
DrillSpotter™

Drillspotter

Manual

Revision US
Version: 09/2000

Thank you,

for choosing the DrillSpotter™. This device has been developed with current state of the art technology and it will provide service for many years if properly cared for.

Exclusion of liability

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Proper assembly and operation of the DrillSpotter is the responsibility of the user. We guarantee all parts included in this kit against defects. We are responsible only for the replacement cost of any defective parts or the entire kit. We are not responsible for any consequential damage or injury

it may be caused by improper use or operation of the DrillSpotter, including but not limited to injury or damage caused by improper use and resulting damage to or caused by drilling through high voltage electrical or computer cables, water, gas or any other pipes or hidden installations.

The DrillSpotter does not detect plastic pipes, and the possible contents of those pipes. The DrillSpotter will not detect electrical wiring, cable, phone lines, or any other type of lines when those lines are not run through rigid metal conduit. We are not responsible for any damages or injuries that result from drilling through these types of materials.

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1 Introduction

In this chapter, we provide general information about this manual and the DrillSpotter™.

**NOTE!**

Read this manual before using, to become familiar with its operation. Pay special attention to the safety instructions in chapter 2.

Craftsman**1.1 Whom the DrillSpotter is suitable for**

The DrillSpotter has been developed for use by craftsmen.

Please make yourself familiar with the special safety instructions (not included in this manual) from other sources (e. g. from the manual of your drilling equipment) to be followed when drilling. Drilling is dangerous and can result in serious personal injury or death if done in an unsafe manner.

Use as directed**1.2 What the DrillSpotter is suitable for**

The general function of the DrillSpotter is to exactly align the receiver with the transmitter to mark the entry and exit points of the drill hole. This is possible through walls, ceilings and similar obstacles made of concrete, stone, brick, wallboard, plaster, and other materials.

The DrillSpotter also indicates the distance between transmitter and receiver. It is therefore possible to measure the approximate thickness of a wall.

Applications

Further more it can detect metal within the walls (such as electrical conduit, metal reinforcements bars or girders).

The DrillSpotter has been produced to assist the craftsmen when drilling through walls, ceilings etc., to install pipes, power cables and computer networks, and telecommunications systems as required.

INTRODUCTION

The functional principal and design is patented. US-Patent Number 5,929,757

1.3 What the DrillSpotter is not suitable for

The DrillSpotter does not ensure the correct alignment of the drill and therefore the direction the drill will follow in actual use. Proper alignment and operation of the drill is the responsibility of the user. The DrillSpotter Transmitter and Receiver must always be removed from the wall before drilling or the units will be damaged. Never drill through the DrillSpotter or the units will be damaged. Interference caused by active computer monitors, television or modern lamps (especially fluorescent lamps) in the immediate area, (within 4 feet of the transmitter or receiver) can disturb the radio connection and cause incorrect alignment and measurements. Large metal beams within the measuring range of the wall can also lead to incorrect positioning. See section 7 Technical data for information regarding metal support.

1.4 FCC-Label

The DrillSpotter meets the requirements of the FCC identifier and the following compliance statement:

Plättner Elektronik GmbH
Pölsenstraße 38
D-06484 Quedlinburg
PHONE: 004939464691 / FAX: 00493946915853
DrillSpotter™

FCC ID: O8W332065590DB

This device complies with Part 15 of the FCC rules operation is subject to the following two conditions:

- 1) This device may not cause harmful interference, and,
- 2) This device must accept any interference received including interference that may cause undesired operation.

SYMBOLS

1.5 About this manual

How to use this manual:

► Warning
(Danger)

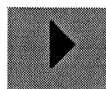
◄ Caution /
Attention

☞ Tips & direc-
tions

1. Safety instructions are summarized in chapter 2 and also mentioned in the description of the respective operating steps.
2. All special instructions are marked by one of the symbols shown on the left. The first symbol represents the greatest danger.
3. If an operation requires more than one step, the single steps are numbered.

