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RISCO RK66S High Security Seismic Detector Instruction Manual

RISCO
A LIFETIME OF SECURITY
SEISMIC DETECTOR

MODEL: RK66S
INSTALLATION INSTRUCTIONS

Contents

INTRODUCTION

The RISCO Seismic Detector is used for the protection against break-in attempts of vaults, safes, reinforced concrete walls, steel armored cabinets and doors. The seismic detector monitors the vibration and temperature of a specific surface and will react to all known types of intruder attacks, such as sledge hammers, diamond head drills, explosives, hydraulic pressure tools and thermal tools. The detector can operate both as a regular relay detector connected to any control panel, or as a BUS accessory when connected to RISCO Group's control panels via the RS485 BUS, empowering it with unique remote control and diagnostic capabilities.

The instructions set forth below describe the RISCO seismic detector in Stand Alone & BUS mode. For BUS installation programming, see RISCO System installation manuals

Main Features:

- Piezo sensor
- Low/High temperature detection
- Detection range up to 5 meters (16 feet) radius
- Tamper protection
- Anti drilling shield
- Remote sensitivity control
- Analogue signal output
- Bar graph LED indicator
- Remote self test
- Stand-alone or RISCO BUS connection

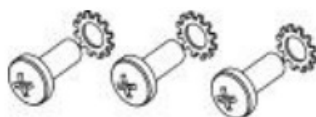## INSTALLATION KIT

Each kit includes:
Wall structure fastening sets:

Expanding plugs M6 x 16
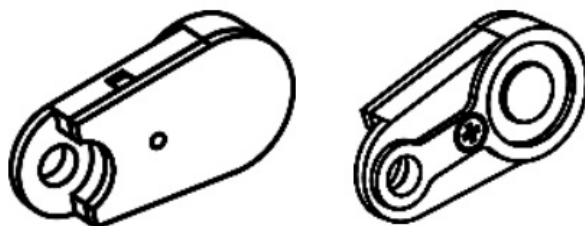Flat head machining screw M6 X 16

Metallic structure fastening sets:

Inner Tooth Washer M4
Pan Head Machining Screw M4 X 10

External Test Generator

Detector
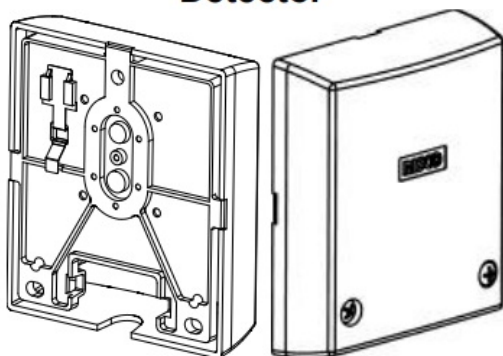
Mounting Plate
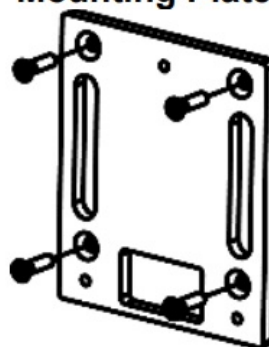
(Mandatory
for surfaces
like concrete)

LD1	
LD2	
LD3	Tamper EOL
LD4	J15 — 4
LD5	
LD6	
LD7	Alarm EOL
LD8	J13
LD9	— 5

1

SW1 SW2 SW3 SW4   SW5 SW6 SW7 SW8   SW9 SW10 SW11 SW12

2

S.A.Bus
J12 — 6

— 7

Ext. Test
J2 — 8

3

— 9   (not visible)

