



**Australian Government**

**National Measurement  
Institute**

Bradfield Road, West Lindfield NSW 2070

# **Cancellation Certificate of Approval NMI 5/6A/92A**

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 1401P Fuel Dispenser for Motor Vehicles

submitted by           Gallagher Fuel Systems Ltd  
                                  (formerly 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**

<b>Rev</b>	<b>Reason/Details</b>	<b>Date</b>
0	Pattern & variants 1 to 3 approved – certificate issued	28/02/01
1	Pattern amended (Test Procedure) – notification of change issued	18/02/05
2	Variant 4 approved – certificate issued	17/02/06
3	Pattern amended (flow rates) – notification of change issued	21/07/06
4	Pattern & variants 1 to 4 reviewed – notification of change issued	6/09/06
5	Pattern amended (calculator/indicator) – notification of change issued	16/03/07
6	Variants 5 to 9 approved – pattern amended (hose numbering) – certificate issued	3/07/07
7	Variant 10 approved – certificate issued	28/03/08
8	Variant 11 provisionally approved – interim certificate issued	27/05/08

DOCUMENT HISTORY (cont...)

Rev	Reason/Details	Date
9	Variant 11 approved – interim certificate issued	24/08/09
10	Variant 11 approved – certificate issued	7/09/09
11	Variant 12 approved – certificate issued	8/03/10
12	Pattern amended (pulse generator & Test Procedure) – notification of change issued	22/10/10
13	Pattern & variants 1 to 12 reviewed – pattern amended (Test Procedure) – notification of change issued	14/07/11
14	Variant 13 approved – pattern (pump) & variant 12 (TÜV approvals) amended – certificate issued	22/09/11
15	Pattern & variants 1 to 13 updated – variant 14 approved – certificate issued	21/06/13
16	Pattern & variants 1 to 14 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**



Australian Government

National Measurement  
Institute

Bradfield Road, West Lindfield NSW 2070

## Certificate of Approval

### No 5/6A/92A

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 1401P 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 1/03/16, and then every 5 years thereafter.

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4	Pattern & variants 1 to 4 reviewed – notification of change issued	6/09/06
5	Pattern amended (calculator/indicator) – notification of change issued	16/03/07
6	Variants 5 to 9 approved – pattern amended (hose numbering) – certificate issued	3/07/07
7	Variant 10 approved – certificate issued	28/03/08
8	Variant 11 provisionally approved – interim certificate issued	27/05/08

DOCUMENT HISTORY (cont...)

Rev	Reason/Details	Date
9	Variant 11 approved – interim certificate issued	24/08/09
10	Variant 11 approved – certificate issued	7/09/09
11	Variant 12 approved – certificate issued	8/03/10
12	Pattern amended (pulse generator & Test Procedure) – notification of change issued	22/10/10
13	Pattern & variants 1 to 12 reviewed – pattern amended (Test Procedure) – notification of change issued	14/07/11
14	Variant 13 approved – pattern (pump) & variant 12 (TÜV approvals) amended – certificate issued	22/09/11
15	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 (or NSC) 5/6A/92A' 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/92A

### 1. Description of Pattern

approved on 28/02/01

A PEC model 1401P fuel dispenser for motor vehicles (Figure 1 & Table 1) approved to dispense various grades of petrol, in attendant-operated mode. The meter is adjusted to be correct for the liquid for which it is to be verified. May also be known as Gallagher' instruments of the same model.

The model 1401P multi-product dispenser has the following components or features:

- Two Tatsuno model POS-0257 or model FP 1001 pump/strainer/gas separators.
- Four Tatsuno model MP-02515 positive displacement meters each fitted with a PEC model #07434 or model 2A90930 pulse generator.
- Two PEC model MHP price-computing indicators.
- A pre-set facility.
- Four ZVA or any other NMI-approved nozzles.

A compatible NMI-approved control system may also be connected to provide self-service operation.

The hose numbering layout for self service installations is shown in Figure 7.

#### 1.1 Field of Operation

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

- Minimum measured quantity,  $MMQ (V_{min})$  2 L
- Maximum flow rate,  $Q_{max}$  50 L/min
- Minimum flow rate,  $Q_{min}$  5 L/min
- Maximum pressure of the liquid,  $P_{max}$  300 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,  $T_{max}$  40°C
- Minimum temperature of the liquid,  $T_{min}$  5°C
- Environmental class class 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 10% 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 Indicator/Calculator

The model MHP indicator/calculator comprises a computing unit and display units. A single display is provided for volume and total price, while a separate unit price display is provided for each type of liquid.

The indicators display the following maximum values:

Volume	To 990.00 L in 0.01 L increments
Unit price	To 999.9 c/L in 0.1 cent increments
Total price	To \$990.00 (#1)
Totaliser	To 9999999 L in 1 L increments (#2)
Pre-set	To \$99 in \$1 increments

(#1) Total price increments in 1 cent increments. For software versions lower than vA2.30P or vA2.29G, when the unit price is \$1.00 per litre or greater, then the Total Price display will increment in 2c increments.

(#2) Electronic totaliser (software driven and resettable). Mechanical totaliser (non-resettable)

The pre-set facility uses two-stage solenoid valves to slow down and cut off the flow.

To achieve pressurisation of the liquid, the instrument inhibits displaying the volume for the first 100 mL of any delivery.

The main software version number for the calculator/indicator is A2.###, which can be viewed by entering the function number '08' while in the set-up function mode. To access the set-up function mode, insert a fuel dispenser key into the calculator/indicator panel lock and turn the key to the unlock position. The 'dollar' display shows the dispenser number, and the 'litres' display shows 'FN- \_'. Use the keypad to enter the function number followed by the 'FILL' key. Press the 'CLEAR' key to leave any setup function. (Refer to the manufacturer's manual for all function numbers.)