2 Safety

Read these safety instructions before using the DrillSpotter.



- Please make yourself familiar with the special safety instructions (not included in this manual) from other sources (e.g. from the manual of your drilling equipment) to be followed when drilling. Drilling is dangerous and can result in serious personal injury or death if done in an unsafe manner.
- Do not place the equipment within easy reach of children (they could swallow small parts).
- The delivered adhesive paste is not suitable for children. It is **not** a toy to play with!
- The adhesive paste does not offer complete security against the transmitter or receiver dropping. It is important to take additional protective measures to keep the unit from being damaged in a fall.
- The alignment of the transmitter to the receiver is only possible when the rear of both are facing the wall/floor/ceiling, and exactly parallel to the surface.
- Metal supports in the wall and interference caused by computer monitors, televisions or lamps (especially fluorescent lamps) can influence the performance of the DrillSpotter and lead to incorrect positioning. See section 7 Technical data for information on this.

Before drilling ensure that there are no electrical cables, wiring, lines or metal objects in the drill path. Electrical cables and wires represent an electrocution hazard which can cause serious injury or death if contacted. Whenever possible shut

off electrical power in the area where you are drilling.

Make sure that you do not damage any electrical cables, water, gas pipes, phone lines, cables, etc. when drilling. Serious injury or death may occur as a result of electrocution, fire, or explosion. Pay special attention to the safety directions of the drilling equipment manufacturer when drilling to avoid damage or injury.

Remove the Transmitter and Receiver from the wall before you drill to protect the equipment. Never drill through the DrillSpotter.

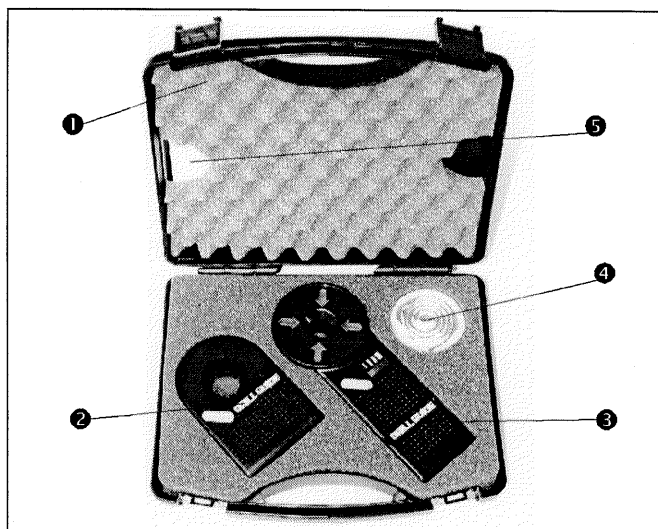
- The DrillSpotter must not be exposed to humidity or water. Treat it carefully and clean it regularly by wiping with a moist towel. The casing screws must not be removed. To change the battery see section 4.1.3. for instructions. If you plan to store the DrillSpotter, it is recommended to remove the batteries to avoid possible damage caused by leaking batteries.
- Fragile surfaces, such as wallpaper or painted walls, may be damaged by the adhesive paste. In such a case use a nail to affix the transmitter or have somebody assist you by holding it in position.
- **Caution!!!** We are not responsible for any liability for damage that may occur while drilling.

3 Product information

This chapter includes some information about the general handling of the DrillSpotter.

3.1 Contents of kit.

Figure 1
Contents



The kit contains:

1. 1 High quality PVC Foam Lined Case, (❶)
2. 1 Transmitter. (❷)
3. 1 Receiver. (❸)
4. 1 Can adhesive paste. (❹)
5. Operation manual (❺).

Please make sure that you have received everything. If not, please refer to your retailer of the DrillSpotter. In addition, you will require two 9V batteries (not included).

3.2 Assembly

Assembly is limited to taking DrillSpotter out of the plastic case (❶ figure 1) and inserting the batteries (refer to chapter 4.1.3). Now the DrillSpotter is ready for operation.

