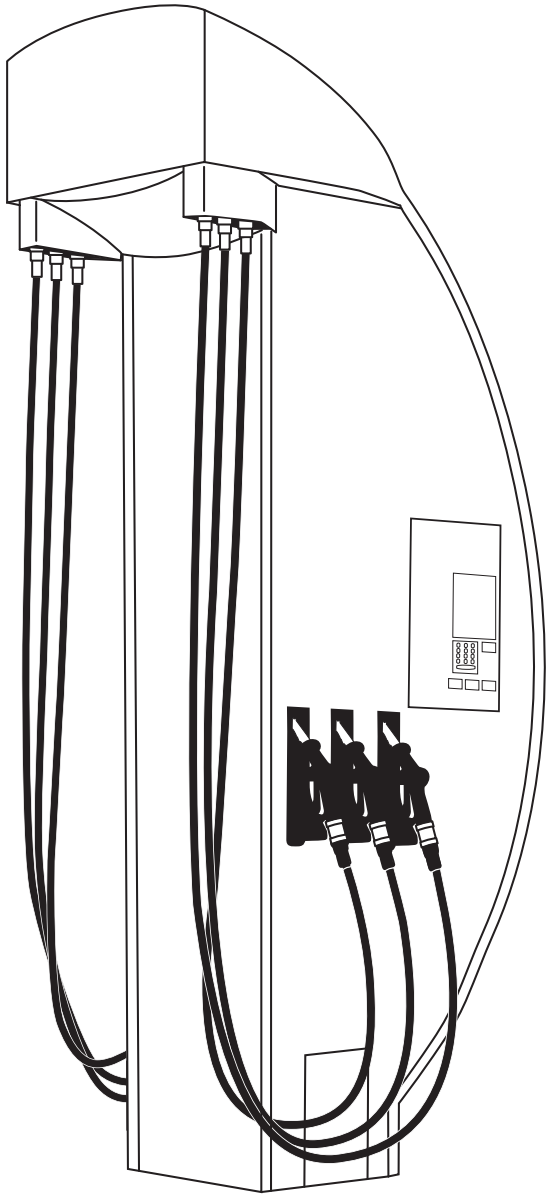
APOLLO 3000L

Installation and Commissioning Manual

Part No. 2A03229

Issue 1



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When contacting Gallagher Fuel Systems Ltd always quote the serial number on the product's nameplate which can be found affixed to the column beneath the User Interface.

The Wiring Regulations

All wiring and installation work shall comply with AS/NZS 3000

Each Fuel Delivery System (FDS) should be protected by a 16 amp circuit breaker that is capable of being locked off.

When designing the site, cable selections should comply with AS/NZS 3008.1 for Australia and AS/NZS 3008.2 for New Zealand.

When terminating external cables in the FDS crimp joints should be used and should comply with AS/NZS 3000.

If the FDS is to be installed at a Marina then all wiring shall be performed in compliance with AS/NZS 3004

Document History

Issue	Date	Comments	Author(s)
1.	Nov 2014	Initial Release	E. Schaub
2.			
3.			

CONTENTS

LIST OF FIGURES

ABOUT THIS MANUAL

This manual describes the installation and commissioning procedure for the Apollo 3000L Fuel Delivery System. This manual is divided into three sections:

- General installation;
- VR2 components installation;
- Commissioning.

This manual does not include the cladding installation, as it is not supplied by Gallagher Fuel Systems.

Definitions

Comms	Communication
ESD	Electro-Static Discharge
GRP	Glass Reinforced Plastic
VMS	Vapour Management System
VR	Vapour Recovery
Pump	Fuel delivery unit where the pump is located within the unit itself.
Dispenser	Fuel delivery unit where the remotely controlled pump is located in the underground tank and not within the delivery unit.
Fuel Delivery System (FDS)	Self-contained system containing equipment for delivering fuel to a customer. May contain one or more modules based on mechanical pumps, dispensers or a combination of both. Does not include any connected remote fuel storage and pumping facilities.
Intrinsic Safety	Protection technique for the safe operation of electronic equipment in explosive atmospheres. The theory behind intrinsic safety is to ensure that the available electrical and thermal energy in the system is always low enough that ignition of the hazardous atmosphere cannot occur. This is achieved by ensuring that only low voltages enter the hazardous area, and that electric supply and signal wires are protected by safety barriers.

Symbols

INFORMATION

Highlights subject areas that should clarify understanding or provides tips or hints that should assist users and/or technicians.

WARNING

The associated text highlights a subject area in which damage to equipment may result if procedures are not carried out correctly.

General Safety Warnings and Precautions

- Installation must only be carried out by suitably **qualified** and **competent** personnel.
- Initial electrical power-up and opening of fuel supply lines must only be carried out after inspection and approval by suitably qualified and competent personnel.
- No naked flames.
- All personnel working with Fuel Delivery Systems must be made aware of how, in an emergency, to turn OFF power to the FDS and any remote fuel storage system. They must also be briefed on fire fighting and other relevant inflammable liquid safety procedures.
- Ensure fuel pipes, flanges etc. are clear of debris before assembling.
- Fuels present a toxic hazard and suitable precautions should be taken at all times to prevent ingestion, inhalation and contact with skin and eyes.
- Only use genuine spare parts. Genuine parts as specified in the original design are integral to the correct function and safety of the system. Gallagher Fuel Systems Ltd cannot be held responsible for any consequences of using non-genuine parts and will not support under warranty any Gallagher FDS where substitution has occurred. Any replacement parts should be like for like. In addition the repairer may be legally liable for the consequences of any unauthorised modifications.
- Do not short out isolation or intrinsic safety barriers.
- Electronic equipment in the dispenser is susceptible to damage by electro-static discharge (ESD). Suitable preventative measures should be taken at all times when working on the electronic system.
- Ensure air is bled from product lines of remote dispensers before delivering product.
- Damage to equipment caused by failure to correctly follow the procedures described in this manual is not covered under warranty.

1 APOLLO 3000L INSTALLATION

The Apollo 3000L dispenser is divided into sections, as follows.

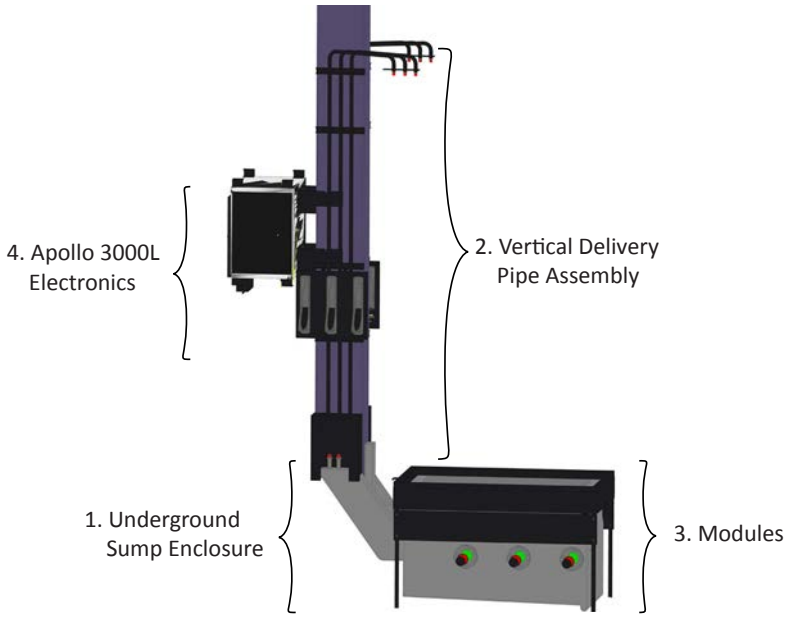


Figure 1. Apollo 3000L Components

1.1 Underground Sump Enclosure Installation.

The following components are supplied by Gallagher:

- Sump box enclosure assembly, with cable duct, pipe ducts and internal delivery pipes fitted;
- Bulkhead seals (pre-fitted into sump enclosure);
- Sump box lid;
- Sump cover and sub-frame.

Figure 2. Underground Sump Enclosure Components

Procedure

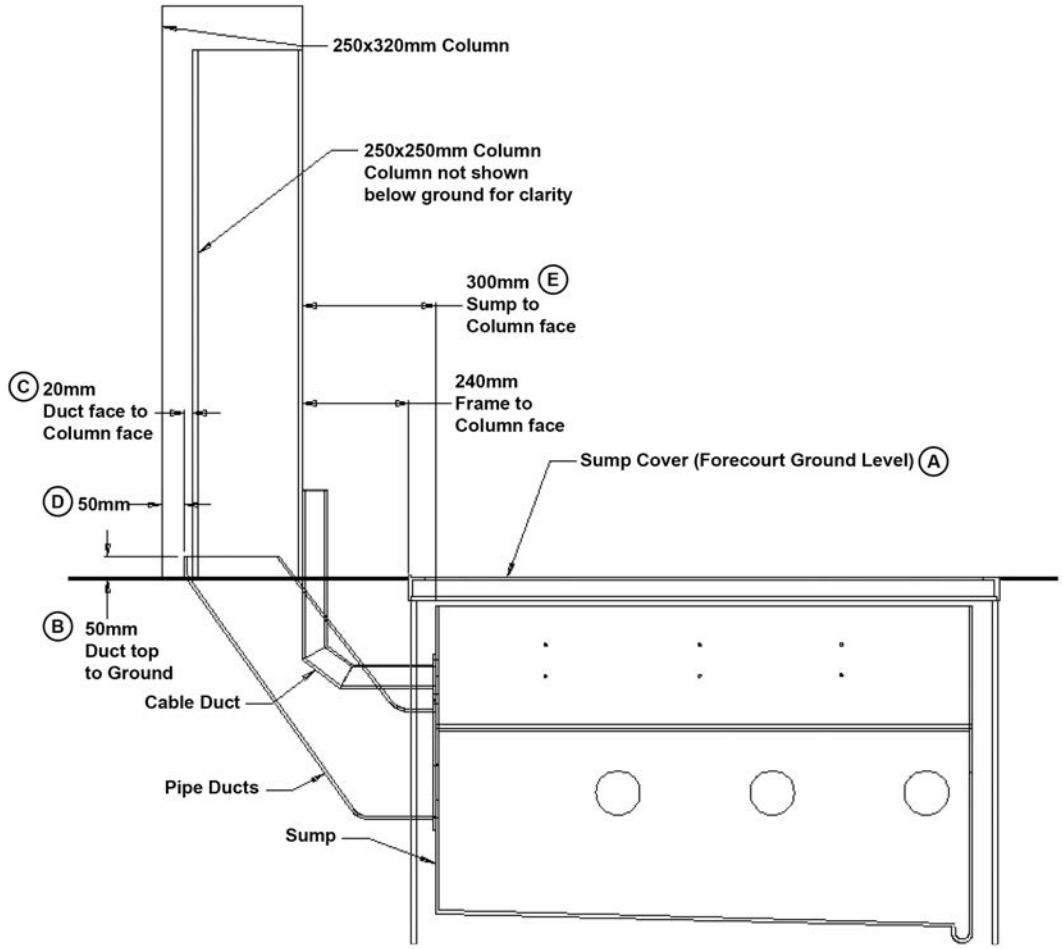


Figure 3. Apollo Underground Sump Front View

- Establish the proposed/final forecourt ground level (A); mark this point on the site column.
- Install the sump box enclosure into the correct position below the proposed ground level as shown in Figure 3.
- Ensure the pipe delivery ducts protrude 50mm above ground level (B) and 20mm (C) proud of column for a 250 x 250mm column. For a 250 x 320mm column, the distance between the end of the protruding delivery ducts and the external side of the column should be 50mm (D).
- Check the end face of the enclosure is 300mm (E) out from the column.
  Note: Ensure the underside of the enclosure is firmly packed to prevent the enclosure from sinking or moving.
- Pack filling material around the sump enclosure approximately up to a point just under the bulkhead fittings; this is to ensure the enclosure does not move while further work is being conducted.

- Plug or cover the pipe delivery ducts to stop any foreign matter entering the sump box.
- Install the main product feed lines into the sump, according to the following figure.

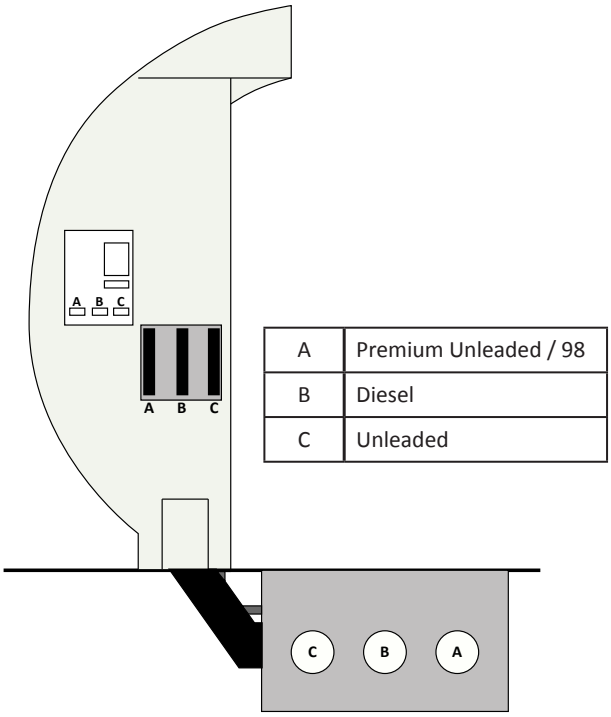


Figure 4. Main Product Feed Line Configuration

- Install the feed line within the sump. The picture below shows the typical feed line assembly. It considers the use of a Tee connector terminated with a ¾" ball valve and a ¾ - ¾" BSP Elbow. These components are not supplied by Gallagher Fuel Systems.

