APOLLO 3000

Objectives

- System description of the 3000 Series
- Discuss the pre-installation and installation considerations
- Discuss the commissioning procedure
- List the common service and maintenance actions

System Description

Apollo 3000

- Cooperative Design with BP New Zealand and Australia in the late 1990's
- BP own the Design / Image
- Always dispensers
- Hydraulics, meters, valves all below ground
- Individual components certified rather than complete system
- Electrical system is same as 8000 series therefore covered by 8000 series Certificate of Conformity

PEC

System Description

Apollo 3000
Models

- 2 or 3 Product MPD (4 or 6 hose)
- MPD can have standard or single side high flow diesel module
- High Flow Diesel (1 or 2 hose)
- LPG (1 or 2 hose)

2000 Series (MK 1)

3000 Series (MK 2)

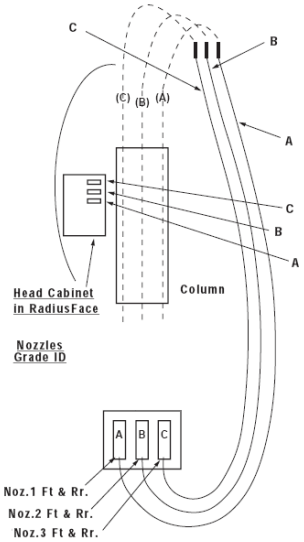
LPG or H/F Diesel

PEC

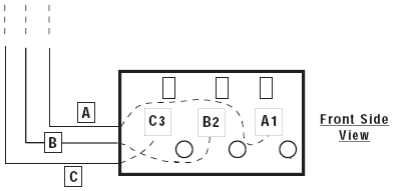
System Description

Apollo 3000

Hose Configurations



- Product C is the closest to the column in the Sump (NOTE: opposite in 2000)
- Product C price display is at the top of the head
- Front side of the head has the mechanical totes



System Description

Apollo 3000

LPG & H/F

LPG & High Flow diesel

- Stand-alone LPG or High Flow diesel
- 1 or 2 hoses
- Batchens LPG metering equipment with PEC electronics
- Special Head cabinet, display PCBs and Input Processor
- Safety break fitted and anchored to ground

System Description

Apollo 3000
Hoses

- Hoses:
  - Earlier Apollos had in-line safety breaks at the top of the column.
  - These are no longer permitted so all safety breaks are now at the nozzle

PEC

System Description

Apollo 3000
Displays

Apollo MPD

Displays are the same as 8000 series.

- Dollar/Litre
- Preset
- Price per litre (1-3)

Apollo LPG/High Flow Diesel

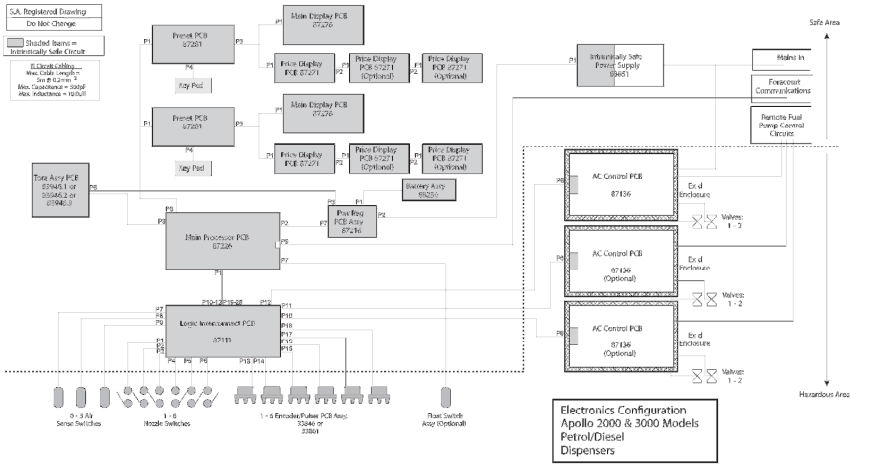
- Different 'all in one' display PCB
- No Preset option

