PROJECT	Job Name	Catalog Number
INFORMATION	Fixture Type	 Approved by

Luminaires for Surgical Applications

#### **M4DL SERIES**

#### **PRODUCT FEATURES:**

- » 6" sealed, recessed downlight with regressed or flush lens trim
- » Conducted emissions controlled as per MIL-STD-461G
- » 675 5,000 delivered lumens with multiple distribution, reflector finish and lens options
- » 1% Dimming via 0-10V or DALI-2 control
- » For M4DL6 with Green LEDs, click here

#### SPECIFICATIONS

HEAT SINK: Die-cast aluminum with external radial fins for natural convection.

**ROUGH-IN FRAME:** 18-gauge die-formed, corrosion-resistant steel. Vertically adjustable collar accommodates ceiling thicknesses up to 2", adjustable post-installation. Universal mounting brackets accept 3/4" and 1-1/2" lathers channel, 1/2" EMT conduit and hanger bars. Quick-access junction box accessible post-installation from above and below ceiling. Includes (4) 1/2" and (2) 3/4" knock-outs to allow straight conduit runs. Listed for (8) 12AWG, 90°C conductors and feed-thru branch wiring. Provided with FMC with electrical quick-connect to Trim Section.

**TRIM/HOUSING SECTION:** IP-rated housing section incorporates the heat sink, LED module, optics and lower trim. Configurable with an IP64-rated Regressed or Flush lens trim that is secured to the Rough-In frame with hidden torsion springs, and an IP65 Flush lens trim secured with four (4) Phillips-head, captive fasteners. Anti-microbial finish standard on all exposed painted surfaces. See Trim Ordering Information for available options.

**OPTICAL:** Clear tempered glass upper lens. Flush lens trims provided with 1/8" clear impact-resistant acrylic lens at ceiling trim. Continuous seal between lens and trim ring. Available with various reflector distribution patterns and finishes. See Ordering Information for available options.

ELECTRICAL: LED source available in multiple CCT and CRI combinations with a maximum 3-step MacAdam variation allowance. See Trim Ordering Information for available options. 120VAC, 277VAC or 347VAC, 50/60Hz electrical input with serviceable constant current driver (<20% THD, >0.90 PF). Minimum 85% driver efficiency. Standard 0-10V dimming with 1-100% range and dimto-dark capabilities; 0.2mA maximum source current. Optional eldoLED ECOdrive DALI-2 (DT6) / LEDcode2 driver with 1-100% range.

PHOTOMETRICS: Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory. For photometric information, go to www.kenall.com.

WARRANTY: Limited five (5) year LED warranty.

LISTINGS: Luminaire is certified to UL standards by Intertek Testing Laboratory for non-IC and Wet Location installations. IP64 and IP65 rating per IEC60598. NSF2 Splash/Non-Food Zone. Conducted emissions controlled as per MIL-STD-461G. Optional CCEA compliant.



