



Installation, Operation and Servicing Manual Version 3.0.0



Models:

1350SLBFS | 2500HBFS | 3500VBFS | 6000VBFS | 10000VBFS | 15000VBFS | 30000VBFS

TUFFA FUEL STATIONS





1.	Introduction	2
2.	Conditions of use	2
3.	Safety	3
4.	Product description	4
4.1	Product identification	4
4.2	Product specification	5
4.3	Product dimensions	6
5.	Transport & storage	13
6.	Installation & commissioning	14
6.1	Installation guidelines	14
6.2	System installation	14
6.3	System location	14
6.4	Electrical requirements	15
6.5	Electrical wiring diagram	15
7.	Operation of the system	17
7.1	Using the system	17
7.2	Summary of main parts 1350 / 1400 / 2500	17
7.3	Summary of main parts 3500 / 6000 / 10000 / 15000 / 30000	19
7.4	Filling diesel fuel station	20
7.5	Dispensing diesel into vehicle	20
7.6	Equipment components	21
8.	Maintenance of the TUFFA TANKS	44
8.1	System maintenance tasks	45
8.2	Inspection by competent person	45
8.3	Internal examination and cleaning	45
8.4	Troubleshooting	46
8.5	Tank maintenance record	52
8.6	Fuel delivery log	54
9.	Warranty	56
10.	Contact	57
11.	Guarantee Registration	57





1. Introduction

This manual contains specific instructions and information relating to the installation, operation and maintenance of Tuffa Tanks systems.

2. Conditions of use

- Read this manual before installing this system.
- Tuffa Tanks accepts no liability for personal injury or property damage resulting from working on or adjusting the equipment incorrectly or without authorisation.
- Tuffa Tanks accepts no liability for direct, indirect, incidental, special, or consequential damages resulting from failure to follow any warnings, instructions, and procedures set out in this manual.
- Tuffa Tanks reserves the right to change the specifications of its products or the information in this manual without necessarily notifying its users.
- Variations in installation and operating conditions may affect the Tuffa Tank systems performance. Tuffa Tanks makes no representations or warranties concerning the performance of the tank system under the operating conditions prevailing at the installation.
- Only parts supplied by or approved by Tuffa Tanks must be used and no unauthorised modifications to the hardware or software should be made. The use of non-approved parts or modifications will void all warranties and approvals and could lead to hazardous safety conditions.
- Unless otherwise noted, references to brand names, product names, or trademarks constitute the intellectual property of the owner thereof.

3. Safety

PLEASE READ THIS MANUAL CAREFULLY BEFORE USE & COMPLY WITH ALL INSTRUCTIONS BELOW.

THIS MANUAL SHOULD BE KEPT WITH THE EQUIPMENT AT ALL TIMES.

1. The major hazard involved with installing and operating the unit is electrical shock. This hazard can be avoided if you adhere to the procedures in this manual and exercise all due care.
2. Installation and use of this product should only be carried out by properly trained and approved personnel.
3. Please refer to storage media MSDS which should be supplied by the proprietor of this system which will detail the PPE required for handling and emergency procedures.
4. The user of this product is responsible for the safe and correct use of this product.
5. This product is only suitable for storage and/or dispensing of the liquid media referenced at the point of sale.



4. Product description

Tuffa Fuel Stations are designed solely for storage and dispensing of diesel. The static bunded systems enable safe diesel storage and dispensing in an outdoor environment and ensures you meet all stringent fuel storage regulations. The high standard of specification ensures optimum safety and functionality. This product's standard specification is not approved for the resale of diesel.

4.1 Product identification

The identification plate is located within the cabinet of each system and will detail the capacity, serial number, model number and year of manufacture.

Technical Details

Model	
Capacity	
Date of manufacture	
Serial number	
Stored product	
Weight	
Material	LDPE
Minimum wall thickness	5.4 mm
Bunded	Yes No
Fire protection rating	N/A 30 min 60 min
Quality check	

UKAS Testing Number: 0402 | Issued: 2009 | EN 13341

SCAN FOR USER MANUAL

Tuffa UK Ltd
Dovefields Industrial Estate
Dorset House, Littleport
Bedfordshire, MK43 8DP
Tel: +44 (0) 1897 847733
www.tuffa.co.uk

CE

LABO

TUFFA TANKS

If a fuel spill occurs:

- Observe safety precautions (e.g. no smoking)
- Stop the fuel from entering drains or watercourses by containing it with sand or earth
- Do not spread the fuel by hosing it down. Do not add detergents.
- Call the Environment Agency (24 hours)
EMERGENCY HOTLINE
0800 80 70 60

TUFFA TANK SERVICE HISTORY

Date	Signature



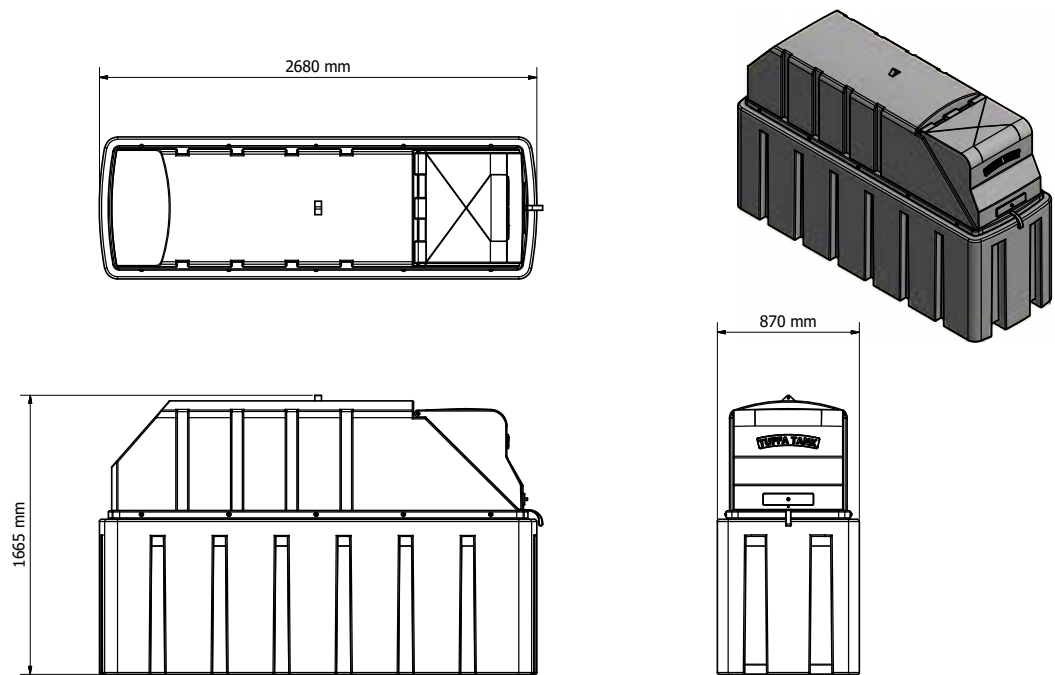
4.2 Product specification

	1350SLBFS	2500HBFS	3500VBFS	6000VBFS	10000VBFS	15000VBFS	30000VBFS
Capacity	1350 litres	2500 litres	3500 litres	6000 litres	10000 litres	15000 litres	30000 litres
Length	2680 mm	2840 mm	-	-	-	-	6080 mm
Width	870 mm	1520 mm	-	-	-	-	2890 mm
Diameter	-	-	2013 mm	2550 mm	2890 mm	2890 mm	-
Height	1665 mm	1630 mm	2520 mm	2585 mm	2590 mm	3500 mm	3500 mm
Cabinet depth	-	-	600 mm	600 mm	600 mm	600 mm	600 mm
Weight (approx.)	190 kgs	280 kgs	350 kgs	430 kgs	500 kgs	700 kgs	1330 kgs
Bund material	Lower Linear Density Polyethylene						
Inner tank material	Lower Linear Density Polyethylene						
Description	Bunded diesel fuel station						
Fill point	2" BSP	2" BSP	2" BSP with overfill prevention valve				
Ventilation	1x 3" vents						2x 3" vents
Flow rate	Standard flow rate - 52 LPM (approx.) High flow rate - 72 LPM (approx.)						
Flowmeter	Mechanical flowmeter (accuracy +/- 1%)						
Delivery hose	6 metres						
Hose reel (optional)	N/A		Hose reel available				
Nozzle	Automatic shut off nozzle						
Filtration	10 micron water and particulate filter						
Gauge	Clock Gauge		FMS gauge and bund alarm (230V)				

