ULTRASONIC MEASURING DEVICE FOR GEAR OIL LEVEL

A1207D
LEVEL GAUGE

USER MANUAL

Acoustic Control Systems – ACS Group
Saarbrücken, Germany 2019

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READ FIRST!

Read this manual carefully before using the device to ensure safe and proper use.

CE certification acc. to 2014/30/EU (EMC) is provided; requirements of the Federal Communications Commission (FCC) -relevant for delivery, sales and import to USA- , as well as corresponding IC prescriptions for Canada, are met likewise.

Liquid ingress protection and solid particle protection of the casing is in conformity with level IP64 (standard EN 60529), so the equipment is splash proof in any direction and dust-tight. Follow the instructions below to maintain water resistance and dust protection. Otherwise, the device may be damaged

- Never immerse the equipment into water.
- After contact with clear water, wipe it thoroughly with a clean soft cloth.
- Contact of the device with liquids other than water may adversely affect the performance and appearance of the device.
- Dropping the device and opening it by unqualified personnel may affect the solid particle protection.

Tests with this device type in a controlled environment have shown that the requirements of EN 60529, IP64 are met. Despite this classification, it is possible that the device will be damaged in certain situations.

Safety symbols used in this Manual:

Symbol	Description
⚠WARNING	Indicates a potential threat. Failure to avoid it can result in death or serious injury.
⚠CAUTION	Indicates a potential threat. Failure to avoid it may result in minor injury.
NOTICE	Indicates a potentially harmful situation. If it is not avoided, the device or something in its vicinity may be damaged.

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1.1 SCOPE OF DELIVERY

The following articles must be included in the product box:

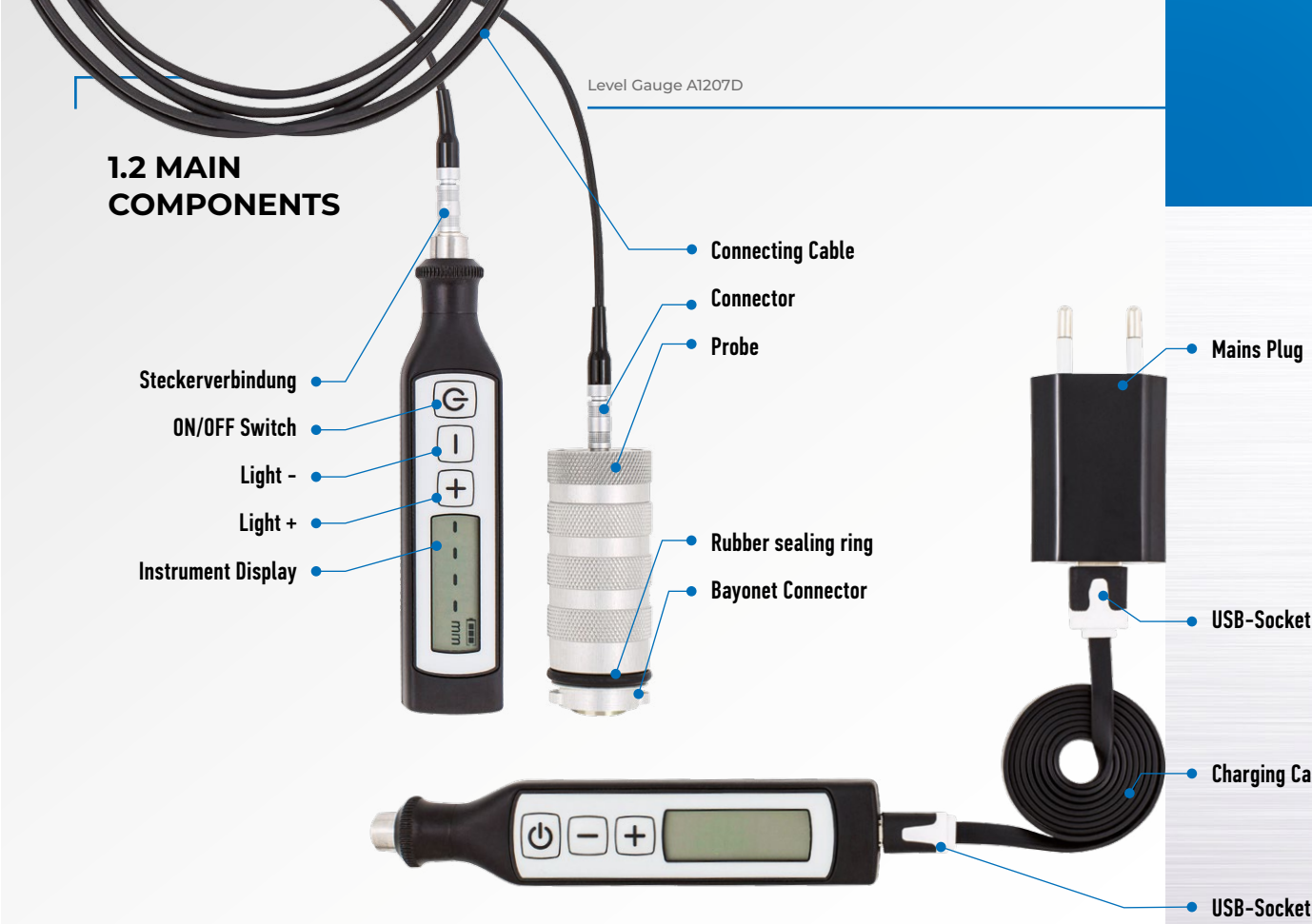
NOTICE The supplied items are for use with this unit only and are not compatible with other equipment. Use only ACS approved accessories. Using unapproved accessories will result in poor performance and malfunctions not covered by the warranty.

