



Liquid Monitoring & Control

Solar Separator Alarm Type 14007

Installation, Operation & Maintenance

Solar Separator Alarm

Type 14007


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Separator Alarm Type 14007 Installation, Operation & Maintenance

↘ Declaration of Conformity

The above product meets all the essential safety requirements of the European Directives and standards listed below, and is issued under the sole responsibility of the manufacturer

Name and Address of Manufacturer	Darcy Products Ltd Unit B7 Chaucer Business Park Watery Lane, Kemsing Sevenoaks TN15 6QY
Valid for European Directives	94/9/EC until 19 th April 2016 2014/34/EU from 20 th April 2016
Equipment Name and Type	Separator Monitor Type 14007
Certificate Number	Baseefa 08ATEX0171X
Specific Marking of Explosion Protection	[Ex ia Ga] IIC (-20°C ≤ Ta ≤ +50°C)
ATEX Directive Marking	Ex II (1) G
Notified Body	Baseefa 1180 Buxton UK
CE Mark with Notified Body Number	CE ₁₁₈₀
Harmonised Standards used	EN 60079-0:2009, EN 60079-11:2012
Serial Number and Year of Manufacture	Displayed on the inside of the control unit
<p>On behalf of the above named company, I declare that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms with all technical and regulatory requirements of the above listed directives.</p> <p>P. Bowden – Quality Manager </p>	

IMPORTANT

Note: In all cases good, standard electrical practice should be followed, and the installation must conform to the appropriate local code of practice – e.g. BS EN 60079-25 in the UK. In essence, the installation must be such that the intrinsic safety is not compromised by: - exposure to risk of mechanical damage, unauthorised modification or interference, exposure to moisture, dust and foreign bodies, excessive heat, invasion of intrinsically safe circuit by other electrical equipment or circuitry. (See Note in installation section)

↘ General Description

The standard system is supplied complete with an intrinsically safe control unit together with a high oil probe and a steel mounting stand. The control unit is capable of monitoring up to 6 probe units in 2 separator tanks (3 probes per tank), their current status is displayed via a 2 x 16 liquid crystal display. Two versions of this unit are available, one which signals an alarm via a flashing beacon, the other which communicates its status via GSM (mobile phone text messages).

↘ General Operation

The Control Unit monitors the condition of the connected probe units by checking their condition every 30 minutes¹, their current status is displayed on the display located on the front of the unit. If an alarm condition is detected, a warning

¹ The unit is factory set to 30 minutes, but in extreme conditions, this can be manually changed from 5 to 60 minutes at one minute intervals. (see Changing Factory Settings)

message is displayed followed by notification of the alarm condition detected, e.g. ***HAZARD ALERT* High Oil Alarm.**

The unit then gives the option, via the display (or text message), to accept/acknowledge the alarm. On doing so, the display instructs the user to take the appropriate action, e.g. empty the separator. After the separator has been emptied and refilled with water, the control unit re-scans the probe sensors attached and presuming no alarm condition is detected, **'All Correct'** will be displayed. If the push button is pressed before the separator has been emptied, or it has been emptied but not refilled with water, then the control simply scans the probe sensor(s) and reverts to the alarm condition.

It is a requirement of the certification that the cabinet door is kept closed during normal operation, only being opened for maintenance.

↘ Changing Factory Settings

WARNING!!! Entering setup mode to change factory settings will set the unit back to an unactivated state and require a new activation code to be entered by contacting Darcy Spillcare Manufacture.

Unused probes can be disabled and the probe check interval changed by entering "setup" mode. To enter setup mode, press and hold the Push Switch whilst pressing and releasing the "RESET" switch mounted on the board to the right of the LCD. After about 10 seconds the screen will display "Setup." At this point release the Push Switch.

↘ Disable Unused Probes

The factory default is for the high oil probe on zone 1 to be enabled and all other probes disabled. If any other probes are to be used they can be enabled by entering setup mode, as described above. The following will be displayed, allowing probes to be enabled or disabled.

1	2	3	4	5	6
E	E	E	E	E	E

The block cursor will flash over the probe that can be currently toggled between enabled and disabled. To move to the next probe, press the reset switch mounted on the board to the right of the LCD. The display will blank for about 5 seconds before returning with the next selected probe. [Table 1](#) shows how the sensor numbers relate to the probes.

