Part B Application form

Application to vary a permit for a Part B service station to add PVR Stage II

Local Authority Pollution Prevention and Control
Pollution Prevention and Control Act, 1999
Environmental Permitting (England and Wales) Regulations 2007

Introduction

When to use this form
Use this form if you are applying for a variation to an existing service station permit in order to extend it to cover the operation of PVR Stage II.

A fee is only required to be enclosed if the variation involves a 'substantial change'. A substantial change is defined as "a change in operation which, in the opinion of the competent authority [the regulator] may have significant **negative** effects on human beings or the environment". (Closure of an existing service station and the building of a new replacement station at another location is likely to require a full fresh application, ie not constitute a variation.)

When complete, send the form and the fee and any additional information to:

Ipswich Borough Council,
Environmental Services,
The Civic Centre,
Civic Drive,
Ipswich,
Suffolk,
IP1 2EE

If you need help and advice
We have made the application form as straightforward as possible, but please get in touch with us at the local authority address given above if you need any advice on how to set out the information we need.

LAPPC application form: to be completed by the operator		
For Local Authority use		
Application reference	**Officer reference**	**Date received**

A1.1. **Name of the premises**

.....Wm Morrison Supermarket Plc IPSWICH 081.....

A1.2. Please give the **address of the premises**

Sproughton Road, Ipswich, Suffolk .....

.....

.....

Postcode..... IP1 5AS.....Telephone..... 01473 743 937

A1.3. Reference number of existing PVR Stage I permit for the installation

1.2/RJD/11/05

A2.1. **The applicant** - Please provide the full name of company or corporate body or the name of the sole trader or the names of the partners

.....Wm Morrison Supermarket Plc.....

Trading/business name (if different)

.....As Above.....

Registered Office address

.....Hilmore House, Gain Lane, Bradford.....

.....

.....

Postcode .....BD3 7DL.....Telephone....0845 6115000.....

A2.2. **Holding companies**

Is the operator a subsidiary of a holding company within the meaning of section 1159 of the Companies Act 2006?

☒ No

☐ Yes

If yes? Name of ultimate holding company .....

Ultimate holding company registered office address

.....N/A.....

.....

.....

Postcode .....Telephone.....

A3 **Who can we contact about your application?**

It will help to have someone who we can contact directly with any questions about your application. The person you name should have the authority to act on behalf of the operator - This can be an agent or consultant.

Name ...Ms Claire Jackson.....

Position ...Petroleum Licensing Coordinator.....

Address

.....Wm Morrison Supermarket Plc, Petroleum Department, Hilmore House,

.....Gain Lane, Bradford.....

.....

Postcode ....BD3 7DL.....Telephone....0845 6116216.....

Fax number ...0845 6116743.... email address ...claire.jackson@morrisonsplc.co.uk.

B. About the installation

B1.1 Is PVR Stage II equipment already fitted:

☐ No

☒ Yes **(Please note that stage II will not be switched on until approval Has been given by the Authority)**

B1.2 If the answer to B1.1 is "no",

a) when do you intend to fit it.....

b) what arrangements are in place (eg contract with installers) to fit it

.....

B2.1 What systems have been installed or is it intended to install to comply with PVR Stage II?

.....Active System With Automatic Monitoring.....

Dresser Wayne Vapour Gate (TUV cert.U-12.14-Appendix B).....

Doc Reference...**001** section 3 (Dress Wayne Guidance Manual for Site Operators)

B2.2 What is or will be the vapour/petrol ratio?

.....95% to 105%.....

B2.3 Please attach process diagrams and plans of VPR Stage II system, including pipework layout.

Doc Reference...**005** (section12 Appendix A) & **007** & **008** This plan is subject to changes see repump plan 009.

B2.4 What arrangements will be/have been made for preventative maintenance of the PVR Stage II equipment.

Annual periodic test also automatic monitoring system in place which will highlight

any issues immediately.....

.....

.....

Doc Reference **002** & **004**.....

B2.5 What arrangements will be/have been made to ensure relevant staff are adequately familiar with/trained in the use of the PVR Stage II equipment.

.....See documents attached ref 004 Stage 2 vapour recovery training

documents.....

.....

.....

Doc Reference .....**004**.....

B2.6 Please attach procedures and contingency measures in the event of vapour containment equipment failure (including the system for vapour recovery during filling of vehicle petrol tanks).

Doc Reference **004** & **005**.....

B2.7 Please provide a certificate to confirm conformity of the PVR Stage II equipment with approval for use under the regulatory regimes of at least one European Union or European Free Trade Association country and to confirm that the hydrocarbon capture efficiency of the equipment is not less than 85% (ie that at least 85% of the displaced vapours are recovered, according to the relevant 'type approval' test (see Section 5.16 of PG1/14(06)), expressed as the ratio of the volume of hydrocarbon vapours displaced to the volume of petrol discharged.

Doc Reference ....**006**.....

B2.8 What arrangements will be put in place to test delivery systems and vapour recovery systems, including the testing of the vapour/petrol ratio? Please provide details of testing of the vapour containment integrity in accordance with the manufacturer's specifications (to be undertaken prior to commissioning and periodically at least once every 3 years thereafter and always following substantial changes or significant events that lead to the removal or replacement of any of the components required to ensure the integrity of the containment system).

Doc Reference ...**002** & **003a** & **003b**.....

B2.9 Is an "automatic monitoring system" installed, or will it be installed, to automatically detect faults in the proper functioning of the petrol vapour recovery system including the automatic monitoring system; to indicate faults to the operator; and to automatically cut off the flow of fuel on the faulty delivery system if the fault is not rectified within 1 week?

☐ No

☒ Yes

B3 Additional Information

Please supply any additional information, which you would like us to take account of in considering this application.

Doc Reference: .....**009** (site re-pump layout plan).....

C1. **Fees and Charges**

C1.1. Please enclose the relevant sum if this variation involves a substantial change, and state the amount enclosed.

£.....

Cheques should be made payable to:

We will confirm receipt of this fee when we write to you acknowledging your application.

C1.2. Please give any company purchase order number or other reference you wish to be used in relation to this fee.

C2. Annual charges

If we grant you a permit, you will be required to pay an annual subsistence charge. If you don't pay, your permit can be revoked and you will not be able to operate your installation.

C2.1.If different to details provided in relation to your current PVR Stage I permit, please provide details of the address you wish invoices to be sent to and details of someone we may contact about fees and charges.

FAO Service Accounts Payable, Wm Morrison Supermarket Plc.....

Hilmore House Gain Lane .....

Bradford.....

Postcode BD3 7DL.....Telephone.....0845 6115000.....

C3. **Commercial confidentiality**

C3.1. Is there any information in the application that you wish to justify being kept from the public register on the grounds of commercial or industrial confidentiality?

If **Yes**, please provide full justification, considering the definition of commercial confidentiality within the EP Regulations (See the General Guidance Manual).

C4. **Data Protection**

The information you give will be used by the Local Authority to process your application. It will be placed on the relevant public register and used to monitor compliance with the permit conditions. We may also use and or disclose any of the information you give us in order to:

- consult with the public, public bodies and other organisations,

- carry out statistical analysis, research and development on environmental issues,
- provide public register information to enquirers,
- make sure you keep to the conditions of your permit and deal with any matters relating to your permit
- investigate possible breaches of environmental law and take any resulting action,
- prevent breaches of environmental law,
- offer you documents or services relating to environmental matters,
- respond to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 (if the Data Protection Act allows)
- assess customer service satisfaction and improve our service.

We may pass on the information to agents/ representatives who we ask to do any of these things on our behalf.

It is an offence under regulation 38 of the EP Regulations, for the purpose of obtaining a permit (for yourself or anyone else) to:

- make a false statement which you know to be false or misleading in a material particular,
- recklessly make a statement which is false or misleading in a material particular.

If you make a false statement

- we may prosecute you, and
- if you are convicted, you are liable to a fine or imprisonment (or both).

C5 Declaration: previous offences (delete whichever is inapplicable)

I/~~We certify~~

EITHER

No offences have been committed in the previous five years which are relevant to my/our competence to operate this installation in accordance with the EP Regulations.

OR

~~The following offences have been committed in the previous five years which may be relevant to my/our competence to operating this installation in accordance with the Regulations:~~

.....

.....

Signature .....

Name .....Mr Phil Maud.....

Position.....Petroleum Director .....

Date 10/7/2009.....

6 Declaration

C6.1 Signature of current operator(s)*

I/We certify that the information in this application is correct. I/We apply for a permit in respect of the particulars described in this application (including supporting documentation) I/We have supplied.

Please note that each individual operator must sign the declaration themselves, even if an agent is acting on their behalf.

For the application from:

Premises name ..... Wm Morrison Supermarket Plc IPSWICH 081.....

Signature .....

Name ..... Mr Phil Maud .....

Position..... Petroleum Director .....

Date ..10./7/2009.....

Signature .....

Name .....

Position.....

Date .....

** Where more than one person is defined as the operator, all should sign. Where a company or other body corporate – an authorised person should sign and provide evidence of authority from the board of the company or body corporate.*

DRESSER Wayne

DRESSER Wayne

Guidance Manual for Site Operators

61/140626

Issue 1A

January, 2009

Stage II Vapour Recovery

Table of Contents

HAZARDS & SAFETY PRECAUTIONS
ELECTRIC SHOCK WARNINGS
AND SAFETY PRECAUTIONS

1. INTRODUCTION

This preamble gives details of the precautions which must be observed during the operation of the test facility.

2. WARNINGS

PETROLEUM FUEL / VAPOUR CAN DAMAGE YOUR HEALTH. CARE MUST BE TAKEN TO PREVENT SPILLAGE OF FUEL.

Forecourt equipment is only approved for operation when all enclosures and seals are in place and intact. There is a serious risk of fire or explosion when servicing electrical equipment in hazardous areas. Any electrical test gear must be approved for use in the areas concerned.

Refer to the installation manual for hazardous areas around pump/dispenser.

No electrical equipment should be used near storage tanks or in any other area where a high concentration of petroleum vapour is likely to occur.

LETHAL VOLTAGES ARE PRESENT IN THE EQUIPMENT. SWITCH OFF POWER SUPPLIES WHENEVER POSSIBLE BEFORE SERVICING. WHEN POWER IS APPLIED TAKE CARE TO AVOID CONTACT WITH HIGH VOLTAGE POINTS.

EARTH BONDING MUST BE MAINTAINED AT ALL TIMES WHEN POWER IS APPLIED TO THE UNIT.

When using or servicing the equipment, ensure that all equipment is correctly earthed.

3. CAUTIONS

3.1 LETHAL VOLTAGES

3.1.1 In this equipment, all points carrying high voltages are normally enclosed by covers.

3.1.2 A lethal voltage is 50Vdc or 30Vac (r.m.s.) or greater, where the source is capable of delivering more than 50 millicoulombs through a non-reactive resistance of 500 ohms. A potentially lethal current is 9mA or greater, flowing through the human body.

3.1.3 The equipment is safe ONLY if your approach is correct. Learn and follow these safety rules:-

a. Always regard all electrical equipment as dangerous.

b. Learn how to deal with cases of severe electric shock.

c. Keep all equipment covers closed whenever possible.

d. When using or servicing the equipment, take great care to avoid touching high-voltage points. Work with one hand whenever possible and avoid touching metal with any other part of the body.

e. Switch off the power supplies and ensure that all capacitors are discharged before changing components.

3.1.4 EMERGENCY SWITCHING OFF

In an emergency, all power can be switched off at the **FIREMAN'S SWITCH** or the **EMERGENCY STOP** push button.
Personnel must be aware of the locations of these switches.

4. FIRE EXTINGUISHERS

Personnel must be familiar with the location, type and use of fire extinguishers in the forecourt area.

5. First Aid Actions (L.P.G. Cold Burn Treatment)

In severe cases summon medical attention to site immediately.
Immerse affected area in tepid or cold (tap) water for at least 10 minutes, and preferably 20 minutes. Do not use hot water or apply any direct heat.
If the area cannot be immersed then flush gently with cold water for the same period.
Loosen any clothing that may restrict blood circulation to the affected area.
Thaw out frozen clothing and, providing not stuck to the skin, remove.
Cover affected area with clean, dry dressing and bulky protective covering. Dressings should not be applied tightly.

Guidance Manual for Site Operators

Note:

1. This Operators Guide should be read in conjunction with the 'Stage II Vapour Recovery Test Certificate' supplied with the pump / dispenser. The Test Certificate indicates the 'Vapour Recovery System Type Fitted' & 'Vapour Recovery Monitoring Type Fitted' (see page 1 of Test Certificate).

2. Refer to the 'Stage II Vapour Recovery Test Certificate' to identify the relevant 'System Conformity Certificate'. Certificates are located in the Appendix Section of this manual.

1. The Dresser Wayne System.

Dresser Wayne supply 'Open Active with Return of Vapours to Underground Storage Tank Systems'. The frequency of monitoring for different vapour recovery systems is shown in table 1

Table 1	
Type of System	Tests Required (post-commissioning)
Active System without automatic monitoring	Vapour containment integrity = 3 years Vapour recovery effectiveness (V/P ratio) = 1 year
Active System with automatic monitoring	Vapour containment integrity = 3 years Vapour recovery effectiveness (V/P ratio) = 3 year

2. Active System without Automatic Monitoring.

2.1 Weekly Functionality Check

Where an automatic monitoring system is not employed, operators should undertake a weekly check to verify functionality of the vapour recovery system.

Such checks should include:

- A test of functionality using appropriate equipment
- A visual inspection for damage to VR hoses and nozzles etc.
- An entry of the checks and findings in the station log book.

2.2 Dresser Wayne LED Indicator.

The LED System is an **Active System Without Automatic Monitoring,** this system requires a weekly functionality check as indicated at **2.1**.

Pumps/Dispensers fitted with display LEDs can be functionally tested by:

- Observing the display LED while customers are filling.
- Dispensing fuel into an approved container and observing display LED.
- Lifting and replacing a vapour recovery (VR), nozzle.

The indicating LED will blink RED or GREEN depending on status of previous filling.

After a sale with no faults on a VR nozzle the green LED will blink when the nozzle is replaced.

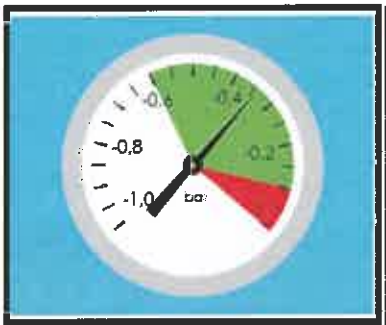
After a sale with a fault on a VR nozzle the red LED will blink when the nozzle is replaced.

The RED LED will stay on if there have been 10 consecutive faulty VR sales.
Once the RED LED is on continuously a service visit must be requested and the system will be reset by an engineer.

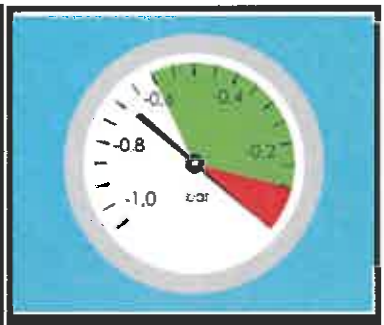
If required, a further functionality test can be carried out as indicated at **2.5**.

2.3 Dresser Wayne Vapour Gauge.

The Vapour Gauge System is an **Active System Without Automatic Monitoring,** this system requires a weekly functionality check as indicated at **2.1**.



Good VR Filling will have the pointer in the Green area.



Faulty VR Filling will have the pointer in the Red or White area.

Pumps/Dispensers fitted with vacuum gauges can be functionally tested by:

- Observing the vacuum gauge while customers are filling.
- Dispensing fuel into an approved container and observing the vacuum gauge.

If required, a further functionality test can be carried out as indicated at **2.5**.

2.4 Dresser Wayne Vapour Flow Switch.

The Flow Switch System is an **Active System Without Automatic Monitoring,** this system requires a weekly functionality check as indicated at **2.1**.

The Flow Switch monitors the flow of the vapour through the system and the pump electronics will log if the switch is open during the fuel delivery and closes when the delivery is finished.

Pumps/Dispensers fitted with flow switch can be functionally tested by:

- Checking the information at the kiosk point of sale. See the manufacturers POS manual for information on error codes.

If required, a further functionality test can be carried out as indicated at **2.5**.

2.5 Dresser Wayne Vapour Flow Switch with LED Indicator

The Flow Switch & LED Indicator System is an **Active System Without Automatic Monitoring,** this system requires a weekly functionality check as indicated at **2.1**.

The Flow Switch monitors the flow of the vapour through the system and the pump electronics this will be indicated by the LED's indicators on the pump display see Para. **2.2.**

Pumps/Dispensers fitted with display LEDs can be functionally tested by:

- Observing the display LED while customers are filling.
- Dispensing fuel into an approved container and observing display LED.
- Lifting and replacing a vapour recovery (VR), nozzle.
- Checking the information at the kiosk point of sale. See the manufacturers POS manual for information on error codes.

If required, a further functionality test can be carried out as indicated at **2.5**.

2.5 Functionality Testing

Pumps/Dispensers with / without vacuum gauges or display LEDs can be checked by using an Elaflex 'Quick Tester' (Dresser Wayne Pt. No. 81098=00620)

Site operator should fit 'quick tester' onto spirit spout as shown. When the nozzle is dispensing fuel into a customer's vehicle or a suitable fuel container a 'Whistle' should be heard.

Whistle tests that fail should be logged as a fault and a service visit requested.

Note: Rotation of the brass tester may be required to improve operation.

3. Active System With Automatic Monitoring.

3.1 Dresser Wayne Vapour Gate (TUV cert. U-12.14 - Appendix B)

If Vapour Gate detects a fault with the Vapour Recovery system it will cause the **unit price display of the spirit grades only** to indicate an error code.
If the following error codes are displayed, contact Dresser Wayne Service to arrange for a engineer to visit the site.

