Data Sheet

LED LEONARDO 6

110 W High Power – Enhanced CRI

LED Fresnel SPOTLIGHT CRI greater than 90

White light, either Tungsten or Daylight balanced Correlated Colour Temperature

Led Leonardo Standard Range

Super Led Fresnel Range

LED Lighting, Green Energy

International Patent N° WO 2013/024501 A1
Advanced Optics for LED Projector with FRESNEL or PLANAR-CONVEX Lens

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OVERVIEW

The LED LEONARDO 6 is a high efficiency Fresnel lens spotlight using the innovative High Power 110W COB (Chip on Board) LED ARRAY, in combination with the DE SISTI Internationally Patented optical system for LED FRESNEL and with an enhanced CRI (Color Rendering Index) higher than 90 for appropriate chromacity performances.

The Lighting Fixture is DMX Controlled from 0 to 100% with a super smooth Dimming and a negligible variation of Colour Temperature while controlling the Light intensity.

The LED LEONARDO 6 is available with either Tungsten (3.200°K) or Daylight (5.600°K) Balanced CCT (Correlated Color Temperature), in both cases with a CRI higher than 90 and both in Manual or Pole operated versions.

The lighting Performances of the Tungsten Balanced CCT are comparable from medium to full flood to those of a 1000W tungsten Fresnels, while the Daylight Balanced CCT is equivalent to a 575W HMI.

The fixture combines the classical SPOT/FLOOD beam control on an equivalent FOCUS RANGE to a conventional lamp fresnel, with an excellent barn door cutting.

It utilizes Standard accessories from the DE SISTI range of equivalent Fresnel Lens size, such as Barndoor, Colour Frame, Cones, scrims.

FEATURES

- 150 mm. (6") diameter high quality, shock resistant Borosilicate glass Fresnel lens on spring supports.
- Rugged and Lightweight Carbon Steel housing with low glare black epoxy powder coating, with internal double walls and reinforces.
- High efficiency Self Stabilizing Active Cooling: Automatic, thermal stabilization of the LED operating temperature is managed by an internal thermal sensor and CPU, variable speed fan and heat sink to maintain the LED Array's constant temperature at a maximum of 65°C. The hydro dynamic bearing fan operates silently with a very low RPM.
- Special Patented Optics for LED Technology.
- Steel cable driven focus mechanism which guides Teflon bushings supported LED ENGINE along 2 rods. This ensures smooth operation during focusing, in any tilting position of the fixture. The Teflon bushings also provide a wiping action, which cleans the steel guide rails during focus. The focusing mechanism can be activated from both front and rear of the fixture and the whole spot to flood action is accomplished with 1 and half turn of the focusing knob.
- The unit is equipped with a hinged lens door with wire-guard, it includes accessory holding brackets. One of the 4 brackets has a locking knob and is spring loaded, it can be locked to either safely hold barndoor, color frame and scrims or to be rotated 90° and locked in an open position for fast accessories changes. A double safety accessory bracket with spring loaded catch is available on request to be assembled opposite to the locking knob.
- The accessories are secure regardless of the orientation of the fixture. Accessories have been designed for one hand installation.
- Available with either positive lock manual yokes for comfort and ease of handling, or pole operated yokes which can be used via the lighting pole for Panning and Tilting the lights as well as manually, since the mechanical activators are equipped with clutches. It is possible the conversion between the two types.

