

# REDNET®

**INFRARED BEAM SET TYPE RN4/10-25, RN4/25-75 & RN4/75-150**

## **INSTALLATION AND SET UP INSTRUCTIONS**

### **DESCRIPTION**

REDNET® is an external beam system that may be used for outdoor ranges between 10 and 150 metres. The electronics for the beams are supplied with 4 transmitter and 4 receiver heads pre-wired to their respective electronic control modules. The electronics can then be mounted into either free standing or wall mounted tower enclosures.

### **OPERATION**

The operating system for the beams uses sequential transmission starting from the top (A Head) and sequencing down to the bottom (D Head). Synchronisation is achieved electronically eliminating the need for synchronising cables between transmitters and receivers. All receiving heads will be in the field of view of all transmitting heads and vice versa creating 16 beam paths.

Beam sets are normally supplied pre-set to code channel number "A" and cannot be changed in the field. Other channels can be supplied to special order, but, are only used in exceptional circumstances.

Beam heads have integral heating elements to direct warm air onto the tower front covers to prevent the build up of frost. The heaters are powered via a thermostatic switch (supplied with beam sets) this switches when the temperature drops to below 15 degrees C.

The system provides three alarm responses as follows:

- 1) FAST RESPONSE of 40mSec, if two adjacent heads are blocked simultaneously.
- 2) SLOW RESPONSE, adjustable between 120mSec and 1500mSec if any one beam head is blocked.
- 3) NO RESPONSE if ANY ONE head is blocked (switch selectable).

A FAST RESPONSE is initiated only when the network is blocked by an object bigger than the distance between adjacent beam heads. (See Fig. 6)

### **OUTPUTS**

Alarm and fog outputs are via a changeover (Form C) contact. To avoid spurious operation, the fog detection circuit output is delayed by 10 seconds. To cater for all security requirements the fog detection output is adjustable.

### **MOUNTING**

Beam sets can be mounted onto the beam head brackets inside the free standing or wall mountable towers. These brackets are pre-fitted to the towers and may be adjusted vertically as required. The control modules may be fitted close to the base with the 4 heads stacked above, or, alternatively fitted between the lower two heads using the locking clips provided. (See Fig. 1A, 1B)

A tamper switch (supplied with each tower) operates when the top cover of the tower is removed. Free standing towers can be fitted with an anti-climb top tamper system type RNTT, to detect attempts to climb over the tower.

Wall mount towers must be fixed to a stable surface, such as brick, by means of suitable wall fixings.

**WARNING:** ensure that tower extrusion is not bent by bumps in the wall surface, use spacers if required. A pole mount kit RNPK (accessory) may be used for fixing to scaffold poles.

Whenever possible, use the rear hole for cable access. If the bottom end cap (with the drain holes) is to be used for cable entry, remove from tower before drilling.

Remove the control electronics covers, keeping the two screws safe and fit to the tower extrusion using the swivel locking clips. The unit may be located either between heads 'C' and 'D' or close to the bottom of the tower with the heads stacked above. The choice will depend upon the type and flatness of the ground surface. To avoid confusion when setting or re-alignment, it is recommended that both receiver and transmitter heads are fitted with 'A' at the top and 'B' - 'D' below. The signals received by head 'D' are used for fog detection and must be nearest the ground.

Ensure that all the transmitter and receiver heads are within sight of each other and that the bottom 'D' heads are not obscured by rising ground, see Fig. 1B. Locate the head cables into the cut-outs on the brackets, run any other cables behind the brackets.

When planning the system layout, ensure that the receiver heads only see their respective transmitters. Figures 1-4 illustrate preferred layouts. **It is strongly recommended that towers contain either all transmitters or all receivers as shown.**

## **ELECTRICAL CONNECTIONS**

Terminal connections are shown on the controller covers. The transmitter has 3 terminals.

H: 12VDC nominal	heater supply via thermostat
+: 12VDC nominal	transmitter supply
- : Common ground	both supply

The receiver has 10 terminals, two heater terminals located towards the top of the circuit board. The other 8 terminals are split for the fog and alarm relay and power. See Fig. 5 for connection. With heaters operating, each tower will require a total of typically 450mA. (Assume 0.5 Amp. for cable voltage drop calculations.)