-	**Vapour Gate has detected an error and a 7 day timer has been started.** **(Spirit grades are still useable.)**	
	5 days have elapsed since timer started. **(Spirit grades are still useable.)**	
	6 days have elapsed since timer started. **(Spirit grades are still useable.)**	
OFF 1	**7 days have elapsed since timer started. Spirit grades are now shut down.** **(Diesel is still useable.)**	
OFF2	**Vapour Gate has detected a hardware fault. Spirit grades are now shut down.** **(Diesel is still useable.)**	

4. Vapour Recovery Log Book

Operators should record in a log book, details of all installations, maintenance, examination, repairs etc. Operators should maintain the log book at the permitted installation.

4.1 Suggested Log Book Entry

The log book entry should look similar to the specimen shown below.

A blank sheet is provided at the rear of this manual which can be used as a photocopy master.

Pump Number	Fault	Log date	Action Taken
4	Damaged Hose	01/11/08	Nozzle locked off and fault reported to Wayne
Further Information: Site Inspection		Completion Date: 10/11/08	Reported By: A.N. Other

Appendix A. TUV Cert.85-2.127-1

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Industrie Service

Zertifikat Nr. 85-2.127-1

Certificate No. 85-2.127-1

Die Prüfstelle für Gasrückführungssysteme des
TÜV SÜD, Westendstr. 199, D-80686 München,
bescheinigt die Prüfung gemäß dem Merkblatt:
„Systemprüfung für aktive Gasrückführungssysteme und deren Überwachungssysteme in Deutschland (Merkblatt I)" vom 17.6.2002
für folgendes Gasrückführungssystem:

The TÜV SÜD Test Body for Vapor Recovery Systems,
Westendstr. 199, D-80686 Munich, certifies having conducted tests as per the following code:
"Testing of active vapor recovery systems and their monitoring devices in Germany (Code I)"
of June 17, 2002 on the following vapor recovery system:

- Zapfventil: Fuel-hose nozzle: **ELAFLEX ZVA 200 GR**
- Schlauch: Hose: **ELAFLEX Conti Slimline 21/8 Coax**
- Steuerventil: Control valve: **Bürkert, 6022 / 2832,** mit Ansteuerung Bürkert/ with Bürkert control
- Gasrückführungspumpe: Vapor recovery pump: **Gardner Denver Thomas GmbH** (ehemals previously ASF Thomas), **Typ 8014-5.0, 8014-6.0**

Folgende Randbedingungen sind bei der Installation einzuhalten:
The following general conditions must be observed during installation:

- maximaler Kraftstoffvolumenstrom: Maximum volumetric fuel flow rate: **38 l/min**
- maximaler Gegendruck in der Rückführleitung: Maximum counter pressure in recovery line: **150 mbar**
- Korrekturfaktor für die Systemeinstellung mit Luft: Correction coefficient for system settings with air: **1,09**

Der geforderte Wirkungsgrad von mindestens 85 % wurde nachgewiesen.
The required minimum efficiency ratio of 85% was proved.
Das Gasrückführungssystem entspricht dem Stand der Technik im Sinne der 21. BImSchV (Verordnung zur Begrenzung der Kohlenwasserstoffemissionen bei der Betankung von Kraftfahrzeugen) vom 07.10.1992 zuletzt geändert am 6.5.2002.
The vapor recovery system corresponds to the state of the art as defined in the 21st BImSchV (Air-pollution Control Regulation on the restriction of hydrocarbon emissions during vehicle refueling) of October 7, 1992, last amended on May 6, 2002.

München, 12.02.2007
Munich, February 12, 2007

TÜV SÜD Industrie Service GmbH

Der Sachverständige
The officially authorized expert

Peter Szalata

Appendix B. TUV Cert. U-12.14

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Zertifikat Nr. Ü-12.14

Certificate no. Ü-12.14

TÜV SÜD Industrie Service

Für eine automatische Überwachungseinrichtung
Issued for an automatic monitoring system

Die Prüfstelle für Gasrückführungssysteme der
TÜV SÜD Industrie Service GmbH, Westendstr. 199, D-80686 München,
bescheinigt die Prüfung einer automatischen Überwachungseinrichtung für aktive Gasrückführungssysteme gemäß § 3 Abs. 5 der 21. BImSchV.

The TÜV SÜD Industrie Service GmbH Test Body for Vapour Recovery Systems, Westendstr. 199, D-80686 Munich, hereby certifies testing of an automatic monitoring device for active vapour recovery systems as per Article 3 (5) of the 21st Regulation on Air-Pollution Control (Bundesimmissionsschutzverordnung, BImSchV).

- Typ Bezeichnung:
  Type designation:
  VapourGate
  Automatische Überwachungseinrichtung für Gasrückführungssysteme in Dresser Wayne Zapfsäulen
  Automatic monitoring system for vapour recovery systems in Dresser Wayne dispensers
- Hersteller:
  Manufacturer:
  Dresser Wayne AB
  Malmö, Sweden
- Systemkomponenten:
  System components:

  Gasdurchflusssensor:
  Gas flow sensor:
  DWP VR Meter
  Montage vor der Gasrückführungspumpe und dem Proportionalventil in der Gasrückführungsleitung
  Flow sensor installed in the vapour recovery pipe in front of the vapour recovery pump and the proportional valve

  Betriebselektronik:
  Operating electronics:
  Dresser Wayne
  Integriert im **iGEM**-Zapfsäulenrechner
  Integrated in the **iGEM** dispenser processor

Die Prüfungen gemäß VDI 4205 Blatt 5, Ausgabe Sept. 2006 ergaben, dass die Anforderungen nach 21. BImSchV § 3 Abs. 5 und dem Merkblatt 1 Teil II (Prüfung von automatischen Überwachungseinrichtungen an aktiven Gasrückführungssystemen) erfüllt werden.
Tests according VDI 4205, sheet 5, edition sept. 2006 showed that the requirements outlined in the 21st BImSchV, Article 3 (5), and Code of Practice 1, Part II (Testing of automatic monitoring devices in active vapour recovery systems) have been satisfied

Diese automatische Überwachungseinrichtung ist für aktive Gasrückführungssysteme in Dresser Wayne Zapfsäulen mit iGEM-Rechner geeignet.
This automatic monitoring device for active vapour recovery systems is suitable for fitting in Dresser Wayne dispensers with iGEM processor.

München, den 10.04.2007
Munich, 04/10/2007

TÜV SÜD Industrie Service GmbH

Der Sachverständige
The officially authorized expert
Peter Szalata

TÜV®

Appendix C. Cert.85-2.xxx

Applicable for all valid vapour recovery systems with ELAFLEX ZVA 200 GR nozzle. The general conditions of this certificate are still valid.

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Industrie Service

Ergänzungs - Zertifikat
für fortlaufende Nummern: 85-2.xxx

Amendmend certificate
For no. 85-2.xxx

Die Prüfstelle für Gasrückführungssysteme des
TÜV Süddeutschland, Westendstr. 199, D-80686 München,
bescheinigt die Prüfung gemäß dem Merkblatt:
„Systemprüfung für aktive Gasrückführungssysteme und deren Überwachungssysteme in Deutschland (Merkblatt i)" vom 17.6.2002
für folgendes Gasrückführungssystem:
The TÜV Süddeutschland Test Body for Vapor Recovery Systems,
Westendstr. 199, D-80686 Munich, certifies having conducted tests as per the following code:
"Testing of active vapor recovery systems and their monitoring devices in Germany (Code i)" of June 17, 2002 on the following vapor recovery system:

• Zapfventil: Fuel-hose nozzle:	**ELAFLEX ZVA SLIMLINE 2 GR**
• Gasrückführungs-systeme: Vapor recovery systems:	**Geeignet für alle Gasrückführungssysteme für die ein gültiges Zertifikat mit dem ELAFLEX ZVA 200 GR Zapfventil vorliegt. Die in diesem Zertifikat genannten Randbedingungen gelten unverändert.** Applicable for all valid certified vapour recovery systems with ELAFLEX ZVA 200 GR nozzle. The general conditions of this certificate are still valid.

Der geforderte Wirkungsgrad von mindestens 85 % wurde nachgewiesen.
The required minimum efficiency ratio of 85% was proved.
Das Gasrückführungssystem entspricht dem Stand der Technik im Sinne der 21. BImSchV (Verordnung zur Begrenzung der Kohlenwasserstoffemissionen bei der Betankung von Kraftfahrzeugen) vom 07.10.1992 zuletzt geändert am 6.5.2002.
The vapor recovery system corresponds to the state of the art as defined in the 21st BImSchV (Air-pollution Control Regulation on the restriction of hydrocarbon emissions during vehicle refueling) of October 7, 1992, last amended on May 6, 2002.

München, 26/11/2007

TÜV SÜD Industrie Service GmbH

Der Sachverständige
The officially authorized expert

Peter Szalata

Pump Number	Fault	Log Date	Action Taken
Further Information		Completion Date	Reported By
Pump Number	Fault	Log Date	Action Taken
Further Information		Completion Date	Reported By
Pump Number	Fault	Log Date	Action Taken
Further Information		Completion Date	Reported By
Pump Number	Fault	Log Date	Action Taken
Further Information		Completion Date	Reported By
Pump Number	Fault	Log Date	Action Taken
Further Information		Completion Date	Reported By
Pump Number	Fault	Log Date	Action Taken
Further Information		Completion Date	Reported By
Pump Number	Fault	Log Date	Action Taken
Further Information		Completion Date	Reported By
Pump Number		Log Date	Action Taken
Further Information		Completion Date	Reported By
Pump Number	Fault	Log Date	Action Taken
Further Information		Completion Date	Reported By

Dresser Wayne, DI U.K. Ltd.

Butlerfield Industrial Estate,
Bonnyrigg, Midlothian,
Scotland. EH19 3JQ

Tel. : 01875 402140
Fax : 01875 400010
E-mail : Sales@bonx-wayne.com

DRESSER Wayne

www.dresserwayne.com

Dresser Wayne

Stage II Vapour Recovery Test Certificate

Completed certificate to be kept on site with site records and a copy retained by the contractor.

Part A. Work and Equipment Record

Date:	
Engineer:	
Site Name & Operator:	
Address of Site:	
Dispenser/Pump Make & Model:	
Vapour Recovery System Type Fitted:	
Vapour Recovery Monitoring System Type Fitted:	

Indicate all options that apply (X):

- ☐ New Installation
  - ☐ New Pumps with Stage II
  - ☐ Stage II Retrofit
  - ☐ Automatic Monitoring RetroFit
- ☐ Work on Vapour Recovery System
- ☐ Work on Automatic Monitoring System
- ☐ Ordered by Customer or Other Agency
- ☐ Annual Periodic Test
- ☐ 3 Yearly Periodic Test
- ☐ Test After Modification or Repair

Remarks: _____

Dresser Wayne
DI UK Ltd
Butterfield Industrial Estate,
Bonnyrigg, Midlothian, Scotland EH19 3JQ
Office: +44 1875 822500 Fax: +44 1875 400010
DI UK Ltd Registered in England No 4153802
Registered Office: 6 St. Andrew Street, London, EC4A 3LX
www.dresserwayne.com

Stage II Vapour Recovery Test Certificate

Part B. VR Efficiency Test Record

The Manufacturer's documentation, including approval certificate, contains data required for efficiency tests.

Correction Factor for Air (in manufacturer's documentation): _

Maximum Fuel Flow Rate: _ Outdoor Temperature: _____°C

Tolerance Range for V/P ratio: _% to _%

Pulsing Rate (factor) located on Gas Meter:

Pump Side	Pump Number	Grade Name		V/P ratio and fuel flow rate			
				Before adjustment		After adjustment (if applicable)	
				[%]	[l/min]	[%]	[l/min]
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					

If more than 6 pumps see additional sheet (Sheet 4).

Note: If the Vapour Recovery monitoring device is equipped with a regulation or correction function then this has to be disabled during the measurements.

If an Automatic Monitoring System is fitted (see Sheet 1) is this operating correctly – indication for normal operation, alarm condition and stop condition. Yes ☐ No ☐.

Date of this inspection: _____ Date next inspection due: _____

Certifying Engineer: _____

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Stage II Vapour Recovery Test Certificate

Part C. Initial Installation Inspection and Test

Leak test executed and passed on Vapour Recovery pipes & components:

☐ Inside of dispenser (retro kits) ☐ Between dispenser and tank

	Test steps	Details – Pass/Fail or Values					
		P1/2	P3/4	P5/6	P7/8	P9/10	P11/12
1	Conforms with installation instructions.						
2	Visual inspection of Vapour Recovery system for security of fittings.						
3	Visual inspection of Vapour Recovery monitoring device – if fitted.						
4	Leak tests to internal dispenser pipes and components. (Retro kits).						
5	Leak tests to pipes connecting dispenser to tanks or other external systems.						
6	Running of Vapour Recovery pump – no loose or vibrating pipes.						
7	Confirm operation of Vapour Recovery monitoring device and alarm test. (See Note 1)						
8	Dry measurement at each nozzle.						

	Test steps	Details – Pass/Fail or Values					
		P13/14	P15/16	P17/18	P19/20	P21/22	P23/24
1	Conforms with installation instructions.						
2	Visual inspection of Vapour Recovery system for security of fittings.						
3	Visual inspection of Vapour Recovery monitoring device – if fitted.						
4	Leak tests to internal dispenser pipes and components. (Retro kits).						
5	Leak tests to pipes connecting dispenser to tanks or other external systems.						
6	Running of Vapour Recovery pump – no loose or vibrating pipes.						
7	Confirm operation of Vapour Recovery monitoring device and alarm test. (See Note 1)						
8	Dry measurement at each nozzle.						

Note 1: The alarm signal and the switch-off function have to be tested for every nozzle if the switch-off function is nozzle specific.

Date of this inspection: _____

Certifying Engineer: _____

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FM25559

FORM REF WA368A ISSUE 02

Stage II Vapour Recovery Test Certificate

ADDITIONAL PUMPS

Pump Side	Pump Number	Grade Name		V/P ratio and fuel flow rate			
				Before adjustment		After adjustment (if applicable)	
				[%]	[l/min]	[%]	[l/min]
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					
1		G1					
		G2					
		G3					
2		G1					
		G2					
		G3					

Note: If the Vapour Recovery monitoring device is equipped with a regulation or correction function then this has to be disabled during the measurements.
If an Automatic Monitoring System is fitted (see Sheet 1) is this operating correctly – indication for normal operation, alarm condition and stop condition. Yes ☐ No ☐.

Date of this inspection: _____ Date next inspection due: _____

Certifying Engineer: _____

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RISK ASSESSMENT

Document No: DW/RA/F007	**Title: Modification/Repair/Functional Testing -VR II/VR Monitoring**	
Issue No. 2	**Issue Date:** May 2009	**Review Date:** May 2010
Initiator:	**Date:** 19/5/09	**Approved:** **Date:** 19/5/9

IDENTIFIED RISKS:

- Exposure to Various Grades of Fuel (Vapour) - fire/explosion and or toxicological effects on human health
- Vehicular Movements on Site
- Slips, Trips and Falls
- Manual Handling
- Using Hand Tools
- Electrocution
- Working at Height
- Waste Handling/Disposal
- Substances Hazardous to Health

EMPLOYEES INVOLVED:

- Service Engineers/Other Technical Employees

NON EMPLOYEES WHO MAY BE INVOLVED:

- Employees of the Client
- Other Contractors
- General Public

OTHER ASSESSMENTS REQUIRED:

Probability (Of Exposure or Creating a Hazard)	**Severity**	**Risk Rating**
1 = Very Unlikely (0 – 5 %) 2 = Slight Probability (5 – 15%) 3 = Greater Probability (15 - 30%) 4 = More probable (30 – 50%) 5 = Very likely (50 – 75%) 6 = Almost Certain (75 – 100%)	1 = Trivial Injuries 2 = Minor Injuries 3 = Major Injuries = 1 Person 4 = Major Injuries – Several People 5 = Death of 1 Person 6 = Multiple Deaths	1 – 8 Low: No further Action Required 9 – 18 Medium: Take action(s) to reduce Risk 19 – 36 High: Take immediate action(s) to reduce danger

RISK ASSESSMENT

DW/RA/F007 Modification/Repair/Functional Testing – VR II/VR Monitoring

Issue No. 2 | **Issue Date:** May 2009 | **Review Date:** May 2010

ORIGINAL RISK ASSESSMENT					REVISED ASSESSMENT				
TASK OR OPERATION	**HAZARD – POTENTIAL HARM**	**Px**	**S**	**R**	**CONTROL MEASURES**	**Px**	**S**	**R**	**Legislation/Notes**
Preparation of Work Area	Risk of personal injury from vehicular movements	4	5	20	Create safe working area by effective use of cones and barrier tape, defensive parking of vehicle and siting of warning signs in conspicuous locations Wear fluorescent outer garments at all times even in bright daylight. Be conspicuous – BE SAFE	1	5	5	
Modification/servicing/testing or replacement of electronic components or parts connected to a mains electrical supply	Risk of personal injury from electrocution	3	5	15	Install appropriate signage e.g. Danger risk of electric shock/danger live supplies/men working signs Isolate and lock off switches where possible Engineers trained in working with electricity	1	5	5	
Modification/servicing/testing/ or replacement of parts containing petroleum products	Risk of pressurised fuel leaks/sprays Contamination of skin, eyes and clothing with petroleum products and additives e.g. biocides Risk of exposure to breathing in the low lying petrol vapours Risk of Fire/Explosion	4	3	12	Control any release of pressure and drain the contaminated part into an approved container before repair or removal Use barrier cream; wear protective clothing and suitable gloves Work up stream of wind and keep head as high as possible Ensure "No Smoking" signs are visible and fire extinguishing equipment is available and ready for use Use sand or mineral granules to soak	2	3	6	

					up any spillage and dispose of safely/legally				
Working in hydraulics area where moving components are exposed	Risk of trapping clothing, hair and fingers in any moving parts such as pulley wheels and belts	4	3	12	Follow manufacturers' guidance notes on safe working procedures Tie back loose hair and avoid loose clothing Switch off and isolate equipment before working on mechanisms if possible Ensure panels and guards are in place wherever possible Keep work area tidy and restrict access whilst working	2	3	6	
Filling/carrying measures filled with petroleum product	Contamination of skin, eyes and clothing with petroleum products and additives e.g. biocides Risk of Fire/Explosion Risk of personal injury from carrying full measure	5	3	15	Use barrier cream; wear protective clothing and suitable gloves Ensure "No Smoking signs are visible and fire extinguishing equipment is available and ready for use Use sand or mineral granules to soak up any spillage and dispose of safely/legally Follow appropriate manual handling techniques Use mechanical carrying aid e.g. trolley Wear non-slip foot wear	1	3	3	
Working at height i.e. replacement of hose brackets, hoses, couplings	Risk of substantial personal injuries from falling	4	5	20	Only use approved working platforms that are regularly inspected and have an appropriate maintenance record	2	3	6	