Data Sheet

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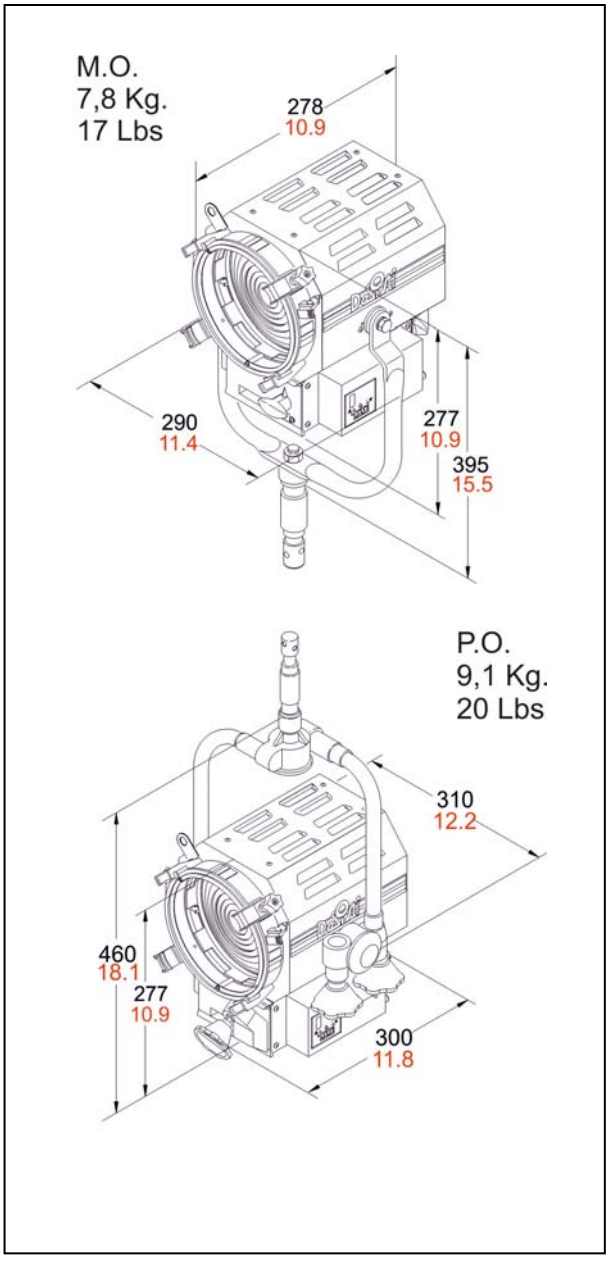
CHARACTERISTICS & PERFORMANCE DATA

DESCRIPTION	VALUE	
➲ Power to LED	110W DC Current to the LED (no flicker)	
➲ Power Consumption	Europe	America
	130W @ 230 V 50-60 Hz	138W @ 120 V 50-60 Hz
➲ DMX Data link USITT DMX512-A	This product uses a 5-pin XLR for DMX input and output. Use a shielded data cables. Do not overload the daisy chain. Up to a maximum of 32 devices can be used on a single DMX chain.	
➲ DMX Channels	1 at 8bit: Dimmer 2 at 16bit: Dimmer	
➲ LED ARRAY Lifetime	50.000 hours with 70% Lumen Maintenance. The LED ARRAYS are tested and certified up to LM80	
➲ Protection Type	IP 22	
➲ Max. Housing Surface Temperature	70° C	
➲ Weight of Fixture	M.O.	P.O.
	7,8 kg.	9,1 kg.
➲ Weight of Barndoor	4 leaf	8 leaf
	0,63 kg.	0,85 kg.
➲ Size of Barndoor ring	Seat Diameter	Ring Diameter
	192 mm	190 mm ($7''_{1/2}$)
➲ Weight of color frame	0,13 kg.	
➲ Size of scrims & color frame	Seat Diameter	Accessory Diameter
	187 mm	185 mm ($7''_{1/4}$)
➲ Lens diameter	150 mm.	



