



TECHNICAL DOCUMENTATION

INSTALLATION AND USER GUIDE FOR  
**MM0100 AND MM0100-EH6028**  
ULTRASONIC GAS LEAK DETECTORS





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**MM0100 AND MM0100 - EH6028**  
ULTRASONIC GAS LEAK DETECTORS

From serial number: 056-001





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## SAFETY CONSIDERATIONS

### WARNINGS

- Switch off all equipment before connecting or disconnecting them. Failure to do so could damage the equipment.
- The Gas Leak Detectors MM0100 and MM0100-EH6028 are intrinsically safe units (EEx ib IIC T6). The voltage and current levels at the detector must be limited by Ex approved isolators/barriers. Failure to do so may result in an explosion.
- Precautions shall be taken to avoid electrostatic charging of the device.
- Only original Innova GasSonic screws with isolators should be used to tighten the lid.

## ABOUT THIS INSTALLATION GUIDE

This installation guide describes how to install the MM0100 and MM0100- EH6028 Gas Leak Detector and tells you how to adjust it to the local conditions.

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# 1. INTRODUCTION

This installation guide describes how to install Ultrasonic Gas Leak Detectors MM0100 and MM0100-EH6028 and how to make the necessary checks and adjustments to ensure optimal performance.

## 2. DESCRIPTION OF MM0100 AND MM0100-EH6028

The MM0100/MM0100-EH6028 detects leaks from pressurised gas systems by sensing the airborne ultrasound produced by the gas escaping. This detection method is Omni-directional. It can function in extreme weather conditions and is ideal for monitoring leaks from valves and flanges in complex pipeline systems, both onshore and offshore.

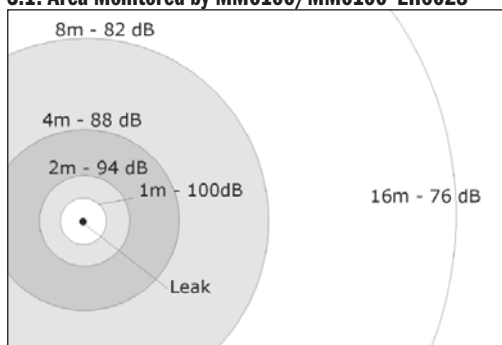
The MM0100 detector has an adjustable alarm trigger level setting (7 levels, from 44 to 104dB in 10dB steps) and an internal adjustable alarm delay from 0 – 480 seconds. If the internal alarm delay is set to zero, an alarm delay of at least 15 seconds should be introduced at the control system. These functions enable the detector to recognise leaks more easily and prevent the occurrence of false alarms.

The MM0100-EH6028 detector has an adjustable alarm trigger level setting (10 levels, from 54 to 99dB in 5dB steps) and no internal alarm delay. It is necessary for an alarm delay of at least 15 seconds to be introduced at the control system.

Ex approved isolators must be used to limit the current and voltage to the detector. These isolators need to be installed in the non-hazardous area. The detectors satisfies ATEX - **EEx ib IIC T6** and UL/ULC - **Class 1/Div. 1/ Group ABCD** classifications. It is certified by DEMKO (certificate no. DEMKO 02 ATEX 131173X and UL File/NO. E228468). Copies of the certificates are available on request from your local INNOVA GasSonic representative.

## 3. INSTALLING THE DETECTOR

### 3.1. Area Monitored by MM0100/MM0100-EH6028



#### Sound in Air:

Sound pressure levels (SPL) decrease by approximately 6dB each time the distance is doubled.

This means that if a gas leak generates a SPL of 100 dB at 1 metre the SPL will drop by 6 dB every time the distance from the gas leak is doubled. As illustrated in the diagram, the SPL at 2 metres will be 94 dB.





Although these calculations are for ideal conditions, where there are no obstacles or reflecting walls between the leak and the detector, they provide reliable guidelines as to the number of detectors required and where they might be positioned.

We recommend that the detector should be positioned in line of sight to and within an 8 - 12 metres radius from the possible leak, to accurately detect leaks of 0.1 kg/sec. (e.g. 4 mm leak size at 735 psi). This may depend on local conditions (background noise etc.).

