

LED FRESNEL PROJECTOR IN COOL WHITE AND WARM WHITE

## Robert Juliat ZEP 340LF, the cyber-Fresnel.

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The Fresnel and the profile spot may be the most emblematic luminaires for theatre and opera. It was only natural that France, with its rich cultural heritage, gave birth to one of the leading manufacturers of theater lighting, the timeless Robert Juliat.

Nearly 100 years after its birth, this company has remained true to its iconic classicism, at least as far as aesthetics are concerned. Following the introduction of the fully outfitted Tibo range, it was time to modernize its sacrosanct Fresnel projector, in an LED version. Join me in a tour around this high-tech fixture.



## Previously, in SoundLightUp...

If you click in the right column on the title “Tibo 533”, you will find the results of my test of the Tibo LED profile. The article is very poetically subtitled “Un Tibo, deux Tibo, plein de Tibo doudou” so that, first of all, you will get the background on Robert Juliat LED fixtures and, as a bonus, without realizing it, you will begin singing the little tune in the title.

If the Tibo range was intended as a break from tradition to offer new customers diversity and a more affordable price, ZEP, instead, fits right into the continuity and know-how of Robert Juliat, following the risky gamble of proposing LED sources in a rather conservative environment.

One recognizes the body of a halogen fixture, a precision assembly of steel and aluminum under black epoxy, a functional and classic look yet packed with features. Something with which to renew one’s lighting kit without upsetting old habits. Only its DMX base and a simple display give away its type. This control panel is now common to all the Robert Juliat LED projectors.

The choice of a high-efficiency 150 W LED light source addresses several issues. The first of these is staying within a price using a proven technology and, secondly, offering the equivalent of a 1000 W halogen source with the warm white LED version or of a 2 kW source “cooled” by a color corrector – like a Lee201 – for the cool white version.

## The Cast



The two main models: same outfit but different role.

Two models of Fresnel are available under the 340LF reference, only the color temperature of the LEDs differs. The WW model (for Warm White) is rated at 3200 K and has a beam angle variable from 11° to 68°. The CW (Cool White) model, at 6500 K, claims an output 40% higher than that of the warm white model, which sort of changes everything as we shall see later.

The fixtures are delivered in their original shipping carton with their instructions, PowerCon TRUE1 power cable, a filter holder and a Wi-Fi DMX antenna, if you purchased this option.





LED references (“cool” or “warm”) and the country, important for the voltage standard.



Freshly unwrapped, with instructions in French, if you please.

On the back, you find the connector for Wi-Fi DMX antenna (protected by a small red cover), the male and female DMX connectors, the connections for power input and output and a resettable circuit breaker, which takes the place of a standard mono-use fuse.



As a reminder, the power connectors are yellow PowerCon TRUE1 for a secure connection.



CW = Cool White = 6500 K / WW = Warm White = 3200 K. It’s almost Braille so that you can differentiate in the dark.

A serial number plate indicates the type of LED source with a small “x”, which is visually the only way to know if the fresnel is warm white or cool white.

## Costumes



The ZEP Fresnel dressed in steel with black epoxy paint, equipped with handles, ergonomic molded gray plastic knobs and some pink indication keys that are more subtle than in the past.

The ZEP Fresnel weighs as much as a 2 kW halogen Fresnel and is about the same size, a little more narrow, though

The output lens is identical to that of a 2 kW Fresnel, with a diameter of 200 mm, but the frame is reduced to the format of a 1 kW Fresnel (215 X 215 mm) and therefore perfectly compatible with the accessories of this range.

The release latch of the gel frame or barn door pane is visible on the upper left. Of course, without a lamp (and therefore no risk of explosion), the front grille is now superfluous.



The yoke of the fixture, with its graduated tilt index.

The central yoke is still adjustable and lockable with its detachable molded handle, the azimuth can be set using the etched index. For custom orders, Robert Juliat offers a special version of ZEP with adjustable offset handles for azimuth, sharpness and zoom.

The top, bottom and, to a lesser extent, the sides of the fixture are almost completely made of vents, evidence of the ever-present constraint of maintaining optimum cooling of the LED module. In detail, the light source is cooled via a heat pipe radiator. Underneath, a silent fan speeds controlled heat exchange.



The impressive copper piping of the cooling system.



The exhaust fan in its place when the beam aperture is set to a minimum.

