

D/DM


Hultafors



Operating instructions

EN

Operating manual

Digital Spirit Level D/DM

About this manual

Congratulations on the purchase of your new D/DM! You have acquired a Hultafors measuring instrument, which can make your work easier, faster and more precise. To utilize the complete functionality range of this measuring instrument, and to ensure safe operation, please observe the following instructions:

- Please read this operating manual before starting to use the device.
- Always keep the operating manual near the device.
- Only hand over the device to other users together with the operating manual.
- Never render the attached warning signs unreadable.

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1. General information

1.1 Signal words and their meaning

DANGER

For an imminent danger that could lead to serious injury or death.

WARNING

For a possibly dangerous situation that could lead to serious injury or death.

CAUTION

For a possibly dangerous situation that could lead to slight injury or property damage.

NOTE

For application notes and other useful information.

1.2 Pictograms and other information

1.2.1 WARNING SIGNS



Warning of dangers in general.

1.2.2 SYMBOLE



Read instructions before use.



Batteries and devices must not be disposed of with household waste.



Do not throw batteries into a fire.



Warning signs on battery: Do not heat the battery above 60 °C.

2. Description

2.1 Device components, display and operating elements

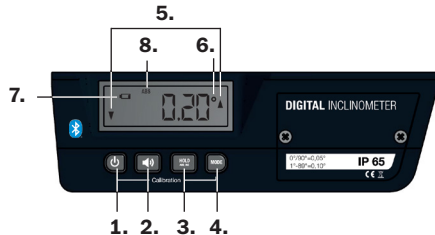
2.1.1 D/DM

1. Acrylic glass block vials
2. Gradient module
3. Gradient module battery compartment



2.1.2 GRADIENT MODULE

1. On/off switch / Display light
2. On/off switch acoustics (signal at 0° and 90°)
3. Hold function (measurement is retained by pressing once) /
Toggling between ABS (absolute) and INC (incremental)
4. Mode button for switching between measured value settings (°, mm/m, %, in/ft)
5. Arrows show in which direction the spirit level has to be moved
6. Display ° / mm/m / % / in/ft
7. Display in the case of low battery voltage
8. Display of ABS or INC



3. Technical data

Max. measurement tolerance

0° & 90° ± 0.05°

1°–89° ± 0.10°

Protection class IP 65

Power supply 3 x 1.5 V AAA batteries

Battery life (at 20°C) 30 hrs (if display light switched off, approx. 80 hrs)

Permissible temperatures

Operating temperature -10°C to +50°C

Storage temperature -20°C to +70°C

4. Safety instructions

4.1 Area of responsibility

4.1.1 MANUFACTURER

Hultafors is responsible for the safe delivery condition of the product, including the operating manual and the original accessories.

4.1.2 OPERATOR

The operator is responsible for using the product as intended, the deployment of personnel, their training and the operational safety of the product.



- The operator understands the safety information which is stated on the product and the instructions which are contained in the operating manual.
- The operator shall comply with local regulations relating to safety and accident prevention regulations as well as worker protection laws and regulations.
- The operator shall immediately notify Hultafors if safety-related issues should develop on the product or during its utilization.
- The operator shall ensure that the product is not utilized any further if defects become evident, and he will have the product repaired professionally.

4.2 Improper Use

- Use of the device and the accessories without instruction.
- Use of third-party accessories or additional equipment.
- Use outside of the intended limits (see Chapter 3 Technical data).
- Use under extreme temperature fluctuations without an adequate acclimatization.
- Disabling of safety devices and removal of hazard notices and labels.
- Unauthorized opening of the device.
- Performance of modifications or alterations the device or the accessories.
- Deliberate blinding of third parties.
- Inadequate safeguarding at the installation site.

4.3 Utilization limitations

The D/DM is suitable for a continuous use in an atmosphere which can be inhabited by humans.