3.3 Maintenance

To ensure safe and proper operation, it is recommended to regularly clean the cases (to ensure that the adhesive paste will stick). Use only a damp piece of cloth to clean the units, as detergents and water could damage the casing and electronic components.

The maintenance is limited to changing batteries. Use only the recommended battery types. For information about how and when to change the batteries please refer to chapter 4.

3.4 Disposal

The DrillSpotter is supplied in a PVC case, well suited for transport and storage.

If the complete DrillSpotter must be disposed of after its useful life, please consider the following:

1. Batteries, transmitter and receiver are toxic waste and have to be disposed of in accordance with local, state, and federal regulations and laws!
2. The PVC foam lined case, and adhesive paste with can are recyclable.
3. This manual is normal waste paper and is recyclable.

Maintenance**Batteries**

4 Functional description

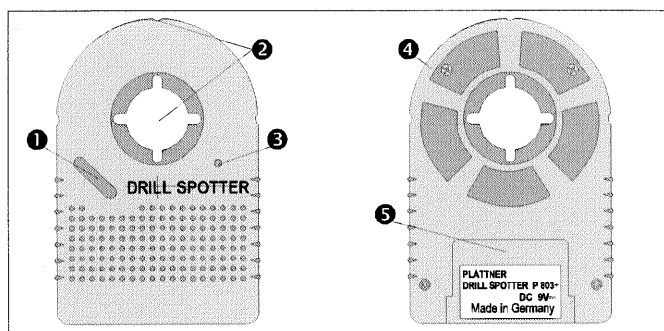
This chapter includes a detailed description of the Drill-Spotter™.

4.1 Transmitter

The transmitter generates a magnetic field when activated. This field is used by the receiver for alignment with the transmitter. Due to the frequencies and the transmission power, the operation is license-free.

4.1.1 Operating element

Figure 2
Transmitter



1. Master on- off switch (❶)
2. Marking cut-out and outer marks (❷) for aligning the transmitter with the drill mark.
3. LED (❸), flashes 1 time per second when activated
4. Rear side of the transmitter (❹)
5. Battery cover (❺)

4.1.2 Activation/ Deactivation

To switch the transmitter on press the master on/off switch (❶ in figure 2) once; the LED starts flashing 1 time per second and a beep tone is sounded once when the unit is on.

Activation

To switch the transmitter off, press the master on/off switch once again. If left on, the transmitter switches off automatically after 8 minutes.

Deactivation

Insufficient or low battery voltage is indicated by a beep tone and LED III flashing every 8 seconds (see also para 4.2.4.). Additionally every 8 seconds the transmitter turns off and on again. Please replace the battery when these signals occur for proper operation.

Battery lifetime

TIP!

Even though both devices switch off automatically, the lifetime of the battery can be considerably extended by switching off the transmitter and the receiver manually after each use.



4.1.3 Changing the battery

Open the battery case (❸ in figure 2) by using. The following procedure.

1. Turn the transmitter or receiver so that the battery cover is facing you.
2. Hold it between the thumb and the index finger with the thumb on top of the battery case.
3. Press the cover of the battery case slightly down with your thumb and pull the top in your direction. You need to apply a small amount of pressure.

Opening the battery case

Take out the battery and disconnect the contacts carefully. Insert the new battery (assure the correct positioning of the

Battery types

“+” and “-” poles) and close the battery case. Then switch the device on and off once to check its operation.

Only use high quality 9 V batteries or equivalent rechargeable batteries. Alkaline type batteries last about 5 times longer than rechargeable batteries.

4.1.4 The Transmitter as a Metal Detector

In order to detect metal within a wall or ceiling to a maximum depth of approximately 6 inches (for large iron beams or girders), or approximately 3 inches (for individual reinforcement bars, cables, metal gas, water pipe, conduit from 1/3 “ to 1-1/2” in diameter or width), or approximately 2 inches for small quantities of reinforcing bar or metal reinforcing bar grids (with minimum spacing of 4.8” between bars), as well as to avoid errors due to inaccuracies in alignment caused by large metal objects such as beams or girders, the system is equipped with an integrated metal detector, which indicates metal objects with a continuous beep tone. The system automatically calibrates during the first 3 seconds after turning the transmitter on. The metal detector works on a dynamic principle. The Transmitter has to be moved slowly over the area that is to be checked.