For the regulation of the beam width, this whole module slides inside the fixture – LED and ventilation included – on a set of frictionless guides. On the body of the fixture, a graduated scale allows the user to take reference values for identical settings of multiple fixtures.

All of the elements of this Fresnel exude sturdiness and an understated efficiency.

## Menu and Settings

The display, an aluminum panel delicately set in the right side, plunges us into a world of information and settings hitherto unknown on a Fresnel fixture. The interface is identical to that of the Tibo LED, which I previously tested, so I will summarize here the main points.



Modernity to serve the theater. The four navigation keys, the display and an insert point for carrying out an electronic reset using the tip of a pencil.



The first menu for the DMX addressing of the fixture. The indication “Val” means the value given locally (and in analog) to the fixture.

To adjust the focus without a console operator, one operation is essential. From the initial screen (corresponding to menu “1/6 DMX config”), if you press the “exit” button you will light projector at 100% for one minute. You press it a second time to turn it off.

**This first menu** allows you to perform the DMX addressing of the fixture.

Depending on the selected operating mode, a submenu appears with the exact address for each parameter.

**This second menu** allows you to enter a value for current output intensity directly on the fixture. In case of conflict with an intensity value given by the lighting console, the higher of the two values is chosen.



Manual control of the fixture locally or via an optional analog remote control.



Setting up the fixture. Here the intensity control is at 16 bits, the curve is linear, the inertia similar to a 600 W halogen lamp, the dimming in PWM and the strobe activated.

**The third menu** lists the operating modes: 8-bit dimming or 16-bit for precision, linear or exponential dimming curve, simulation of the inertial dimming of a halogen lamp (smoothing), a choice of a continuous, stepped or mixed dimming (this last mode maintains the advantage of the precision of the first and the lack of flicker of the second), the possibility to add a strobe channel and another Master (maximum permissible limit). A final parameter allows you to limit output intensity, in order to calibrate an entire inventory of ZEPs with slightly different fluxes.

**The fourth menu**, which is quite long, contains all the operational information and highlights any eventual failures. Thus, it displays the various operating voltages, temperatures within the unit, the fan speed, etc. Automatic display shutdown and the reset to factory settings are in the 7th and 8th positions in this menu.



The different protocols available.



Software version and manufacturer contacts.

**In the 5th position, a surprising menu** provides the firmware version and the contact details of Robert Juliat, in case you want to write them a little note.



Wireless DMX menu

**The final menu** allows the activation of wireless DMX. Robert Juliat has selected the protocol of Wireless Solution, a leader in wireless transmission

DMX-In must not be connected in this case, but the DMX output remains active, allowing you to chain to other devices.

## Under the test cells

Robert Juliat provides a series of very detailed measurements for both models, to which we compared our own calculations. The two blocks of Osram LEDs consume 150 W and offer a lifetime 50,000 h

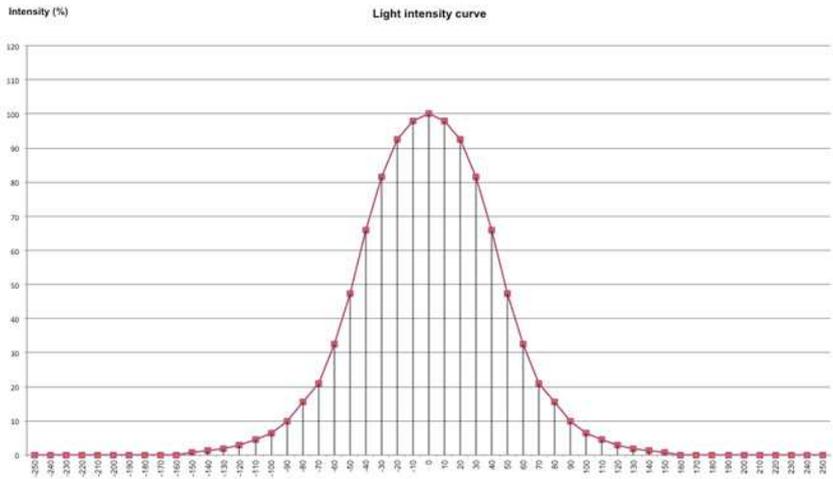
## ZEP 340 WW (warm white)

The “warm” white LEDs provide a color temperature of 3200 K and a proper CRI of 82%. The luminous flux delivered by the single module is 12,000 lm, which provides 2700 lux at the center at 5 meters with minimum opening of 12° and 280 lux at 69.6°, according to the manufacturer's data.