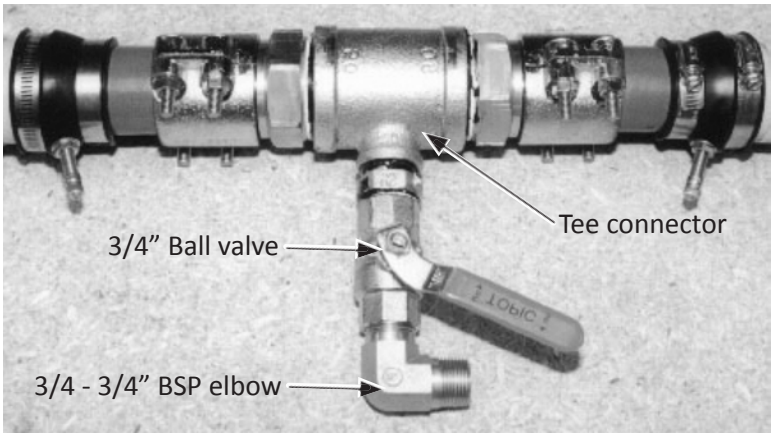


Figure 5. Typical Feed Line Assembly

Note: Inside distance between bulkhead seals in hydraulic enclosure is 432mm, therefore the feed line Tee termination arrangement must fit within this distance. Ensure the ball valve faces toward the bottom of the sump, no more than 10 degrees off vertical and with the lever side towards the column.

- Re-check the sump position in relation to the column and the forecourt surface as per Figure 3 and Figure 6.
- Secure the pipe delivery ducts and main feed lines into position to prevent movement while backfilling.
- Temporarily pack the internal side walls of the sump using timber or similar to prevent walls collapsing inwards during backfilling.
- Re-check seals and sump position.
- Backfill to cover feed lines and secure sump enclosure position.
- Backfill and compact to within 150mm of forecourt surface, 30 – 50mm up skirting walls.
- Concrete the forecourt as per site requirements.

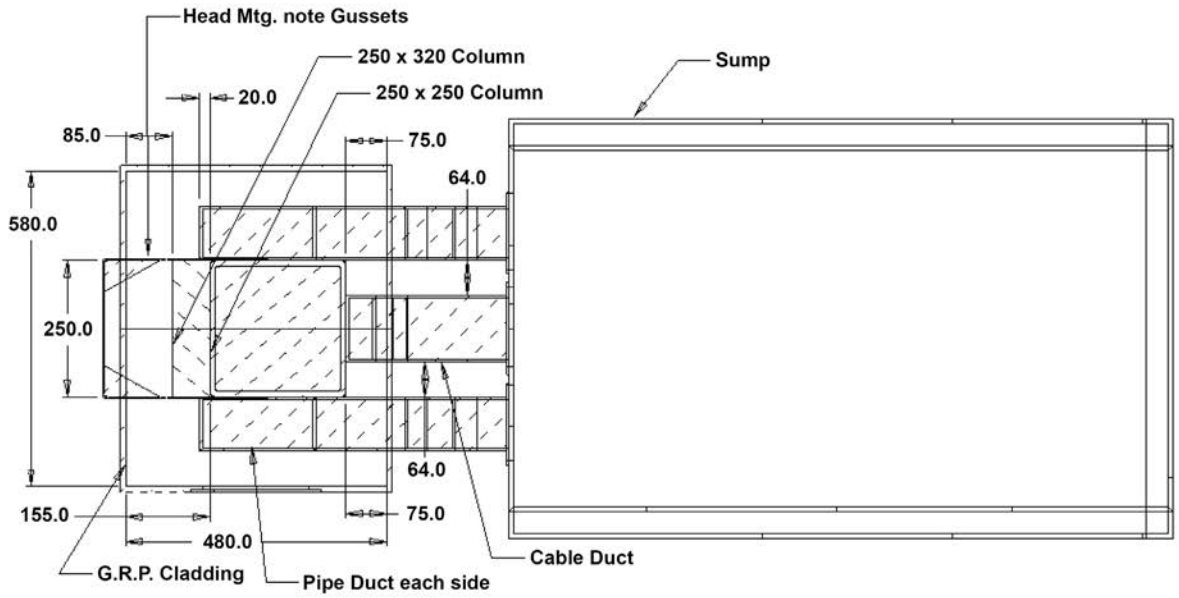


Figure 6. Apollo Sump/Column Position Top View

1.2 Vertical Delivery Pipe Assembly Installation

The following components are supplied by Gallagher:

- Front and rear vertical delivery pipe assemblies;
- Head cabinet assembly;
- Head cabinet mounting brackets;
- Flexible safety hose assemblies;
- External hose assembly, fitted with nozzles, grade covers and splash guards;
- Vent box assembly front and rear with their respective top caps;
- Serial name plate (to be adhered to top left hand corner of external door).

The installation procedure for this module is explained separately for each section, according to the following picture.

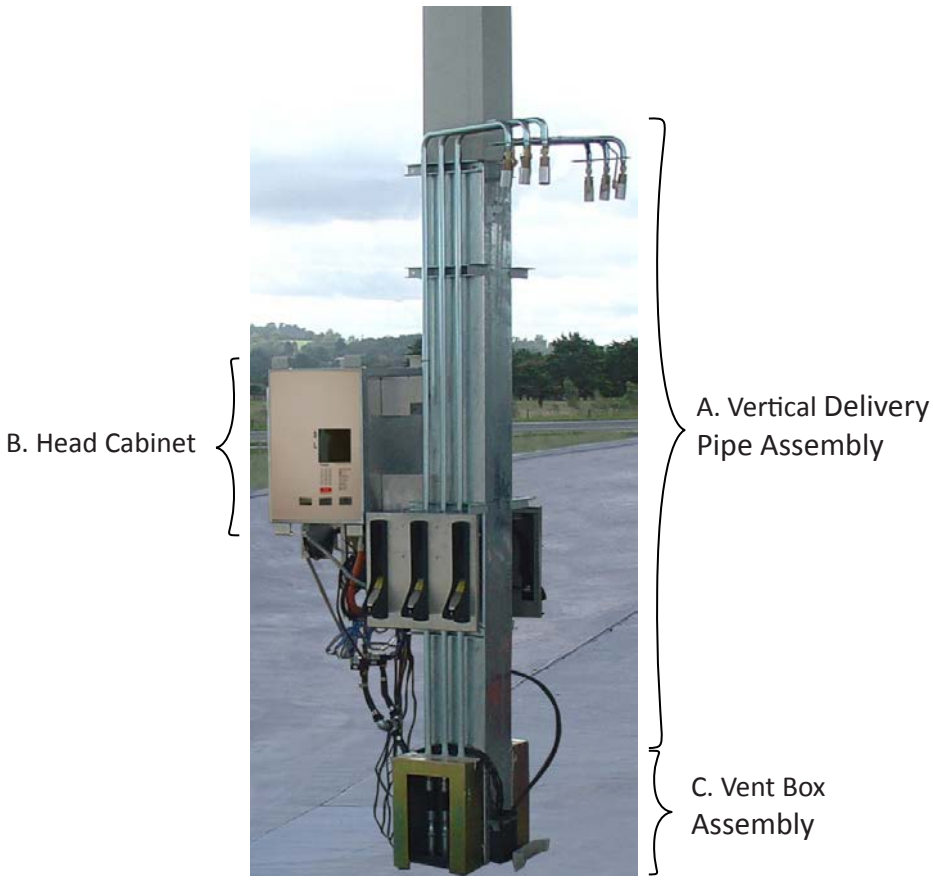


Figure 7. Vertical Delivery Pipes Assembly Components

Procedure

A. Vertical Delivery Pipes Assembly

- Using a spirit level, find the highest point on the forecourt out to a distance of 160mm from the main column (in any direction). Transfer this point onto the front face of the column (front = sump at right hand side of column) and mark it as a datum point on the face of the column. It must be established as an initial point to start measuring the positions of components and mounting brackets and to obtain mounting heights and ground clearances for final cladding.

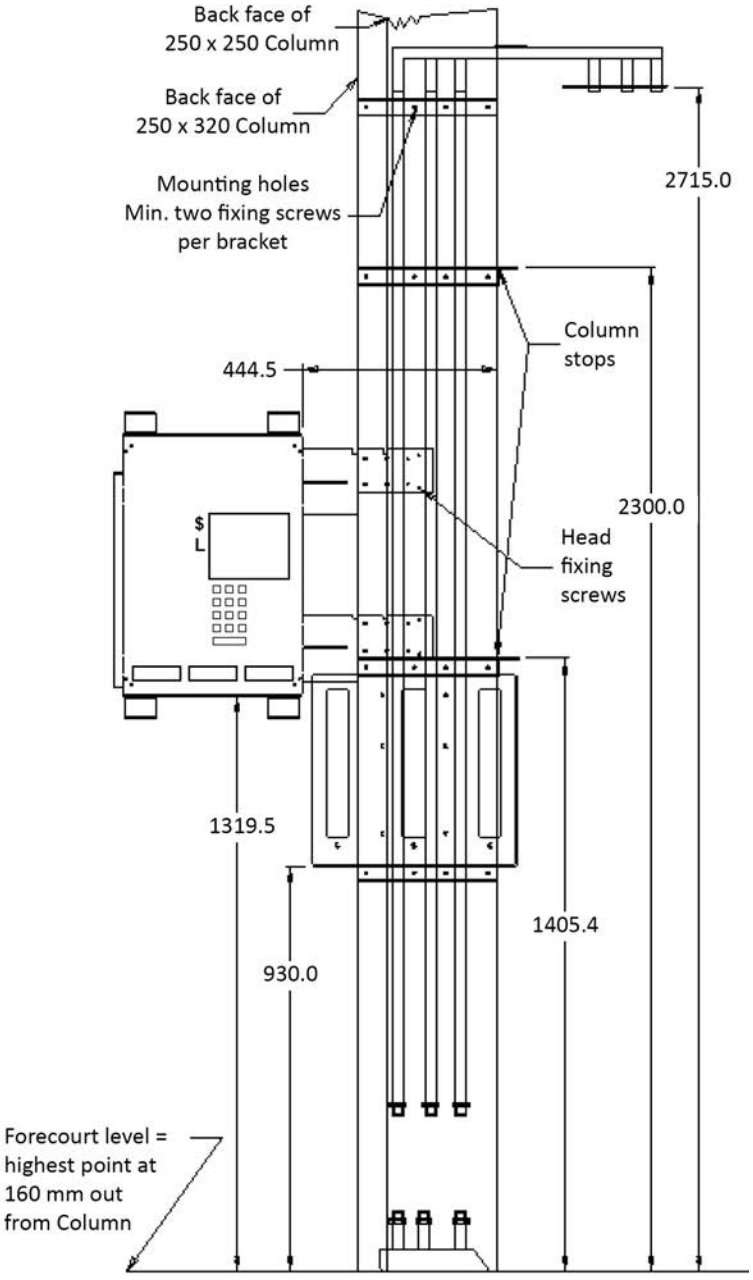


Figure 8. Vertical Delivery Pipes Assembly Mounting Positions

- From the datum line, transfer and mark a point 2300mm vertically up the column. If preferred, a second but lower point could be marked at 1405.4mm up the column. Having both these datum points marked on the column could be advantageous as they could then both serve as double checks.
  Note: Marks should be made horizontally, as they will later be used to align vertical pipe and holster assembly mounting brackets (refer to Figure 8 for details).

- Place the front vertical pipe assembly 8A89826 onto the front face of the column (see Figure 9 for part numbers). The top angled section of the pipe assembly should be pointing out to the right hand side (e.g. towards the sump).
  Note: Both of the middle two mounting brackets on the vertical pipe assembly have a right angle lug welded to them (column stops). These are location lugs and should be positioned up against the right hand face of the column.

- With lugs positioned against the column side face, slide the pipe assembly up until the top face of the third horizontal bracket (from the top) aligns with the lower mark at 1405.4mm on the column and/or the top face of the second horizontal bracket aligns with the upper mark on the column. Secure into position with “G” or “F” clamps (or ratchet ties).

- Check the column stops on second and third horizontal brackets are hard against the column face; also check the vertical pipe assembly is vertical. If not, this could indicate the column is not truly vertical. In this instance, move either top or bottom of the pipe assembly to obtain a true vertical reading. Secure the clamps and re-check heights from forecourt datum marks.

- Drill pilot holes into the column through holes provided in the horizontal fixing brackets (a minimum of 2 per bracket is required). Fix the brackets to the column using suitable screws.

- Repeat process on the rear side. Verify that the brackets on the rear pipe assembly are horizontal with the front set. Also ensure the column stops on rear pipes are positioned exactly in the same relationship from the column as per front set.

