

INSTALLATION AND USER GUIDE FOR  
**GASSONIC OBSERVER**  
ULTRASONIC GAS LEAK DETECTOR



**INSTALLATION AND USER GUIDE FOR**

# **GASSONIC OBSERVER**

**ULTRASONIC GAS LEAK DETECTOR**

From serial number: 1011-014

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# 1. TECHNICAL DATA ON THE GASSONIC OBSERVER

## ACOUSTIC SPECIFICATIONS

Microphone unit:  
Detector frequency range: 25 kHz – 70 kHz  
Dynamic range: 58 dB – 104 dB

## TEST SOUND SOURCE:

Test frequency: 40 kHz +/- 3 kHz  
Sound pressure: 100dB, 60 mm from the sound source

## POWER REQUIREMENTS

Input voltage: 15 – 30 VDC (Class 2 power supply for UL/ULc areas)  
Maximum current consumption: 250 mA

## OUTPUT SIGNALS

- Analogue 4 - 20 mA interface  
(Maximum permitted load resistance is 500Ω):
  - 0 mA: No power / Low supply voltage
  - 1 mA: Acoustic error
  - 3 mA: Unit inhibit
  - 4 – 20 mA: 58 dB – 104 dB SPL
- Digital RS 485 interface
- Relay1 - Error/fault indication (NC):
  - Load: 500 mA max. Switch Voltage: 200 VDC max.
- Relay2 - Indication of alarm trigger level reached.
  - Load: 500 mA max. Switch voltage: 200 VDC max.
  - Factory default = NC (de-energized).
  - This can be changed by the operator.

## ENVIRONMENTAL DATA

Operational temperature range: -40°C to 60°C  
Humidity: 0 to 100% relative humidity

## GAS LEAK DETECTION COVERAGE (REF= METHANE)

Ultrasonic background noise < 74 dB, (low noise areas)  
12 m radius @ leak rate = 0.1 kg/sec  
8 m radius @ leak rate = 0.03 kg/sec

Ultrasonic background noise < 84 dB, (high noise areas)

8 m radius @ leak rate = 0.1 kg/sec  
4 m radius @ leak rate = 0.03 kg/sec

## CERTIFICATIONS

ATEX: Ex II 2G EEx d e ib IIB + H2 T6  
UL/ULc: Flameproof enclosure. CLASS 1 DIV 1 Groups BCD  
-40°C to +60°C  
IECEX: Ex II 2G EEx d e ib IIB+H2 T6  
GGTN K Permit to use, Kazakhstan  
GOST R (Russia): Pending

## INGRESS PROTECTION

EN60529/A1: IP66

## RF EMISSION AND IMMUNITY

Tested according to:  
EN61010-1  
EN61000-6-2  
EN61000-6-3

## CONSTRUCTION

Stainless steel AISI 316L  
Weight: 7.5 Kg

## DIMENSIONS

Ø 202\*189 mm (7.95 \* 7.44 in)

## 2. INTRODUCTION

The Gassonic Observer is an ultrasonic gas leak detector for detecting pressurised gas leaks. This user manual describes how to install the Gassonic Observer and how to make the necessary checks and adjustments to ensure optimal performance.

## 3. GENERAL DESCRIPTION AND FEATURES

The Gassonic Observer detects leaks from pressurised gas systems by sensing the airborne ultrasound produced by the gas escaping. This detection method is omnidirectional. 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.

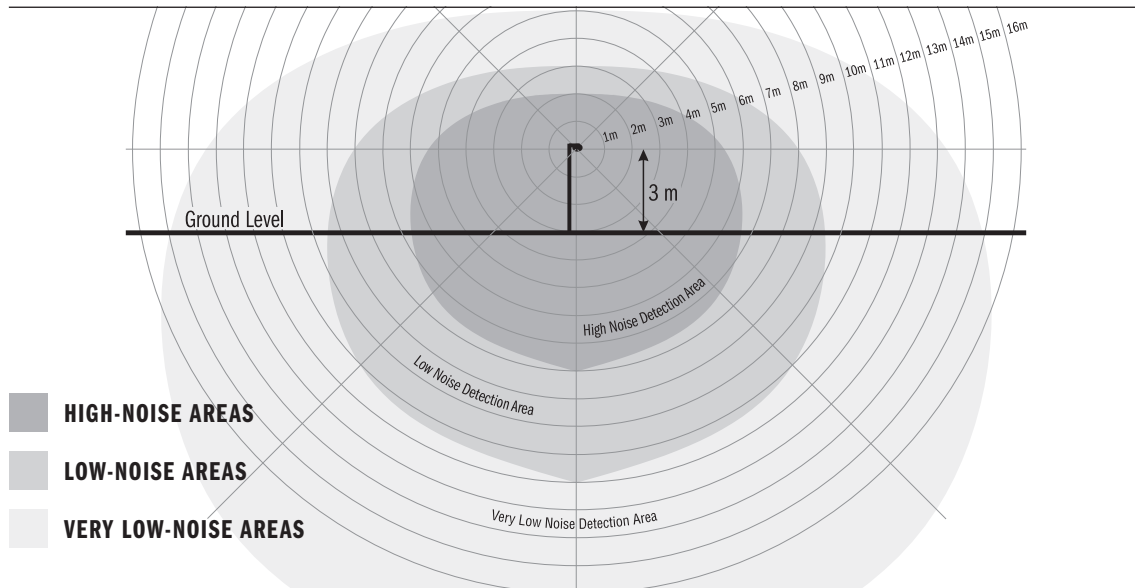
The detector has the following certifications:

ATEX approval, Ex II 2G EEx d e ib IIB+H2 T6 according to standards EN 50014, EN 50018, EN 50019 and EN 50020 (certificate number DEMKO 04ATEX136396). UL/ULc approval, Class 1 Div 1 Group BCD -40°C to +60°C, according to standards UL 1203 and UL 913. IECEx approval, Ex II 2G Ex d e ib IIB+H2 T6 according to standards IEC 60079-0, IEC 60079-1, IEC 60079-7 and IEC 60079-11 (certificate number ULD 05.0007). A copy of the ATEX certificate is available on request from your local Gassonic representative.

The detector housing is casted AISI 316L, acid-proof stainless steel and the ingress protection is IP66.

The performance of the Gassonic Observer as a safety device is not covered by the ATEX certificate.

## Detection Coverage Characteristics



### HIGH-NOISE AREAS

In "high-noise areas" (background noise < 78dB), the trigger level must be set at 84 dB. This corresponds to a detection radius of 5-8 metres.

### Typical areas:

- Turbo compressor areas
- Complete open offshore weather deck
- Next to very noisy machinery

### LOW-NOISE AREAS

In "low-noise areas" (background noise < 68dB), the trigger level must be set at 74 dB. This corresponds to a detection radius of 9-12 metres.

### Typical areas:

- Areas with no machinery
- Areas with low frequency machine made noise

### VERY LOW-NOISE AREAS

In "very low-noise areas" (background noise < 58dB), the trigger level must be set at 64 dB. This corresponds to a detection radius of 13-20 metres.

