

NOVA Energy & Automation



Product Specifications

MaxLumen MRI LED Diffused Lighting

Model MXLumen22-X

03 January 2012

Product Description

1. Standard Applications

The Nova Max Lumen LED 2x2 light fixture was developed specifically for use inside MRI imaging suites to provide entire room illumination while emitting no electrical magnetic interference and shielded to prevent distortion from the high frequency noise emitted from the MRI machine. The LED system provides maintenance free operation with a rated LED life of 10 years. The Max Lumen LED 2x2 is fully dimmable and provides a smooth linear dimming when used in conjunction with the Nova Dimming controls.

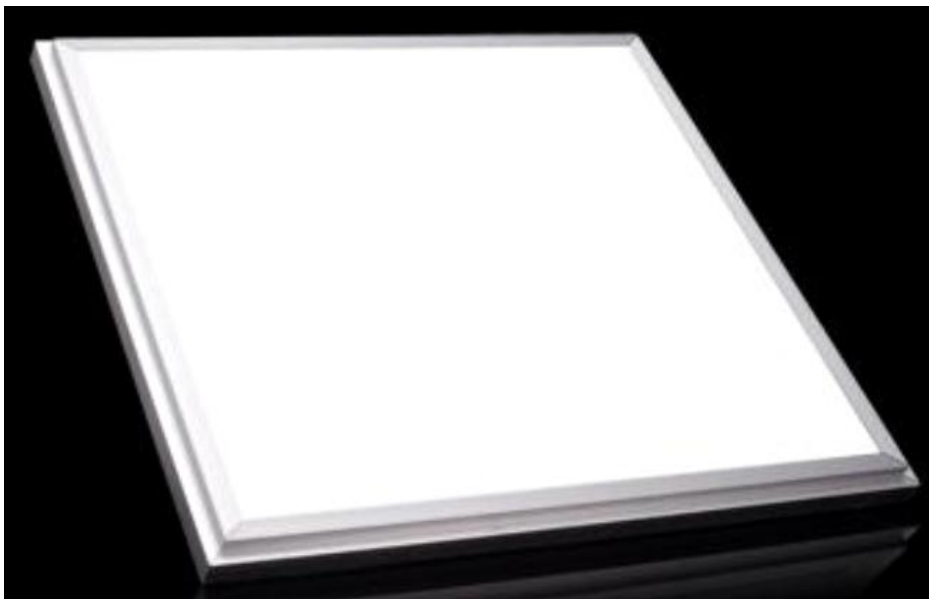


Figure 1 Nova Max Lumen LED 2x2 fixture

2. System Compatibility

The Nova Max Lumen LED 2x2 light fixtures are designed, shielded, and tested specific for MRI applications including MRI installations including 3T.

3. Features/ Benefits

Features

- ETL, cETL, CE listed, tested to UL standards to conform to NEC.
- Labeled to conform with NFPA99, NFPA-70.
- MRI tested
- Multiple configurations to fit the budget and architecture of the room
- Factory wired and tested.
- Shielded Electronics
- Non Ferrous Construction- Constructed with light weight aluminum extrusions and commercial grade stainless steel hardware
- Photography grade acrylic diffuser
- White Powder Coated Finish
- Remote Modular Power Supply
- Smooth Linear Dimming Control
- High Efficient LED technology 91 lm/W
- Multiple color temperatures available from warm, natural and cool white
- LM-79 IES tested
- RoHS certified
- Low Watt LED array dissipates heat without the need for heavy heat sinks
- Maintenance free LEDs provide a 10 year illumination life span
- No UV or IR Radiation
- 4 corner earthquake bracing

Benefits

- Designed, tested, and installed on several projects world wide
- Manufactured using the highest quality components for high reliability and long life
- Available to ship in 3 weeks
- Thin, Light Weight, Durable Panels
- Even and diffused Illumination
- Simplified Wiring
- 500% reduction in energy consumption as compared to MRI DC Lighting
- Cool to the touch, reduces building heat load
- Reduces Building Carbon Footprint
- No Bulbs to replace
- Save on initial cost- The Nova MaxLumen LED system provides substantially more lumens per fixture than comparable products, requiring fewer fixtures per room.
- The MaxLumen LEDs do not require a large, expensive DC power supply that would be needed on an incandescent installation.
- Save On Maintenance Costs- MRI lighting with traditional incandescent DC power require lamp maintenance at ½ the rated life of the lamp- requiring a maintenance technician to enter the room with the proper non ferrous tools every 4 months and change out the lamps.
- Reduce Insurance Liability- the risk of injury to a maintenance technician changing lamps is completely eliminated. The room will always be properly lit to the desired foot candle which will reduce the risks to patients and staff associated with a poorly lit procedure room.

