



CANNABIS CONTROL BOARD

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**ENERGY EFFICIENCY GUIDANCE FOR LICENSE
RENEWALS
AUGUST 2023**

**JAMES PEPPER, CHAIR
JULIE HULBURD, COMMISSIONER
KYLE HARRIS, COMMISSIONER**

BRYNN HARE, EXECUTIVE DIRECTOR

What is required of indoor and mixed cultivation licensees upon their first license renewal?

Cultivators must comply with the energy standards and energy usage reporting and reduction efforts set forth in Board Rule 2.5. Upon renewal, indoor or mixed cultivators must have implemented, or be working towards ensuring that equipment used in the cultivation of cannabis meets the specifications of the energy standards. In addition, cultivators must have a process for recording and reporting energy usage and energy reduction efforts.

What are the Energy Standards and how do I know if my equipment is compliant?

Cultivation Lighting:

Lighting for indoor cultivation must have a minimum photosynthetic photon efficacy (PPE) of 1.9 umol/J or greater.

Lighting for greenhouse cultivation must have a minimum PPE of 1.7 umol/J (unless total load under 40kw).

Most modern horticultural Light Emitting Diodes (LED's) will have a PPE of 1.9 umol/J or greater, while typical double-ended HPS fixtures have a PPE of 1.7 umol/J. Cultivators can refer to "spec sheets" associated with lighting equipment to understand if they are compliant.

The DLC Horticultural Lighting Qualified Product Library is a third-party verified repository of technical performance information for LED lighting: <https://qpl.designlights.org/horticulture>.


Cultivators should look at both spec sheets and the Qualified Product Library (QPL) if the light is DLC listed. The DLC offers a more reliable source of PPE data than the manufacturer's spec sheet.

An example of a manufacturer's published spec sheet and the independently verified QPL listing for a lighting fixture may be found on the following pages.


In the manufacturer spec sheet below, the fixture has a PPE of 2.8 umol/J:

MID-FLUX LED SYSTEM

MF060300513146404-D101





Horticulture LED system for indoor and vertical farming



MF060300513146404-D101 Specifications

<p>Performance</p> <p>PPF (µmol/s)..... 1470</p> <p>PPE (µmol/J)..... 2.8</p> <p>SPD (400 - 499nm)..... 23%</p> <p>SPD (500 - 599nm)..... 28%</p> <p>SPD (600 - 699nm)..... 49%</p> <p>PPF Maintenance (Q90)..... >36,000 hours</p> <p>Environmental</p> <p>Ingress protection..... IP66</p> <p>Suitable locations..... Wet</p> <p>Max ambient temperature..... 40° C</p>	<p>Electrical</p> <p>Power (WAC)..... 520</p> <p>Input voltage (V)..... 277V</p> <p>Driver lifetime..... 100,000 hours</p> <p>Driver power factor (PF)..... >.95</p> <p>Driver THDi..... <15%</p> <p>Dimming method..... 0-10V</p> <p>Misc.</p> <p>LED Module*.... (6) MF0103005000000-XXXX</p> <p>Manufacturer's warranty..... 5 years</p> <p>Tolerance..... ±5%</p> <p>Dimensions..... 1153mm x 19mm x 595mm</p> <p>Certification*..... UL 8800/DLC Hort QPL</p>
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*The D101 Flower LED System is based on the MF0103005000000-XXXX LED Module which is listed on the DLC Hort QPL under Special Considerations for DC-Powered Fixtures. The D101 Flower LED System uses six (6) Modules powered at 75% of tested input wattage.

