



Installation and Operation Manual



AdBlue Storage and Dispensing Above Ground Polyethylene Tanks

Issue 1 January 2010



Index

1. Safety Instructions
2. Product Description
3. Transport & Storage
4. Installation & Commissioning
5. User Guide
6. Maintenance & Service Schedule Information
7. Warranty
8. Trouble shooting Guide

Appendix A – Further Details of Main Parts

Appendix B – Tank Monitoring System Information

1. Safety Instructions

PLEASE READ OPERATION MANUAL CAREFULLY BEFORE USE & COMPLY WITH ALL INSTRUCTIONS HEREIN

OPERATION MANUAL SHOULD BE KEPT WITH THE EQUIPMENT AT ALL TIMES

1. This manual contains important information concerning the safe installation and use of this product. Read the manual carefully before installation and use. Pay attention to all safety warnings.
2. Installation and use of this product should only be carried out by properly trained and approved personnel.
3. The user of this product is responsible for the safe and correct use of this product.
4. Any changes to this product, which have been done without consulting the manufacturer, may invalidate all warranties and guarantees.
5. The manufacturer will not be responsible for any accidents or damages caused by incorrect installation or use of this product.
6. This product is only suitable for storage and dispensing of AdBlue to DIN70070.

2. Product Description

The BlueMaster range of tanks are designed to answer the needs of commercial companies as well as public depots with truck fleets for storage and dispensing of 32.5% urea, trade mark AdBlue. The tank enables safe AdBlue storage outdoors, at a safe distance from buildings and Atex hazardous zoned areas. High resistance against mechanical impact and protection against frost and heat due the "tank in tank" construction and optional inbuilt heating and cooling to suit UK and ROI temperature conditions can be shown. The high standard of specification ensures optimum safety and functionality. The product is not Atex approved.

	BMH2500	BMV5000	BMV9000
Capacity	2500 litres/550 gallons	5000 litres/1100 gallons	9000 litres/ 1980 gallons
Length/Diameter	2460mm	2230mm	3580mm
Width	1430mm	2700mm	2460mm
Height	1850mm	2380mm	2950mm

3. Transport & Storage

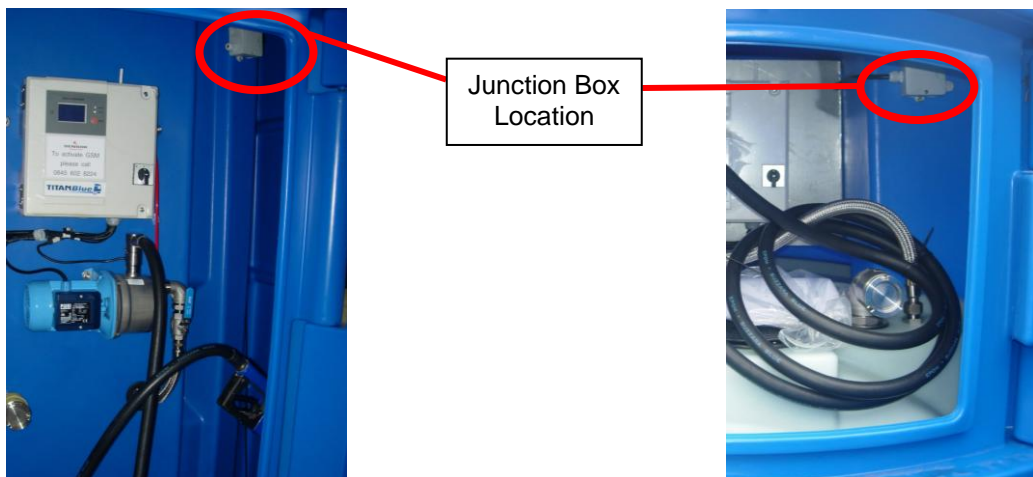
1. **DO NOT TRANSPORT WITH LIQUID INSIDE**
2. On the BlueMaster 5000 and 9000 litre tanks, a plastic strap is used to secure the housing to the tank for transportation and off loading. Do not remove until tank is in final location.
3. The BlueMaster tanks must be protected against mechanical damage during transport and storage.
4. Loading and off-loading must be carried out using only professional equipment, either a forklift with extended forks/tines or a crane. If lifting slings are used they must be attached to the lifting points on the external tank. The covers, sockets or other protruding elements, which are not designed for lifting or moving the tank, must not be used to lift or move the tank.
5. The BlueMaster tanks must never be pushed or rolled.
6. During transport and storage, the door must be tightly closed and secured. The dispensing nozzle must be placed in its holster and the control box shut.

