



# WATCHMANALARM

ULTRASONIC OIL LEVEL MONITOR & ALARM

# INSTALLATION INSTRUCTIONS

## HOW IT WORKS

The oil alarm on tank unit checks the oil level approximately once every minute. Under normal conditions it communicates this level to the receiver approximately once every half hour. In the event that a level outside the predefined threshold trigger level is reached in a given period (approximately 1.5cm per hour) then the on tank unit sends a signal to the receiver and an alarm will be set off on the receiver unit.

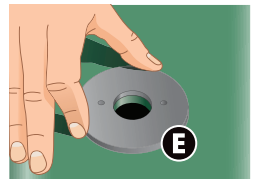
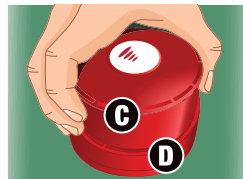
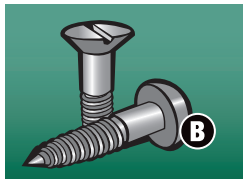
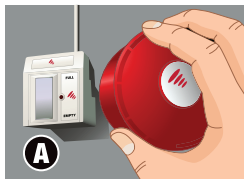
In alarm mode the receiver unit will emit a siren type sound and the 10 bars will appear on the screen in sequence. The red LED will also flash. This can only be reset by plugging in and out the receiver unit from the mains.

The maximum permissible usage of oil that the unit will allow in height terms is 1.5cm per hour. This is the maximum rate that the height can drop in one hour without the alarm going off.

## Warning:

- Alarm and level functionality will be disabled if the unit detects a no echo condition (ref: section 9 – trouble shooting). The no echo condition is indicated by a triangle symbol in the centre of the screen with a line to the right of it. The no echo condition can be caused by the unit being incorrectly installed on the tank, alternatively it can indicate in some instances that the unit has been moved or removed from the tank. An audible alarm can alert the user that a no echo condition or a transmission not heard condition has occurred (Refer to trouble shooting for explanation of these conditions). The audible notification indicator (3 beeps every 5 seconds) can be enabled by turning on or pulling dip switch 2 in an up position. Turning off or putting dip switch 2 in a down position (default position is down or off). Please note this is not a tamper alarm and should not be used as such.
- The alarm functionality at ullage levels of less than 25cm is disabled. Therefore if a leak or theft occurs when the oil level is closer than 25cm to the WatchmanAlarm on tank unit the alarm will not go off.
- In the event that the on tank unit detects a level drop there may be up to a 2 minute delay in sending the information to the receiver. This delay is to enable validation and protect against false alarms.
- This product is to be used only on domestic oil tanks within the parameters outlined in the specifications. Any use of the product on applications that lie outside a domestic environment is done so at users own risk.

## READ FULLY BEFORE INSTALLATION AND USE



**A** RECEIVER **B** SCREWS **C** WATCHMANALARM TRANSMITTER **D** WATCHMANALARM BASE **E** WEATHER SEAL

## 1. CHECK LEVEL, DISTANCE AND HEIGHT

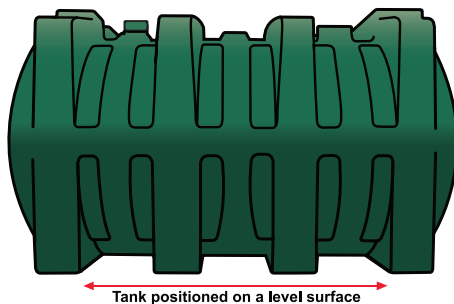
Suitable for use in tanks for the storage of diesel fuel, kerosene, and gas oil types A2, C1, C2 and D as defined by BS 2869. Check with the manufacturer and/or supplier before using with any other fluids. Ensure before you start your install that the tank the WatchmanAlarm is to be fitted to is:

1. Level (See Picture 1)
2. Within a 200-metre range of the line of sight of receiver position.

### NB – UNDERGROUND TANKS

Please note any radio frequency signal may be seriously inhibited if positioned underground. Please check that the transmitter - receiver link works in the desired location before installation.

