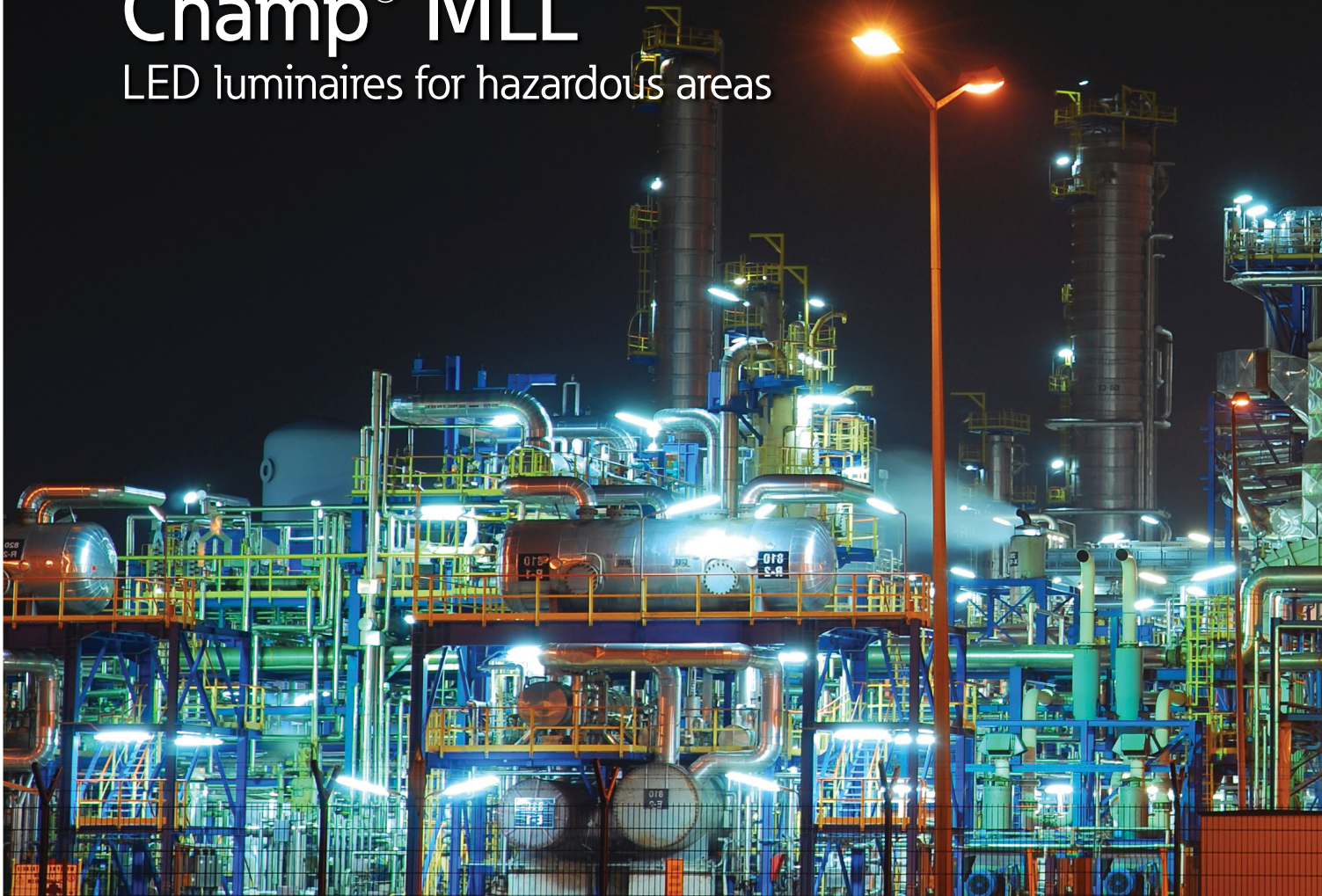


LED lighting for hazardous areas
Champ® MLL LED Luminaires

CROUSE-HINDS
SERIES

Champ® MLL

LED luminaires for hazardous areas



EATON

Powering Business Worldwide



Champ® MLL Series LEDs

Safe. Reliable. Efficient.

Featuring the industry's broadest range of LED luminaires for harsh and hazardous environments, Eaton's Crouse-Hinds can deliver a lighting solution that performs reliably in even the worst operating conditions. All the while reducing your energy, maintenance and manpower costs.



Why LED?

Useful life

Rated life is up to 60,000 hours of maintenance-free and safe operation

Energy efficiency

LED average energy consumption is 65% less than T12, T8 and T5HO fluorescent fixtures

Start/restart time

Instant illumination vs. 10 minute restrike time for fluorescent

Light quality

Higher color rendering and color temperature compared to fluorescent

Environmental benefits

Mercury-free LED eliminates disposal costs and lower energy consumption for a smaller carbon footprint

Why Crouse-Hinds?

Industry-best reliability

Built to withstand extreme temperatures, vibration, water and dust

Thermal management

Effective heat sinking ensures longer life

Quality of light

Custom optics designed to maximize light distribution and intensity

Retrofit compatibility

LED fixtures are compatible with Pauluhn™ DuraPro, MagnaPro, Rig-A-Lite™ and Snelson® fluorescent fixtures

Why Champ® MLL LED?

Designed for harsh and hazardous. Champ MLL linear LED luminaires are engineered to handle demanding conditions. The MLL stands up to high vibration, hose down, shock and impact, while delivering long life and high lumen performance for up to 20 years.

Custom optics:

- Standard wide (120°) beam spread for control room and indoor application maximizes illumination on wall panels
- Narrow (80°) beam spread option for targeted illumination; avoids spillage and light loss

Comprehensive certification:

- Single model certified for use in Class I, Division 2 and Class II, Division 1 harsh and hazardous applications

Quick & easy installation:

- Easy access to drivers and wiring
- No custom brackets or hardware needed
- Seven mounting options available

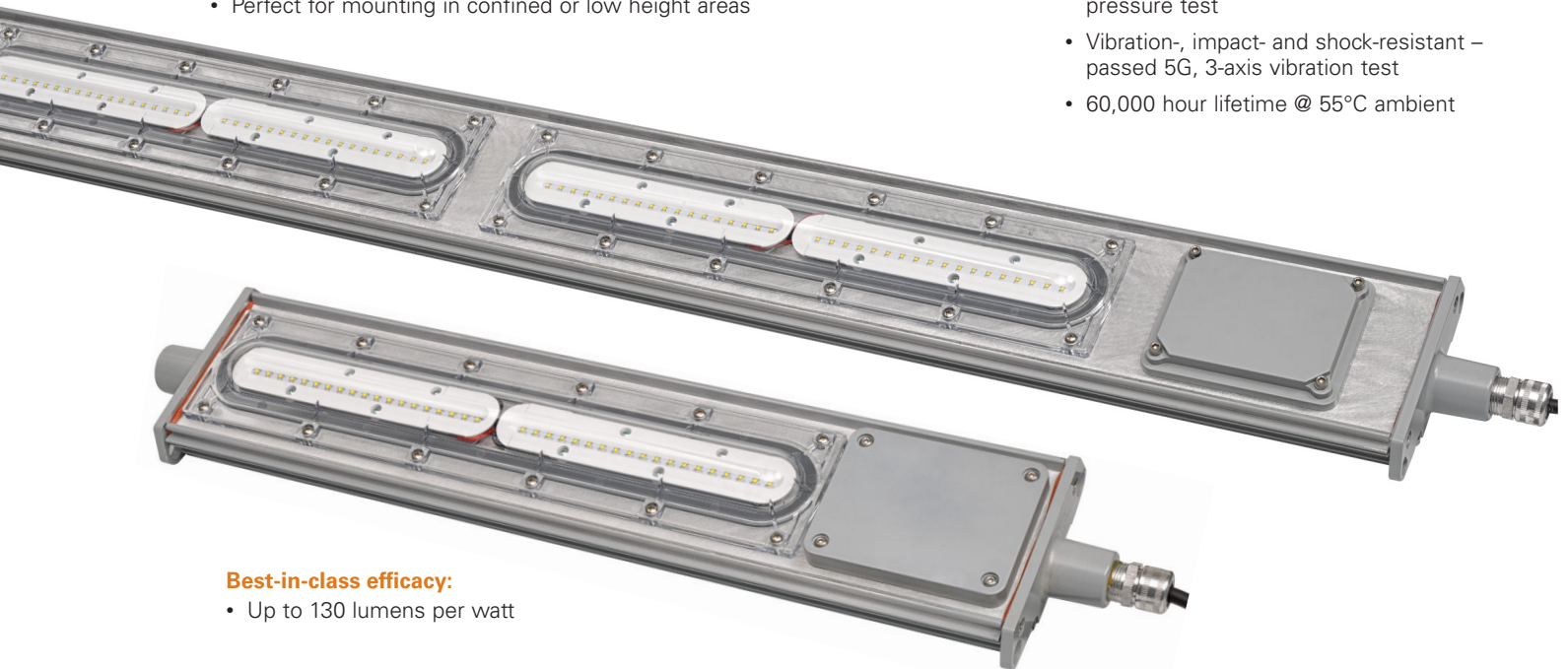


Slim profile:

- 2.7" fixture height (excluding mounting brackets)
- Perfect for mounting in confined or low height areas

Built to last:

- Ingress protection from hose down water or diesel fuel in harsh operational conditions – passed 2,000 psi high pressure test
- Vibration-, impact- and shock-resistant – passed 5G, 3-axis vibration test
- 60,000 hour lifetime @ 55°C ambient



Best-in-class efficacy:

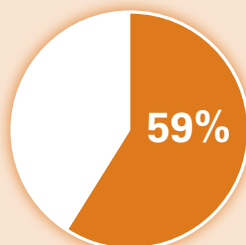
- Up to 130 lumens per watt

LED vs. fluorescent savings at a glance

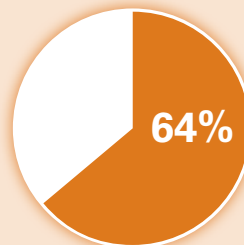
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The numbers say it all.

MLL4 vs. 2-lamp T5HO



59% REDUCTION IN ENERGY COSTS



64% LOWER TOTAL COST OF OWNERSHIP



100% MAINTENANCE REDUCTION

Assumptions: Calculations based on overall life of the LED system. Energy cost of \$.09 per kilowatt; 24 hour per day operation; labor rate of \$75 each for 2 workers; average time for fixture maintenance of 2 hours.

Champ® MLL Series LED Luminaires

The Champ MLL Linear LED by Eaton's Crouse-Hinds is specifically designed to replace fluorescent T12, T8 and T5HO lighting in harsh and hazardous applications. The rugged and durable design features the industry's most versatile and flexible mounting options. The Champ MLL is the ideal solution for high vibration, impact and hose down applications.

Applications:

Oil and gas refineries, petrochemical facilities, food and beverage facilities, platforms, loading docks, tunnels, outdoor wall and stanchion mounted general area lighting, and where flammable vapors, gases, ignitable dusts, fibers or flyings are present.