### Typical areas:

- Onshore wellhead areas in calm environment
- Salt dome gas storage facilities in calm environment

### 3.1. Area monitored by the Gassonic Observer

The detection coverage of the Gassonic Observer is determined by the ultrasonic noise levels in the area of installation. Experience has shown that most process environments can be divided into three overall noise levels. This is illustrated in the image below. The detection coverage characteristics are based on live tests and show the minimum coverage of the Gassonic Observer detector in areas without solid physical obstructions between the detector and the leak. For further instructions on installation, Gassonic A/S can be consulted.

### 3.2. Detector Outputs

The Gassonic Observer detector has several output methods:

- Analogue 4-20 mA interface - Sink or Source (Factory setting = Source)\*
- Digital RS485 interface
- Alarm relay

The Alarm relay is controlled by an adjustable trigger level in 5 dB steps, from 59 to 99 dB and has an adjustable internal alarm delay from 0 to 600 seconds. It is necessary to introduce an alarm delay of at least 10 seconds either internally or in the control system. (Factory setting - 79 dB and 10 seconds delay)

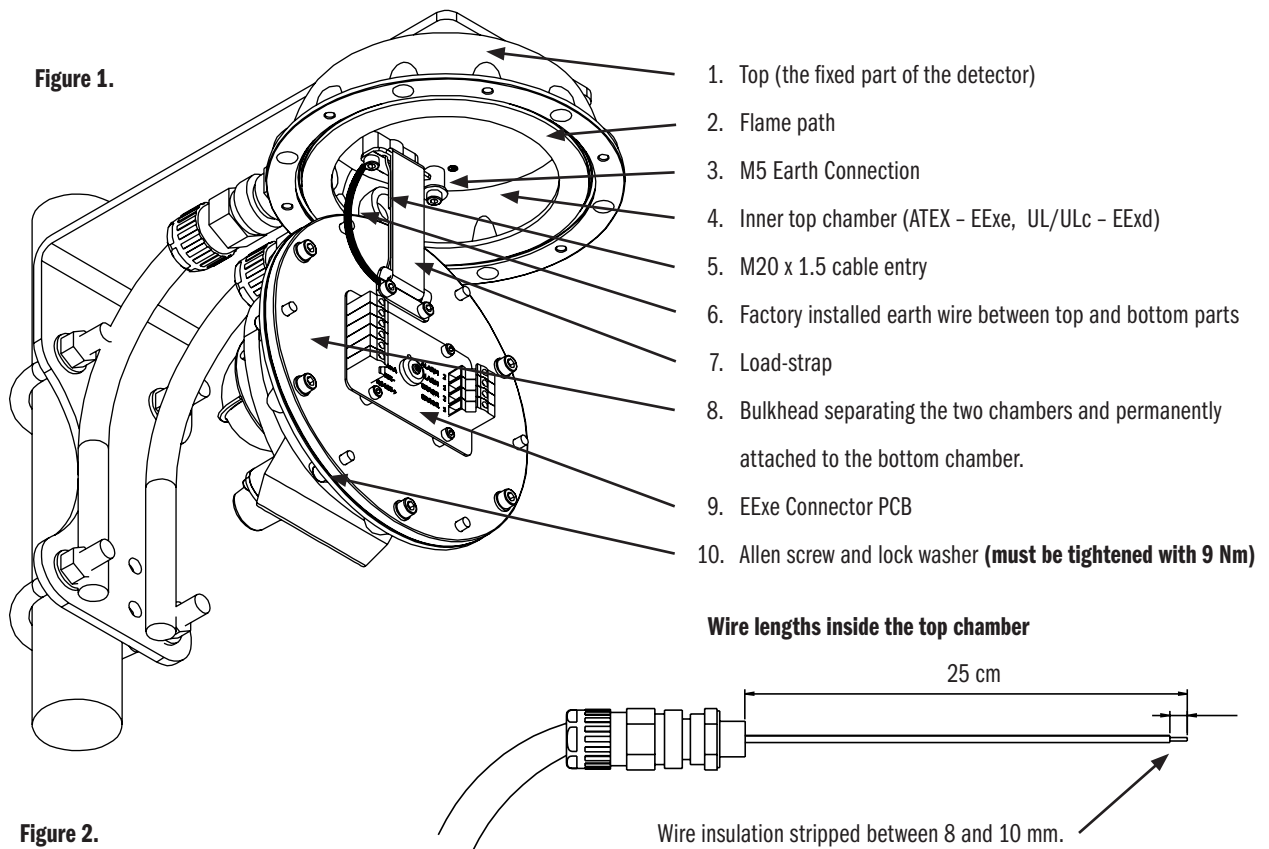
- Error relay (NC)

\* **Sink** - The detector receives a current loop. **Source** - The detector sends out a current loop.

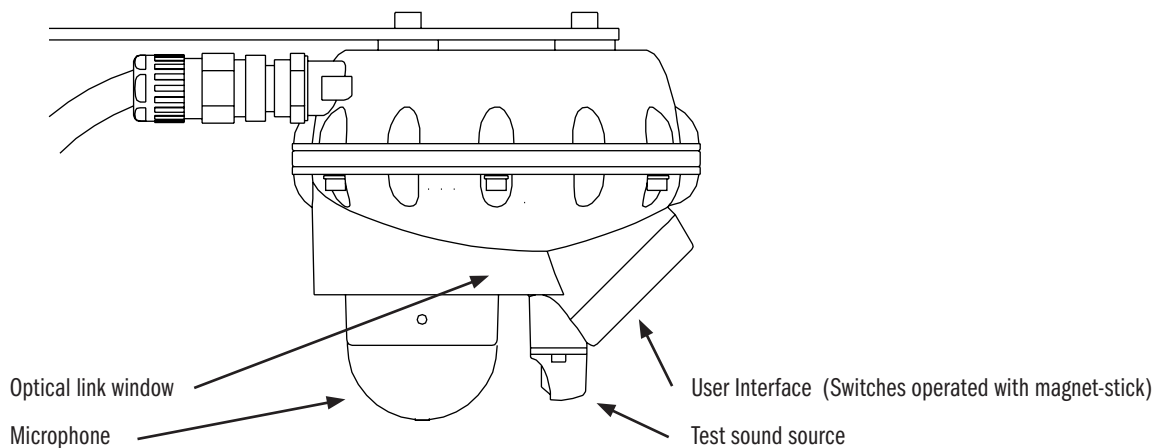
## 4. INSTALLATION

### 4.1. Mechanical construction

The Gassonic Observer consists of two chambers. In the ATEX certification the top chamber is an increased safety enclosure (EExe) and the bottom chamber is a flameproof enclosure (EExd). In the UL/ULc certification the top chamber as well as the bottom chamber are flameproof enclosures. The cables are connected through M20 x 1.5 cable entries in the top chamber using approved EExe glands or approved conduit with seal installed within 18" of the detector. The inner cores of the cable penetrating the detector should be at least 25 cm long. This will ensure no tension on the wires and connector PCB when the top chamber is opened. The two mounting bolts are on the top chamber of the detector and this means that the cables will enter on the fixed part of the detector. The bottom part is attached to the top by means of six allen screws with lock washers. Unscrewing these screws will expose the connector PCB in the top chamber. These screws will be fixed by retaining washers to the bottom part. The bottom part of the detector is supported by the Load-strap, which is connected to the top.



