Kenall is dedicated to solving the most difficult lighting challenges faced by healthcare design and facilities professionals. One such challenge is the magnetic imaging or the MRI suite.

MRI systems utilize powerful magnets capable of propelling ferrous metal objects into the scanner envelope at dangerously high velocities. They also emit powerful radio frequency (RF) pulses that can interfere with other electronic equipment in the suite. Just as important, machine generated images can be compromised by externally generated RF emissions. As a result, MRI luminaires must be free of ferrous metals, and can neither create objectionable interference nor be susceptible to these powerful MRI machine RF pulses. Traditionally, low voltage incandescent sources in non-ferrous enclosures have been used for these spaces, but this approach has significant limitations including extremely short lamp life, high energy cost, fixed lumen levels and limited fixture choices.

After years of rigorous research development and testing, we are proud to introduce a broad line of aesthetically pleasing, non-interfering and non-susceptible LED luminaires for imaging/MRI suites. Our Envela® architectural downlights, CleanScene™ graphic ceiling fixtures, Auracyl™ wall sconces and Stratalume MRI™ undercabinet fixture systems all deliver safe and dependable illumination even in suites equipped with the most powerful and advanced MRI equipment. They provide the patient with the pleasing aesthetics, exceptional visual comfort, dimming and scene settings to help transform traditionally intimidating, institutional spaces into more comfortable and calming environments.

We are so confident of our system’s compatibility with MRI/imaging suites that our products are covered by the industry’s first guarantee related to emissions and susceptibility, the unique ScanSafe Guarantee™ from Kenall. Because our LEDs are designed for a service life of over 50,000 hours, they require virtually no maintenance once installed. When you install Kenall’s LED lighting systems you will never have to worry about the integrity, dependability or longevity of your MRI lighting system again.

KENALL MRI PRODUCT WARRANTY
When installed properly, Kenall’s MRI luminaires are warranted to be free of defects in workmanship and materials for a period of one year from the date of invoice. The DC power supply contained in the external power supply carries a five-year warranty from the date of invoice.

The warranty is void if all power and dimming signal wiring is not completely shielded in grounded conduit and installed with a suitable MRI room filter (by others).

Kenall reserves the right to issue credit, repair or replace the defective merchandise, at its discretion, upon notification and confirmation by its local representative of the defect. Kenall also reserves the right to examine the defective product if the defect is questionable and to deny the warranty herein for any product altered, improperly installed or installed in applications for which it is not intended.

Kenall 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 other consequential or incidental damages arising from the use of the product. Kenall’s entire liability on any claim of loss or damage resulting from a defective product is limited to the replacement price of the product.

The foregoing warranty is exclusive of all other warranties and no other warranties of any kind are expressed or implied.

SCANSAFE GUARANTEE™
Kenall will repair or replace any MRI LED product, for a period of one year, when installed according to our instructions, that fails to perform to applicable MRI room interference and susceptibility standards.

In addition, Kenall will repair or replace only LED products that fail to provide 70% of rated light output for five years from its date of installation.

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James Hawkins, President
Kenall Manufacturing
MEDMASTER™ LED PRODUCTS FOR MRI IMAGING SUITES

All Kenall MRI lighting systems are patent pending.

MEDMASTER ENVELA® SEALLED ARCHITECTURAL REGRESSED AND FLUSH LENSED DOWNLIGHTS

The new Envela Series incorporates an aesthetically pleasing regressed lens into a high performance, sealed unit without external doors or fasteners. A flush lens version is also available. The downlights are available in a 6-inch aperture with dimmable LED and feature a smooth, die-cast trim ring with a choice of reflector finishes.

MRIRDL – MRI Imaging Suite Regressed Downlight
MRIDL – MRI Imaging Suite Downlight with flush lens

Product features: pages 12-15  Specification sheets: pages 36-37

MEDMASTER™ CLEANSCENE™ LED LIGHTBOXES

The 2'x2', 2'x4', and 4'x4' LED MedMaster CleanScene graphic image lightbox allows for beautiful backlit images to be uniformly displayed in MRI/imaging suites. Kenall’s high resolution, fade-resistant images are produced using the best quality photographic process available. The fixtures are available in dimmable, 6500K daylight-balanced LED. Choose from wide variety of graphic images and luminaire combinations.

CSMRI22 (2’x2’)  CSMRI24 (2’x4’)  CSMRI44 (4’x4’)

Product features: pages 16-17  Specification sheets: pages 29-31

MEDMASTER AURACYL™ – SCALABLE, ARCHITECTURAL SEALED SCONCE

The MedMaster Auracyl is an attractive line of wall mounted luminaires that meet the aesthetic and functional challenges often encountered in MRI/imaging and healthcare applications. With its clean, simple lines and gentle curves, the Auracyl’s timeless styling complements a wide range of interior designs. Available in 1’, 2’, 3’ and 4’ lengths in dimmable LED, the luminaire scale makes it suitable for any setting.

MRIMAS813 (8”x13”)  MRIMAS826 (8”x26”)
MRIMAS838 (8”x38”)  MRIMAS850 (8”x50”)


MEDMASTER ENVELA® SEALED ARCHITECTURAL LUMINAIRE

The new Sealed Envela Series for MRI/imaging suites provides smooth, ambient illumination from its high performance LED source. This unique patented optical chamber eliminates the glare and reflections that are commonly found in traditional lensed units and is perfect for perimeter illumination in imaging suites, patient waiting areas and control rooms.

ME11MRI (1’x1’)

Product features: pages 6-7  Specification sheets: page 28

STRATALUME™ MRI UNDERCABINET LIGHTING

Stratalume MRI provides the features and options that make them appropriate for MRI/imaging and control room environments where high quality undercabinet task lighting is needed. The extruded, non-ferrous aluminum housing and dimmable LED source is an excellent choice for installations mounted to fine custom millwork or high-end furniture systems.

MRIAUC

Product features: pages 18-19  Specification sheet: page 38
Lighting for the control room of MRI/imaging suites requires the combination of even ambient and non-glare task illumination with the added flexibility of dimmable control.

Providing for patient comfort during imaging procedures is achieved with gentle ambient illumination and decorative sconces along with the calming effects of beautiful graphic image lightboxes.
Ambient illumination can also be achieved from a variety of light sources where light levels can be adjusted through conventional dimming or through sophisticated control systems.

All line voltage and 24-volt DC power supplies, RF filtering and dimming control systems are located in an adjacent equipment room with general illumination.
MRI/imaging rooms require soft, ambient dimmable illumination in order to maintain a calm, comforting environment for patients. Low brightness with soft light distribution is ideal for patients undergoing scan procedures, especially children.

The new MedMaster Envela ambient ceiling fixture for MRI/imaging rooms (ME11MRI Series) meets this need with a functionally designed, yet aesthetically pleasing luminaire.

The Envela ambient fixture features a 24-watt, 3000K or 4000K high brightness, dimmable LED source with equivalent light output to a 32-watt CFL. Its high transmittance, frosted lens provides smooth, homogenous light levels for the imaging and control room areas of the MRI suite. This non-ferrous, tool-less fixture is designed for easy installation and maintenance while preserving the integrity of the sealed environment. Its smooth surfaces prevent dust and other contaminants from collecting and it successfully stands up to the most rigorous of cleaning protocols.
**MEDMASTER ENVELA® Product Features**

1. Patented, fully gasketed, sealed optical chamber
2. Door-less design with tool-less access for maintenance
3. One-piece seam welded aluminum housing construction for strength and durability
4. Extruded low-glare frost lens (high light transmittance)
5. Optional clear DR acrylic lens with internal perforation
6. One-piece seam-welded aluminum reflector with 94% reflectance polyester powder finish

- Requires 24-volt DC (120-240V AC) remote-mounted, high-power factor power supply (page 23)
- 5%-100% dimming range capable
- Certified to UL 1598 and UL 8750 standards
- NSF2 Splash and Non-Food Zone listed
- IP64 rated
Creating a comforting and pleasing environment is the goal of lighting specifiers when designing MRI/imaging suites for healthcare facilities. Kenall’s MedMaster Auracyl Sconce (MRIMAS Series) provides attractive accent lighting with superior performance in critical surroundings.

The Auracyl Sconce’s clean, simple lines and gentle curves complement a wide range of architectural and interior designs that can extend beyond MRI/imaging suites and into patient rooms, hallways, lobbies, atriums and other public spaces. This allows the designer to use the Auracyl as an element of design consistency that can be scaled to any room throughout the facility.

This advanced lighting system is available with a long-lasting LED source in either 3000K or 4000K and a specially designed, 24-volt DC remote mounted high-power factor supply to ensure non-interference and compatibilities with sensitive medical equipment. The Auracyl can also be dimmed with any standard 0-10V analog dimmer to 5% and meets the most stringent requirements for electromagnetic compatibility with MRI equipment.

The sconce is sealed for infection control and is NSF2 Splash/Non-Food Zone certified. Optional IP64 rating to IEC 60598 is also available to protect against moisture, contaminant and debris infiltration.