### Tight beam

ZEP Fresnel WW (Warm White) Tight Beam Measurements at 1/2 (light output at the center/2)	
Beam diameter	0,97 m
Corresponding angle	11,08°
Light output at the center when switching On	3100 lux
Light output at the center after derating	3070 lux
Flux when switching On	2030 lm
Flux after derating	2010 lm
Measurements at 1/10 (light output at the center/10)	
Beam diameter	2 m
Corresponding angle	22,5°
Light output at the center when switching On	3100 lux
Light output at the center after derating	3070 lux
Flux when switching On	3500 lm

Flux after derating 3470 lm



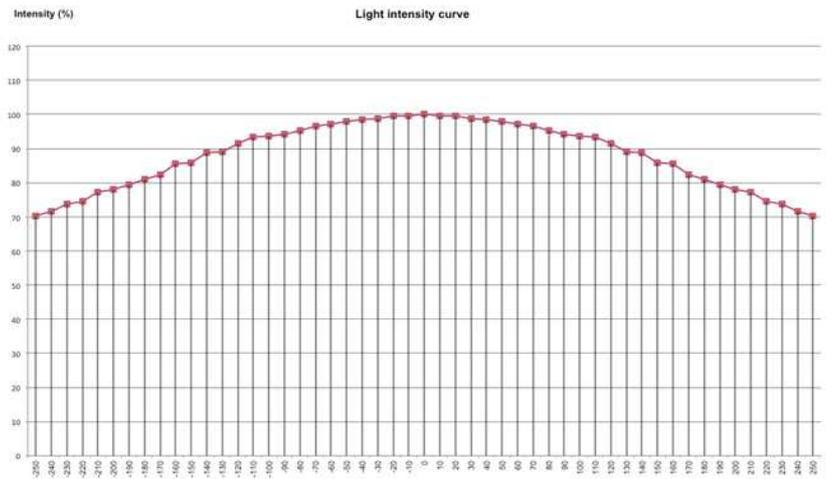
Our measurements give us nearly 3000 lux at 5 meters, with a measured aperture of 11° at 1/2, which is consistent with the values reported. The flux is close to 3500 lumens. **In practice, the flux is almost identical to that of a 1000 W halogen Fresnel.**

With such a small beam width, a large part of the energy of the light source, whether Halogen or LED, is lost in the body of the luminaire. The resulting beam is very coherent, with normal hot spot at the center. The edges are soft, and quite circular. The color temperature of 3160K measured here is identical to that of a filament lamp.

### Wide beam

ZEP Fresnel WW (Warm White,) Wide Beam Measurements at 1/2 (Light output at the center/2)	
Beam diameter	7,3 m
Corresponding angle	72,2°
Light output at the center when switching On	258 lux
Light output at the center after derating	256 lux
Flux when switching On	7595 lm
Flux after derating	7520 lm

Measurements at 1/2 (Light output at the center/2)	
Beam diameter	9,3 m
Corresponding angle	86°
Light output at the center when switching On	258 lux
Light output at the center after derating	256 lux
Flux when switching On	9930 lm
Flux after derating	9830 lm





The ZEP WW open to the max, with the beam's unfortunate yellow border.

At maximum zoom we get 256 lux at the center and a 72° aperture at 1/2 maximum intensity, for a total luminous flux of 9740 lumens.

The beam is quite homogeneous, practically constant from one side to the other with almost no interference.

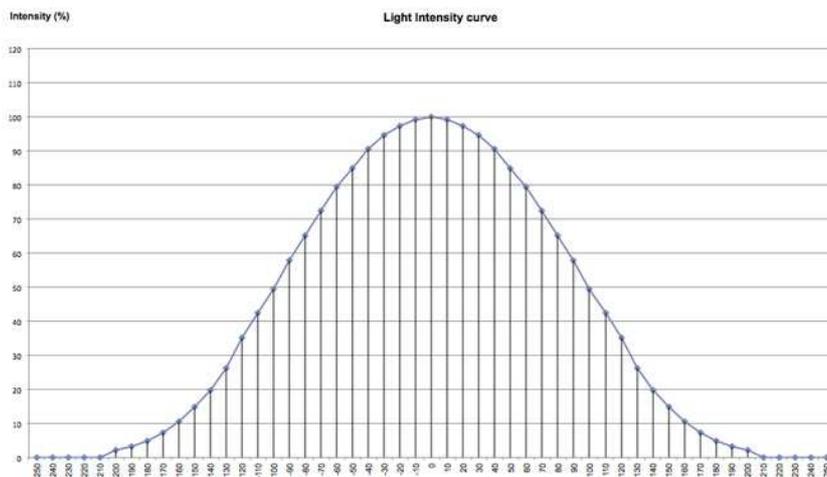
Some iridescence appears at the edges, slightly tending towards yellow.