- Do not operate the product in explosion-prone or corrosive environments.
- Inform the local safety authorities and safety experts before working in hazardous environments, in close proximity to electrical installations or similar surroundings.

4.4 Usage Hazards

4.4.1 GENERAL



WARNING

Missing or incomplete instructions may result in improper or incorrect use. This can cause accidents with serious damages to persons, property, assets and the environment.

- Follow the manufacturer's and operator's safety instructions.
- Protect equipment and accessories from access by children.



CAUTION

A fall, longer storage, transportation or other mechanical effects can lead to erroneous measurement results. Check the unit for damage before use. Do not use damaged equipment.

- Repairs have to be exclusively performed by Hultafors.
- Before use, check the accuracy of the device (see Chapter 7 Calibration).

4.4.2 CHARGER/BATTERIES/RECHARGEABLE BATTERIES



DANGER

Strong mechanical influences, can lead to a leakage, fire or explosion of the batteries or trigger the release of toxic substances.

- Batteries and rechargeable batteries may not be opened or exposed to mechanical loads.
- Damaged batteries may not be used.
- Repairs have to be exclusively performed by Hultafors.



WARNING

High ambient temperatures and immersion into liquids can cause a leakage, fire or explosion of the batteries or trigger the release of toxic substances.

- Protect batteries and rechargeable batteries from mechanical influences during transport.
- Do not overheat batteries and rechargeable batteries or expose them to fire.
- Avoid the ingress of moisture into batteries and rechargeable batteries.
- Do not use damaged batteries or rechargeable batteries. Perform a proper disposal (see Chapter 11 Disposal).



WARNING

A short-circuiting or unintended use can cause batteries to overheat and create an injury or fire hazard.

- Do not transport or store batteries in the pockets of garments.
- Do not bring the battery contacts in contact with jewelry, keys, or other electrically conductive objects.
- Do not charge non-rechargeable batteries.
- Do not discharge the batteries through short-circuiting.
- Do not solder the batteries within the device.
- Do not mix old and new batteries, and do not mix batteries from different manufacturers or with a differing type designation.



WARNING

If disposed of improperly third parties can possibly be seriously injured and the environment polluted. The burning of plastic components generates toxic fumes which may impair the health of people. Batteries/rechargeable batteries may explode if they are damaged or heated excessively, and thereby cause poisoning, burning, corrosion or environmental contamination.

If disposed of negligently unauthorized persons are able to use the product improperly.

- The product must not be disposed of together with household waste. Dispose of the device and accessories properly (see Chapter 11 Disposal).
- Protect the product at all times from access through unauthorized persons, especially children.

4.5 Electromagnetic compatibility (EMC)

The electromagnetic compatibility is the ability of the product to function in an environment where electromagnetic radiation and electrostatic discharges are present, without causing electromagnetic interference to other devices.

4.5.1 INTERFERENCE OF OTHER DEVICES BY D/DM

Although the product meets the strict requirements of the relevant directives and standards, Hultafors can not completely exclude the possibility of interference with other devices (for example, when using the product in combination with third-party devices, such as field computers, personal computers, wireless devices, mobile phones, certain cables or external batteries).

- When using computers and radio equipment make sure to observe the vendor-specific information about electromagnetic compatibility.
- Only use original Hultafors equipment and accessories.

4.5.2 INTERFERENCE OF THE D/DM BY OTHER DEVICES

Although the product meets the strict requirements of the relevant directives and standards, Hultafors can not entirely exclude the possibility that intense electromagnetic radiation in the immediate vicinity of radio transmitters, two-way radios, diesel generators, etc. can distort the measurement results.

- When performing measurements under these conditions check the plausibility of the results.

5. Getting Started

Prior to initial set-up, check whether the batteries have been installed correctly in the device.

Inserting batteries

1. Open the battery compartment cover with an appropriate screwdriver (PH2).
2. Insert battery making sure that the poles of the battery are in the right position.
3. Close the battery compartment cover with an appropriate screwdriver (PH2).