					Assemble and use working platforms as per the manufacturer's instructions Visually check working platform for excessive wear and tear which would compromise safe use Wear non slip footwear				
Heavy and awkward lifting operations	Personal injury sustained from handling heavy and awkward loads e.g. removal and servicing of parts	4	3	12	Training in manual handling techniques Adopt appropriate manual handling techniques	2	3	6	
Removing nozzle scuff guards	Risk of cuts to hands using incorrect hand tools	3	3	9	Do not use blades to remove scuff guards etc. Use only correct, well-maintained tools	1	3	3	

DRESSER Wayne

SAFETY METHOD STATEMENT

Document No: DW/SMS/F007	**Title:** Modification/Repair/Functional Testing VR II / VR Monitoring		
Issue No. 2	**Issue Date:** May 2009	**Review Date:** May 2010	
Initiator:	**Date:** 19/5/9	**Approved:**	**Date:** 19/5/9

LOCATION:

Clients Premises

TOOLS/EQUIPMENT:

Standard Engineering Tools
Warning Signs
Fire Extinguishing Equipment
Cones
Barrier Tape
Electrical "Lock off" Kit
VR Calibration Kit
Vapourgate Calibration Kit
VR 'Whistle' Quick Tester
Working Platform

PROTECTIVE CLOTHING:

Overalls
Safety Footwear
Hard Hat
Gloves
High Visibility Clothing
Eye Protection

Protective Clothing to be worn as appropriate

SEQUENCE METHOD OF WORKING:

- The Service Engineer is to introduce himself/herself to the client or site representative
- Complete site register if appropriate
- Obtain information regarding any unusual safety requirements or instructions on day
- Identify equipment to be worked upon
- Carry out site specific Risk Assessment and determine appropriate control measures.
- Complete Clearance Certificate
- Present Clearance Certificate and associated Risk Assessments and SMSs to the client or site representative and discuss proposed works and obtain signature of client or site representative
- Create safe working area
- Make safe any hazards, following isolation procedures as required
- Carry out the retrofit of VR II / Vapourgate VR Monitoring
- Test/Calibrate VR II / Vapourgate VR Monitoring
- Clear working area and dispose of contaminated waste safely and legally
- Complete Clearance Certificate/Site Visit Report and customer documentation as required
- Complete site register if appropriate

POSSIBLE HAZARDS

Exposure to Various Grades of Fuel (Vapour) - fire/explosion and or toxicological effects on human health
Vehicular Movements on Site
Slips, Trips and Falls
Manual Handling
Using Hand Tools
Electrocution
Working at Height
Waste Handling/Disposal
Substances Hazardous to Health

PRECAUTIONS TO REDUCE HAZARDS:

Create a safe working area by effective use of cones and barrier tape, defensive parking of vehicle and siting of warning signs in conspicuous location.

Wear fluorescent outer garments at all times even in bright daylight.

Wear appropriate PPE and apply barrier cream if required.

Ensure work environment is safe i.e. no obvious presence of vapour and maintain a clear and tidy workspace

Use tools that are fit for purpose and use work equipment in accordance with manufacturers instructions and training

Use appropriate lifting equipment as required and observe good manual handling methods

Assemble, check and use approved working platform as per manufacturer's instructions

DETAIL OF ANY ISOLATION:

The engineer shall indicate where any circuit breakers on the main electrical distribution board have been turned off – for example by labelling "Danger do not switch on" or similar. The Service Engineers shall restor the power and remove label on completion of work.

DISPOSAL OF SURPLUS OR CONTAMINATED MATERIALS:

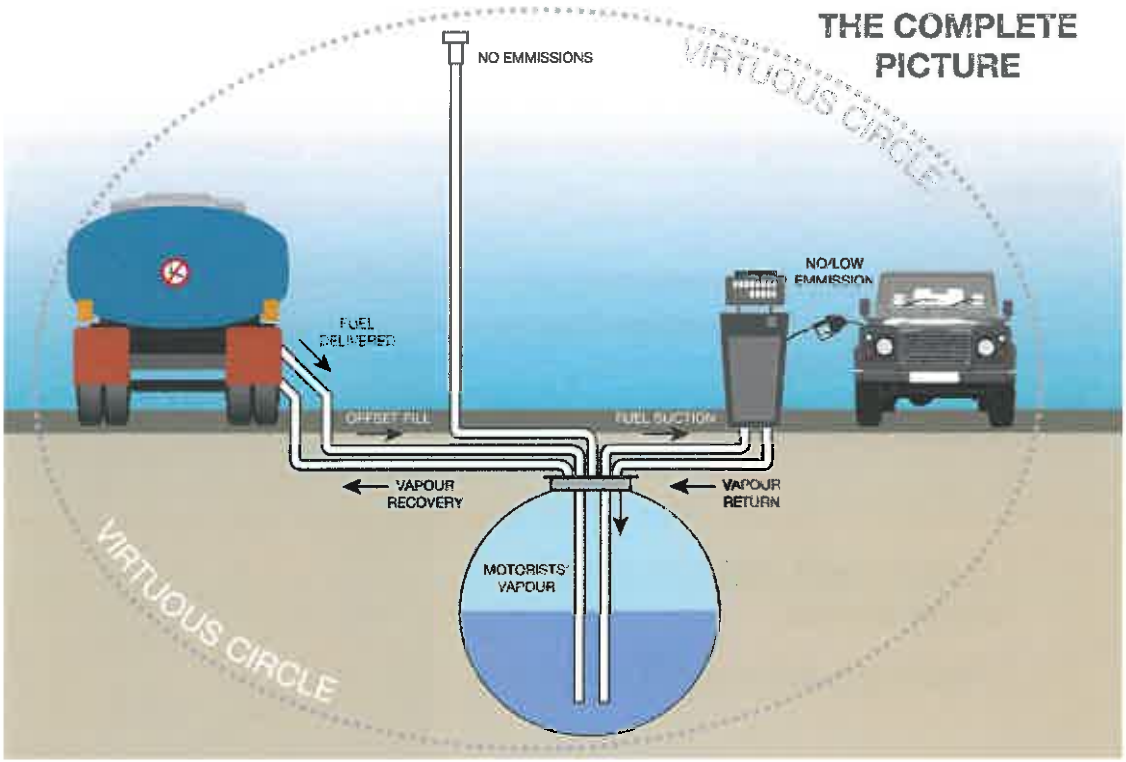
All waste or contaminated materials will be disposed of safely and legally in conjunction with Company and clients procedures.

OUTSIDE AUTHORITIES:

None

MORRISONS

STAGE 2 VAPOUR RECOVERY TRAINING DOCUMENT



Stage 2 Vapour recovery is a process which 'sucks' vapour emitted from the spirit nozzle spouts during a customer filling and returns it back to the underground petrol storage tank. This recovered vapour can subsequently be removed by the fuel tanker and returned to the refinery for processing.

Daily Checks

Ensure that all VR nozzles and hoses are in good condition and free from cuts, leaks etc.

Vapourgate Vapour Recovery Monitoring

See over.

VAPOURGATE VAPOUR RECOVERY MONITORING is a system which monitors the efficiency of each Vapour Recovery Transaction (spirit grades only).

If Vapourgate detects a fault with the Vapour Recovery system it will cause the **unit price display of the spirit grades only** to indicate an error code.

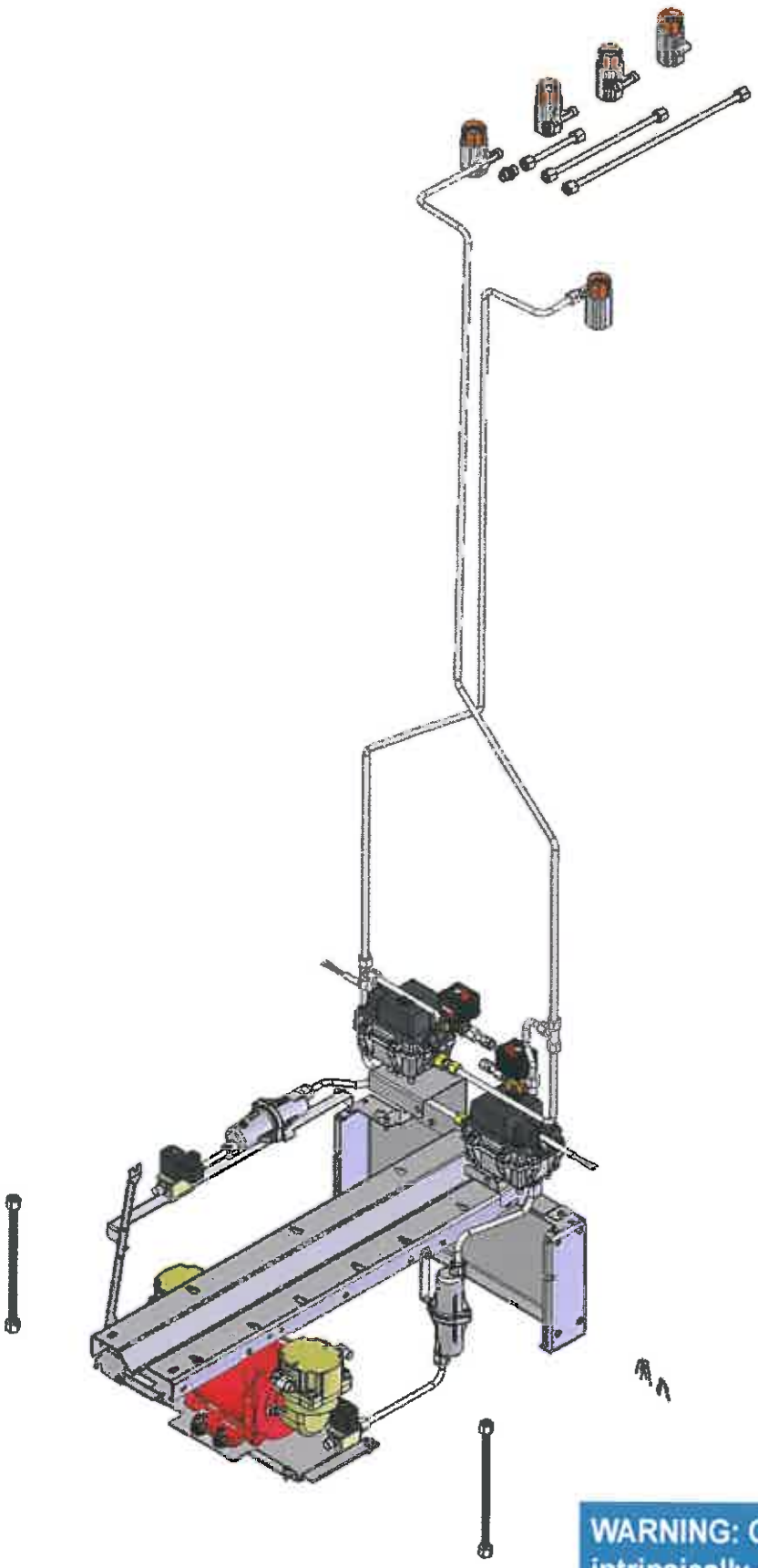
If any of the following error codes are displayed, contact **LBI** for a service visit.

-	Vapourgate has detected an error and a 7 day timer has been started. (Spirit grades are still useable.)	
--	5 days have elapsed since timer started. (Spirit grades are still useable.)	
---	6 days have elapsed since timer started. (Spirit grades are still useable.)	
0FF1	7 days have elapsed since timer started. Spirit grades are now shut down. (Diesel is still useable.)	
0FF2	Vapourgate has detected a hardware fault. Spirit grades are now shut down. (Diesel is still useable.)	

005

DRESSER Wayne

Vapour Gate
Retrofit Manual



WARNING: Contains intrinsically safe equipment

WM023706
2008-03-11 Rev.01




Product Liability

For the supplier's product liability to be valid, no alterations, additions or the like may be made to the equipment without the supplier's express permission.
Use only genuine parts

Produktansvar

För att en leverantörs produktansvar skall gälla får ändringar, kompletteringar och liknande ej göras i utrustningen utan leverantörens godkännande.
Originalreservdelar skall alltid användas.

Produkthaftung

Damit die Produkthaftung des Lieferanten ihre Gültigkeit behält, dürfen ohne ausdrückliche Genehmigung des Lieferanten keine Änderungen, Ergänzungen o. Ä. an der Ausrüstung vorgenommen werden.
Verwenden Sie nur Originalteile.

Ответственность поставщика

Для сохранения ответственности нельзя вводить в оборудование изменения, дополнения и т.п. без разрешения поставщика.
Пользуйтесь только оригинальными запасными частями, выпущенным изготовителем бензоколонки.

Caution

To prevent damage that might result in electric shock or fire, disconnect the main power prior to any work.

Varning

Gör pumpen/enheten strömlös innan Du gör ingrepp i den. I annat fall föreligger risk för skada.

Vorsicht

Um Beschädigungen zu vermeiden, die zu einem elektrischen Schlag oder Feuer führen können, unterbrechen Sie vor jeder Arbeit die Stromzufuhr.

Осторожно

Во избежание поражения электрическим током или пожара отключайте напряжение питания перед началом любых работ.

Warning

Never run a leaking pump! Be careful with the environment and mind the skidding risk; take care of leaking fuel immediately.

Varning

Använd aldrig en läckande pump.
Tänk på miljön och halkrisken, sanera utläckt drivmedel snarast.

Warnung

Lassen Sie nie eine undichte Zapfsäule laufen! Seien Sie umweltbewusst und denken Sie an die Rutschgefahr; beseitigen Sie austretenden Kraftstoff umgehend.

Предупреждение

Не пользуйтесь колонкой при наличии утечки топлива! Охраняйте окружающую среду, помните об опасности скольжения: в случае утечки топлива на дорожное покрытие возле колонки, примите меры немедленно.

1 To the owner

This instruction manual is your reference book for retrofit installation and maintenance for Vapour Gate system. Dresser Wayne AB recommends you to study this manual and the User's Manual for the pump carefully and make sure that the manuals are available for people who are using, maintaining and installing the system.

It is important that you:

- Keep this instruction manual and other applicable document as long as the equipment is in operation.
- Send it on to other owners or users of the equipment.

Dresser Wayne AB is not responsible for any machine damage caused by the owner's failure to follow the instructions of this document.

This instruction manual describes the authorised methods/ways to use the equipment. Dresser Wayne AB is not responsible for bodily injury and material damage if the instructions are not followed.

1.1 First of all, read through the manual

Before you start to unpack, install or use the unit, please read applicable parts of the manual. Consider all dangers, warnings, cautions and notes mentioned in the manual. Serious bodily injury and material damage may occur if you neglect this information.

2 Contents

3 Figure register

4 Definitions and Abbreviations

VR – Vapour Recovery

VRM – Vapour Recovery Monitoring

DWP – Dresser Wayne Pignone

iGEM – Global Electronic Module, current generation of Wayne pump electronics.

ISB – Intrinsic Safe Barrier

BHT – Bürkert hand terminal

5 Instructions specific to hazardous area installations

(reference European ATEX Directive 94/9/EC, Annex II, 1.0.6.)

The following instructions apply to the Dresser Wayne AB DWP VR Meter covered by certificate number Sira 06ATEX2266X.

1. The equipment may be used with gases and vapours associated with Group IIB and IIA with temperature classes T1, T2 and T3, in category 1, 2 and 3 locations.
2. The equipment is only certified for use in ambient temperatures in the range -40°C to +70°C and should not be used outside this range.
3. Installation shall be carried out in accordance with the applicable code of practice by suitably-trained personnel in accordance with the System Manual provided.
4. Repair of this equipment shall be carried out in accordance with the applicable code of practice.
5. The certificate number has an 'X' suffix which indicates that special conditions of installation and use apply. See certificate on next page.
6. If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

   Aggressive substances - e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.

   Suitable precautions - e.g. regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals.
7. There are no special checking or maintenance conditions other than a periodic check.

