



***compac***

***INTEGRATED REFUELLING SOLUTIONS***

## **AdBlue Kit Installation Manual Version 1.0.1**

**Model: AdBlue Tank Kits  
Date: 1<sup>st</sup> March 2019**



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- Read this manual completely before working on, or making adjustments to, the Compac equipment.
- Compac Industries Limited accepts no liability for personal injury or property damage resulting from working on or adjusting the equipment incorrectly or without authorization.
- Along with any warnings, instructions, and procedures in this manual, you should also observe any other common sense procedures that are generally applicable to equipment of this type.
- Failure to comply with any warnings, instructions, procedures, or any other common sense procedures may result in injury, equipment damage, property damage, or poor performance of the Compac equipment.
- The major hazard involved with operating the Compac C4000 processor is electrical shock. This hazard can be avoided if you adhere to the procedures in this manual and exercise all due care.
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CONDITIONS



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## Introduction

This manual contains specific instructions relating to installing AdBlue kits. For the servicing and other information relating to non-AdBlue specific components refer to the Compac C4000 Master Manual.

## Static Electricity Precautions

Electronic components used are sensitive to static. Please take anti-static precautions.

An anti-static wrist strap should be worn and connected correctly when working on any electronic equipment. If an anti-static wrist strap is unavailable, or in an emergency, hold onto an earthed part of the pump/dispenser frame whilst working on the equipment. This is not a recommended alternative to wearing an anti-static wrist strap.

**NOTE:** *Compac Industries Limited reserves the right to refuse to accept any circuit boards returned, if proper anti-static precautions have not been taken.*

## Pre-installation Check

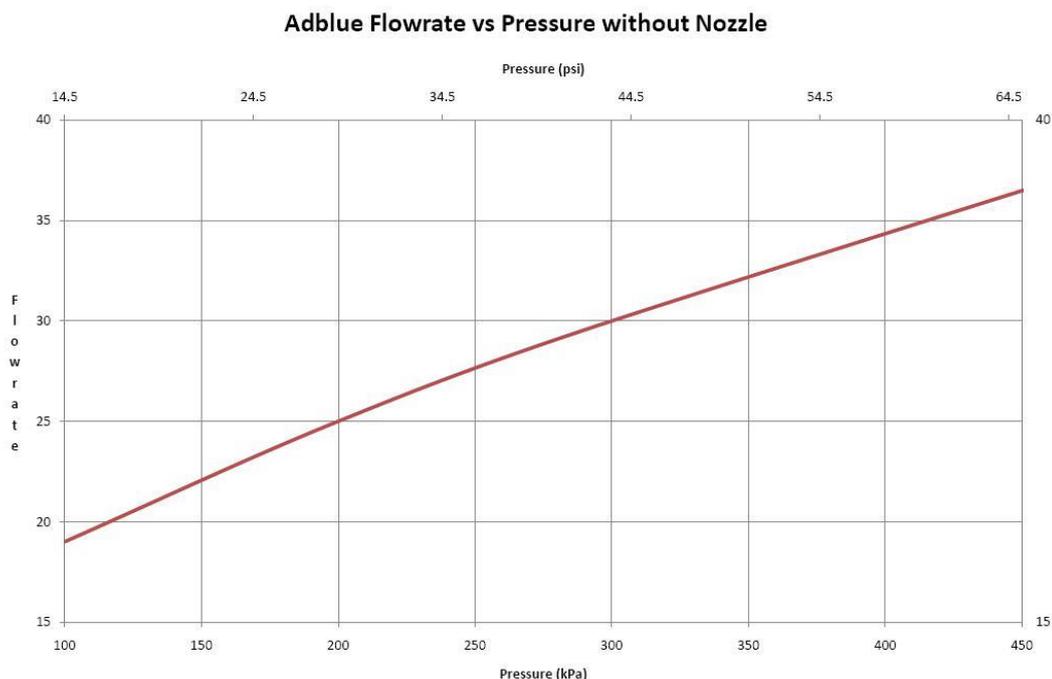
Once the pump is received on site, check that no damage has occurred while in transit – in particular, damage to electronics due to vibration or jarring. All terminals and plugs should be checked, including IC chips to ensure they are securely in place.

## Pump Specifications

The AdBlue supply pump must be Adblue compatible. It must either have flooded suction or be fitted with an air separation device to eliminate air prior to the dispenser.

Ensure the supply pump pressure does not exceed the rated pressure of the nozzle.

