



compac

PREMIUM DISPENSER TECHNOLOGY

**CNG Dispenser Installation Manual
Version No: 1.0.2**

Date: 7th December 2018



Conditions of Use

- 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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- Compac Industries Limited has made every effort to explain all servicing procedures, warnings, and safety precautions as clearly and completely as possible. However, due to the range of operating environments, it is not possible to anticipate every issue that may arise. This manual is intended to provide general guidance. For specific guidance and technical support, contact your authorised Compac supplier, using the contact details in the Product Identification section.
- Only parts supplied by or approved by Compac may be used and no unauthorised modifications to the hardware or software may be made. The use of non-approved parts or modifications will void all warranties and approvals. The use of non-approved parts or modifications may also constitute a safety hazard.
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Product Identification

Specifications

This manual applies to CNG dispensers

Models Covered

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:

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Document Control

Document Information	
Manual Title	CNG Installation Manual
Current Revision Author(s)	R Liu
Original Publication Date	12/01/2012
Authorised By	W Zheng

Revision History			
Version	Date	Author(s)	Revision Notes
1.0.0	17 Jan 2017	J Jang	Updated Manual
1.0.1	29 Feb 2018	S Laycock	Added footprints
1.0.2	07 Dec 2018	R Liu	Updated Contact Information

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Safety

DANGER PRECAUTIONS

You must adhere to the following safety precautions at all times when working on the Compac equipment. Failure to observe these safety precautions could result in damage to the dispenser, injury, or death.

Make sure that you read and understand all safety precautions before operating the Compac equipment

Failure to take adequate safety precautions could result in explosion, injury and loss of life.

System Design

Ensure the system design does not allow the dispenser inlet pressure to exceed its rating. The dispenser does not include any safeties to protect against excessive inlet pressure. If necessary, suitable protective devices should be fitted prior to the dispenser inlet.

Mechanical Safety

Observe the following electrical precautions:

- Never tighten a fitting under pressure, even if a fitting or joint is leaking. Always depressurise the line first.
- Never disassemble a fitting under pressure. Always depressurise the line first.
- Be very careful when disassembling frozen pipework, as gas pressure may be trapped and suddenly released. Always depressurise the line before using.
- Never reuse any O-ring seals that have been in a high pressure gas atmosphere and then exposed to air. These o-rings swell and cannot be reused. Always make sure you have a new seal kit available to replace the seals before disassembly.
- Make sure that all internal surfaces are cleaned and that sliding surfaces are lightly greased with O-ring lubricant before reassembly. Dust and dirt entering components reduce the life span of the components and can affect operation.
- Ensure the service area is thoroughly cleaned before initiating service on CNG components. Dust and dirt entering the components reduce the life span of the component and affect future operations.

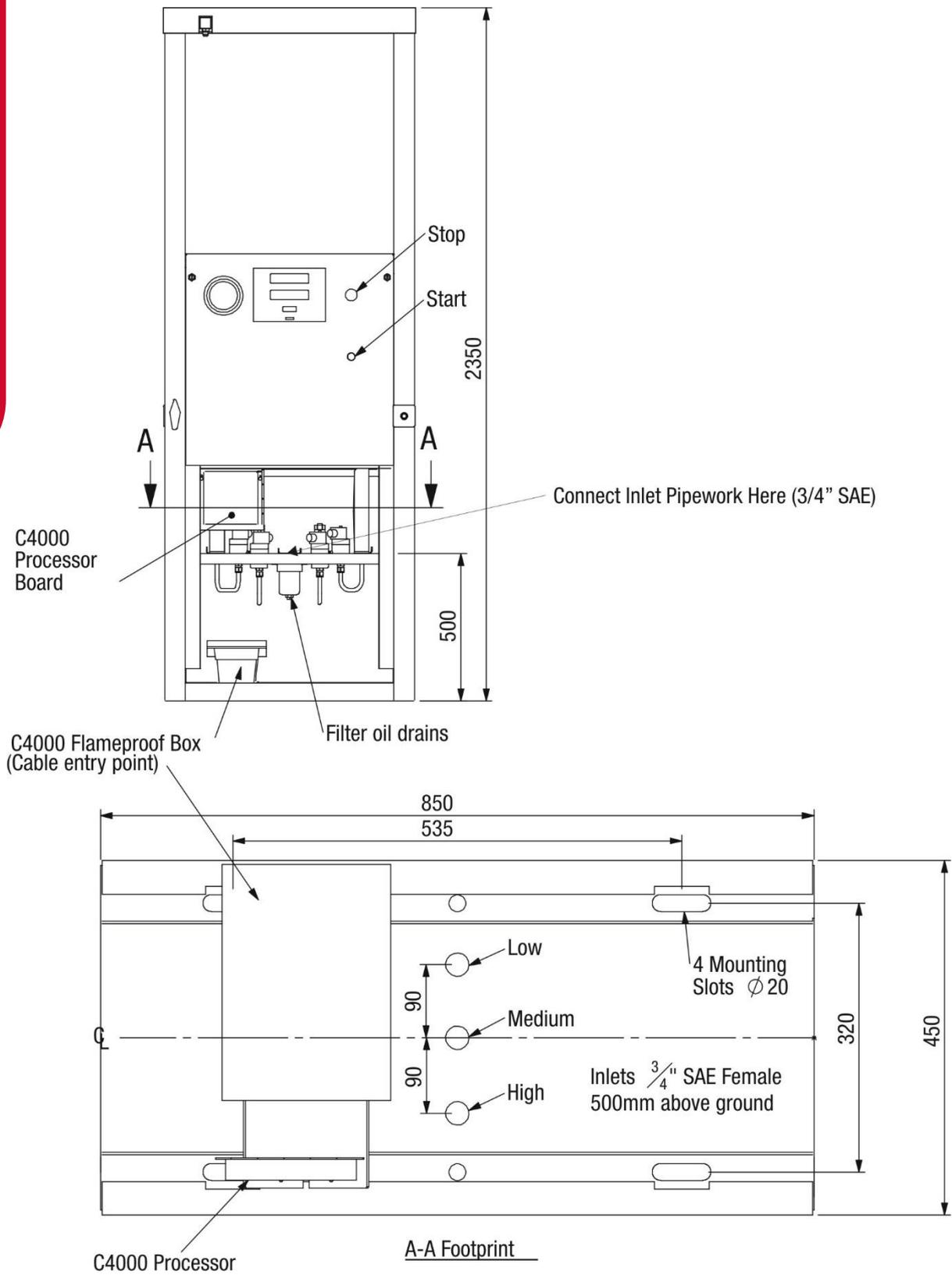
Electrical Safety

Observe the following electrical precautions:

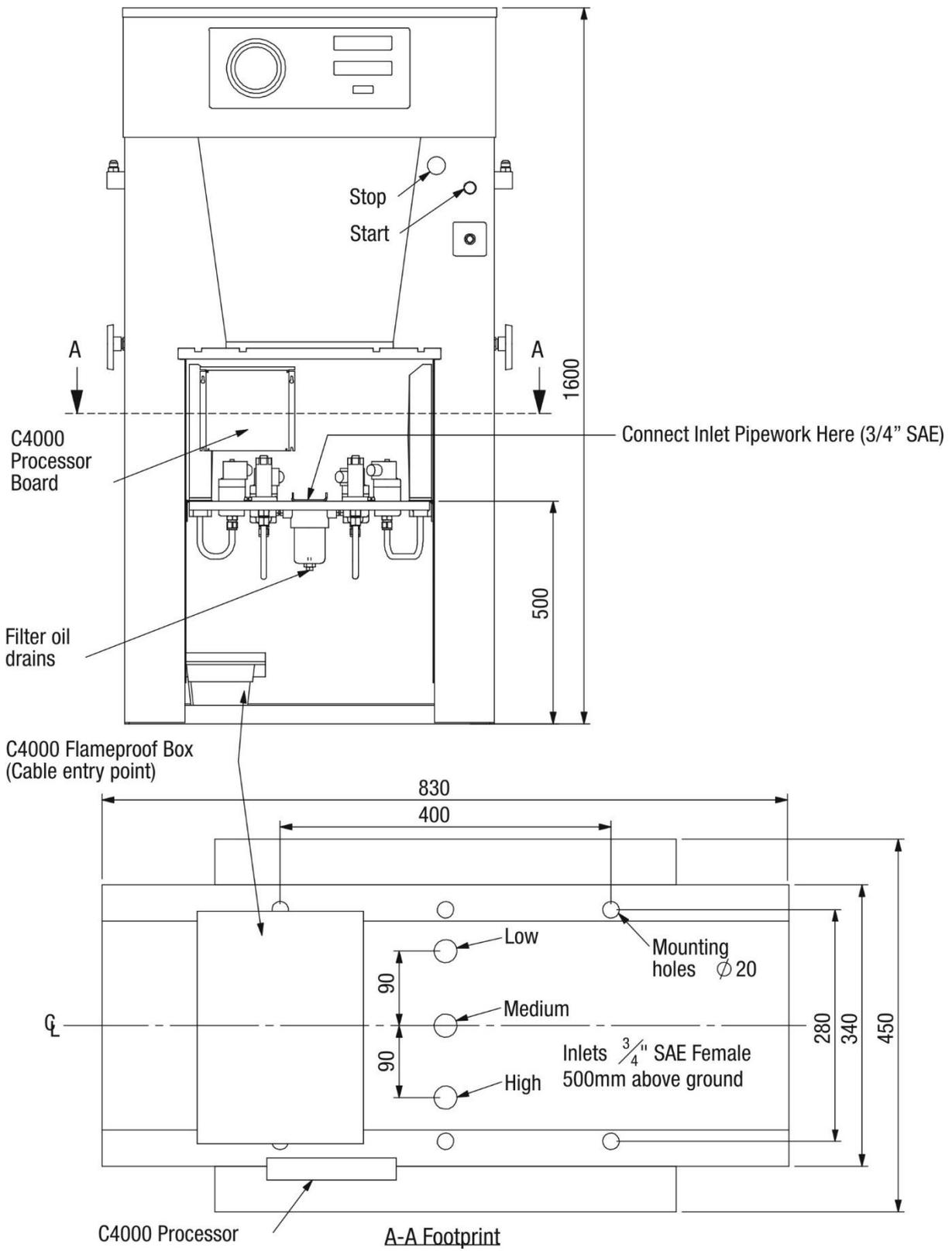
- Always turn off the power to the CNG Dispenser before removing the box lid. Never touch wiring or components inside the CNG Dispenser with the power on.
- Never power up the CNG dispenser with the flameproof box lid removed.
- Always turn off the power to the dispenser before removing or replacing software or memory IC's
- Always take basic anti-static precautions when working on the electronics, i.e., wearing a wristband with an earth strap. The Compac CNC dispenser is designed to provide safe and reliable dispensing of CNG fuels. They are available in either single or dual hose configurations and with different flow rates.
- Compac CNG dispensers are controlled by a C4000 board which has many programmable features to suit your individual operation.

Footprints

LEGEND Footprints



LASER Footprints



Installation

Mechanical Installation

The stages of mechanical installation include:

- Preparing and cleaning the pipework.
- Mounting the dispenser.
- Connecting the pipework.

Special Precautions

CAUTION: Ensure the system design does not allow the dispenser inlet pressure to exceed its rating. The dispenser does not include any safety mechanisms to protect against excessive inlet pressure. If necessary, suitable protective devices should be fitted prior to the dispenser inlet.

CAUTION: Ensure you use the correct SAE thread on the inlet pipework and do not use thread tape.

NOTE: Take all possible steps to prevent water or dirt from entering the system, both during installation and in the future. Water and dirt blocks up the pipework, which can damage seals, and stop gas from flowing and valves from operating.

NOTE: At 200 bar of pressure, water freezes at 15°C in natural gas, causing ice particle contamination that may damage equipment. Make sure the pipework is clean and dry before connection.

NOTE: Seals that have been damaged by moisture, methanol, impurities, dirt slag etc, are not covered by warranty.

During installation, potential sources of water include:

- Inlet gas.
- Testing new inlet gas pipework with water, or allowing water to enter the pipework before making the final connections.
- Pumping the storage with air.
- Allowing water to enter the high-pressure gas lines during installation.

If the inlet gas is likely to be saturated, install a gas drier into the compressor inlet to ensure a dew point of -32°C at 250 bar of pressure.

CAUTION: Do not use methanol as an anti-freeze. If used in the wrong concentrations, it causes freezing. It is also absorbing water, which can be more damaging than the water that was originally present.

Pipework

Check the high points and low points of the pipework distribution system to make sure that:

- Vents have been provided on all high points.
- Drains have been provided on all low points.

Preparing and Cleaning Pipework

This section provides a guide to current best practice in preparing the distribution pipework that will be connected to the Compac Dispenser.

For new stations, flush the gas feed lines thoroughly to remove all welding slag, moisture, and impurities that may be present in the system.

Any steel, brass, or other impurities can damage the regulator and solenoid valve seals.

NOTE: The **pipework installer is responsible** for installing all pipework to the dispenser with due diligence. Compac is not responsible for any pipework external to the dispenser.

CAUTION: Ensure that all pipework is completely clean. Any dirt trapped in the pipework can damage the valve seals and surfaces.

Clean and Degrease the Pipework

To clean and degrease the pipework, prepare pipework, purge the pipework with nitrogen at 200bar vented to the atmosphere to remove dirt, moisture, and water.

- Mix together a 10% hydrochloric acid solution, to which you have added 25% to 50% ammonia bi-fluoride and heat to a minimum of 65°C.

DANGER: Wear adequate safety gear and take adequate precautions when using chemicals. Clean up all spills in compliance with the local territory authority laws and regulations.

- Circulate the mixture through the pipework for four hours or more, depending on the condition of the pipework.
- Drain the acid solution from the pipework.
- Blow out the pipework with compressed air.
- Flush the pipework with clean water until the pH value is neutral.

Neutralise the Pipework

To neutralise the pipework:

- Pass a 25% citric acid solution through the pipework once, or dry out the pipework by blowing hot air through it.

