

TEST

Machinery category according to standards:

UNE-EN 12198-1:2001+A1:2008: Safety of machinery. Assessment and reduction of risks arising from radiation emitted by machinery. Part 1: General principles.

UNE-EN 12198-2:2001+A1:2008: Safety of machinery. Assessment and reduction of risks arising from radiation emitted by machinery. Part 2: Radiation emission measurement procedure.

Product evaluation according to the artificial optical radiation directive (2006/25 / EC)

APPLICANT'S INFORMATION

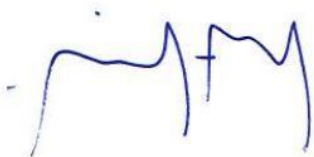
Name: ACB ILUMINACION, S.L.

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Telephone: +34 96 277 90 21

Test date: 23/12/2020

Tested by:



Teresa Molina Jiménez
Laboratory Technician
28/12/2020

Approved by:

Elena Sanjuán Sánchez
Laboratory Manager
05/01/2021

The test results of this report relate only to the tested sample identified in this report. This report will not be valid if it has erasures or alterations.

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1. DESCRIPTION OF THE MACHINE EVALUATED

Identification: EE200491-1; EE200473-2; EE200473-3; EE200491-2

Test sample EE200491 with parts: EE200491-1; EE200473-2; EE200473-3; EE200491-2

Descripción: Machine intended for air disinfection using UV-C radiation

Information provided by the applicant:

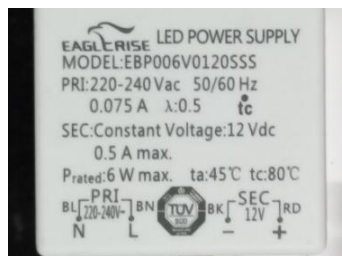
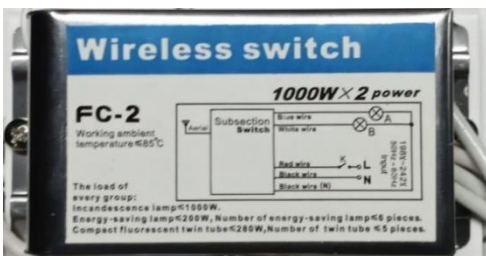
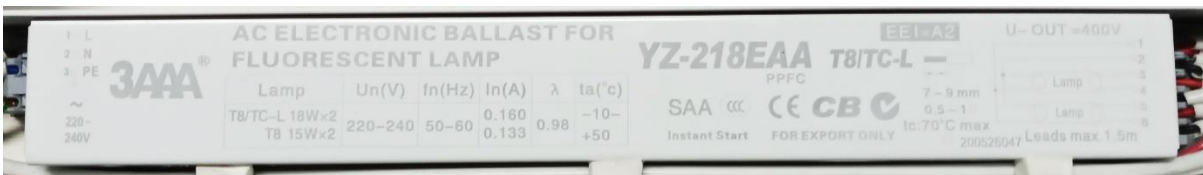
Dimensions: (LxWxH) (83 x 17 x 5) cm

Name: AIR CLEANER ACB

Model/Reference: A39272B (Turbo Air Cleaner)

This model is representative of the models: A39272N (Turbo Air Cleaner) / A383320B (Fosca Air Cleaner) and A383320N (Fosca Air Cleaner)

EE200491-1: housing, electrical equipment, lamps and forced ventilation system.



EE200473-2: lamp PHILIPS TUV 16W G16 T5



EE200473-3: lamp PHILIPS TUV 16W G16 T5

EE200491-2: remote control

**Characteristics of the machine radiation emissions**

The machine incorporates two UV-C sources that turn on as the machine is turned on with the remote control.

Machine operating conditions

The machine only has one operating mode in which the lamps stay on continuously for a set time (defined using the remote control, to choose between 2h, 4h or 8h).

Identifying marks

Die-cut logo on the case (EE200491-1).



Label on remote control (EE200491-2)



Date of receipt: 09/12/2020: EE200473-2, EE200473-3
22/12/2020: EE200491-1, EE200491-2

Sample supplier: The applicant.

2. OPTICAL RADIATION RISK ASSESSMENT

2.1 Testing method

Test performed according to standards: UNE-EN 12198-1:2001+A1:2008 y UNE-EN 12198-2:2001+A1:2008. All measurements of irradiance are performed at distances defined in the standard.

At each testing point, the spectral power distribution is measured (in the range 200 to 600 nm) with a spectroradiometer, three measurements are recorded and the average is calculated.

The machine is evaluated in its normal operating function. Cleaning and maintenance operations are carried out with the machine switched off according to the indications of the applicant, so the machine is not evaluated for these operations.

Since the main radiation of the lamps incorporated in the machine is UV-C, only the risk due to ultraviolet light is analysed.

