



Australian Government

**National Measurement
Institute**

Bradfield Road, West Lindfield NSW 2070

Cancellation Certificate of Approval NMI 5/6A/208

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that the approval for use for trade granted in respect of the

PEC Model 9601P Fuel Dispenser for Motor Vehicles

submitted by PEC Fuel Pumps Ltd
 2 Station Road
 Marton 4741 NEW ZEALAND

has been cancelled in respect of new instruments as from 1 August 2015.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 to 3 provisionally approved – interim certificate issued	29/03/04
1	Pattern & variants 1 to 3 approved – interim certificate issued	7/10/04
2	Pattern & variants 1 to 3 approved – certificate issued	21/03/05
3	Variant 3 amended (flow rates) – notification of change issued	21/07/06
4	Variants 4 to 9 approved – certificate issued	12/07/07
5	Variant 10 approved – certificate issued	28/03/08
6	Variant 11 approved – interim certificate issued	12/03/09
7	Variant 11 approved – certificate issued	5/08/09
8	Variant 12 approved – pattern amended (software version) – certificate issued	19/05/10
9	Pattern amended (pulse generator) & variant 11 amended (all text replaced) – notification of change issued	22/10/10
10	Variant 13 approved – certificate issued	4/02/11
11	Variant 14 approved – pattern (pump) & variant 11 (TÜV approvals) amended – certificate issued	8/09/11

DOCUMENT HISTORY (cont...)

Rev	Reason/Details	Date
12	Pattern & variants 1 to 14 updated – variant 15 approved – certificate issued	21/06/13
13	Pattern & variants 1 to 15 cancelled – cancellation certificate issued	6/07/15

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.



Dr A Rawlinson



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Certificate of Approval

No 5/6A/208

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

PEC Model 9601P Fuel Dispenser for Motor Vehicles

submitted by Gallagher Fuel Systems Ltd
 2 Station Road
 Marton 4741 New Zealand

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 117 Measuring Systems for Liquids Other than Water, dated July 2004.

This approval becomes subject to review on 1/04/15, and then every 5 years thereafter.

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6	Variant 11 approved – interim certificate issued	12/03/09
7	Variant 11 approved – certificate issued	5/08/09
8	Variant 12 approved – pattern amended (software version) – certificate issued	19/05/10

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10	Variant 13 approved – certificate issued	4/02/11
11	Variant 14 approved – pattern (pump) & variant 11 (TÜV approvals) amended – certificate issued	8/09/11
12	Pattern & variants 1 to 13 updated – variant 14 approved – certificate issued	21/06/13

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 5/6A/208' and only by persons authorised by the submitter.

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificates No S1/0/A or No S1/0B.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.



Dr A Rawlinson

TECHNICAL SCHEDULE No 5/6A/208

1. Description of Pattern **provisionally approved on 29/03/04**
approved on 7/10/04

A PEC model 9601P fuel dispenser for motor vehicles (Figures 1 to 3, & Table 1) approved to dispense distillate or various grades of petrol, in attendant-operated mode. May also be known as Gallagher' instruments of the same model.

The hose numbering layout for self service installations is shown in Figures 4 and 5.

1.1 Field of Operation

The field of operation of the measuring system is determined by the following characteristics:

- Minimum measured quantity, V_{min} 2 L
 - Maximum flow rate, Q_{max} 50 L/min
 - Minimum flow rate, Q_{min} 5 L/min
 - Maximum pressure of the liquid, P_{max} 350 kPa
 - Minimum pressure of the liquid, P_{min} 100 kPa (#1)
 - Range of liquids viscosity 0.5 to 20 mPa.s (at 20°C) (#2)
 - Maximum temperature of the liquid, T_{max} 50°C
 - Minimum temperature of the liquid, T_{min} -10°C
 - Ambient temperature range -10°C to 55°C
 - Accuracy class 0.5
- (#1) Minimum pressure required for effective operation of the gas elimination device.
- (#2) The flowmeter is adjusted for use with one product viscosity. Fuels include kerosene, distillate and various grades of petrol (which may include up to 85% ethanol). The pattern and variants constructed for use to dispense various grades of pure biodiesel and biodiesel/distillate blends (to Australian government standard).

1.2 Description of the Metering System

The PEC model 9601P fuel dispenser (Figures 1 and 2) is equipped with six hoses each connected to a ZVA nozzle in banks of three hoses on either side of the dispenser.

A single grade of fuel can be supplied to each pair of hoses (one either side of the dispenser). These hoses are connected to the supply through a measuring system that incorporates the following components:

- (i) The supply line for each grade of fuel is connected to a Tatsuno model PGS-0257 or model FP 1001 pump/strainer/gas separator (three in total).
A gas/air test valve is provided for checking the operation of the gas elimination device.
- (ii) The supply is then diverted to two Tatsuno model MP-02515 4-piston positive displacement meters (six in total), one for each nozzle (Figures 2 and 3). Each meter is fitted with a PEC model #07434 or model 2A90930 pulse generator that communicates the volume of fluid measured to the indicators.

- (iii) Control to the flow of each nozzle is achieved with an Asco model PAG-29221 or model PAT-29227 single or two-stage solenoid valve.
- (iv) Two Production Engineering model MHP price-computing calculator/indicators (one either side of the dispenser, Figures 1 and 2) display the following for each grade of fuel:
- | | |
|---------------|---|
| Volume | 000.00 L to 999.99 L in 0.01 L increments |
| Unit price | 0.1 to 999.9 c/L in 0.1 c/L increments |
| Price | \$000.00 to \$999.99 in 1 c increments |
| Totaliser (#) | to 9999999 L |
- (#) Electronic totaliser (software driven and resettable), and three non-resettable mechanical totalisers (one for each grade of fuel).

Software version number P2.xxx is used. This may be displayed as one of the manager's functions accessed using the 'diagnostic switch' and the 'service agent button' – refer to the operator's manual.

1.3 Pre-set Facility

The fuel dispenser is fitted with a pre-set keypad facility that allows pre-set values to be entered in two ways:

- A numeric keypad up to a maximum of \$999; or
- A \$20 key (which can be pressed repeatedly).

The pre-set amount is displayed on a separate display that is positioned above the keypad. The amount may be viewed before, during and after the delivery is complete.

1.4 Checking Facilities

Removing the nozzle from its normal hang-up position initiates a segment check of the price, volume and unit price displays.

- Delivery is stopped if excessive amounts of air/vapour are detected.
- In the event of a power failure, the displayed value for a delivery is retained.
- Delivery is halted and an error code displayed if an error in pulse output is detected.