## INSTALLATION

The towers must be mounted firmly. Free-standing towers should be bolted to a solid surface using the expansion bolts provided. When the free-standing towers are to be fitted into soft earth, it is essential to provide a concrete pad. Anchor plate, type RNBB (accessory) may be cast into wet concrete to provide 4 projecting studs to which the tower base may be firmly bolted.

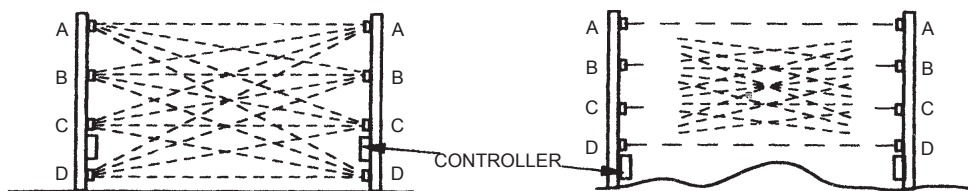


Fig. 1A

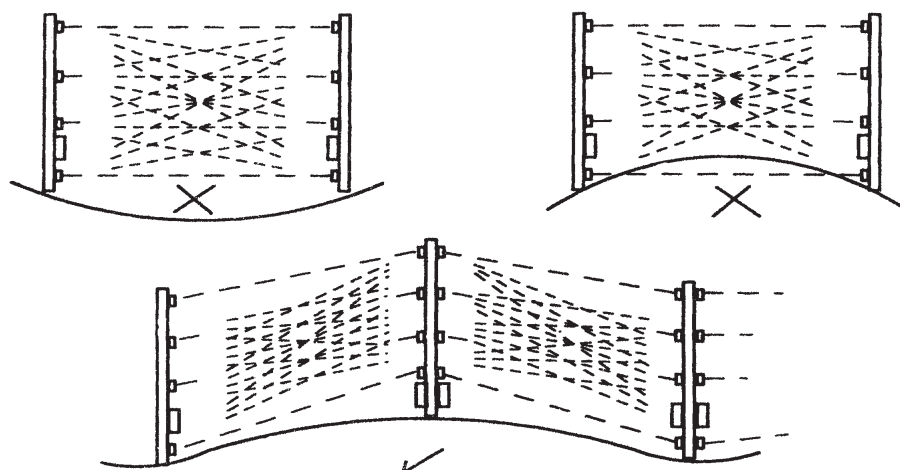


Fig. 1B

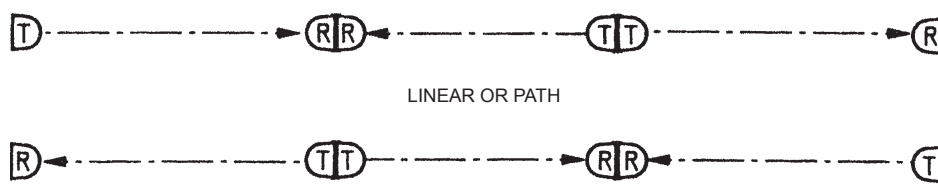


Fig. 2

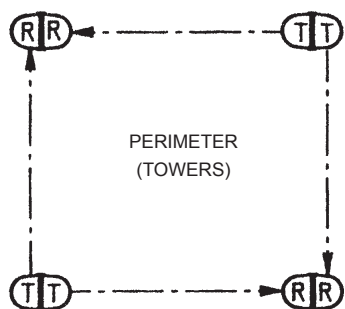


Fig. 3

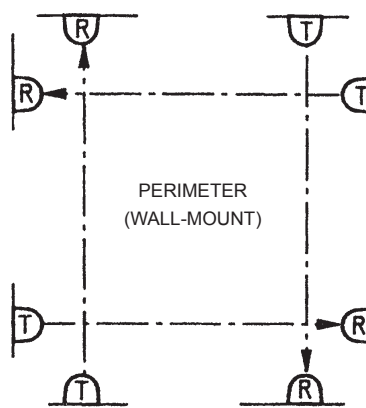


Fig. 4

## **CONTROLS AND INDICATORS**

The transmitter (Tx) control unit has a 4 way selector switch used to switch off each Tx head. These can be used during alignment if the head blanking plates, supplied, are missing. The red LED confirms power is applied to the Tx control unit.

### **WARNING: DO NOT ADJUST ANY POTS ON Tx or Rx BOARDS WITHOUT REFERENCE TO INSTRUCTIONS**

The receiver (Rx) control unit also contains a similar 4 way switch which is used to route the head signal pulse outputs to the signal strength LED, test point and fog detection circuit. The test point produces a voltage output proportional to the signal strength of the received pulses and can be used for alignment if the RN TEST (normally supplied) is not available.