#### ORDERING INFORMATION (EX: M4DL6-FF-2FW-18L-40K8-W-CSS-T-RIS6-277-DIM1)

TRIM		ROUGH-IN
Model Trim Style Trim Finish Lamp Power	Lamp Color Distribution Reflector Finish Flush Lens Type	Rough-In Input Voltage Driver Type Options
M4DL6		
Trim Style	Lamp Color	Rough-In
R Regressed Lens (IP64)	30K8 3000K / 80 CRI min.	RIS6 6" Surgical Rough-In
NF Flush Lens (Without Fasteners - IP64)	35K8 3500K / 80 CRI min.	5 5
FF Flush Lens (With Fasteners - IP65)	35K9 3500K / 90 CRI min.	Input Voltage
	40K8 4000K / 80 CRI min.	120 120VAC, 60Hz
Trim Finish	40K9 4000K / 90 CRI min.	277 277VAC, 60Hz
DCFW Die-Cast Aluminum in Flat White	50K8 5000K / 80 CRI min.	347† 347VAC, 60Hz
(R and NF Trim Style)		
2FW Cold-Rolled Steel in Flat White	Distribution	Driver Type
5BR Type 304 Stainless Steel with 4B Brushed Finish	M Medium	DIM1 0-10V Dimming to 1% with Dim-to-Dark
<b>5FW</b> Type 304 Stainless Steel in Flat White	W Wide	DALI DALI-2/LEDcode2 Dimming to 1% without Dim-to-Dark
Lamp Power	Reflector Finish	Options
9L 9 Watt LED	FW Flat White	LEL Emergency Battery Backup with Remote Test Switch
18L 18 Watt LED	CS Clear Specular	FS Fuse & Holder
24L 24 Watt LED	CSS Clear Semi-Specular	CCEA
32L 32 Watt LED	·	
43L▲ 43 Watt LED	Flush Lens Type (n/a Regressed Trim Style)	
	T 1/8" Clear High-Impact Acrylic	t N/A with DALI Driver Type. N/A with LEL and CCEA option
		<ul> <li>Must be installed with a minimum 24" on-center spacing,</li> </ul>
		12" from wall, and have 3" clearance above the
		Trim/Housing

N/A with W-CS Distribution-Reflector Finish



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Luminaires for Surgical Applications

## **M4DL SERIES**

### **PERFORMANCE - REGRESSED LENS**

Op	tic			Initial De	livered Lur	nens, By La	mp Color				TM-21	TM-21
Distribution	Reflector Finish	Lamp Power	30K8	35K8	35K9	40K8	40K9	50K8	Efficacy (Im/W)	Input Power (W)	Reported L90 (hrs)	Reported L70 (hrs)
		9L	1,162	1,189	978	1,196	998	1,210	80 - 103	12	>55,000	>55,000
		18L	2,032	2,080	1,710	2,092	1,745	2,116	81 - 104	20	>55,000	>55,000
	CS	24L	2,982	3,052	2,509	3,070	2,561	3,105	85 - 109	28	52,000	>55,000
		32L	3,751	3,838	3,155	3,861	3,221	3,905	81 - 104	38	52,000	>55,000
		43L	4,803	4,916	4,041	4,945	4,125	5,001	77 - 98	51	51,000	>55,000
		9L	1,028	1,052	865	1,059	883	1,071	71 - 91	12	>55,000	>55,000
		18L	1,799	1,841	1,513	1,851	1,544	1,873	72 - 92	20	>55,000	>55,000
м	CSS	24L	2,639	2,701	2,220	2,717	2,266	2,748	75 - 97	28	52,000	>55,000
		32L	3,319	3,397	2,792	3,417	2,850	3,456	72 - 92	38	52,000	>55,000
		43L	4,250	4,350	3,576	4,375	3,650	4,425	68 - 87	51	51,000	>55,000
		9L	1,056	1,081	888	1,087	907	1,099	73 - 94	12	>55,000	>55,000
		18L	1,847	1,890	1,554	1,901	1,586	1,923	74 - 95	20	>55,000	>55,000
	FW	24L	2,710	2,773	2,280	2,789	2,327	2,821	77 - 99	28	52,000	>55,000
		32L	3,408	3,488	2,867	3,508	2,927	3,548	74 - 95	38	52,000	>55,000
		43L	4,365	4,467	3,672	4,493	3,748	4,544	70 - 89	51	51,000	>55,000
		9L	1,139	1,166	958	1,173	978	1,186	79 - 101	12	>55,000	>55,000
		18L	1,993	2,039	1,676	2,051	1,711	2,075	80 - 102	20	>55,000	>55,000
	CS	24L	2,924	2,992	2,459	3,010	2,511	3,044	83 - 107	28	52,000	>55,000
		32L	3,677	3,763	3,093	3,785	3,158	3,828	80 - 102	38	52,000	>55,000
		43L	4,709	4,819	3,961	4,847	4,044	4,903	75 - 96	51	51,000	>55,000
		9L	1,099	1,125	924	1,131	944	1,144	76 - 98	12	>55,000	>55,000
		18L	1,922	1,967	1,617	1,979	1,651	2,001	77 - 99	20	>55,000	>55,000
W	CSS	24L	2,820	2,886	2,373	2,903	2,422	2,936	80 - 103	28	52,000	>55,000
		32L	3,547	3,630	2,984	3,652	3,046	3,693	77 - 98	38	52,000	>55,000
		43L	4,543	4,649	3,821	4,676	3,901	4,730	72 - 93	51	51,000	>55,000
		9L	989	1,012	832	1,018	849	1,029	68 - 88	12	>55,000	>55,000
		18L	1,729	1,770	1,455	1,780	1,485	1,800	69 - 89	20	>55,000	>55,000
	FW	24L	2,537	2,597	2,134	2,612	2,179	2,642	72 - 93	28	52,000	>55,000
		32L	3,191	3,266	2,684	3,285	2,740	3,323	69 - 89	38	52,000	>55,000
		43L	4,087	4,182	3,438	4,207	3,509	4,255	65 - 84	51	51,000	>55,000
		9L	916	938	771	943	787	954	63 - 81	12	>55,000	>55,000
		18L	1,603	1,640	1,348	1,650	1,376	1,669	64 - 82	20	>55,000	>55,000
ww	CSS	24L	2,351	2,406	1,978	2,421	2,019	2,448	32 - 86	28	52,000	>55,000
		32L	2,957	3,027	2,488	3,044	2,540	3,079	42 - 82	38	52,000	>55,000
		43L	3,787	3,876	3,186	3,899	3,252	3,943	60 - 77	51	51,000	>55,000

