

ÉCLAIRAGES

PACO

L I G H T I N G



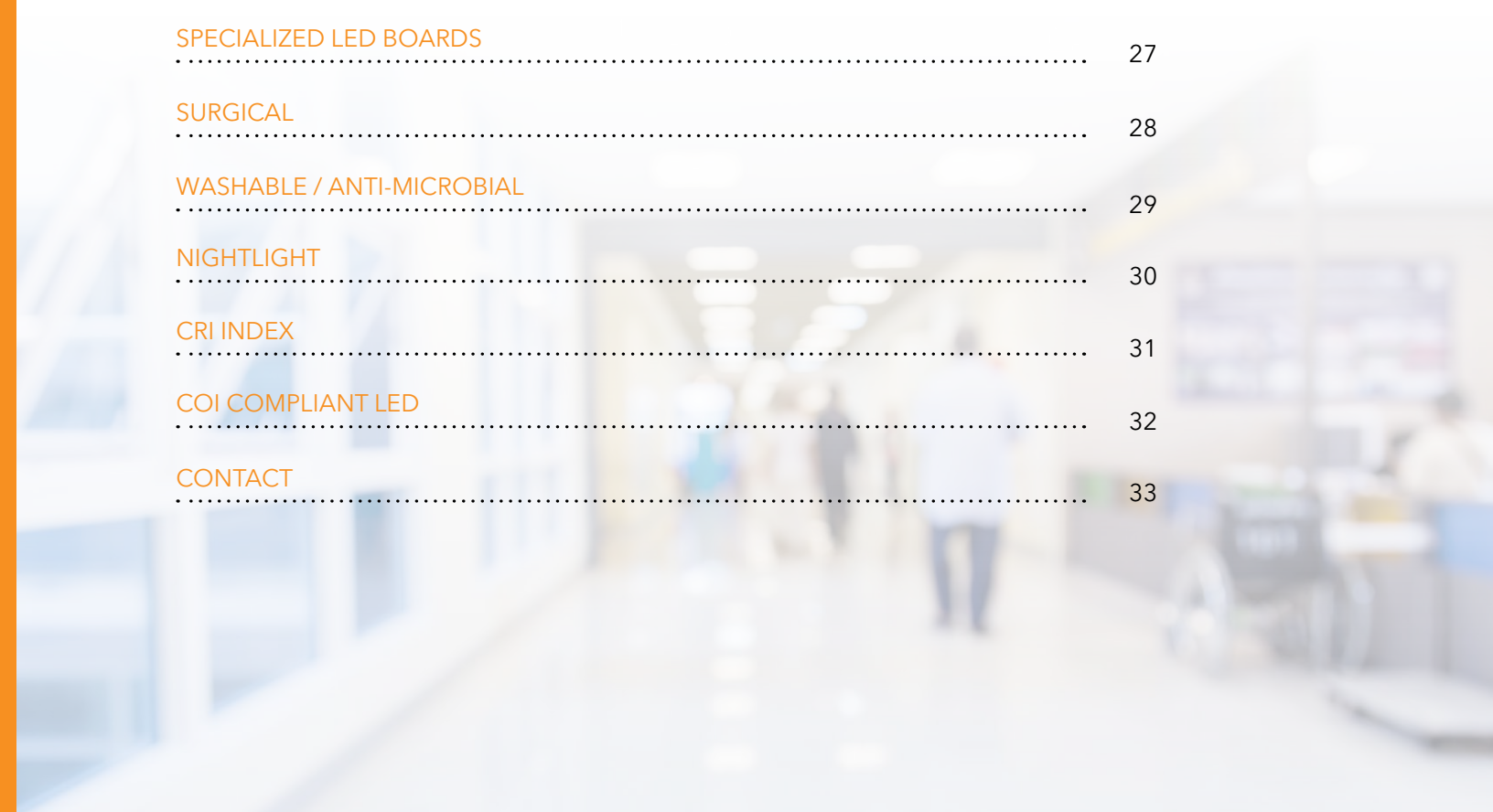
SANTE SERIES

MEDICAL SPECIFICATION GUIDE



CONTENT

ABOUT US	3
STATE OF THE ART MANUFACTURING FACILITY	4
MEDICAL APPLICATIONS	5
STANDARD VS. BEHAVIORAL	7
THE MR SERIES	8
GENERAL LIGHTING	9
MULTIFUNCTION / PATIENT ROOM	14
BEHAVIORAL: MRGA / MRPA	20
BEDLIGHTS	21
CLEANROOM & CONTAINMENT	25
SPECIALIZED LED BOARDS	27
SURGICAL	28
WASHABLE / ANTI-MICROBIAL	29
NIGHTLIGHT	30
CRI INDEX	31
COI COMPLIANT LED	32
CONTACT	33





FIRSTLY, ABOUT US

Established in 1978 and privately owned, Pa-Co has a longstanding history of manufacturing custom and institutional specification grade luminaires for hospitals, behavioral facilities, specialized medical clinics and nursing homes.

Our state-of-the-art manufacturing equipment paired with local testing laboratories allow us to design, produce and deliver top quality products with all the options needed to fulfill most healthcare applications.

The Engineering, design, fabrication and assembly of our products are all done in house at our Canadian facility, located in the greater Montreal area.

Pa-Co has evolved throughout the years and will continue to do so as we strive to offer our valued customers and their patients the latest technologies, options, and designs. In designing our healthcare luminaires we've emphasized quality and functionality as our foremost priorities, while integrating design aesthetics to create the perfect atmosphere and experience for patients and medical personnel.

We are your local solution for your health care applications.

The Pa-Co Team



State of the art manufacturing facility

For over 40 years, Pa-Co has been designing and manufacturing specification grade luminaires for the North American market.

The design, engineering, fabrication and assembly of our luminaires are all done under the same roof here in Laval, Quebec. We do our own forming, punching, laser cutting, welding and painting (powder coating) using the latest metal fabrication technologies.

