



## Locator Accessories **INSTRUCTION MANUAL**

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Signal Clamp

Signal Injector

General Purpose Sonde 33kHz

General Purpose Sonde 8kHz

Metal Pipe Sondes 512Hz / 640Hz

Duct Sonde 33kHz

20m & 50m Plastic Pipe Tracers

Flexible Tracer



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## Accessory Range for Pipe & Cable Location Equipment

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## GENERAL WARNINGS (see other Accessory specific warnings)



### **ALWAYS EXCAVATE WITH CARE**

Do not use the equipment outside of the temperature range  $-10^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  ( $14^{\circ}\text{F}$  to  $122^{\circ}\text{F}$ ), as the batteries may cease to function adequately.

Do not use the equipment in areas where hazardous gases may be present.

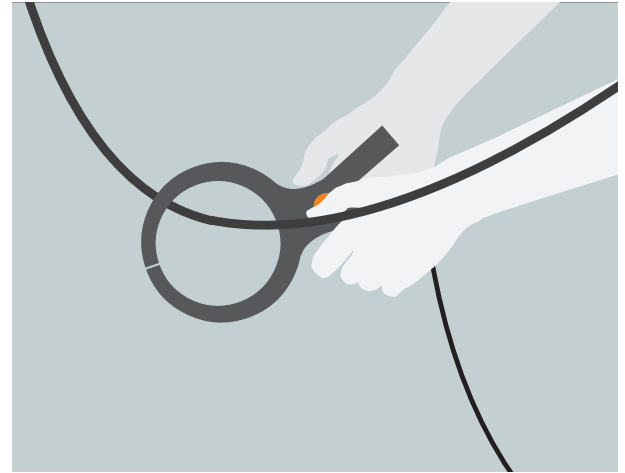
Always make sure that the Locator and Transmitter/ Sonde are set to the same frequency when used together.

Performance may be impaired by unusually strong electromagnetic fields.

## Signal Generator/ Transmitter Accessories: Signal Clamp

### Signal Clamp

1. Plug the Signal Clamp into the connection socket on the Signal Generator/ Transmitter.
2. Turn the Signal Generator/ Transmitter on and select either 8kHz, 33kHz or CF setting on the Signal Generator/ Transmitter.
3. Check that the jaws of the Signal Clamp are clean. Place the Signal Clamp AROUND the cable making sure that the jaws are able to fully close. The audible signal from the Signal Generator/ Transmitter should drop in pitch indicating that the clamp jaws have closed correctly and the response on the Signal Generator/ Transmitter display (if fitted) should increase.



**WARNING** NEVER attempt to place the Signal Clamp around electricity cables that are deliberately suspended out of reach. They may be unsheathed or unprotected cables.

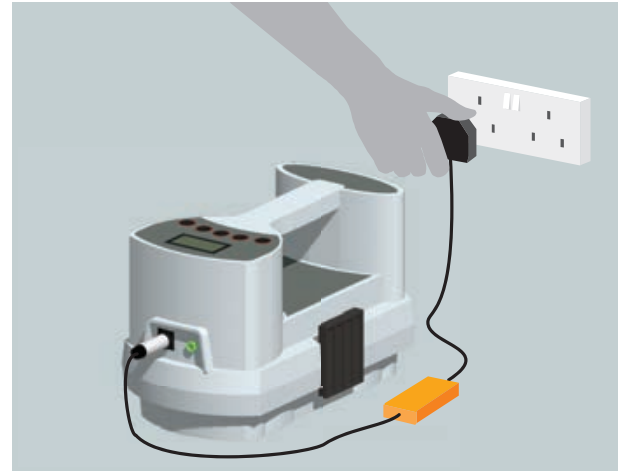


**NOTE** The Signal Clamp cannot apply a signal to a cable that is not earthed at both ends such as abandoned cables that have been cut off where they appear above ground or cables supplying unearthed equipment.

# Signal Generator/ Transmitter Accessories: Signal Injector

## Signal Injector

1. Plug the Signal Injector into the connection socket on the Signal Generator/ Transmitter and an electric outlet.
2. Turn the Signal Generator/ Transmitter on and select either 8kHz, 33kHz or CF setting on the Signal Generator/ Transmitter.
3. Turn the wall socket on. The audible tone from the Signal Generator/ Transmitter will drop in pitch to indicate a successful connection and the Signal Generator/ Transmitter display (if fitted) should go to full scale.