**Figure 2.**



## 4.2. MECHANICAL OPERATION AND SAFETY

When closing the top chamber ensure that the Load-strap and wires are not caught between the bulkhead and the top part of the detector. Check the status of the O-ring and the flame path (if top chamber is used as EExd). Replace O-ring if damaged. Send unit to Gassonic for repair if the EExd flame path is damaged.

The six allen screws with lock washers must be tightened to 9 Nm using a torque-wrench.

### WARNING:

**The inner six screws should not be unscrewed and the bottom EExd chamber should not be opened.**

The warranty will be void if the bottom chamber is opened.

## 4.3. MOUNTING

Two M8 stainless steel bolts (not supplied), 88mm apart, attached to the top of the detector are used to fix the Gassonic Observer in its operating position. These bolts may penetrate the detector top by a maximum of 14 mm. The detector can be mounted to a freestanding pole or wall, using the Gassonic mounting bracket UA1352. This bracket is an optional accessory and is supplied with two M8 mounting U-bolts which can fit around a pole with a maximum dimension of 63 mm. It is possible to mount the detector directly onto non-vibrating structural beams or cable-trays.

The microphone should face downwards and if tilting of the detector is necessary, the angle of incline should not exceed 45°. Avoid when mounting the detector within a half metre from a solid structure for example a wall or a big vessel, to point the acoustic test sound source into the direction of this structure. The sound source should as far as possible be pointing into free space.

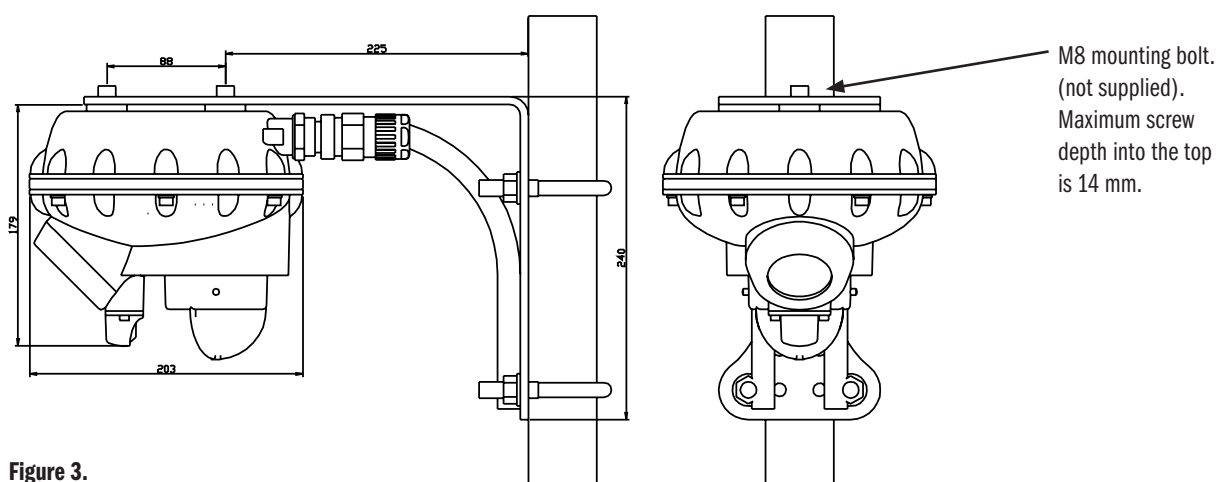


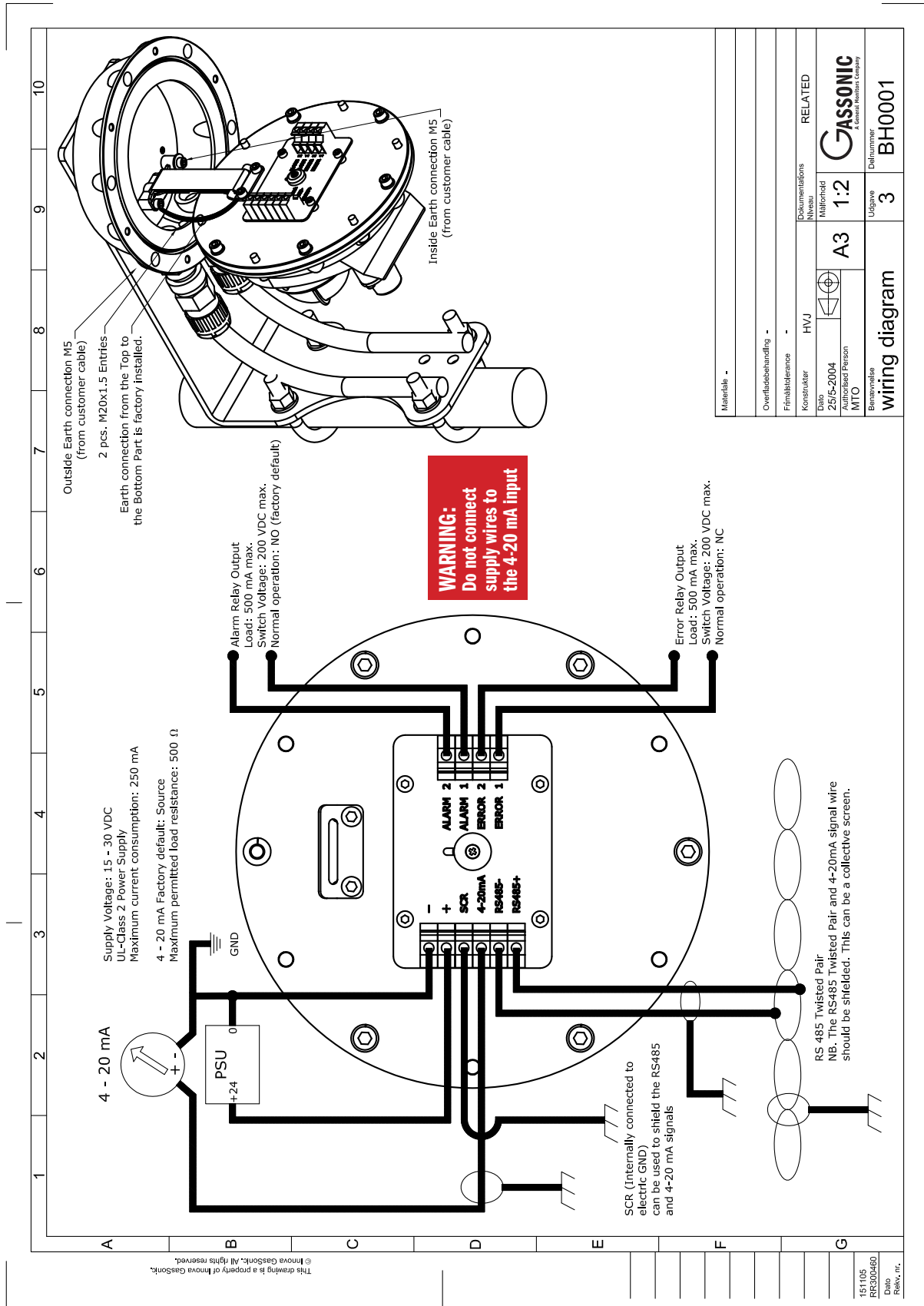
Figure 3.