POWER AND DMX DAISY CHAIN

The LED LEONARDO FRESNELS permit both POWER and DMX DAISY CHAIN. In fact each Fixture is respectively equipped with:

For DMX:
- 1 XLR5 pin Panel Mount Male & Female (DMX IN & OUT)

For Mains Supply
- 1 20A Powercon NAC3MPA BLUE (POWER IN)
- 1 20A Powercon NAC3MPB WHITE (POWER OUT)

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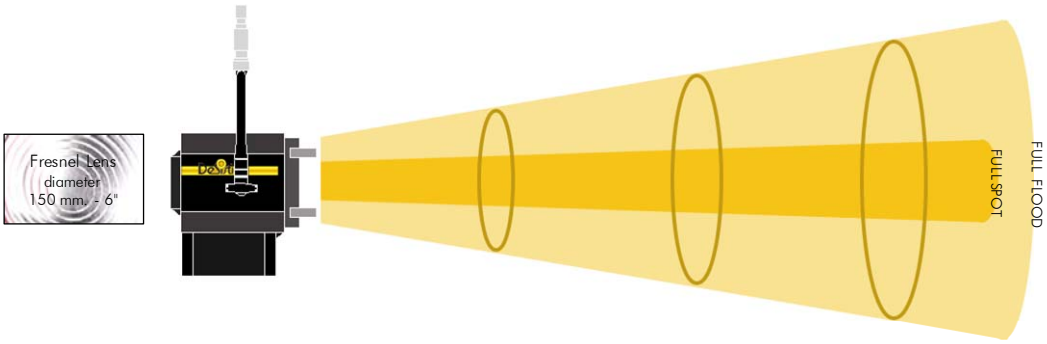
PHOTOMETRIC DATA

C.C.T. (Correlated Color Temperature) balanced to match 3.200°K TUNGSTEN LAMPS

PHOTOMETRIC DATA LED LEONARDO 6 - 110W *V90 (CRI Greater than 90)*

C.C.T. (Correlated Color Temperature) balanced to match 3.200°K TUNGSTEN LAMPS

Illumination center values at Distances	870 lux	313 lux	78 lux
Central Light intensity (Candle Power) 7.830 cd	*81 FC*	*29 FC*	*7 FC*
Light beam diameter with Beam Angle	3,61 mt	6,01 mt	12,02 mt
(50% of center value): 62,0°	*11,8 ft*	*19,7 ft*	*39,4 ft*
Light beam diameter with Field Angle	4,36 mt	7,27 mt	14,53 mt
(10% of center value): 72,0°	*14,3 ft*	*23,8 ft*	*47,7 ft*
FULL FLOOD **DISTANCES**	3 mt	5 mt	10 mt
	9,8 ft	*16,4 ft*	*32,8 ft*

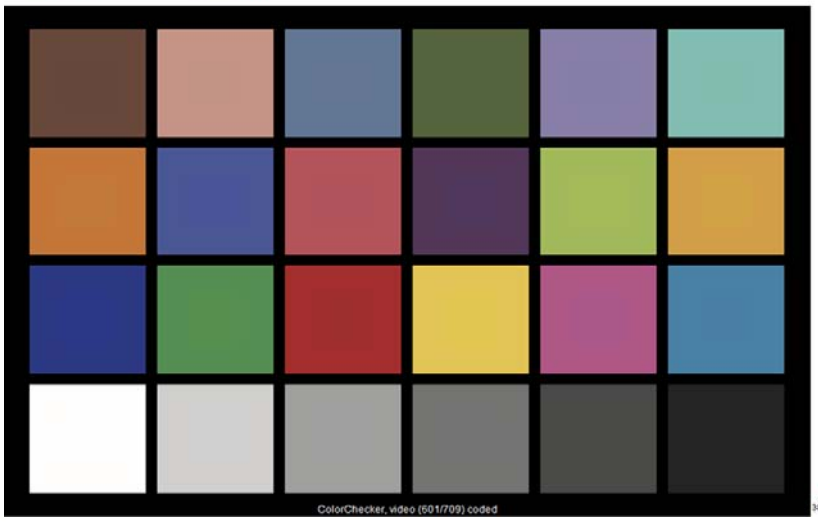


FULL SPOT **DISTANCES**	3 mt	5 mt	10 mt
	9,8 ft	*16,4 ft*	*32,8 ft*
Illumination center values at Distances	4.280 lux	1.541 lux	385 lux
Central Light intensity (Candle Power) 38.520 cd	*398 FC*	*143 FC*	*36 FC*
Light beam diameter with Beam Angle	0,68 mt	1,14 mt	2,28 mt
(50% of center value): 13,0°	*2,2 ft*	*3,7 ft*	*7,5 ft*
Light beam diameter with Field Angle	1,17 mt	1,94 mt	3,89 mt
(10% of center value): 22,0°	*3,8 ft*	*6,4 ft*	*12,8 ft*