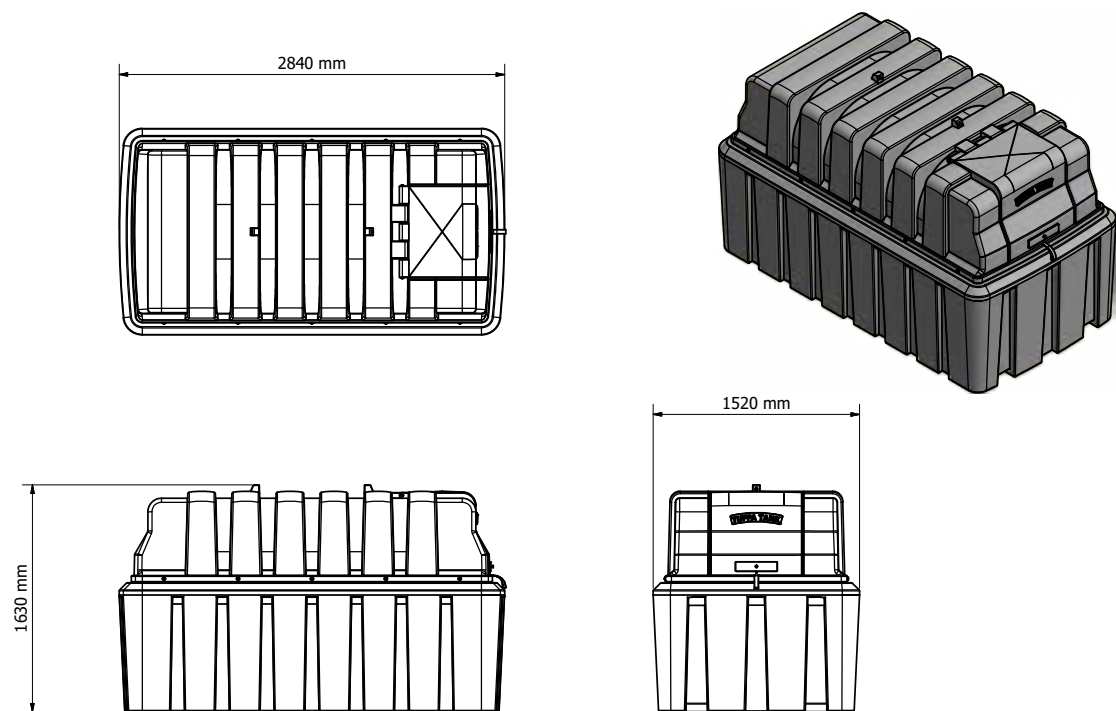


4.3 Product dimensions

1350SLBFS

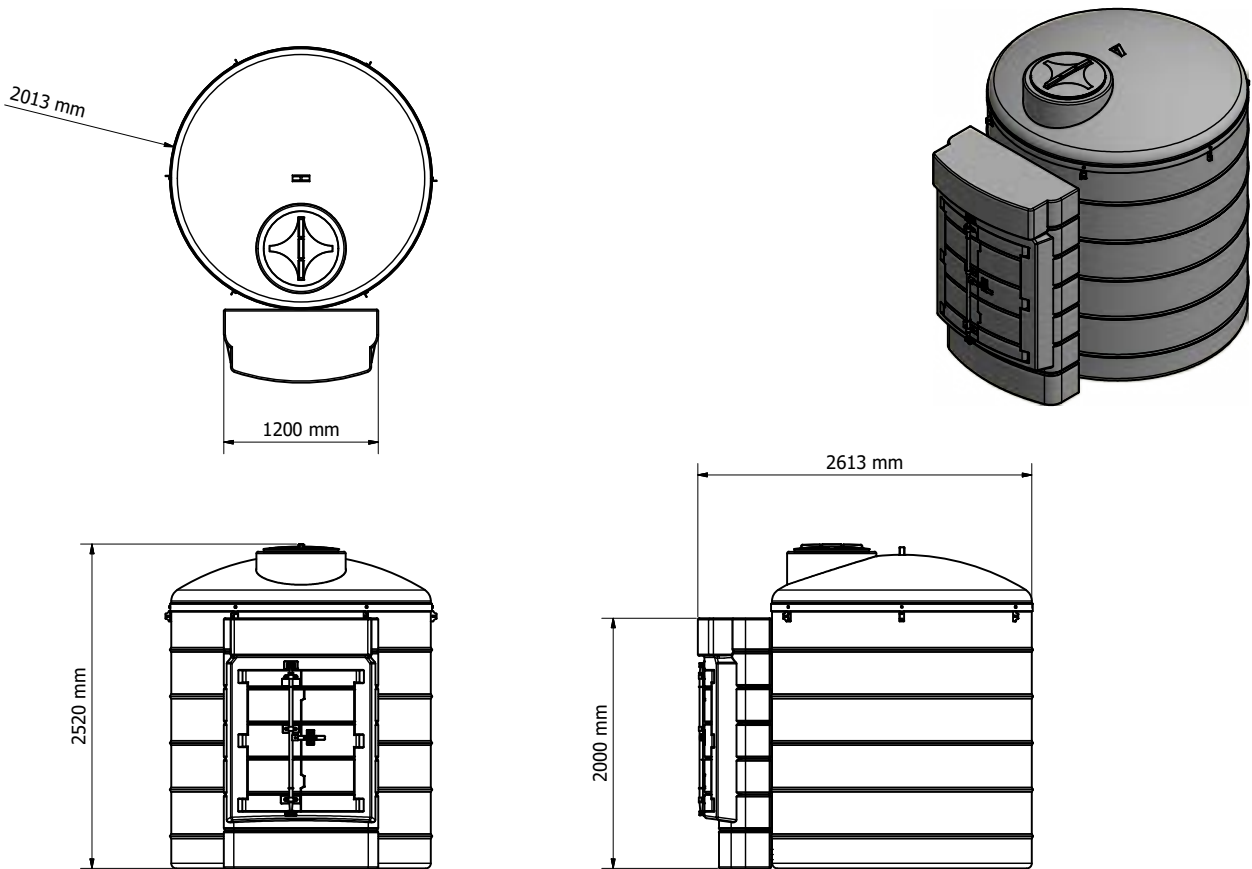


2500HBFS

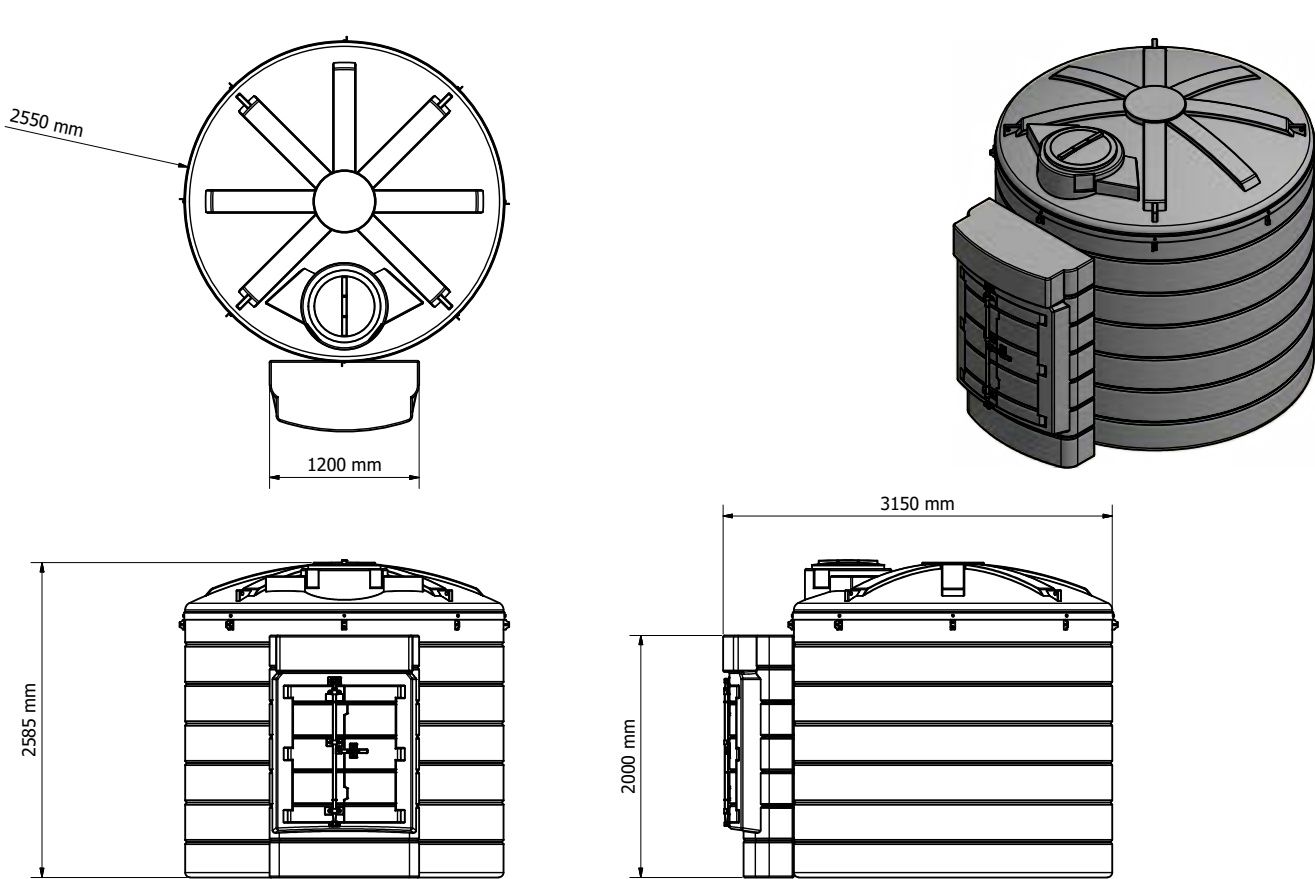




3500VBFS



6000VBFS



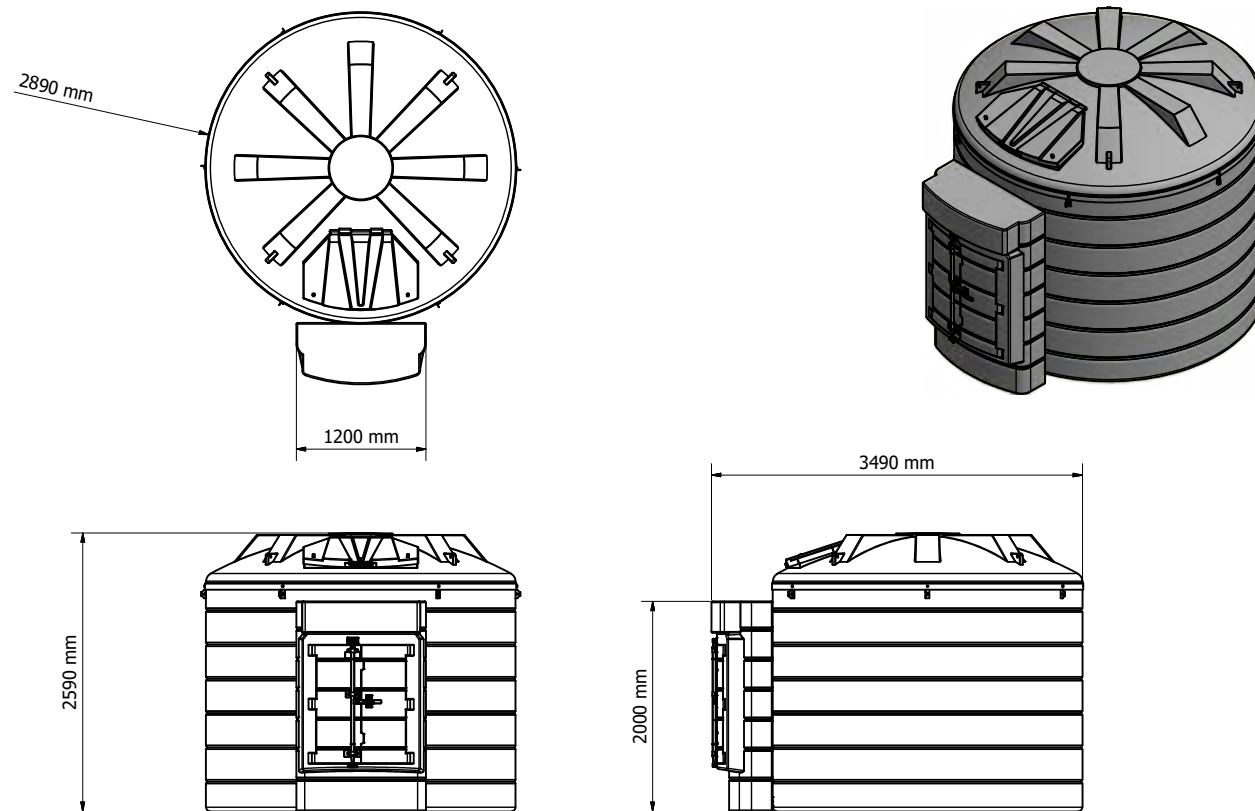
4. PRODUCT DESCRIPTION



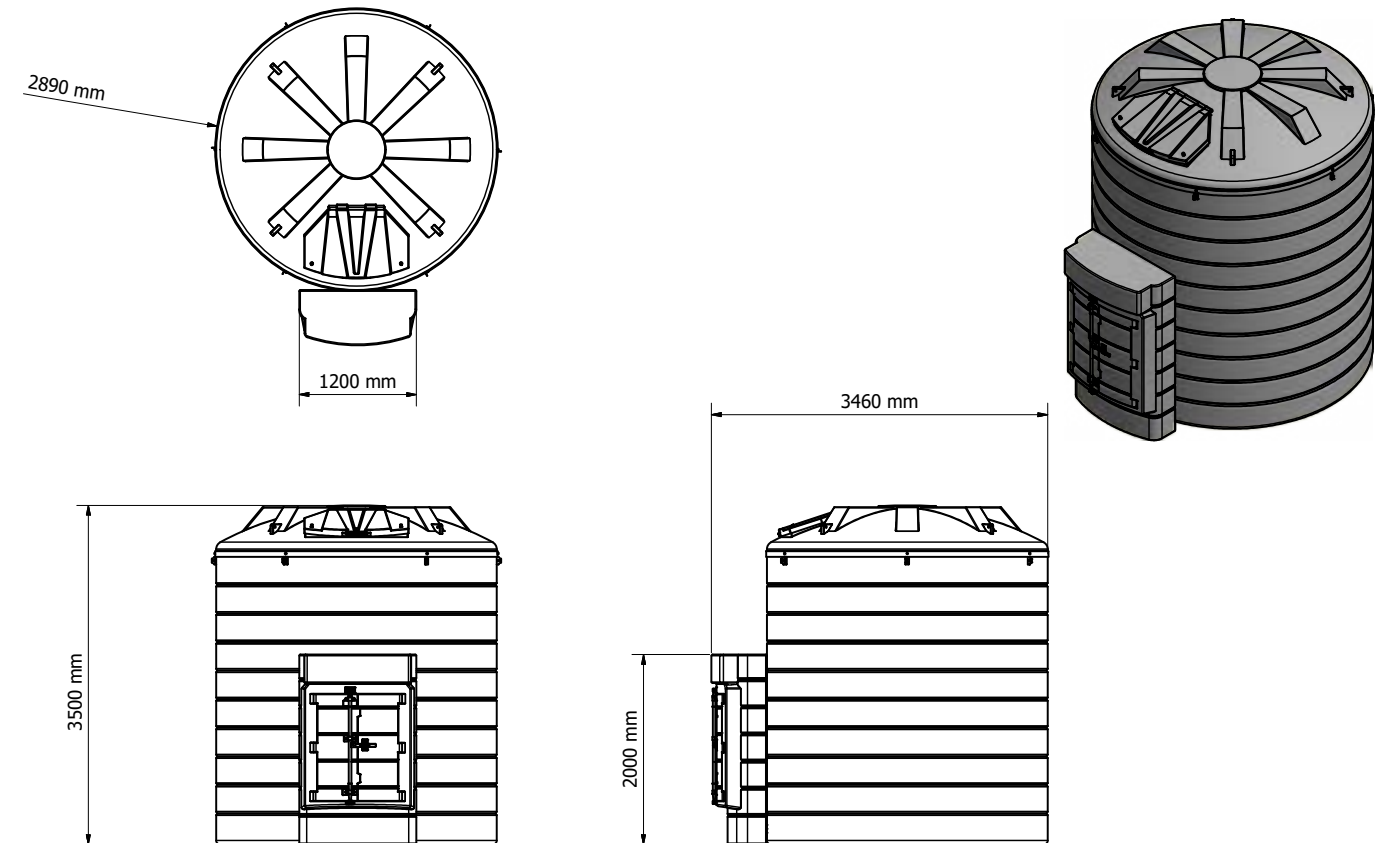
4. PRODUCT DESCRIPTION



10000VBFS

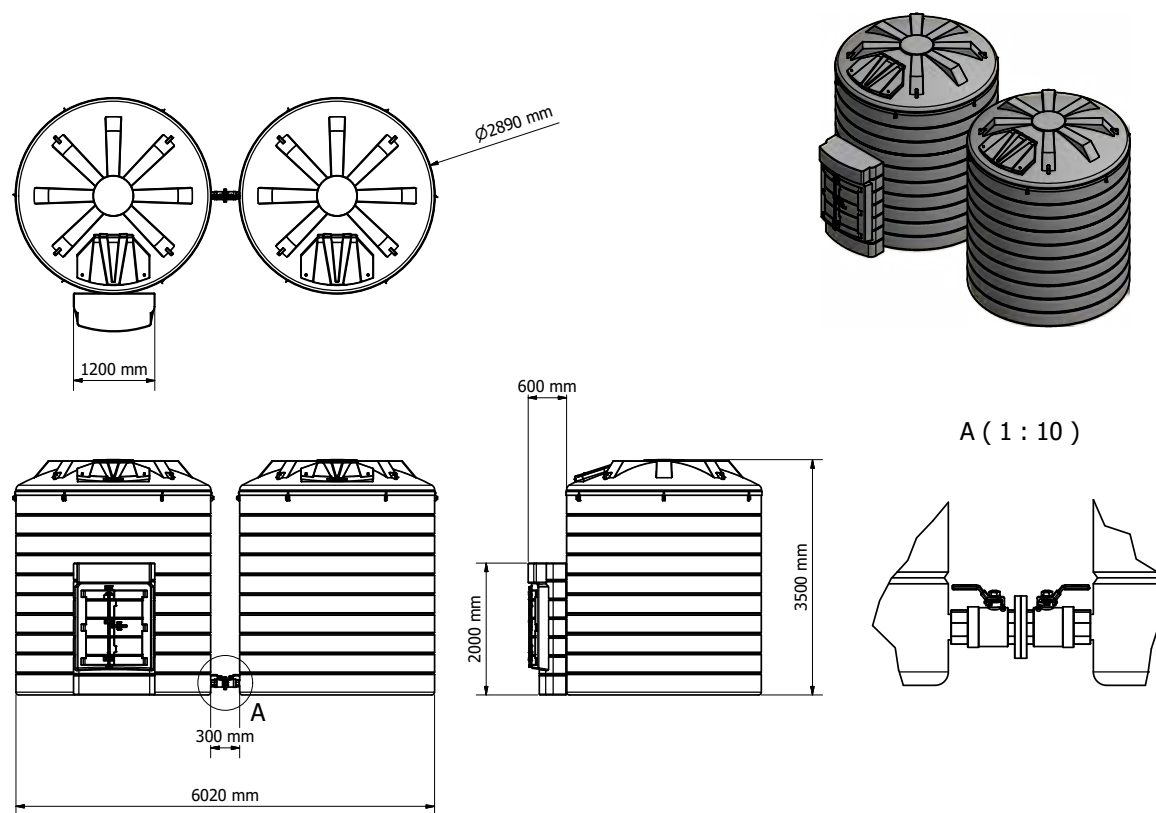


15000VBFS





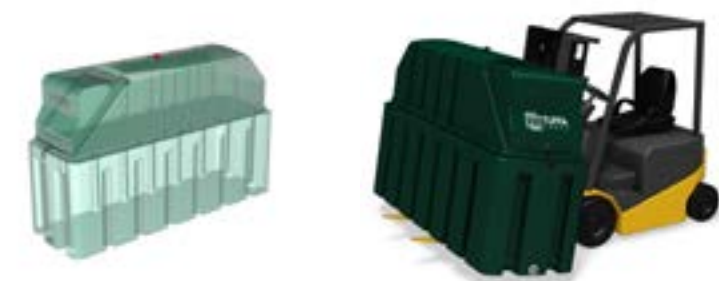
30000VBFS



5. Transport & storage

DO NOT TRANSPORT WITH LIQUID INSIDE THE TANK

1. During transportation the flip lid and cabinet doors are secured by 1 x R clip. The R clip must be installed prior to transportation.
2. Loading and off-loading must be carried out by a competent person using suitable rated and maintained equipment, either a forklift with extended forks/tines or a crane. If lifting slings are used, they must be attached to the lifting points as shown in the pictures below using a steel lifting eye insert. If lifting from below use a suitable rated forklift with extended forks. If lifting from above use a suitable rating lifting slings / chains.
3. 1350SLBFS / 2500HBFS - Lift with main lifting eye highlighted in red in the image below or forklift from the side.