The voltage at the test point varies between 0 Volt with no signal and 3.5 Volts with a strong signal.

The **REDNET®** system provides the option of controlling the single beam or small object response by means of a switch and potentiometer. (See Fig. 5)

With the switch up, "SINGLE", the response to a single head blockage or small object can be set between 120mSec and 1500mSec (1.5Sec) by means of the alarm **RESPONSE** pot.

With the switch down, "DUAL", there will be no alarm if any one head is blocked or an object enters the beam network which is smaller than the distance between two adjacent heads. (See Fig. 6)

If the blockage is bigger than the distance between two adjacent heads, then the alarm will be fast (approximately 40mSec) irrespective of the switch or pot settings.

**NOTE:** Blockage of the bottom 'D' receiver head for more than 10 seconds will activate the fog relay and LED.

The fog level pot, **FOG**, controls the point at which the fog relay operates. For most installations a midway setting is recommended. For high security installations, where only a small reduction in signal strength is acceptable, set the pot clockwise. The fog relay response is delayed by 10 seconds to avoid spurious operation.

## **ALIGNMENT PROCEDURE**

For reliable operation it is essential that the heads are accurately aligned. Although it is possible to set the system up using only the signal strength LED, it is not recommended. For trouble-free operation it is essential that the alignment viewer, the RN TEST pulse detector and the 8 head blanking plates are used and that the multi-step procedure is followed exactly.

Before any alignment is carried out, it is essential that the beam towers are rigidly fixed. Any movement will swing the beams away from the optimum alignment and may cause false alarms during bright sunlight or misty conditions.

## **RN TEST**

The RN TEST is a combination tester that includes four LED's inside the lens window for receiver alignment and a high intensity flashing light and bleeper for transmitter alignment.