4. Specifications

Model	MxLumen22- X (3 rd generation)
Application	MRI LED Light Fixture
Input Voltage	24-28V DC (See Power Supply Specifications)
Current	1400mA
Power Classification	Class 2 power limited circuit
Power Consumption	42W ± 2W
Power Factor	>0.95
LED Count	729
Luminous Flux	3850± 50 lm
Luminous Efficacy	91lm/W
Color Temperature	Warm White: 2800-3200 K Part Number MxLumen22-W Natural White 4250-4750 K Part Number MxLumen22-N Cool White: 5500-6500 K Part Number MxLumen22-C
CRI	>85
Beam Angle	150 ⁰
Lighting Source	LED Array
Approvals	ETL, cETL, CE, RoHS, IES LM 79, California title 24

5. Weight and Dimensions

Mounting	Surface or hard lid or suspended ceiling grid installation
Dimensions	23.74" (603mm) x 23.74" (603mm)
Depth	1.57" (40mm)
Weight	9 lbs
Enclosure	Aluminium Extrusion
Finish	White housing with brushed aluminium trim
Lens Type	1/8" Frosted Acrylic diffuser
Environment	Indoor use only
Operating Temperature	-4~104 ⁰ F (-20~40 ⁰ C)

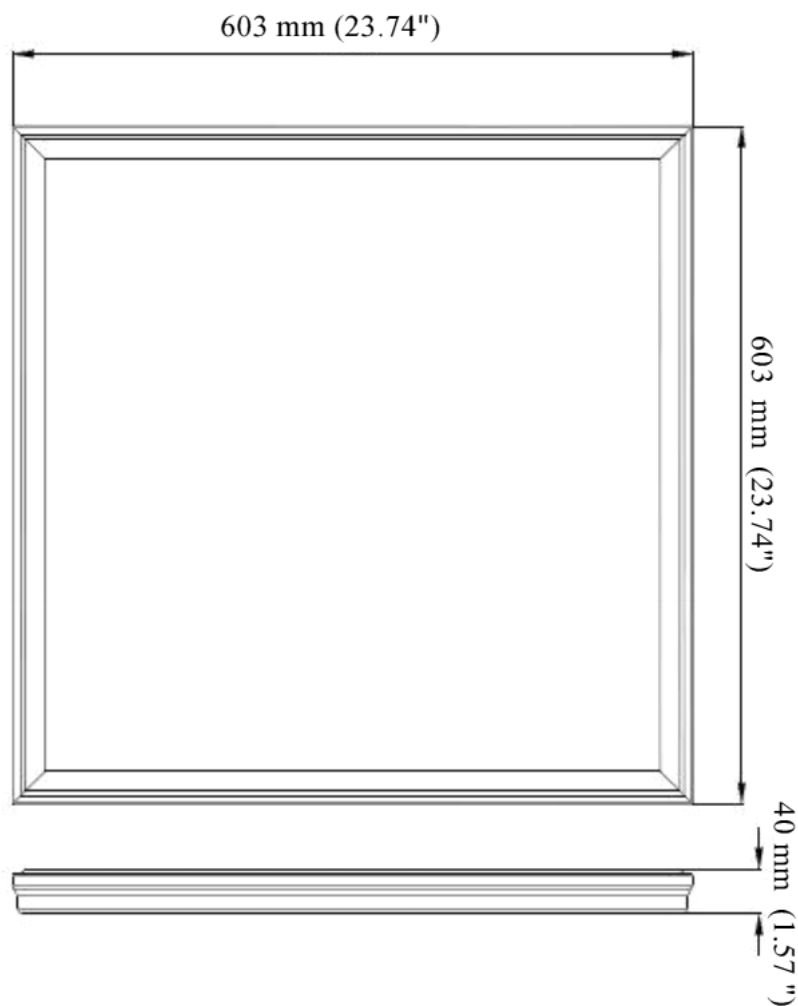


Figure 2 Dimensions: Outside, Mounting, Depth

6. IESNA LM 79 Test Results

IES file available for download.