5.1 Approvals

The VR meter fulfils:

- European ATEX directive 94/9/EC
- EMC directive 89/336/EEC
- Tüv regulation 21.BImSchV

6 General Description

6.1 System overview with self check

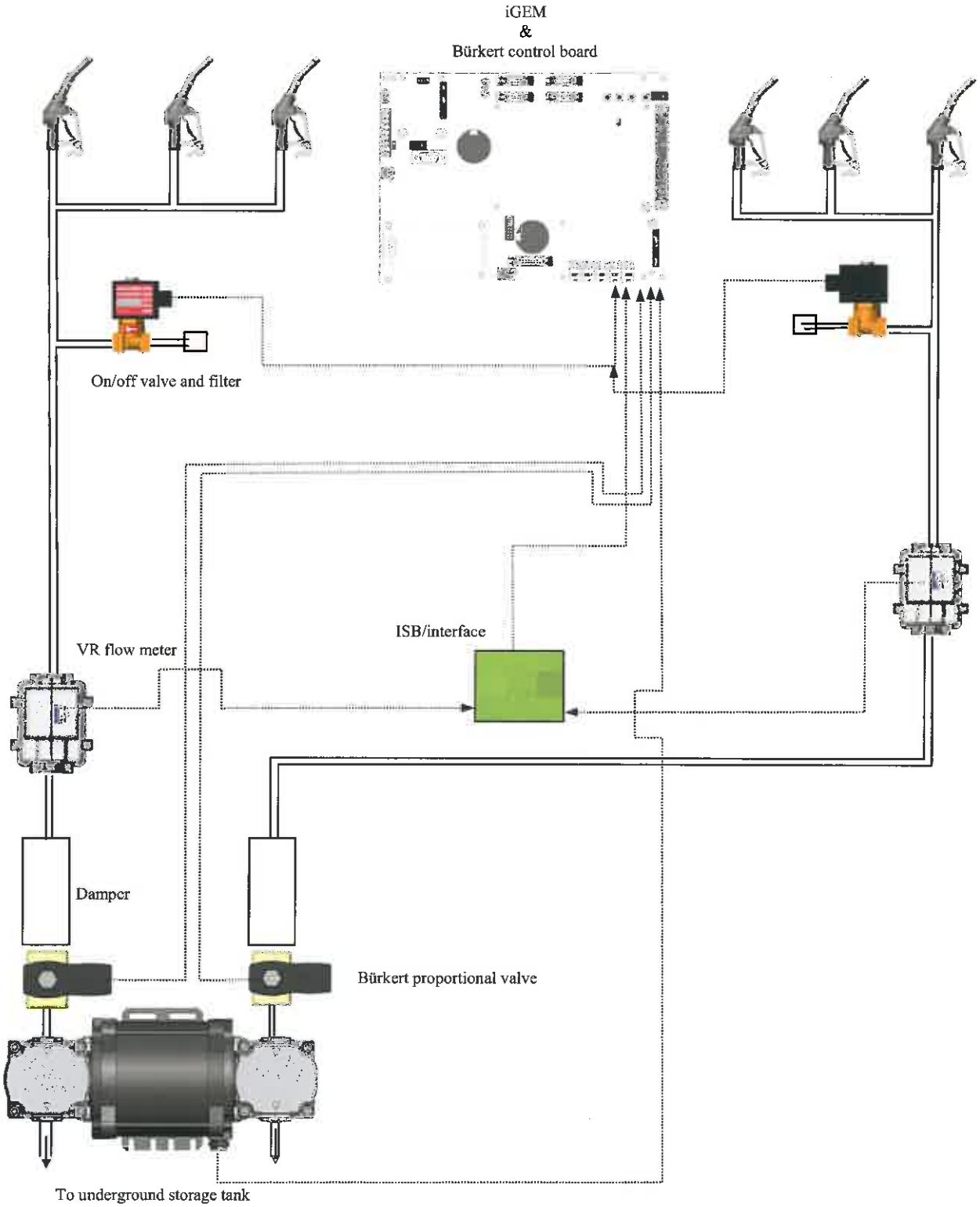


Figure 1 System overview with self check

6.2 System overview without self check

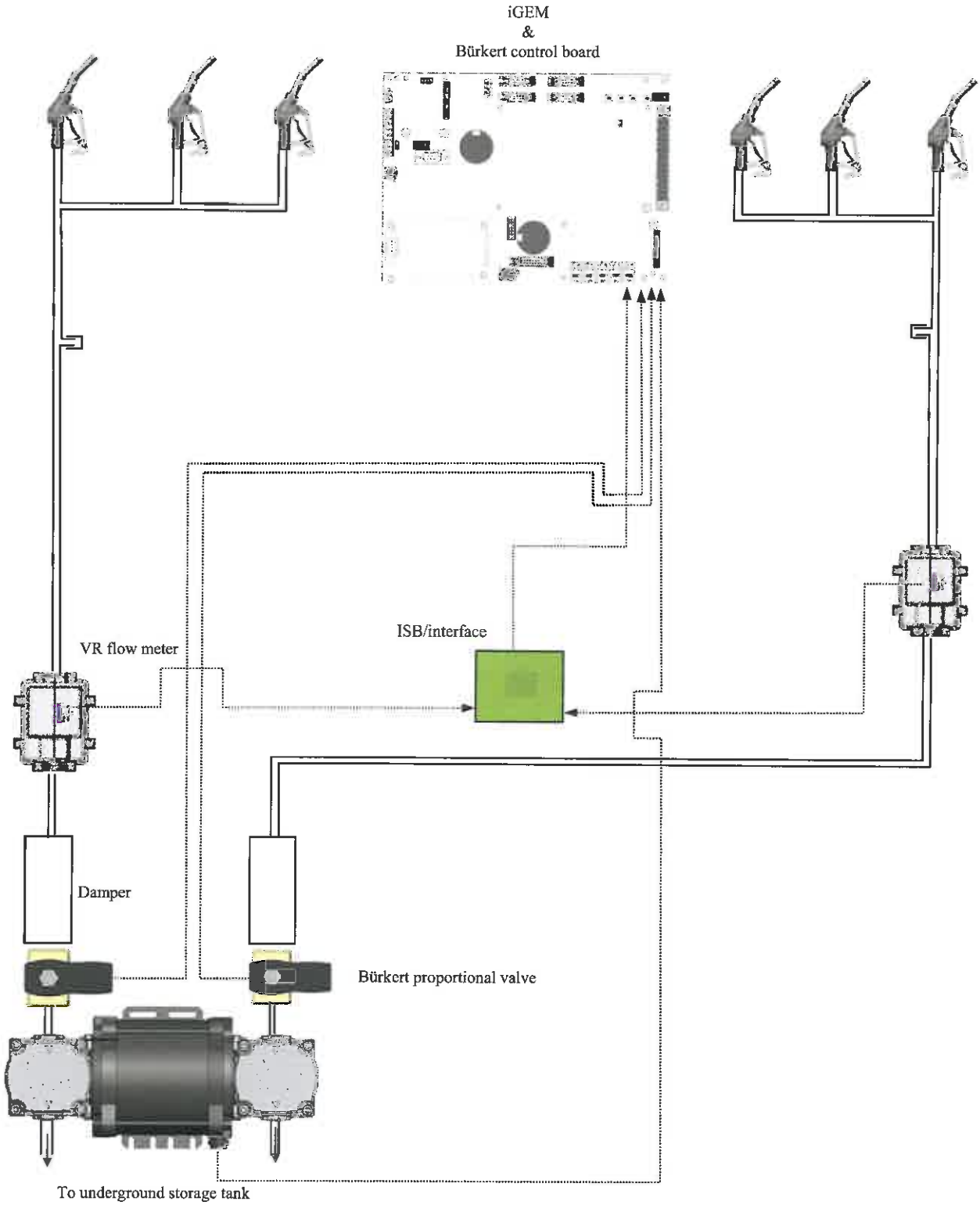


Figure 2 System overview without self check

6.3 System Description

Due to stricter environmental regulations a system for monitoring the vapour recovery stage II is needed in fuel dispensers in some countries.

The DWP VR meter measures the gas volume that passes the vapour recovery system. The meter is an oscillating type of gas meter. A small amount of gas that passes the meter starts to oscillate inside the meter and passes a thin heated platinum wire. This creates a frequency that is proportional to the gas flow. The ISB/ interface transform this frequency to pulses to iGEM. During fillings iGEM calculates the volume from the liquid meter and from the VR meter. A quote, referred later to as A/L, is calculated by dividing the amount of gas volume recovered with the amount of liquid dispensed. This quote is allowed to be $0.85 \geq A/L \geq 1.15$, according to Tüv regulation 21.BImSchV, otherwise will the filling be considered as erroneous.

A second path could be installed between the nozzle/nozzles and the VR meter that is controlled by an on/off valve. During normal circumstances this valve will be closed. Every filling is evaluated by iGEM and if fillings start to be out of the normal characteristics, according to certain parameters, the system will perform a self check just after the filling has ended. IGEM simulates a short filling during the self check and the on/off valve is opened to obtain a known and controlled pressure. If the A/L value from the self check is a certain amount higher than the A/L value from the filling, iGEM will consider the filling erroneous even if the measured A/L value is within range. This test is used to detect if any of the nozzles has a jammed suction path in the vapour channels. This is a feature that is mandatory for Germany and Switzerland but optional for all other countries.

If the system has ten fillings on the same side out of range, ten unapproved self checks on the same nozzle or a combine of out of range fillings and unapproved self checks it will start a timer (country dependent, Germany and Switzerland 72 h, UK 168 h and for other is it eligible between 0-250 h). When the timer has elapsed it will close down the side until the error is reset.

7 Parts and equipment

This chapter describes the parts that are required to retrofit the system, e.g. meter, damper, and etc. Screws, couplings and other standard parts are not listed.

7.1 VR Meter with cable

The DWP VR meter measures the volume of gasoline vapours recovered by the vapour recovery system.

Figure 3 DWP VR meter with mounted cable

7.2 Damper WM018634

A damper is connected via tubes between the vapour recovery pump and the DWP VR meter to reduce fluctuations in flow from the pump.

Figure 4 Damper

7.3 On/off valve WM021576-0001 (WM021576-0002)

The valve that is used for the self check of the system.

WM021576-0001 has a cable length of 3 m and is used for Global Star and Global Century.

WM021576-0002 has a cable length of 5 m and is used for Global Ovation.

Figure 5 On/off valve

7.4 Strainer WM012100

The strainer that protects the second path from dirt and particles.

Figure 6 Strainer

7.5 ISB & Signal converter WM018523

The VR meter will be connected to the pump computer via a certified ISB (Intrinsic safe barrier) with a built in signal converter. This interface converts the signals from the DWP VR meter to TTL signals that iGEM is able to process.

Figure 7 ISB

7.6 iGEM WM001908-0005

The system is controlled by an iGEM board WM001908-0005.

NOTE!

Software version 10.01 or higher has to be used!

Figure 8 IGEM board

7.7 Support for meter

WM018665

Figure 9 Support

7.8 Support for dumper

Suction
WM021720
WM020967

Figure 10 Support for suction

Remote/Dispenser
WM022045
WM022047

Figure 11 Support for remote/dispenser

7.9 Tubes LHR

Suction	Suction
WM022272	WM022272
WM022274	WM022274
WM022276	WM022276
WM021796	WM021796
WM021792	WM021792
WM021798	WM021798
WM021809	WM021809
WM021787	WM021787
WM021801	WM021801
WM021813	WM022038
WM021815	WM019369 (2 pcs.)
WM022102	WM022102
WM019373	WM019373
WM019369	

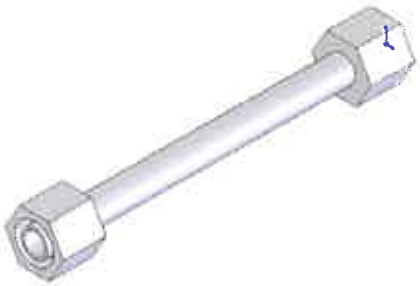


Figure 12 Tube WM022272

7.10 Tubes HH

Suction	Suction
WM022272	WM022272
WM022274	WM022274
WM022276	WM022276
WM021796	WM021796
WM021792	WM021792
WM021798	WM021798
WM021809	WM021809
WM021787	WM021787
WM021801	WM021801
WM021813	WM022038
WM021815	WM019369 (2 pcs.)
WM022102	WM022102
WM019373	WM019373
WM019369	

Figure 13 Tube WM021804

7.11 Bürkert kit

The kit consists of hand terminal, extension cable for serial port, meter and a hose with adapter to nozzle.

Figure 14 Bürkert kit

7.12 Calibration kit

To calibrate the DWP VR meter a calibration kit is required.

Figure 15 Calibration kit

8 Installation

8.1 Mechanical installation

8.1.1 Global Star suction phase IV - Suction

Disassemble the "Front panel side A and B", "Top panel hydraulic" and "Side panel barrier" to gain full access to the hydraulic side. Disassemble the "Nozzle column 1A", "Nozzle column 1B", and the "Cover plate tubes" to gain access to the blind column. Disassemble the "Top panel", if a LHR model to gain access to the roof. For disassemble instructions see "User manual" (Eng WM002295, DE WM002299). Disassemble all vapour tubes between the pump and the hose on both sides. Disassemble the Bürkert valves from their support and mark the valves which side they belong to. The Bürkert valve closest to the physical side A also belongs to side A.

WARNING!
To prevent damage which may result in electric shock or fire, disconnect the main power prior to any work.

LHR
Assemble tubes WM021796 and WM021798 with T-connection WM020460 for side A. Assemble tubes WM021792 and WM021798 with T-connection WM020460 for side B.

Figure 16 T-connection WM020460

HH
Assemble tubes WM021806 and WM021798 with T-connection WM020460 for side A. Assemble tubes WM021804 and WM021798 with T-connection WM020460 for side B.

NOTE!
If the first gasoline nozzle is not on the first position, use coupling WM022280 and connect tube WM022272, WM022274 or WM022276.

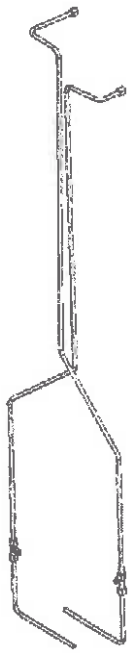


Figure 17

Assemble the respective package of tubes to its respective adapter. See drawing WM021849-0001 (LHR) and WM021849-0002 HH) in Appendix A and B, chapter 12 and 13.

Figure 18

Mount both VR meters on the support WM018664 as shown in Figure 19. Mount tube WM019373 on VR meter side A and tube WM021813 on VR meter side B. The lowest shelf of the support is for the meter to side B. Fasten the tubes in the meters with sprint WM012100.

NOTE!
Use a small amount of grease on the O-ring when mounting the tube with bump connection in the meter.

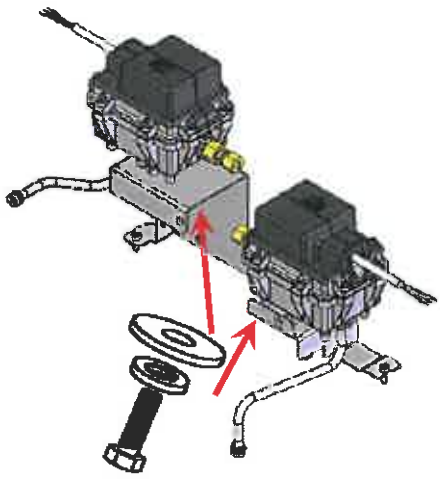


Figure 19 VR meters with tubes mounted onto support.

Mount the support with the VR meters as shown in Figure 20. Make sure tubes WM019365 (side A) and WM021813 (side B) points towards the gas pump. Fasten the support with two screws. Connect the tubes from the T-coupling (WM021798) to the VR-meters.

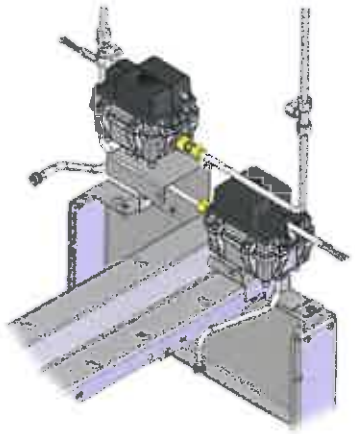


Figure 20 Support in place

With self check (option)

Assemble tube WM021801 in the T-coupling that is physically on side B on the pump (belongs to the meter for side A). Connect the solenoid valve WM021576-0001 and tube WM021787. Mount strainer WM021571 over the bump and press on it so it does not fall of.

NOTE!
Mark the cable from the solenoid valve with an "A".

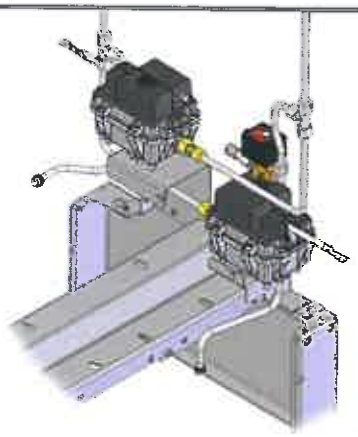


Figure 21

Assemble tube WM021809 in the T-coupling that is physically on side A on the pump (belongs to the meter for side B). Connect the solenoid valve WM021576-0001 and tube WM021787. Mount strainer WM021571 over the bump and press on it so it does not fall of.

NOTE!
Mark the cable from the solenoid valve with a "B".

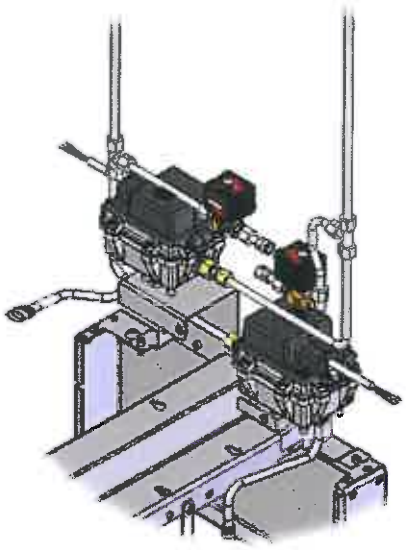


Figure 22

Without self check

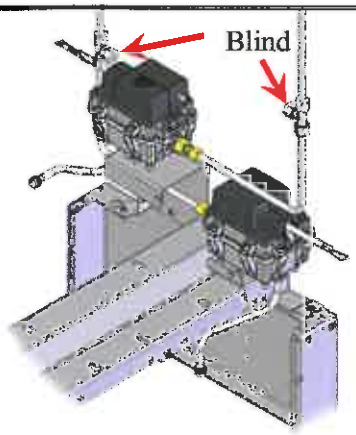
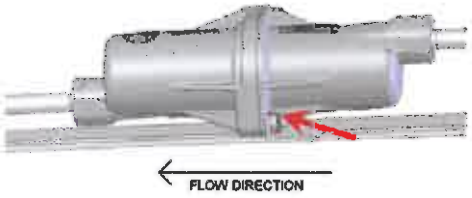


Figure 23 Blind the T-connectors

Mount the Bürkert valve with two M4 x 8 screws (marked with A during disassemble), tube WM019369 and the damper WM018634 on the shelf WM021720. Fasten the tubes in the damper with sprint WM012100. The damper is fastened by losing one of the screws on it and placing it in the position on the shelf and fastened it again. To be able to turn the head on the Bürkert valve, loosen the 17 mm nut on the top but DO NOT REMOVE IT COMPLETELY! When the head is in correct position fasten the nut again.