## 4.4. REPLACEMENT PARTS

Description	Gassonic Part Number
Allen screw	YQ9850
Lock washer	Y00684
O-ring	YJ0908
Microphone	MM4190
Sound source assembly	UD0131
Magnet-stick	UC5352
Torque-wrench	EZ1000
Mounting Bracket	UA1352A



## 4.5. WIRING DIAGRAM



## 5. OPERATION AND SETUP

### 5.1. Normal operation

On power up of the Gassonic Observer the unit will perform an initialization of the micro-controller, internal tests and then goes into normal operation mode within a few seconds.

- The real-time ultrasonic sound level will be shown on the display.
- The corresponding 4-20 mA value will be set on the analogue output.
- The Alarm relay is Normally open (de-energized) but this can be changed by the operator to Normally closed (energized).
- The error relay is Normally closed (energized).
- The RS485 digital interface is ready to receive command.
- The acoustic Self-test is done at regular intervals.

### 5.2. Senssonic™ acoustic self-test

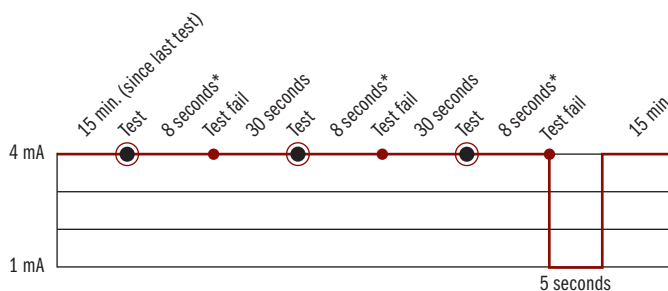
An acoustic self-test (named Senssonic™) is done every 15 minutes and takes approximately 8 seconds. A test signal with a frequency sweep at a constant amplitude is transmitted by the ultrasonic sound source to the microphone. The detector analyses the result of the sweep and stores the highest dB value. This value is compared to a factory reference value and the result must be within a predefined tolerance. If the test signal is out of the predefined tolerance, the Observer will do a new acoustic self-test 30 seconds after the first failed test. If this test signal is still out of tolerance a new acoustic self-test is done again 30 seconds later. If the third test signal is still out of tolerance, the Gassonic Observer will go into acoustic error mode. In acoustic error mode the code "ERAC" will be displayed, the Error Relay will be de-energized and the user can acquire the relay status via the RS485 digital interface. Furthermore, the 4-20 mA output will indicate 1 mA for 5 seconds and return to normal ultrasonic background noise level until the next acoustic test failure. This sequence will repeat until the acoustic fault is repaired.

#### Acoustic self-test sequence

There could be a number of causes for this error:

- There is an obstacle blocking the sound path.
- The sound source is faulty and needs replacement.
- The microphone is faulty and needs replacement.

If none of the above is true, the unit can be tested by means of a "Gain Test" with a Gassonic 1701 Portable Test and Calibration Unit, before sending the unit back to Gassonic for service. When the detector is performing the Acoustic Self-test the last dB level is displayed on the user interface and sent to the 4-20 mA output. During this time a green LED will be illuminated and can be seen through the optical link window.



### 5.3. Output Methods

The Gassonic Observer has three major output methods:

- Alarm Relay output.
- Standard source 4-20 mA analogue output.
- RS485 digital communication (Half duplex).

In addition to this the detector has an Error Relay. The users need to determine the output method suited for their use.

#### 5.3.1. Alarm relay output

When using this method, an internal trigger level and delay time must be set. The trigger level should be at least 6 dB higher than the background noise. The trigger level can be set in steps of 5 dB from 59 dB to 99 dB and the factory setting is 79 dB. An alarm delay time is implemented to eliminate spurious alarms due to short background noise peaks. This delay time can be set internally from 0 to 600 seconds through the user interface or via the RS485 digital interface. The factory setting is set to 01 (10 seconds). The delay can alternatively be set in the "Fire and Gas Panel".

When a gas leak occurs in the detector's coverage area, the trigger level will be reached, the LED in optical link window will be illuminated and the alarm relay timer will be started. When the delay times out, the unit will go into alarm mode, which will result in the following:

- The dB value preceded by an "A" will flash on the display.
- The alarm relay will energize (if in factory default) and the contact will close.

For setting of trigger level and delay time see section 5.4.2. and 5.4.3

### 5.3.2. 4-20 mA output

The 4-20 mA output is factory set to be Source<sup>1</sup>, but this can be specially ordered to be Sink<sup>2</sup>. At normal operation the output will be between 4 and 20 mA. When using this output method, a trigger level at least 6 dB higher than the background noise and an alarm delay time > 10 seconds should be set in the fire & gas system.

#### dB and mA comparison for trigger levels:

dB	mA Output
≤ 58	4.0
59*	4.3
64*	6.1
69*	7.8
74*	9.6
79*	11.3
84*	13.0
89*	14.8
94*	16.5
99*	18.3
≥ 104	20.0

The output value in mA corresponding to the sound pressure in dB can be calculated by the following formula:

$$\{[(n - 58) * 16] / 46\} + 4 = x$$

The transposed formula:

$$\{[(x - 4) * 46] / 16\} + 58 = n$$

n: Sound Level in dB

x: Output value in mA

Error readouts can be monitored using the 4-20 mA output. See section 5.3.3.

#### \* Relay trigger levels

<sup>1</sup> **Source** - The detector sends out a current loop.

<sup>2</sup> **Sink** - The detector receives a current loop.

### 5.3.3. Error output

Error/fault conditions are indicated in three ways:

- On the User Interface display.
- Through the 4-20 mA analogue output.
- By means of the Error relay.

Error	Display	4-20 mA output	Error Relay
Low Supply Voltage	ERV-	0 mA	De-energized
Acoustical Error	ERAC	1 mA *	De-energized
Unit Inhibit (communicating with the detector through the User Interface)	(See section 5.4)	3 mA *	Energized

#### \* Tolerance: ± 0.4

The unit will have an Inhibit output when the local operator is changing settings on the detector.

1 mA for 5 seconds and then showing the measured ultrasonic background noise level until the next acoustic self-test, where the same sequence will be repeated, if the test signal is too low.

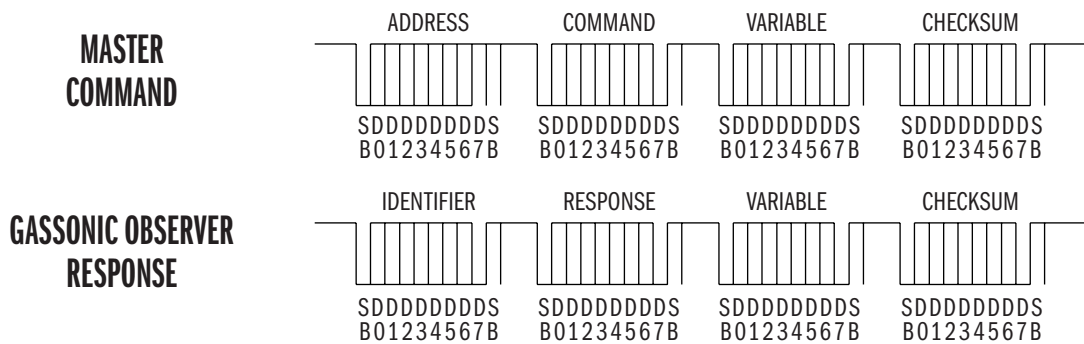
When a forced acoustic test is in progress via the RS485 digital communication "COM" will be displayed on the User Interface.