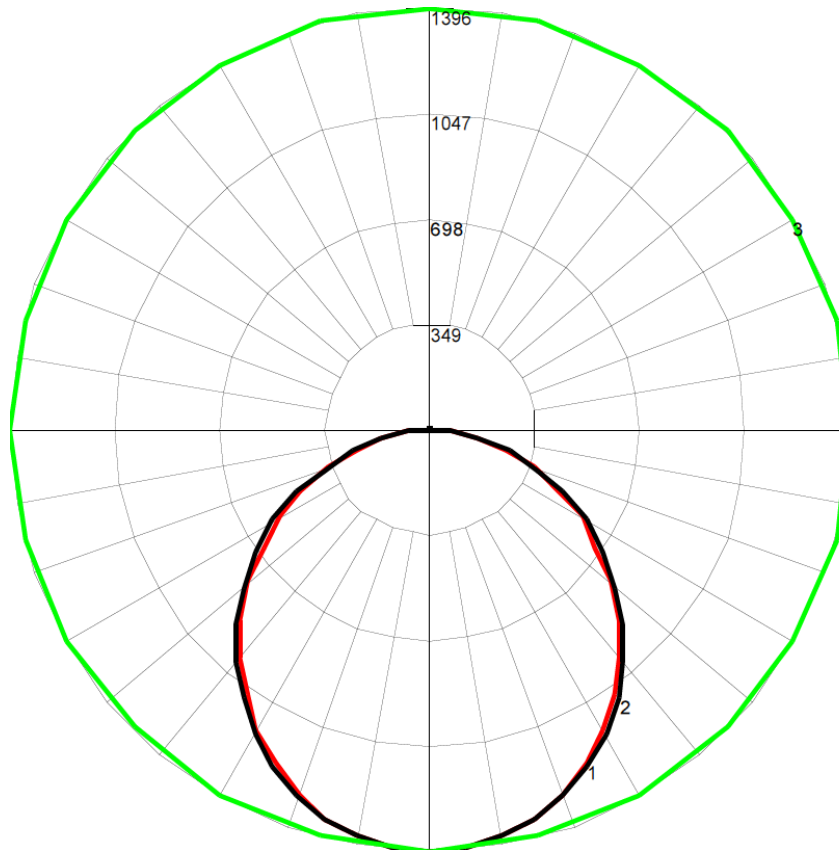


Figure 3: Polar Graph

Maximum Candela = 1395.85 Located at Horizon Angle =0, Vertical Angle = 0

#1 – Vertical Plane Through Horizontal Angles (0-180) Red

#2 Vertical Plane Through Horizontal Angles (90-270) Black

#3 Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.) Green

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Fixture
0-30	1071.91	27.4	27.4
0-40	1744.93	44.6	44.6
0-60	3055.28	78.1	78.1
0-90	3894.93	99.6	99.6
90-120	7.34	.2	.2
90-130	9.77	.2	.2
90-150	113.32	.3	.3
90-180	16.68	.4	.4
0-180	3911.61	100	100
Total Luminaire Efficiency = 100%			

Luminance Data (cd/sq.m)			
Angle	Average 0-deg	Average 45-deg	Average 90-deg
45	4324	4381	4428
55	4070	4155	4241
65	3838	3922	3982
75	3453	3527	3629
85	2662	2704	2808

Candela Tabulation					
	0	30	45	75	90
0	1395.85	1395.85	1395.85	1395.85	1395.85
5	1388.55	1388.16	1388.95	1388.87	1389.03
15	1329.66	1330.76	1332.05	1333.99	1334.62
25	1218.87	1221.11	1224.97	1230.33	1230.25
35	1064.74	1071.27	1075.81	1084	1085.11
45	885.38	891.06	896.93	905.56	906.67
55	675.99	683.76	690.09	702.6	704.43
65	469.64	474.77	479.93	488.21	487.31
75	258.77	261.49	264.3	269.85	271.95
85	67.19	67.37	68.23	70.48	70.87
90	7.97	8.43	8.44	8.17	6.09

7. Power Supply

The Nova Max Lumen LED Power Supply is the ideal LED power supply to meet the hospital-grade lighting power requirements of RF-shielded MRI suites. The voltage regulation and performance characteristics of the LED Lighting Control Unit offer a significant advantage over competing products. As a single phase or 3-phase (optional), solid state DC power supply, the LED Lighting Control Unit assures a highly-filtered, regulated, dimmable, DC output, and provides illumination without image interference.

