CNG DISPENSER SERVICE MANUAL

C5000 CNG Dispenser Service Manual
Version 1.0.5

Date: 5th November 2024

compac
PREMIUM DISPENSER TECHNOLOGY

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 C5000 processor is electrical shock. This hazard can be avoided if you adhere to the procedures in this manual and exercise all due care.
- Compac Industries Limited accepts no liability for direct, indirect, incidental, special, or consequential damages resulting from failure to follow any warnings, instructions, and procedures in this manual, or any other common sense procedures generally applicable to equipment of this type. The foregoing limitation extends to damages to person or property caused by the Compac C5000 processor, or damages resulting from the inability to use the Compac C5000 processor, including loss of profits, loss of products, loss of power supply, the cost of arranging an alternative power supply, and loss of time, whether incurred by the user or their employees, the installer, the commissioner, a service technician, or any third party.
- Compac Industries Limited reserves the right to change the specifications of its products or the information in this manual without necessarily notifying its users.
- Variations in installation and operating conditions may affect the Compac C5000 processor's performance. Compac Industries Limited has no control over each installation's unique operating environment. Hence, Compac Industries Limited makes no representations or warranties concerning the performance of the Compac C5000 processor under the actual operating conditions prevailing at the installation. A technical expert of your choosing should validate all operating parameters for each application.
- 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 of 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.
- Information in this manual shall not be deemed a warranty, representation, or guarantee. For warranty provisions applicable to the Compac C5000 processor, please refer to the warranty provided by the supplier.
- Unless otherwise noted, references to brand names, product names, or trademarks constitute the intellectual property of the owner thereof. Subject to your right to use the Compac C5000 processor, Compac does not convey any right, title, or interest in its intellectual property, including and without limitation, its patents, copyrights, and know-how.
- Every effort has been made to ensure the accuracy of this document. However, it may contain technical inaccuracies or typographical errors. Compac Industries Limited assumes no responsibility for and disclaims all liability of such inaccuracies, errors, or omissions in this publication.

Product Identification

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.

Models Covered	Standard	High Flow	Ultra-High Flow
Laser	L-CNG15	L-CNG50	L-CNG80
	L-CNGD15	L-CNGD50	L-CNGD80
		L-CNG50-15	L-CNG80-15
Legend	LGDCNG15	LGDCNG50	LGDCNG80
	LGDCNGD15	LGDCNGD50	LGDCNGD80
	LE3KG25D	LGDCNG50-15	LGDCNG80-15

Manufactured By:

The Compac C5000 CNG dispenser 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
Email: techsupport@compac.co.nz
www.compac.biz

Document Control

Document Information	
Document Details	C5000 CNG Dispenser Service Manual
File Name and Location	G:\Masters\Manuals\Authorised Manuals\CNG Manuals
Current Revision Author(s)	Trevor Watt

Revision History

Version	Date	Author(s)	Revision Notes
1.0.0	27/08/2021	Phillip Foy	C5000 CNG Manual
1.0.1	13/09/2021	V Amarakoon	Updated Spare parts
1.0.2	11/07/2023	Trevor Watt	Added MODBUS registers
1.0.3	26/03/2024	Bradley Nixon	Revised error code list
1.0.4	30/10/2024	Bradley Nixon	Added CNG Region settings for 2x K Factor switches
1.0.5	05/11/2024	Trevor Watt	Added new K Factor switch Menu structure for 2x K Factor switches. Update MODBUS Data Sheet with timing diagram

Document Control

Contents

Document Control

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 C5000 board which has many programmable features to suit your individual operation.

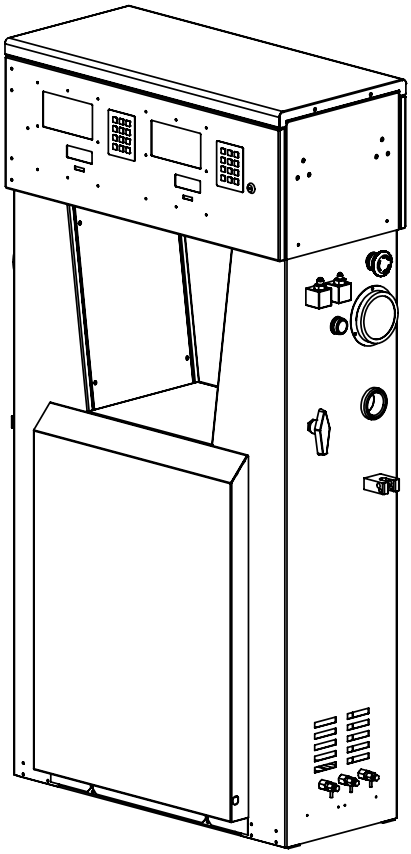
Introduction

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 C5000 board which has many programmable features to suit your individual operation.

This manual contains the information required to operate and maintain your dispenser. Due to ongoing improvements and customised designs, there may be software features that are not available on your particular unit.

For clarity, this manual will refer to the "Dollars" display. If you do not use dollars please substitute this for your local currency.



Refuelling Modes

Fixed Pressure Refuelling

In this mode an over pressure limit is set in the Dispenser. If the pressure measured at the pressure transducer is greater or equal to the limit the dispenser will end the fill.

Installation

For Installation instructions, please refer to the Installation manual.

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 hold.
   The dispenser is in a **ready state** once the hold is finished, and the display shows 0.00.

3. With the dispenser in a **ready state.**
   Press the **Start** button.
   The display will show 88888 and the solenoids energise, initiating a fill.
   On the K factor board check that the output leds T1 T2 and T3 turn on, indicating a signal is being sent to the triacs to open the solenoid valves.
   The diagnostic LED (D9) 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.

4. 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 10 seconds. This is a default time-out setting in the software for situations when there is no gas flow registered.

5. 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 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 hoLd. When it is ready, 0.00 is displayed.

- Press the star 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 10 seconds 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 10 second 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 10 second 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.

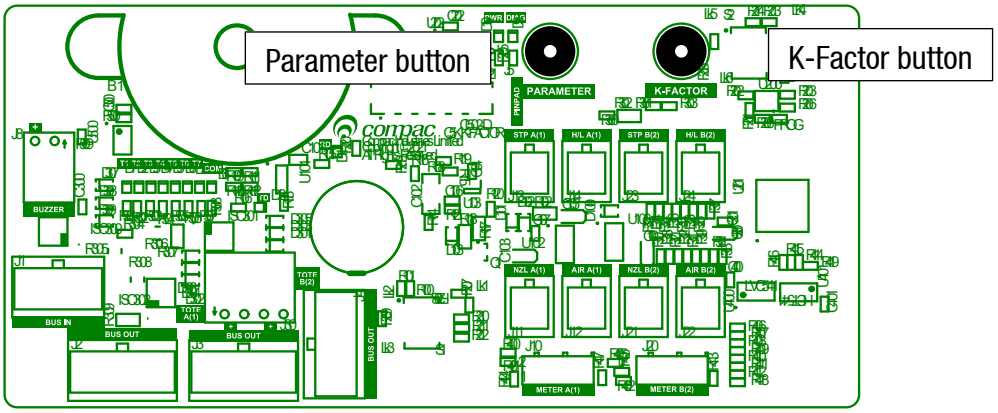
- Complete a few fills on a test cylinder, checking for leaks or unusual operation.

Dispenser Set-Up

Parameter Switch

The **Parameter** switch is located on the K factor board behind the main display and allows you to adjust the unit price, hose number, Pump settings high low cut off and display setting.

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



Menu Options

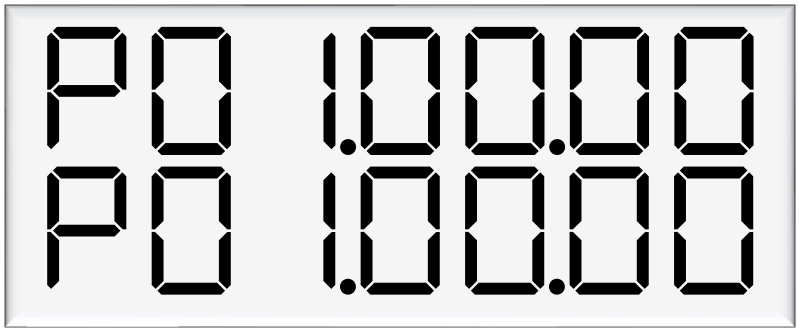
Listed below is the order in which the **Parameter** switch menu options are presented. There are different menu options depending on the current setting of the C configuration code.

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.

Setting	Price Display	Litres Display
Software Version	P******	P******
Pump Number		PnA *** or Pnb ***
Price		PA***** or Pb*****
Pump Settings		bA **** or bb ****
Low-flow cut off		LFA ***
High-flow cut off		HFA ***
Heat of compression		hcA**
b Setting		b ****
Slave display		dS ****
Custom display		dc ****
		dP
		du
Last Sale	****	A **** or b ****
Electronic Totes	LA **** or dA **** Lb **** or dA ****	L****** d******

How to View the Software Version

Pressing the parameter switch once will show the software version.



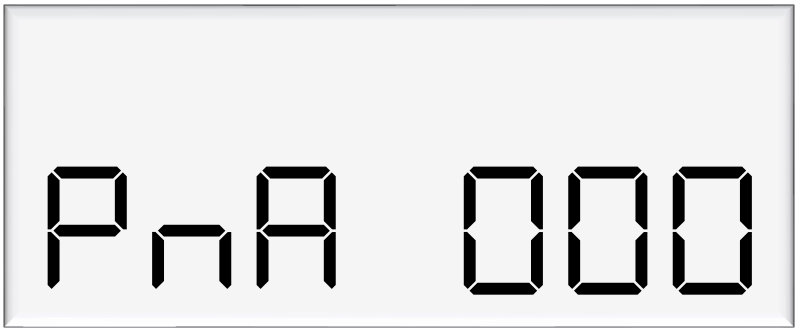
The dispenser will then run through a segment test.

Changing the Pump Number

If the parameter switch is continually depressed, the following menu to change the pump number will appear. Each side must be numbered between 1-99.

NOTE: *Entering a pump number 0 will disable the pump.to the pump controller*

See Using the Dispenser Menus to edit these settings. Use the procedure for both side A and B.



Unit Price

The **unit price (PA)** 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.

The unit price can be set at the dispenser or set remotely via a POS or controller

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 (**PA**).
- 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.*

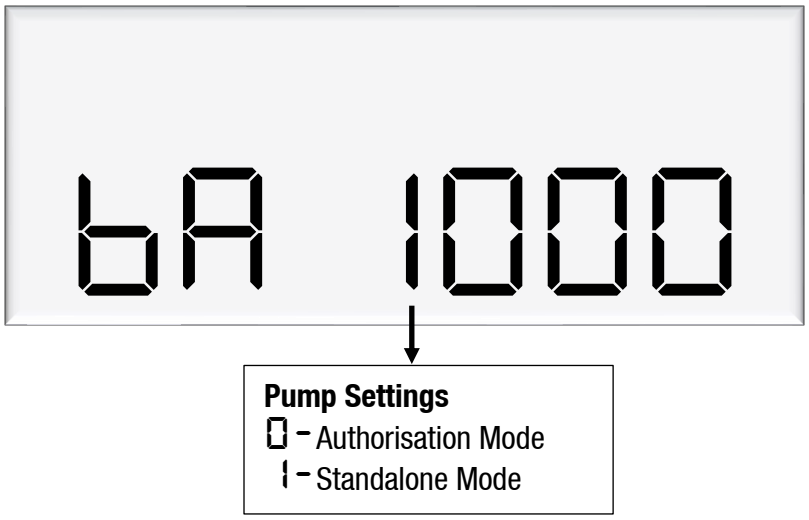
- Let the menu time out so that the value and quantity amounts are displayed.

B Pump Settings

The bA setting is where you can set the dispenser in to standalone mode. Standalone mode means that the dispenser doesn't communicate to a controller or POS.

If the dispenser is in authorisation mode the dispenser will not start even if there is no controller or POS connected.

Note: If the dispenser is communicating to a controller or POS it will not operatate in standalone mode. To put the dispenser in to standalone while still connected to the controller or POS set the cc setting to cc0000 setting



Changing the Low-flow Cutoff

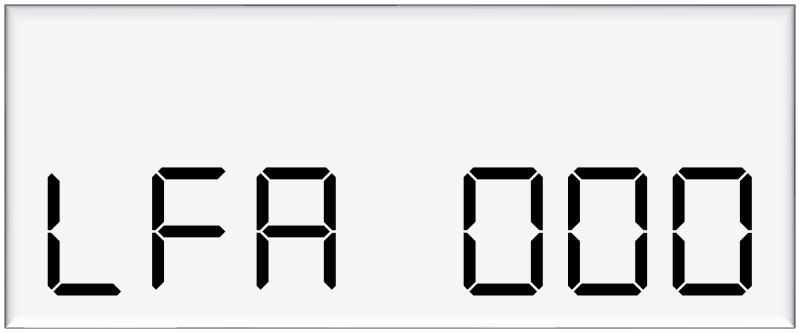
A flow range is needed for each pump to dispense an accurate amount of product. If too much or too little fuel is dispensed, the meter can not accurately measure the dispensed fuel and therefore should cut off and display an end of sale message.

The low-flow cutoff will end the transaction (without an error code) if flow drops below this value. In LPG operation, the default value for the low flow cutoff is 0.1x the maximum flow. For example, if the maximum flow was 40L/min (the default):

$$LF = 0.1\ x\ 40 = 4L/min$$

If a custom value is desired, enter the value in this menu in litres. In non-LPG mode, the low-flow cutoff only applies if a custom value is entered.

See Using the Dispenser Menus to edit these settings. Use the procedure for both side A and B.



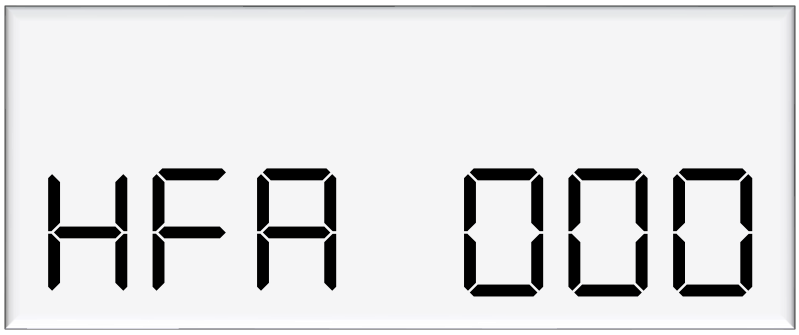
Changing the High-flow Cutoff

The high-flow cutoff will stop transactions if the flowrate exceeds this value, and will return an error. For LPG operation the default value for the high flow cutoff is 1.5x the maximum flow. For example, if the maximum flow was 40L/min (the default):

$$HF = 1.5\ x\ 40 = 60L/min$$

If a custom value is desired, enter the value in this menu in litres. In non-LPG mode, the high-flow cutoff only applies if a custom value is entered.

See Using the Dispenser Menus to edit these settings. Use the procedure for both side A and B.



Minimum Flow Rate

The **minimum flow rate (LFA and LFb)** is the low flow cut-off at the end of the fill.

LFA is the minimum flow rate of side A of the dispenser.

LFb is the minimum flow rate of side B of the dispenser.

These values are adjustable and can be set between $0.5 - 99\ kg/min$.

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

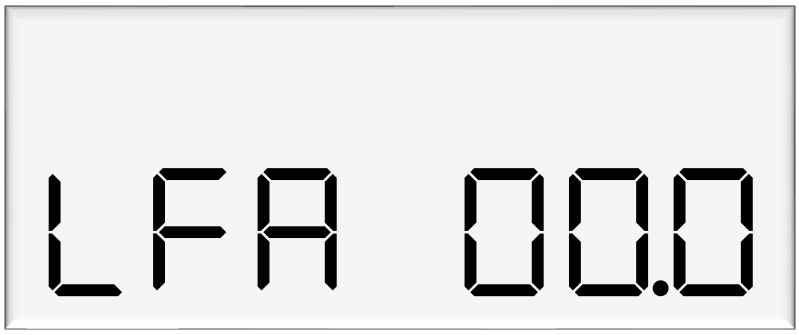
To Adjust the Minimum Flow Rate

- Make sure that the dispenser is idle, with the nozzle in its holster.
- Press and release the **Parameter** switch until the required minimum flow rate is displayed. **(LFA or LFb)**
- Enter the new minimum flow rate.

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.*

NOTE: *The Compac factory default setting is* $1.0\ kg/min$.

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



Maximum Flow Rate

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

hFA 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 $1 - 9999\ kg/min$.

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 **Parameter** switch until the required maximum flow rate is displayed. **(**HFA or HFb**)**
- Enter the new maximum flow rate.

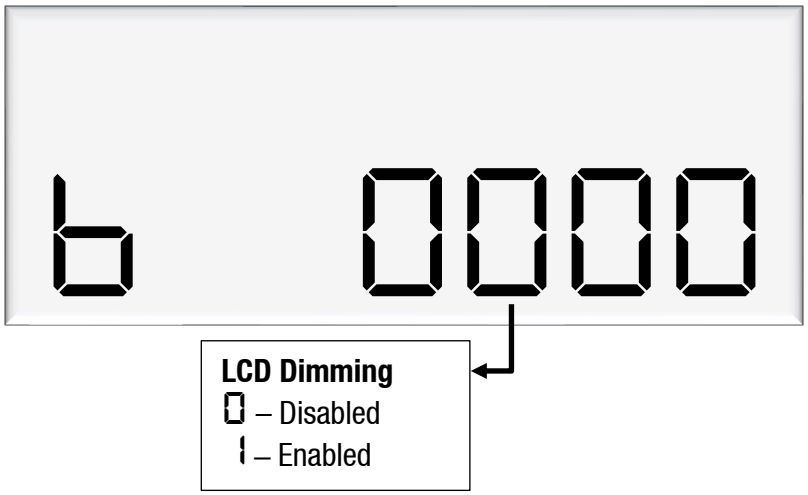
NOTE: *Each press of the* ***Parameter*** *switch passes you over a digit in a setting, making the digit blink. Holding the switch down for more than a second changes whichever digit is currently displayed. If you want to pass over a setting without changing any digits, keep pressing and releasing the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

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

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

Changing the b Setting

The b setting is currently only used for LCD dimming. Set the b configuration code as desired.



Slave Display Configuration

Slave displays are the displays that are additional to the K-factor board display. You can have up to 4 slave displays connected to one C5000. These displays can be configured as one of the following:

- Clone of the main display. This will display what is on the A side display but not error check the LCD
- Side A will display what is on the A side display but will error check the LCD
- Side B. will display what is on the B side display but will error check the LCD
- disabled.

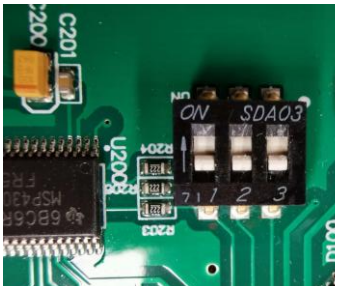
Slave display configuration is a two-step process.

1. Assign the correct number to the slave display by changing the slave display board dip switches.
2. Change dS setting to assign a side to the slave display

Assigning a number to slave display

Slave display numbers can be set with dip switch 2 and 3 on the slave display board. Use the following table as a guide to configure the slave displays

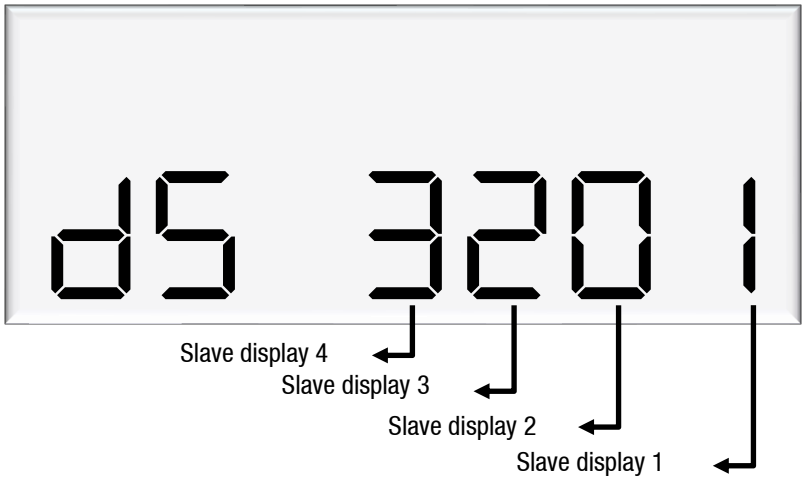
Slave Display	Switch 1	Switch 2	Switch 3
1	OFF	OFF	OFF
2	OFF	OFF	ON
3	OFF	ON	OFF
4	OFF	ON	ON



The first digit from the right correlates to slave display 1, and so on. In this example, slave display 1 – clone, slave display 2 – disabled, slave display 3 - side A, slave display 4 - side B.

0 – Disabled
1 – Clone
2 – Side A
3 – Side B

Note: *Each digit can have 4 different values, each value has a different meaning.*

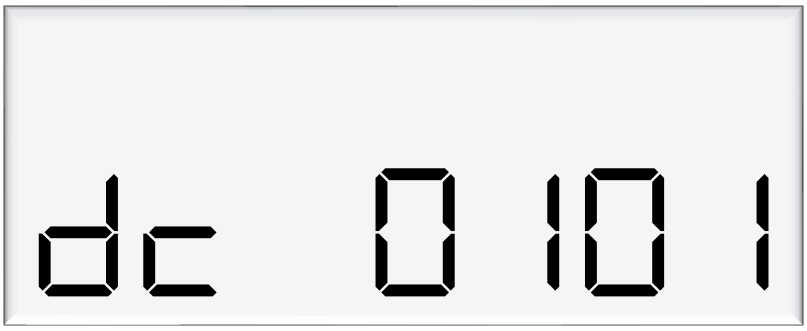


Changing the Custom Display Configuration

The custom display configuration can be used to show additional information on the unit price display. The additional information that can be shown includes the density, temperature, flowrate, and reset batch. This can be configured with the dc setting. Each digit corresponds to a custom display option. Setting a digit to 1, as opposed to 0, enables the custom display. The digits represent the following options:

Digit 1: Reset batch
Digit 2: Temperature display
Digit 3: Density display
Digit 4: Flowrate display

For example, the following code would enable temperature and flowrate to be shown on the custom display.

