RADIODETECTION®

RD5100™S

Multifunction precision cable and pipe locator

User Guide
Bedienungsanleitung
Gebruikershandleiding
Guide d'utilisation
用户指南

PART NO. 90/UG111INT/02

SPX®

Preface

About this guide

CAUTION: This guide provides basic operating instructions for the RD5100S locator. It also contains important safety information and guidelines and as such should be read in its entirety before attempting to operate the RD5100S locator.

This guide is intended as a quick reference guide only. For detailed instructions, including the use of accessories, please refer to the RD5100S locator operation manual, which is available for download from: **www.radiodetection.com**

Certificates of conformity for the RD5100S locator can be found at: **www.radiodetection.com**

⚠ WARNING: Direct connection to live conductors is POTENTIALLY LETHAL. Direct connections to live conductors should be attempted by fully qualified personnel only using the relevant products that allow connections to energized lines.

⚠ WARNING: The optional transmitter is capable of outputting potentially lethal voltages. Take care when applying signals to any pipe or cable and be sure to notify other technicians who may be working on the line.

⚠ WARNING: Risk of Hearing Loss. The locator emits noise levels which can cause partial or total hearing loss. When using headphones these must have an independent volume control. Set the volume level to its lowest value before donning the headphones.

⚠ WARNING: This equipment is NOT approved for use in areas where hazardous gases may be present.

⚠ WARNING: When using the optional transmitter, switch off the unit and disconnect cables before removing the battery pack.

⚠ WARNING: Batteries can get hot after prolonged use at full output power. Take care while replacing or handling batteries.

3 Year Extended Warranty

The RD5100S locator is covered by a 1 year warranty as standard. Customers can extend their warranty period to a total of 3 years by registering their products within 3 months of purchase.

Visit **https://portal.radiodetection.com/** to create your company portal account, and use the Product page to register your locator or transmitter.

Information on how to create a company account can be obtained from: **https://support.radiodetection.com**

From time to time Radiodetection may release new software to improve the performance or add new functionality to its products. By registering, users will benefit from email alerts advising about new software and special offers related to its product range.

Users can opt-out at any time from receiving software and technical notifications, or just from receiving marketing material by contacting Radiodetection.

eCert

The RD5100S locator is safety equipment which should be regularly checked to ensure its correct operation.

eCert[1] provides a thorough test of the RD5100S's locating circuitry, and supplies a Radiodetection Calibration Certificate when a positive test result is obtained.

Refer to the RD5100 Manager[1] operation manual for further details. Additional purchase may be required.

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1 Contact Radiodetection for eCert and RD5100 Manager availability.

RD5100S locator

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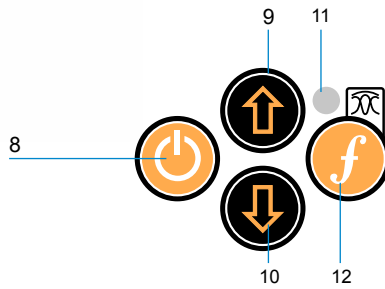
Locator features

1. Keypad.
2. LCD with auto backlight.
3. Speaker.
4. Battery compartment.
   (Optional Lithium-Ion battery pack).
5. Accessory connector (Not used).
6. Headphone connector.
7. Mini USB-B port
   (inside battery compartment).

Locator keypad

8. Power key.
9. Up arrow key.
10. Down arrow key.
11. Backlight sensor.
12. Frequency key.

Locator screen icons

13. Signal strength bargraph with peak marker.
14. Signal strength readout.
15. Proportional Guidance arrows.
16. Battery level.
17. Sensitivity readout.
18. Frequency readout.
19. Sonde icon: Indicates that a sonde signal source is selected.
20. Compass: Shows the orientation of the located sonde relative to the locator.
21. Antenna mode icon:
    Indicates antenna mode selection:
    Guidance / Peak+.
22. Line icon: Indicates that a line signal source is selected.
23. Depth readout, metric or imperial (configuration dependent).
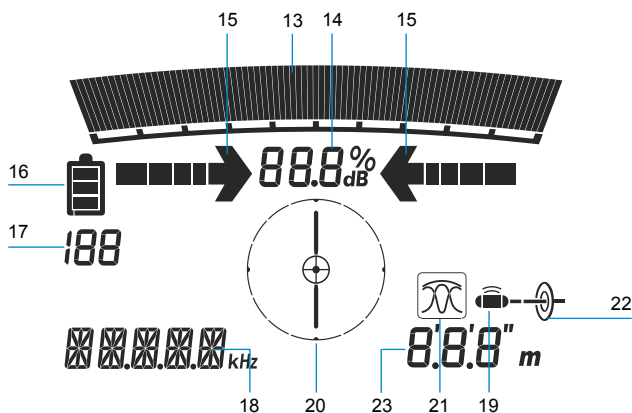
Keypad actions and shortcuts

