

D 60
DM 60
DM 120


Hultafors



Operating instructions

EN

SCOPE OF DELIVERY FOR D 60, DM 60, DM 120:

1. D 60, DM 60, DM 120
2. AAA batteries
3. Quick start guide

1



2



3



Operating manual

D 60, DM 60, DM 120

About this manual

To utilize the complete functionality range of this measurement 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 persons 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



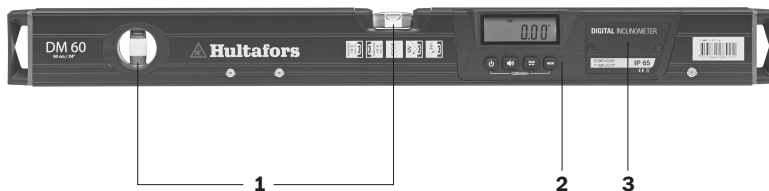
Warning signs on battery Do not heat the battery above 60°C.

2. Description

2.1 Device components, display and operating elements

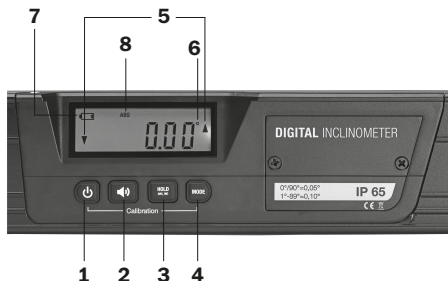
2.1.1 D 60, DM 60, DM 120

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



2.1.3 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

3.1 Gradient module

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 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 60, DM 60, DM 120 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 8 / Checking the accuracy)

4.4.2 BATTERIES



DANGER

Mechanical damage 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, chargers and charging stations 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 damage during transport.
- Never store the Li-Ion battery in the sun, on radiators or behind glass windows.
- 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. Dispose of properly. (see Chapter 12 / Disposal).



WARNING

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

Using charging devices from other manufacturer's can damage the Li-Ion batteries. This can lead to a fire and explosion hazard.

- Only use original Hultafors accessories.



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 12 / Disposal).
- Protect the product at all times from access by unauthorized persons, and 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 discharge are present, without causing electromagnetic interference to other devices.

4.5.1 INTERFERENCE OF OTHER DEVICES BY D 60, DM 60 DM 120

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 60, DM 60, DM 120 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. Start-up

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.
2. Insert batteries making sure that the poles of the batteries are in the right position.
3. Close the battery compartment cover with an appropriate screwdriver.

Only use type 1.5 V AAA batteries!

If the device is not used for a long period of time, remove the batteries.

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 gradient 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 no longer being moved.

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 gradient 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

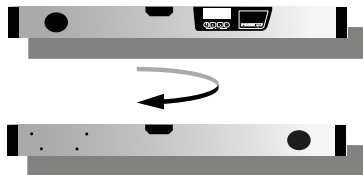
Press the “Display switch“ to change between ° / mm/m / % / in/ft.

7. Calibration and adjustment





7.1 Calibration of gradient module

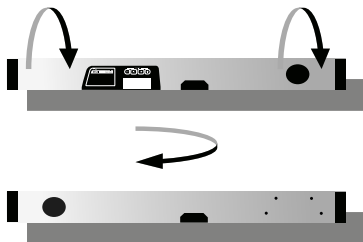
Calibration stage ① based on position 0°

- Place the 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 DM by 180°
- Press the  button briefly, display -2- flashes for approx. 5 seconds
- Measurement display appears on the screen, calibration stage 1 is complete.







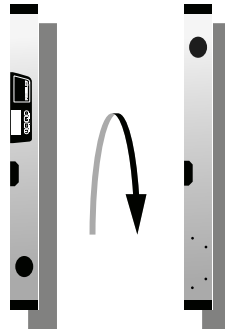
Calibration stage ② based on position 180°

- Turn 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 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.

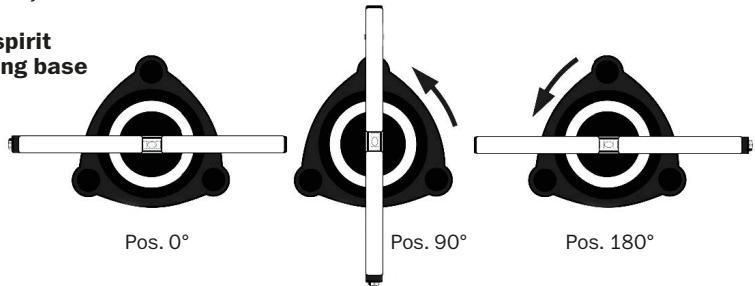


Calibration stage ③ based on position 90°

- Place the 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 DM by 180°
- Press the  button briefly, display -2- flashes for approx. 5 seconds
- Measurement display appears on the screen.
- The DM is therefore fully calibrated.



7.2 Adjusting the spirit level on the levelling base



Place the device on the levelling base so that the product logo is in front of you (Pos. 0).

- 1) Adjust vial to a 0° position
- 2) Adjust vial to a 90° position
- 3) Adjust vial to a 180° position



WARNING

Always work with both screws when adjusting! Making slight corrections after every turn mean no errors occur. These are sometimes necessary and therefore state of the art.

8. Maintenance, storage and transportation

8.1 Cleaning

- Wipe off any 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.
- Keep plug connections clean and protected from moisture.

8.2 Storage

8.2.1 GENERAL

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

8.2.2 BATTERIES / RECHARGEABLE BATTERIES

- For storage, remove the batteries from the device or from the charging station.
- The storage should preferably be performed in a dry environment at room temperature (see Chapter 3/Technical data).
- Protect from moisture and humidity. Dry wet or damp batteries before storage or before use.
- Prior to a prolonged storage, charge the battery to 80 % capacity (see Chapter 7/operation). Repeat the procedure every 6 months.

- After storage, fully charge the battery before use.
- Check the battery for damage before use. Do not use damaged batteries!

8.3 Transport

8.3.1 GENERAL

- The device may be damaged by strong vibrations or by dropping.
- 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 damage 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. Scope of delivery and accessories

9.1 Scope of delivery for D 60, DM 60, DM 120:

D 60, DM 60, DM 120

AAA batteries

Quick Starter

Further information regarding the accessories
can be found at **www.hultafors.com**

10. Troubleshooting

Error	Possible cause	Rectification
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 batteries, 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 may be 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 - must not be disposed of with household waste.

- Dispose of the device and the accessories properly
- 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 must 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.

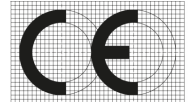
12. Manufacturer's Guarantee

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 60, DM 60, DM 120

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

D 60, DM 60, DM 120:

- 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