



***compac***  
***PREMIUM DISPENSER TECHNOLOGY***

## **Master Pumps Installation Manual Version No 1.0.2**

**Model:** Master Pumps

**Date:** Friday, 8 December 2017

**Compac Industries Ltd.**

52 Walls Road, Penrose, Auckland 1061, New Zealand.

PO Box 12 417, Penrose, Auckland 1642, New Zealand.

Tel: +64 9 579 2094 Fax: +64 9 579 0635 [info@compacngv.com](mailto:info@compacngv.com)

[www.compacngv.com](http://www.compacngv.com)



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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.
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- 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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PO Box 12 417, Penrose, Auckland 1642, New Zealand.

Tel: +64 9 579 2094 Fax: +64 9 579 0635 info@compacngv.com

www.compacngv.com



## Product Identification

### Specifications

#### Models Covered

This manual applies to:

MR40P  
MR80P  
MR160P  
MMR40P (std and marine)  
MMR80P (std and marine)  
MMR80-40P (std and marine)

***NOTE:*** Do not use this manual for earlier models. Contact Compac for archived manuals if required.

### Validity

Compac Industries Limited reserves the right to revise or change product specifications at any time. This publication describes the state of the product at the time of publication and may not reflect the product at all times in the past or in the future.

### Manufactured By:

The Compac Master Pump is designed and manufactured by Compac Industries Limited  
52 Walls Road, Penrose, Auckland 1061, New Zealand  
P.O. Box 12-417, Penrose, Auckland 1641, New Zealand  
Phone: + 64 9 579 2094  
Fax: + 64 9 579 0635

[www.compac.co.nz](http://www.compac.co.nz)

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Tel: +64 9 579 2094 Fax: +64 9 579 0635 info@compacngv.com

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52 Walls Road, Penrose, Auckland 1061, New Zealand.  
 PO Box 12 417, Penrose, Auckland 1642, New Zealand.  
 Tel: +64 9 579 2094 Fax: +64 9 579 0635 info@compacngv.com  
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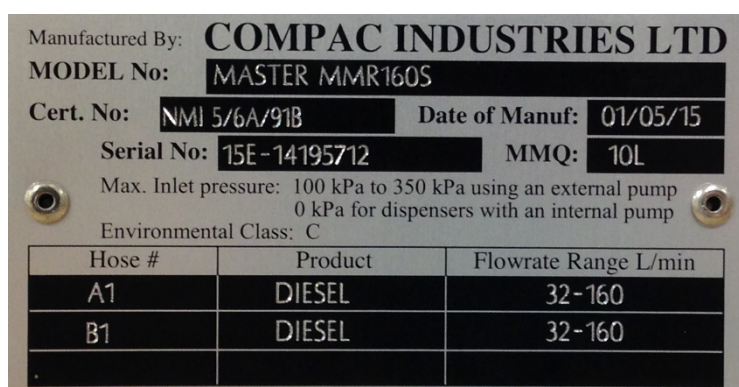
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## Product Identification

Ensure you are using the correct installation instructions and footprint drawing before commencing site work or installation.

The identification plate is fastened to the bottom of the right-hand side panel when facing the front of the dispenser.

The model number is on the first line of the identification plate.



### Understanding the model number:

The model number for Laser pumps is split into: Chassis style, hose configuration, pump or dispenser and specific application.

Use the table below to help identify the unit.

Style	L/min per hose	Pump style	Options
MR = single hose	MR40 = one hose @ 40 l/min	P = pump	Blank = Standard
MMR = multi hose	MMR40 = two hoses @ 40 l/min	S = dispenser	Avi = Aviation
	MMR80-40 = side A 80, side B 40		Marine = Marine

For example: MMR 80-40P Marine is a two-hose unit. Hose side A is 80 l/min, side B is 40 l/min with internal pumps. As a marine model it has stainless steel pipework and stainless-steel chassis for marine conditions.

**NOTE:** Make sure you use the footprint that relates exactly to your model refer to sales order for any variations to the standard setup.

## Footprints

All outlets are approximately 680mm above the base:

- 40 l/min - 3/4" female BSP socket
- 80 l/min - 1" female BSP socket
- 160 l/min - 1 1/4" female BSP socket

Inlet pipework can be connected to the pump flange(s). An optional flexible coupling is offered by Compac. There must be no fuel pressure in the pump line when pump is not operating.