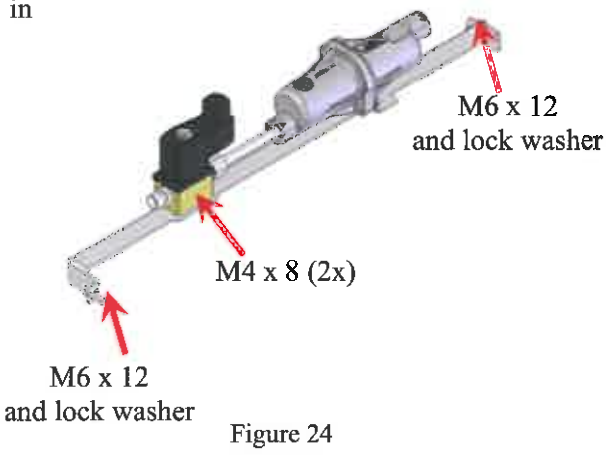


Figure 24

NOTE!
An arrow on Bürkert valve showing direction of vapour flow!

NOTE!
The lower end of the damper shall be pointed towards the Bürkert valve.

NOTE!
Use a small amount of grease on the O-ring when mounting the tube with bump connection in the damper.

Mount the tube in to the damper that is assembled on the meter. Fasten the shelf with assembled components in the blind column and in the vertical shelf, WM020593, to the junction box shelf with two M6 x 12 screws and lock washers.

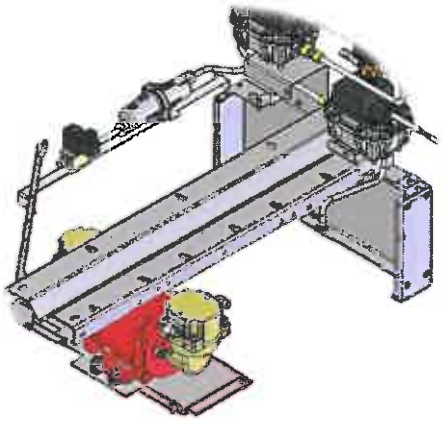


Figure 25

Assemble the flexible tube WM022102 between the Bürkert valve and the VR pump.

NOTE!
Observe the flow direction of the pump.

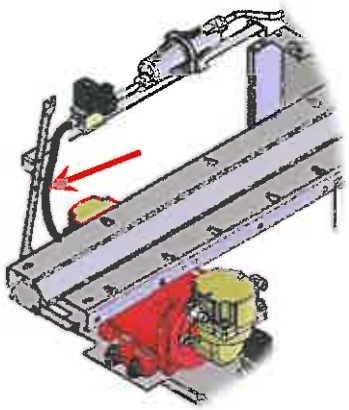


Figure 26

Mount the Bürkert valve with two M4 x 8 screws (marked with B during disassemble) on the shelf WM012778 (the shelf to the vapour pump).

NOTE!
An arrow on Bürkert valve showing direction of vapour flow!

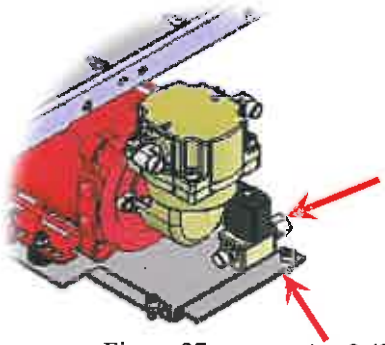


Figure 27 M4 x 8 (2x)

Fasten the damper WM018634 on the shelf WM020967 and the shelf to the frame work with one M8 x 14 screws. The damper is fastened by losing one of the screws on it and placing it in the position on the shelf and fastened it again.

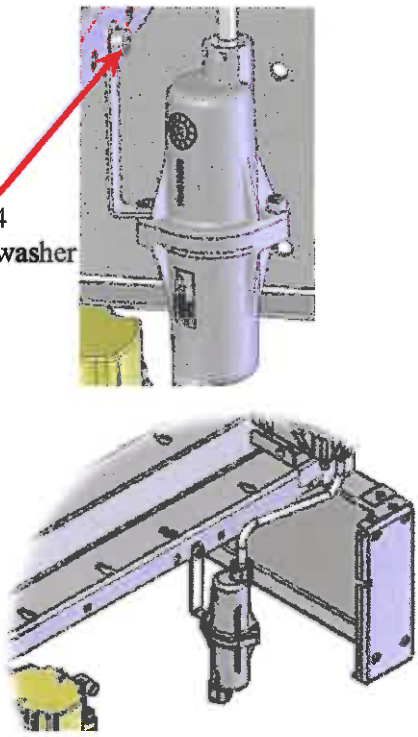


Figure 28

Connect the tube WM021813 between the meter that belongs to side B and the damper. Fasten the tube in the damper with sprint WM012100.

NOTE!
Use a small amount of grease on the O-ring when mounting the tube with bump connection in the damper.

Connect the tube WM021815 between the damper and the Bürkert valve. Fasten the tube in the damper with sprint WM012100.

NOTE!
Use a small amount of grease on the O-ring when mounting the tube with bump connection in the damper.

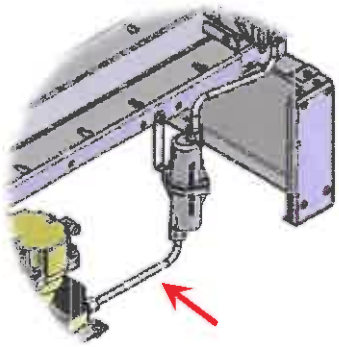


Figure 29

Assemble the flexible tube WM022102 between the Bürkert valve and the VR pump.

NOTE!
Observe the flow direction of the pump.

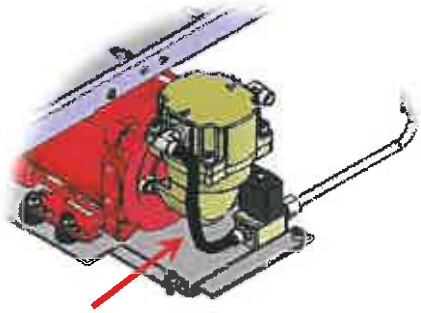


Figure 30

Mark the cables to which meter they belong and wire the cable up to electric head through the vapour barrier. Also wire the cables from the solenoid valves up to the electronic head through the vapour barrier. For instructions regarding vapour barrier see "User manual" (Eng WM002295, DE WM002299).

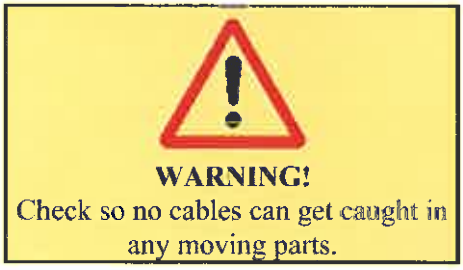
NOTE!
Always replace used vapour barriers.

Figure 31 Marked cables

The cables shall be marked with sticker WE000886 on each end of the cable to the meter.

Figure 32 Label WE000886

Make sure that the cables to the Bürkert valves are fastened in a safe manner with stripes. Check so no cables can get caught in any moving parts.



8.1.2 Global Star suction phase IV - Remote/Dispenser

Disassemble the "Front panel side A and B", "Top panel hydraulic" and "Side panel barrier" to gain full access to the hydraulic side. Disassemble the "Nozzle column 1A", "Nozzle column 1B", and the "Cover plate tubes" to gain access to the blind column. Disassemble the "Top panel", if a LHR model to gain access to the roof. For disassemble instructions see "User manual" (Eng WM002295, DE WM002299). Disassemble all vapour tubes between the pump and the hose on both sides. Disassemble the Bürkert valves from their support and mark the valves which side they belong to. The Bürkert valve closest to the physical side A also belongs to side A.

WARNING!
To prevent damage which may result in electric shock or fire, disconnect the main power prior to any work.

LHR
Assemble tubes WM021796 and WM021798 with T-connection WM020460 for side A. Assemble tubes WM021792 and WM021798 with T-connection WM020460 for side B.

Figure 33 T-connection WM020460

HH
Assemble tubes WM021806 and WM021798 with T-connection WM020460 for side A. Assemble tubes WM021804 and WM021798 with T-connection WM020460 for side B.

NOTE!
If the first gasoline nozzle is not on the first position, use coupling WM022280 and connect tube WM022272, WM022274 or WM022276.

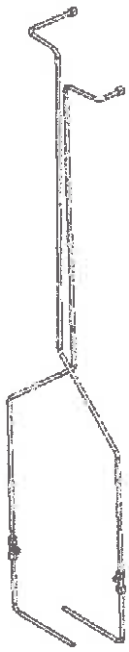


Figure 34

Assemble the respective package of tubes to its respective adapter. See drawing WM021849-0001 (LHR) and WM021849-0002 HH) in Appendix A and B, chapter 12 and 13.

Figure 35

Mount both VR meters on the support WM018664 as shown in Figure 19. Mount tube WM019373 on VR meter side A and tube WM022038 on VR meter side B. The lowest shelf of the support is for the meter to side B. Fasten the tubes in the meters with sprint WM012100.

NOTE!
Use a small amount of grease on the O-ring when mounting the tube with bump connection in the meter.

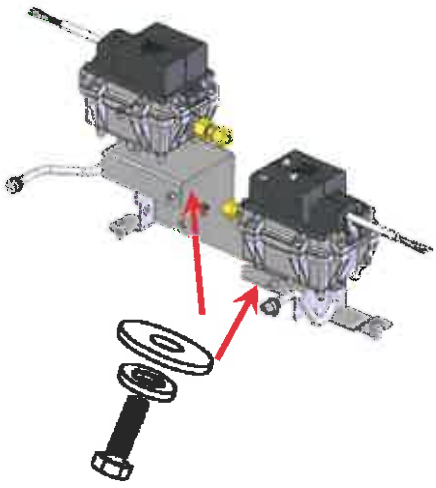


Figure 36 VR meters with tubes mounted onto support.

Mount the support with the VR meters as shown in Figure 20. Make sure tubes WM019365 (side A) and WM021813 (side B) points towards the gas pump. Fasten the support with two screws. Connect the tubes from the T-coupling (WM021798) to the VR-meters.

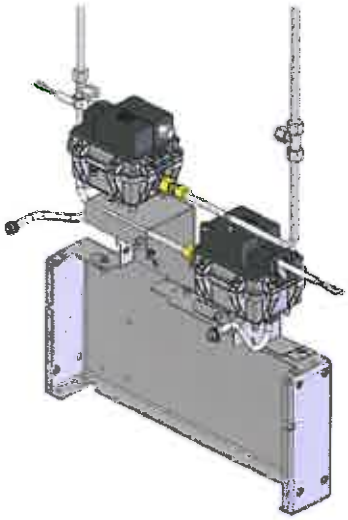


Figure 37 Support in place

With self check (option)

Assemble tube WM021801 in the T-coupling that is physically on side B on the pump (belongs to the meter for side A). Connect the solenoid valve WM021576-0001 and tube WM021787. Mount strainer WM021571 over the bump and press on it so it does not fall of.

NOTE!
Mark the cable from the solenoid valve with an "A".

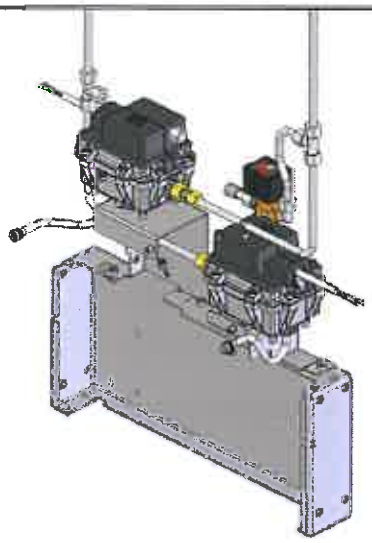


Figure 38

Assemble tube WM021809 in the T-coupling that is physically on side A on the pump (belongs to the meter for side B). Connect the solenoid valve WM021576-0001 and tube WM021787. Mount strainer WM021571 over the bump and press on it so it does not fall of.

NOTE!
Mark the cable from the solenoid valve with a "B".

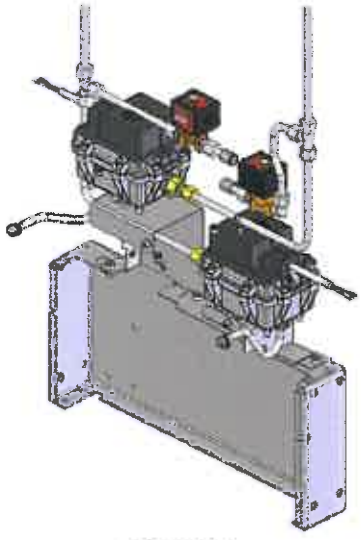


Figure 39

Without self check

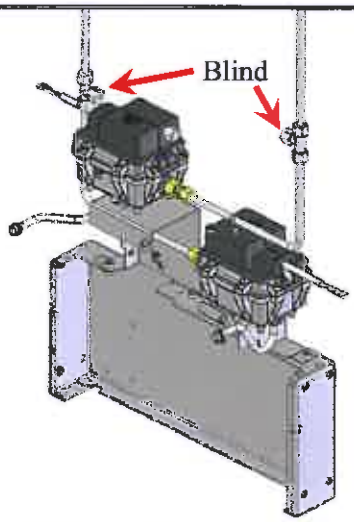
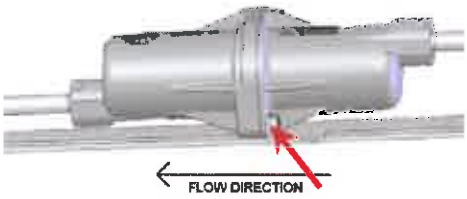


Figure 40 Blind the T-connectors

Mount the Bürkert valve with two M4 x 8 screws (marked with A during disassemble), tube WM019369 and the damper WM018634 on the shelf WM021720. Fasten the tubes in the damper with sprint WM012100. The damper is fastened by losing one of the screws on it and placing it in the position on the shelf and fastened it again. To be able to turn the head on the Bürkert valve, loosen the 17 mm nut on the top but DO NOT REMOVE IT COMPLETELY! When the head is in correct position fasten the nut again.



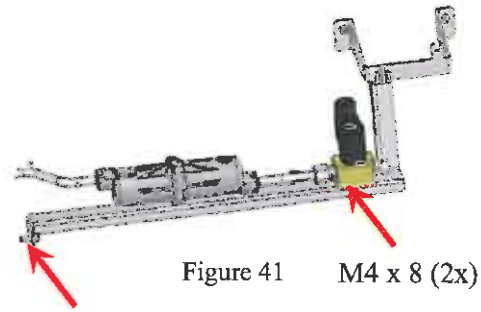


Figure 41 M4 x 8 (2x)

M6 x 12 (2x)
and lock washer (2x)

NOTE!
An arrow on Bürkert valve showing direction of vapour flow!

NOTE!
The lower end of the damper shall be pointed towards the Bürkert valve.

NOTE!
Use a small amount of grease on the O-ring when mounting the tube with bump connection in the damper.

Mount the tube in to the damper that is assembled on the meter. Fasten the shelf with assembled components in the blind column and in the vertical shelf, WM020593, to the junction box shelf with two M6 x 12 screws.

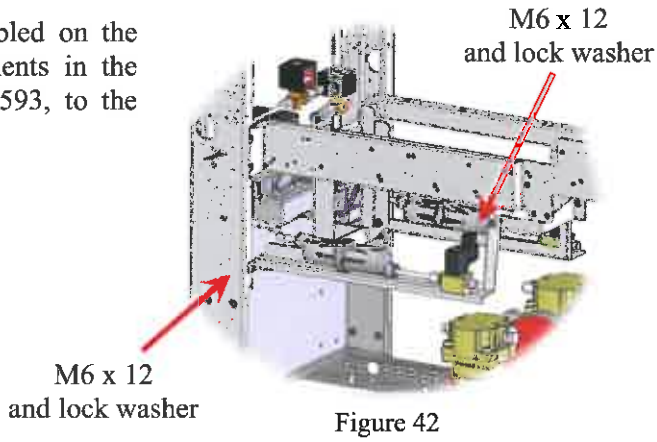


Figure 42

Assemble the flexible tube WM022102 between the Bürkert valve and the VR pump.

NOTE!
Observe the flow direction of the pump.

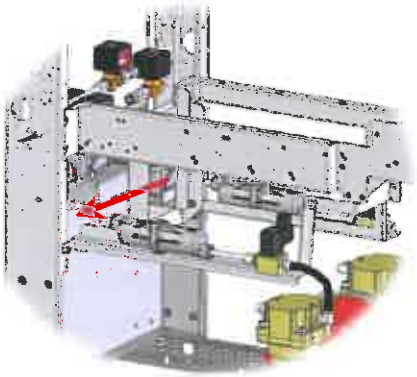


Figure 43

Mount the Bürkert valve with two M4 x 8 screws, and tube WM019369.

NOTE!
An arrow on Bürkert valve showing direction of vapour flow!

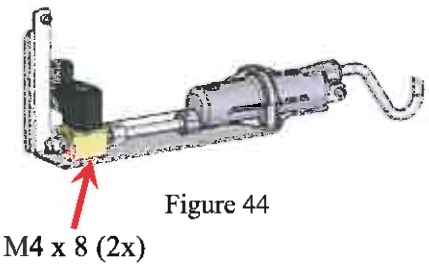


Figure 44

Connect the tube WM019369 between the damper and the Bürkert valve. Fasten the tube in the damper with sprint WM012100.

NOTE!
Use a small amount of grease on the O-ring when mounting the tube with bump connection in the damper.

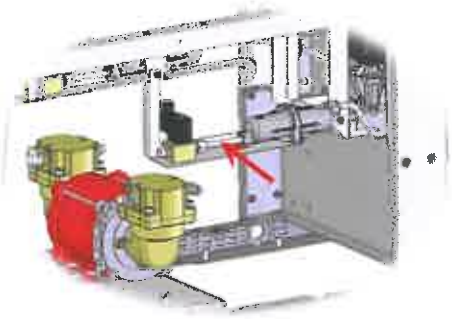


Figure 45

Fasten the damper WM018634 on the shelf WM020967 and the shelf to the frame work with one M6 x 12 screws. The damper is fastened by losing one of the screws on it and placing it in the position on the shelf and fastened it again.