1.5 Sealing Provision

The meter is sealed as shown in Figure 6.

The gas separator test valve has provision for sealing.

1.6 Verification Provision

Provision is made for the application of a verification mark.

1.7 Descriptive Markings

Instruments are marked with the following data, together in one location on a data plate:

Pattern approval number	NMI No 5/6A/208
Manufacturer's identification or trade mark	.....
Manufacturer's designation (model number)	.....
Serial number	....
Year of manufacture .	....
Environmental class	class C (#1)
Maximum flow rate (Q_{max})	..... L/min
Minimum flow rate (Q_{min})	..... L/min
Maximum operating pressure (P_{max})	..... kPa
Minimum operating pressure (P_{min})	..... kPa
Nature of the liquids to be measured	..... (#2)
Maximum temperature of the liquid, T_{max}	.....°C
Minimum temperature of the liquid, T_{min}	.....°C

(#1) See clause 1.1 Field of Operation.

(#2) Shall be in a form such as 'petrol', 'distillate', 'P' or 'D'.

The minimum measured quantity (V_{min}) shall be clearly visible on any indicating device visible to the user during measurement, in the form 'minimum delivery 2 L'.

2. Description of Variant 1 provisionally approved on 29/03/04 approved on 7/10/04

Certain other models and configurations of the 9000 series of fuel dispensers as identified in Table 1. Figure 7 shows a typical instrument with a gas detection system.

3. Description of Variant 2 provisionally approved on 29/03/04 approved on 7/10/04

With one or more approved submersible turbine pump (STP) hydraulic systems. These hydraulic systems replace the equivalent components (i.e. motor, pump/strainer/gas separator, and associated pipework) in any fuel dispenser covered by this approval in which case the model number has a 3 or 5 as the third digit (refer to Table 1). More than one fuel dispenser may be connected to the same submersible turbine pump hydraulic system.

4. Description of Variant 3 provisionally approved on 29/03/04 approved on 7/10/04

With hydraulics designed for high flow rates using a compatible approved submersible turbine pump (STP) hydraulic system. Instruments have a 25 mm diameter delivery hose instead of the standard 19 mm diameter hose, and the model number has an additional suffix, namely 'M' (refer to Table 1).

- Minimum measured quantity, V_{min} 2/5 L
- Maximum flow rate, Q_{max} 50/90 L/min
- Minimum flow rate, Q_{min} 5/9 L/min

5. Description of Variant 4 **approved on 12/07/07**

With an alternative price-computing calculator/indicator with increased display capabilities as detailed below.

- Volume 0000.00 L to approximately 9990.00 L (*) in 0.01 L increments
(*) Always less than 9999.99 L
- Unit price 0.1 to 999.9 c/L in 0.1 c/L increments
- Price \$0000.00 to \$9990.00 in 1 cent increments
- Totaliser (#) To 9 999 999 L, mechanical or electronic
(#) resettable information

6. Description of Variant 5 **approved on 12/07/07**

The pattern and variants for use to dispense various grades of petrol which may include up to 10% ethanol ('E10').

7. Description of Variant 6 **approved on 12/07/07**

The pattern and variants constructed for use to dispense various grades of pure biodiesel and biodiesel/distillate blends (to Australian government standard).

8. Description of Variant 7 **approved on 12/07/07**

The pattern and variants fitted with the hose extension masts shown in Figure 8.

9. Description of Variant 8 **approved on 12/07/07**

The pattern and variants fitted with up to 8 hoses. A typical dispenser is shown in Figure 9.

10. Description of Variant 9 **approved on 12/07/07**

Without the gas detection system referred to for variant 1.

11. Description of Variant 10 **approved on 28/03/08**

With a Wix or Fit Safe in-line $\frac{3}{4}$ " cartridge filter installed downstream of the meter and outside the fuel dispenser housing (Figure 10).

The filter may be installed on any model dispenser of this approval and used with any liquid hydrocarbon for which the dispenser is approved.

The filter unit is sealed to prevent any drainage of the product between the inlet of the filter and the nozzle of the fuel dispenser.

The maximum permissible errors applicable are those applicable to the fuel dispenser to which the instrument approved herein is fitted.

When the filter is changed the system is required to be primed with liquid up to the nozzle, and then the filter is to be sealed.

If a filter is installed after the fuel dispenser has been verified, then the dispenser must be tested and certified again after the filter has been installed.

Similarly if the filter is removed then the dispenser must again be tested and verified. A destructible adhesive label should be applied after verification.

12. Description of Variant 11

approved on 5/08/09

Any PEC 9000 fuel dispenser of this approval now fitted with a PEC model Vapour Recovery Stage 2 (aka VRII) vapour recovery and monitoring system and used up to a maximum flow rate of 40 L/min. A typical instrument and system are shown in Figures 11 and 12.

The VRII system controller continuously monitors the underground supply tank pressure, taking inputs from a pressure switch or sensor whilst monitoring the correct operation of the vapour recovery system for hoses on each side of the fuel dispenser.

The site vacuum system uses vacuum pumps housed in enclosures designed to reflect the look of the PEC/Gallagher fuel dispensers. Each enclosure can hold up to three vapour pumps; the VRII system uses a minimum of two vapour pumps in each enclosure.

The vapour recovery and monitoring system is approved by the German TÜV SÜD Industrie Service GmbH authority.

Only vapour recovery components and systems as listed below and included in the relevant TÜV approval certificates may be used.

The relevant TÜV approvals (and the approved components) are:

(i) For collection of vapour:

- TÜV 85-2.169 NSW
- TUV 85-2.169-1 NSW
- TUV 85-2.168 NSW
- TUV 85-2.168-1 NSW
- TUV 85-9.10 NSW
- TÜV 85-11.2 NSW
- TÜV 85-11.3 NSW
- TÜV 85-9.10-1 NSW

and the only approved system components are:

- Vapour recovery nozzles – Elaflex SLIMLINE 2 GR, or OPW 12 VW (*)
- Coaxial hose – Elaflex model Conti Slimline 2 1/8 Coax, or Goodyear Flexsteel Vapour Assist
- Control valves – Burkert model 2832 NB 5 (^)
- Control board – Burkert model 1094 EV
- Vapour recovery pump(s) – PEC Zephyr 8

(*) Vapour suction inlet on high position

(^) Nominal bore 5 mm

(ii) or automatic monitoring of the vapour to fuel ratio:

- TÜV M-20.1 NSW,

and the only approved system components are:

- Vaporix model control monitor.
- Vafnir model Vaporix flowmeter.