### 5.3.4. RS485 Digital Communication

Via the "half duplex" RS485 interface the user can look up and change various settings of the Gassonic Observer. Up to 32 Gassonic Observer units can be connected into a RS485 multidrop interface. The transmission line should be terminated at both ends (at master computer and before last unit) of the line with a 120 Ohm resistor.

The Gassonic Observers can not initiate a communication, but can only respond to a command from the master computer. The Gassonic Observers operate in polled slave mode. When the master computer broadcasts an address, a command, a variable and checksum, the Gassonic Observer with that address will respond. The Gassonic Observer will respond with its identification (address), a response, a variable and a checksum. The use of a checksum ensures that if data corruption occurs during transition, the information is disregarded and the information is transmitted again.

The units should be connected by means of a "twisted pair" cable to reduce the effect of interference. A low Baud rate of 2400 Baud is used for the RS485 communication.



To allow the Gassonic Observer to distinguish between the address field and other fields, D7 is always set in the address field and always cleared in other fields.

$$\text{Computer Checksum} = (\text{ADD}_{D0-D6}) + (\text{CMD}_{D0-D6}) + (\text{VAR}_{D0-D6})$$

$$\text{Gassonic Observer Checksum} = (\text{ID}_{D0-D6}) + (\text{RES}_{D0-D6}) + (\text{VAR}_{D0-D6})$$

A detailed description of the protocol can be found in section 7.

## 5.4. USER INTERFACE SETTINGS

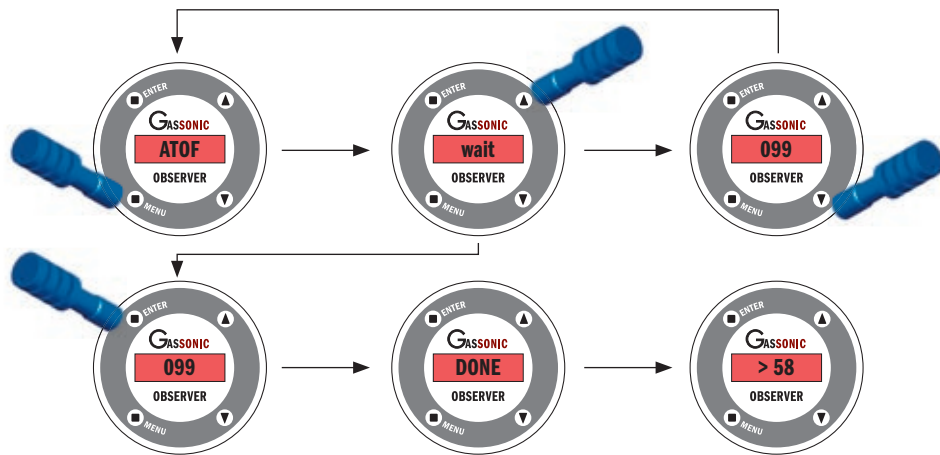
The User Interface consists of a four-digit LED display window and four magnetic switches to enable a local operator to confirm or change settings without opening the unit. When the user interface is used the unit will move out of normal operating mode.

### 5.4.1. Forced Acoustic Test

This will enable the local operator to test the acoustic properties of the unit.

Activate the MENU switch with the magnet-stick. The code "ATOF" (Acoustic Test Off) will be displayed. Activating the UP switch (▲) will display the "wait" command followed by the sound level detected by the microphone emitted from the sound source. If this value is **flashing**, the unit is failing the acoustic test. There could be a number of causes for this error, see section 5.2. for more information. The DOWN switch (▼) will stop the acoustic test and display "ATOF". Activating the ENTER switch at any time during this operation will display "DONE" and take the unit back to Normal Operation.

If no switch is activated for 60 seconds the detector will return to normal operation.



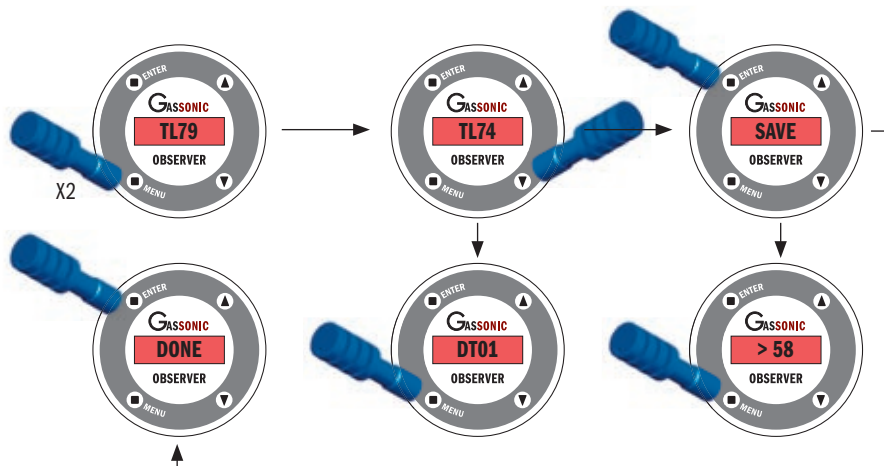
### 5.4.2. Setting/Checking Trigger Level

The trigger level can be set from 59 to 99 dB in steps of 5 dB. The ALARM RELAY will activate at this trigger level changing from open contact to closed (factory default).

Activate the MENU switch **twice** with the magnet-stick. The current trigger level will be displayed (factory setting = 79 dB). Activating the UP switch (▲) will increment the trigger level by 5 dB. Activating the DOWN switch (▼) will decrement the Trigger Level in 5 dB increments. Activating the ENTER switch without changes made, switches the unit back to Normal Operation. Activating the ENTER switch with changes made, will **flash** "SAVE" on the display. Confirm the save action by activating the ENTER switch once more. Activating the MENU switch while "SAVE" is flashing, will discard the save and switch the unit back to Normal Operation. If ENTER was activated the unit will display "DONE" to confirm that the changes have been saved and return to Normal Operation.

**NB.** The operator can change the trigger level and if desired move to the next item (delay time) in the menu structure by activating the MENU switch straight after the change. The change will be saved at a later stage by activating the ENTER switch at any point in the menu structure.

If no switch is activated for 60 seconds the detector will return to normal operation without saving the changed settings.