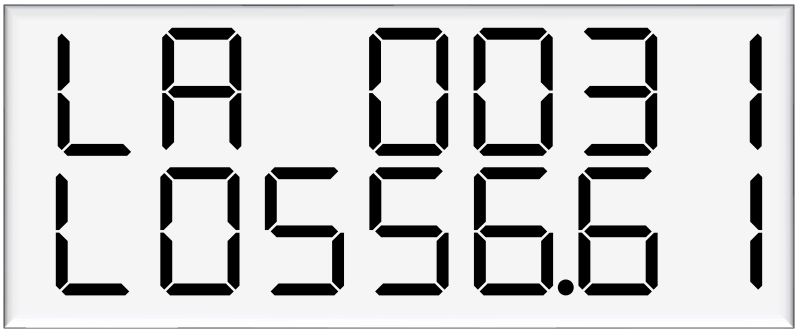


Last Sale

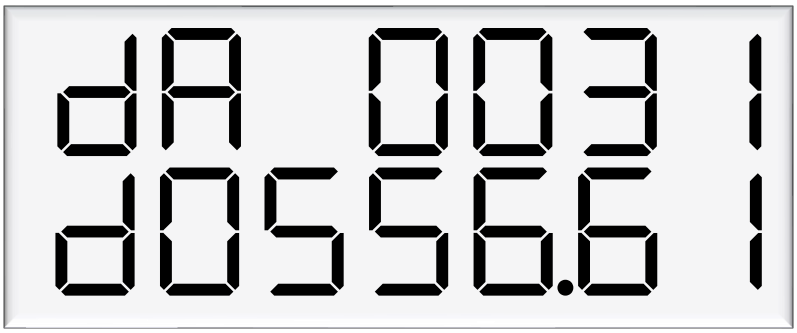
This menu is used to view the last sale details. It is only use when the dispenser is used for LPG

Electronic Totes

The dispenser records electronic totes for price and dollars. To view the electronic totes, continue pressing the parameter switch until the following display is shown:



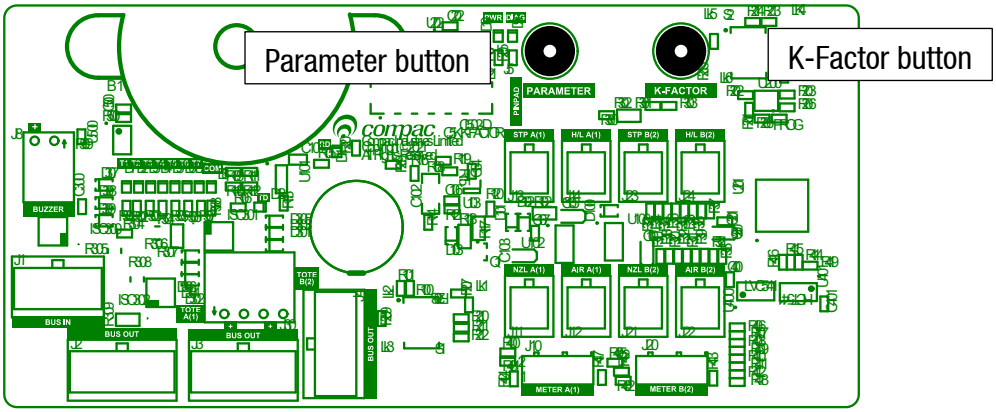
The bottom row is a continuation of the top row – for example, the above display should be read as 003 10556.6 1. The side (A or B) will be shown in the unit price display. Dollars totals are also recorded, which can be viewed by continually pressing the parameter switch.



The electronic totes can also be viewed by pressing the # key five times on the main display, as long as the unit is not in a transaction. Each tote will be shown for ten seconds before the next tote is displayed.

K-Factor Switch

The **K-Factor** switch is located on the C5000 K-factor board. It is used to access and set up options on the dispenser.



K-Factor Settings

A summary of the K-Factor settings can be seen below. Information on these settings and how to change them can be found on the following pages.

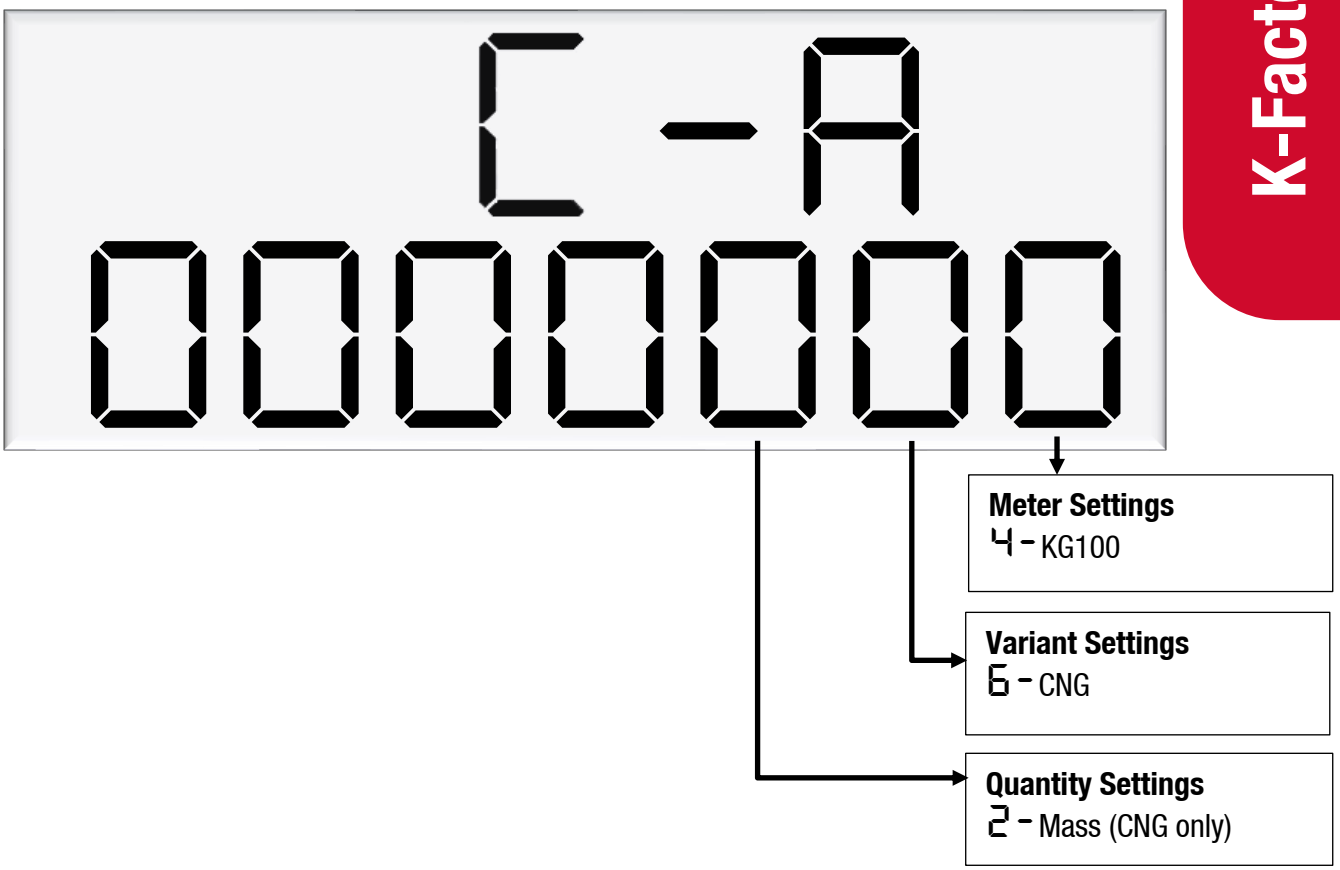
Setting	Price display	Litres display
Dispenser Hose settings	c-A or c-b	*******
Meter ID	id-A or id-b	******
Meter temperature calibration	E-A or E-b	***.
Meter density calibration	d 15-A or d 15-b	****.
Target fill pressure		FPA ***
Overfill pressure	OPA	***.*
CNG Setting	cnG	*******
Density factor	dSF	*.****

Ambient temperature	E	**.*
Pressure probe 1 low calibration point	uA 1L	*.****
Pressure probe 1 high calibration point	uA 1h	*.****
Pressure probe 2 low calibration point	uA2L	*.****
Pressure probe 2 high calibration point	uA2h	*.****
Overpressure time	dEb	**.*
Maximum flow		9A **** or 9b ****
K-Factor	FA or Fb	*******
Configuration code	c	*******
Comms	cc	****
Solenoid delay		SdA *** or Sdb ***
Preset cutoff		PcA *** or Pcb ***
Preset rounding		PrLA*** or PrLb*** PrHA*** or PrHb***
Flow time out		n-A *** or n-b ***
GPIO	GP i0	****
GPIO pulse value	GP i0 Pu	*****
CNG Region setting	cnGrGn	****

Dispenser Settings

The following diagram displays how to change the dispenser settings, such as the meter type, variant and minimum delivery. To get to the following menu, depress the K-Factor switch once when not in a transaction. The menu shown is for side A – if side B is required, continue depressing the K-Factor switch until the same menu for side B is reached and follow the same set up instructions.

These settings will likely be set in the factory. Only change the following settings if required. See following pages for information on these settings.



Meter Settings

This setting corresponds to the type of meter plugged in to the dispenser. Options 1-3 are for an encoder meter and depend on the channel setting of this meter. Encoder meters are used for petrol and diesel, while V50 and KG100 meters (option 4) are used for LPG, AdBlue and CNG. Some settings (such as temperature and density calibration) are only available for V50 and KG100 meters and therefore will not appear if the correct meter type is not set

Variant Settings

This setting should be changed depending on the product. For CNG the variant needs to be set to 6.

Quantity Settings

This setting is what quantity will be shown on the main display when fuel is being dispensed. For CNG application the quantity setting needs to be set to 2 for mass.

Meter ID

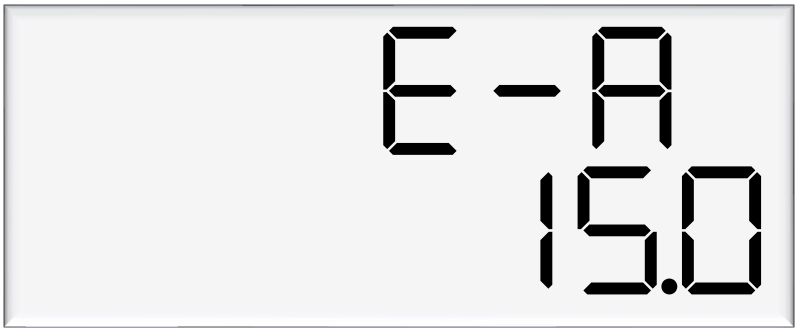
All KG100 meters have a specific ID which must match the ID recorded in the dispenser settings. This is a 6-digit number which can be found on the meter.

If the IDs do not match, the dispenser will return a cALAb error .

To set the meter id Each press of the K-Factor switch passes you over a digit, 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.

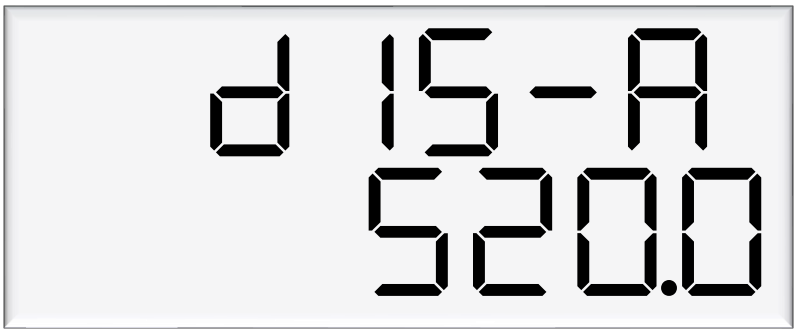
Meter Temperature Calibration

The temperature calibration can be used to adjust the temperature being retrieved from the meter, if this is not the actual temperature of the product being dispensed. The actual temperature of product being dispensed should be entered in this menu. This will be used to adjust new temperatures returned from the meter.



Meter Density Calibration

The density calibration can be used to adjust the density being retrieved from the meter, if this is not the actual density of the product being dispensed. The actual density of product at 15 °C being dispensed should be entered in this menu. This will be used to adjust new densities returned from the meter.



Target fill pressure

The target fill pressure is the pressure that the dispenser will fill the tank to. The dispenser will use the start fill pressure and the flow rate throughout the fill the dynamically work out the pressure in the tank. When the dispenser pressure reaches this the fill will end.

Overfill pressure

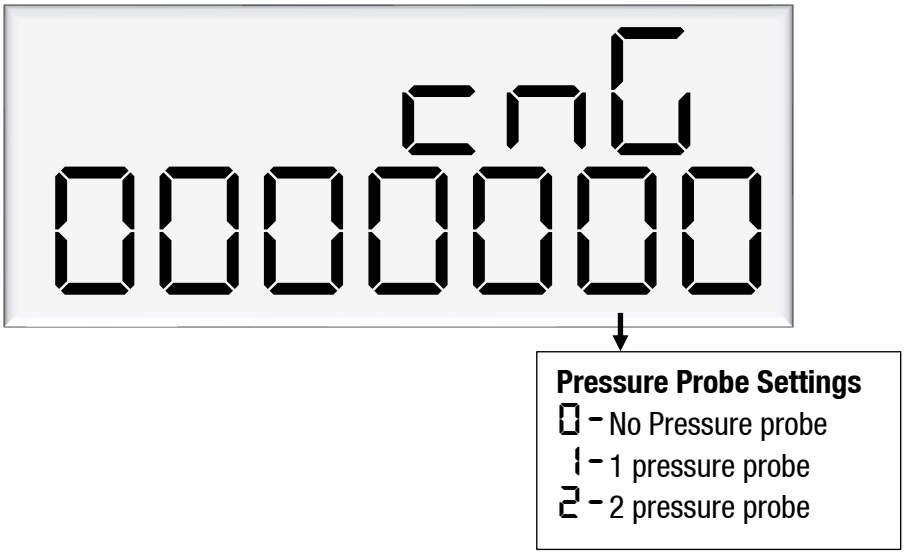
The Overfill pressure is the pressure that the dispenser will end the fill at. This setting is used with the dEb setting(time is seconds over the overfill pressure) to ajust the final fill pressure.

CNG Setting

The CNG setting is specific settings for the CNG application. These settings are currently under development but will inculed the following:

- Fill mode i.e. Mech or electronic
- Number of pressure probes
- Number of banks

Currently the setting that are available are below



Density Factor

The **density factor (dSF)** 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:

$1\ pound = 0.4534kg$

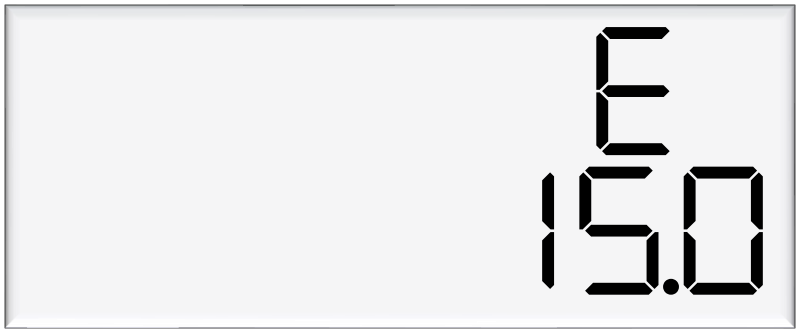
$so\ density\ factor\ is\ entered\ as\ 0.4534.$

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

Ambient Temperature

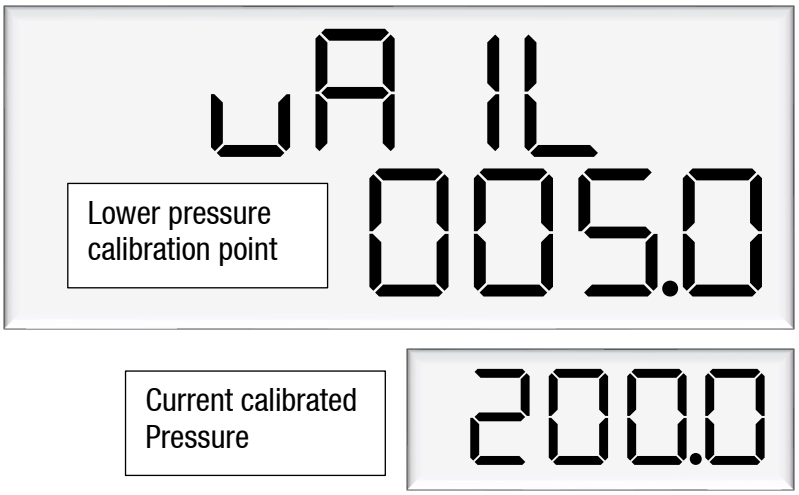
The ambient temperature is used to work out the temperature compensated target fill pressure.

The ambient temperature is set at the factory during the calibration phase and does not usually require adjusting during service. However if the Ambient temperature is showing incorrectly this setting is use to adjust it.



Electronic Pressure Calibration points

The Electronic pressure calibration points (uA 1L, uA 1h, uA2L and uA2h) are used to calibrate the pressure transducer in the dispenser's utility manifold. uA 1L is the lower pressure calibration point and uA 1h is the upper pressure calibration point. The current calibrated pressure is displayed in the unit price window uA2L and uA2h are relate to the second pressure transducer.

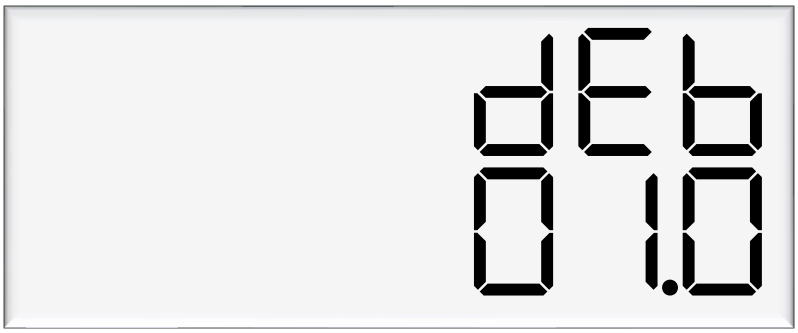


See pressure calibration procedure for details on how to calibrate the pressure transducer.

Note changing these values while not calibrating the pressure transducers will cause the pressure readings to be incorrect

Overfill pressure Time

This in the number of seconds that the current pressure needs to be over the overfill pressure before the fill will end.

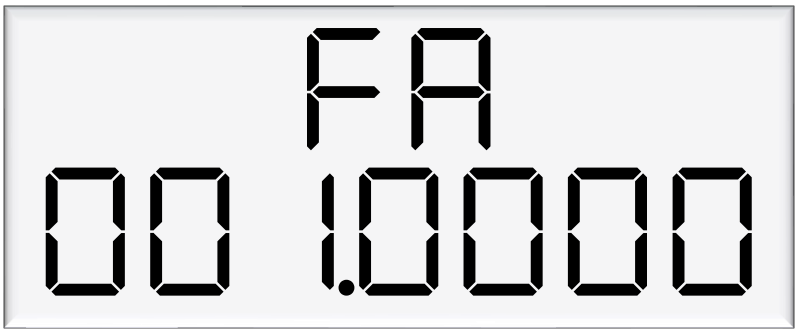


Maximum Flow

If this setting is left at 0000 the maximum flow, or Qmax, is 40 kg/minute by default. This setting is used for weights and measures.

Changing the K-Factor

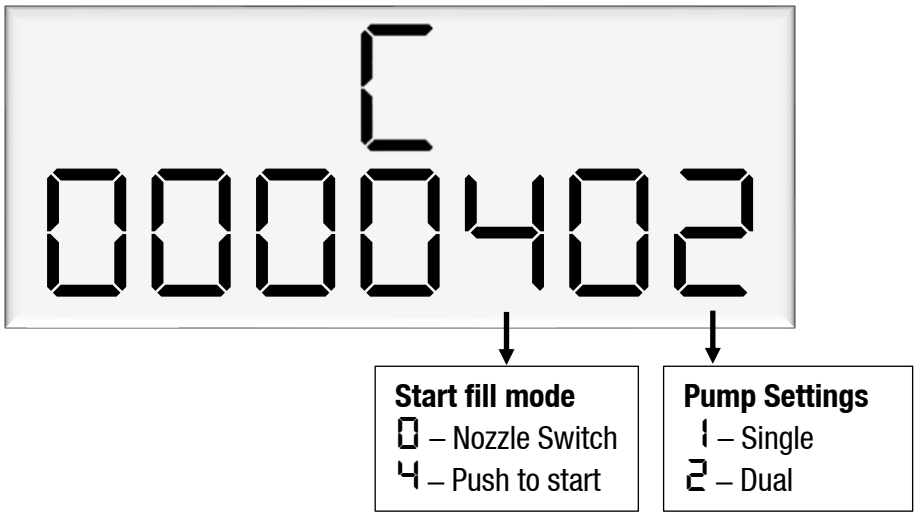
The K-Factor is used to calibrate the dispensers KG100 meter with a master meter or meter prover (Scales). See meter calibration for more details on calibrating the dispenser



C Configuration Code

The **C configuration code (C)** changes the operation of the dispenser.

The configuration code has been factory set and should not be changed. If the memory gets wiped you will need to re-enter it.



Pump settings

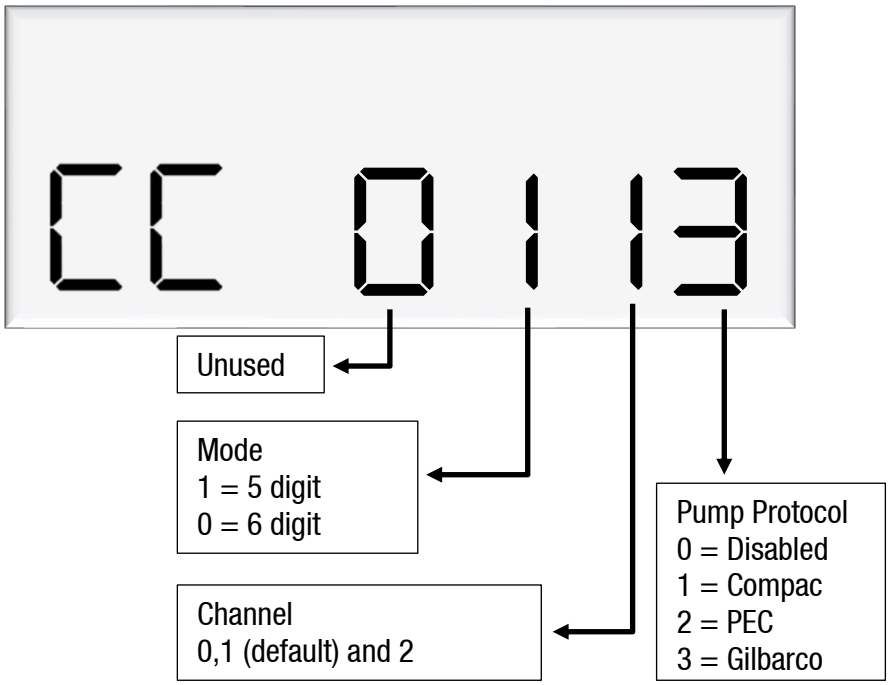
This sets the number of hoses setup in the C5000. After setting this setting the number of settings in the parameter and the K-Factor switch will change.

Start fill mode

This sets how the fill is started. If the setting is set to 0, when the nozzle is lifted the dispenser starts. If at any time the nozzle is hung the dispenser ends the fill. It the setting is set to 4, when the start button is pushed momentarily the dispenser starts the fill. To stop the fill manually when the dispenser is in this mode you have to push the stop button.

Changing COMMS

Use the following diagram to setup COMMS as required.

