



GROVELEY DETECTION

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GDU-01-TT

Ultrasonic Test Transmitter

INSTALLATION AND MAINTENANCE MANUAL



RELEASE NOTES

Rev.	Date	Revision History	Prepared	Approved
1.0	April 07	Initial Release	DR	DR

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2. Introduction

The GDU-01-TT has been designed to electrically replicate the airborne ultrasound generated from a pressurised gas leak using a piezoelectric disc and can be used to activate alarm conditions with any Ultrasonic Gas Leak Detector.

Airborne ultrasound is generated when gas moves from a high-pressure area to a low-pressure area. This is because it expands very rapidly causing turbulent flow and creating a sound wave. The sound wave ranges from audible frequencies into ultrasonic frequencies the level of which depend on three main factors:

- Pressure drop across leak
- Size of leak (area)
- Specific gas properties (molecular weight and specific gas ratio)

The GDU-01-TT construction is from 316 stainless steel mounting hardware and a semi-crystalline Polyphenylenesulphide (PPS) enclosure, IP66 (when Transmitter cap is fitted).

The unit is independently battery operated and is intended to be activated within close proximity of the detector sensing face whilst results are verified from the control room. This method has the added benefit of also confirming site signal wiring whilst verifying detector operation.

The performance is limited due to the nature of electronically produced ultrasound, for full detector coverage it is recommended that the gas release verification test is undertaken at installation. Results can then be calculated to verify GDU-01-TT testing.

3. Safety Guidelines

3.1. Use in hazardous areas

The GDU-01-TT is not hazardous area certified and should only be used in accordance with site specific safety guidelines for non-certified equipment.

3.2. Accessories

The GDU should only be used with Groveley Detection approved accessories and charging equipment.

3.3. Liability

All liability for the correct function of the GDU-01-TT is irrevocably transferred to the owner / operator to the extent that the GDU-01-TT is altered or installed incorrectly by personnel not authorised by Groveley Detection or if the GDU-01-TT is used in a non conformance to its intended use.

4. Operation

The key for correct operation of the GDU-01-TT is in the relationship between the ultrasonic transmitter and ultrasonic detector sensing face.

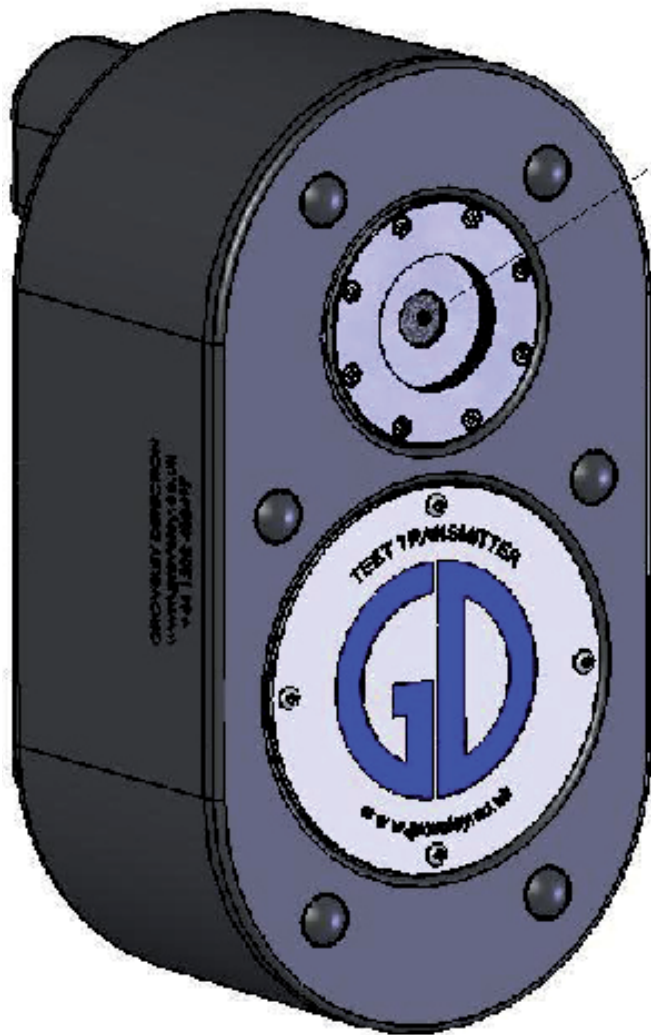
Due to the nature of electronically emitted ultrasonic waves it is very important to have the transmitter aligned parallel ($\pm 2.5^\circ$) to the detector sensing face. Distance is key factor to maintaining repeatable results.

The GDU has no adjustable controls and is set up to produce 106dB at 1M ($\pm 0.5^\circ$) in single operation mode. Other modes are available tailored to suit customers individual requirements.