Key features & benefits:

- Industry-leading efficacy: up to 130 LPW
- -40°C to +65°C ambient operating temperature (standard model)
- Low profile (<3" height)
- Versatile ceiling/swivel, wall, flush, pole and pendant mounting options
- Wide and narrow optics for uniform illumination
- Four points of secondary retention
- 2,000 psi high pressure hose rated
- High vibration resistance
- Emergency battery back-up (90 minutes) and surge protection options (up to 10kV)‡
- DesignLights Consortium® Qualified (some models are not DLC qualified)*
- 5 year fixture warranty†



‡ One year warranty

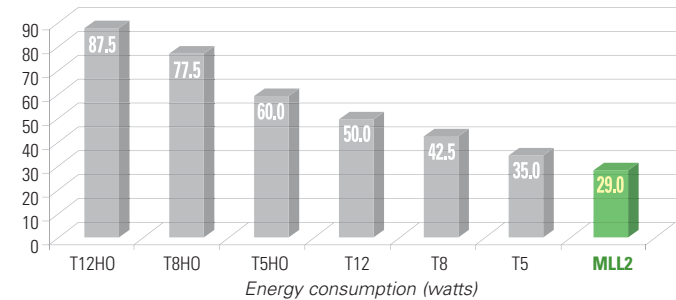
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Energy consumption comparison

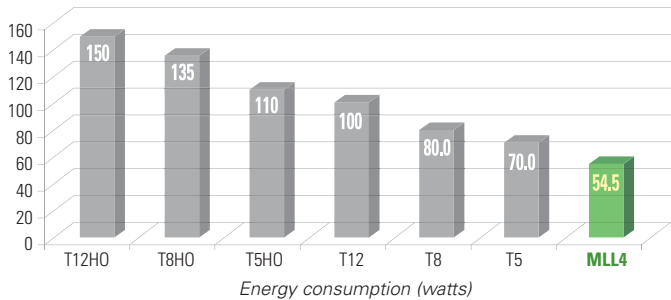
2 foot MLL linear LED vs. fluorescent



Model	Typical lumens	Wattage	Lumens per watt	Equivalent HID luminaire	Typical energy savings / lifetime
MLL2	3,600	29	124	T12HO	Up to 67%
				T8HO	Up to 63%
				T5HO	Up to 52%
				T12	Up to 42%
				T8	Up to 32%
				T5	Up to 17%

All luminaires in the comparison are 2 lamp, 2 foot

4 foot MLL linear LED vs. fluorescent



Model	Typical lumens	Wattage	Lumens per watt	Equivalent HID luminaire	Typical energy savings / lifetime
MLL4	7,100	54.5	130	T12HO	Up to 64%
				T8HO	Up to 60%
				T5HO	Up to 50%
				T12	Up to 46%
				T8	Up to 32%
				T5	Up to 22%

All luminaires in the comparison are 2 lamp, 4 foot

Specifications

Certifications:

NEC standards:

- Class I, Division 2, Groups A, B, C, D
- Class II, Division 1, Groups F, G
- Class I, Zone 2
- Class III
- NEMA 4X; IP66
- Marine and Wet Locations

UL standards:

- UL844 Electrical Fixture Hangers for Hazardous Locations
- UL1598 Luminaire
- UL1598A Luminaire for Installation on Marine Vessels
- UL924 for Emergency Lighting

CSA standard:

- C22.2 No. 137

Additional certifications:

- ABS design assessed

Materials:

Housing:

- Copper-free aluminum
- Optional Corro-free™ epoxy powder coat

Lens:

- Glass or polycarbonate
- Diffused glass or polycarbonate

Mounting:

Versatile mounting options:

- Flush back mount
- Swivel/ceiling back mount
- Offset ceiling mount
- Offset wall mount
- Pole mount
- Pendant mount

Easily retrofit to:

- Existing Pauluhn™ DuraPro and MagnaPro fluorescent light fixtures
- Rig-A-Lite™ and Snelson® C1D2 fluorescent lighting fixtures



Electrical ratings:

	MLL2	MLL4
Lumen output	3,600	7,100
Frequency	50/60 Hz	50/60 Hz
Voltage	100-277 VAC/108-250 VDC; 347-480 VAC	

Model	Voltage	Current (A)	Wattage (W)	Power factor	THD
MLL2/UNV1	100	0.28	28.2	0.90	<20%
MLL2/UNV1	277	0.12	29.4	0.90	<20%
MLL2/UNV34	347	0.09	29.2	0.90	<20%
MLL2/UNV34	480	0.07	30.1	0.90	<20%
MLL4/UNV1	100	0.55	55.0	0.95	<20%
MLL4/UNV1	277	0.20	54.5	0.95	<20%
MLL4/UNV34	347	0.16	55.8	0.95	<20%
MLL4/UNV34	480	0.12	56.2	0.95	<20%

Temperature codes:

Ambient temperature	Min. temp. wire supply	Class I, Div. 2	Class II, Div. 1	Simultaneous rating Class I, Div. 2, Class II, Div. 1
40°C	60°C	T6	T6	T6
55°C	75°C	T5	T5	T5
65°C	90°C	T5	T5	T5

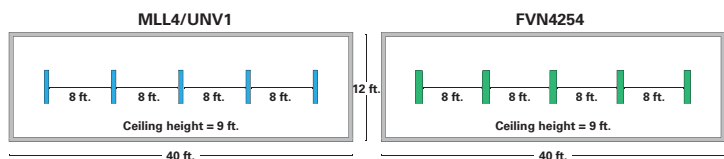
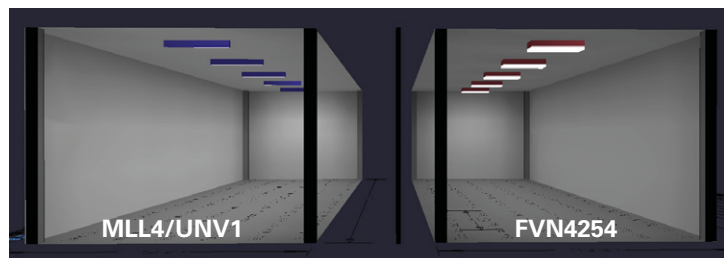
Weights:

Luminaire	lbs.	kg.
MLL2	12.5	5.7
MLL4	22.5	10.2



Photometrics: control room/pump shed

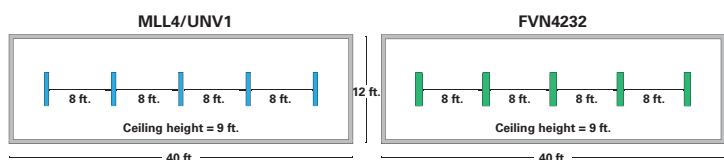
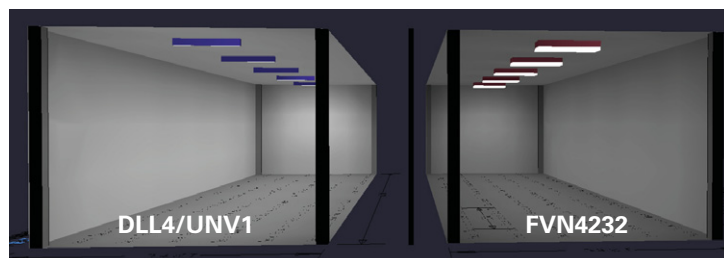
4 foot MLL LED with 120° optics vs. 4 foot 2 lamp T5HO FVN



Illuminance (Fc)	MLL4/UNV1	FVN4254
Average	44.87	33.78
Maximum	55.40	42.50
Minimum	25.20	18.90
Average/minimum	1.78	1.79
Maximum/minimum	2.20	2.25

Higher average illumination than 2 lamp T5HO FVN and up to 50% energy savings

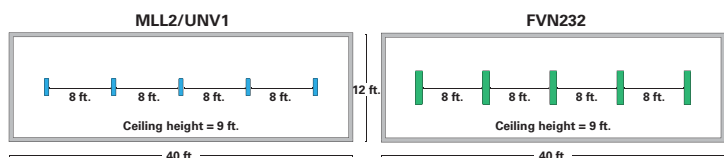
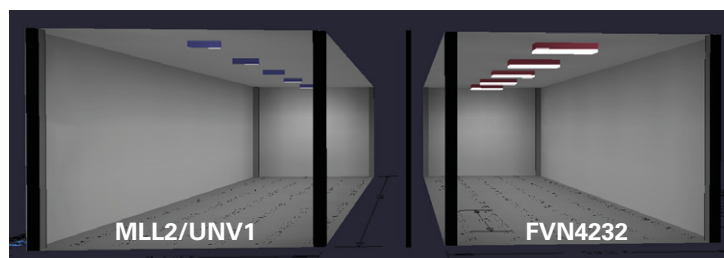
4 foot MLL LED with 120° optics vs. 4 foot 2 lamp T8 FVN



Illuminance (Fc)	MLL4/UNV1	FVN4232
Average	44.89	22.46
Maximum	55.50	28.30
Minimum	25.20	12.40
Average/minimum	1.78	1.81
Maximum/minimum	2.20	2.28

Twice the average illumination of 2 lamp T8 FVN

2 foot MLL LED with 120° optics vs. 4 foot 2 lamp T8 FVN



Illuminance (Fc)	MLL2/UNV1	FVN4232
Average	22.57	22.04
Maximum	27.90	27.70
Minimum	12.70	12.00
Average/minimum	1.78	1.84
Maximum/minimum	2.20	2.31

Equivalent illumination to a 2 lamp T8 FVN and up to 50% energy savings

Ordering information

Part number example

MLL4N/UNV1 S903 TF P EM

MLL series linear LED, cool white, 4 foot, 3/4" hubs, 80° narrow light pattern, 100-277 VAC driver, polycarbonate lens, through feed hubs, painted, battery back-up

Series	Optics	Lens	Emergency backup
MLL	BLANK Wide (120°)	BLANK Glass	EM1* Integrated emergency battery back-up
	N Narrow (80°)	S891 Diffused glass	
		S903 Polycarbonate	
		S903D Diffused polycarbonate	
Length/lumens	Voltage		Finish
4	/UNV1 100-277 VAC; 108-250 VDC		BLANK Natural aluminum
2	/UNV34 347-480 VAC		P Painted (gray, epoxy)
			WH Painted (white, epoxy)
			Options
			TF Pull wire included in fixture

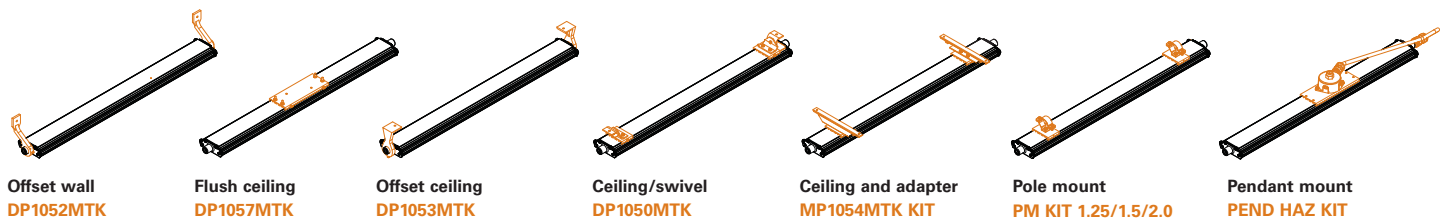
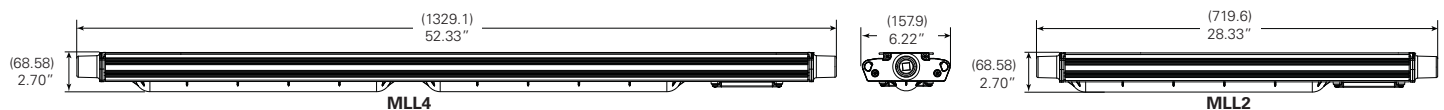
Accessories (ordered separately)