Sensor Number	Zone	Probe Description
1	Zone 1	High Oil
2		High Liquid
3		Silt
4	Zone 2	High Oil
5		High Liquid
6		Silt

Table 1 - Sensor to Probe Mappings

To exit from setup mode, press and hold the Push Switch whilst pressing and releasing the reset switch mounted on the board to the right of the LCD.

➤ **Probe Check Interval**

Once setup mode is entered, as described earlier, press the “TEST” switch mounted on the board to the right of the LCD. The following will be displayed which allows the probe check interval to be adjusted between 5 and 60 minutes.

Check Intvl: 05

To exit from setup mode, press and hold the Push Switch whilst pressing and releasing the reset switch mounted on the board to the right of the LCD.

➤ **Testing the Probe Sensors**

The probe interrogation function can be activated at any time by simply pressing the push switch.

➤ **Installation**

This product has been designed and certified as being intrinsically safe. It is of paramount importance, that the unit should not be modified in any way and the installation be carried out by an approved installer, in accordance with the Environment Agency guidelines (PPG3). Any deviation from this could invalidate the certification warranty and render the unit unsafe for its intended use. Upon powering up the unit for the first time, the LCD will display the following message:

➤ **HAZARDOUS AREA EQUIPMENT**

ACTIVATION CODE REQUIRED

The unit will not be able to function without the code which can be obtained by calling Darcy Spillcare Manufacture on 01732 441016. For GSM units, Darcy staff will assist in programming the unit with 1 to 8 phone numbers which are required to receive alert messages.

➤ **Control Unit**

Refer to Table 8 on page 8 for required cable specifications.

The control unit is designed for installation outdoors and must be mounted on the stand provided to ensure it is out of the hazardous zone. For all wiring details, please refer to Table 2 on page 7.

It is important that the solar panel has a clear line of sight towards the sun, faces due south and is kept clear of debris, e.g. leaves. Failure to do this will result in the battery not being charged sufficiently for continued normal operation. Care must also be taken to ensure that the solar panel is not partially or totally shadowed by nearby objects, e.g. buildings or trees, at certain times of the day as this will also reduce the charging efficiency.

↘ **Probes (High Oil & High Liquid Level Probes)**

The high oil probe (14000) and the high liquid probe (14011) (if required), need to be installed such that the float switch housing is located below or above the static liquid level. The probe cable can be secured inside the neck of the separator using a probe mounting kit (14050).

Please note the distance below or above the static liquid level will be determined by the type, style and/or size of separator. This information can be obtained from the separator manufacturer. However, as a general *rule of thumb*, the high liquid level probe should be placed 300mm **above** the static liquid level and the High Oil Probe placed 150mm **below** the static liquid level.

Due to the varying neck lengths (turrets) that occur within each separator, each normal probe unit is fitted with 5 metres of cable.

↘ **Silt Probe**

The silt probe is mounted in its own stainless steel stand and should be set to the required height, it can then be lowered to the base of the separator and the cable/rope can be secured to the neck of the separator using the probe mounting kit (14050).

↘ **Cable Distribution Box**

It is advisable to connect the probe cables to a cable distribution box (14039) which should be fixed near to the top of the separator neck. The probe cable can then be terminated with a waterproof plug (provided with the distribution box). The plug is then connected to the bulkhead socket (provided with the distribution box). A cable must then be laid to connect the distribution box and the control unit. The type of connection cable required will be dependent on the environment it is used in, the route taken and maximum allowable cable capacitance and inductance (see cable parameters in [Table 8](#) on page 8).

After making the connections in the distribution box, it is advisable to spray the terminals with a conformal coating lacquer to prevent moisture ingress before finally sealing them with waterproof putty.