PEC

System Description

Apollo 3000
Electrical System

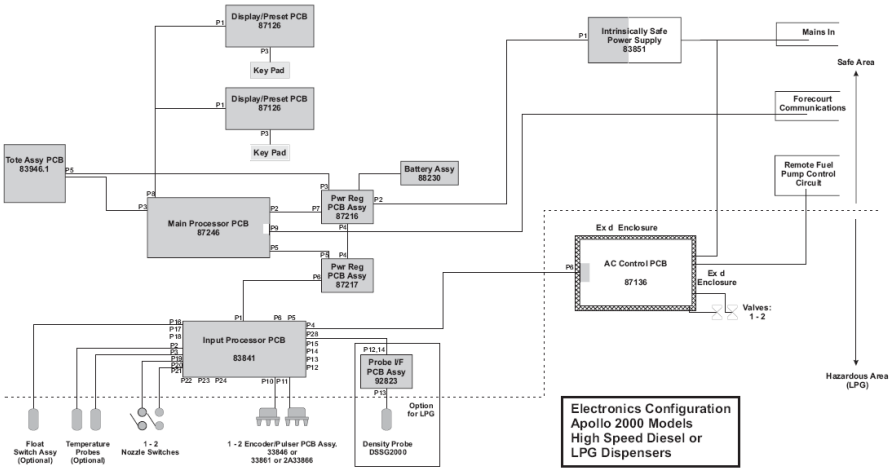
Electrical System MPD



System Description

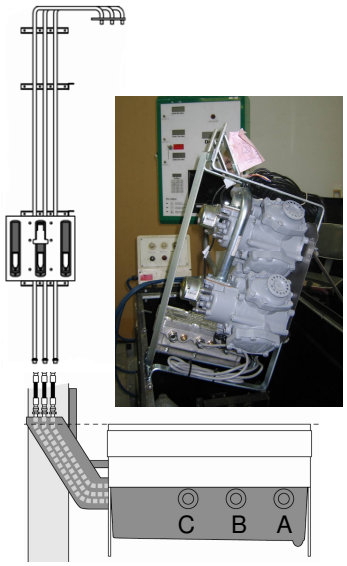
Apollo 3000
Electrical System

Electrical System LPG/High Flow Diesel

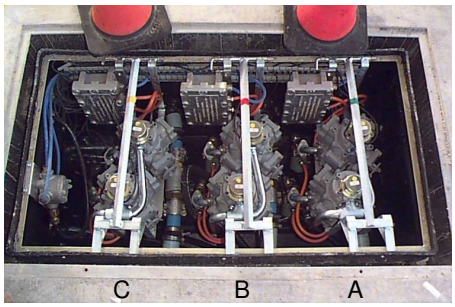


System Description

Apollo 3000
Hydraulic System



Hydraulic System Interconnect:



System Description

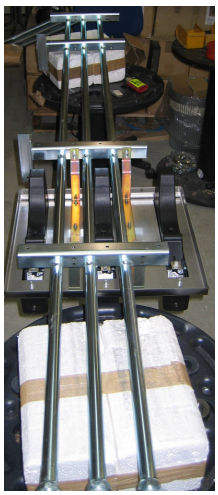
Apollo 3000
Operating Limits

- Ambient temperature range = -10 ℃ to +40 ℃
- Typical flowrate for standard flow = 40 LPM
- Typical flowrate for High flow = 80 LPM
- Max operating pressure dispensers PMax = 350kPa
- Min operating pressure dispensers PMin = 100kPa
- Mains Power supply requirement = 230/240VAC 50Hz.

Installation

Apollo 3000
Pre-Installation

- Many separate components – assembled on site
- All tested as individual working units but sent separately for site installation
- Packaged to fit into container space
- Apollo Technical file. Complete manual for all aspects of the Apollo product. One supplied for each site, file must remain on site.



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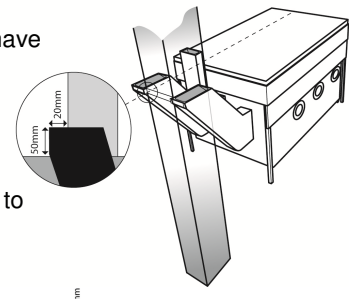
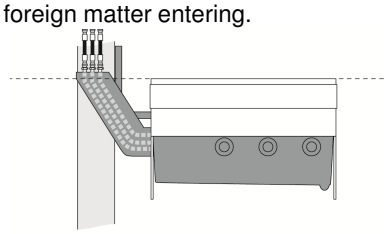
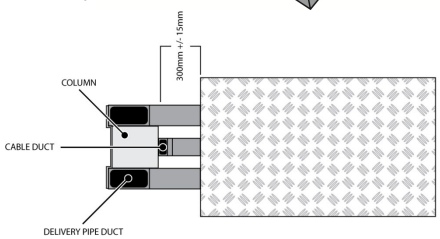
Installation

Apollo 3000
Sump

- Establish proposed final forecourt ground level and mark on column
- Install sump below ground ensuring frame legs have solid support such as concrete block to prevent sinking
- Delivery pipe ducts 50mm above ground level
- Delivery ducts 20mm past column
- Top of frame just proud of forecourt ground level to prevent water ingress
- Plug or cover delivery pipe ducts to prevent any foreign matter entering.





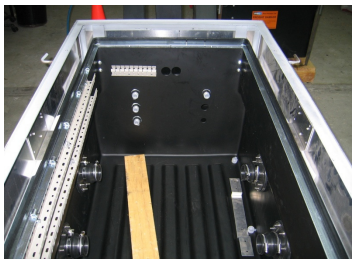


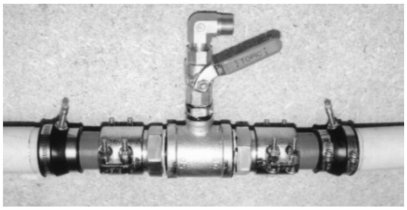
PEC

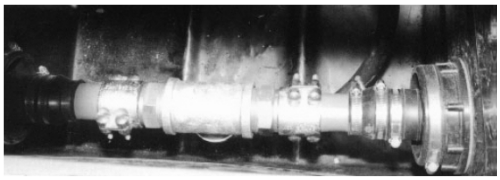
Installation

Apollo 3000
Sump

- Pack fill material around sump enclosure to a point just under bulkhead fittings to stabilize
- Install main product feed lines through sump
- Tee connector and 3/4’” Ball valve must face towards bottom of the sump with lever towards the column
- Recheck sump position in relation to column and forecourt surface





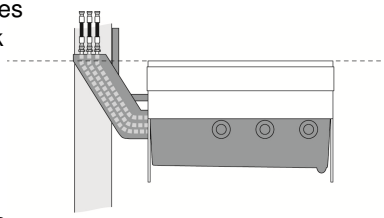


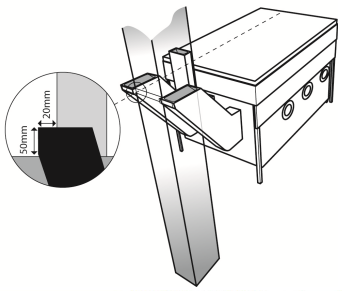
PEC

Installation

Apollo 3000
Sump

- Secure Pipe delivery ducts and main feed lines into position to prevent movement while back filling.
- Temporarily brace internal walls of the sump using timber or similar to eliminate walls collapsing inwards during back filling
- Install all servicing cabling and pipe work. Ensure all services are positioned correctly to clear vent box, head mounting and GRP cladding
- Recheck seals and sump position
- Backfill to cover feed lines and secure sump position
- Compact to within 150mm of forecourt surface, 30-50mm up skirting walls
- Concrete forecourt as per site requirements