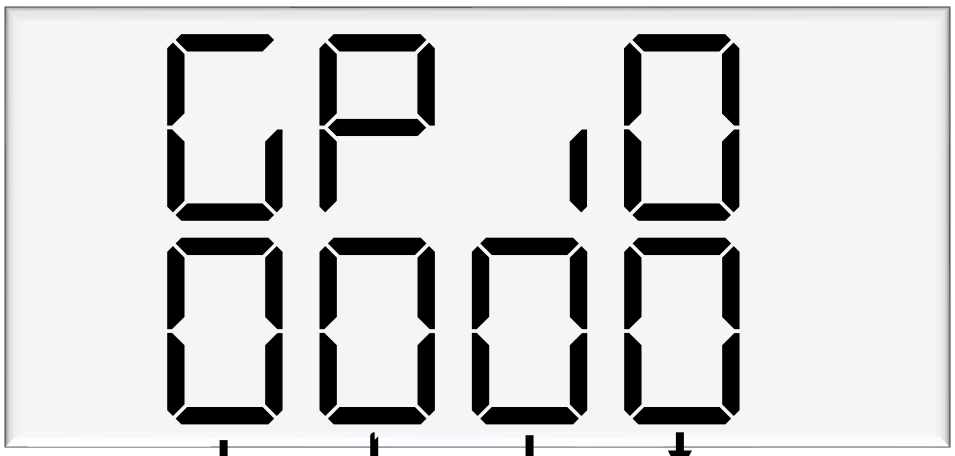


Change the Protocol and the mode to match the controller's settings. Channel 1 is the default channel for dispensers (channel number should always match the with the comms board terminal block used).

E.g. CC = 0113 Gilbarco on Channel 1, 5 Digit mode

GPIO K Factor settings

The GPIO settings in the K factor board is where you set the GPIO specific settings. The below figure shows details of all the options available for each setting.



Duty Cycle Setting
0 - 50%
1 - 10%
2 - 20%
3 - 30%
4 - 40%
5 - 50%
6 - 60%
7 - 70%
8 - 80%
9 - 90%

Inputs Setting
0 - 1KHz
1 - 100Hz
2 - 200Hz
3 - 300Hz
4 - 400Hz
5 - 500Hz
6 - 600Hz
7 - 700Hz
8 - 800Hz
9 - 900Hz
A - 1KHz
b - 1.1KHz
c - 1.2KHz
d - 1.3KHz
c - 1.4KHz
d - 1.4KHz

Inputs Setting
0 - 0 Off
1 - 1 Channel Encoder
2 - 2 Channel Encoder
3 - 3 Channel Encoder
4 - Switch Input
5 - Remote Push to start

Output Settings
0 - 0 off
1 - Volume (Litres/Kg's)
2 - Amount (Dollars)

Remote push to start

The setting on the K Factor board to enable the remote push to start is GPIO XXX5. When remote push to start is enabled the dispenser will start a transaction when the input is pulled high for at least 0.5 seconds.

Output

The output setting enables the GPIO board to output pulses. It also sets whether the output pulses are representing volume(litre/Kg's) or amount(dollars). Majority of applications will set the pulses to represent volume

Note you cannot have meter input enabled at the same time.

Frequency

The Frequency output setting sets the maximum speed of the output pulses. The Default setting of 0 sets the frequency to 1KHz. This setting combined with the Value per pulse setting sets the maximum flow rate of the dispenser.

Example

Frequency set to 1KHz (1000 pulses/sec)
Pulses per value are set to 00001 (10ml/pulse)

That means the maximum flow rate the dispenser can do before the output pulses lag behind is

$$maximum\ flow = maxium\ frequency\ \times\ pulses\ per\ value$$
$$maximum\ flow = 1000Hz\ \times\ 10ml$$
$$maximum\ flow = 10000\ ml\ per\ second$$
$$maximum\ flow = 600\ l\ per\ minute$$

The default setting of 1KHz should be sufficient for most applications. In applications where the maximum flow rate is lower and the 3rd party controller is only able to read pulses at a lower frequency then a lower frequency output can be selected.

Note that if the flow rate exceeds the maximum pulse output the next transaction will not be allowed until the pulses have completed being outputted.

Duty Cycle

The duty cycle setting gives the ability to set the percentage of the pulse high and low. The default setting is 50%. The pulse length is determined by the following formula.

Example

Duty cycle set to 50%
Frequency set to 1KHz (1000 pulses/sec)

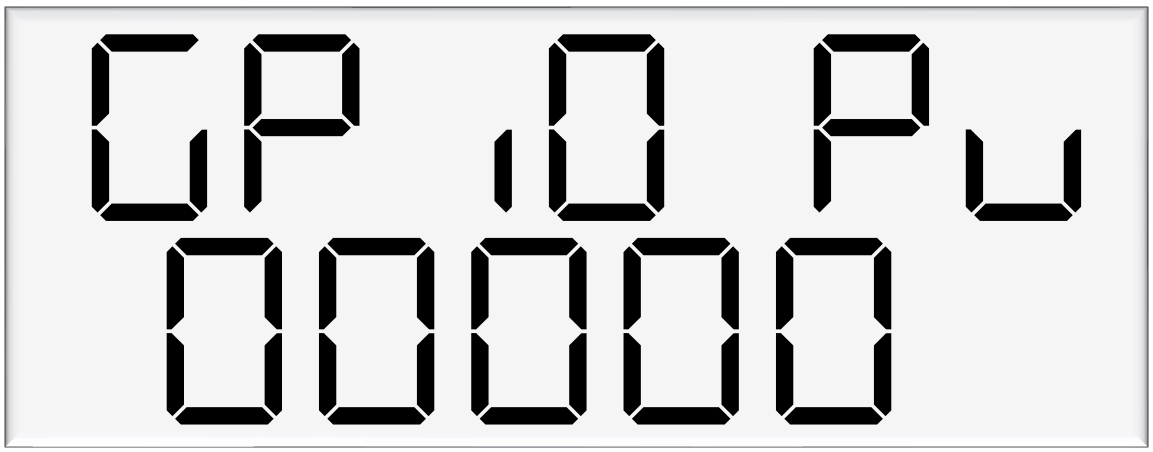
$$Duty\ Cycle = Pulse\ Width\ (sec) \times Frequency\ (Hz) \times 100$$
$$50 = Pulse\ Width\ (sec) \times 1000 \times 100$$
$$\frac{50}{100} = Pulse\ Width\ (sec) \times 1000$$
$$\frac{0.5}{1000} = Pulse\ Width\ (sec)$$
$$500\ microseconds = Pulse\ Width\ (sec)$$

The Default setting of 50% should be sufficient for most applications.

Pulse value

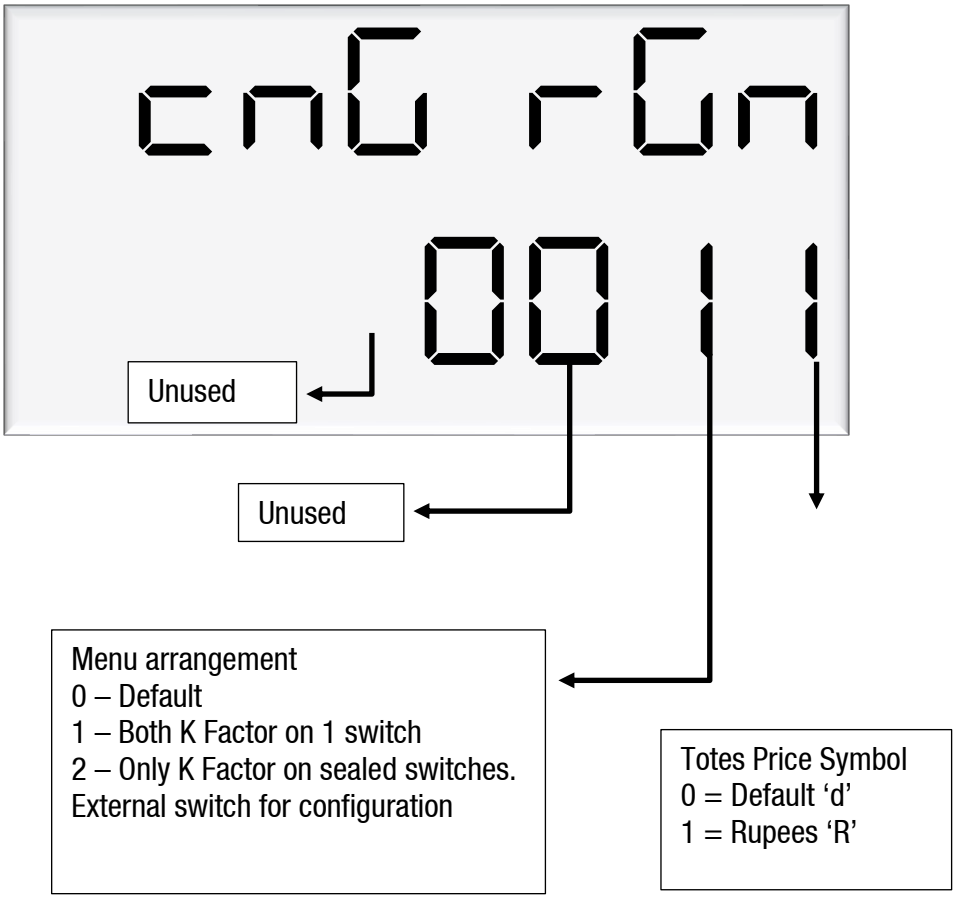
The pulse value setting sets what a pulse is worth. When the output is set to volume the lowest volume a pulse can be set to is 00001 which is 10 ml. If the output is set to amount the lowest amount a pulse can be set to is 00001 which is 1 cent or 0.01 dollars.

The most common setting for most applications would be 00001 or a factor of 10. Any other setting would cause an error with rounding.



Changing CNG Region

The CNG Region setting changes region-specific customization.



Digit 2 – Configuration Menu Arrangement

There are currently 3 arrangement configurations options supported:

0 - Default (Normal)
1 - Only K-Factor (A/B) available on K Factor switch
2 - Only K-Factors available on sealed switches (KF-A Param, KF-B KFactor)
- All other settings are accessed using an external unsealed switch

Option ‘1’
In this mode only the K Factors are left available on the K Factor menu accessed through the K Factor switch. All other settings are moved to another quasi-Kfactor menu "Set B2" accessed by holding down the parameter button.

Option '2'

In this mode the K Factor and Parameter button switches only contain the K factor and meter ID of either sideA or side B:

- *Parameter switch*
  - Meter ID A - "ID-A"
  - K Factor A - "FA"
- *K Factor switch*
  - Meter ID B "ID-B"
  - K Factor B – "FB"

Other configurations including price are moved to an external switch wired into the High/Low switch of side A "H/L A(1)". These configuration menus are entered in the same method as when using setting 1 :

-**Short** press external switch - Enter parameter setting menu

-**Long** press external switch - Enter "Set B2" menu

Security

For security reasons, the density factor "dsf" and CNG region "CNG RGN" settings are moved to a new menu when using menu configuration options 1 or 2 to prevent changing these without first breaking both K factor switch seals.

These 2 settings can be seen and configured in a "more" settings menu by:

1. Holding down the parameter button THEN holding down the K-Factor button
2. Quickly release once "more" is displayed
3. Cycle through and change settings with the K-Factor button

Dispenser Operation

Turning the Dispenser on

When the power is applied to the dispenser, the display will show hoLd. This start-up procedure ensures the dispenser is functioning properly before gas is dispensed.

Dispenser will be ready to use when the display indicates 0.00

Refuelling a Vehicle

Appropriate personal safety equipment should be worn whilst refuelling a vehicle.

To Refuel a Vehicle

- Press the start button or remove the nozzle from the holster to initiate a fill.
- The display will show 888888 and clear, at this point both the gas and value totals will display 0.00
- Connect the refuelling nozzle to the vehicle.
- Open the nozzle refuelling valve to commence filling.
- The dispenser will emit a long beep signalling the end of the fill, at this point the gas total.
- Close the refuelling valve.

NOTE: *Closing the valve shuts off the gas from the dispenser. It also vents the gas between the refuelling valve and coupling to the dispenser vent point.*

- Disconnect the nozzle from the vehicle.
- Return the refuelling nozzle to the nozzle holder.

Reading the Dispenser Totals

To read the dispenser totals:

- Quickly press the StArt button or nozzle switch five times on the side of the dispenser you wish to view the totals for. The total is 10 digits long. The four most significant digits are displayed on the top line and the number wraps to the second line showing the six least significant digits.

  The dispensed amount will be shown on the display for 10 seconds.
  This will be shown as:
  d Followed by a 10-digit total (e.g. d**********).

  The dispensed quantity will then be shown next and will be displayed for 10 seconds.
  This will be shown as:
  L Followed by a 10-digit total (e.g. L**********).

NOTE: *From software version HIA29.25.3CNG onwards the decimal place has been removed from the tote. There will be two digits on the top ($) display and six digits on the lower (kg) display. For dual dispensers, the A or B side will be indicated in the unit price display.*

Servicing

Degassing the Dispenser

When replacing or servicing dispenser hydraulics the dispensers must be de-gassed.

Degas the Dispenser

- Isolate the dispenser by closing the inlet gas supply valves at the base of the unit or at the priority panel.
- Fill one or more CNG bottles until the dispenser pipework is completely depressurized. Ensure that the isolation valve remains open during this process.

Open the bleed valve on the utility manifold (where fitted) to remove any remaining gas inside the dispenser.

Schedules Servicing

Weekly Checks

- Check the sealing and operation of the three-way refuelling valve.
- Check the sealing and operation of the solenoids.
- Check the sealing and setting of the regulator.
- Drain the Coalescing Filter.

Suggested 6-monthly or 400 Compressor Run Hour Service

- Check the dispenser for leaks.
- Check the Coalescing filter elements, replace if necessary.
- Check damage and electrical continuity of Refuelling Hoses.
- Replace Breakaway seals.
- Replace 3-way refuelling valve seals and inspect ball for scratches and wear. Replace ball if necessary.
- Replace refuelling probe O-rings. Check that the probe is not damaged or bent, replace if necessary.
- OEM Nozzles and Breakaways - Refer to manufacturer's instructions.

Suggested Yearly or 8000 Compressor Run Hour Service

In addition to all the checks listed in the 6-month service, carry out the following:

- Dismantle and clean the solenoid valves. Replace the seals and O-rings.
- Dismantle and clean the regulator valves. Replace the seals and O-rings.
- Check the dispenser calibration. Meter Calibration.
- Check the eletronic boards are clean, dry and dust free.
- Check the UPS and voltage stabiliser supplying power to the dispenser is working according to the manufacturer's specifications.
- Check the C5000 flameproof box lid is bolted down tight and all glands are tight.
- Check the zero point and calibration of the dispenser pressure transducers.

Checking Dispenser Operation

To check that the dispenser is operating correctly:

1. Fill two gas bottles.
2. Check that:
   - The bottles fill to the desired pressure.
   - The dispenser fills to the preset value.
   - The displays and gauges are working.

Checking the Sealing of the Solenoid

- De-gas the hose by opening the 3 way valve.
- When the hose is empty check that the flow has stopped. If the flow does not stop, the seals in the final stage solenoid will need to be replaced.

Checking the Setting and Sealing of the Regulator

Before you start, make sure you have:

An 8mm hex key

NOTE: *When you are undertaking this check, the dispenser must be turned on and pressurised.*

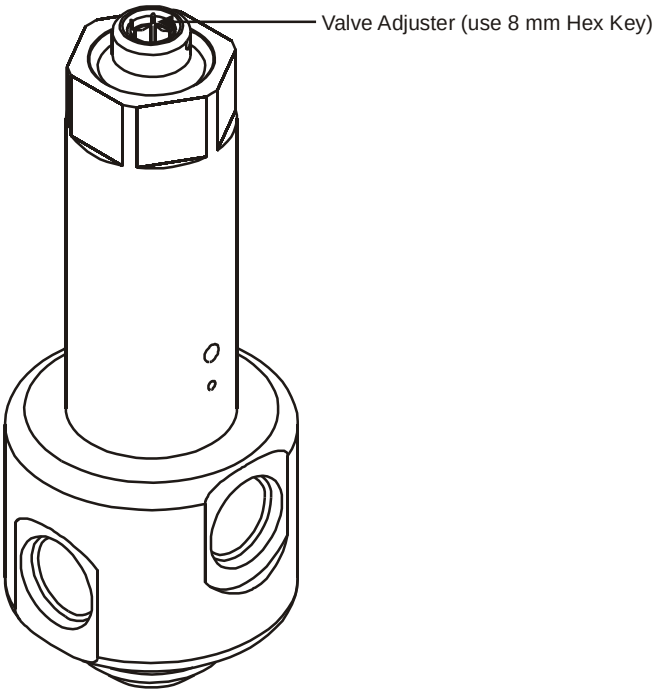
To check the setting and sealing of the regulator:

- Hang up the nozzle and check that the three-way valve is closed.
- Press the start button to initiate a fill and open the solenoids.
- Check that the pressure gauge is at the setpoint reading (typically 200 bar).
- Check that the pressure gauge reads at a steady state, rather than creeping after a fill.

If the pressure gauge is not reading the correct setpoint:

- Insert an 8mm hex key into the top of the regulator body.
- Adjust the pressure up clockwise or down anticlockwise to 200 bar.

If the pressure on the gauge does not remain stable, the regulator valve seal is leaking and will have to be replaced.



Checking the Over-Pressure Operation

To check the operation of the **Overfil Pressure** cut off:

- Access the **K-Factor** switch on the K-Factor board.
- Obtain the overfill pressure settings OPA
- Set the overfill pressure cut-off point to below the regulator pressure.
- Set the over pressure time to (dEb) 01.0 or 1 second.
- For example, if the regulator pressure is 220 bar, then set the over-pressure to 100 bar. An exact value is not required; just make sure that the value is significantly lower than the regulator pressure.
- Start a fill. The dispenser should stop the fill after 1 second.
- Check the dispenser **End of Sale** indicator states that the fill has ended because of over-pressure. End of Sale Indicators.
- Reset the over-pressure cut-off point to its original value.

Checking the Dispenser for Leaks

Before you start, make sure you have:

- Soapy water

To check the dispenser for leaks:

CAUTION: Be careful not to spray or drip water into any of the dispenser electronics when checking for leaks.

- Apply soapy water to all joins in the assemblies and fittings on the inside and outside of the dispenser, including the hose.

If bubbles form, there is a leak with that assembly or fitting. The fitting may require tightening, or the seals might need to be replaced.

DANGER: You must isolate the gas supply and depressurise the dispenser before disassembling any component or adjusting any fitting. Serious injury may result if components are removed while the dispenser is under pressure.

- Threaded SAE Fittings.
- Adjustable Threaded SAE Fittings.
- Compression Fittings.

- To remedy a leak, refer to the appropriate section, depending on the leak is location.
- After checking for leaks, wipe any excess water off the dispenser to prevent corrosion.

Checking the Refuelling Hose for Leaks

Before you start, make sure you have:

- Soapy water

To check the refuelling hose:

- Visually check the refuelling hose for damage, such as fraying and cuts.
- Apply soapy water to all valves and connections.

If bubbles form, there is a leak in that assembly or fitting. The fitting may require tightening or the seals might need to be replaced.

DANGER: You must isolate the gas supply and depressurise the dispenser before disassembling any component or adjusting any fitting. Serious injury may result if components are removed while the dispenser is under pressure.

Replace the hose if it is damaged or leaking.

Checking the Isolation Ball Valve Operation

Before you start, make sure you have:

- Soapy water

To check the operation of the isolation ball valve:

- Close the isolation valve.
- Open the dispenser access door.
- Open the bleed valve on the utility manifold block (where fitted) and bleed the gas from the refuelling hose.
- Close the bleed valve once the hose is degassed.
- Start a fill.

If the pressure gauge starts to move, the isolation ball valve is leaking or passing gas.

- Apply soapy water to the valve.

If bubbles form, there is a leak in the assembly or fitting. The fitting may require tightening, or the seals might need to be replaced.

For servicing refer to Isolation Valve Seal Replacement.

Checking the Three-Way Refuelling Valve Operation

Before you start, make sure you have:

- Soapy water

Check the Sealing of the Three-Way Refuelling Valve

To check the sealing of the three-way refuelling valve, apply soapy water to the valve.

If bubbles form, there is a leak, in which case you should replace the three-way refuelling valve seals.

To check the operation of the three-way refuelling valve:

To check the operation of the three-way refuelling valve, do a test fill to check that the valve is filling the vehicle, and venting properly when you disconnect it from the vehicle.

If bubbles form, there is a leak, in which case you should replace the three-way refuelling valve seals.

Draining the Coalescing Filter

Before you start, make sure you have:

- A 3/16" hex key

To drain the coalescing filter:

- De-gas the dispenser.
- Open the dispenser access doors.
- Unscrew the drain plug from the bottom of the filter cover.
- Allow all oil and water to drain from the filter*.
- If excessive amounts of oil and water are present, remove and replace the coalescing filters.
- Screw in the drain plug and repeat steps 1 to 4 for all additional filters.

***NOTE:** Make sure you dispose of any fluids responsibly.*

Filter Element Replacement

The coalescing filters are designed to trap dirt, moisture, oil, and other debris that may damage the valve seals.

Before you start, make sure you have:

- A seal kit - Part number FC-FIL-0001
  - 1 x filter
  - 1 x filter bowl O-ring seal
- O-ring lubricant

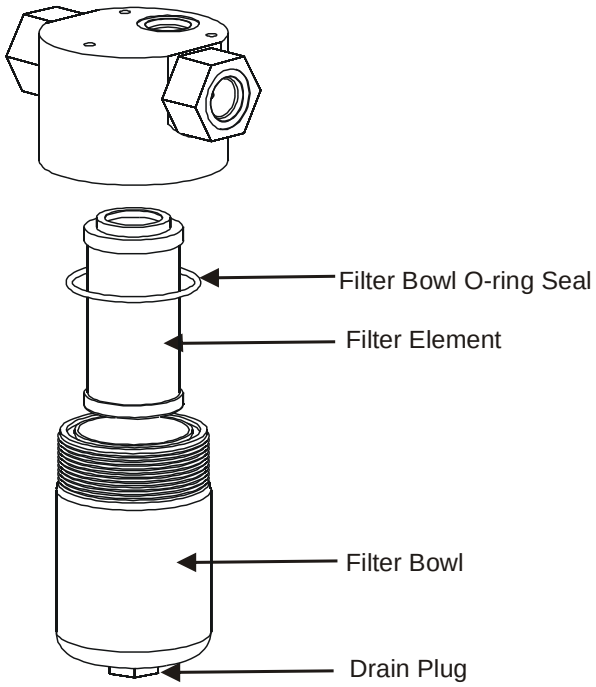
To remove the coalescing filter:

- Degas the dispenser.
- Drain the coalescing filters if they have not been drained already.
- Unscrew the filter bowl(s) with a spanner on the 22mm hex nut at the base of the filter bowl.
- Remove the filter element.
- Clean all oil and dirt off the components with a clean cloth.

To install the new coalescing filter:

- Insert the new filter element and lubricated filter bowl O-ring seal.

CAUTION: O-rings that are subjected to natural gas at high pressure swell when exposed to air. Once swollen, they cannot be reused and must be replaced.



NOTE: *Always use O-ring lubricant to prevent damage to the O-rings.*

- Screw in the filter bowl(s)
- Check the dispenser for leaks.

Solenoid Valve Seal Replacement

These instructions refer to the current Compac S2-350 solenoid valve. The solenoids are available in several types: Standard, high oil and low temperature. Always quote the dispenser serial number when ordering parts and check the model number on the valve body before installation.

NOTE: *For applications where the gas has a high oil content, a special piston with an O ring seal is available. If you are having problems, discuss this option with your service agent. If the special piston is used for low oil content gas, no harm will occur, but the service life of the seal may be shortened.*

Before you start, make sure you have:

- A seal kit - Part number FC-SK-0001
  - 1 x Teflon valve seal
  - 1 x solenoid top O-ring seal
  - 1 x gas return line O-ring seal
- O-ring lubricant
- Solenoid piston – Part number FC-VLV-PSTN-0001 (optional standard)
- Solenoid piston – Part number FC-VLV-PSTN-S2 (optional high oil)
- Solenoid top service kit standard. Part number FC-SVK-0003 (replace valve top if leak detected through stem)
- Solenoid top service kit - low temperature option (-40 degrees C). Part number FC-SVK-0004 (replace valve top if leak detected through stem).