3. A maximum height of 3 meters



Pic 1

## 2. TANK PREPARATION

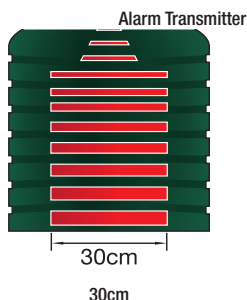
Please note- it is important to keep all items dry during installation.

### A) PRE-DRILLED TANKS.

There may already be a 32mm pre-drilled opening in the tank top and possibly a tube fitted. If so, remove the cover by undoing the two screws holding it in place, and dispose of the tube in accordance with local government guidelines.

**NB – Ensure the hole is a minimum DIAMETER 30mm.**

Ensure that the space beneath the WatchmanAlarm unit is free of any obstacles and that the ultrasonic beam path is clear of obstructions. (See Picture 2)

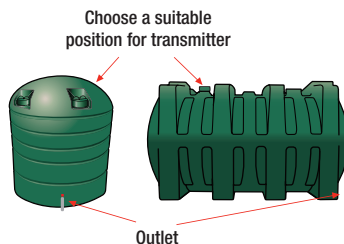


Pic 2

### B) UN-DRILLED TANKS.

Where drilling is required to fit the transmitter, choose a flat level point that is at the same level and no higher than any opening at the top of the tank (filling point etc.). (See Picture 3)

**WARNING: If you are unsure if you should drill a tank please check with the tank manufacturer first.**



Pic 3

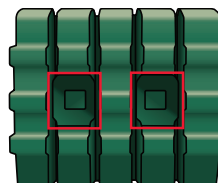
The Transmitter can't sit at an angle as this gives an incorrect level reading on the receiver. Take care not to choose an area on which water could gather i.e. a dent/depression or a position directly above any restricted area inside the tank. (See Picture 4)



Pic 4

**NB:** For Windowed Tanks ensure that the WatchmanAlarm is not positioned above or within 15 cm of the area of the WINDOW or the edge of the tank. If the WatchmanAlarm is positioned over or close to the WINDOWED area it transmits faulty readings to the receiver. (See Picture 5)

**NB:** When installed incorrectly on some windowed tanks the unit can experience false alarms as the oil level drops. It is important to ensure that the unit is positioned so that the ultrasonic beam has a 30cm diameter clear area to the bottom of the tank. Positioning the unit too close to the tank wall or near a tank window may cause false alarms..

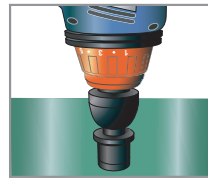


Example of a windowed tank

Pic 5

Drill a hole in the place that you have selected on the tank's top surface using a 32mm hole-saw. (shown in **Picture 6**)

**Warning:** If you are unsure if you should drill the tank please check with the tank manufacturer first.

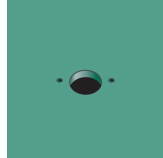


**Pic 6**

### 3. FITTING TRANSMITTER BASE

For tanks with pre-drilled holes

- Remove cap from the hole (**Picture 7**) and insert transmitter base, ensuring the weather seal is securely in place (**Picture 8 & 9**).
- Tighten the WatchmanAlarm base (**Part D**) on to the tank with 2 stainless steel self-tapping, counter sunkscrews supplied (**Part B**). Do not over tighten!



**Pic 7**



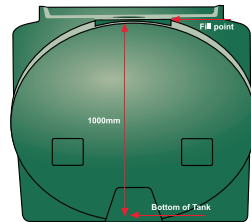
**Pic 8**



**Pic 9**

### 4. DEFINE THE TANK HEIGHT

Accurately measure the height of your tank. The permissible maximum tank height is 3 metres from the base of your tank to the position of the WatchmanAlarm (which should be the same as the fill point). (Seen in **Picture 10**).



