



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: IECEx ITS 18.0041X

Issue No: 0

Certificate history:

Issue No. 0 (2018-10-17)

Status: **Current**

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Date of Issue: **2018-10-17**

Applicant: **Appleton Group LLC**  
9377 W Higgins Rd; Rosemont, IL 60018  
**United States of America**

Equipment: **Mercmaster LED Luminaire, models: Generation 3 (MGZxHxxxxx and MGZxLxxxxx)**  
*Optional accessory:*

Type of Protection: **Ex e, m, op is, t**

Marking:

Ex eb mb op is IIC T4/T5/T6 Gb

Ex op is tb IIIC T75°C/T85°C/T100°C Db

-40°C < T<sub>AMB</sub> < +65°C

IP64/66

120 – 277 VAC, 50/60 Hz

170 – 300 VDC

150 W (max), 1.6A (max)

IECEX ITS 18.0041X

*Approved for issue on behalf of the IECEx  
Certification Body:*

Paul Moss

*Position:*

Certification Officer

*Signature:  
(for printed version)*

*Date:*

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:



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**Intertek Testing & Certification Limited**  
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# IECEX Certificate of Conformity

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Date of Issue: 2018-10-17 Page 3 of 4  
Manufacturer: **Appleton Group LLC**  
9377 W Higgins Rd; Rosemont, IL 60018  
**United States of America**

Additional Manufacturing location(s):

**Emerson**

Emerson Street No. 4,  
Parc Industrial Tetarom 2,  
400641, Cluj-Napoca  
Romania

**EGS Mexico S. de R.L. de C.V**

Via Monterrey Matamoros No. 598 Parque Industrial  
Milenium C.P. 66626 Apodaca, Nuevo Leon  
Mexico

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

**STANDARDS:**

The apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

- |   |   |
|---|---|
| <b>IEC 60079-0 : 2011</b><br>Edition:6.0  | Explosive atmospheres - Part 0: General requirements  |
| <b>IEC 60079-18 : 2014</b><br>Edition:4.0 | Explosive atmospheres – Part 18: Equipment protection by encapsulation "m"                                |
| <b>IEC 60079-28 : 2015</b><br>Edition:2   | Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation |
| <b>IEC 60079-31 : 2013</b><br>Edition:2   | Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"                      |
| <b>IEC 60079-7 : 2015</b><br>Edition:5.0  | Explosive atmospheres – Part 7: Equipment protection by increased safety "e"                              |

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

**TEST & ASSESSMENT REPORTS:**

*A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in*

Test Report:

[GB/ITS/ExTR18.0045/00](#)

Quality Assessment Report:

[FR/LCI/QAR07.0008/12](#)

[US/UL/QAR17.0020/02](#)



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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The Mercmaster Generation 3 luminaires are LED luminaires housed in an aluminum enclosure. The MGZxH and MGZxL luminaire models are identical in construction except for the enclosure dimensions. The equipment consists of a main luminaire compartment, which is connected to different array of mounting hoods, the LED array compartment and the LED driver compartment. The main luminaire compartment has the following dimensions: 11.60 inch x 2.22 inch / 294.64 mm x 56.39 mm. The LED array compartment and LED driver compartment have the following dimensions: 14.75 inch x 3.62 inch / 374.65 mm x 91.95 mm. The mounting hoods can either be pendant type, 25° stanchion hood, 90° stanchion hood, a ceiling hood, trunnion or a wall hood. The luminaires are equipped with a clear tempered borosilicate or soda lime glass, as well as the clear or diffused polymeric lens. Each LED luminaire utilizes silicone gaskets. The luminaires have 1 threaded entry located on the mounting hood, filled with a blanking element for connection of entry devices in the main luminaire compartment. All luminaire models have been successfully evaluated/tested for IP64/66 per the requirements of IEC 60079-0:2012+A11 (with reference to IEC 60529). The luminaires contain 1 IECEx certified LED driver (50W, 100W or 150W), LED array and AC/DC terminal blocks. The LED driver is housed within the LED luminaire compartment located mid-point between the main and LED module compartments. All luminaire models contain 3 LED array strips, with a total of 36 or 48 LED's across all LED array strips.