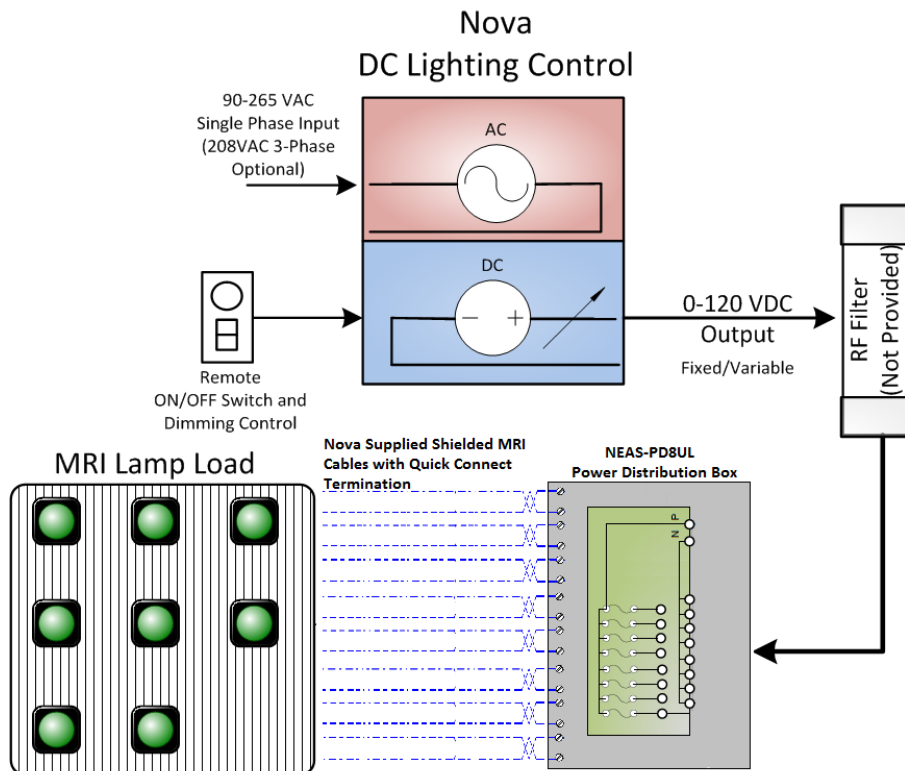


Figure 1 Typical LED Power Supply One-Line

8. System Compatibility

The Nova 24-28V LED Power Supply are designed, filtered, and tested specific for MRI applications including MRI installations up to 3T. The Nova LED Lighting System has been successfully installed on MRI installations from OEMs including: Toshiba, GE, Siemens, and Philips.

9. Features/ Benefits

Features

- ETL, cETL, CE listed, tested to UL standards to conform to NEC.
- Labeled to conform with NFPA99, NFPA-70.
- MRI tested
- Multiple configurations to fit the budget and architecture of the room
- Factory wired and tested.
- Filtered Power
- Smooth Linear Dimming Control
- RoHS certified
- Pre wired Pre-terminated Power Distribution Box
- Includes MRI Shielded Cables
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Benefits

- Designed, tested, and installed on several projects world wide
- Manufactured using the highest quality components for high reliability and long life
- Available to ship in 3 weeks
- Thin, Light Weight, Durable Panels
- Simplified Wiring
- 500% reduction in energy consumption as compared to MRI DC Lighting
- Cool to the touch, reduces building heat load
- Reduces Building Carbon Footprint
- Save on initial cost
- Fast Installation



Figure 2 MRI LED Power Supply

10. Power Supply Specifications

Dimming LED Power Supply

Model	NEAS-DLPS-24		
Application	Dimming 24-28V DC MRI LED Power Supply		
Output Voltage	24-28V DC		
Output Power	240W	320W	480W
Input Voltage	120/ 277	120/ 277	120
AC Input Current	2.1A	2.8 A	4.3A
Output Current	10A	15A	20A
Efficiency	95%	95%	92.7%
Number of Fixtures	6	8	10
Part Number	NEAS-DLPS-24-240	NEAS-DLPS-24-320	NEAS-DLPS-24-1-480

