 13

WARNING: WIPE LED LENS COVER WITH CLEAN SOFT CLOTH AFTER INSTALLATION.

FAILURE TO DO SO WILL INVALIDATE THE WARRANTY.

Figure 13

6) Place the screw of the LED light engine Yoke through the middle hole in the metal plate that was removed in Step 5. Secure them together with a second 6-32 nut. Figures 14 & 15

Figure 14

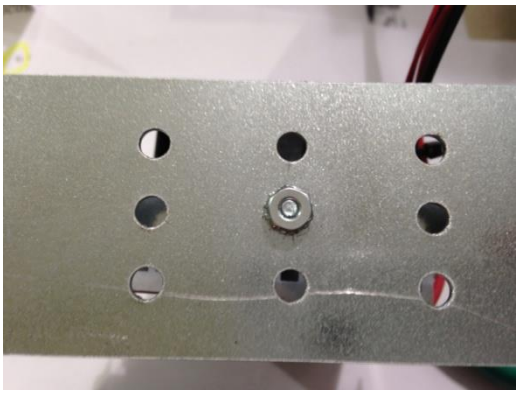


Figure 15

7) Reattach the metal plate, with the LED light engine Yoke assembly attached, to the housing. Be sure the LED is tilted outward toward you. Figure 16

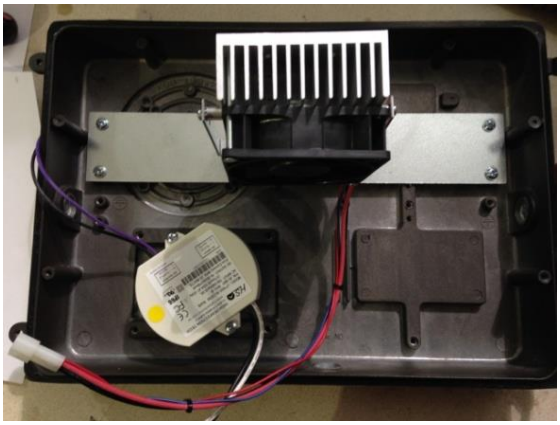


Figure 16


Figure 17

8) Connect the LED light engine to the power supply via the polarized, 2-pin connectors. Figure 17

9) Connect the line voltage wires to the power supply

10) Close and seal the fixture, apply power to the circuit and test for function and aim. Aiming adjustments may give different lighting results; test for best output per application.

Troubleshooting Tips:

1. If the LED fails to light, turn off power at the breaker and check for loose connections at the wire nuts and connector.

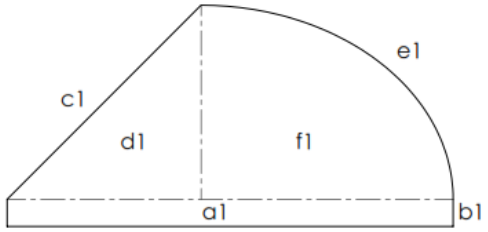
2. If a 'heart beat' like flicker is seen at the LED light source, the circulation fan may be stuck (a loose wire or foreign object may have jammed the fan rotor). Turn off power at the breaker and check for a stuck fan rotor condition. Correct and return to normal service.

3. If any other abnormal conditions are noticed, remove power immediately and call your service company.

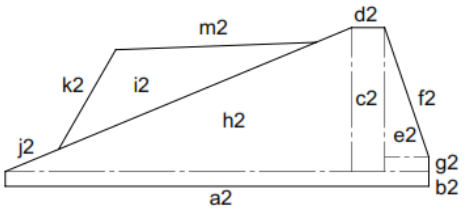
For further information or warranty questions, contact:

Energy Focus, Inc.
32000 Aurora Road, Suite B
Solon, OH 44139
(800) 327-7877
customerservice@efoi.com

Surface Area Values



Fixture 1 diagram



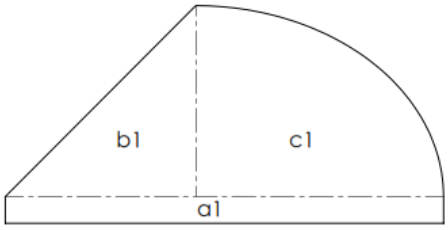
Fixture 2 diagram

Fixture Base	
A1 = 2*1.7*12.5	42.500
A2 = 2*1.7*8.75	29.750
A3 = 12.5*8.75	109.375
A (Base) = A1 + A2 + A3	181.625 sq. in.

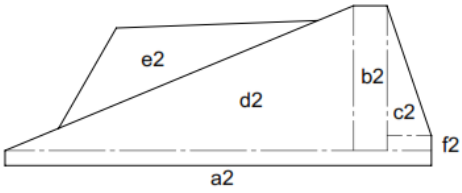
Fixture 1 Top	
A (a1) = 2*1.2*9	21.600
A (b1) = 2*1.2*12.875	30.900
A (c1) = 6.5*12.875	83.688
A (d1) = 2*.5*5.5*3.464	19.052
A (e1) = .5*pi*5.5*12.875	111.232
A (f1) = .5*pi*5.5*5.5	47.517
A (Fixture 1 Top) = 2A(a1) + A(b1) ....+A(f1)	313.989 sq. in.
A (fixture 1) = A (Base) + A (Fixture 1 Top)	495.614 sq. in.

Fixture 2 Top	
A (a2) = 2*.7*9	12.600
A (b2) = 2*.7*12.875	18.025
A (c2) = 2*.4*5	4.000
A (d2) = .4*12.875	5.150
A (e2) = 2*.5*4.31*1.875	8.081
A (f2) = 4.7*12.875	60.513
A (g2) = 2*1.875*.49	1.838
A (h2) = 5*7.18	35.900
A (i2) = 3.84*5.5	21.120
A (j2) = (12.875-11)*8.75	16.406
A (k2) = 3.84*11	42.240
A (m2)= 5.5*11	60.500
A (Fixture 2 Top) = 2A(a2) + A(b2) ....+A(m1)	286.373 sq. in.
A (fixture 2) = A (Base) + A (Fixture 2 Top)	467.998 sq. in.

Volumetric Values



Fixture 1 diagram



Fixture 2 diagram

Fixture Base	
V = 8.75*12.5*1.7	185.938
V1 = 4*.5*.564*2	2.256
V2 = ((3.44*2)+[(4.5-2)*.44])*.3	2.394
V2 = (.41*.53*.2)+(3.6*1*.2)+(.7*.41*.2)	0.821
V (Base) = V - (V1+V2+V3)	180.467 cu. in.

Fixture 1 Top	
V (a1) = 9*12.875*1.2	139.050
V (b1) = .5*5.5*3.464*12.875	122.647
V (c1) = .25*pi*(5.5*5.5)*12.875	305.888
V (Fixture 1 Top) = V(a1)+V(b1)+V(c1)	567.585 cu. in.
V (Fixture 1) = V (Base) + V (Fixture 1 Top)	748.052 cu. in.

Fixture 2 Top	
V (a2) = .7*9*12.875	81.113
V (b2) = .4*(5.7-.7)*12.875	25.750
V (c2) = .5*4.31*1.875*12.875	52.023
V (d2) = .5*5*7.18*12.875	231.106
V (e2) = .5*3.84*5.5*11	116.160
V (f2) = .49*1.875*12.875	11.829
V (Top 2) = V(a2) + V(b2) ....+V(f2)	517.981 cu. in.
V (Fixture 2) = V(Base) + V(Fixture 2 Top)	698.448 cu. in.

Illustration 6