### 1.3 Markings

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

Pattern approval number	NMI (or NSC) No 5/6A/92A	
Manufacturer's identification or trade mark	.....	
Manufacturer's designation (model number)	.....	
Serial number and year of manufacture .	....	
Maximum flow rate ( $Q_{max}$ )	..... L/min	(##1)
Minimum flow rate ( $Q_{min}$ )	..... L/min	(##1)
Minimum measured quantity ( $V_{min}$ )	..... L	(##2)
Maximum operating pressure ( $P_{max}$ )	..... kPa	
Minimum operating pressure ( $P_{min}$ )	..... kPa	
Type of liquid	.....	(##3)
Maximum temperature of the liquid, $T_{max}$	40°C	
Minimum temperature of the liquid, $T_{min}$	5°C	
Environmental class	class C	

(##1) The maximum and minimum flow rates shall be marked when different rates are used for various hoses/nozzles within the same fuel dispenser e.g.  $Q_{max} = 50/80$  L/min,  $Q_{min} = 5/8$  L/min.

(##2) This may also be marked on the indicator/calculator.

(##3) e.g. 'petrol', 'distillate', 'P' or 'D'.

## 1.4 Sealing and Verification Provision

Provision is made for the application of a verification mark.

The meters and the gas separator test valve have provision for sealing.

## 2. Description of Variant 1 approved on 28/02/01

Certain other models and configurations of the 1000 series of fuel dispensers identified using Table 1. Figure 2 shows a model 1101P, Figure 3 shows a typical dispenser with two meters and including a gas detection system, and Figure 4 shows a typical multiproduct dispenser including a gas detection system.

Configurations include with a high speed pump replacing the standard pump in certain fuel dispensers covered by this approval, e.g. model 1421P (refer to Table 1), in which case the maximum flow rate,  $Q_{max}$  is 65 L/min.

## 3. Description of Variant 2 approved on 28/02/01

With one or more compatible submersible turbine pumps (STPs) incorporating a leak detection system. The STP replaces the equivalent components (i.e. motor, pump/strainer/gas separator, and associated pipework) in certain fuel dispensers covered by this approval (refer to Table 1). Figure 5 shows a typical multi-product fuel dispenser, e.g. model 1232D, using an integral pump/gas separator system and a submersible turbine pump system supplying product to the respective meters.

More than one fuel dispenser may be connected to the same submersible turbine pump.

Dispensers may operate with the standard maximum flow rate,  $Q_{max}$  of 50 L/min, or with the high maximum flow rate,  $Q_{max}$  of 65 L/min.

## 4. Description of Variant 3 approved on 28/02/01

A PEC model 1101P fuel dispenser for dispensing various grades of oils having a dynamic viscosity greater than 20 mPa.s and up to 1000 mPa.s (at 20°C), over a range of 5 to 50 L/min.

The supply tank is located above ground so that the pump in the fuel dispenser is in a positive suction head (flooded suction) installation. The tank has a Flowtech low level float switch to inhibit dispensing product when the tank is  $\frac{3}{4}$  empty. Note a gas elimination device need not be fitted for this variant.

## 5. Description of Variant 4 approved on 17/02/06

With a standard pump as covered by this approval, a Goodyear 25 mm model Flexsteel hose (or any other compatible hose), and a ZVA 25 mm nozzle (or any other approved 25 mm nozzle), the fuel dispenser has the following field of operation:

- Maximum flow rate ( $Q_{max}$ ) is 80 L/min
- Minimum flow rate ( $Q_{min}$ ) is 8 L/min
- Minimum measured quantity ( $V_{min}$ ) is 2 L

The model number of the fuel dispenser is according to the relevant designations in Table 1 including having 1, 2, 4, 6, 7, 8 or 9 as the third digit.

**6. Description of Variant 5** **approved on 3/07/07**

With an alternative 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

**7. Description of Variant 6** **approved on 3/07/07**

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

**8. Description of Variant 7** **approved on 3/07/07**

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

**9. Description of Variant 8** **approved on 3/07/07**

The pattern and variants fitted with the hose extension masts shown in Figure 6.

**10. Description of Variant 9** **approved on 3/07/07**

Without the das detection system referred to in clause 2. **Variant 1** and Table 1.

**11. Description of Variant 10** **approved on 15/10/07**

Without the gas detection system referred to for variant 2.

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

With a Wix or Fit Safe in-line ¾" cartridge filter installed downstream of the meter and outside the fuel dispenser housing (Figure 8).

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.

**13. Description of Variant 12** **approved on 7/09/09**

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 8/03/10**

Any fuel dispenser of this approval now fitted with a PEC model Vapour Recovery Stage 2 (aka VRII) vapour recovery and monitoring system (Figures 9 and 10) and used up to a maximum flow rate of 40 L/min.

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.

#### **14. Description of Variant 13**

**approved on 22/09/11**

A PEC Stage II vapour recovery system similar to variant 12 but with a vacuum pump located within the dispenser housing (Figure 11).