Refer to the diagram below:



**NOTE:** Pumps must be rated for AdBlue.

## Electrical Requirements

**Power cable:** 3 Core Steel Wire Armour Cable 2.5mm<sup>2</sup>

**Core 1:** 230 Volt Supply (Active). **Core 2:** Neutral. **Core 3:** Earth.

**Dispenser power requirements:** 220 - 240 Volts. 50 Hz, +/-10%

**Current draw:** 25W Idle, 200W with all solenoids active.

**Communications cable:** 2 Core Steel Wire Armour Cable 1.5 mm<sup>2</sup>. Maximum cable length 100 m. 12 V current loop. For connecting to controller or other dispensers (option).

**Submersible pump(s):** Suitable cable for 230V solenoid switching current. 300mA maximum load. Do not wire submersible pumps directly to C4000 power supply.

Prior to pump installation, ensure that there is at least a two-metre tail on all cables.

## Dispensing Hoses and Nozzles

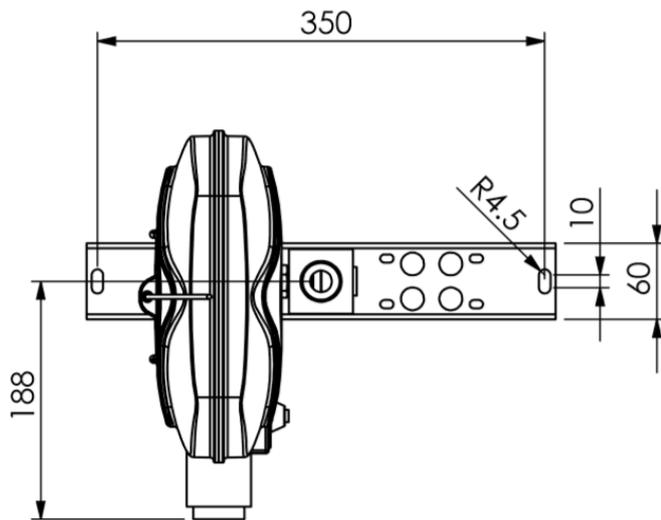
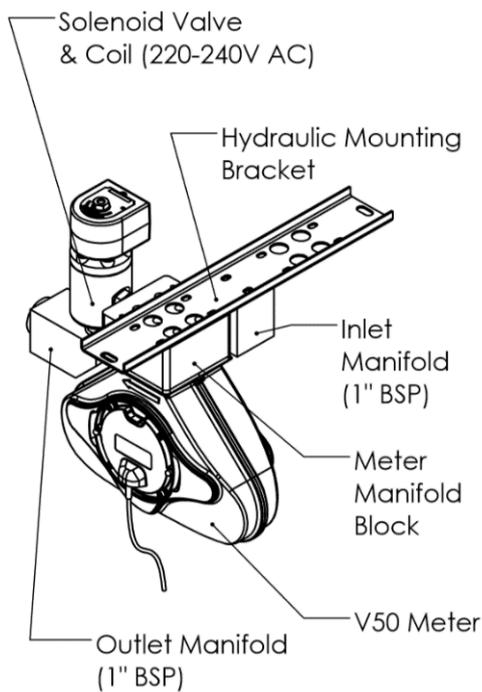
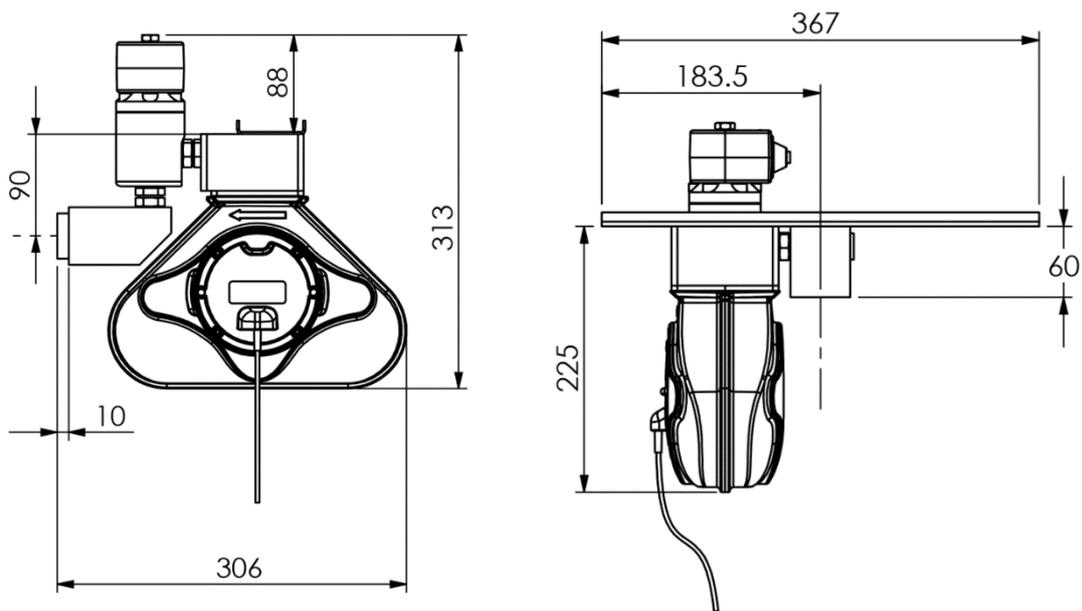
If customer supplied hose assemblies, pylons, reels, safe breaks and nozzles are used they must comply with the requirements outlined in AS/NZS 2229. All hoses, nozzles and fittings that come in contact with AdBlue must be compatible with it.