Switch the locator on by pressing the power ⏻ key. Once powered up, the keys function as follows:

Locator keys

KEY	● SHORT PRESS	▭ LONG PRESS
⏻	–	Switch power off
𝑓	Switch sonde frequency (options include: 512Hz[i] / 640Hz[i], 8kHz and 33kHz)	Switch between Guidance and Peak+ with guidance arrows
⬆	Set gain to mid position and increases gain in 1dB increments in Peak+ mode.	Rapidly increases gain in 1dB increments in Peak+ mode.
⬇	Set gain to mid position and decreases gain in 1dB increments in Peak+ mode.	Rapidly decreases gain in 1dB increments in Peak+ mode.

Note. [i]Configuration dependent.

Tip. Gain values set for each sonde frequency are stored internally and available when the unit is powered on.

Before you begin

IMPORTANT
This guide is intended to be a quick reference guide. We recommend you read the full operation manual before you attempt to operate the RD5100S locator.

First use

The RD5100S locator can be powered by D-cell alkaline batteries, D-cell NiMH batteries, or by an accessory Lithium-Ion (Li-Ion) battery pack.

To fit the D cell batteries in the locator, open the battery compartment and insert two D-Cell Alkaline or NiMH batteries, taking care to align the positive (+) and negative (-) terminals as indicated.

Rechargeable battery packs

Lithium-Ion battery packs are available for the locator, providing superior performance over traditional alkaline batteries. To fit these rechargeable packs, follow the instructions provided with each pack.

Checking the system software version and last calibration date

To check which version of software is running on your locator and the date of the last calibration, press and hold the ⓕ key when switching the locator on. This information may be asked for when contacting Radiodetection or your local representative for technical support.

System setup

Regional and operational requirements are factory configured, no set-up is required.

Locating pipes with a sonde

For more detailed descriptions of using the locator, and for detailed sonde locate techniques, refer to the RD5100S Operation Manual.

Make sure the sonde frequency matches the selected locator sonde frequency.

Note: The 'blade' of the locator must be in-line with the central axis of the sonde.
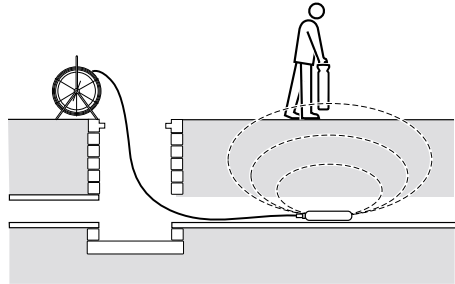
A new battery or a freshly recharged battery should be used at the beginning of each day and preferably at the start of a job. Check that the locator and sonde are working correctly.

A quick test for both sonde and locator is to position the sonde at ground level at a distance equal to its rated depth range from the locator. Point the locator at the sonde with its blade in-line with the sonde, and check that the bar graph on the locator displays more than 50% with the sensitivity of the locator set to maximum.

With the sonde in place at the survey location, hold the locator vertically and directly over the sonde's estimated position. Make sure the blade is in-line with the sonde. Adjust the sensitivity (gain) of the locator to give a bar graph display reading between 60% and 80%.