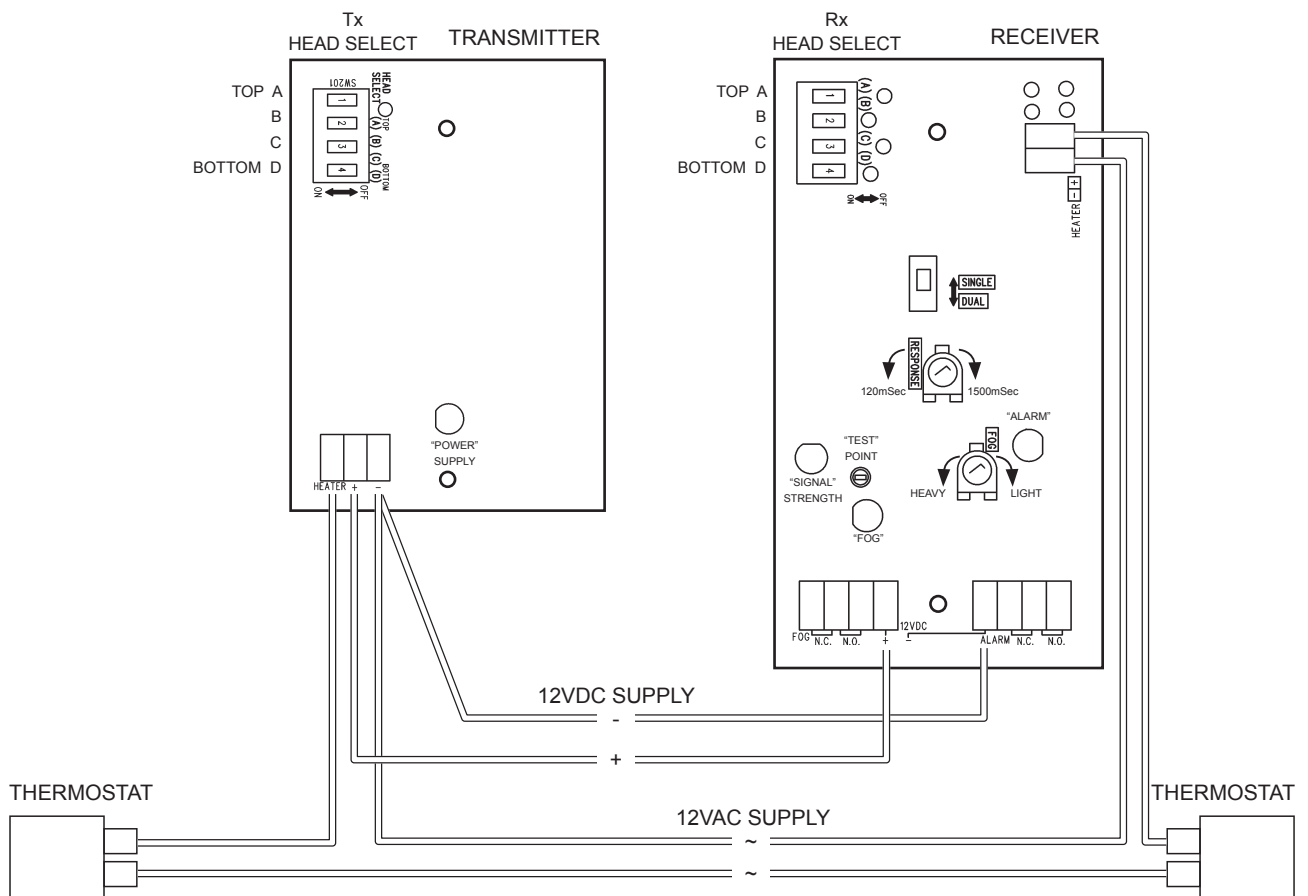


Fig. 5

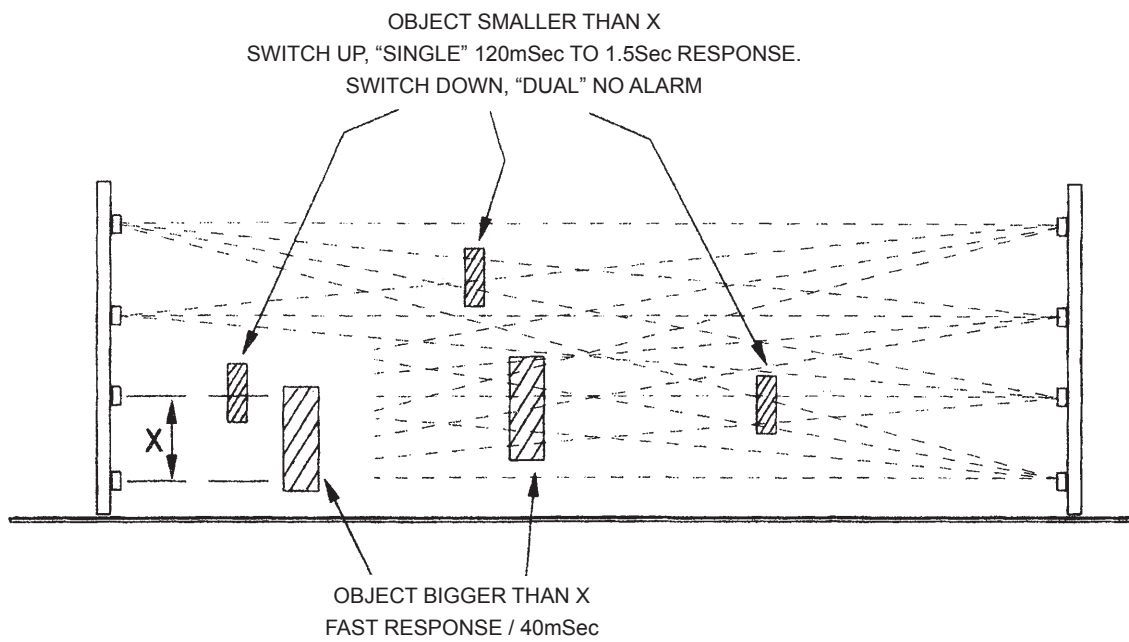


Fig. 6

## ALIGNMENT USING THE RN TEST

### At the Transmitter

- Step 1. Fit the viewer into the Tx lens holes (Fig. 8) and align all Tx heads to the centre of the Rx tower. Lightly lock the heads, but do not over tighten.
- Step 2. At the 4-way switch on the Tx board switch heads A, B & D off, (1,2 & 4 switches to the right). Switch 3 **ON** (to the left). Fit blanking plates to front of all Tx heads and leave all fully open.