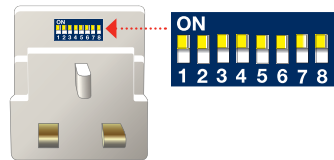
**Pic 10**

### 5. SETTING THE SWITCHES ON THE RECEIVER

Using the tank height chart (see section 11), read across to the relevant multi switch settings. The multi switches are located in a recess at the back of the receiver above the pins.

Using a screwdriver or tip of a ballpoint pen, flip the relevant switch (e.g.) upwards (= ON). As an example, if the tank is 100 cm high, set switches 5 & 7 ON (Up). (See **Picture 11**)

**NOTE:** Switch one if set in the on (up) position will cause the unit to beep in the event of a low level reading. To deactivate this set the switch to an off (down) position. Switch 1 position will not affect the alarm function.



Switch 2 is set in the off position (down) therefore the audible notification for the no echo condition is disabled. To enable the no echo condition audible notification (beep 3 times every 5 seconds) put switch 2 in an on (up) position.

**Pic 11**

### 6. MATCHING RECEIVER AND TRANSMITTER

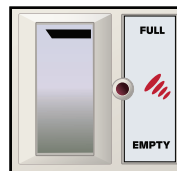
You should match the receiver (**Part A**) with the transmitter (**Part C**) so that the system code is unique to your tank. You only need to do this once. Plug receiver into a suitable and convenient electrical socket and switch on.

The display screen (**Picture 12**) on the front of the receiver will show a flashing top bar as shown in diagram. This indicates that the receiver is waiting for the unique code. The bar will continue to flash for 2 minutes during which time you can match the transmitter to the receiver.

Hold the transmitter against the receiver right hand side, as shown (**Picture 13**), so that the white dot on the transmitter is touching the black dot on the receiver (important!) for about 20 seconds to allow unique code to be transferred. Bars will increase up the display screen. When all 10 bars are shown they will flash to indicate that the unique code is transferred. When matched the transmitter must immediately be placed on the tank.

- The receiver will wait for a code for 2 minutes when plugged in.
- If you should want to change the height, just unplug the receiver, change the dip switches and plug it back in.

- If you are installing more than one WatchmanAlarm unit please wait 9 minutes between each matching.
- In the event of a power failure or if the receiver is switched off or moved to a new socket: When power returns again or unit is switched on, the receiver display screen will show the top bar flashing. There is no need to repeat the matching instruction. The top bar will continue to flash for 2 minutes, after which time the last valid signal is displayed. It may take up to two hours for the next transmission from the transmitter.



**Pic 12**

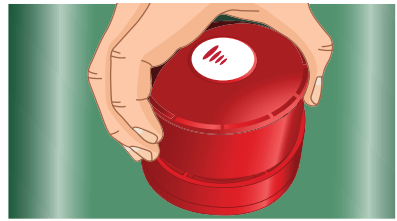


**Pic 13**

## 7. FITTING THE TRANSMITTER TO THE BASE

Screw the transmitter (Part C) into the base (Part D). Ensure the transmitter is vertical on top of the tank and level.

Ensure that the WatchmanAlarm unit is screwed correctly into the base and that the threads have not crossed, to give a secure seal. (See Picture 14)



Pic 14

## 8. CHECK THE LEVEL OF OIL IN THE TANK

The bar graph represents the level of oil in your tank.

**Note:** It can take up to 2 hours for the first accurate reading from the WatchmanAlarm to be displayed.



## 9. TROUBLESHOOTING

### CHANGING BATTERY:

Though the lithium battery will have a very long service life, it will eventually become exhausted and will need replacing.

Batteries can be purchased from a good photographic shop or chemist. The battery model is: VARTA CR2430.