A sonde radiates a peak radio frequency field from the center of its axis with weaker signal (ghost) lobes at each side. Ghost lobe identification helps to confirm the accuracy of the peak (center) position. Move the locator a little way to one side and then along the axis of the sonde iteratively forwards and backwards to detect the ghost lobes. Reduce the sensitivity of the locator until the ghost lobes are no longer detected.
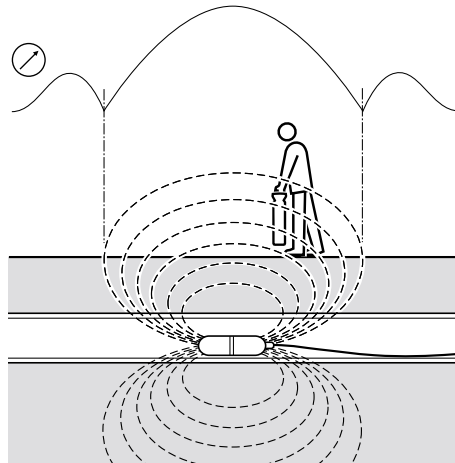
With the locator sensitivity set as desired, propel the sonde along three to four paces and stop.

Place the locator over the estimated position of the sonde:

1. Refer to Figure 1.
Move the locator backwards and forwards with the blade in-line with the sonde. Stop when the locator display indicates a clear peak response.

2. Refer to Figure 2.
Rotate the locator as if the blade were a pivot, stop when the display indicates a clear peak response.

3. Refer to Figure 3.
Move the locator from side to side until the display indicates a clear peak response.

4. Repeat Steps 1 to 3 in smaller increments with the locator blade resting on or near the ground. The locator should now be directly above the sonde with the blade in line with the sonde. Now mark the position.

5. Propel the sonde a further three to four paces along the drain or duct and pinpoint and mark. Repeat this procedure along the route at similar intervals. It should only be necessary to change the locator sensitivity while tracing the sonde if there is a change in the depth of the drain or duct, or the distance between locator and sonde.
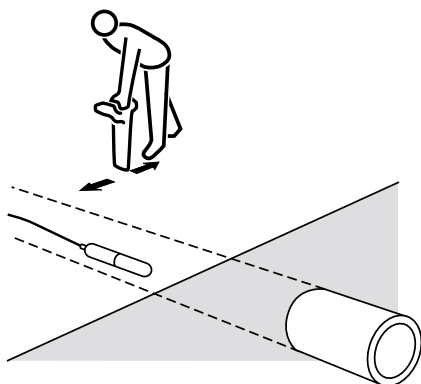
Figure 1:
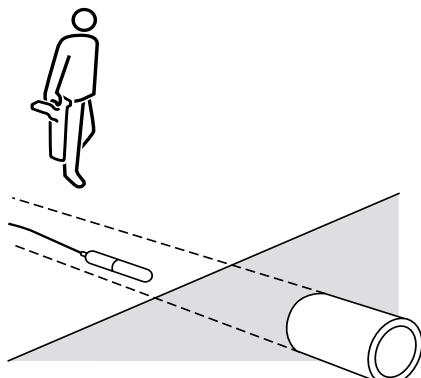
Figure 2:
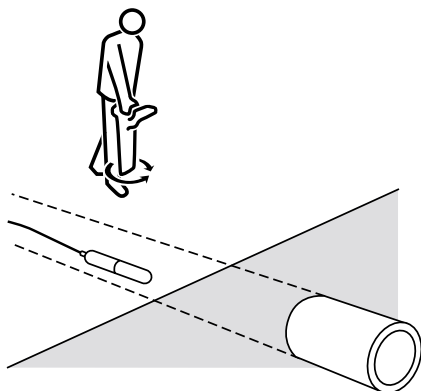
Figure 3:

Locate Modes

The RD5100S locator offers a choice of two locate modes for each sonde frequency. These are designed to maximise the effective use of sonde devices for pipe detection.

To switch between locate modes, press and hold the 🄵 key. Modes are described as follows:

GUIDANCE: Proportional arrows and a ballistic 'needle' combine with audio left/right indication for rapidly tracing the general path of a buried utility.

PEAK+: A peak bargraph provides a visual readout of the signal strength with proportional Guidance arrows for rapid line tracing.

Depth and compass readout

⚠️ WARNING: Never use the depth measurement readout as a guide for mechanical or other digging activity. Always follow safe digging guidelines.

The RD5100S locator can measure and display sonde depth and the relative orientation of a sonde to the locator. This helps you to make sure that you are following the right pipe, especially when other utilities are present.

The RD5100S locator features TruDepth™, a feature that helps you to ensure the accuracy of your locates. The depth is automatically removed from the display when the locator is at an angle of more than 7.5° from the path of the pipe being located, or when the locator determines that signal conditions are too poor for reliable measurements.