4.1. User Interface Layout



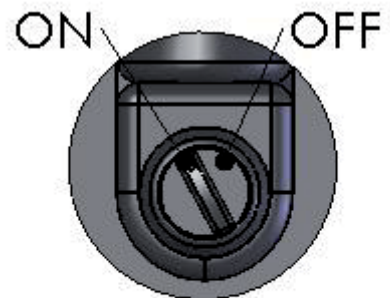
Figure 1



ULTRASONIC
EMITTER

NOTE:
ULTRASONIC EMITTER
SHOULD ALWAYS BE
COVERED USING THE
CAP PROVIDED WHEN
NOT IN USE.

Figure 2



SWITCH SHOWN
IN ON POSITION

Figure 3

4.2. Operational Instructions

Ensure the GDU-01-TT is fully charged before use. Refer to section 4.8 for charging instructions.

Turn the rotary switch to the ON position (figure 3), the ON/OFF indicator should be illuminated whilst the Battery Low Indicator should be off.

If Battery Low Indicator is illuminated it is recommended that the GDU-01-TT is recharged before use.

Remove Transmitter cap and aim the GDU-01-TT at the detector sensing face. To achieve best results please read sections 4.3 to 4.6.

Press and hold the Activation Button for the required time. The Activation Indicator should illuminate to show ultrasound emission. If the Activation Indicator is off at any time for the duration that the button is pressed the results are invalid.

Once testing of detector is complete it is recommended that the transmitter cap is replaced and the GDU-01-TT is turned off, move the rotary switch to the OFF position (figure 3) and ensure the ON/OFF indicator has gone out, this will help to prolong battery life.

4.3. Recommended Alarm Settings

Detector alarm settings should be checked before using the GDU-01-TT for operational verification. Detector alarm settings are usually divided into two categories, low background 74dB or below and high background 74 to 84dB.

The alarm setting of the detector to be tested needs to be determined before using the recommended distance settings as described in section 4.6.

4.4. Time Delayed Alarm Activation

Detector alarm delay should be determined before using the GDU-01-TT for alarm verification. The transmitter should then be activated using the activation button for a time longer than the delay, ensure that the activation indicator is illuminated for the specified time to ensure detector alarm.

It is recommended that the alarm delay is turned off for the duration of the test if possible whilst the results are observed at site control.

4.5. Environment Considerations

The GDU-01-TT is rated to IP66 whilst the cover is fitted. During operation the cover has to be removed and it is then not recommended for use in deluge conditions. The cover should only be removed whilst the transmitter is activated and should be refitted when not in use.