- Remove transmitter from tank
- Take transmitter indoors, into a clean dry environment
- Using a cross point screwdriver, undo the four screws, located under the main body of transmitter
- Remove the top cover
- Flip out battery
- Clip in new battery
- Re-fit cover
- Evenly tighten all four screws - do not over tighten
- Replace transmitter on the tank

If the receiver detects a low battery the following warning message is displayed on the LCD. The level of oil in the tank plus a constantly flashing warning triangle. (Shown in picture 15).

### RECEIVER FAULT DISPLAY KEY:

If the receiver detects a transmission not heard for a long time the symbol outlined in Pic 16 is displayed on the LCD accompanied by a beep sequence of 3 beeps every 5 seconds (if Dip switch 2 is in the on position). This starts approximately 12 hours from the last received good signal. (Shown in picture 16). To rectify this re-site the receiver in a location where the transmission is heard.

If the receiver detects a No Echo Condition the following message is displayed on the LCD Warning triangle constantly flashing plus indication bar 5 on. (Shown in picture 17) This is accompanied by a beep sequence of 3 beeps every 5 seconds (if Dip switch 2 is in the on position).

To rectify this situation check that the transmitter unit is correctly positioned on the tank and no interference is present from a tank wall, corrugation or window.

### FALSE ALARM:

False alarms may be caused by poor installation of the unit on the tank. Please ensure that the unit is sitting correctly on the tank with the correct amount of clearance each side of it to the bottom of the tank. (See section 2).

Ensure that the tank is not prone to vibration by the wind or passing traffic. Sudden ripples of the fluid in the tank caused by vibrations may cause false alarms. Check the tank is sitting level on a stable base.



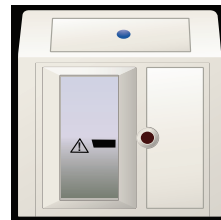
LOW BATTERY

Pic 15



TRANSMISSION NOT HEARD

Pic 16



NO ECHO CONDITION

Pic 17

## 10. GUARANTEE

The WatchmanAlarm has a warranty period of 1 year. For each product accepted by Kingspan Environmental Ltd as warrantable, Kingspan Environmental will rework or replace the product and return to the customer at Kingspan Environmental expense. The warranty becomes invalid if the sealed unit is opened (Part C).

Kingspan Environmental Ltd will not warrant products that have been:

- Used outside the functional and environmental conditions for which they were designed.
- Physically abused, incorrectly handled/ installed or damaged in transit.
- Despatched from Kingspan Environmental more than 1 year previously.
- Returned to Kingspan Environmental in a form other than in which they were originally supplied.
- Subjects to "Act of God", e.g.: lightning strike, flood or any other catastrophic event beyond Kingspan Environmentals control.

Any Sensor product deemed damaged by the customer shall be returned to Kingspan Environmentals facility at the customer's expense.

Kingspan Environmental shall not be liable for any costs in relation to the returned products.

The purchase invoice and a description issue should be joined with the faulty product. The product should be returned at your shop or directly at the following address:

Kingspan Environmental Ltd, Sensor Systems Team, 180 Gilford Road, Portadown, Co. Armagh, Northern Ireland BT63 5LF.

Each faulty product must receive Kingspan Environmentals After-Sale-Service approval before being returned.

## 11. WATCHMANALARM RECEIVER MULTI SWITCH SETTING CHART

Measure the vertical height of the tank from the transmitter position on top of the tank to the bottom of the tank. Read to the nearest measurement on the chart. Ignore dip-switches 1 & 2. Unless see NOTE under point 5.