**NOTE** On two wire Protective Multiple Earth (PME) systems it may be necessary to also provide an external earth using the yellow 10 metre Auxiliary Earth Lead and Earth Stake.

**NOTE** Always check with the owners that it is acceptable to interrupt the supply before connecting the Signal Injector.

**NOTE** Using the Signal Injector may cause the system protection to trip.



**WARNING** DO NOT use the Signal Injector on systems with voltages in excess of 240 volts AC. Domestic systems will normally be below this voltage.

# Pipe Tracing using a Sonde

Non-metallic pipes such as sewers or drains, service ducts, plastic gas and water pipes are not electrically conductive and so will not be detectable using a Locator on Power, Radio (or All/Scan Mode if available). It is also impossible to apply a detectable Signal Generator/ Transmitter signal to the non-metallic pipe or, for that matter, to the water or gas within that pipe.

If access can be gained into these pipes then a C.Scope Sonde, Plastic Pipe Tracer or Flexible Tracer should make it possible to determine their position and route.

## Sondes

C.Scope Sondes are small, battery powered, waterproof transmitters that can be inserted into a pipe, such as a sewer, drain or cable duct. The position of the Sonde (and therefore the location of the pipe) can be pinpointed by using the Locator switched to Generator/ Transmitter Mode.

The Sonde is inserted into and then moved along the pipe to the point at which the pipe needs to be located.

This is normally done by fitting the Sonde to drain rods. Alternatively, the Sonde can be attached to a continuous fibreglass duct rod, jetter hose or camera inspection system.

- The 33kHz and 8kHz General Purpose Sondes can be used in pipes as small as 50mm (2 inches) in diameter and up to 7 metres (23 foot) deep (Locator dependent).
- The 33kHz Duct Sonde can be used in pipes as small as 30mm (1.1 inches) in diameter and up to 5 metres (16 foot) deep (Locator dependent).
- 512Hz and 640Hz Metal Pipe Sondes are able to transmit a signal from within a metal pipe. The Metal Pipe Sonde can be used in pipes as small as 50mm (2 inches) in diameter. The maximum depth the Metal Pipe Sonde can be detected will depend on the pipe material and wall thickness.



**NOTE** A 33kHz or 8kHz Sonde will NOT transmit a signal through a metal pipe.

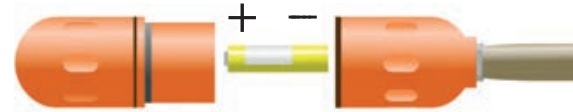
# Pipe Tracing using a Sonde: Batteries

## General Purpose Sonde and Metal Pipe Sonde

The General Purpose Sonde is supplied in two frequencies; 33kHz (orange casing) or 8kHz (green casing) and is powered by a single standard alkaline or Nickel-Metal Hydride rechargeable (NiMH) AA (LR6) size battery.

The Metal Pipe Sonde (red casing) is available in two frequencies, 512Hz and 640Hz, and is powered by a single AA (LR6) size alkaline battery. The frequency of the Sonde is indicated on the label within the battery compartment.

1. To turn the Sonde on, separate the two halves of the Sonde casing. Insert a new battery into the battery compartment with the positive end down.
2. Screw the two halves of the Sonde together being careful not to over tighten them. The Sonde is now transmitting a signal.
3. To turn the Sonde off the battery must be removed or reversed.



**NOTE** Only use alkaline or Nickel-Metal Hydride (NiMH) rechargeable AA (LR6) size batteries.

**NOTE** Dispose of the used battery safely in accordance with local regulations.

**NOTE** Always use a new battery in a Sonde if you expect to take a long time to trace the pipe or duct route.



**WARNING** The Locator frequency **MUST** always be set to the same frequency as the Sonde.



# Pipe Tracing using a Sonde: Batteries

## Duct Sonde

The Duct Sonde transmits at 33kHz only (yellow casing) and is powered by a single AAA (LR03) size alkaline battery.

