H360G

Hultafors

Operating instructions **EN**

SCOPE OF DELIVERY FOR H360G:

1. H360G line laser
2. Battery adapter BA
3. AA batteries
4. Wall bracket UH
5. Case

1

2

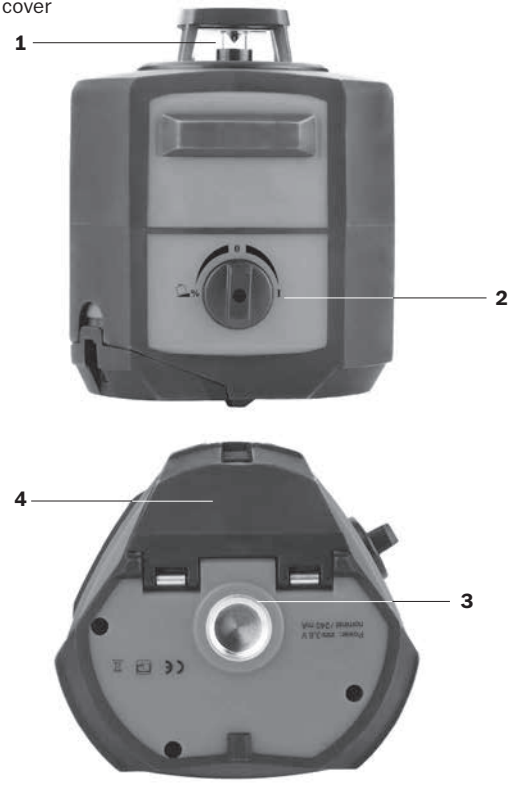
3

4

5

H360G

1. Laser beam output aperture
2. On/off switch, transport lock
3. Tripod adapter ¼“ and 5/8“
4. Battery compartment cover



Operating manual
H360G line laser

About this manual

Congratulations on the purchase of your new H360G! You have acquired a Hultafors measurement instrument, which can make your work easier, faster and more precise. To utilize the complete functionality range of this measurement instrument, and to ensure a 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.

Contents

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.

Class 2 laser device

Do not look into the laser beam!

2. Description

2.1 Device components, display and operating elements

2.1.1 H360G

1. Laser beam output aperture
2. On/off switch, transport lock
3. Tripod adapter ¼" and 5/8"
4. Battery compartment cover

2.2 Intended use

The H360G is a line laser that enables a single person to level and align items horizontally and vertically.
The device is mainly intended for indoor use. For outdoor applications, it must be ensured that the ambient conditions are similar to those indoors.
The visibility range of the laser lines depends on the ambient conditions. In low light conditions or for long distances, the hand-held receiver can be used to locate the laser line position.
Follow the instructions contained in this manual. The device and accessory equipment may present a danger if they are utilised improperly or inappropriately by persons who are not instructed as required.

3. Technical data

3.1 H360G line laser

Working range - Laser lines - Receiver	 r = 25 m* r = 80 m*
Max. measurement tolerance - Laser lines	 ± 0.2 mm/m
Protection class	IP 54
Levelling range (typical)	± 4°
Levelling time (typical)	≤ 5 s
Power supply	3 x 1.5 V AA batteries/Li-ion battery 5.2
Battery life (at 20°C) - AA batteries - Li-ion battery 5.2 (Optional)	 4 h 14 h
Permissible temperatures Operating temperature Storage temperature	 -10°C to +50°C -20°C to +60°C
Laser diode lines/points	512-520 nm < 1 mW
Laser class	2M, DIN EN 60825-1 : 2014
Tripod adapter	¼“ and 5/8“
Weight without batteries	450 g
Dimensions H x W x L	110 x 100 x 130 mm

*... depending on the ambient conditions in the workplace. Subject to modifications (drawings, descriptions and technical data).

3.2 Hultafors Li-Ion battery 5.2 (optional)

Type	Li-Ion with circuit protection
Cells	2 x ICR 18650 parallel
Capacity	5200 mAh
Voltage	3.6 V DC
Power	28 Wh
Permissible temperatures Operating temperature Storage temperature (ideal)	 -10°C to +50°C -20°C to +60°C (ideal +20°C to +25°C)
Charging temperature	0°C to +45°C (ideal +20°C to +25°C)
Humidity	65 ± 20%
Charging time	3 - 5 h
Weight	100 g
Dimensions	71 x 39 x 22 mm

3.3 Hultafors charger LG Li-ion (optional)

Nominal input voltage	100 - 240 V AC / 50 - 60 Hz
Nominal input current	0.4 A @ 100 V AC - 0.2 A @ 240 V AC under maximum load
Nominal input power	21 Wrms under maximum load
Output voltage	3.6 V DC
Charging current	3000 mA
Ambient temperature	-10°C to +50°C
Protection class	IP40
Power consumption during standby	≤ 0.3 W @ 100 V AC / ≤ 0.5 W @ 240 V AC

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 H360G 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.