CAUTION: Never remove or service the stem. If it is leaking, it must be replaced using the appropriate top service kit.

CAUTION: Cleanliness is essential. When working on the open solenoid assembly, cover the opening with a cloth to prevent dust and dirt from entering.

CAUTION: O-rings that are subjected to natural gas at high gaswell when exposed to air. Once swollen, they cannot be reused and **must** be replaced.

CAUTION: The Nitrile O-rings have a life span of over 10 years from cure date but improper handling of these O-rings before use can shorten their useful life. O-rings will deteriorate if exposed to ozone or ultraviolet light so keep in original packaging and away from UV light. If in unsure about their condition, do not use old O-rings and order new ones.

NOTE: *It is not necessary to remove the solenoid body from the dispenser to service the solenoid seals.*

To remove the old solenoid valve seals:

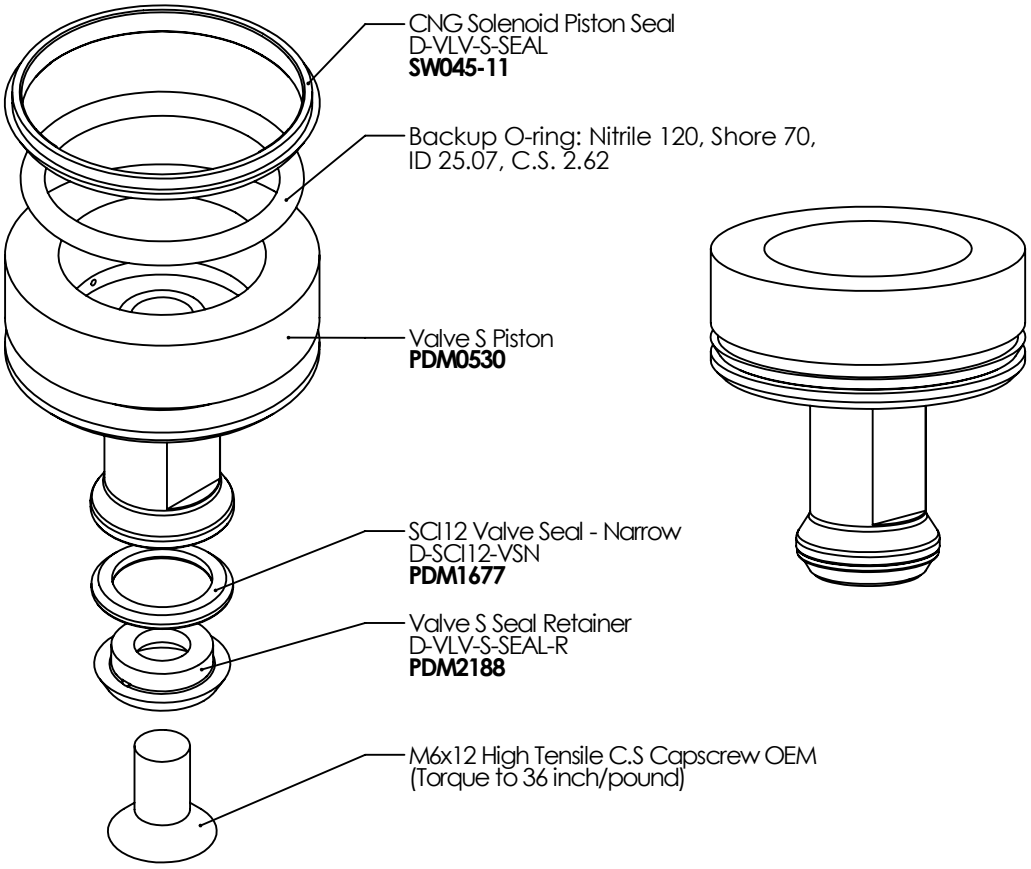
- De-gas the dispenser.
- Switch off the power supply to the dispenser.

DANGER: Never remove any electrical components without first switching off the power to the dispenser. Failure to turn off the power could result in an electric shock.

- Unscrew the solenoid coil retaining nut and move the coil out of the way.
- Remove the six cap screws from the solenoid top.

NOTE: *Do not remove the angled grub screw from the solenoid top. This is epoxied in place during manufacture and should never be removed.*

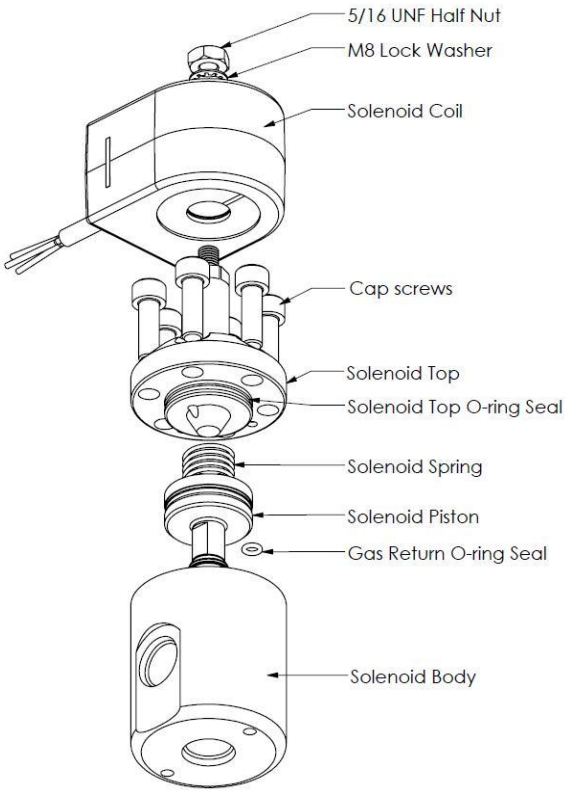
- Remove the solenoid top and remove the old top O-ring seal and gas return O-ring.
- Remove the solenoid spring.
- Screw an M6 cap screw into the solenoid piston to withdraw it from the solenoid body.



- Taking care not to damage the piston, hold the flat part of the piston with a spanner to prevent rotation, then unscrew the M6 x 12 mm cap screw from the bottom of the piston. This releases the solenoid seal retainer and valve seal.
- Discard the old valve seal.
- Clean all oil and dirt off the components with a clean cloth and check that the bleed hole is not blocked.
- While the solenoid is apart, inspect the solenoid piston centre seal and piston for wear, scratching or damage. Replace piston if required.

To install new solenoid valve seals:

- Place the new valve seal and seal retainer on the cap screw.
- Taking care not to damage the piston, hold the flat part of the piston to prevent rotation, and then screw the M6 cap screw into the bottom of the piston.
- Insert a new gas return O-ring.
- Insert the piston back into the solenoid body.
- Insert the solenoid spring.
- Replace the solenoid top O-ring seal.
- Place the solenoid top back on the solenoid body, making sure that the locating dowel is engaged.
- Screw in and tighten the six cap screws.
- Replace the solenoid coil.



- Re-power and re-gas the dispenser then check for leaks and correct operation of the valve.

Solenoid Coil Replacement

Before you start, make sure you have:

- Replacement solenoid coil **FC-COIL-0005** (Compac S2-350).

NOTE: *Solenoid coils are not interchangeable between models. Make sure you order the correct one by quoting the dispenser serial number. To replace obsolete coils, the entire solenoid will need replacing.*

To remove the solenoid coil:

- De-gas the dispenser.
- Switch off and isolate the power supply to the dispenser.

DANGER: Never remove any electrical components without first switching off the power to the dispenser. Failure to turn off the power could result in an electric shock.

- Remove the flameproof box lid to gain access to the C5000 Terminal board.
- Disconnect the appropriate solenoid coil wiring from the C5000 Terminal board board.

CAUTION: Take basic anti-static precautions by wearing a wristband with an earth strap.

- Loosen the gland on the flameproof box that is clamping the solenoid coil lead and pull the lead out of the gland.

Undo the nut on the top of the solenoid valve that is securing the coil and remove the coil from the top of the valve.

To install the new solenoid coil:

- To install a new solenoid coil, reverse the procedure above.

NOTE: *Before replacing the lid on the flameproof box, make sure that the O-ring is not damaged and is seated properly in its groove. If the O-ring is damaged and needs replacing, replace it with an O-ring of the same size and specification (**176 N70**).*

Complete Solenoid Valve Replacement

These instructions refer to the current Compac S2-350 solenoid valve. This replaces all previous solenoids.

Before you start, make sure you have:

- Solenoid valve standard 350 bar model (FC-VALVE-0035) or
- Solenoid valve 350 bar O ring seal option for high oil content gasses (FC-VALVE-0036) or
- Solenoid valve 350 bar low temperature option (FC-VALVE-0037)

NOTE: *Solenoid valves are supplied without coils. If you need the coil it must be ordered as well.*

CAUTION: Cleanliness is essential. When working on the open pipes and solenoids, cover the openings with a clean, lint-free cloth to prevent dust and dirt from entering.

To remove the old solenoid valve:

- De-gas the dispenser.
- Switch off the power supply to the dispenser.

DANGER: Never remove any electrical components without first switching off the power to the dispenser. Failure to turn off the power could result in an electric shock.

- Undo the nut and remove the solenoid coil.
- Undo the gland nuts connecting the solenoid valve to the pipework and manifold and remove valve.

To replace the solenoid valve:

- Ensuring all surfaces are clean and any sealing plugs are removed from the valve, reconnect the pipework and tighten the gland nuts.
- Replace the solenoid coil.
- Repower and re-gas the unit, check for leaks and test for correct operation.

Regulator Valve Seal Replacement

Before you start, make sure you have:

- A regulator seal kit - Part Number FC-SK-0002
  - 2 x regulator O-ring seals
  - 2 x Teflon back-up ring
  - 1 x Teflon valve seal
- O-ring lubricant

To remove the old regulator valve seals:

- De-gas the dispenser.
- Open the dispenser access doors.
- Unscrew the spring tube by placing a 1 ¼" spanner on the machine hex nut at the top of the spring tube.

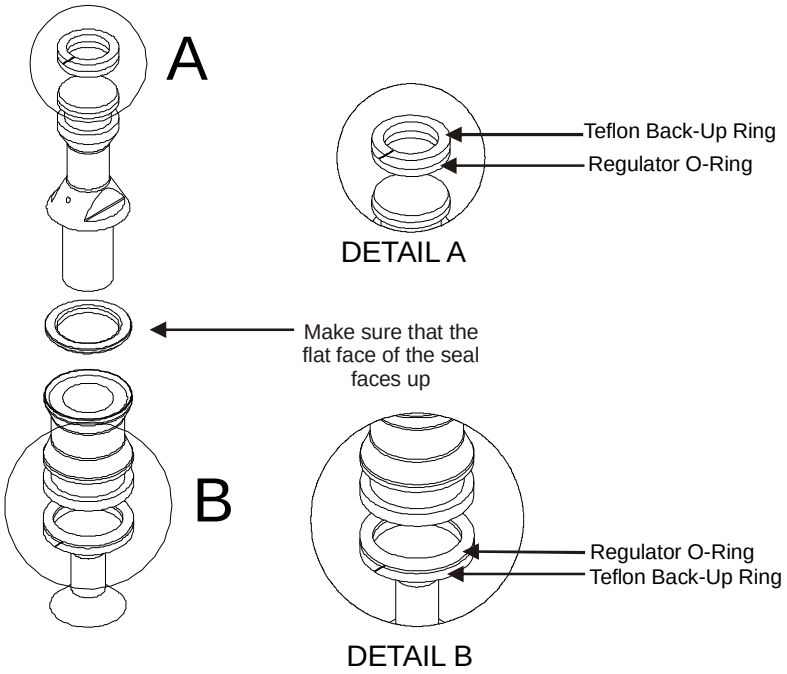
NOTE: *Do not unscrew the valve adjustment nut. The spring remains at the set tension.*

- Unscrew the bottom plug in the regulator body.
- Using a hex key inserted into the base of the piston to stop the piston from twisting sideways and being damaged, push the piston downwards out the bottom of the regulator body.
- Hold the piston by the 8mm flat and remove the M6 cap screw from the bottom.

NOTE: *The M6 cap screw has a special hole through it. Never substitute it for a normal cap screw.*

To install the new regulator valve seals:

- Install the new valve seal. Make sure that the larger flat side of the seal faces upwards.



NOTE: *O-rings that are subjected to natural gas at high pressure swell when exposed to air. Once swollen, they cannot be reused and must be replaced.*

CAUTION: The Nitrile O-rings have a life span of over 10 years from cure date but improper handling of these O-rings before use can shorten their useful life. O-rings will deteriorate if exposed to ozone or ultraviolet light so keep in original packaging and away from UV light. If unsure about their condition, do not use old O-rings and order new ones.

- Lever off the two regulator O-rings and two Teflon back-up rings.
- Install two new regulator O-rings and two new Teflon back-up seals.

The back-up rings go on the outside of the O-rings.

NOTE: *Always use O-ring lubricant on the O-rings to increase the service life.*

- Reassemble the piston.
- Push the piston back up into the regulator body with a hex key.

NOTE: *Keep the piston straight, rotate it clockwise to prevent the new O-ring from catching or ripping.*

- Screw in the bottom plug.
- Screw on the spring tube until tight.

Check the setting and sealing of the regulator for correct pressure.

Isolation Valve Seal Replacement

NOTE: *Please make sure you identify the valve before disassembling it to make sure you have the correct seal kit available.*

Complete valve is part number FC-Valve-0001

Before you start, obtain the following replacement parts and equipment:

- FC-SK-0010 Parker Isolation Valve Seal Kit
- Refer to Spare Parts list for other items that you may need.

To remove the isolation valve seals:

CAUTION: Take care when disassembling the valve, as a lot of parts look similar.

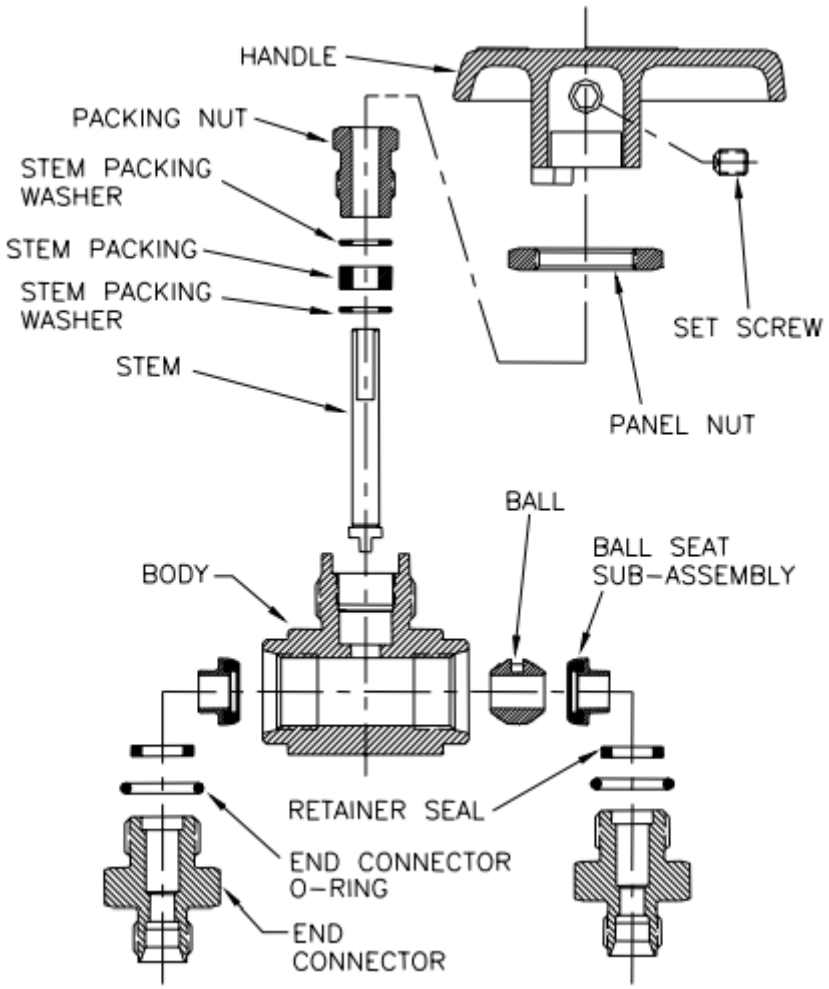
- De-pressurise the valve and remove it from the pipework.
- Remove the handle and panel nut to remove it from the cabinet.
- Disassemble the valve, as per the drawing below.
- Undo the packing nut and remove packing washers, packing and stem.
- Undo the end connectors and remove the seals, seat assembly and ball

Clean all components with a clean dry lint free rag.

CAUTION: O-rings that are subjected to Natural Gas at high pressure. Swell when exposed to air. Once swollen they must be replaced.

- Blow compressed air (100 psi) through all ports to remove any impurities that may damage the seals in operation.

CAUTION: Wear appropriate safety eye wear when using compressed air.



To replace the isolation valve seals:

CAUTION: Take care to keep all parts clean while assembling.

- Apply a light coating of approved grease to the ball then replace the ball and ball seat sub-assemblies, making sure the slot in the ball is at the top.
- Making sure the retainer seal and end connector O ring are in place, screw in the end connectors. Do not tighten yet.
- Locate the stem in the ball slot then replace the stem washers, stem packing and packing nut.
- Open and close the valve a few times to seat the ball valve before tightening the end connectors and packing nut.
- Reattach the valve to the cabinet and reconnect the pipework.
- Reapply gas to the valve and check for leaks.

Gas Operated Valve (option) Seal Replacement

CAUTION: Follow all safety precautions listed at the front of this manual.

Before doing any work on the valve, ensure that the power is off and the system pressure is reduced to atmospheric levels. Ensure that the pressure is removed from both the inlet and outlet ports of the valve and from the air supply line.

Before you start, obtain the following replacement parts and equipment:

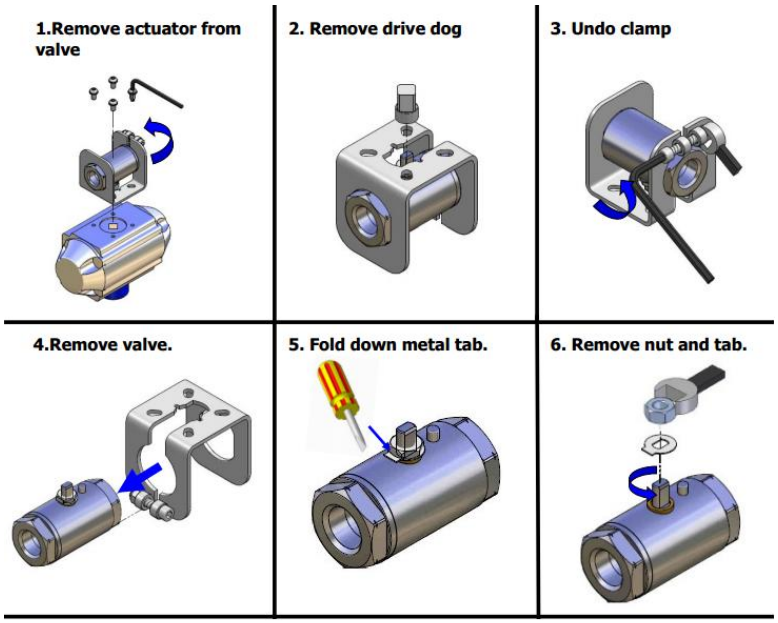
- FC-SK-0029 Oasis Gas Operated Valve Seal Kit

Always quote model and serial number of your dispenser when ordering.

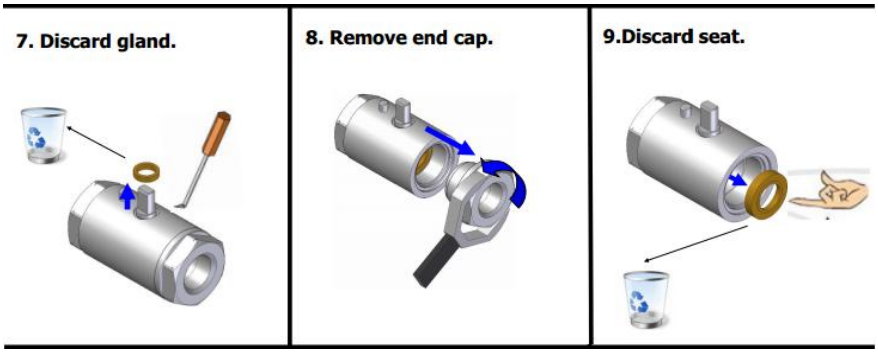
To dissemble the valve:

CAUTION: Take care when disassembling the valve, as a lot of parts look similar.

- Undo the pipework and remove the valve and actuator
- Undo the four Allen screws and remove the actuator from the valve
- Remove the drive dog (note orientation)
- Undo clamp (note orientation of clamp in relation to flow direction)
- Remove valve from the clamp
- Fold down metal locking tab
- Remove nut and tab



- Use a pick to pull out the stem seal and discard.
- Undo the end cap, remove the valve seat and discard it.

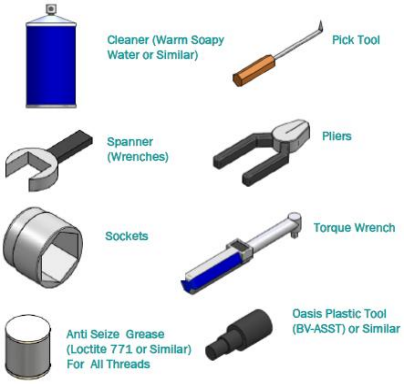


- Turn the valve stem to the “Closed” position then tap on the end of the ball valve with a wooden or soft plastic dowel (BV ASST) to remove it. Discard the ball.
- Push the valve stem down into the valve and remove it from the valve body. Discard the valve stem.

1. With a pick, carefully remove the second valve seat taking care not to scratch the internal surfaces of the valve. Discard the valve seat.
2. Remove and discard the O-ring from the end cap.

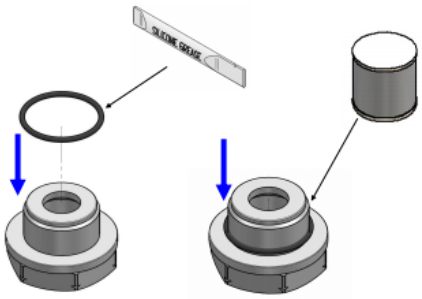
Service kit

Suggested service tools



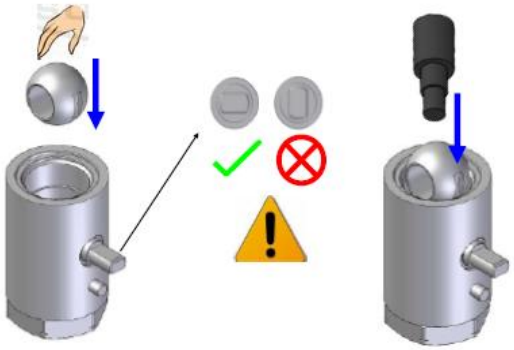
To replace the valve:

- Thoroughly clean and dry the valve body and end cap.
- Place the new O-ring on the end cap and lubricate with the supplied grease. Put an anti-seize compound on the threads.