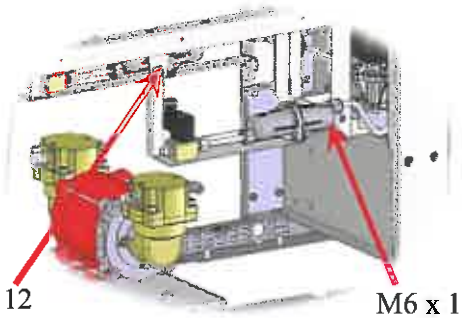
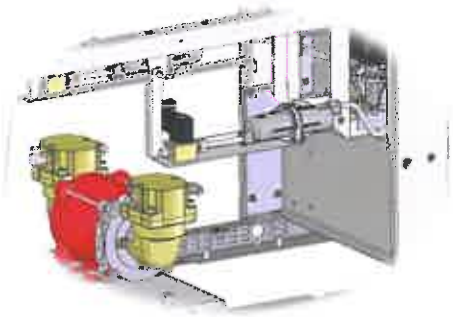


Figure 46

Connect the tube WM022038 between the meter that belongs to side B and the damper. Fasten the tube in the damper with sprint WM012100.

NOTE!
Use a small amount of grease on the O-ring when mounting the tube with bump connection in the damper.



Assemble the flexible tube WM022102 between the Bürkert valve and the VR pump.

NOTE!
Observe the flow direction of the pump.

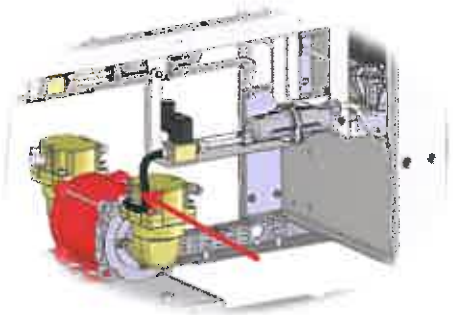


Figure 47

Mark the cables to which meter they belong and wire the cable up to electric head through the vapour barrier. Also wire the cables from the solenoid valves up to the electronic head through the vapour barrier. For instructions regarding vapour barrier see "User manual" (Eng WM002295, DE WM002299).

NOTE!
Always replace used vapour barriers.

Figure 48 Marked cables

The cables shall be marked with sticker WE000886 on each end of the cable to the meter

Figure 49 Label WE000886

Make sure that the cables to the Bürkert valves are fastened in a safe manner with stripes. Check so no cables can get caught in any moving parts.

8.2 Electrical installation

Remove the sheet metals that cover the cables.
Mount the cables from the meters in the clips marked with red arrows in Figure 50. Let the meter cables follow the other cables up to the electronic head.

Figure 50 Cable path

Place the ISB-interface (WM018523) as showed in the Figure 51. The ISB interface is pointed out with yellow arrow. Fix it with 2 M4 lock nuts and two locking washers.

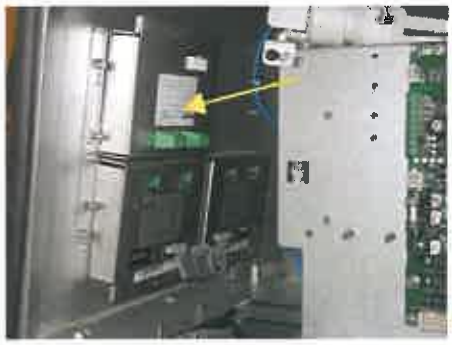


Figure 51 ISB-interface

Strip the outer cable jacket so the shield will be free for a space of 25 mm. Mount the cable clip as described in Figure 52. Fix it with a M4 lock nut.

Figure 52 Cable clip

Mount the connector WM002592 on each cable from the meters as described in Figure 53. Connect the cable from the A-side meter to the ISB-connector marked 1 and the cable from the B-side meter to the connector marked 2 on the ISB-interface.

Figure 53. Connection of Meter cable

Mount the multi cable WM018584-0001 between the CPU board and the ISB-interface. Connect the 10-pol mini-MNL connector to the ISB-interface as described in Figure 54. Connect the 4-pol mini-MNL connector to connector J12 on the CPU-board as showed in Figure 55. Connect the Red and Black single wires to the power connector J1 on the CPU-Board. See Figure 56. Place black wire there the blue arrow is pointing and red wire there the red arrow is pointing. Tie the multi cable to some anchor in the bottom of the electronic head.

Figure 54 Connector pos.

Ensure that the iGEM board is has item number WM001908-0005.

Figure 55 CPU-Board

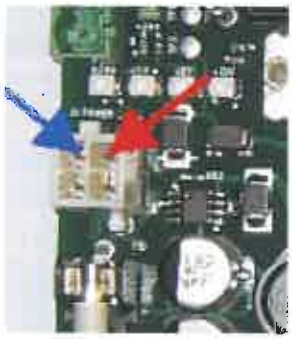


Figure 56 Power connector

If self check (option):

Connect the cables from the solenoid valves in a 4-pol mini-MNL connector, as described in picture X.

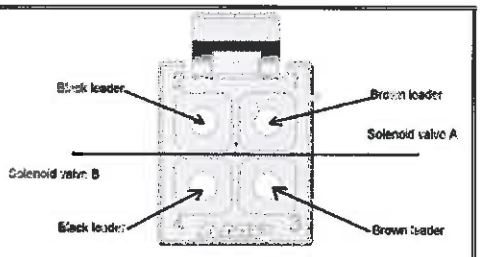


Figure 57

Connect the 4-pol mini-MNL connector in "Spare output 3&4" (J10) on the iGEM board.

However, if the pump also has other options requiring the use of spare outputs 3 & 4 such as e g nozzle out indication signal, then the VRM SC valve(s) are connected to spare outputs 1 & 2 instead.

Figure 58 Connect VRM SC valve(s) to the spare output 3 & 4

9 Operator Instructions

9.1 Activation of Vapour Gate VRM

The iGEM board needs to be WM001908-0005 that has a real time clock and have software version 10.01 or higher.

1.	Make sure that correct country code is selected	**F38**
2.	Set real Time Clock to current Time and Date	**F02**
3.	Enable Vapour Gate VRM	**F26.04 = 3**
4.	**With self check**	
	Enable Vapour Gate SC valve by setting spare outputs 3 (side A) and 4 (side B).	**F41.07 = 9** **F41.08 = 9**
	Normally the VRM SC valve(s) are controlled from iGEM spare outputs 3 & 4 (default HW configuration). However, if the pump also has other options requiring the use of spare outputs 3 & 4 such as e g nozzle out indication signal, then the VRM SC valve(s) are connected to spare outputs 1 & 2 instead.	*F41.05 = 9* *F41.06 = 9*
	NOTE! *From iGEM SW version 10.02 the Vapour Gate SC valve will be configured automatically to spare outputs 3 & 4.*	
	Without selft check	
	Disable self check	**F47.04 = 0** **F48.04 = 0**

9.2 Calibration of Vapour Gate VRM

9.2.1 General

- For optimum performance, each Vapour Gate VR meter operates with 10 individual calibration factors. Each of the flow rates 5, 10, 15, 20, 25, 30, 35, 40, 45 and 50 LPM has their own calibration factors.
- The calibration factors are store din F49 and are not cleared on cold start.
- If the iGEM CPU board is replaced, one of the following has to be done:
  - A. Perform calibration again.
    or
  - B. Read out the calibration factors from old board then re-enter them in F49 of the new board manually.

9.2.2 The Calibration Factor, F49

The calibration factors can be set between 100 and 700 representing the volume per pulse in tenths (1/10) of millilitres from the VR meter at the specific flow rate.
The calibration factors are stored according to below…

F49.00 =	**Side A** VR Meter calibration factor	@ 5 LPM
F49.01 =	"	@ 10 LPM
F49.02 =	"	@ 15 LPM
…		…
F49.09 =	"	@ 50 LPM

F49.10 =	Side B VR Meter calibration factor	@ 5 LPM
F49.11 =	"	@ 10 LPM
F49.12 =	"	@ 15 LPM
…		…
F49.19 =	"	@ 50 LPM

Each factor can be entered and adjusted manually but the quickest way to perform calibration is to perform the calibration automatically via function F49.09.

Below is example of typical calibration values.

5 LPM	*400*
10 LPM	*300*
15 LPM	*250*
20 LPM	*205*
25 LPM	*200*
30 LPM	*205*
35 LPM	*200*
40 LPM	*195*
45 LPM	*210*

9.2.3 Performing Calibration

The calibration is performed by iGEM itself using the diaphragm meter from the Bürkert VR calibration kit.
The calibration shall be performed according to the steps below…

1. Connect the calibration kit ground cable. See figure.

Figure 59 Connect the calibration kit ground cable.

2. Disconnect 10-pin connector of cable between Vapour Gate ISB and iGEM and instead connect it to the calibration kit cable marked "iGEM".

3. Connect the calibration kit cable marked "ISB" to the 10-pin connector of the Vapour Gate ISB.
4. Connect the diaphragm meter to Vapour Gate Calibration kit connector marked "REF".
5. Set the switch of the calibration kit box to the position of the side to be calibrated (A or B).

   NOTE! When switch is in position "BYPASS", the calibration equipment is bypassed and both meters are logically connected as in normal operating mode.

The calibration kit only suitable for use in unclassified (non-haxardous) location. (see the classification scheme for the pump)

6. Enter maintenance mode then remove a VR nozzle and connect the diaphragm meter via the nozzle adapter (same as used when calibrating Bürkert VR). Direct the nozzle pointing down forcing the VR valve of the Elaflex nozzle to open ("click" sound).

Figure 60 Position of the nozzle

7. Start the calibration by entering value "8" in F47.09 (side A meter) or F48.09 (side B meter).
8. The calibration will now start with a heating sequence of the motor during 1 minute.

   To skip heating (in case the VR components are already warm) press ENTER or NEXT on remote control.

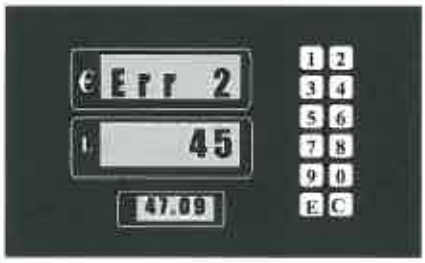
The calibration sequence can be interrupted at any time by pressing CLEAR on the remote control or by returning the nozzle

9. When heating is finished, calibration will start at target flow rate 45 LPM.

   The target flow rate is displayed in Volume display.

10. The procedure will then automatically continue with the next lower target flow rate (starting with 45 LPM then stepping down in 5 liter decrements down to 20 LPM.

If the system have problem calibrating the meter, Money display will indicate "Err" along with an error code…



- ***1 = no flow pulses detected from Vapour Gate meter (…disconnected?)***
- ***2 = no flow pulses detected from reference meter (…disconnected?)***
- ***5 = illegal Vapour Gate meter signal (…bad meter, bad connection or bad grounding of shield?)***
- ***6 = illegal Reference meter signal (…bad connection?)***
- ***7 = Could not reach target flow rate (…need to re-calibrate Burkert?)***

The Volume display will indicate "END" along with the current target flow rate for duration of 2 seconds.

11. If calibration was completed successfully, exit and save via F00=3 to store the calibration values in F49.

    If calibration was not completed, take proper actions and retry again.

9.3 Check of VR fillings, statistics

9.3.1 General

The pump distinguishes between **regular fuelling transaction** and **VR Monitoring (VRM) transaction**.

- A **fuelling transaction** starts on nozzle lift and stop on nozzle return (or filling termination).
- A **VRM transaction** starts when fuel flow has lasted 20 seconds @ ≥ 25 LPM. The VRM transaction does not end until there has been 60 seconds of zero flow (0 LPM).

The statistic logs of the Vapour Gate VRM transactions log a number of transactions (S31/32 log 20 latest and S33/34 log the 30 transactions around the time of timer starting).

For each VRM transaction there will be a log event. This means that a **VRM transaction** in the log can be based on 1 or more **fuelling transaction(s)**.

The data in the statistics are the following:

Data	Description	Page #
Status	*See next page*	1
Consecutive order #	In what consecutive order of erroneous fillings the concerned filling was.	1
A/L	Volume ratio between recovered vapour and delivered fuel	1
Nozzle #	Physical nozzle	1
Vapour volume, VRM	Vapour Volume of VRM transaction part	2
Fuel Volume, VRM	Fuel Volume of VRM transaction part	2
Vapour volume, compl.	Vapour Volume of the complete fuelling transaction	3
Fuel Volume, compl.	Fuel Volume of the complete fuelling transaction	3
Date	Date that the logged transaction ended	4
Time	Time that the logged transaction ended	4
Ref. A/L	A/L that possible self check compare against	5
A/L of self check	A/L result of the self check (0 if no self check was performed)	5

Status value:

Description	VRM Log Status Value *(bit #)*	iGEM UPD Indication
VRM OK.	0	Un-changed
A/L for a filling is out of limits, less then 85% or greater then 115%. Counts as an erroneous filling.	1 *(0)*	Can lead to "- " (Timer starting) in case of tenth consecutive filling.
Frequency error 1. Possibly bad sensor or incorrectly mounted sensor/wiring. System recovers automatically 20 seconds after error/symptom disappear.	1 *(0)* *(Possibly)*	Same as above
Frequency error 2. Possibly VR is blocked after vacuum pump (pressure side). Can also be bad sensor or incorrectly mounted sensor. Counts as an erroneous filling.	2 *(1)*	Same as above

Frequency error 3. Possibly bad sensor or incorrectly mounted sensor/wiring. System recovers automatically 20 seconds after error/symptom disappear.	No effect on status bit in vrm log.	UPD indicates "OFF2" immediately on occurrence.
Not used at the moment.	*4 (2)*	*Not used*
There have been **10 consecutive erroneous fillings** in row and the **timer** is **started.**	8 *(3)*	UPD indicates "- "
Frequency error 4. Has deactivated meter signal input to iGEM and is not counting pulses at the moment. System recovers automatically 5 minutes after error disappear after 1:st occurrence and 30 minutes after subsequent occurrences. Also reset after power cycle.	16 *(4)*	UPD indicates "OFF2" after filling ended.
Failure of self check. Counts as an erroneous filling. It also has a separate error counter per nozzle.	32 *(5)*	Can lead to "- " (Timer starting) in case of tenth consecutive filling.

Example: Status value = 0 OK VRM filling
Status value = 1 A/L out of limit (< 85% or >115%)
Status value = 9 A/L out of limit **and** timer is started.
Status value = 8 Timer started but current filling OK.

9.3.2 Layout of the Logs

Below is the format in which the data is displayed in logs S31- S34.

Layout of VRM history log	
	Page 1 Amount display: **Status**[1] (1) and consecutive error filling (2). Volume display: A/L (1.13) and nozzle (1) Unit price display: "P 1" altered with statistic and sub statistic ("30.xx").
	Page 2 Amount display: Vapor volume of monitoring part. Volume display: Fuel volume of monitoring part. Unit price display: "P 2" altered with statistic and sub statistic ("30.xx").
	Page 3 Amount display: Vapor volume of complete transaction. Volume display: Fuel volume of complete transaction. Unit price display: "P 3" altered with statistic and sub statistic ("30.xx").

	Page 4 Amount display: Date of filling (2007-04-06) Volume display: Time of filling (10:36) Unit price display: "P 4" altered with statistic and sub statistic ("30.xx").
	Page 5 Amount display: Reference A/L (102%) Volume display: A/L for self check (if done) (106%) Unit price display: "P 5" altered with statistic and sub statistic ("30.xx").

[1] *See description on previous side.*

9.3.3 20 latest VRM transactions, S31 & S32

S31 (side A) and S32 (side B) store the 20 latest VRM transactions in a circular buffer where the latest transaction is logged in position S31/32.00 and for each new VRM transaction the oldest one will be "pushed out" of the log.

Data is displayed according to previous section of this document.

9.3.4 30 VRM transactions around the time of timer started, S33 & S34

S33 (side A) and S34 (side B) store 30 VRM transactions. Data is presented in same format as for S31 (se previous page).

When timer has not started, the log is empty or contains old data (from previous time timer was started).

When the VRM timer has triggered to start, the 10 consecutive erroneous fillings that triggered the timer as well as the 10 preceding fillings are available in (xx.00 - xx.19). The log will keep updating with the 10 subsequent fillings then **freeze**.

.00 - .09 Fillings that did not trigger the timer (not 10 consecutive erroneous fillings).

.10 - .19 The 10 consecutive fillings where .20 was the 10:th that triggered the VRM timer to start.

.20 - .29 The 10 subsequent fillings following after the timer started (will be added as they occur).

NOTE! When the timer is triggered and xx.01 – xx.20 are updated, xx.21 – xx.30 may contain old data. Make sure to look at the date and time of each filling.

The log is frozen until timer is cleared and timer is triggered to start by 10 new consecutive erroneous fillings.

This log is useful to determine the characteristics of the system at the time period around which the 72 hour countdown was started.

Example: If the preceding fillings where close to the lower limit (some fillings out of limit but not 10 consecutive) and the fillings triggering the timer where close to the old values but slightly lower, this indicate a gradual decrease in performance that could be caused by e g a clogged nozzle or reduced performance of the vacuum pump.

9.3.5 iGEM Error Codes

These error codes are logged in S21 and S22 of iGEM. The error counters in S03 and S04 are incremented on occurrence of the specific error code.

Error codes:

37 Ten consecutive fillings out of limit. Timer started (UPD indicates "- ").

38 72 hour timer have elapsed. Pump is shut down (UPD indicates "OFF1").

39 Internal VRM system error (UPD indicates "OFF2").

40 Error cleared (F47.01 and/or 48.01). Also logged on each power-on.

For more information see the iGEM Maintenance Mode Manual

9.4 Functional check

After the system has been activated and/or calibrated a check of the system on both sides is necessary to determine the status.

9.4.1 Simulating flow

1. Connect the Bürkert meter to a vapor recovery nozzle on the first side.

Figure 61 Connect the Bürkert meter to nozzle

2. Enter maintenance mode ensure that the pump is configured as described in chapter 10 and set F26.08=2.

   Save and exit!