DANGER: Wear adequate safety gear and take adequate precautions when using chemicals. Clean up all spills in compliance with the local territory authority laws and regulations.

- Fill the pipework with seal oil, then drain.
- Blow out the pipework with compressed air.
- Blast the pipes with nitrogen at 200 bar, letting the gas expand through the pipes.

- Once the pipework is cleaned, seal off the system to ensure no water, dirt or other contaminants can re-enter the pipework.

NOTE: *Keep the pipework venting open to the atmosphere and feed in the 200 bar of nitrogen to achieve maximum velocity.*

CAUTION: Take care to keep pipe openings closed until the compressor is started. This prevents rusting of the pipework, and stops dirt from entering.

Mounting the Dispenser

The mounting points on the dispenser differ depending on whether you are installing a Legend or a Laser.

To mount the dispenser:

- Make sure that the dispenser is located on a solid, horizontal foundation or plinth.
- Seal the supply pipes to prevent dirt, moisture, or water from entering during the mounting process.
- Mark out the mounting points on the foundation, using the correct footprint diagram for the model of dispenser being installed.

Refer to Footprints for legend and laser drawings.

Secure the dispenser with 12 mm dynabolts and washers. 12 mm dynabolts have the required strength to hold the unit but up to 16 mm x 75 mm dynabolts can be used in the 20 mm footprint holes.

Connecting the Pipework

- Make sure that your work area (including the vice, workbench, tool storage area, and floor) is totally clean of particles or previous work. Cleanliness and correct assembly practice can avoid most seal problems.
- Make sure that the gas inlet pipes are properly supported before connection.
- Refer to one of the following procedures, depending on the fitting that you are using:
 - SAE Fittings.
 - Adjustable SAE fittings.
 - Compression tube Fittings.

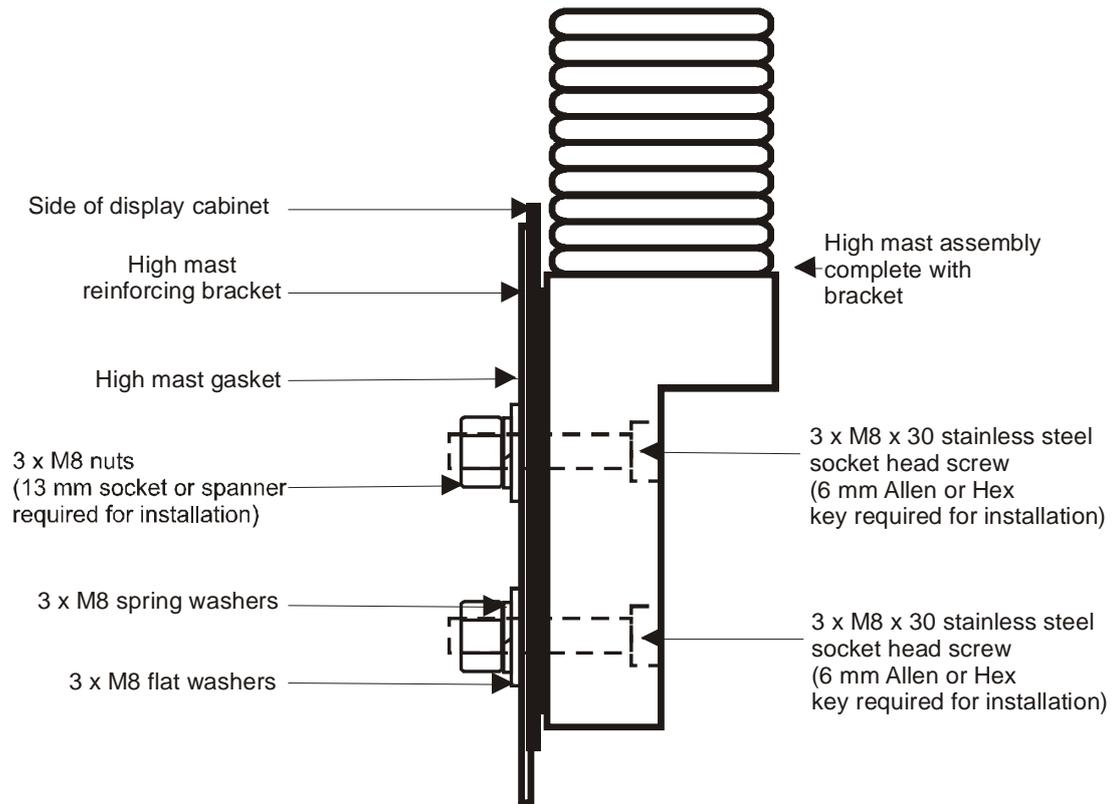
Attaching the High Mast (Laser Only)

All high masts come pre-assembled with the dispenser and simply require connection.

To attach the high mast:

- Remove the stainless-steel screws from the side of the dispenser.
- Attach the mast using the screws, as pictured below.

NOTE: The high mast gasket and stainless-steel screws are fitted to the dispenser in the factory.



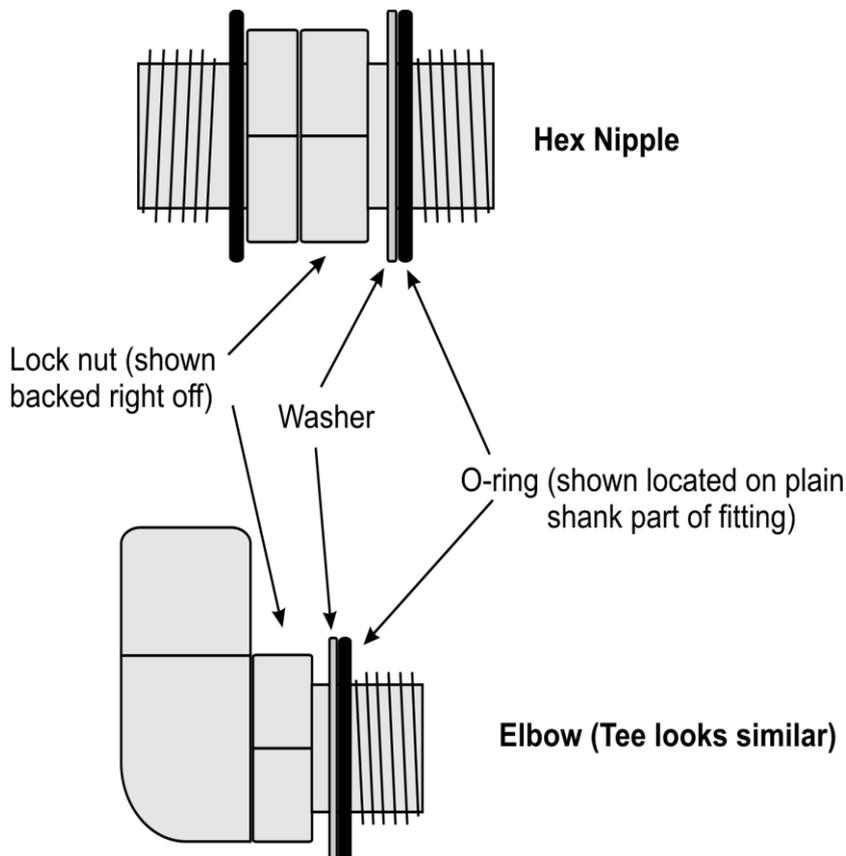
Dispenser Fittings

Aside from some NPT fittings located in the utility manifold, all fittings used in a Compac CNG Dispenser are SAE. Some SAE fittings are adjustable to allow for rotational positioning of components such as solenoids. Nipples, tees, and elbows are used, but the procedure is the same for each.