## Generator Power

The power output from onsite generators can cause power spikes that may damage electrical components within the cabinet. When connecting to sites powered by generators, please take the following precautions:

1. Install a power conditioner. Although generators are fitted with power regulators, most are not filtered sufficiently for powering sensitive electrical components. We recommend installing a commercial power conditioner and/or UPS between the generator and the unit.
2. Before starting a generator, make sure the power to the unit is turned off.
3. Start the generator, let the generator reach stable operating speed and wait 30 seconds before reconnecting the power to the unit.
4. For units where the generator starts and stops on demand, install a delay timer or PLC to automatically isolate the unit until the operating speed and consistent power output is achieved.
5. Isolate the unit before shutting down the generator.

## Installation



**IMPORTANT: The "V50 DEF Module" must be mounted in a "horizontal" orientation (as shown), to ensure correct operation.**

**NOTE:** Consider the limited length of the cables on the Meter and Solenoid

The drawings shown are for single units. For dual units, the solenoid and outlet are separated and connected to the meter assembly with a tube.

Installation instructions are as follows:

1. Mount the V50 Module assembly. Ensure that the meter is in the correct orientation by checking the 'In' and 'Out' print on the base of the meter. The meter must be installed in a horizontal orientation.

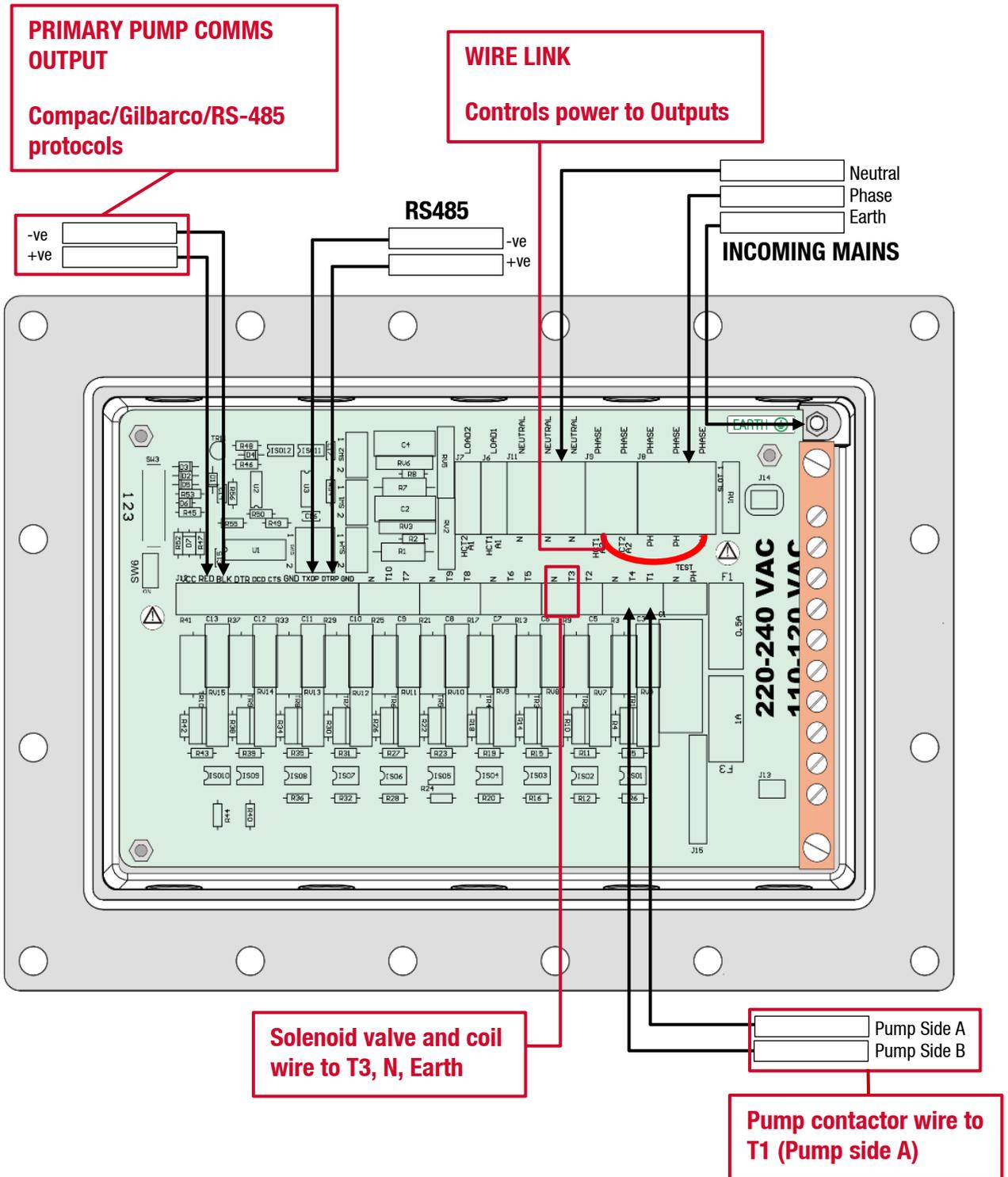
2. Connect the pump to the Inlet Manifold (1" BSP thread) shown above in the meter manifold diagram.
3. Connect the nozzle hose to the Outlet Manifold (1" BSP thread) shown above in the meter manifold diagram.
4. Mount the C4000 Processor Box. It is recommended to mount the bracket without the lid initially, so that connections can be brought into the processor box. Ensure the bracket is mounted with a minimum of 12mm clearance above the bracket so that the lid can be fitted.
5. Mount the Flameproof Box. Note the box has four 105x185 mounting holes on the bottom of the casing (M6 thread). A bonding wire is attached to the flameproof box for earthing requirements.
6. Mount the DCA unit using mounting holes and glanding found on the bottom of the unit.
7. Connect the nozzle to the microswitch. If this is supplied, it must be mounted first.

# Electrical Connections

## Electrical Connections

Electrical cables are terminated at the C4000 Power Supply, which is housed in the Flameproof Enclosure. The incoming cables are terminated as shown in the following picture. Single hose use only the pump side A connection. Pump Comm's connections are only used when the dispenser is communicating to a site controller.

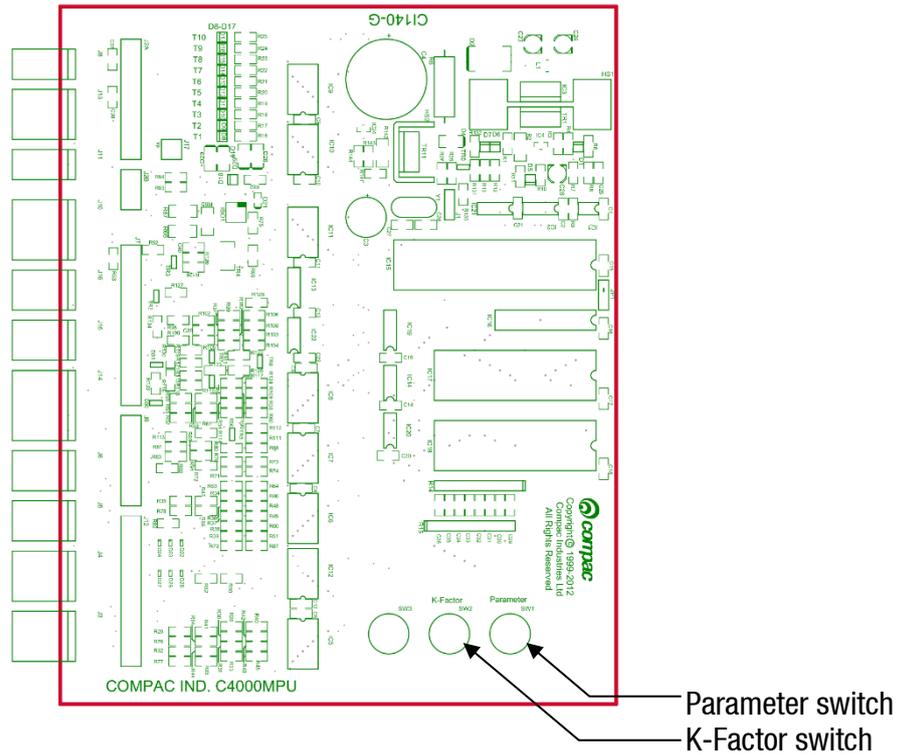
**NOTE:** Output to pump(s) goes to the pump contactor, not directly to the pump wiring.