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

#### **15. Description of Variant 14**

**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;
- 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

TABLE 1

Meaning of model designations for the fuel dispensers:

First digit	Series, namely 1 = 1000
Second digit	Number of hoses, 1 to 4
Third digit	Delivery system type, either 0 = Standard speed integral (*) pump/s 1 = High speed/standard speed integral (*) pump 2 = High speed integral (*) pump 3 = Integral (*) pump/STP (#) 4 = High flow rate STP (#) 5 = Standard flow rate STP (#) 6 = High flow rate STP (#) 7 = High flow rate STP (#)/standard speed integral (*) pump 8 = Standard flow rate STP (#)/high speed integral (*) pump 9 = High flow rate STP (#)/high speed integral (*) pump  (* ) integral = integral pump/strainer/gas separator (refer the pattern) (#) STP = submersible turbine pump (refer variant 1)
Fourth digit	Gas detection system 1 = no gas detection fitted 2 = One standard speed system with gas detection fitted 3 = Two standard speed systems with gas detection fitted 4 = One high speed system with gas detection fitted 5 = Standard speed/high speed system with gas detection fitted 6 = Two high speed systems with gas detection fitted
Suffix	N = no pre-set fitted P = pre-set is fitted D = 'dual product' - using an integral pump/gas separator system and a submersible turbine pump system Q = 'quad' - using an integral pump/gas separator system and a submersible turbine pump system (simultaneous hose operation)

TEST PROCEDURE No 5/6A/92A

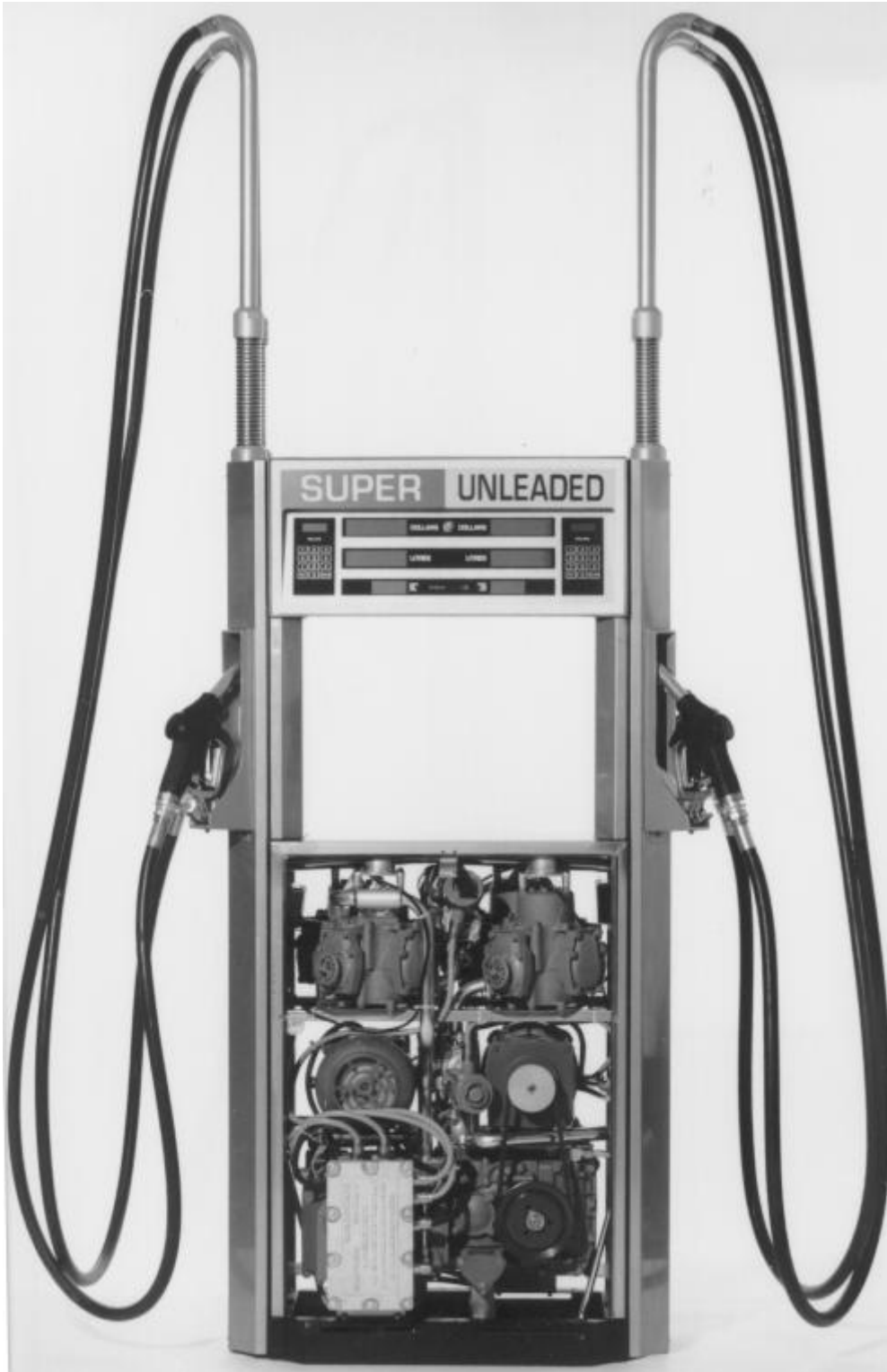
Instruments shall be tested in accordance with any relevant tests specified in the National Instrument Test Procedures.