## Optional Flexi Coupling

### Pump Flange

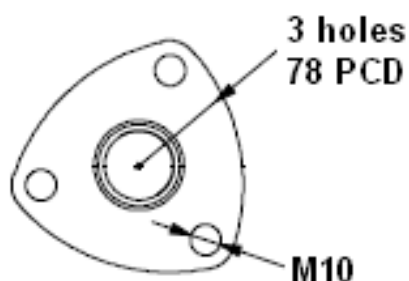


Figure 1: Pump Flange

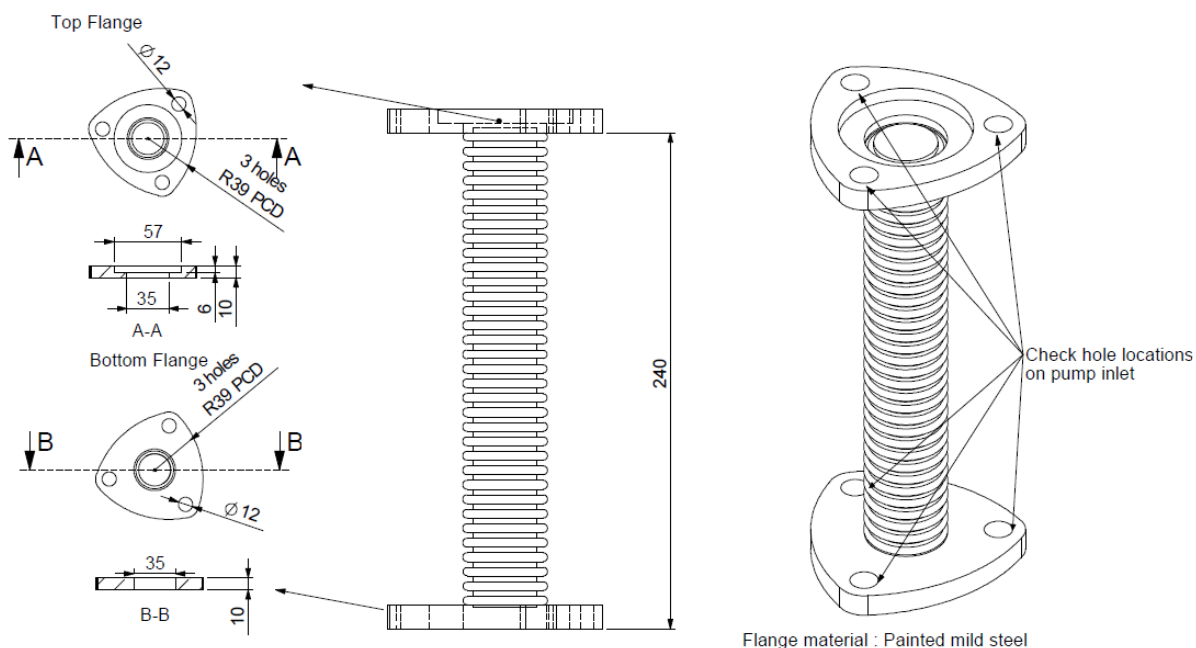
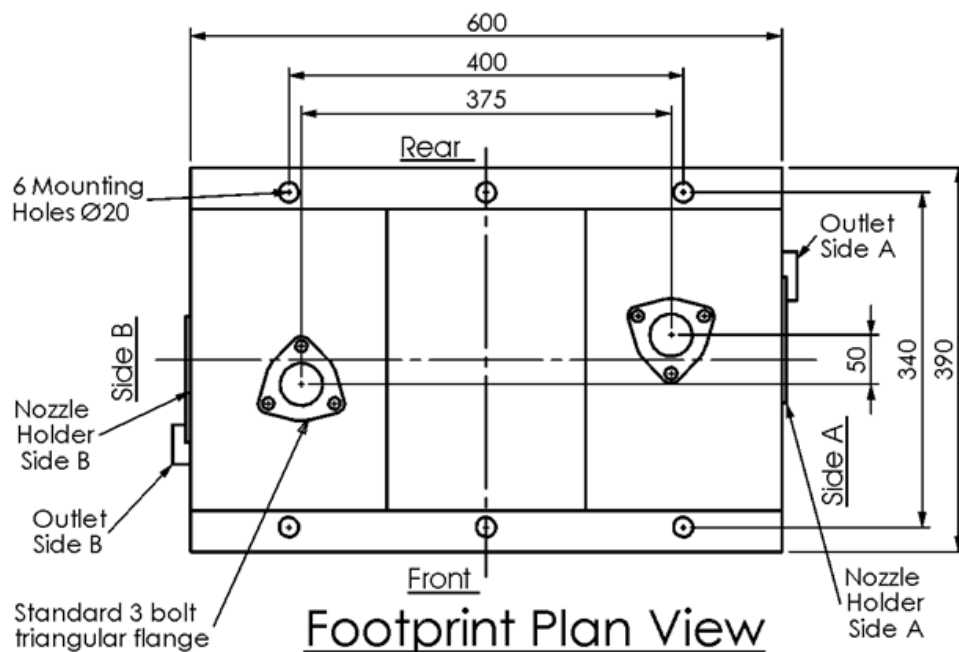
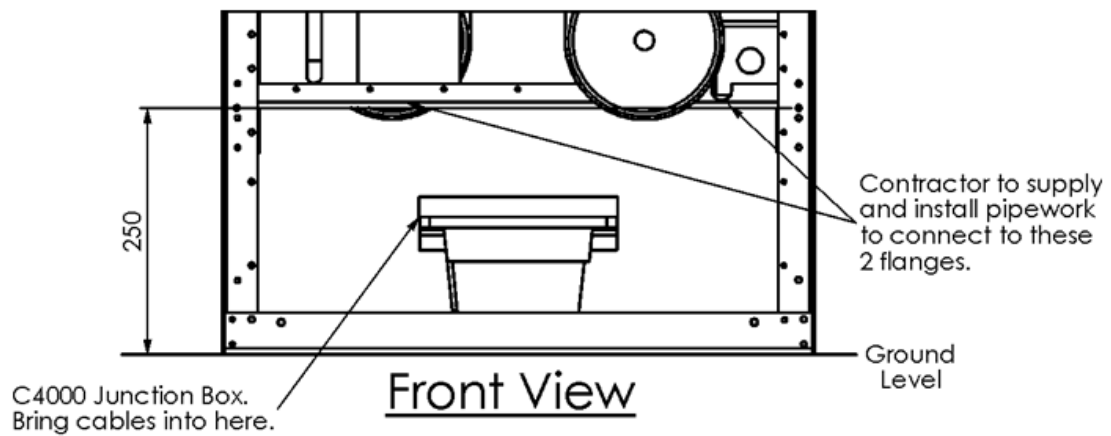