Tank Height (cms)	DIP 3	DIP4	DIP5	DIP6	DIP7	DIP8
50						
55						ON
60					ON	
65					ON	ON
70				ON		
75				ON		ON
80				ON	ON	
85				ON	ON	ON
90			ON			
95			ON			ON
100			ON		ON	
105			ON		ON	ON
110			ON	ON		
115			ON	ON		ON
120			ON	ON	ON	
125			ON	ON	ON	ON
130		ON				
135		ON				ON
140		ON			ON	
145		ON			ON	ON
150		ON		ON		
155		ON		ON		ON
160		ON		ON	ON	
165		ON		ON	ON	ON
170		ON	ON			
175		ON	ON			ON
180		ON	ON		ON	
185		ON	ON		ON	ON
190		ON	ON	ON		
195		ON	ON	ON		ON
200		ON	ON	ON	ON	
205		ON	ON	ON	ON	ON
210	ON					
215	ON					ON
220	ON				ON	
225	ON				ON	ON
230	ON			ON		
235	ON			ON		ON
240	ON			ON	ON	
245	ON			ON	ON	ON
250	ON		ON			
255	ON		ON			ON
260	ON		ON		ON	
265	ON		ON		ON	ON
270	ON		ON	ON		
275	ON		ON	ON		ON
280	ON		ON	ON	ON	
285	ON		ON	ON	ON	ON
290	ON	ON				
295	ON	ON				ON
300	ON	ON			ON	

## SPECIFICATIONS

<b>Tank Depth measurement:</b>	Minimum depth: 0.5m. Maximum depth: 3m.
<b>Display:</b>	Bar graph level display, 10% tank height per bar. Early warning indication (flashing tank fill) at a predetermined height above tank bottom (see section 11). Tank empty warning flashes red LED at a predetermined height from tank bottom. (see section 11) Meets EN60335.
<b>Max communication distance:</b>	200m in normal "line of sight" conditions. The effective range of this product can be influenced by external sources that may reduce the range of the transmitter or sensitivity of the receiver.
<b>Power supply:</b>	Receiver: 230V, 50-60HZ +/- 10%. Transmitter: 3-voltlithium cell.
<b>Battery life:</b>	Up to 3 years (dependant on tank height).
<b>Wireless com:</b>	433 mHz. FM transmission. EN 300-220.
<b>Dimensions:</b>	Receiver: 50 x 55 x 35mm (not including aerial). Transmitter: 70x93mm.
<b>Max and min operating temp. (transmitter):</b>	Operating temp. Range -10° to +60 ° C. Operating humidity: 0-100%. Sealed airtight unit made from PP3317 UV stabilized.
<b>Hole size for tank fitting:</b>	32mm 2" BSP external thread adaptor

**Declaration:** this apparatus is designed to: Not give rise to physical injury or other harm due to contact. Not to produce excessive surface temperatures, infrared, electromagnetic, ionising radiation. To have no non-electrical dangers. When used in accordance with these user and installation instructions.

**Warning:** If the equipment is likely to come in to contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised. Aggressive substances; - e.g. liquids or gases that may attack metals, or solvents that may affect polymeric materials.

In order to minimize the risks of electric shock,

- i** The receiver is for indoor use only, never use outdoors.
- i** The receiver is a sealed unit; do not attempt to open it.

Supplied by Kingspan Environmental Ltd  
180 Gilford Road, Portadown, Co. Armagh, Northern Ireland

### Safety Information

Do not replace in a potentially explosive atmosphere  
Periodically check that the unit is intact and securely fastened to the tank.  
Check with the manufacturer on the chemical compatibility prior to use.  
Do not attempt to repair this equipment. It must be returned to the manufacturer for repair.

Warning! Electrostatic hazard! Clean only with damp cloth.

Use only VARTA CR2430 batteries.

Not suitable for pressurised containers. Use on tanks vented to atmosphere.

Warranty: 1 year.

### FOR SUPPORT CONTACT:

sales@sensor-systems.com

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**DISCLAIMER:** The WatchmanAlarm acts as a warning for the householder and is intended as a deterrent for any potential thief. However, it cannot prevent theft or leakage and householders should take all reasonable steps to ensure the tank is secured. Kingspan Environmental Limited accepts no liability for any fuel losses.



## WATCHMANALARM

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Visit our website [www.sensor-systems.com](http://www.sensor-systems.com)

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