The device has a casing seal. Breaking the seal leads to a loss of warranty.

Changes in appearance and technical specifications are subject to change without previous notification.

**Couplant must be ordered separately.*

1.2 MAIN COMPONENTS



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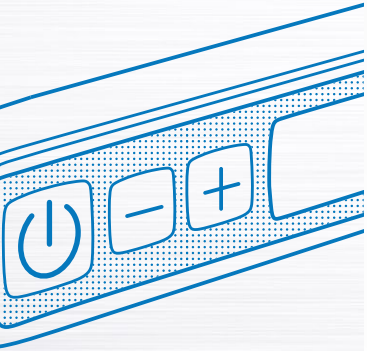


1.3 KEYS

Key	Function
⏻	1) ON/OFF 2) To switch from mm to inch, press once more with device switched ON
−	Illumination decrease
+	Illumination increase

1.4 RECHARGEABLE BATTERY

NOTICE Before first use, the rechargeable battery must completely be charged. If the instrument is not used for an extended period, make sure that the accumulator is completely charged once in two months, to prevent total discharge.

In that case of total discharge, the rechargeable battery may be destroyed and must be replaced

⚠WARNING Use only ACS approved chargers, batteries, and cables. Unauthorized chargers or cables may cause the battery to explode or damage the device.

Incorrect connection of the charger may cause serious damage to the device. Damage caused by improper use is not covered by the warranty.

Charging of the rechargeable battery

1. Connect one end of the USB cable to the USB power supply, and the other end to the multifunction jack.
2. Connect the USB power supply to the mains socket.
3. Separate the charging unit from the device, as soon as the rechargeable battery has completely been charged. This becomes visible by means of the battery symbol.
4. First disconnect the charger from the device and then from the mains socket.

NOTICE Tips and precautions for charging the battery

• Low level of the rechargeable battery is visualized by an “empty battery” symbol.

• In normal mode the device switches OFF as soon as the level drops beyond a certain safety limit. It is recommended not to restart the device before the charging procedure is complete to avoid damage.

• When the battery is discharged, the device will not turn on immediately after it has been connected to the charger. Charge the battery for a few minutes before turning the device back on.

• If the device is not charged through the USB power supply, but for example via a computer, this may result in a reduced charging speed due to a limited electrical power supply

• You cannot use the device while it is being charged.

• A moderate increase of temperature during charging procedure is not critical. In the case of a drastic temperature rise on the other hand, the charging unit must be removed at once.

• The charger does not have an on / off switch. So, you need to disconnect the charger from the power socket when not in use to prevent wasting energy.

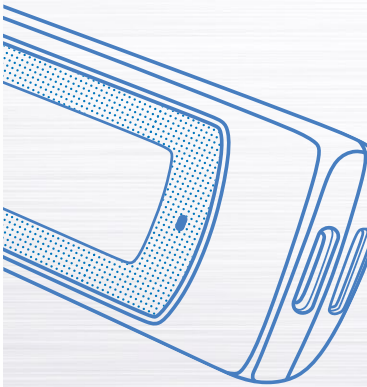
• It is advisable to install the charging unit close to the mains connection and to keep the surroundings free, so that easy access is possible anytime.

Removal of the rechargeable battery

⚠WARNING The rechargeable battery is permanently installed in the device and is not intended to be replaced by the operator. For safety reasons, do not attempt to remove the battery.

Incorrect removal of the battery may result in damage to the battery and the device, personal injury, and / or equipment damage including impairment of safety.