Figure 2: Flexi Coupling Diagram



MMR40P MMR80P MMR80-40P  
MMR40P Marine MMR80P Marine MMR40-80P Marine

Figure 3: Footprints for MMR40P MMR80P MMR80-40P Std. and Marine

**MMR40P MMR80P MMR80-40P Std. and Marine**

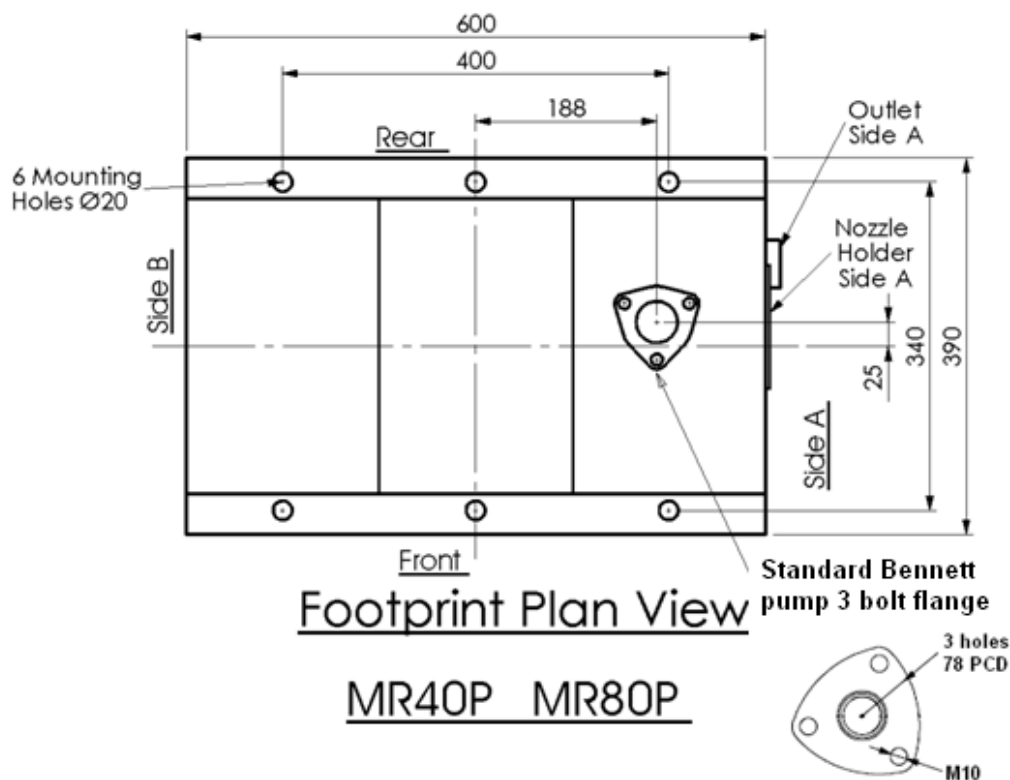
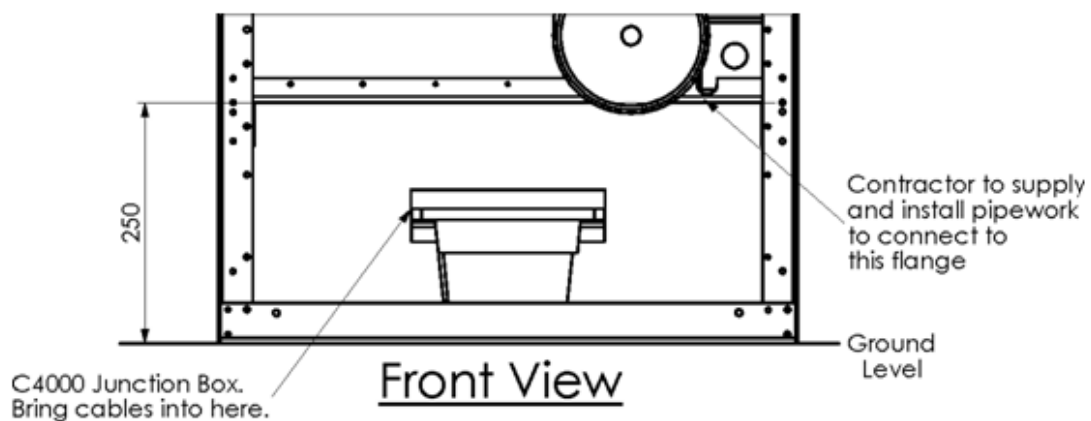