Flexibility is one of our guiding principles. We have the capabilities to customize products to fit your applications and deliver in a timely manner.

Our local production ensures unmatched quality control. We are laser focused on quality and functionality which we achieve through teamwork, collaboration and the seamless integration of all functions which are located under the same roof.

We are our own biggest critics and that is why we have evolved so much over the last decade.

Take a tour! [🔗](#)



Specialized luminaires for various medical applications !

Healthcare facilities comprise of an array of distinct spaces with a variety of intended uses and corresponding requirements. These areas will, for the most part, require different lighting specifications.

The Pa-Co medical lighting guide will help professionals specify the right luminaire for the right application. We will break down the various types of spaces in healthcare facilities and match them with the appropriate medical luminaires.



General Lighting

The perfect general ambient lighting solution for waiting rooms, sorting areas, corridors, offices, etc.



Patient Room / Multifunction

Multi-functional luminaires (lighting for examination, ambient and reading) to provide lighting that meets medical staff requirements while maximizing patient comfort.



Bedlights

A great user-friendly and practical solution for hospitals, nursing homes, chronic care facilities and retirement homes.



Specialized luminaires for various medical applications !

Healthcare applications often require very specific options, certifications or construction requirements. Having the appropriate luminaire for each application can help the medical staff better perform their daily tasks and life-saving duties.



Cleanroom

Luminaires engineered and designed for applications such as laboratories, research, cleanrooms, confinement and containment areas.



Surgical Suite

Luminaires for operating rooms meeting the necessary standards for surgical activities.



Behavioral

Luminaires built and designed to ensure the safety of caregivers and patients in behavioral, psychiatric and mental health institutes.

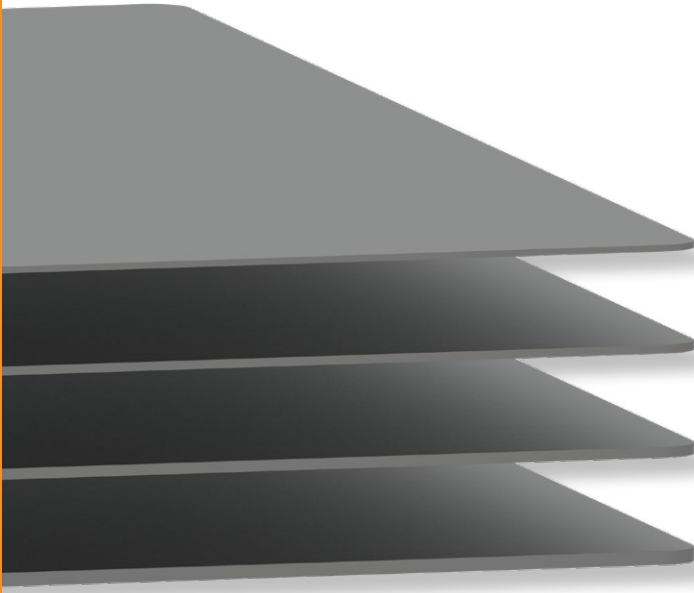


Standard vs. Behavioral

All our health care luminaires for general lighting and patient rooms are offered in both standard and tamper proof/anti-vandal versions. Heavier gauge steel and thicker polycarbonate security lens are the two main modifications that make our fixtures suitable for behavioral and psychiatric facilities. The higher the security level needed the thicker the steel gauge and security lens will be.

Choose to fit your needs!

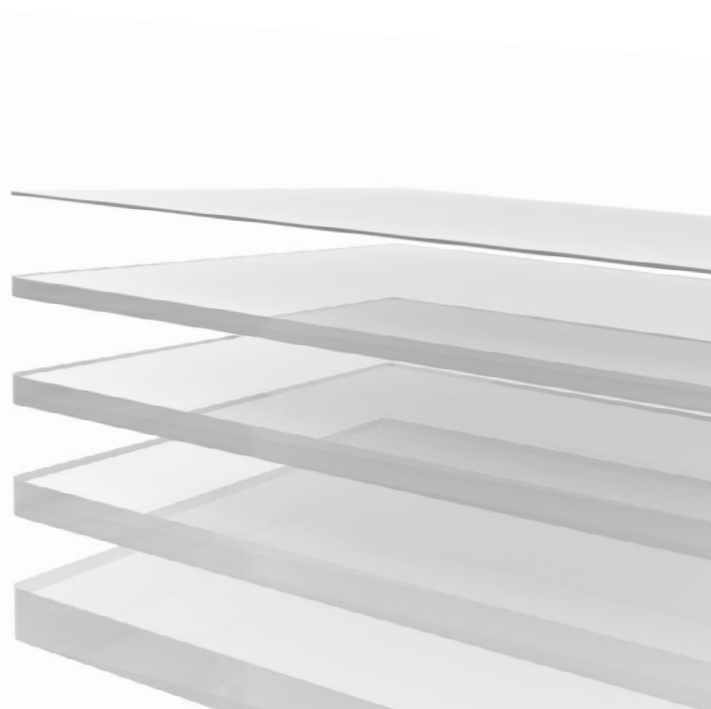
Steel Gauge



20 GAUGE (0.036")	STANDARD For general medical applications.	MRG / MRP
18 GAUGE (0.048")	SECURITY LEVEL "LIGHT"	
16 GAUGE (0.060")	SECURITY LEVEL "MEDIUM"	MRGA / MRPA
14 GAUGE (0.075")	SECURITY LEVEL "MAXIMUM"	