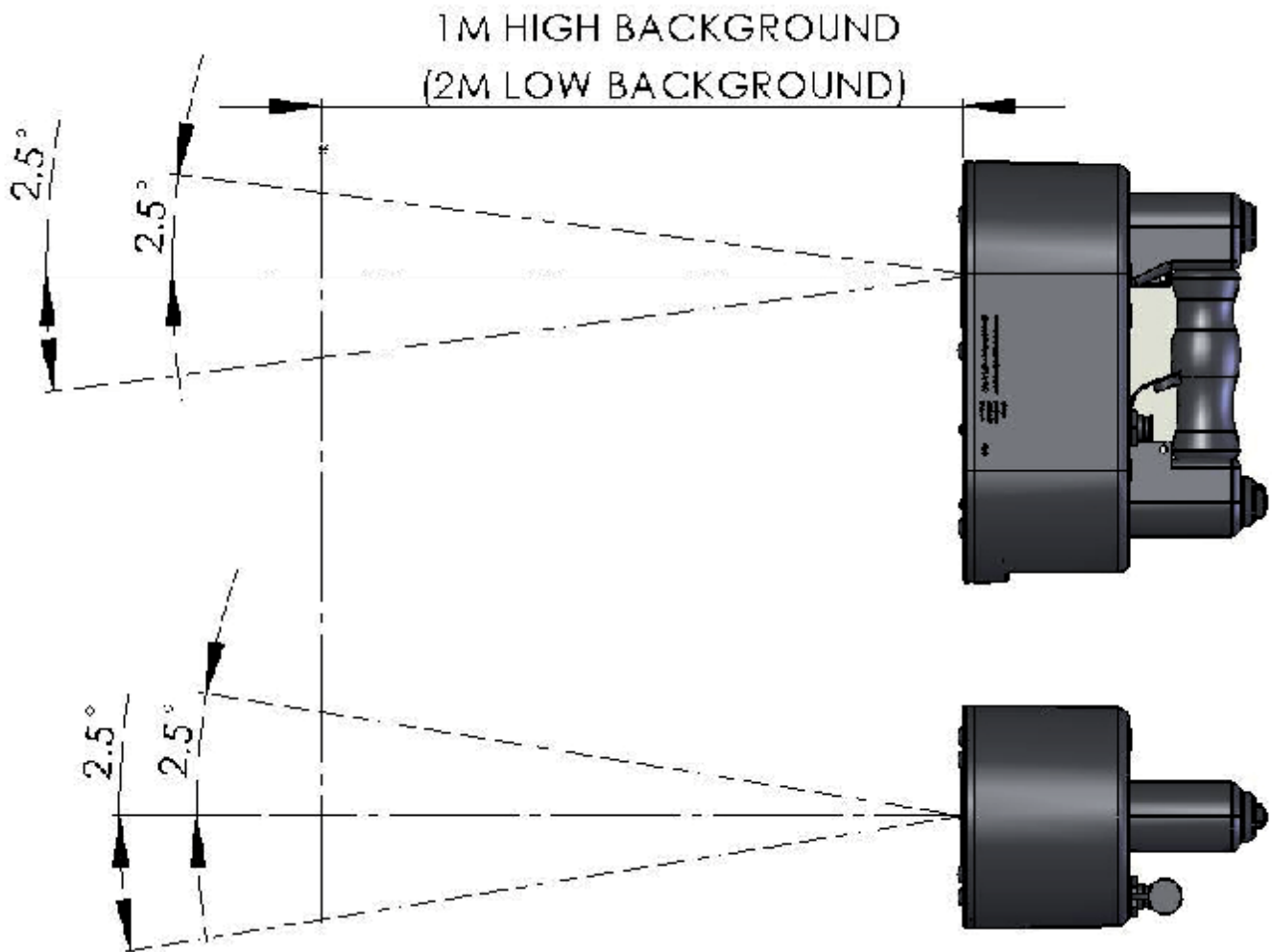


Figure 4

4.6. Range

GDU-01-TT can electronically transmit ultrasonic waves over a long distance but typically has a narrow field of response when used in conjunction with an ultrasonic detector due to the nature of electronically emitted sound.

Figure 4 shows the recommended angular alignment and distance to sensor face for maximum output.

Background noise should be taken into account before using the GDU-01-TT to verify detector operation.

4.7. Use of Accessories

It is recommended that the shoulder strap should be attached to the GDU-01-TT using the fastening clips before use.

4.8. Charging

If the Battery Low Indicator illuminates when the GDU-01-TT is turned on it is recommended to fully charge before use. Plug the charger into the charging socket (orientation tab ensures correct polarity) and charge for 8 hours to ensure full charge cycle. Mains connected indicator will illuminate to show power is connected and battery charge indicator will illuminate to show charge cycle has begun. When battery charge indicator is off the charge cycle is complete.

NOTE: The rotary switch should be in the off position to ensure a full charge cycle is achieved.

5. Fault Finding

The GDU-01-TT has been designed to perform in the harshest of conditions found offshore.

The GDU-01-TT is a sealed unit so in the event of detector failure, i.e. user interface indicators fail to light, charging problems, loss of ultrasound emission please consult Groveley.

6. Technical data

- Power Required: 18 to 27 Vdc rechargeable cells
- Frequency Range(s): 40kHz (± 1 kHz)
- Dimensions : 245mm x 180mm 98.5mm
- Ingress protection: IP66 (with cover)
- Shipping weight: 4kg
- Enclosure material: Semi-crystalline modified Polyphenylenesulphide & AISI 316 Stainless Steel transmitter mounting
- Operating Temperature: -20° C to 75° C (Standard)
-40° C to 75° C (Option)
- Storage Temperature: -40° C to 85° C
- Humidity: 0 to 100% RH

7. Ordering information

The GDU-01-TT is available in a variety of versions with regards to operating Sound Pressure Level Output, please consult Groveley for options.

8. Accessories

- Transmitter Cover
- Shoulder Strap
- Carry Harness
- Battery Pack
- Charger
- Transportation Case

9. Shipping Instructions

This procedure is to inform the customer of the shipping details for delivery of the GDU

The GDU-01-TT will be delivered individually packed in boxes.

The box must be unloaded carefully from the transportation due to the delicate instrumentation inside. Remove the lid and inspect the contents for any damage caused during transportation.

Any visual damage must be reported to the vendor immediately. Secure the box and despatch to the storage location.

10. Storage Instructions

Storage must be in a covered, dry, clean and safe environment.

Storage temperature should be between -40° C to 85° C.

Relative Humidity to be a maximum of 99% non-condensing.

Periodic inspection of the stored box must be carried out to ensure no tampering or deterioration has occurred.

All components to be kept in their original packaging as far as possible until required for installation.

11. Help Us to Help You!

Every effort has been made to ensure the accuracy in the contents of our documents, however, Groveley Detection Limited can assume no responsibility for any errors or omissions in our documents or their consequences.

Groveley Detection Limited would greatly appreciate being informed of any errors or omissions that may be found in our documents. To this end we include a form, below, for you to photocopy, complete and return to us so that we take the appropriate action. Thank you.

Please fax or e-mail your response to:

■ Fax: +44 (0) 1202 486658

■ E-mail: QA@groveley.co.uk

From:	
Tel:	
Fax:	
Email:	
I suggest the following corrections/changes be made to section....	
Mark up copies attached as appropriate	YES / NO
Please inform me of the outcome of this change	YES / NO
Groveley Detection Ltd	
Actioned by _____	Date _____
Response _____	Date _____