7. Loading and transport areas must be smooth and free of sharp edges. During transportation the tank must be secured to prevent the tank from moving.

4. Installation & Commissioning

When installing a BlueMaster tank, the following guidelines must be observed:

1. The area on which the tank sits on should be solid (eg. concrete), smooth and free of sharp edges.
2. The tank should be placed at a minimum distance of 0.5m from all devices with surface temperatures > 100 ° C.
3. The tank should be protected against direct sunlight in hot regions with ambient temperatures > 40° C.
4. The user shall ensure safe urea supply (tank filling) and free space around the tank for periodic inspections and reviews.
5. Tank is delivered without power supply line. A qualified engineer should connect a suitable 230V power line to junction box in the pump housing. The individual cores of the power supply cable should be minimum 2.5mm².



6. The BlueMaster user is responsible for complying with all legal requirements related to the installation and use of this product, as well as the guidelines issued by local fire fighting authorities and environmental authorities.
7. Provision should be made to protect tank from impact damage.

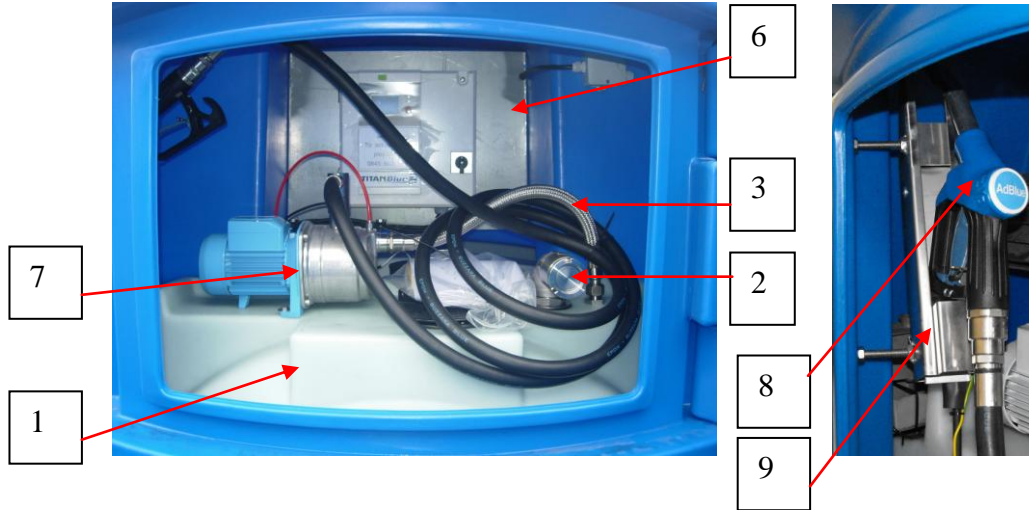
5. User Guide

(a) Summary of Main Parts

1. Bunded tank - inner storage tank with capacity equal to 95% of nominal volume & outer bund with capacity equal to 110% of inner tank.
2. 2" filling line and dry break coupling
3. Stainless steel ¾ " suction pipe with filter, check valve & shut-off valve (not available on 2500 litre).
4. Lockable equipment housing
5. Inner tank ventilation
6. Tank Monitoring System (TMS). *To connect TMS to a management interface with and without software please refer to Appendix B: TMS Management Interface.*
 - level & flow displays
 - overfill, leak and equipment alarms
 - low level & time cut-offs
 - remote monitoring telemetry (optional)

- 7. Pump – in cabinet or submersible
- 8. Dispensing hose and autonozzle - Standard or ZVA
- 9. Nozzle holster and switch

BMH2500



BMV5000



For further details on main parts see Appendix A and B

(b) Filling BlueMaster Tank

Do not exceed a maximum fill rate of 350 litres per minute.

During the first fill of the tank the level indicator shows less volume than that filled. The level indicator minimum read point is placed several centimetres above the base of the tank, which creates a dead zone in the bottom of the tank.

- Filling should be performed only under constant supervision of an authorised person
- This tank can only be filled by a tanker equipped with a female dry-break coupling.
- Ensure dispensing nozzle is in the holster.
- Fit delivery hose to dry-break coupling
- Fill tank in normal manner.
- Stop filling when desired amount has been dispensed into tank or when overfill alarm sounds.
- Disconnect delivery hose from dry-break coupling.