LUX AT ANY DISTANCE = Candle Power : [Distance(in m.)] ^{2} F.C. AT ANY DISTANCE = Candle Power : [Distance(in ft)] ^{2}

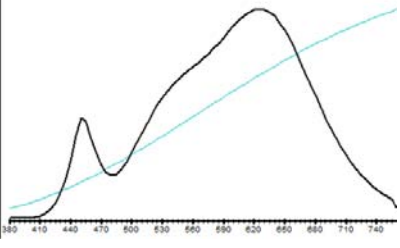
De Sisti Led Leonardo 6 - 110W Tungsten F : CCT = P3025 (+0.2)

TLCI-2012 : 90 (P3025)



Television Lighting Consistency Index-2012

Sector	Lightness	Chroma	Hue
R	0	0	0
R/Y	0	0	- -
Y	0	-	-
Y/G	0	-	0
G	0	0	+
G/C	0	0	+
C	0	0	++
C/B	+	0	-
B	0	-	- -
B/M	+	-	+
M	0	0	+++
M/R	+	0	++



Data Sheet

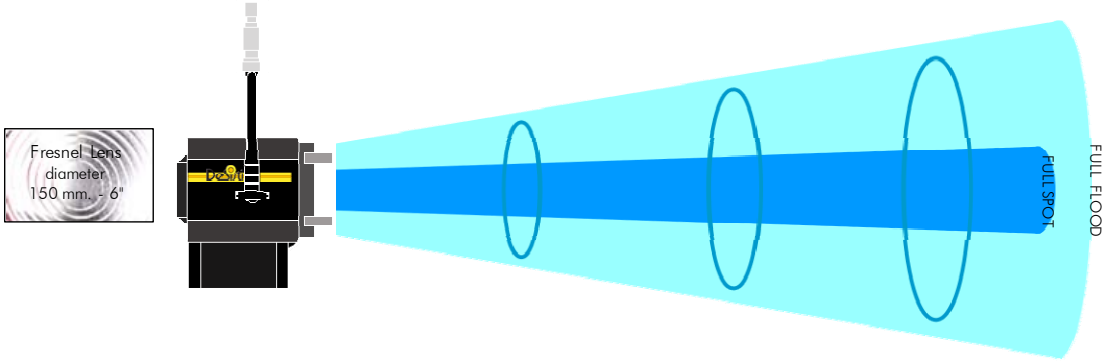
PHOTOMETRIC DATA

C.C.T. (Correlated Color Temperature) balanced to match 5.600°K DAYLIGHT LAMPS

PHOTOMETRIC DATA LED LEONARDO 6 - 110W *V90 (CRI Greater than 90)*

C.C.T. (Correlated Color Temperature) balanced to match 5.600°K DAYLIGHT LAMPS

Illumination center values at Distances	968 lux	348 lux	87 lux
Central Light intensity (Candle Power) 8.712 cd	*90 FC*	*32 FC*	*8 FC*
Light beam diameter with Beam Angle	3,61 mt	6,01 mt	12,02 mt
(50% of center value): 62,0°	*11,8 ft*	*19,7 ft*	*39,4 ft*
Light beam diameter with Field Angle	4,36 mt	7,27 mt	14,53 mt
(10% of center value): 72,0°	*14,3 ft*	*23,8 ft*	*47,7 ft*
FULL FLOOD **DISTANCES**	3 mt	5 mt	10 mt
	9,8 ft	*16,4 ft*	*32,8 ft*