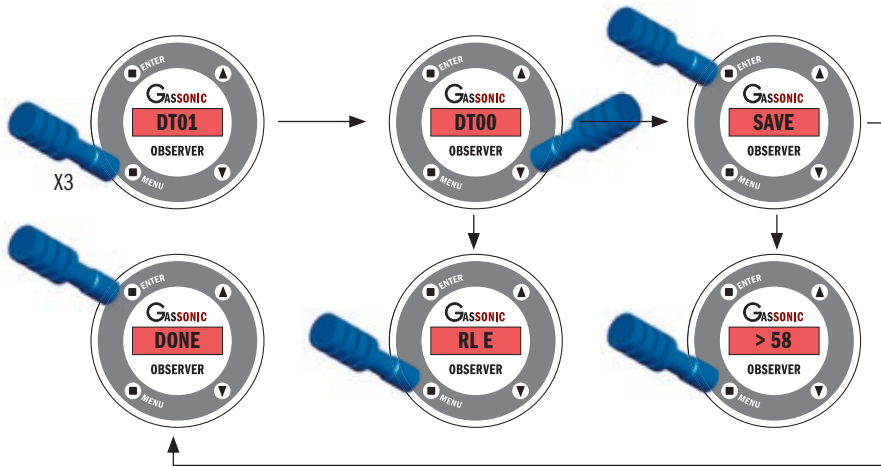
### 5.4.3. Setting/Checking Delay Time

The delay time is linked to the ALARM RELAY. The delay time can be set from 0 to 600 seconds. If the relay output is being used for executive action, it is of utmost importance that the delay time is of a sufficient length to eliminate spurious alarms.

Activate the MENU switch **three times** with the magnet-stick. The current delay time will be displayed (factory setting = 01 = 10 sec.). Activating the UP switch (▲) will increment the delay time by 10 sec. Activating the DOWN switch (▼) will decrement the delay time by 10 sec. Activating the ENTER switch without changes made, switches the unit back to Normal Operation. Activating the ENTER switch with changes made, will **flash** "SAVE" on the display. Confirm the save action by activating the ENTER switch once more. Activating the MENU switch while "SAVE" is flashing, will discard the save and switch the unit back to Normal Operation. If ENTER was activated the unit will display "DONE" to confirm that the changes have been saved and return to Normal Operation.

The operator can change the delay time and if desired move to the next item (alarm relay energized/de-energized) in the menu structure by activating the MENU switch straight after the change. The change will be saved at a later stage by activating the ENTER switch at any point in the menu structure.

If no switch is activated for 60 seconds the detector will return to normal operation without saving the changed settings.



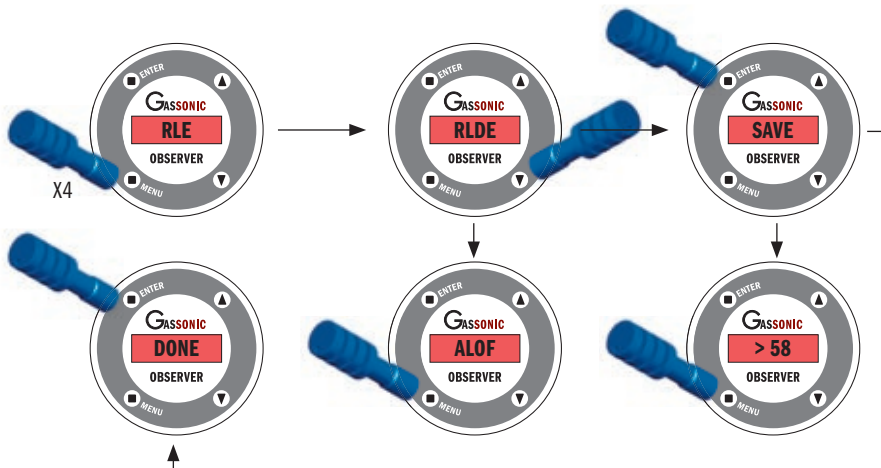
### 5.4.4. Setting/Checking Alarm Relay Energized/De-energized

The Alarm Relay is normally de-energized at power up of the unit. The output is an open contact. The output can be changed to closed contact at alarm by energizing the Alarm Relay.

Activate the MENU switch **four times** with the magnet-stick. The current Alarm Relay status will be displayed (factory setting = RL E = energized). Activating the UP switch (▲) will switch the Alarm Relay status to de-energized. Activating the DOWN switch (▼) will switch the Alarm Relay status back to energized. Activating the ENTER switch without changes made, switches the unit back to Normal Operation. Activating the ENTER switch with changes made, will **flash** "SAVE" on the display. Confirm the save action by activating the ENTER switch once more. Activating the MENU switch while "SAVE" is flashing will discard the save and switch the unit back to Normal Operation. If ENTER was activated the unit will display "DONE" to confirm that the changes have been saved and return to Normal Operation.

The operator can change the relay energizing settings and if desired move to the next item (alarm latching ON/OFF ) in the menu structure by activating the MENU switch straight after the change. The change will be saved at a later stage by activating the ENTER switch at any point in the menu structure.

If no switch is activated for 60 seconds the detector will return to normal operation without saving the changed settings.



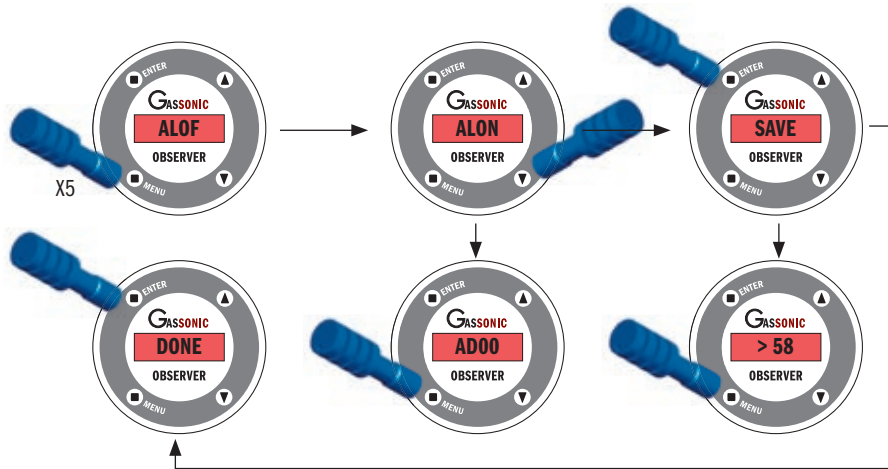
### 5.4.5. Setting/Checking Alarm latching ON/OFF

The alarm latching feature gives the local operator the opportunity to latch the alarm relay output in alarm even if the sound level drops below the trigger level. The alarm latching is factory set to OFF.

Activate the MENU switch **five times** with the magnet-stick. The current Alarm Latching status will be displayed (factory setting = ALOF = OFF). Activating the DOWN switch (▼) will switch the Alarm Latching status to ON. Activating the UP switch (▲) will switch the Alarm Latching status back to OFF. Activating the ENTER switch without changes made, switches the unit back to Normal Operation. Activating the ENTER switch with changes made, will flash “SAVE” on the display. Confirm the save action by activating the ENTER switch once more. Activating the MENU switch while “SAVE” is flashing will discard the save and switch the unit back to Normal Operation. If ENTER was activated the unit will display “DONE” to confirm that the changes have been saved and return to Normal Operation.

The operator can change the latching settings and if desired move to the next item (RS485 Address) in the menu structure by activating the MENU switch straight after the change. The change will be saved at a later stage by activating the ENTER switch at any point in the menu structure.

If no switch is activated for 60 seconds the detector will return to normal operation without saving the changed settings.



