



# 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](http://www.iecex.com)

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

Page 1 of 4

Certificate history:

Status: **Current**

Issue No: 4

[Issue 3 \(2023-03-21\)](#)

[Issue 2 \(2019-11-14\)](#)

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

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

Date of Issue: 2024-02-02

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

Equipment: **Flow Switch, Type M-50X\*, M-60X\*, M-100X\*, M-200X\***

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:

**Katy A. Holdredge**

Position:

**Senior Staff Engineer**

Signature:  
(for printed version)

Date:  
(for printed version)

2024-02-02

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Certificate issued by:

**UL Solutions (US)**  
333 Pfingsten Road  
Northbrook IL 60062-2096  
**United States of America**





# IECEX Certificate of Conformity

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

Page 2 of 4

Date of issue: 2024-02-02

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

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

**Malema Sensors (I) Private Limited**  
No. 1433, 3rd And 4th Floor Pipeline  
Road,  
Mahalakshmi Puram  
Bangalore 560 086, Karnataka  
**India**

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 Reports:

**US/UL/ExTR13.0070/00**  
**US/UL/ExTR13.0070/03**

**US/UL/ExTR13.0070/01**  
**US/UL/ExTR13.0070/04**

**US/UL/ExTR13.0070/02**

### Quality Assessment Reports:

**US/UL/QAR13.0006/06**

**US/UL/QAR23.0017/00**



# IECEx Certificate of Conformity

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

Page 3 of 4

Date of issue: 2024-02-02

Issue No: 4

## **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 Hastelloy.

**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.



# IECEx Certificate of Conformity

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

Page 4 of 4

Date of issue: 2024-02-02

Issue No: 4

## **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, 7<sup>th</sup> 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.

Issue 3: Minor update to labels.

Issue 4: Addition of new manufacturing location.

## **Annex:**

[Annex to IECEx UL 13.0067X Issue 4.pdf](#)



# IECEX Certificate of Conformity

Annex to Certificate No.:

IECEX UL 13.0067X

Issue No.: 4

Page 1 of 3

## 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 – Hastelloy
- 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



# IECEx Certificate of Conformity

Annex to Certificate No.:

IECEx UL 13.0067X

Issue No.: 4

Page 2 of 3

## 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:

Model M-100X:

<b>MALEMA SENSORS</b>		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	300 psig max.	YR. OF MFG	CE 0539
ATEX-INTRINSIC SAFETY - DEMKO 19 ATEX 2270X   ENCAPSULATION- DEMKO 19 ATEX 2278X			
II 1 G Ex ia IIC T6...T3 Ga		II 2 G Ex mb IIC T3 Gb	
II 1 D Ex ia IIIC T80°C...T150°C Da		II 2 D Ex mb IIIC T150°C Db	
INTRINSIC SAFETY: IECEx UL 13.0065X		ENCAPSULATION: IECEx UL 13.0067X	
For Gases: Ex ia IIC T6...T3 Ga		For Gases: Ex mb IIC T3 Gb	
For Dusts: Ex ia IIIC T80°C...T150°C Da		For Dusts: Ex mb IIIC T150 °C Db	
UL ≤ 30V Ci=40pF SPDT switching I/carrying I=0.25/1.5A		SPDT switching Vdc/Breakdown= 175/200	
Pi≤0.7W Li=4uH Li=0.5A SPST switching I/carrying I=0.5/1.2A		SPST switching Vdc/Breakdown=200/250	
UL RATING 120Vac, 0.1A or 240Vac, 0.208A			
RANGE	sccm Air/ ccm Liquid		
SERIAL #	Set @		

Model M-200X:

<b>MALEMA SENSORS</b>		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	300 psig max.	YR. OF MFG	CE 0539
ATEX-INTRINSIC SAFETY - DEMKO 19 ATEX 2270X   ENCAPSULATION- DEMKO 19 ATEX 2278X			
II 1 G Ex ia IIC T6...T3 Ga		II 2 G Ex mb IIC T3 Gb	
II 1 D Ex ia IIIC T80°C...T150°C Da		II 2 D Ex mb IIIC T150°C Db	
INTRINSIC SAFETY: IECEx UL 13.0065X		ENCAPSULATION: IECEx UL 13.0067X	
For Gases: Ex ia IIC T6...T3 Ga		For Gases: Ex mb IIC T3 Gb	
For Dusts: Ex ia IIIC T80°C...T150°C Da		For Dusts: Ex mb IIIC T150 °C Db	
UL ≤ 30V Ci=40pF SPDT switching I/carrying I=0.25/1.5A		SPDT switching Vdc/Breakdown= 175/200	
Pi≤0.7W Li=4uH Li=0.5A SPST switching I/carrying I=0.5/1.2A		SPST switching Vdc/Breakdown=200/250	
UL RATING 120Vac, 0.1A or 240Vac, 0.208A			
RANGE	SCFM Air/ GPM Liquid		
SERIAL #	Set @		



# IECEx Certificate of Conformity

Annex to Certificate No.:

IECEx UL 13.0067X

Issue No.: 4

Page 3 of 3

Model M-50X/60X:

<b>MALEMA SENSORS</b> 1-800-637-6418	
MALEMA ENGINEERING CORPORATION 1060 South Rogers Circle, Boca Raton, FL USA 33487	
PART #	
TYPE	EXPLOSION PROOF FLOW SWITCH (IP65)
YR. OF MFG	
PRESSURE 3000 psig max.	
Set @	scfm INCREASING DECREASING
ATEX-INTRINSIC SAFETY - DEMKO 19 ATEX 2270X ENCAPSULATION- DEMKO 19 ATEX 2278X	
II 1 G Ex ia IIC T6...T3 Ga II 2 G Ex mb IIC T3 Gb	
II 1 D Ex ia IIIC T80°C...T150°C Da II 2 D Ex mb IIIC T150°C Db	
INTRINSIC SAFETY: IECEx UL 13.0065X ENCAPSULATION: IECEx UL 13.0067X Um=250 VDC OR AC For Gases: Ex ia IIC T6...T3 Ga For Gases: Ex mb IIC T3 Gb Im=1A For Dusts: Ex ia IIIC T80°C...T150°C Da For Dusts: Ex mb IIIC T150 °C Db Temp. Rang -40°C ≤Tamb+145°C	
UI < 30V CI=40pF SPDT switching I/carrying I=0.25/1.5A SPDT switching Vdc/Breakdown=175/200	PI<0.7W LI=4uH LI=0.5A SPST switching I/carrying I=0.5/1.2A SPST switching Vdc/Breakdown=200/250
UL RATING 120Vac, 0.1A	SERIAL #
FLOW DIRECTION	

## ROUTINE EXAMINATIONS AND TESTS

Each piece 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.