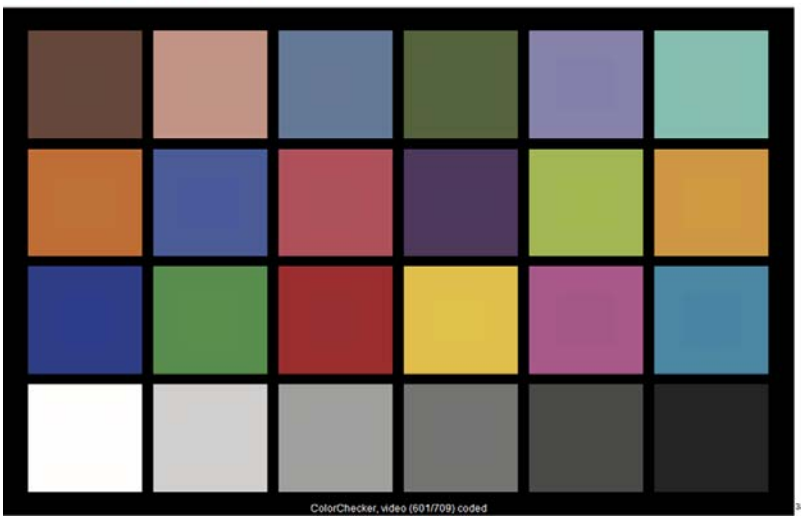


FULL SPOT **DISTANCES**	3 mt	5 mt	10 mt
	9,8 ft	*16,4 ft*	*32,8 ft*
Illumination center values at Distances	4.523 lux	1.628 lux	407 lux
Central Light intensity (Candle Power) 40.707 cd	*420 FC*	*151 FC*	*38 FC*
Light beam diameter with Beam Angle	0,68 mt	1,14 mt	2,28 mt
(50% of center value): 13,0°	*2,24 ft*	*3,74 ft*	*7,48 ft*
Light beam diameter with Field Angle	1,17 mt	1,94 mt	3,89 mt
(10% of center value): 22,0°	*3,83 ft*	*6,38 ft*	*12,75 ft*

LUX AT ANY DISTANCE = Candle Power : [Distance(in m.)] ^{2} F.C. AT ANY DISTANCE = Candle Power : [Distance(in ft)] ^{2}

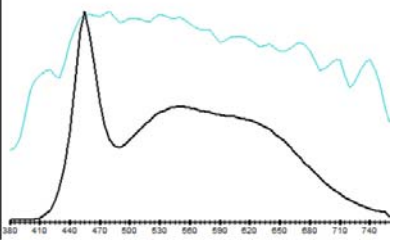
De Sisti Led Leonardo 6 - 110W Daylight F : CCT = D5750 (+1.1)

TLCI-2012 : 90 (D5750)



Television Lighting Consistency Index-2012

Sector	Lightness	Chroma	Hue
R	0	0	0
R/Y	0	0	--
Y	0	-	-
Y/G	0	0	0
G	0	0	0
G/C	0	0	0
C	+	0	-
C/B	+	0	---
B	0	-	-
B/M	0	0	+
M	0	0	+
M/R	+	0	+