4. 3500VBFS / 6000VBFS / 10000VBFS / 15000VBFS - Lift with x4 equal spaced lifting brackets as highlighted in red in the image below or forklift from one side using a ratchet strap to secure the tank to the forklift mast.



5. Tuffa Fuel Stations must never be pushed or rolled.
6. During transport and storage, the flip lid or cabinet doors must be closed and secured.
7. Loading, transport and storage areas must be smooth and free of sharp edges.



6. Installation & commissioning

6.1 Installation guidelines

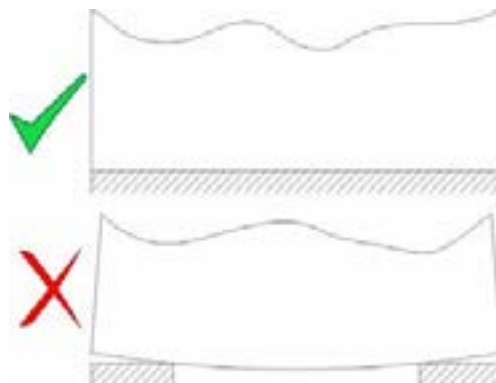
The proprietor of the Tuffa Fuel Station is responsible for complying with all legal requirements relating to the installation and use of this product, as well as the guidelines issued by local firefighting authorities and environmental authorities.

Once the Tuffa Fuel Station has been received on site, check that no damage has occurred while in transit. Locate the tank in the desired location using either a crane, forklift or rollers.

6.2 System installation

System foundation

The system must be installed and fully supported on a smooth levelled concrete base built in accordance with good building standards and engineering principles. It is recommended that tanks be installed on a concrete base at least 100mm thick. Please refer to diagram below:



6.3 System location

The location of the system should be positioned by a road or passing with sufficient width, and loading capacity to accommodate a tanker delivering diesel. Provision for the U-turn of a tanker should be considered. Potential obstacles in the form of tree branches, high voltage lines, or parked vehicles must be minimized.

The space around the system should allow free and collision-free movement of served vehicles.

Provision should be made to protect tank from impact damage.



6.4 Electrical requirements

Only a suitably qualified electrician according to applicable regulations may work on the electric wiring installation. The system components under service, maintenance, and repair work must be disconnected from the power supply before any work is undertaken.

System power requirements:

230V

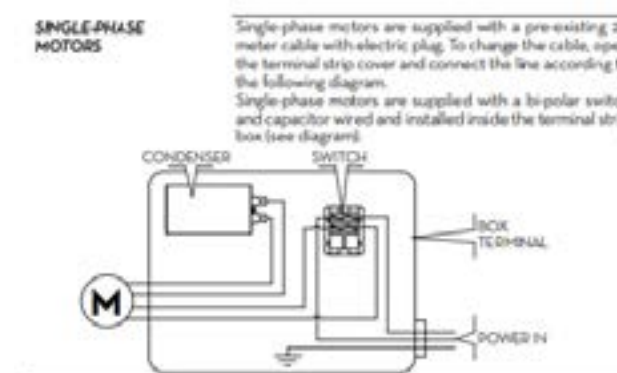
- 220 - 240 Volts, 50 Hz +/- 10%
- 20 amp circuit breaker recommended
- Power cable recommendation: 3 Core 2.5mm flex cable
- Duty cycle: 20 minutes
- **CAUTION: DO NOT RUN PUMP MOTOR WITH A CLOSED NOZZLE FOR MORE THAN 2 MINUTES**

12V / 24V

- Cable clips come pre-wired
- Duty cycle: 20 minutes
- **CAUTION: DO NOT RUN PUMP MOTOR WITH A CLOSED NOZZLE FOR MORE THAN 2 MINUTES**

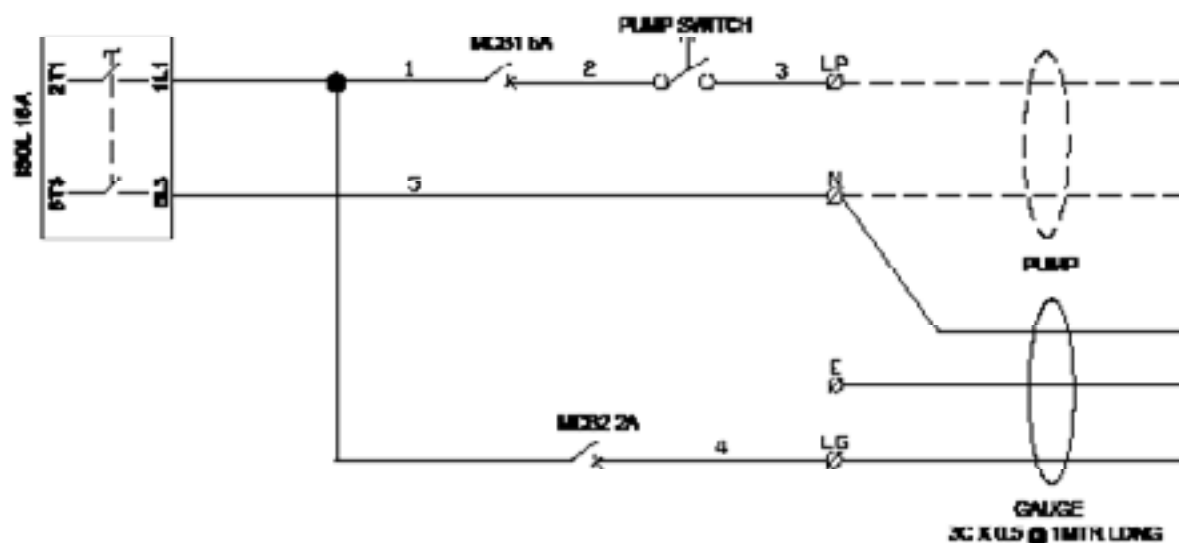
6.5 Electrical wiring diagram (230 V)

6.5.1 1350SLBFS / 2500HBFS – Key Switch





6.5.2 3500VBFS / 6000VBFS / 10000VBFS / 15000VBFS / 30000VBFS – Key Switch



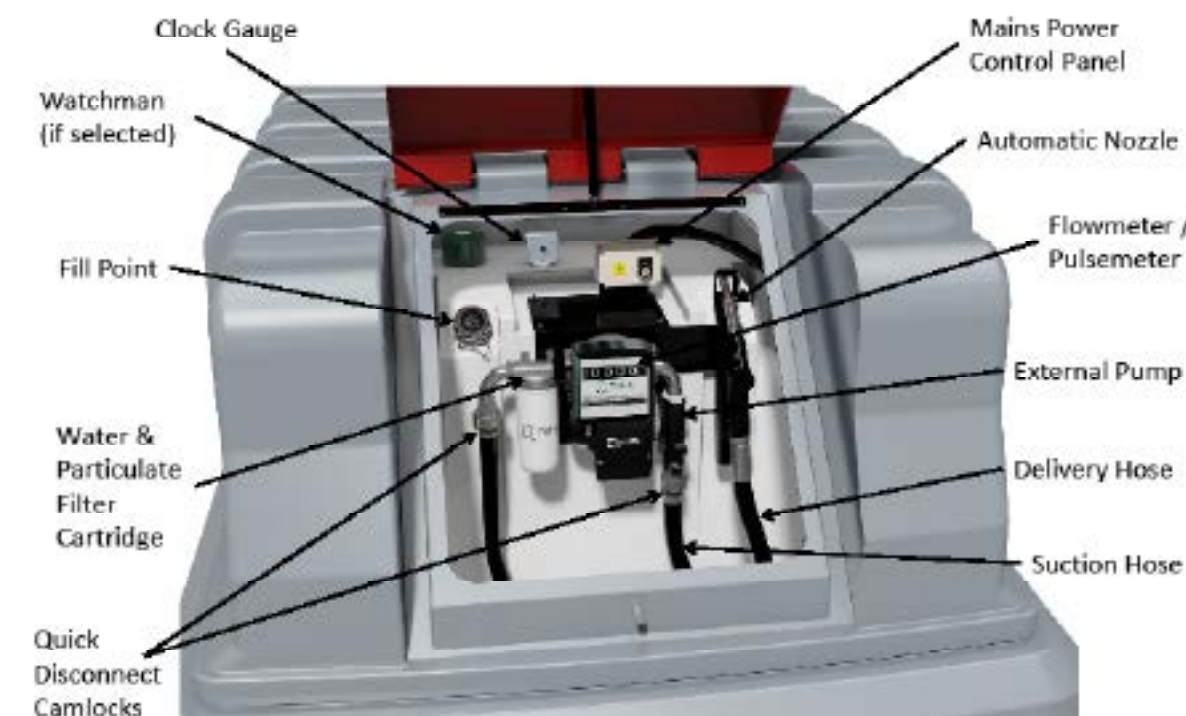
7. Operation of the system

The system and its components are intended for diesel fuel only and for the purposes described below. Use of this system in a means other than described below is regarded as mis-use of the system, the user of the system will be liable for any defects that occur due to its unintended use.

7.1 Using the system

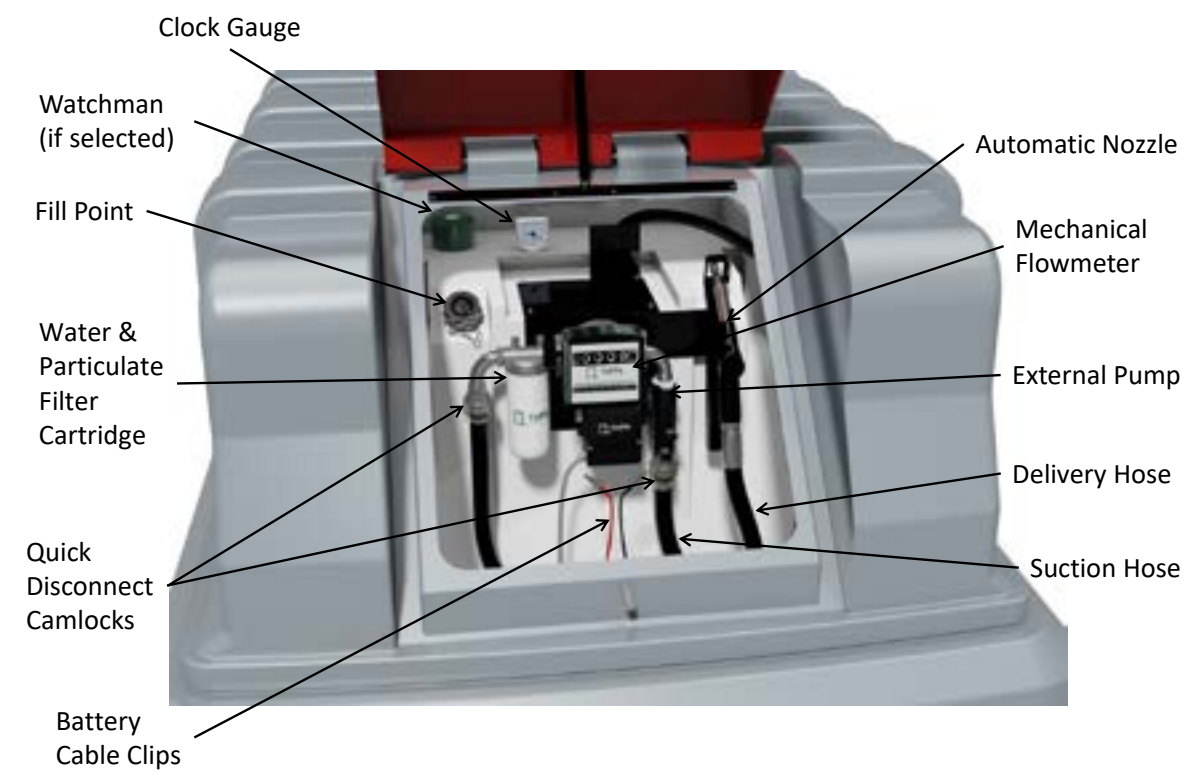
The operation and maintenance personnel must be suitably trained to use the system, the user must make sure they fully understand the operation and maintenance sections of this manual.