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/92A – 1



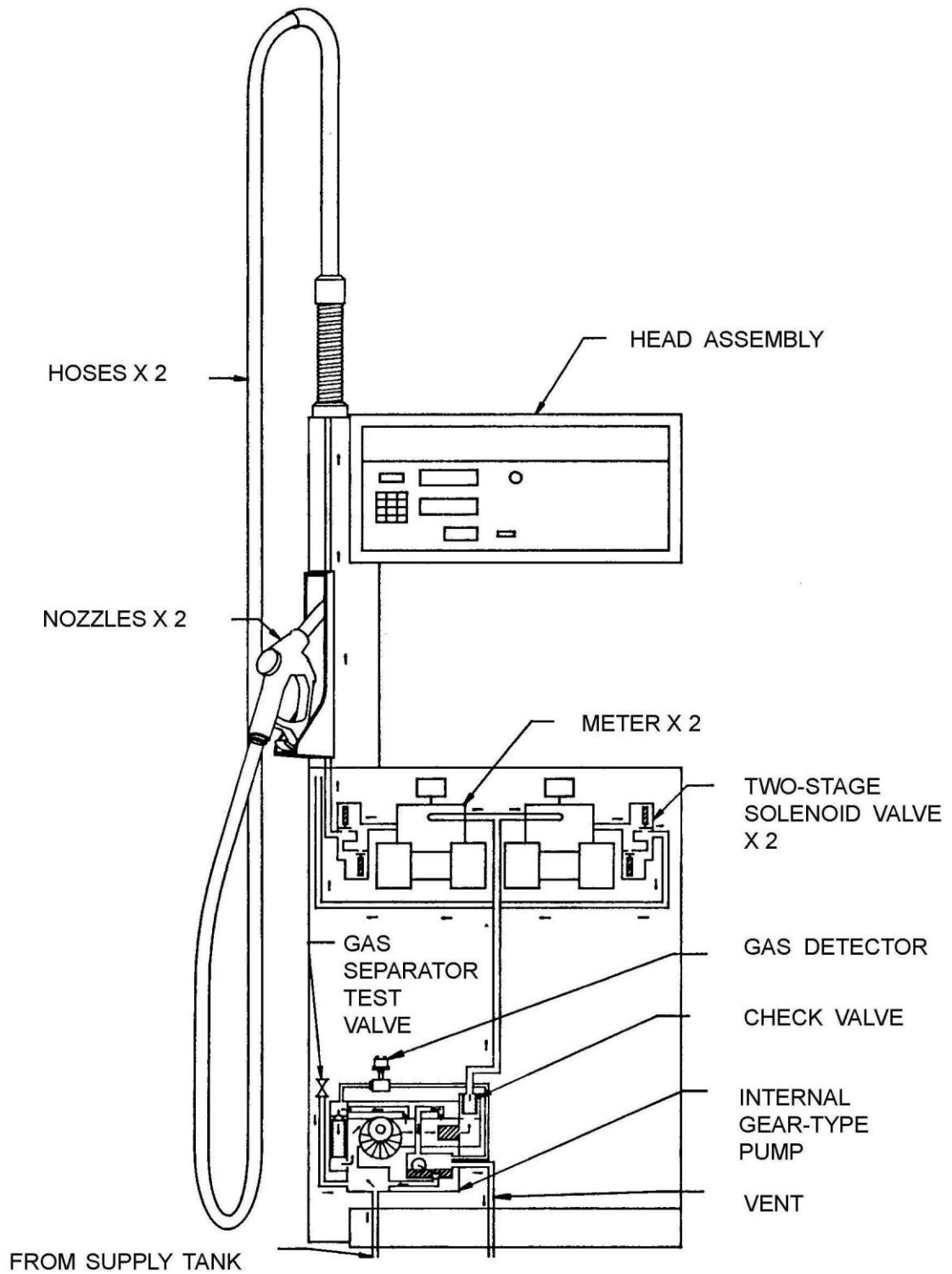
PEC Model 1401P Fuel Dispenser for Motor Vehicles – The Pattern