(c) Dispensing From BlueMaster Tanks

- Lift dispensing nozzle from holster.
- The TMS display will automatically switch to the Dispensing Screen and pump will start.
- Dispense AdBlue.
- Replace dispensing nozzle in holster.
- Dispensing Screen will revert back to the Main Screen in 1 minute.

Note: If the dispensing nozzle is not replaced into the holster correctly, the pump will run for 5 minutes before automatically switching off. If this occurs press the reset button on the TMS or lift and replace the dispensing nozzle in the holster.

(d) General Operation (via TMS)

Main Screen

When the control panel is switched on, the TMS 'Main Screen' will appear, as shown in Figure 1 below. The numeric indicator shows the volume of liquid remaining in the tank, in litres. The bar chart below the number is a visual indication of the tank's volume; each bar represents 1/10th of the volume (ullage).

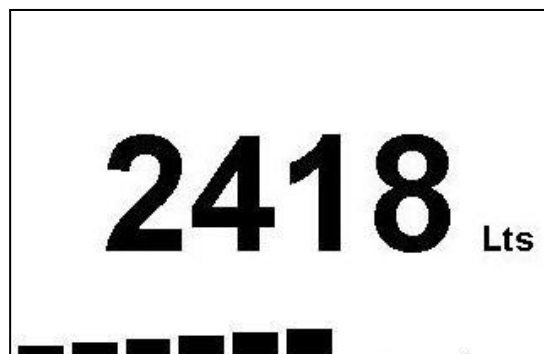


Figure 1 LCD – Main Screen

Flow Mode

When the dispensing nozzle is removed from its holder, the TMS will automatically switch to the 'Dispensing Screen', as shown in Figure 2 below. The large size numbers in the centre of the screen indicate how many litres have been dispensed at present. The small size numbers beside "TOTAL" indicates the total volume of liquid dispensed in litres.

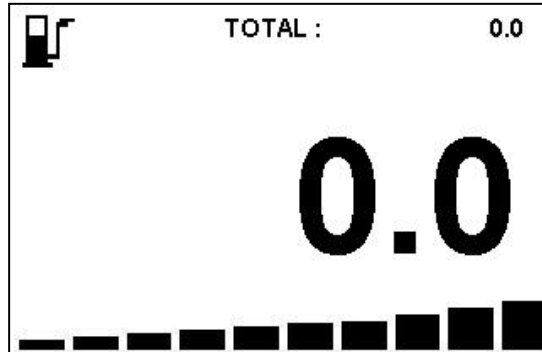


Figure 2 LCD – Dispensing Screen

When the dispensing operation is complete and the dispensing nozzle is returned to its holster, the 'Dispensing Screen' will revert back to the 'Main Screen' in approximately one minute. There is still the ability to move between the 2 screens, by using the reset button. If the dispensing nozzle is lifted off its holster or not positioned back correctly, the pump turns off after 5 minutes if nothing is dispensed.

Pushing the reset button in the middle of dispensing will reset the flow meter to 0.

Alarms



: This symbol will appear in the top left corner of display to indicate that there is at least 1 alarm mode present.

Low Level Alarm:

This indicates the level in the tank is low, and therefore it is not possible to dispense any liquid. The pump is switched off automatically, and cannot be switched on until the volume in the tank exceeds the low level setting, i.e. tank has to be filled to enable pump to operate.

Note: The first section of the bar chart will be flashing. There will be no buzzer sound and no Alarm LED light.

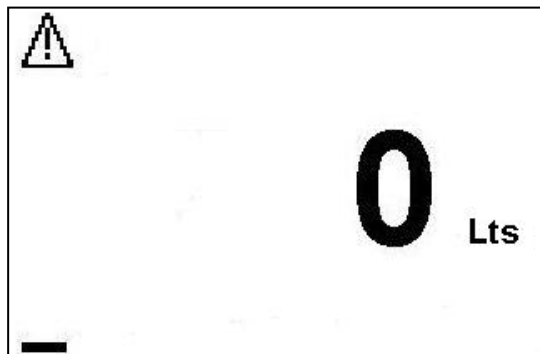


Figure 3 LCD – Low Level Alarm

Level Alarm:

This indicates a fault has occurred with the tank’s level detection device and therefore cannot measure the volume of liquid remaining in the tank. The volume displayed is the last good level received and will remain until new level is received. An Alarm LED will light and a buzzer will also sound. It will not be possible to dispense liquid while in this alarm mode, as the pump will be automatically switched off.