7.2 Summary of main parts 1350 / 2500 (230V)

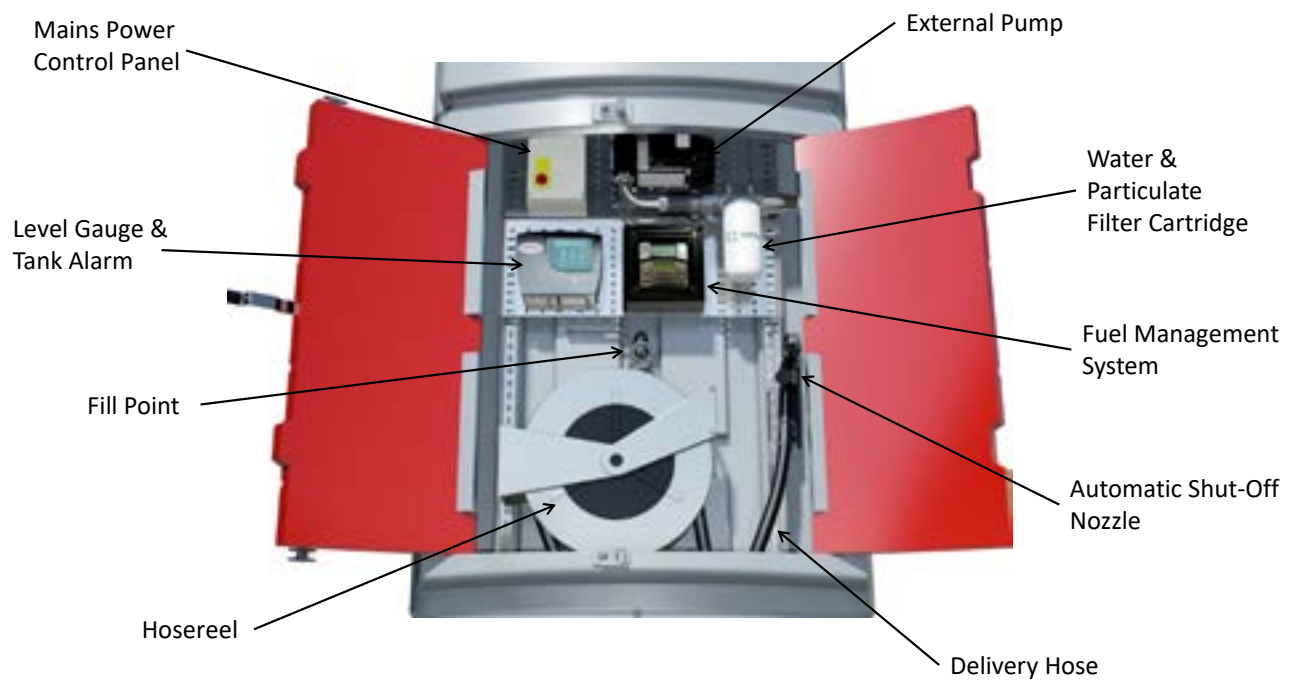




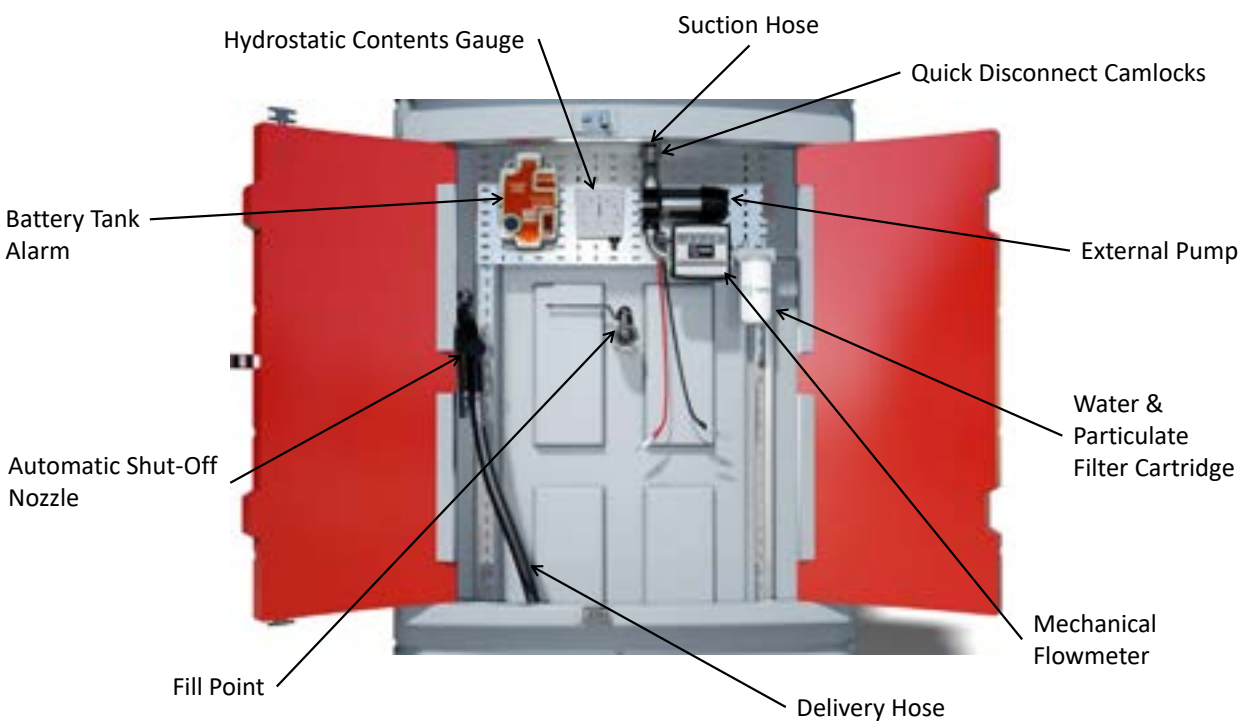
(12V / 24V)



7.3 Summary of main parts 3500 / 6000 / 10000 / 15000 / 30000 (230V)



(12V/24V)





7.4 Filling a Tuffa Fuel Station

1. Filling should be performed only under constant supervision of an authorised person.
2. This tank can only be filled by a tanker equipped with a 2" female BSP coupling.
3. On 3500 / 6000 / 10000 / 15000 models before filling the tank with diesel, please check the level of the tank and make note of the tank level before filling and ensure the high-level alarm indicator functions correctly.
4. Fit tanker delivery hose to 2" BSP fill coupling on tank.
5. Engage tanker pump and begin to fill. Stop filling when desired amount has been dispensed into tank, or when high-level alarm sounds.
6. During the tanker fill always observe tank level gauge throughout the duration of the filling process. The tanker driver must observe the tank being filled at all times during this process.
7. Once complete disconnect delivery hose from tank coupling.

7.5 Dispensing diesel into vehicle

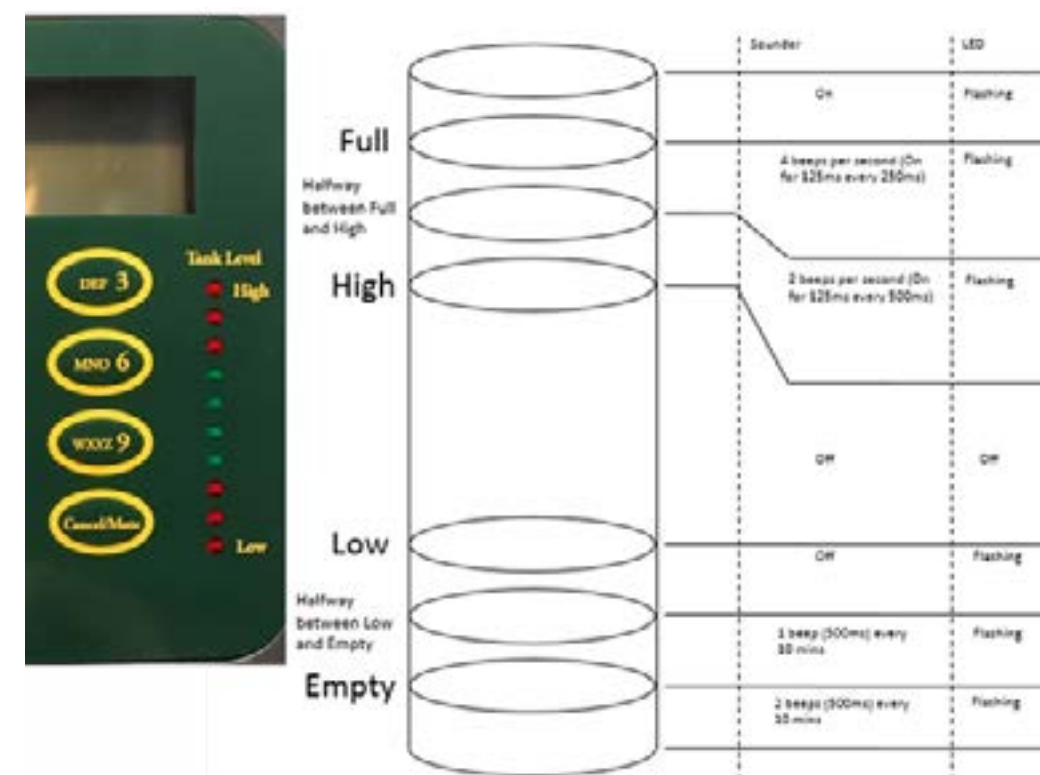
1. Reset the flowmeter totalizer to 0.
2. Activate pump using one of the following: rocker switch / key switch / auto - operational nozzle holster / battery cable clips.
3. Remove nozzle from nozzle holster and insert the nozzle completely into the diesel tank filler neck.
4. Pull trigger on the nozzle to allow diesel to flow into the vehicle diesel tank.
5. At this time the flowmeter counter will start recording the flow, continue refueling until the desired amount is reached or when the vehicle diesel tank is full.
6. When the fuel tank is full the nozzle will automatically switch off.
7. Release the trigger of the nozzle and replace back into the holster.
8. Deactivate pump with rocker switch / key switch / auto operational nozzle holster / removal of battery cable clips.



7.6 Equipment components

1. FMS gauge level (3500 litres models and above)

The Fuel Level Monitoring System is a 240v combined digital tank level indicator and bund and high-level alarm that is designed to provide both visual and audible alarms whenever a predetermined level in a storage tank is reached. The FMS gives a content readout in both litres and a percentage.



a. Full alarm

Activation of this alarm indicates that the tank is full. This alarm is shown through visual LED's and audible siren. Note: This audible and visual alarm will remain triggered for a short period of time after it sounds. The audible can be muted using the mute button on the keypad. THE PUMP WILL CONTINUE TO DISPENSE IN THIS ALARM MODE.

b. High level alarm

Activation of this alarm indicates the tank has reached a high capacity and close attention must be paid to the diesel inside the tank. This alarm is shown through visual LED's and audible siren. Note: This audible and visual alarm will remain triggered for a short period of time after it sounds. The audible can be muted using the mute button on the keypad. THE PUMP WILL CONTINUE TO DISPENSE IN THIS ALARM MODE.



c. Low level alarm

Activation of this alarm indicates the tank has reached a low level. This alarm is shown through visual LED's and audible siren. Note: This audible and visual alarm will remain triggered for a short period of time after it sounds. The audible can be muted using the mute button on the keypad. THE PUMP WILL CONTINUE TO DISPENSE IN THIS ALARM MODE.

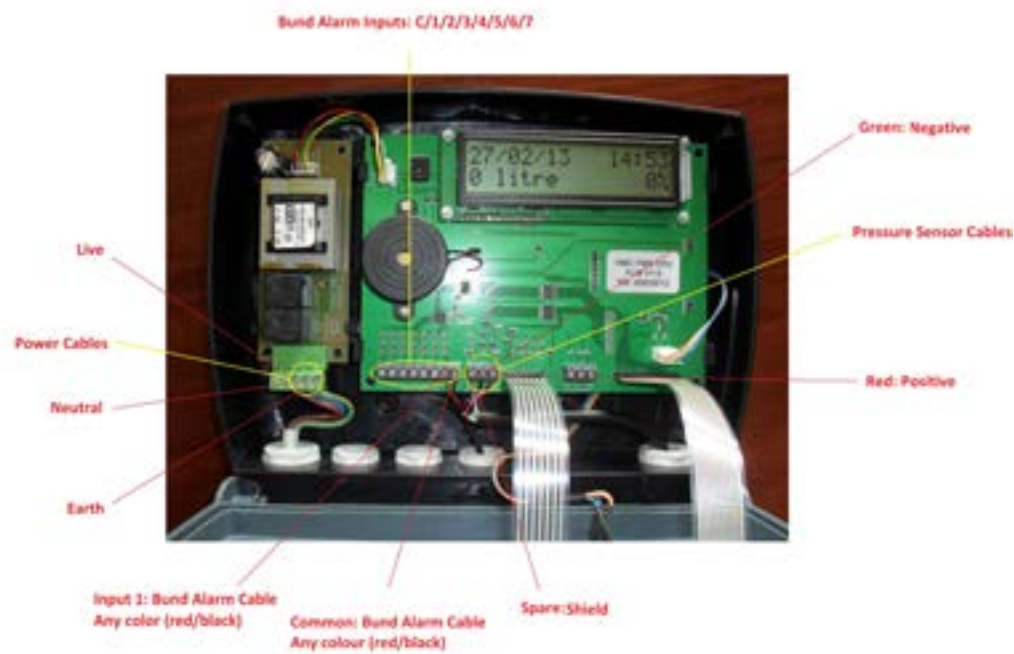
d. Empty alarm

Activation of this alarm indicates the tank is empty and needs filling. This alarm is shown through visual LED's and audible siren. Note: This audible and visual alarm will remain triggered for a short period of time after it sounds. The audible can be muted using the mute button on the keypad. THE PUMP WILL CONTINUE TO DISPENSE IN THIS ALARM MODE.

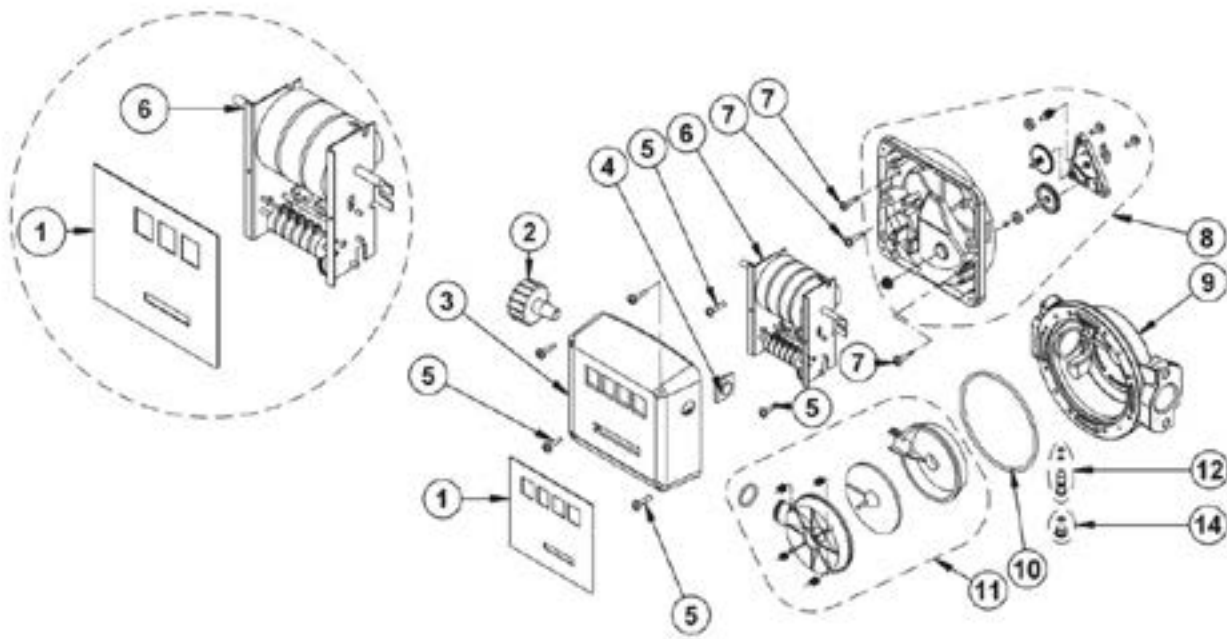
e. Bund alarm

Activation of this alarm indicates that there is product in the bund cavity. This alarm is shown through visual LED's and audible siren. Note: This audible and visual alarm will remain triggered constantly until muted or until the product is removed. The audible can be muted using the mute button on the keypad. In the event of this it is advised the bund cavity is checked and drained as soon as practicable.

f. FMS Wiring diagram



2. Flowmeter (fitted to all systems)



1.1 GENERAL INFORMATION

The K33 meter is a mechanical flowmeter with nutating disk, designed to allow a precise measurement of Diesel oil or other fluids compatible with the manufacturing material. The nutating disk of the metering chamber (see diagram 1, drawing "15"), which is set in motion by the fluid itself, drives the gear train located in the cover of the meter body (drawing "8") which transmits the motion to the meter (pos. "6"). The meter is equipped with a non-resettable litre totaliser and a batch register which can be reset by means of a knob (Pos. "2") whose unit digit is provided with marks for the readout of the tenths of a litre.