+12V-   YEL GRN NO   C   NC TAMPER SENS A.OUT TEST
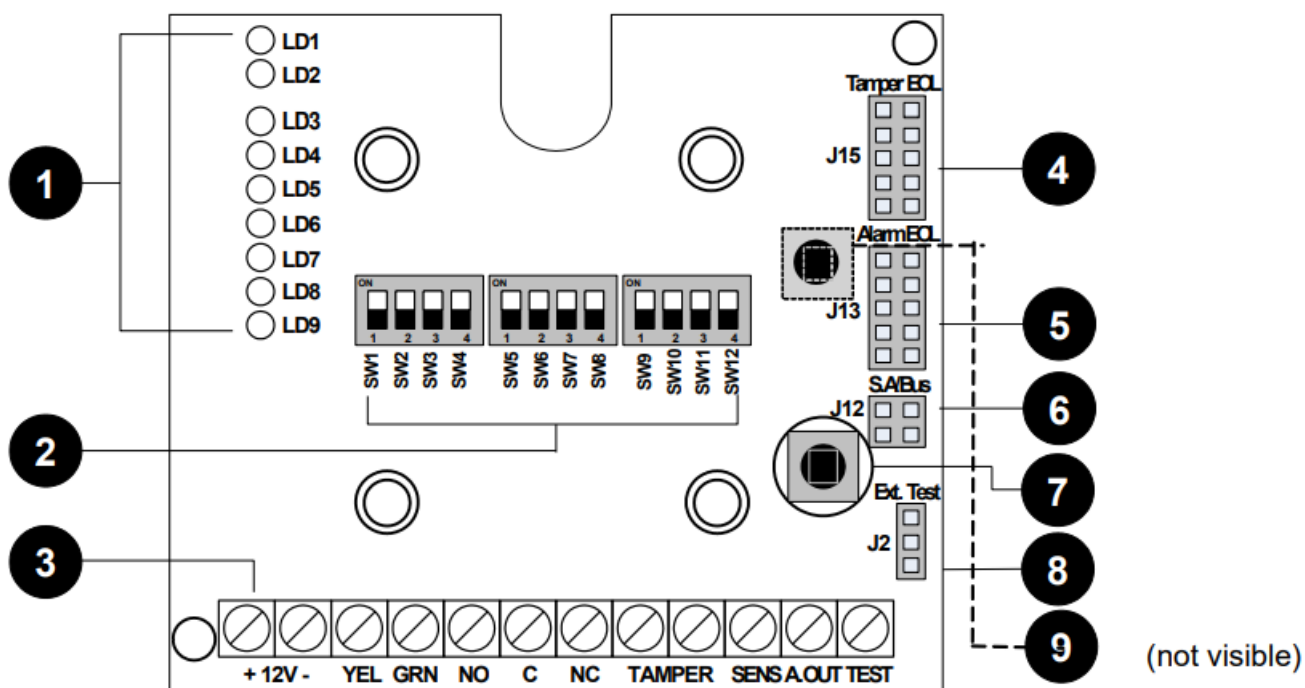
1	Bar Graph LEDs	2	Dipswitches (default state)	3	Terminal Blocks
4	Tamper EOL Jumper	5	Alarm EOL Jumper	6	Stand Alone/BUS Jumper
7	Tamper (Front))	8	External Test Generator Connector	9	Tamper (Back)

MOUNTING THE DETECTOR

- Determine the mounting position. Potential false alarm sources must be accounted for when installing RK66S, Therefore:
- Attach the sensor to a surface as isolated as possible from extraneous vibrations, with close contact between the concrete surface and the detector. For metallic surfaces, remove residual paint from sensor installation site. Do not use silicon grease between sensor and object!
- For maximum vibration detection, the concrete surface should be smooth. Use the mounting plate (see Figure 2) when mounting on drill-resistant steel, brick or concrete surfaces. The plate can also be welded onto metallic surfaces.
- Adjust dipswitch settings for sensitivity; time and other parameters (see Dipswitch settings, below) for background vibration – bearing in mind the inverse relation between detection range and sensitivity and the construction material of the object to be monitored. Detectors with high sensitivity can be spaced up to 5m apart on secure protected surfaces (for example, steel), confirmed by hammer or scratch tests.
- Hinged doors, such as those on safes or ATM, and other attachments without continuous acoustic transmission paths, should be protected with their own detectors.
- Remove the cover fixing screws to separate the cover from the base, see Figure 1(A) / 2(B).
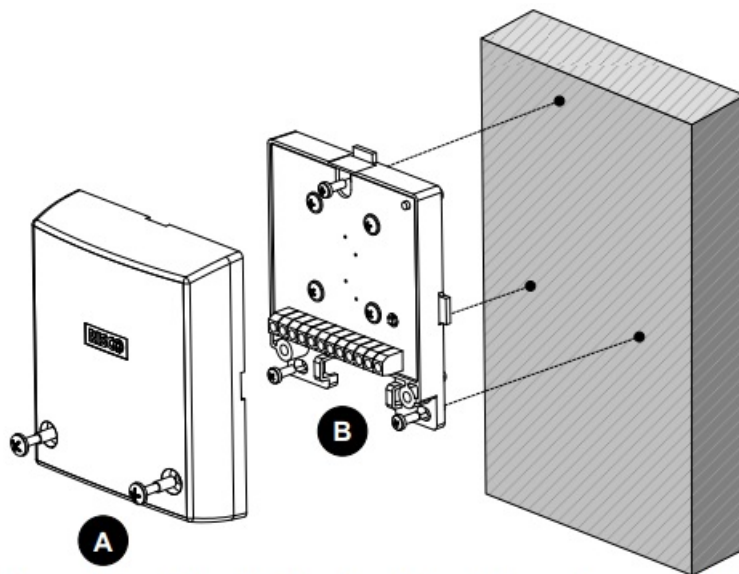- Drill holes on the mounting surface, using the detector base or mounting plate as a guide, as follows:

Figure 1: Mounting the detector directly onto a metallic surface

Direct mounting on a metallic surface (Figure. 1)
a. Ensure that the mounting surface is level to within 1/128" (0.1mm).
b. Use the detector base as a drilling template for the three holes (3.2 mm dia.) and tap M4 thread at least ¼" (6 mm) deep.

Deburr threaded holes in metal.
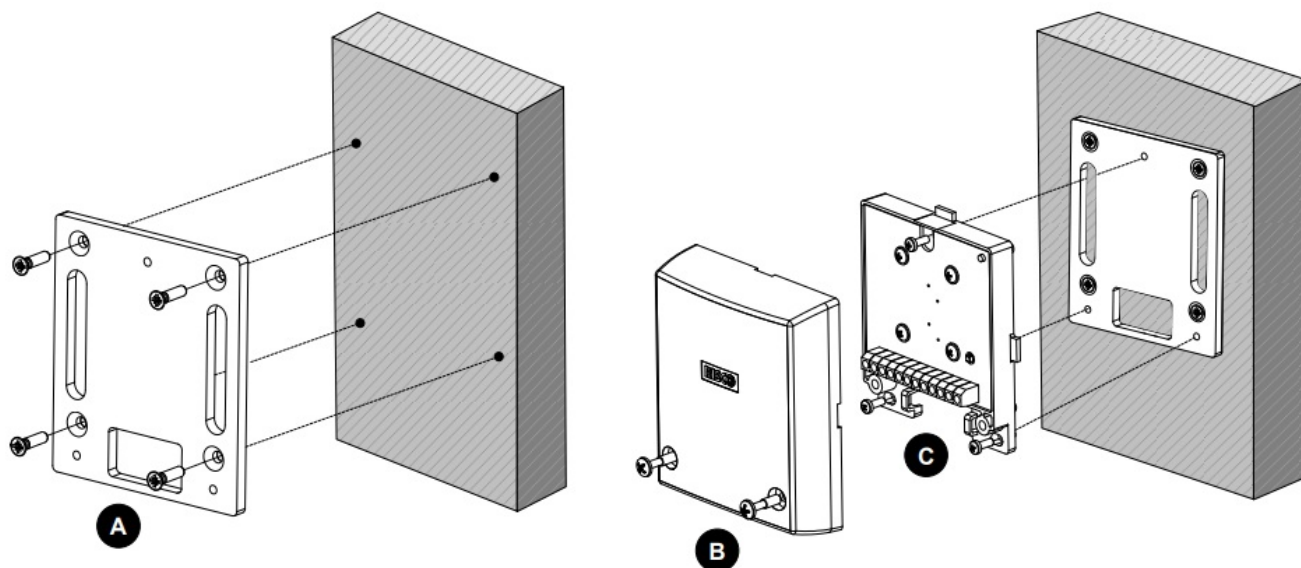c. Fit the detector using the supplied fixing screws, see Figure 1(B).