### 5.4.6. Setting/Checking RS485 Address

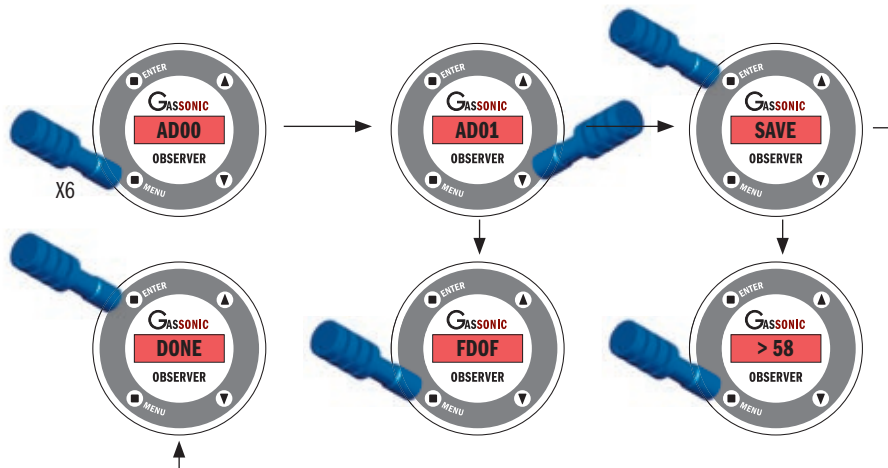
The RS485 Address is a two-digit number from 00 to 99. This can only be changed locally.

Activate the MENU switch **six times** with the magnet-stick. The current RS485 Address will be displayed (factory setting = 00). Activating the UP switch (▲) will increment the RS485 Address. Activating the DOWN switch (▼) will decrement the RS485 Address. Activating the ENTER switch without changes made, switches the unit back to Normal Operation. Activating the ENTER switch with changes made, will flash “SAVE” on the display. Confirm the save action by activating the ENTER switch once more. Activating the MENU switch while “SAVE” is flashing will discard the save and switch the unit back to Normal Operation. If ENTER was activated the unit will display “DONE” to confirm that the changes have been saved and return to Normal Operation.

The operator can change RS485 address settings time and if desired move to the next item (Factory Default ON/OFF) in the menu structure by activating the MENU switch straight after the change. The change will be saved at a later stage by activating the ENTER switch at any point in the menu structure.

More information about the RS485 protocol is available in section 7.

If no switch is activated for 60 seconds the detector will return to normal operation without saving the changed settings.



### 5.4.7. Setting/Checking Factory Default ON/OFF

The Factory Default command gives the local operator the opportunity to return all settings to factory default.

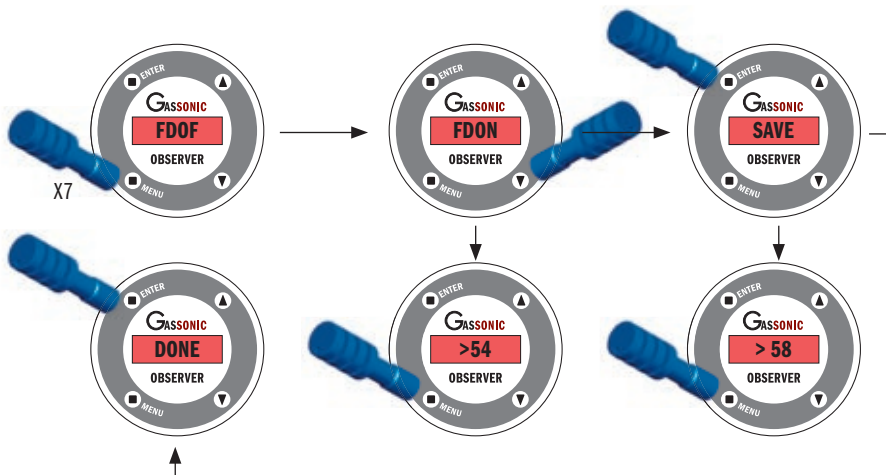
Activate the MENU switch **seven times** with the magnet-stick. Factory Default OFF (FDOF) will be displayed. Activating the DOWN switch (▼) will switch the Factory Default ON. Activating the UP switch (▲) will switch the Factory Default OFF. Activating the ENTER switch **without** changing the status to ON, switches the unit back to Normal Operation. Activating the ENTER switch having changed the status to ON, will **flash** "SAVE" on the display. Confirm the save action by activating the ENTER switch once more. Activating the MENU switch while "SAVE" is flashing will discard the save and switch the unit back to Normal Operation. If ENTER was activated the unit will display "DONE" to confirm that all settings have been returned to the Factory Default and return to Normal Operation.

Activating the MENU switch an eighth time will switch the unit to Normal Operation, if any changes were made in previous menu items (not in factory Default ON/OFF) the unit will flash "SAVE" on the display. Confirm the save by activating the ENTER switch or discard the save by activating the MENU switch once more.

If no switch is activated for 60 seconds the detector will return to normal operation without saving the changed settings.

The Factory default settings are:

- Trigger level 79
- Delay time 01
- Alarm relay de-energized
- Alarm latching off
- RS485 address to 00





## 6. GAIN TEST AND CALIBRATION

Calibration of the Gassonic Observer is only needed when the unit is more than  $\pm 3$  dB out of tolerance. This can be verified by doing an Observer Gain Test on the unit. The Observer Gain Test is one of the test sequences of the Gassonic 1701. Calibration is done with a calibrated Gassonic 1701.

### 6.1. Gain Test

Set the Gassonic 1701 into Observer Gain Test (See Gassonic 1701 User Manual for details).

Turn the Gassonic 1701 onto the Gassonic Observer and activate the Gain Test by pressing ENTER or TEST button.

The Gassonic 1701 will output a constant sound pressure level of 99dB for 8 seconds and then to 0dB for 3 seconds. Thereafter, the sound pressure level will return to 99dB and the sequence will be repeated until a new sound pressure level is selected or the test stopped.

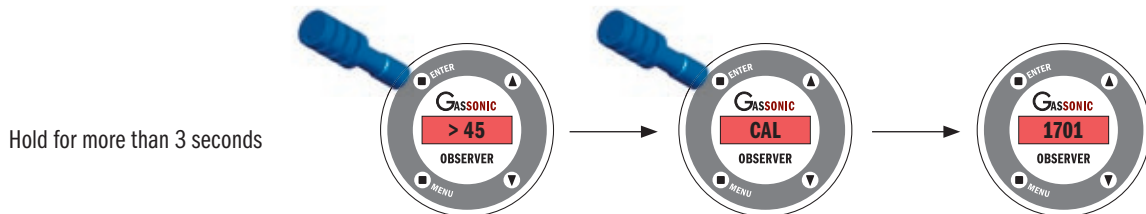
To select a new sound pressure level the DOWN button should be pressed. There are four levels; 99dB, 89dB, 79dB and 64dB.

**The dB readout on the display of the Gassonic 1701 can now be compared with that of the Observer.**

### 6.2. Calibration

Set the Gassonic 1701 into Observer Gain Test (See Gassonic 1701 User Manual for details).

Set the Gassonic Observer into Calibration mode by holding the magnet stick on the ENTER switch for more than 3 seconds. The Observer will display a flashing "CAL". Verify the need for calibration by activating the ENTER switch one more time. The Observer will now display a flashing "1701". This indicates that the Gassonic Observer is ready for calibration and is awaiting communication from a Gassonic 1701 unit.