It is possible to detect metal reinforcing bar up to a depth of 6 inches within reinforced concrete. The structure of metal reinforcing bar can be located by sliding the transmitter slowly over the area in all directions. To ensure an accurate reading this should be carried out several times.

After measuring the wall/floor thickness it is advisable that a search for metal on the exit point side should also be carried out.

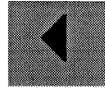
WARNING!

The DrillSpotter does not detect plastic pipe or the contents of that pipe. The DrillSpotter does not detect phone lines, cable, or electrical wiring that is not in rigid metal conduit. Always check before

drilling to make sure that these materials are not in the path of your hole.

ATTENTION!

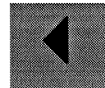
Due to the high sensitivity of the detector it is possible that a short beep tone is sounded once when placing the equipment against a damp wall.

**4.1.5 Wall mounting**

The rear side (④ in figure 2) of the transmitter must be fixed to the wall or hung under the ceiling when affixed to the wall or ceiling.

Caution!

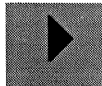
The DrillSpotter will only supply correct results if the transmitter as well as the receiver are used with the back of each facing the wall and therefore each other, and aligned exactly parallel with the wall. If this is not the case, incorrect positioning and misalignment can occur. One can of adhesive paste is included in the DrillSpotter Kit to affix the transmitter easily.

**Wall marking**

Before affixing the transmitter to the wall, you can mark the drill point on the wall with a cross, the centre of which indicates the planned exit point of the drill. The cross should have a diameter of at least 2 inches for easy alignment with the transmitter's marking cutout. (② in Figure 2).

**Adhesive
paste**

The enclosed adhesive paste is called PHP 440.01 and can be obtained at your supplier. It is non-toxic and will last for years. Small amounts are sufficient for affixing the transmitter. Used paste can be utilized repeatedly as long as it continues to adhere.

**Additional
security****WARNING!**

The adhesive paste is not suitable for children (it is **not** a toy to play with!). It does not provide complete secure adhesion! Take additional protective measures to avoid dropping the transmitter. If the surface you wish to install the transmitter on is fragile and easily damaged, choose an alternative attachment method (see next section).

When attaching the transmitter to the wall, you can hammer a nail approximately 6/10 of an inch above the drill mark into the wall and use the upper notch of the mark cut-out for hanging the transmitter. In addition, you can secure the transmitter with a string or have someone hold it in position. Make sure that the center of the marking cut out is directly aligned with the drill mark. If the transmitter must be affixed to the ceiling, press the adhesive paste with extra high pressure.

**TIP!**

When drilling through ceilings, it is often easier and more secure to place the transmitter on the upper side of the ceiling and then align and affix the receiver from below.

In order to achieve best results with the adhesive paste, it is important that all surfaces are dry and clean. If needed clean the back side of the transmitter and the wall also. Then take an approx. 1- ¼ inch strip of the paste and make three little balls out of it (diameter approx. 1/3 inch). Place the balls evenly spread on the back side of the transmitter.

Then align the transmitter with the mark cutout exactly to the drill mark and press it **even and parallel** to the wall. The more firmly you press, the better the paste adheres.

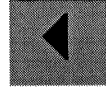
CAUTION!

Remove the paste and make fresh balls before you affix the transmitter to the wall again reusing the same paste.

For very uneven surfaces (e. g. made of natural stone), it is possible to ensure parallel alignment of the transmitter by leaning out the surface with a non-metal plate (e. g. Styrofoam, wood, or corrugated cardboard) between the transmitter and the wall or by equalizing the uneven patches with a large ball of adhesive paste.