ACS is not liable for any damage or loss (whether contractually or unauthorized, including negligence) caused by not following this warning.



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DEVICE USAGE AND LIMITATIONS

2.1 APPROPRIATE USE

⚠WARNING This section contains safety-relevant information and defines minimum requirements for user groups. Use of the device outside the intended use and by unintended user groups may result in damage.

Intended use

This instrument has been designed for manual measurement of gear oil level in cars. It is used in roofed buildings and only in non-hazardous areas.

User groups

Group	Minimum Age:	Qualification:	Task:
Qualified Operator	18 years	Trained in handling of measurement equipment, trained in work safety for the corresponding area	Measurement of gear oil level in cars
Apprentices/Trainees/ Students:	16 years	Trained in handling of measurement equipment, trained in work safety for the corresponding area	Measurement of gear oil level in cars
Public (e.g. visitors)	No user group. The handling of the measuring device is prohibited for these persons.		
Vulnerable persons (e.g. pregnant women)	No user group. The handling of the measuring device is prohibited for these persons.		

Ambient limits

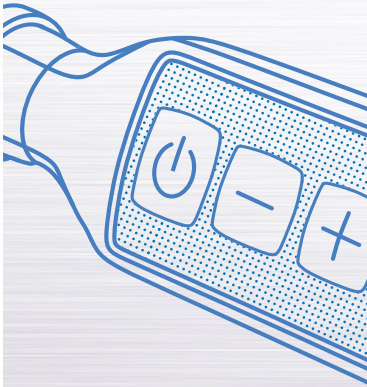
Temperature Range
Storage: From -20 °C to +60 °C,
Operation: From -10°C to +50°C
For measurement at the gearbox: From -10°C to +80 °C
: Relative humidity 85%

Contamination
Despite the provided protection acc. to IP 64 (dust, splash water), use in clean, dry environment is advisable.
After use, the device must be cleaned and stored in the transport box provided for this purpose.

2.2 REASONABLY FORESEEABLE MISUSE

NOTICE The device may only be operated by trained personnel. Nevertheless, misuse is not excluded if care is not taken. For troubleshooting, see „Chapter 8 Troubleshooting“

Problem cause	Consequence
Incorrect use of the calibration block (coupling and determination of temperature compensation)	Incorrect measurement
Inadequate couplant	Incorrect measurement
Excessive quantity of couplant	Incorrect measurement
Insufficient quantity of couplant	No signal 
Skewed / improper insertion of the probe into the guide at the oil pan	Damage of the bayonet connector, incorrect measurement
Damaged probe	No signal 
Damaged probe cable	No signal 
Dropping the instrument	Damage of casing, rechargeable battery, display, electronics. Loss of IP protection.



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SAFETY

⚠WARNING The general safety instructions listed in this section relate to the use of the device in a workshop environment when measuring the gear oil level on cars under controlled conditions

⚠WARNING Without exception, working with the device requires the previous risk assessment of the workplace according to BetrSichV §3, GefStoffV §6 and ArbSchG §5 and applicable and additional national and international requirements by a qualified person or a specialist for occupational safety of the employer.

General safety instructions:

- The equipment should not be handed over to persons not aware of inherent risks, or not knowing the content of this manual.
- Be sure to stand securely when measuring with the device.
- Pay attention to your environment and potential hazards during the measurement.
- Motor components and the underside of the car may be hot, protective clothing may be required and avoid contact with hot surfaces.
- Cars are always subject to contamination by oil or other dangerous liquids. Use suitable protective equipment and pay attention to national and international laws and regulations for cleaning and disposal.
- The operation of internal combustion engines produces toxic gases. Always ensure adequate exhaust ventilation.
- Use only approved and checked lifting equipment.
- When using coupling agents, pay attention to the safety instructions given in the safety data sheet.

NOTICE For this measuring device, calibration is imperative. It should be included in the measuring equipment monitoring of the enterprise.

4.1 PREVENTIVE MAINTENANCE

Frequency	Parts Concerned	Action
Before each use	Device, cable, probe	Check for damage
Before establishing plug connection	Plugs and jacks	Check for dirt and adherent particles
Before functionality check	Calibration block	Check for damage
Before each test	Device plugged together, with calibration block	Perform functional check
After each use	Device, cable, probe	Remove dirt and couplant. Check for damage
Once per year	Device, cable, probe	Inspection and calibration by ACS or authorized dealer

4.2 CONTROL PROCEDURES AND TEST EQUIPMENT

Correct functionality is inspected by means of the calibration block contained in the set.

NOTICE The procedure is detailed in section 7.4.

4.3 DOCUMENTATION OF MAINTENANCE

Annual inspections must be documented by factory service or the authorized person for measuring equipment monitoring.