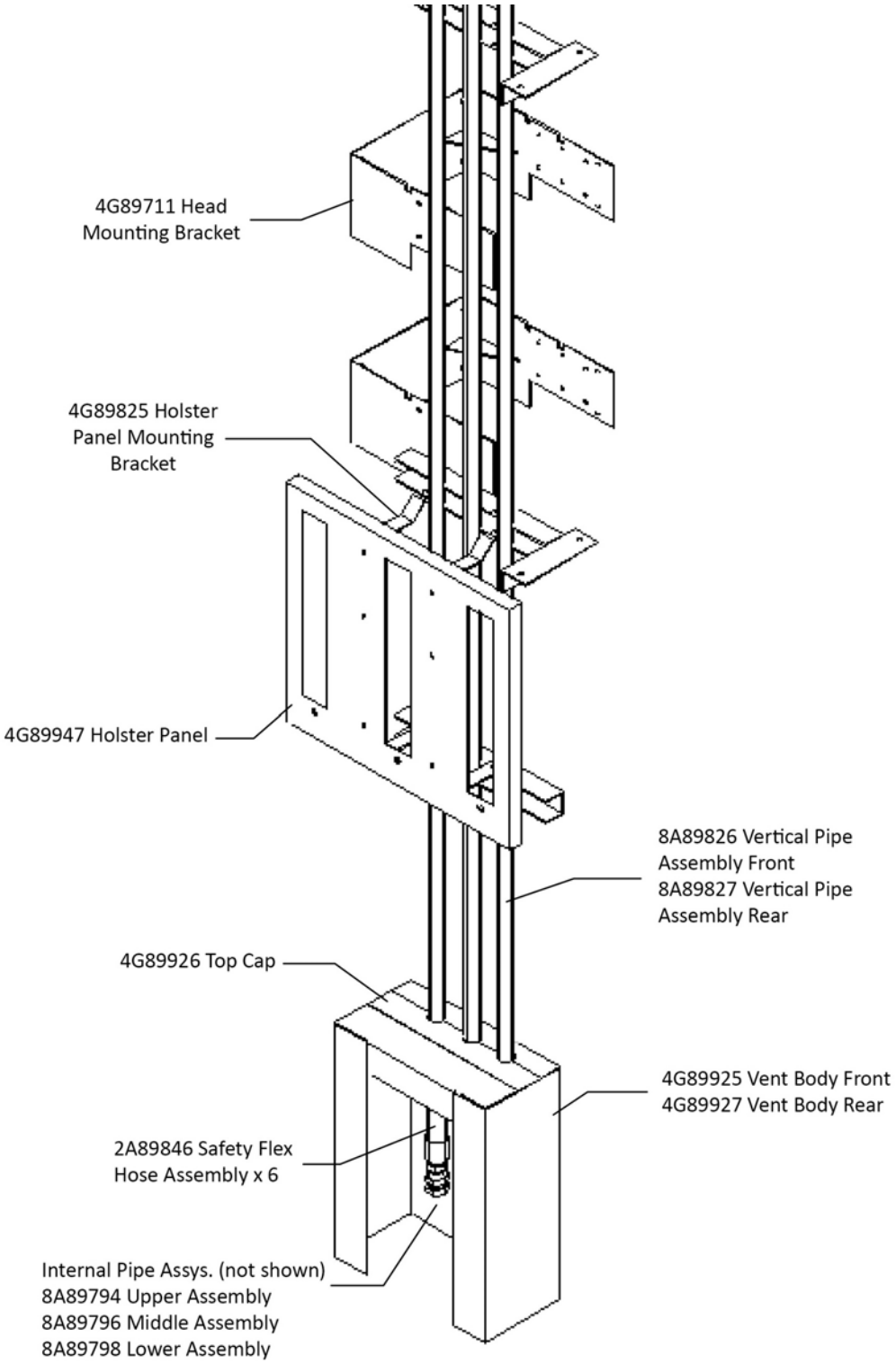


Figure 9. Delivery Pipes Assembly Part Numbers

B. Head Cabinet

- Assemble the head cabinet mounting brackets 4G89711 onto the head cabinet, using the M5 studs and nuts supplied.
  Note: The cut out section of the brackets must be positioned towards the bottom of the cabinet as shown in Figure 10.

- Position the lower head mounting bracket onto the top face of the third horizontal fixing bracket of the vertical pipe assembly. The cut out section in the lower head mounting bracket must be located over the fixing bracket.

- Secure the head into position with clamps. Drill pilot holes into the column through the holes in the head mounting brackets and fix the head with screws as per vertical pipe assembly (**see Figure 8**).

- Attach the Multiplexer board to the underside of the head cabinet assembly (studs are pre-positioned).

- Fit VR equipment as per Section 2.

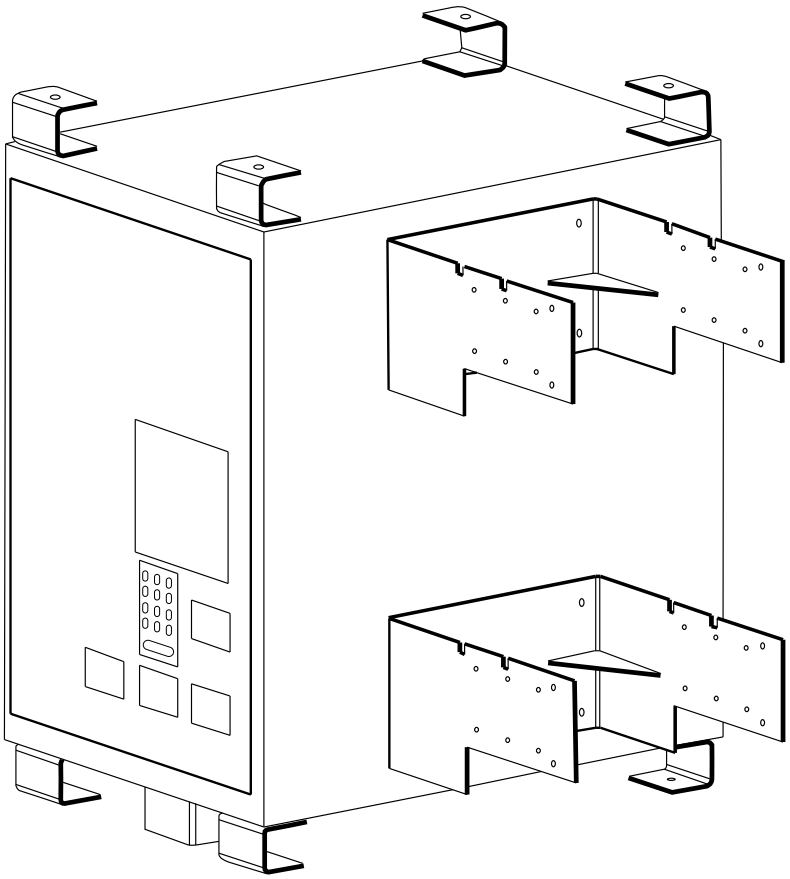


Figure 10. Head Cabinet Mounting Brackets

C. Vent Box

- With the top cap of the vent box removed, insert the bottom end of the vertical pipes into the gap and manoeuvre the vent box up into position, behind vertical pipe assembly as shown in Figure 11, ensuring the base edge makes contact with the forecourt ground.
- Place the top cap into the gap of the vent box. Ensure the cap is fitting correctly into the recess.
- Seal the cap from the inside using 50mm wide aluminium tape to provide a vapour seal. Also tape the top of the vent box to the column (refer to Figure 11).
- Using a Bostik Matrix 600 or 700FC polyurethane sealant, seal all joints and pipe holes. Ensure a good sized fillet at the intersection of the vent box to the forecourt.
  Note: Ensure the inside of the vent box assembly is sealed sufficiently to eliminate the potential to leak out into the inside of the dispenser cladding.

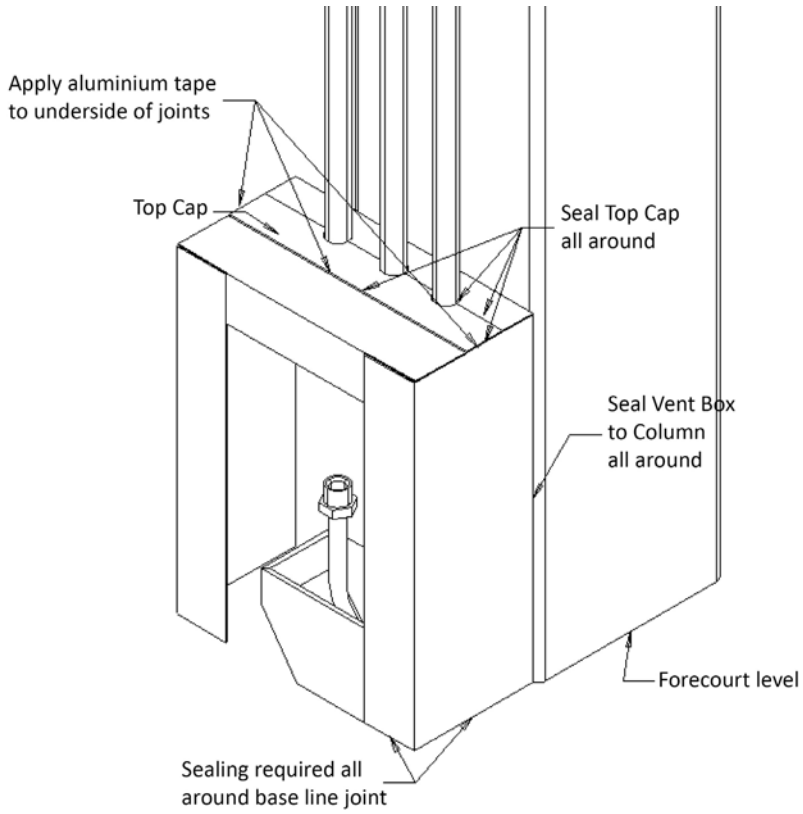


Figure 11. Vent Box Position and Sealing Specifications

- Fit the safety flexible hose assembly between the delivery pipes assembly (from the sump) and the vertical pipes assembly, as shown in Figure 12.
- Repeat the above process at the rear side of the dispenser.

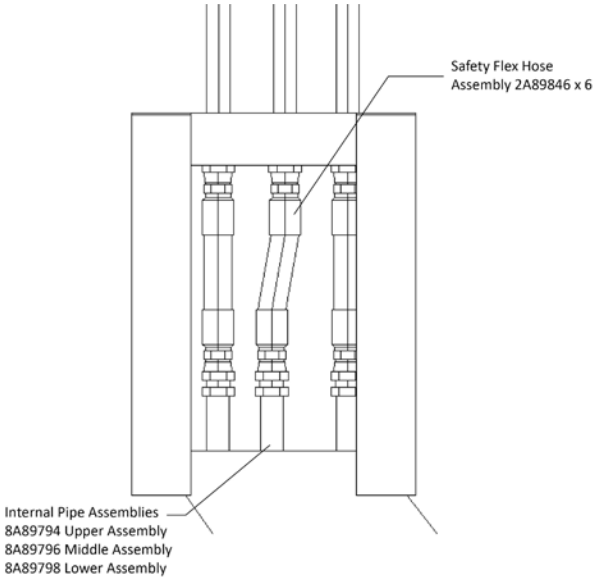


Figure 12. Safety Hose Position

- Install external hoses after the external cladding has been fitted. Refer to Section 2 for instructions on the installation of coaxial hoses. The hoses have different lengths according to their position, as shown in Figure 13.

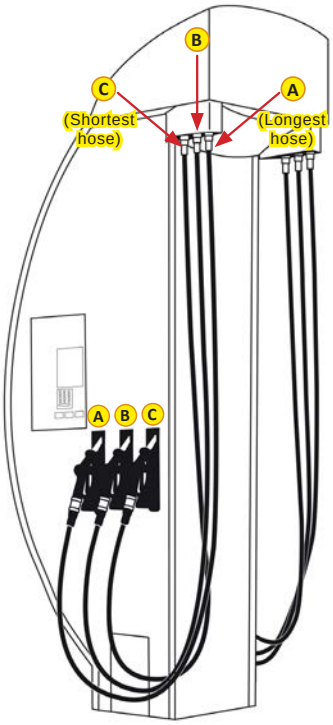


Figure 13. External Hose Positions

1.3 Module Installation

The following components are supplied by Gallagher:

- Meter module assemblies;
- Module hinge pins;
- Product feed line hose assemblies x 3 (product feed line to modules);
- Product delivery hose assemblies, 2 per module (valve to delivery pipe assemblies in pipe ducts);
- Float switch and cable assembly with mounting bracket;
- Ex e enclosure with mounting bracket.