All individually approved IECEx components have been certified to the standards noted above, except for the AC/DC terminal blocks, for which the Gap analysis has been completed from IEC 60079-7:2006 to IEC 60079-7:2015 per DS 2014/001. Reference the IEC 60079-7 ExTR for more information.

See Annex for Routine tests

### SPECIFIC CONDITIONS OF USE: YES as shown below:

Potential Electrostatic Charging Hazard – Use a damp cloth for maintenance and cleaning purposes on the equipment. Refer to the Installation Manual for more information.

### Annex:

[Annex doc for IEC Ex C of C 103509297DAL-001.pdf](#)



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<b>Annex No. 1</b>		

## General product information:

The Mercmaster Generation 3 luminaires are LED luminaires housed in an aluminum enclosure. The MGZxH and MGZxL luminaire models are identical in construction except for the enclosure dimensions. The equipment consists of a main luminaire compartment, which is connected to different array of mounting hoods, the LED array compartment and the LED driver compartment. The main luminaire compartment has the following dimensions: 11.60 inch x 2.22 inch / 294.64 mm x 56.39 mm. The LED array compartment and LED driver compartment have the following dimensions: 14.75 inch x 3.62 inch / 374.65 mm x 91.95 mm. The mounting hoods can either be pendant type, 25° stanchion hood, 90° stanchion hood, a ceiling hood, trunnion or a wall hood. The luminaires are equipped with a clear tempered borosilicate or soda lime glass, as well as the clear or diffused polymeric lens. Each LED luminaire utilizes silicone gaskets. The luminaires have 1 threaded entry located on the mounting hood, filled with a blanking element for connection of entry devices in the main luminaire compartment. All luminaire models have been successfully evaluated/tested for IP64/66 per the requirements of IEC 60079-0:2012+A11 (with reference to IEC 60529). The luminaires contain 1 IECEx certified LED driver (50W, 100W or 150W), LED array and AC/DC terminal blocks. The LED driver is housed within the LED luminaire compartment located mid-point between the main and LED module compartments. All luminaire models contain 3 LED array strips, with a total of 36 or 48 LED's across all LED array strips.

The model nomenclature for the Mercmaster LED luminaires is shown below:

Series	Mounting	Lumen Level	Hub Size	Color Temperature	Diffusion	Beam Spread	Voltage
<b>MGZ - Mercmaster Gen 3 Zone 1</b>	<b>A - Pendant</b>	<b>L3 - 3500</b>	<b>2 - 3/4" NPT</b>	<b>C - 5000K</b>	<b>P - Clear Polycarbonate Globe</b>		<b>BU - 120- 277 Vac 50/60 Hz, 170- 300Vdc</b>
	<b>C - Ceiling</b>	<b>L5 - 5500</b>	<b>3 - 1" NPT</b>	<b>N - 4000K</b>	<b>D - Diffused Polycarbonate Globe</b>		
	<b>R - 90 Stanchion</b>	<b>L7 - 7500</b>	<b>4 - 1-1/4" NPT Stanchion</b>	<b>W - 3000K</b>	<b>G - Clear Glass Globe</b>	<b>W - Type V Wide</b>	
	<b>S - 25 Stanchion</b>	<b>L9 - 9500</b>	<b>5 - 1-1/2" NPT Stanchion</b>				
	<b>T - Trunnion</b>	<b>H9 - 9500</b>	<b>6 - Metric M20</b>				
	<b>W - Wall</b>	<b>H1 - 11,500</b>					
<b>H3 - 13,500</b>							
<b>H6 - 17,500</b>							

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Temperature codes assigned to each model type based on driver current is shown below:

### Mercmaster Generation 3 models for Gas atmospheres:

Model	T-Code at 40°C ambient temperature	T-Code at 55°C ambient temperature	T-Code at 65°C ambient temperature
<b>MGZxH6xxxxBU</b> (150W @ 900mA max)	T4	T4	T4
<b>MGZxH3xxxxBU</b> (150W @ 900mA max)	T4	T4	T4
<b>MGZxH1xxxxBU</b> (100W @ 650mA max)	T5	T4	T4
<b>MGZxH9xxxxBU</b> (100W @ 520mA max)	T5	T5	T4