- Fit the new valve seat making sure it is seated properly. Insert the valve stem into the valve body and pull it upwards until it clicks into place.

- With the valve stem in the “Closed” position, insert the ball so the slot engages with the stem.



- Insert the second valve seat
- Install the end cap and tighten to 60 N/m
- Install the valve stem gland then the lock tab and nut. Tighten nut to 3 N/m and bend the lock tab to stop the nut undoing
- Hold the valve stem with pliers and open and close the valve four or more times to bed in the seal. Leave the valve in the closed position
- Reinstall the bracket, drive dog and air actuator
- Reinstall the assembled valve and connect pipework
- Repower the dispenser and check for correct operation of the valve and for any leaks

DANGER: Do not use thread tape or sealing compounds on parallel SAE fittings.

CAUTION: O-rings that are subjected to natural gas at high pressure swell when exposed to air. Once swollen, they cannot be reused and must be replaced.

Bleed Valve Replacement

The bleed valve seldom gives problems and is not serviceable.

For a replacement valve and instructions if required, contact your Compac service agent with your Model and Serial numbers.

Pressure Relief Valve Replacement

The pressure relief valve seldom gives problems and is not serviceable.

For a replacement valve and instructions if required, contact your Compac service agent with your Model and Serial numbers.

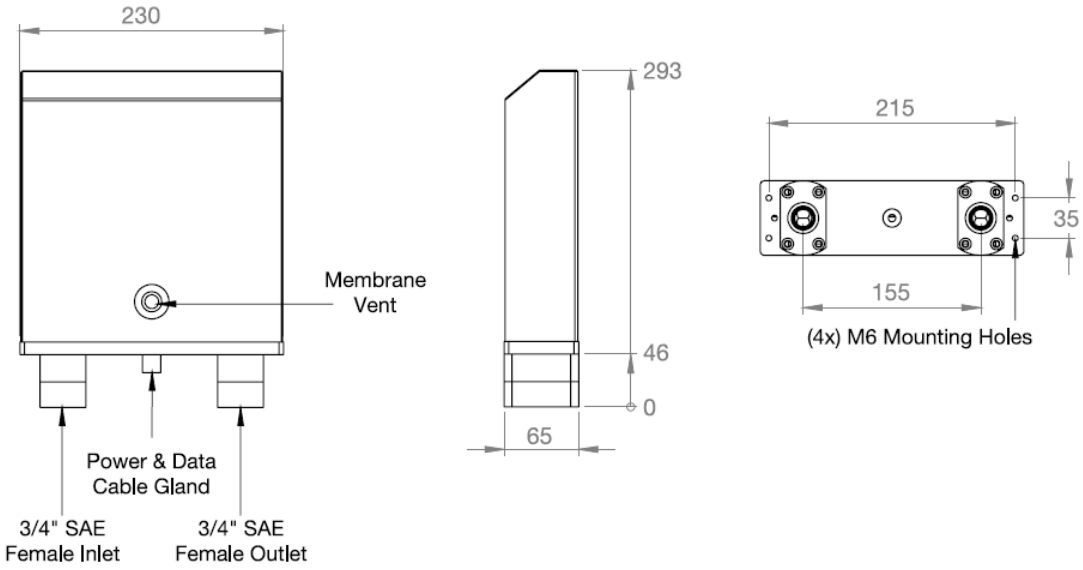
KG100 Meter Replacement

To remove the meter:

- Shut off gas supply and degas the meter.
- Remove the inlet and outlet pipes from the old meter.
- Unscrew the SAE fittings from the meter inlet and outlet.
- Take note of the position and orientation of the communications plug then unplug the meter cable from the K-Factor board and cut any cable ties that hold it in place.
- Undo the four bolts that hold the meter on the dispenser frame.
- Remove the old meter.

To replace the meter:

- Secure the new meter to the dispenser frame using the four bolts.
- Plug the communications cable into the K-Factor board.
- Screw the SAE fittings into the meter inlet and outlet.
- Install the inlet and outlet pipes.
- Cable tie the communications cable to avoid pulling or damage to it.
- Load the meter ID into the K-Factor board
- Pressurise the meter and check for leaks.
- Calibrate the meter in accordance with the instructions in the dispenser service manual.



Compac Breakaway Seal Replacement

This section describes how to replace the seal in a QBCI model breakaway.

The Compac Breakaway QBCI is only used on 15 kg/min models or on models where the vent is returned to the dispenser.

The excess flow end (female) and check valve end (male) should not require servicing. Both have metal to metal seats that are not affected by dirt.

Before you start, obtain the following replacement parts and ancillary equipment:

- A seal kit - Part number FC-SK-0011
  - 3 x O-rings
  - 2 x probe O-rings
- O-ring lubricant

To reassemble the breakaway:

In the event of a breakaway, check the O-rings in the male end of the breakaway for damage.

If they are damaged, replace the breakaway QBCI seals by following the steps below.

To replace the breakaway seals:

- Remove the old O-rings.

NOTE: *If you are dismantling the quick breakaway valve, make sure that you have a spare seal kit available. O-rings that are subjected to natural gas at high pressure swell when exposed to air and must be replaced.*

- Replace the old O-rings with the new lubricated O-rings.

NOTE: *Always use O-ring lubricant to prevent the O-rings from being damaged.*

If the breakaway parts under gas pressure for no apparent reason check that the pressure relief hole is clear. If the pressure relief hole is blocked, gas pressure will force the male and female ends apart.

To reconnect the breakaway:

- Make sure that both male and female receptacle breakaway parts are clean before reassembly.
- Check that the pressure relief hole is clear.

NOTE: *If the pressure relief hole is not clear, gas pressure will force the male and female ends to part.*

- Firmly connect the female and male connectors.

NOTE: *If the breakaway is not connected correctly when gas pressure is applied, it will come apart completely.*

Three-Way Refuelling Valve Seal Replacement

NOTE: *Make sure you identify the valve before disassembling it to make sure you have the correct seal kit available. For more information see Compac Technical bulletin CTB10015.*

Before you start, obtain the following replacement parts and equipment:

Seal Kit Part Number is FC-SK-0049
Three-way valve ball spindle is FC-SVK-0002 (optional)

To remove the three-way valve seals:

CAUTION: Take care when disassembling the valve, as a lot of parts look similar.

- De-pressurise the valve and remove it from the hose assembly.
- Disassemble the valve, as per the figure on the next page.

Clean all components with a clean dry lint free rag.

CAUTION: O-rings that are subjected to Natural Gas at high pressure. Swell when exposed to air. Once swollen they must be replaced.

- Blow compressed air (100 psi) through all ports to remove any impurities that may damage the seals in operation.

CAUTION: Wear appropriate safety eye wear when using compressed air.

To install new three-way valve seals:

- Cut the handle shaft back-up ring on an angle so it can be fitted onto the shaft

NOTE: *Check that the back-up rings are free of burrs and sharp edge.*

- Position the seals in the appropriate slots on the handle shaft.

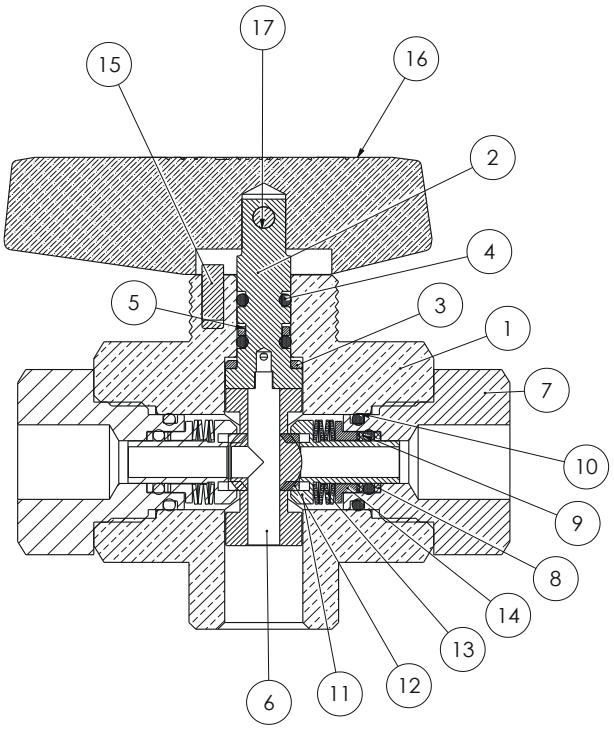
CAUTION: O-rings that are subjected to Natural Gas at high pressure swell when exposed to air. Once swollen they must be replaced.

- Insert the handle shaft into the valve body from the bottom.
- Insert the ball shaft into the valve body from the bottom.

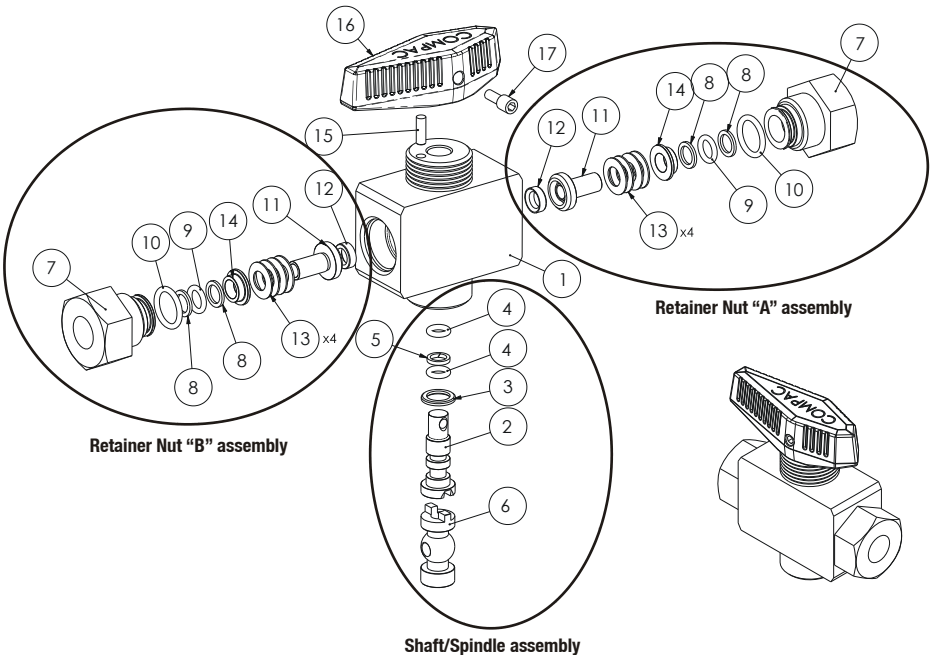
NOTE: *Ensure that the slotted handle shaft and ball shaft engage.*

- Insert the ball shaft seals in both sides of valve body.
- Insert the ball shaft retainers in either side of the valve body until the retainer face meets with body of the valve.
- Place the handle on the handle shaft and screw in the grub screw to lock it in place.

Compac Refuelling Valve Exploded View



ITEM NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	3-Way Valve Body	D-3WAY-B
2	1	3-Way Valve Handle Shaft	D-3WAY-HSH
3	1	Teflon Spindle Washer	D-3WAY-SPTW
4	2	Nitrile Oring ID4.5 x 1.8	D-ORING-008-N70
5	1	Teflon Spindle Back Up Ring	D-3WAY-SPTBR
6	1	3 Way Valve Ball Spindle	D-3WAY-BSP
7	2	3-Way Valve Retainer Nut	D-3WAY-RET
8	4	Teflon Inlet Back Up Ring	D-3WAY-ITBR
9	2	Nitrile Oring ID6.3 x 1.7	D-ORING-010-N70
10	2	Nitrile Oring ID11 x 1.8	D-ORING-013-N70
11	2	3-Way Valve Seal Shaft	D-3WAY-SSH
12	2	3-Way Valve Seal Shaft Seat	D-3WAY-SSHS
13	8	3-Way Valve Dome Washer	D-3WAY-DWSHR
14	2	3-Way Valve Seal Shaft Bush	D-3WAY-SSHB
15	1	3-Way Valve Handle Stop	D-3WAY-HSTP
16	1	3-Way Valve Handle	D-3WAY-H
17	1	3-Way Valve Handle Screw	D-3WAY-HGSCR



Refuelling Hose Replacement

To remove the refuelling hose:

- De-gas the dispenser.
- Undo the JIC hose connection at the dispenser's outlet block.
- Undo the connection between the hose and the nozzle assembly.

To install the new refuelling hose:

- Attach the nozzle assembly to the new hose.
- Attach the new hose to the dispenser at the outlet block.
- Re-gas the dispenser and push the **Start** button to fill the new hose assembly with gas.
- Check all hose connections for leaks by applying soapy water mixture and looking for bubbles.

Power Supply Fuse Replacement

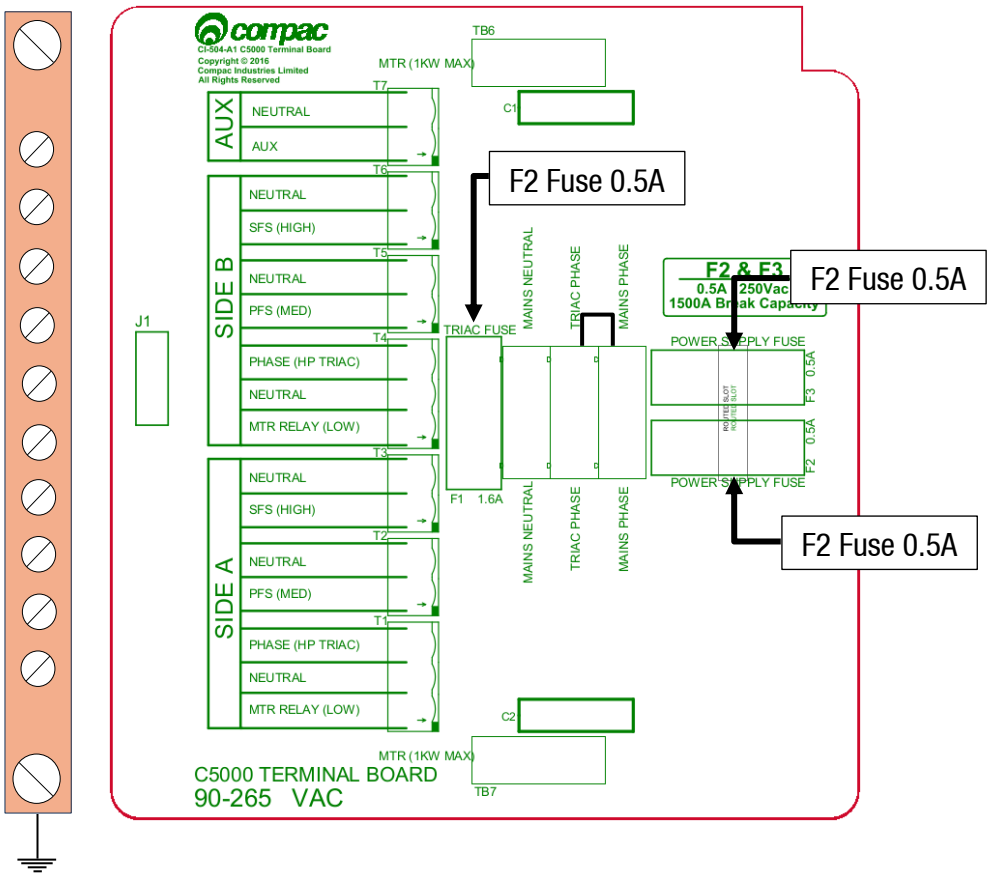
NOTE: *There are three fuses used in the C5000 Flame proof box.*

Before you start, make sure you have the following fuses with these ratings:

- F1 = 1.6 A
- F2,F3 = 0.5 A
- OR Compac fuse kit F-C5PWR-FKE

Fuse locations are displayed on the C5000 terminal board in the flameproof box.

NOTE: *Every new dispenser is supplied with one spare F1, F2 and F3 fuse, located on the inside of the flameproof box lid.*



To remove the C5000 terminal board fuse(s):

- Degas the dispenser.
- Switch off the power supply to the dispenser.

DANGER: Never remove any electrical components without first switching off the power to the dispenser. Failure to turn off the power could result in an electric shock.

- Remove the flameproof box lid.
- Remove the blown fuse and discard.

CAUTION: Take basic anti-static precautions by wearing a wristband with an earth strap.

To install the new C5000 terminal board fuse(s):

- Replace the blown fuse element with a new one of equal type and rating.

CAUTION: You must use the correct rating when replacing a fuse. The correct ratings are printed next to each fuse on the printed circuit board. Using the incorrect fuse rating may compromise the intrinsic safety of the dispenser.

- Replace the flameproof box lid, ensuring that the O-ring in the lid engages in its associated groove.
- Turn on the power to the dispenser.

DANGER: Do not power up the dispenser with the flameproof box lid removed.

NOTE: *Before replacing the lid on the flameproof box, make sure that the O-ring is not damaged and is seated properly in its groove. If the O-ring is damaged and needs replacing, replace it with an O-ring of the same size and specification (**176 N70**).*

Power Supply Replacement

Before you start, obtain the following replacement parts

- Replacement Power Supply part number **F-CP-C5K-PS**

To remove the C5000 Power Supply:

- De-gas the dispenser.
- Switch off the power supply to the dispenser.

DANGER: Never remove any electrical components without first switching off the power to the dispenser. Failure to turn off the power could result in an electric shock.

- Remove the flameproof box lid to gain access to the C5000 power supply board.

CAUTION: Take basic anti-static precautions by wearing a wristband with an earth strap.

- Undo the screws that hold the earth bar in the Flameproof box, taking care not to lose any of the spacers or other mounting hardware
- Undo the screws that hold the terminal board in the flame proof box and remove the terminal board.
- Undo the screws that hold any coms or GPIO board into the C5000 processor board.
- Undo the screws that hold the C5000 processor board in the flameproof box and remove the C5000 processor board.
- Undo the screws that hold the C5000 power supply board in the flame proof box
- Carefully slide out the C5000 power supply board to gain access to the plugs on the Com bus Cable that connects into the bottom PCB, and unplug this.

Completely remove the C5000 power supply board.

To install the new C5000 power supply:

- To install the new C5000 power supply, reverse the procedure above.

DANGER: Before replacing the lid on the flameproof box, make sure that the O-ring is not damaged, and is seated properly in its groove. If the O-ring is damaged and needs replacing, replace it with an O-ring of the same size and specification (**176 N70**).

NOTE: *It should not be necessary to recalibrate the dispenser. However, in some locations, this may be legally required as per the Calibrate the Meter section.*

Processor Board Replacement

Before you start, obtain the following replacement parts

- Replacement C5000 Processor part number **F-CP-C5K-PROCES**

To remove the C5000 processor board:

- De-gas the dispenser.
- If possible, record all the set-up data by accessing the **Parameter** switch and the **K-Factor** switch. The Software Set-Up and Upgrade section contains details on obtaining this information.
- Switch off the power supply to the dispenser.

DANGER: Never remove any electrical components without first switching off the power to the dispenser. Failure to turn off the power could result in an electric shock.

- Remove the flameproof box lid to gain access to the C5000 Processor board.

CAUTION: Take basic anti-static precautions by wearing a wristband with an earth strap.

- Undo the screws that hold any coms or GPIO board into the C5000 processor board.
- Undo the screws that hold the C5000 processor board in the flameproof box and remove the C5000 processor board.

To install the new C5000 processor board:

- Put the new C5000 board in place of the old one,

- Do up the screws that hold the C5000 processor board in the flameproof box.
- Do up the screws for any coms or GPIO board into the C5000 processor board.
- Reinstalled the lid on the flameproof box

DANGER: Before replacing the lid on the flameproof box, make sure that the O-ring is not damaged, and is seated properly in its groove. If the O-ring is damaged and needs replacing, replace it with an O-ring of the same size and specification (**176 N70**).

- Switch on the power supply to the dispenser.
- Press the K-factor button on the K-Factor board to sync the settings in the K-Factor board with the C5000 processor board
- Check dispenser operation

NOTE: *It necessary to recalibrate the dispenser.*

Temperature Pressure Board Replacement

Before you start, obtain the following replacement parts

Replacement Temperature and Pressure board part number: **F-CP-C5K-CNG-TP**

To remove the temperature pressure board:

- De-gas the dispenser.
- Switch off the power supply to the dispenser.

DANGER: Never remove any electrical components without first switching off the power to the dispenser. Failure to turn off the power could result in an electric shock.

- Access the temperature pressure board.

CAUTION: Take basic anti-static precautions by wearing a wristband with an earth strap.

Unplug all wiring from the temperature pressure board and remove the board from its position.

To install the new temperature pressure board:

- Put the new board in place of the old one and plug all the wiring back in the same order as before.

- Make sure the Dip switches are the same as the board that was taken out
- Turn the power to the dispenser back on.
- Check Dispenser operation. Checking Dispenser Operation.

NOTE: *It should not be necessary to re-calibrate the dispenser unless a pressure transducer or temperature probe needs to be replaced.*

Dispenser Software Upgrade/Replacement

You can upgrade the dispenser software via USB Stick. Make sure the USB stick is formatted as FAT32 and has the new dispenser software loaded on it.

CAUTION: Before working on the dispenser electronics, take basic anti-static precautions by wearing a wristband with an earth strap.

To record set-up data and tote information:

- Access the K-Factor board by opening the cover behind the main display.
- Record all the set-up data by accessing the **Parameter** switch and the **K-Factor** switch. Refer to Parameter Switch Settings and K-Factor Switch Settings to obtain this information.

  The following data is required from the **Parameter** switch :
  - Dispenser pump price.
  - Dispenser pump number.
  - Dispenser Setting
  - Software Program number, if you are upgrading to a new version.

  The following data is required from the **K-Factor** switch:
  - The K-Factor. There is a value for side A and side B in dual hose dispensers.
  - Configuration Code C.
  - The Density Factor.

- Record the tote information by pressing the nozzle switch or start button quickly five times

To install the new C5000 software

- Switch off the power supply to the dispenser.

DANGER: Never remove any electrical components without first switching off the power to the dispenser. Failure to turn off the power could result in an electric shock.

- Remove the flameproof box lid to gain access to the C5000 Processor board.
- Install the USB stick for the software that you want to install. If there is a coms or GPIO card installed on the C5000 processor board, you might have to remove it.
- Reinstalled the lid on the flameproof box

DANGER: Before replacing the lid on the flameproof box, make sure that the O-ring is not damaged, and is seated properly in its groove. If the O-ring is damaged and needs replacing, replace it with an O-ring of the same size and specification (**176 N70**).

- Switch on the power supply to the dispenser.
- The Display will display hold. The display will change from hold to calib, this mean that the software has been upgraded.
- Press the K-Factor board button on the K-Factor board to clear the caib from the display and sync the K-Factor board settings will the C5000 processor board.
- Check the dispenser operation Checking Dispenser Operation.

Meter Replacement

Before you start, make sure you have:

- A new Compac meter F-D-MTR350-C5

To remove the Meter:

- De-gas the dispenser.
- Remove the tubing from the meter inlet and outlet.
- Unscrew the SAE fittings from the meter inlet and outlet.
- Unplug the meter connections to the K-Factor board.
- Undo the four bolts that hold the meter on the dispenser frame.
- Remove the meter.

To install the new meter:

- Reverse the steps above to install the new meter.
- Enter the Meter ID of the new meter into the K-Factor board
- Enter the new meter K-Factor into the K-Factor board.
- Check the dispenser calibration with the master meter. Refer: Meter Calibration.