To ensure a proper and safe use of the meter it is necessary to read and follow the instructions and warnings contained in this manual. An improper installation or use of the meter may cause damage to objects and people.

1.2 TECHNICAL DATA

Meter Mechanism		Nutating disk
Flow Rate	(range)	20 - 120 litres/min
Operating pressure	(max)	3.5 bar
Burst pressure	(min)	28 bar
Storage temperature	(range)	-20 +80°C
Storage humidity	(max)	95% RU
Operating temperature	(range)	-10 +60°C

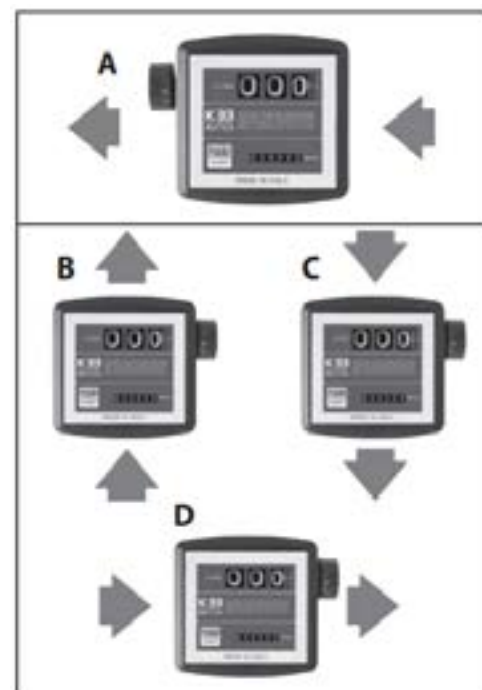


Pressure loss with diesel oil	Flow rate (l/min)	30	60	90
	Pressure loss (bar)	0.005	0.2	0.4
Accuracy after calibration		+/- 1%		
Repeatability	(typical)	+/- 0.3%		
Batch total readout		3 digits height 18mm		
Totaliser readout		6 digits height 6mm		
Readout resolution		0.1 litri		
Connections	(inlet/outlet)	1" BSP		
Weight	(approximate)	1.8 Kg		
Package dimensions		185 x 185 x 170 mm		
Optional features		Registration in US gallons female threaded inlet/outlet 1" NPT		

1.3 INSTALLATION

The K33 can be installed in any position, on rigid pipelines or flexible hoses, directly on pumps or tanks. The meter flow direction is fixed and indicated by an arrow. The meter is supplied in the standard configuration (A).

The meter and the cover can be rotated by 90° to 90° in respect to the body in order to carry out the different configurations shown (B, C, D). The reset knob can be installed either on the right side or on the left side of the meter. In order to modify the standard configuration follow the instructions given in section "Disassembling / Reassembling". The meter body is equipped with 4 blind holes which can be threaded (M5) for a possible fastening. If solid particles enter the measuring chamber the correct working of the nutating disk may be affected. Always filter the fluid by installing a filter on the meter inlet (recommended filter 400 µ).



1.4 CALIBRATION

The K33 is pre-calibrated in factory to be used with Diesel oil. As specific operating conditions (such as real flow rate, nature and temperature of the measured fluid) may affect the meter accuracy, a re-calibration should be carried out after the installation has been completed. A new calibration is necessary each time the meter is disassembled for maintenance operations or when it is used to measure fluids that differ from Diesel oil.

1.4 CALIBRATION PROCEDURE

1. Unscrew the plug (see diagram 1, pos. "14").



2. Purge the system (pump, pipelines, meter) of air by dispensing until the flow stream is full and steady.

3. Stop the flow by shutting off the nozzle, but let the pump running.

4. Reset the batch register by means of the reset knob (pos. "2").

5. Dispense at the flow rate which the best accuracy is required at, by using a calibration container having a capacity not lower than 20 litres. Do not reduce the flow in order to reach the graduated zone of the calibration container. The right method is to start and stop the full flow repeatedly until the required filling is obtained.

6. Compare the indication of the calibration container (real value) with the one of the meter (indicated value).

- If the indicated value is higher than the real value, loosen the screw (pos. "12");

- If the indicated value is lower than the real value, tighten the screw (pos. "12").

7. Repeat the operations 4 to 6 until accuracy is satisfactory.

8. Tighten the plug (pos. "14") again. The O ring which the calibration screw is provided with, has the function to avoid accidental loosening of the adjustment screw but does not have any sealing functions. Therefore it is always necessary to properly fix the plug with the sealing gasket (pos. "12").

1.5 USE

After installation and calibration the K33 is ready to work. Turn the reset knob (see diagram 1, pos. "12") (clockwise if it is mounted on the left of the meter and anticlockwise if it is mounted on the right) until the batch register is completely reset. The totaliser cannot be reset in any way. Make sure that during use pressure does not exceed the value indicated in section "Technical data".

1.6 USE BY GRAVITY

K33 can also be used in fuel units which are not equipped with pump and where the flow is generated by the difference in fuel level between the tank and the nozzle outlet. As a reference, a system composed of a tank off the ground, with the meter installed right at the bottom of the tank, a 3-m long 1" flexible pipe and a manual nozzle type Self 2000, guarantees a flow rate of approximately 30 litres/minute if the difference in level is higher than 1.5 metres. Longer pipes or nozzles producing higher pressure losses reduce the flow in respect to the existing difference in level. Use by gravity is not recommended with differences in level lower than 1 metre, as the consequent reduced flowrate causes the meter to work outside its guaranteed accuracy range. On field calibration is always advisable in case of gravity installations.

1.6 MAINTENANCE

No ordinary maintenance is required provided that the meter K33 is properly installed and used. An incorrect filtering on the meter inlet may block or wear out the measuring chamber, thus affecting the meter accuracy. Should this problem occur (see section "Problem, Causes and Solutions") disassemble the measuring chamber, as shown in section "Disassembling/ Reassembling".





WARNING:

Before disassembling always make sure that all fluid is drained from the meter and pipes connected to it.

Necessary cleaning can be carried out by means of a soft brush or small tool (i.e. a screwdriver). During cleaning be careful not to damage the chamber or the disk. Carefully check the meter and replace the parts which have suffered any possible damage. Only use the original spare part kits shown in diagram 1 “Exploded view and spare part list”. A new calibration is always necessary after cleaning or replacing the meter parts. 3) The meter resets the present total already.

1.7 DISASSEMBLING REASSEMBLING

K33 can be easily disassembled into its main parts without removing the body from the pipes.

1.8 METER UNIT

To disassemble the meter unit operate as follows:

- Remove the reset knob by firmly pulling it axially.
- Loosen the 4 retaining screws (see diagram 1, pos. “7”).
- Loosen the 2 screws (pos. “5”).

To reassemble the unit reverse the procedure described above.

1.9 RESET KNOB

To modify the reset knob position:

- Perform only the operations a) and b) described above.
- Take out the plug (see diagram 1, pos. “4”) by pushing it from the inside towards the outside of the cover.
- Fix again the plug on the opposite hole by placing it inside the cover and pushing it outwards.
- Fix again the meter cover and reset knob.

1.10 MEASURING CHAMBER

To enter the measuring chamber operate as follows:

- Disassemble the meter unit.
- Loosen the eight screws (see diagram 1, pos. “7”).
- Remove the body cover (pos. “8”) together with the gear unit. During this operation be careful not to damage the gasket (pos. “10”).
- Remove the whole measuring chamber (pos. “11”) by lifting it from the meter body and at the same time pulling it back towards the inlet in order to remove the O ring (pos. “16”) from its seat at the outlet. To check the inside of the measuring chamber (pos. “15”), remove the O ring and divide the two half chambers containing the nutating disk. Measuring chamber.

To enter the measuring chamber operate as follows:

- Disassemble the meter unit.



- Loosen the eight screws (see diagram 1, pos. “7”).
- Remove the body cover (pos. “8”) together with the gear unit. During this operation be careful not to damage the gasket (pos. “10”).
- Remove the whole measuring chamber (pos. “11”) by lifting it from the meter body and at the same time pulling it back towards the inlet in order to remove the O ring (pos. “16”) from its seat at the outlet. To check the inside of the measuring chamber (pos. “15”), remove the O ring and divide the two half chambers containing the nutating disk.

1.11 GEAR UNIT

To reach the gear unit components:

- Remove the cover.
- Loosen the screws.
- Remove the plate. Now all gears can be reached for inspection. Should the gasket be replaced, remove the bevel gear from the shaft by pulling axially, then remove the gear together with the shaft. The gasket replacement always requires the replacement of the bush provided with the spare part kit. To reassemble reverse the above described procedure paying particular attention to:

- Lubricate the O ring before installation.
- Check that the gear unit can rotate freely before fixing the cover

1.12 PROBLEMS, CAUSES AND SOLUTIONS

Problem	Possible cause	Corrective action
Leak from the shaft gasket	- Damaged gasket	Remove (see section “Gear unit”) and replace the O ring and the bush
Insufficient accuracy	- Wrong calibration	Repeat calibration following the instructions in section “Measuring chamber”
	- Soiled or blocked measuring chamber	Clean the measuring chamber following the instructions in section “Meter unit”
	- Air in the fluid	Locate and eliminate leaks in inlet lines
Reduced flowrate	- Clogged or blocked measuring chamber	Clean the measuring chamber following the instructions in section “Measuring chamber”
	- Blocked or soiled filter	Clean the filter



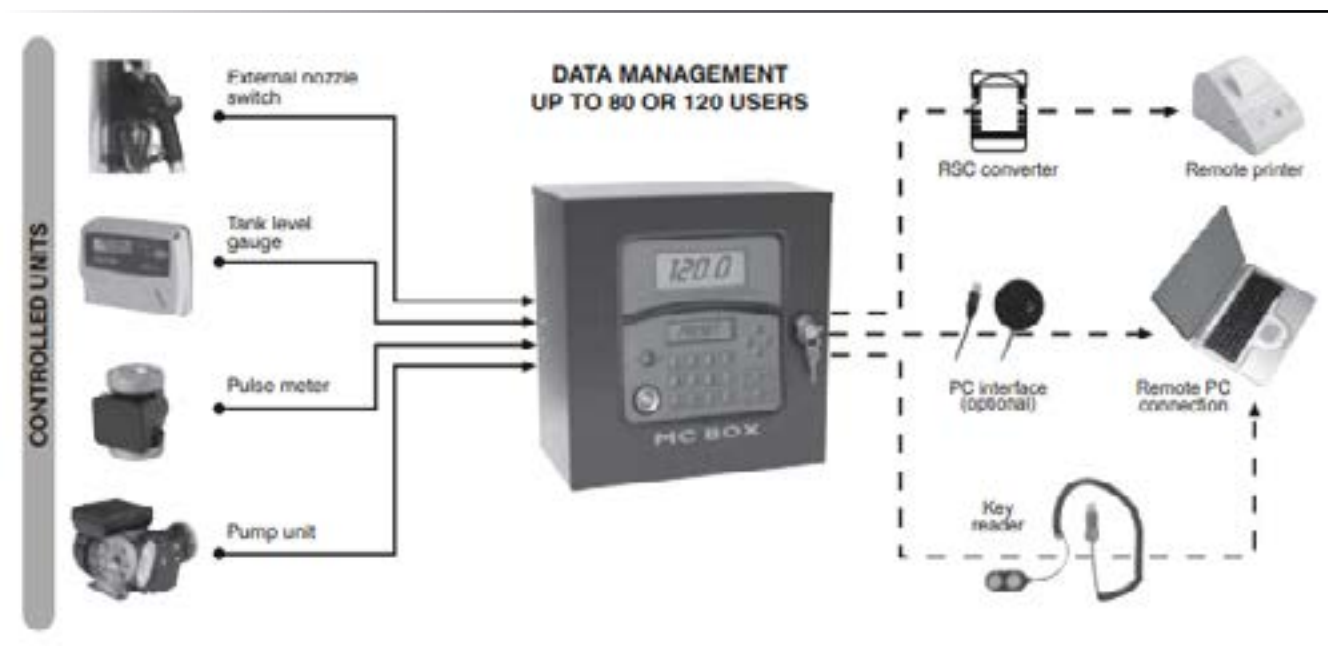
3. MC Box Fuel Management Operation

MC BOX Electronic Panels are designed for the private distribution of fuel (or other liquids).

All of the models in the series are characterised by the same form for which the MC BOX is known: a solid metal structure, high-accuracy measurements in the dispensed product and PC software that is designed for simplicity.

This electronic panel allows you to control and monitor private use fuel consumption via a fuel dispenser with pump and flow meter.

The MC system consists of a multi-user panel, dedicated software and the option to connect to a PC



The MC BOX System has the ability to:

- Switch the pump on;
- Recognise authorised users;
- Preset the dispense quantity;
- Manage the pulse meter;
- Manage an external level switch that turns off the pump in the event of minimum flow level;
- Operate an external nozzle switch;
- Connect directly to a PC;
- Connect to an external printer

The panel is easy to install and is adequately protected. The wiring connections can be easily accessed. The group can also be supplied with a meter, to be installed together with the pump.