Figure 2: Mounting the detector using the mounting plate. **(Note:** Affix the mounting plate using fixing screws or optionally, by welding the plate to a metallic surface.)
Installation using mounting plate (Figure 2):

a. (Optional metal welding) Weld the mounting plate along the two provided vertical oblong cutout surfaces. Tap off slag and remove weld splatter from the plate surface.
b. (On concrete) : Never install the detector directly on a bare or plastered concrete surface, since bending forces may cause damage to the seismic sensor. Plaster of less than 10mm need not be removed.
i. Drill four holes for mounting plate (8 mm dia, min 35 mm depth for anchor; using a sintered carbide bit.
ii. Also, use the mounting plate as a drilling template for the three threaded detector holes (5 mm dia) at least 3 mm deep.
iii. Insert supplied metal plugs into drilled hole flush with the concrete surface
iv. Ensure that the mounting plate is correctly positioned. Press the mounting plate onto surface, knock in screw with plug and tighten well. The plate should not be capable of rotation.
v. Fit the detector using the supplied fixing screws, see Figure 2(C).

c. (On metal) :
i. Use the mounting plate as a drilling template for the four holes (5 mm dia.) and tap M6 thread at least 10 mm deep. Deburr threaded holes in metal.
ii. Also, use the mounting plate as a drilling template for the three threaded detector holes (5 mm dia) at least 3 mm deep.
iii. Affix the mounting plate with the supplied screws.
The plate should not be capable of rotation
iv. Fit the detector using the supplied fixing screws, see Figure 2(C).

- Connect wiring; Refer to Terminal Blocks section.
- Set Jumpers; Refer to Jumper Selection section.
- Set Dipswitches; Refer to Dipswitch Settings section.
- To verify detector operation, perform:
    a. A self test (See Testing the Detector section).
    b. Sensitivity calibration using an external test generator (See
    External Test Generator section).
- Replace the cover and tighten the cover fixing screws; See Figure 1(A) / 2(B).
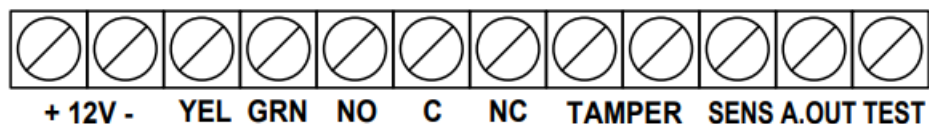
TERMINAL BLOCK LAYOUT

Figure 3: Terminal Block Layout

Terminal Block	Description
+12V (RED)	Power supply positive (+) input voltage
– (BLK)	Power supply negative (-) input voltage
YEL	Used for data communication with RISCO panels (only for BUS connection)
GRN	Used for data communication with RISCO panels (only for BUS connection)
NO	Alarm Normally Opened relay output, 24VDC.0.1A
C	Alarm Common relay output
NC	Alarm Normally Closed relay output, 24VDC.0.1A
TAMPER	N.C. Tamper Switch, 24VDC.0.1A
SENS	Remote sensitivity control for lowering vibration sensitivity for ATM-type dispensers when cash is being disbursed and internal vibration generated. GND = Low sensitivity Not Connected = Reguler sensitivity
A.OUT	Analog signal output: Connect a multimeter/scope or an analogic tester between the A.OUT and -12V terminals, to view the noise and signal voltage levels (in parallel to the LED bar representation). In the absence of vibrations, the voltage signal is OV, and it increases as it detects vibrations. If the voltage measured (in absence of vibrations) doesn't remain stable but continues to increase, it means that environmental noise is being captured and therefore the detector sensitivity must be reduced.
TEST	A short between TEST and GND activates the Remote Test (see Dipswitch Settings 8 and 9). (Not relevant for BUS mode.)

LED DISPLAY DURING NORMAL MODE

LED ON	Color	Severity	Description
LD1	Red		Temperature alarm detection
LD2	Red	**HIGH** ↑ (arrow pointing up)	Vibration alarm detection: Bar graph (from LED8-2) indicating signal power.
LD3	Yellow		
LD4-8	Green	**LOW**	
LD9	Green		Power On

NOTE:

During Test mode the LED displays have a different meaning. Refer to the section:
Testing the detector.