With its wide selection of housing finishes and lens textures/patterns, beautiful illumination and technical compatibility, the Auracyl Sconce is a complete lighting system.
MEDMASTER AURACYL™ Product Features

1. Non-ferrous, marine grade extruded aluminum housing with die-cast end caps. Antimicrobial finish available.
2. Frosted, high transmittance extruded acrylic lens for maximum uniformity.
3. Die-formed non-ferrous marine grade aluminum reflector with 92% reflectivity.
4. Sealed construction keeps out contaminants, dirt and liquid for infection control and facilitates cleaning.

- Requires 24-volt DC (120-240V AC) remote-mounted, high-power factor power supply (page 23)
- NSF2 Splash and Non-Food Zone listed
- Optional IP64 certified in compliance with IEC 60598
- U.S. Patent Number D610,294
- ADA compliant

**DECORATIVE OUTER LENS**

- AS Frosted Acrylic (Standard)
- CAP Clear Acrylic w/Inner Perforation
- NL Natural Leaf*
- SS Silver Spun*
- OL Oyster Linen*
- ST Saffron Taipei*
- PL Paper Leaf**

*Lumicor®Lumiclear™ Acrylic Resin
**Lumicor® Lumiform™ PETG Resin

Lumicor® is a registered trademark of Lumicor, Inc., the leader in encapsulated resin technology. All Rights Reserved.

**FRAME FINISH**

- MB Matte Black
- MW Matte White
- WS Warm Satin Painted Anodized
- CS Cool Satin Painted Anodized
- BR Bronze (Architectural)
- BE Beige

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COMPLEMENTARY APPLICATIONS

Although the MedMaster MRI Product Specification Guide is devoted to luminaires for the MRI/imaging Room (Zone 4), matching, non-MRI configured fixtures are also available for any unshielded area within the suite (Zone 1 through 3).

SCALABLE ACCENT LIGHTING

Available in 1', 2', 3', and 4' lengths, the Auracyl Sconce looks equally at home in MRI/imaging rooms, patient waiting rooms, dressing areas or corridors. Auracyl Sconces are ideal for both accent lighting and contributing to ambient levels. IES formatted photometrics are available for standard lens. Translucence data for optional lens materials is provided for photometric calculations specific to lens selection.

EASE OF INSTALLATION AND MAINTENANCE

The MedMaster Auracyl Sconce was designed for ease of installation and maintenance. Wall attachment is simple with its standard four- or six-point mounting on the baseplate. With its NSF2 listing, the luminaire will stand up to non-abrasive cleaning protocols in demanding environments.

ADA COMPLIANT WITH SOFT WALL WASH EFFECT

The clean lines and gentle curves of the luminaire are highlighted by the standard backlighting component. The low profile design of the MedMaster Auracyl Sconce is also ADA compliant.
MEDMASTER ENVELA® Sealed Regressed Downlights

Downlights are commonly used in MRI/imaging suites and must provide smooth, low-glare illumination for patient comfort. Kenall’s line of downlight luminaires offer a variety of options to meet the needs of these applications with a high performance, dimmable LED light source.

The LED MedMaster Envela Regressed Downlight (MRIRDL Series) incorporates aesthetically pleasing, even illumination into a architectural-grade, sealed regressed lens unit that is perfect for MRI, imaging and control rooms. The Envela Regressed Downlight features a clear, semi-specular, spun aluminum reflector with 45% cutoff.

The sealed lamp compartment is specially designed to ensure that environmental integrity is maintained during cleaning or servicing. Additionally, the intelligent, tool-less design allows for easy installation and maintenance.

The fixture provides 1842 lumens from its 26-watt LED source, available in either 3000K or 4000K, and achieves a 1.4 s/mh. The Envela Sealed Regressed Downlight has an equivalent light output to a 32-watt CFL, achieving 64 lumens per watt – the highest lumen output of any comparable, MRI safe luminaire.

The Envela Regressed Downlight is NSF2 Splash and Non-Food Zone listed for corrosion resistance, cleanability and lack of toxicity and is able to withstand the most stringent cleaning protocols for healthcare environments.

www.kenall.com P: 800-4-Kenall Email: info@kenall.com 1020 Lakeside Drive Gurnee, Illinois 60031

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MEDMASTER ENVELA® Sealed Regressed Downlight Features

1. Fully gasketed, sealed regressed lens and optical chamber
2. Adjustable mounting frame for strength and durability
3. MRIRDL Series features tool-less access with hidden spring clips for easy relamping and maintenance
4. Marine-grade, die-cast aluminum trim ring with antimicrobial white polyester powder finish
5. Spun aluminum reflector with clear, specular, low iridescent anodized finish

- Reflectors finishes: Antimicrobial Low-Gloss White, Clear semi-specular (Standard)
- Requires 24-volt DC (120-240V AC) remote-mounted, high-power factor power supply (page 23)
- 5%-100% dimming range capable
- Certified to UL 1598 and UL 8750 standards
- NSF2 Splash and Non-Food Zone listed
- IP64 rated
MEDMASTER™ MRI Flush Lens Downlights

Another downlight option from Kenall is the Flush Lens Series (MRIDL) that provides a one-piece housing and flush lens surface for cleanability. The MRIDL assures that plenum contaminants won’t enter the room through the fixture or its mounting when properly installed.

With a clear tempered glass lens, the fixtures are free from surface contaminants, are easy to clean and able to withstand extreme cleaning protocols without sustaining damage. Further, these fixtures provide EMI protection – they won’t expose sensitive electronic equipment to problematic levels of electromagnetic interference.

Kenall’s line of downlights offer a variety of options to meet the needs of these applications with a high performance, dimmable LED light source.

The MRIDL provides 1285 lumens from its 30-watt LED source, available in either 3000K or 4000K and has an equivalent light output to a 26-watt CFL.

The MedMaster Flush Lens downlight is NSF2 Splash and Non-Food Zone listed for corrosion resistance, cleanability and lack of toxicity and are able to withstand the most stringent cleaning protocols for healthcare environments.
MEDMASTER™ MRI Flush Lens Downlight Features

1. Fully gasketed, sealed lens and optical chamber
2. Adjustable mounting frame for strength and durability
3. High efficiency symmetric diffusion inner lens
4. Marine-grade, die-cast aluminum trim ring with antimicrobial white polyester powder finish
5. Optional brushed stainless steel trim/reflector

- Reflector finish: Spun aluminum reflector with high-efficiency diffuse white coating
- Requires 24-volt DC (120-240V AC) remote-mounted, high-power factor power supply (page 23)
- 5%-100% dimming range capable
- Certified to UL 1598 and UL 8750 standards
- NSF2 Splash and Non-Food Zone listed

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MEDMASTER CLEANSCENE™

Healthcare facility architects, physicians and medical staff know the importance of patient comfort during MRI/imaging procedures. MedMaster CleanScene (CSMRI Series) Recessed Graphic Lightbox luminaires provide soothing images that create a serene ambiance, helping the patient take focus off of the medical procedure.

CleanScene’s nature scenes are produced from high resolution, fade-resistant photographic film with a protective, light diffusing sheath laminate – making them the industry’s most attractive line of backlit luminaires.

Additionally, Kenall images are more life-like because they are projected from considerably brighter 6500K daylight balanced LED’s.

MedMaster CleanScene luminaires for MRI are available in 2’x2’, 2’x4’ and 4’x4’ with replaceable, high-brightness LEDs. CleanScene also features a 5%-100% dimming range.

Choose from over 90 beautiful images of landscapes, trees, flowers or clouds in a variety of luminaire combinations. The entire CleanScene Image Gallery is available online at www.kenall.com.
The CleanScene doorframe is available in matte white or black finishes.

The Regressed Frame accessory adds depth by recessing the graphic two inches into the ceiling. When used in conjunction with multiple fixtures, the frame creates the illusion of a skylight and the proximity of open spaces.

The Regressed Frame Kit accessory is now available in matte white and black finishes for 2’x2’, 2’x4’ or 4’x4’ luminaire sizes.

- Requires 24-volt DC (120-240V AC) remote-mounted, high-power factor power supply (page 23)
- 5%-100% dimming range capable
- Certified to UL 1598 and UL 8750 standards
- NSF2 Splash and Non-Food Zone listed
- IP65 rated

REGRESSED FRAME KIT

The CleanScene doorframe is available in matte white or black finishes.

The Regressed Frame accessory adds depth by recessing the graphic two inches into the ceiling. When used in conjunction with multiple fixtures, the frame creates the illusion of a skylight and the proximity of open spaces.

White doorframe with matte white regressed frame

Black doorframe with black regressed frame
Kenall’s high performance Stratalume MRI provides high quality task illumination for MRI/imaging room technicians and other staff members.

With outstanding operational and performance benefits, the Stratalume MRI undercabinet task light is available in an 18-inch length with 16-watt high brightness LED (650 lumen output) or a 36-inch length with 32-watt high brightness LED (1000 lumen output).