PEC

Installation

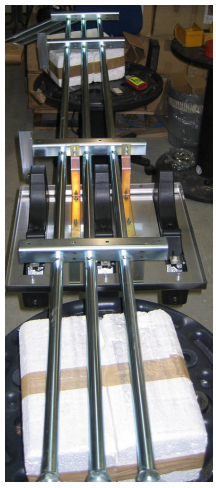
Apollo 3000
Pipes

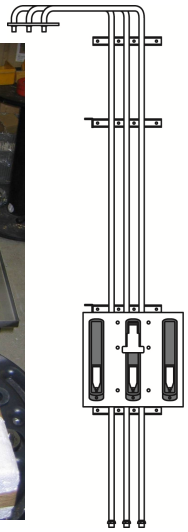
- Find highest point in forecourt out to a distance of 160mm from the main column in any direction. Mark this point on column
- This is a datum point to start measuring from for positioning of components and mounting brackets etc.
- Mark horizontal lines 2.3m and 1.405m up the column from this point.

Installation

Apollo 3000
Pipes

- Place FRONT Vertical Pipe Assy onto front face of Column, top of pipes should angle towards the sump
- Slide Pipe assy up until the top face of the second horizontal bracket lines up with the lower 1.405m mark, or top face of the second horizontal bracket down lines up with the 2.3m mark.
- Secure into position with G or F clamps or ratchet ties
- Check column stops are hard against column
- Check pipe assy are truly vertical – column may not be. As cladding mounts to pipes





Installation

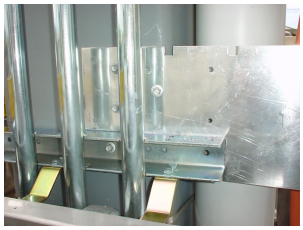
Apollo 3000
Pipes

- Drill pilot holes into column through holes in horizontal fixing brackets. Minimum of 2 required. Uses 12 gauge 32mm
- Repeat processes on rear side. Ensure brackets on rear pipe assembly are horizontal with the front set. Also ensure column stops on rear pipes are positioned exactly the same in relationship to the column as the front side.

Installation

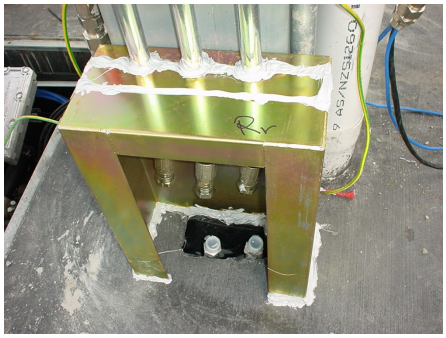
Apollo 3000
Head

- Assemble Head cabinet mounting brackets onto head cabinet – the cut out section of the bracket points down
- Position lower head bracket onto top face of second horizontal fixing bracket of vertical pipe assy
- Secure head into position with clamps, drill pilot holes and fix with screws.
- Attach Logic Box to under side of head cabinet assy



Installation

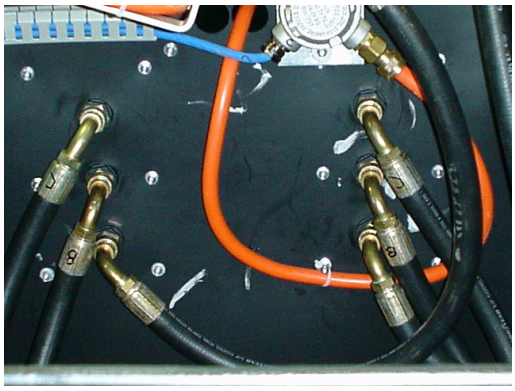
Apollo 3000
Vent Box



- Fit vent box to vertical pipes ensuring base edge contacts against the forecourt
- Fit top cap to vent box ensuring it fits correctly into the recess
- Seal the cap from the inside using 50mm wide aluminum tape to provide a vapor seal. Also tape top of vent box to the column.
- Using Bostik Matrix 600 or 700FC Polyurethane sealant, seal all joints and pipe holes. Ensure a good sized filet where the Vent box meets the forecourt
- Seal must be good enough to prevent vapor gathering inside the dispenser cladding
- Fit Safety Flex hose between delivery pipes and the vertical pipe assembly
- Repeat vent box installation for the rear side

Installation

Apollo 3000
Sump Hoses

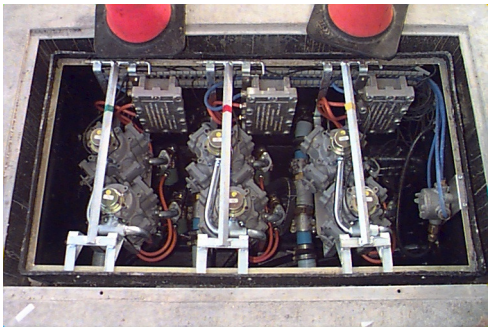


- Start with Module C – closest to column in 3000
- Connect Internal delivery hoses to Internal delivery pipe
- Attach Internal Product Feed hoses assy to main feed lines – ensure correct feed path