13. Description of Variant 12

approved on 19/05/10

The pattern and variants for use to dispense various grades of petrol which may include up to 85% ethanol ('E85').

14. Description of Variant 13

approved on 4/02/11

The pattern and variants now identified using alternative model numbering as listed in Table 2.

TABLE 2

Meaning of alternative model designations (in the form model 9XNYZPS) for the 9000 series of fuel dispensers: (e.g. the pattern, model 9601P, may now be alternatively known as a model 9260CPS.)

First digit	Series, namely 9 = 9000
Second digit	Body style, either 0 = 1.0 m body length 2 = 1.2 m body length 4 = 1.4 m body length
Third digit	Number of hoses, 1 to 8
Fourth digit	Hydraulic system type, either 0 = Integral (*) pump/s 3 = Integral (*) pump/STP combination (#) 6 = STP (#) (*) integral = integral pump/strainer/gas separator (refer to the pattern) (#) STP = submersible turbine pump (refer to variant 3)
Fifth digit	Number of products, 1 to 4 A = 1 product B = 2 products C = 3 products D = 4 products
Suffixes	Pre-set, either No suffix = no pre-set fitted P = pre-set is fitted Maximum flow rate, either S = standard flow rate, 50 L/min H = high flow rate, 90 L/min Vapour Recovery Stage 2 (VRII) – refer to Variant 11 No suffix = no VRII fitted V = VRII is fitted

15. Description of Variant 14

approved on 8/09/11

A PEC Stage II vapour recovery system similar to variant 11 but with a vacuum pump located within the dispenser housing (Figure 13).

The vacuum pumps used may be Dürr models Mex 0831-10 or Mex 0831-11. The pumps are driven by a Dürr model Mex 0544 motor.

The following TÜV Certificates apply:

- TÜV 85-2.67-3
- TÜV 85-2.57-3
- TÜV 85-2.93
- TÜV 85-2.79
- TÜV 85-2.XXX
- TÜV 85-2.23-2
- TÜV 85-2.160

16. Description of Variant 15

approved on 21/06/13

Any fuel dispenser of this approval now fitted with a PEC model Vapour Recovery Stage 2 (aka VRII) vapour recovery and monitoring system and used up to a maximum flow rate of 45 L/min.

The VRII system controller continuously monitors the vacuum line pressure, taking inputs from a pressure switch or sensor whilst monitoring the correct operation of the vapour recovery system for hoses on each side of the fuel dispenser.

The site vacuum system uses vacuum pumps housed in enclosures designed to reflect the look of the PEC/Gallagher fuel dispensers. Each enclosure holds two vapour pumps.

The vapour recovery and monitoring system is approved by the German TÜV SÜD Industrie Service GmbH authority.

Only vapour recovery components and systems as listed below and included in

The relevant TÜV approvals (and the approved components) are:

(i) For collection of vapour:

- TÜV 85-2.176 NSW
- TÜV 85-2.176-1 NSW
- TÜV 85-2.175 NSW
- TÜV 85-2.175-1 NSW; or
- TÜV 85-11.5 NSW
- TÜV 85-11.5-1 NSW
- TÜV 85-11.6 NSW
- TÜV 85-11.6-1 NSW
- TÜV 85-15.24 NSW
- TÜV 85-15.24-1 NSW
- TÜV 85-15.25 NSW
- TÜV 85-15.25-1 NSW

and the only approved system components are:

- Vapour recovery nozzles – Elaflex SLIMLINE 2 GR, or OPW 12 VW (*), HUSKY V34/V34I/V34IS, AVANCE by OPW series AVN-V

- Coaxial hose – Elaflex model Conti Slimline 2 1/8 Coax, or Goodyear Flexsteel Vapour Assist, Good year listed Flexsteel vapour assist
 - Control valves – Burkert model 2832
 - Control board – Burkert model 1094 EV
 - Vapour recovery pump(s) – PEC Zephyr 24 with constant under pressure
- (*) Vapour suction inlet on high position
- (ii) For automatic monitoring of the vapour to fuel ratio:
- TÜV M-20.1 NSW

and the only approved system components are:

- Fafnir model Vaporix-Control monitor
- Fafnir model Vaporix-Flow flowmeter

TEST PROCEDURE No 5/6A/208

Instruments shall be tested in accordance with any relevant tests specified in the National Instrument Test Procedures.

The instrument shall not be adjusted to anything other than as close as practical to zero error, even when these values are within the maximum permissible errors.

Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009*.

FIGURE 5/6A/208 – 1



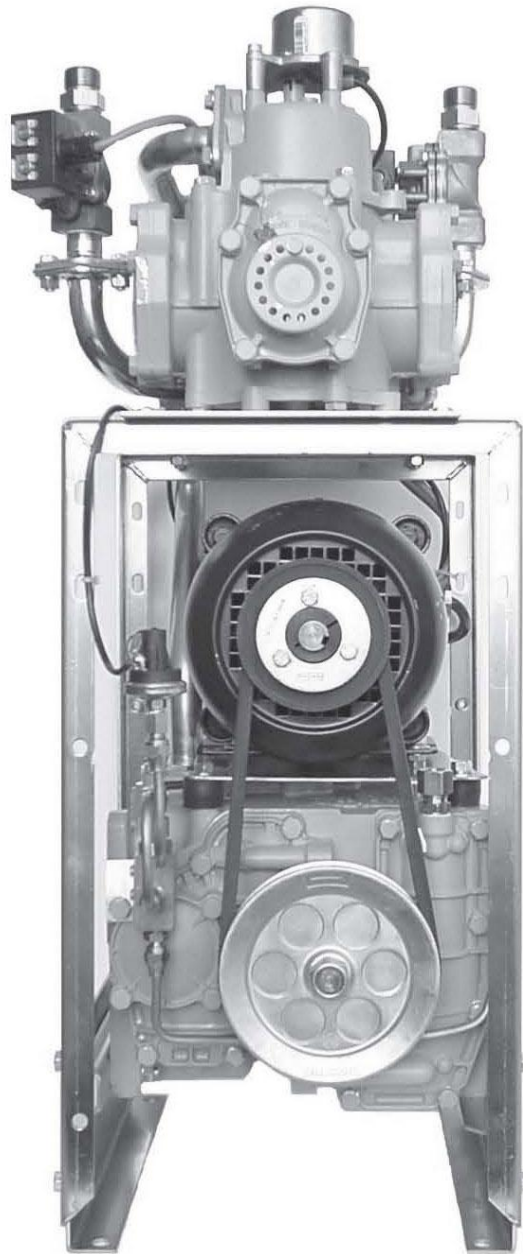
PEC Model 9601P Fuel Dispenser for Motor Vehicles – The Pattern