4.4 REPAIR

Repair is reserved to factory service or authorized dealer.

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INITIAL STEP FOR TROUBLE-SHOOTING

TECHNICAL SPECIFICATION

In case of device failure switch OFF and ON again If the device problem is not solved, consult factory service.

Description	Dimension	Value
Interfaces		
Human-Device interaction		Digital display, buttons
IT – Device		Bluetooth interface
Power supply to the device		USB3 Connection
Device – material supply		Couplant to be applied by user
Time Limits		
Uninterrupted operation	Hours	16 hours max.
Lifetime for device and probe:	Hours	18,000
Functionality check		Before each use
Cleaning		After each use
Inspection		Once per year
General description		
Dimensions	mm	125 x 25 x 15
Weight	g	40
Display	mm	30 x 10
Display update rate	Hz	10
Probe connection		LEMO 0
Operating time of accumulator	Hours	> 8
Ambient temperature	°C	-10 to +80
Dimensional units		mm / inch selectable
Performance		
Measuring range, sonic run-time	µS	16 to 160
Tolerance	µS	± 1

NOTICE The sound velocity in liquids like oil, and solids like the calibration block, depends on temperature. For this reason, a correct measurement requires a previous temperature measurement for the test object. The results must be compared with the corresponding table.

⚠WARNING Accessories for temperature measurement are not included in the delivery.
Nominal values with respect to temperature are supplied by the manufacturer of the workshop diagnosis equipment.
Inappropriate temperature determination and / or an incorrect correction value table can lead to incorrect measurements and the resulting consequential damage.
ACS is not liable for any damage or loss (whether contractually or unauthorized, including negligence) caused by not following this warning.

7.1 COUPLANT

The instrument is designed for use with brake paste Mercedes-Benz "Bremspaste bräunlich", A002 989 37 51.

⚠WARNING Couplant must be ordered separately. The coupling agent used has an influence on the proper functioning of the device. Choose a coupling agent with non-corrosive properties so as not to damage the probe. Always pay attention to the safety instructions given in the safety data sheet.

7.2 PROBE CONNECTION

1. First connect the LEMO cable to the measuring device, by inserting the plug of the cable into the socket. The plug at either end of the cable is identical.
2. Repeat the connecting procedure for the probe.

⚠CAUTION Pay attention to ease of movement when making the plug connection. Before making the connection, there must be no dirt or foreign objects in the sockets.

3. When separating the cable from device or probe, carefully grasp the LEMO plug by the knurled sleeve and straightly draw it back.

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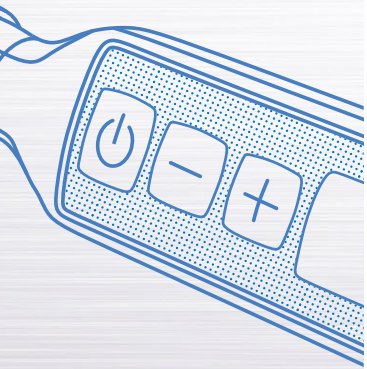
⚠CAUTION Pay attention to ease of movement when releasing the plug connection. Exaggerated application of a force can damage the plug connection. Avoid bending or levering on the plug connections.

7.3 SWITCHING ON

Press and release ⏻ - key

7.4 FUNCTIONAL CHECK



NOTICE The functional check must be carried out before each measuring task.

1. Apply some couplant to the probe.
2. Calibration block and probe must be mutually connected, by insertion into the bayonet connector and careful turning.
3. Switch ON the device.
4. The value displayed must be within the range of the values specified on the calibration block label.
5. If the value is out of tolerance, refer to troubleshooting section 8.2, or consult factory service.

Temperature	Displayed value
10 °C / 50°F	54,5 ± 0,3 mm
15 °C / 59°F	54,7 ± 0,3 mm
20 °C / 68°F	54,9 ± 0,3 mm
25 °C / 77°F	55,1 ± 0,3 mm
30 °C / 86°F	55,3 ± 0,3 mm

7.5 CHANGING THE DIMENSIONAL UNIT

Switch ON the device and press, ⏻ - key once more to change from mm to inch or vice versa.

7.6 MEASUREMENT

1. Switch ON the device.
2. Apply some couplant to the probe.
3. Connect the probe to the car gearbox by turning the bayonet connector.

NOTICE Measuring positions usually vary depending on the type of vehicle. It is essential that the connecting positions at the car and at the probe are clean. In order to prevent jamming of the probe, correct orientation during insertion into the connector is essential. If insertion turns out to be difficult, remove the probe in a careful rotation.