DP1057MTK	Flush/back mount back plate (compatible with DuraPro)
DP1050MTK	Ceiling/swivel mount (compatible with DuraPro)
DP1053MTK	Ceiling/wall mount offset (compatible with DuraPro)
MP1054MTK KIT	Ceiling mount bracket and adapter kit (compatible with MagnaPro)
DP1052MTK	Offset wall mount (compatible with DuraPro)
PM KIT 1.25	Pole mount kit, 1.25" conduit
PM KIT 1.5	Pole mount kit, 1.50" conduit
PM KIT 2.0	Pole mount kit, 2.00" conduit

Accessories (ordered separately)

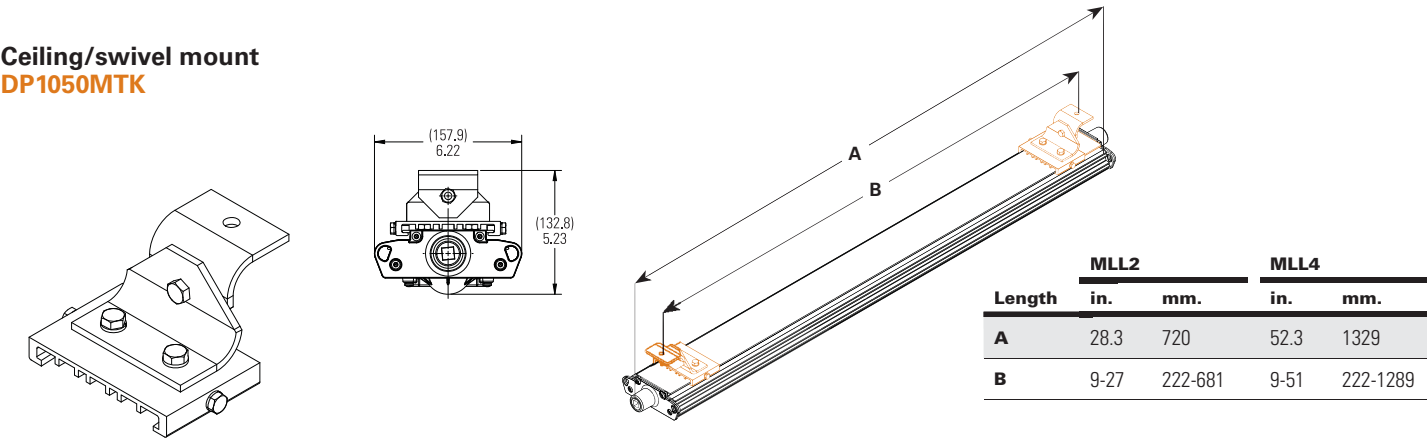
PEND HAZ KIT	Pendant mount kit
SS KIT	Safety chain kit
VMVL/UNV1 80W 1A KIT	1 amp driver replacement kit 100-277 VAC for 4 ft. linear
VMVL/UNV34 80W 1A KIT	1 amp driver replacement kit 347-480 VAC for 4 ft. linear
VMVL/UNV1 80W 0.5A KIT	0.5 amp driver replacement kit 100-277 VAC for 2 ft. linear
VMVL/UNV34 80W 0.5A KIT	0.5 amp driver replacement kit 347-480 VAC for 2 ft. linear

Dimensions & mounting options:

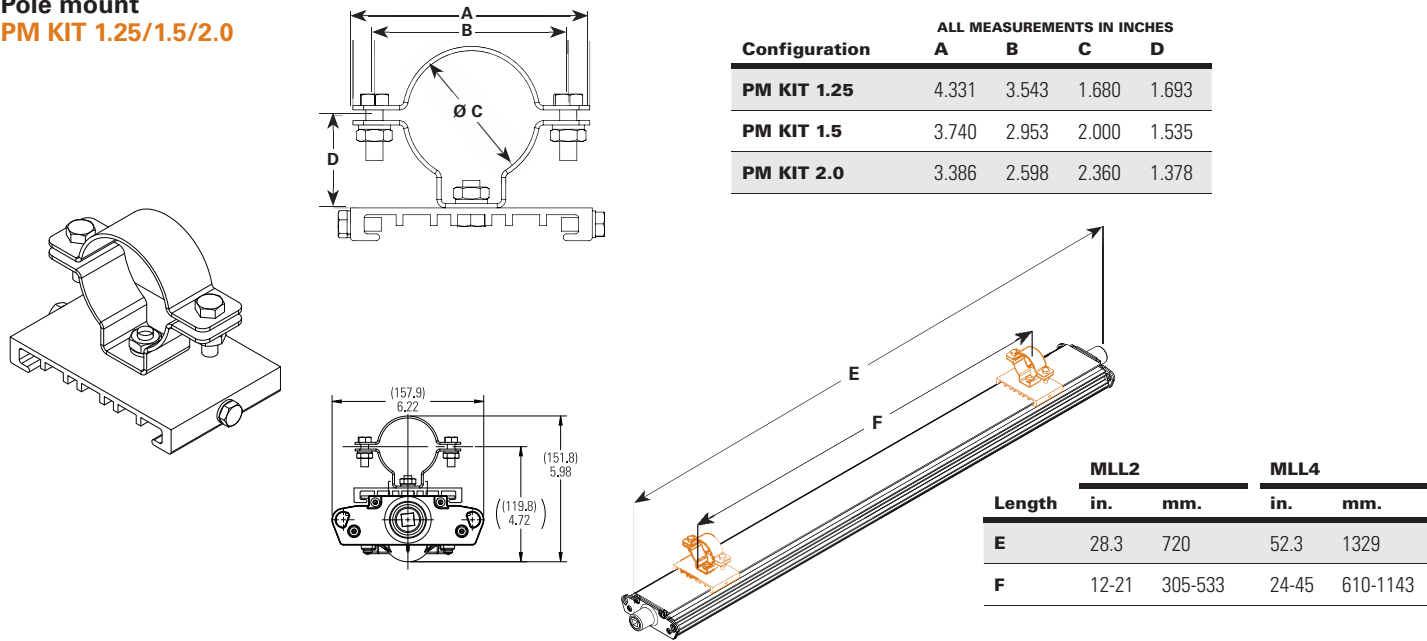


Mounting options

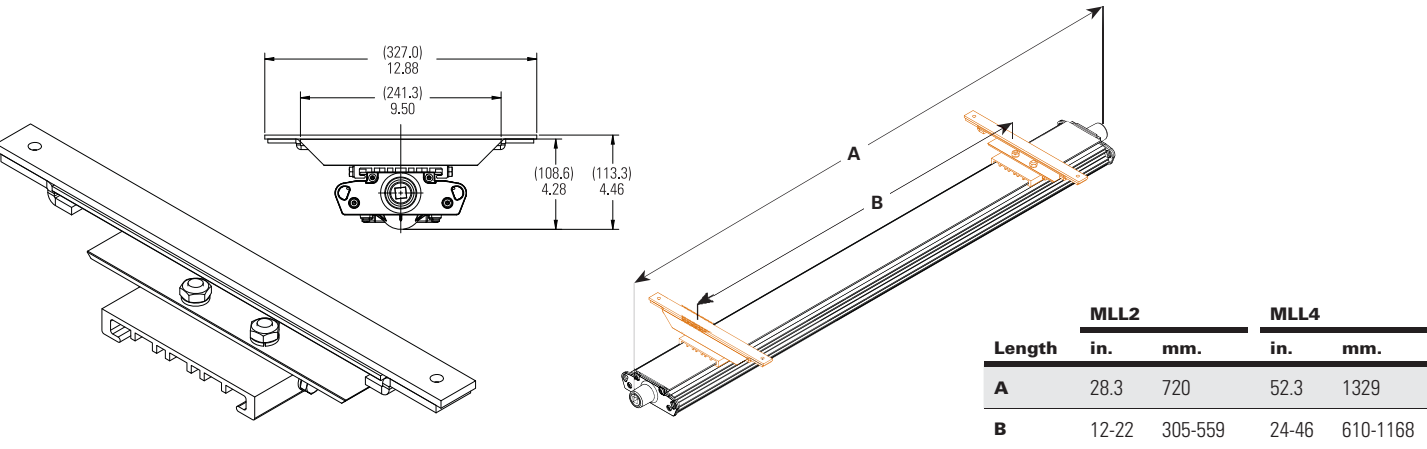
Ceiling/swivel mount DP1050MTK



Pole mount PM KIT 1.25/1.5/2.0

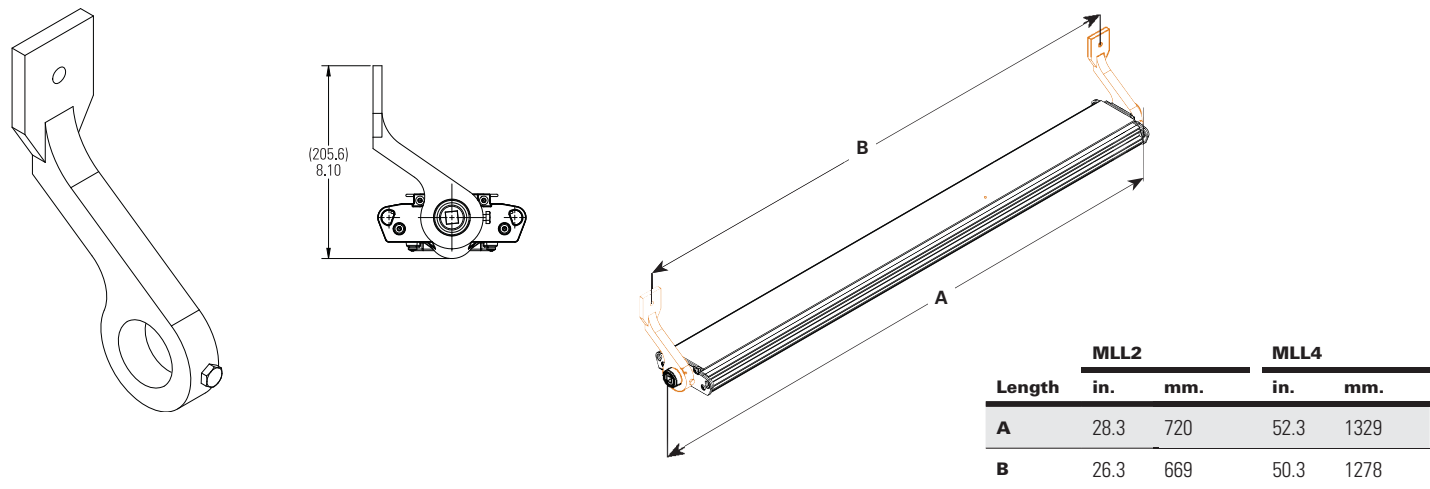


MagnaPro mount MP1054MTK KIT

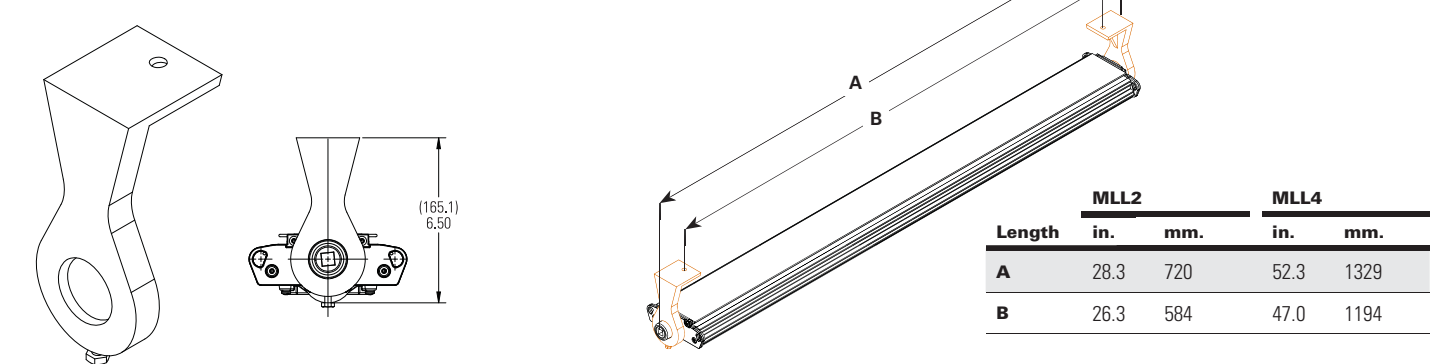


Mounting options

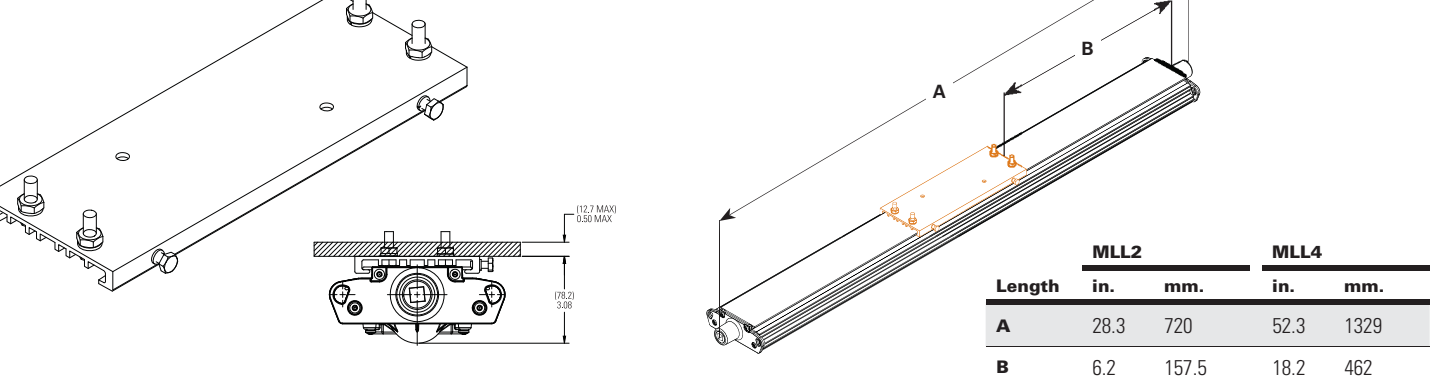
Offset wall DP1052MTK



Offset ceiling/wall mount DP1053MTK

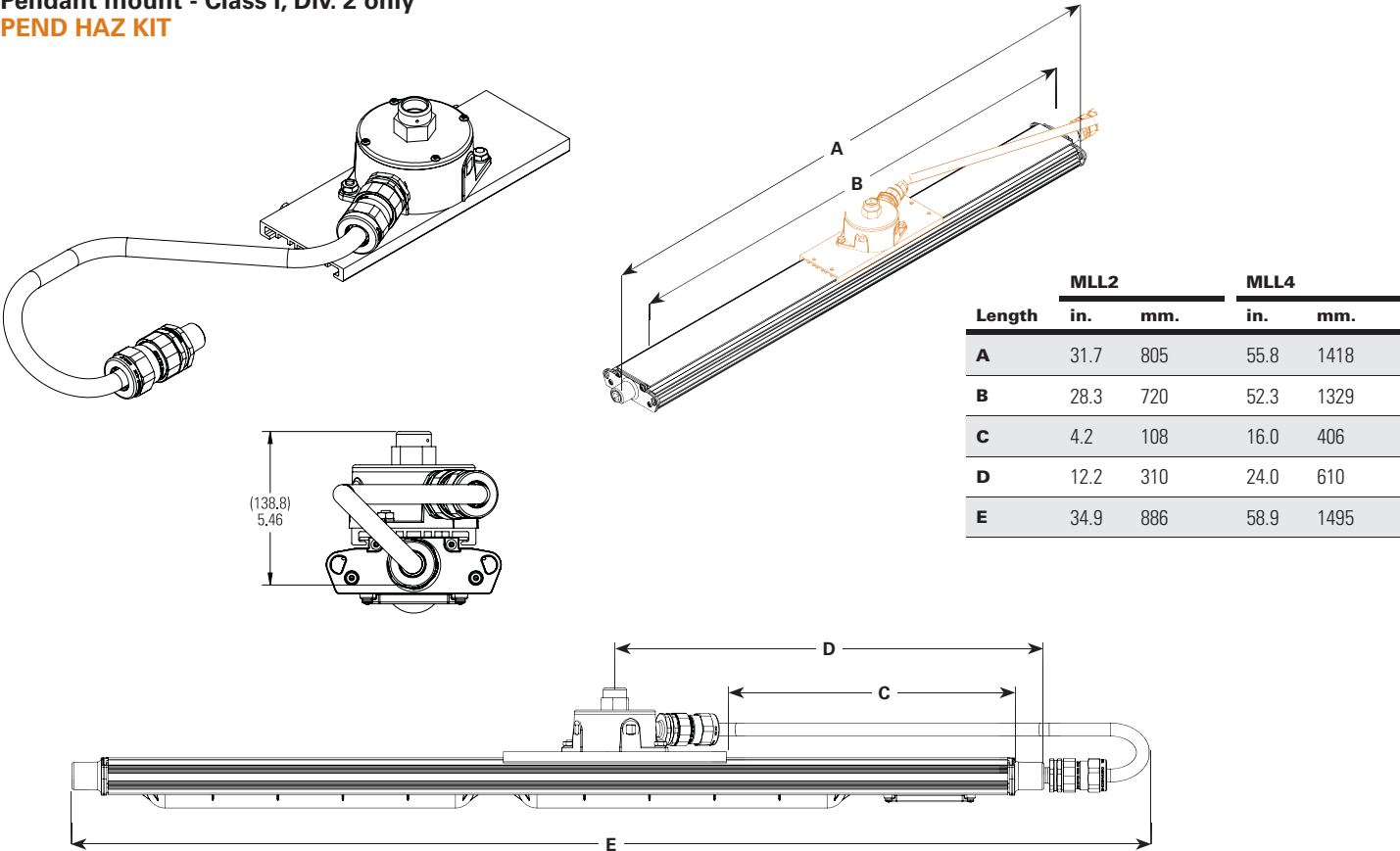


Flush ceiling DP1057MTK



Mounting options

Pendant mount - Class I, Div. 2 only
PEND HAZ KIT



Battery back-up

Champ MLL linear LED luminaires are now available with an integral battery back-up module. Virtually the same size as the standard 4 foot model and up to 90 minutes of emergency lighting to keep your facility and people safe.



Model	EM output	Normal output
MLL4/UNV1 EM1	1,400 lumens (100-277V)	6,720 lumens (100-277V)

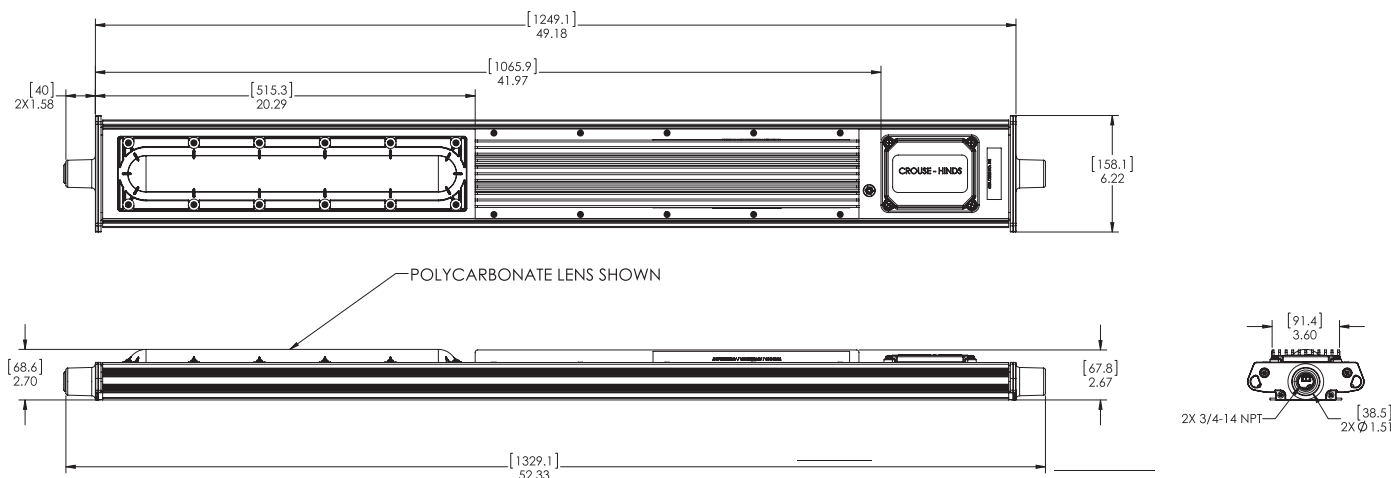
Applications:

- Egress and emergency lighting for areas requiring uninterrupted lighting during power failure
- Hazardous rated indoor and outdoor emergency lighting in manufacturing plants, heavy industrial, chemical and petrochemical facilities, platforms, loading docks and parking areas.

Key features:

- Operating ambient: 0°C to +40°C
- 90 minute runtime in emergency mode
- 6,720 lumen output for normal operation
- 1,400 in emergency mode
- 50,000 hours rated life @ 40°C
- IP66 rated enclosure
- LED indicator to check battery operation
- Nickel-cadmium battery
- 1 year warranty

Dimensions:



Certifications and compliances:

NEC/CEC

- Class I, Division 2, Groups A, B, C, D
- Class II, Division 2, Groups F, G
- Wet Location, IP66, Type 4X

UL Standards

- UL844 Hazardous (Classified)
- UL1598 Luminaires, UL1598A Marine
- UL924 Emergency Lighting

CSA Standard

- CSA C22.2 Nos. 250, 137, 141

Electrical ratings:

Voltage	120	277
Amperage @ 120VAC	.48	.212
Wattage @ 120VAC	57.8	57.7
Lumen output	6,720	6,720
Frequency	50/60Hz	50/60Hz
Power factor @ 100 VAC	.997	.980
THD	6.58	11.70

Temperature codes:

Ambient temperature	Min. temp. wire supply	Class I, Div. 2	Class II, Div. I	Simultaneous rating Class I, Div. 2, Class II, Div. 1
40°C	60°C	T5	T6	T5

**U.S. (global headquarters):
Eaton's Crouse-Hinds business**

1201 Wolf Street
Syracuse, NY 13208

(866) 764-5454
FAX: (315) 477-5179
FAX Orders Only:
(866) 653-0640

crousecustomerctr@eaton.com

For more information:

If further assistance is
required, please contact
an authorized Eaton
Distributor, Sales Office,
or Customer Service
Department.