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## Luminaires for Surgical Applications

## **M4DL SERIES**

#### PERFORMANCE - REGRESSED LENS

	M4DL6-R-18L	40K8-W-CS		M4DL6-R-18	L-40K8-M-CS	Medium Distribution Candela Curve		
Wide Distribution Candela Curve	Initial center beam foot-candles	Beam diameter (ft)	Distance to illuminated plane (ft)	Initial center beam foot-candles	Beam diameter (ft)			
563	57.7	6.8	5'	83.7	4.9	730		
1126	40.1	8.2	6'	58.1	5.9	1459		
1689	29.5	9.6	7'	42.7	6.9	2189 7		
	22.6	10.9	8'	32.7	7.8			
	17.8	12.3	9'	25.8	8.8	$HT \setminus Y$		
	14.4	13.7	10'	20.9	9.8			
Spacing Criteria: 1.33	Foot-can	Foot-candle multipliers for 30K8 (0.97), 35K8 (0.99), 35K9 (0.82), 40K9 (0.83), 50K8 (1.01)						
Beam Angle: 69°		Beam diameter is where foot-candles drop to 50% of maximum						

	M4DL6-R-18L	-40K8-W-CSS		M4DL6-R-18L	-40K8-M-CSS	Medium Distribution Candela Curve	
Wide Distribution Candela Curve	Initial center beam foot-candles	Beam diameter (ft)	Distance to illuminated plane (ft)	Initial center beam foot-candles	Beam diameter (ft)		
472	58.9	4.1	5'	117.1	4.5	732	
944	40.9	4.9	6'	81.3	5.4	1463	
1416	30.1	5.7	7'	59.7	6.3	2195	
	23.0	6.5	8'	45.7	7.2		
	18.2	7.3	9'	36.1	8.1	$HT \setminus Y$	
	14.7	8.1	10'	29.3	9.0		
Spacing Criteria: 1.31	Foot-can	Spacing Criteria: 0.71					
Beam Angle: 44°		Beam diame	ter is where foot-candles drop to 50%	of maximum		Beam Angle: 48°	

	M4DL6-R-18L	-40K8-W-FW		M4DL6-R-18L	-40K8-M-FW	Medium Distribution Candela Curve		
Wide Distribution Candela Curve	Initial center beam foot-candles	Beam diameter (ft)	Distance to illuminated plane (ft)	Initial center beam foot-candles	Beam diameter (ft)			
379	60.6	6.4	5'	66.3	6.5	451		
758	42.1	7.7	6'	46.0	7.9	901		
1137	30.9	9.0	7'	33.8	9.2	1352		
	23.7	10.3	8'	25.9	10.5			
$  \times / +$	18.7	11.5	9'	20.5	11.8	HTV		
	15.2	12.8	10'	16.6	13.1			
Spacing Criteria: 1.11	Foot-can	Foot-candle multipliers for 30K8 (0.97), 35K8 (0.99), 35K9 (0.82), 40K9 (0.83), 50K8 (1.01)						
Beam Angle: 65°		Beam diameter is where foot-candles drop to 50% of maximum						