4 Compare the displayed result to the value correlating to the measured oil temperature from the diagnosis instrument.

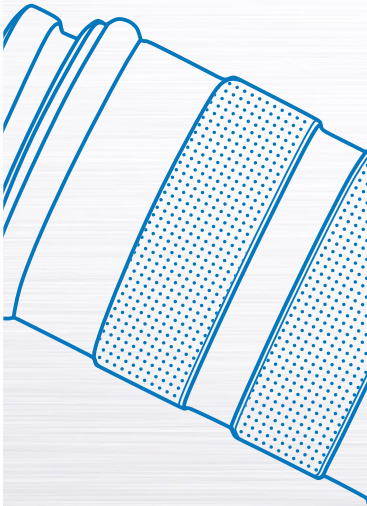
7.7 SWITCHING OFF

Press and release ⏻ - key

NOTICE Do not forget to clean the instrument and to store it in its transport box.

7.8 STORAGE

The instrument has to be stored in the transport box included in the delivery.



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TROUBLE-SHOOTING

Problem	Possible Reason(s)	Action
Incorrect measurement during functionality check	Calibration block has not adequately been used.	- Disconnect the probe from the calibration block. - Verify the quantity of couplant - The coupling surface must be clean, not damaged and without adherent foreign particles. - Establish the connection again. - Read the correction value for temperature from the table, and check the result.
Incorrect measurement	Improper couplant.	Replace couplant
Incorrect measurement	Excessive quantity of couplant.	Remove some couplant.
No signal 	Insufficient quantity of couplant.	Add some couplant.
Incorrect measurement, no result	The probe has been introduced in a skewed manner into the guide of the oil pan.	- Detach the probe - Insert it again, correctly oriented.
No signal 	Damaged probe	Probe must be replaced.
No signal 	Damaged probe cable	Cable must be replaced.
Damaged casing, rechargeable battery, display and electronics	Device has been dropped	Send the device back for repair in its original box, or hand it over to a designated collection point for recycling. **NOTICE** The product must not be disposed of with the domestic waste.

⚠CAUTION This electronic instrument must not be disposed of with the domestic waste. Local authorities inform about the address of designated collection points for recycling.

NOTICE Recycling of the product: This product consists of valuable materials and components, to be reintroduced into the reusable materials cycle. The illustrated symbol shows that the product is subject to European Directive 2002/96/EC:

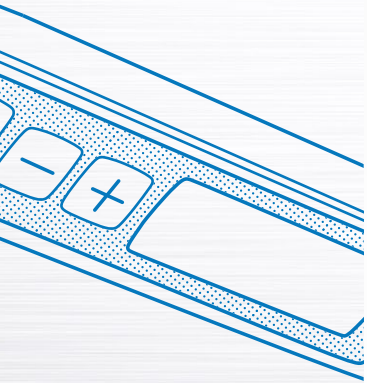
Never dispose of your product with other domestic waste. Please refer to the regional guidelines for the separation of electrical and electronic products. The proper disposal of your old product protects against potential and negative effects on the environment and human health.

NOTICE

Battery disposal:

Your product includes a built-in, rechargeable battery that is covered by European Directive 2006/66 / EC, which states that the battery should not be disposed of with normal domestic waste. Please refer to the regional guidelines on battery separation. The proper disposal of batteries protects against potential and negative effects on the environment and human health. Note for products with non-replaceable, built-in batteries:

Removing (or attempting to remove) the battery automatically invalidates the warranty. This procedure is only applied when the product life has expired.



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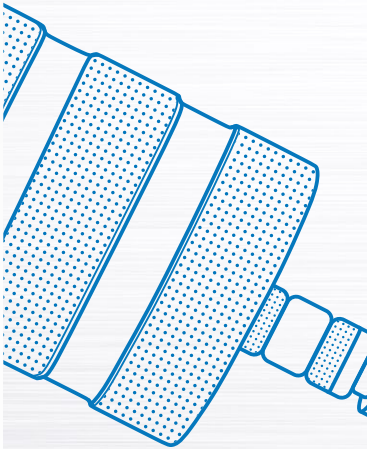

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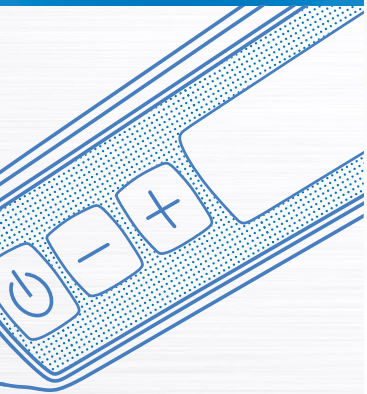

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