DIPSWITCH SETTINGS

STANDALONE MODE

Dipswitch	Description (SW7 OFF)				
SW1 SW2 SW3	Used to determine the detector's sensitivity. Sensitivity is a function of coverage area and surface material.				
	SW1	SW2	SW3		**Low Sensitivity** ↓ **High Sensitivity**
	*OFF	*OFF	*OFF		
	ON	OFF	OFF		
	OFF	ON	OFF		
	ON	ON	OFF		
	OFF	OFF	ON		
	ON	OFF	ON		
	OFF	ON	ON		
	ON	ON	ON		
SW4	Used to detect single and extremely brief and intense signals (including explosions and sledge hammers). ON: Enable *OFF: Disable				

Dipswitch		Description (SW7 OFF)			
SW5 SW6		Used to adjust the integration time. In combination establish a threshold value; SW5-6 establishes a signal value which, when exceeding the threshold an alarm event.			Low Sensitivity ↑↓ High Sensitivity
		SW5	SW6	Duration (in sec.)	
		*OFF	*OFF	10 (example: vending machine)	
		ON	OFF	26	
		OFF	ON	46	
		ON	ON	80 (example: bank vault)	
SW7		Used to determine Stand Alone or BUS mode (Ensure that the J12 position (as below) matches the SW7 spec.) ON: BUS *OFF: Stand Alone			
SW8		Used to determine Local or Remote Test ON: Local. An internal self test is performed every 24 hours from power-up. Test failure lights up the LEDs (see the Testing the Detector section) and the LEDs remain lit until the next self test. *OFF: Remote. A test is activated whenever the TEST input is connected to GND. If the test passes, the alarm relay opens for three seconds.			
SW9		External test generator ON: Enable External Test Generator *OFF: Disable (internal test)			
SW10		Used to enable the temperature sensor (alarm temperature threshold of +85°C (+185°F)) ON: Enable *OFF: Disable (No temp. threshold is set)			
SW11		Used to determine LEDs operation ON: Enable *OFF: Disable			
SW12		Not used			

BUS MODE

Dipswitch	Description
SW1-5	BUS Address
SW7	ON: BUS
SW6,8-12	Not Applicable

ID	1	2	3	4	5
01	OFF	OFF	OFF	OFF	OFF
02	ON	OFF	OFF	OFF	OFF
03	OFF	ON	OFF	OFF	OFF
04	ON	ON	OFF	OFF	OFF
05	OFF	OFF	ON	OFF	OFF
06	ON	OFF	ON	OFF	OFF
07	OFF	ON	ON	OFF	OFF
08	ON	ON	ON	OFF	OFF
09	OFF	OFF	OFF	ON	OFF
10	ON	OFF	OFF	ON	OFF
11	OFF	ON	OFF	ON	OFF
12	ON	ON	OFF	ON	OFF
13	OFF	OFF	ON	ON	OFF
14	ON	OFF	ON	ON	OFF
15	OFF	ON	ON	ON	OFF
16	ON	ON	ON	ON	OFF

ID	1	2	3	4	5
17	OFF	OFF	OFF	OFF	ON
18	ON	OFF	OFF	OFF	ON
19	OFF	ON	OFF	OFF	ON
20	ON	ON	OFF	OFF	ON
21	OFF	OFF	ON	OFF	ON
22	ON	OFF	ON	OFF	ON
23	OFF	ON	ON	OFF	ON
24	ON	ON	ON	OFF	ON
25	OFF	OFF	OFF	ON	ON
26	ON	OFF	OFF	ON	ON
27	OFF	ON	OFF	ON	ON
28	ON	ON	OFF	ON	ON
29	OFF	OFF	ON	ON	ON
30	ON	OFF	ON	ON	ON
31	OFF	ON	ON	ON	ON
32	ON	ON	ON	ON	ON