Figure 4 LCD – Level Alarm

Overfill Alarm:

Activation of this alarm indicates the tank has reached full capacity and filling must be stopped immediately. An Alarm LED will light and a buzzer will also sound for 5 minutes. **Note:** It will remain like this until the level falls below the Overfill Level.



Figure 5 LCD – Overfill Alarm

Factory Programmed Level Settings

BMH2500	Low Level	250 litres
	Overfill	2325 litres
BMV5000	Low Level	485 litres
	Overfill	4700 litres
BMV9000	Low Level	600 litres
	Overfill	8500 litres

Bund Alarm:

If fluid in the bund area has been detected the buzzer will sound and an Alarm LED will light. The buzzer will stop after 5 minutes, but the LED will remain lit. Check to see if bund area is wet. Once bund area is emptied, the LED will turn off and the LCD will revert back to the main screen.

Repetitive occurrences of this alarm should be investigated to determine cause of fluid in bund.



Figure 6 LCD – Bund Alarm

Bund Sensor Error Alarm:

If a fault has been detected with the bund sensor, the buzzer will sound and Alarm LED will light. Check the connection between the TMS and the bund sensor.



Figure 7 LCD – Bund Sensor Error Alarm

6. Maintenance & Service Schedule

- Transport and store the tank so as not to damage the tank walls.
- Keep all tank equipment in good working condition.
- A daily check should be carried out in the visual condition of the tank, devices and power line.
- Any faults or alarms should be reported to the tank supplier immediately.
- If fluid is found in the bund, contact the tank supplier immediately.
- Spare parts must comply with the requirements of the manufacturer.
- Protect against unauthorised access.
- BlueMaster tanks should be serviced every 6 months or every 50,000 litres dispensed, depending on which occurs first.
- BlueMaster tanks should only be serviced by Kingspan Environmental approved qualified personnel. Please contact Kingspan Environmental for further details.

7. Warranty

Within the warranty period Kingspan Environmental will repair or replace, at their discretion, any tanks found faulty due to incorrect material or workmanship. Kingspan Environmental products are guaranteed against material or manufacturing defect and have the following guarantee period commencing from the date of invoice:

For polyethylene tanks: 5 years
For accessories/components: 12 months

This guarantee is not valid for the following defects:
Mechanical damage caused by the user, dealer or improper maintenance.
Faults, damage or premature wear caused by improper use.
Damage caused by third parties.
Repairs carried out by unauthorised service personnel.

Claims:

If a problem develops during the guarantee period, please call Commercial Fuel Solutions Ltd Customer Care with the serial number and model type on +44 (0) 2380 231 007

Commercial Fuel Solutions Ltd

6 City West
Millbrook Road East
Southampton SO15 1AH
Tel: +44 (0)845 688 9755
Fax: +44 (0)845 688 9744

8. Trouble Shooting Guide

Fault	Action/Solution
Nozzle fails to operate	<ol style="list-style-type: none"> 1. If nozzle is ZVA ensure magnetic collar is fitted to receiving tank 2. Check TMS for alarms - See below. 3. If no alarm is displayed check if nozzle is blocked by adblue. If so, submerge nozzle in bucket of water for approx. 20 minutes to dissolve AdBlue. 4. Internal parts may be damaged if nozzle has been dropped or damaged. New nozzle required. 5. Pump may need priming see Appendix A <p>If problem not resolved please contact Customer Care</p>
Pump fails to operate	<ol style="list-style-type: none"> 1. Check power supply to tank. 2. Check TMS for alarms – see below. 3. If tank is fitted with nozzle holder into which nozzle is pointed downwards check the nozzle switch area has no adblue crystals surrounding it. Hot wash away any crystallisation. 4. Check that nozzle switch is operating by using a pencil to push down inside the tube – click/click should be heard. <p>If problem not resolved please contact Customer Care</p>
Pump requires priming	<p>See priming instructions in Section A. If pump requires repetitive priming please contact Customer Care.</p>