Specifications

Panel with dual display, keyboard and i-button reader.

The electric box can be opened, allowing easy access to the wiring.

Maximum power supply: 6.5 amps.

Optional

- PC Software with dedicated RS converter or i-button reader to export data.
- I-button keys for users.
- High-accuracy oval gear flow meters.

Performance

- 80 or 120-user capacity (depending on model), managed via password or i-button key.
- Total consumption calculation for defined periods for each user.
- Local memory that can store data until the last 255 dispenses.
- Vehicle identification and mileage tracking option.
- Dispensing date and time control.
- Dedicated software that allows you to print dispense data for each user.
- Ability to manage up to 16 control panels with one single software.
- Key reader with USB plug for exporting data.
- RS converter with USB plug for direct connection to the PC via cable (up to 1000 m)

MC Box Installation

General

The MC BOX can be installed outdoors. Nevertheless, it is advisable to locate it under the shelter of a roof to ensure the dispenser's longevity and provide greater comfort during refueling in the event of bad weather. The installation of the dispenser must be carried out by skilled personnel and performed according to the instructions provided in this chapter.

Electrical connections

The power connections must be workmanlike performed by skilled personnel, in strict compliance with the laws applicable in the country of installation and with the instructions on the wiring diagrams in this manual.



The MC BOX is equipped with 3 junction boxes. These can easily be accessed by opening the door to where the screw terminals for the external cable connections are located.

WARNING

Before accessing the electrical parts, be sure that you have disconnected all of the general switches that power off the device.

The connections that need to be made vary according to the model (AC or DC):

AC Versions:

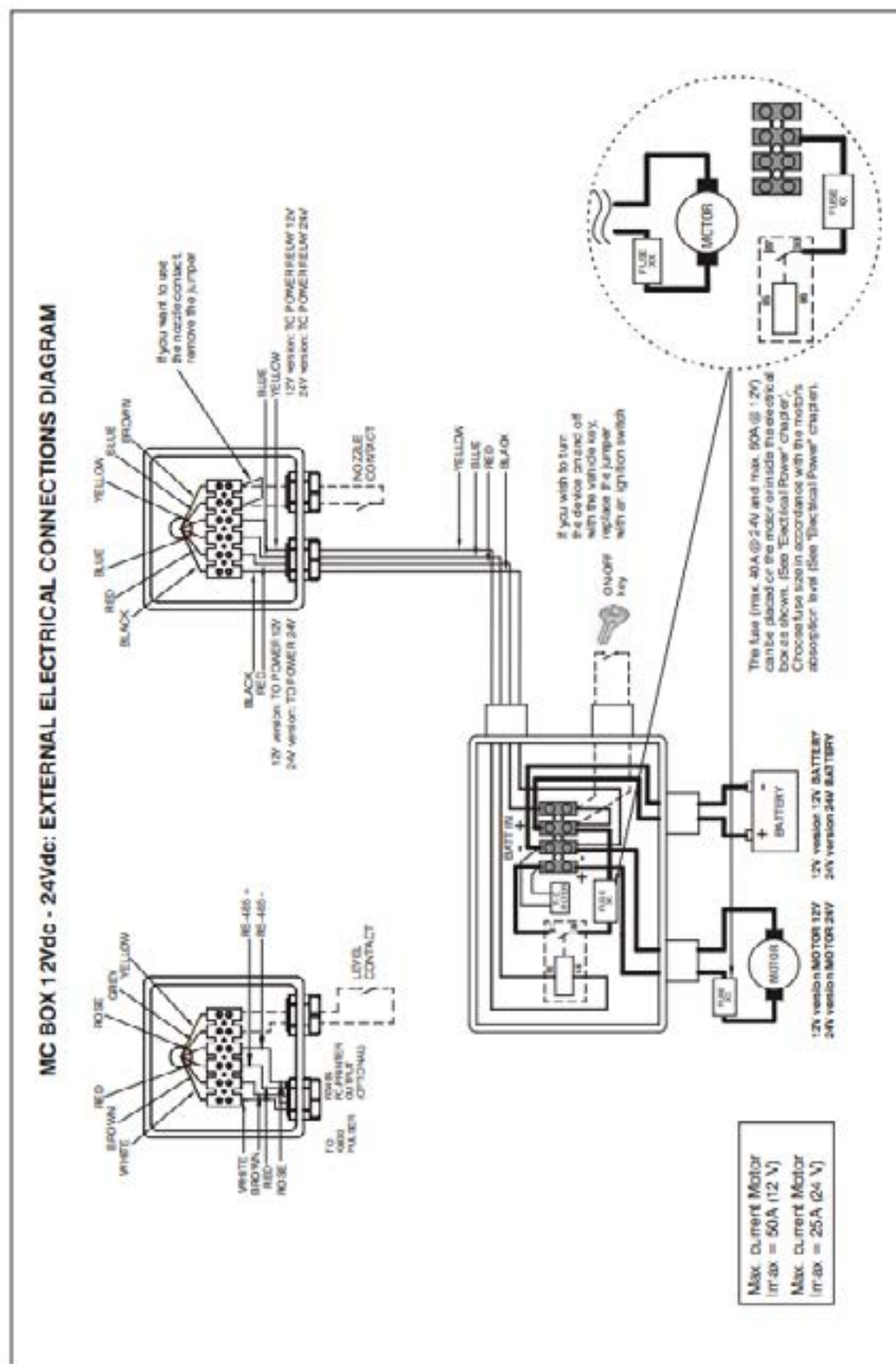
Inputs	Outputs	Note
AC mains supply	AC motor power the same voltage as the mains-	Voltage: 230Vac or 110Vac, depending on the maximum power of the pluggable motors: <ul style="list-style-type: none">• 230Vac version = 1400 W• 110Vac version = 750 W
Nozzle contact: clean contact: Open with nozzle replaced and Closed when nozzle dispensing		
Level contact: clean contact: Open with nozzle in normal conditions and Closed below the minimum flow level		
Pulse meter input: clean contact or Open Collector output signal, with 60 Hz maximum frequency and between 20% and 80% duty cycle		
	The RS 485 data line to the PC (optional)	



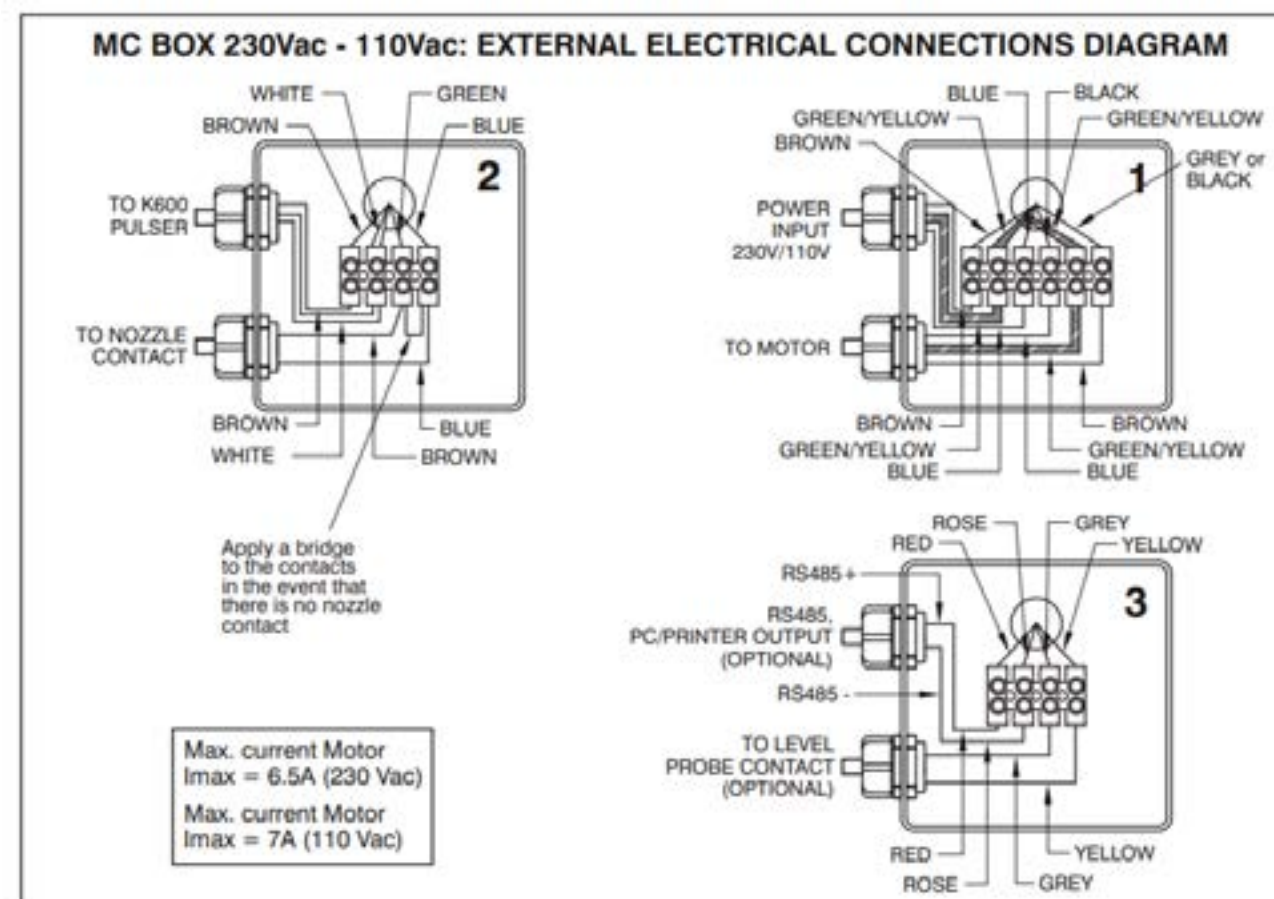
DC Versions:

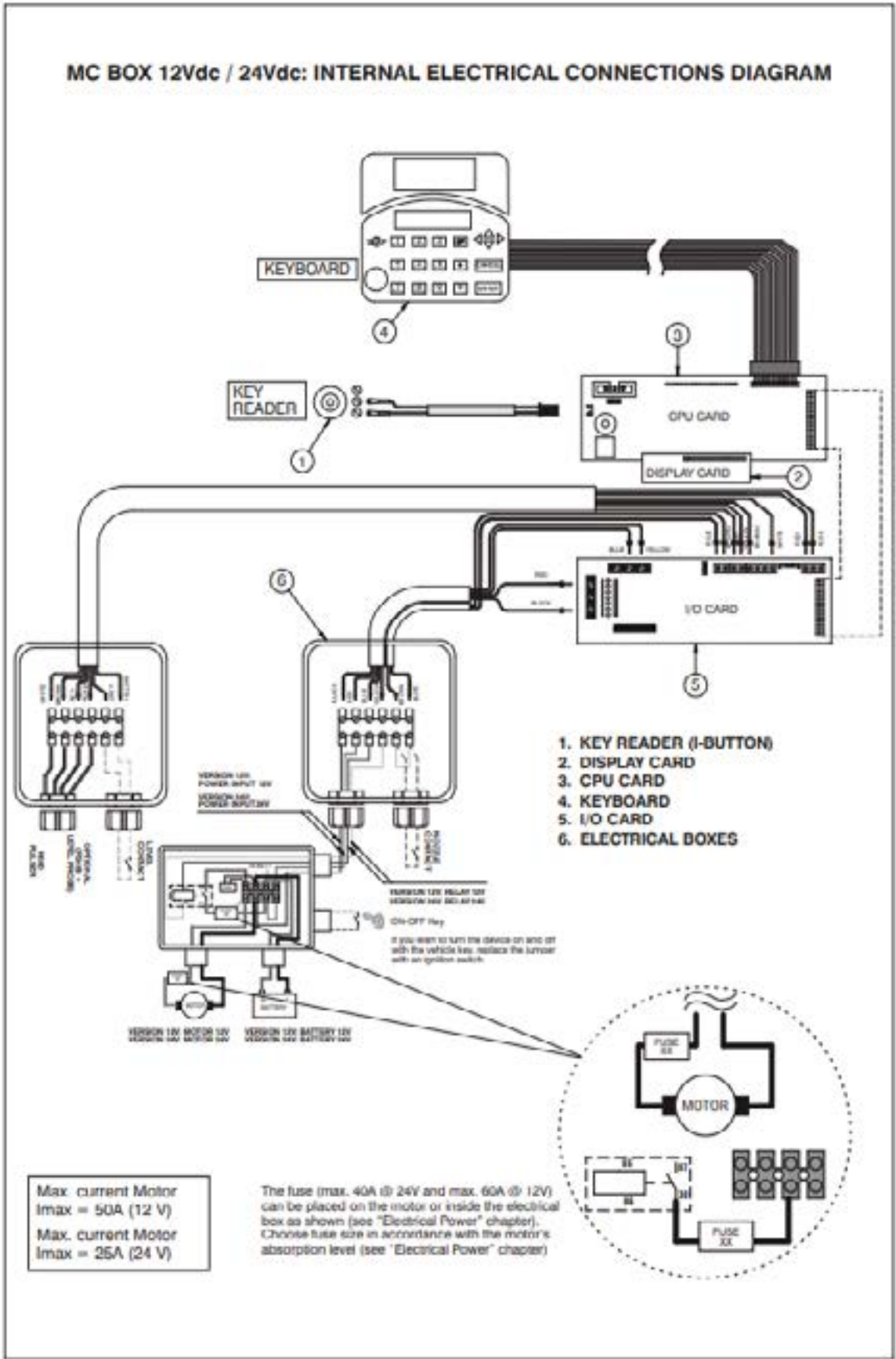
Inputs	Outputs	Note
DC Power Supply	DC motor power is the same as the supply voltage	Voltage: 12Vdc or 24Vac, depending on the maximum power of the pluggable motors: <ul style="list-style-type: none">• 12Vdc version = 600 W• 24Vdc version = 600 W
Power input WITH IGNITION ON. Given the DC systems' high power absorption, the motor should be powered while the battery is being recharged		By removing a jumper and inserting the "in ignition" contact in its place, the electronics can be powered only when the vehicle is switched on
Nozzle contact: clean contact: Open with nozzle replaced and Closed when nozzle dispensing		
Level contact: clean contact: Open with nozzle in normal conditions and Closed below the minimum flow level		
Pulse meter input: clean contact or Open Collector output signal, with 60 Hz maximum frequency and between 20% and 80% duty cycle		
	The RS 485 data line to the PC (optional)	

7. OPERATION OF THE SYSTEM



7. OPERATION OF THE SYSTEM





Commissioning

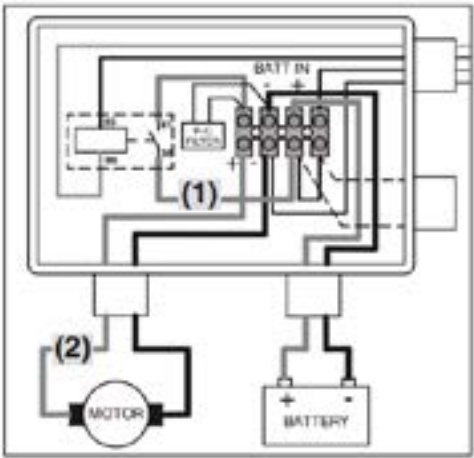
To correctly commission the MC BOX the sequence of operations indicated below must be followed and the MC control system functions must be known.