### At the Receiver

- Step 3. Fit the viewer into the Rx lens holes (Fig. 8) and align all Rx heads to the centre of the Tx tower. Lightly lock the heads but do not over tighten.
- Step 4. At the 4-way switch on the Rx board deselect heads A, B & D, (1,2 & 4 switches to the left). Select 3 (to the right). Fit blanking plates to front of all Rx heads and leave all fully open. Check that the single beam response switch is in the "SINGLE" (up) position.
- Step 5. Switch the **RN TEST** tester to the flash and bleep mode (**TOGGLE UP**) and connect yellow lead to signal-strength test point. Use alignment viewer to aim **RN TEST** at the Tx tower. Adjust Rx C to give maximum flash/bleep rate. Progressively block lens with blanking plate (Fig. 10), adjusting to maintain fastest flash/bleep rate. When alignment is completed, fully open blanking plate on Rx C.

### At the Transmitter

- Step 6. Align transmitter head C to give maximum flash/bleep rate. Progressively block lens with blanking plate (Fig. 10) adjusting to maintain fastest flash/bleep rate. When fully adjusted leave blanking plate in position. When alignment is completed, fully tighten hex head bolts to lock head.
- Step 7. To align head D, switch 4 ON (to the left) and 1,2 & 3 OFF (to the right). Align as Step 6.  
To align head A, switch 1 ON (to the left) and 2,3 & 4 OFF (to the right). Align as Step 6.  
To align head B, switch 2 ON (to the left) and 1,3 & 4 OFF (to the right). Align as Step 6.  
Compare blanking plates to ensure similar levels of blanking on all heads. If unequal repeat Step 6.
- Step 8. Remove all blanking plates from Tx heads and move all Tx head switches, **ON** (1,2,3 & 4, to the left).

### At the Receiver

- Step 9. Deselect all Rx head switches, 1,2,3, & 4 (to the left) and switch **RN TEST** to pulse detect mode. (**TOGGLE DOWN**).
- Step 10. Connect pulse detector yellow lead to top head, test point (A).
- Step 11. Swivel the **RN TEST** alignment tester or remove it from its bracket so that the lens faces you and observe the 4 LED's. If they are flickering, carefully adjust head A until there are four solid LED's. If one or more LED's are out, check for beam blockage or re-align the transmitters. Progressively block lens with blanking plate adjusting to maintain four solid LED's. When maximum achieved, fully tighten hex head bolts to lock head.

Step 12. To align head B, connect pulse detector yellow lead to head test point (B). Align as per Step 11.  
 To align head C, connect pulse detector yellow lead to head test point (C). Align as per Step 11.  
 To align head D, connect pulse detector yellow lead to head test point (D). Align as per Step 11.  
 Compare blanking plates to ensure similar levels of blanking on all heads. If unequal repeat Step 11.

**Alarm LED should now be off.**

Remove all blanking plates and check for correct operation.

### **ENSURE ALL FOUR RECEIVER SWITCHES ARE TO THE LEFT (DESELECT)**

Remove and disconnect the alignment head clip and leads.

The complete system should be working. The signal strength LED should be lit and the alarm relay energised with the alarm and fog LED's out.

Blocking any one head should produce a SLOW RESPONSE alarm, blocking any two adjacent heads should give a FAST RESPONSE alarm. Refer to the main installation instructions for response and fog level setting details.