Use of the adhesive paste

“Affix” to the wall

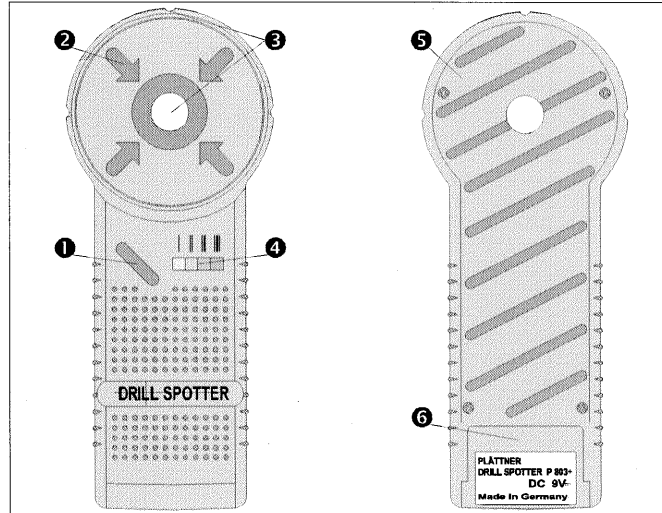


Natural stone

4.2 Receiver

The receiver detects the positioning signal of the transmitter in a circumference range of 4 feet 9 inches maximum from the transmitter. With the help of its luminous arrows it can be aligned extremely accurate with the transmitter and also allow the user to estimate the wall thickness.

Figure 3
Receiver



4.2.1 Operating elements

1. Master on/off switch (1)
2. Luminous arrows (2) for the alignment with the transmitter
3. Mark cut-out and outer marks (3), used to mark the drill hole
4. Bar display (4 LED's) (4), to measure the approximate thickness of the wall
5. Rear side of the receiver (5), (must face the wall)
6. Battery cover (6)

4.2.2 Activation/ Deactivation

Activation

To activate the receiver, press the

master on/off switch (● in figure 3) once. It beeps and the arrows light up one after the other for one revolution. Afterwards the receiver is ready for operation which is signalled by a beeping once every 8 seconds.

To deactivate the receiver, press the master on/off switch once again. It will then beep twice. In addition, the receiver will switch off automatically 3 minutes after the illumination of the arrows. If the battery voltage in the receiver is too low then LED ● flashes. Please replace the battery when this signal occurs for proper operation.

Deactivation

4.2.3 Changing the battery

Changing the battery of the receiver is done in the same way as described for the transmitter in chapter 4.1.3.

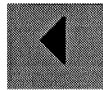
Battery lifetime

4.2.4 Alignment with the transmitter

After having affixed the transmitter to one side of the wall and switching it on, you can align the receiver on the other side of the wall. The detection range is 4 feet 9 inches maximum from the transmitter. Within this range, at least one arrow lights up and the receiver starts beeping slowly.

CAUTION!

Always position the receiver with the back facing the wall surface exactly parallel with the wall. Interference, as caused by computer monitors, TV's and special lamps (especially fluorescent lamps) can influence the receiver and lead to incorrect positioning and misalignment.

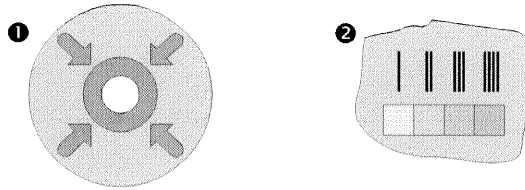


To detect and remove sources of interference, the receiver should be switched on once on site before activating the transmitter. It must show no signals and remain quiet.

If this is not the case, switch off any possible source of interference until there are no more signals. Then activate the transmitter and start measuring.

Excluding sources of interference

Figure 4
Positioning
displays



Following the luminous arrows

Once in approximate alignment with the transmitter as indicated by one or more arrows illuminating, guide the DrillSpotter into the direction the arrows point to (see ❶ figure 4). The closer the receiver is aligned to the transmitter, the faster it will beep. If you move it too far, the illuminated arrows will point in the opposite direction.