1. To turn the Duct Sonde on, use a large flat bladed screwdriver to unscrew the battery cover located within the hollow end of the Sonde casing. Insert a new battery into the battery compartment with the positive end down.
2. Replace the battery cover fully using the screwdriver to secure. The Duct Sonde is now transmitting a signal.
3. To turn the Sonde off the battery must be removed.



**NOTE** Only use an alkaline battery.

**NOTE** Dispose of the used battery safely in accordance with local regulations.

**NOTE** Always use a new battery in a Sonde if you expect to take a long time to trace the pipe or duct route.



**WARNING** The Locator frequency **MUST** always be set to the same frequency as the Sonde.

## Pipe Tracing using a Sonde: Tracing a Sonde

The technique used to determine the position of a Sonde is always the same irrespective of which Sonde is being used.

Before inserting the Sonde into the pipe it is best to set up the Locator so that the Sensitivity is correctly adjusted to suit the pipe depth. This is much easier to do when the Sonde is visible at the bottom of the manhole rather than already some distance up the pipe.

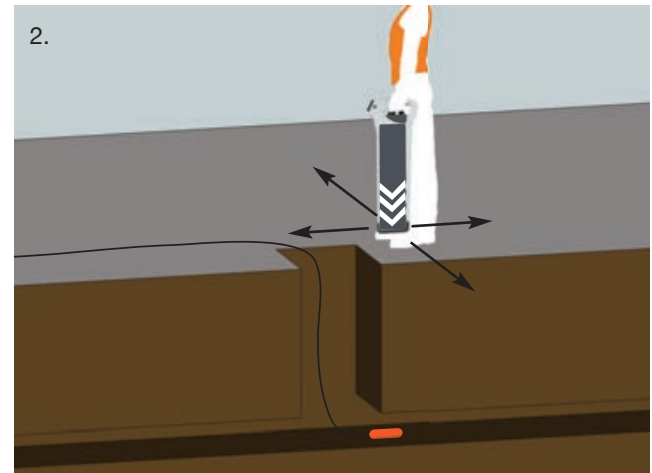
The blade of the Locator must be held IN LINE with the Sonde at all times.

1. Turn the Locator to Generator/ Transmitter Mode, switch on and select the correct frequency. Check the Battery Level Indicator to confirm the Locator batteries are usable. Replace if necessary.

2. Keeping the blade of the Locator in line with the Sonde, move the Locator **backwards and forwards** over the length of the Sonde. Adjust the Sensitivity until a clear peak response is shown on the display as the Locator passes directly over the position of the Sonde.

Still keeping the blade of the Locator in line with the Sonde, now move the Locator from **side to side** over the position of the Sonde. A similar peak response should be seen on the display as the Locator passes directly over the position of the Sonde. The Locator is now set up ready for tracing the Sonde.

3. Push the Sonde up the pipe.



**NOTE** This is at 90 degrees to the way in which the Locator is held for most other locating tasks.

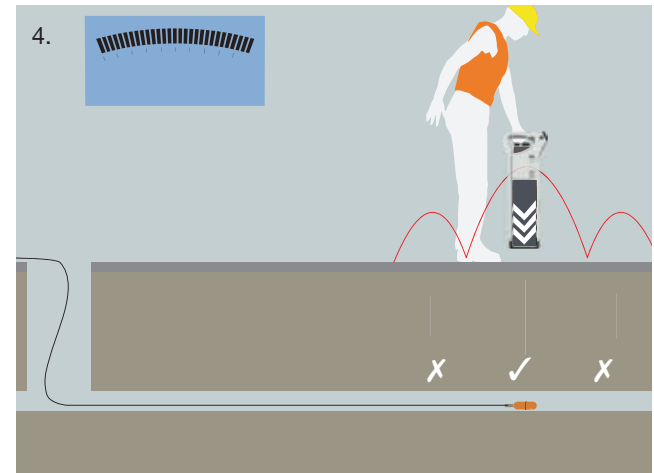
## Signal Generator/ Transmitter Accessories: Tracing a Sonde

4. With the Locator turned on, walk from the pipe access point in the direction that the Sonde was pushed. A strong peak signal directly over the Sonde should be detected with two lesser 'ghost' signals found, one in front of and one behind the Sonde's true position. These ghost signals are always weaker than the main signal and should not be mistaken for the true Sonde signal.