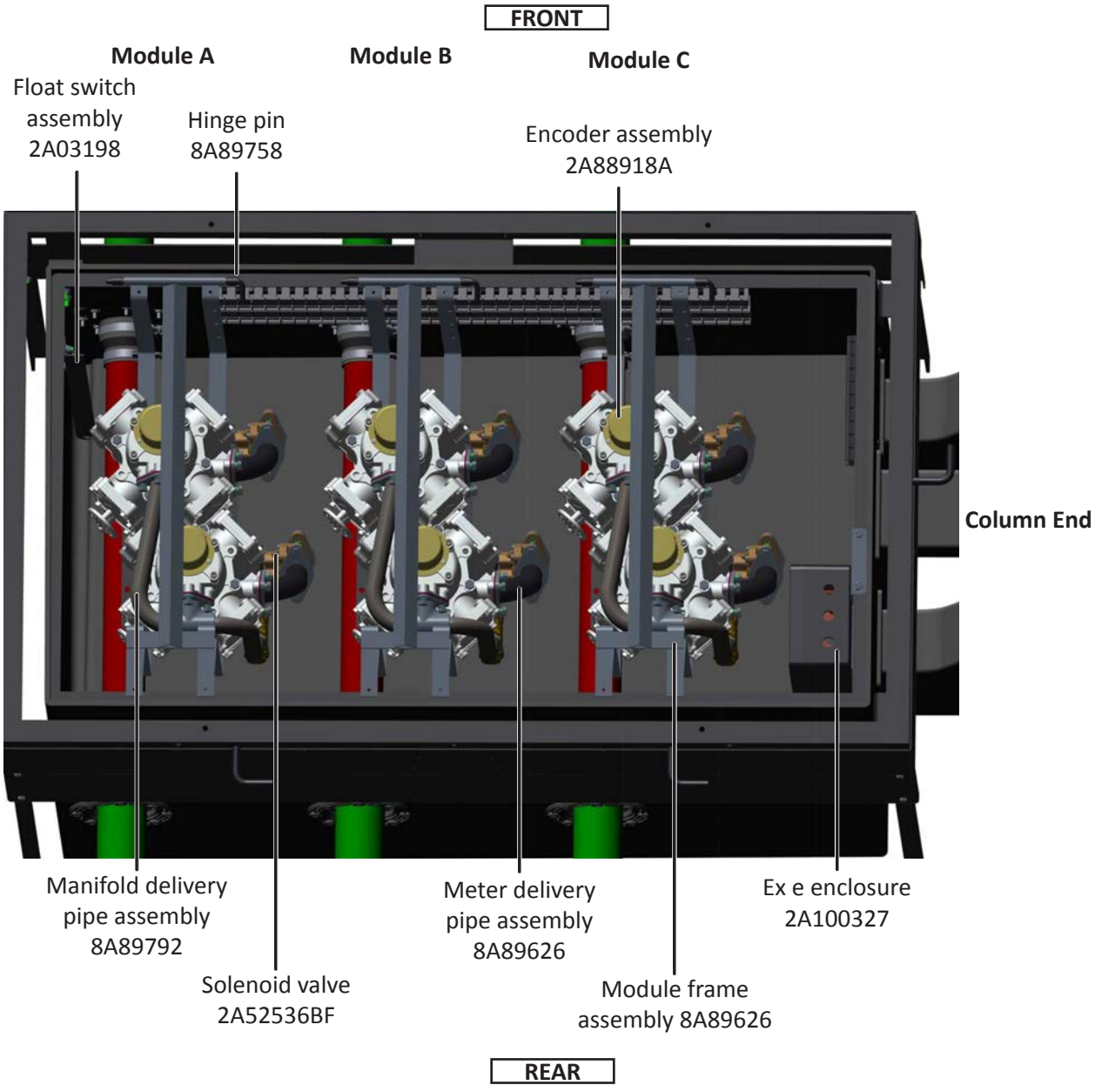


Figure 14. Apollo Sump and Modules Assembly

Procedure

- Connect the product delivery hoses to the internal delivery pipes, starting with module C (closest to the column), according to the following image.

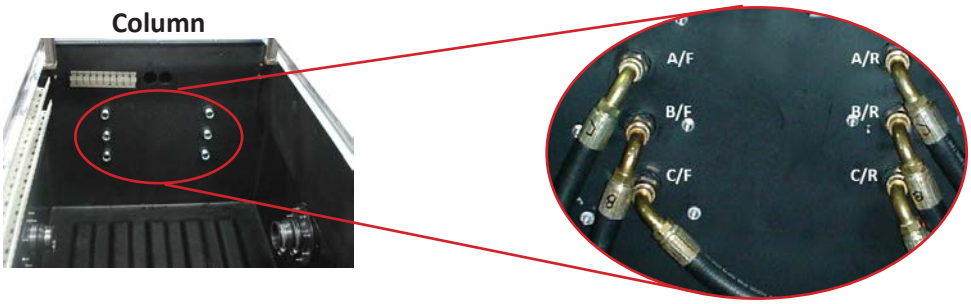


Figure 15. Product Delivery Hoses Connection

- Connect the product feed line hoses assemblies (x3) to the feed line assembly shown in Figure 5.
- Fit the float switch assembly using the studs provided, as shown in the image below. Position the float switch as low as possible. Verify that float is free to move upwards without obstruction.
- Using the cable clips, route the float switch cable through the cable duct out of the sump to the Multiplexer board located under the head cabinet.

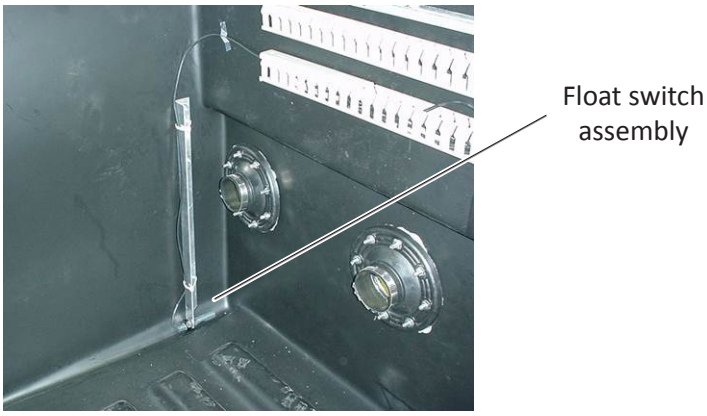


Figure 16. Float Switch Assembly Installation

- Install module C. Fit the hinge pin then lift above the sump and brace to hold the module in place.
- Attach feed and delivery hoses to the meter module.
- Repeat the last two steps for modules B and A.

- Route the solenoid valves cables (1 - 6) through the cable clips provided into the Ex e enclosure through the glands indicated in the following image.

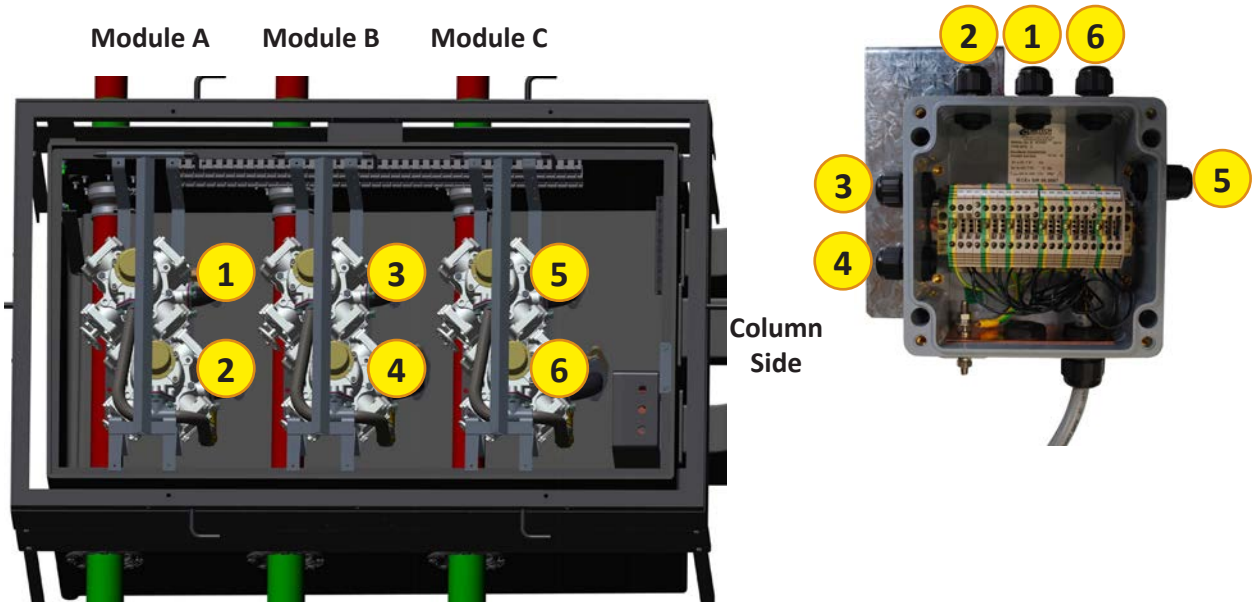
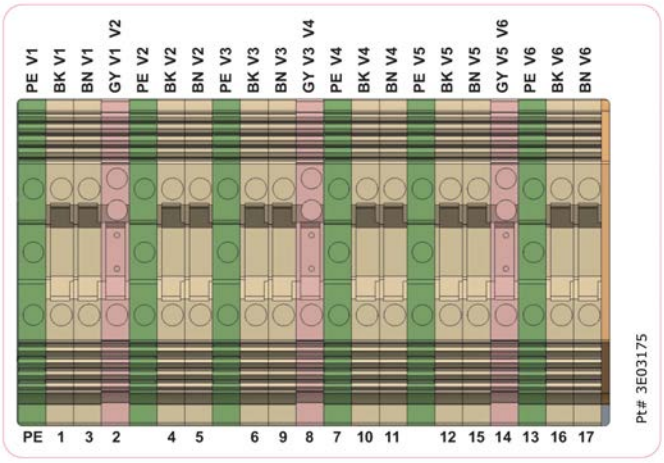


Figure 17. Solenoid Valves Cable Distribution

- Connect the solenoid valve cables inside the Ex e enclosure according to the wiring guide decal located inside the enclosure cover.



Valves	Module
V1 and V2	A
V3 and V4	B
V5 and V6	C

PE: Protective Earth;
BK: Black;
BN: Brown;
GY: Grey.

Figure 18. Wiring Guide Decal

- Attach the Ex e enclosure to the sump box using the supplied mounting bracket and bolts. Ensure the cables are tidy using the cable clips on the sump wall.
- Run the 18 core cable through the cable duct up to the bottom of the head cabinet.
- Run the encoder cables through the cable duct to the Multiplexer board located under the head cabinet.

1.4 Apollo 3000L Electronics Installation

As shown in the image below, most of the electronic set modules are mounted to the gear plate inside the head cabinet, except for the Multiplexer module that is located under the head cabinet.