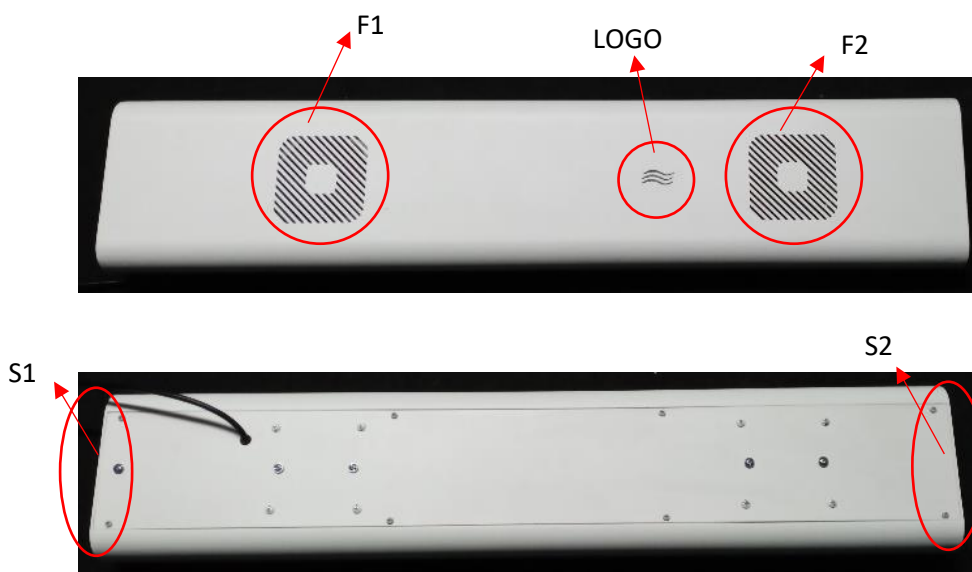
2.2 Lamp aging

The Applicant informs that the lamps have been aged for at least 100 hours (as indicated by ISO 15727: UVC DEVICES: MEASURING THE OUTPUT OF THE UV-C LAMP) before delivering the sample to the laboratory for measurements.

2.3 Selection of testing points

A visual inspection allows the selection of zones where the artificial radiation can escape from the machinery: the openings of the two fans, the logo cut-out on the surface of the case, and two slits in the lower part of the machinery. Measurements are made from different directions on these areas. The following pictures show the location of the testing zones.

2.4 Testing zones



V1: fan farthest from logo, measurements with different orientations. Distance from the sample: 10 cm.

V2: fan closest to logo, measurements with different orientations. Distance from the sample: 10 cm.

LOGO: measurements done towards the logo cut-out in the case. Distance from the sample: 10 cm.

R1: slit closest to the power cord, measurements with different orientations. Distance from the sample: 10 cm.

R2: slit farthest from power cord, measurements with different orientations. Distance from the sample: 10 cm.

2.5 Test equipment

- Spectroradiometer StellarNet Blue-Wave UV-50 (E0015). S/N: 16020409
Calibration certificates nº P189254.DMSI.001; P198212-DMSI/1
- Thermo-hygrometer PCE 313-A (E0020). S/N: Q899064
Calibration certificate: C-10017.00006
- Calliper Insize 1108-150 (E0050). S/N: 0810162082
Calibration certificate: 8852-12578

2.6 Environmental conditions during the test:

Temperature: (25.19 ± 0.48) °C

Humidity: (38.0 ± 2.9) % Hr

2.7 Test distance ⁱ

(100.00 ± 0.10) mm

3. RESULTS

3.1. Measuring points

See # 2.3, #2.4.

On each zone several measurements have been performed. In the following the less favourable result is shown.

3.2 Measured values

Effective Irradiance values calculated from data measured in the [200-400] nm range and weighted by the function $s(\lambda)$ and uncertainties ⁱ

Measurement point	UV risk [200-400] nm	
	E_{eff} ($\text{W}\cdot\text{m}^{-2}$)	U ($\text{W}\cdot\text{m}^{-2}$)
Zone V1	$0.0614 \cdot 10^{-3}$	$0.0217 \cdot 10^{-3}$
Zone V2	$0.3584 \cdot 10^{-3}$	$0.0302 \cdot 10^{-3}$
Zone Logo	$0.0047 \cdot 10^{-3}$	$0.0154 \cdot 10^{-3}$
Zone R1	$0.0456 \cdot 10^{-3}$	$0.0319 \cdot 10^{-3}$
Zone R2	$0.0433 \cdot 10^{-3}$	$0.0247 \cdot 10^{-3}$

4. CATEGORY OF THE MACHINE ACCORDING TO STANDARD UNE-EN 12198-1: 2001 + A1: 2008 AND UNE-EN 12198-2: 2001 + A1: 2008

The category of the machine is determined according to tables B.2, B.4 and B.5 of the UNE-EN 12198-1: 2001 + A1: 2008 standard, where the radiation emission categories are established.

For the determination of the category, the measured value and its corresponding uncertainty are considered.

Correlation between effective irradiance and radiation emission category:

E_{eff} (180 nm -400 nm) ($\text{W}\cdot\text{m}^{-2}$)	Radiation emission category
$E_{\text{eff}} \leq 0.1 \cdot 10^{-3}$	0
$0.1 \cdot 10^{-3} < E_{\text{eff}} \leq 1.0 \cdot 10^{-3}$	1
$E_{\text{eff}} > 1.0 \cdot 10^{-3}$	2

UV [200-400] nm		
Measurement point	$E_{\text{eff}} + U$ ($\text{W}\cdot\text{m}^{-2}$)	Category
Zone V1	$0.0831 \cdot 10^{-3}$	0
Zone V2	$0.3886 \cdot 10^{-3}$	1
Zone Logo	$0.0200 \cdot 10^{-3}$	0
Zone R1	$0.0774 \cdot 10^{-3}$	0
Zone R2	$0.0680 \cdot 10^{-3}$	0

MACHINE CATEGORY	1
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5. EVALUATION ACCORDING TO THE ARTIFICIAL OPTICAL RADIATION DIRECTIVE (2006/25/CE)

The machine does not exceed the exposure limits given by the directive for the following exposure times: (selecting the most unfavourable result – Zone V2).

Wavelength range (nm)	Exposure limits	Result ⁱ
180 – 400 nm	$H_{\text{eff}} = 30 \text{ J/m}^2$ (8 h)	$(10.32 \pm 0.87) \text{ J/m}^2$

NOTE: This report is a translation of the original IE200317 report in Spanish

^[i] All the expanded uncertainties that appear in this test report have been calculated with a coverage factor $k=2$ (which, for a normal distribution, defines a level of confidence of approximately 95%)