



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx UL 13.0067X**

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Certificate history:

Status: **Current**

Issue No: 2

[Issue 1 \(2015-09-30\)](#)

[Issue 0 \(2014-03-14\)](#)

Date of Issue: 2019-11-14

Applicant: **Malema Engineering Corp.**
1060 S. Rogers Circle
Boca Raton, FL 33487
United States of America

Equipment: **Flow Switch**

Optional accessory:

Type of Protection: **Encapsulation "mb"**

Marking: Ex mb IIC T3 Gb
Ex mb IIIC T150°C Db
-40°C to +145°C

Approved for issue on behalf of the IECEx
Certification Body:

Erin LaRocco

Position:

Staff Engineer

Signature:
(for printed version)

Date:

2019-11-14

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 www.iecex.com or use of this QR Code.



Certificate issued by:

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096
United States of America





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Manufacturer: **Malema Engineering Corp.**
1060 S. Rogers Circle
Boca Raton, FL 33487
United States of America

Additional
manufacturing
locations:

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 equipment 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

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-18:2017 Explosive atmospheres - Part 18: Protection by encapsulation "m"
Edition:4.1

This Certificate **does not** indicate compliance with 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:

[US/UL/ExTR13.0070/02](#)

Quality Assessment Report:

[US/UL/QAR13.0006/04](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Flow Switch Type M-50X, M-60X, M-100X, and M-200X is composed of a reed relay encapsulated in a non-metallic capsule inside an enclosure. When fluid flows through the unit, it causes a magnetic piston to move against the spring force. As soon as the piston travels beyond the flow set point, the magnet piston actuates the encapsulated hermetically sealed reed switch. Decreasing the flow below the set point causes the reed switch to de-actuate. The reed switch can be either SPDT or SPST. The enclosure can be stainless steel 316, brass, Monel, or Hasteloy.

Please see Annex for additional information.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- The field wire leads shall only be installed with metallic conduit with the termination suitability protected with an Ex type of protection as appropriate.
- A fuse rated not less than 1A, 250 VDC/VAC with a breaking capacity not less than 1500A shall be connected externally and suitability protected with an Ex type of protection as appropriate.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Issue 1: Manufacturer is adding a new encapsulate material and raising the upper ambient temperature from +75°C to 145°C

Issue 2: Updates to IEC 60079-0, 7th Edition and IEC 60079-18, Edition 4.1. Deletes ambient temperature range -40°C to +75°C and T6 and T80°C under Ex marking, and adds alternate cable sizes.

Annex:

[Annex to IECEx UL 13.0067X Issue 2.pdf](#)



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TYPE DESIGNATION

Nomenclature

M 50X S 1 1 1 0 0 0
I II III IV V VI VII VIII IX

- I. Series
M – M Series
- II. Model Number
50X
55X
60X
65X
70X
75X
100X
200X
- III. Material Code (Body Material)
S – 316SS
B – Brass
M – Monel
H – Hasteloy
- IV. Port Size
Not critical to the protection method
- V. Contact Configuration (Switch)
1 – SPST N.O.
2 – SPST N.C.
3 – SPDT
- VI. Flow Range
Not critical to the protection method
- VII. Mounting (Optional)
Not critical to the protection method
- VIII. Pistons (Optional)
Not critical to the protection method
- IX. Seals (Optional)
Not critical to the protection method



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PARAMETERS RELATING TO THE SAFETY

For SPDT:

Voltage switching/breakdown = 175VDC/200VDC

Current switching/carrying = 0.25A/1.5A

For SPST:

Voltage switching/breakdown = 200VDC/250VDC

Current switching/carrying = 0.5A/1.2A

MARKING

Marking has to be readable and indelible; it has to include the following indications:

malema sensors 1-800-637-6418	
Malema Engineering Corporation 1060 South Rogers Circle, Boca Raton, FL USA 33487	
PART #	EXPLOSION PROOF FLOW SWITCH (IP65)
TYPE	EXPLOSION PROOF FLOW SWITCH (IP65)
YR OF MFG	
PRESSURE	3000 psig max.
SET @	sccm
INCREASING	DECREASING
ATEX-INTRINSIC SAFETY-DEMKO 19 ATEX 2270X	
ENCAPSULATION-DEMKO 19 ATEX 2278X	
II 1 G Ex ia IIC T3 Ga	
II 2 G Ex mb IIC T3 Gb	
II 1 D Ex ia IIC T150°C Da	
II 2 D Ex mb IIC T150°C Db	
INTRINSIC SAFETY: IECEx UL 13.0065X	
ENCAPSULATION: IECEx UL 13.0067X	
Um=250 VDC or AC Im=1A	
Temp. Range -40°C ≤ T _{amb} ≤ +145°C	
For Gases: Ex ia IIC T3 Ga	
For Gases: Ex mb IIC T3 Gb	
For Dusts: Ex ia IIC T150°C Da	
For Dusts: Ex mb IIC T150°C Db	
UI ≤ 30V CI = 40pF	
SPDT switching I/carrying I = 0.25/1.5A	
SPST switching I/carrying I = 0.5/1.2A	
SPDT switching Vdc/Breakdown = 175/200	
SPST switching Vdc/Breakdown = 200/250	
UL RATING 120 Vac, 0.1A or 240Vac, 0.208A	
SERIAL #	
FLOW DIRECTION	