Wall thickness display

The LED bar has two functions. The complete package **LED I to IIII** are there to estimate the thickness of the wall and proper length of the drill. When approaching correct alignment with the position of the transmitter, the beep stops and the wall thickness is displayed (❷ in figure 4). No display means that you are closer than 10 inches to the transmitter. If one LED is illuminated, this indicates a distance of 10 inches. Each additional LED represents another 10 inches, i. e. one complete bar of LED's signals a wall thickness of at least 40 inches.

The **LED III** flashes when:

- the transmitter is not turned on or separated by more than 4 feet 8 inches from the receiver.
- the transmitter has automatically turned off after 8 min or the battery voltage is too low for proper operation
- the transmitter battery capacity is running low
- the LED flashes every 8 seconds as a warning that
- the transmitter is defective.

The **LED IIII** flashes when the receiver battery capacity is running low.

The exact and correctly aligned position is located when the beeping has stopped and the wall thickness is displayed. The wall thickness will only be displayed if the wall is at least 10" thick. Alignment is indicated when all 4 arrows are either fully illuminated or equally flickering. Next, make sure that you are holding the receiver exactly parallel to the wall and mark the drill hole in the center of the marking cut out. Now it is possible to pre-drill or drill the hole.

For a higher accuracy level you can switch the receiver to precision mode by using the following procedures.

When all 4 arrows are illuminated while carrying out a measurement press the on switch.

When the arrows are lighting rotationally after switching the receiver on, press the on switch twice again.

With a small circular movement reposition the receiver until all 4 arrows flicker.

The exact position

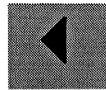
Variation 1

Variation 2

Limitations

CAUTION!

Some limitations apply to the use of the Drill-Spotter:



The thickness of heavily reinforced concrete cannot be measured correctly, and the maximum range of the Drill-Spotter will decrease. See chapter 7 technical data for information on this. In walls in which iron supports are located within the measuring range the function of the DrillSpotter is limited.

If the surface of the wall is very uneven (e. g. natural stone) you can hold a non-metal plate under the receiver for exact parallel alignment with the wall (see section 4.1.4).

After marking the drilling position remove the transmitter and receiver and you may start drilling. Proper and straight drilling procedures are the responsibility of the user.

Reinforced concrete

Natural stone walls etc.

Get ready to drill



CAUTION!

Remove the Transmitter and Receiver from the wall before you drill to protect the equipment. Never drill through the DrillSpotter.

Before drilling ensure that there are no electrical cables, phone lines, pipes, cables, or other metal objects in the drill path. Electrical cables and wires represent an electrocution hazard which can cause serious injury or death if contacted. Whenever possible shut off electrical power in the area where you are drilling.

Make sure that you do not damage any electrical cables, water or gas pipes etc. when drilling. Serious injury or death may occur as a result of electrocution, fire, or explosion. Pay special attention to the safety directions of the drilling equipment manufacturer when drilling to avoid damage or injury.

5 Troubleshooting guide

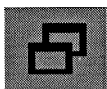
If your DrillSpotter does not operate correctly use the following table to determine whether you can correct the problem yourself. If not, please contact your retailer.

WARNING!

Never open the casing of the DrillSpotter.



Problem	Possible cause	Possible solution
The receiver is activated but does not receive any signal.	You have allowed 8 minutes to pass and the transmitter has switched off automatically, or its battery is low.	Switch on the transmitter or change the battery.
The transmitter switches off after a short while or does not switch on at all.	Low battery	Change the transmitter battery.
The receiver switches off after a short while or does not switch on properly	Low battery	Change the receiver battery.
The luminous arrows flicker erratically	Low battery, damaged receiver sensor, or interference caused by computer monitors.	Change the battery, ensure that any sources of interference are deactivated or removed.
Adhesive paste does not adhere	The paste has been used too often, or the surfaces are not clean.	Use a new piece of adhesive paste, and clean the mating surfaces.