Plus, the fixture has been designed for easy installation and maintenance with an easy-to-clean 100% DR acrylic lens that can be removed and reinstalled without tools. The Stratalume MRI features a non-ferrous housing, hardware and polycarbonate end caps. Further, its solid front design provides a sharp cutoff distribution, making it ideal for workstations and undercabinet installations.
STRATALUME™ MRI Product Features

1. Sharp cutoff distribution for workstations and undercabinet installations
2. External mounting feet allow installation without accessing internal compartments
3. 100% DR-acrylic lenses for superior distribution and lamp image diffusion
4. Solid, interlocking end caps prevent light leaks and hide mounting hardware
5. Marine grade extruded, non-ferrous aluminum housings. Standard antimicrobial finish on housing and ballast cover

- Available in 16- or 32-watt high-brightness LED source in 4000K
- Requires 24-volt DC (120-240V AC) remote-mounted, high-power factor power supply (page 23)
- Certified to UL 1598 and UL 8750 standards
- NSF2 Splash and Non-Food Zone listed

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**Incandescent Lighting: A Solution Based On Compromise**

Since AC-powered luminaires and dimming systems are known to generate Electromagnetic Interference (EMI), DC-powered, fixed-output incandescent luminaires became the lighting systems of preference within magnetic resonance imaging (MRI) suites. Although this is an effective technique for mitigating EMI, it negatively impacts such important factors as power consumption, lumen output, lamp life and occurrences of sudden lamp failure – all of which increase operation and maintenance costs and the MRI’s operational downtime. In addition, the use of fixed-output severely restricts staff control of illumination levels.

**LED Lighting: The Superior Alternative**

Today’s solid-state, DC-powered LED sources solve the EMI issues that make fluorescent lamps unsuitable for MRI area use. Recent advances in LED technology make this source a superior alternative to incandescent lamps as well. When compared to a typical 150-watt incandescent installation with a 750-hour rated lamp life, white LED systems average 50,000 hours – or 66 times – more life than incandescents. LEDs even exceed the rated life of both compact and most linear fluorescents. LEDs are also far more energy efficient than incandescents and gradually lose their efficacy (unlike heated-filament counterparts) preventing the interruption of MRI usage for lamp replacement.

Finally, Kenall’s LED fixtures are dimmable, giving the MRI suite technicians the ability to tailor illumination levels to both preference and the specific function being performed at any given time.

**EMI Transmission**

One of the most problematic areas of lighting MRI suites has historically been EMI. Not only are MRI systems highly sensitive to EMI emissions from lighting fixtures and other electrical devices, MRI scanners themselves emit RF pulses that can negatively affect the operational performance of lighting equipment and the lifespan of certain light sources.

When EMI from light fixtures, AC voltage, or dimming systems is present, it can adversely affect the performance of the MRI system, rendering its output unusable. On the other hand, when the MRI scanner emits its own RF pulses they can create EMI that defeats the operational integrity of traditional light sources by causing unwanted lamp flicker and premature source burnout.

It is for reasons such as these that fluorescent sources and AC power are rarely installed in MRI suites, having been replaced in most cases by low voltage DC incandescent. While this change by itself has been successful in mitigating some EMI related issues, it has not solved all problems. In order to achieve an appropriately lit MRI environment free of problematic EMI, all potential sources of interference must be either successfully controlled or eliminated altogether.

**Dimming**

Dimming is an important feature for both operational safety and patient comfort in MRI suites. When scanning is performed, low light levels are appropriate as they create a more relaxed and comfortable ambience for patients. Conversely, higher light levels are needed for maintenance and other staff functions. Despite this need, even DC-powered dimming is often omitted from MRI suites due to potential EMI issues caused by voltage changes, as well as lamp flicker caused by MRI-originated EMI. Kenall engineers have successfully solved these problems by designing and integrating special shielding systems inside the luminaires, allowing a problem-free, 0-10 volt full-range dimming capability on any system such as the Lutron Graphik Eye®, or other scene controllers, when installed per our instructions.

**Magnetic Fields and Non-Ferrous Construction**

Clinical MRI systems employ tremendously powerful 15,000 gauss (1.5T) to 30,000 gauss (3T) magnets. (Earth’s magnetic field is 0.5 gauss by comparison.) Within such conditions, any ferrous metal object – as small as a paper clip or pen to as large as a light fixture or oxygen tank – can become a dangerous projectile inside an MRI suite that is pulled toward the scanner’s cylindrical opening at speeds as high as 40 mph. Therefore, it is critical that ferrous metal components and materials be excluded from luminaires destined for MRI suite applications. Every Kenall MRI suite fixture is 100% non-ferrous – without compromising Kenall’s industry-leading performance and durability.
UNLIKE THE EUROPEAN COMMUNITY (EC), the U.S. has no government standards for RF compatibility between MRI systems and other electrical devices, nor do we have government-based programs for testing the susceptibility of one device to the RF of another. It is therefore up to the lighting manufacturer to determine the RFI potential between the luminaires and the MRI system being used. Not only must the effect of the luminaire(s) on the MRI be identified, the effect of the MRI's RF transmissions on the lighting systems must be identified as well.

To minimize the luminaire's potential effect on the MRI and vice-versa, the first step is to shield the fixture's interior to keep potential RF from escaping while also preventing the MRI's RF from affecting the luminaire. Step two is to pragmatically determine how the MRI and luminaire perform together. Only with the combination of expert design and empirical knowledge can the specifier and user be assured of compatibility between the devices. Kenall MRI fixtures not only have the most effective shielding developed to date, they've been field-verified as compatible with systems from the world's foremost MRI systems manufacturers.

HIGH QUALITY LEDS REPRESENT THE BEST choice for lighting MRI suites. Far more energy efficient and with vastly longer lives than incandescents, LEDs are also more durable and generate virtually no heat. While the powerful magnetic fields produced by MRI systems cause incandescents to fail prematurely, LEDs in the same environment will last over 50,000 hours. LEDs don't produce RFI, aren't affected by magnetic fields, lose lumen output slowly and run on DC power. Kenall uses the most reliable, best performing LED's available with a lifespan rating greater than 50,000 hours.

ALTHOUGH MRI SUITES ARE TYPICALLY “CLEAN” spaces, infection control is nonetheless an important consideration in clinical MRI settings. Lighting systems must be easy to clean and able to withstand the most rigorous cleaning protocols without corroding or introducing toxicity into the environment. To this end, MRI suite luminaires should carry the NSF2 Splash/Non-Food Zone certification.

A second area of infection control pertains to the luminaire's ability to prevent pathogens and other contaminants from entering or escaping the MRI suite via the fixture itself, even during relamping. Kenall luminaires for MRI/imaging suites are tested to stringent ingress protection standards, ensuring a barrier between the plenum and the environmental side of the room. Unparalleled experience in creating fixtures for research laboratories, clean rooms and other environmentally critical facilities has provided Kenall with the know-how to design luminaires that are easily cleaned and able to withstand even the most caustic cleaning solutions and rigorous protocols. In addition, our new Envela MRI Downlights, for example, maintain their environmental integrity even during relamping by using a pressure-based, self-sealing mechanism. All Kenall MRI fixtures are NSF2 Splash/Non-Food Zone certified.

AC line power is generally avoided for powering light fixtures in MRI rooms; when AC power is used in close proximity to an MRI scanner it can interfere with the MRI's own internal electronics, resulting in artifacts and other noise that can distort the MRI's digital image. This interference is usually attributed to the AC power system being prone to voltage transients that causes RFI. Low-Voltage DC (LVDC) is becoming the preferred and most appropriate power type for MRI suite lighting since DC power is better conditioned (less RFI) and more reliable. LVDC is also preferred due to its inherent safety versus AC voltage, eliminating potential shock hazard. All Kenall MRI fixtures are engineered specifically for 24V LVDC power.
**Room configuration and precise equipment installation are critical**

Proper configuration and installation of lighting and supporting equipment in MRI/imaging rooms is critical in ensuring successful operation, patient safety and comfort and optimum scan/image resolution. In addition to non-ferrous fixture construction and proper room shielding, special low-voltage DC power supplies, RF filtering and shielded, grounded conduit are essential elements to successful installation.

To assure a trouble-free installation, Kenall provides detailed configuration and installation sheets and technical support for installation. If Kenall’s installations instructions are followed and confirmed, Kenall will provide the industry’s first guarantee against fixture interference and susceptibility.

The wiring diagrams (below) illustrate two different room configurations, depending on the need for single or multiple power supplies. Please also refer to the lamp chart for luminaire connection per power supply.

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### MRI Luminaire connection per power supply

<table>
<thead>
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<th>Luminaire number</th>
<th>Product</th>
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<td>MRIMAS838</td>
<td>Auracyl Sconce 39&quot;</td>
<td>1.30</td>
<td>8</td>
</tr>
<tr>
<td>MRIMAS850</td>
<td>Auracyl Sconce 50&quot;</td>
<td>1.70</td>
<td>6</td>
</tr>
</tbody>
</table>
PROJECT INFORMATION

Job Name

Fixture Type

Catalog Number

Approved by

SPECIFICATIONS

HOUSING: Die formed marine grade extruded aluminum. Black TGIC polyester powder coat finish – 5-stage pre-treatment; Salt spray test: 1,000 hours.