Only use type 1.5 V AAA batteries!
Remove the batteries if the instrument is not used over a longer period of time.

5.1 Bluetooth

Fast and efficient data transfer of measured values can be made directly to a smartphone via Bluetooth.



NOTE

To pair with a smartphone, launch the Hultafors measures app and connect using one of the function options.



6. Operation

6.1 Switching On/Off

On:

Press the “On/off switch / Display light” to switch on the gradient module.

Off:

Press the “On/off switch / Display light” for at least 2 seconds to switch off the gradient module.

6.2 Display

If the spirit level is used in the inverted position (upside down – above your head), the display screen turns too so that the measurement can be read easily.

The display switches off automatically after 5 minutes, as soon as the device is stationary.

6.3 Display light

1. Switch on the gradient module (display light is active).
2. Press the “On/off switch / Display light” to switch the light on and off.

6.4 Acoustic signal

The acoustic signalling is switched on by pressing the “On/off switch for acoustics”. The closer the spirit level gets to the standard position, the more rapid the frequency of the acoustic signal. This function assists you with levelling work, where it is not possible for you to read the measurement from the display.

6.5 Hold function

The current measurement is frozen by pressing the “Hold function” once.

A previously measured value can be “frozen” on the display using this function.

The measurement remains unchanged until the “Hold function” button is pressed again.

6.6 Toggling between ABS and INC

You can toggle between ABS (absolute) and INC (incremental) by pressing the “Hold function” for more than 2 seconds.

In “ABS” (absolute) mode, the measurement result is displayed based on the device calibration. In contrast, in “INC” (incremental) mode, the measurement result is displayed based on a relative reference level.

For example, you can take a measurement on a 5° inclined plane in “ABS” mode and then toggle to “INC” function. In doing so, the measurement display is set to 0°. You can now take additional measurements based on this new zero value. To leave “INC” mode, press the button again for 2 seconds.

6.7 Changing measurement display

- Press the “Display switch” to change between ° / mm/m / % / in/ft.

7. Calibration



Calibration stage 1 based on position 0°

- Place the D/DM with the measurement surface horizontally.
- Press the and buttons briefly.
- Display -1- appears on the screen.
- Press the button briefly, display -1- flashes for approx. 5 seconds.
- Display -2- appears on the screen.
- Turn D/DM again by 180°.
- Press the button briefly, display -2- flashes for approx. 5 seconds.
- Measurement display appears on the screen, calibration stage 1 is complete.



Calibration stage 2 based on position 180°

- Turn D/DM “upside down” and place horizontally.

- Press the and buttons briefly.
- Display -1- appears on the screen.
- Press the button briefly, display -1- flashes for approx. 5 seconds.
- Display -2- appears on the screen.
- Turn D/DM again by 180°.
- Press the button briefly, display -2- flashes for approx. 5 seconds.
- Measurement display appears on the screen, calibration stage 2 is complete.

Calibration stage 3 based on position 90°

- Place the D/DM with the measurement surface vertically.
- Press the and buttons briefly.
- Display -1- appears on the screen.
- Press the button briefly, display -1- flashes for approx. 5 seconds.
- Display -2- appears on the screen.
- Turn D/DM by 180°.
- Press the button briefly, display -2- flashes for approx. 5 seconds.
- Measurement display appears on the screen.
- The D/DM is therefore fully calibrated.



8. Maintenance, storage and transportation

8.1 Cleaning

- Wipe off the dirt with a soft damp cloth.
- Do not use aggressive cleaning agents or solvents.
- Do not immerse the device into water!
- Clean and dry wet equipment, accessories and transport containers prior to packaging them. Only pack equipment again when it is completely dry.

8.2 Storage

- The equipment may only be stored within the specified temperature limits (see Chapter 3 Technical data).
- After prolonged storage check the accuracy of the measuring device before using it.