Electrical power supply

Once the power connections have been made, the MC BOX can be energised by means of the master switch to be fitted by the installer on the upstream line. Switching on of the MC system will be indicated by the lighting up of the two backlit LCDs fitted on the front.

NOTE:

In the event of continuous current power supply (DC), a fuse size that is appropriate to the DC motor's absorption level should be introduced to the motor power line.



- For example:
- If the connected motor is one that absorbs 10A max then a 12A delay fuse should be inserted.
 - If, however, the motor absorbs 50A max, then a 60A delay fuse should be inserted.
 - If the fuse is small, it can be fitted along the cable inside the junction box, in position (1) (see illustration)
 - If, however, the fuse is very big (e.g. 60A) and cannot physically fit inside the box, then it can be inserted along the motor's power supply cable in position (2) (see illustration)

Station configuration

Every MC BOX station can be adapted to the specific requirements of the station manager. To do this the MC control system must be CONFIGURED.

WARNING

MC configuration is crucial and must be done by skilled personnel.
To perform this operation, the MC manual must be carefully and thoroughly read.

After completing configuration, user PIN CODES can be assigned to the persons charged with using MC BOX, in accordance with the detailed information in the MC manual.



Disengaging the “MC” system

All the MC BOX functions are controlled by the MC control system.

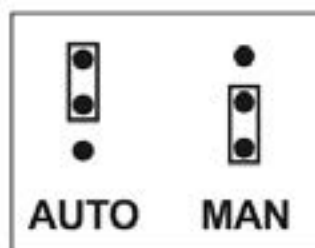
The MC system can nevertheless be disengaged for any startup or maintenance activities requiring repeated pump starting.

In these case, it is often convenient to simplify pump startup by not having to enter any code and record any dispensing data.

To do this, a JUMPER has been fitted on the card that permits switching from AUTOMATIC mode (code request to access dispensing) to MANUAL mode (no code request).

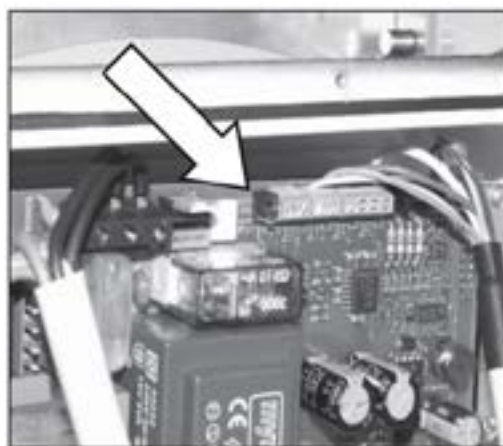
WARNING

The jumper is only accessible by opening the front panel and is positioned as shown in the photo. In this operating mode, MC does not record any data relating to performed dispensing operations. **Before accessing this jumper, the voltage must be removed.**



WARNING

Before accessing the electrical parts, be sure that you have disconnected all of the general switches that power the device.



In MANUAL mode:

- The MC's LCD may be switched off (only the backlight is clearly visible) or you may continue to see the indication that was present at the time of transition from AUTO to MAN.
- No PIN CODE is required to activate the pump; the pump starts when the dispenser nozzle is removed from its lodging and stops when it is put back (naturally this is in the event that the “nozzle contact” function is used).
- The amount dispensed is not shown in any way.



Meter calibration

Before using the MC BOX station, check the METER ACCURACY.

For this purpose, proceed as follows:

- Enter a previously enabled USER PIN code;
- Run the fuel into a calibrated container;
- Compare the quantity of dispensed diesel fuel using a calibrated container.

If accuracy is NOT satisfactory, proceed to CALIBRATE THE METER according to the instructions in the specific manual.

WARNING

To correctly check accuracy, always keep to the following instructions:

- Use a precision sample container, featuring a graduated scale, with a capacity of at least 20 litres.
- Before making the check, always make sure you have eliminated all the air from the system and then run the fuel until a full and regular flow is achieved.
- Dispense continuously at MC BOX maximum flow rate.
- Stop the flow by quickly closing the nozzle.
- Reach the graduated area of the sample container, avoiding prolonged dispensing at low flow rate, but rather performing short dispensing operations at maximum flow rate.
- Compare the reading provided by the container, with that provided by MC BOX, after waiting for all the froth to disappear

WARNING

Differences of up to 1/10 of a litre affecting the dispensing of 20 litres of fluid fall within the guaranteed precision of +/- 0,5%.

Every day use

Thanks to the MC control system, all the MC BOX models provide access to authorised users only. MC acknowledges User authorisation by means of two alternative systems:

- The entering of a 4-figure SECRET CODE (PIN CODE)
- The fitting of an electronic key (OPTIONAL)

WARNING

All the users to whom a PIN CODE is assigned must be adequately instructed and be at least acquainted with the contents of this chapter.



The configuration of the MC system permits requiring the User to enter further optional data (vehicle licence plate, mileage, quantity to be dispensed).
For details, see the MC control system manual.

In the event that these options are not set, MC will recognise an activated PIN CODE and, once the nozzle contact (if applicable) has been closed, the pump is enabled, allowing it to dispense.

The pump will start (if previously enabled) just as soon as the control lever is moved to ON position, while it switches off as soon as the control lever is moved to OFF position.

WARNING

Such enabling does not result in immediate pump startup. The pump is in fact controlled by a switch (positioned in the nozzle seat) operated by the user.

No further manual operation is required to start or stop the pump.

Fuel dispensing

WARNING

Fuel must ONLY be dispensed under the careful control of the user.

In the case of the simplest configuration (no optional data required), the fuel dispensing procedure is the following:



- Insert PIN CODE
(or apply the electronic key)

If the MC recognises the activated PIN (or key), a "GOOD MORNING MANAGER / USER" message is displayed and the pump enabled.



4. Watchman Sonic

1. CHECK LEVEL, DISTANCE AND HEIGHT

Ensure before you start your install that the tank the WatchmanSonic is to be fitted to is:

1. On a flat level base.
2. Within a 200 metre range from receiver position.
3. A maximum actual tank height of 3 metres. 50 metre effective range (200 metre clear line of sight).
4. Tank must be fitted in accordance with manufacturers guidelines & instructions.

NB: 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.

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.

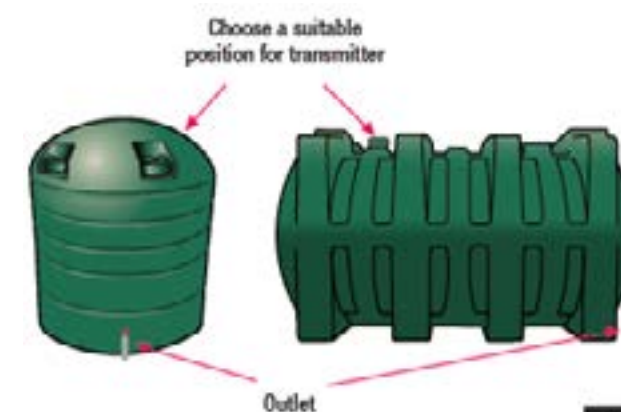
Ensure that the space beneath the WatchmanSonic unit is free of any obstacles and that the Itrasonic beam path is clear of obstructions. (See Picture 2)



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 lower than any opening at the top of the tank (filling point etc.).
(See Picture 3)



3

7. OPERATION OF THE SYSTEM

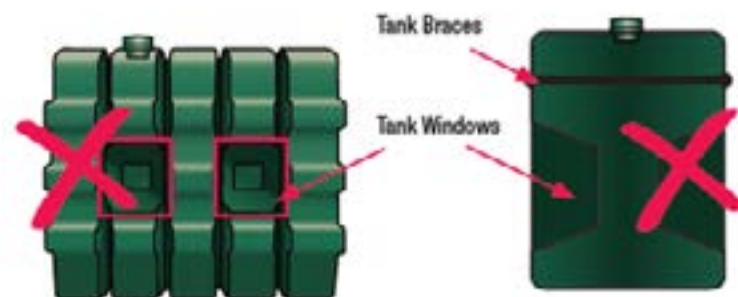


The Transmitter can't sit at an angle as this gives an incorrect level reading on the receiver. Take care not to choose an area on which water could gather i.e. a dent/depression or a position directly above any restricted area inside the tank. (See Picture 4)



4

NB: For tanks with window corrugations or internal braces please ensure that the WatchmanSonic is not positioned above or within 15 cm of the area of the WINDOW or the edge of the tank. (See Picture 5). Ensure that the sonic path is clear to the bottom of the tank as per pic 2.



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.



6

3. FITTING TRANSMITTER BASE

For tanks with pre-drilled holes. Ensure guidelines from points 4 & 5 are adhered to.

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



7

8

9

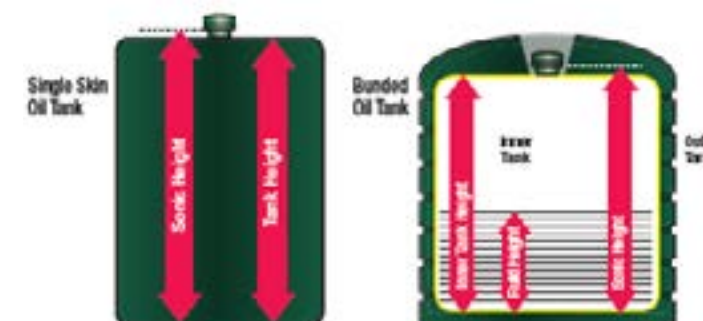
7. OPERATION OF THE SYSTEM



4. DEFINE THE SONIC HEIGHT

Accurately measure the sonic height making note of this measurement. The permissible maximum tank height is 3 metres from the base of your tank to the position of the WatchmanSonic (which should be no lower than the fill point). (Seen in Picture 10).

- Height does not include the base/piers which tank sits on.

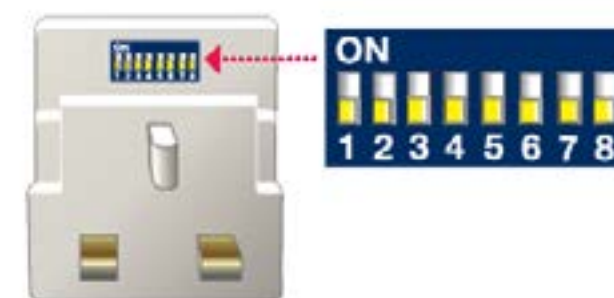


10

5. SETTING THE SWITCHES ON THE RECEIVER

Using the tank height chart (see section 9), read across to the relevant multi switch setting using tank measurements you took down earlier. 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). NOTE: Switches 1 & 2 are factory set switches and are no relevance to the end user. If you wish to set the audible ring feature the Switch1 needs to be moved up. Switch one if set in the on (up) position will cause the unit to bleep in the event of a low level reading.



11

6. MATCHING RECEIVER AND TRANSMITTER

You should match the receiver (Part A) with the transmitter (Part D) so that the system code is unique to your tank. Plug receiver into a suitable and convenient electrical socket and switch on.

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



12

13



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 and you will hear a clicking sound. 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.

- If you are installing more than one WatchmanSonic unit please wait 15 minutes between each matching.

7. FITTING THE TRANSMITTER TO THE BASE

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

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



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 WatchmanSonic to be displayed.



9. WATCHMANSONIC RECEIVER MULTI SWITCH SETTING CHART

Measure the sonic 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 (mm)	SW3	SW4	SW5	SW6	SW7	SW8
50						
60						ON
70					ON	ON
80					ON	ON
90					ON	ON
100					ON	ON
110					ON	ON
120					ON	ON
130					ON	ON
140					ON	ON
150					ON	ON
160					ON	ON
170					ON	ON
180					ON	ON
190					ON	ON
200					ON	ON
210					ON	ON
220					ON	ON
230					ON	ON
240					ON	ON
250					ON	ON
260					ON	ON
270					ON	ON
280					ON	ON
290					ON	ON
300					ON	ON
310					ON	ON
320					ON	ON
330					ON	ON
340					ON	ON
350					ON	ON
360					ON	ON
370					ON	ON
380					ON	ON
390					ON	ON
400					ON	ON
410					ON	ON
420					ON	ON
430					ON	ON
440					ON	ON
450					ON	ON
460					ON	ON
470					ON	ON
480					ON	ON
490					ON	ON
500					ON	ON
510					ON	ON
520					ON	ON
530					ON	ON
540					ON	ON
550					ON	ON
560					ON	ON
570					ON	ON
580					ON	ON
590					ON	ON
600					ON	ON
610					ON	ON
620					ON	ON
630					ON	ON
640					ON	ON
650					ON	ON
660					ON	ON
670					ON	ON
680					ON	ON
690					ON	ON
700					ON	ON
710					ON	ON
720					ON	ON
730					ON	ON
740					ON	ON
750					ON	ON
760					ON	ON
770					ON	ON
780					ON	ON
790					ON	ON
800					ON	ON
810					ON	ON
820					ON	ON
830					ON	ON
840					ON	ON
850					ON	ON
860					ON	ON
870					ON	ON
880					ON	ON
890					ON	ON
900					ON	ON
910					ON	ON
920					ON	ON
930					ON	ON
940					ON	ON
950					ON	ON
960					ON	ON
970					ON	ON
980					ON	ON
990					ON	ON
1000					ON	ON



8. Maintenance of the TUFFA TANKS

Keep this manual stored in a place of use so it can be obtained for future reference. All persons who install, commission, maintain, and operate the system must be deemed competent by their employers and have the adequate knowledge and training required to carry out any required tasks which are recommended by this manual, it is recommended that any persons carrying out work on the system have fully read and understood the instructions set out by this manual.