Data Sheet

LED LEONARDO 6 *VERSIONS & MODEL NUMBERS*

MOD.	*DESCRIPTION*
	TUNGSTEN BALANCED CCT (CRI90)
LTV90 310.110	**LED LEONARDO 6 - high power CRI 90 Tungsten CCT, M.O.** LED Fresnel Spotlight including: - **Mod. LTV90 310.101** M.O. FIXTURE HEAD with - 150 mm. (6") diameter Fresnel lens - POWERCON IN & OUT PANEL MOUNTED CONNECTORS. - XLR 5 Pin DMX IN & OUT PANEL MOUNTED CONNECTORS. - **110W** high power CRI 90 LED with Tungsten Balanced Correlated Color Temperature (CCT) - Built In Power Supply 230-240V 50/60Hz DMX controlled. - **Mod. 5403.135** 3 mt. detachable Blue POWERCON power cable with bare ends - **Mod. LT310.110.40** M.O. yoke with 28,57 mm. spigot (B.S. 1 1/8"), with top end for "C" clamp - **Mod. 316.100** four leaf rotating barndoor - **Mod. 317.100** colour frame **DMX cable is not included, to be ordered separately**
LTV90 311.110	**LED LEONARDO 6 - high power CRI 90 Tungsten CCT, P.O.** LED Fresnel Spotlight including: - **Mod. LTV90 311.101** P.O. FIXTURE HEAD with - 150 mm. (6") diameter Fresnel lens - POWERCON IN & OUT PANEL MOUNTED CONNECTORS. - XLR 5 Pin DMX IN & OUT PANEL MOUNTED CONNECTORS. - **110W** high power CRI 90 LED with Tungsten Balanced Correlated Color Temperature (CCT) - Built In Power Supply 230-240V 50/60Hz DMX controlled. - **Mod. 5403.135** 3 mt. detachable Blue POWERCON power cable with bare ends - **Mod. 311.110.40** P.O. yoke with 28,57 mm. spigot (B.S. 1 1/8"), with top end for "C" clamp - **Mod. 316.100** four leaf rotating barndoor - **Mod. 317.100** colour frame **DMX cable is not included, to be ordered separately**
	DAYLIGHT BALANCED CCT (CRI90)
LDV90 310.110	**LED LEONARDO 6 - high power CRI 90 Daylight CCT, M.O.** LED Fresnel Spotlight including: - **Mod. LDV90 310.101** M.O. FIXTURE HEAD with - 150 mm. (6") diameter Fresnel lens - POWERCON IN & OUT PANEL MOUNTED CONNECTORS. - XLR 5 Pin DMX IN & OUT PANEL MOUNTED CONNECTORS. - **110W** high power CRI 90 LED with Daylight Balanced Correlated Color Temperature (CCT) - Built In Power Supply 230-240V 50/60Hz DMX controlled. - **Mod. 5403.135** 3 mt. detachable Blue POWERCON power cable with bare ends - **Mod. LT310.110.40** M.O. yoke with 28,57 mm. spigot (B.S. 1 1/8"), with top end for "C" clamp - **Mod. 316.100** four leaf rotating barndoor - **Mod. 317.100** colour frame **DMX cable is not included, to be ordered separately**
LDV90 311.110	**LED LEONARDO 6 - high power CRI 90 Daylight CCT, P.O.** LED Fresnel Spotlight including: - **Mod. LDV90 311.101** P.O. FIXTURE HEAD with - 150 mm. (6") diameter Fresnel lens - POWERCON IN & OUT PANEL MOUNTED CONNECTORS. - XLR 5 Pin DMX IN & OUT PANEL MOUNTED CONNECTORS. - **110W** high power CRI 90 LED with Daylight Balanced Correlated Color Temperature (CCT) - Built In Power Supply 230-240V 50/60Hz DMX controlled. - **Mod. 5403.135** 3 mt. detachable Blue POWERCON power cable with bare ends - **Mod. 311.110.40** P.O. yoke with 28,57 mm. spigot (B.S. 1 1/8"), with top end for "C" clamp - **Mod. 316.100** four leaf rotating barndoor - **Mod. 317.100** colour frame **DMX cable is not included, to be ordered separately**
5402.503	**DMX DAISY CHAIN CABLE 3 mt. (10') LONG, including:** - 3 mt. (10') cable terminated with XLR 5 pin Connectors (male and female) at the ends, to allow daisy chain of DMX fixtures.
NOTES: The models above are for the 200/230/240V Versions. For the **100/120V Versions** the last 3 digits of the model number change to **.210**	

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LED LEONARDO 6 *OPTIONALS & ACCESSORIES*