**Handle the alignment head with care, it contains fragile optical components.**

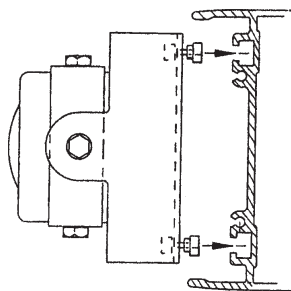


Fig. 7 FIXING FOR RN TEST

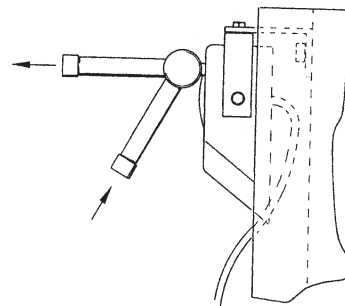


Fig. 8 VIEWER OPERATION

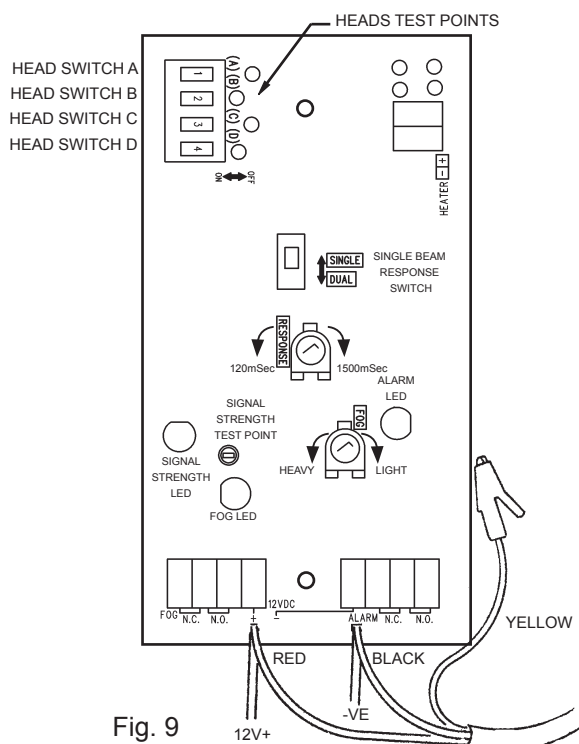


Fig. 9

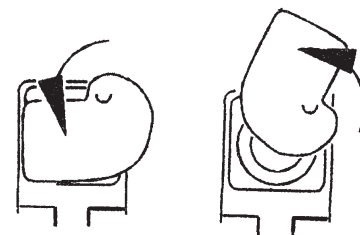


Fig. 10 BLANKING PLATE OPERATION

## MAINTENANCE

Periodically remove the acrylic covers. Remove any dirt, BY WASHING, not by dry rubbing or scraping since this may scratch the polished surfaces and reduce performance margins.

Inspect the head lenses for insects, taking care not to move the heads. Remove the receiver control box lid and check for insects, corrosion or water ingress. Check signal level by observing the signal level LED or by connecting a meter to the test terminal. If the system produces un-explained activities, check the ground and adjacent area for excessive grass or foliage growth. Always re-check the alignment using the procedure here. Do not try to re-align individual heads without using the RN TEST. Always follow the procedure.

Before replacing covers, check that wall mount back extrusion is still firmly fixed. (Some wall fixings may become loose with time.)

SPECIFICATIONS				
Model		RN4/10-25	RN4/25-75	RN4/75-150
Range		10-25m	25-75m	75-150m
Power Input		11-15VDC		
Current Draw	Transmitter	40mA (max) at 12VDC		
	Receiver	60mA (max) at 12VDC		
Power Input (Heater)		10-15VAC/DC		
Current Draw (Heater)	Transmitter	400mA nominal (450mA (max)) at 12VDC		
	Receiver	400mA nominal (450mA (max)) at 12VDC		
Synchronisation		no synchronisation wiring required		
Operating Temperature		-25 to +60 °C		
Heating System		Integral thermostat below +15 deg. C.		
User Controls		SINGLE BEAM RESPONSE SWITCH		SINGLE / DUAL
		RESPONSE CONTROL POTENTIOMETER		120mSec - 1500mSec
		FOG LEVEL CONTROL POTENTIOMETER		LIGHT - HEAVY
		(Other controls factory sealed)		
System Alarm Response (Interruption Period)		1) 40mSec any 2 blocked. 2) 120mSec to 1,500mSec any 1 blocked. 3) No alarm, any 1 blocked.		
Alarm Output		Form C (change-over) relay contacts. 24VDC 1A		
Fog Output		Form C relay contacts. 24VDC 1A		
Indication		Signal strength, alarm & fog LEDs.		
Tamper Switch		N.C opens when tower cover removed 28VDC 0.1A		
Accessories Supplied		Reflex viewer, locking spanner, blanking plates (8) and RN TEST.		

## ACCESSORIES

RNT175	Free-standing tower
RNW175	Wall mount tower
RNBB	Base Bracket for RNT175
RNTT	Anti-Climb Top Tamper for RNT175
RNTEST	Rednet Electronic Alignment Tester
RNPK	Pole Mount Bracket for RNW175(48mm dia)
IR2000 B8/L	Replacement Acrylic Cover

### NOTE

These units are designed to detect movement of an intruder and activate an alarm control panel. Being only part of a complete alarm system, we cannot accept responsibility for any damages or other consequences resulting from an intrusion. These products conform to the EMC Directive 89/336 EEC.



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