ELECTRICAL:

INPUT: 120–240 VAC, 50/60 Hz. Active PFC Function, PF>0.95.

OUTPUT: Constant-voltage DC output. Factory preset at 24VDC, adjustable range 20–26.4VDC. Maximum current load 13ADC.

WARRANTY: This product is warranted by Kenall Manufacturing to be free of defects in workmanship and materials for a period of one year from the date of invoice. The DC power supply contained in the enclosure carries a five-year warranty from the date of invoice. Warranty is void if all wiring is not completely shielded in grounded conduit.

LISTINGS: Power supply is certified to UL1012 and CSA C22.2 No. 107.1 by Intertek Testing Services. Dry Location only.

NOTE: See Kenall luminaire specifications that utilize remote power supplies for use with this unit.

INSTALLATION

WIRING/CONDUIT: All power and signal wiring must be completely shielded in grounded conduit. Total length of low-voltage supply wires, at least 18AWG, from power supply to filter to luminaires, should not exceed 50 feet (15m).

EMI FILTERS: All MRI room EMI filters must be sized as suitable for power supply load (supplied by others).

AMBIENT TEMPERATURE/HUMIDITY: The surrounding ambient temperature must remain below 104°F (40°C). The working temperature is between -20–+65°C. Allowable relative humidity is 20–90% non-condensing.

PRODUCT LOCATION: The MRIPS-312 power supply must be installed outside the shielded MRI environment. It contains ferrous components that can damage or interfere with MRI equipment. A minimum free-air spacing must exist of 3” around all sides and 6” over exhaust fan. Location should not allow excessive dirt/dust to clog ventilation holes and prevent internal air circulation.

MRI LUMINAIRES CONNECTION PER POWER SUPPLY

<table>
<thead>
<tr>
<th>Luminaires</th>
<th>Amps per Luminaires</th>
<th>Max. Luminaires per Power Supply per room</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSMR122</td>
<td>0.75</td>
<td>16</td>
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<tr>
<td>CSMR124</td>
<td>1.5</td>
<td>8</td>
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<tr>
<td>CSMR144</td>
<td>3.5</td>
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<tr>
<td>MRIRDL6V2</td>
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<tr>
<td>MRIMAS813 (6W)</td>
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</tr>
<tr>
<td>MRIMAS813 (14W)</td>
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<td>16</td>
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<tr>
<td>MRIMAS826</td>
<td>1.0</td>
<td>10</td>
</tr>
<tr>
<td>MRIMAS838</td>
<td>1.3</td>
<td>8</td>
</tr>
<tr>
<td>MRIMAS850</td>
<td>1.7</td>
<td>6</td>
</tr>
<tr>
<td>MRIAUC 18</td>
<td>0.7</td>
<td>16</td>
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<tr>
<td>MRIAUC 36</td>
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</tr>
<tr>
<td>ME11MRI</td>
<td>1.4</td>
<td>8</td>
</tr>
</tbody>
</table>

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Technical Resource – EMI Proportioned Susceptibility

**EMI Test Procedure:**
To ensure Kenall luminaires for MRI/ imaging suites are not producing EMI emission levels that could jeopardize the integrity of MRI images, refer to MIL STD-461F as a guideline, specifically RE102. RE102 is a radiated emissions test that covers the frequency ranges of interest. The RE102 test procedure is also suited for this application due to the set-up commonality it shares with existing MRI rooms. The test measures emissions one meter away from the luminaire in units of dB microvolts per meter.

**Immunity/Susceptibility:**
Another consideration is the immunity or susceptibility of a device. Ensuring our luminaires do not interfere with the MRI is part of the objective. MRI scanners put out emissions that exceed 200 V/m, which can couple onto power and control lines and can interfere with the DC supply current energizing the LED light source. The sensation the human eye experiences when this happens is commonly known as flicker. To eliminate this potential situation, it is imperative that the lighting system and installation be configured to avoid harmful absorption and transmission of electrical pulses.

**How we protect our product:**
Assuming the system is properly designed and installation instructions are followed, the only path MRI scanner emissions have left to penetrate through the luminaire itself. The first line of defense is the integrity and construction of the housing; Kenall’s housings are aluminum, which has low resistivity and therefore an excellent shield. The housings are fabricated in-house and inspected to ensure no gaps exist that may leave the circuit board vulnerable to interference. Finally, our robust electronic drivers are designed to withstand many small transients that exist on supply lines. These design properties ensure our products withstand pulses from 3.0T MRI units as well as emission levels in excess of 300 V/m as measured by an independent EMC test lab.

**ELECTROMAGNETIC INTERFERENCE (EMI) TESTING & MILITARY STANDARD 461F**
The most comprehensive, widely recognized and acknowledged domestic EMI standard is Military Standard MIL-STD-461F, a mandatory standard for military hospitals and other EMI-sensitive military facilities and a voluntary standard for public and private facilities applications. MIL STD testing measurements cover both radiated and conducted emissions, in addition to maximum allowable amounts of emitted energy based on both frequency range and field strength. The MIL-STD-461F testing procedures and requirements appropriate to light fixtures are found under Navy and Air Force Limits for Electronic Devices, with the specific testing information for conducted emissions outlined in CE 102-1 and for radiated emissions in RE 102-4. While both are designed to emulate worst case operating conditions, both the test procedures and the standards themselves are logical and reasonable. Kenall MedMaster fixtures have been tested and proven to be in compliance with MIL-STD-461F (Air Force/Navy Fixed) by an independent laboratory (DLS Electronic Systems, Inc.) accredited by both NIST and the U.S. DOC. Copies of test reports are available from Kenall.

**LED LM-79 Testing Protocol**
All Kenall SSL Luminaires are tested to the IESNA LM-79-08 standard requiring spectroradiometric measurements for CRI and CCT as well as goniochronometric measurements for lighting distributions and total luminous flux.

**NATIONAL SANITATION FOUNDATION LISTINGS**

**Fixtures for use in Food Processing, Handling & Preparation**
Kenall lighting fixtures for use in food processing, handling and preparation areas have been investigated and listed by the National Sanitation Foundation (NSF) as conforming to the requirements in their criteria C2. The purpose of criteria C2 is to insure that equipment located in a food storage, handling, or preparation area will not compromise the sanitation requirements for those areas. Equipment listed to criteria C2 has been evaluated as to its corrosion resistance, cleanability and exposed material.

Specifically, exposed materials shall withstand normal wear, the corrosive action of foods, beverages, and cleaning compounds, and the material itself shall not impart an odor, color, taste, or toxic material to any food that would come in contact with it.

Within this category, NSF defines the surfaces of equipment as Food Contact or Non-Food Contact surfaces. Food Contact surfaces are further divided into areas as Food Zone, Splash Zone, and Non-Food Zone, with Food Zone requirements being the most stringent and Non-Food Zone being the least stringent.

A subcategory of Food Zone equipment is Non-Contact, i.e. equipment in the Food Zone but not normally in contact with the food.

**SPASH ZONES (SN)**
Kenall has two levels of fixture construction depending on the area where the fixtures are being installed.

Our SN type construction is listed for use in Splash Zones and Non Food Zones. All exposed sheet metal will be painted CRS, painted aluminum, or anodized aluminum. Fasteners will be stainless steel, and lenses can be acrylic, polycarbonate or tempered glass, all with prisms on inside.
How long has Kenall provided LED luminaires?

Kenall has been an OEM manufacturer of specialized lighting products since 1963 and has always embraced new lamp technologies. Since 1996, Kenall has offered low-brightness LED sources in its exit sign and low-level steplight products. Kenall’s first commercial offering of a product containing high-brightness white LEDs was the Millenium FreeScale™ product launched in February 2006. It utilized Lumileds Luxeon III lamp sources and Advance Xitanium constant-current drivers. Since then, Kenall has expanded its LED offering to nearly all product lines, utilizing a multitude of brand name LED lamp sources and drivers.

Who are Kenall’s LED suppliers?

Kenall selects LED components from brand name manufacturers (Nichia, Lumileds, Osram, Cree, Seoul Sem, etc). There are a variety of reasons that Kenall chooses this approach:

- A lower risk of patent infringement and supply chain disruptions
- They are typically at the forefront of research and development breakthroughs
- Highest performance levels (lumen output, CRI)
- Higher quality; higher probability of future sustainability

Beyond LED manufacturers, Kenall selects specific LEDs that are most appropriate for the application. No two brands of LEDs will perform identically in a luminaire, which means that the strengths and weaknesses of each LED must be matched up with every product and the product’s intended use.

How does Kenall state LED product performance?

In order to provide a true assessment of delivered light, Kenall is committed to stating SSL luminaire performance at the luminaire level, not the lamp level. Lumen output, power consumption, lifetime and even color temperature all depend on the unique characteristics of the lamp enclosure (luminaire). Therefore, it is important to understand that the only way to assess SSL luminaire performance is to measure to industry standard testing procedures such as IESNA LM-79. Evaluating products to this standard includes the optical, thermal and electrical losses that will significantly drop the delivered output from the published LED output.

Are LM-79 and LM-80 test results available on Kenall LED products?