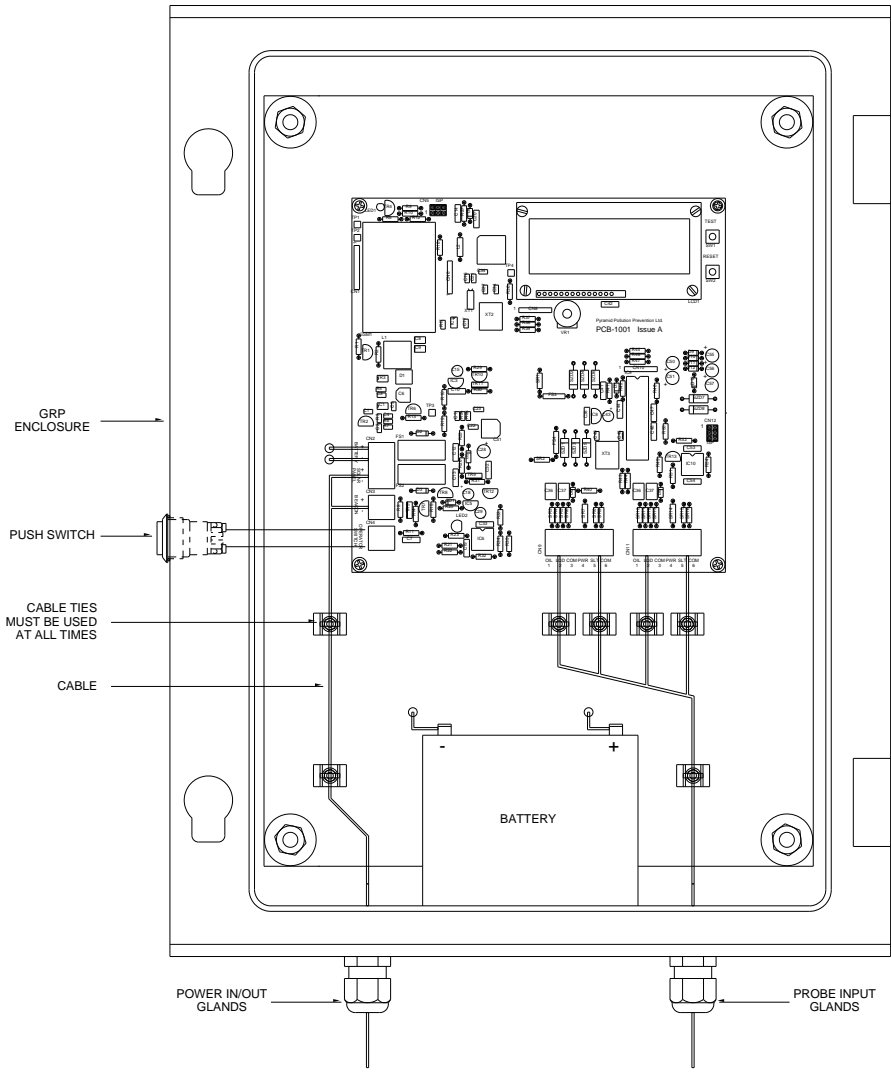
↘ **Connection to Control Unit**

The Probe cable should be fed through the appropriate gland in the bottom *right hand* side of the control unit and connected to the terminals as instructed. The solar panel cable, and if used, any beacon or sounder cable, must be fed through the appropriate glands on the bottom *left hand* side of the control unit and connected to the terminals as instructed.

IMPORTANT NOTE: Under NO circumstances can cables be entered into the enclosure other than on the underside as indicated, as this would infringe the certification and therefore safety of the product.

ALL CABLES INSIDE THE ENCLOSURE MUST BE SECURED TO THE CRADLES WITH THE CABLE TIES PROVIDED.

DO NOT EARTH ANY PART OF THE UNIT OR STAND AS IT IS A REQUIREMENT OF THE CERTIFICATION THAT 500V ISOLATION IS MAINTAINED TO EARTH.



Probe Type	Terminals					
	1	2	3	4	5	6
High Oil	Red		Blue			
High Liquid		Red	Blue			
Silt				Brown	Green/Yellow	Blue

Table 2 - Probe Connections (CN9 (zone 1), CN11 (zone 2))

CN2 Terminal Assignment			
+	-	+	-
Red	Black	Red	Black
Battery		Solar Panel	

Table 3 – Battery and Solar Panel Connections (CN2)

CN3 Terminal Assignment	
+	-
Brown/Red	Black/Blue
Beacon	

Table 4 – Beacon Connections (CN3)

✚ Maintenance and Repair

Due to the harsh environments which the probes can be subjected to, it is advised that they are inspected and cleaned at regular intervals.
The control unit does not contain user serviceable parts.
For all repairs, contact Darcy Spillcare Manufacture on 01732 441016.