Using accessories

The RD5100S is compatible with a range of sondes and flexrods. For detailed information on using these accessories please refer to the RD5100S locator operation manual.

Sondes and Flexrods

Sondes are battery powered transmitters that are useful for tracing non-metallic pipes. They can be fixed to Flexrods to allow them to be pushed through pipes or conduits, and some are suitable for blowing through ductwork. The RD5100S can detect a range of sonde frequencies, including those transmitted by flexiprobe™ pushrod systems and flexitrax™ crawlers.

Optional transmitter

For information on using the RD5100S with an optional transmitter, please refer to a Radiodetection precision locator operation manual that covers transmitters.

Training

Radiodetection provides training services for most Radiodetection products. Our qualified instructors will train equipment operators or other personnel at your preferred location or at Radiodetection headquarters. For more information go to: **www.radiodetection.com** or contact your local Radiodetection representative.

Care and maintenance

The RD5100S locator and optional transmitter are robust, durable and weatherproof. However you can extend your equipment's life by following these care and maintenance guidelines.

General

Store the equipment in a clean and dry environment.

Ensure all terminals and connection sockets are clean, free of debris and corrosion and are undamaged.

Do not use this equipment when damaged or faulty.

Batteries and power supply

Only use the rechargeable battery packs, chargers and power supplies approved by Radiodetection.

If not using rechargeable packs, use good quality Alkaline or NiMH batteries only.

Batteries should be disposed of in accordance with your company's work practice, and / or any relevant laws or guidelines in your country.

Cleaning

⚠ WARNING: Do not attempt to clean this equipment when it is powered or connected to any power source, including batteries, adapters and live cables.

Ensure the equipment is clean and dry whenever possible.

Clean with a soft, moistened cloth. Do not use abrasive materials or chemicals as they may damage the casing, including the reflective labels. Do not use high pressure jets of water to clean the equipment.

If using this equipment in foul water systems or other areas where biological hazards may be present, use an appropriate disinfectant.

Software upgrades

From time to time, Radiodetection may release software upgrades to enhance features and improve performance of the RD5100S locator or optional transmitter. Software upgrades are free of charge and provided through a software manager Personal Computer (PC) application.

E-mail alerts and notification of new software releases are sent to all registered users.

Disassembly

Do not attempt to disassemble this equipment under any circumstances. The locator and optional transmitter contain no user serviceable parts.

Unauthorized disassembly will void the manufacturer's warranty, and may damage the equipment or reduce its performance.

Service and maintenance

Regulary check your equipment for correct operation by using eCert.

The locator and optional transmitter are designed so that they do not require regular recalibration. However, as with all safety equipment, it is recommended that they are serviced and calibrated at least once a year either at Radiodetection or an approved repair center.

NOTE: Service by non-approved service centers may void the manufacturer's warranty.

Details of Radiodetection offices and distribution partners can be found at: **www.radiodetection.com**

Radiodetection products, including this guide, are under continuous development and are subject to change without notice. Go to **www.radiodetection.com** or contact your local Radiodetection representative for the latest information regarding the RD5100S locator or any Radiodetection product.

序言

关于本指南

注意：本指南提供了 RD5100S 定位仪的基本操作说明。本指南中包含重要的安全信息和指导，在操作 RD5100S 定位仪前应完整阅读本指南。

本指南仅用作快速参考指南。有关配件使用等详细说明，请参考 RD5100S 定位仪操作手册，该手册可从以下网站下载：**www.radiodetection.com**