Installation

Apollo 3000
Modules

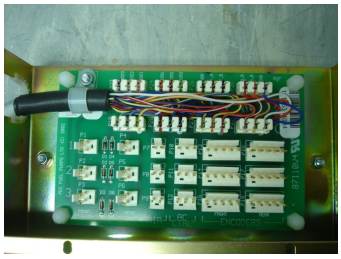
- Fit float switch onto studs provided – position as low as possible
- Install Module C, fit hinge pin and lift and brace module up
- Attach Feed and delivery hoses to Meter module
- Repeat for module B and A



Installation

Apollo 3000
Wiring

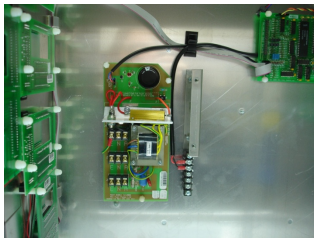
- Connect Mains and Relay cables into AC Control boxes and secure cables into trunking
- Using a draw cord pull encoder, float switch and AC cables up through the cable duct. Also feed through SWA cable.
- Plug cables into Logic Board beneath head cabinet.



Installation

Apollo 3000
Wiring

- Fit SWA from sump, Mains cable, and comms cable into the head using appropriately sized Flameproof glands (not supplied)
- Mains connects to Power Supply. Relays connect to connector block
- BEFORE connecting comms to connector block, check comms jumpers set correctly on main processor board. Factory set to PEC comms.

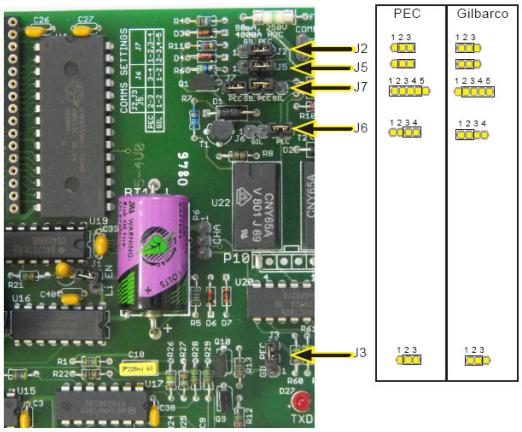


PEC

Installation

Apollo 3000
Installation

- 6 Jumpers used to set Forecourt Comms protocol. MUST be set before comms wiring is connected otherwise Fuse at F1 can be blown.
- Either PEC or Gilbarco



PEC

Installation

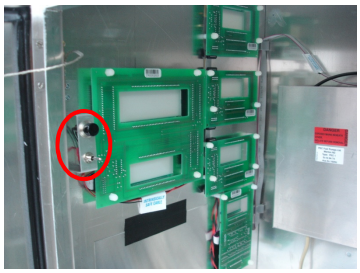
Apollo 3000
Installation

- Attach Nozzle Holster cables to logic box and holsters
- Fit light bulb
- Check all Hydraulic and electrical connections.
- Fit cover back over Power Supply
- **All electrical connections require inspection and certification.**
- Connect 12v battery and lithium battery jumper

Installation

Apollo 3000
Commissioning

- Power up dispenser. Beep, pause, 6 beeps
- Access functions with switch and button
- Clear RAM. Function 10, FILL, FILL



- Set Hoses Active (22/23, 42/43, 62/63). 1 = Active
- Check price per litre correct. (0.0 for cents, 0.000 for dollars)
- Set Product Prices (31, 51, 71) – set as unreal prices
- Set Pump comms numbers (20, 21)
- Set Float switch active (14) – set to 1
- Set Startup delay (16) - set 040-060 (4 – 6 seconds)
- Set managers switch to run mode
- Price change will occur with prices from POS system

Installation

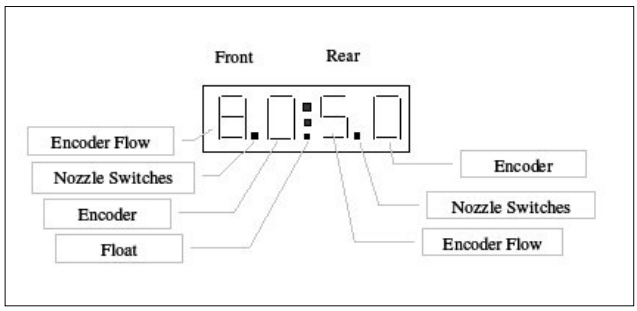
Apollo 3000
Commissioning

- Cladding supplied by FDL (Fibreglass Development Ltd). Refer to FDL instructions for fitting
- External hoses are fitted after cladding

Installation

Apollo 3000
Commissioning

- Access Agent Functions using Manager switch and agent button
- Use the Stack Test for the initial fuel deliveries (30,50,70)
- Open nozzles in test cans, open valves, start motor and flush through thoroughly before closing nozzles or valves



1 Motor
2 Pump A Slow
3 Pump A Full
4 Pump B Slow
5 Pump B Full

7 Approx LPM
8 Back

Commissioning

Apollo 3000
Test deliveries

- Set Managers switch back to run position
- Perform test deliveries on comms, check pump versus POS figures
- Lift float switch to test operation – FLUId displayed. Power reset to clear FLUId error.
- Carry out normal calibration procedure

Installation

Apollo 3000
Long term Storage

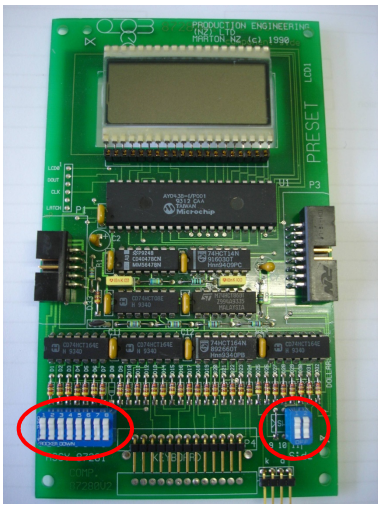
If the unit has been in storage for 3 months or more prior to installation, the following additional checks are required:

- Nozzle Autostop – Check the sensing port
- Solenoid Valves – Check for correct operation using the Stack test
- Hoses – Check for kinking
- Nozzles and swivels – Check full/free movement.
- Head – Inspect for any moisture ingress, and check battery charge.