3. Enter function F34.03 (F34.04 for the B-side) and simulate the set point flow rates according to Table 1. Direct the nozzle pointing down forcing the VR valve of the Elaflex nozzle to open ("click" sound").

   Read the flow rate from the Bürkert hand terminal and the Vapour Gate flow rate from the money display and compare the results with Table 1. If any of the results does not comply with Table 1 one or both calibrations has to be redone.

   If other errors, please consult the troubleshooting chapter 11.

Figure 62 Position of the nozzle

Set point (lpm)	Allowable Bürkert flow (lpm)	Allowable Vapour gate flow (lpm)
25	25,9-28,6	Bürkert flow ± Bürkert flow*1,05 (e.g. Bürkert flow= 27,2 lpm => allowable Vapour gate flow between 25,8-28,6 lpm)
32	33-36,4	Bürkert flow ± Bürkert flow*1,05 (e.g. Bürkert flow= 35 lpm => allowable Vapour gate flow between 33,2-36,8 lpm)
38	39,3-43,5	Bürkert flow ± Bürkert flow*1,05 (e.g. Bürkert flow= 41,4 lpm => allowable Vapour gate flow between 39,4-43,4 lpm)

Table 1 Allowable flow rates for Bürkert meter and Vapour Gate

4. Repeat steps 1-3 for the other side.

5. Enter maintenance mode and set F26.08=0.
   Save and exit!

9.4.2 Filling

1. Perform a real filling in a verification vessel.

NOTE!
During the filling a flow rate of 25 lpm for at least 20 seconds must be obtained, otherwise it will not be considered as a VRM filling.

2. Wait at least 60 seconds after the filling has ended and the nozzle is returned.

3. Enter maintenance mode and check that A/L value in S31.00 (S32.00 for Side B), see chapter 9.3, is within range (0,85 ≥ A/L ≥ 1,15) and no error code, see chapter 9.3.

4. Repeat steps 1-3 for the other side.

9.5 TÜV Test

9.5.1 General

To verify that the Vapour Gate functionality is activated correct a special mode has been added that can be entered without having to enter regular maintenance mode with its passwords functions and sub-functions.

1. Press the CRC-button. This will make the pump susceptible to the remote control for 30 seconds
2. When the display has returned to normal indication, press button "4" on the remote control to enter the VRM simulation mode.

9.5.2 Simulation of 72h Timer running (ten consecutive fillings out of limit)

1. Press buttons "Up" or "Down" on the remote control to get to choose 72 hour timer activated. The amount display shows "72h" and the volume display "StArt", then press "Enter" to start the simulation. The Unit Price display shall indicate a dash "- ".

2. After 30 seconds, the simulation is ended and the display will return to its previous state.

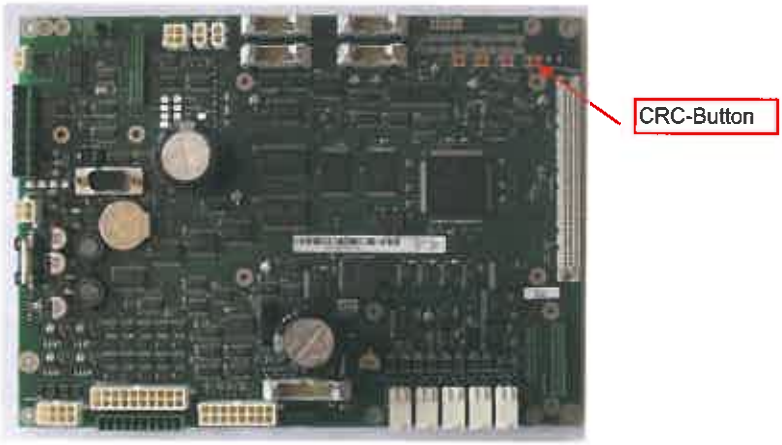


Figure 63. iGEM CPU board with CRC-button

10 Parameters in iGEM

10.1 VR and VRM Related Parameters

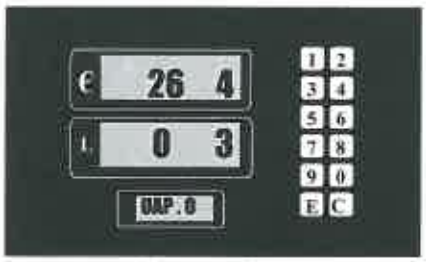
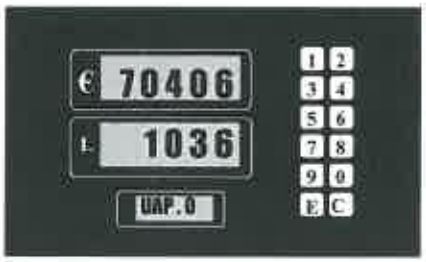
Bold indicates directly related to Vapour Gate VRM.

Parameter #	Value	Description
F26.00	1	Enable Bürkert VR without nozzle information
F26.01	0	Manual calibration disabled
F26.02	100	A/L K-factor 1 for manual calibration (not used since F26.01=0).
F26.03	100	A/L K-factor 2 for manual calibration (not used since F26.01=0).
F26.04	**3**	**Vapour recovery monitoring configuration** **0 = Disabled, 3 = Vapour Gate enabled**
F26.05	0	Dry test time (0 = disabled)
F26.06	**5**	**Vapour Gate meter flow rate calculation averaging time (1-5 seconds)**
F26.07	**72**	**Vapour Gate VRM time from 10 consecutive errors to shut down (hours)**
F26.08	**0**	**Vapour Gate Vapour, vapour data indication on sales display** **0 = Disabled** **1 = Recovered Vapour Gate vapour volume displayed in Money amount display** **2 = Momentary Vapour Gate vapour flow rate displayed in Volume amount display**
F41.07 & F41.08 *(alt. F41.05 & F41.06)*	**7**	**To activate the Vapour Gate self check, set to 7.** ***NOTE. Only required to be set manually in rev 10.01.***
F47.01 (A) **F48.01 (B)**	**0**	**VRM status for side.** **1 = Timer started** **3 = Timer elapsed**
F47.02 (A) **F48.02 (B)**	**100**	**Vapour Gate self check reference level.** ***(Adjusted automatically depending on wear of system)***
F47.04 (A) **F48.04 (B)**	**2**	**Mapping of which pair of spare outputs (1&2 or 3&4) to be used for Vapour Gate self check valve.** **Default = 2 Spare outputs 3 & 4 used for self check valves.** **= 1 Spare outputs 1 & 2 used for self check valves.** **= 0 Self check deactivated.** ***NOTE. Available from rev 10.02.***
F47.09 (A) **F48.09 (B)**	**0**	**Set to 8 to start auto-calibration of the Vapour Gate meter for side A.** **" side B**
F49.00-19	**-**	**Calibration factors for DWP VR meter, see chapter 9 in this document.**

10.2 Parameter Change Event Log (Audit Trail)

The iGEM will monitor the 10 last changes to VRM related parameters in an event log. The event log is accessed by:

1. Pressing CRC-button to enable remote control
2. Pressing CLEAR-button on remote control
3. Stepping to VRM related changes by pressing NEXT until UPD display "VAP"
4. Press ENTER-button.
5. UPD indicate VAP.0 and the latest change event is now displayed toggling between 2 pages according got below.
6. To step to next previous change, press NEXT-button.

Audit trail layout	
	Amount display: function and sub function Volume display: old value and new value Unit price display: "VAP." and log number
	Amount display: Date of change Volume display: Time of change Unit price display: "VAP." and log number

The information is presented in two pages that alternate with 1 second's interval.

The event log will be exit automatically if no buttons are pressed within 30 seconds.

11 Troubleshooting

For explanation of different status codes and guidance for reading the data, consult chapter 9.3 or iGEM operation manual.

Status		Error	Possible source		Check		Action if source of error
--- /OFF1 in UPD	**Status 1, 2, 3, 8, 9, 10, 11 (S31-34)**	Unrealistic high A/L in consecutive order	A-1	System	A-1-1	Simulate flow in F34.0X and check the system calibration with a Bürkert meter.	Recalibrate the system.
			A-2	Meter	A-2-1	Measure the resistance between black leader 1 and 2 on the cable from the meter to the ISB/interface in the electrical head. If the value is below 25 Ω the meter is probably broken.	1) Check A-2-2 2) Replace the meter
					A-2-2	Another possible source to ∞ Ω is bad connection between the sensor and the connector beneath the black plastic cover. Measure the resistance between the conductors beneath the plastic cover. If a value over 25 Ω between the conductors while it was zero between the black leaders in the electrical compartment the cause is bad connection or a broken cable.	Order a complete meter (WM019233) with cable
					A-2-3	A meter with resistance can generate high A/L values caused by a bad wired sensor together with vibrations. Simulate flow with F34.0X and display the "Vapour Gate" flow with F26.08=2. If correct flow at high set point flow rates and unrealistic high flow at low set point flow rates then the problem is probably caused by bad sensor in the meter.	Replace the meter
			A-3	Cable & Electronics	A-3	For correct functionality the system is dependant on correct grounding.	Check that all cables are connected properly.
			A-4	ISB/interface	A-4-1	Unlikely cause. If above possible errors has been excluded, this could be the cause.	Change the ISB/interface
			A-5	iGEM	A-5-1	Very unlikely cause. If all other possible errors have been excluded, this could be the cause.	Change the iGEM board

Table 2 Possible source of error when fillings with unrealistic high A/L values

Status		Error	Possible source		Check		Action if source of error
--- /OFF1 in UPD	**Status 1, 2, 3, 8, 9, 10, 11 (S31-34)**	A/L = 0	B-1	System	B-1-1	Check the flow rate with a Bürkert meter. If zero flow, check the following components by simulating flow rate in F34.0X: 1) Ensure pump flow by disassemble the tube before the pump. 2) Ensure flow before the Bürkert valve by disassemble the tube before the valve 3) Ensure flow rate before the nozzle/nozzles by disassemble the cutting ring connection at the nozzle adaptor	Change the dysfunctional component
			B-2	Meter	B-2-1	Measure the resistance between black leader 1 and 2 on the cable from the meter to the ISB/interface in the electrical head. If the value is below 25 Ω the meter is probably broken.	1) Check B-2-2 2) Replace the meter
					B-2-2	Another possible source to ∞Ω is bad connection between the sensor and the connector beneath the black plastic cover. Measure the resistance between the conductors beneath the plastic cover. If a value over 25 Ω between the conductors while it was zero between the black leaders in the electrical compartment the cause is bad connection or a broken cable.	Order a complete meter (WM019233) with cable
			B-3	Cable & Electronics	B-3-1	For correct functionality the system is dependant on correct grounding.	Check that all cables are connected properly.
			B-4	ISB/interface	B-4-1	Unlikely cause. If above possible errors has been excluded, this could be the cause.	Change the ISB/interface
			B-5	iGEM	B-5-1	Very unlikely cause. If all other possible errors have been excluded, this could be the cause.	Change the iGEM board.
	Status 32, 34, 40, 42 (S31-34)	Nozzle jammed/obstacle in suction path.	C-1	System	C-1-1	The error is nozzle dependent, check if it is only on one nozzle or on all. If on only on one vapour recovery nozzle (if multiple vapour recovery nozzles) it is likely caused by C-1-2. If on all nozzles (including if only one vapour recovery nozzle) it could be caused by low average A/L.	Recalibrate the system.
					C-1-2	Jammed nozzle or other obstacle in suction path. NOTE! This error is nozzle depend.	Change the nozzle or find the obstacle.

Table 3 Possible source of error when fillings whit A/L=0 or fillings with error code 32, 34, 40, and 42

Status		Error	Possible source		Check		Action if source of error
OFF2 in UPD (Self terminating error)	**Error 39.01.00 in S21-22**	High frequency detected	D-1	Meter	D-1-1	Measure the resistance between black leader 1 and 2 on the cable from the meter to the ISB/interface in the electrical head. If the value is below 25 Ω the meter is probably broken.	1) Check B-2-2 2) Replace the meter
					D-1-2	Another possible source to ∞ Ω is bad connection between the sensor and the connector beneath the black plastic cover. Measure the resistance between the conductors beneath the plastic cover, if a value over 25 Ω then it is a broken meter. See D-2-1, action	Replace the meter
			D-2	Cable & Electronics	D-2-1	For correct functionality the system is dependant on correct grounding.	Check that all cables are connected properly.
			D-3	ISB/interface	D-3-1	Unlikely cause. If above possible errors has been excluded, this could be the cause.	Change the ISB/interface
			D-4	iGEM	D-4-1	Very unlikely cause. If all other possible errors have been excluded, this could be the cause.	Change the iGEM board
	Error 39.02.00 in S21-22	Ghost pulses (Flow during no filling)	E-1	Meter	E-1-1	Measure the resistance between black leader 1 and 2 on the cable from the meter to the ISB/interface in the electrical head. If the value is below 25 Ω the meter is probably broken.	1) Check B-2-2 2) Replace the meter
					E-1-2	Another possible source to ∞ Ω is bad connection between the sensor and the connector beneath the black plastic cover. Measure the resistance between the conductors beneath the plastic cover. If a value over 25 Ω between the conductors while it was zero between the black leaders in the electrical compartment the cause is bad connection or a broken cable.	Order a complete meter (WM019233) with cable
			E-3	Cable & Electronics	E-3-1	For correct functionality the system is dependant on correct grounding.	Check that all cables are connected properly.
			E-4	ISB/interface	E-4-1	Unlikely cause. If above possible errors has been excluded, this could be the cause.	Change the ISB/interface
			E-4	iGEM	E-4-1	Very unlikely cause. If all other possible errors have been excluded, this could be the cause.	Change the iGEM board

Table 4 Possible source of errors when OFF2 is shown in UPD.