RD5100S 定位仪合格证书请见：**www.radiodetection.com**

⚠ 警告：和带电导体直连可能具有致命危险。与带电导体的直连仅可由具有充分资质的人员操作，并仅使用允许和通电线路连接的相关产品。

⚠ 警告：选配发射机能输出具有可致命的电压。将信号引用于管道或线缆时应注意，要确保通知可能在线路上工作的其他技术人员。

⚠ 警告：失聪风险。定位仪发出的噪声级可能导致部分或完全失聪。使用耳机时，必须能够进行独立音量控制。在戴上耳机前，将音量级设为最低值。

⚠ 警告：在可能存在有害气体的区域不得使用本设备。

⚠ 警告：在使用选配发射机时，关闭装置电源并在拆卸电池组前断开电缆。

⚠ 警告：在全功率输出下长时间使用后，电池可能变热。在更换或处理电池时要小心谨慎。

3 三年延长质保

RD5100S 定位仪的标准质保期为 1 年。顾客可以在购买产品后 3 个月内，通过产品注册将质保期延长至 3 年。

访问 **https://portal.radiodetection.com/** 创建您的公司门户网站账户，使用产品页注册定位仪或发射机。

公司账户创建方式信息可在以下网站获取：
https://support.radiodetection.com

雷迪可能不时发布新的软件，来提升这些产品的性能或增加新功能。通过产品注册，用户可获得电邮订阅提醒，了解产品相关的新软件和特别优惠及服务。
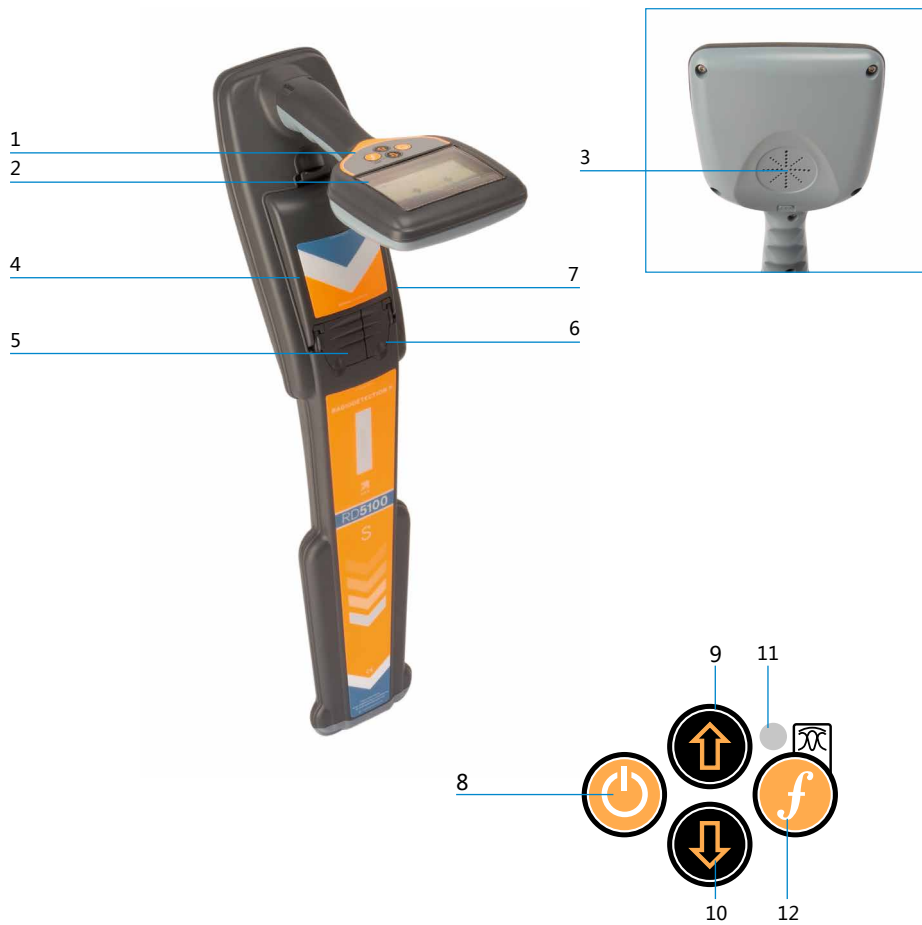
用户可以随时选择停止接收软件和技术通知，或通过联系雷迪选择停止接收营销材料。