5. Pinpoint the Sonde's exact position by moving the Locator first backwards and forwards and then from side to side to get the peak response on both occasions.

6. Push the Sonde further up the pipe and repeat the pinpointing process.

See Page 14 for depth measurement using a Sonde.

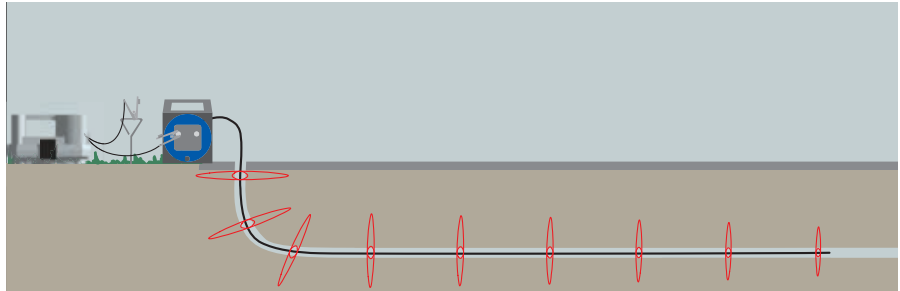


## Non-Metallic Pipe Tracing: Plastic Pipe Tracers/ Flexible Tracer

The Plastic Pipe Tracers and Flexible Tracer can be used in small diameter non-metallic pipes that normal Sondes cannot fit into. Two methods of detecting and tracing can be used: line tracing and end tracing.

For **Line Tracing**, the Plastic Pipe Tracer needs to be inserted into the pipe before a signal from the Signal Generator/ Transmitter is applied to the length of the Tracer.

The slip-ring mechanism of the Flexible Tracer allows a Signal Generator/ Transmitter to be connected before it is inserted into the pipe.



The 33kHz, CF or 131kHz Signal Generator/ Transmitter signal is applied using the 'Direct Connection to a metal pipe' method as shown in the Locator Instruction Manual. Connect the red Direct Connection Lead to the red terminal of the Plastic Pipe Tracer/ Flexible Tracer. Connect the black lead to the Earth Stake. Leave the other terminal of the Plastic Pipe Tracer/ Flexible Tracer unconnected.



**WARNING** Authorisation may be required before using the Plastic Pipe Tracer/ Flexible Tracer on some pipes or ducts.  
**WARNING** DO NOT touch the metal of the Crocodile Clips or the terminals of the Plastic Pipe Tracer/ Flexible Tracer when using the Signal Generator/ Transmitter.



**NOTE** It is important that a change of pitch is heard when making the connections to ensure that there is a detectable signal present on the Tracer.

**NOTE** The Signal Generator/ Transmitter signal is unlikely to travel the entire length of the Tracer within the pipe. Never assume that you have located the end of the Tracer on Line Tracing Mode. Use End Tracing if required.

**NOTE** The Plastic Pipe Tracer and Flexible Tracer can be used inside a metal pipe or duct but the signal will transfer onto the pipe or duct itself.

## Non-Metallic Pipe Tracing: Plastic Pipe Tracers/ Flexible Tracer

### End Tracing

The very tip of the Plastic Pipe Tracer/ Flexible Tracer can be energised with the signal from a Signal Generator/ Transmitter. It is acting much like a Sonde and offers a very reliable way of pinpointing the position of the tip. Pipes and ducts up to 4 metres (13 foot) deep can be traced (Locator dependent).



A 33kHz or CF Signal Generator/ Transmitter signal is applied by connecting the red Direct Connection Lead to the red terminal on the Tracer and the black Earth Lead to the other terminal. As the second connection is made a change of pitch should be heard from the Signal Generator/ Transmitter signal indicating successful connection.

The tip of the Plastic Pipe Tracer/ Flexible Tracer is then pinpointed using the same technique as for Sonde tracing with the Locator blade always in line with the Tracer.



**WARNING** Authorisation may be required before using the Plastic Pipe Tracer/ Flexible Tracer on some services.  
**WARNING** DO NOT touch the metal of the Crocodile Clips or the terminals of the Plastic Pipe Tracer/ Flexible Tracer when using the Signal Generator/ Transmitter.