Connecting SAE Fittings

- Inspect the components ensuring that the threads and sealing faces are clean and undamaged.
- Lubricate the O-ring with a light oil
- Screw the components together by hand until the O-ring touches the face of the port.
- Tighten the fitting firmly with a suitable spanner.

CAUTION: Never use thread tape on SAE parallel fittings.



Connecting Compression Tube Fittings

- Ensure the end of the tube is square, not deformed, clean and free from burrs inside and out.
- Remove the nut from the fitting and ensure the two ferrules are present and correctly orientated.

- Replace the nut and insert the tube ensuring it is located hard up against the internal shoulder of the fitting
- Pre-swage the tube by tightening the nut by hand and then a further 1 1/4" turns
- Disassemble the fitting and inspect the pre-swaging. The ferrules should square and unable to be removed from the tube
- Reassemble the fitting, tightening it by hand and then a further 1/4" turns with the appropriate spanner.

NOTE: *Correctly made tube should not need to be sprung into position.*

Electrical Installation

CNG Cable Requirements

Cable requirements are as follows:

	Cable Type	Requirement
Power	3 Core Steel Wire Armour Cable 2.5mm ² ,	220 - 240 Volts. 50 Hz, +/-10% Core 1: 230 Volt Supply (Active). Core 2: Neutral. Core 3: Earth.
Power Consumption	25W Idle	200W with all solenoids active
Comms	Standard comms: 2 Core Steel Wire Armour Cable 1.5 mm ²	Maximum cable length 100 m. 12 V current loop.
	Maximum cable length 100 m. 12 V current loop.	
	NOTE: Make sure that there is at least a two-metre cable tail on both the incoming underground 230 V and comms cables to reach the C4000 flameproof box.	

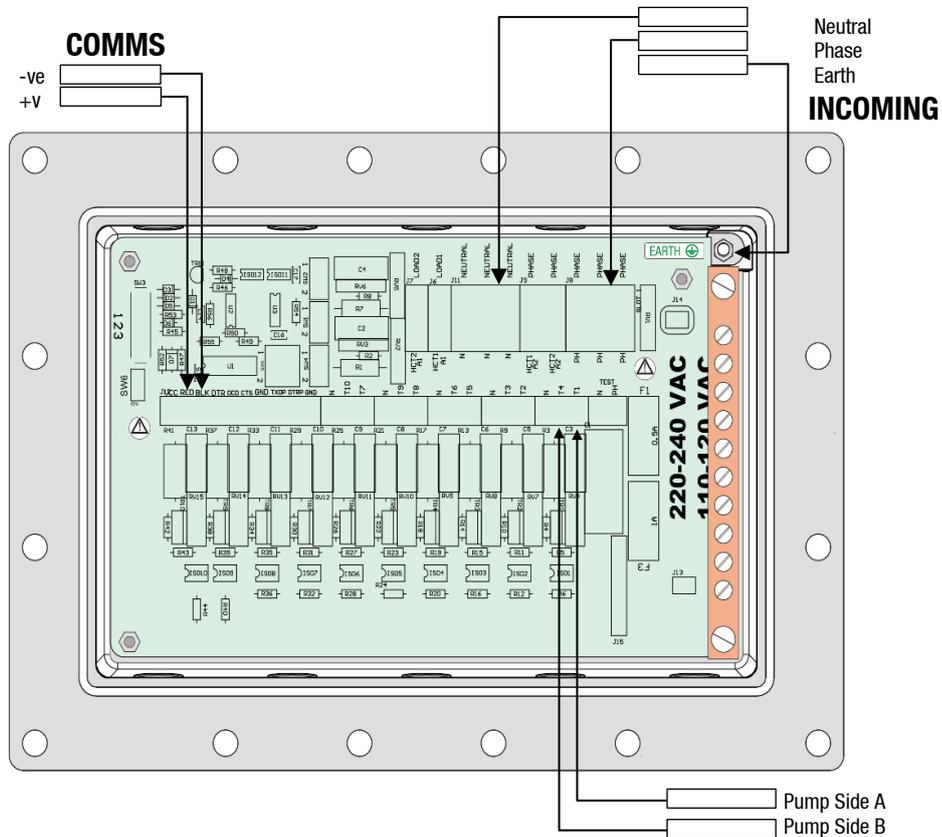
Connecting Mains Power and Communication

CAUTION: In sites where the electrical supply is unstable, it is recommended that a power conditioner or UPS is installed.

To connect the dispenser:

- Wire the power and comms to the C4000 Termination Board, as shown in the diagram below.
- Connect the earth lead of the supply cable to the earth stud in the flameproof junction box.

NOTE: All cables must be terminated with approved flameproof glands. The thread is 20 mm.



Commissioning

Electrical

This procedure outlines how to perform an electrical operational test before carrying out full mechanical commissioning, making sure that the dispenser is functioning correctly. Check for any damage that may have occurred in transit. Check all terminals, plugs, and chips to make sure that they are securely in place.

NOTE: *Damage to electronics occurs most commonly from vibration and jarring.*

Before beginning this test, check that no gas pressure has been applied to the dispenser inlets. The factory set-up information should be programmed into the dispenser, but all K-factor and Parameter switch settings should be checked and confirmed before commissioning tests are carried out.

To perform an electrical operational test:

1. Make sure that the inlet shut-off valves are closed (these are the valves in the inlet lines at the base of the dispenser, but they are not part of the dispenser).
2. Turn on the power supply to the dispenser.
The displays and backlighting will illuminate, and the displays read **PAUSE**, then count down for one minute.
The dispenser is in a **ready state** once the countdown is finished and the display shows **0.00**.
3. 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, 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.*

- 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.)
 - Watchdog LED (D5) is turned off
4. Press the **Start** button.
The display will show **888888** and the solenoids energise, initiating a fill. 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.
 5. 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 one minute. This is a default time-out setting in the software for situations when there is no gas flow registered.

6. Press the **STOP** button. The solenoids switch off and the fill ends. When you release the **STOP** button, the dispenser resets and returns to a **ready state**.

Mechanical

At the mechanical commissioning stage, the dispenser should not be pressurised.

NOTE: If you find any leaks during commissioning, immediately close all of the valves and de-gas the dispenser.

To perform a mechanical test:

- Make sure that the inlet shut-off valves are closed. (These are the valves in the inlet lines at the base of the dispenser, but they are not part of the dispenser.)
- Check all dispenser fittings, especially the inlet connections, to make sure that they are tight.

DANGER: Always de-gas the lines before tightening any fittings. Never tighten fittings while they are under pressure.