FIGURE 5/6A/92A – 2



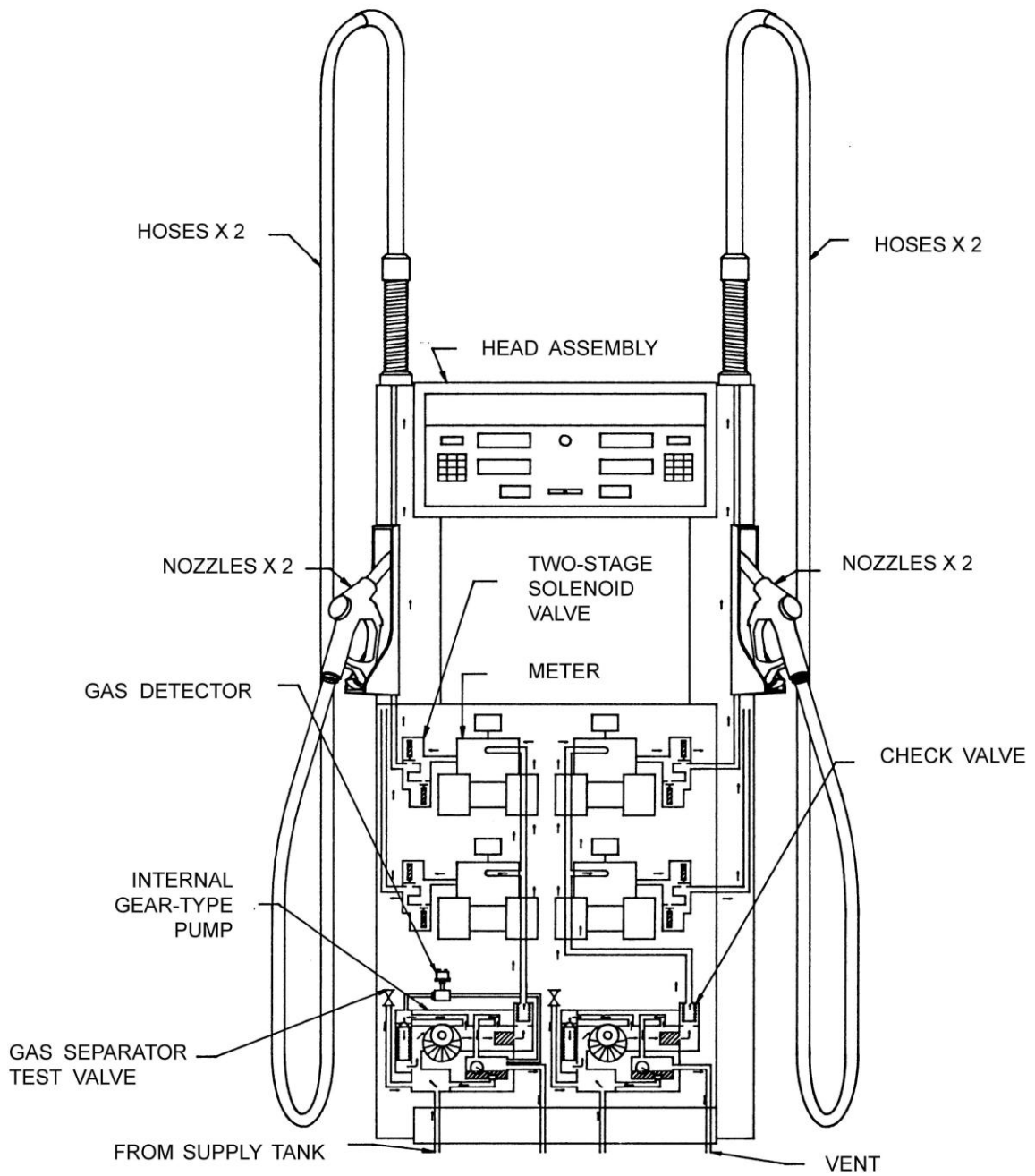
PEC Model 1101P Fuel Dispenser for Motor Vehicles – Variant 1