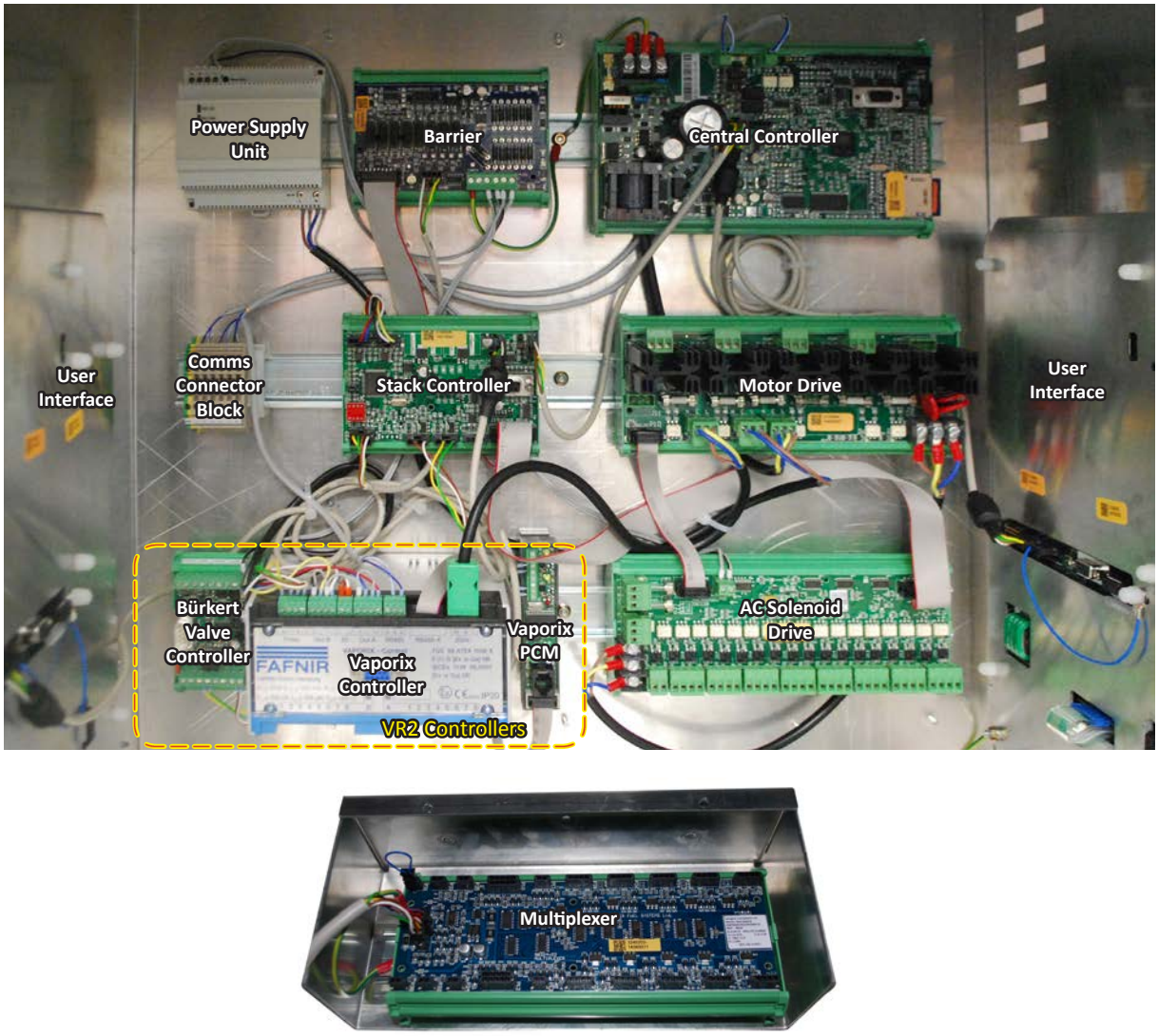


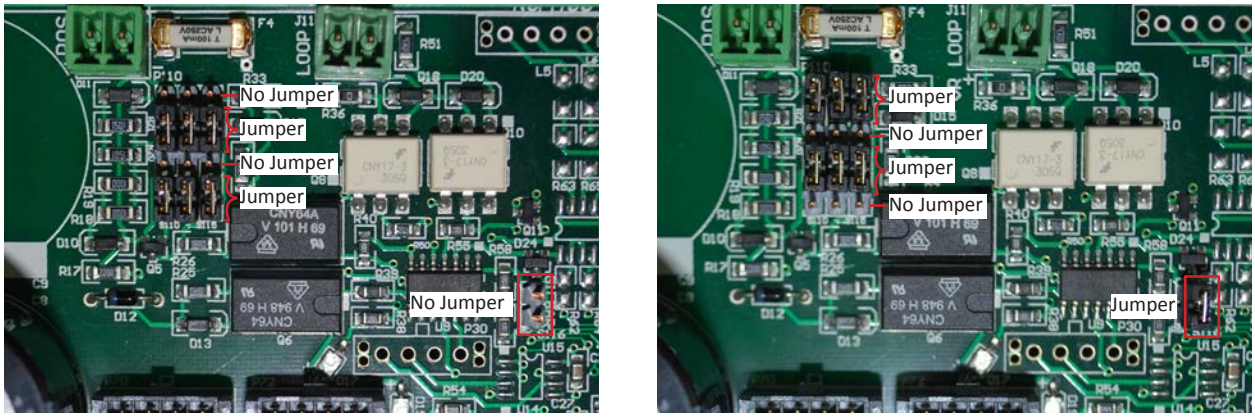
Figure 19. Apollo 3000L Electronic Set

Procedure

Most of the cables inside the head are connected prior to dispatch with the following exceptions that have to be connected during the installation procedure:

- Comms cables;
- Mains cable;
- Relay cables;
- Solenoid valve cables.

- Fit the comms cables, mains cable, relay cables and 18 core cable into the head cabinet using appropriate glands.
- Before connecting the comms cables to the Comms Connector Block ensure the POS protocol jumpers are set correctly on the Central Controller module, according to the following image.



PEC Protocol Gilbarco Protocol

Figure 20. Setting of Protocol Jumpers for PEC and Gilbarco Protocols

- Connect the Comms cables to the Comms Connector Block according to the following diagram.

Communications	PE	1	2	3	4	5	6
2 Wire Pump Comms		+	-				
Vapour Recovery	dG			dA	dB	SP	SN

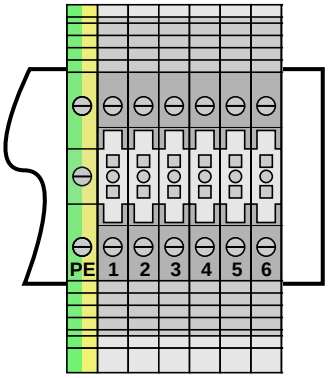


Figure 21. Comms Connections

- Connect the mains and relay cables to the Motor Drive module according to the following image.

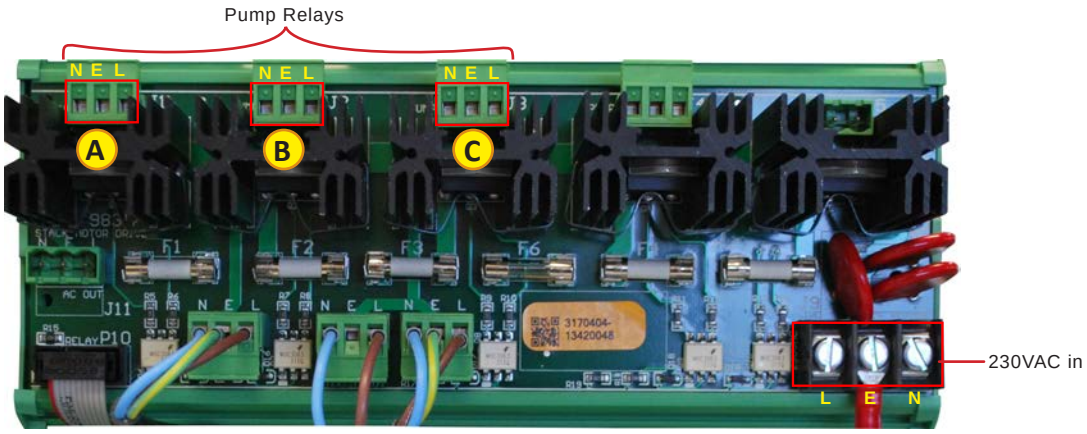


Figure 22. Motor Drive Module Connection Guide

- The solenoid valve cables have to be connected to the AC Solenoid Drive module according to the connection guide located inside the head cabinet (see Figure 23). Each valve cable has a number that has to match the number on the module.

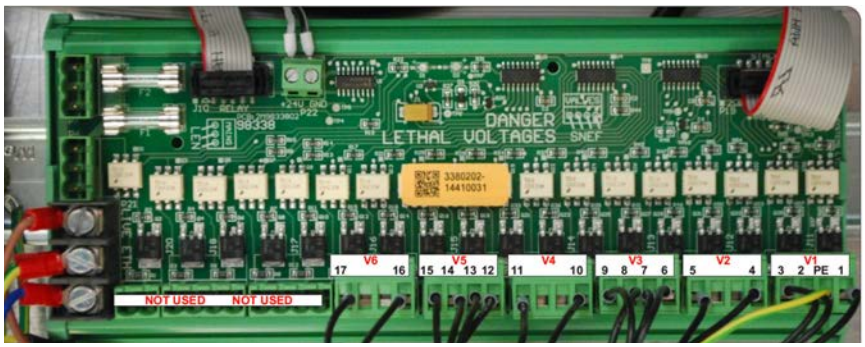


Figure 23. Solenoid Valves Connection Guide

The following cables have to be connected to the Multiplexer module located under the Head Cabinet:

- Encoder cables;
- Holster switch cables;
- Float switch cable.

- Connect the cables according to the following diagram.

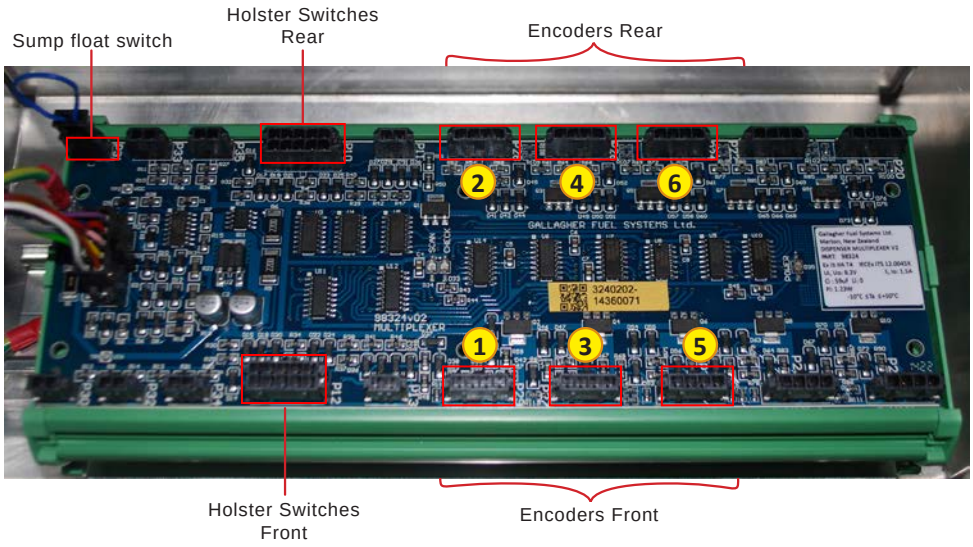


Figure 24. Multiplexer Module Connection Guide

- Check all hydraulic and electrical connections.
- Fit the protective covers once the commissioning process has finished.
- External cladding can be fitted now.

Refer to Section 2 for instructions on the wiring of VR proportional valve cables and Fafnir vapour sensor cables.

2 APOLLO 3000L VR2 COMPONENTS INSTALLATION

The installation of the VR2 equipped dispensers differs in some respects from that of the non-VR2 systems. Where these differences exist, details are given in this section.

2.1 Installation Procedure Overview

2.1.1 Pre-installation Requirements

Site infrastructure requirements are described in the relevant VMS Site Requirements Manual.

2.1.2 General Outline

Assuming that all the necessary pre-installation requirements have been met, the procedure will typically be:

- Installation of the coaxial adaptors (including manifold and vapour return pipes) between the delivery pipes and hoses;
- Installation of the vapour sensor assembly (including proportional valves) beneath the head;
- Installation of the coaxial hoses;
- Installation of electrical components.

2.1.3 Required Tools/Materials

- Self vulcanising tape
- M4, M6 open spanners and sockets
- Standard tools - Posi-drive screwdrivers and metric hex keys
- Drills: hand and battery - 3mm, 5mm, 6mm and 20mm bits
- Thread tape

2.1.4 VR2 Components

The VR2 Apollo 3000L differs from the non-VR2 version in the following key areas:

- Extra electronic components inside the Head Cabinet;
- VR2 nozzles;
- VR2 coaxial hoses and adaptors with supplementary brackets;
- Vapour return hoses and sensors within the Apollo cladding, including supporting brackets.

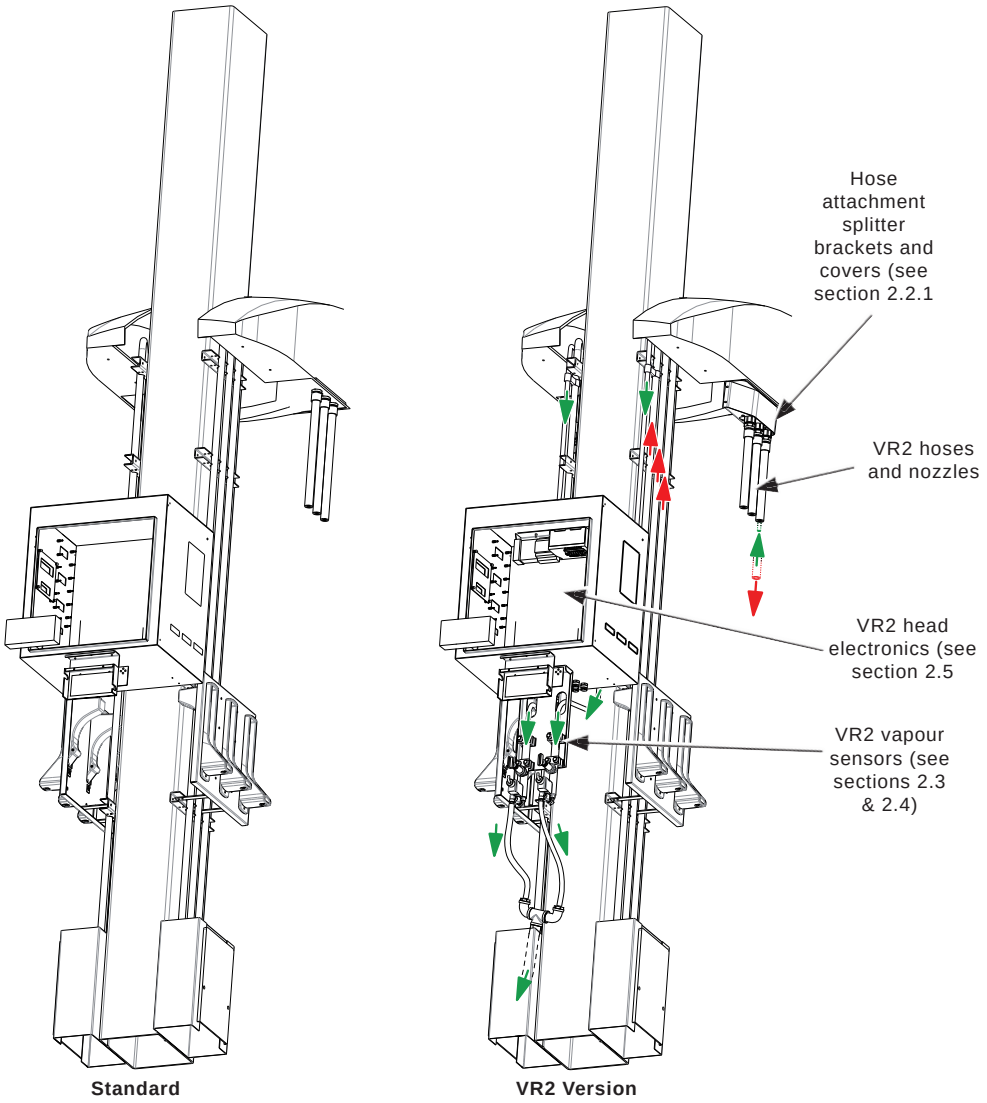


Figure 25. Internal Comparison of Apollo 3000L Standard and VR2

VR2 Nozzles, Vapour Return Hoses and Manifold

VR2 nozzles and hoses are significantly different to their non-VR2 counterparts.