MOD.	*LED LEONARDO 6 High power - Enhanced CRI - OPTIONALS & ACCESSORIES*
15.300	DIN SPIGOT 28 mm. to M12 threaded stud with washer and nut for "C" clamp or stand mountig
95.100	28,57 mm. (1-1/8") spigot to M12 threaded stud with washer and nut for "C" clamp or stand mounting
LT310.110.40	Steel tube Manual Operated stirrup with 28,57 mm. spigot (B.S. 1 1/8"), with top end for attachment to "C"clamp.
LT310.300.40	Steel tube Manual Operated stirrup with 28,00 mm. spigot (D.I.N)
LT310.220.40	Steel tube Manual Operated stirrup with M 12 Threaded hole
311.110.40	Pole operated stirrup with 28,57 mm. spigot (B.S. 1 1/8"), with top end for attachment to "C" clamp.
311.300.40	Pole operated stirrup with 28,00 mm. spigot (D.I.N.)
315.310	Stainless Steel wire guard
316.100	Four leaf rotating barndoor
316.200	Eight way rotating barndoor
317.100	Colour Frame
318.100	Cone with two discs (with front aperture diameter: 105 mm. 80 mm. 55 mm.)
319.100	Set of scrims - Stainless steel
319.101	Full single scrim - Stainless steel
319.102	Full double scrim - Stainless steel
319.103	1/2 single scrim - Stainless steel
319.104	1/2 double scrim - Stainless steel
91.210	Aluminum black painted "C" clamp to hang fixtures overhead and for mounting on pipe with diameters up to 52 mm. (2"), with safety pin (no adapters)
93.102	Extruded Black "C" Clamp with M 12 Threaded Stud
93.103	Extruded Black "C" Clamp with M 10 Threaded Stud
20.100	Safety cable 800 mm. long with 4 mm. diameter steel rope and safety catch.
DGP-A1035 CS	Combo steel stand 35
DGP-A9000N	Wheel set with brakes

Data Sheet

ENERGY SAVINGS:

The Energy Savings introduced by this products are remarkable. The following table shows a Comparison of the energy conversion for both Tungsten and Daylight LED LEONARDO 6 when compared respectively to 1kW Tungsten Fresnel and to a 400W HMI, which are the equivalent lighting performance conventional fixtures, when analysing the output beam from middle to full flood:

DE SISTI - LED LEONARDO 6 Energy & Thermal Savings versus equivalent Conventional Fixtures

The DE SISTI LED FRESNELS Tungsten are:
- 100% Dimmable locally or via DMX with super smooth dimming dynamics
- No separate DIMMERS required (No Dimmer Room and Simpler Cabling system)
- All self contained in the Luminaire housing (no separate ballasts or power supply)
- Power and DMX Daysy chain able
- High energy savings when compared to Tungsten Fixtures with negligible POWER REQUIREMENTS and very low Thermal Emission for contained cooling systems in the studio.
- Extremely contained Maintenance (mostly cleaning): no lamps replacement

LED LEONARDO 6
110W Tungsten balanced CCT
Energy & Thermal Savings versus equivalent Filament Fixture

The lighting Performances of the 110W Tungsten Balanced CCT are comparable from medium to full flood to those of a 1000W tungsten Fresnels

ENERGY CONVERSION	Tungsten Fresnel	1.000 W	LED Fresnel	110 W
Visible Light	8%	80 W	25%	28 W
IR	73%	730 W	0%	0 W
UV	0%	0 W	0%	0 W
Total Radiant Energy	81%	810 W	0%	0 W
Heat (Conduction + Convection)	19%	190 W	75%	83 W
Total Power Consumption of Lighting Fixture	100%	1.000 W	100%	110 W
Total % of Input Energy converted in Thermal Dissipation	92%	920 W	75%	83 W
ENERGY SAVINGS on LIGHTING FIXTURE consumptiom with DE SISTI LED	89%	Using the DE SISTI LED instead of Tungsten Fixtures		
THERMAL EMISSION SAVINGS with DE SISTI LED	91%			
BTU to refrigerate the Dissipation of the Lighting Fixture		3.140 BTU		282 BTU
HVAC Power Consumption to produce the above BTU		293 W		26 W
Tot. CONSUMPTION in kWhrs in 2600 hrs (typical yearly use)		3.362 kWh		354 kWh
TOTAL yearly cost for Electricity per Fixture with 1 kWh = 0,2 €		€ 672,39		€ 70,87
TOTAL ENERGY SAVINGS with DS LEDS = on LIGHTING FIXTURE + HVAC consumptiom	Per Fixture Savings	€ 601,5	Per Fixture Savings in %	89%