FIGURE 5/6A/208 – 2



PEC Model 9601P Hydraulics – The Pattern

FIGURE 5/6A/208 – 3



PE Tatsuno Model MP-02515 Meter

FIGURE 5/6A/208 – 4

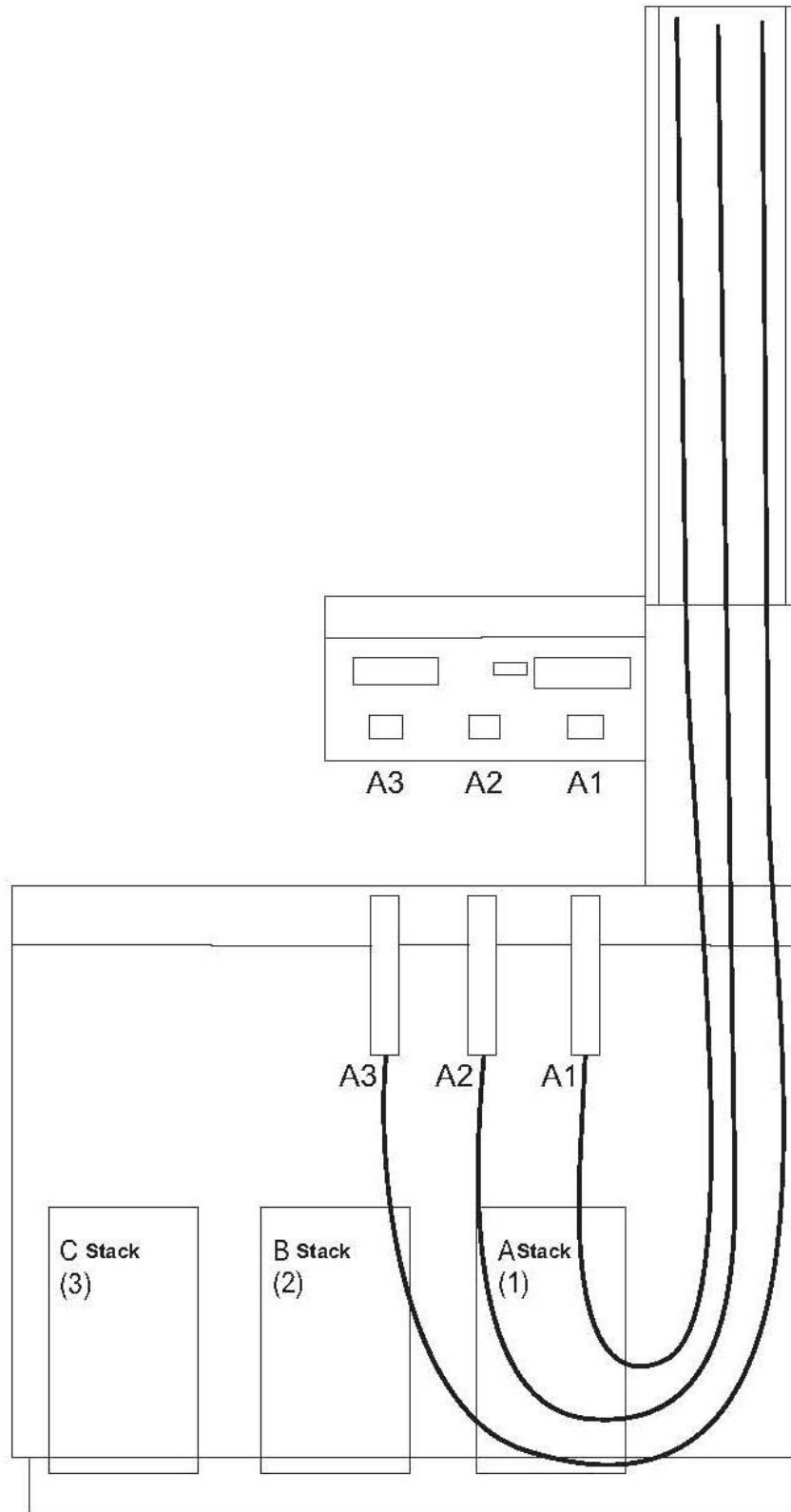
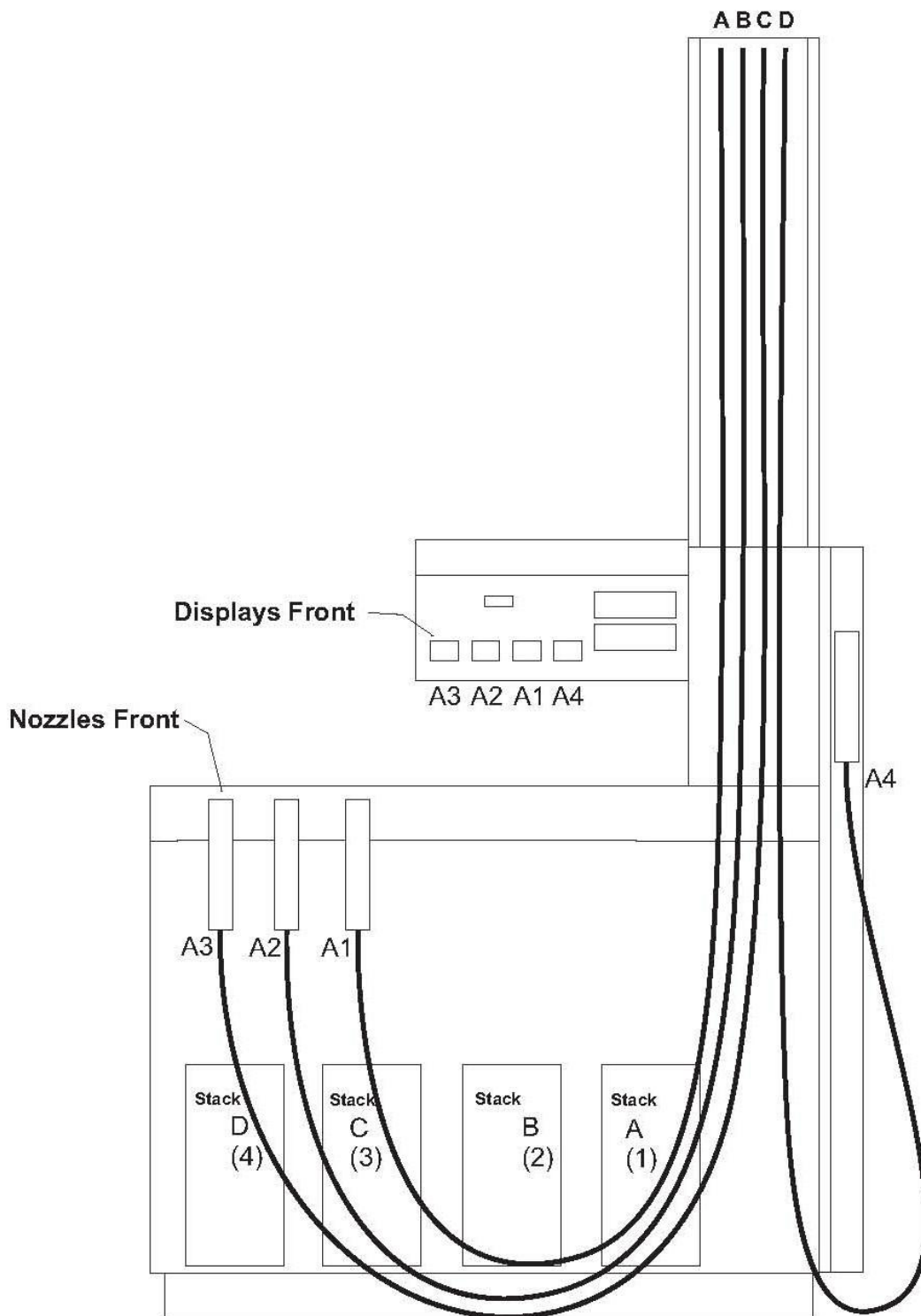
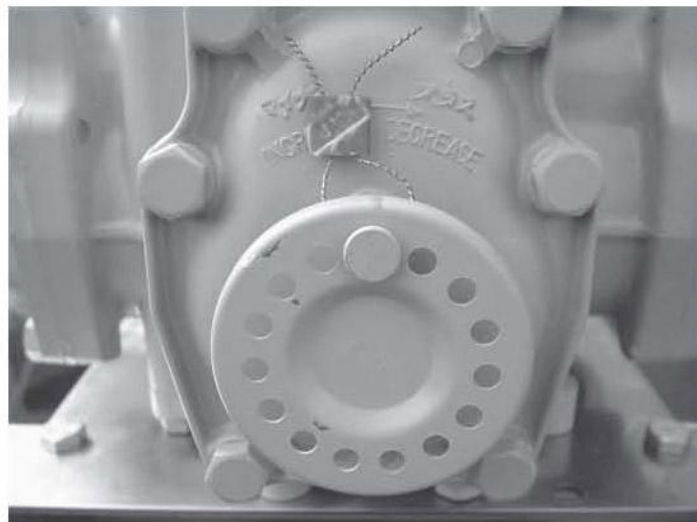
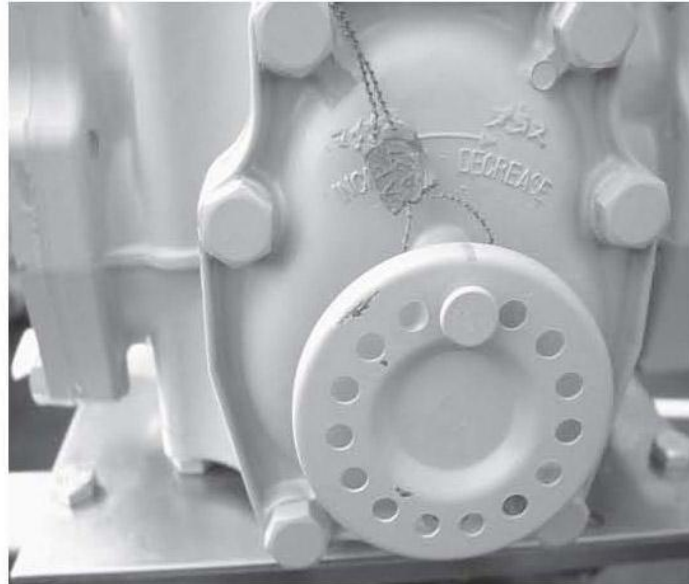