This can be attenuated by using barn doors. The leaves of the barn door will hide the edges, though you will lose 1° or 2° of aperture.

## 20° Beam

ZEP Fresnel WW (Warm White) 20° Beam Measurement at 1/2 (Light output at the center/2)	
Beam diameter	1,76 m
Corresponding angle	20°
Light output at the center when switching On	1272 lux
Light output at the center after derating	1260 lux
Flux when switching On	2710 lm
Flux after derating	2690 lm

Measurement at 1/10 (Light output at the center/10)	
Beam diameter	3,10 m
Corresponding angle	34,5°
Light output at the center when switching On	1272 lux
Light output at the center after derating	1260 lux
Flux when switching On	4890 lm
Flux after derating	4843 lm



With the focus set to 20° (our reference value) we measure a luminous flux of 4840 lumens, with 1260 lux at the center, at 5 meters. Again the beam remains perfectly traditional.

**In mixed halogen/LED use, the ZEP equipped with warm white source provides a less warm but very controlled light, at the same time golden and slightly pink.** Its advantage is to be free from chromatic alteration depending on the intensity, although this characteristic glow gives its charm to halogen sources.

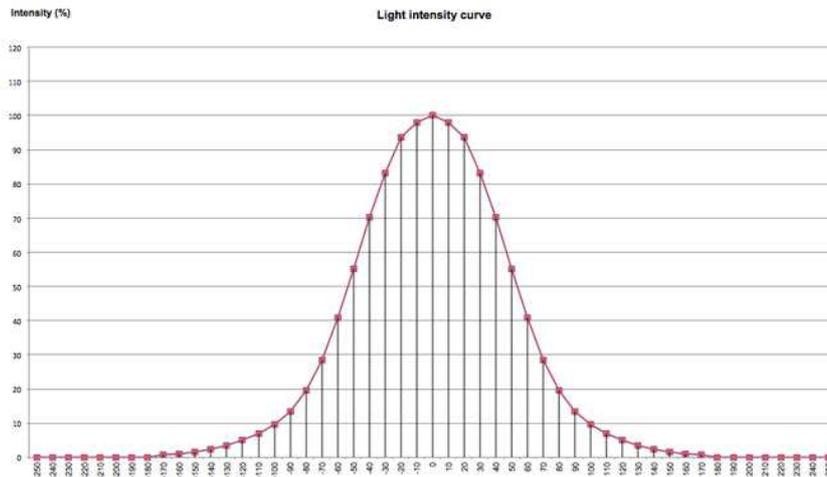
## The ZEP 340 CW (cool white)

This version has a better luminous flux, “cool white” technology has been better mastered by manufacturers of LEDs. This module produced a luminous flux of 17,000 lumens. In exchange, the very high color temperature (6500 K) and the CRI of 70 will fade the colors of sets or costumes illuminated by the Fresnel. Robert Juliat declares 3850 lux at the center at five meters with the minimum aperture of 10.6° and 370 lux at the maximum of 68.7°.