eCert

RD5100S 定位仪是一种安全设备，应定期进行检查，确保其正常运行。

eCert[1] 可对 RD5100S 定位电路进行全面测试，如果测试结果合格，将提供雷迪标定证明。

有关更多信息，请参考 RD5100 Manager[1] 操作手册。该软件可能需要另外购买。

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1 有关 eCert 和 RD5100 管理器的可用性，请联系雷迪公司。
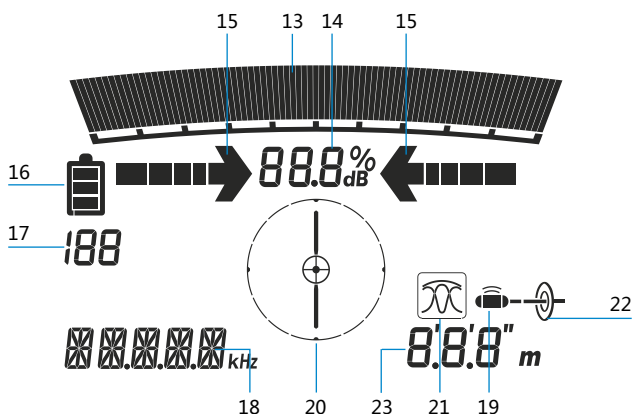
RD5100S 定位仪

定位仪特点

1. 键盘。
2. 含自动背光的 LCD 显示屏。
3. 扬声器。
4. 电池盒。
   （选配锂离子电池组）。
5. 配件连接器（未使用）。
6. 耳机连接器。
7. 迷你 USB B 型端口
   （位于电池盒内部）。

定位仪键盘

8. 电源键。
9. 向上箭头键。
10. 向下箭头键。
11. 背光传感器。
12. 频率键。

定位仪屏幕图标

13. 带峰值标识的信号强度条形图。
14. 信号强度读数。
15. 比例导向箭头。
16. 电量图标。
17. 灵敏度读数。
18. 频率读数。
19. 探头图标：表示已经选定一个探头信号源。
20. 罗盘：表示定位探头与定位仪的相对方位。
21. 天线模式图标：
    表示天线模式选择：
    导向/峰值+。
22. 管线图标：表示已经选定一个管线信号源。
23. 公制或英制深度读数（依赖于配置）。

英文

键盘操作和快捷键

按下电源 ⏻ 键，打开定位仪。通电后，按键功能如下：

定位仪按键

按键	● 短按	▬▬ 长按
⏻	–	电源关闭
⨍	切换探头频率（选择包括：512Hz[i] / 640Hz[i]、8kHz 和 33kHz）	使用导向箭头在导向和峰值+之间切换
⇧	将增益设为中间位置，在峰值+模式中以 1dB 的增量增加增益。	在峰值+模式中以 1dB 的增量快速增加增益。
⇩	将增益设为中间位置，在峰值+模式中以1dB的增量减小增益。	在峰值+模式中以 1dB 的增量快速减小增益。

注：[i]依赖于配置。

小贴士：每个探头频率所设的增益值均存储在内部，在装置接通电源时可用。

在您开始之前

首次使用

RD5100S 定位仪可由 D 型碱性电池、D 型镍氢电池或辅助锂离子（Li-Ion）电池组供电。

在定位仪中安装 D 型电池时，打开电池盒，插入两块 D 型碱性或镍氢电池，注意按照说明对齐正（＋）端和负（－）端。

可充电电池组

锂离子电池组可用于定位仪，提供优于传统碱性电池的性能。按照每个电池组所附的说明书安装这些可充电电池组。

检查系统软件版本和最后校准日期

在打开定位仪时，按住 🅕 键，即可检查定位仪上正在运行的软件版本以及最后校准日期。还可在联系雷迪或您当地的技术支持代表时询问版本信息。

系统设置

区域和操作要求已在工厂进行配置，无需设置。

英文

使用探头定位管道

有关更详细的定位仪使用说明以及探头定位技术详情，请参考 RD5100S 操作手册。

确保探头频率与所选定位仪探头频率相匹配。

注意：定位仪"叶片"必须与探头中心轴成一条直线。

应在每天开始时，最好在工作开始时使用新电池或刚充好电的电池。检查定位仪和探头是否正常运行。

探头和定位仪快速试验为：将探头放在地面上，距定位仪的距离等于其额定深度范围。使定位仪对准探头，同时其叶片与探头成一条直线，在定位仪灵敏度设为最大值时，检查定位仪上的条形图显示值是否大于 50%。

在探头位于适当测量位置时，垂直握住定位仪，使其位于探头估计位置正上方。确保叶片与探头成一条直线。调整定位仪灵敏度（增益），使条形图显示的读数在 60% 和 80% 之间。