The released vapour is recovered by special nozzles which 'suck' it back into the hose (see Figure 26).

VR2 hoses are coaxial and carry the recovered vapour in the central portion while fuel flows through the outer section. The vapour is directed to the vapour return hoses by coaxial adaptors situated at the junction of the delivery pipes and hose assemblies (see Figure 27).

The vapour is taken from the adaptors via a manifold and return hoses to the vapour sensor/meter assemblies.

Figure 26. VR2 Nozzles

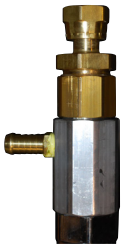


Figure 27. Coaxial Adaptor

2.2 Hydraulic Installation

2.2.1 Connecting the Coaxial Adaptors and Hoses

Coaxial hoses connect to coaxial adaptors in which the returned vapour is directed to the vapour return hoses.

To protect hose fittings, the VR2 version has splitter brackets with covers that enclose the coaxial adaptors.

Each splitter bracket is fixed to the soffit panel using three capscrews and a backing plate. The splitter bracket is used as a template for drilling the required holes in the soffit panel.

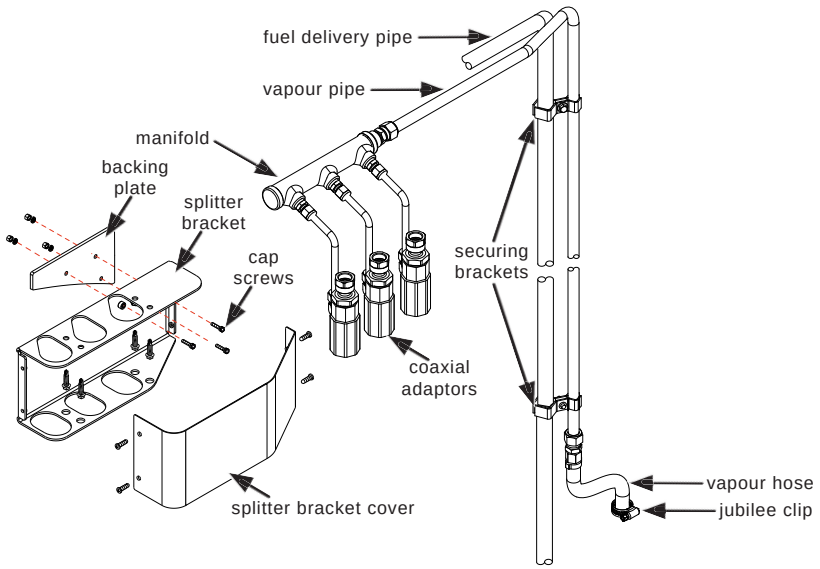


Figure 28. Coaxial Adaptors and Splitter Bracket

The overall process is:

(a) Fit the soffit panel to the dispenser;

(b) Locate splitter brackets and locate holes for backing plate;

(c) Remove soffit;

(d) Drill holes and fit bracket and backing plate using capscrews;

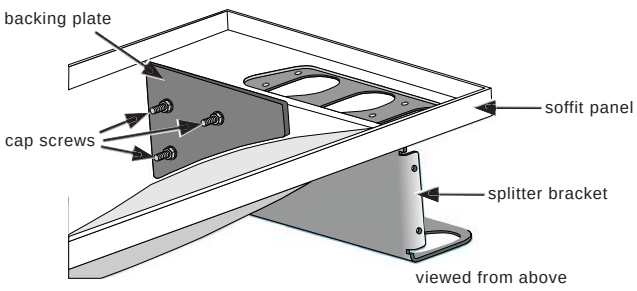


Figure 29. Fitting of Bracket and Backing Plate to Soffit Panel

(e) Refit the soffit panel and, using self tapping screws, secure the splitter brackets to the delivery pipe brackets on each side;

(f) Attach the delivery hoses to the coaxial adaptors;

Note: The right illustration in Figure 30 shows that the diesel hose (or E85) connects directly to the delivery pipe. A plastic grommet strip is fitted to prevent damage to the hose.

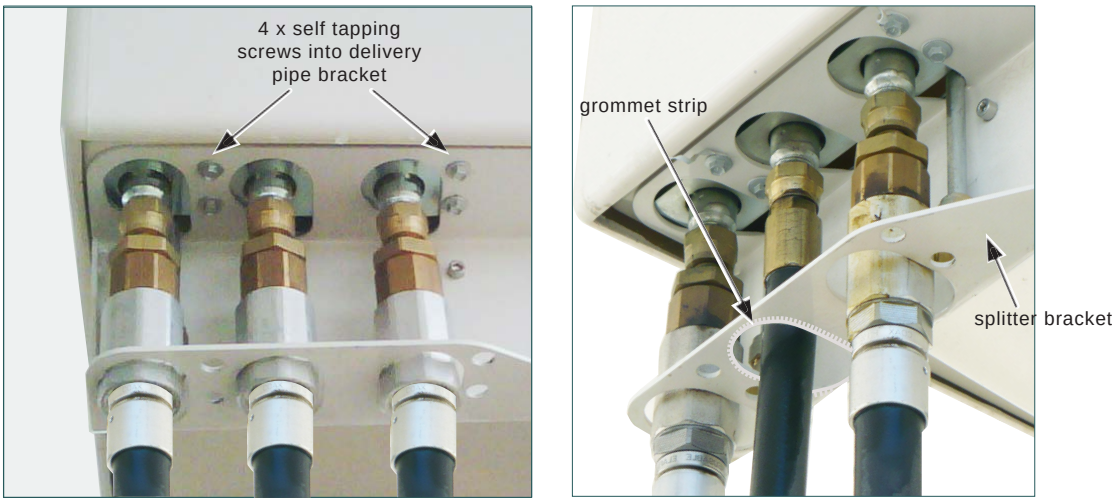


Figure 30. Soffit Panel, Splitter Bracket and Hoses in Place

(g) Fit the splitter bracket covers.

Figure 31. Splitter Bracket Cover in Place

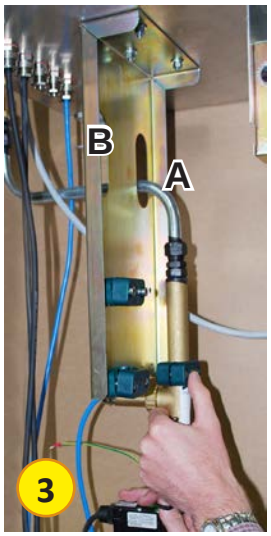
2.3 Vapour Sensor Assembly

2.3.1 Setting Up the Assembly

(1) Attach the assembly bracket to the bottom of the head cabinet using three 6mm washers and nuts;

(2) Remove the vapour sensor clamps from the bracket;

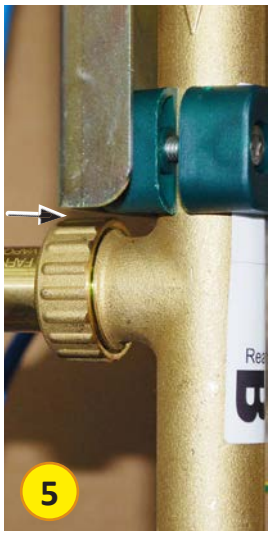
(3) Place both parts of a clamp around the lower part of a vapour flow sensor and feed the gooseneck through the hole in the bracket (B to the left and A to the right);

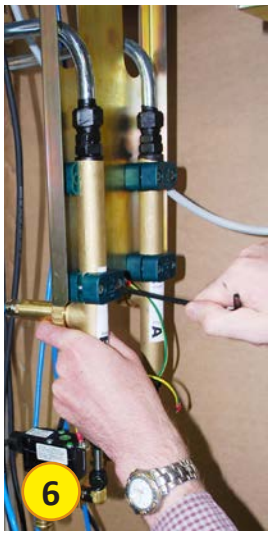


(4) Prior to tightening the bottom clamp, fit the rear part of the top clamp into position;

(5) Ensure there is a space between the ferrule on the rear of the vapour sensor and the bottom of the bracket (see arrow);

(6) Secure all four clamps, ensuring the sides of each clamp are tightened evenly;





(7) Attach the earthstraps to the central bolt as shown using two washers (behind and in front of strap terminators);

(8) Coil excess cable and secure with cable ties as shown.

Cables **MUST NOT** be shortened as they are calibrated for each individual sensor.

2.3.2 Connecting the Upper Manifold Hoses

(1) Place a jubilee clip over the end of each vapour hose which is attached to the end of each vapour pipe that comes down from the upper manifolds;

(2) Fit each hose over the brass fitting of the chromed gooseneck pipes and secure;

(3) Cover the join with 15cm of self-vulcanising tape, stretching it to approximately two thirds its width as it is applied.

2.3.3 Attaching the Lower Manifold Assembly

(1) Place a jubilee clip on each of the upper hoses and slide each hose up onto the vapour sensors, ensuring that no strain is placed on the sensors;

(2) Secure the jubilee clips;

(3) Cover the join with 15cm of self-vulcanising tape, stretching it to approximately two thirds its width as it is applied;

(4) Adjust the length of the bottom hose, refit connection and seal with tape.

The completed Vapour Assembly is shown in the following figure.

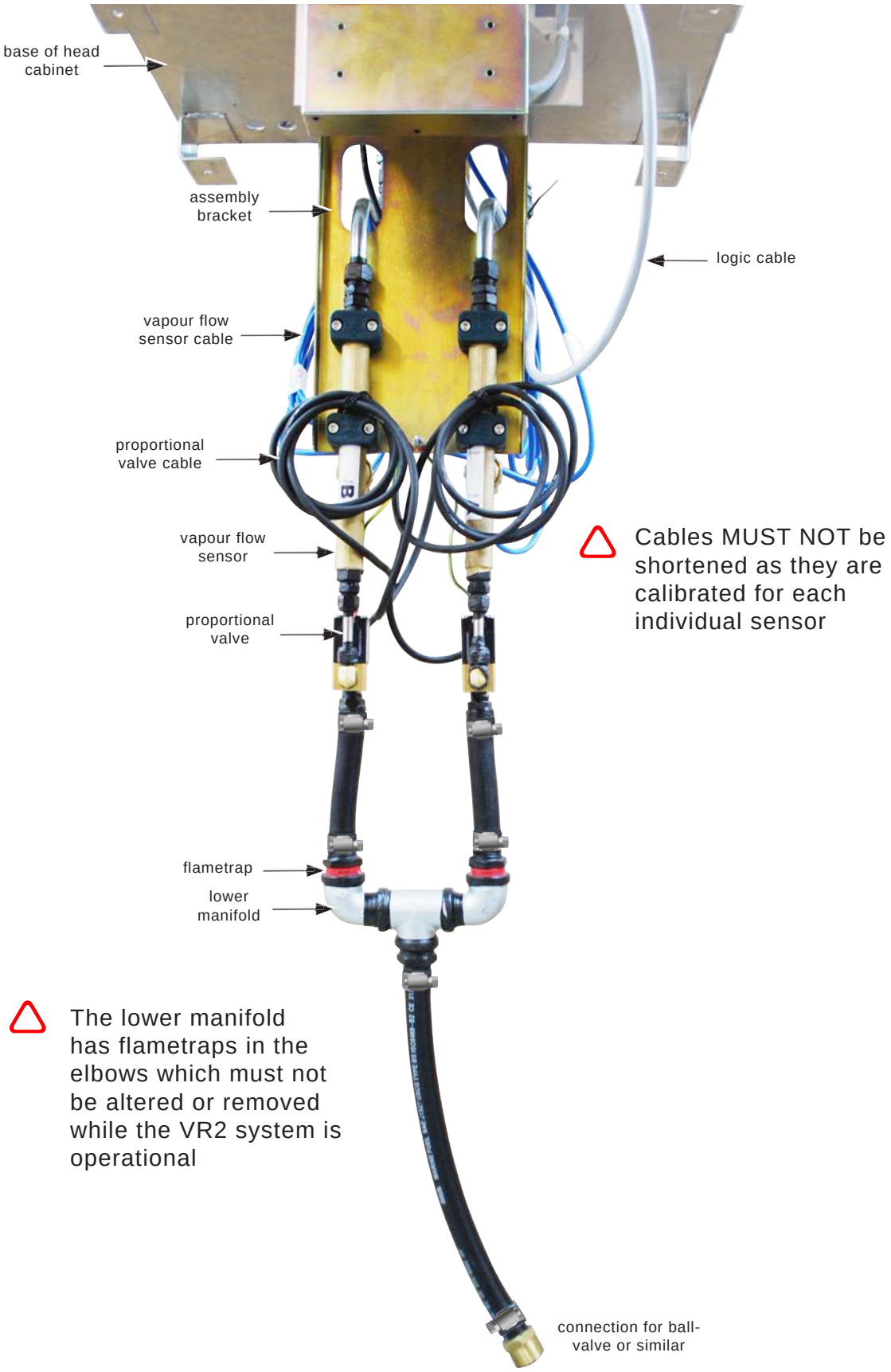


Figure 32. Complete Vapour Sensor Assembly

2.4 Connecting to the Underground Return Pipework

The recovered vapour is returned to the underground storage tanks from the dispenser vapour sensors via flametraps housed in a tee junction, which must be connected to the underground return pipeline.