**NOTE** It is important that a change of pitch is heard when making the connections to ensure that there is a detectable signal present on the Tracer.  
**NOTE** End Tracing is the ideal method to use to determine where the end of the pipe is but does not give the route of the pipe.  
**NOTE** The Plastic Pipe Tracers and Flexible Tracer do not work on End Tracing mode inside a metal pipe or duct.

# Depth Measurement using Sonde or Plastic Pipe Tracer/Flexible Tracer (end tracing only)



**NOTE** The following instructions apply equally to all Sondes, the Plastic Pipe Tracer and the Flexible Tracer in End Tracing Mode.

1. Pinpoint the exact position of the Sonde or Plastic Pipe Tracer/ Flexible Tracer tip. Take care to ensure that you are not over one of the two 'ghost' signals in front of and behind the true position.
2. Rest the Locator on the ground, keeping it vertical and IN LINE with the Sonde or Tracer tip.

### 3. **IMPORTANT.**

**Push the depth button TWICE and hold on the second push, to select Sonde Depth Mode.** The word 'SONDE' will flash on the display and the depth will then be displayed (see picture). If the word 'SONDE' is not displayed then the depth reading will not be accurate.



*Note. Metric version shown.*



**NOTE** The depth shown is that of the Sonde and NOT of the pipe.

## Depth Measurement: Error Readings

The Locator may show the following error codes when attempting a Depth Measurement.

1. 000 - The Sonde/Plastic Pipe Tracer/ Flexible Tracer is too shallow for the Locator to obtain an accurate depth, less than 0.20m (8 inches). Or 0.8m (31 inches) for the Cable Avoidance Tool XD and DXL3 Cable Avoidance Tool. It should be possible to calculate the depth by raising the Locator a set amount and then carrying out the Depth Measurement again.
2. 888 - The Sonde/Plastic Pipe Tracer/ Flexible Tracer is too deep for the Locator to measure its depth or there is no signal at all present.
3. L0 - The signal from the Sonde/Plastic Pipe Tracer/ Flexible Tracer is not strong enough for the Locator to give a reliable depth measurement.
4. OL - Overload. The signal from the Sonde/Plastic Pipe Tracer/ Flexible Tracer is too strong for the Locator to give a reliable depth measurement.

# General Symbols

## GENERAL SYMBOLS

**Warning** - Refer to manual.



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Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your local authority or retailer for recycling advice.  
(In the UK visit [www.recycle-more.co.uk](http://www.recycle-more.co.uk))



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Conforms to EC safety requirements.



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Tested to harmonised standards.  
Some restrictions on use in some EC countries.  
Contact Local Authorities.



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Double Insulated.



## Technical Specifications: Signal Clamp

PRODUCT NAME		SIGNAL CLAMP
Part No.		YIRC-33-8
Construction	Toroidal induction ring housed in robust plastic	Spring loaded jaws
Frequency	Tuned for optimum use with 33kHz Signal Generators/ Transmitters	
Dimensions	270 x 160 x 28 mm (10.6" x 6.3" x 1.1")	
Lead length	2 m (6'6.7")	
Compatibility	Maximum cable diameter 105 mm (4.1")	
	Suitable for use with all C.Scope Signal Generators and Transmitters	
Safety	Built to conform to BSEN61010-1:1993 and BSEN 61010-2-032:1995	
IP Rating		54





# Technical Specifications: Signal Injector

<b>PRODUCT NAME</b>	<b>SIGNAL INJECTOR</b>
Part No.	YIRIP-33-8 and YIRIP-33E
Dimensions:	
Box	100 x 50 x 25 mm (3.9" x 1.9" x 1")
Input Lead Length	1 m (3'3.3")
Output Lead Length	1.5 m (4'11")
Construction	Encapsulated, robust housing Moisture / dust resistant to IP54
Electrical Output (Mains side):	
Electrical Isolation	Class II (Double Insulated)
Maximum Voltage	250 V rms
Maximum Load	<10mA (predominantly capacitive)
Frequency range	45-65Hz
Mains Plug Connector:	
	UK, 3 pin to BS1363, load between Live and Earth (YIRIP-33-8) or 2 pin European Shuko style (YIRIP-33E)
Electrical Input (Signal Generator/ Transmitter side):	
Connector	3 pin XLR male (industry standard)
Maximum Voltage	42 V rms
Maximum Power	<250mW when driven from C.SCOPE Signal Generator/ Transmitter
Input Impedance	2000 Ohms
Frequency	32,768Hz
Safety	Built to conform to BSEN61010-1:1993 and BSEN 61010-2-032:1995