### Tight beam

ZEP Fresnel CW (Cold White.) Tight Beam Measurement at I/2 (Light output at the center/2)	
Beam diameter	1,08 m
Corresponding angle	12,4°
Light output at the center when switching On	3455 lux
Light output at the center after derating	3387 lux
Flux when switching On	2650 lm
Flux after derating	2600 lm

Measurement at I/10 (Light output at the center/10)	
Beam diameter	2 m
Corresponding angle	22,5°
Light output at the center when switching On	3455 lux
Light output at the center after derating	3387 lux
Flux when switching On	4750 lm
Flux after derating	4660 lm

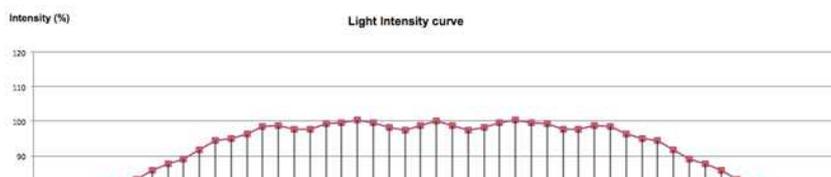


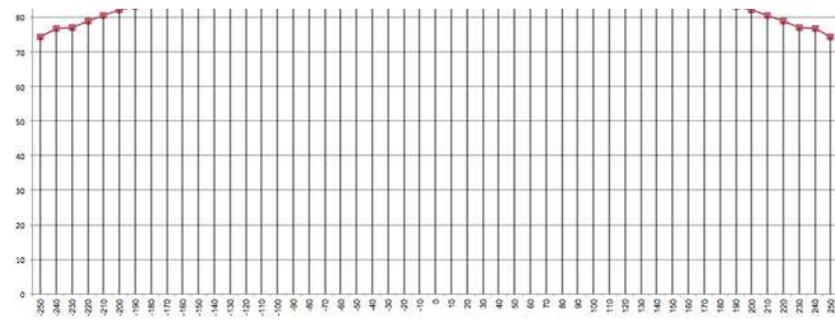
Again, our measurements confirm the manufacturer's data. 3400 lux at the center and 12.4° at I/2 with a luminous flux of 4660 lumens.

### Wide beam

ZEP Fresnel CW (Cold White.) Wide Beam Measurement at I/2 (Light output at the center/2)	
Beam diameter	7,2 m
Corresponding angle	71,5°
Light output at the center when switching On	325 lux
Light output at the center after derating	318 lux
Flux when switching On	10 150 lm
Flux after derating	9 950 lm

Measurement at I/10 (Light output at the center/10)	
Beam diameter	9,2 m
Corresponding angle	85°
Light output at the center when switching On	325 lux
Light output at the center after derating	318 lux
Flux when switching On	12 550 lm
Flux after derating	12 300 lm





With the maximum aperture, we measure an illumination of 325 lux at the center, with 71° at 12,300 lumens of luminous flux.

## 20° Beam

ZEP Fresnel CW (Cold white) 20° Beam Measurements at 1/2 (light output at the center/2)	
Beam diameter	1,76 m
Corresponding angle	20°
Light output at the center when switching On	1853 lux
Light output at the center after derating	1817 lux
Flux when switching ON	3675 lm
Flux after derating	3600 lm

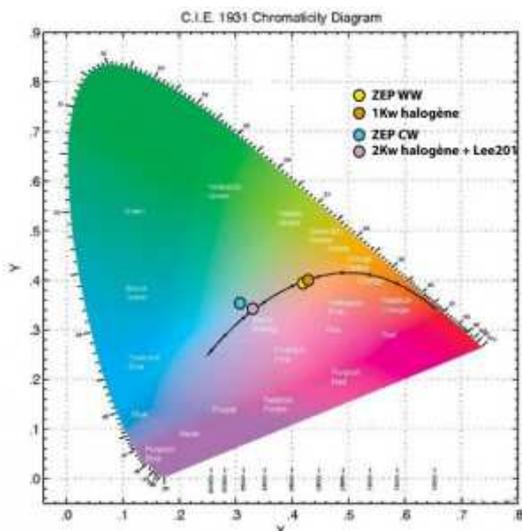
  

Measurements at 1/10 (light output at the center/10)	
Beam diameter	3,10 m
Corresponding angle	34,5°
Light output at the center when switching On	1853 lux
Eclairage au centre après derating	1817 lux
Flux when switching ON	5970 lm
Flux after derating	5850 lm

At our 20 degree (1/2) reference point, we measured 1850 lux and 5850 lumens.

## Tungsten + Lee201 vs. cool white LED

By comparison, a 2 kW tungsten Fresnel with a correction filter, like a Lee 201, proves to be 15% less powerful than the ZEP CW.



If the ZEP WW gives a white very close to a halogen, the ZEP CW pulls blue and green, more than a halogen corrected Lee201. However it deviate more widely if it use dimmer while ZEP will see their color vary only slightly.