## 3.2. ENVIRONMENTAL CONDITIONS

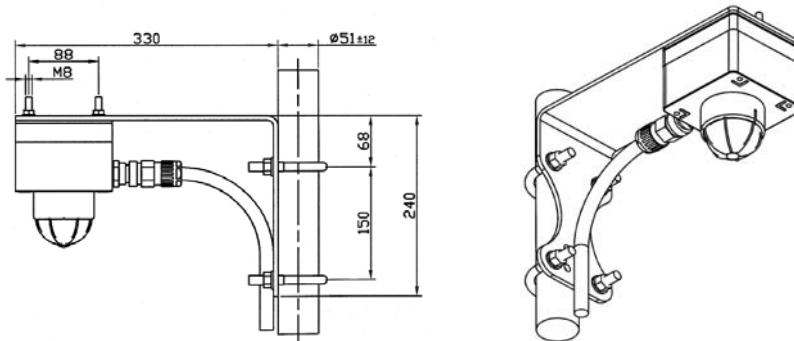
**WARNING!** In order to keep the detector and the junction box intrinsically safe, the voltage and current levels must be limited by Ex approved isolators/barriers placed in the non-hazardous area. MTL isolators are mentioned in drawing BR6008 on page 8. However, any isolators, with the correct specifications, can be used.

### Corrosion Resistant:

The detectors have been tested with salt contamination, followed by 30 cycles of the Kesterwick test with up to 100% relative humidity and 0.21 SO<sub>2</sub> per cycle (according to DIN 5 0 018 - SFW 0.25W). The MM0100/MM0100-EH6028 have been tested and found to comply with IP66 according to IEC 529 second edition: 1989-11.

## 3.3. MOUNTING THE DETECTOR

Two M8 stainless steel bolts attached to the detector's lid are used to fix the MM0100/MM0100-EH6028 in its operating position. The detectors can be mounted to a free-standing pole or wall, using the mounting bracket UA1352. It is possible to mount the detectors to non-vibrating structural beams or cable-trays. The microphone should face downwards, and if tilting of the detector is needed, this angle should not exceed 45°.







The detector is delivered as a sealed unit fitted with a six meter, 2-pair, collective screen, steel-braided, halogen-free, mud resistant, fire resistant cable.

**Pair 1** Power Supply Inputs:

Blue: 13 – 28 VDC

Black: GND

**Pair 2** Trip Outputs:

Blue & Black: Alarm Relay Output.

**Collective screen and drain wire: IS Earth**

**Armour:** Earth

The braided cable must be fastened at least every 0.5m.







## 4. POWER REQUIREMENTS

The detectors are powered by an external 24V DC supply (min. 13 V DC, max. 28 V DC). The maximum power consumption of one detector is approximately 30 mA. The detectors must be electrically connected via certified barriers placed outside the hazardous area.

Intrinsically safe specifications:

**V<sub>max</sub>/U<sub>i</sub> = 28 Vdc**    **I<sub>max</sub>/I<sub>i</sub> = 100 mA**    **L<sub>i</sub> = 0.01 mH**    **C<sub>i</sub> = 10 nF**    **P<sub>i</sub> = 0.75 W**

## 5. ADJUSTMENTS

### 5.1. Adjustable Alarm Level Settings

The MM0100/MM0100-EH6028 is equipped with an adjustable Alarm Trigger Level. This should be adjusted to suit the local conditions.

The alarm has ten level settings:

MM0100	
Level Setting	Trip SPL (dB)
0, 1 & 2	44
3	54
4	64
5	74
6	84*
7	94
8 & 9	104

MM0100-EH6028	
Level Setting	Trip SPL (dB)
0	54
1	59
2	64
3	69
4	74
5	79*
6	84
7	89
8	94
9	99

\* Factory settings (unless otherwise specified)

The Detectors should be adjusted so that the alarm level is at least 6dB above the normal background noise level in the area to be monitored.

A built-in green LED, positioned beside the attenuator inside the detector, helps you to find the correct level setting.

#### Adjusting the Alarm Level

1. Using an Allen-key, remove the screw at the bottom of the detector.
2. Using a small, flat-blade screwdriver set the attenuator to the highest position. Adjust the level downwards until the green LED lights. Increase the setting to at least the next attenuator position. The detector now has the correct alarm level setting.
3. Replace the screw and secure it firmly using the Allen-key. It is important that the screw is tight and sealed to prevent water entering the detector.