Unserviceable Parts List

The following parts are unserviceable on site and have to be returned to Compac for servicing.

Part	Comment
KG Meter	The KG meter: - Can have its firmware upgraded by approved service agents. - Can only be serviced by Compac. - Has no set-up functions. - Is self-characterising. The only function performed in the set-up is setting the K- Factor on the K-Factor Board and setting the Meter ID
C5000 Power Supply	
C5000 CPU Board	
Nozzles	
Solenoid Stem	Replacing the solenoid stem seal requires special tooling.

Dispenser Calibration

Meter Calibration

Calibrating the meter involves:

- Comparing the dispensers stated amount dispensed to actual amount dispensed.
- Adjusting the K-Factor if accuracy is not within the required tolerance.

NOTE: *The K-Factor for each new dispenser is factory set and usually does not need to be changed.*

To test the meter accuracy:

Record the dispenser's current density factor and set it to read out in kg Density Factor (dSF).

- Test the meter accuracy using Calibration Test Fill Procedure - Method 1 or Calibration Test Fill Procedure - Method 2.

To calculate the meter K-Factor:

- Make sure that the dispenser is idle.
- Press and release the **K-Factor** button on the K-Factor board until the K-Factor is displayed

Calculate the new K-Factor with the following formula:

$$New\ K\ Factor = existing\ K\ Factor \times \frac{True\ quantity}{Displayed\ amount}$$

For example:

$$Existing\ K\ Factor = 0.98$$
$$Displayed\ amount = 5.80$$
$$True\ quantity = 6.00kg$$
$$New\ K\ Factor = 0.98 \times \frac{6.00}{5.80} = 1.0138(4dp)$$

To input dispenser settings:

- Input the new meter K-factor.
- Set the density factor back to its original value. (**dSF**).

Calibration Test Fill Procedure (Method 1)

Method 1 of checking calibration involves filling a gas bottle and comparing the read-out scale reading with the dispenser display reading.

Before you start, make sure you have:

- Certified weighing scales with a read-out accuracy of +/- 20 g or better and a range of 0 – 120 kg
- A CNG cylinder with a fill and release valve

To carry out the calibration test fill procedure (Method 1):

- Put the CNG cylinder on the scales.
- Empty the CNG cylinder by venting it to the atmosphere.

DANGER: Always vent cylinders in a safe manner and safe location.

- Zero the TARE read-out on the scales.
- Fill the CNG cylinder from the dispenser.
- Compare the read-out weight (True Quantity) on the scales with the dispenser display (Display Amount).

If the results are not within 0.5% of each other, you will need to change the calibration, as per the Calculate and Set the New K-Factor section.

Calibration Test Fill Procedure (Method 2)

Method 2 of checking calibration involves filling a vessel and comparing a master meter reading with the dispenser display readings.

This method assumes that the master meter is sufficiently accurate and reliable enough to be considered a good reference.

Before you start, make sure you have:

- A master meter

To carry out the calibration test fill procedure (Method 2):

- Plug the dispenser refuelling probe into the master meter, and then plug the master meter refuelling probe into a vehicle to fill.
- Turn on the master meter valve, if applicable, and reset to zero.
- Fill the vehicle from the dispenser.
- Turn off the dispenser refuelling valve and master meter valve, if applicable.
- Compare the master meter read-out (True Quantity) with the dispenser display (Display Amount).

If the results are not within 0.5% of each other, you will need to change the calibration, as per the Calculate and Set the New K-Factor section.

Pressure Transducer Calibration

Calibrating the dispenser pressure transducers is done by setting the Pressure probe calibration points. The following procedure is how to set these points.

NOTE: *The pressure transducers are calibrated at the factory and usually do not require recalibration.*

To set pressure probe calibration points

- Degas the dispenser and close all outlet isolation valves
- Turn on the gas to the dispenser.
- Remove the nozzle from its holster or press the start button, allowing gas to pass through the dispenser.
- Slowly open the outlet isolation valve and watch as the pressure gauge begins to rise. Shut the valve when the reading is approximately 10 bar.
- Hang up the nozzle or press the stop button.
- Set the uA 1L (low pressure probe 1 calibration point)to 10. If there are 2 pressure transducers per side set uA2L (low pressure probe 2 calibration point) as well
- Remove the nozzle from its holster again or press the start button.
- Increase the gauge pressure to approximately 200 bar.
- Hang up the nozzle or press the stop button.
- Set the uA 1h (high pressure probe 1 calibration point)to 200. If there are 2 pressure transducers per side set uA2h (high pressure probe 2 calibration point) as well
- Check current calibrated pressure is the same as the Pressure gauge

Ambient Temperature Sensor Calibration

Calibrating the Ambient Temperature Sensor involves:

- Comparing the dispensers stated temperature to the actual temperature.
- Adjusting the ambient temperature reading if it is found to be incorrect.

To test the sensor accuracy:

Using a calibrated temperature meter, determine the temperature of the body of the dispenser Ambient temperature sensor.

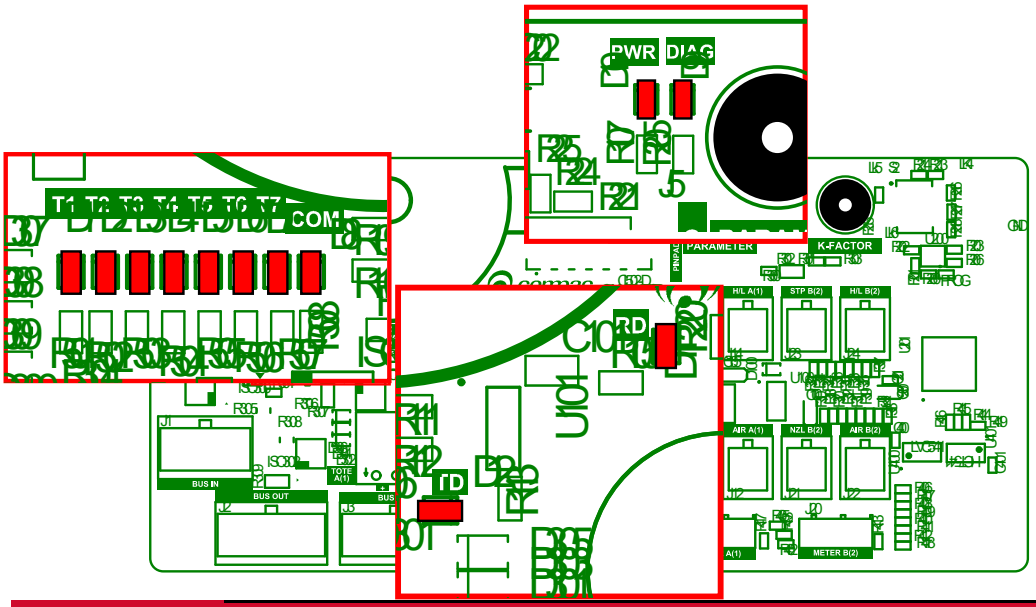
Access the current dispenser ambient temperature reading.

To adjust the dispenser reading:

Adjust the dispenser's ambient temperature reading to match that of the calibrated temperature meter.

Indicator LEDs

LED indicators are used to provide power, output status, and diagnostic information.



Indicator LEDs	LED	Reference	Description
	Power	D10	Indicates power is being supplied to the k-Factor a board. If it is not lit there could be no power or there is a problem with the combus cable
	RD	D11	Flashes when receiving Combus messages. This indicates the C5000 processor is sending messages to K-Factor board
	TD	D12	Flashes when sending messages on the Combus
	Diag	D9	Provides diagnostic information (see below).

Diagnostic LED	The diagnostic LED D9 flashes in 2 different states when the processor is working properly, as outlined in the table below.		
	State	**LED Flashes**	**When**
	1	Slowly	The hose is idle and in stand-alone mode.
	3	Quickly.	The start button is being pressed or the nozzle has been lifted from its holster.

Appendix

The C5000 is ATEX approved for use in a Class 1, Zone 1 hazardous area. Dispensers are wired to Class 1, Zone 1 Australian and European standards.

Approval numbers appear on labels attached to the C5000 and the flameproof junction box lid.

ATEX Approval Marking on the Equipment	Equipment or Protective System	EC - Type Examination Certificate Number
IECEx TRA 17.0002X	C5000 Power Supply	Ex db [ib] IIA T4 Gb (-40°C ≤ Ta ≤ +65°C)
IECEx ExTC 18.0011X	C5000 K-Factor Display	Ex ib IIA T4 Gb -40°C ≤ Tamb ≤ +70°C
IECEx ExTC 18.0016X	C5000 Compac Coriolis Meters - V50 and KG100	Ex ib IIA T4 Gb -40°C ≤ Tamb ≤ +70°C
IECEx ExTC 19.0010X	C5000 TP Slave Display	Ex ib IIA T4 Gb Tamb = -40°C to +70°C

Specifications

Model Specifications

There are various CNG Dispenser models and options available.

The models include:

- Legend frame or Laser frame.

The options include:

- One, two or three lines.
- Single or dual hose.
- Fixed pressure final cut-off or temperature compensated final fill cut-off.
- Standard, high or ultra-high flow.

Model Numbers		Standard	High Flow	Ultra-High Flow
Laser	**Single**	L-CNG15	L-CNG50 L-CNG50-15	L-CNG80 L-CNG80-15
	Dual	L-CNGD15	L-CNGD50	L-CNGD80
Legend	**Single**	LGDCNG15	LGDCNG50 LGDCNG50-15	LGDCNG80 LGDCNG80-15
	Dual	LGDCNGD15	LGDCNGD50	LGDCNGD80
		LE3KG25D (Pakistan only)		

Technical Specifications

Operating Conditions:

Compac CNG Dispensers (excluding hose assembly) are designed to operate within the atmospheric environment. Gas parameters are outlined below.

CNG Dispensers require the following operating conditions:

CNG Dispensers require the following operating conditions:		
	Air temperature range	- 25 °C to + 55 °C
	Air humidity range	10% to 95%
	Gas type	High pressure natural gas (CNG)
	Gas temperature	- 40 °C to + 80 °C (continuous) - 55 °C to + 80 °C (intermittent)
	Maximum water Dew Point	- 32°C at 250bar
	Maximum Working Pressure (Inlet)	275bar (350 bar option)
General Specifications	Power Requirements	230V +/-10%, 50Hz, 2A

Specific Specifications	Standard Model	High-Flow Model	Ultra-High-Flow Model
Flow (The maximum flow rate is not only determined by the type of dispenser but also depends on the size of the refuelling hose, the model of the breakaway, the type of refuelling nozzle, and the vehicle coupling.)	1 – 15 kg /min	1-50 kg /min	1 – 80 kg /min
Pressure rating (350 bar options utilise air actuated valves and require a compressed air supply.)	275 bar (350 bar option)	275 bar (350 bar option)	350 bar
Accuracy	+/- 1.0%	+/- 1.0%	+/- 1.0%
Meter	Compac KG100 coriolis mass flow	Compac KG100 coriolis mass flow	Compac KG100coriolis mass flow
Internal Pipework	1/2”	1/2”	1/2” or 3/4"
Refuelling hose	3/8”	1/2”	1/2” or 3/4"
In-line breakaways	Various available	Various available	Heavy duty
Refuelling valve	NGV1 or NZ 7/16" probe	NGV1 or NGV2	NGV2
Laser (without hoses or high masts)	830W x 450D x 1608H	830W x 450D x 1608H	830W x 450D x 1608H
Legend (without hoses)	850W x 425D x 2355H	850W x 425D x 2355H	850W x 425D x 2355H
Minimum flow cut off	0.5 -10 kg/min (settable)	0.5 -10 kg/min (settable)	0.5 -10 kg/min (settable)
Maximum flow cut off	10 - 99 kg/min (settable)	10 - 99 kg/min (settable)	10 - 99 kg/min (settable)

Component Specifications

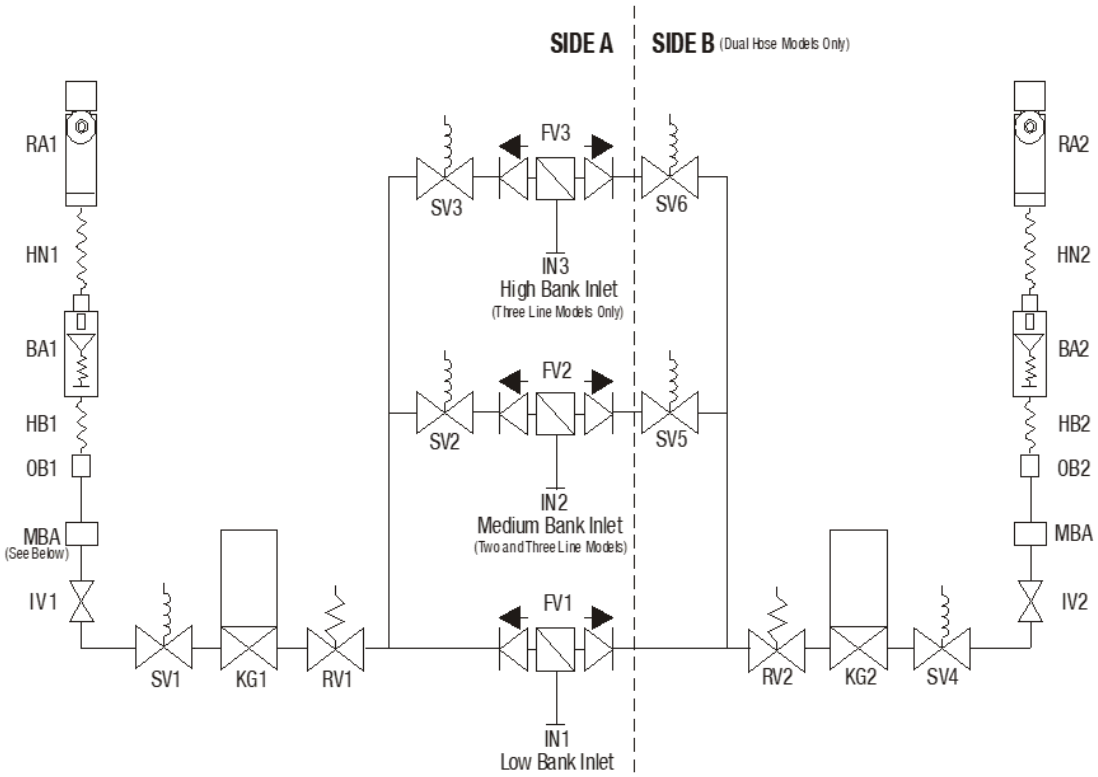
See below for information on serviced equipment.

Equipment Item	Compac Code	Specifications	Description
Coalescing filters		Grade 10 Coalescing Filter	The coalescing filters are designed to trap dirt, moisture, oil, and other debris that may damage the valve seals. A Grade 10 coalescing filter will remove 95% of liquid aerosols in the 0.3 to 0.6 micron range.
Compac filter/check valve	FCVCI-12-SS	3/4” SAE female inlet. 2 x 3/4” SAE female outlets. 350 bar max.	The filter/check valve prevents back-flow from the high storage to the medium and low storage, and from the medium storage to the low storage. The valve has a metal to metal seat and should not leak or require servicing.
Solenoid valve	SCI-12-SS	3/4” SAE female inlet. 3/4" SAE female outlet. 275 bar max.	The high flow solenoid valve is designed to control the flow of gas in a CNG Dispenser. Between the inlet and outlet, the valve opens with a differential pressure of more than 275 bar.
Regulator valve	RCI-12-SS	3 x 3/4" SAE female inlets. 3/4" SAE female outlet. 275 bar max.	The regulator is a high flow valve, designed to limit the outlet pressure of the dispenser. In the **fixed pressure dispenser**, the regulator limits the final fill pressure to 200 bar. In the **temperature compensating dispenser**, the regulator acts as a safety device to limit the amount of over-pressure if the main solenoid fails to shut off at the correct pressure.

Equipment Item	Compac Code	Specifications	Description
Three-way refuelling valve	RVCI-04	1/4" NPT ports 250 bar max.	The three-way valve is designed specifically for refuelling CNG vehicles. The inlet, outlet, and exhaust ports are designed to be used as shown in the figure in the Dispenser Component Location section. Do not re-pipe the valve in a different configuration.
Nozzles	7/16" NZ Probe 1-15 kg/min	1/4" NPT port.	In New Zealand, the probe complies with NZS 5425.1. In Australia, the probe complies with AS/NZS 2739.
	OPW CT1000 1-50 kg/min	9/16" SAE inlet port 200 bar max.	Nozzles allow refuelling for high pressure NGV applications.
	OPW CT5000 1-80 kg/min	7/8" SAE inlet port 250 bar max.	Nozzles allow refuelling for high pressure NGV applications.
Inline breakaways	QBCI-09 1-15 kg/min	9/16" SAE inlet & outlet ports	Brass inline breakaway with reconnectable design.
	OPW ILB- 1 1-50 kg/min	9/16" SAE inlet & outlet ports. 250 bar max. 150 to 200 lbs. (668 to 890 N) breakaway force.	Inline breakaway with reconnectable design. Corrosion-Resistant with high flow for all NGV-1 nozzles.
	OPW ILB-5 1-80 kg/min	7/8" SAE inlet & outlet ports. 310 bar max. 150 to 200 lbs. (668 to 890 N) breakaway force.	Inline breakaway with reconnectable design. Corrosion-Resistant with high flow quick fuelling of large storage vehicles.
Isolation ball valve			Parker 2-way 8 series ball valve

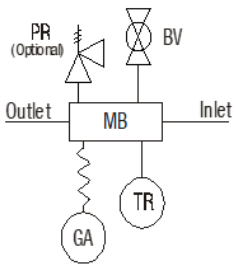
Equipment Item	Compac Code	Specifications	Description
Display	GD1, GD2 or GD3		The display has six 1" digits for price, six 1" digits for quantity and four 3/4" digits for unit price. (Available with one, two or three unit price displays.)
Pressure Gauge			Dual scale pressure gauges are available with psi and either bar, MPa, or kPa. CE Approved
Hose		Parker single and twin line hose. 3/8", 1/2" or 3/4".	The hose is specifically designed to dissipate static electrical build-up and wear resistance. Each hose assembly must be properly grounded. The temperature range for the hose is -40 to +66°C.

Hydraulic Layout



FV	Filter Check Valve	OB	Outlet Block
SV	Solenoid Valve.	HB	Hose from Outlet to Breakaway
RV	Regulator Valve	BA	Inline hose breakaway coupling
KG	KG80 Mass Flow Meter	HN	Hose from Breakaway to Nozzle
IV	Isolation Valve	RA	Refueling Nozzle Assembly

MBA
Manifold Block Assembly



MB	Manifold Block	
GA	Pressure Gauge	
TR	Pressure Transducer	(Temperature compensated models only)
PR	Pressure Relief Valve	
BV	Bleed Valve	

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.

Fitting replacement and servicing:

When replacing, disassembling or tightening fittings:

1. De-gas the dispenser
2. Switch off the power supply to the dispenser.

DANGER: *Never remove any electrical components without first switching off the power to the dispenser. Failure to turn off the power could result in an electric shock.*

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

    - Connect Threaded SAE Fittings
    - Connect Adjustable threaded SAE Fittings
    - Connect Compression Fittings

Connecting SAE Fittings

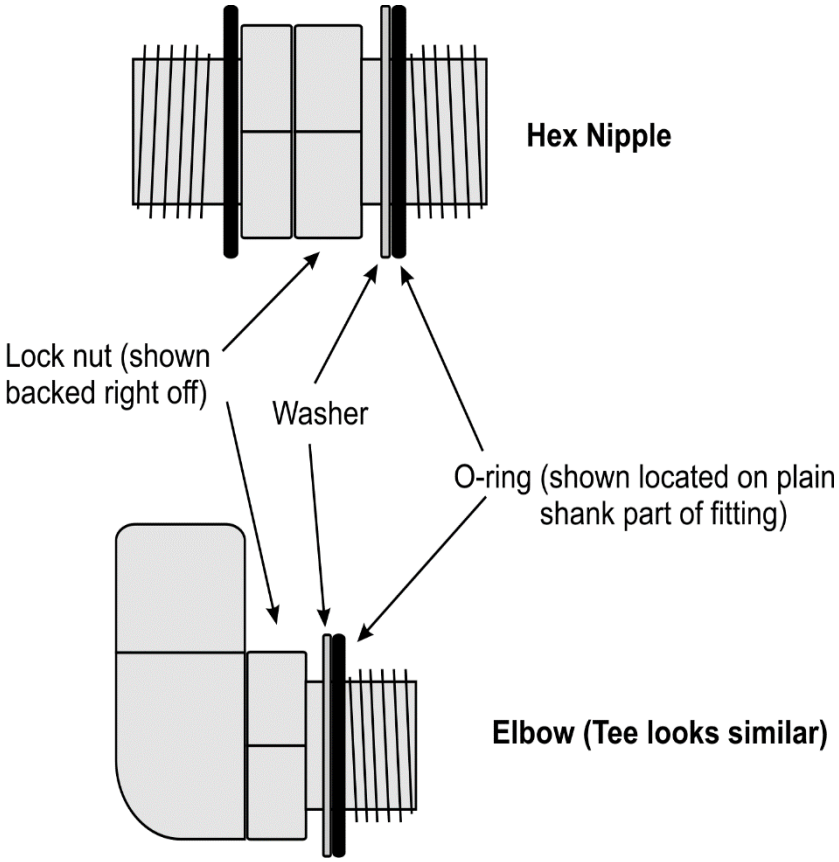
1. Inspect the components ensuring that the threads and sealing faces are clean and undamaged.
2. Lubricate the O-ring with a light oil.
3. Screw the components together by hand until the O-ring touches the face of the port.
4. Tighten the fitting firmly with a suitable spanner.

CAUTION: *Never use thread tape on SAE parallel fittings.*

Connecting Adjustable SAE fittings

1. Inspect the components ensuring that the threads and sealing faces are clean and undamaged.
2. Lubricate the O-ring with a light oil.
3. Back off the lock nut fully so that the O-ring and washer are on the plain shank of the fitting.
4. Screw the components together by hand until the O-rings touch the faces of the ports.
5. Position the components to the desired alignment.
6. Hold the fitting in position and firmly tighten the lock nut.