## C4000 Processor

Use the following diagram and table to link the connectors to the C4000 processor:

- DCA to J7
- Micro switch to J12 for the nozzle flap
- V50 meter to J3
- Flameproof box to J2



J1: Comms Test	J7: Displays	J13: Not used
J2: To Power Supply	J8: Temperature (for Temperature compensation only)	J14: Not used
J3 : Input from KG Meter Side A	J 9 Power for KG Meters	J15: Not used
J4: Input from KG Meter Side B	J10: Totes	J16: Not used
J5 : Not Used	J11: Buzzer	J17 Backlighting
J6 Not used	J12 Nozzle Switches	

## Setting up the C4000

K-Factor, and other various configuration settings, are set via the K-Factor switch. The position of this switch is shown in the previous diagram.

K-Factor settings are adjusted by pressing the button to scroll through the available options to find the digit that requires changing, then holding down the switch to scroll through the digits 09. Releasing the switch on the required digit will lock it in place. The K-factor display will time-out after 10 seconds and will save the setting. For more details refer to the C4000 manual.

### Calibration (K-Factor)

#### Setting the K-Factor

K-Factor is a proportional calibration factor of litres dispensed per revolution of the meter.

To calibrate the dispenser/pump, dispense fuel into a certified measuring container, and compare the display value with the amount dispensed.

#### Example:

Display shows 10.00

True volume 20.00

To calculate the correct 'K' Factor from the information above; firstly, record the existing 'K' Factor.

$$\begin{aligned} \text{New K Factor} &= \text{Existing K Factor} * \frac{\text{Dispensed Amount}}{\text{Displayed Amount}} \\ &= \text{Existing K Factor} * \frac{20}{10} \\ &= \text{Existing K Factor} * 2 \end{aligned}$$

Change the existing 'K' Factor to this new value.

#### Typical K-Factor Settings

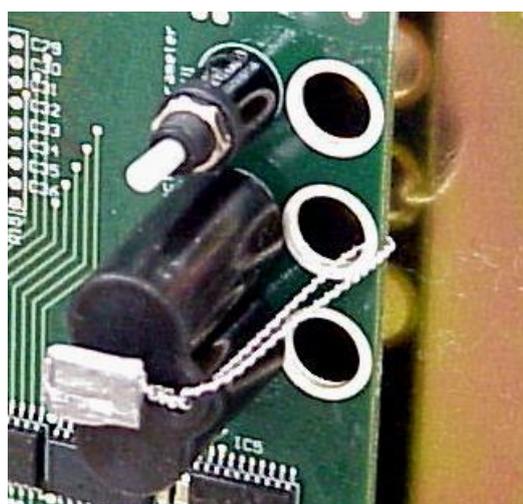
Below is a list of the typical K factor settings in an Adblue dispenser. Please refer to the documentation supplied with your dispenser as there may be slight differences due to meter calibration and dispenser setup.

Setting	Value	Description
F	1000	Standard K-Factor setting. Adjust when calibrating meter. Refer 19.1 C4000 manual.
Sd	000	Solenoid delay in seconds. Default value is zero
P-Cut	000	Preset cut. Set to a larger value if you are having problems with the unit overrunning a preset value.
Sr	0000	Screen Resolution. Default value is 0.000
b	0000	Set to 1000 to inhibit standalone operation (use ***2 for purge mode)
C	0004 1	Configuration code. Always set to 0004 1 (1 hose) or 0004 2 (2 hose)
Id-A	HHHHHH	Six-digit number on V50 meter side A (Id-B for 2 hose models)

Other changes from the standard setup include the removal of the no-flow timeout. The meter will automatically time out after 10 seconds of less than 3 litres per minute flow.