Gallagher Fuel Systems recommends that the vapour return lines be connected via a ball-valve or other suitable isolating device, as shown in the illustration below.

This may require removal of the existing connection to facilitate a shortening of the hose.

When replacing the connection it should be sealed using self-vulcanising tape.

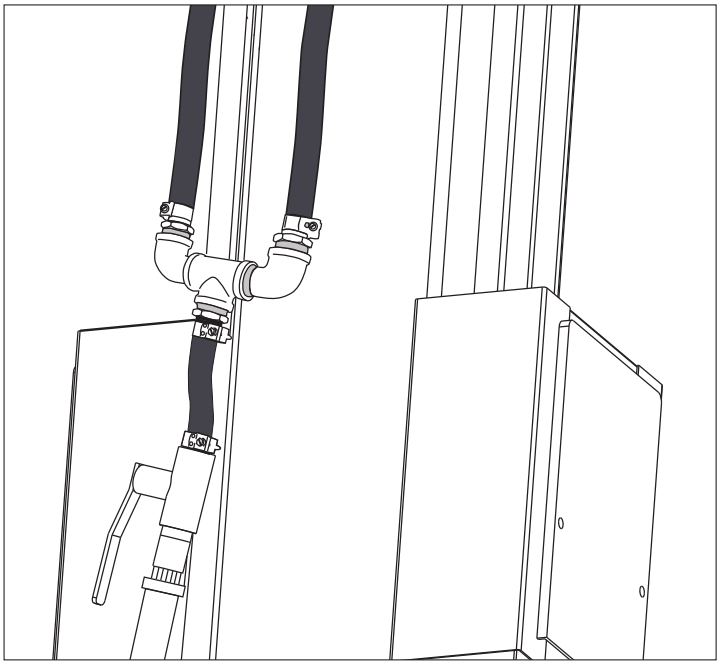


Figure 33. Example Vapour Return Line Connection

2.5 Electrical Installation

The electrical installation of a VR2 FDS is the same as for a non-VR2 versions except for one additional connection which is the communications cable linking the VMS Controller to the FDS. This cable is described in Section 1.4.

Although the following VR cables should be connected prior to despatch, this section can be used as a reference point in the event that some cable may need re-connecting.

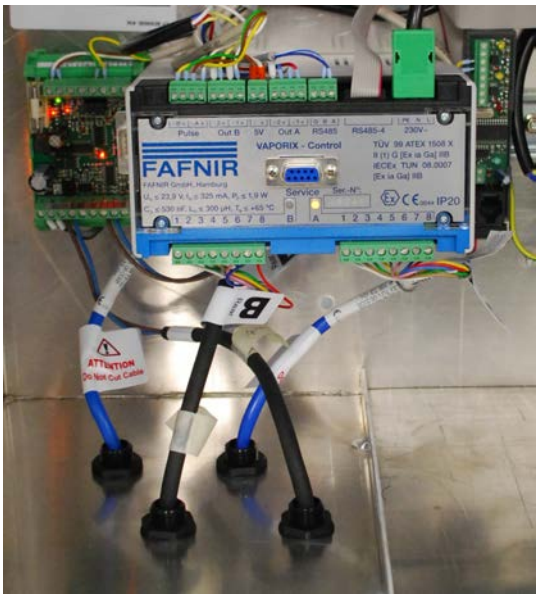
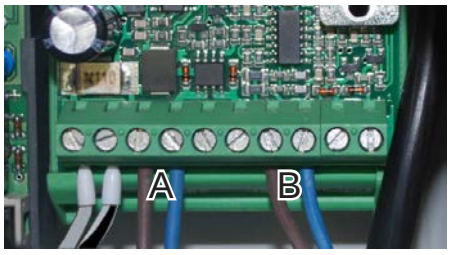


Figure 34. VR Modules Connections

2.5.1 Wiring of the Proportional Valve Cables

Cables A and B have to be wired into their terminals as shown in Figure 35.



Cable	Colour	Terminal
Front (A)	Brown	Ventil 1 +
	Blue	Ventil 1 -
Rear (B)	Brown	Ventil 2 +
	Blue	Ventil 2 -

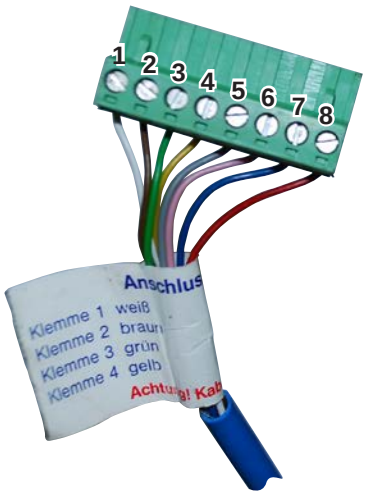
Figure 35. Connections into the Bürkert Valve Controller

2.5.2 Wiring of the Fafnir Vapour Sensor Cables

Both front (A) and rear (B) cables have to be wired into the Phoenix Connectors as shown in the figure below.

Cables **MUST NOT** be shortened as they are calibrated for each individual Sensor

These cables are intrinsically safe components and should be bundled separately from non-intrinsically safe cables



1. White
2. Brown
3. Green
4. Yellow
5. Grey
6. Pink
7. Blue
8. Red

Figure 36. Phoenix Connector for Vapour Sensor Cables

Once wired, the Phoenix Connectors have to be plugged into the Vaporix Control unit taking note of A (front) and B (rear) positions.

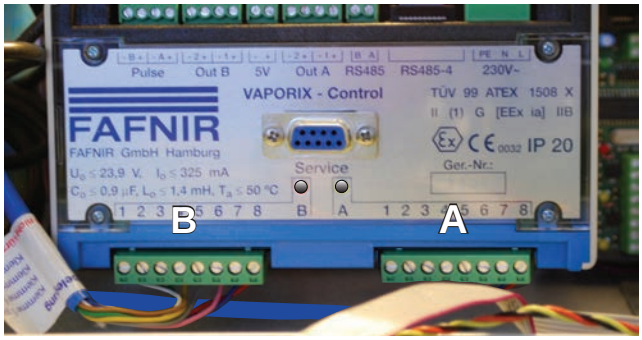
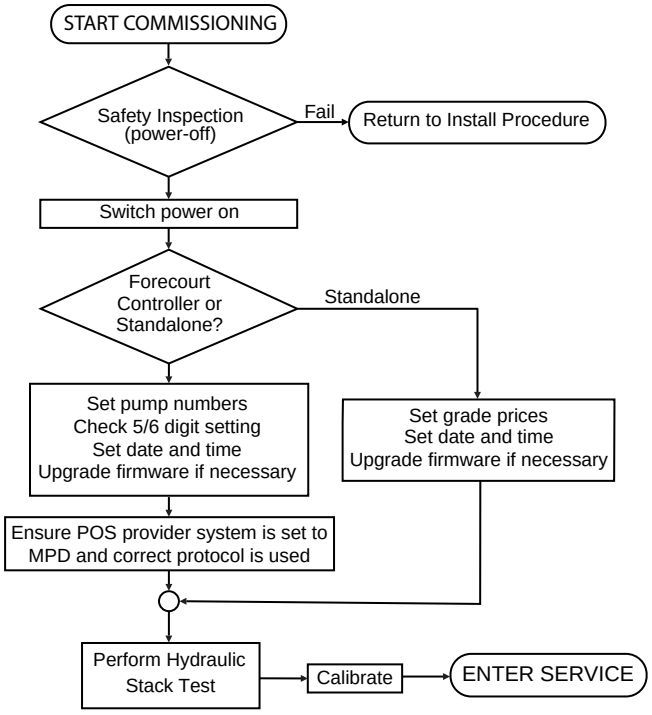


Figure 37. Phoenix Connectors on the Fafnir Unit

3 APOLLO 3000L COMMISSIONING

The following chart gives an overview of the commissioning process.



3.1 Safety Inspection

Before the fuel and electrical supply are turned on for the first time the installation must be inspected and approved for safety by suitably qualified personnel.

Items that must be checked during safety test include:

- VR2 return line connections (where present);
- Electrical power supply connections;
- Remote relay connections;
- Communications cabling and connections;
- Fuel feed line connections.

3.2 Dispenser Configuration and Setup

The dispenser is supplied with an specific configuration loaded onto the SD card on the Central Controller Module. However, following the physical installation of the dispenser, the system must be configured via the Service Mode prior to use.

3.2.1 Entering Service Mode

Service Mode is accessed by holding down the FILL key for three seconds. The word FILL is displayed in the Preset window and then disappears.

Enter the Service Mode password and press FILL again.

The screen will show SDCARD ACTIVE.

Note that it is not possible to enter Service Mode on more than one UI at any given time. If a user attempts to take a second UI into Service Mode whilst another UI is already in Service Mode, the second UI will appear not to respond. However, when the first UI is taken out of Service Mode, the second UI will immediately enter Service Mode.

3.2.2 Service Mode Function Screens

In Service Mode, the 2 and 8 keys initially serve as direction keys and are used to navigate through to a particular function.

Keys 4 and 6 are also used to navigate within a function.

The figure below shows the order in which the various service mode function screens will appear starting at SDCARD ACTIVE. When scrolling vertically or horizontally it is possible to continue beyond the last option to the first option.

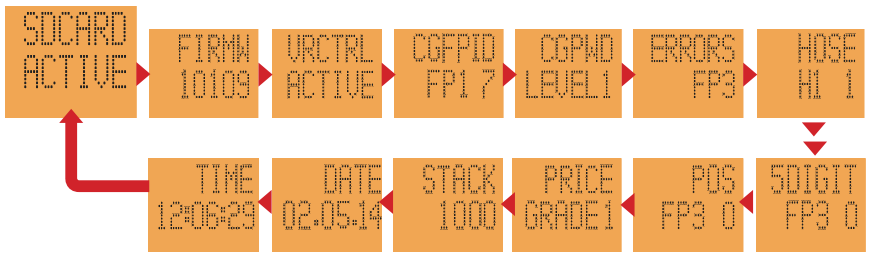


Figure 38. Service Mode Function Screens

3.2.3 SD Card Setting

The SD Card can be set to ACTIVE or LOCKED by pressing the 5 key.

Only remove an SD Card when in the LOCKED mode.

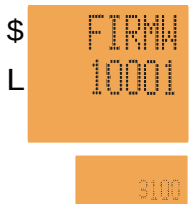
3.2.4 Firmware

The following actions are possible regarding the firmware:

- viewing of the installed firmware version number(s);
- upgrading firmware and
- rollback to previously installed firmware, provided that the previous version is still available on the module.

Note that the rollback option is not available on a Central Controller.

The display will show FIRMW in the Dollars display. The first available price display will show the module hardware address (ID), according to the table below. The installed firmware version number (e.g. 10001) is shown in the Litres display.



Module Name	ID Numbers
Stack Controller	1000; 1100
User Interface	2000; 2100; 3000; 3100
Central Controller	Remains blank

Use the cursor keys [4] and [6] to navigate left and right to view the different firmware versions installed. From this point, either an upgrade or a rollback can be actioned.

Note that if two or more of the same type of module are present with the same firmware version installed, the display will appear not to change other than the ID in the Price window.

Upgrading the Firmware

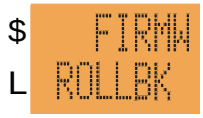
To upgrade firmware, a new firmware file must be present in the firmware folder on the SD Card.

To force a firmware update, scroll to the version to update and press [5]. The Litres display displays UPDATE. Press [5] again to action the upgrade. (If no file is present on the SD card, the Litres display shows NO FILE)

The UI shows BUSY while the update is in progress. Updates can be queued (i.e. both UI's could be updated concurrently). Modules can take up to 10-15 minutes to update, the Central Controller should only take approximately 30 seconds.

When the update is complete the new version number will be displayed. There is no other visible confirmation.

To rollback firmware on a module, press [0]. The Litres display displays ROLL BK. Press [0] again to action the rollback.



Note that the update request may be queued and may not be actioned for some minutes, depending on the number and nature of other queued requests.

Ensure every module's firmware is updated.

3.2.5 Setting VR Active

For non-VR sites VR Control can be set as either ACTIVE or OFF.

For VR equipped sites VR Control must be set to ACTIVE.

VR Control can be set to OFF to disable alarms and forced shutdown. This will enable servicing, testing or calibration.

Press (5) to toggle between ACTIVE and OFF.

3.2.6 Setting Pump Numbers

The front of the dispenser (sump at right hand side) is referred to as Fuel Point 1 and the rear as Fuel Point 2.