It is advised that no changes nor conversions with potential impact on safety may be performed on this system, any spare parts which are used must comply with the technical requirements which are defined in this manual or directly by the manufacturer.

ATTENTION

Please make sure prior to any maintenance work that power supply is turned OFF and that there is not an inadvertent chance to reconnect the system to power supply.

WARNING

System warranty will become void if any repairs are made by technicians not authorised by the manufacturer, the same applies to works with hazardous or potentially hazardous equipment.

ATTENTION

Do not use jet cleaners to clean the system. You can clean the system with water and household cleaners. Do not use an excessive amount of water when cleaning near any electrical items as this can cause a short circuit to occur potentially permanently damaging the equipment.



8.1 System maintenance tasks

Activity	Frequency of Task
Keep equipment in good working order by returning to its original position	After every use
Visually inspect operation of gauge equipment	Weekly
Visually inspect exterior condition of tank	Monthly
Visually inspect condition of delivery hose	Monthly
Physically check bund alarm by activating the float switch in bund cavity (audible alarm)	3 Months
Check electrical cables and cable connection points	3 Months
Visually inspect and if required maintain the tank id plate and warning labels	3 Months
Check and replace filter if necessary	3-6 Months
Physically check fixings and bracket stability	6 Months
Visually inspect inner tank and bund cavity	6 Months

8.2 Inspection by competent person

Inspections should be undertaken by a competent person that is receiving a delivery of product on every fill prior to and whilst filling.

This inspection should include:

- The fill point arrangement for soundness and leaks
- Any outlet valves should be checked for leaks and operation (open and close successfully)
- The testing of contents gauge, any high level / overflow alarm and bund alarm.
- If vents can be seen that they are clear and unblocked and free of debris.
- A visual inspection around the tank with emphasis on the base of the tank. The inspection for plastic tanks should include any deformation of the surface of the tank i.e. excessive bulging, change in colour due to chemical attack, crazing or stress fractures. The inspection of steel tanks should include looking for evidence of rust and heavy corrosion, damp patches on seams & seam fractures.
- Bund to be visually inspected for soundness and integrity, water, spilt product, or other debris.

8.3 Internal examination and cleaning

Internal examinations should be undertaken by a competent person at appropriate intervals, as determined by the product used, and its cleanliness i.e. solids or water falling out of suspension. Entry into confined spaces should be carefully planned and supervised and should be subject to a strict procedures dependent on the substance stored, and in accordance with HSE requirements.



8.4 Troubleshooting		
Symptom	Possible Causes	Solutions
No power	1. Local distribution board fuse	1. Check local distribution board RCD
	2. Power cable damaged	2. Check condition of power cables
	3. Power cable connection broken	3. Check power cable connections
	4. System control panel circuit breakers	4. Open system control panel and check circuit breakers
	5. System control panel connections loose	5. Check cable connections inside of system control panel
	6. Low battery / poor battery clip connection	6. Check battery level / check clip connection
Pump not operating	1. Potential air lock in pipeline caused by tank fill after running dry	1. Remove nozzle allowing air to pass through pipeline
	2. No diesel in the system	2. Request diesel delivery
	3. Pump circuit breaker in control panel tripped	3. Engage pump circuit breaker or replace if necessary
	4. Pump relay fuse in system control panel blown	4. Replace relay / fuse
	5. Pump failure	5. Replace pump
	6. No power to system	6. Check power supply
Slow flow rate	1. Blockage in the system	1. Replace filter element
Auto nozzle not operating	1. Spring mechanism inside nozzle valve failed	1. Replace nozzle
	2. Trigger plunger failed	2. Replace nozzle
Nozzle holster not switching pump correctly (auto operation nozzle holster versions only)	1. Micro switch failure	1. Replace micro switch
	2. Micro switch lever not contacting correctly	2. Adjust position of micro switch or switch lever
Level gauge does not show reading	1. Power failure to gauge	1. Check power supply and cable connections
	2. Sensor cable connection loose	2. Check sensor cable connections inside gauge unit
	3. Sensor failure	3. Refer to manufacturer
	4. Gauge unit failure	4. Refer to manufacturer
Level gauge shows incorrect reading	1. Pressure sensor not positioned at base of tank	1. Lower pressure sensor down until it touches base of tank
	2. Incorrect gauge parameters	2. Refer to manufacturer to alter gauge parameters
	3. Sensor failure	3. Refer to manufacturer
	4. Gauge unit failure	4. Refer to manufacturer



8.4 Troubleshooting		
Symptom	Possible Causes	Solutions
Bund alarm not working	1. Bund float switch not positioned correctly	1. Alter position of float switch to hang approximately 1" off bund floor
	2. Bund float not able to move freely	2. Check float switch for blockage or replace if necessary
	3. Damage to bund cable	3. Refer to manufacturer
	4. Float switch cable	4. Refer to manufacturer
Diesel in bund cavity	1. Inner tank overfill	1. Diesel must be removed from the cavity as soon as possible
	2. Pipework leaking in bund cavity	2. See point 1
	3. Inner tank leaking	3. See point 1
Pipework leaking	1. Threaded connection loose	1. Connection must be tightened
	2. Thread sealant degraded	2. Thread sealant must be replaced
	3. O-ring or seal joint perished	3. O-ring or seal must be replaced
	4. Swaged hose ends leaking	4. Hose assembly needs replacing: refer to manufacturer
	5. Rubber hose perished	5. See point 4
Hose reel not operating correctly	1. Internal reel spring has come loose	1. Refer to manufacturer
	2. Spring failure	2. Refer to point 1
Leak from the shaft gasket	1. Damaged gasket	1. Remove (see section "Gear unit") and replace the O ring and the bush
Insufficient accuracy	1. Wrong calibration	1. Repeat calibration following the instructions in section "Measuring chamber"
	2. Soiled or blocked measuring chamber	2. Clean the measuring chamber following the instructions in section "Meter unit"
	3. Air in the fluid	3. Locate and eliminate leaks in inlet lines
Reduced flowrate	1. Clogged or blocked measuring chamber	1. Clean the measuring chamber following the instructions in section "Measuring chamber"
	2. Blocked or soiled filter	2. Clean the filter
Inner tank has lifted up and ruptured bund lid	1. Diesel inside bund is causing inner tank to float	1. Refer to manufacturer
Tank exterior damaged	1. Impact from external force	1. If the damage is significant refer to manufacturer for further information
Flip lid does not open easily	1. Gas strut(s) have de-gased and are not operating	1. Gas strut(s) need replacing

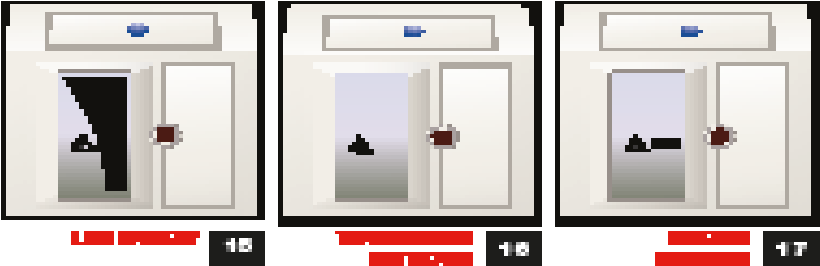


8.4 Troubleshooting		
Symptom	Possible Causes	Solutions
The MC BOX does not switch on	1. Power supply has failed due to: • The power leads being connected incorrectly • The upstream circuit switch being in the OFF position • The power supply fuse being interrupted • For DC versions: vehicle key in the OFF position (if the "ignition on" power supply option has been adopted)	1. • Check connections • Ensure disconnect switch is in the ON position • Check fuse • Turn the vehicle key to the ON position
The MC BOX turns on and the displays light up but no words appear. The MC BOX turns on and the displays light up but the words that appear are irregular and the system does not respond to any commands	1. AUTO/MAN jumper in the MAN position	1. Put the jumper to the AUTO position
The system does not recognise the "USER" with PIN CODE or Electronic key	1. The user has not yet been configured by the system MANAGER	1. The system MANAGER sets up a New User
	2. The key has not been linked to the User by the system MANAGER	2. The system MANAGER links the key to the User
	3. The keyboard is damaged and does not insert the data properly	3. Change keyboard (contact technical support)
	4. The electronic key is damaged and is no longer recognised by the system	4. Change electronic key (contact technical support)
The MOTOR will NOT START	1. It has not been connected properly to the set terminals	1. Check connections
	2. Action not permitted by nozzle contact	2. Check how the nozzle contact option has been set (YES/NO) and the status of the relevant jumper



8.4 Troubleshooting		
Symptom	Possible Causes	Solutions
DOES NOT COUNT when dispensing	1. The Pulser that emits the count signals has not been connected properly	1. Check connections
	2. The Pulser that emits the count signals is NOT compatible with the electronics	2. An incoming electronic signal, namely "clean contact" or "OpenCollector", should be received. If the input signal is an incompatible voltage signal, the electronic board is likely to be damaged, in addition to the malfunction.
The count is INACCURATE	1. The system is NOT calibrated	1. Calibrate the system according to the procedure
The count remains INACCURATE even after calibration, or it is accurate but only for low flow rates	1. The signal sent by the Pulser is outside the acceptable electronic ranges	1. The maximum pulsation frequency must be 70 Hz and between 20% and 80% duty cycle. The system does not process received data correctly outside the acceptable electronic ranges. The system must adapted to fit within the correct ranges, possibly by interposing other electronic interface devices (please contact Technical Support for options)
It DOES NOT COMMUNICATE with the PC	1. The RS485 connection is not correct	1. Check the connections
	2. The driver on the PC is not installed properly or the version is not compatible with the PC's Operating System	2. Check the versions of the drivers and the Operating System. Contact Technical Assistance
	3. The RS232 or USB converter is damaged	3. Try with a different converter: if the problem disappears, replace the converter
	4. The PC's USB or RS232 port is damaged	4. Try a different port or try it on a different PC to check the rest of the device: if it works on another PC, then the problem is with the PC



8.4 Troubleshooting	
Watchman Sonic - Technical Information	
<p>The WatchmanSonic is suitable for use in tanks for the storage of diesel, water, 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.</p> <p>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.</p> <p>Please note opening the unit will potentially affect the lifespan of the unit</p>	
CHANGING BATTERY	<p><u>Under Warranty</u></p> <p>If a unit is still under warranty and is clearly showing low battery symbol (Shown in picture 15), please contact our Watchman helpline. Units under warranty SHOULD NOT BE OPENED. Warranty will be void if unit is opened within the warranty period.</p> <p><u>Out of Warranty Only</u></p> <p>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.</p> <ul style="list-style-type: none">• 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 <p>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)</p>
	



8.4 Troubleshooting	
TRANSMISSION NOT HEARD	If the receiver detects a transmission not heard for a long time the symbol outlined in Pic 16 is displayed on the LCD. 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. Rematch receiver and transmitter as per point 6.
NO ECHO CONDITION	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). 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.

8. MAINTENANCE OF THE TUFFA TANKS

[illegible]

8. MAINTENANCE OF THE TUFFA TANKS

[illegible]

[illegible][illegible]



9. Warranty

Subject to the conditions below, your product is supplied with a warranty against material defects in workmanship or materials from the date of delivery or invoice Tax point date, whichever is earliest for the following warranty period:

PRODUCT	WARRANTY PERIOD IF REGISTERED	WARRANTY PERIOD IF NOT REGISTERED
Bunded fuel station tanks	10 years	5 years

ACCESSORIES	WARRANTY PERIOD
Fuel station suction / delivery hoses	3 months
All other ancillary equipment	1 year

The warranty is subject to the following conditions:

To qualify for the extended warranty period this product must be registered and installed by a registered competent person in accordance with prevailing statutory requirements. The period of the warranty will commence from the date of delivery or invoice Tax point date, whichever is earliest. The warranty is provided to the original purchaser only. Proof of purchase and evidence of annual inspection by a registered competent person will be required in the event of a claim.

To obtain the extended warranty period for your product, you must register the purchase and installation of your product with us within 21 days from date of purchase. To register, please complete and submit our registration form. Registration forms can be obtained and submitted online at www.tuffa.co.uk. Failure to register the purchase and installation of your product (or incomplete registration) within the 21 day period will mean that the shorter warranty period (above) only will apply to your product.

During the warranty period, any component of your product which is proved to contain any material defect in workmanship or materials will be exchanged or repaired, at our sole discretion, by us free of charge for material or labour.

In respect of your product, the warranty does not cover (and we will not accept responsibility for) any consumable items, any component which has not been manufactured by us (please refer to the manufacturer's warranty supplied with the relevant component), fair wear and tear, or any fault:

- in respect of any component not forming part of your product; or
- arising from any cause other than defect in original workmanship or materials; or
- caused by improper installation, maintenance, neglect, misuse or wilful or accidental damage; or

- caused by alteration or repair by you or by a third party who is not one of our authorised repairers; or
- caused by non-observance of either any applicable statutory requirement or any of the instructions contained in the installation and operating instructions appropriate to your product, and in this respect, we would draw particular attention to the fact that your product must not be used in conditions which are either below -17°C or which are above 35°C without protection from exposure to direct sunlight.

Your product has been used only for the purpose for which it is designed, and that any terms and conditions held with your installer have also been adhered to.

To the maximum extent permitted by UK law:

- the warranty is given in lieu of all other warranties, express or implied by statute or common law, including implied warranties or conditions of satisfactory quality and fitness for a particular purpose, provided that this warranty is in addition to your legal rights in relation to goods that are faulty or not as described; and
- we shall not in any circumstances be liable to you or any other party, whether in contract, tort (including for negligence and breach of statutory duty howsoever arising), misrepresentation (whether innocent or negligent), restitution or otherwise, for any special, indirect or consequential loss or damage.

10. Contact

Tuffa UK Limited
Dovefields Industrial Estate
Derby Road
Uttoxeter
Staffordshire
ST14 8SW

Tel: +44 (0) 1889 567700
Web: www.tuffa.co.uk
Email: sales@tuffa.co.uk

11. Guarantee registration

To register your tank warranty please visit the link to our website as below. The guarantee card must be completed online within 21 days of the date of the tank delivery to the first purchaser (namely the person or entity buying direct from Tuffa UK Limited).

<https://www.tuffa.co.uk/services/support/guarantee-registration/>