WARNING
Blinding by laser radiation can indirectly lead to serious accidents, especially for people who are driving a vehicle or operating machinery. Do not look into the laser beam.

- Do not set up the laser beam and the laser plane at eye level or aim at people.

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/RECHARGEABLE 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, 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 from mechanical damage during transport.
- Do not overheat batteries or expose them to fire.
- Avoid the ingress of moisture into batteries.
- Do not use damaged batteries. Dispose of properly. (see Chapter 12/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 jewelery, 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.
- 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 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 iterference to other devices.

4.5.1 INTERFERENCE OF OTHER DEVICES BY H360G

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 H360G 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. Laser safety/classification

The H360G emits a horizontal 360° laser line and a vertical laser line.
The product corresponds to Class 2M Laser according to DIN EN 60825-1:2014

Class 2M laser:
With class 2M laser devices, eyes are protected by the the blink reflex and/or the aversion responses in the event that a person accidentally looks at the laser for a short time.

WARNING
Looking directly into the laser beam with optical aids (such as binoculars, telescopes) can be dangerous.

WARNING
Looking directly into the laser beam can damage the eyes.

- Do not look into the laser beam.
- Do not point the laser beam at other people.

Labelling on the device:

See cover page for the position of the label.

- Do not remove the label!

6. Start-up

6.1 Operation with batteries

1. Open the battery compartment cover.
2. Insert batteries into the Hultafors battery adapter, making sure that the polarity of the batteries is correct
3. Insert the Hultafors battery adapter in the correct position.
4. Close the battery compartment cover (audible click of the cover).

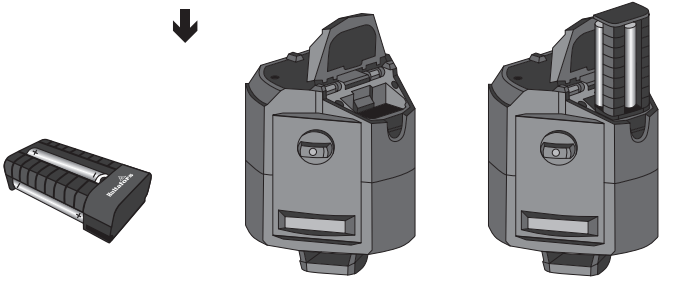
Use only 1.5v AA size (Mignon) batteries. Remove the batteries if the instrument is not used for an extended period

NOTE
The intensity of the laser lines can vary depending on the battery quality.

6.2 Operation with the Hultafors Li-ion battery (optional)

1. Fully charge the battery with the Hultafors Li-ion charger (see Chapter 7.2).
2. Open the battery compartment cover.
3. Insert the Hultafors Li-ion battery in the correct position.
4. Close the battery compartment cover (audible click of the cover).

If the device is not used for a long period of time, remove the batteries and store in a dry place (see Chap. 9/Maintenance, storage and transport).



7. Operation

7.1 H360G

7.1.1 TURNING ON/OFF

On:

- Turn the on/off switch, transport lock to the right (ON position); the pendulum unit will be released.
  The device will emit all lines from the output aperture.
  The instrument will level itself automatically within the specified inclination range
  (see Chapter 3/ Technical data).

Off:

- Turn the on/off switch, transport lock to the left (OFF position) and the pendulum unit will be locked; the laser lines will disappear.

NOTE
Magnets can affect the measurement instrument and lead to false results.

If the vertical laser line is not projected vertically to the wall or to the target surface, uneven surfaces can lead to erroneous measurement results.

- Make sure that the vertical laser line is projected vertically to the wall or to the target surface.

Severe temperature fluctuations can lead to erroneous measurement results.

- Before start-up, allow the device to acclimatise to the environmental conditions.

The laser lines will flash every 30 seconds when the battery capacity falls below 10%.

- Charge the battery in good time or prepare additional batteries.

7.1.2 PULSE-MODE

In order to be able to detect the laser lines at even greater distances or under adverse ambient conditions,

- the optional receiver REC LGD0 can be used. The Pulse mode required for the receiver is the
- standard mode on the H360G.

7.1.3 CREATING INCLINATIONS BEYOND THE RANGE OF AUTOMATIC LEVELLING

On:

- Turn the on/off switch, transport lock to the left (LOCK position). To indicate that the self-levelling is switched off, the lines will blink every 4 seconds.

Off:

- Turn the on/off switch, transport lock to the right (OFF position). The laser lines will disappear.

CAUTION
If the laser line is not projected vertically to the surface or the surface is uneven, this can lead to incorrect measurement results.