FIGURE 5/6A/208 – 5



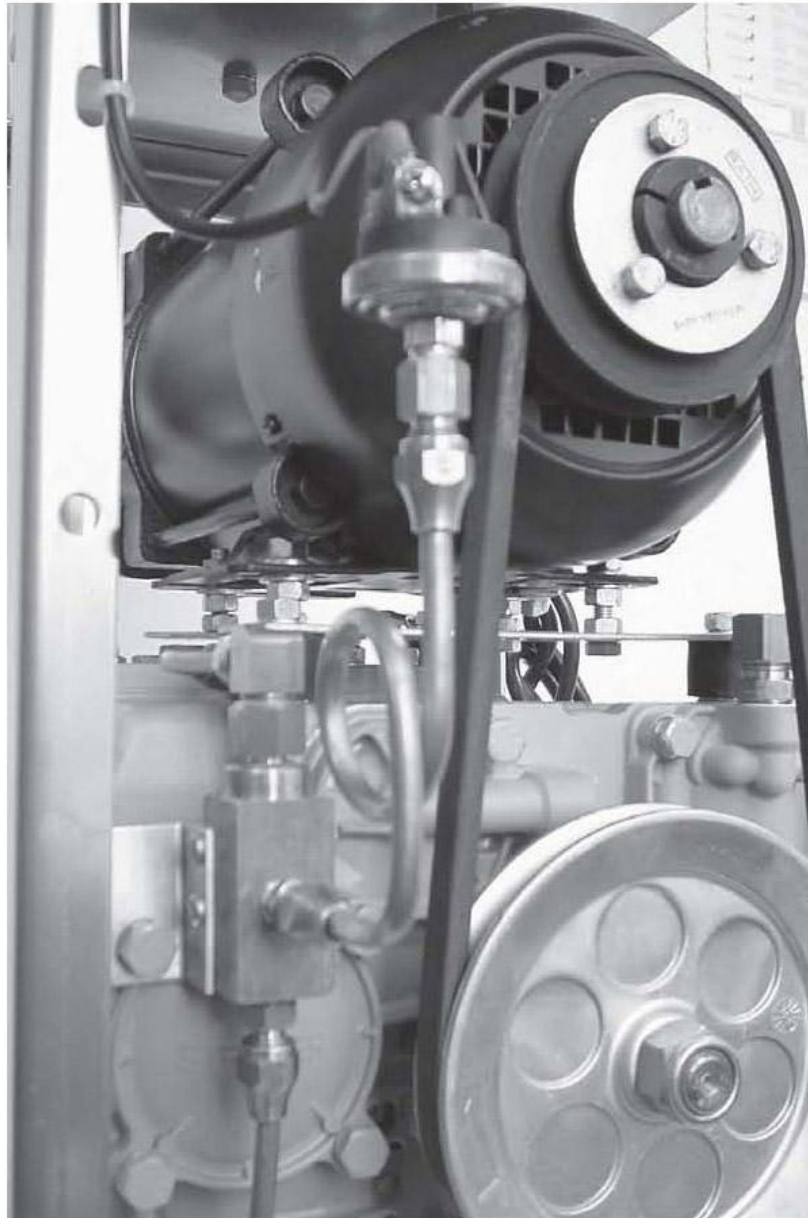
1000 Series 8 Hose Numbering Layout For Self Service Installations