- Check that the outlet supply valve to hose 1 on the side of the dispenser (or hose 2 if you are working on side 2) is closed and the nozzle valve is closed.
- Turn on the dispenser and wait for it to power up.

The dispenser initially displays **PAUSE**. When it is ready, **000** is displayed.

- Press the **START** button.

NOTE: If you are commissioning a dual hose dispenser, press the Start button on either side. This opens the dispenser's solenoids. The dispenser automatically shuts off after approximately one minute if no flow is detected.

- Slowly open the inlet shut-off valves and listen for leaks. If you hear leakage, shut off the inlets immediately. If the dispenser shuts off during this process, shut off the inlet valves, restart the dispenser, and continue.
- Once the inlet valves are fully open, allow the dispenser to time out on the 1-minute no-flow timer and shut the solenoid valves, or manually shut it down and close the solenoid valves by pressing the **STOP** button.
- Press the **START** button on the dispenser.

NOTE: If you are commissioning a dual hose dispenser, only press the Start button for one of the hoses.

- Slowly open the outlet isolation valve on the side of the dispenser and listen for leaks. If you hear leakage, shut the valve immediately.

If the dispenser shuts off during this process then shut the outlet supply valve, restart the dispenser, and continue.

- Repeat steps 8 and 9 for the second hose on a dual hose dispenser.
- Once the outlet isolation valves are fully open, allow the dispenser to time out on the 1-minute no-flow timer and shut the solenoid valves, or manually shut it down and close the solenoid valves by pressing the **STOP** button.

The dispenser and hose(s) are now fully pressurised.

- Use soapy water to check all fittings (including the hose fittings) for leaks.

DANGER: Always de-gas the lines before tightening any fittings. Never tighten fittings while they are under pressure.

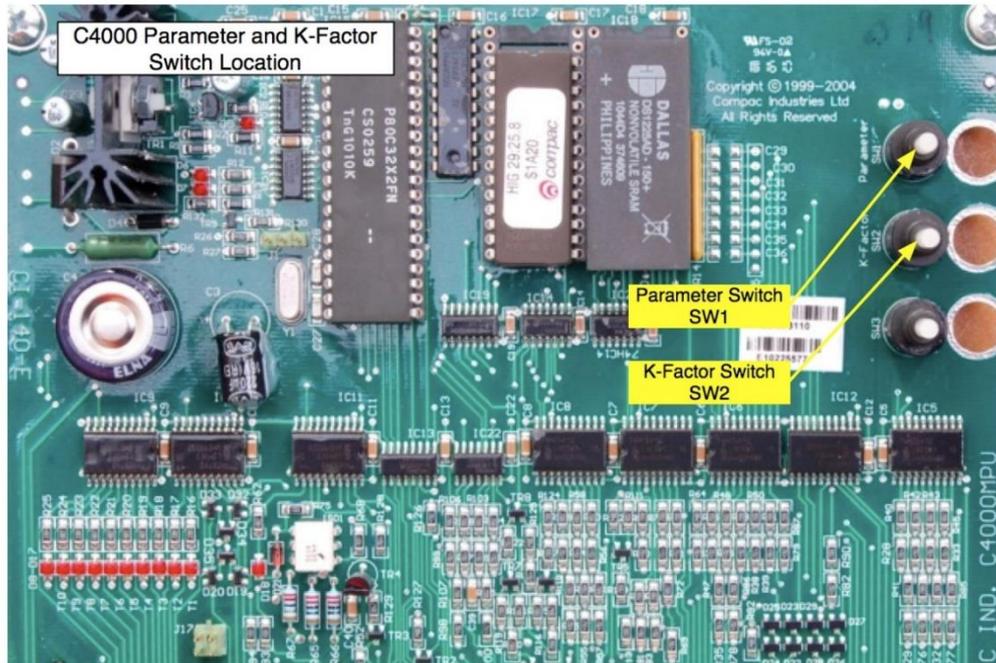
- Complete a few fills on a test cylinder, checking for leaks or unusual operation.

Dispenser Set-Up

Parameter Switch

The **Parameter** switch is located on the C4000 processor board and allows you to adjust the unit price, hose number, sequencing rate, and password.

The Parameter switch also enables you to view the **Dispenser Software Version** and **End of Sale Indicators**.



Menu Options

Listed below is the order in which the **Parameter** switch menu options are presented. There are different menu options depending on the current setting of the C configuration code.

The * indicates that you can achieve the displayed menu option, regardless of what the indicated part is set to. You may need to change the C configuration in order to access the parameter code you require.

C Configuration	Set-Up Code	Code Description
c***61	P	Software Program version
	Pr	Unit Price
	SE9	CNG Sequencing rate (FAS,nOr,SLO)
	Pn	Hose Number
	codE	Dispenser Passcode
c***62	P	Software Program version
	PrA	Unit Price Side A
	Prb	Unit Price Side B
	PnA	Hose Number Side A
	Pnb	Hose Number Side B
	codE	Dispenser Passcode

Dispenser Software Version

The dispenser **software version (P)** is the version number of the software currently loaded in the dispensers C4000.

See Dispenser Software Upgrade/Replacement for instructions on Upgrading dispenser software

To Identify the Software Program Version Number:

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Press and release the **Parameter** switch once or until **P** is displayed. The system enters a diagnostic mode whereby it displays the software program version and performs a display segment test. It cycles through this program for approximately 10 seconds before reverting to the normal display.

When displaying program version data, the display panel shows **P** in the Dollars screen and *********, in the Kilograms screen where ********* is the abbreviated program version number. For example: Software version HIA29.26.0CNG will read **29260**

Unit Price

The **unit price** (P_r , P_{rA} and P_{rB}) is used to calculate the total value of the quantity dispensed. The unit price can be different on each side of a dual hose dispenser.

P_r or P_{rA} is the unit price for side A of the dispenser.

P_{rB} is the unit price for side B of the dispenser

The unit price can be set at the dispenser or set remotely with the **Compac Dispenser Monitor**.

NOTE: If the unit price is not set **Error 3** will be displayed and the dispenser will not operate.

To set the unit price:

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Press and release the **Parameter** switch until the required unit price is displayed. (P_r , P_{rA} or P_{rB})
- Enter in the unit price.

NOTE: Each press of the **Parameter** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

- Let the menu time out so that the value and quantity amounts are displayed.

Sequencing Rate

NOTE: Only available on CNG dispensers. Needs appropriate software.

The sequencing rate (SE9) enables you to set the percentage level of maximum flow that sequencing occurs to the next pressure bank.

There are three settings to choose from:

- **FAS**: Switching to the next higher-pressure bank occurs at 40% of the maximum flow rate for a particular bank.
- **nor**: Switching to the next higher-pressure bank occurs at 30% of the maximum flow rate for a particular bank.
- **SLo**: Switching to the next higher-pressure bank occurs at 20% of the maximum flow rate for a particular bank.

NOTE: From software version HIA29.25.3CNG onwards the sequencing rates are as follows:

- **FAS**: Switching to the next higher-pressure bank occurs at 60% of the maximum flow rate for a particular bank or when the flow rate drops to 5 kg/min, whichever occurs first.
- **nor**: Switching to the next higher-pressure bank occurs at 40% of the maximum flow rate for a particular bank or when the flow rate drops to 3 kg/min, whichever occurs first.
- **SLo**: Switching to the next higher-pressure bank occurs at 20% of the maximum flow rate for a particular bank or when the flow rate drops to 1 kg/min, whichever occurs first.