6 Tips for Use

Useful application Tips for Use...

Examples

In addition to the applications mentioned in chapter 1, there are many other possible uses for your DrillSpotter.

- **You do not like drilling over head,** because it is physically exhausting and the drilling equipment can be clogged by the falling debris. ➔ Use the DrillSpotter to determine the correct spot for the drill hole on the upper surface of the ceiling and drill the hole from above.

- **Estimating the thickness of walls, wooden pillars etc.**

➔ Use a yardstick along with the DrillSpotter. Align the DrillSpotter transmitter and receiver with the respective wall and hold the yardstick right next to the receiver. Now move the DrillSpotter receiver away from the wall along the yardstick until the next distance LED lights up. Subtract the distance indicated on the yardstick from the value shown by the LED's (10,20,30,40, inches). The result equals the approximate thickness of the wall. (note deletion) Inaccuracies of up to 8/10 of an inch per 40 inches of wall thickness are possible. Large metal beams or girders within the area of the wall being measured will influence and invalidate results. See chapter 7, technical data for information on this

- **When drilling through external walls,** frequently plaster is damaged when drilling from the inside to the outside, or tiles or panels are hit and damaged with the drill when drilling from the outside to the inside.

➔ Use the DrillSpotter to mark the entry point to start the drilling process on the side that is best for avoiding damage to the surface. In special cases (if you have difficult or fragile material on

both sides of the wall), an experienced craftsman can - because of the accuracy of the DrillSpotter - start drilling from both sides and then finish the drilling through the remaining center part of the wall. If the wall is made of natural stone, the DrillSpotter can locate a gap between bricks or stones to drill through without damaging the brick front.

- **You need to measure the levels of 2 adjacent rooms (i.e. to install a door or window)** and wish to know what the levels of the adjacent rooms in regard to each other.

➡ Attach the transmitter of the DrillSpotter at the measured level to the wall separating the two rooms and align the receiver with the transmitter from the other side. This process allows you to compare the level of two rooms that are separated by a solid wall.

We hope that we were able to point out how the DrillSpotter can facilitate various daily tasks for the craftsman and save you time and money. Now you are able to enjoy the complete range of advantages offered by the state-of-the-art **DrillSpotter™**.

7 Technical data

This chapter includes a list of the important technical data of the DrillSpotter.

	Transmitter	Receiver
Dimensions (W x H x T)	3.15x 4.7x 1.2 inches	3.15x 7.8x 1.2 inches
Weight including battery approximately	5 ounces approx.	6.7 ounces
Transmission frequencies	4.096 kHz and 65.5 KHz	—
Transmission power	maximum. 10 mW	—
Automatic deactivation after	8 minutes	3 minutes after the last flashing of a luminous arrow
Protection	IP 53	
Working temperature	17 to 121 degrees Fahrenheit	
Power supply	high quality 9V battery or rechargeable battery	
Measurement	40 inches maximum	
Measurement accuracy of the positional information	Drilling point	Wall thickness display
	For proper use of the equipment see para. 4.2.4	
Walls and ceilings of all types of material with out metallic content	Less than 1/12 of an inch for every 8 inches of wall thickness	When the LED's are lit 10/20/30/40 inches +5% -10%

Reinforced cement	Less than 1/6 of an inch for every 8 inches of wall thickness	--- +10% -20%
Measurements within the close vicinity of large metallic objects and metal girders	Less than 6/10 of an inch for every 8 inches of wall thickness (it is forbidden to drill through iron beams)	--- +20% -20%
Search depth for the dynamic metal detector	Up to 6 inches for iron girders and large metallic objects Up to 3.3 inches for individual steel piping or bars and reinforcements from 1/3" to 1-1/2" in diameter or width. Up to 2 inches to locate individual bars in reinforcing bar grids with minimum spacing of 4.8 inches between bars.	

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