Figure 4: Footprints for MR40P, MR80P

**MR40P MR80P**

## MR160P

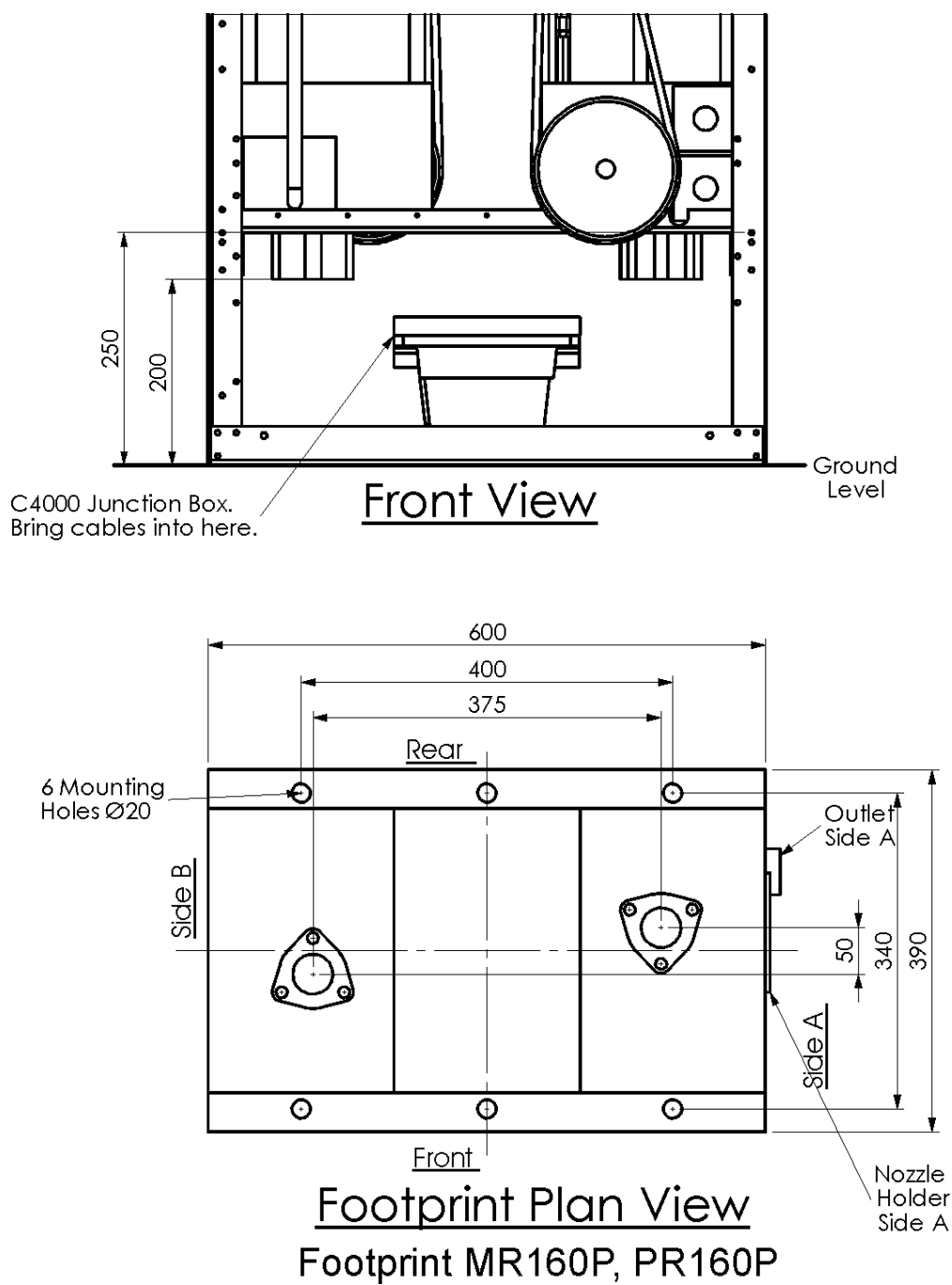


Figure 5: Footprints for MR160P



## Installation

### 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.

### Procedures

Installation should be in accordance with local regulations.

To obtain maximum flow on a self contained pump, observe the following guidelines:

1. Pumps must not be subject to any head pressure. Design your installation to eliminate any possibility of this occurring.
2. Total length of horizontal piping between tank and pump should be no longer than 18 metres. Use galvanised steel or approved non-metallic pipe and fittings.
3. The unit contains two pumps. It is recommended that each pump is supplied by a separate pipe. For 40 l/min pumps, use 1½" pipe. For 80 l/min pumps, use 2" pipe. Check valves must also be installed below each pump inlet.

***NOTE:*** *Ensure you remove the bung from the pump inlet before connecting the pipe.*

4. Pipe must slope up from the tank to the pump (approximately 15 mm per metre). Pipe should be straight and supported along its length.
5. All horizontal piping must be buried at least 450mm below ground level.
6. The area under the pumping unit(s) must be filled with sand or dirt as far up the suction line as possible. Use water to pack the sand or dirt when put in place.

7. Avoid asphalt drive surfaces covering the piping. Asphalt increases heat absorption causing vapour lock.
  8. Static lift must not exceed 3 metres (vertical distance from the product level in the tank to the centre of the pump unit).
  9. To absorb ground movement from settling of the tank, frost heaving of the ground or pump island settling, a swing joint must be used in the supply line at the tank and directly underneath the dispenser. Three additional directional changes using elbows are permitted.
  10. Piping must hold a 3.4 Bar (50PSI) pressure test for a minimum of 10 minutes.
  11. It is recommended that a vertical, in-line check valve be installed underneath the pump.
  12. The dispensing equipment shall be installed to prevent the delivery hose from contacting the ground when not in use.
  13. A check valve must be installed at the tank end of the suction pipe on the top of the tank in a serviceable location. Many clients install an extra check valve at the inlet to the pump. It is important neither of the check valves interfere with the flow of fuel. They must be adequately sized.
- Refer to the footprint drawings for pump installation details.