Lens Type

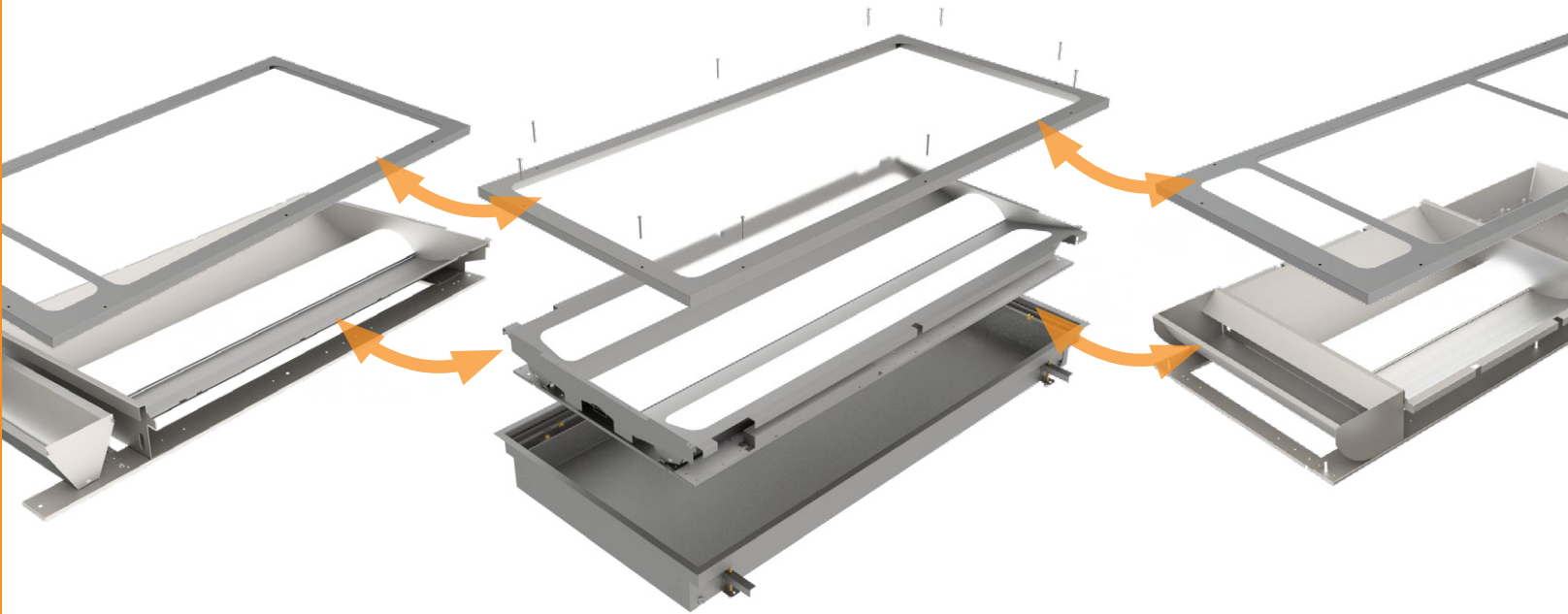
"DIFFUSER" Direct lighting and reduce glare (frosted, white opal or prismatic)	Diffuser
MRG / MRP	STANDARD For general medical applications
	Acrylic or Polycarbonate (0.125")
MRGA / MRPA	SECURITY LEVEL "LIGHT"
	SECURITY LEVEL "MEDIUM"
	SECURITY LEVEL "MAXIMUM"
	Polycarbonate (0.125")
	Polycarbonate (0.187" or 0.250")
	Polycarbonate (0.375")



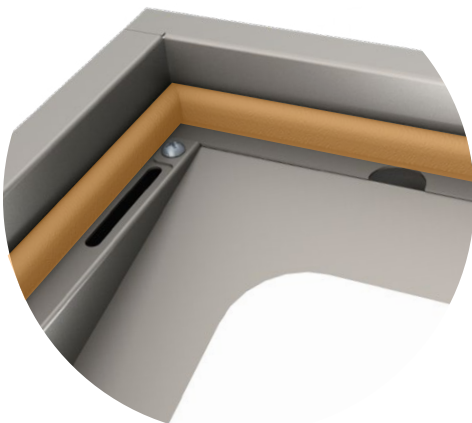


The MR Series

Our MR series were thoughtfully designed so that all configurations use the same basic housing, easily adaptable to T-bar or Plaster installation, as well as the same gasketed door system which makes for highly repeatable production, assembly and quality control. What varies are the interior modular systems and lenses that create all the needed options for patient rooms and other medical lighting applications.



Modular system, gasketed design...IP65!

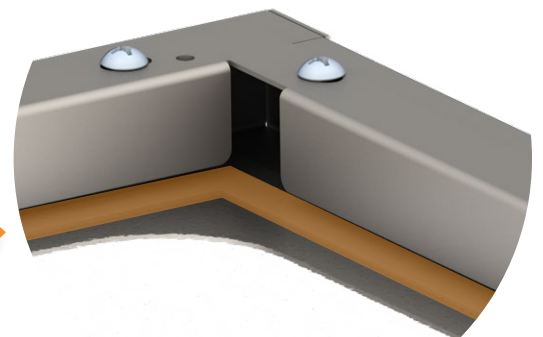


Housing Gasket

"D-Shape" Gasket
High quality D-Shape gasket provides a perfect seal between the door and the housing. The hollow shape assures a long lasting dust and water tight seal after multiple door openings.

.125" Thick "EPDM"
The lenses for all MR Series are gasketed between the door and its frame. Stainless steel fasteners all around the frame guarantees a tight fit between the lens and gasket.

Door Lens gasket





General Lighting



Pa-Co's MRG series consist of a comprehensive line of luminaires specially designed for general lighting applications in healthcare facilities. Sealed washable fixtures with front door access for easy maintenance featuring a clean, modern look with all the technical features and specifications for healthcare installations. The MRGA series is the anti-vandal counterpart to the MRG series for behavioral facilities, featuring heavier duty construction on the same luminaire designs.