FIGURE 5/6A/208 – 6



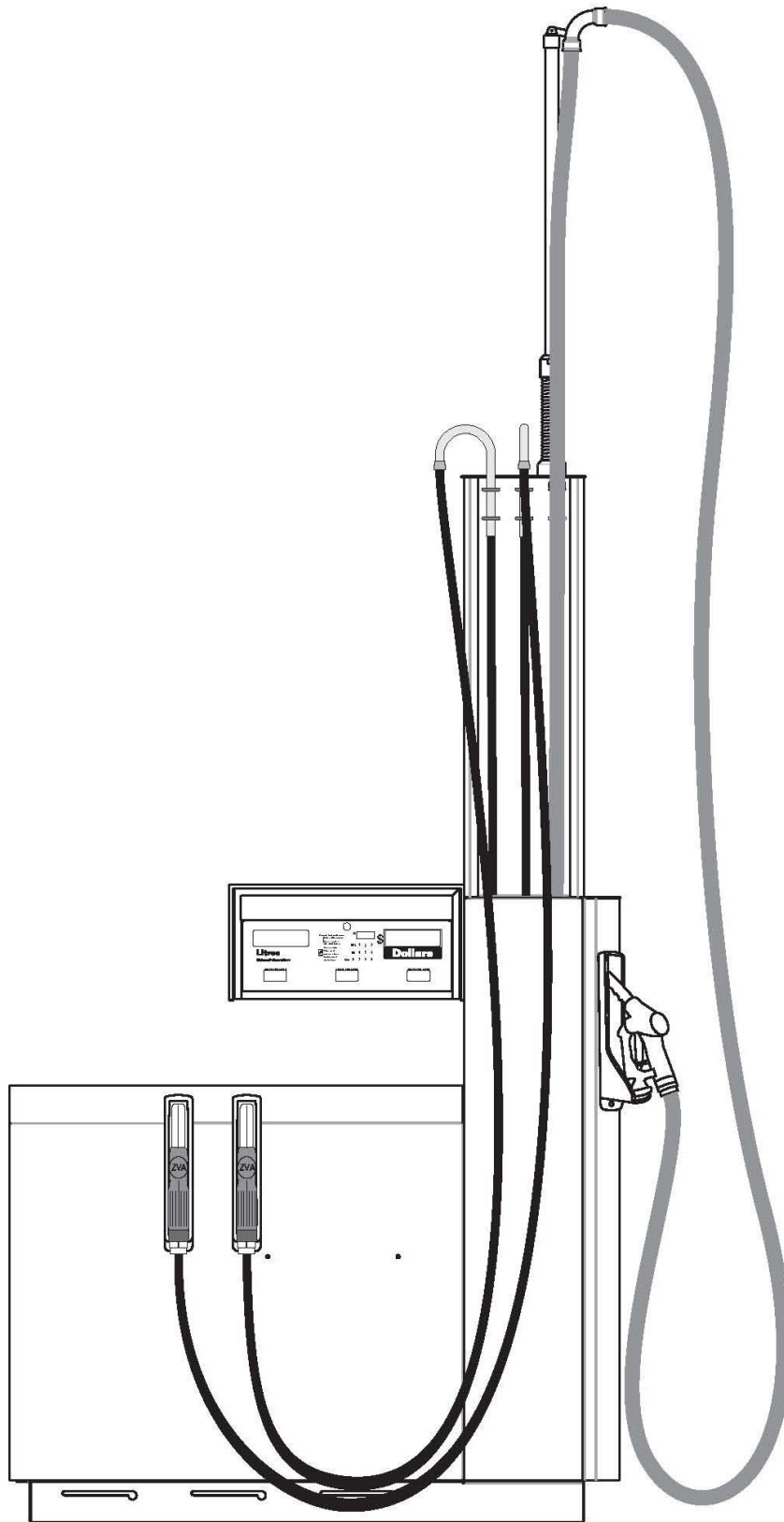
Showing Meter Sealing

FIGURE 5/6A/208 – 7



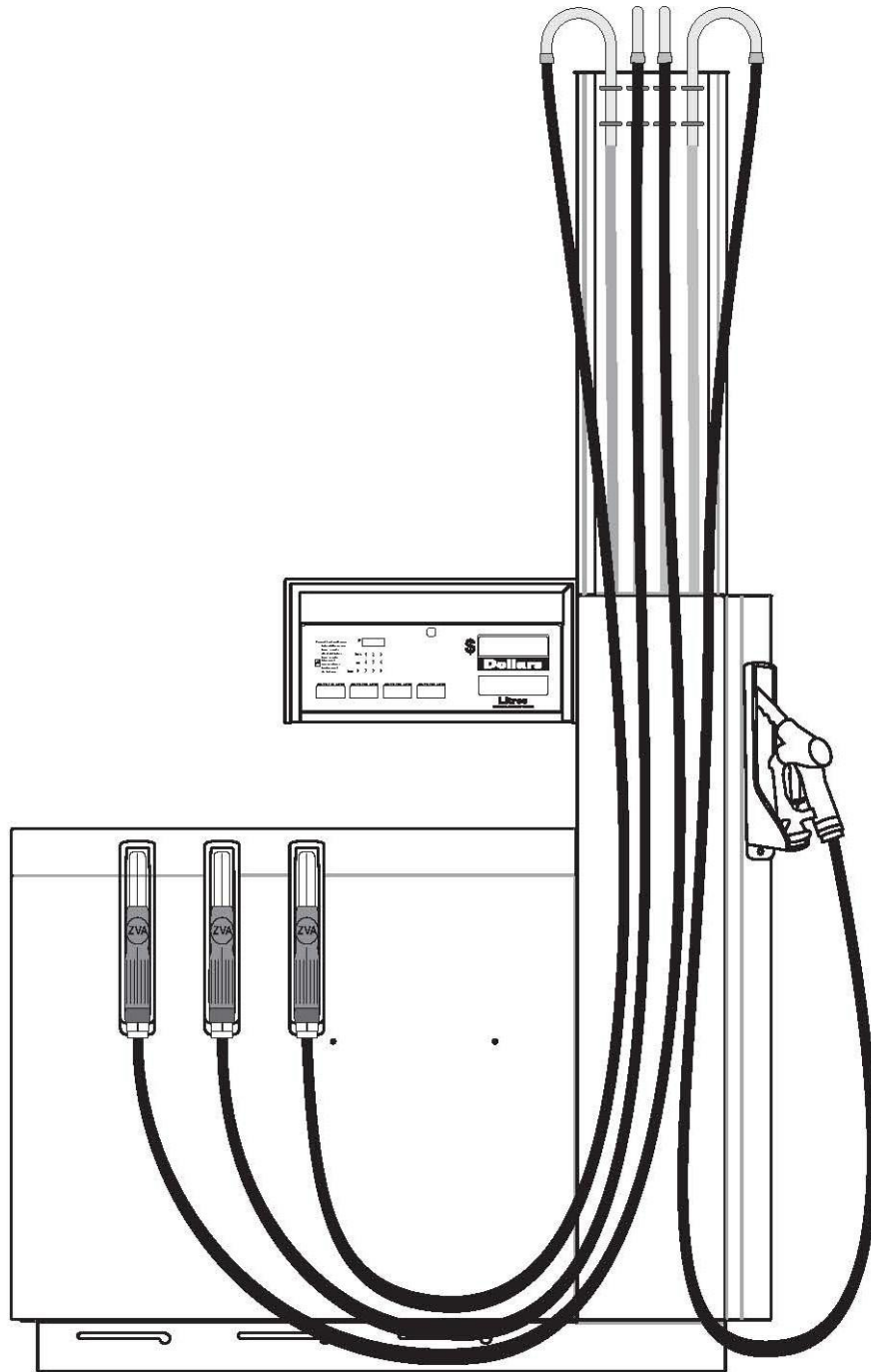
Showing Typical Gas Detection System – Variant 1