NOTE: The dispenser leaves the factory with the **FAS** setting.

To set the sequencing rate:

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Press and release the Parameter switch (17 or more times) until SE9 xxx is displayed.
- Enter the sequencing rate. Each press of the Parameter switch passes you over a digit in the setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.
- The displayed sequencing rate is now selected, and operation of the dispenser will be affected immediately. The displays will reset after a ten (10) second timeout

Hose Number

The **Hose Number** (Pn, PnA and Pnb) identifies the dispensers hose(s) when the dispenser is communicating to a forecourt controller such as the **Compac Dispenser Monitor**.

Pn or PnA is the hose number of side A of the dispenser.

Pnb is the hose number side B of the dispenser

When using forecourt controller all dispenser hoses must have unique numbers.

To Set the dispenser hose numbers:

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Press and release the **Parameter** switch until the required hose number is displayed. (Pn, PnA or Pnb)
- Enter the hose number.

NOTE: Each press of the **Parameter** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

- Let the parameter menu time out so that the value and quantity amounts are displayed.

Software Version HIA29.24.9CNG onwards:

From this version of software onwards the hose number (PN) display has been modified to also display the following information:

- A count of the total error 9 faults in the unit shown in the price display.
- The display will also flash in the price/kg screen, the last recorded reason for the end of sale and the last recorded error 9.

This information can be used to as a diagnostic aid to check whether error 9 faults are occurring on a regular basis.

Dispenser Passcode

The **dispenser passcode** (CODE and PASS) enables you to limit the access to sensitive settings found under the parameter and K-factor switches.

If set, only the dispenser software version can be viewed.

NOTE: If the dispenser is connected to the forecourt PC, you can access the dispenser information via the **Compac Dispenser Monitor** program, even if the dispenser is passcode is enabled.

To Set the Dispenser Passcode:

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Press and release the **Parameter** switch until **Code** is displayed.
- Enter the new passcode.

NOTE: Each press of the **Parameter** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

- Let the menu time out so that the value and quantity amounts are displayed.

The dispenser is now passcode protected. Store the passcode in a secure place.

To Disable the Dispenser Passcode:

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Press and release the **Parameter** switch until **PASS** is displayed.
- Enter the current password.

NOTE: Each press of the **Parameter** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

- Press and release the **Parameter** switch until **Code** is displayed.
- Clear the password by setting it to **000000**.

NOTE: Each press of the **Parameter** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

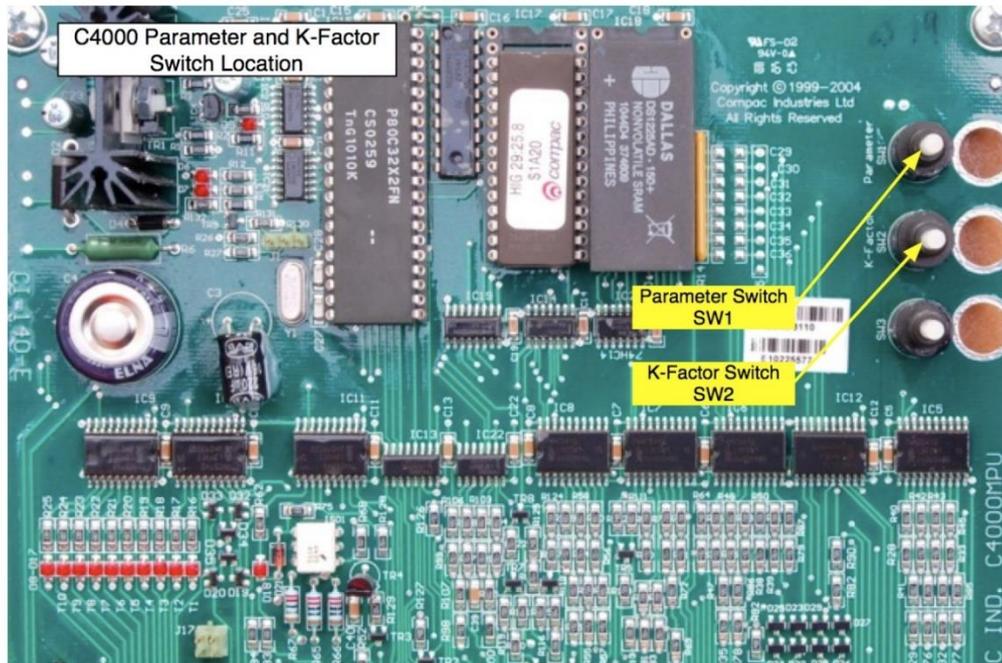
- Let the menu time out so that the value and quantity amounts are displayed.

The dispenser passcode is now disabled.

K-Factor Switch

The **K-Factor** switch is located on the C4000 indicator board. It is used to access and set up options on the C4000 dispenser. (The order in which they appear here is not the order in which they should be set).

NOTE: Some settings are only used in temperature compensated systems, and dual hose dispensers.



Menu Options

The K-factor switch will offer different menu options depending on the current C Configuration Code.

The * indicates that you can achieve the displayed menu option, regardless of what the indicated part is set to.

C Configuration	Menu Options Available
c0**6 1	dSf, f, LfA, HfA, Sp, b, C
c0**62	dSf, fA, Fb, LfA, HfA, Lfb, Hfb, SP, b, C
c 1**6 1	dSf, f, fpA, PLA, rA, E, U, gAin, LfA, HfA, gC, Sp, b., C
c 1**62	dSf, fA, fb, LfA, HfA, E, uA, ub, gAinA, gAinb, FpA, pLA, rA, fpb, pLb, rb, Lfb, Hfb, 9C, Sp, b, C
c2**6 1	dsf, f, LfA, HfA, E, u, u2, gAin, gAin2, fpA, pLA, rA, 9C, sp, b, C
c2**62	dSf, fA, fb, LfA, HfA, Lfb, Hfb, E, uA, ub, uA2, ub2, gAinA, gAinb, gAinA2, gAinb2, fpA, PLA, rA, fpb, pLb, rb, gC, Sp, b, C
c3**6 1	dsf, f, LfA, HfA, u, gAin, FpA, 9C, sp, b, C
c3**62	dsf, fA, fb, LfA, HfA, uA, ub, gAinA, gAinb, fpA, fpb, Lfb, Hfb, 9C, sp, b, C
c4**6 1	dsf, f, LfA, HfA, u, u2, gAin, gAin2, fpA, gC, sp, b, C
c4**62	dsf, fA, fb, LfA, HfA, Lfb, Hfb, uA, ub

Dispenser Set-Up

Density Factor

The **density factor** ($d_b F$) is used to set the format of the quantity that is displayed. For KG, a density factor of **1.000** is used. For other units of measure, different density factors are required.