JUMPER SELECTION

| Jumper	Function
S.A (Stand Alone) /BUS J12	Used to enable tamper indication during Stand Alone or BUS mode.
	Stand Alone mode (Default).
	BUS connection mode. (See RISCO system programming manuals).
J13: Alarm EOL J15: Tamper EOL	Jumpers J13 and J15 allow for the selection of Alarm and Tamper resistance (1K, 2.2K, 4.7K, 5.6K and 6.8K) according to the control panel. Follow the terminal block connection diagram in Figure 4 when connecting the detector to a Double End Of Line (DEOL) zone.
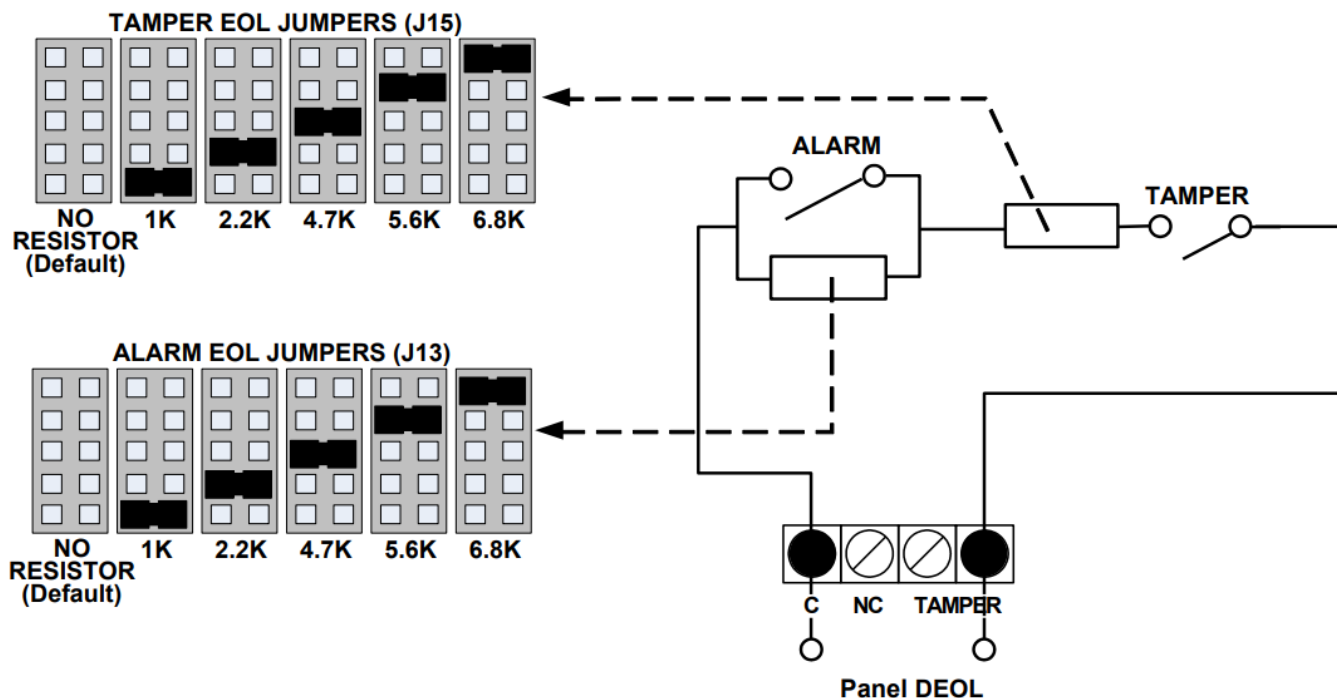
Figure 4: Schematic of EOL Resistors

TESTING THE DETECTOR

RISCO recommends performing a self test after installation and before final cover mounting. The test can be performed manually (locally or remotely) or automatically every 24 hours

Remote self-test (Manual Test)
This test requires that a command be given in order to be performed.
To activate the remote self-test:

- Ensure that the Dipswitch SW8 is set to OFF.
- Short the TEST terminal block to GND.
- All LEDs will turn on to indicate test commencement and sequentially turn off after each successful parameter test.

The detector unit self test examines the following parameters:

| LED	Trouble
1	External power supply failure
2	Internal voltage faulty
4	Piezo sensor failure
5	Temperature sensor failure
3, 6-9	Not Applicable

All LEDs will turn off at the end of a successful test, except the POWER LED
(LED9) and the alarm relay opens for three seconds. If a malfunction occurs, one of the LEDs remains lit.
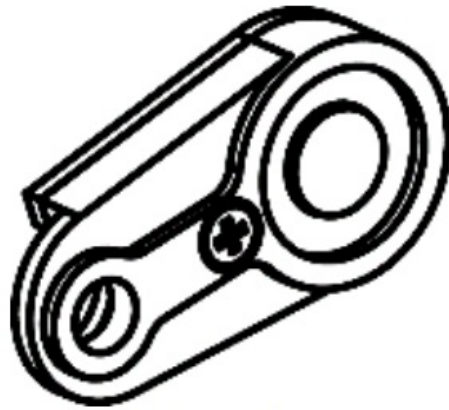**Local self-test (Automatic Test)**
Ensure that the Dipswitch SW8 is set to ON.