MRG1 / MRGA1



MRG2 / MRGA2



MRGL / MRGAL



MRG3 / MRGA3



General Lighting Recommendations

General	Illumination Standards (fc)
Corridors (day)	10 to 20
Corridors (night)	5
Offices (general)	30
Offices (examination)	75 to 100
Sorting room	40
Waiting areas	30

*(ANSI-IES RP-29-16)

PRRA



MRG1 / MRGA1



IP65

Spec Sheets & IES Files:

[MRG1](#)

[MRGA1](#)

Dimensions:

- 1'x 4'
- 2'x 2'
- 2'x 4'

Mounting:

T-Bar / Plaster

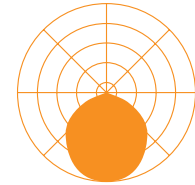
Led Options:

- 2700K
- 3000K
- 3500K
- 4000K
- 5000K
- TW
- 80 CRI
- 90 CRI
- COI

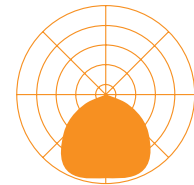
Lumen Output

Dimensions	Lumens*
1'x4'	3000
	5000
2'x2'	3000
	5000
2'x4'	4000
	6000

* Custom lumen package available



Acrylic lens



Perforated basket

MRG2 / MRGA2



IP65

Spec Sheets & IES Files:

[MRG2](#)

[MRGA2](#)

Dimensions:

- 1'x 4'
- 2'x 2'
- 2'x 4'

Mounting:

T-Bar / Plaster

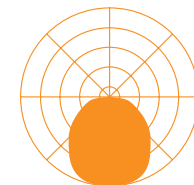
Led Options:

- 2700K
- 3000K
- 3500K
- 4000K
- 5000K
- TW
- 80 CRI
- 90 CRI
- COI

Lumen Output

Dimensions	Lumens*
1'x4'	3000
	5000
2'x2'	3000
	5000
2'x4'	4000
	6000
	8000

* Custom lumen package available



White Opal

MRGL / MRGAL

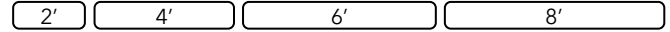


Spec Sheets & IES Files:



Dimensions:

8' Wide x



Mounting:

T-Bar / Plaster

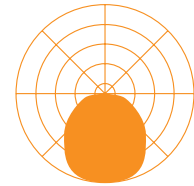
Led Options:



Lumen Output

Lumens Per Foot

- 500
- 750
- 1000
- 1500



White Opal

* Custom lumen package available

MRG3 / MRGA3



Spec Sheets & IES Files:



Dimensions:



Mounting:

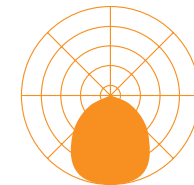
T-Bar / Plaster

Led Options:



Lumen Output

Dimensions	Lumens*
2'x2'	3000
	4000
	5000



White Opal

* Custom lumen package available

PRRA



Spec Sheets & IES Files:



Dimensions:

10"

Vandal Resistant

Mounting:

Plaster

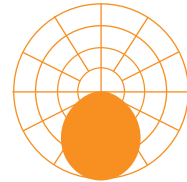
Led Options:



Lumen Output

Dimensions	Lumens*
10"	2000
	4000

* Custom lumen package available



White Opal



MRG3



MRG2



MRGL



Multifunction / Patient room



Pa-Co's MRP series is a complete line of multifunction recessed luminaires created specifically for patient rooms. Featuring multiple compartments for ambient, exam and/or reading illumination (depending on the model), the MRP series luminaires are conceived for functionality and enhanced patient experience. All MRP models are sealed washable fixtures with front door access for easy maintenance and a clean modern design. In addition, the MRP series can be built for compatibility with wide range of sophisticated control systems as well as patient-controlled nurse call system (low voltage relay ready) or wall switches.

MRP1 / MRPA1



MRP2 / MRPA2



MRP3 / MRPA3



MRP4 / MRPA4



Patient Rooms Lighting Recommendations

Patient Room	Illumination standards (fc)
Ambient	10 to 20
Reading	30 to 40
Exam	75 to 100
Night Light	2
Bathroom	15

*(ANSI-IES RP-29-16)

MRP5



MRP7



MRP1 / MRPA1



Functions:

- Ambient
- Reading

Dimensions:

2'x 4'

Mounting:

T-Bar / Plaster

Led Options:

2700K 3000K 3500K 4000K 5000K TW Amber / Red Night Light optional

*TW available in ambient only

Spec Sheets & IES Files:

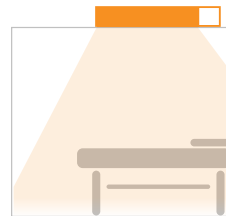


Lumen Output

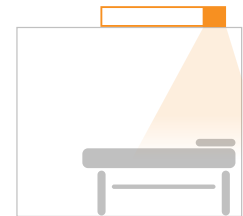
Function	Lumens*	Avg. Illuminance**
Ambient	3000	16 fc
	4000	21 fc
Reading	1500	18 fc
	2500	31 fc

* Custom lumen package available

**For illustrative purposes only based on a 10' x 10' x 9' room and subject to a number of assumptions based on the specific configuration of the room.



Ambient



Reading

*Based on book held at 45°



MRP2 / MRPA2



Functions:

- Exam
- Ambient
- Reading

Dimensions:

2'x 4'

Mounting:

T-Bar / Plaster

Led Options:

80
CRI
90
CRI
COI

2700K 3000K 3500K 4000K 5000K TW Amber / Red Night Light optional
 *TW available in ambient only

Spec Sheets & IES Files:

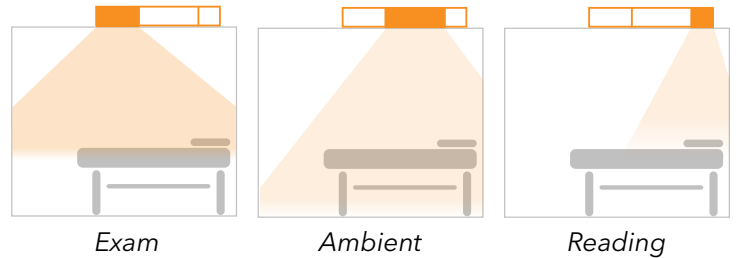


Lumen Output

Function	Lumens*	Avg. Illuminance**
Exam	8000	91 fc
	9000	103 fc
Ambient	3000	17 fc
	4000	22 fc
Reading	1500	18 fc
	2500	31 fc

* Custom lumen package available

**Avg. Illuminance; For illustrative purposes only based on a 10' x 10' x 9' room and subject to a number of assumptions based on the specific configuration of the room.