Canada

Toll Free: 800-265-0502
FAX: (800) 263-9504
FAX Orders only: (866) 653-0645

Mexico/Latin America/Caribbean

52-555-804-4000
FAX: 52-555-804-4020
ventascentromex@eaton.com

Europe (Germany)

49 (0) 6271 806-500
49 (0) 6271 806-476
sales.CCH.de@cooperindustries.com

Middle East

971 4 8066100
FAX: 971 4 8894813
chmesales@eaton.com

Singapore

65-6645-9888
FAX: 65-6297-4819
chsi-sales@cooperindustries.com

China

86-21-2899-3600
FAX: 86-21-2899-4055
cchsales@cooperindustries.com

Korea

82-2-3484-6783
82-2-3484-6778
CCHK-sales@cooperindustries.com

Australia

61-2-8787-2777
FAX: 61-2-9609-2342
CEASales@cooperindustries.com

India

91-124-4683888
FAX: 91-124-4683899
cchindia@cooperindustries.com

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

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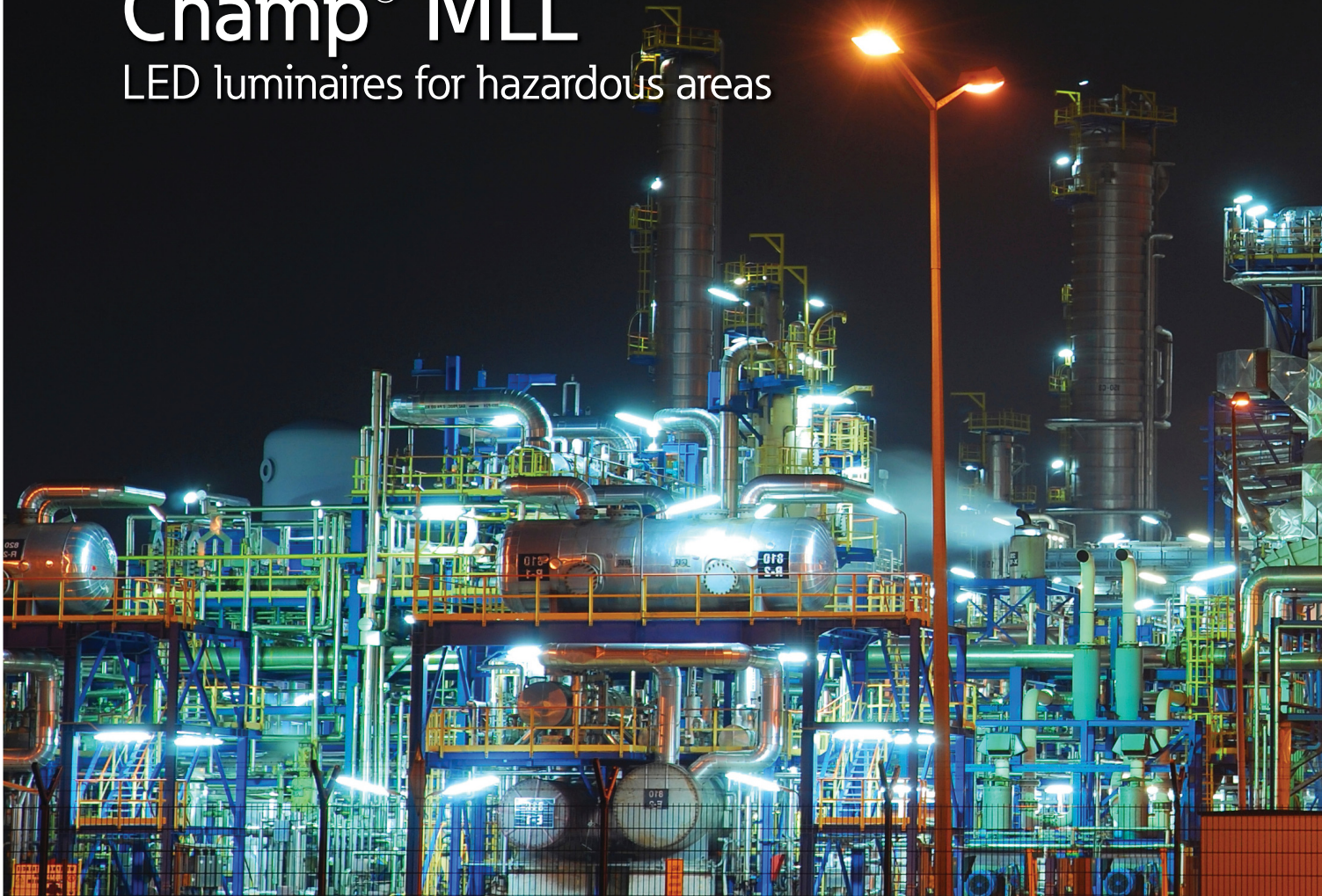
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- Seven mounting options available

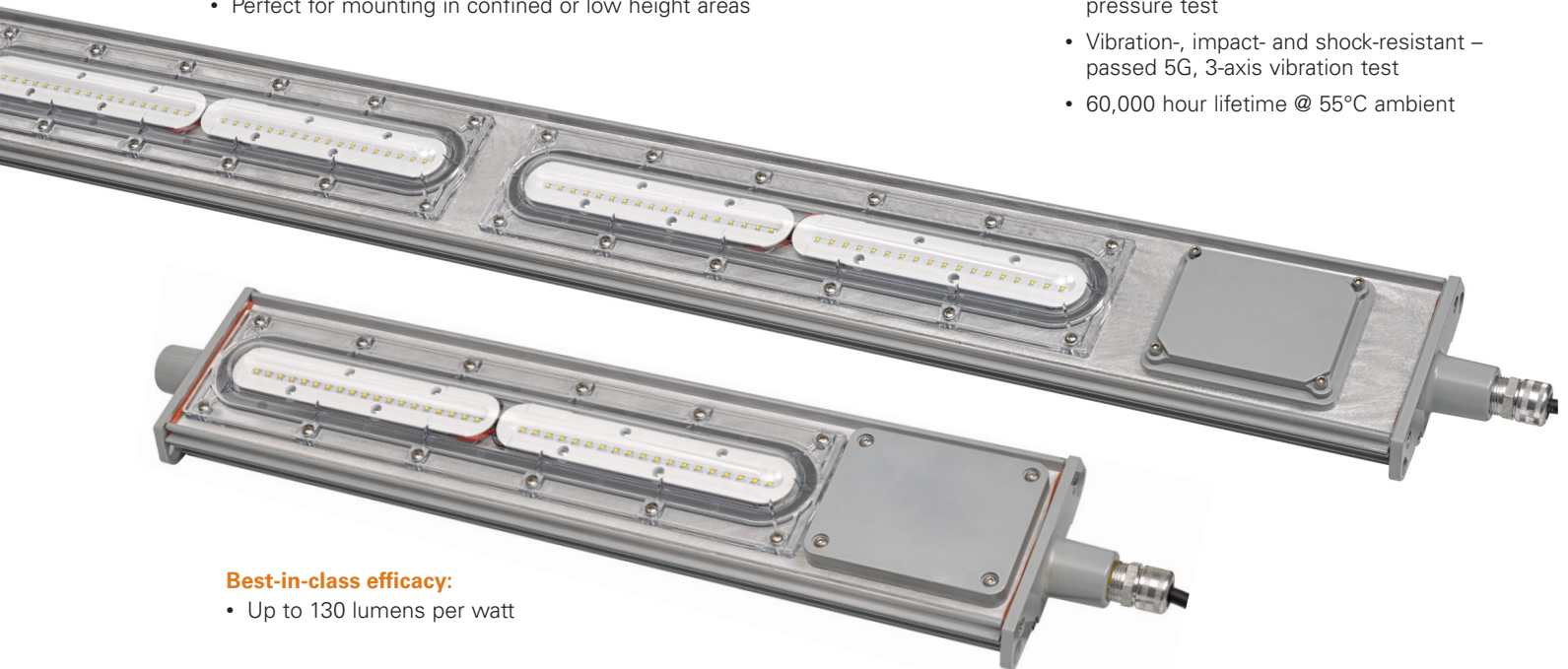


Slim profile:

- 2.7" fixture height (excluding mounting brackets)
- Perfect for mounting in confined or low height areas

Built to last:

- Ingress protection from hose down water or diesel fuel in harsh operational conditions – passed 2,000 psi high pressure test
- Vibration-, impact- and shock-resistant – passed 5G, 3-axis vibration test
- 60,000 hour lifetime @ 55°C ambient



Best-in-class efficacy:

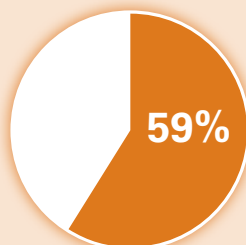
- Up to 130 lumens per watt

LED vs. fluorescent savings at a glance

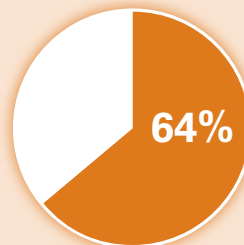
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Key features & benefits:

- Industry-leading efficacy: up to 130 LPW
- -40°C to +65°C ambient operating temperature (standard model)
- Low profile (<3" height)
- Versatile ceiling/swivel, wall, flush, pole and pendant mounting options
- Wide and narrow optics for uniform illumination
- Four points of secondary retention
- 2,000 psi high pressure hose rated
- High vibration resistance
- Emergency battery back-up (90 minutes) and surge protection options (up to 10kV)‡
- DesignLights Consortium® Qualified (some models are not DLC qualified)*
- 5 year fixture warranty†



‡ One year warranty

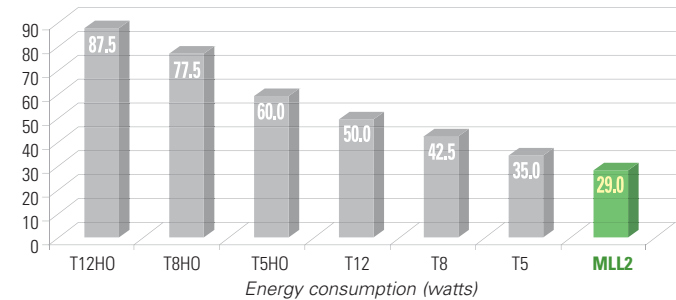
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Energy consumption comparison