FIGURE 5/6A/92A – 3



Typical Dispenser Including Two Meters and a Gas Detection System – Variant 1

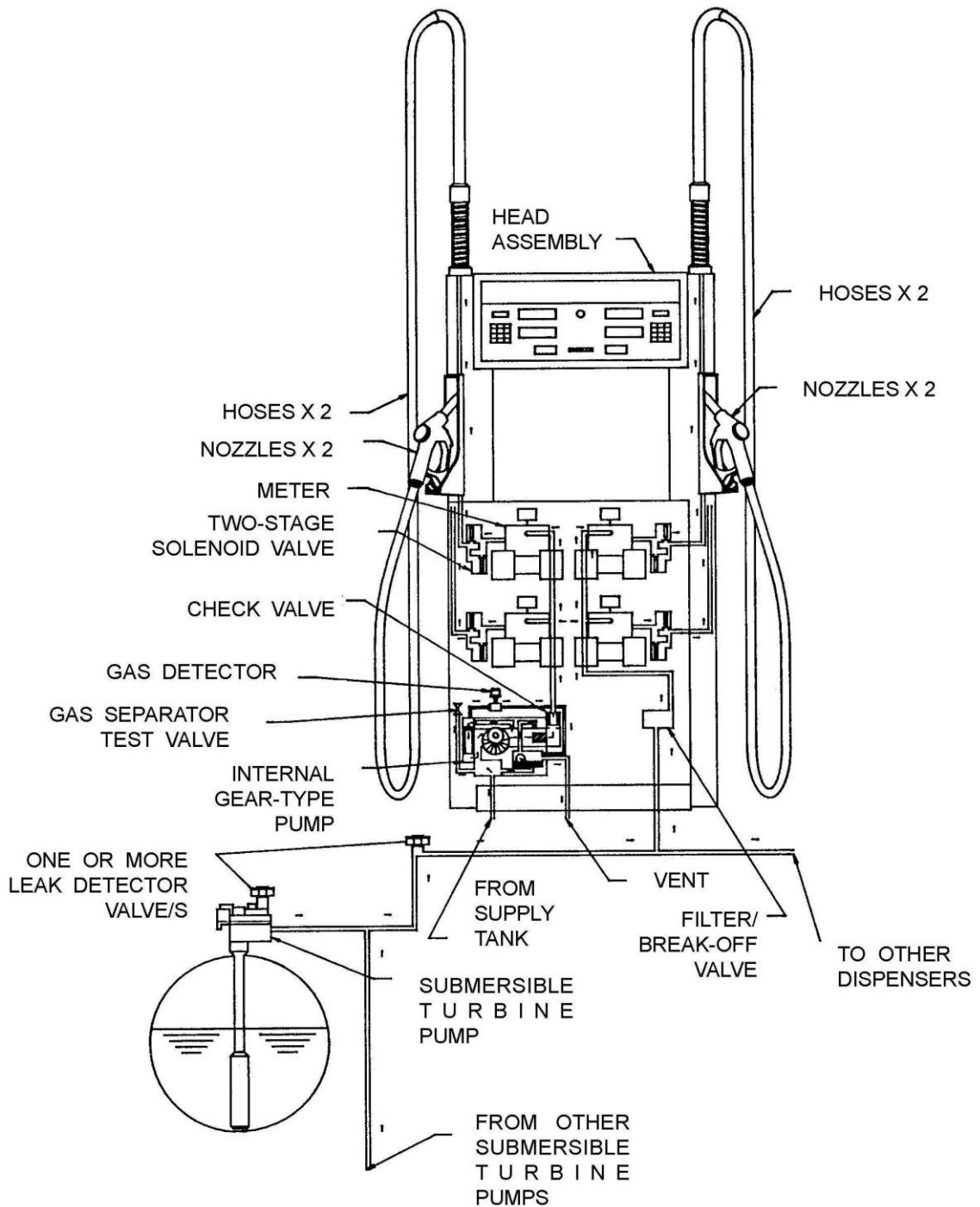
FIGURE 5/6A/92A – 4



Typical Multi-product Dispenser Including a Gas Detection System – Variant 1

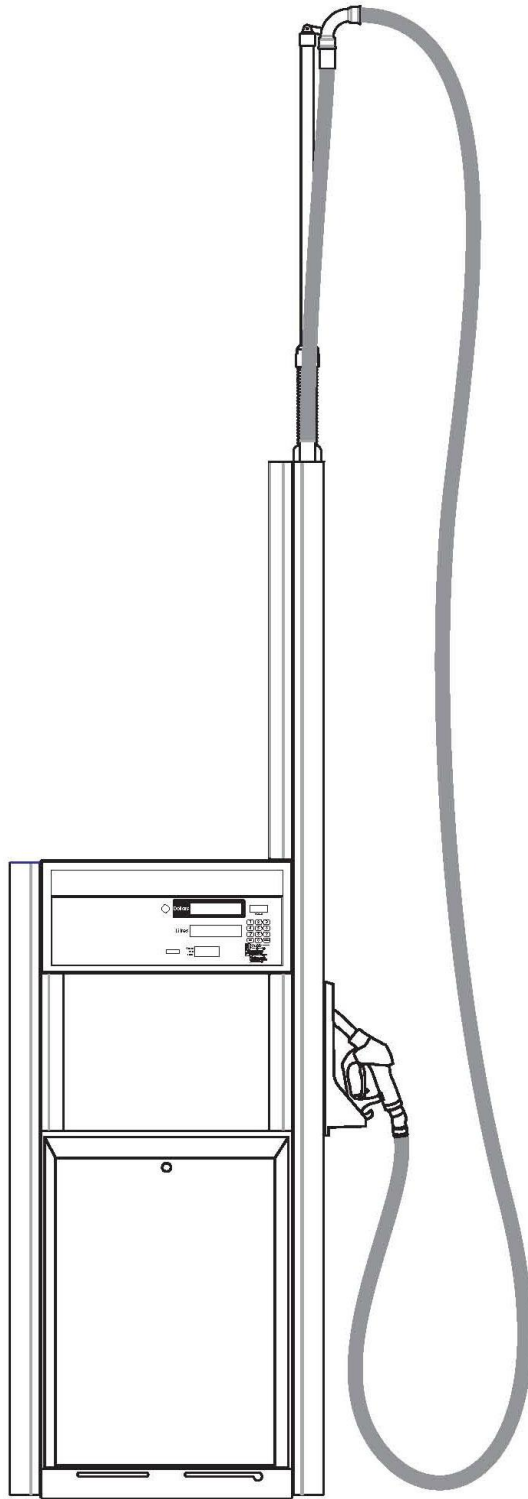


FIGURE 5/6A/92A – 5



Typical Multi-product Dispenser With Both Integral Pump/Strainer/Gas Separator and Submersible Turbine Pump – Variant 1

FIGURE 5/6A/92A – 6



Typical 1000 Series Dispenser With a Hose Extension Mast  
(Optional at Either End of Dispenser) – Variant 8