The dispenser leaves the factory with the default pump numbers FP1: 91 and FP2: 92.

Once in Service Mode the SDCARD ACTIVE screen is displayed

Scroll up or down, using keys (2) or (8) to access the CGFPID FP1 (Fuel Point 1) screen

CGFPID = Change Fuel Point ID

Press the (FILL) key

Enter the desired number (for example (7))

Then press the (FILL) key

Once allocated scroll using keys (4) or (6) to access other fuel points and repeat this process

Hold (C) for 3 seconds to exit Service Mode.

3.2.7 Setting a Password

This function allows the password for the Service Mode to be changed.

Once set, if the password is forgotten, Gallagher will only be able to reset to default when provided with the serial number of the Central Controller module.

- To change the password enter Service Mode using the default password.
- Scroll to CGPWD LEVEL 1 = Manager Mode
  or CGPWD LEVEL 2 = Service Mode
- Press (FILL) (CGPWD* shows edit mode)
- Enter password (eg: 123456)

- Press (FILL) (shows CONFIRM)

- Re-enter the password (eg: 123456)
- Press (FILL) (shows OK - password has been changed)

This will set the password for both sides of the dispenser.

Repeat for each dispenser.

Lost passwords can make dispenser servicing impossible. Do not change passwords unless a reliable system of recording a change is in place.

3.2.8 Errors

The ERROR function displays the numbers and types of fatal errors that have occurred since the error log was last cleared. The errors are displayed for each fuel point.

The dispenser logs all errors to the SD Card (even those that have been cleared) in a form that is not easily read. Gallagher Technical Support can interpret dispenser logs and provide a more detailed description of errors.

In Service Mode, scroll to ERRORS FP1.

Press (5) view the current error status of the fuelpoint

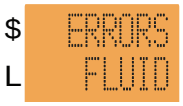
ALL OK = FDS **is not** currently in an error state

ERROR = FDS **is** currently in an error state

Press (5) to exit

Press (FILL) and use (4) or (6) to scroll through specific errors;

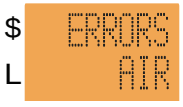
FLUID, POS, ENCODER, AIR, ERRO5, ERRO6, etc.



Press (5) to view number of instances of each type of error (since last cleared)

Press (5) to exit

Press (6) to scroll to the next error type



Press (5) to view number of instances of each type of error (since last cleared)

Press (5) to exit.

To clear an error press (0), then (0) again

Press (CLEAR) to return to the initial ERRORS screen

Press (4) or (6) to move to another Fuel Point

Interpreting Error Codes

Name	Meaning
FLUID	The float switch has been activated
POS	Communications have been lost for an extended period
ENCODER	Encoder operation outside normal parameters
AIR	Air sensor switch has been activated
ERROR 5	Not used
ERROR 6	Not used

FATAL ERRORS require the dispenser to be repowered to clear the error. If the error persists some action will be required to address the cause.

NON-FATAL ERRORS are cleared by lifting and rehanging a nozzle. These errors are not displayed using the method outlined previously. Non-fatal errors are recorded to the SD Card.

3.2.9 Setting Hoses Active/Inactive

Newly delivered dispensers have hoses set as active before leaving the factory.

To set hoses active/inactive enter the service mode.

Scroll to the screen shown where H1 indicates the hose number followed by 1 for active or 0 for inactive.

Pressing the 6 key will move between hoses and pressing 5 will toggle between active and inactive.

Hoses are set as active/inactive at the local fuel point found on the User Interface on the side of the hose to be set.

3.2.10 5/6 Digit Mode

When set to 6 Digit mode, a dispenser will allow sales up to a maximum of $9999.00. The 5 Digit mode allows sales up to a maximum of $999.00. The dispenser must be set to the same mode as the POS system, some of which are only capable of operating in 5 Digit mode.

The Dollars display shows 5DIGIT and the Litres display FP(?) 0 (or 1) where (?) represents the fuel point number.

Pressing 5 toggles the 0 or 1 following the fuel point number in the Litres display, indicating that the selected fuel point is set to 5 Digit mode (1) or 6 Digit mode (0).

Each fuel point (side) must be set. After making this change, the dispenser must be repowered.

3.2.11 POS/Standalone

Allows the POS/Standalone setting to be changed at the dispenser (via the User Interface). Set for each fuel point (FP).

For Standalone mode the dispenser must first be isolated from the Forecourt Controller.

The display shows POS in the Dollars display followed by the fuel point number and a 0 or 1 in the Litres display.

Pressing 5 toggles the 0 or 1 following the fuel point number in the Litres display, indicating that the selected fuel point is set to POS (1) or Standalone (0) mode.

Use the cursor keys 4 and 6 to navigate left and right through the different fuel points.

After setting one or more fuel points to Standalone mode, the dispenser must be repowered.

If the dispenser is overridden to Standalone mode, but communication is received from the POS (e.g. after reconnecting the Comms cable), the dispenser will automatically revert to POS enabled.

3.2.12 Grade Prices

Prices can only be set in Standalone Mode. When the fuel point is POS enabled, the grade price cannot be changed at the dispenser User Interface.

This function allows the grade price to be changed at the dispenser via the User Interface. It is set for each hose individually only on the local fuel point side.

The Dollars display shows PRICE and the Litres display shows GRADE followed by the grade number, starting at 1.

Use the cursor keys 4 and 6 to navigate left and right through the different grades.

To set the price, select the displayed grade by pressing the FILL key. The Dollars display now shows GRADE followed by the grade number and an asterisk (*) The Litres display shows the current price for that grade. Enter the grade price in a sequence of 4 digits, without a decimal point. To confirm the price, press FILL.

The dispenser leaves the factory with a default price of 999.9 CPL (cents per litre). The presence of any other price indicates either the grade price has been manually set or a price has been received from the POS.

3.2.13 Hydraulic Stack Test

A stack test should be performed for each dispenser to ensure that the fuel supply is flowing freely. This will also flush the delivery pipes and hoses as well as prime the system. A test can is required.

Stack test is accessed by entering the Service Mode.

Procedure

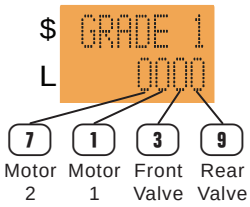
Enter Service Mode

Use the [2] and [8] keys to scroll through the list until STACK is displayed in the Dollars display. 1000 is shown in the Litres display

Press [6] to select a different stack (if present) eg: 1100.

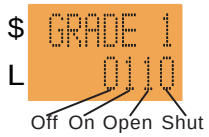
Press [FILL] to select the stack for testing.

The Dollars display now shows GRADE1 and the Litres display shows a row of four digits, indicating the state of motors and valves. (0 = Off 1 = On / Open)



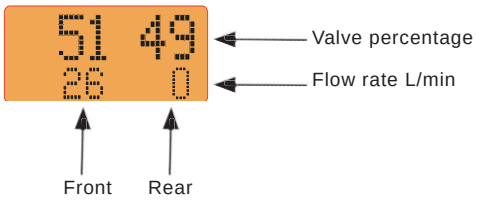
Motor and valves can be toggled between On/Off or Open/Shut using the following keys:

[1] Motor 1	[3] Front Valve
[7] Motor 2	[9] Rear Valve



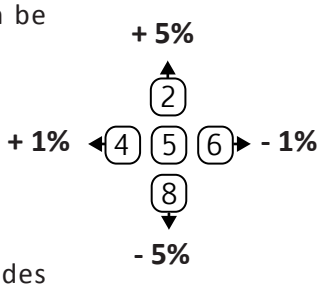
Dispense fuel taking note of the actual flow rate once it has stabilised (after 3-5 seconds of flow).

While delivering fuel the cents per litre display window will show:



Adjusting Flow Rates

When a proportional valve is opened and the motor is turned on (i.e. when the output digit shows a **1**), the flow rate can be adjusted as follows:



5% increments using the keys [2] (+) and [8] (-)

1% increments using the keys [4] (+) and [6] (-)

Press [5] to store the setting

Press the [FILL] key to scroll through and set the available grades in the dispenser.

Notes:

- A flow rate of 30 – 38 L/min is optimal. 40 L/min or greater will likely cause the nozzle to trip with tight filler necks.
- A change of 1 - 2% can affect flow rates by several litres per minute

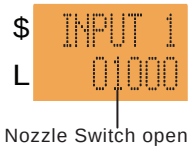
Checking Input Status

When in Stack Test press the FILL key again to display the available stack input groups. The digits in each group relate to the following inputs:

INPUT 1 1 - 5

FRONT Nozzle Switches

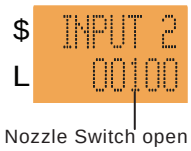
Lifting each nozzle opens the switch which is indicated by a 1 on the associated digit.



INPUT 2 1 - 5

REAR Nozzle Switches

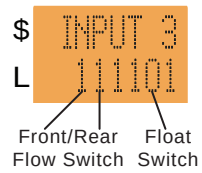
Lifting each nozzle opens the switch which is indicated by a 1 on the associated digit.



INPUT 3 1 - 6

Supplementary Inputs

For use with features such as highflow switches or float switches.

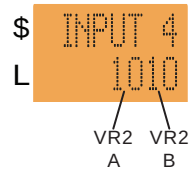


INPUT 4

VR Switches Inputs

For use when VR2 equipment is installed. 10 indicates the system is working correctly.

00, 01 or 11 indicates a fault.



Pressing the CLEAR key exits the stack test and turns all valves off.

3.2.14 View/Set Date and Time

Setting the date and time ensures that the time stamps on Error Logs are correct.

The display will show DATE in the Dollars display and the current Central Controller date in the Litres display.

To set the date, press (FILL). The Dollars display shows DATE*

An asterisk (*) after the function name indicates that the system is in edit mode.

Enter the date (DDMMYY). Note that if the date is entered using all six figures, there is no need to confirm entry, i.e. the system automatically accepts and acts on the entered date. If less than six digits are entered, press (FILL) to confirm the new date.

The Dollars display shows DATE (without the asterisk) to indicate that the UI is back in 'view date' mode.

Press (6) to move to TIME and set in the same manner.

Gallagher advise the checking of the date and time when obtaining dispenser logs. Should either be incorrect, make a note to be included with the logs. This will assist in finding the events being investigated.

3.2.15 View Totes Mode

Totes mode is provided to allow site staff to view litre and dollar totes. Totes are displayed in the price window of the specific hose. Each Fuel Point of the dispenser must accessed from its particular side to view its totes.

The procedure is:

1. Press (FILL) for 3 seconds
2. Enter totes password
3. Press (FILL)
4. Press (6) to show dollars totals
5. Press (4) to show litres totals
6. Press (CLEAR) to exit
7. Repeat on the other side of the dispenser

3.3 Tatsuno Meter Calibration

The Tatsuno Meter is used with petrol and diesel.

Calibration adjustments affect the volume of fuel delivered per revolution of the flow meter, while the displayed volume always advances by exactly the same amount for each revolution.

Calibration is achieved by using the Adjustment Wheel to alter the volume delivered by the Flow Meter per revolution so that it matches the volume displayed after a test delivery.

Refer to local legislation for requirements pertaining to calibration procedures.

Remove the locking pin prior to moving the Adjustment Wheel.

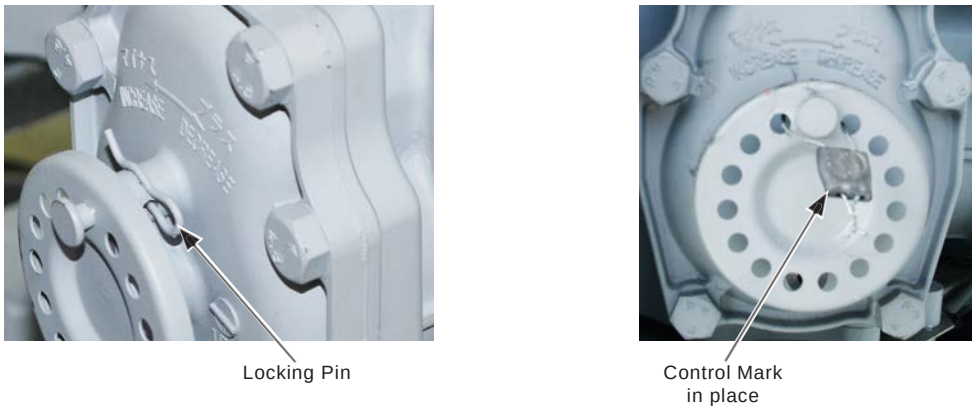


Figure 39. Adjustment Wheel

A single pitch-turn (one hole to the next) varies the flow by 0.04% (approx 0.2ml per revolution). The meter can be adjusted up to a maximum of 0.64% (3.2ml per revolution).

After calibration, the meter must be wired with a sealed plate (Control Mark).

Over-Delivering

When a Flow Meter delivers **MORE** fuel than required the display will show an amount less than the actual delivery.

Solution: "**DECREASE**" the amount delivered per revolution by moving the calibration wheel in a clockwise direction.

Under-Delivering

When a Flow Meter delivers **LESS** fuel than required the display will show an amount greater than the actual delivery.

Solution: "**INCREASE**" the amount delivered per revolution by moving the calibration wheel in an anti-clockwise direction.