TMS Alarms	Action/Solution
Low Level Alarm	Fill Tank
Overfill Alarm	Stop Filling the Tank
Level Alarm	Check connection to Level Device
Bund Alarm	Pump out bund area as soon as possible. Dispose of fluid safely and according to the requisite legislation
Bund Sensor Error Alarm	Check connection to the Bund Sensor

Appendix A

Pumps

Suzzara Blue

Name and producer: Suzzara Blue, PIUSI

Voltage: 230 V, 50 Hz, +/- 5%

Power: 370 Watt;

Maximum flow: 40 litres/min

Weight: 15kg

Maximum delivery pressure: 5 bar

Self-priming height: up to 2m

Maximum sound level: 75 dB (A)



Attention:

1. Before use carefully read the instructions provided by the pump manufacturer.
2. The pump is only suitable for dispensing AdBlue
3. Running the pump dry can damage the seals.
4. Pump must be filled with AdBlue or demineralised water for priming (about 1,5L).
5. Do not leave the pump filled with liquid when there is a risk of freezing. Prime pump again before next use.

Priming Instructions:

(available in full in Pump Manual)

1. Undo grub screws that lock cap on top of flowmeter using a 2.5mm Allen key.
2. Lift the cap taking care not to pull cable.
3. Fill the pump using a suitable spouted container with 1.5 litres of suitable liquid.
4. Replace the flowmeter cap and retighten grub screws.

Submersible

Name and producer: Ecodiver, Leader

Voltage: 230V, 50Hz

Maximum flow: 80 litres/min

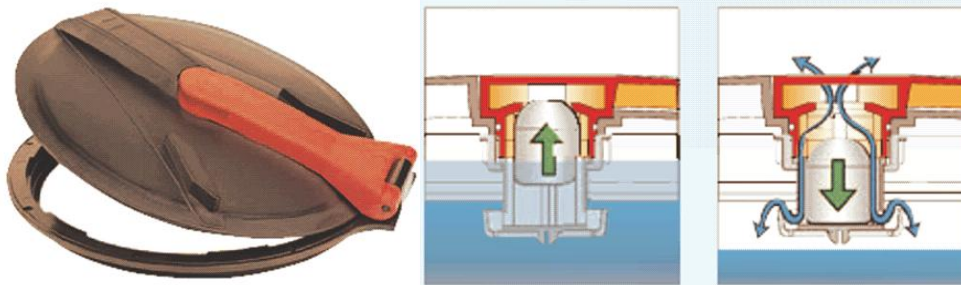
Weight: 7.3 – 8.8kg



Inner Tank Ventilation

The inner tank is ventilated by two means:

A). The plastic 16" lid in the centre top of the inner tank is equipped with a built-in vent unit. The lid provides access to the inside of the inner tank if necessary. Before using the lid the top of the bund tank must be removed.



B). Plastic 2" vent, with protection mesh, varying in number depending on tank size



Filling Line

The filling line consists of 2" EPDM pipe or stainless steel elbow (on 2500) and stainless steel fittings. The fill line is attached to the tank. The other end of the filling line is in the pump housing. It is connected to a spill free, male 2" dry break valve (shown on right below). Filling lines to this must be equipped with a female 2" dry break connection (shown on left below).



Suction line, Nozzle and Nozzle Holster (In-cabinet pump)

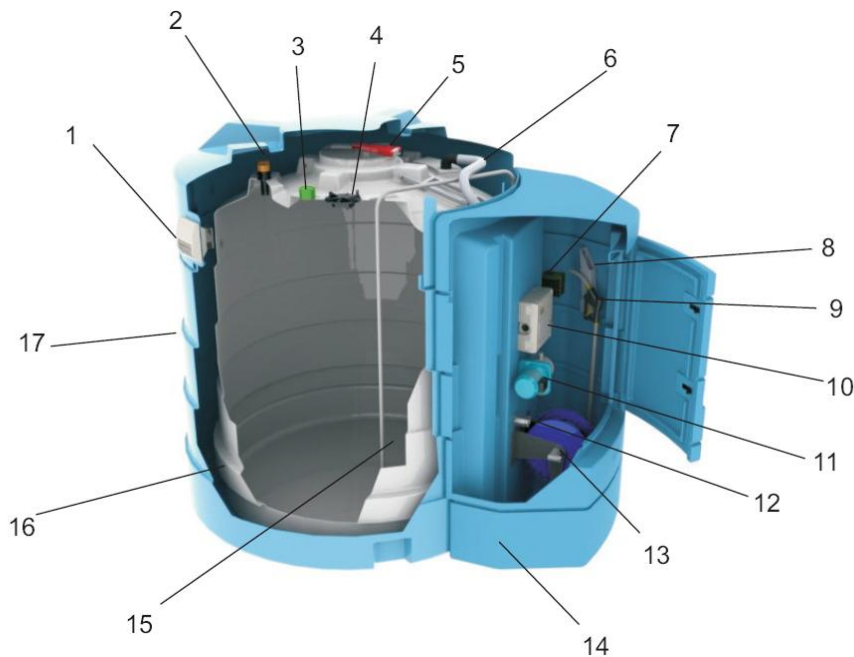
The suction line is made entirely from stainless steel. The mesh filter prevents dirt from entering the line. A shut off ball valve (not available on 2500litre) enables easy pump maintenance. The pump outlet is connected to Turbinox flowmeter and from there to a dispensing hose and automatic nozzle. The nozzle holster contains an on/off switch for the pump.