### Sealing the K-Factor Switch

After calibration the K-Factor switch should be sealed as shown.



## Configuration Code

The configuration code has been set at Compac and should not be changed.

In the event of it being lost and having to be re-entered the configuration is written on the yellow label on the C4000 processor board cover.

## Parameter Switch Settings

### Setting the Pump Number

This must be set at the pump for each hose, so that communications with a controller can take place. The location of this switch is shown in the diagram below.

Depress the Parameter Switch nine (9) or more times until the message **PnA\*\*** appears in the litres display window. When the switch is pressed again **Pnb\*\*** will appear on the display. These two options will toggle each time the switch is pressed. To alter either of the pump numbers, press and hold the Parameter Switch when the pump number to be altered appears on the display. This number will then increment. The switch should be released when the desired pump number is displayed. The value of the displayed number will then be stored in the C4000 memory as the pump number for that hose.

**NOTE:** For a single hose only **Pn** will appear.

### Setting the Price

Using the Parameter Switch, follow the chart to set the price for the hose(s) in question.

STEP	ACTION	RESULT
1	Ensure that the nozzle is hung up	Dispenser in idle state
2	Press and Hold the Parameter switch until the "Price per litre" is displayed.	The price for side <b>A</b> is shown as <b>P****</b> on the litres display and <b>P r A</b> is displayed on the money display.
3	Press and hold the Parameter switch.	A digit, of the displayed 'Price per litre', will begin to increment.
4	When the digit is correct, release the Parameter switch.	
5	Repeat steps 3 and 4 for each digit of the 'Price per litre'.	<b>NOTE:</b> the C4000 will reset itself if the Parameter switch is left for more than 60 seconds.
<b>Continue for Dual hose units</b>		
6	Press and release the Parameter switch 8 or more times in quick succession	The price for side <b>b</b> is shown as <b>P****</b> on the litres display and <b>P r b</b> is displayed on the money display.
7	Repeat steps 3 to 5 above.	

## Installation Tests

### Electrical Operation Test

For dispensers with a diesel hose as well as an AdBlue hose, refer to the C4000 manual for testing the diesel side of the dispenser. The instructions below refer to the AdBlue side of the dispenser.

Make sure that the inlet valves are closed (these are the valves in the inlet lines at the base of the dispenser, but not part of the dispenser).

Turn on the power supply to the dispenser.

With the dispenser in a **ready state**, check that the C4000 Microprocessor Power LED (D1) is turned on.

**NOTE:** If the dispenser is receiving information from a controller, Comms RXD LED (D6) will poll. If the dispenser responds to polls for its respective pump number/s, Comms TXD LED (D7) will also poll.

Check that Diagnostic LED (D18) slowly flashing. (If the dispenser is connected to an operational Controller, it flashes slowly but erratically. If the dispenser is not connected to a Controller, it flashes slowly and consistently.)

Check that Watchdog LED (D5) is turned off.

Once the display has gone through its test sequence, use the K-Factor switch to check that the fourth digit of the C setting is 4 (AdBlue). **0004 1** is for a single hose dispenser, **00042** is for a two hose dispenser.

Using the Parameter button put the dispenser into **PURGE** mode by changing the b setting to **\*\*\*2**. Retail dispensers will display **PURGE** in the Dollars display. Commercial dispensers will display a dot on the left hand side of the litres display. The temperature and measured density will toggle in the S/L display. Wait for the C4000 to time out and return to the normal display.

Lift the nozzle.

The display will show "Purge" and the solenoids will energise, starting the pump motor. Check that Diodes D8, D10 and D11 turn on, indicating a signal is being sent to the triacs to open the solenoid valves.

The diagnostic LED (D18) flashes quickly when the start button is pushed or the nozzle removed from the holster to initiate a fill. When the button is released or nozzle returned to the holster it will return to the normal state and flash slowly.

Verify solenoid operation by listening for a click, or by using a screwdriver tip or some other metallic tool to check for a magnetic field present on the solenoid coils.

The solenoids will switch off after 60 seconds. This is a default time-out for the **PURGE** setting.

Hang the nozzle, and using the Parameter button, put the dispenser into standard mode by changing the b setting to **\*\*\*0**.