FIGURE 5/6A/92A – 7

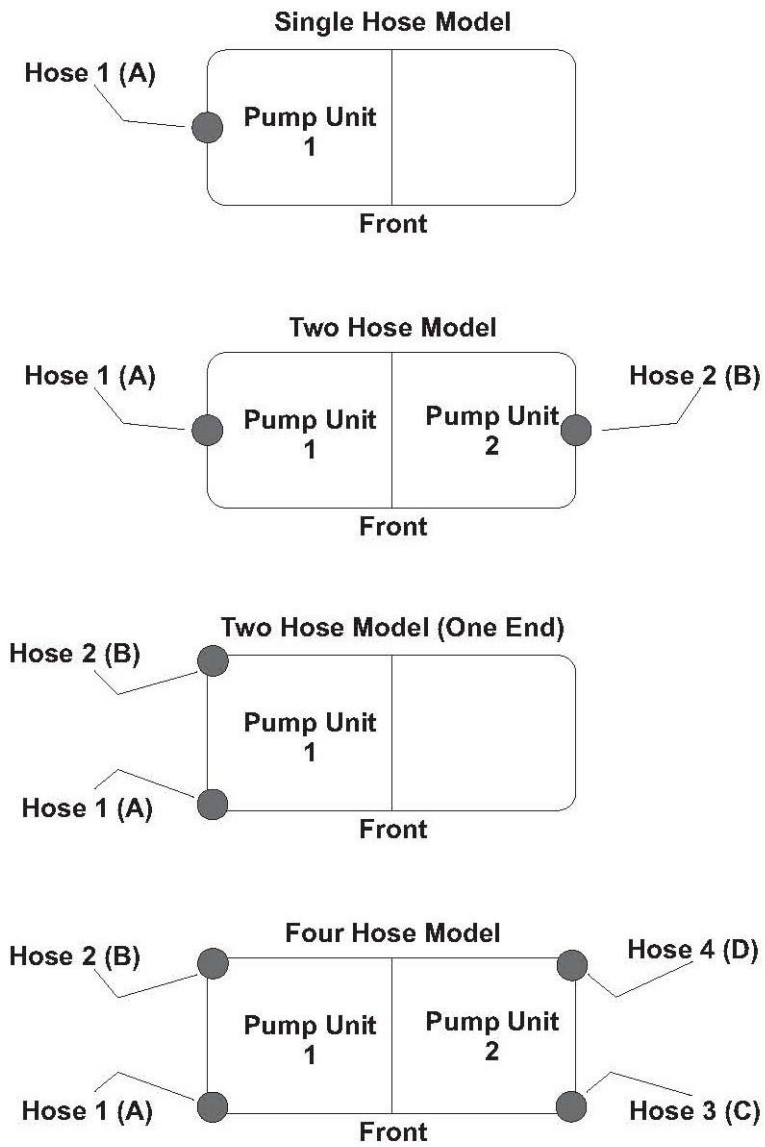
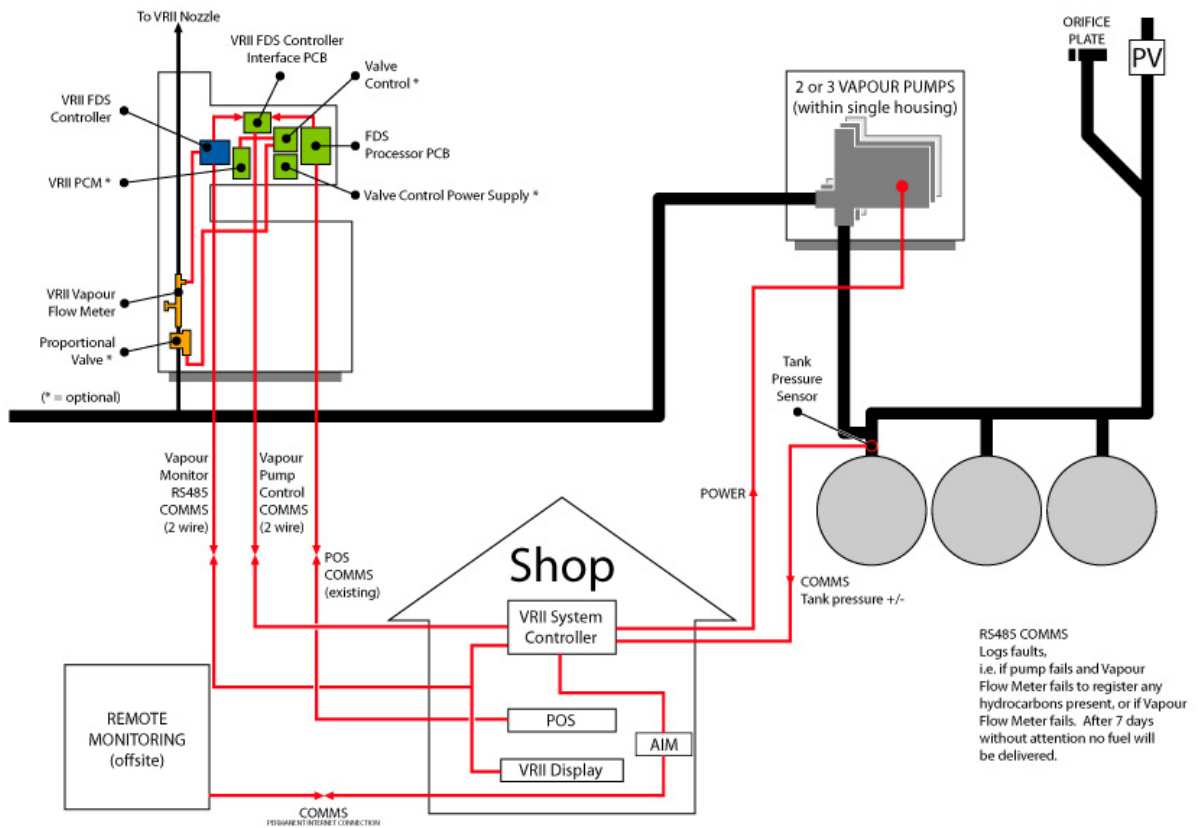