Commissioning

Apollo 3000
DIP Switches

Preset Display DIP Switches



87281 Display PCB	SW2 ON 1 2 3 4 5 6 7 8				
Switch No.	Switch Position				
1	7000 Series - On				
	8000 - Off				
2	Base Model Multipec - Off				
3	Display Type = One Display per Side - On				
	Multipec Models				
	1MPD	2MPD	3MPD	Dual	
4	Off	On	Off	On	
5	Off	Off	On	On	
6	Off	Off	Off	Off	
7	Off = non LPG On = LPG				
8	Off = 5 Digit On = 6 Digit				
Display Board					
Link/Track	Display Type	Dollar/Litre - Link Not connected/Cut			
		Cents/Litre - Link connected			

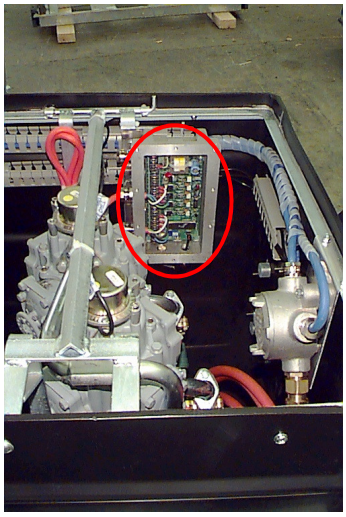
87281 Display PCB	Link/Track ON 1 2 9 10 11 12 SW3	
Switch No.	Switch Position	
9 Link	Price Display	Dollar/Litre - Link Not connected/Cut
		Cents/Litre - Link connected
10 Link	Fluid - Link Not connected/Cut	
	Air Sense - Link connected	
11	(Not Used)	
12	Display Side	Front - On
		Rear - Off

Commissioning

Apollo 3000
DIP Switches

- Apollo have AC Control Board per module (Product). These are mounted in a flame proof box on each module in the sump
- Therefore each AC board must be addresses using dipswitchs so it responds to the appropriate commands from the processor
- Older boards had 4 switches, but only two are used for addressing, the other two are left ON in all cases.

Box	AC DIP Switches	
	1	2
A	Off	On
B	On	Off
C	Off	Off



LPG / High Flow Diesel

Apollo 3000
Installation

LPG

- LPG Sump assembled by Batchens in Sydney and sent direct to site. Sump includes mounting points for column
- PEC supply Encoders, Input processors, AC Control and float switches to Batchens
- Not built around canopy columns, stand alone structure
- Single or Dual hose
- Smaller Head cabinet, special display PCBs, Input Processor

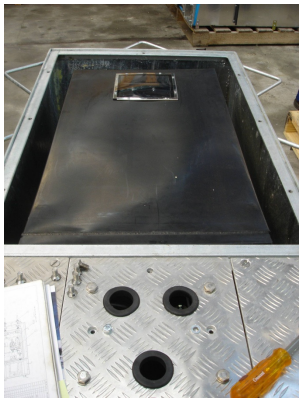
Diesel

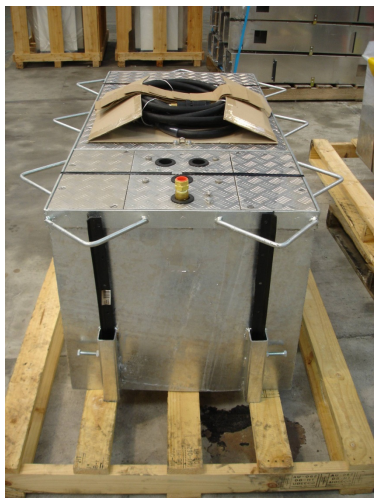
- Standard Apollo sump with outrigger to mount column
- Cut down delivery pipe ducts and pipes
- Not built around canopy columns, stand alone structure
- Single or dual hoses
- Same head cabinet and displays as LPG, has Input Processor

LPG / High Flow Diesel

Apollo 3000
Installation

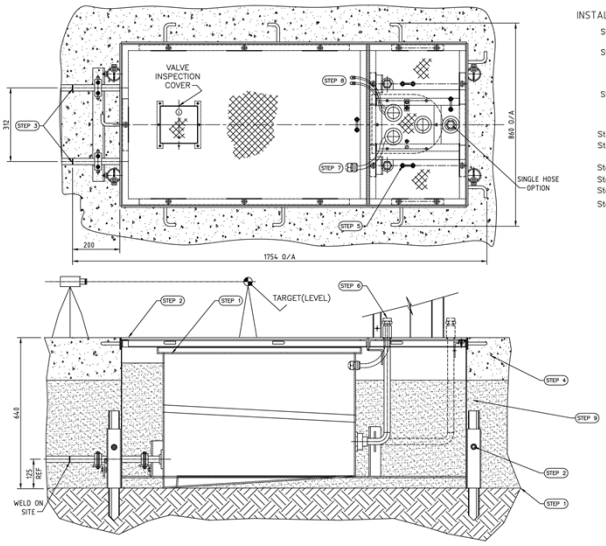
- LPG Sump assembly as supplied by Batchen, fitted with PEC electronics