CAUTION: *Never use thread tape on SAE parallel fittings.*



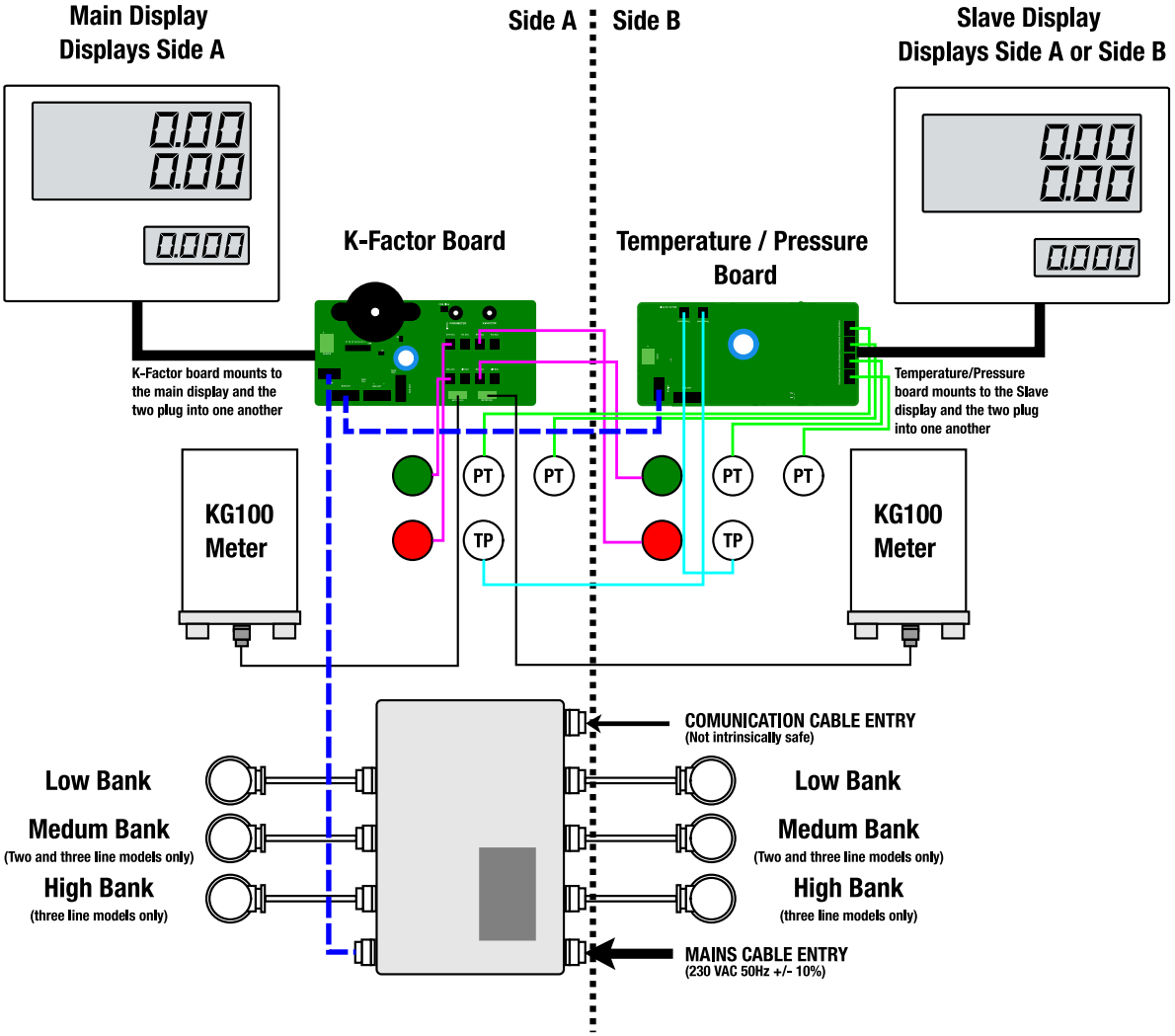
Connecting Compression Tube Fittings

1. Ensure the end of the tube is square, not deformed, clean and free from burrs inside and out.
2. Remove the nut from the fitting and ensure the two ferrules are present and correctly orientated.
3. Replace the nut and insert the tube ensuring it is located hard up against the internal shoulder of the fitting.
4. Pre-swage the tube by tightening the nut by hand and then a further 1 1/4" turns.
5. Disassemble the fitting and inspect the pre-swaging. The ferrules should square and unable to be removed from the tube.
6. 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.*

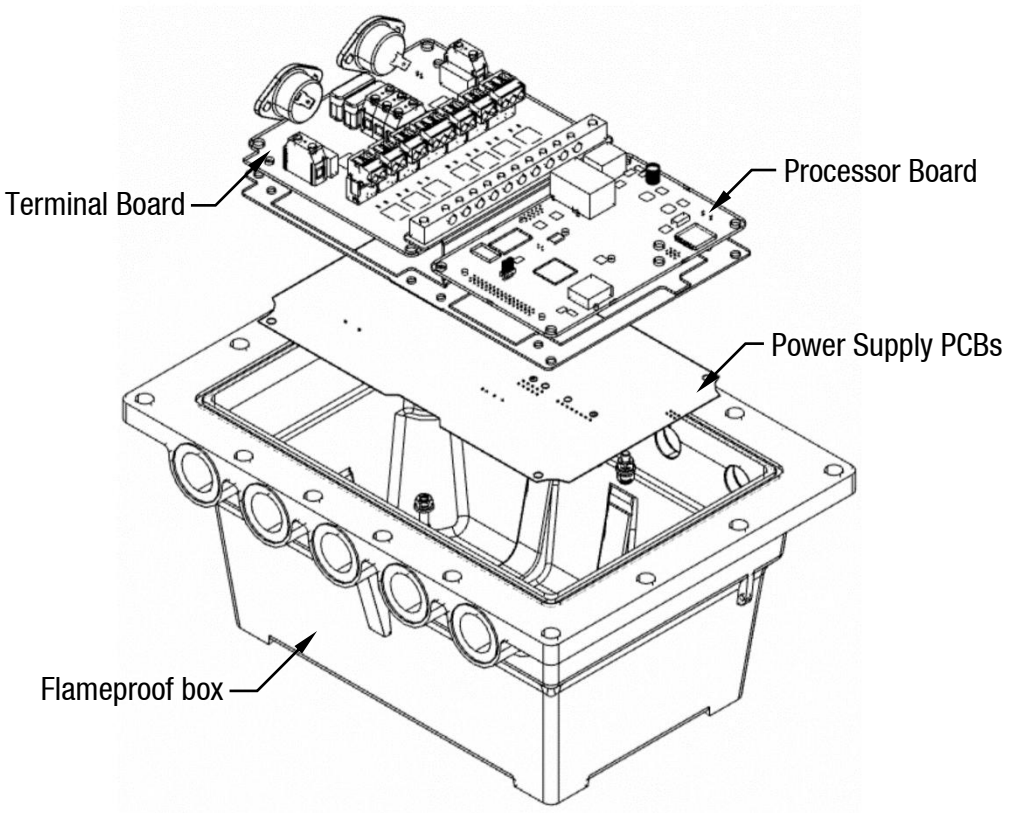
Electrical Drawings

CNG Dispenser Electrical Schematic



Power Supply

The C5000 power supply is found within the flameproof box, located on the unit. The power supply contains the processor board and the terminal board.

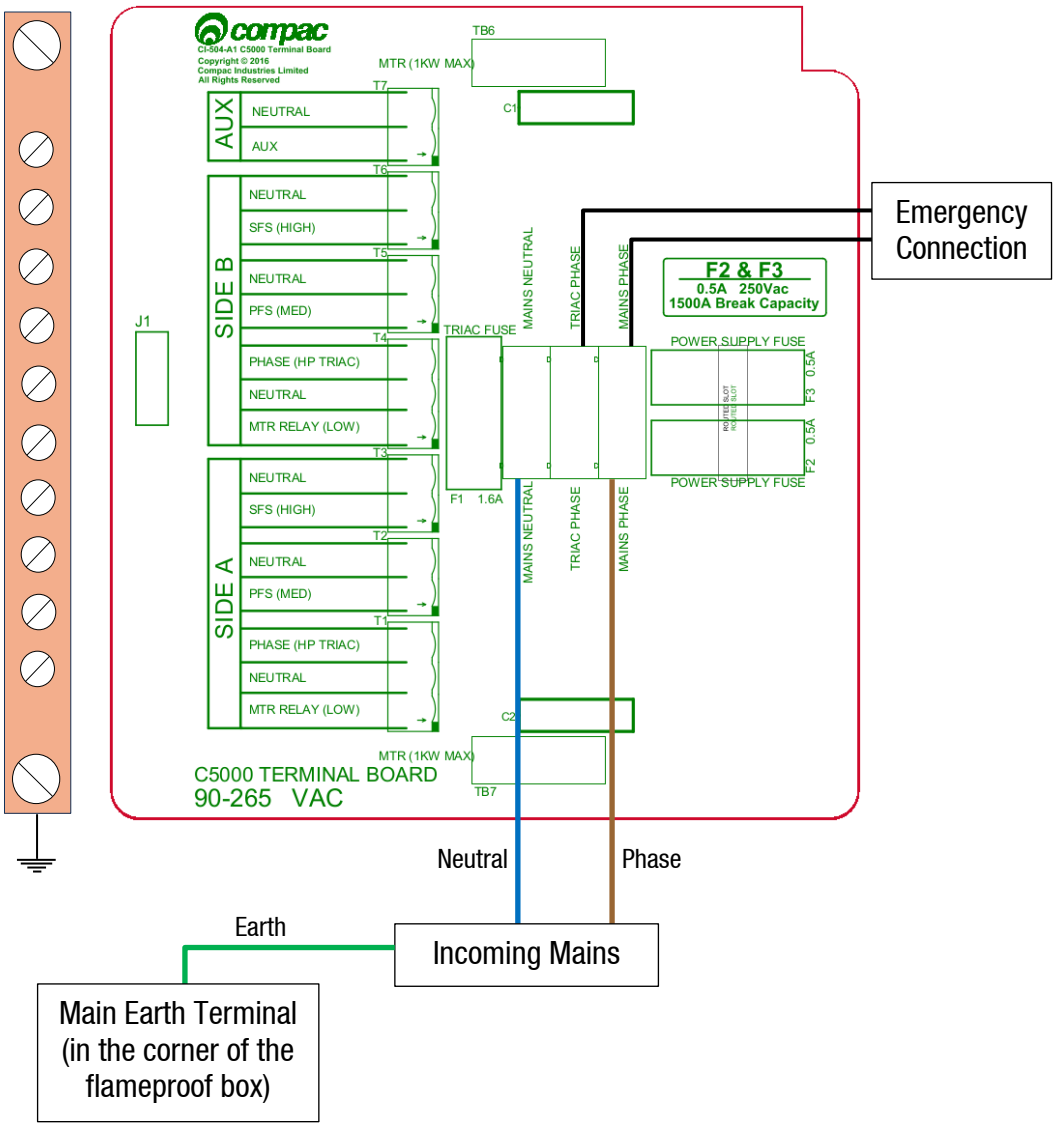


Incoming Mains

Incoming mains connections should be brought in to the terminal board.

An emergency stop connection, if desired, can also be wired into the terminal board, shown below. This will be in place of the normal loop between the triac and main phases. Wires have standard colours which are shown. In case these are unclear, the colours are as follows:

- Incoming mains phase: Brown
- Incoming mains neutral: Blue
- Incoming mains earth: Green/Yellow



Solid State Relays (Triacs)

There are 7 separate solid state relays (small triacs) on the C5000 terminal board. The output terminals for these triacs are T1 to T7. See below for information about the use of these outputs.

Power Terminal	Function
T1	Solenoid Low Bank Side A
T2	Solenoid Medium Bank Side A
T3	Solenoid High Bank Side A
T4	Solenoid Low Bank Side B
T5	Solenoid Medium Bank Side B
T6	Solenoid High Bank Side B
T7	Auxiliary Output for Fill Active

Auxilliary Output for Fill active and Beacon lights

In Single Hose CNG Dispensers, the 230V low current output T7 is turned ON for the duration of the fill.

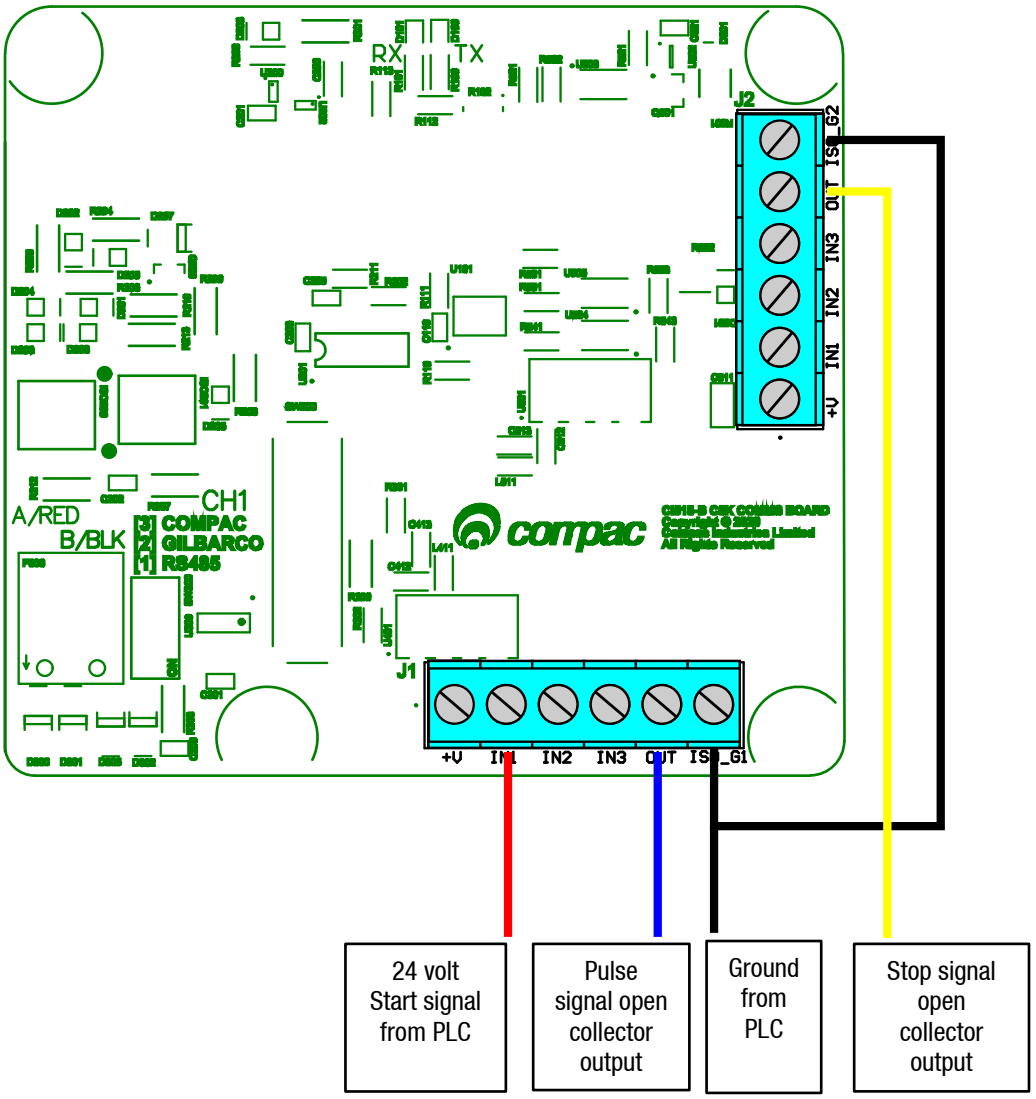
This can be used to switch a contactor or relay to operate an external light to indicate a fill is in progress (example a Beacon Light)

GPIO wiring for remote push to start

In this application the start signal will wire to IN1 terminal on the J1 connector. The signal from the PLC should be at least a 0.5 second 3 to 24 volt DC pulse.

The end of fill indicator is wired to the OUT terminal on the J2 connector. This is an open collector output. Depending on the PLC you might have to install pullup resistors on the input to the PLC.

The Output pulse signal is to be wired to the OUT terminal on the J2 connector. Like the end of fill indicator, the output is and open collector.


RX
TX
J2
ISO_G2
OUT
IN3
IN2
IN1
+V
A/RED
B/BLK
CH1
[3] COMPAC
[2] GILBARCO
[1] RS485
compac
J1
+V
IN1
IN2
IN3
OUT
ISO_G1
24 volt Start signal from PLC
Pulse signal open collector output
Ground from PLC
Stop signal open collector output

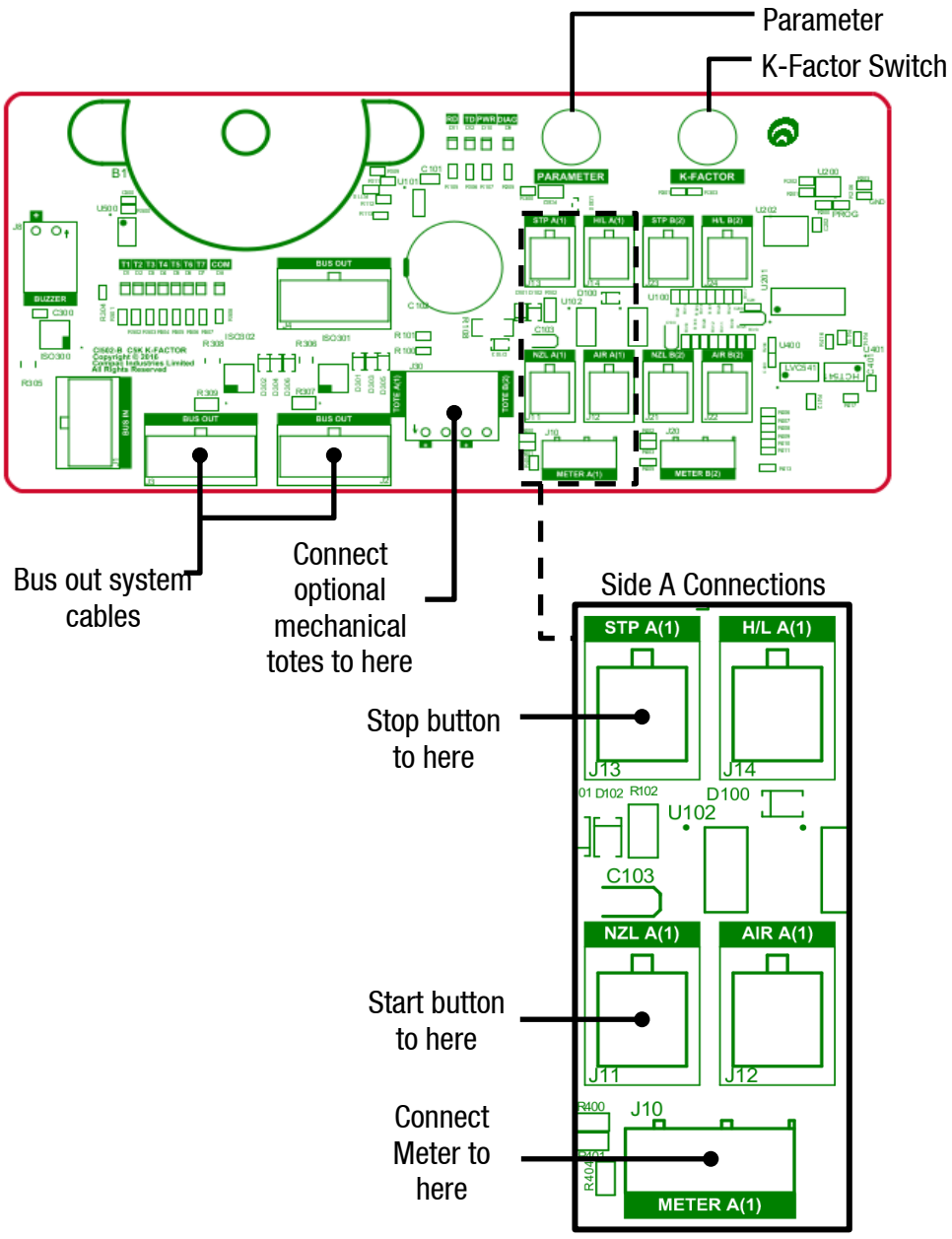
C5000 K-Factor Board

The Compac C5000 K-Factor board is the Main Calculator in the Compac Dispenser. It communicates to the KG100 meter to get the current mass and returns it to the C5000 Processor board. It also reads the Start and stop buttons for both sides (side A and side B).

The Compac C5000 K-Factor board also is a user interface enabling the setup operation of the dispenser .

These set-up interfaces (located on the drawing) are:

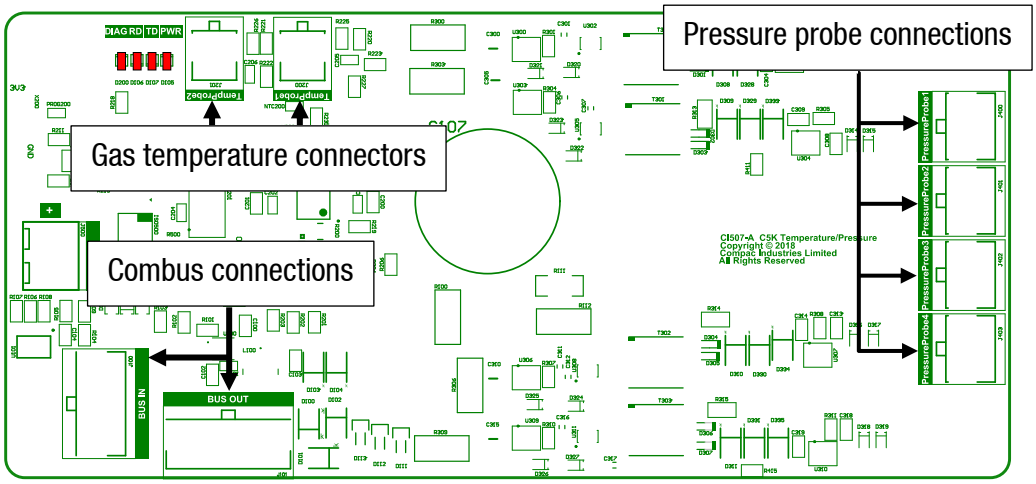
- The **Parameter** switch.
- The **K-Factor** switch.



Temperature Pressure Board

The Temperature pressure board is responsible for the following tasks:

- Communication to the slave display
- Reading the Gas temperature probe
- Reading the ambient temperature
- Reading the Pressure transducer
- Communication to the C5000 Processor board



Dispenser Spare Part

The following lists contain the most commonly used spare parts and kits for Servicing Compac Dispensers. They are not an exhaustive list of all possible parts for current or historical Dispensers. If a part you want to order is not listed, please contact the Compac spare parts department for a complete listing.