FIGURE 5/6A/92A – 8



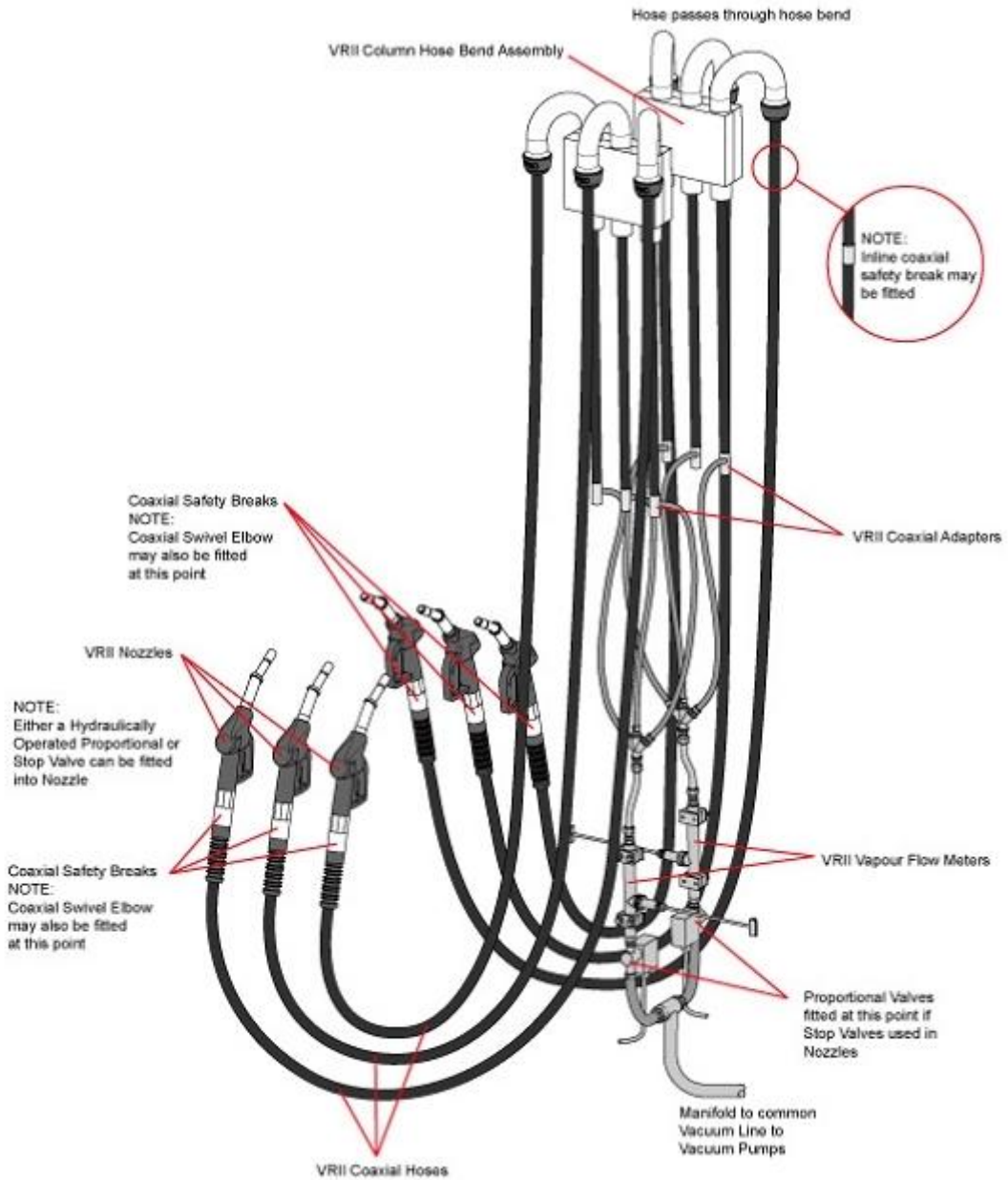
Typical External Filter Installation – Variant 10

FIGURE 5/6A/92A – 9



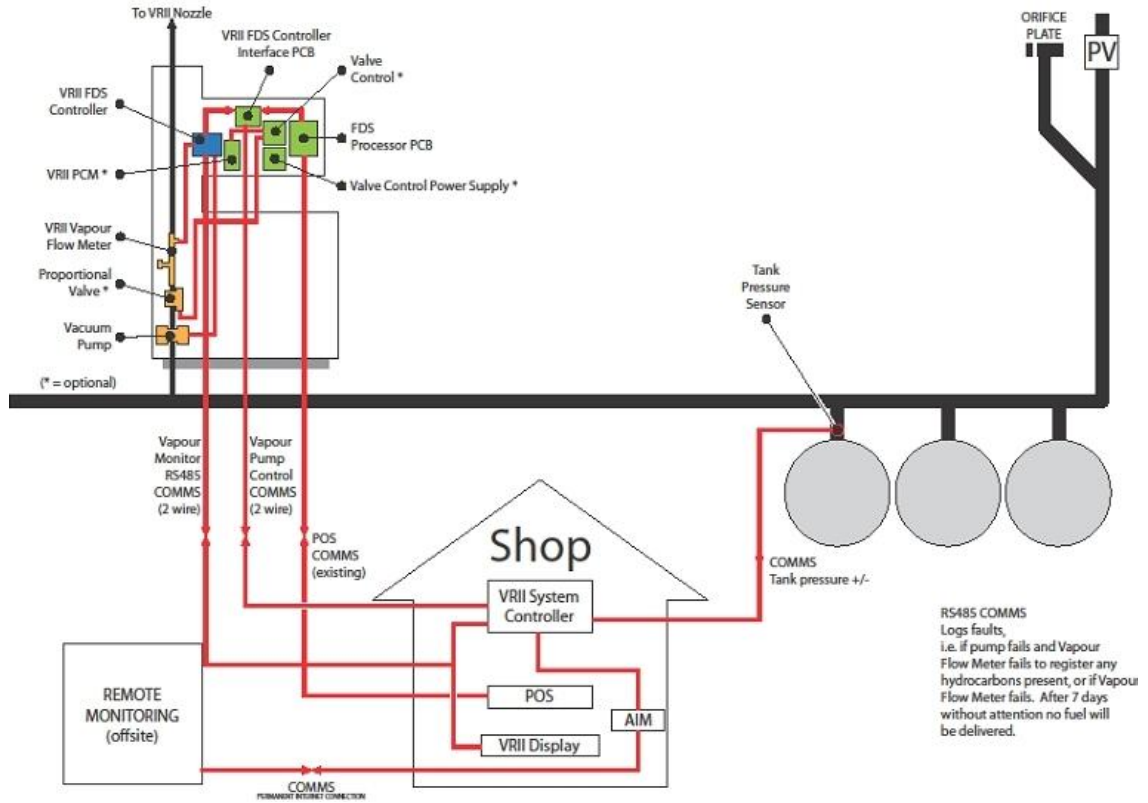
A Typical PEC Model Vapour Recovery Stage 2 (aka VRII)  
Vapour Recovery System – Variant 12

FIGURE 5/6A/92A – 10



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

FIGURE 5/6A/92A – 11



A Typical PEC Stage II Vapour Recovery System  
With The Vacuum Pump Located Within The Dispenser Housing – Variant 13

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