Lifetime Expectancy	> 130k Hrs
Noise Voltage max	<50mVpp
Output Over Voltage Protection	Typ 30.5VDC max 32Vdc
Over Temp Protection	Shutdown & Auto Restart
Input Transient Voltage Protection	MOV (Metal Oxide Varistor)
Power Classification	Class 1 power limited circuit

Dimming Mode	Pulse Width Modulation
Operating Frequency	390 Hz
Dimming Range	0-100%

11. Power Supply Weight and Dimensions

The controller may be semi flush mounted within a 6" deep wall. This will leave exposed approximately 2.27" extending past the finish drywall surface.

Model	NEAS-DLPS-24
Dimensions	Height: 15.75 (400mm) Width:13.77" (350mm) Depth: 5.99" (150mm)
Weight	30 lbs. (14 kg)
Mounting	Rear wall mounting holes (4). Spaced 0.79" (20mm) from enclosure edge. Optional mounting brackets are available
Enclosure	16 Gauge Carbon Steel, all rounded corners 1 gland plate in the enclosure base.
Enclosure Sealing	Foamed-in place polyurethane door gasket
Finish	Dip coat primed, powder coated in textured RAL 7035
Latching Mechanism	Two ¼ turn latches with double-bit inserts (cam lock). Door is hinged on left side but can be swapped if specified when order is placed.
Interior Panel	Zinc-Plated subpanel
Protection Category	IP 66 to EN60 529/09:2000, complies with NEMA 4 Enclosure Approvals: UL, CSA, TUV, GL, Lloyds, VDE, Bureau Veritas

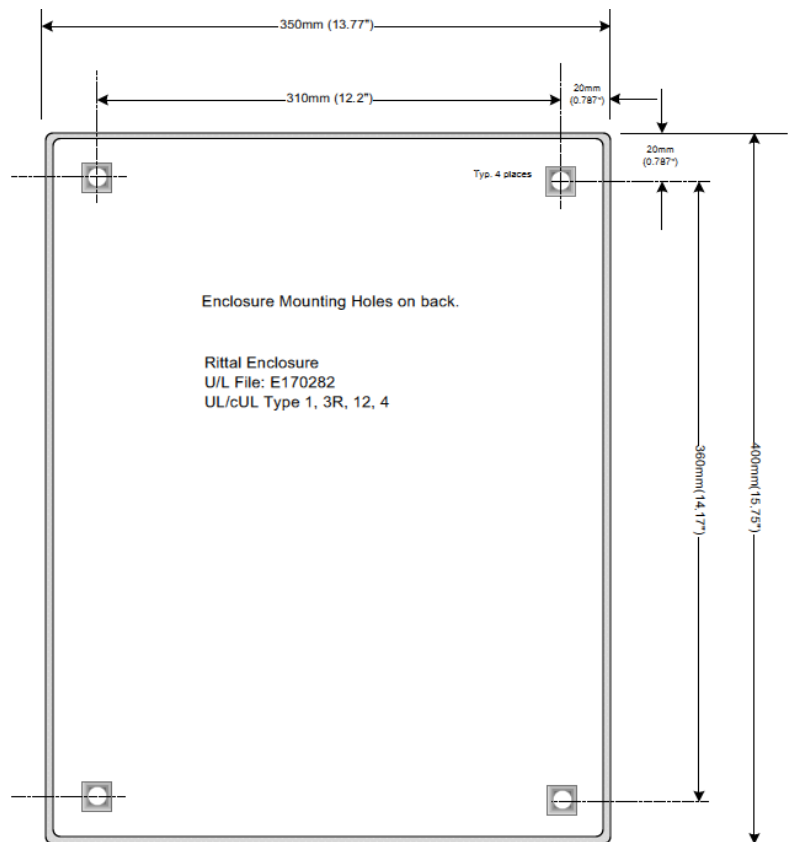


Figure 3 LED Power Supply Mounting Diagram

12. Class 2 Power Distribution Panel Specifications

The Class 2 Power Distribution Panel allows intrinsically safe (NEC Article 504) class 2 low voltage wiring to be completed using a single class 1 RF Filter