- Make sure that the laser line is projected vertically to the wall or to the detection surface.

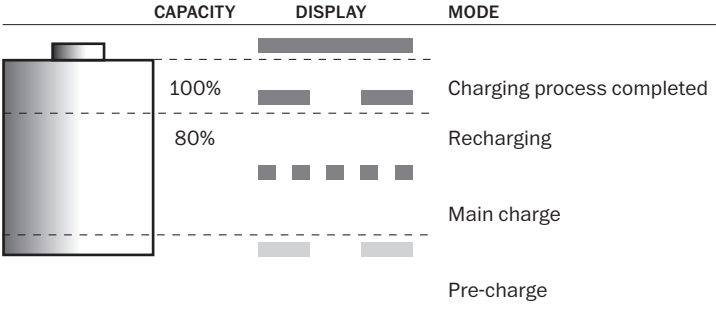
7.2 Hultafors Li-Ion battery, charging station & charger (optional)

The Hultafors Li-ion battery must be completely charged prior to use.

- Plug the charger plug into the charging port of the Li-Ion Charger
- Connect the Hultafors Li-ion charger to a socket.
- Insert the Hultafors Li-ion battery in the charging station in the correct position.
- The charging process takes between 3 and 5 hours, depending on the state of charge and environmental conditions.
- The battery reaches its full capacity after a maximum of 10 charging cycles.
- The battery should, ideally, be fully charged at all times. The battery can also be removed from the charging station before completing the charging process, in urgent cases. The durability of the battery will not be negatively affected as a result of this (no “memory effect“).

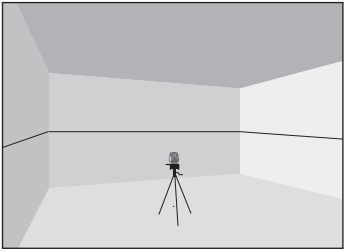
Charger operating display:

COLOUR	DISPLAY	MODE	DESCRIPTION
yellow green		Standby	No battery in the charger
yellow green		Wait cycle	Battery temperature beyond the valid range
yellow green		Pre-charge	Protective charging for deeply discharged batteries
yellow green		Main charge	Rapid charging phase with max. Power up to 80 %
yellow green		Recharging	Recharging between 80 – 100 %
yellow green		Completed	Charging process completed, battery is 100 % charged
yellow green		Error	Battery too hot / too cold, let it acclimatize and reinsert

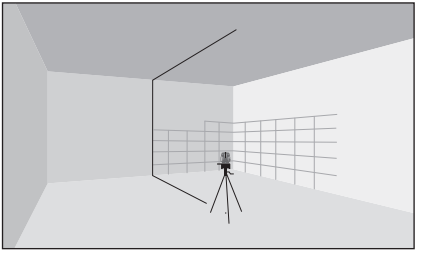


7.3 Applications

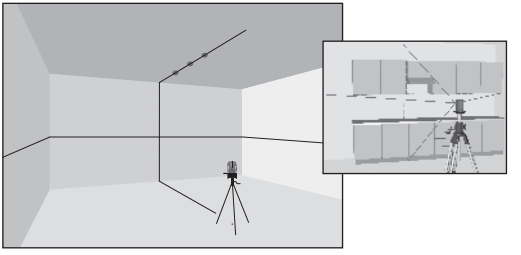
7.3.1 HORIZONTAL LEVELLING 360°



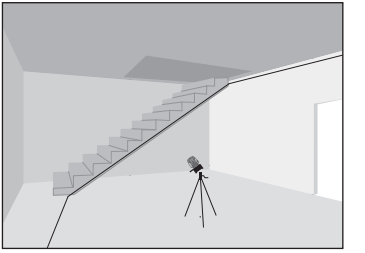
7.3.2 VERTICAL LEVELLING



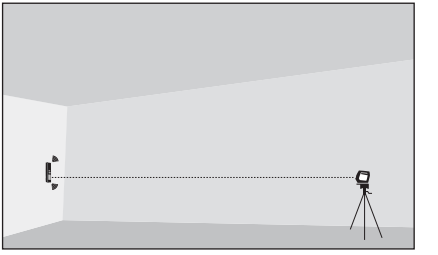
7.3.3 90° ANGLE



7.3.4 INCLINATION



7.3.5 WORKING AT DISTANCES



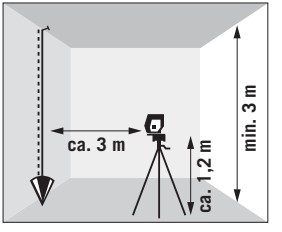
8. Checking the accuracy

Check the accuracy of the Hultafors H360G before each measurement.

- Before starting the check, let the device acclimatise to the environmental conditions.