FIGURE 5/6A/208 – 8



Typical 9000 Series Dispenser With a Hose Extension Mast – Variant 7

FIGURE 5/6A/208 – 9



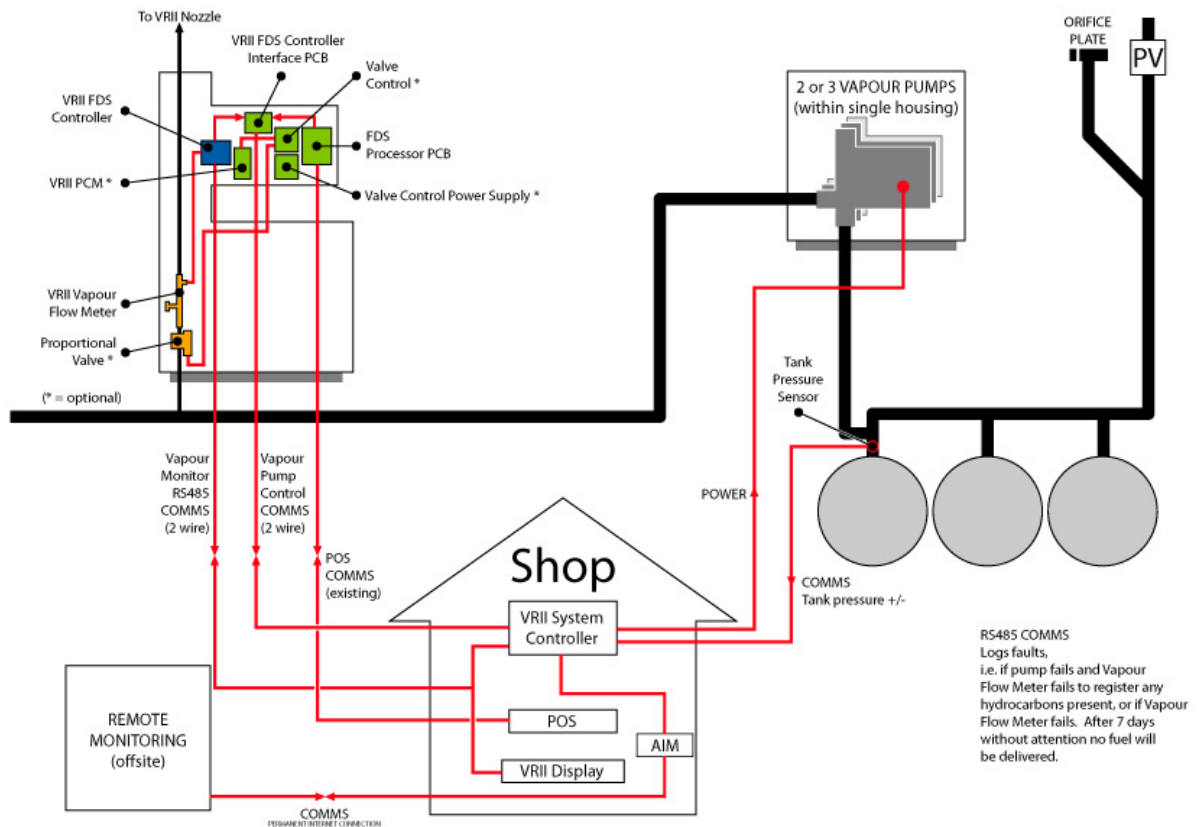
Typical 9000 Series Dispenser With 8 Hoses – Variant 8