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## Luminaires for Surgical Applications

## **M4DL SERIES**

### **PERFORMANCE - FLUSH LENS**

	Optic		1	I	Initial Delivered Lumens, By Lamp Color						Insurate	TM-21	TM-21
Distribution	Reflector Finish	Lens Type	Lamp Power	30K8	35K8	35К9	40K8	40K9	50K8	Efficacy (Im/W)	Input Power (W)	Reported L90 (hrs)	Reported L70 (hrs)
			9L	1,119	1,145	941	1,152	961	1,165	77 - 99	12	>55,000	>55,000
			18L	1,957	2,002	1,646	2,014	1,680	2,037	78 - 100	20	>55,000	>55,000
	CS	Т	24L	2,871	2,938	2,415	2,955	2,465	2,989	82 - 105	28	52,000	>55,000
			32L	3,611	3,695	3,038	3,717	3,101	3,759	78 - 100	38	52,000	>55,000
			43L	4,624	4,732	3,890	4,760	3,971	4,815	74 - 94	51	51,000	>55,000
			9L	983	1,006	827	1,012	844	1,024	68 - 87	12	>55,000	>55,000
			18L	1,720	1,760	1,447	1,771	1,477	1,791	69 - 88	20	>55,000	>55,000
М	CSS	Т	24L	2,524	2,583	2,123	2,598	2,167	2,628	72 - 92	28	52,000	>55,000
			32L	3,174	3,248	2,670	3,267	2,726	3,305	69 - 88	38	52,000	>55,000
			43L	4,065	4,160	3,420	4,184	3,491	4,232	65 - 83	51	51,000	>55,000
			9L	1,016	1,040	855	1,046	873	1,058	70 - 90	12	>55,000	>55,000
			18L	1,777	1,819	1,495	1,830	1,526	1,851	71 - 91	20	>55,000	>55,000
	FW	Т	24L	2,608	2,669	2,194	2,685	2,239	2,715	74 - 95	28	52,000	>55,000
			32L	3,280	3,357	2,759	3,376	2,817	3,415	71 - 91	38	52,000	>55,000
			43L	4,200	4,299	3,533	4,324	3,607	4,373	67 - 86	51	51,000	>55,000
			9L	1,103	1,129	928	1,135	947	1,148	76 - 98	12	>55,000	>55,000
			18L	1,929	1,974	1,623	1,986	1,656	2,008	77 - 99	20	>55,000	>55,000
	CS	Т	24L	2,830	2,896	2,381	2,913	2,430	2,947	81 - 104	28	52,000	>55,000
			32L	3,560	3,643	2,994	3,664	3,057	3,706	77 - 99	38	52,000	>55,000
			43L	4,559	4,665	3,835	4,693	3,915	4,746	73 - 93	51	51,000	>55,000
			9L	1,045	1,070	879	1,076	898	1,088	72 - 93	12	>55,000	>55,000
			18L	1,828	1,871	1,538	1,882	1,570	1,903	73 - 94	20	>55,000	>55,000
W	CSS	Т	24L	2,682	2,745	2,256	2,761	2,303	2,793	76 - 98	28	52,000	>55,000
			32L	3,374	3,453	2,838	3,473	2,897	3,513	73 - 94	38	52,000	>55,000
			43L	4,320	4,422	3,634	4,448	3,710	4,498	69 - 88	51	51,000	>55,000
			9L	932	954	784	959	800	970	65 - 83	12	>55,000	>55,000
			18L	1,630	1,668	1,371	1,678	1,400	1,697	65 - 84	20	>55,000	>55,000
	FW	Т	24L	2,392	2,448	2,012	2,462	2,054	2,491	68 - 87	28	52,000	>55,000
			32L	3,008	3,079	2,531	3,097	2,583	3,132	65 - 84	38	52,000	>55,000
			43L	3,853	3,943	3,241	3,966	3,309	4,011	61 - 79	51	51,000	>55,000