# Technical Specifications: General Purpose Sondes 8kHz/33kHz

PRODUCT NAME	33kHz GENERAL PURPOSE SONDE	
Part Numbers	YIRS-33	
Frequency	Transmits 32,768Hz	
Construction	Rugged plastic casing, stainless steel stud. Epoxy resin filled	
Colour	Orange casing for 33kHz	
Detection Depth Range	Up to 7 m (23 foot) (dependent on type of C.SCOPE Locator and site conditions)	
Dimensions	39mm diameter x 121 mm long (1.5" x 4.7")	
End fitting	M10 threaded stud Supplied with Rod Connector to fit standard drain rods with 7 T.P.I. thread	
Battery Type	Single AA, LR6 (either alkaline non-rechargeable or NiMH rechargeable)	
Battery Life	Up to 15 hours	
Approvals	EN301 489 EN300 330	
IP Rating	68	



PRODUCT NAME	8kHz GENERAL PURPOSE SONDE	
Part Numbers	YIRS-8	
Frequency	Transmits 8,192Hz	
Construction	Rugged plastic casing, stainless steel stud. Epoxy resin filled	
Colour	Green casing for 8kHz	
Detection Depth Range	Up to 7 m (23 foot) (dependent on type of C.SCOPE Locator and site conditions)	
Dimensions	39mm diameter x 121 mm long (1.5" x 4.7")	
End fitting	M10 threaded stud Supplied with Rod Connector to fit standard drain rods with 7 T.P.I. thread	
Battery Type	Single AA, LR6 (either alkaline non-rechargeable or NiMH rechargeable)	
Battery Life	Up to 15 hours	
Approvals	EN301 489 EN300 330	
IP Rating	68	



# Technical Specifications: Metal Pipe Sonde/ Duct Sonde

PRODUCT NAME	METAL PIPE SONDE
Part Numbers	YIRS-512 and YIRS-640
Frequency	Transmits 512Hz and 640Hz respectively
Detection Depth Range	Up to 5 metres (16'5") dependent on pipe material and wall thickness
Dimensions	39mm diameter x 121 mm length (1.5" x 4.7")
End fitting	M10 threaded stud supplied with 7 t.p.i. rod fitting (other adaptors are available)
Battery Type	1 x AA (IEC type LR6)
Battery Life	Up to 25 hours intermittent use at 20°C (68°F)
Approvals	EN301489 EN300 330 EAN 5060086350791
IP Rating:	68

PRODUCT NAME	DUCT SONDE 33kHz
Part No.	YIRSD-33
Construction	Waterproof, robust plastic O Ring battery compartment seal, stainless steel end fittings
Frequency	Transmits 32,768Hz continuous
Detection Depth Range	4.5m (15') dependent on type of C.SCOPE Locator and site conditions
Dimensions	24mm diameter x 200mm length (1" x 7.8")
End fitting	Standard rod thread (" Whitworth 16 T.P.I.) female connector at one end
Battery Type	1 x AAA (IEC type LR03) Alkaline
Battery Life	Up to 20 hours intermittent use at 20°C (68°F)
IP Rating	68