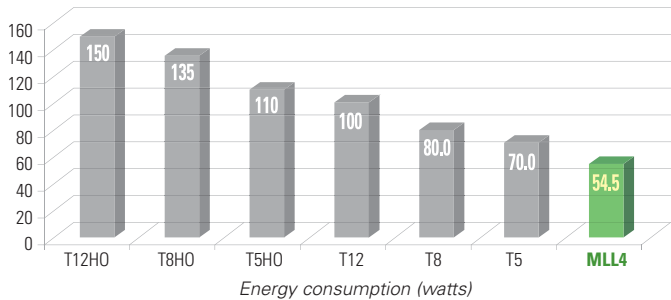
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				T8	Up to 32%
				T5	Up to 17%

All luminaires in the comparison are 2 lamp, 2 foot

4 foot MLL linear LED vs. fluorescent



Model	Typical lumens	Wattage	Lumens per watt	Equivalent HID luminaire	Typical energy savings / lifetime
MLL4	7,100	54.5	130	T12HO	Up to 64%
				T8HO	Up to 60%
				T5HO	Up to 50%
				T12	Up to 46%
				T8	Up to 32%
				T5	Up to 22%

All luminaires in the comparison are 2 lamp, 4 foot

Specifications

Certifications:

NEC standards:

- Class I, Division 2, Groups A, B, C, D
- Class II, Division 1, Groups F, G
- Class I, Zone 2
- Class III
- NEMA 4X; IP66
- Marine and Wet Locations

UL standards:

- UL844 Electrical Fixture Hangers for Hazardous Locations
- UL1598 Luminaire
- UL1598A Luminaire for Installation on Marine Vessels
- UL924 for Emergency Lighting

CSA standard:

- C22.2 No. 137

Additional certifications:

- ABS design assessed

Materials:

Housing:

- Copper-free aluminum
- Optional Corro-free™ epoxy powder coat

Lens:

- Glass or polycarbonate
- Diffused glass or polycarbonate

Mounting:

Versatile mounting options:

- Flush back mount
- Swivel/ceiling back mount
- Offset ceiling mount
- Offset wall mount
- Pole mount
- Pendant mount

Easily retrofit to:

- Existing Pauluhn™ DuraPro and MagnaPro fluorescent light fixtures
- Rig-A-Lite™ and Snelson® C1D2 fluorescent lighting fixtures



Electrical ratings:

	MLL2	MLL4
Lumen output	3,600	7,100
Frequency	50/60 Hz	50/60 Hz
Voltage	100-277 VAC/108-250 VDC; 347-480 VAC	

Model	Voltage	Current (A)	Wattage (W)	Power factor	THD
MLL2/UNV1	100	0.28	28.2	0.90	<20%
MLL2/UNV1	277	0.12	29.4	0.90	<20%
MLL2/UNV34	347	0.09	29.2	0.90	<20%
MLL2/UNV34	480	0.07	30.1	0.90	<20%
MLL4/UNV1	100	0.55	55.0	0.95	<20%
MLL4/UNV1	277	0.20	54.5	0.95	<20%
MLL4/UNV34	347	0.16	55.8	0.95	<20%
MLL4/UNV34	480	0.12	56.2	0.95	<20%

Temperature codes:

Ambient temperature	Min. temp. wire supply	Class I, Div. 2	Class II, Div. 1	Simultaneous rating Class I, Div. 2, Class II, Div. 1
40°C	60°C	T6	T6	T6
55°C	75°C	T5	T5	T5
65°C	90°C	T5	T5	T5

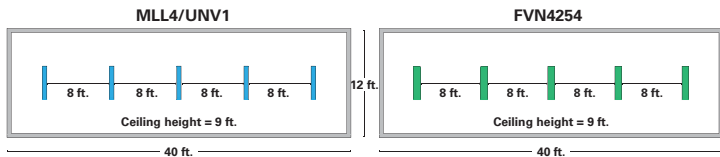
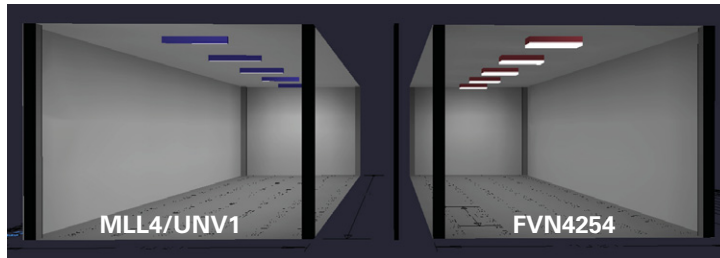
Weights:

Luminaire	lbs.	kg.
MLL2	12.5	5.7
MLL4	22.5	10.2



Photometrics: control room/pump shed

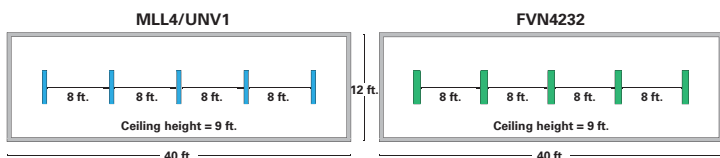
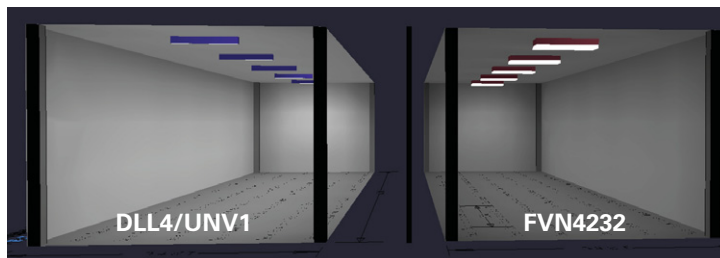
4 foot MLL LED with 120° optics vs. 4 foot 2 lamp T5HO FVN



Illuminance (Fc)	MLL4/UNV1	FVN4254
Average	44.87	33.78
Maximum	55.40	42.50
Minimum	25.20	18.90
Average/minimum	1.78	1.79
Maximum/minimum	2.20	2.25

Higher average illumination than 2 lamp T5HO FVN and up to 50% energy savings

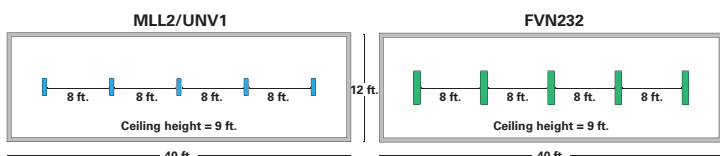
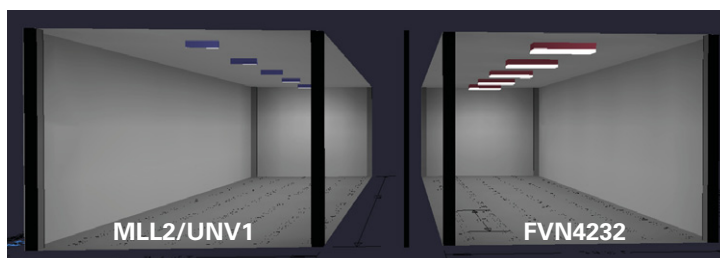
4 foot MLL LED with 120° optics vs. 4 foot 2 lamp T8 FVN



Illuminance (Fc)	MLL4/UNV1	FVN4232
Average	44.89	22.46
Maximum	55.50	28.30
Minimum	25.20	12.40
Average/minimum	1.78	1.81
Maximum/minimum	2.20	2.28

Twice the average illumination of 2 lamp T8 FVN

2 foot MLL LED with 120° optics vs. 4 foot 2 lamp T8 FVN



Illuminance (Fc)	MLL2/UNV1	FVN4232
Average	22.57	22.04
Maximum	27.90	27.70
Minimum	12.70	12.00
Average/minimum	1.78	1.84
Maximum/minimum	2.20	2.31

Equivalent illumination to a 2 lamp T8 FVN and up to 50% energy savings

Ordering information

Part number example

MLL4N/UNV1 S903 TF P EM

MLL series linear LED, cool white, 4 foot, 3/4" hubs, 80° narrow light pattern, 100-277 VAC driver, polycarbonate lens, through feed hubs, painted, battery back-up

Series	Optics	Lens	Emergency backup
MLL	BLANK Wide (120°)	BLANK Glass	EM1* Integrated emergency battery back-up
	N Narrow (80°)	S891 Diffused glass	
		S903 Polycarbonate	
		S903D Diffused polycarbonate	
Length/lumens	Voltage	Options	Finish
4 4 foot length, 7,100 lumens	/UNV1 100-277 VAC; 108-250 VDC	TF Pull wire included in fixture	BLANK Natural aluminum
2 2 foot length, 3,600 lumens	/UNV34 347-480 VAC		P Painted (gray, epoxy)
			WH Painted (white, epoxy)

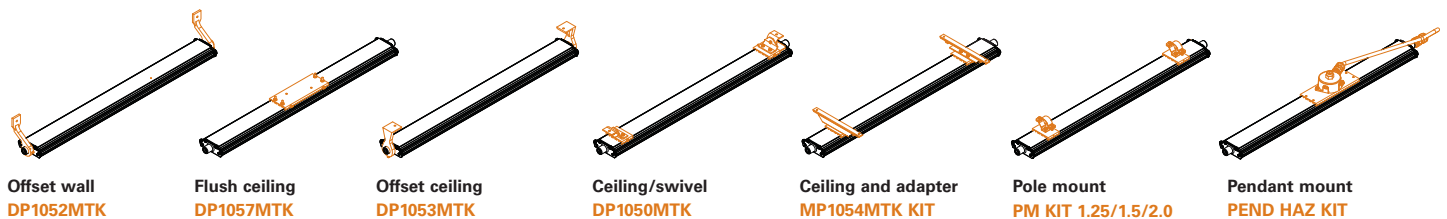
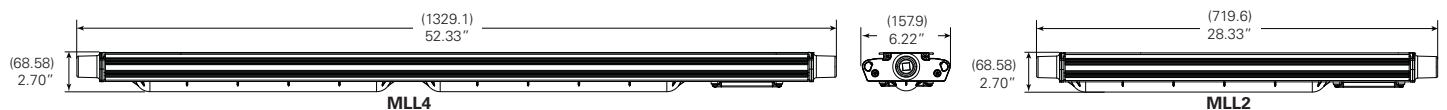
Accessories (ordered separately)

DP1057MTK	Flush/back mount back plate (compatible with DuraPro)
DP1050MTK	Ceiling/swivel mount (compatible with DuraPro)
DP1053MTK	Ceiling/wall mount offset (compatible with DuraPro)
MP1054MTK KIT	Ceiling mount bracket and adapter kit (compatible with MagnaPro)
DP1052MTK	Offset wall mount (compatible with DuraPro)
PM KIT 1.25	Pole mount kit, 1.25" conduit
PM KIT 1.5	Pole mount kit, 1.50" conduit
PM KIT 2.0	Pole mount kit, 2.00" conduit

Accessories (ordered separately)