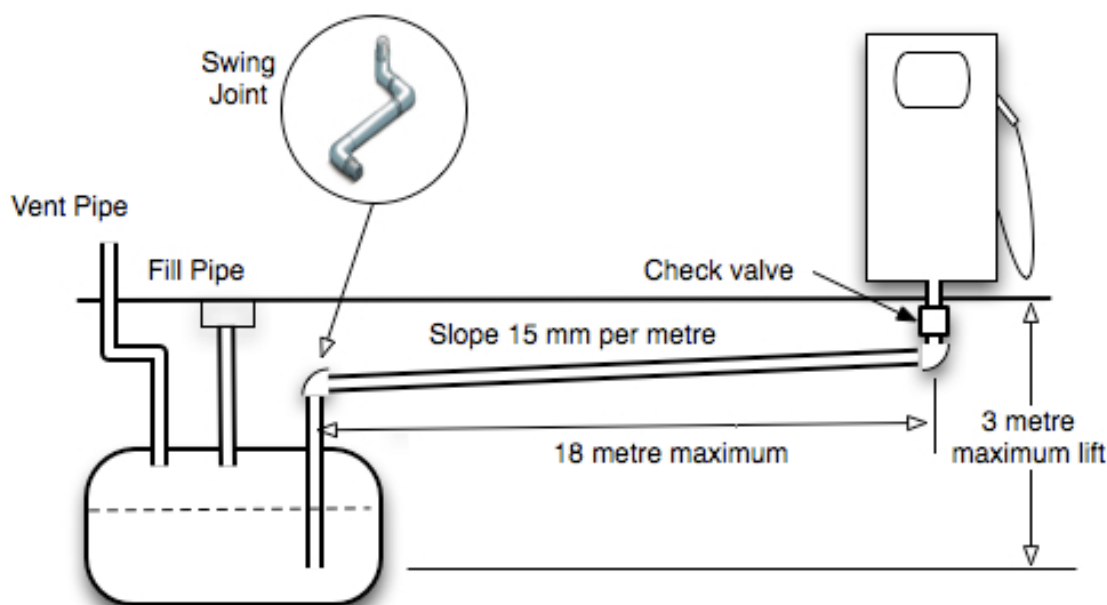


Figure 6: Installation Guidelines

Where local regulations require a sump to be fitted:

- a. Sumps must be provided at all dispenser installations with secondary containment pipework and at all new installations; and
- b. at all sites with sumps, dispensers should be installed with a liquid level detection device fitted in the sump that will raise an alarm if liquid is detected in the base of the sump.

**DANGER:** The pump inlet must not be pressurised at any time. This will cause fuel to flow from the air eliminator. Unregulated connection to an above ground tank will cause pressurisation.

**DANGER:** For above ground tanks a regulator valve such as a Tokheim valve or similar device **MUST** be used so that the inlet of the pump cannot become pressurised at any time.

**CAUTION:** The air switch is not to be disconnected. Disconnection will void NSC and TMU approvals.

### Comms Dip-switch settings

The actual Comms I/O is controlled by the position of SW3.

SW3	Comms Protocol
Position 1	Compac Standard
Position 2	Gilbarco
Position 3	RS485

## Triac Dip-switches

Important note:

Great care should be taken not to accidentally change the setting of these switches while working in the Flame-proof box. Operating the unit with these incorrectly set can result in damage to the C4000 Power Supply or incorrect operation of the triacs.

These switches are set in the factory and should not be changed.

If they are accidentally changed these are the correct settings for Master / Premier Pump applications.

**NOTE:** *They are 3 position switches*

Pump (Motor triac fitted)	
SW1	1
SW2	1
SW4	Centre

## Electrical Connections

The instructions below refer to basic installation wiring. For full wiring specifications refer to drawing AP375 available on the Resources section of the Compac website. Prior to pump installation ensure that there is at least a two-metre tail on both the incoming underground mains supply cable and comms cable (if comms enabled). These cables are terminated at the C4000 power supply, which is housed in the flameproof enclosure located in the bottom of the pump, behind the door.

Mains power wiring should be rated for a maximum current draw of 10 A rms at 220-240 V ac.

The incoming cables are terminated as shown in the following picture.