Kenall’s policy is to make LM-79 information (regarding photometric and spectroradiometric luminaire performance) and LM-80 information (regarding LED lumen maintenance) available on all LED-based products. Of special note is that IESNA LM-80 only describes lumen maintenance testing at the LED component level, conducted over a minimum period of 6,000 hours. To provide an estimate of LED lumen maintenance at a luminaire level, Kenall incorporates the LM-80 test results from the LED manufacturer (Nichia, Cree, etc) with LED case temperatures from a UL Accredited DAP laboratory testing under similar drive current and ambient temperature conditions, to provide an assessment of luminaire lumen maintenance over the 6,000-hour period. Kenall’s published lumen maintenance test results will describe both sets of data.

What is the design lifetime of Kenall LED products?

LEDs are notably different in their common failure mode from incumbent lamp sources such as incandescent, fluorescent or HID. Whereas these lamps typically fail catastrophically, LEDs will experience a continuously degrading lumen output until the luminaire becomes ineffective. Although LED light sources can be designed for a very long life expectancy, their functionality can be limited by the failure of the driver or the degradation of components that protect the internal electronics. Taking these factors into account, the end-of-life of the SSL luminaire is defined as the point at which the lumen depreciation of the fixture is 30% or greater from the product’s LM-79 lumen output on the date of manufacture. To that extent, Kenall, to the best of its abilities, will adhere to the following product design policy to design its SSL luminaires to a minimum lifetime of 50,000 hours of continuous operation. At which time it is expected that the lumen depreciation of at least 50% of a population will be greater than 30%.

What is Kenall’s LED Component & Driver Replacement Policy

Kenall will design and manufacture its SSL luminaires to allow for field-replacement of all LED components and power electronics by a certified electrician with the knowledge of handling sensitive electronic devices. Furthermore, Kenall will support its SSL products for a period of 5 years from the date the product is discontinued. This includes warranty and non-warranty failures.

Kenall will make a best effort to provide direct replacement components. However, due to the rapid advancement of LED performance levels and their long expected lifetime, it may not be possible to provide a direct replacement. The same is true for the driver/power electronics. Although Kenall will attempt to match the original characteristics as much as possible, replacement LED components may have a slightly different appearance and a higher total flux than originally specified. Nominal color temperature and a minimum CRI will be held constant. In no cases will the rated flux of the LED be lower than the original product when new.
Limitations of Wet & Hosedown Ratings – UL Standards

UL standards for “wet” type ratings only offer a wet location rating, which simulates an outdoor rain condition. UL standards for a type 4 or NEMA 4 “hosedown” rating uses a 1 inch diameter nozzle on a fire hose delivering 65 gallons of water per minute. Various conditions exist where a fixture requires a rating better than a wet location label but not NEMA 4. These conditions typically exist in washdown applications where hose directed water or cleaning agents will be directed at the fixture.

Benefits of Ingress Protection Ratings – IEC standards

The IP water rating of “5” (IP_5), described in IEC Standard 60598, provides an intermediate step between the rain rating and the NEMA 4 rating. It also provides an internationally accepted standard which can be used to evaluate fixtures or any other electrical equipment, and the test can be performed by an independent third party testing agency for verification. Underwriters Laboratories investigates products and tests to the IEC standard.

Dust-tight Protection

An additional test criterion that can be applied to fixtures is the ability to exclude solid matter. The IP solid rating of “6” (IP6_) means the fixture will be dust tight. The specified test requires that the fixture be placed in a circulating talc atmosphere for 3 hours. The particle size of the talc is a range of one to 75 microns and the fixture is placed under negative pressure in an attempt to draw the talc into the fixture. No talc shall be found inside the fixture after this test.

The Importance of Recognized Standards & Independent Testing

Other lighting manufacturers that claim a hosedown rating other than NEMA or IP are not testing to recognized standards and cannot have the tests confirmed or audited by an independent outside testing agency.

Beware of statements such as “Tested to 75psi at 1 inch.” No reference is made to the volume of water that is leaving the nozzle and impacting the product. In fact, high nozzle pressures typically have low water volumes because the nozzle is restricting the flow of water causing the pressure in the hose to increase, minimizing the amount of water leaving the nozzle.

Regardless of the hose pressure, any water volume less than 3.3 gal/minute is less severe than the IP_5 test. The most relevant characteristics are the diameter of the nozzle and the flow rate of the water. The following chart shows the test characteristics for various Standards.

MedMaster™ Ratings

Kenall’s MedMaster line of hosedown rated products are approved by UL and CUL for IP ratings according to IEC Standard 60598.

What are IEC Standards?

IEC Standards are international standards that many European countries adopt as their national standard. North America has traditionally adopted UL standards as the source for standards. U.S. product manufacturers designed their products to IEC standards initially for sale overseas but are finding them increasingly useful here in North America.

IP STANDARDS CHARACTERISTICS

<table>
<thead>
<tr>
<th>Rating</th>
<th>Standard</th>
<th>Nozzle Dia</th>
<th>Flow Rate</th>
<th>Distance</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP_5</td>
<td>IEC 60598</td>
<td>0.2 inches</td>
<td>3.3 gal/min</td>
<td>8-10 ft</td>
<td>15 min</td>
</tr>
<tr>
<td>NEMA4</td>
<td>NEMA 250</td>
<td>1.0 inches</td>
<td>65 gal/min</td>
<td>10-12 ft</td>
<td>5 min</td>
</tr>
<tr>
<td>Marine</td>
<td>UL 595</td>
<td>1.0 inches</td>
<td>115 gal/min</td>
<td>10 ft</td>
<td>5 min</td>
</tr>
</tbody>
</table>
EXPLANATION OF “INGRESS PROTECTION” IP NUMBERS
for Degrees of Protection for Sealed Luminaires

Example:

**IP65**

<table>
<thead>
<tr>
<th>Numeral</th>
<th>Short Description</th>
<th>Brief details of objects which will be “excluded” from the enclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Non-protected</td>
<td>No special protection</td>
</tr>
<tr>
<td>1</td>
<td>Protected against solid objects greater than 50 mm</td>
<td>A large surface of the body, such as a hand (but no protection against deliberate access). Solid objects exceeding 50 mm in diameter.</td>
</tr>
<tr>
<td>2</td>
<td>Protected against solid objects greater than 12 mm</td>
<td>Fingers or similar objects not exceeding 80 mm in length. Solid objects exceeding 12 mm in diameter.</td>
</tr>
<tr>
<td>3</td>
<td>Protected against solid objects greater than 2.5mm</td>
<td>Tools, wires, etc., of diameter or thickness greater than 2.5 mm. Solid objects exceeding 2.5 mm in diameter.</td>
</tr>
<tr>
<td>4</td>
<td>Protected against solid objects greater than 1.0 mm</td>
<td>Wires or strips of thickness greater than 1.0 mm. Solid objects exceeding 1.0 mm in diameter.</td>
</tr>
<tr>
<td>5</td>
<td>Dust-protected</td>
<td>Ingress of dust is not totally prevented but dust does not enter in sufficient quantity to interfere with satisfactory operation of the equipment.</td>
</tr>
<tr>
<td>6</td>
<td>Dust-tight</td>
<td>No ingress of dust</td>
</tr>
</tbody>
</table>

**IP6**

<table>
<thead>
<tr>
<th>Numeral</th>
<th>Short Description</th>
<th>Brief details of objects which will be “excluded” from the enclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Non-protected</td>
<td>No special protection</td>
</tr>
<tr>
<td>1</td>
<td>Protected against dripping water</td>
<td>Dripping water (vertically falling drops) shall have no harmful effect.</td>
</tr>
<tr>
<td>2</td>
<td>Protected against dripping water when tilted up to 15°</td>
<td>Vertically dripping water shall have no harmful effect when tilted up to 15° when the enclosure is tilted at any angle up to 15° from its normal position.</td>
</tr>
<tr>
<td>3</td>
<td>Protected against spraying water</td>
<td>Water falling as a spray at an angle up to 60° from the vertical shall have no harmful effect.</td>
</tr>
<tr>
<td>4</td>
<td>Protected against splashing water</td>
<td>Water splashed against the enclosure from any direction shall have no harmful effect.</td>
</tr>
<tr>
<td>5</td>
<td>Protected against water jets</td>
<td>Water projected by a nozzle against the enclosure from any direction shall have no harmful effects.</td>
</tr>
<tr>
<td>6</td>
<td>Protected against heavy seas</td>
<td>Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quantities.</td>
</tr>
<tr>
<td>7</td>
<td>Protected against the effects of immersion</td>
<td>Ingress of water in a harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time.</td>
</tr>
<tr>
<td>8</td>
<td>Protected against submersion</td>
<td>The equipment is suitable for continuous submersion in water under conditions which shall be specified by the manufacturer.</td>
</tr>
</tbody>
</table>

NOTE: The author thanks the Internal Electrotechnical Commission (IEC) for permission to reproduce definitions for IP65 from its International Standard IEC 60598. All such extracts are copyright of IEC, Geneva, Switzerland. All rights reserved. Further information on the IEC is available from www.iec.ch. IEC has no responsibility for the placement and context in which the extracts and contents are reproduced by the author, nor is IEC in any way responsible for the other content or accuracy therein.
PRODUCT FEATURES:

» Ceiling mount – 1’×1’

» Non-ferrous construction safe for sensitive MRI equipment

» Dimmable LED with same output as 32-watt CFL

» Tool-less access for relamping and maintenance

SPECIFICATIONS


HOUSING FLANGE: .050” aluminum standard 4-piece construction, spot-welded to housing. Mitered and welded corners.