The same fixture's DLC QPL record validates the 2.8 $\mu\text{mol}/\text{J}$ PPE from the spec sheet on the preceding page:



DesignLights Consortium



Model Number	MF01030050000000-XXXX
Product Name	MF Module
Product ID	H-FVWH95
QPL	Horticultural
Manufacturer	Libra Design
Brand Name	Libra Design
DLC Family Code	EAEGDZ
Listing Status	Listed
Date Qualified	2023-01-30

PRODUCT INFORMATION VIEW DETAILS

Qualified Product List	Horticultural
Product ID	H-FVWH95
Manufacturer	Libra Design
Brand	Libra Design
Product Name	MF Module
Model Number	MF01030050000000-XXXX
Technical Requirements Version	2.1
DLC Family Code	EAEGDZ
Parent	Yes
Input Power Type	DC
Actively Cooling Presence	No
Fixture Maximum Ambient Temp	40 °C

PRODUCT CATEGORIZATION VIEW DETAILS

Category	Horticultural Lighting Fixture
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PRODUCT CAPABILITIES VIEW DETAILS

Fan Presence	No
Spectrally Tunable	No
Dimmable	Yes

https://qpl.designlights.org/horticulture?search=libra&dlic_session_id=dbd1ad5a4895e61c226b&dlic_company_id=34681
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2/15/23, 11:51 AM
DLC Qualified Product List - Horticultural Lighting

REPORTED PHOTOMETRIC PERFORMANCE VIEW DETAILS

Reported Photosynthetic Photon Flux (400-700nm)	325 $\mu\text{mol}/\text{s}$
Reported Photon Flux Blue (400-500nm)	72 $\mu\text{mol}/\text{s}$
Reported Photon Flux Green (500-600nm)	90 $\mu\text{mol}/\text{s}$
Reported Photon Flux Red (600-700nm)	162 $\mu\text{mol}/\text{s}$
Reported Photon Flux Far Red (700-800nm)	4 $\mu\text{mol}/\text{s}$
Reported DC Photosynthetic Photon Efficacy (400-700nm)	2.82 $\mu\text{mol}/\text{J}$
Reported AC-Derated Photosynthetic Photon Efficacy (400-700nm)	2.47 $\mu\text{mol}/\text{J}$

REPORTED ELECTRICAL PERFORMANCE VIEW DETAILS

Voltage Range	50 - 350 V
Reported Input Wattage	115 W
Reported DC Input Current	2 A
Reported AC-Derated Input Wattage	131 W

Dehumidification:


Standalone dehumidifiers **smaller than 8 cubic feet:**

Must have a minimum integrated energy factor of 1.77 L/kWh



Standalone dehumidifiers **larger than 8 cubic feet:**

Must have a minimum integrated energy factor of 2.41 L/kWh.

Standalone Energy Star Rated dehumidifiers that remove over 50 pints per day will meet energy standards set forth in Rule 2.5.3.

	Look for this sticker when determining if your standalone dehumidifier meets the energy standards for dehumidification.
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Commercial-grade equipment may not be Energy Star rated but may still meet the efficiency standards set out in Rule 2. Cultivators can refer to spec sheets associated with the dehumidifier to understand if it is compliant. For example, this standalone dehumidifier has a rating of 2.9L/kWh.

		High-Capacity Grow-Optimized Dehumidifier Model A210V1 Specification Sheet
SPECIFICATIONS		
Capacity ⁽¹⁾ PPD AT 80°/60%RH	210	
Energy factor ⁽¹⁾	2.9 L/kWh 6.1 pints/kWh	
Voltage, Phase, Frequency	208-240VAC, 1 Phase, 60 Hz	
Current draw (amps) ⁽¹⁾	7.1	
Power (watts) ⁽¹⁾	1,450	
Btu/h ⁽²⁾	4,950	
Power cord type and length	SJT, 6-15P, 10ft	
Hardware	Field-configurable	
Breaker size	15 amp	
CFM	525	
Dimensions:	Width: 19½" Height: 18¾" Length: 30½"	
Weight	118 lbs.	
Operating range Temp/RH	60/50 to 85/80	
<small>⁽¹⁾Rated capacity and energy factor test done and current draw measured in accordance with AHAM DH-1 2008 at 80°F/60% RH inlet air at 0.0 ESP, 208 VAC. ⁽²⁾Total cooling load @ 80°F/60% RH.</small>		
	► PRINCIPLE OF OPERATION	
	The Anden Model A210V1 Dehumidifier is designed to dehumidify the air coming into the unit by passing the incoming air over an evaporator coil to drop the air temperature below the dew point of the air. Moisture is removed from the air and drained out of the unit to a common floor or waste drain. The air is then reheated in the condenser coil and exits the unit.	
Dehumidification occurs until the set point is reached, then shuts off until the control determines a need for operation.		