The ZEP CW also has a border, which is more greenish.

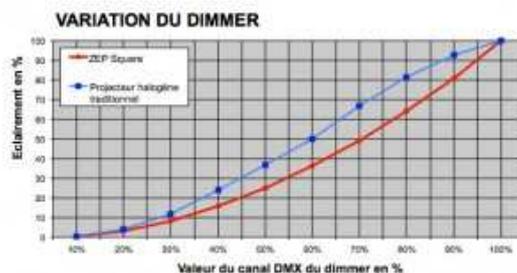
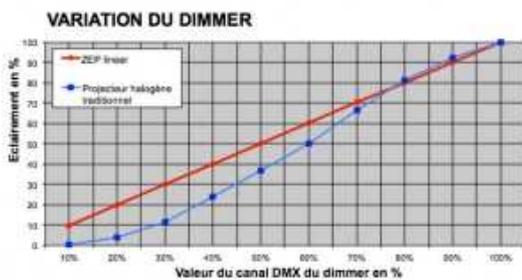
But this power is less controlled in the cool white LED than in the warm white LED. The beams are less uniform. In particular, at maximum aperture the light spreads like a pond covered with small waves caused by a slight breeze but this is nothing serious, considering the low amplitude of the undulations:  $\pm 1\%$  and thus invisible to the eye.

This, combined with some reflections on the inside the chassis, causes various chromatic aberrations, including an increase in color temperature to around 8000 K (also mentioned by the manufacturer) and a greenish edge around the beam. The barn doors are also almost mandatory to cover up this defect.

**ZEP CW is therefore not a replacement for a halogen Fresnel, but a complement. It has more metallic color, of course, but it provides very nice power with color that doesn't vary with intensity.**

### Dimmer

The intensity variation is perfectly controlled, either with a linear curve, which is straight as an arrow, or a so-called "Square" curve, which provides the most authentic feeling of a traditional projector.



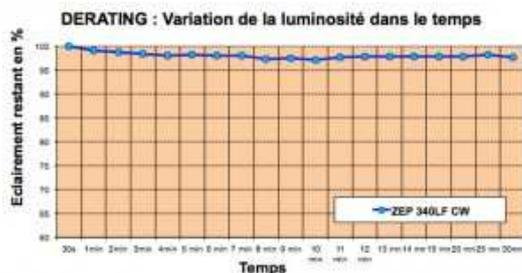
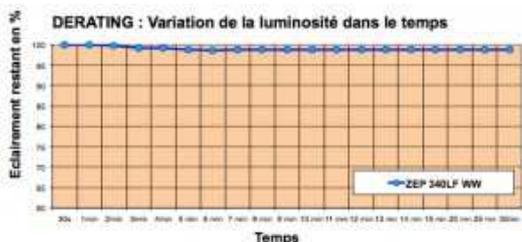
### Thermal and noise measurements.

Several constraints mandate optimal cooling of LED sources. The temperature

tolerances on the substrate of light emitting diodes are very limited, and exceeding them will initially result in reduced luminous flux and significantly reduced operational lifetime.

RRobert Juliat has chosen to use a massive heat pipe radiator in conjunction with an automatic fan for cooling of the LED source. This system works like a chimney and the expelled hot air encounters no baffle and no extraneous noise is created. With this oversized cooling system, the LEDs can be used at their maximum capacity, without risk or noise.

## Derating



Derating is negligible here: just over 1% of luminous flux loss after 30 minutes of operation with the projector at full power for the WW (warm white) version and just 2% for CW (cool white) version. The cooling on this fixture is perfectly engineered.



In normal use the ZEP is almost silent and the chassis gets barely warm. Inside, as indicated by the temperature sensors accessible from the menu, only the CPU warms up.

## In use

**This Fresnel remains a classic.** Solid construction, well balanced, comfortable handles, easy access to all settings, accuracy of focus, clear and simple accessory installation, this product meets the highest Robert Juliat quality standards. The focus control has a graduated index and a very pleasant and smooth movement. The menu is simple but effective, with enough parameters to lose most beginners. Therefore, the settings of the curves, the electronic dimming or fading may not be so easy to understand the first time.

Control via a console allows you to adjust the intensity precisely, even in 8-bit mode, and dimmer variations are smooth. The simulation of the inertia of a halogen lamp filament is finely dosed and brings a little soul back into a rather synthetic light. The power is quite reasonable, comparable to that of a 1- or 2-kilowatt halogen Fresnel, depending on the settings and the desired effect.