LPG / High Flow Diesel

Apollo 3000
Installation



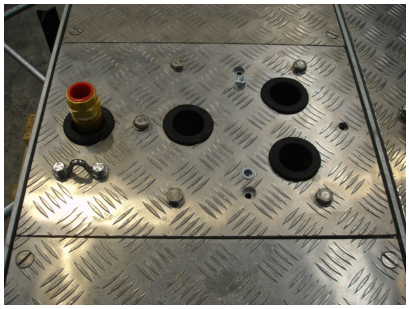
INSTALLATION PROCESS, UNDERGROUND HYDRAULICS MODULE

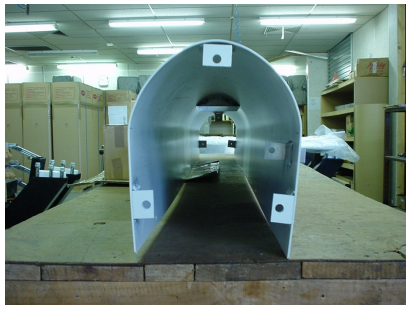
Step 1 Excavate to specified Dimension & Compact Sand Prior to Placing Module
Step 2 A) Loosen bolts holding star posts.
B) Hammer in star posts.
C) Lift module till level
D) Tight bolts onto star posts
Step 3 A) Prepare to weld pipes to module.
B) Place wet rags around pipe to prevent damage to plastic pipe support.
C) Weld pipes, Run cables & air line.
Step 4 Pour concrete
Step 5 Mount column & fit break glass assembly. breakaway coupling
Step 6 Connect hose and breakaway coupling
Step 7 Complete S.W.A Cable installation
Step 8 Complete Nozzle limit Switch and Comms cable installation
Step 9 Back fill the gaps with sand to avoid pockets for gas accumulation

LPG / High Flow Diesel

Apollo 3000
Installation

- Remove flat panel from column
- Column mounts onto the sump via 3 bolts

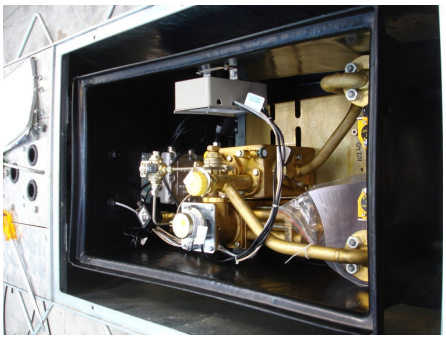


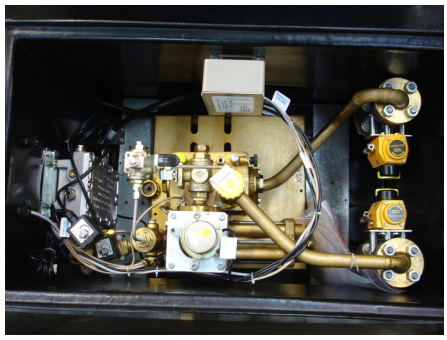


LPG / High Flow Diesel

Apollo 3000
Installation

- Feed SWA and Input Processor cable from sump up column
- Connect nozzle switch cable from holster into Input processor
- Fit Input Processor Eprom supplied with Head





PEC

LPG / High Flow Diesel

Apollo 3000
Installation

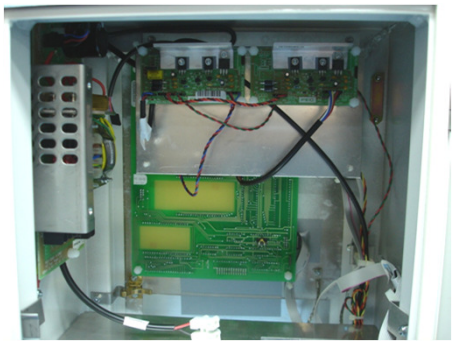
- The head mounts to the flat side of the column via 4 pem studs. Head hangs over the sump.
- 5 holes and 1 gland and 1 bung provided for cables

PEC

LPG / High Flow Diesel

Apollo 3000
Installation

- Connect data cable from input processor to Power regulator
- Connect SWA mains to Power Supply board
- Connect comms cable
- Connect Replay to connection block on Power Supply board



PEC

LPG / High Flow Diesel

Apollo 3000
Installation

- Hoses are supplied by Batchens with PEC hose clamps and Gasguard Nozzle fitted
- Fit spring extension to column cap
- Assemble hose clamp into swivel body using supplied cotter pin
- Fit hose assembly to delivery pipe
- Anchor safety break

PEC

LPG / High Flow Diesel

Apollo 3000
Commissioning

- Connect 12v battery to power regulator
- Ensure lithium batter jumper in place
- Set comms protocol jumpers before connection comms cable
- Power up dispenser. Beep, pause, 6 beeps
- Access functions with switch and button
- Keypad template required – supplied with each head
- Clear RAM. Function 10, FILL, FILL
- Set Hoses Active (22/23). 1 = Active
- Check price per litre correct. (0.0 for cents, 0.000 for dollars)
- Set Product Prices (31) – set as unreal prices
- Set Pump comms numbers (20, 21)

- NOTE: In Apollo LPG the float switch is activated using a Dipswitch on the Input Processor.
- SW3 switch 2: ON = float switch active

LPG

Apollo 3000
Commissioning

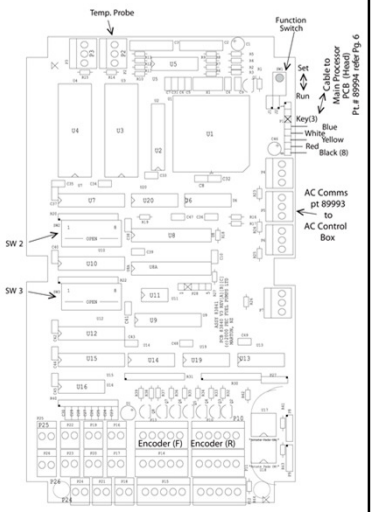
- Switch Input Processor switch to setup position
- Set specific gravity – Function 82, set to 545
- Set encoder direction – Function 36, set to 0
- Set Encoder constant – Function 34/35, set to 2500
- Switch Input processor switch to run position
- Set managers switch to run mode
- Price change will occur with prices from POS system