REFLECTOR/LENS ASSEMBLY: .032” aluminum. One-piece seam-welded construction. Tool-free lamp access. White high reflectance (94%) low gloss TGIC polyester powder coat – 5-stage pre-treatment. Salt spray test: 1,000 hours. Antimicrobial white high reflectance low gloss finish on exposed surfaces.

LAMP SHIELDING: Fully gasketed, sealed luminous shield of impact resistant DR acrylic. See Ordering Information for lens options.

INSTALLATION: Designed for 1” and Slot-T grid. Includes hardware to secure hanger wire.

ELECTRICAL: Replaceable high-brightness ANSI 3000K, 3500K or 4000K LED array. 80 CRI minimum standard, 90 CRI available on 3000K lamp. Luminare input 24V DC from remote-mounted, 120-240V AC, high power factor power supply (MRIPS-312, ordered separately). Dimming capability controlled through compatible 0-10V dimmer (supplied by others). Dimming capability range 10% to 100%. MRI room EMI filter required (supplied by others).

WARRANTY: One (1) year warranty against defects in materials and workmanship. Five (5) year warranty on LED lamps and driver for defects resulting in a fixture lumen depreciation of 30% or greater.

PATENT: U.S. Patent No. 8,511,850.

LISTINGS: UL and CUL Listed for Wet Location. UL certified IP64 per IEC 60598. NSF2 Splash/Non-Food Zone. Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory.

LED Nomenclature 24L40K
LED Wattage 24 Watt
Luminaire Equivalent (1) 32W Quad
Delivered Lumens 1717
Input Watts 35
Lumens / Watt 50
Nominal CCT 4000K

Displayed information is for selected luminaires only. Additional wattages and color temperatures are also available. Consult IES files at www.kenall.com.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Model</th>
<th>Mounting</th>
<th>Lamp Type</th>
<th>Voltage</th>
<th>Lens Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME11MRI</td>
<td>G (Grid 1”)</td>
<td>24L30K</td>
<td>24VDC</td>
<td>FA (Frost DR Acrylic)</td>
</tr>
<tr>
<td></td>
<td>ST (Slot-T)</td>
<td>24L30KH</td>
<td></td>
<td>CAP (Clear DR Acrylic with Internal Perforation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24L35K</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24L40K</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MRI LUMINAIRE CONNECTION PER POWER SUPPLY

<table>
<thead>
<tr>
<th>Luminaire</th>
<th>Amps/</th>
<th>Max Luminaires/Po</th>
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</thead>
<tbody>
<tr>
<td>ME11MRI</td>
<td>1.4</td>
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</table>

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MEDMASTER CLEANSCENE™
MRI/Imaging Suite Luminaires

CSMRI SERIES

PRODUCT FEATURES:

» Recessed ceiling mount – grid; 2’ x 2’
» Non-ferrous construction
» Expansive offering of high quality graphic images
» Antimicrobial finish option available

SPECIFICATIONS


LENS: Smooth .177” acrylic lens sealed to doorframe with high-strength acrylic adhesive.

REgressed FRAME Kit (ACCESSory): One-piece, .08” thick, seamless aluminum construction TGIC polyester powder coat finish in matte white or black. Provides easy-to-install, architectural skylight effect by raising fixture 2-inches above standard 1” or 1.5” T-bar grid ceiling.

ELECTRICAL: High-brightness, 6500K LED light source. Luminaire input 24V DC from remote-mounted, 120-240V AC, high power factor power supply (MRIPS-312, ordered separately). Dimming capability controlled through compatible 0-10V dimmer (supplied by others). Dimming range 10-100%. MRI room EMI filter required (supplied by others).

INSTALLATION: 1” or 1.5” T-Bar installation standard. Includes hardware to secure hanger wire. Regress Kit raises fixture 2”. All power and signal wiring must be completely shielded in grounded aluminum conduit.

WARRANTY: One (1) year warranty against defects in materials and workmanship. Five (5) year warranty on LED lamps and driver for defects resulting in a fixture lumen depreciation of 30% or greater.

LISTINGS: Luminaire is certified to UL1598 and UL8750 standards by Intertek Testing Services for Damp Location. NSF2 Splash/Non-Food Zone. Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Model</th>
<th>Mounting Opt</th>
<th>Configuration</th>
<th>Lamp Type</th>
<th>Voltage</th>
<th>Options</th>
<th>Accessory</th>
<th>Image Selection</th>
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</thead>
<tbody>
<tr>
<td>CSMRI22</td>
<td>G10 Grid (1”)</td>
<td>C1 One Square</td>
<td>18L65K</td>
<td>24VDC</td>
<td>AMF</td>
<td>Regressed Frame Kit – White</td>
<td>Click here for CleanScene lightbox image selections and ordering numbers. Consult factory for alternate image selection approval.</td>
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<tr>
<td></td>
<td>G15 Grid (1.5”)</td>
<td>C2 Two Rectangle</td>
<td>18L65K</td>
<td>24VDC</td>
<td>AMF</td>
<td>Regressed Frame Kit – Black</td>
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<tr>
<td></td>
<td></td>
<td>C4 Four Square</td>
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<td></td>
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<td></td>
<td></td>
<td>C6 Six Rectangle</td>
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<td></td>
<td></td>
<td>C9 Nine Square</td>
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<td>SC Specified Configuration (Consult Factory)</td>
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MEDMASTER CLEANSCENE™
MRI/Imaging Suite Luminaires

CSMRI SERIES

PRODUCT FEATURES:
> Recessed ceiling mount – grid; 2’×4’
> Non-ferrous construction
> Antimicrobial finish option available
> Expansive offering of high quality graphic images

SPECIFICATIONS


Grid 1.5” (G15)
Grid 1” (G10)

Mounting Options
standard by an ILAC/ISO17025 accredited laboratory.

LUMINAIRE CONNECTION PER POWER SUPPLY
Luminaire Number Amps/ Luminaires Max. Luminaires/ Power Supply/Room
CSMRI24 1.5 8

INSTALLATION: All power and signal wiring must be completely shielded in grounded aluminum conduit. 1” or 1.5” T-Bar installation standard. Includes hardware to secure hangar wire. Regress Kit raises fixture 2”.

WARRANTY: One (1) year warranty against defects in materials and workmanship. Five (5) year warranty on LED lamps and driver for defects resulting in a fixture lumen depreciation of 30% or greater. Warranty is void if all wiring is not completely shielded in grounded aluminum conduit.

LISTINGS: Luminaire is certified to UL1598 and UL8750 standards by Intertek Testing Services for Damp Location. NSF2 Splash/Non-Food Zone. Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory.

REGRESSED FRAME KIT (ACCESSORY):
One-piece, .08” thick, seamless aluminum construction TGIC polyester powder coat finish in matte white or black. Provides easy-to-install, architectural skylight effect by raising fixture 2-inches above standard 1” or 1.5” T-bar grid ceiling.

LENS: Smooth, .177” acrylic lens sealed to doorframe with high-strength acrylic adhesive.

ELECTRICAL:
Replaceable high-brightness 6500K LED light array. Luminaire input 24VDC from remote-mounted, 120-240VAC, high power factor power supply (MRIPS-312, ordered separately). Dimming capability controlled through compatible 0-10V dimmer (supplied by others). Dimming range 10-100%.

Flange
2.00*

23.75”×47.75”

"Subtract .50” from housing width and length when 1.5” grid mounting option is specified.

| Graphic Image Size Needed – 2×4 Fixture |
| Grid 1.0 (G10) | 21.00×45.00 |
| Grid 1.5 (G15) | 20.50×44.50 |

| Fixture Configurations |
| D1H 2’×4’ 1 |
| D1V 2’×4’ 2 |
| D2 4’×4’ 3 |
| D3 4’×6’ 4 |
| D4 4’×8’ 5 |

Accessories
RFK24W Regressed Frame Kit – White
RFK24B Regressed Frame Kit – Black

There are 18 grid sizes available. Consult factory for alternate image selection approval.

Options
AMF Antimicrobial Finish (All Exposed Surfaces)
BLK Black Doorframe

Image Selection
Click [here](#) for CleanScene lightbox image selections and ordering numbers. Consult factory for alternate image selection approval.

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PRODUCT FEATURES:
- Recessed ceiling mount – grid; 4’x4’
- Non-ferrous construction
- Expansive offering of high quality graphic images
- Antimicrobial finish option available

SPECIFICATIONS


LENS: Smooth .177” acrylic lens sealed to doorframe with high-strength acrylic adhesive.