8.1 Checking the accuracy of the vertical line

- Attach a plumb line as close as possible possible to a (at least) 3 m high wall.
- Mount the H360G onto a tripod at a height of approx. 1.2 m.
- Position the device approx. 3 m in front of the plumb line.
- Switch on the H360G and project the vertical laser line onto the plumb line.

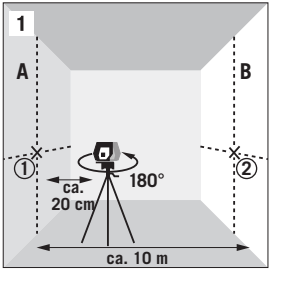


If the deviation is greater than 4 mm, the device must be readjusted. In this case, consult your dealer.

8.2 Checking the leveling accuracy of the horizontal line

1. Select two horizontal, flat walls (A & B), which are approx. 10 meters apart.

- Mount the H360G onto a tripod and position it at a distance of approx. 20 cm from wall A.
- Mark the intersecting point ① of the vertical and horizontal lines on wall A.



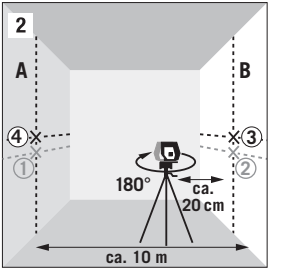
2. Rotate the H360G by 180° and mark point ② on wall B.

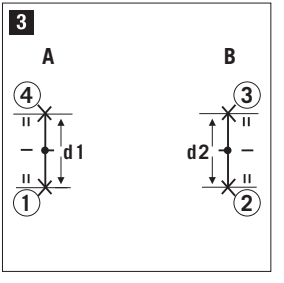
- Position the laser at the same height approx. 20 cm away from wall B and mark point ③ on wall B.

3. Rotate the H360G by 180° and mark point ④ on wall A.

- Measure the vertical distance (d1) of the marked points ①-④ and the vertical spacing (d2) of the points ②-③ .
- Mark the center point of (d1) and (d2).
- If the reference points ① and ③ are on different sides of the center point, (d2) must be subtracted from (d1).
- If the reference points ① and ③ are on the same side of the center point, (d2) must be added to (d1).
- Divide the results with twice the value of the room length.

If the result is greater than 4 mm, the device must be readjusted. For this, please consult your dealer.





9. Maintenance, storage and transportation

9.1 Cleaning

- Wipe off any dirt with a soft damp cloth.
- Check the outlet openings of the laser regularly, and thoroughly clean them if necessary. Do not touch the glass with your fingers.
- 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.

9.2 Storage

9.2.1 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.

9.2.2 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!

9.3 Transport

9.3.1 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. During the shutdown the pendulum unit is locked in position and protected against damage.
- Check the unit for damage before use.
- Regularly check the accuracy of the device (see Chapter 8 / Checking the accuracy).

9.3.2 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.

When shipping through third parties (e.g. forwarding agent or air freight) the special requirements regarding the packaging and labeling must be observed.

- Remove the battery from the device.
- Cover exposed contacts with tape.
- Package the battery in such a manner that it can not move around in the packaging, and that it can not be damaged by external influences.
- Further national and international regulations and any additional requirements as well as the stipulations of the respective transport company must be observed.

10. Scope of delivery and accessories

10.1 Scope of delivery for H360G BASIC
1 H360G line laser
1 Battery adapter **BA**
3 AA batteries
1 Wall bracket **UH**
1 case

10.2 ACCESSORIES (optional)
Receiver **RECG**
Li-Ion battery **HRB**
Li-Ion battery set **HRB-S**
Tripod **B-120**
Magnetic bracket **MAH**

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

11. Troubleshooting

Error	Possible cause	Rectification
The device turns itself off immediately after start-up	• Battery flat	• Replace battery • Charge battery
Laser lines flash at one-second intervals	• Device not within the selflevelling range	• Align device horizontally
Laser lines flash every 4 seconds	• Device is in manual inclination mode	• Turn the on/off switch, transport lock to the right (OFF position).
Laser lines flash every 30 seconds	• Battery capacity below 10%	• Replace batteries

12. 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 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.

Only for EU countries

Electric tools must not be disposed of 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.

13. 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.

14. EC conformity declaration

Hultafors

Declaration of Conformity

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

declare under our sole responsibility that the Product(s)

H360G

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

H360G:

- EN 61326-1: 2013
- EN 61326-2-2: 2013
- EN 61000-3-2: 2014
- EN 61000-3-3: 2013
- EN 60825-1: 2014

Following the provisions of Directive(s)

Electromagnetic compatibility 2004/108/EC
Low Voltage Directive 2006/95/EC

MARCH 2018 v.1

Hultafors