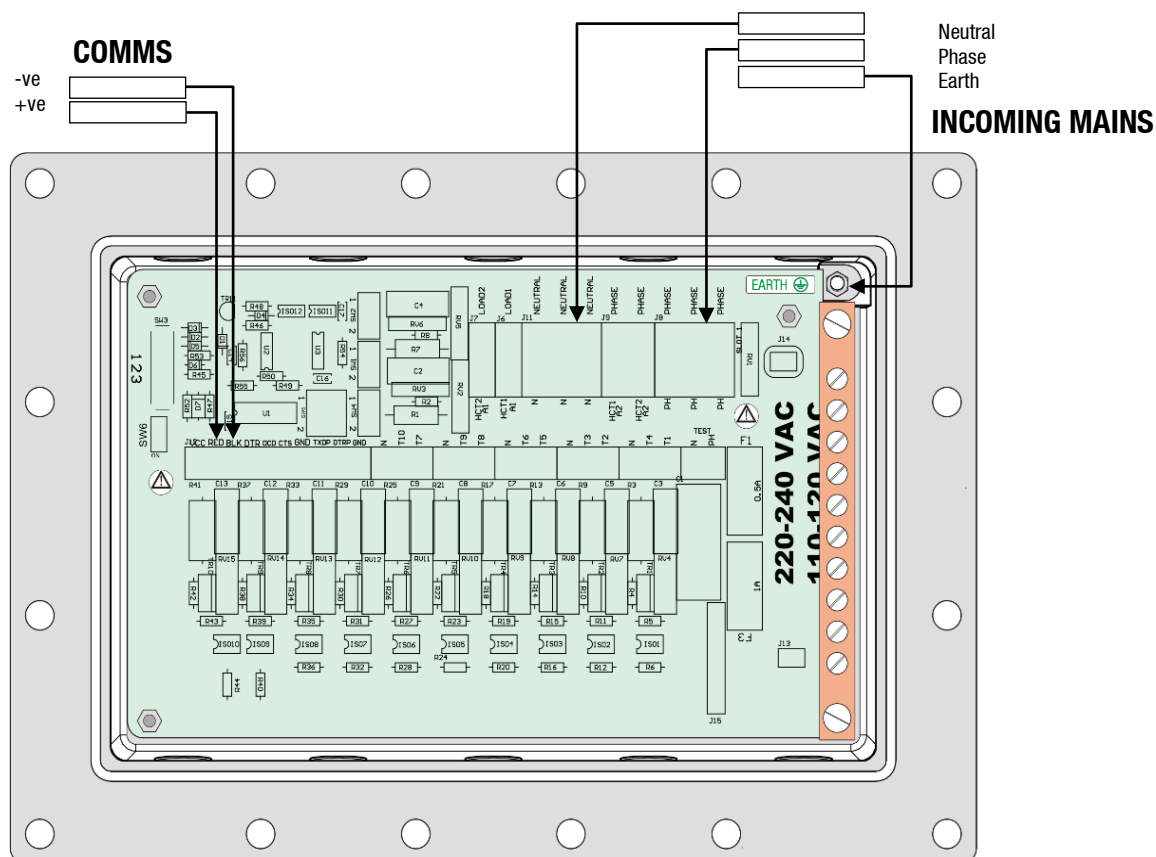
Refer to AS/NZS 60079.14 for appropriate cabling.

**NOTE:** All cables entering the power supply must be glanded with approved 20mm flameproof glands.

**NOTE:** Comms cable is not intrinsically safe.

**NOTE:** Pump comm's connect to pump controller such as DCA, Communicator Controller etc. (option).

When replacing the lid of the flameproof enclosure, ensure the sealing O ring is in place.



## Dispensing Hoses and Nozzles

The unit may or may not be supplied with dispensing hose and nozzle assemblies.

If customer supplied hose assemblies, pylons, reels, safe breaks and nozzles are used they must comply with the requirements outlined in AS/NZS 2229.

## Breakaways

For all dispensers fitted with breakaways, ensure the breakaway is installed between the nozzle and the high-mast or pylon (if fitted). Any breakaways that have been subject to a break-away situation should be inspected and refitted or replaced in accordance with the original manufacturer's 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) Switch.

These switches are found on the C4000 Microprocessor Board which is housed in a metal enclosure located on the left front of the unit below the display panel.

## Configuration Codes

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

The parameter switch is used to configure the pump to your site.