REGRESSED FRAME KIT (ACCESSORY): One-piece, .08” thick, seamless aluminum construction TIGC polyester powder coat finish in matte white or black. Provides easy-to-install, architectural skylight effect by raising fixture 2-inches above standard 1” or 1.5” T-bar grid ceiling.

ELECTRICAL: Replaceable high-brightness 6500K LED light array. Luminaire input 24V DC from remote-mounted, 120-240V AC, high power factor power supply (MRIPS-312, ordered separately). Dimming capability controlled through compatible 0-10V dimmer (supplied by others). Dimming range 10-100%. MRI room EMI filter required (supplied by others).

INSTALLATION: 1” or 1.5” T-Bar installation standard. Includes hardware to secure hanger wire. Regress Kit raises fixture 2”. All power and signal wiring must be completely shielded in grounded aluminum conduit.

WARRANTY: One (1) year warranty against defects in materials and workmanship. Five (5) year warranty on LED lamps and driver for defects resulting in a fixture lumen depreciation of 30% or greater. Warranty is void if all wiring is not completely shielded in grounded aluminum conduit.


LISTINGS: Luminaire is certified to UL1598 and UL8750 standards by Intertek Testing Services for Damp Location. NSF2 Splash/Non-Food Zone. Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory.

GRAPHIC IMAGE SIZE NEEDED – 4×4 FIXTURE
Grid 1.0 (G10) - 44.575×44.575
Grid 1.5 (G15) - 44.075×44.075

ORDERING INFORMATION
<table>
<thead>
<tr>
<th>Model</th>
<th>Lamp Type</th>
<th>Voltage</th>
<th>Options</th>
<th>Accessory</th>
<th>Image Selection</th>
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<tbody>
<tr>
<td>CSMRI44</td>
<td>84L65K</td>
<td>24VDC</td>
<td>AMF</td>
<td>RFK44W</td>
<td>MEDMASTER CLEANSCENE™ *Subtract .50” from housing width and length when 1.5” grid mounting option is specified.</td>
</tr>
</tbody>
</table>

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MEDMASTER AURACYL™ SCONCE
MRI/Imaging Suite Luminaires
MRIMAS8 SERIES

PRODUCT FEATURES:
- Surface wall mount – 8” × 13”, 8” × 26”, 8” × 38” & 8” × 50”
- Non-ferrous marine-grade extruded aluminum construction
- Sealed backlighting creates a pleasing visual accent and NSF2 listing
- Standard antimicrobial finish for cleanliness

SPECIFICATIONS
HOUSING: Non-ferrous marine grade extruded aluminum. Non-ferrous marine grade die-cast aluminum end caps. TGIC polyester powder coat finish – 5-stage pre-treatment; Salt spray test: 1,000 hours. Antimicrobial finish on all exposed components of installed luminaire.
DECORATIVE OUTER LENS: Acrylic transparent white lens standard. Nominal thickness .125”. Optional decorative Lumicor® resins – see Ordering Information.
INNER LENS: UV-stabilized, high impact resistant, extruded 100% DRAcrylic frost lens. Nominal thickness .100”. Lens secured in place by lens frame.
ELECTRICAL: Replaceable high-brightness ANSI 3000K or 4000K LED array. Luminaire input 24V DC from remote-mounted, 120-240V AC, high power factor power supply (MRIPS-312 ordered separately). Dimming capability controlled through compatible 0-10V dimmer (supplied by others). 10%-100% dimming range. MRI room EMI filter required (supplied by others). 24V DC from remote-mounted, 120-240V AC, high power factor power supply (MRIPS-312 ordered separately). Dimming capability controlled through compatible 0-10V dimmer (supplied by others). 10%-100% dimming range. MRI room EMI filter required (supplied by others).
HARDWARE: One non-ferrous stainless steel Phillips-head fastener; four fasteners with IP64 option for MRIMAS813 and MRIMAS826; six fasteners for MRIMAS838 and MRIMAS850. Internal brackets and fasteners are non-ferrous and non-corrosive.
INSTALLATION: Standard four-point mounting required on MRIMAS813 and MRIMAS826, Standard six-point mounting on MRIMAS838 and MRIMAS850. All power and signal wiring must be completely shielded in grounded conduit.
PHOTOMETRICS: For photometric information, go to www.kenall.com

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Model</th>
<th>Frame Type</th>
<th>Outer Lens</th>
<th>Finish</th>
<th>Lamp Qty</th>
<th>Voltage</th>
<th>Lamp Type</th>
<th>Option</th>
<th>Number</th>
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</thead>
<tbody>
<tr>
<td>MRIMAS813</td>
<td>PAN</td>
<td>AS</td>
<td>Matte Black (Antimicrobial finish)</td>
<td>1</td>
<td>24VDC</td>
<td>19 Watt 3000K LED</td>
<td>IP64</td>
<td>MRIMAS8130W</td>
</tr>
<tr>
<td>MRIMAS826</td>
<td>PAN</td>
<td>AS</td>
<td>Matte Black (Antimicrobial finish)</td>
<td>1</td>
<td>24VDC</td>
<td>25 Watt 3000K LED</td>
<td>* Lumicor® Lumiclear™ Acrylic Resin</td>
<td>MRIMAS81314W</td>
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<tr>
<td>MRIMAS838</td>
<td>PAN</td>
<td>AS</td>
<td>Matte Black (Antimicrobial finish)</td>
<td>1</td>
<td>24VDC</td>
<td>32 Watt 3000K LED</td>
<td>** Lumicor® Lumiform™ PETG Resin</td>
<td>MRIMAS81314W</td>
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</table>

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**MEDMASTER™ MRI/Imaging Suite Downlights**

**MRIDL6VL2 SERIES – LED**

**PRODUCT FEATURES:**
- 6” aperture, recessed ceiling mount
- Non-ferrous construction
- One-piece housing and flush lens surface for deanability

**SPECIFICATIONS**

**HOUSING:** 0.050” aluminum with seam-welded construction. Non-ferrous material content. External extruded aluminum heatsink.

**REFLECTOR:** Spun aluminum with high-efficiency diffuse white coating.

**TRIM:** 0.050” aluminum. White TGIC polyester powder coat – 5-stage pre-treatment. Salt spray test: 1,000 hours. Antimicrobial finish standard. See Ordering Information for optional materials/finishes.

**LENS:** High-efficiency symmetric diffusion inner lens. See Ordering Information for outer lens options. Sealed to trim with continuous lens retention system.

**ELECTRICAL:** Replaceable high-brightness ANSI 3000K or 4000K white LED array. Luminaire input 24V DC from remote-mounted, 120-240V AC, high power factor power supply (MRIPS-312, ordered separately). Dimming capability controlled through compatible 0-10V dimmer (supplied by others). Dimming capability range 10% to 100%. MRI room EMI filter required (supplied by others).

**HARDWARE:** Four captive, non-ferrous, stainless steel Phillips head fasteners secure lens/trim to housing. Internal brackets and fasteners are non-ferrous and non-corrosive.

**INSTALLATION:** Adjustable mounting brackets for use with installer-supplied conduit or c-channel. All power and original wiring must be completely shielded in grounded aluminum conduit.

**PHOTOMETRICS:** For photometric information, go to www.kenall.com.

**WARRANTY:** One (1) year warranty against defects in materials and workmanship. Five (5) year warranty on LED lamps and driver for defects resulting in a fixture lumen depreciation of 30% or greater.

**LISTINGS:** Luminaire is certified to UL 1598 and UL 8750 standards by Intertek Testing Services. ETL certified IP65 in compliance with IEC 60598. NSF2 Splash/Non-Food Zone. CCEA Approved. Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory.

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lamp Type</th>
<th>Voltage</th>
<th>Trim/Finish</th>
<th>Outer Lens Option</th>
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</thead>
<tbody>
<tr>
<td>MRIDL6VL2</td>
<td>30L30K</td>
<td>30 Watt 3000K LED</td>
<td>Die-Cast Aluminum Flat White (Antimicrobial Finish)</td>
<td>.125” Clear High Impact Acrylic</td>
</tr>
<tr>
<td>30L40K</td>
<td>30 Watt 4000K LED</td>
<td>DCFW</td>
<td>DCFB</td>
<td>.125” Clear Polycarbonate</td>
</tr>
<tr>
<td>24VDC</td>
<td>24 Volts DC</td>
<td>.050” Aluminum Flat White (STD) (Antimicrobial finish)</td>
<td>.050” Aluminum Flat Black (Antimicrobial finish)</td>
<td>8</td>
</tr>
<tr>
<td>24 VOLTS DC (MRIPS-312 Power Supply required – order separately)</td>
<td>5BR</td>
<td>18 Gauge Type 304 SS Brushed</td>
<td>SBR</td>
<td>.187” Clear Tempered Glass</td>
</tr>
<tr>
<td>24 VOLTS DC</td>
<td>5FB</td>
<td>18 Gauge Type 304 SS Flat Black (Antimicrobial finish)</td>
<td>SFB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5FCC</td>
<td>18 Gauge Type 304 SS Custom Color (Consult Factory)</td>
<td>SFC</td>
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<tr>
<td></td>
<td>PAFW</td>
<td>.050” Aluminum Flat White (STD) (Antimicrobial finish)</td>
<td>.125” Clear Tempered Glass</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PAFB</td>
<td>.050” Aluminum Flat Black (Antimicrobial finish)</td>
<td>.187” Clear Tempered Glass</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PACC</td>
<td>Painted Aluminum Custom Color (Consult Factory)</td>
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**PROJECT INFORMATION**

<table>
<thead>
<tr>
<th>Job Name</th>
<th>Fixture Type</th>
<th>Catalog Number</th>
<th>Approved by</th>
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</table>

**MRI LUMINAIRE CONNECTION PER POWER SUPPLY**

<table>
<thead>
<tr>
<th>Luminaire Number</th>
<th>Amps/Max. Luminaires/ per Power Supply/ per room</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRIDL6VL2</td>
<td>1.4</td>
</tr>
</tbody>
</table>

**MRIDL6VL2 – D31313**
**PRODUCT FEATURES:**
- 6" aperture, regressed ceiling mount
- Non-ferrous construction
- Tool-less design allows for easy installation and maintenance.
- Fully gasketed, sealed regressed lens and optical chamber (IP64 option only)

**SPECIFICATIONS**

**HEATSINK:** Marine-grade, die-cast aluminum. External radial fins for natural convection. Secures trim and optical components to mounting frame with hidden spring clips.