*Based on book held at 45°



MRP3 / MRPA3



Functions:

- Exam
- Ambient

Dimensions:

2'x 4'

Mounting:

T-Bar / Plaster

Led Options:



2700K 3000K 3500K 4000K 5000K TW

*TW available in ambient only

Spec Sheets & IES Files:

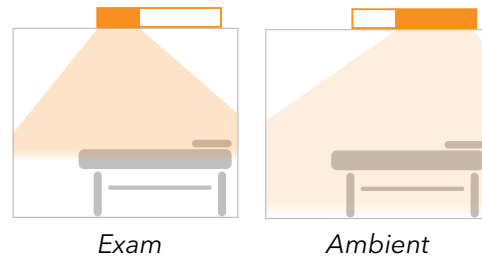


Lumen Output

Function	Lumens*	Avg. Illuminance**
Exam	8000	91 fc
	9000	103 fc
Ambient	3000	16 fc
	4000	21 fc

* Custom lumen package available

**Avg. Illuminance; For illustrative purposes only based on a 10' x 10' x 9' room and subject to a number of assumptions based on the specific configuration of the room.



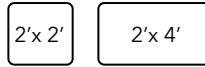
MRP4 / MRPA4



Functions:

- Exam
- Ambient

Dimensions:



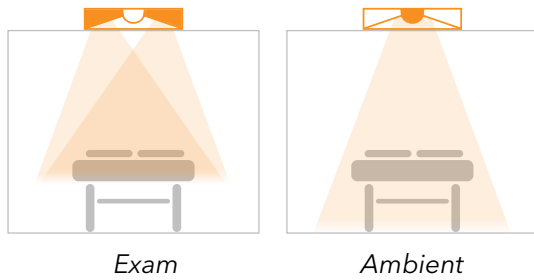
Mounting:

T-Bar / Plaster

Led Options:



Spec Sheets & IES Files:



Lumen Output

Function	Lumens*	Avg. Illuminance**
Exam	7000	89 fc
	10000	112 fc
Ambient	3000	16fc
	4000	21 fc

* Custom lumen package available

**Avg. Illuminance; For illustrative purposes only based on a 10' x 10' x 9' room and subject to a number of assumptions based on the specific configuration of the room.



MRP5



Functions:

- Exam
- Ambient
- Reading
- Night light

*** Must be Specified in Pairs
Left & Right**

Dimensions:

8" Wide x

4'

Mounting:

T-Bar / Plaster

Led Options:



2700K 3000K 3500K 4000K 5000K TW
*TW available in ambient only

Amber / Red
Night Light
optional

Spec Sheets & IES Files:

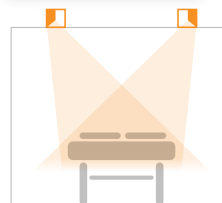


Lumen Output (L & R combined)

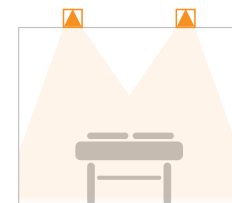
Function	Lumens*	Avg. Illuminance**
Exam	5000 (2x)	77 fc
	6000 (2x)	114 fc
Ambient	2000 (2x)	19 fc
	3000 (2x)	32 fc
Reading	1000 (2x)	17 fc
	1500 (2x)	29 fc

* Custom lumen package available

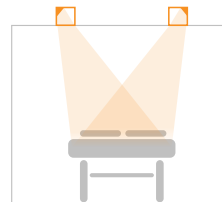
**For illustrative purposes only based on a 10' x 10' x 9' room and subject to a number of assumptions based on the specific configuration of the room.



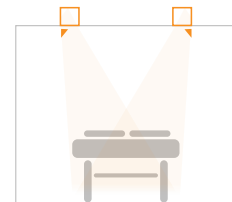
Exam



Ambient



Reading



Night Light

*Based on book held at 45°



MRP7



Functions:

- Exam
- Ambient
- Reading

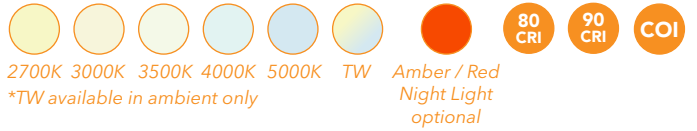
Dimensions:

1'x 4'

Mounting:

T-Bar / Plaster

Led Options:



Spec Sheets & IES Files:

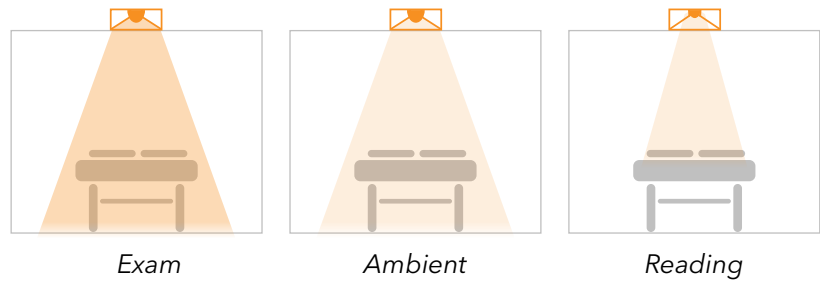


Lumen Output

Function	Lumens*	Avg. Illuminance**
Exam	7000	89 fc
	10000	112 fc
Ambient	3000	16 fc
	4000	21 fc
Reading	1500	18 fc
	2500	32 fc

* Custom lumen package available

**Avg. Illuminance; For illustrative purposes only based on a 10' x 10' x 9' room and subject to a number of assumptions based on the specific configuration of the room.