# Technical Specifications: Plastic Pipe Tracers

PRODUCT NAME	20M AND 50 M PLASTIC PIPE TRACER	
Part No.	YIRPPT20-33 and YIRPPT50-33	
Frequency	Operates at 32,768Hz	
Detection Depth Range:		
Line Detection	3m (10')	
Tip Detection	4m (13')	
	(dependent upon Locator and Signal Generator type and site conditions)	
Compatibility	Any Signal Generator or Transmitter with 33kHz or 33/131kHz combined output	
Rod Length	20m or 50m (65' and 160')	
Rod and Sonde Diameter	6mm (0.2")	
Rod Minimum Bend Radius	50mm (1.9")	
Construction:		
Reel	Robust plastic housing	
Rod	Flexible, chemical resistant plastic	
Reel dimensions (20m)	150 x 120 x 250mm (5.9" x 4.7" x 9.8")	
Reel dimensions (50m)	165 x 290 x 240mm (6.5" x 11.4" x 9.4")	
Reel weight (20m)	1248g (2 pound 12 ounces)	
Reel weight (50m)	2073g (4 pound 8.5 ounces)	
Operational Temperature Range	-20°C to 50°C (-4°F to 122°F)	
Storage Temperature Range	-20°C to 50°C (-4°F to 122°F)	
IP rating for actual Tracer Rod & Tip	68	
IP rating for Plastic Pipe Tracer Casing	54	



# Technical Specifications: Flexible Tracer

<b>PRODUCT NAME</b>	<b>80 M FLEXIBLE TRACER</b>
Part No.	YIRRF-80
Frequency	Optimised for 32,768Hz
Detection Depth Range:	
Line Detection	3 m (10 foot)
Tip Detection	4 m (13 foot)
	(dependent upon Locator and Signal Generator type and site conditions)
Compatibility	Any Signal Generator or Transmitter with 33kHz or 33/131kHz combined output
Rod Length	80 m (260')
Rod Diameter	5 mm nominal (0.2")
Rod Material	Quality sleeved fibreglass rod with three integral copper wires
Rod Minimum Bend Radius	10 cm (3.9") reducing to 15 cm (5.9"), 5 cm (1.9") from Tip
Rod wire diameter	0.45 mm each wire (0.018")
Transmitting Sonde Diameter	7.5 mm max. (0.3")
Tip Length	160 mm (6.3")
Tip Diameter	9mm (0.35")
Tip Material	Brass
Frame Size	58.8 x 28.8 x 48.5 cm (1'11" x 11.3" x 1'7")
Frame Material	Powder coated 16 mm steel tube (0.6")
Reel Diameter	48 cm (1'7")
Weight	7.5 kg (16 pound 8.5 ounces)
Slip ring assembly	Sealed multi-wire duplexed
Operational Temperature Range	-20°C to 50°C (-4°F to 122°F)
Storage Temperature Range	-20°C to 50°C (-4°F to 122°F)
IP rating for Tracer Rod & Tip	68
IP rating for Casing	54
IP rating for Terminal Box	66



# Maintenance

## **Maintenance**

All C.Scope accessories must be visually inspected for any signs of deterioration prior to each use. Do not use if there is any deterioration.

There are no user serviceable parts for these Accessories.

## **Handling**

All C.Scope accessories are rugged products designed for the rigours of every day use. However, to ensure that the specified performance is maintained, it is essential to treat them with care by avoiding shocks, vibration and excesses of temperature. They are not guaranteed to prevent water ingress if immersed with the exception of all Sondes.

## **Cleaning**

The equipment can be cleaned with a sponge dampened with warm water. A mild soap may be used if required. The use of solvents should be avoided.

Do not allow moisture in the battery compartments or near the connectors.

## **Storage**

The equipment should be stored in a clean and dry environment. The temperature should not exceed the range  $-10^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  ( $14^{\circ}\text{F}$  to  $122^{\circ}\text{F}$ ). If stored for long periods the batteries should be removed.

## Support Services: Training/ Servicing/ Repairs

### **Training**

This Instruction Manual is comprehensive but cannot replace expert tuition. Excellent training is available directly from C.Scope and via authorised C.Scope agents, cost effectively, at your chosen location. C.Scope recommend operators are trained before using this equipment.

### **Servicing**

Routine periodic servicing and re-calibration of your equipment is available from C.Scope and C.Scope Authorised Service Centres if required.

### **Repairs**

Before returning equipment suspected of being faulty, please check the machine carefully with a fresh set of batteries. Check the battery connections and rotate the batteries in the holder. Refer to the section in the manual on functional checks and if possible substitute known good equipment as a confirmation.

If the problem persists then contact the company from whom you purchased the equipment, or contact C.Scope indicating the nature of the fault. Advice on the best course of action can then be given.



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