malema sensors 1-800-637-6418	
Malema Engineering Corporation 1060 South Rogers Circle, Boca Raton, FL USA 33487	
PART #	EXPLOSION PROOF ADJ. FLOW SWITCH (IP65)
TYPE	EXPLOSION PROOF ADJ. FLOW SWITCH (IP65)
PRESSURE	3000 psig max.
YR OF MFG	
ATEX-INTRINSIC SAFETY-DEMKO 19 ATEX 2270X	
ENCAPSULATION-DEMKO 19 ATEX 2278X	
II 1 G Ex ia IIC T3 Ga	
II 2 G Ex mb IIC T3 Gb	
II 1 D Ex ia IIC T150°C Da	
II 2 D Ex mb IIC T150°C Db	
INTRINSIC SAFETY: IECEx UL 13.0065X	
ENCAPSULATION: IECEx UL 13.0067X	
Um=250 VDC or AC Im=1A	
Temp. Range -40°C ≤ T _{amb} ≤ +145°C	
For Gases: Ex ia IIC T3 Ga	
For Gases: Ex mb IIC T3 Gb	
For Dusts: Ex ia IIC T150°C Da	
For Dusts: Ex mb IIC T150°C Db	
UI ≤ 30V CI = 40pF	
SPDT switching I/carrying I = 0.25/1.5A	
SPST switching I/carrying I = 0.5/1.2A	
SPDT switching Vdc/Breakdown = 175/200	
SPST switching Vdc/Breakdown = 200/250	
UL RATING 120Vac, 0.1A or 240Vac, 0.208A	
RANGE SCFM Air / GPM Liquid	
SERIAL # Set @	



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		1-800-637-6418	
Malema Engineering Corporation 1060 South Rogers Circle, Boca Raton, FL USA 33487			
PART #			
TYPE	EXPLOSION PROOF ADJ. FLOW SWITCH (IP65)		CE 0539
PRESSURE	3000 psig max.	YR OF MFG	
ATEX-INTRINSIC SAFETY - DEMKO 19 ATEX 2270X		ENCAPSULATION-DEMKO 19 ATEX 2278X	
II 1 G Ex ia IIC T3 Ga		II 2 G Ex mb IIC T3 Gb	
II 1 D Ex ia IIC T150°C Da		II 2 D Ex mb IIC T150°C Db	
INTRINSIC SAFETY: IECEx UL 13.0065X For Gases: Ex ia IIC T3 Ga For Dusts: Ex ia IIC T150°C Da		ENCAPSULATION: IECEx UL 13.0067X For Gases: Ex mb IIC T3 Gb For Dusts: Ex mb IIC T150°C Db	
Um=250 VDC or AC Im=1A Temp. Range -40°C ≤ T _{amb} ≤ +145°C			
UI ≤ 30V Ci=40pF Pi ≤ 0.7W Li=4μH Ii=0.5A		SPDT switching I/carrying I=0.25/1.5A SPST switching I/carrying I=0.5/1.2A	
UL RATING		120Vac, 0.1A or 240Vac, 0.208A	
RANGE		sccm Air / ccm Liquid	
SERIAL #		Set @	

ROUTINE EXAMINATIONS AND TESTS

Each pieces of equipment defined above has to have successfully passed; before delivery:

- Visual inspections - Each piece of "m" equipment shall be subjected to a visual inspection. No damage shall be evident, such as cracks in the compound, exposure of the encapsulated parts, flaking, inadmissible shrinkage, swelling, decomposition, failure of adhesion or softening.
- Dielectric strength test – The test shall be conducted between the reed switch and the equipment enclosure at minimum 1500 V r.m.s. at 48 Hz to 62 Hz or 2100 V d.c. for at least 1 second. Alternatively, 1.2 x test voltage may be applied and maintained for at least 100 ms. The test shall be deemed as passed if no breakdown or arcing occurs during testing.