Cooling:

There are multiple efficiency ratings used for cooling. The seasonal energy efficiency ratio (SEER) represents the expected overall performance for a typical year's weather in a given location. Energy efficiency ratio (EER) is evaluated at a single operating condition.

Electrically operated air conditioners / condensing units must comply with the following standards:

- **Split System minimum SEER:** 13.00 (EER minimum: 11.375)
- **Single system SEER:** 14.00 (ERR minimum: 12.25)

Cultivators can refer to spec sheets associated with the cooling unit to find the SEER.

For split systems, SEER will be listed on the condensing (outside unit) nameplate. Not all HVAC manufacturers provide SEER, some provide just EER.

For example, this spec sheet shows the condensing unit has an EER of 9.5 at operating conditions:

System:	38APD027
No. of Circuits:.....	Dual Circuit
System Quantity:.....	1
Altitude:	0.0 ft
EER @ ARI Conditions:	10.9
EER @ Operating Conditions:	9.5
IPLV:	14.0
Capacity Split Percentage (A ckt/B ckt):.....	50/50 %
Suction Line Loss:.....	2.0 °F
Condensing unit is rated in accordance with ARI 365.	

Energy Usage Reporting and Reduction Efforts

Licensees must also report their energy usage and efforts to reduce energy consumption, as set forth in C.C.B. Rule 2.5:

- (a) License holders must report energy efficiency benchmarks annually to the Board as a condition of license renewal.
- (b) License holders must annually update and submit to the Board written operating procedures regarding equipment maintenance, calibration and proper operation, for all major energy equipment, including, but not limited to, horticultural lighting, HVAC systems, and dehumidification systems.
- (c) License holders must annually assess and report to the Board on opportunities to reduce energy

These are examples of acceptable energy usage reporting:

- Calculated energy efficiency benchmarks on an annual basis. Energy efficiency benchmarks could include annual electricity and fossil fuel use, annual renewable energy generated and used, total annual energy use, annual dry flower produced, canopy area under production, kWh per square foot of canopy, total Btu per square foot of canopy, grams of flower produced per kWh of electricity, and grams of flower produced per Btu of total energy.
- Provide a report demonstrating your energy efficiency. Demonstration of efficiency includes: installation of energy efficient equipment, improvement in annual energy efficiency benchmarks, installation of renewable energy systems, implementation of demand reduction strategies, and engagement in energy efficiency programs.
- Provide written operating procedures regarding equipment maintenance, calibration, and proper operation, for all major energy equipment, including, but not limited to, horticultural lighting, HVAC systems, and dehumidification systems.
- Provide identification of potential energy use reduction opportunities (such as natural lighting and energy efficiency measures), and a plan for implementation of such opportunities in an Energy Reduction Report
- Upload an Energy Reduction Report to the Renewal's Documents Section

Energy reduction strategies should include:

- Consideration of opportunities for renewable energy generation, including, where applicable, identification of building plans showing where energy generators could be placed on the site, and an explanation of why the identified opportunities were not pursued, if applicable;
- Strategies to reduce electric demand (such as lighting schedules, active load management, and energy storage); and
- Engagement with energy efficiency programs offered by Efficiency Vermont, Burlington Electric Department, or Vermont Gas Systems.

Efficiency Vermont

Licensees can choose to work with Efficiency Vermont to get rebates for efficient cultivation equipment. Licensee's that enter into an Incentive Agreement with Efficiency Vermont for these rebates can provide the agreement during the renewal process. The Incentive Agreement can serve as an alternative to reporting specific cultivation equipment information, depending on what rebates were provided in the agreement. Cultivators choosing to provide the Incentive Agreement instead of reporting must upload the Incentive Agreement and all associated efficiency project documentation to the licensing portal to satisfy the requirements of Rule 2.5.