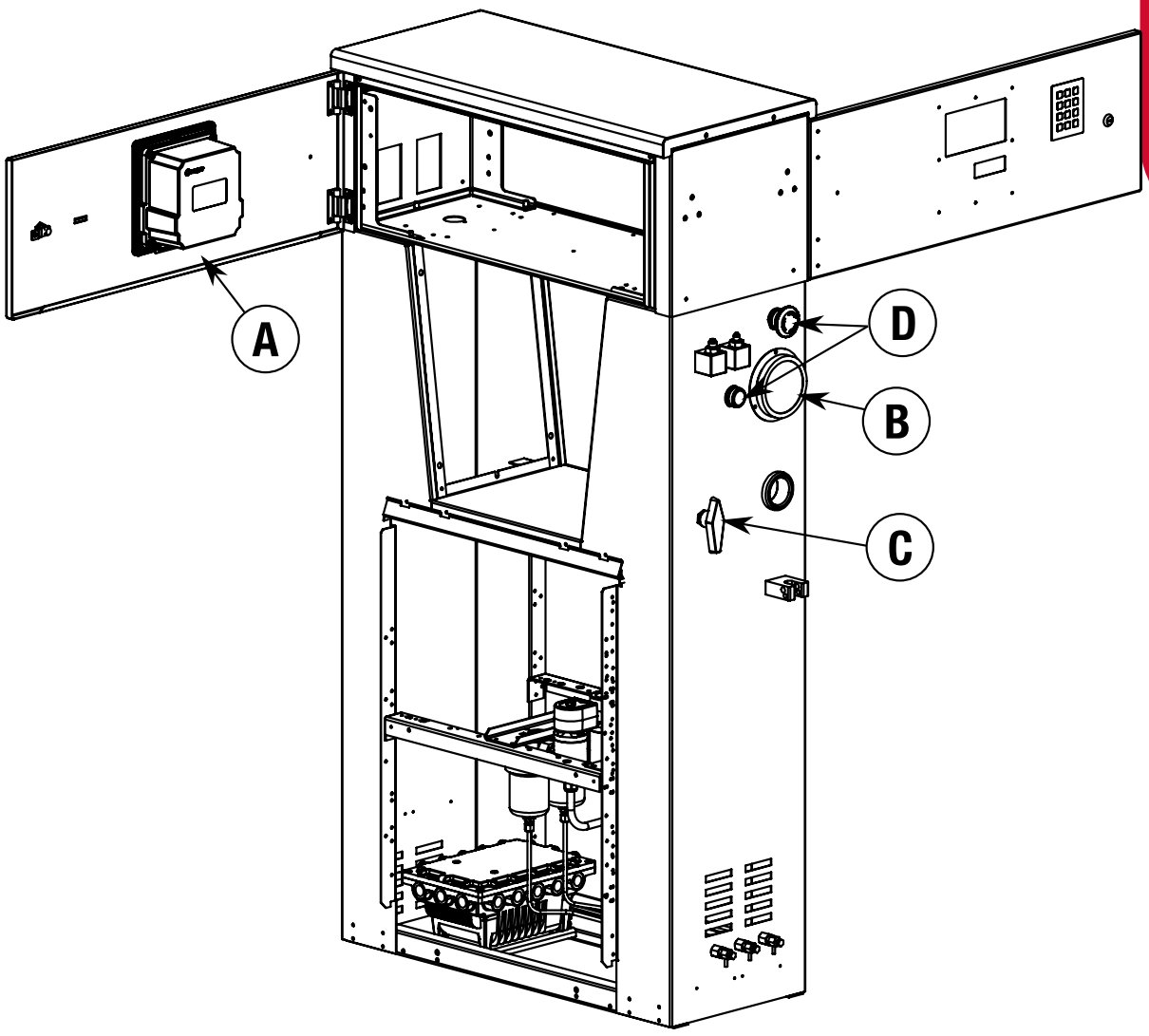
Main Dispenser Spare Parts

See diagram on the next page for part locations.

Item	Part Number	Description
A	F-CP-C5K-DSPY7D1	C5000 7D1 DISPLAY
	F-BA-TOTE-A-K	Electromechanical Tote With 200mm Cable
	F-CP-PRESET-3KMB	3 Key Membrane Keypad - Horizontal
	F-CP-PRESET-3KMV	3 Key Membrane Keypad - Vertical
	F-CP-C5K-PSET	C5000 Preset interface board
	F-CP-C5K-CNG-TP	C5000 Temperature/Pressure board CI507
	F-CP-C5K-KFACT	C5000 K-Factor board CI502
B	FC-GAUGE-0001	Dual Scale Pressure Gauge, Units Of Measure In "bar + psi" 100mm. Used on units up to serial number 07F-XXXXXX July 07
	FC-GAUGE-0003	Dual Scale Pressure Gauge, Units Of Measure In "bar + psi" 100mm. Used on units from serial number 07g-XXXXXX July 07 onwards
	FC-GAUGE-0005	Dual Scale Pressure Gauge, Units Of Measure In "kg/cm2 + psi" 100mm
	FC-GAUGE-0006	Dual Scale Pressure Gauge, Units Of Measure In "Mpa + psi" 100mm
C	FC-VALVE-0001	Isolating Valve (Complete). Parker 2 Way 8 Series Stainless Steel
	FC-SK-0010	Isolating Valve Seal Kit, Parker 2 Way 8 Series
	FC-B8-HLDBLK	Isolating Valve Handle (Black), Parker 2 Way 8 Series
	FC-B8-HDLRED	Isolating Valve Handle (Red), Parker 2 Way 8 Series
	FC-B8-HLDGSCR-SS	Isolating Valve Handle Grub Screw, Parker 2 Way 8 Series

Item	Part Number	Description
D	**FC-PBSW-ESTOP**	Red Stop Button With Mushroom Head
	FC-PBSW-START	Green Start Button
E	**F-D-MTR350-C5**	KG100 Mass Flow Meter
	Compac Hydraulic Module	See Hydraulic Module Spare Parts

Main Dispenser Parts Location



Other Dispenser Parts Not Shown in Drawing

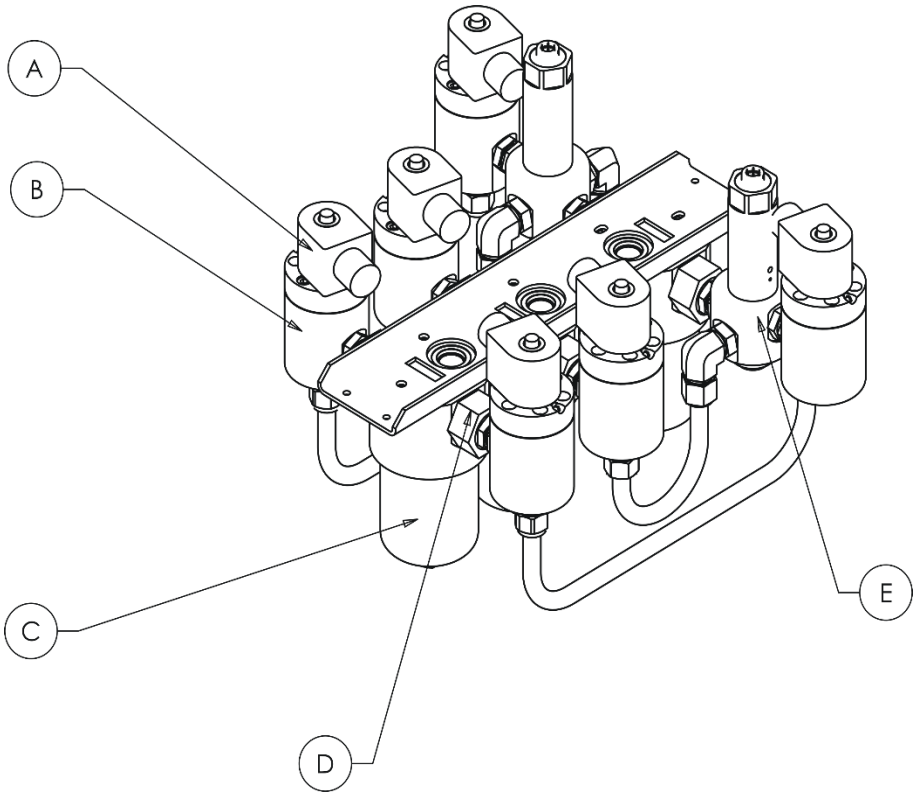
Part Number	Description
F-CU-CNGPRMS5200	C5000 MS5200 CNG PRESSURE SENSOR
F-CU-CNG-TEMPSEN	CNG Temperature Sensor
F-CP-C5K-TERM	C5000 Termainal board CI504
F-CP-C5K-GPIO	C5000 GPIO board CI518
F-CP-C5K-PROCES	C5000 Proessor board CI500
F-CP-C5K-PS	C5000 Power supply CI505
F-CP-C5K-COMMS	C5000 Coms interface board
FC-VALVE-0002A	OASIS BV704 Air Actuated Ball Valve incl. actuator
FC-SK-0029	Service kit for OASIS Air Actuated Ball Valve
P-SOLND-3W-115	Parker Pneumatic Air Solenoid Valve (without coil)
FC-COIL-0001	Coil for Parker Pneumatic Air Solenoid Valve
D-VALVE-BV-1/2PM	Parker Outlet Isolation Valve (for Dispensers with ¾” tubing)
FC-SK-0010	Service kit for Parker Outlet Isolation Valves

Nozzles and Breakaways

Part Number	Description
FC-VALVE-0032	Three way valve with stainless steel body with return pipe (replaces FC-VALVE-0005)
FC-VALVE-0033	Three way valve with stainless steel body without return pipe (replaces FC-VALVE-0009)
FC-SK-0048	Seal kit for three way valve with stainless steel body
FC-SVK-0002	Three way valve ball spindle (order with FC-SK-00048 if required)
FC-PROBE-NZ	NZ 7/16" CNG Refuelling Probe With O-rings
FC-NOZL-CT1000S	NGV1 Type 1 CNG Nozzle With Integral 3-Way Valve, OPW / Sherex CT1000

Part Number	Description
FC-NOZL-CC600	NGV1 Type 2 CNG Nozzle, OPW CC600P30NFS 3000PSI
FC-NOZL-NGV1	NGV1 Type 2 CNG Nozzle, Parker FM301-6FOPC
FC-NOZL-CT5000S	NGV2 CNG Refuelling Nozzle OPW CT5000S (Includes 3/8" Tube To 1/8" NPTF Stainless Steel Fitting For Vent Tube)
FC-BWY-0001	QBCI-09 Compac Inline Quick Breakaway 9/16" SAE Ports (Not For Vent Line Use)
FC-BWY-0003	QBCI-09 Compac Inline Quick Breakaway
FC-SK-0011	QBCI-09 and QBCI-06 Compac Inline Quick Breakaway Seal Kit
FC-OPW-BWY-ILB1	OPW ILB-1 Breakaway
FC-SK-0012	OPW ILB-1 Breakaway Seal Kit
FC-OPW-BWY-ILB5	OPW ILB-5 High Flow Breakaway
FC-SK-0013	OPW ILB-5 High Flow Breakaway Seal Kit

Hydraulic Module Parts



Item	Part Number	Description
A	FC-COIL-0001	SCI-12-SS solenoid coil (Parker) With 3 metre lead
	FC-COIL-0005	S2 -350 solenoid coil (Compac) with 3 metre lead
B	FC-VALVE-0035	S2-350 Complete 350 bar standard solenoid (Without Coil)
	FC-VALVE-0036	S2-350 Complete 350 bar solenoid with O ring piston (Without Coil)
	FC-VALVE-0037	S2-350 Complete 350 bar low temperature solenoid (Without Coil)
	FC-SK-0001	Solenoid Seal Kit for all valves
	FC-VALVE-PSTN-0001	Solenoid Piston - standard
	FC-VALVE-PSTN-S2	Solenoid Piston (O ring style for high oil content gasses)
	FC-SVK-0001	SCI-12-SS Solenoid Top Service Kit (275 bar models only)
	FC-SVK-0003	S2-350 Solenoid Top Service Kit (350 bar standard)
	FC-SVK-0004	S2-350 Solenoid Top Service Kit (350 bar low temperature)
	FC-VALVE-0018	SCI-12-SS Complete 275 bar solenoid (Without Coil)
C	FC-FIL-0001	FCVCI-12-SS Grade 10 Coalescing Filter Element And Filter Bowl O-ring
	FC-VALVE-0012	FCVCI-12-SS Complete Filter/Check Valve With Grade 10 Coalescing Filters
D	FC-SK-0005	FCVCI-12-SS Check Valve Seal Kit
E	FC-SK-0002	RCI-12-SS Regulator Valve Seal Kit
	FC-VALVE-0015	RCI-12-SS Complete Regulator Valve

NOTE: *There are two different solenoid valves available, rated for either 275 or 350 bar pressure. Always quote the serial number of your dispenser when ordering parts, check the part you receive matches the model number on the valve label and never replace valves with a different type.*

Troubleshooting

This **troubleshooting** section outlines issues that you may encounter when using the dispenser, and provides recommended actions.

For sites where the temperature falls below –10°C, power should only be removed from the dispenser for servicing.

Problem	Likely Cause(s)	Recommended Action
For all problems not listed here please contact your service agent		
The C5000 electronics are not working. The indicator LEDs are off and nothing happens when you lift the nozzle (i.e., no beeps or 888888s are displayed).	Unacceptable voltage spikes are causing the fuses on the C5000 to blow.	Fit a voltage-stabilising UPS to the dispenser. Contact your service agent.
	There is low input voltage.	Turn the dispenser off and then on again. Check power supply to dispenser.
A display LCD segment is always on or always off.	Display is faulty.	Contact your service agent
When the Start button is pressed the dispenser does not display the 88888s and reset for the next fill.	The dispenser number has not been set.	Set the dispenser number.
	The Start button or **nozzle** switch is faulty, stuck, or broken.	Check that the **nozzle** switch is operating correctly and is not broken. Check the nozzle switch mechanism is free to move in and out. Contact your service agent.
	The connection between the forecourt controller and dispenser communications connection is faulty.	Check the forecourt controller. Contact your service agent.
The dispenser is under filling the vehicle	The pressure in the storage cascades is lower than target filling pressure.	This is not a dispenser fault. If cascade pressure is above target filling pressure, please contact your service agent.

Problem	Likely Cause(s)	Recommended Action
The preset display is flashing after a fill.	The preset amount has been exceeded. ***NOTE:*** The preset display will stop flashing when the next fill is started	If problem continues contact your service agent.
Gas flows but does not read up on the display.	The C5000 needs to be reset.	Re-power dispenser. If problem continues contact your service agent
The dispenser stops at 999999, 99999.9, or 9999.99 units according to where the decimal point is set.	The dispenser will stop dispensing if either the money or the quantity displays ever reach these values.	Hang up the nozzle to reset the display and restart. This is not a dispenser fault.
NOTE: *When fixing a Compac CNG Dispenser fault, please follow the recommendations and safety information in this manual. Failure to do this may cause injury or void the warranty.*		

End of Sale Indicators

The **end of sale indicator** allows you to determine the reason why the last fill ended. This can be very useful for fault finding and diagnostics.

To View the End of Sale indicators:

- Press and release the **Parameter** switch until the required hose number is displayed.
- The number in the unit price display is the end of sale indicator for the hose number shown

See the table below for the meaning of the number displayed.

Number	Meaning	Checks
1	Nozzle switch de-activated (does not apply to push to start dispensers).	
2	Preset or temperature compensated value reached. **Normal end of sale message for temperature compensated and Fast Fill dispensers.**	
3	Fill timed out. **Start** button pressed, or nozzle lifted, without flow.	Check inlet gas pressure. Check solenoid operation. Refer Solenoid Problems Check nozzle and breakaway for blockages.
4	The dispenser was stopped by a remote device such as a Point of Sale (POS) or Compac Communicator.	Check that the point of sale is not sending a stop command and is correctly configured.
5	Maximum display value reached.	Check display resolution (Sr) setting. Refer Display Resolution
7	An error has occurred. The error will be shown on the main display.	Check error code reason. Refer Error Codes
8	Outputs sequenced normally and dispenser finished on the low flow cutoff setting. **Normal end of sale message for regulator controlled dispensers**	
12	Parity error on main display. This is caused by a fault in the display or a bad connection in the display wiring loom.	Check displays are dry and all connections tight. Try swapping with another display if available.

Number	Meaning	Checks
14	Main display not detected. This is caused by a fault in the display or a bad connection in the display wiring loom.	See above.
20	The pressure at the first measurement was within 20bar of the calculated maximum pressure.	Check for blockage in the fuel delivery hose, breakaway or vehicle pipework.
21	The pressure at the second measurement exceeded the calculated maximum pressure.	Check for blockage in the fuel delivery hose, breakaway or vehicle pipework.
22	The pressure at the third measurement exceeded the calculated maximum pressure.	Check for blockage in the fuel delivery hose, breakaway or vehicle pipework.
25	StoP switch operated.	Check the stop switch wiring and switch operation. Refer CNG Dispenser Electrical Schematic.
26	Twin pressure sensor values (when fitted) do not agree.	Check pressure sensor calibration.
30	Maximum flow rate exceeded.	
31	Over-pressure switch has been activated.	
32	Dispenser on hoLd. (No fuel will be dispensed).	

Error Codes

Error codes indicate any problems with the dispenser. These problems are indicated to you by codes displayed on the screen.

After you have physically corrected a fault, you need to clear the fault message displayed on the control panel before normal operation can resume.

NOTE: *You should read and understand all safety precautions before operating or maintaining the Compac CNG Dispenser.*

NOTE: *When fixing Compac CNG Dispenser faults, please follow the recommendations in this manual. Otherwise you may injure yourself and void the warranty.*

Error Code		Likely Cause	Recommended Action
Err 3		Loss of price in the Dispenser.	If the dispenser is connected to a site Controller, the price on the dispenser should be set to 0.00 and the pricing should be sent from the Controller. This procedure is outlined in the Hose Price section. If the dispenser is not connected to a site Controller, the price must be set on the dispenser. This procedure outlined in Hose Price section.
		Loss of hose number in the Dispenser.	Check that the hose number has been set. This procedure is outlined in the Hose Number section.
Err 7		Excessive flow	Repower dispenser If problem persists, contact your service agent
Err 8		Excessive reverse flow.	Repower dispenser If problem persists contact your service agent.
Err 9		Gas metering error	Re-power the dispenser. If problem persists contact your service agent
Err 10		No Configuration data	Contact your service agent
Err 12	Abd	Slave display error	Check configuration. If problem persists, contact your service agent

Error Code		Likely Cause	Recommended Action
Err 13		The temperature pressure interface board or slave display board has repowered	Check configuration, if problem persists, contact your service agent
Err 14		Display error	Check configuration. If problem persists, contact your service agent
Err 15		The display board has repowered	Check configuration. If problem persists, contact your service agent
Err 16	AbdL	Display error	Check configuration. If problem persists, contact your service agent
StoP		The StoP switch is latched on.	Establish why the StoP switch was operated. If safe, reset the switch by rotating the button clockwise.
Err30	orun	The preset has overrun.	If problem persists, contact your service agent
Err32	Er PrSt	Preset amount is less than minimum	Set up a valid preset amount.
PrLo		POS is sending a preset amount below the minimum required by the dispenser	Send a preset amount greater than the minimum requirement.
:0.0		The dispenser's power supply has been turned off and back on since the last transaction.	The colon disappears when the nozzle is lifted for the next transaction.
PEd PEP PSd PSP		The display has an error	Check for moisture or humid environment Contact your service agent
Err 50		The KG meter is not configured	Check modbus meter ID
Err 52		The KG meter is not configured	Check modbus meter ID

Error Code		Likely Cause	Recommended Action
Err 53		The KG meter stopped vibrating	Repower dispenser If problem persists, contact your service agent
Err 54		The KG meter is reporting a temperature sensor issue	Recalibrate the meters temperature offset. If problem persists, contact your service agent
Err 55		The KG meter is not ready for use	Wait for the KG meter to turn on. If problem persists, contact your service agent
Err 58	cAL ib	The KG meter has an incorrect pairing ID set	Set correct KG meter ID pairing
Err 157	cnG 157	The dispenser expected no flow. Potential solenoid valve leak	Check solenoid valve for leakage, if problem persists, contact your service agent
Err 158	cnG 158	Tank volume predictor uncertainty	Check for leaks in the dispensers hose or fittings
Err 159	cnG 159	Temperature probe calibration out of specification	Recalibrate temperature probe
Err 160	cnG 160	Pressure probe alignment error. There is more than 10 bar difference between probes	Recalibrate pressure probes
Err 161	cnG 161	Temperature compensation uncertainty	Contact your service agent
Err 164	cnG 164	Pressure probe error. Reading is out of range	Check for disconnected or faulty probe
Err 162	cnG 162	Generic CNG error	Contact your service agent
Err 200	unAuth	The dispenser is detecting unauth flow	Contact your service agent

MODBUS Data Sheet

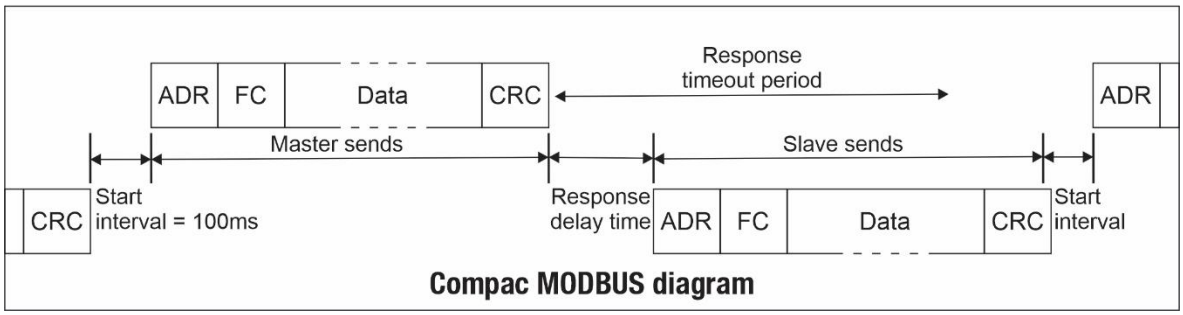
MODBUS Registers

Register	Type	Access	Designation	Operational	Notes
0100	U16	RO	Operation Flags	YES	
0101	U16	RO	Unit Price	YES	
0102	U32	RO	Current Quantity	YES	3dp implied
0104	U32	RO	Current Amount	YES	2dp implied
0106	BCD12	RO	Hose Quantity	YES	00+ 5 BYTES BCD
0109	BCD12	RO	Hose Amount	YES	00+ 5 BYTES BCD
0112	U16	RO	Pressure	YES	Live, Transducer
0113	U16	RO	Flow rate	YES	Live, kg/min 2dp (3dp is available with native I32)
0114	U16	RO	Error Flags	YES	
0115	I16	RO	Ambient Temperature	YES	Live from onboard T/P Board sensor
0116	I16	RO	Gas Temperature	YES	Live from MODBUS meter
0117	BCD8	RO	Hose Quantity per electronic tote	YES	2dp implied
0124	U16	RO	End of sale indicator	YES	Last end of delivery
0125	U32	RO	Quantity	YES	Last end of delivery, 3dp
0127	U32	RO	Amount	YES	Last end of delivery, 3dp
0129	I16	RO	Gas Temperature	YES	Last end of delivery, 1dp
0130	U16	RO	Pressure	YES	Start of last delivery, 0dp
0131	U16	RO	Pressure	YES	End of last delivery, 0dp
0200	U16	RW	Dispenser lock	YES	0 = free; 1 = locked. Acts as a nozzle up reason to prevent fill or stop fill. These things to right are no longer in use ->Setting the C4000 B code to 1xxx will continue to apply the lock status after dispenser re-power, else the dispenser will re-power in stand-alone mode
0201	U16	RW	Unit Price	YES	0.00->655.35, 2dp implied. Size limited by U16 register. Stored as U32, 3dp.
0202	U16	RW	Target Fill Pressure	YES	0-350, bar 0dp
0203	U16	RW	Max fill pressure	YES	0-350.0, bar 1dp. Internally sets overpressure cutoff (Max pressure setting is now redundant
0204	U16	RW	Sequence rate Low to Med bank	YES	0,1,2 (fast, med, slow). internally does not exist, sets global bank switch over rate! Only Side 1 changes. Side 2 is ignored to stop toggling of shared global setting. Backwards compatible with existing tool if 10,20,30 (10,2.0,3.0) etc is sent, sets the closest setting (1.0kg slow, 3.0kg med, 5.0kg fast)
0205	U16	RW	Sequence rate Med to High bank	NO	Register is not linked to config. Use 204 to change sequencing speed.
0206	U32	RW	Density Factor (NEW)	YES	Density factor, 4dp (10000 -> 1.0000)

0208	U16	RW	Virtual switch		0 (0b00) no switch pressed. 1 (0b01) start. 2 (0b10) stop. 3 (0b11) Start & stop.

Compac MODBUS timing diagram

The following Compac MODBUS timing diagram specifies the Start Interval Time



Compac MODBUS diagram