Identification Plate

Each BlueMaster has an identification plate (shown below) attached:

Serial No:	_____	Unpressurised operation.
Production date:	_____	Approved for external installation.
Nominal capacity:	_____	Storage of only aqueous urea "AUS 32" (32.5%) or
Material:	LLDPE	AdBlue® with a max. density of 1.15g/cm ³
Max. fill rate:	350 litres/min	Before installation and use read operation manual.
		Manufacturer: Kingspan Environmental Ltd
		180 Gilford Road, Portadown
		Co Armagh,
		Northern Ireland, BT63 5LF
		Tel: +44 (0) 28 3836 4400
		sales@titanenv.com
		www.titanenv.com

Sectional image of a BlueMaster 5000 litre tank BMV5000



1. Vent fan
2. 2" Inner tank vent
3. Ultrasonic level sensor
4. 4" Screw lid
5. 16" vented lid
6. 2" Fill hose
7. Housing heater
8. Nozzle holster
9. Dispensing nozzle
10. Tank Management System (TMS)
11. Pump unit
12. 2" Dry break coupling
13. Hose reel
14. Equipment housing
15. Stainless steel suction line
16. Inner tank
17. Bund

Please note: Equipment shown is not standard on all tanks and positions of equipment may vary depending on BlueMaster model.

Appendix B

ADBLUE TMS

General

The AdBlue TMS is a bespoke design to control, monitor and accommodate efficient storage and dispensing of AdBlue.



Functions of AdBlue TMS

- Level Measurement
Ultrasonic or 4 – 20mA type identical transducer
- Overfill Alarm
Visual and audible
- Variable Low Level Cut Off
Visual and audible
- Bund Alarm
Active Conductive type sensor, 10mm from tank base
- Equipment Alarms
Notification if level measurement, bund or capacitive sensors are damaged
- Integrated Flow Meter
Flow in litres and cumulative amount
Auto display when pistol is lifted
Reverts back to level after 1 minute or via button toggle facility
- Flow Meter Conversion
91 – 100 pulses converter for flow equipment
- Automatic Pump Control
Cuts off after 5 minutes if not used

Optional Features

- Remote Monitoring Facility
GSM/GPRS real time accessibility
Provision of Alarms
Web hosting and integration of level / status information to SAP, Sage etc

Physical Features

- Fire Resistant Cabling
- Safety Cut Off Emergency Stop Button
- Fire Retardant Box
- IP65 Rated Box
- Tested for Humidity, (see Technical Specification)
- Fits full range of BlueMaster AdBlue tanks