LPG / High Flow Diesel

- Input Processor has two banks of DIPS – SW2& SW3

Density Probe & V3 software		
DIP	SW2	SW3
1	On ****	Off *
2	Off	Off ***
3	Off	Off
4	Off	Off
5	Off	Off
6	Off	Off
7	Off	Off
8	Off	Off

NO Density & V1 Software		
DIP	SW2	SW3
1	Off	Off *
2	Off	Off **
3	Off	Off
4	On	Off
5	Off	Off
6	Off	Off
7	Off	Off
8	Off	Off

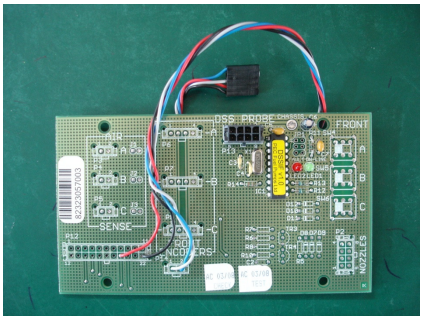


* OFF = dollars per litre ON = cents per litre
** OFF = Float switch disabled ON = Float switch enabled (V1.121s or greater)
*** OFF = Float switch disabled ON = Float switch enabled (V3 software)
**** OFF = Stand alone Temp probe ON = Density probe

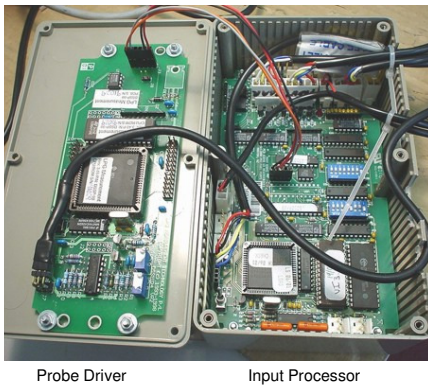
PEC

LPG

- Probe Driver board mounting on lid of Input Processor box in sump
- Older Apollo use LPG measurements board, newer Apollo use PEC (cut down 9000 Logic PCB)



Probe Driver - PEC



Probe Driver LPG Measurements

Input Processor

PEC

LPG

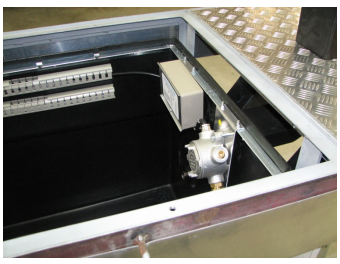
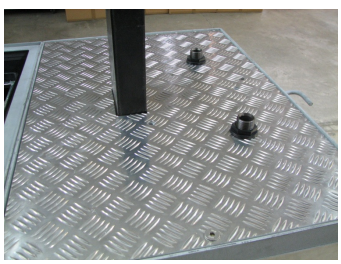
Apollo 3000
LPG Calibration

- Connect nozzle to calibration meter
- Run 20 litres through test meter
- Hang up nozzle
- Switch Input Processor switch to ‘setup’ mode
- View uncompensated value, Function 37/38
  Press 37 – FILL – 2000 – FILL – 34 – FILL
  Uncompensated value is displayed eg 2498
- Enter new readings on Setup and Test Record Sheet
- Retest and check

High Flow Diesel

Apollo 3000
Commissioning

- Standard Sump with cut down delivery pipe ducts and pipes
- One High Flow module with single meter fitted per hose
- 1 inch pipework, Y Strainer, Valve, hoses and nozzles
- Outrigger fitted to Sump to give mounting point for column
- Same smaller head as LPG
- Input Processor in sump


2000 Series – Mark 1

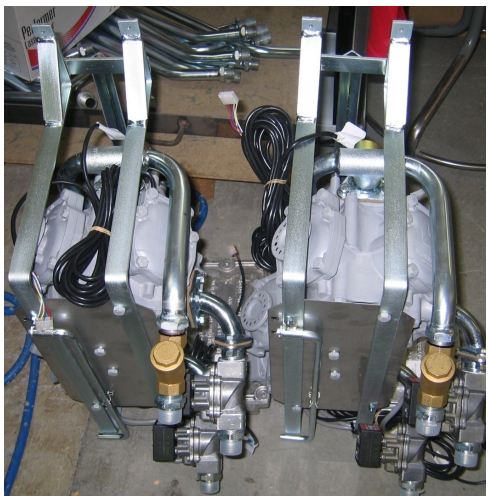
Apollo 2000

- Sump Installation is the same as 3000 series.
- Modules named in reverse order to 3000 – A is closest to column
- Vertical pipe assy different, bend away from sump rather than towards it.
- Mount vertical pipe assy with bottom of holster panel 930mm off forecourt
- No vent box
- Logic box mounts to vertical pipe assy rather than bottom of head
- Bottom of head cabinet is 1355mm from forecourt
- Early 2000 have different electronics. Older Processor that did not require a power regulator
- Metal framing to support cladding supplied by FDL

Service and Maintenance

Apollo 3000
Strainer

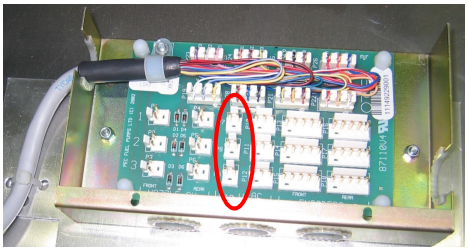
- Simple Y strainer before the meter
- Foreign material can gather in the flexible supply hose before the strainer – so if poor flow rate ensure hose is cleaned out.