探头从其轴中心辐射出峰值射频场，每侧有微弱的信号（假）波瓣。假波瓣识别有助于确认峰值（中心）位置的准确性。将定位仪略向一侧移动，然后沿探头轴反复前后移动，以检测假波瓣。降低定位仪灵敏度，直至检测不到假波瓣。

按需设置定位仪灵敏度后，将探头推动三至四步，然后停止。
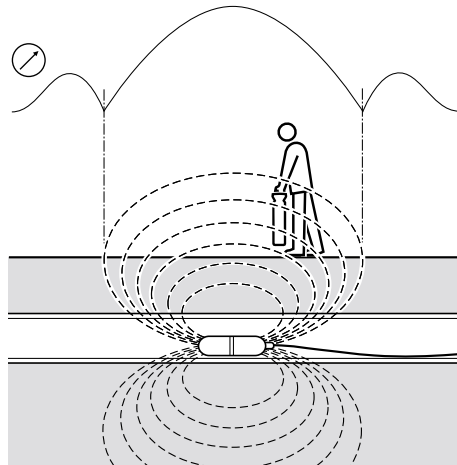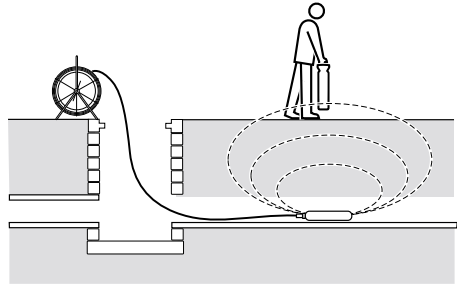
将定位仪放在探头估计位置上方。

1. 参考图 1。
   前后移动定位仪，同时叶片与探头成一条直线。在定位仪显示屏表明出现明确峰值响应时停止。

2. 参考图 2。
   旋转定位仪，如同将叶片用作枢轴，在显示屏表明出现明确峰值响应时停止。

3. 参考图 3。
   将定位仪从一侧移动到另一侧，直至显示屏表明出现明确峰值响应。

4. 以更小增量重复步骤 1 至 3，同时定位仪叶片置于或接近地面。此时，定位仪应位于探头正上方，同时叶片与探头成一条直线。现在标记位置。

5. 沿排水管或管道将探头推动三至四步，确定并标记。以相同间隔沿该路线重复这一步骤。若排水管或管道深度或者定位仪与探头之间的距离发生变化，在跟踪探头时，才需改变定位仪灵敏度。
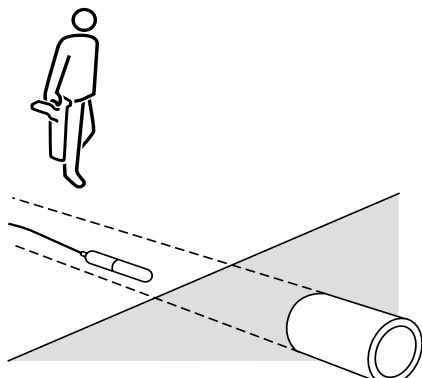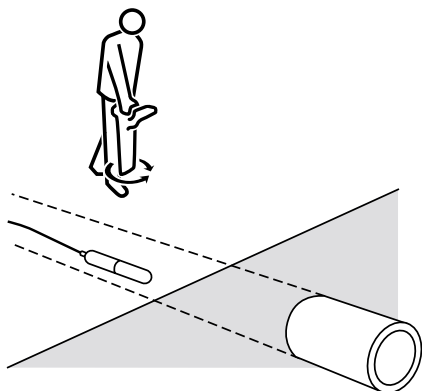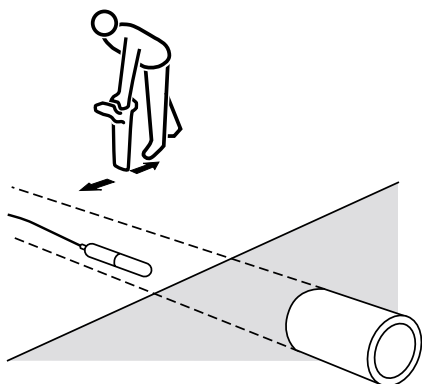
图1：