Turn the Gassonic 1701 onto the Gassonic Observer and activate the calibration by pressing ENTER or TEST button.

The calibration sequence is automatic. If communication between the Gassonic Observer and the Gassonic 1701 is broken "EER" will be displayed and the unit will return to normal operation.

If the calibration sequence was completed successfully and adjustments were made "ADJ" will be displayed for 2 seconds and the unit will return to normal operation.

If the calibration sequence was completed successfully and adjustments were not necessary "OK" will be displayed for 2 seconds and the unit will return to normal operation.

## 7. RS485 DIGITAL INTERFACE

### 7.1. Customer Commands

The Gassonic Observer will always start up in Customer Command mode. The Customer Commands are public domain and written in the Gassonic Observer manual, so that the end user is able to write PLC or PC codes which can communicate with the Gassonic Observer.

CUSTOMER COMMANDS				
WRITE TO SETUP REGISTERS				
DESCRIPTION	CMD	VAR	RES	VAR
Set Trigger Level (dB)	01	54 - 99 (< 54 → 54) (> 99 → 99)	00	ACK
Set Alarm delay (in steps of 10 sec.)	02	0 - 60 = 0 - 600 sec. (> 60 → 60)	00	ACK
Relay function (NO/NC)	03	0 = NO, 1 = NC (> 1 → NO)	00	ACK
Alarm Latching (OFF/ON)	04	0 = OFF, 1 = ON	00	ACK
READ FROM SETUP REGISTERS				
DESCRIPTION	CMD	VAR	RES	VAR
Get Trigger Level (dB)	11	xx	11	54-99
Get Alarm delay (in steps of 10 sec.)	12	xx	12	0 - 60 = 0 - 600 sec.
Get Relay function (NO/NC)	13	xx	13	0 = NO, 1 = NC
Get Alarm Latching (OFF/ON)	14	xx	14	0 = OFF, 1 = ON
Get Sound level (dB)	20	xx	20	50-99
Get Alarm status	21	xx	21	Bit 0 : Low supply Bit 1 : Acoustical Bit 2 : Electrical Bit 3 : Inhibit
Get Box Temperature	28	xx	28	0 - 121 (-40°C to +80°C)
Read 24V supply	29	xx	29	13 - 28 (13V - 28V)
SPECIAL FUNCTION COMMANDS				
DESCRIPTION	CMD	VAR	RES	VAR
Set To Factory Default	30	xx	00	ACK
Reset Alarm	31	xx	00	ACK
Forced Acoustic Test (OFF/ON)	32	0 = OFF, 1 = ON (> 1 → ON)	00	ACK

xx: Any value.

→: Invalid input value is changed to a valid value.

CMD: All commands in HEX

ACK: 06 HEX

## 7.2. DETAILED “CUSTOMER COMMAND” DESCRIPTION

### Set Trigger Level:

Sound level before activating alarm relay.

n: 59 - 99 [dB]

Automatic range adjustment:

< 58 = 59

> 99 = 99

	ADR	CMD	VAR	SUM
MASTER	ADR	01	n	SUM
OBSERVER	ID	00	06	SUM

### Get Trigger Level :

	ADR	CMD	VAR	SUM
MASTER	ADR	11	x	SUM
OBSERVER	ID	11	n	SUM

### Set Alarm Delay:

Delay from detected alarm sound level before activating alarm relay.

n: 0 - 60 [10 sec] = 0 - 600 sec.

Automatic range adjustment :

> 60 = 60

	ADR	CMD	VAR	SUM
MASTER	ADR	02	n	SUM
OBSERVER	ID	00	06	SUM

### Get Alarm Delay:

	ADR	CMD	VAR	SUM
MASTER	ADR	12	x	SUM
OBSERVER	ID	12	n	SUM

### Set Relay Function:

Set the relay default in normally closed (NC) or normally open (NO) position.

n: 1 = NC (normally closed (default)), 0 = NO (normally open)

Automatic range adjustment:

> 1 = NO (normally open)

	ADR	CMD	VAR	SUM
MASTER	ADR	03	n	SUM
OBSERVER	ID	00	06	SUM

**Get Relay Function:**

	ADR	CMD	VAR	SUM
MASTER	ADR	13	x	SUM
OBSERVER	ID	13	n	SUM

**Set Alarm Latching Function:**

Function to hold alarm, instead of resetting alarm when sound level falls below trigger level. The alarm can be reset on the front panel by activating the SET switch, or by sending "Reset Alarm" command on RS485.

n: 0 = OFF, 1 = ON

Automatic range adjustment:

> 1 = ON

	ADR	CMD	VAR	SUM
MASTER	ADR	04	n	SUM
OBSERVER	ID	00	06	SUM

**Get Alarm Latching Function:**

	ADR	CMD	VAR	SUM
MASTER	ADR	14	x	SUM
OBSERVER	ID	14	n	SUM

**Get Sound Level:**

Read current sound level in [dB].

n: 51 - 99 [dB]

Note: This function does not affect analog output or alarm relay output.

	ADR	CMD	VAR	SUM
MASTER	ADR	20	x	SUM
OBSERVER	ID	20	n	SUM

**Get Alarm Status:**

Read current sound level in [dB].

n: Binary coded alarm status

- Bit 0: Low supply error
- Bit 1: Acoustical error
- Bit 2: Electrical error
- Bit 3: Inhibit

Note: This function does not affect analog output or alarm relay output.

	ADR	CMD	VAR	SUM
MASTER	ADR	21	x	SUM
OBSERVER	ID	21	n	SUM

**Get Box Temperature:**

Read box temperature relative in [°C].

n: 0 - 121 [°C]

0 = -40°C, 120 = +80°C, 121 => +80°C

Note : This function does not affect analog output or alarm relay output.

	ADR	CMD	VAR	SUM
MASTER	ADR	28	x	SUM
OBSERVER	ID	28	n	SUM

**Get +24V supply:**

Read Gassonic Observer power supply voltage in [V].

n: 13 - 28 [V]

Note : This function does not affect analog output or alarm relay output.

	ADR	CMD	VAR	SUM
MASTER	ADR	32	x	SUM
OBSERVER	ID	32	n	SUM

**Set to Factory Default:**

Copy default values from "Service and Productions" registers to user data registers.

	ADR	CMD	VAR	SUM
MASTER	ADR	30	x	SUM
OBSERVER	ID	00	06	SUM

**Reset Alarm:**

Reset alarm output that is hold by the "Alarm Latching" function.

Note: This function sets relays and analog output back to normal state.

	ADR	CMD	VAR	SUM
MASTER	ADR	31	x	SUM
OBSERVER	ID	00	06	SUM

**Forced Acoustic Test:**

Start one transducer frequency sweep. Return max sound level in dB when sweep is finished.

n: <58-104 [dB]

Note: Set analog output to "inhibit" and disable gas alarm relay output.

	ADR	CMD	VAR	SUM
MASTER	ADR	32	x	SUM
OBSERVER	ID	32	n	SUM

# GASSONIC OBSERVER

## ULTRASONIC GAS LEAK DETECTOR

From serial number: 1011-014

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