AdBlue Control Panel Technical Specification

Dimensions	Height: 310mm, Width: 358.5mm, Depth: 114.7mm
Material	ABS
Ambient temperature	-20°C to +40°C
Supply voltage	230 V ac
Electrical connections	High voltage: 2 and 3 way connectors 5.08 pitch Low voltage: 2 way and 20 way connector 3.5 pitch, Jack connector – 3 pole, 3.5mm, 1A jack socket
Inputs	High voltage: <ul style="list-style-type: none"> - power supply 230 V - thermostat 35 C - thermostat –8 C Low voltage: <ul style="list-style-type: none"> - ultrasonic input (3 V) - 4 - 20 mA - flowmeter input (91 impulses/ litre) - thermistor 10k - bund sensor - pistol
Outputs	High voltage (230 V): <ul style="list-style-type: none"> - fan 1 - fan 2 - pump - house heater - tank heater - management interface - light Low voltage: <ul style="list-style-type: none"> - impulses out (100 impulses/litre), open collector, 12 V dc
Interface	Jack connector – 3 pole, 3.5mm, 1A jack socket (RS232)
Display	128x64 graphic LCD, blue
LEDs	Green – power Red – alarm
Operation	<ul style="list-style-type: none"> - switch - emergency button
Buzzer	12 V dc
Circuit breakers	<ul style="list-style-type: none"> - fans - 6A - pump and MC Box - 6A - house heater - 10A - tank heater and lamp - 16A
Approvals	Unit meets the requirements of; <ul style="list-style-type: none"> • Low Voltage Directive: EN 61010:2001 • EMC Directive: EN55011:1999+A2:2001, EN 61326:1998+A3:2003



High Voltage Outputs (Fan 1, Fan 2, Light, Pump House Heater, Tank Heater) are hazardous voltage (mains voltage).

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

F1 (Fuse) - 315mA Slow Blow Fuse

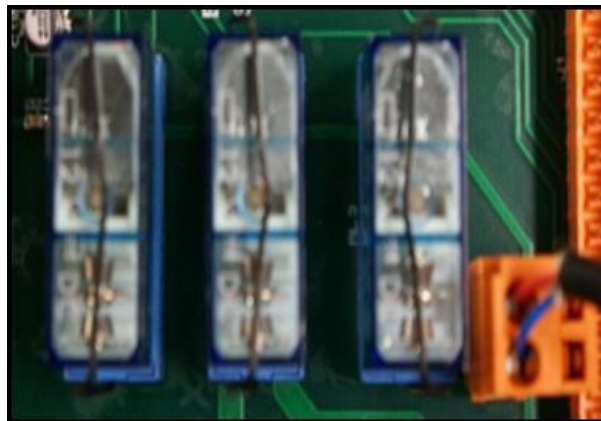
The equipment contains no other user serviceable parts and all maintenance and repair must be carried out by the manufacturer.

TMS Management Interface

This should only be undertaken by trained personnel

Pistol: Pin14: blue
Pin15: red

a) In normal mode **and** management mode, when the pistol is lifted and the pump is switched on and the screen switches to dispensing mode. In normal mode and management mode, when the pistol is lifted the third relay closes until the pistol is returned to park position. To use this relay output, ensure that the third relay is inserted. To connect to the output of the relay use the red and blue wire outlined in the figure below. If the board has no relay please call Kingspan Environmental and we can send a kit for easy installation of this relay.



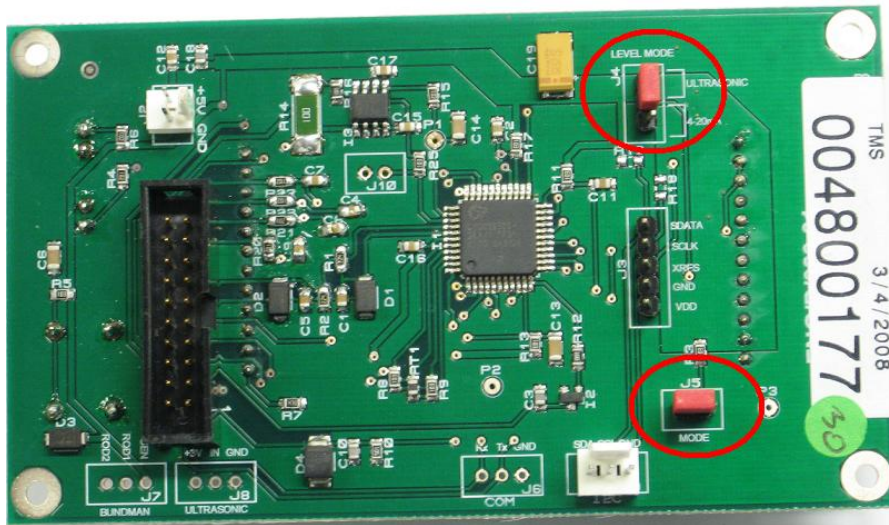
b) Ext In:

Note: This input will only work when the jumper on the Display board is connected to both pins as per picture on the next page.

This is an active low control signal that is used by external management systems to over ride the local control of the pump. Creating a short circuit between the two pins of EXT In will enable the pump. Creating an open circuit between the two pins on EXT in will disable the pump.