The DE SISTI LED FRESNELS Daylight are:
- much less expensive then equivalent HMIs fixtures
. They are 100% Dimmable locally or via DMX with super smooth dimming dynamics
- All self contained in the Luminaire housing (no separate ballasts or power supply)
- Power and DMX Daysy chain able
- Yet introduce significant energy savings when compared to HMIs
- Extremely contained Maintenance (mostly cleaning): no expensive lamps replacement

LED LEONARDO 6
110W Daylight balanced CCT
Energy & Thermal Savings versus equivalent Daylight Discharge Lamp Fixture

The lighting Performances of the 110W Daylight Balanced CCT are comparable from medium to full flood to those of a 400W HMI Fresnel.

ENERGY CONVERSION	HMI Fresnel	400 W	LED Fresnel	110 W
Visible Light	27%	108 W	25%	28 W
IR	17%	68 W	0%	0 W
UV	19%	76 W	0%	0 W
Total Radiant Energy	63%	252 W	0%	0 W
Heat (Conduction + Convection)	37%	148 W	75%	83 W
Total Power Consumption of Lighting Fixture	100%	400 W	100%	110 W
Total % of Input Energy converted in Thermal Dissipation	73%	292 W	75%	83 W
ENERGY SAVINGS on LIGHTING FIXTURE consumptiom with DE SISTI LED	73%	Using the DE SISTI LED instead of Discharge Fixtures		
THERMAL EMISSION SAVINGS with DE SISTI LED	72%			
BTU to refrigerate the Dissipation of the Lighting Fixture		997 BTU		282 BTU
HVAC Power Consumption to produce the above BTU		93 W		26 W
Tot. CONSUMPTION in kWhrs in 2600 hrs (typical yearly use)		1.282 kWh		354 kWh
TOTAL yearly cost for Electricity per Fixture with 1 kWh = 0,2 €		€ 256,37		€ 70,87
TOTAL ENERGY SAVINGS with DS LEDS = on LIGHTING FIXTURE + HVAC consumptiom	Per Fixture Savings	€ 185,5	Per Fixture Savings in %	72%

Data Sheet

DE SISTI LED FRESNELS – LIGHTING QUALITY FIRST:

When choosing a FRESNEL you are expecting:

- Appropriate and effective Focusing Range from Spot to Flood
- Single shadows and their consistency within the Flood Field
- Even and wide Flood with appropriate Barn-door capability

This is exactly what you get with the DE SISTI LED FRESNELS.

The Internationally Patented Optical system specifically developed by DE SISTI to optimize the use of a LED Engine Technology in combination with a Fresnel Lens (or a Plano Convex) is providing to the DE SISTI LED FRESNELS the exact same lighting projection you would expect from a Standard Fresnel.

The following EXAMPLE SHOWS a COMPARISON between:

LED FIXTURE by "OTHERS" NOT REAL FRESNEL performances

- The Beam in full flood is NARROW (only 45°) and shows an HOT SPOT (large area to go from Beam to Field Angle)

- The Barndoor in a NOT REAL FRESNEL optics does not work properly: the projection is OVAL and the more you barndoor the more you dim the central beam

LED FIXTURE by "DE SISTI" EXACT FRESNEL performances

- The Beam in full flood is LARGE (above 60°), even and flat (No Hot Spots and rapid passage from Beam to Field Angle)

- The Barndoor on the DE SISTI LED FRESNEL has exactly the same functionality obtained with a PROPER FRESNEL optics.