**MOUNTING FRAME:** 0.050" die-formed aluminum. Vertically adjustable collar accommodates ceiling thicknesses between 1/2" and 2". Hanger bars with post-installation adjustment for integration with wood and steel frame joists and T-grid ceilings spaced up to 24" on-center.

**JUNCTION BOX:** Die-formed aluminum with hinged access covers and spring latch. Accessible post-installation from above and below ceiling. (6) 1/2" knockouts.

**REFLECTOR:** Spun aluminum with clear semi-specular, anodized finish standard. See Ordering Information for other finishes.

**LAMP COMPARTMENT:** High-efficiency mixing chamber design for homogenous light output.

**LENS:** Regressed. See Ordering Information for lens options.

**TRIM:** Marine-grade, die-cast aluminum. Flat white acrylic finish. See Ordering Options for available finishes.

**LED LIGHT ENGINE:** Replaceable high-brightness 3000K Nichia or 4000K Nichia LED array. Light engine is fastened directly to heatsink for optimal thermal dissipation.

**POWER SUPPLY:** Luminaire input 24 VDC from remote-mounted, 120-240 VAC, high power factor power supply (MRIPS-312, ordered separately). Dimming controlled through 0-10V dimmer (supplied by others). Dimming range is 10%-100%.

**INSTALLATION:** All power and signal wiring must be completely shielded in continuously grounded aluminum conduit. Light engine and internal driver are replaceable post-installation. MRI room EMI filters required (supplied by others).

**PHOTOMETRICS:** For photometric information, go to www.kenall.com.

**WARRANTY:** One year warranty against mechanical defects. Five-year warranty on LED lamps and power regulation components for defects resulting in a fixture lumen depreciation of 30% or greater. Warranty is void if all wiring is not shielded in continuously grounded aluminum conduit.

**LISTINGS:** Luminaire is certified to UL standards by Intertek Testing Laboratory for Wet Location and non-IC installations to UL1598 and UL8750 standards. UL Certified IP64 per IEC 60598. NSF2 Splash/Non-Food Zone. Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory.

---

### LED Nomenclature

<table>
<thead>
<tr>
<th>Lamp Type</th>
<th>LED Wattage</th>
<th>Luminaire Equivalent</th>
<th>Delivered Lumens</th>
<th>Input Watts</th>
<th>Lumens / Watt</th>
<th>Nominal CCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>24L30K</td>
<td>24 Watt</td>
<td>(1) 32W Quad</td>
<td>1290</td>
<td>24</td>
<td>54</td>
<td>3000K</td>
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</table>

Displayed information is for selected luminaires only. Additional wattages and color temperatures are also available. Consult IES files at www.kenall.com.

### ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Model</th>
<th>Lamp Type</th>
<th>Voltage</th>
<th>Trim Finish</th>
<th>Reflector Finish</th>
<th>Lens Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRIRDL6</td>
<td>24L30K</td>
<td>24VDC</td>
<td>FW Flat White</td>
<td>ALG Antimicrobial Low-Gloss White</td>
<td>8 .187” Clear Tempered Glass</td>
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<td></td>
<td>24L35K</td>
<td>24VDC</td>
<td>ALG Antimicrobial Low-Gloss White</td>
<td>CC Custom Color (Consult Factory)</td>
<td>8 .125” Clear Polycarbonate</td>
</tr>
<tr>
<td></td>
<td>24L40K</td>
<td>24VDC</td>
<td>ALG Antimicrobial Low-Gloss White</td>
<td>T .125” Clear Acrylic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24L30K</td>
<td>24VDC</td>
<td>FW Flat White</td>
<td>ALG Antimicrobial Low-Gloss White</td>
<td>CC Custom Color (Consult Factory)</td>
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</table>

### MRI LUMINAIRE CONNECTION PER POWER SUPPLY

<table>
<thead>
<tr>
<th>Luminaire</th>
<th>Amperage</th>
<th>Max. Luminaires per Power Supply per room</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRIRDL6</td>
<td>1.4</td>
<td>8</td>
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</tbody>
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PRODUCT FEATURES:
» Surface mount – solid front; 1.5’ or 3’ lengths
» Non-ferrous construction
» External mounting feet allow for easy installation
» Antimicrobial finish and NSF2 listing for cleanability

SPECIFICATIONS
LENSES: UV-stabilized, high-impact resistant, extruded frost 100% DR acrylic. Smooth exterior, linear prism interior. Snap-in tool-less entry design.
END CAPS/CVERS: UV-stabilized, high-impact resistant, injection-molded white or black opaque polycarbonate. Black end caps/covers provided when silver finish (SL) is ordered. Light leak-preventing interlocking design.
ELECTRICAL: Replaceable high-brightness ANSI 4000K LED white array. Luminaire input 24V DC from remote-mounted 120-240V AC, high power factor power supply (MRIPS-312, ordered separately). Dimming capability controlled through compatible 0-10V dimmer (supplied by others). MRI room EMI filter required (supplied by others).
HARDWARE: Non-ferrous hardware and internal bracketing.
GASKET: Closed-cell extruded EPDM gasket seals lens to end caps.
INSTALLATION: All power and signal wiring must be completely shielded in grounded conduit. External mounting feet allow installation without accessing internal compartments. Four-point mounting required. 3/8” conduit fitting supplied.
WARRANTY: One (1) year warranty against defects in materials and workmanship. Five (5) year warranty on LED lamps and driver for defects resulting in a fixture lumen depreciation of 30% or greater. Warranty is void if all wiring is not completely shielded in grounded conduit.
LISTINGS: Luminaire is certified to UL1598 and UL8750 standards by Intertek Testing Services for Damp Location. NSF2 Splash/Non-Food Zone. Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Model</th>
<th>Installation Type</th>
<th>Finish</th>
<th>Lamp Type/Length</th>
<th>Voltage</th>
<th>Options</th>
</tr>
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<tbody>
<tr>
<td>MRIAUC</td>
<td>I</td>
<td>MW Matte White</td>
<td>14L40K 18.5” – 14 Watt 4000K LED</td>
<td>24VDC</td>
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<tr>
<td></td>
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<td>MB Matte Black</td>
<td>27L40K 35” – 27 Watt 4000K LED</td>
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<tr>
<td></td>
<td></td>
<td>SL Silver</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CCB Custom Color Housing with Black end caps</td>
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LENGTH DIMENSION – MRIAUC SERIES

<table>
<thead>
<tr>
<th>MODEL</th>
<th>LAMP</th>
<th>Voltage</th>
<th>Max. Current</th>
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</thead>
<tbody>
<tr>
<td>14L40K</td>
<td>14W LED</td>
<td>24V DC</td>
<td>0.668</td>
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<tr>
<td>27L40K</td>
<td>27W LED</td>
<td>24V DC</td>
<td>1.336</td>
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MRI LUMINAIRE CONNECTION PER POWER SUPPLY

<table>
<thead>
<tr>
<th>Lamp</th>
<th>Amps/Luminaire</th>
<th>Max. Luminaires/Power Supply/room</th>
</tr>
</thead>
<tbody>
<tr>
<td>14L40K</td>
<td>0.668</td>
<td>16</td>
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<tr>
<td>27L40K</td>
<td>1.336</td>
<td>8</td>
</tr>
</tbody>
</table>
Visit the Kenall website to view our broad selection of lighting for Healthcare Environments

Look to www.kenall.com for product details, specification sheets, photometric data and Revit® files for our innovative, healthcare specific luminaires. Whether your project calls for illuminating patient rooms, surgical suites, MRI rooms or general public areas, Kenall has the design expertise, performance standards and product quality to meet the critical needs of any healthcare application.

Other Kenall MedMaster™ Publications

- Lighting for Healthcare Environments Product Selector Guide
- MedMaster Auracryl™ Sconce Brochure
- CleanScene™ Brochure
- Stratalume™ Brochure
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