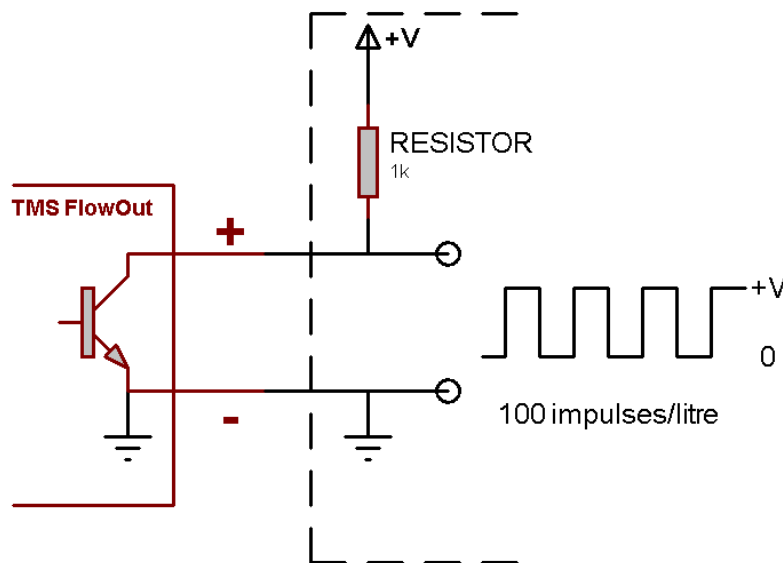
Pin16: black
Pin17: red

Note: Ext In only works when the Mode jumper is as show in the picture below. You must also configure the Panel setting in software to be turned on.



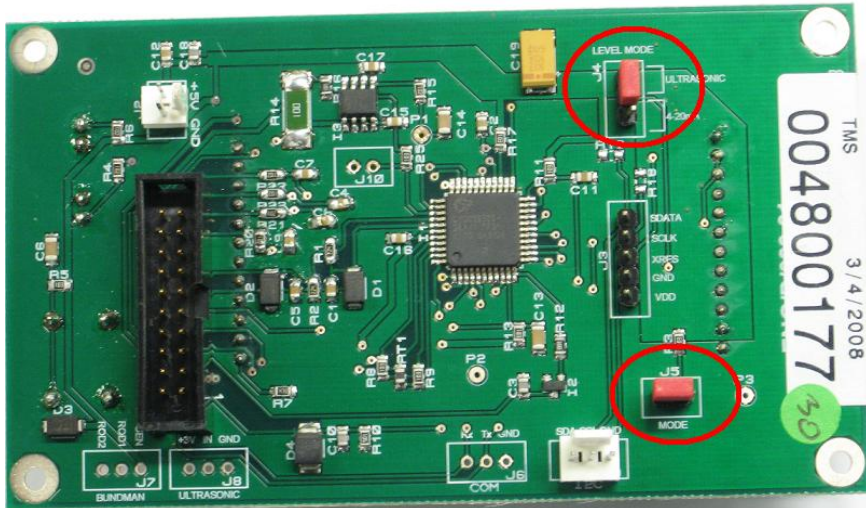
c) Flow Out: open collector output, max. 30V DC, 20mA, 100 impulses/litre, microprocessor convert impulses from pump flow meter and creates 100 impulses per litre. This output is present in normal mode and management mode.

Pin18: green
Pin19: yellow



3. Jumpers on the PSoC board:

At the back of the PSoC board (board with blue LCD) there are two places for jumpers:



- LEVEL MODE - J4:

J4 is a 3 pin connector. If we put the jumper (red) on the top two pins that means the TMS box will read the tank level from ultrasonic unit. If the jumper is on the bottom two pins the TMS box will read level from 4..20 mA level probe.

- MODE – J5:

J5 is a 2 pin connector. J5 without the jumper means that TMS is in “normal mode”. If there is a jumper on the J5 connector the TMS is in “access mode”. In this mode we can see the pad lock symbol on blue LCD in the top-right corner. If the pad lock is closed this means the pump is disable. A short circuit on EXT IN input enables the pump. EXT IN it is 4th (positive) and 5th (negative) pin from the left side in the 20 way connector J1. This input has an internal pull-up resistor to work with any switch, relay or open collector output device. The active low signal (short circuit) should remain for as long as pump control is required.