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## Luminaires for Surgical Applications

## **M4DL SERIES**

### **PERFORMANCE - FLUSH LENS**

	MDL6-xF-18L-	40K8-W-CS-T		MDL6-xF-18L-	40K8-M-CS-T	Medium Distribution Candela Curve		
Wide Distribution Candela Curve	Initial center beam foot-candles	Beam diameter (ft)	Distance to illuminated plane (ft)	Initial center beam foot-candles	Beam diameter (ft)			
543	56.5	5.3	5'	80.0	5.0	664		
1086	39.3	6.4	6'	55.6	6.0	1328		
1629	28.8	7.5	7'	40.8	7.0	1992		
	22.1	8.5	8'	31.3	8.0			
	17.5	9.6	9'	24.7	9.0	++		
	14.1	10.7	10'	20.0	10.0			
Spacing Criteria: 1.35	Foot-car	Spacing Criteria: 0.97						
Beam Angle: 56°		Beam diameter is where foot-candles drop to 50% of maximum						

	MDL6-xF-18L-4	40K8-W-CSS-T		MDL6-xF-18L-	40K8-M-CSS-T	Medium Distribution Candela Curve	
Wide Distribution Candela Curve	Initial center beam foot-candles	Beam diameter (ft)	Distance to illuminated plane (ft)	Initial center beam foot-candles	Beam diameter (ft)		
433	59.0	3.9	5'	108.9	4.5	681	
866	41.0	4.6	6'	75.6	5.4	1361	
1299	30.1	5.4	7'	55.6	6.3	2042 7	
	23.1	6.2	8'	42.5	7.2		
	18.2	7.0	9'	33.6	8.1	$HT \setminus Y$	
	14.8	7.7	10'	27.2	9.0		
Spacing Criteria: 1.28	Foot-car	Spacing Criteria: 0.72					
Beam Angle: 42°		Beam diame	eter is where foot-candles drop to 50%	of maximum		Beam Angle: 49°	

	MDL6-xF-18L-	40K8-W-FW-T		MDL6-xF-18L-	40K8-M-FW-T	Medium Distribution Candela Curve		
Wide Distribution Candela Curve	Initial center beam foot-candles	Beam diameter (ft)	Distance to illuminated plane (ft)	Initial center beam foot-candles	Beam diameter (ft)			
361	57.7	6.3	5'	63.9	6.4	429		
721	40.1	7.6	6'	44.3	7.7	859		
1082	29.4	8.8	7'	32.6	9.0	1288		
	22.5	10.1	8'	24.9	10.3			
$  \times / \uparrow +$	17.8	11.4	9'	19.7	11.6			
	14.4	12.6	10'	16.0	12.9			
Spacing Criteria: 1.1	Foot-ca	Foot-candle multipliers for 30K8 (0.97), 35K8 (0.99), 35K9 (0.82), 40K9 (0.83), 50K8 (1.01)						
Beam Angle: 64.6°		Beam diameter is where foot-candles drop to 50% of maximum						



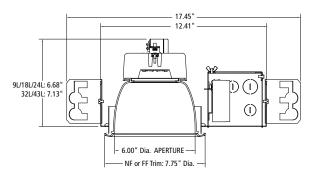
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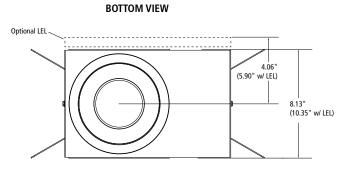
Luminaires for Surgical Applications

### **M4DL SERIES**

**DIMENSIONAL DATA** 

#### CROSS SECTION





RECOMMENDED CEILING CUT-OUT NF Trims: 7.13" Dia. FF Trims: 7.38" Dia.



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