## 5.2. ALARM DELAY & CUT-ON FREQUENCY SETTINGS

### 5.2.1 MM0100-EH6028

The Alarm Delay and Cut-on Frequency settings are fixed in the MM0100-EH6028.

These values are:

**Alarm Delay: 0 seconds**      **Cut-on frequency: 25 kHz**

### 5.2.2 MM0100

The MM0100 is equipped with an adjustable Alarm Level, Alarm Delay and a Cut-on Frequency. These should be adjusted to suit the local conditions.

#### 5.2.2.1. Alarm Delay

The MM0100 is fitted with an Alarm Delay function. This can prevent short duration ultrasound noise events, which exceed the alarm level, from triggering the alarm. Gas leaks normally produce an almost constant ultrasound level. The detector may be subjected to short duration ultrasound noise events, such as air-valves, sirens or loud bangs, which exceed the alarm level. By adjusting the alarm delay to a period longer than these events it will be able to illuminate false alarms.

The alarm delay is set using the dip switches inside the detector. The time delays and the corresponding dip switch positions are shown below:

Dip On.	Delay
1	0
2	15 sec*
3	30 sec
4	2 min
5	4 min
6	8 min

\* Factory settings

The time-delay is typically set between 15 seconds and 2 minutes. However, this depends entirely on the duration of the noise events. The alarm delay can be set up to 8 minutes.

If a delay longer than 8 minutes is necessary, an external delay unit can be added.

#### 5.2.2.2. Cut-on Frequencies

The detector can also be set so that it ignores frequencies below a defined level. The H.P. filter controls this “cut-on” option. The frequency is defined using the dipswitches labelled 7 and 8.

DIP 7	DIP 8	Freq. (kHz)
On	On	25*
Off	On	20
On	Off	15
Off	Off	10

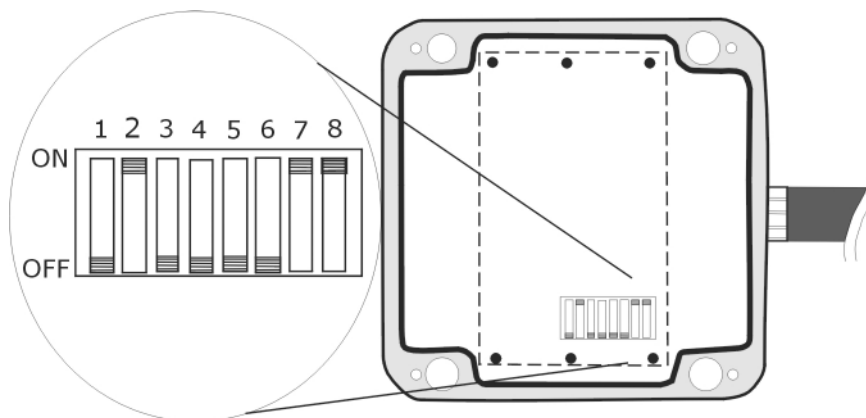
\* Factory settings





### Adjusting the DIP Switches:

1. Unscrew the four screws in the top of the MM0100, and remove the lid.
2. Unscrew the six screws on the metalplate located under the lid and remove the plate. The dipswitches, illustrated below, are now visible.
3. Using a small, flat-blade screwdriver, change the positions of the dipswitches to suit your measuring site requirements.
4. Replace the plate and secure it with the six screws.
5. Replace the lid and secure the four screws using an Allen-key.



## 6. OPERATING THE EQUIPMENT

### 6.1. Trip Output Data

The only output from the device is a trip output. This has two states:

Normal:  $1.28k\Omega \pm 1\%$

Alarm:  $10k\Omega \pm 1\%$  (No power or an ultra sound level above the preset trigger level)





# MM0100 AND MM0100-EH6028

From serial number: 056-001

BB 6016-01  
CAPITOL COPENHAGEN +45 4580 0831



## **INNOVA GASSONIC**

Energivej 30

DK-2750 Ballerup

Denmark

Tel +45 4420 0100

Fax +45 4420 0101

mail@gassonic.com

www.gassonic.com