8.3 Transport

8.3.1 GENERAL

- The device may be damaged by strong vibrations or by falling.
- Never transport the product loose. Always use the original packaging or an equivalent transport container.
- Switch off the measuring device before transporting it.
- Check the unit for damages before use.

8.3.2 BATTERIES/RECHARGEABLE BATTERIES

- When transporting or shipping batteries, the operator is responsible for complying with the applicable national and international laws and regulations.
- Before shipping, remove the batteries from the device.

9. Delivery contents and accessories

Delivery contents of D/DM

D/DM

AAA batteries

Quick start guide

Further information on accessories can be found at www.hultafors.com

10. Troubleshooting

Error	Possible cause	Remedy
Device is switched on, no display, screen not illuminated	<ul style="list-style-type: none">• Battery flat• Battery inserted incorrectly• Device or switch faulty	<ul style="list-style-type: none">• Replace battery• Insert battery correctly• Contact dealer and have device repaired
Display jumps or screen "frozen"	<ul style="list-style-type: none">• Program error	<ul style="list-style-type: none">• Remove battery, wait one minute, reinsert batteries
Irregular display screen	<ul style="list-style-type: none">• Battery power low	<ul style="list-style-type: none">• Change the batteries
The device turns itself off immediately after start-up	<ul style="list-style-type: none">• Battery flat	<ul style="list-style-type: none">• Change the batteries

11. Disposal

If disposed of improperly third parties can possibly be seriously injured and the environment polluted.

The burning of plastic components generates toxic fumes which may impair the health of people.

Batteries/rechargeable batteries may explode if they are damaged or heated excessively, and thereby cause poisoning, burning, corrosion or environmental contamination.

If disposed of negligently unauthorized persons are able to use the product improperly.

Measuring tools, accessories and packaging must be recycled in an environmentally-friendly manner.



The product as well as the accessories – especially the batteries and rechargeable batteries – may not be disposed of with household waste.

- Ensure proper disposal of the device and the accessories.
- Only dispose of batteries in a discharged state.
- Observe the country-specific disposal requirements.

Your Hultafors dealership will take back batteries as well as old equipment, and will ensure proper disposal.

Only for EU countries



Electric tools may not be disposed of with household waste!

According to the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation in national law, no longer usable electrical and electronic equipment must be collected separately and recycled in an environmentally friendly manner.

12. Manufacturer's Guarantee

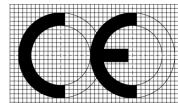
The manufacturer warrants to the original purchaser stated on the guarantee card, freedom from defects of the device for a period of two years, with the exception of batteries, as of the point in time the device is handed over. The guarantee is limited to repairs and/or replacements at the manufacturer's discretion. Defects which are caused through improper handling by the purchaser or third parties, natural wear and optical flaws that do not affect the usability of the equipment, are not covered by this guarantee. Claims under this guarantee can only be invoked if the device is submitted along with the guarantee card, completely filled out by the dealer, dated and provided with the company stamp. If the guarantee claim is justified, the manufacturer shall bear the transport costs. The duration of the guarantee will not be extended through repair or spare parts work which is carried out within the scope of the guarantee.

Further claims are excluded, unless these are stipulated by the respective by the respective national legislation. In particular the manufacturer shall not be liable for any direct, indirect, incidental or consequential damages, losses or expenses in connection with the use or because of the inability to use the tool for any purpose whatsoever. Implied warranties for the usage or suitability for a particular purpose are expressly excluded.

13. EC conformity declaration



Declaration of Conformity



We **Hultafors Group AB, Hultaforsvägen 21, Hultafors**

declare under our sole responsibility that the Product(s)

D/DM

to which this declarations relates is in conformity with the following standards.

**Gradient module:
EN61326-1:2013
EN55011:2009+A1:2010
EN61000-4 2:2009
EN61000-4-3:2006+A1:2008+A2:2010**

Following the provisions of Directive(s)

**Electromagnetic compatibility 2014/30/EU
Low Voltage Directive 2014/35/EU**



Hultafors