Model	T-Code at 40°C ambient temperature	T-Code at 55°C ambient temperature	T-Code at 65°C ambient temperature
<b>MGZxL9xxxxBU</b> (100W @ 520mA max)	T6	T5	T4
<b>MGZxL7xxxxBU</b> (100W @ 400mA max)	T6	T5	T5
<b>MGZxL5xxxxBU</b> (50W @ 780mA max)	T6	T6	T5
<b>MGZxL3xxxxBU</b> (50W @ 780mA max)	T6	T6	T5

### Mercmaster Generation 3 model for Dust atmospheres:

Model	T-Code at 40°C ambient temperature	T-Code at 55°C ambient temperature	T-Code at 65°C ambient temperature
<b>MGZxH6xxxxBU</b> (150W @ 900mA max)	85°C	100°C	100°C
<b>MGZxH3xxxxBU</b> (150W @ 900mA max)	85°C	100°C	100°C
<b>MGZxH1xxxxBU</b> (100W @ 650mA max)	85°C	85°C	100°C
<b>MGZxH9xxxxBU</b> (100W @ 520mA max)	85°C	85°C	100°C

Model	T-Code at 40°C ambient temperature	T-Code at 55°C ambient temperature	T-Code at 65°C ambient temperature
<b>MGZxL9xxxxBU</b> (100W @ 520mA max)	75°C	85°C	85°C
<b>MGZxL7xxxxBU</b> (100W @ 400mA max)	75°C	85°C	85°C
<b>MGZxL5xxxxBU</b> (50W @ 780mA max)	75°C	75°C	85°C
<b>MGZxL3xxxxBU</b> (50W @ 780mA max)	75°C	75°C	85°C



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**Manufacturer's documents**

**Drawings associated with Issue 0 of this certificate:**

<b>Technical Documents</b>			
Title:	Drawing No.:	Rev. Level:	Date:
MERCMaster LED GLASS GLOBE	607646	G	08/16/2018
GLOBE – MERCMaster LED	607647	K	08/16/2018
GASKET, O-RING MERCMaster LED GEN 3.0	609222	J	08/10/2018
MMG3 ZONE1, 48 LG LED ARRAY ASSEMBLY (MCPCB+LEDS+WIRES)	609324	01	04/11/2018
MMG3 ZONE1, 48 LG LED ENGINE (ENCAPSULATED)	609325	01	04/11/2018
MMG3 ZONE1, 36 LG LED ARRAY ASSEMBLY (MCPCB+LEDS+RESISTANCE+WIRE S)	609326	01	04/12/2018
MMG3 ZONE1, 36 LG LED ENGINE (ENCAPSULATED)	609327	01	04/12/2018
MERCMaster LED GEN 3.0-LITTLE PRIMO ZONE 1	637019	00	09/12/2018
MERCMaster LED GEN 3.0-BIG PRIMO ZONE 1	637020	00	09/12/2018
ZONE 1 RATED LED DRIVER (50W – BU VERSION)	299707556	01	05/22/2018
ZONE 1 RATED LED DRIVER (100W – BU VERSION)	299707557	01	05/21/2018
ZONE 1 RATED LED DRIVER (150W – BU VERSION)	299707558	01	05/21/2018
THREADED PLUG – SQUARE RECESS	503712	C	10/31/2016
GASKET FOR RTV MASKING	661285	00	10/31/2018
MERCMaster LED NAMEPATE TEMPERATURE LABEL IECEX AND ATEX	663640	B	10/11/2018
MERCMaster LED NAMEPLATE TEMPERATURE LABEL ZONE 1	663641	A	08/27/2018
SILICON ADHESIVE/SEALANT RTV – GENERAL PURPOSE	669014	N	06/15/2018
Zone 1 MMG3 Metric Fasteners	669183000	A	09/04/2018
Zone 1 MMG3 Imperial Fasteners	669184000	A	09/04/2018
Polyester Powder Coating	MS4003	E	06/27/2018
Installation Instructions for Appleton Mercmaster LED Zone 1 Generation 3 Luminaire	650602-000	B	10/11/2018
MERCMaster LED WARNING LABEL	663530	B	09/21/2017

Note: An \* is included before the title of documents that are new or revised.