FIGURE 5/6A/208 – 10



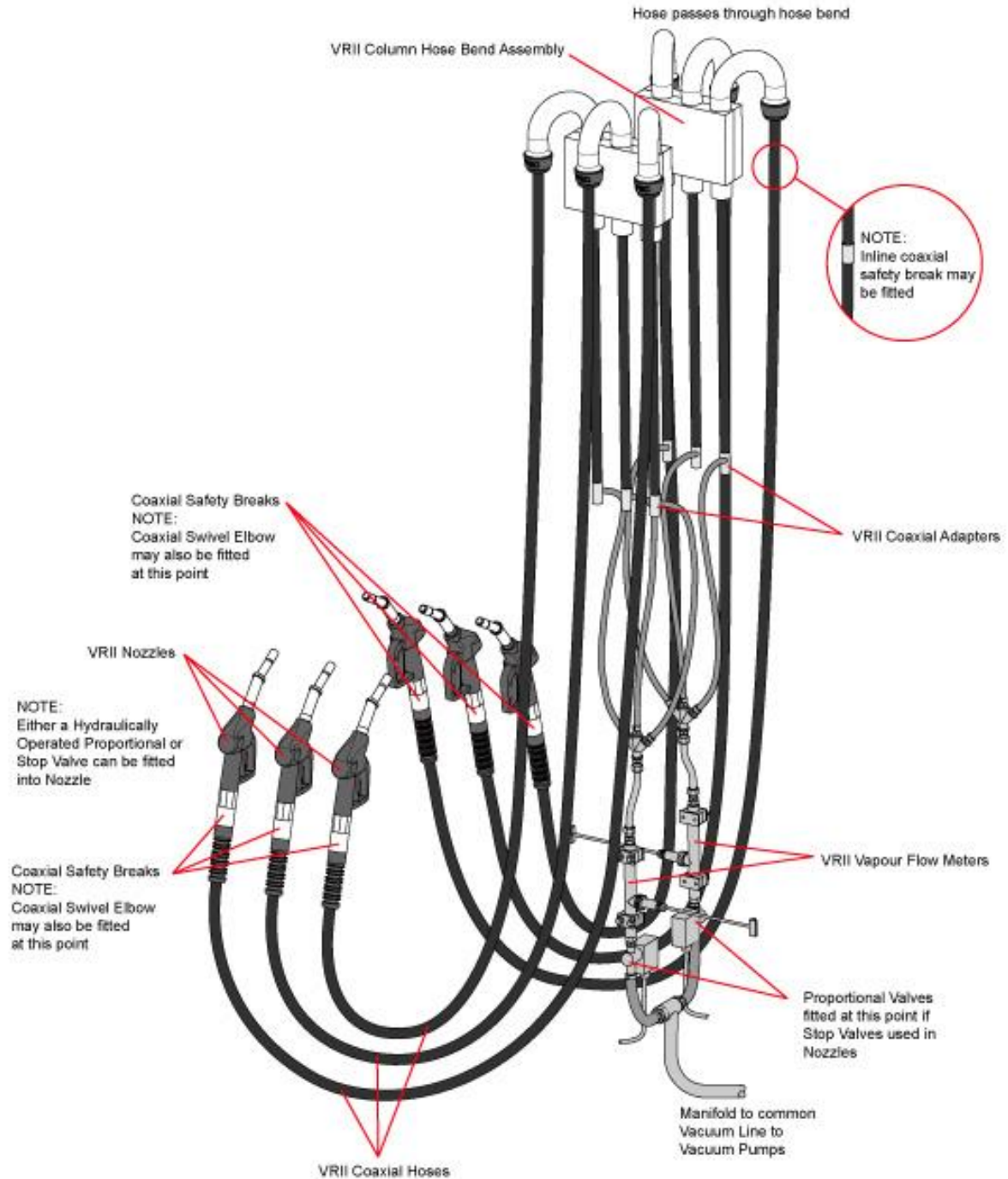
Typical External Filter Installation – Variant 10

FIGURE 5/6A/208 – 11



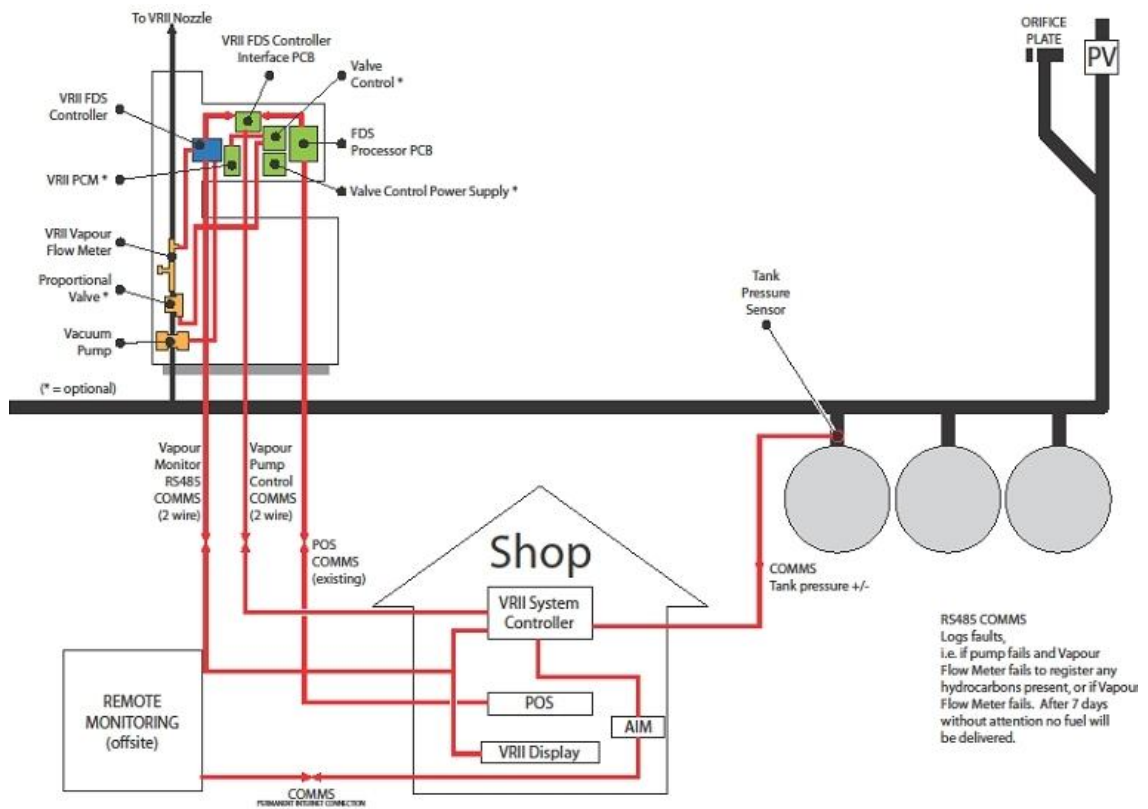
A Typical PEC Model Vapour Recovery Stage 2 (aka VRII)
Vapour Recovery System – Variant 11

FIGURE 5/6A/208 – 12



A PEC Model VR11 Vapour Recovery System
Showing the Typical Components for a 9000 Series Dispenser – Variant 12

FIGURE 5/6A/208 – 13



A Typical PEC Stage II Vapour Recovery System
With The Vacuum Pump Located Within The Dispenser Housing – Variant 14

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