To determine the correct density factor for the unit of measure you would like to use on the read-out, consider the following:

- The dispenser read-out displays the **measured quantity in KG divided by the density factor**.
- When the required unit of measure is kg the density factor should be set to 1. In this case the display will show the **measured quantity in kg**
- When another unit of measure is required, the density factor should be set to the ratio between the required unit of measure and kgs. In this case the display will show the **measured quantity (kg) / density factor (unit of measure/kg)**

For example: if you wish to show the display in pounds:

$$1 \text{ pound} = 0.4534 \text{ kg}$$

so density factor is entered as 0.4534.

$$\text{If 1kg is dispensed the display will read } \frac{1}{0.4534} = 2.205 \text{ pounds}$$

Adjusting the Density factor

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Open the access panel and remove the cover of the C4000 processor box, which is illustrated in the Dispenser Component Locater section.
- Press the **K-Factor** switch once and release.

The display shows $d_b F$ ***** , which is the current density factor setting for the dispenser that you are commissioning.

- Enter the required Density Factor.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

Meter K-Factor

The meter **K-Factor** (F_A and F_B) is a meter correction factor used to ensure the displayed quantity is correct.

F_A or F_A is the meter K-factor on side A of the dispenser.

F_B is the meter K-factor on side B of the dispenser.

The K-Factor is set during the calibration phase Meter Calibration and does not require adjusting during service.

To adjust the meter K-Factor

- Make sure that the dispenser is idle, with the nozzle in its holster.

Press and release the **K-Factor** switch until the required meter K-factor is shown (**F** or **F A** or **F b**)

- Enter the required K-Factor.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

Minimum Flow Rate

The **minimum flow rate** (**L F A** and **L F b**) is the low flow cut-off at the end of the fill.

L F A is the minimum flow rate of side A of the dispenser.

L F b is the minimum flow rate of side B of the dispenser.

These values are adjustable and can be set between $0.5 - 9.9 \frac{kg}{min}$.

CAUTION: Do not set the minimum flow rate so that it is equal to or above the maximum flow rate.

To adjust the Minimum Flow Rate

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Press and release the **K-Factor** switch until the required minimum flow rate is displayed. (**L F A** or **L F b**)
- Enter the new minimum flow rate.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

NOTE: The Compac factory default setting is $1.0 \frac{kg}{min}$.

- Let the menu time out so that the value and quantity amounts are displayed.

Maximum Flow Rate

The **maximum flow rate** (hFR and hFb) is the high flow cut-off for when the flow through the dispenser is too high.

hFR is the maximum flow rate of side A of the dispenser.

hFb is the maximum flow rate of side B of the dispenser

These values are adjustable and can be set between 5 – 99 $\frac{kg}{min}$.

CAUTION: Do not set the maximum flow rate so that it is equal to or below the minimum flow rate.

To adjust the Maximum Flow Rate

- Make sure that the dispenser is idle, with the nozzle in its holster
- Press and release the **K-Factor** switch until the required maximum flow rate is displayed. (hFR or hFb)
- Enter the new maximum flow rate.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

NOTE: The Compac factory default setting is 40 $\frac{kg}{min}$ for Car Dispensers and 60 $\frac{kg}{min}$ for High flow or Bus dispensers.

- Let the menu time out so that the value and quantity amounts are displayed.

Ambient Temperature (Temperature Compensated Units Only)

The ambient **temperature** (E) is the temperature inside the dispenser measured by the temperature probe.

The ambient temperature is set at the factory during the calibration phase and does not usually require adjusting during service.

To adjust the Ambient Temperature

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Press and release the **K-Factor** switch until E displayed.
- Enter in the new ambient temperature as measured.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

- Let the menu time out so that the value and quantity amounts are displayed.

Electronic Pressure Reading (Fast Fill & Temperature Compensated Units Only)

The Electronic pressure reading (P , P_A , P_B , P_{A2} and P_{B2}) is taken from the pressure transducer in the dispenser's utility manifold.

P , P_A and P_{A2} relate to the readings of pressure transducers one and two (where fitted) on side A of the dispenser.

P_B and P_{B2} relate to the readings of pressure transducers one and two (where fitted) on side B of the dispenser.

The electronic pressure reading can be adjusted during pressure transducer calibration to bring it in line with the actual value.

To adjust the electronic pressure reading

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Press and release the **K-Factor** switch until the required pressure reading is shown (P , P_A , P_B , P_{A2} or P_{B2})
- Enter in the new pressure.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

Let the menu time out so that the value and quantity amounts are displayed.

Pressure Transducer Gain (Fast Fill & Temperature Compensated Units Only)

The **pressure transducer gain** (G_A G_A , G_A G_B , G_A G_{A2} and G_A G_{B2}) is a correction factor used to ensure the pressure transducer is correctly calibrated. Typical values for the gain are usually close to **0.4000**.

G_A G_A and G_A G_{A2} relate to the gains of pressure transducers one and two (where fitted) on side A of the dispenser.

G_A G_B and G_A G_{B2} relate to the gains of pressure transducers one and two (where fitted) on side B of the dispenser.

The pressure transducer gain is set during the calibration phase and does not require adjusting during service

To adjust the Pressure Transducer Gain

- Make sure that the dispenser is idle, with the nozzle in its holster.

- Press and release the **K-Factor** switch until the required gain is shown (GA inA, GA inB, GA inA2 or GA inB2)
- Enter in the new gain.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

Let the menu time out so that the value and quantity amounts are displayed.

Target Fill Pressure (Fast Fill & Temperature Compensated Units Only)

The **target fill pressure** (FPA and FPB) is the final desired vehicle fill pressure after filling and temperature compensation. The units of measure are in bar.

FPA is the target fill pressure of side A of the dispenser.

FPB is the target fill pressure of side B of the dispenser.

CAUTION: Do not set the target fill pressure so that it is above the maximum fill pressure.

To adjust the Target Fill Pressure

- Make sure that the dispenser is idle, with the nozzle in its holster
- Press and release the **K-Factor** switch until the required target fill pressure is displayed flow rate is displayed. (FPA or FPB)
- Enter the new target fill pressure.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

Let the menu time out so that the value and quantity amounts are displayed.

Maximum Fill Pressure (Temperature Compensated Units Only)

The **maximum fill pressure** (PLA and PLB) is the upper limit for temperature compensated filling. The units of measure are in bar.

PLA is the maximum fill pressure of side A of the dispenser.

PLB is the maximum fill pressure of side B of the dispenser

This is only used in temperature compensated dispensers.

CAUTION: Do not set the maximum fill pressure so that it is below the target fill pressure.

To adjust the Maximum Fill Pressure

- Make sure that the dispenser is idle, with the nozzle in its holster
- Press and release the **K-Factor** switch until the required target fill pressure is displayed flow rate is displayed. (**PLA** or **PLB**)
- Enter the new maximum fill pressure.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

Let the menu time out so that the value and quantity amounts are displayed.

Vehicle Tank Temperature Rise (Temperature Compensated Units Only)

Vehicle Tank Temperature Rise (**rA** and **rB**) is used to compensate for temperature rise in the gas during a fill. As the tank fills, the temperature of the gas rises. The lighter the tank, the greater the temperature rise will be.

rA is the vehicle tank temperature rise of side A of the dispenser.

rB is the vehicle tank temperature rise of side B of the dispenser

Typical values for these may be:

Car filling = 20[heavy steel cylinder].