Behavioral: MRGA / MRPA



Tamper proof and anti-ligature luminaires with the same options as our medical series. MRGA/MRPA fixtures are available in three security levels (minimum, medium or maximum). Modern look, robust construction, dust proof and water tight (IP65).

Medical

All the same available options as our regular medical luminaires (antimicrobial paint, ambient-exam-reading sections, night light, 90 CRI or COI compliant LED boards, sealed and IP65 rated, etc).

Anti-vandal

Heavy gauge steel, polycarbonate security lens, tamperproof fasteners. Built to resist heavy impacts.

Durable

Long lasting LED boards and drivers, heavy duty housings and lenses for low-maintenance peace of mind.

Anti-ligature

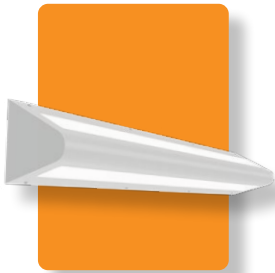
Ligature resistant, no cutting, tamper resistant, cannot be use as a weapon and no contraband storage.

Bedlights



Wall mounted direct and indirect lighting fixtures providing patients with multiple options to maximize their comfort level. Our bedlights are usually controlled via a pull switch but can also be made compatible with a variety of control systems or wall switches.

MURA



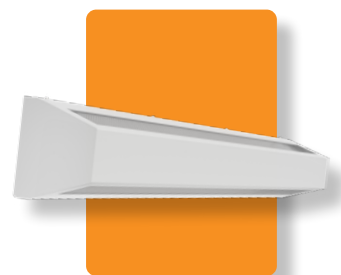
MBL2



PUHE



PUOA



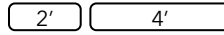
MURA



Spec Sheets & IES Files:



Dimensions:

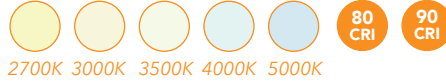


Vandal Resistant

Mounting:

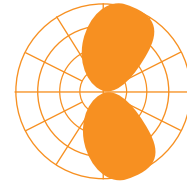
Wall mount

Led Options:



Lumen Output

Function	Lumens
Down Light	2000
	4000
	6000
Up Light	2000
	4000
	6000
Night Light	500



White Opal

** Custom lumen package available*

***Night Light only available in 4'*

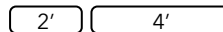
MBL2



Spec Sheets & IES Files:



Dimensions:



Mounting:

Wall mount

Led Options:



Lumen Output (4')

Function	Lumens*
Down Light	2000
	4000
	6000
Up Light	2000
	4000
	6000
Night Light**	500



White Opal

** Custom lumen package available*

***Night Light only available in 4'*

PUHE



Spec Sheets & IES Files:



Dimensions:

4'

Mounting:

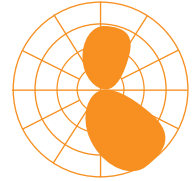
Wall mount

Led Options:



Lumen Output

Function	Lumens*
Down Light	2000
	4000
	6000
Up Light	2000
	4000
	6000
Night Light**	500



White Opal

* Custom lumen package available

**Night Light only available in 4'

PUOA



Spec Sheets & IES Files:



Dimensions:

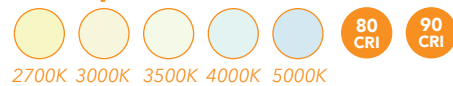
2' 4'

Vandal Resistant

Mounting:

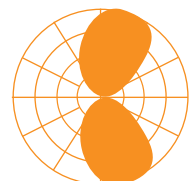
Wall mount

Led Options:



Lumen Output

Function	Lumens
Down Light	2000
	4000
	6000
Up Light	2000
	4000
	6000
Night Light	500



White Opal

* Custom lumen package available

**Night Light only available in 4'



Cleanroom & Containment



Ideal lighting to conduct the important tasks that are being performed in these cleanroom areas without altering their environment. Sealed IP66 recessed fixtures suitable for ISO classes 5-9 cleanrooms.

- The cleanroom class is the level of cleanliness the room complies with, according to the quantity and size of particles per volume of air. The primary authority in the US and Canada is the ISO classification system ISO 1464-1. This standard includes the cleanroom classes ISO 1, 2, 3, 4, 5, 6, 7, 8 and 9. ISO 1 being the "most stringent" and ISO 9 being the "less stringent" class.

PRCL



ISO 14644-1 Cleanroom Standards

maximum particles/m³

Class	>=0.1 µm	>=0.2 µm	>=0.3 µm	>=0.5 µm	>=1 µm	>=5 µm	FED STD 209E
ISO 1	10	2					
ISO 2	100	25	10	4			
ISO 3	1000	237	102	35	8		Class 1
ISO 4	10 000	2370	1020	352	83		Class 10
ISO 5	100 000	23 700	10 200	3520	832	29	Class 100
ISO 6	1 000 000	237 000	102 000	35 200	8320	293	Class 1000
ISO 7				352 000	83 200	2930	Class 10 000
ISO 8				3 520 000	832 000	29 300	Class 100 000
ISO 9				35 200 000	8 320 000	293 000	Room air

PRCL



Spec Sheets & IES Files:



Dimensions:

- 1'x 4'
- 2'x 2'
- 2'x 4'

Mounting:

T-Bar / Plaster

Options:

- Stainless Steel
- Rear access door
- Specialized color LED boards

Led Options:

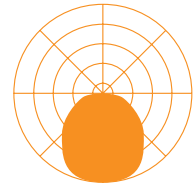
2700K 3000K 3500K 4000K 5000K TW 80 CRI 90 CRI COI