✚ Technical Information

✚ Electrical

Supply Voltage	12V DC
Max probe cable length	200m (less if values in Table 8 would be exceeded)
Beacon Output	12V DC 100mA max.

Table 5 – Electrical Specifications

✚ Apparatus Supply and I/O Parameters

U_m	253Vrms (Note: only intended to operate from 12V DC! See Table 5)
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Table 6 – Battery, Solar Panel, Beacon and Operator Switch Terminals (CN2 – 4)

U_o	12.6V
I_o	41mA
P_o	128mW
C_i	0
L_i	0

Table 7 – Hazardous Area Terminals (CN9, 11)

Group	Capacitance (μF)	Inductance OR Ratio (mH)	L/R (μH/Ω)
IIC	1.15	21.4	92.3
IIB	7.4	85.7	369
IIA	27	171	739

Table 8 – CN9, 11 Load Parameters

✚ Special conditions for safe use

The two connectors to the hazardous area CN9 & CN11 are isolated from earth but have ground connections that are connected to each other inside the apparatus. This must be taken into account when connecting to hazardous area equipment.

✚ Probe Cables

The total capacitance and inductance of the cable used between the control unit and the probe must not exceed that shown in [Table 8](#).

↘ **Mechanical**

Protection and/or screening of the cable should also be taken into account. The maximum length of cable between probe and control unit must not exceed 200 metres or less if the values in [Table 8](#) on page 8 would be exceeded.

↘ **GSM Commands**

The following text commands (**in bold**) can be sent to the alarm panel, all commands can be upper or lower case, or even a mix.

STATUS – Performs a scan of the probes and returns the status of zone 1 in one text message and zone 2 in a separate message, if zone 2 is enabled. An example is shown below.

Battery: 100% (Normal)
Status zone 1:
High oil
High water
Silt build-up
Alarm unaccepted
Unaccepted alarms exist

ACCEPT 1 – Accepts the zone 1 alarm. Accepting the alarm above responds with a text message as shown below.

Battery: 100% (Normal)
Status zone 1:
High oil
High water
Silt build-up
alarms accepted

ACCEPT 2 – Accepts the zone 2 alarm. Accepting the above alarm above responds with a text message as shown below.

Battery: 100% (Normal)
Status zone 2:
High oil
High water
Silt build-up
alarms accepted

ACCEPT – Accepts the alarms on zone 1 and zone 2, but a low battery alarm must be accepted separately as below.

A low battery alarm looks like this:

Battery: 5% (Low)
alarm unaccepted
Status zone 1:
All correct
Unaccepted alarms exist

ACCEPT BATTERY – Accepts the low battery alarm and sends a response as shown below.

*Battery: 5% (Low)
alarm accepted
Status zone 1:
All correct*

SIM

The SIM supplied with the 14507 GSM unit is a Virgin Mobile SIM. Although text messages can be sent and received using SIMs from other service providers, remote firmware upgrades rely on certain settings in the firmware that currently only work with Virgin Mobile. Note that 3G SIMs will **not** work in this unit.

PLEASE NOTE:

The SIM card provided with this Alarm is Pay As You Go and comes with £10.00 credit. We strongly advise that the owner puts this SIM card on account with Virgin. Failure to do so will in time render the Separator Alarm inoperable. Details of how to set up an account are contained within the Virgin booklet.

↳ Accessories

	Part No.
High Oil Probe -----	PP/14000
High Level Probe -----	PP/14011
Silt Probe -----	PP/14220
Probe Mounting Kit -----	PP/14050
Signal Distribution Box -----	PP/14039

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Environmental Services

Established in 1935, The Darcy Group is at the forefront of Environmental Protection and specialises in the manufacture and provision of solutions helping sites to achieve environmental and ISO compliance and care for the environment in increasingly demanding circumstances.