Model	NEAS-PD8UL, NEAS-PD16UL
Application	Class 1 to Class 2 Power Distribution Panel
Incoming Voltage	24VDC
Incoming Current	10A/ 20A
Lighting Load	8/16 Circuit, Class 2 Power Limited 3.5A
Dimensions	10”Hx 6” W x 4” D



Figure 3: MRI LED Class 2 Power Distribution

13. MRI Shielded Cable Specifications

The 50' Pre-terminated MRI Shielded Cable with quick connect termination comes installed and connected to the Power Distribution Panel (1 cable/ fixture) and allows each light to be installed with no additional tools.

Model	MXLumen-Cable
Application	MRI Shielded cable with quick connect termination
Cable Size	20 AWG
Termination at Power Distribution Box	Pre Wired and terminated
Termination at Light Fixture	Quick Connect Plug (no tools required)
Length	50 feet

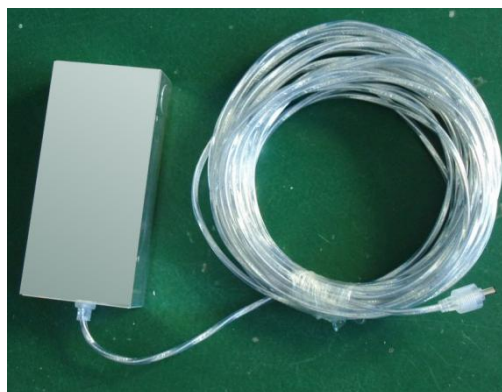


Figure 4: 50' MRI Shielded Cable- Pre-terminated with a quick connect for fast installation- no tools or conduit needed

Dimming Controls

The LED Dimming switch is proprietary to the power supply, and it is not recommended to use dimming controls from other manufacturers

Model	LED-DSW
Application	0-10V Dimmer Switch for LED lighting



Figure 7: MRI LED Dimming Control

14. Additional requirements

RF Filter

The RF filter is typically provided and installed by the shielding contractor. There are no special requirements for this item, a typical off the shelf 30A filter will meet the needs of the LED lighting circuit.

Model	RF Filter supplied by shielding contractor
Description	Typical 30A MRI filter, no special requirements
Quantity	Minimum 1
Suggested Manufacturer	Filcoil or equal
Suggested Part Number	FC-3147 or equal

15. Example Projects



29ft L x 17ft W MRI room

1.5T magnet

7 LED 2x2 fixtures



26ft L x 16ft W MRI room

1.5T magnet

6 LED 2x2 fixtures

4 LED 2x2 sky ceiling mural



26ft L x 19ft W MRI room

3T magnet

8 LED 2x2 fixtures

6 LED 2x2 Sky Mural



24ft L x 15ft W MRI room

3T magnet

6 LED 2x2 fixtures

16. Product Service and Technical Assistance

Nova Automation, LLC
2722 N. Avondale Blvd
Milwaukee WI 53210
PH# 414-779-NOVA

Website: www.NovaAutomation.Net

17. Warranty

This limited warranty set forth below is given by Nova Automation (“Seller”) with respect to the electrical equipment (“Product”) packaged with this limited warranty. The Product, when delivered to you in new condition in its original packaging, is warranted against defects in materials or workmanship as follows: For a period of three (3) years from the date of original purchase, defective parts or a defective Product returned to a Seller, or its authorized service providers, as applicable, and proven to be defective upon inspection, will be repaired, or exchanged for a new Product, as determined by the Seller, or the authorized service provider.

This limited warranty covers all defects encountered in normal use of the Product, and does not apply in the following cases: Loss of or damage to the Product due to abuse, mishandling, alteration, accident, electrical current fluctuations, failure to follow operating, maintenance or environmental instructions prescribed by Seller, failure to follow Sellers installation instructions, or service performed by someone other than Seller or its authorized service provider.

Nova assumes no responsibility for labor or freight costs incurred in connection with the installation, removal, or replacement of products determined to be defective or any consequential or incidental damages arising from the use of the product. Nova Automations entire liability on any claim of loss or damage resulting from a defective product is limited to the replacement of the product.

WARRANTY IS VOID IF PRODUCT IS NOT USED FOR THE PURPOSE FOR WHICH IT WAS MANUFACTURED.