Red LED optional Amber LED optional

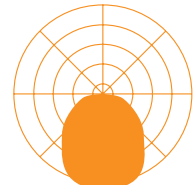
Lumen Output

Dimensions	Lumens*
1'x4'	3000
	5000
2'x2'	3000
	5000
2'x4'	4000
	6000

* Custom lumen package available



White Opal



Frosted





Specialized LED Boards



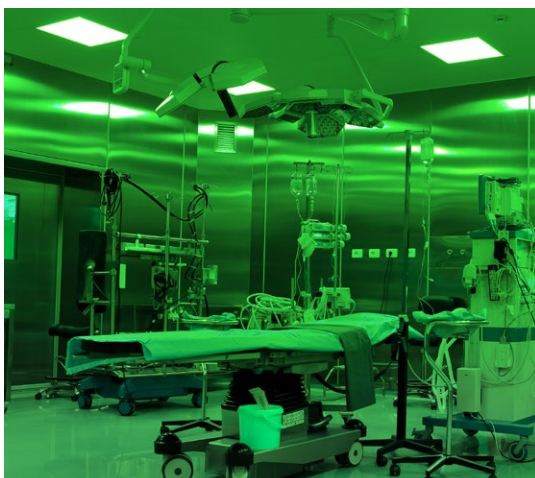
Amber

- 585nm to 595nm LED boards are often used for medical research, laboratories and biological work.
- Amber lighting is recommended for detailed tasks where precision and acute vision are needed.
- Reduces the impact that white light could have over time on sensitive elements.
- Good option for patient room night light.



Red

- 625nm to 635nm RED LEDs for vivarium light.
- Rodents are far less sensitive to red light.
- RED LEDs are used for observation when subjects should not be disturbed by white light or to minimize circadian disruption.
- Good option for patient room night light.



Green

- 525nm to 535nm GREEN LEDs for operating room.
- Green LEDs enhance contrast on monitors.
- Reduces fatigue and helps with medical staff's concentrations.



Surgical



Multiple options are provided with this series focusing on aspects like safety, precision, glare reduction and visual comfort.

PRCL-S



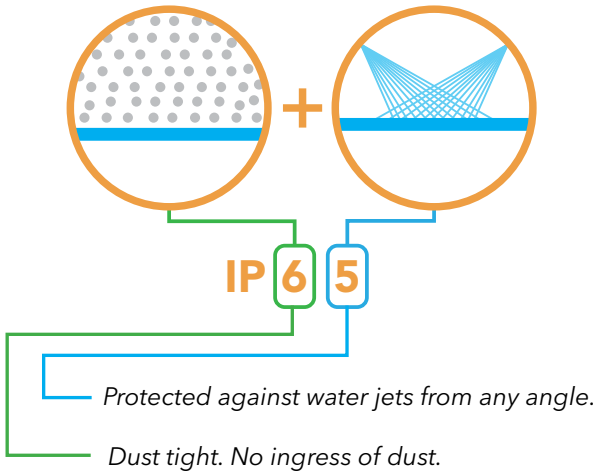
Features

- IP66 certified.
- Luminaire can be washed down with high pressure water jet. (up to 15psi at 9.8ft)
- Symmetrical, asymmetrical and symmetrical/asymmetrical light distributions available.
- NSF certified for splash zone installations.
- EMI/RFI filtering available. (optional)
- Available with 1, 2 or 3 circuits for low lumen output, high lumen output and green LEDs.
- White LEDs, green LEDs and white and green LEDs luminaires available.
- Emergency power pack optional.
- 80+ CRI standard and 90CRI available.

Washable and Anti-microbial

INGRESS PROTECTION

Sealed luminaires are washable which is important to help prevent accumulation and spread of microbes.



ANTI-MICROBIAL COATING (Optional)

Pa-Co's MR series are available with anti-microbial coating to help protect against harmful bacteria and mold.

Hospitals are known to harbor pathogenic bacteria and other microbes for extended periods of time.

This option is recommended for all medical facilities.



Night Light

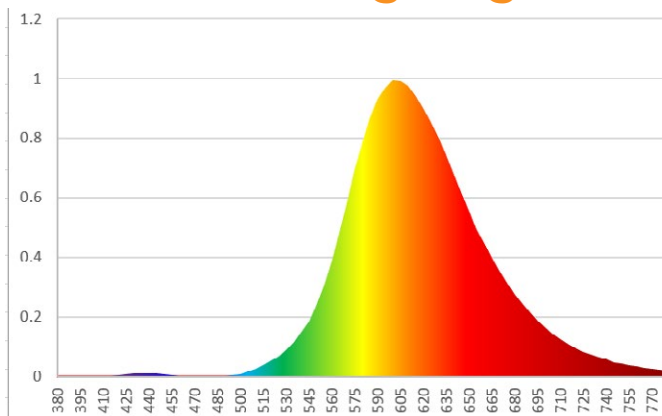
(Optional)



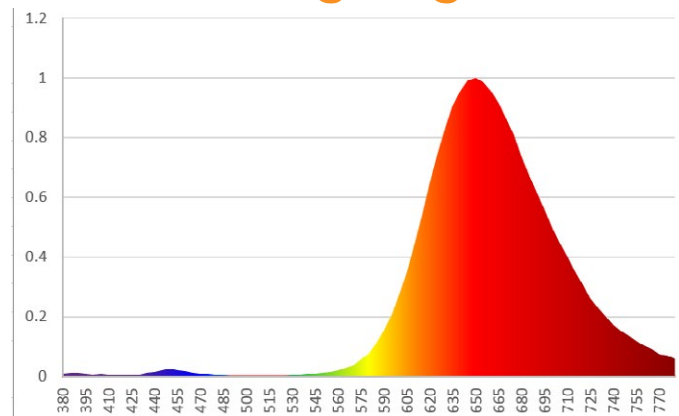
Pa-Co offers white, red or amber night light options on MRP series or bedlight luminaire with an optional nightlight compartment. Red or amber night lights are recommended to minimize disruption to a patient's sleep while providing sufficient warm lighting for medical workers or patients to comfortably conduct their night-time activities.