图2：

图3：

英文

定位模式

RD5100S 定位仪针对每个探头频率提供了两种定位模式选择。这些模式旨在最大程度地有效利用探头装置进行管道检测。

按住 🅵 键，即可在两种定位模式之间切换。两种模式描述如下：

导向：比例箭头和"弹道"针与音频左/右指示结合，可快速跟踪埋地公共设施的一般路径。

峰值+：峰值条形图可提供信号强度的可视读数，比例导向箭头可用于快速管线跟踪。

深度和罗盘读数

⚠️ 警告：请勿将深度测量读数用作机械或其他挖掘活动指南。始终遵循安全挖掘指南。

RD5100S 定位仪可测量和显示探头深度以及探头与定位仪的相对方位。这有助于确保顺着正确管道施工，特别是在存在其他公共设施时。

RD5100S 定位仪具有 TruDepth™ 功能，该功能有助于确保定位准确性。当定位仪与需定位的管道路径呈 7.5° 以上的角度，或定位仪测定信号状态太差，无法进行可靠测量时，显示屏会自动删除深度。

使用配件

RD5100S 与一系列探头和柔性杆均兼容。有关使用这些配件的详细信息，请参考 RD5100S 定位仪操作手册。

探头和柔性杆

探头是一种由电池供电的发射机，用于跟踪非金属管道。它们可固定在柔性杆上，从而能够将其推过管道或导管，一些则适合吹过管道系统。RD5100S 可检测一系列探头频率，包括 flexiprobe™ 推杆系统以及 flexitrax™ 爬行器发射的频率。

选配发射机

有关使用带有选配发射机 RD5100S 的信息，请参考包含发射机的雷迪精密定位仪操作手册。

培训

雷迪公司提供大部分雷迪产品的培训服务。我们具有相关资质的讲师将在贵方选择的地点或雷迪总部对设备操作员或其他人员进行培训。如需了解更多信息，请访问 **www.radiodetection.com** 或联系您当地的雷迪代表。

维护和保养

RD5100S 定位仪和选配发射机功能强大、持久耐用，并不受气候影响。但您还可以通过遵循以下维护与保养指南，来延长您设备的使用寿命。

一般

将该设备存放在清洁干燥的环境中。

确保所有终端和连接插座清洁、无污物、无腐蚀且未损坏。

当本设备受损或有故障时请勿使用。

电池和供电

仅允许使用雷迪公司批准的可充电电池组、充电器以及电源。

若未使用可充电电池组，则仅允许使用优质的碱性电池或镍氢电池。

应根据贵公司的工作规范，以及/或贵国家的相关法律或准则来处理电池。

清洁

⚠️ 警告：当本设备通电或连接到任何电源时，包括电池、适配器以及带电线缆，不要尝试清洁本设备。

尽可能确保本设备清洁、干燥。

请使用柔软湿润的布料清洁本设备。不要使用研磨材料或化学物质，因为这些物质可能损坏外壳，包括反光标签。不要使用高压水流清洗设备。

若在污水系统中或可能存在生物风险的其它区域内使用本设备，请使用恰当的消毒剂。

软件升级

雷迪公司可能会不时发布软件升级以增强功能，并提高 RD5100S 定位仪或选配发射机的性能。软件升级是免费的，且将通过软件管理器个人电脑（PC）应用程序提供。

新软件版本的电子邮件提醒和通知会发送给所有注册用户。

英文

拆卸

在任何情况下都不要试图拆卸本设备。定位仪和选配发射机不包含用户可维护零件。

未经批准的拆卸将导致制造商的质保失效，并且可能会损坏设备或降低设备性能。

维修和维护

使用 eCert 定期检查您的设备是否运转正常。

定位仪和选配发射机在设计上是无需定期标定。然而，和所有安全设备一样，建议每年至少在雷迪公司或其批准的维修中心对设备进行一次维修和校准。

注意：若由未经批准的维修中心维护，可能导致制造商的质保失效。

雷迪公司办公室和经销合作伙伴的详细信息可登录 **www.radiodetection.com** 进行查找。

雷迪公司的产品（包括本指南）均在不断的开发之中，因此会在不预先通知的情况下出作出变更。有关 RD5100S 定位仪或任何雷迪产品的最新信息，请访问 **www.radiodetection.com** 或联系您当地的雷迪公司代表。

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