For two hose AdBlue dispensers, repeat the procedure for side B. For AdBlue / Diesel dispensers the diesel hose test procedure is the same as the Electrical Operation Test in the C4000 manual.

Re-power the dispenser and then move on to the Mechanical commissioning of the Dispenser.

### Mechanical Operation Test and Hose Purge

Make sure that the electrical commissioning tests have been carried out and the solenoid operation has been verified before carrying out the following tests.

Slowly open the supply valves to the dispenser, checking for any leaks.

Turn on the power supply to the dispenser.

Using the Parameter button put the dispenser into **PURGE** mode by changing the b setting to **\*\*\*2**. Retail dispensers will display **PURGE** in the Dollars display. Commercial dispensers will display a dot on the left-hand side of the litres display. The temperature and measured density will toggle in the \$/L display. Wait for the C4000 to time out and return to the normal display.

Lift the nozzle.

The display will show **PURGE** and the solenoids will energise, starting the pump motor. Check that Diodes D8, D10 and D11 turn on, indicating a signal is being sent to the triacs to open the solenoid valves.

In **PURGE** mode the dispenser will only operate for 60 seconds at a time before shutting down. If the dispenser shuts down, hang up the nozzle and start again.

Check all the dispenser fittings, solenoids and pipework for leaks.

Slowly dispense AdBlue from the dispenser, being careful to shield yourself from splashes as there may be air in the fuel causing it to spray from the nozzle. If the dispenser stops, hang up the nozzle then remove it start dispensing again.

Continue until the AdBlue flows without any air being present, then hang up the nozzle.

Put the dispenser back into normal mode by changing the b setting back to **\*\*\*0**. On commercial displays check that the dot is no longer on the litres display.

Lift the nozzle and slowly dispense AdBlue from the dispenser. The display and tote should increment when fuel is flowing. If the dispenser stops and the error message AIR displays, go back and purge the hose again.

For two hose AdBlue dispensers, repeat the procedure for side B.

For AdBlue / Diesel dispensers follow the instructions in the C4000 manual for mechanical commissioning of the diesel hose.

The dispenser can now be calibrated. Refer to the C4000 Master Manual for calibration instructions. Setting up the C4000.

Once the pump is connected on site, the final setup check and calibration to complete the installation must be carried out, using the Parameter Switch and Calibration (K-Factor) Switches on the C4000 processor board.

## AdBlue Instructions

### Cleaning the AdBlue Nozzle

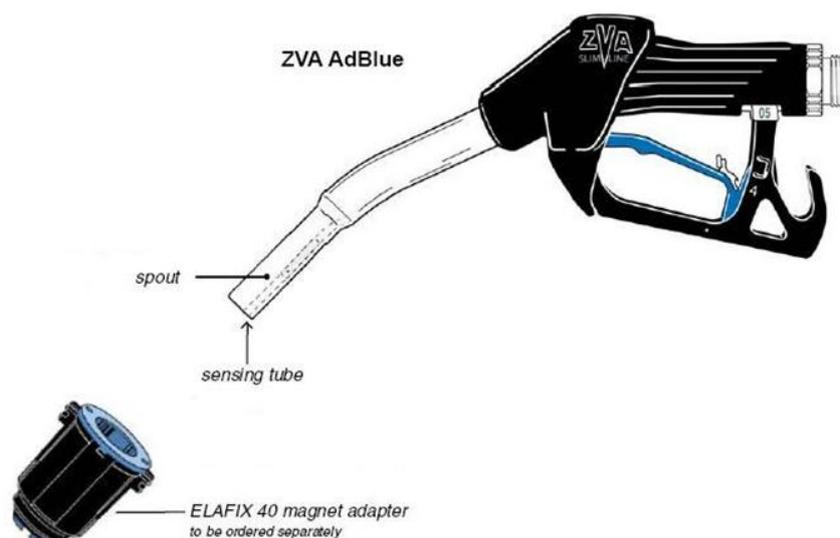
If AdBlue evaporates it may form crystals around the dispenser nozzle. A build up of crystals can block the air passage causing the nozzle to continuously trip off.

If this occurs, rinsing the nozzle in a bucket of warm water will dissolve the crystals and unblock the air passage.

To avoid contamination of the AdBlue, thoroughly dry the nozzle after rinsing.

### ZVA AdBlue Nozzle

The ZVA AdBlue nozzle with a magnetic safety catch is commonly used on AdBlue dispensers. The following image is included for reference. For further information refer to ZVA direct.