The RK66S detector runs a local/automatic SELF-TEST every 24 hours from the time of initial power on. Test procedure and result presentation is as per the Remote self-test above.
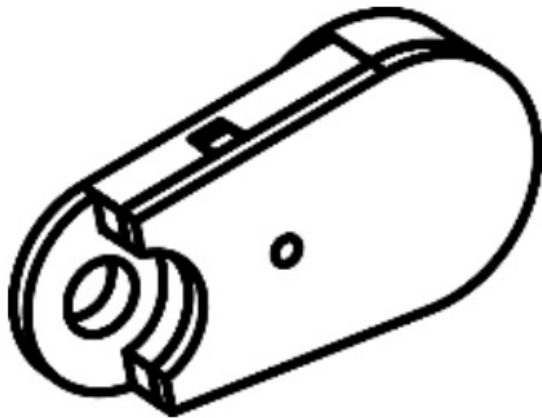
Front view   Rear view

Attach to the concrete surface, using the supplied mounting screw in this hole opening.
The external test generator can be used to:

- Periodically verify proper functioning of the detector
- Observe the detector's sensitivity during installation

To use the test generator:

- Connect the test generator to J2 on the PC board (with the polarity resulting from the red wire connected to the plug pin closest to the terminal block, in other words, the lowest)
- Switch SW9 to ON.
- Attach the test generator to the concrete surface.
- Perform test, as follows:
    a. For remote test, see the DIPSWITCH Settings section
    b. For calibration test, Switch SW8 to ON and observe the LEDs

Specifications

Coverage	Up to 5 meters (16 feet) radius
Operating voltage	9 to 16 VDC
Current consumption	Typically 20mA @ 12VDC
RFI immunity	According to EN50130-4
Alarm contacts	24VDC, 0.1A, N/C and N/O
Tamper contacts	24VDC, 0.1A
Alarm contact hold time	2 5 seconds
Operating temperature	-40°C to +70°C (-40°F to 158°F)
Storage temperature	-50°C to +70°C (-58°F to 158°F)
Ingress protection (IP) rating	IP43
Impact Rating	IK08
RFI immunity	According to EN50130-4
Dimensions (L x H x W)	102 X 27.5 X 80.2 mm (4.0″ X 1.1″ X 3.2″)
Weight	220 g (7.7 oz)

In order to continue improving the product, RISCO Group reserves the right to change specifications and/or designs without prior notice.

Ordering Information

Model	Description
RK66S	Seismic Detector

NOTES

UKCA and CE EMC Compliance Statement:

Hereby, RISCO Group declares that this equipment is in compliance with the essential requirements of the UKCA Electromagnetic Compatibility Regulations 2016 and CE Directive 2014/30/EU. For the UKCA and CE Declaration of Conformity please refer to our website: **www.riscogroup.com**.

Standard Limited Product Warranty ("Limited Warranty")

RISCO Ltd. ("RISCO") guarantee RISCO's hardware products ("Products") to be free from defects in materials and workmanship when used and stored under normal conditions and in accordance with the instructions for use supplied by RISCO, for a period of (i) 24 months from the date of delivery of the Product (the "Warranty Period"). This Limited Warranty covers the Product only within the country where the Product was originally purchased and only covers Products purchased as new. Contact with customers only. This Limited Warranty is solely for the benefit of customers who purchased the Products directly from RISCO or from an authorized distributor of RISCO. RISCO does not warrant the Product to consumers and nothing in this Warranty obligates RISCO to accept Product returns directly from end users who purchased the Products for their own use from RISCO's customer or from any installer of RISCO, or otherwise provide warranty or other services to any such end user directly. RISCO's authorized distributor or installer shall handle all interactions with its end users in connection with this Limited Warranty. RISCO's authorized distributor or installer shall make no warranties, representations, guarantees or statements to its end users or other third parties that suggest that RISCO has any warranty or

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Contacting RISCO Group
RISCO Group is committed to customer service and product support. You can contact us through our website (**www.riscogroup.com**) or at the following telephone and fax numbers:

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support-uk@riscogroup.com

USA
Tel: +1-631-719-4400
support-usa@riscogroup.com

Documents / Resources

	RISCO **RISCO RK66S High Security Seismic Detector** [pdf] Instruction Manual RK66S, High Security Seismic Detector, Seismic Detector, High Security Detector, Detector

References

- ⚲ riscogroup.com
- ⚲ riscogroup.com/
- ⚲ riscogroup.com/warranty