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**Certified Components (LED Luminaires, models: Mercmaster Generation 3, MGZxH and MGZxL):**

#	Component	Manufacture and Type	Qty	Certificate Number	Standard and Edition	Ratings
1.	LED Driver	Appleton Group – ATX, APMZ050C135UD, APMZ100C090UD, APMZ150C135UD	1	IECEX UL 17.0067U	Issue 0, 2018-02-21 IEC 60079-0:2011 IEC 60079-18:2014	Ex mb IIC Gb -40°C to +90°C
2.	Terminal Blocks (AC)	Phoenix Contact GmbH & Co. KG, GB 2,5-EX	5	IECEX SEV 13.0012U	Issue 1, 2014-04-28 IEC 60079-0:2011 IEC 60079-7:2006	Ex eb IIC -60°C to +110°C
3.	Terminal Blocks (DC)	Phoenix Contact GmbH & Co. KG, GB 5/3-EX	3	IECEX PTB 06.0043U	Issue 1, 2014-05-26 IEC 60079-0:2011 IEC 60079-7:2006	Ex eb IIC -60°C to +110°C
4.	LED Array	Appleton Group – ATX, 59609 series	3	IECEX UL 17.0008U	Issue 3, 2018-07-24 IEC 60079-0:2017 IEC 60079-18:2014	Ex mb IIC Gb -40°C to +130°C

#	Special Conditions and Verification of Conformance for Each Component
1.	<p><b>Special Conditions of Safe Use:</b></p> <ol style="list-style-type: none"> <li>1. The equipment shall be installed in an enclosure that provides a degree of protection not less than IP54 in accordance with IEC 60079-0.</li> <li>2. End product shall be marked with the following warning: <b>WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT</b></li> <li>3. A conductor used for earthing connection is provided; termination is to be determined in the end use.</li> <li>4. The service temperature range is -40°C to +90°C for LED driver models APMZ050C135UD, 50W, APMZ100C090UD, 100W and APMZ150C135UD, 150W.</li> <li>5. There are no adverse effects on the surface top of the device when intended faults are applied as compared to temperatures measured under normal conditions.</li> <li>6. Determination of the applicability of the dielectric test must be determined in the end use product.</li> </ol> <p><b>Conformance of Each Condition:</b></p> <ol style="list-style-type: none"> <li>1. Equipment is installed in an enclosure that provides a degree of protection IP54 min.</li> <li>2. End product (luminaires) marked with the warning marking: <b>WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT</b></li> <li>3. Earthing connection termination of the LED driver to the enclosure exists, which is externally earthed to the surface it is installed to.</li> <li>4. Service temperature range of the LED luminaire is -40°C to +65°C. The LED driver temperatures do not exceed 90°C (measured 83.7°C) at +65°C ambient temperature. Reference Test Data for more details regarding Temperature Tests.</li> <li>5. There are no adverse effects on the surface top of the LED driver under fault operation vs. normal conditions.</li> <li>6. Dielectric Strength Test conducted per the requirements of IEC 60079-7. Reference Test Data for more details regarding Dielectric Strength Tests.</li> </ol>
2.	<p><b>Special Conditions of Safe Use:</b></p> <ol style="list-style-type: none"> <li>1. The terminal blocks of the MUT series are to be installed in enclosures that meet the requirements of the standards IEC/EN 60079-0 and IEC/EN 60079-7 (for gas atmospheres) and IEC/EN 60079-31 (for dust atmospheres).</li> <li>2. When installing the terminal blocks, clearances and creepage distances according to the standard IEC 60079-7 must be observed, as well as reduced current ratings when multiple terminals are installed, according to the rating of the enclosure explained in sub-clauses 5.8,</li> </ol>