The strobe feature provides some additional effects, but do not expect to find randomized effects, flash or sawtooth pulsing. This parameter, too, remains very practical. Note that the strobe will lock to the frequency of the DMX frame,

allowing all the fixtures to be perfectly synchronized. There is, however, a slight delay when setting the strobe, until it locks onto the correct frame.

Accustomed as we have been for decades to the warm glow of an overheated filament, the luminous flux emitted by the LEDs does not seem very natural, especially when conventional sources disturb our vision. Even if the ZEP with the warm white source brings a certain sweetness and a pleasant shade on faces, which would be ideal for small scenes, the cool white source gives a very industrial impression, with low contrast. The CRI of the latter also quickly buries warm or vivid colors, but will provide very interesting results for contemporary performances, urban or tragic operas. For use in the TV studio it is an excellent choice, with reduced consumption and no heat emission.

## Maintenance



Removing the Fresnel lens leads directly to the LED circuit. It should never be touched or cleaned by someone who doesn't know how, for risk of damaging it. Interestingly, the inner lining generates green hues.

Maintenance is reduced to its simplest form. Apart from possible mechanical maintenance – tightening the bolts and cleaning the lens – the LEDs do not require any intervention.

A blast of air from time to time through the ventilation grills will be sufficient, keeping in mind to block the fan. Certain improvements could be made to the software in the future but, in this case, contact your dealer.

It is not possible to change a faulty LED module yourself or exchange a “cool white” module for a “warm white” or vice versa

## Verdict

The ZEP Fresnel is not presented as a replacement for a traditional Fresnel, but as a brand new product, bringing other ideas of light. While its use will prove to be a real gain in power economy and certainly in comfort on TV sets or conventions, the theatrical lighting designer will have at his disposal a different source, which he will have to tame in order to use it at its best. By the way, Robert Juliat continues the evolution of its halogen and discharge ranges more than ever, evidence that all these technologies can coexist when the users know how to employ them wisely.

FONCTION DU CANAL DMX				
Canal DMX	8 bits	8 bits with strobe	16 bits	16 bits with strobe
1	Dimmer	Dimmer	Dimmer	Dimmer
2		Strobe	Dimmer fine	Dimmer fine
3				Strobe

ZEP CHARACTERISTICS	
<b>Dimensions and weight</b>	
length	494 mm
Depth	344 mm (width yoke)
Height	343 mm (no yoke), 521 mm (yoke at 90°)
Weight	14,2 kg
<b>General Characteristics</b>	
Type of projector	LED Fresnel
Voltage and power consumption	90-230V / 47-63 Hz - 185W (0,8A) in normal operation
Protection class	IP20
Cooling	Heatsink with caloduc + Controlled silent fan
Control	Via protocole DMX512 (USITT DMX 512A), DMX and W-DMX
Number of DMX channels and DMX modes	1,2,3 or 4 channels
Lamp type-	LED High density matrix 150 W
Type of ballast /driver	Electronic power "flicker free"
Optical system	Fresnel lens diameter 200 mm
Connectors	2 XLR 5 in&out, 2 Neutrik True1 in&out
Control Panel	Digital screen 2 lines; 4 butons, LED for control
Soft version of the tested model	V 1.A
<b>Fixing brackets</b>	
	Three holes on the yoke for steel hook
<b>PAN &amp; TILT lock</b>	
	Manual
<b>Transport handles</b>	
	1 under the base
<b>Fastening point for safety cable</b>	
	Oui, under the base and next to the lens
<b>Supplied accessories</b>	
	Filter holder, power cable, manual
<b>Functions</b>	
Pan & Tilt	Pan & Tilt 360° manual
Zoom	11°/68° manual
Dimmer / Shutter	Dimmer 16bit and electronic strobe
Prism	No
Colours	Dual cassette slideway for colour filter
<b>General measurements</b>	
Highest temperature on the projector	65° max
Ambiant noise	36 dB
Noise when projector On @1m	36 dB (silent projector)
<b>Manufacturer contry of origin</b>	
	Robert-Juliat, France
Warranty	2 years
Price	1 990€ HT



Soyez le premier de vos amis à indiquer que vous aimez ca.



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