Automatic nozzle ZVA AdBlue for the refuelling of the “AdBlue” urea solution tanks.

Flow rate up to 40 l/min, working pressure 0,5 – 3,5 bar.

To avoid misfuelling, the standard type of ZVA AdBlue is equipped with a magnet opening in the spout. The nozzle will only open in combination with the magnet adapter ELAFIX 40 which must be installed in the AdBlue filler neck. For the refuelling of other containers or canisters please push an ELAFIX 40 over the spout.

AdBlue tends to crystallise. Due to the evaporation of water, white crystals will show. If these should block the air passage (a sign for this is that the ZVA AdBlue keeps tripping off continuously) this can be solved easily by moving the nozzle spout in a bucket with warm water. In order to avoid contamination, please rinse the nozzle spout with AdBlue previous to the next refuelling.

## Meter Replacement

The V50 meter has a replaceable electronics module. If the meter is not working, replace this. If the meter still does not work the entire meter will need to be replaced.

### Replacing the Electronic Module

The electronic module can be replaced without removing the meter from the dispenser.

1. Turn the power off the dispenser.
2. Remove the side panel to access the meter.
3. Undo the four retaining screws on the front of the meter.
4. Snip the sealing wires and remove the electronic module from the meter.
5. Snip any cable ties and noting where it is plugged in and unplug the module from the C4000 board.
6. Fit the new electronic module to the meter. Feed the cable up to the C4000 board and plug it into the same socket as the old module (the clips face outwards).
7. Cable-tie the new cable in place and fix the module in place with screws and new anti-tamper seals.

### Pairing the Electronic Module

The new module needs to be paired to the C4000 board using the K-Factor switch.

1. Start the dispenser and copy down the serial number stuck on the face of the new module.
2. Using the K-Factor switch scroll through the menu until you reach the **1d-A** (side A) or **1d-B** (side B) screen depending on which meter the module has been installed in (dual hose models).
3. By pressing then holding in the K-Factor switch, scroll through each digit in turn until the number matches the number printed on the new module.
4. When you have the correct number continue to scroll through until you leave the **1d** menu entirely.

**NOTE:** On two hose units it is important to do this operation even if you are only replacing one module. Failure to do this is one of the prime causes of setup problems.

5. You will now need to calibrate the new module by comparing a dispensed amount of AdBlue with the displayed amount and adjusting the K-Factor. Refer to the Calibration section of the C4000 manual for details.

## Removing the Complete Meter

The entire V50 meter is available as a spare part complete with manifold and electronic module.

**CAUTION:** When removing the meter, take care to prevent spilling AdBlue onto any electronic component, aluminium or metal surface. Clean up any spillage immediately. Any skin contact should be washed thoroughly with water.

1. Turn off the AdBlue supply to the dispenser.
2. Turn the power off the dispenser.
3. Snip any cable ties and noting where it is plugged in, unplug the meter from the C4000 board.
4. Undo the six screws holding the meter in place and remove the meter.

## Replacing the Complete Meter

1. Make sure the front of the meter containing the electronic module is facing out.
2. Using the six screws, fasten the new meter in place.
3. Feed the meter cable up to the C4000 board and plug it into the same socket. The clips face outwards.
4. Cable tie the lead neatly out of the way if required.
5. Make sure all connections are tight.
6. Open any valves you may have turned off.
7. Restart the dispenser and pair the new meter to the C4000.
8. Purge the air from the system.
9. Calibrate the new meter.

## Error Messages

Error Code	Fault	Action
Err 3	No price or pump number set.	Set the pump number or: Set a price at the pump or at the controller.
Err 7	Excess flow.	Max Flowrate exceeded
Err 8	Excess reverse flow.	Check product is not flowing back into the tank once the delivery has finished.
Err 9	Faulty or disconnected meter.	<ol style="list-style-type: none"> <li>1. Check that encoder is plugged in.</li> <li>2. Replace encoder PCB on meter</li> </ol>
Err 10	Configuration Lost	Reconfigure C4000 refer to C4000 manual
Err 12	C4000 memory failure.	Change memory IC. F-AD-DS1225 (not applicable to Futra)
Air	Air in the AdBlue meter	Purge the hose(es)
PEd Abd	Display error	<ol style="list-style-type: none"> <li>1. Check display cable for loose wires/crimps</li> <li>2. Replace display PCB</li> </ol>