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	<p>6.7 and Annex E.</p> <p>3. Service temperature range: -60°C ... +110°C.</p> <p><b>Conformance of Each Condition:</b></p> <ol style="list-style-type: none"> <li>1. The terminal blocks are mounted within an enclosure that is evaluated per IEC 60079-7 and IEC 60079-31. The enclosure has been successfully tested for IP64/66 per IEC 60079-0.</li> <li>2. Clearances and creepages are satisfied per the requirements of IEC 60079-7. Reference the applicable checklist for more information.</li> <li>3. Service temperature range of the LED luminaire is -40°C to +65°C. The terminal block temperatures do not exceed 110°C (measured 73.9°C) at +65°C ambient temperature. Reference Test Data for more details regarding Temperature Tests.</li> </ol>
3.	<p><b>Special Conditions of Safe Use:</b></p> <ol style="list-style-type: none"> <li>1. The terminal shall be mounted in an enclosure that meets the requirements of an approved type of protection as specified in IEC 60079-0, section 1.</li> <li>2. For combustible dust and the enclosure shall satisfy the requirements according to the applicable/relevant standards of IEC 60079-series e.g. IEC 60079-31, type protection “t”.</li> <li>3. When installing the terminals in an enclosure designed to Increased Safety “e” type of protection as specified in IEC 60079-7, the clearances and creepage distances shown in table 1 shall be duly considered. If accessories are used, the instructions for installation provided by the manufacturer shall be observed.</li> <li>4. Installation of electrical components requires a further assessment by an ExCB.</li> </ol> <p><b>Conformance of Each Condition:</b></p> <ol style="list-style-type: none"> <li>1. The terminal blocks are mounted within an enclosure that is evaluated per IEC 60079-7 and IEC 60079-31. The enclosure has been successfully tested for IP64/66 per IEC 60079-0.</li> <li>2. See item #1 above.</li> <li>3. Clearances and creepages are satisfied per the requirements of IEC 60079-7. Reference the applicable checklist for more information.</li> <li>4. Terminal blocks are installed within the final equipment assembly per the requirements of IEC 60079-14.</li> </ol>
4.	<p><b>Special Conditions of Safe Use:</b></p> <ol style="list-style-type: none"> <li>1. Evaluated service temperature range of -40°C to +130°C.</li> <li>2. Must be mounted inside a suitable, IECEx certified enclosure with protection method “p”, “d”, “e”, or “t”.</li> <li>3. Temperature tests will need to be considered for service and surface temperature suitability of the encapsulant in the end application.</li> <li>4. When integrating the Encapsulated LED Array, the temperature at the surface of the resin at the hottest point shall not exceed 130°C.</li> <li>5. Optical radiation equipment requirements must be evaluated as part of the end use application.</li> </ol> <p><b>Conformance of Each Condition:</b></p> <ol style="list-style-type: none"> <li>1. Service temperature range of the LED luminaire is -40°C to +65°C. The LED array temperatures do not exceed 130°C (measured 124.9°C) at +65°C ambient temperature. Reference Test Data for more details regarding Temperature Tests.</li> <li>2. Component is mounted within an enclosure suitable for protection methods “e” and “t”.</li> <li>3. Temperature tests are considered for service and surface temperature suitability of the encapsulant in the end application and to ensure the surface of the resin at the hottest point does not exceed 130°C. Reference Test Data for more details regarding Temperature Tests.</li> <li>4. See #3 above.</li> <li>5. Equipment is evaluated per the requirements of IEC 60079-28: 2015.</li> </ol>

**Routine Tests:**

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1. Routine Dielectric Strength testing of the LED luminaires per IEC 60079-7:2015, Clause 7.1 is applicable. Dielectric strength shall be verified by test at the following test voltage and maintained for at least 1 min without dielectric breakdown occurring:
  - For other electrical equipment and Ex Components, where working voltages exceeding 90 V peak are present:  $(1\ 000 + 2U)$  V r.m.s. + 5/0 % or 1 500 V r.m.s. +5 0 %, whichever is greater, where  $U$  is the working voltage.

The LED luminaire shall be tested as follows:

- Between inputs and ground (frame of the enclosure) – 1600V r.m.s.

Alternatively, a test shall be carried out at 1.2 times the test voltage, but maintained for at least 100ms.

2. Where the equipment incorporates certified components, the manufacturer shall ensure that any changes to those components do not affect the compliance of the certified product that is the subject of this certificate.

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