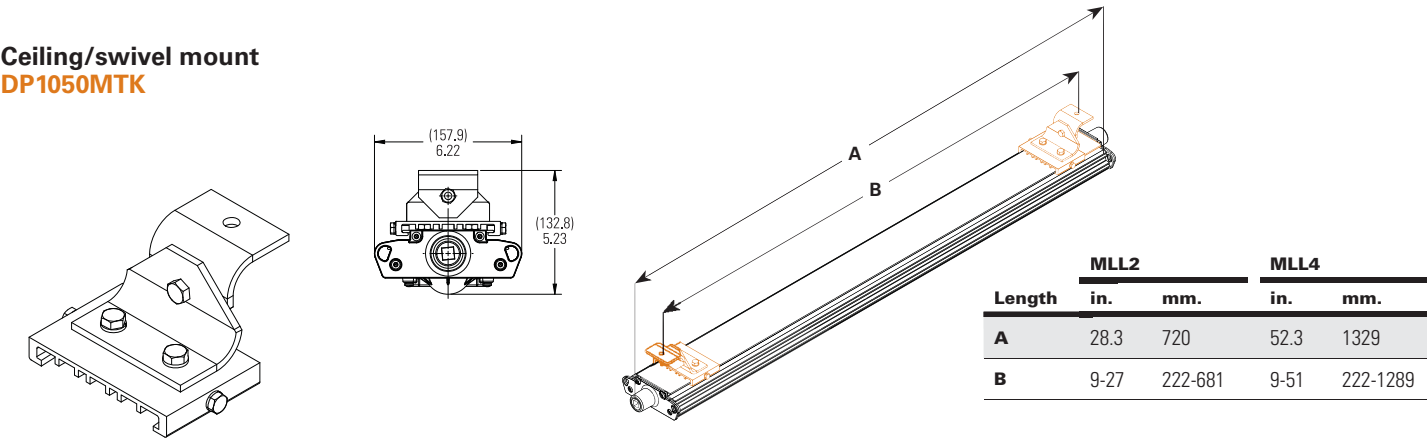
PEND HAZ KIT	Pendant mount kit
SS KIT	Safety chain kit
VMVL/UNV1 80W 1A KIT	1 amp driver replacement kit 100-277 VAC for 4 ft. linear
VMVL/UNV34 80W 1A KIT	1 amp driver replacement kit 347-480 VAC for 4 ft. linear
VMVL/UNV1 80W 0.5A KIT	0.5 amp driver replacement kit 100-277 VAC for 2 ft. linear
VMVL/UNV34 80W 0.5A KIT	0.5 amp driver replacement kit 347-480 VAC for 2 ft. linear

Dimensions & mounting options:

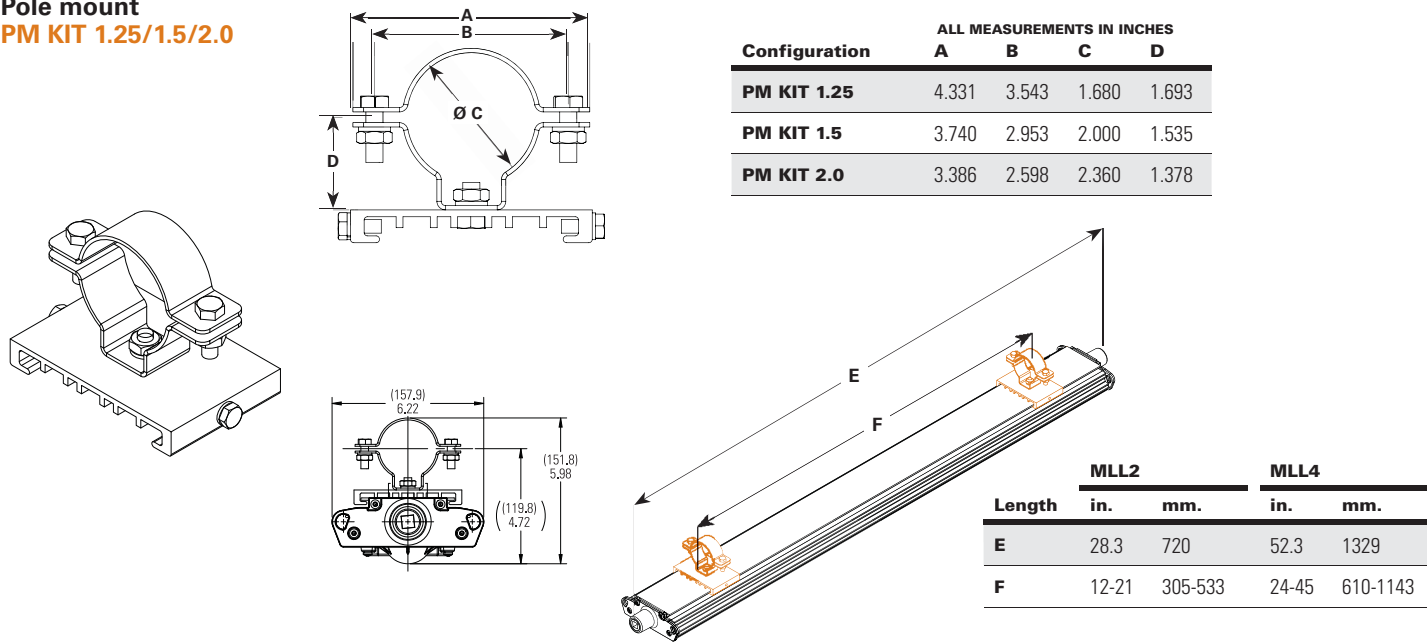


Mounting options

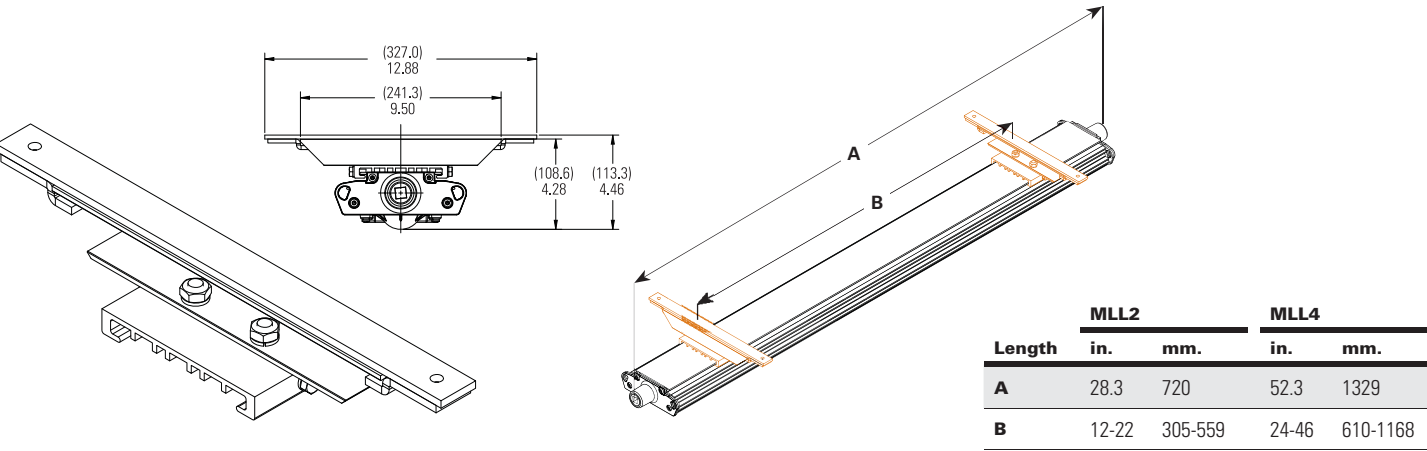
Ceiling/swivel mount DP1050MTK



Pole mount PM KIT 1.25/1.5/2.0

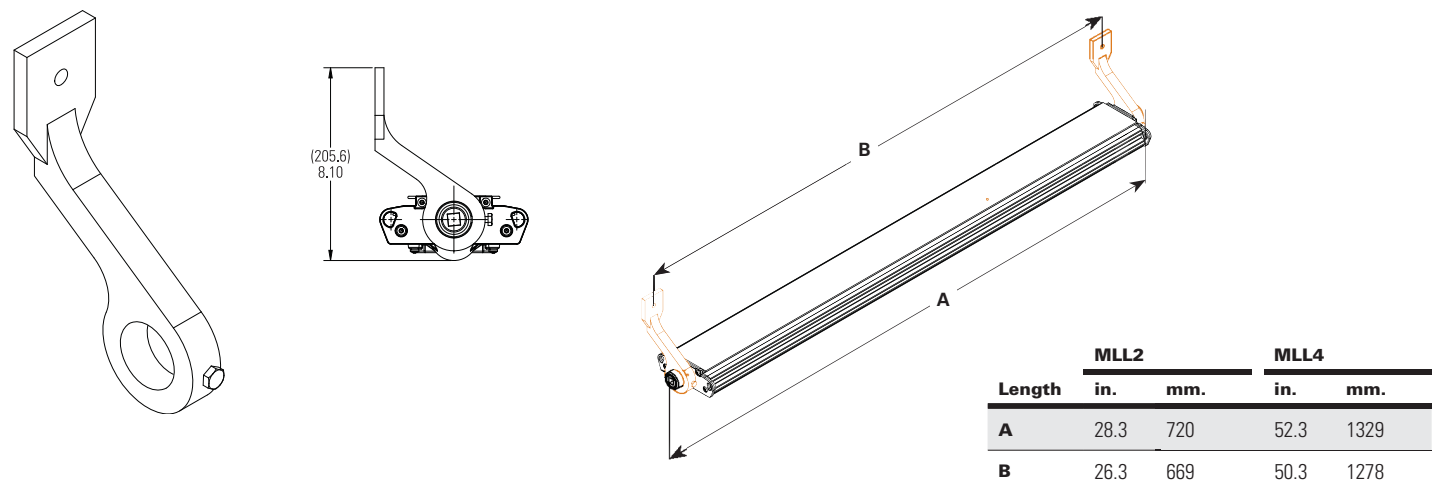


MagnaPro mount MP1054MTK KIT

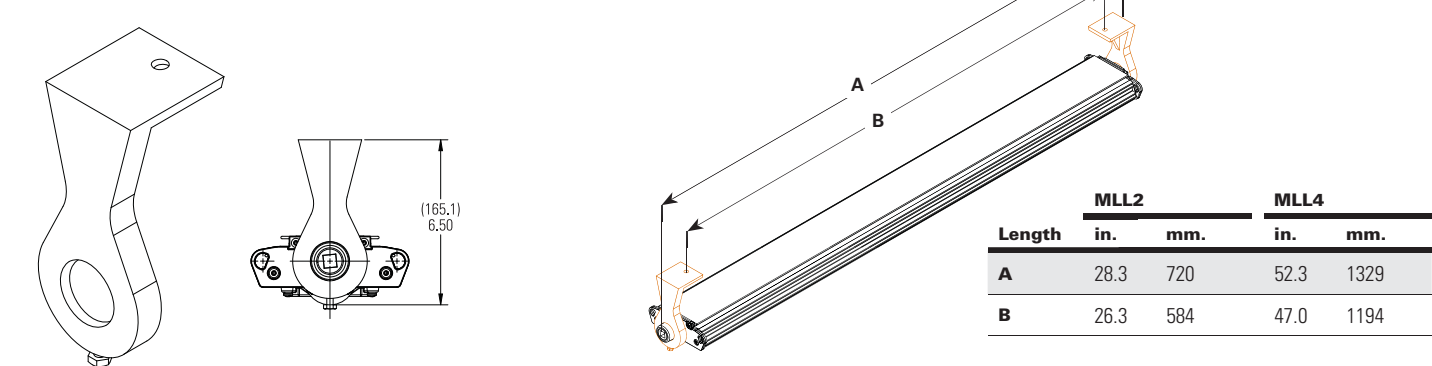


Mounting options

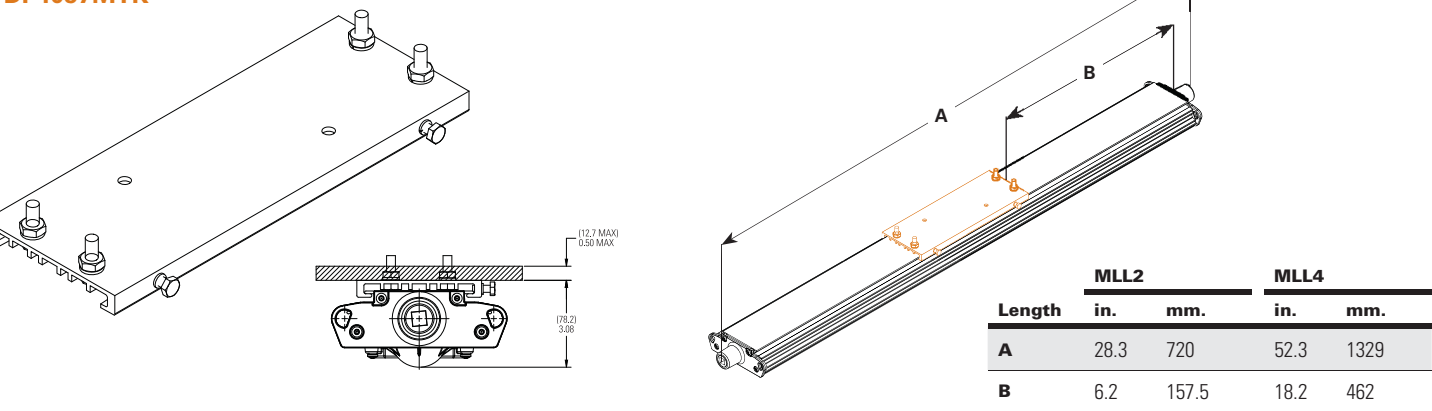
Offset wall DP1052MTK



Offset ceiling/wall mount DP1053MTK

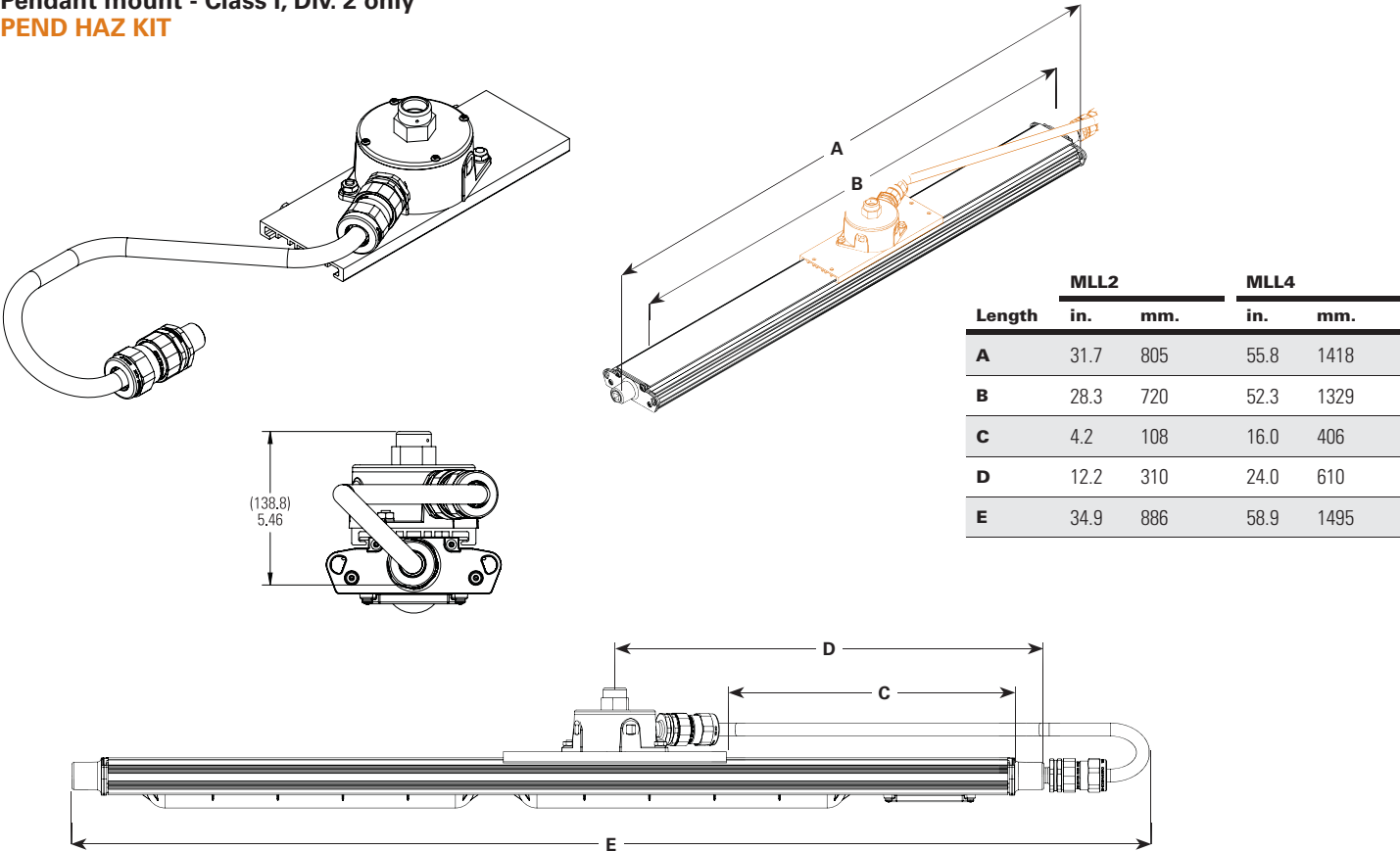


Flush ceiling DP1057MTK



Mounting options

Pendant mount - Class I, Div. 2 only
PEND HAZ KIT



Battery back-up

Champ MLL linear LED luminaires are now available with an integral battery back-up module. Virtually the same size as the standard 4 foot model and up to 90 minutes of emergency lighting to keep your facility and people safe.



Model	EM output	Normal output
MLL4/UNV1 EM1	1,400 lumens (100-277V)	6,720 lumens (100-277V)

Applications:

- Egress and emergency lighting for areas requiring uninterrupted lighting during power failure
- Hazardous rated indoor and outdoor emergency lighting in manufacturing plants, heavy industrial, chemical and petrochemical facilities, platforms, loading docks and parking areas.

Key features:

- Operating ambient: 0°C to +40°C
- 90 minute runtime in emergency mode
- 6,720 lumen output for normal operation
- 1,400 in emergency mode
- 50,000 hours rated life @ 40°C
- IP66 rated enclosure
- LED indicator to check battery operation
- Nickel-cadmium battery
- 1 year warranty

Certifications and compliances:

NEC/CEC

- Class I, Division 2, Groups A, B, C, D
- Class II, Division 2, Groups F, G
- Wet Location, IP66, Type 4X

UL Standards

- UL844 Hazardous (Classified)
- UL1598 Luminaires, UL1598A Marine
- UL924 Emergency Lighting

CSA Standard

- CSA C22.2 Nos. 250, 137, 141

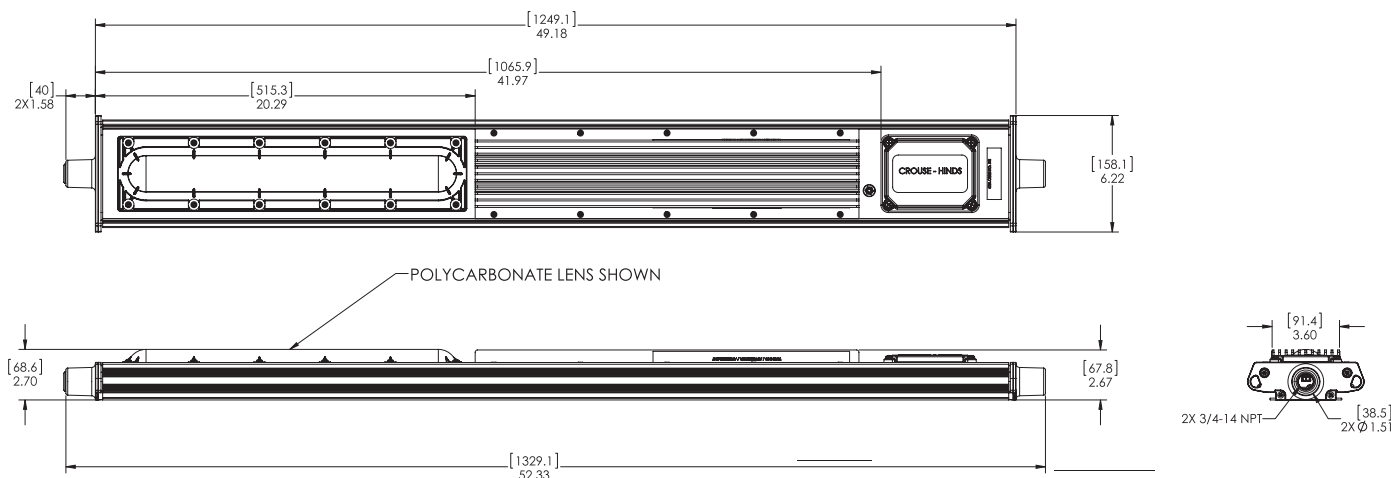
Electrical ratings:

Voltage	120	277
Amperage @ 120VAC	.48	.212
Wattage @ 120VAC	57.8	57.7
Lumen output	6,720	6,720
Frequency	50/60Hz	50/60Hz
Power factor @ 100 VAC	.997	.980
THD	6.58	11.70

Temperature codes:

Ambient temperature	Min. temp. wire supply	Class I, Div. 2	Class II, Div. I	Simultaneous rating Class I, Div. 2, Class II, Div. 1
40°C	60°C	T5	T6	T5

Dimensions:



**U.S. (global headquarters):
Eaton's Crouse-Hinds business**

1201 Wolf Street
Syracuse, NY 13208

(866) 764-5454
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Europe (Germany)

49 (0) 6271 806-500
49 (0) 6271 806-476
sales.CCH.de@cooperindustries.com

Middle East

971 4 8066100
FAX: 971 4 8894813
chmesales@eaton.com

Singapore

65-6645-9888
FAX: 65-6297-4819
chsi-sales@cooperindustries.com

China

86-21-2899-3600
FAX: 86-21-2899-4055
cchsales@cooperindustries.com

Korea

82-2-3484-6783
82-2-3484-6778
CCHK-sales@cooperindustries.com

Australia

61-2-8787-2777
FAX: 61-2-9609-2342
CEASales@cooperindustries.com

India

91-124-4683888
FAX: 91-124-4683899
cchindia@cooperindustries.com

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

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