The advantage of red or amber lighting is that, unlike white light, they do not contain blue light which is known to create alertness and disrupt sleep. The body can interpret white/blue light as daylight which can cause it to reduce the production of melatonin, create alertness and disrupt a patient's sleep.

Amber Night light



Red Night light



Reduced blue wavelengths



Improved color rendering leads to improved accuracy



70 CRI



80 CRI



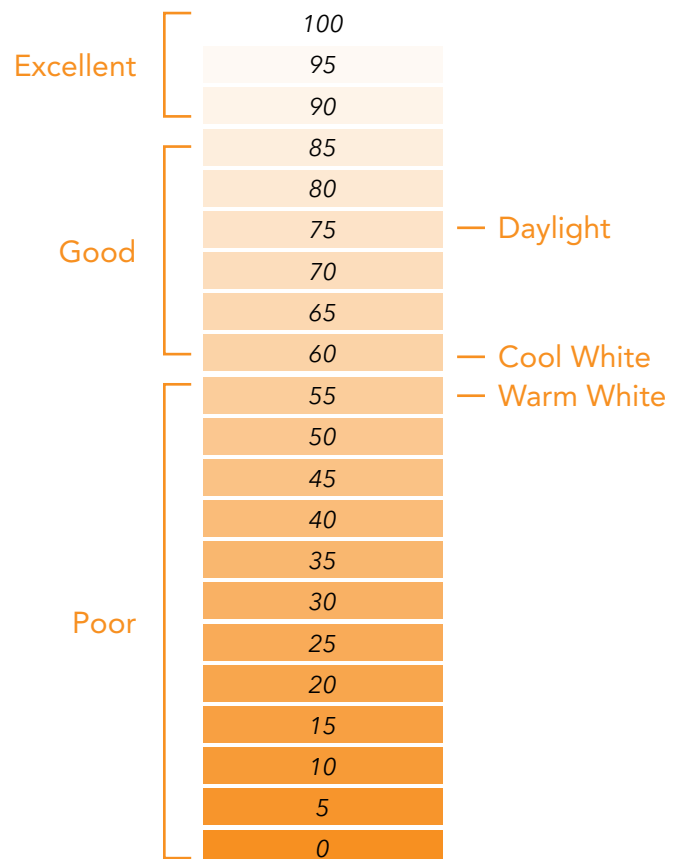
90 CRI

90 CRI vs. 80 CRI LED boards

Pa-Co's MR series are available with optional 90 CRI boards. This option is recommended for spaces where medical personnel would benefit from a more accurate color rendering.

- Many healthcare workers must visually evaluate patients every single day.
- They need to quickly diagnose based on visual inspections.
- Skin color needs to reflect reality (yellowish color for jaundice).
- Higher CRI equals better accuracy of work in healthcare settings.

Color Rendering Index (CRI)





COI Compliant LED boards

(Optional)



Designed for cyanosis observation

Cyanosis is a condition in which there's a blue tint to the skin, indicating the body is not receiving enough oxygen-rich blood.¹ Per the American Journal of Medicine "Cyanosis is an abnormal bluish discoloration of the skin and mucous membranes [...]. Hypoxemia [...] is the deficient oxygenation of blood that leads to cyanosis". Cyanosis can be associated with underlying medical conditions which are "predominantly cardiopulmonary in nature, although shock of any kind also may cause cyanosis".²

For cyanosis observation, healthcare lighting should have an appropriate power output in the red part of the spectrum. In order to determine whether medical lighting is good for diagnosing Cyanosis, a methodology has been developed to calculate the Cyanosis Observation Index in standard AS 1680.2.5:1997. Lighting must have a COI index <3.3 as tested against AS 1680.2.5 in order to be COI compliant.

PACO's MR series luminaires are available with special optional COI compliant boards which have a COI index < 3.3 upon request. Please contact us for more information.

Illustrative result of MRG luminaire (Using special COI compliant boards)

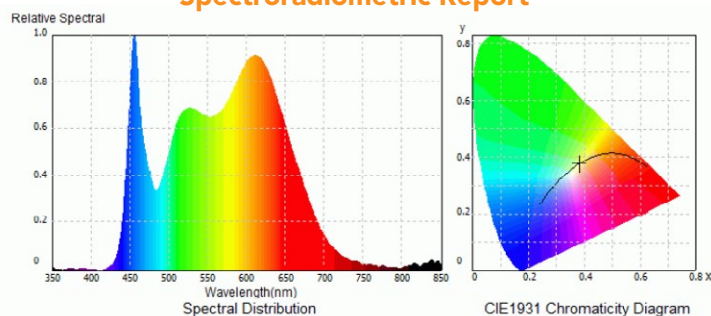
Spectrum measurements analysis

Chromaticity Coordinates	X= 0.3903	Y= 0.3835
Correlated Color Temperature	Tc= 3792.415K	

Color Rendering Index : Ra= 95.407

R1=98	R2=99	R3= 98	R4= 97	R5= 97
R6= 95	R7= 92	R8= 86	R9= 68	R10= 99
R11= 97	R12= 75	R13= 99	R14= 99	R15= 93

Spectroradiometric Report



Lens	COI
Acrylic ribbed lens + Clear optics	2.886
H1 (White Opal)	2.4037
P95 (Frost)	2.8304

1. WebMD <https://www.webmd.com/heart-disease/heart-failure/qa/what-is-the-definition-of-cyanosis>

2. The American Journal of Medicine Sarah M. McMullen, MD Ward Patrick, MD full article here: <https://www.amjmed.com/article/S0002-9343%2812%2900904-7/full-text#tbl1>



ÉCLAIRAGES

PACO

L I G H T I N G

LOCAL / GLOBAL PACO LIGHTING



780 salaberry
Laval QC H7S 1H3
450.668.9620



info@pacolighting.com
www.pacolighting.com



LinkedIn



MADE IN CANADA
FAIT AU CANADA