Service and Maintenance

Apollo 3000
Float Switch

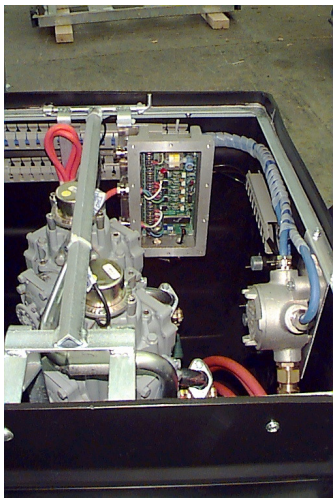
- Sump Float switch, activates with only a cup or so of fluid
- Connects to Air Sense pins on logic or Input Processor board
- Needs to be activated with dipswitch or Function 14(set to 1) V2.51 onwards
  - Older software uses link on dip 10 on preset display
  - LPG uses SW3 Dip 2 on Input processor
- When activated (circuit open) idle sides with display FLUId.
- Sides in use will cease delivering and show sale value until nozzle lifted again – will then display FLUId



Service and Maintenance

Apollo 3000
AC Control PCB

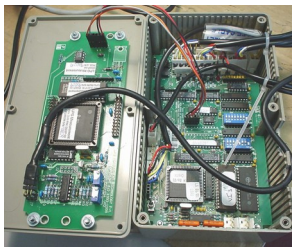
- Valve control
- Relay control
- LED on indicates Data being received from Processor = normal operation
- LED blinking indicates no data from Processor, check processor started up or cable connections
- LED OFF indicates no power, check 315ma fuse. Likely cause of blown fuse is faulty valve coil

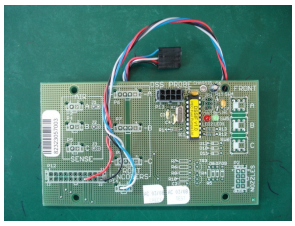


Service and Maintenance

Apollo 3000
Input Processor

- Input Processor replaces Logic board in LPG and High flow diesel
- In LPG a Probe interface is required, older models have LPG Measurements, new have PEC Interface
- LPG Measurements board requires mods if sourced direct. If sourced from Batchen should come modified
- LPG Measurement probes and boards must be matched pairs (matching serial numbers) as calibrated together
- PEC board is cut down 9000 Logic board, LED indicators same as 9000





Service and Maintenance

Apollo 3000
Encoder

- 2 Revolutions per litre
- 400 pulses per revolution
- Accurate to 1.25ml
- Not a serviceable part
- Processor must see 40 (50ml) pulses from encoder before switching up to full flow
- Apollo LPG Encoder is different part number, works in opposite direction.
- Apollo encoders have very long cables

Service and Maintenance

Apollo 3000
Software

- Apollo without Input Processors can run the latest version. Current version is **VC2.61g**
- Apollo with Input Processors (LPG & High Flow Diesel) have two different code branches. Early versions that only had Temperature probes, and newer versions that have density Probes.
- Input Processor and Main processor versions have matches pairs, only certain versions will work together.

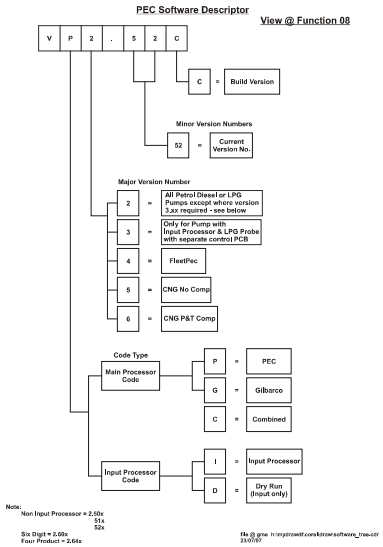
	Input	Main
• **Current Pairs:**		
– **Temp probe**	**VI1.29S**	**2.35C (VP, VG or VC)**
– **Density Probe/Diesel**	**VI3.07A**	**3.08A (VP, VG, or VC)**

PEC

Service and Maintenance

Apollo 3000
Software

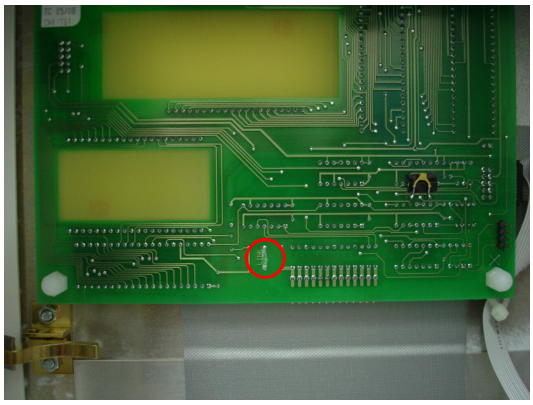
- EPROM Software program version can be identified/viewed by using Function 08 on any model of the PEC range of Pumps/Dispensers
- Two eprom sizes:
  Current 32pin 1mb
  Older 28pin 512k
- 28 pin only fits PEC or Gilb code, hence labeled VP or VG
- 32 pin fits both – combined, hence labeled VC



PEC

LPG H/F diesel display

- Front and Rear the same except Link cut on Rear
- Keyboard cable extension required



Service and Maintenance
Apollo 3000

Questions?

PEC