## 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

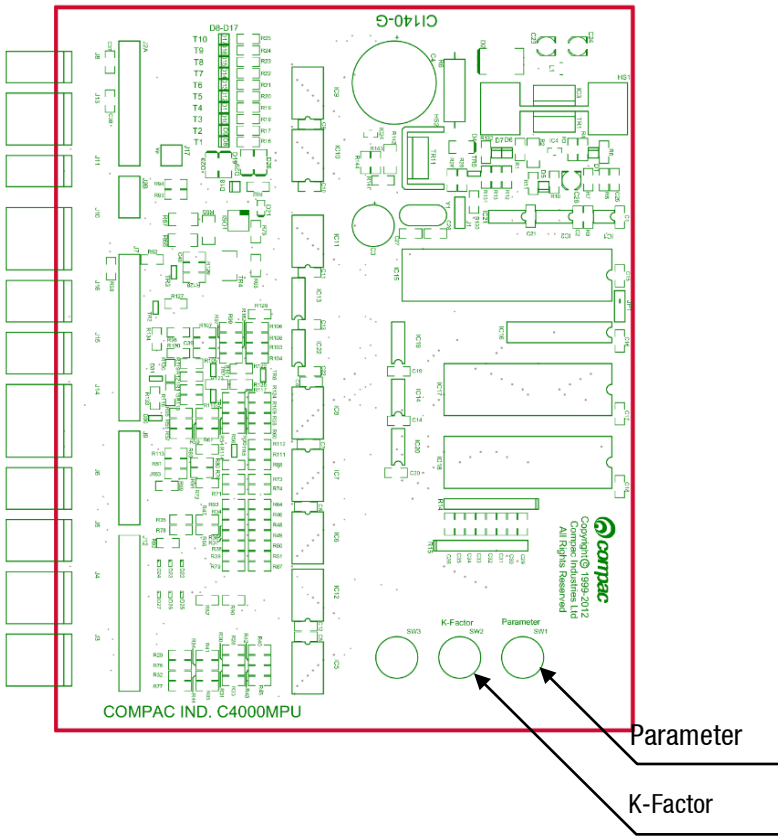
## Setting the Price

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>PrA</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>Prb</b> is displayed on the money display.
7	Repeat steps 3 to 5 above.	

# K-Factor Switch Settings

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



J1: Comms Test	J7: Displays	J13: Not used
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Figure 8: Location of K-Factor Switch

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

## 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.

### Sealing the K-Factor switch

After calibration the K-factor switch should be sealed as shown:

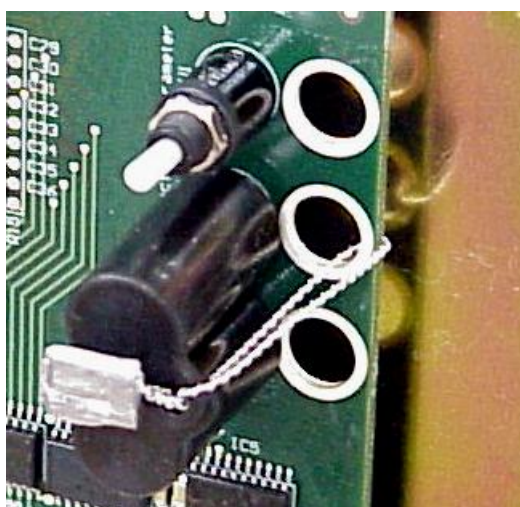


Figure 9: Sealed K-Factor Switch

## Standalone Operation

In standalone operation, the dispenser will continue working when not connected to a controller. '*Stand-alone*' mode being when no authorisation of fills is required and so fills are simply initiated by removing the refuelling assembly from its holder. If standalone operation is inhibited, the dispenser will not work in '*stand-alone*' mode, regardless of whether the dispenser is **ONLINE** to a controller or not.

The dispenser ceases to work in '*stand-alone*' mode if connected to a controller, regardless of the position of standalone setting.

Generally, on retail forecourts the dispenser should be set-up for standalone operation. Hence, if the forecourt controller breaks down the dispensers can be set to work in '*stand-alone*' mode simply by turning them off then on again.

For unattended refuelling sites, the dispensers should not be able to work in '*stand-alone*' mode in the event of a controller failure. Therefore, the dispenser should be set-up to inhibit standalone operation.

This is set in the **b** code on the K factor switch.

The **b** code to run Standalone without Dispenser Controller is **0000**.

The **b** code to inhibit Standalone is **1000**.

## Notes

### Pump Controller

If the pump is connected to a controller, check that pump data and transaction information is being correctly uploaded to it. Refer to the controller manual for specific instructions regarding connection and setup.

### Spare Fuses

In the event of a fuse blowing on the C4000 Power supply a bag of 3 is included in each flameproof box. Any fuses used from this bag should be replaced.

**NOTE:** *There are three different ratings used. If replacing a fuse, ensure that the correct value is used.*

### Precautions if Using 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. Start the generator, let the generator reach stable operating speed and wait 30 seconds before reconnecting the power to the unit.
3. 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.
4. Isolate the unit before shutting down the generator.

## Error Messages

Error Code	Fault	Action
<b>Err 3</b>	No price or pump number set.	Set the pump number or: Set a price at the pump or at the controller.
<b>Err 7</b>	Excess flow.	Max Flowrate exceeded.
<b>Err 8</b>	Excess reverse rotation of encoder.	Check product is not flowing back into the tank once the delivery has finished.
<b>Err 9</b>	Faulty or disconnected meter encoder.	Check that encoder is plugged in. Replace encoder PCB on meter.
<b>Err 10</b>	Configuration Lost.	Reconfigure C4000 refer to C4000 manual
<b>Err 12</b>	C4000 memory failure.	Change memory IC. F-AD-DS1225 (not applicable to Futra.)
<b>Ped</b> <b>Abd</b>	Display error.	Check display cable for loose wires/crimps. Replace display PCB.

## Error Messages