Bus, Truck filling = 30[lighter carbon wrapped aluminium cylinder]

To adjust the Vehicle Tank Temperature Rise

- Make sure that the dispenser is idle, with the nozzle in its holster
- Press and release the **K-Factor** switch until the required vehicle tank temperature rise is displayed. (**rA** or **rB**)
- Enter the new vehicle tank temperature rise.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

- Let the menu time out so that the value and quantity amounts are displayed.

Display Resolution

The display **resolution** (**↳P**) refers to the location of the decimal point. The value, quantity and price per unit display may have none, one, two or three digits displayed after the decimal point, depending upon the currency.

To adjust the Resolution

- Make sure that the dispenser is idle, with the nozzle in its holster
- Press and release the **K-Factor** switch until the unit display shows **↳P**.
- Enter the new resolution. Do this by pressing the K-Factor switch five times. On the fifth time hold the switch down until the decimal point is in the correct place.

There are four positions that the decimal point can be located, allowing the price/kg to be set to the formats **0.000**, **00.00**, **000.0** or **0000**

- Let the menu time out so that the value and quantity amounts are displayed.

NOTE: If the **K-Factor** switch is not pressed for 10 seconds the menu item will time out.

NOTE: If either the value or the quantity displays ever reach **999.99** or **9999.9** or **99999** units, the dispenser will stop dispensing.

b-Configuration Code

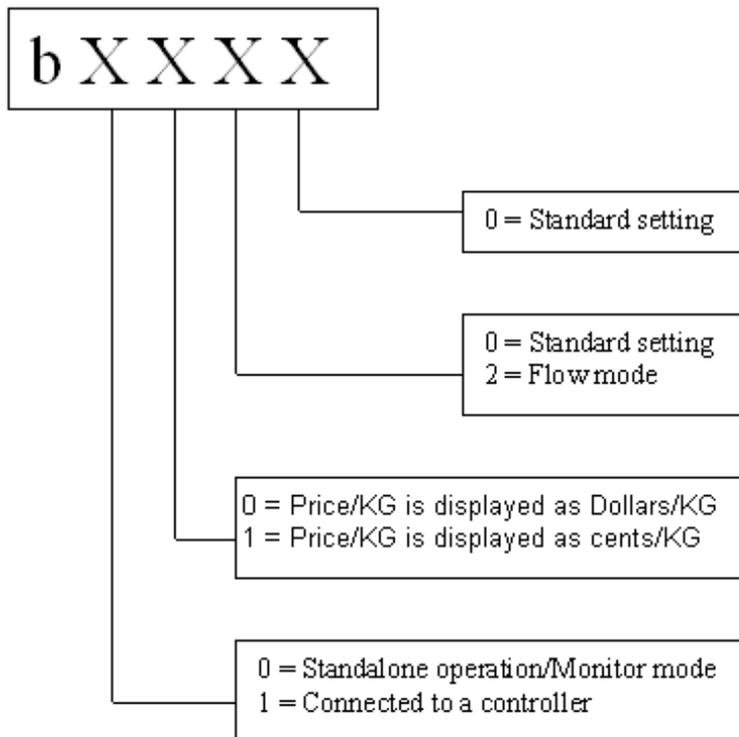
The **b configuration code** (**↳b**) is a secondary configuration code that changes display options and the forecourt communication operation.

To Adjust b Configuration Code:

- Make sure that the dispenser is idle, with the nozzle in its holster
- Press and release the **K-Factor** switch until **↳b** is displayed.
- Enter the new b configuration.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

- Let the menu time out so that the value and quantity amounts are displayed.



NOTE: In stand-alone operation/monitor mode [b 0***], the dispenser operates even when not connected to a site Controller. If it is connected to a controller, it will only dispense gas when authorised by the controller. If the controller is turned off and the dispenser power is cycled off and on, the dispenser will operate in standalone mode.

In Controller mode [b 1***], the dispenser only operates if it is connected to a site Controller. Transactions are displayed.

NOTE: Flow mode [b **2*] is used to view the current flow rate of the gas. When this mode is set FLQ will appear in the value display and the current flow rate value will appear in the unit price display. This is used for testing only and not during normal dispenser operation.

C Configuration Code

The **C configuration code (c)** changes the operation of the dispenser. It is the last setting accessed through the **K-Factor** switch, but it must be set first so that other settings can be selected correctly.

The configuration code has been factory set and should not be changed. If the memory gets wiped and you need to re-enter it, the configuration is written on the yellow label on the C4000 processor board cover.

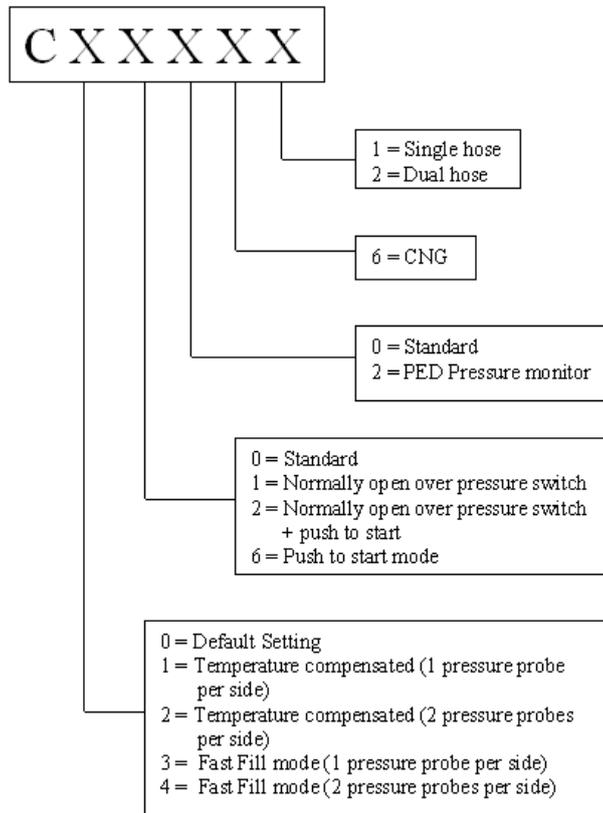
To adjust the C Configuration Code

- Make sure that the dispenser is idle, with the nozzle in its holster

- Press and release the **K-Factor** switch until **C** is displayed.
- Enter the new C configuration see diagram below.

NOTE: Each press of the **K-Factor** switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the switch.

- Let the menu time out so that the value and quantity amounts are displayed.



NOTE: The **PEd** pressure monitor mode checks the pressure probe against the pressure limit (PLA), plus 10% during the fill.

NOTE: Temperature compensation mode modifies the target pressure, based on the ambient temperature. This can be implemented with one or two pressure probes per hose. Two pressure probes are used for redundancy to check that the pressure of the first probe is within 10bar of the second.

NOTE: Fast fill mode measures the pressure, but not the temperature. The dispenser fills to the configurable target fill pressure (**FPA** or **FPb**).