12 Appendix A

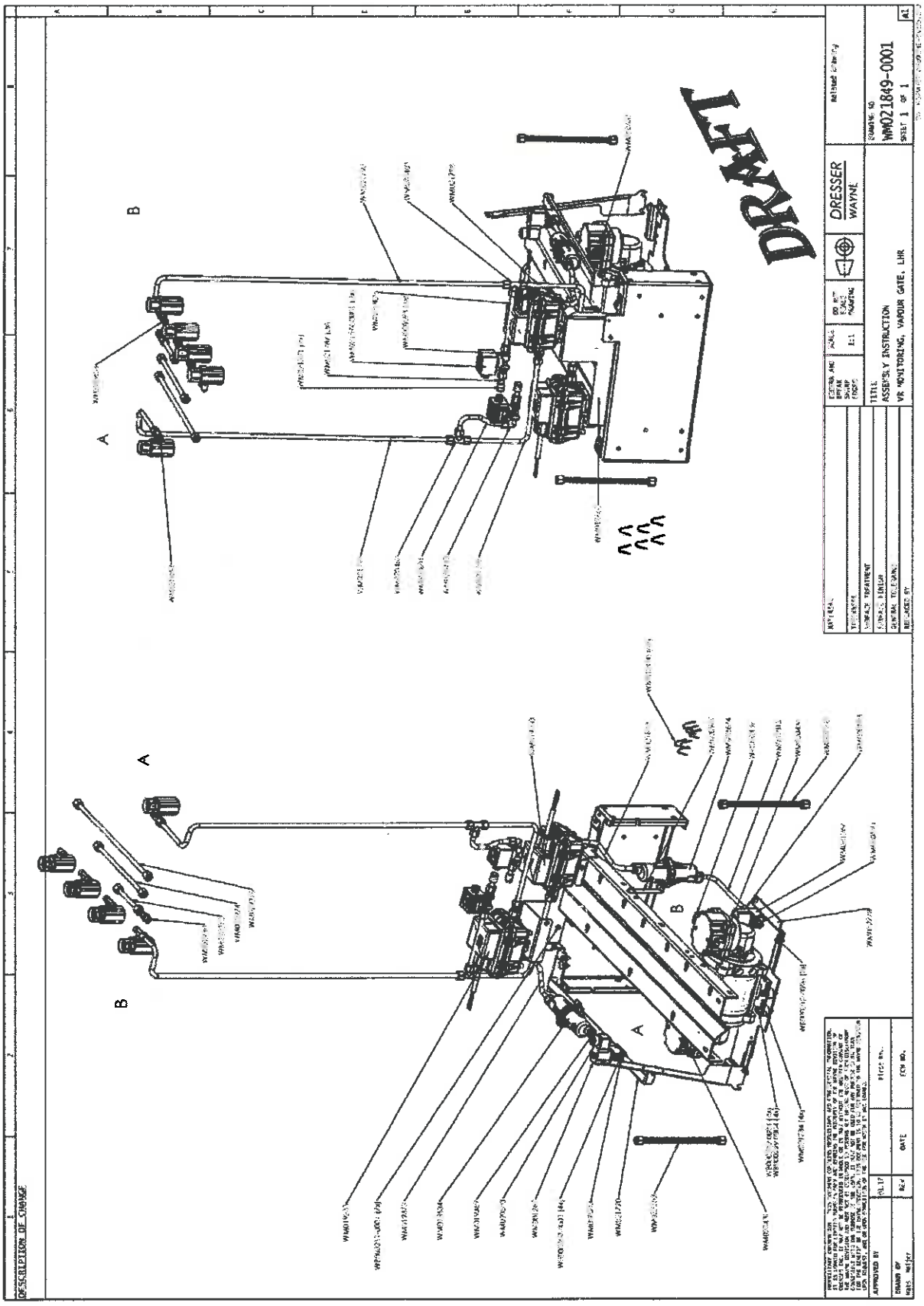


Figure 64 WM021849-0001

13 Appendix B

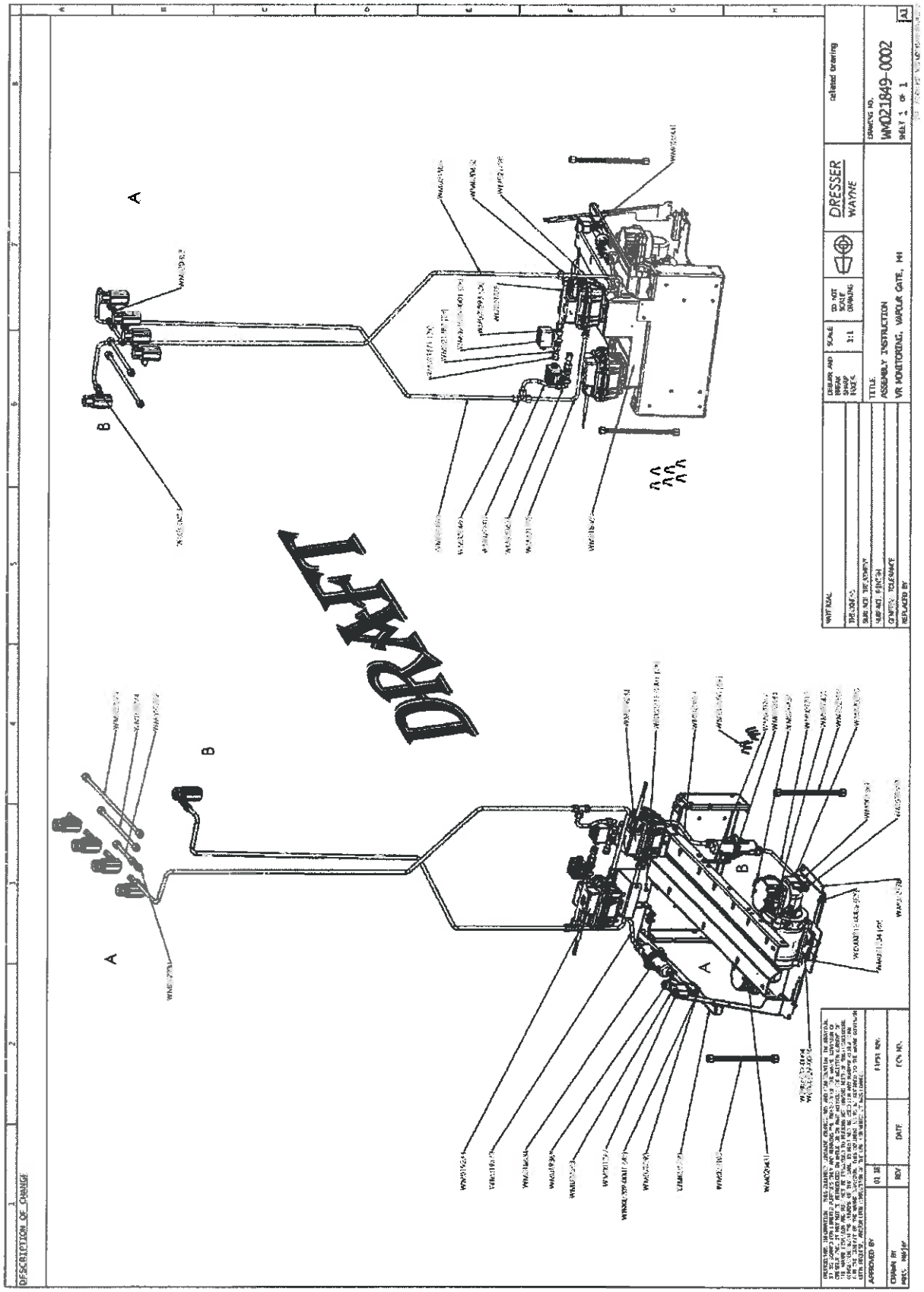


Figure 65 WM021849-0002

14 Appendix C

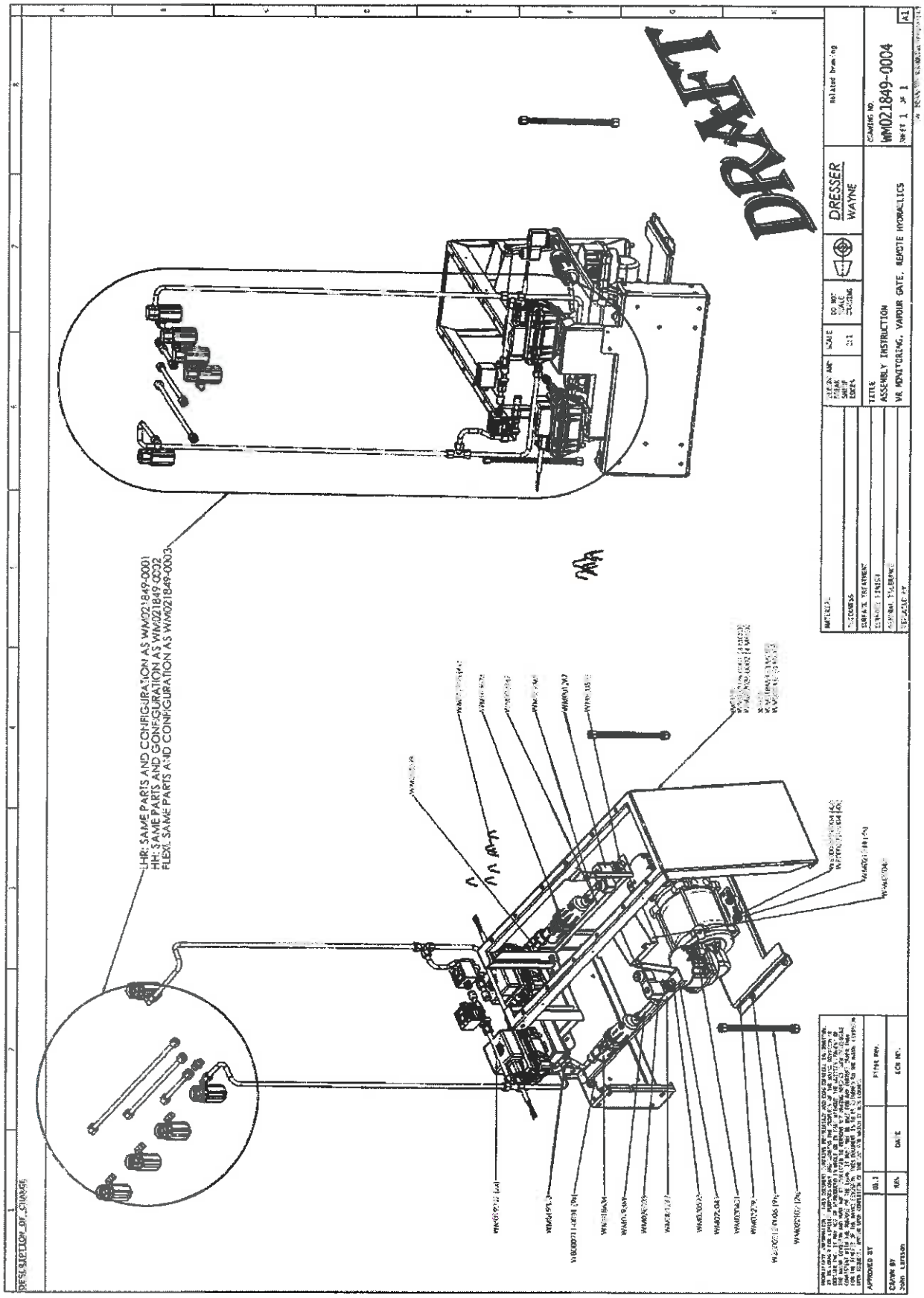


Figure 66 WM021849-0004

15 Notes

16 Market & Service

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Более, чем столетний опыт работы

Wayne Dresser develops, manufactures and markets complete operative systems for fuel handling at service stations. Everything from development and design to efficient production and assembly of components is pursued under one roof.

Wayne Dresser entwickelt, produziert und vermarktet komplette funktionierende Systeme für die Abgabe von Kraftstoffen an Tankstellen.. Von der Entwicklung über das Design bis zur Herstellung und Installation liefern wir alles aus einer Hand.

Wayne Dresser utvecklar, tillverkar och marknadsför kompletta operativa system för drivmedelshantering på servicestationer. Under ett och samma tak ryms allt från utveckling och konstruktion till rationell tillverkning och sammansättning av komponenter.

Wayne Dresser разрабатывает, производит и продает совершенные оперативные системы для торговли топлива на станциях обслуживания. Все начиная от разработок и конструкции до эффективного производства и сборки компонентов происходит в пределах одного предприятия.

The operations of Wayne Dresser comprise four interacting parts:

- Equipment such as petrol pumps, payment terminals, point-of-sale terminals and service station operative systems.
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Die Niederlassungen von Wayne Dresser umfassen vier ineinander greifende Bereiche:

- Ausrüstungen wie Zapfsäulen, Zahlterminals, Kassenterminals und Tankstellensysteme
- Software für Registrierung und Kommunikation auf der Tankstelle u. zwischen Station und Mineralölfirma sowie Banken und Kreditinstituten.
- Projektgestaltung mit umfassender Verantwortlichkeit dem Kunden gegenüber.
- Service, technische Unterstützung und Lieferung von Ersatzteilen.

Verksamheten omfattar fyra samverkande delar:

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- Programvara för registrering och kommunikation internt på stationen samt mellan stationen och oljebolaget, banker och kreditinstitut.
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- Оборудование, например, топливораздаточные колонки, платежные терминалы, терминалы точек продажи и системы управления АЗС.
- Программное обеспечение для регистрации и для внутренней связи на АЗС, а также между АЗС и нефтяной компанией, банками и институциями кредитов.
- Проектирование с полной ответственностью к клиенту.
- Обслуживание на местах, техническая поддержка и поставка запасных частей.

Wayne Dresser makes it easier for the motorist to fill up and make his motoring purchases, while effectively meeting the needs of the service station owner for operating supervision and for conforming to the demands of the authorities on measuring accuracy, minimising pollution and ensuring safety.

Wayne Dresser erleichtert dem Fahrer die Betankung und damit verbundene Einkäufe, unterstützt gleichzeitig den Stationär bei der übersichtlichen Führung seines Betriebes unter Berücksichtigung der behördlichen Vorschriften hinsichtlich Messgenauigkeit, Umwelt- und Sicherheitsauflagen.

Wayne Dresser gör det lättare för bilisten att tanka och handla. Samtidigt tillgodoses stationsägarens krav på en effektiv driftskontroll och myndighetskraven på mätnoggrannhet, miljövänlighet och driftssäkerhet.

Wayne Dresser упрощает процесс заправки и приобретения покупок при эффективном согласовании потребностей владельца АЗС для оперативного управления и для соблюдения требований государственных и метрологических служб, а также уменьшения загрязнения окружающей среды и обеспечения безопасности.

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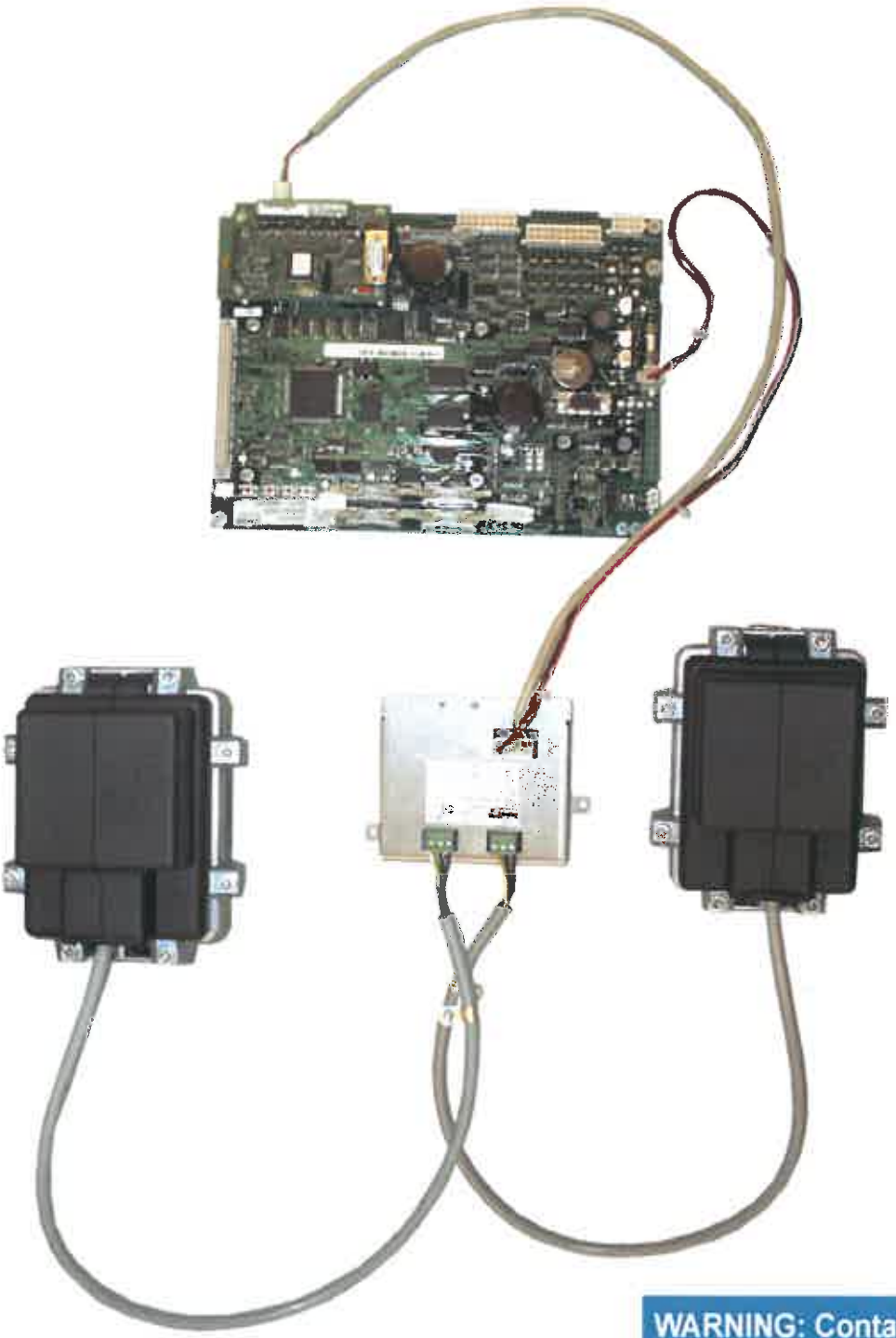
DRESSER Wayne

Wayne VR monitoring
operation and installation



WARNING: Contains intrinsically safe equipment

461459
2008-10-13 V1.1 ZT

Product Liability

The supplier's product liability is only valid if no alterations, additions etc. have been made to the equipment without the supplier's express permission.
Use only genuine parts.

Produkthaftung

Damit die Produkthaftung des Lieferanten ihre Gültigkeit behält, dürfen ohne ausdrückliche Genehmigung des Lieferanten keine Änderungen, Ergänzungen o. Ä. an der Ausrüstung vorgenommen werden.
Verwenden Sie nur Originalteile.

Produktansvar

För att en leverantörs produktansvar skall gälla får ändringar, kompletteringar och liknande ej göras i utrustningen utan leverantörens godkännande.
Originalreservdelar skall alltid användas.

Ответственность поставщика

Для сохранения ответственности нельзя вводить в оборудование изменения, дополнения и т.п. без разрешения поставщика.
Пользуйтесь только оригинальными запасными частями, выпущенным изготовителем бензоколонки.

Caution

To prevent damage that might result in electric shock or fire, disconnect the main power prior to any work.

Vorsicht

Um Beschädigungen zu vermeiden, die zu einem elektrischen Schlag oder Feuer führen können, unterbrechen Sie vor jeder Arbeit die Stromzufuhr.

Varning

Gör pumpen/enheten strömlös innan Du gör ingrepp i den. I annat fall föreligger risk för skada.

Осторожно

Во избежание поражения электрическим током или пожара отключайте напряжение питания перед началом любых работ.

Warning

Never run a leaking pump! Be careful with the environment and mind the skidding risk; take care of leaking fuel immediately.

Warnung

Lassen Sie nie eine undichte Zapfsäule laufen! Seien Sie umweltbewusst und denken Sie an die Rutschgefahr; beseitigen Sie austretenden Kraftstoff umgehend.

Varning

Använd aldrig en läckande pump.
Tänk på miljön och halkrisken, sanera utläckt drivmedel snarast.

Предупреждение

Не пользуйтесь колонкой при наличии утечки топлива! Охраняйте окружающую среду, помните об опасности скольжения: в случае утечки топлива на дорожное покрытие возле колонки, примите меры немедленно.

1 To the owner

This instruction manual is your reference book for assembling and maintenance the Wayne VR-meter. Dresser Wayne AB recommends you to study this manual and the User's Manual for the pump carefully and make sure that the manuals is available for people who are using, maintaining and installing the system.

It is important that you:

- Keep this instruction manual and other applicable documents as long as the equipment is in operation.
- Send it on to other owners or users of the equipment.

Dresser Wayne AB is not responsible for any machine damage caused by the owner's failure to follow the instructions of this document.

This instruction manual describes the authorised methods/ways to use the equipment. Dresser Wayne AB is not responsible for bodily injury and material damage if the instructions are not followed.

1.1 First of all, read through the manual

Before you start to unpack, install or use the unit, please read applicable parts of the manual. Consider all dangers, warnings, cautions and notes mentioned in the manual. Serious bodily injury and material damage may occur if you neglect this information.

Figure 1 VR meter

2 Contents

3 Figure

4 Definitions and Abbreviations

VR – Vapour Recovery

VRM – Vapour Recovery Monitoring

iGEM – Global Electronic Module, current generation of Wayne pump electronics.

ISB – Intrinsic Safe Barrier

5 General Description

5.1 Background

Due to stricter environmental regulations a system for monitoring the vapour recovery stage II is needed in fuel dispensers in some countries. A part of this system is a meter that can measure gasoline vapours.

5.2 Product Function

The technical principle of the VR meter is fluidic oscillation. The meter measures the volume of vapours that is sucked by the vapour recovery system. The meter is a part of a VR monitoring system to detect if the VR system efficiency rate is outside the regulatory limits.

5.3 VRM system overview

The VR meter is part of a VR monitoring system where the meter is connected mechanically on the suction side of a vapour recovery pump and electrically to iGEM via an ISB.

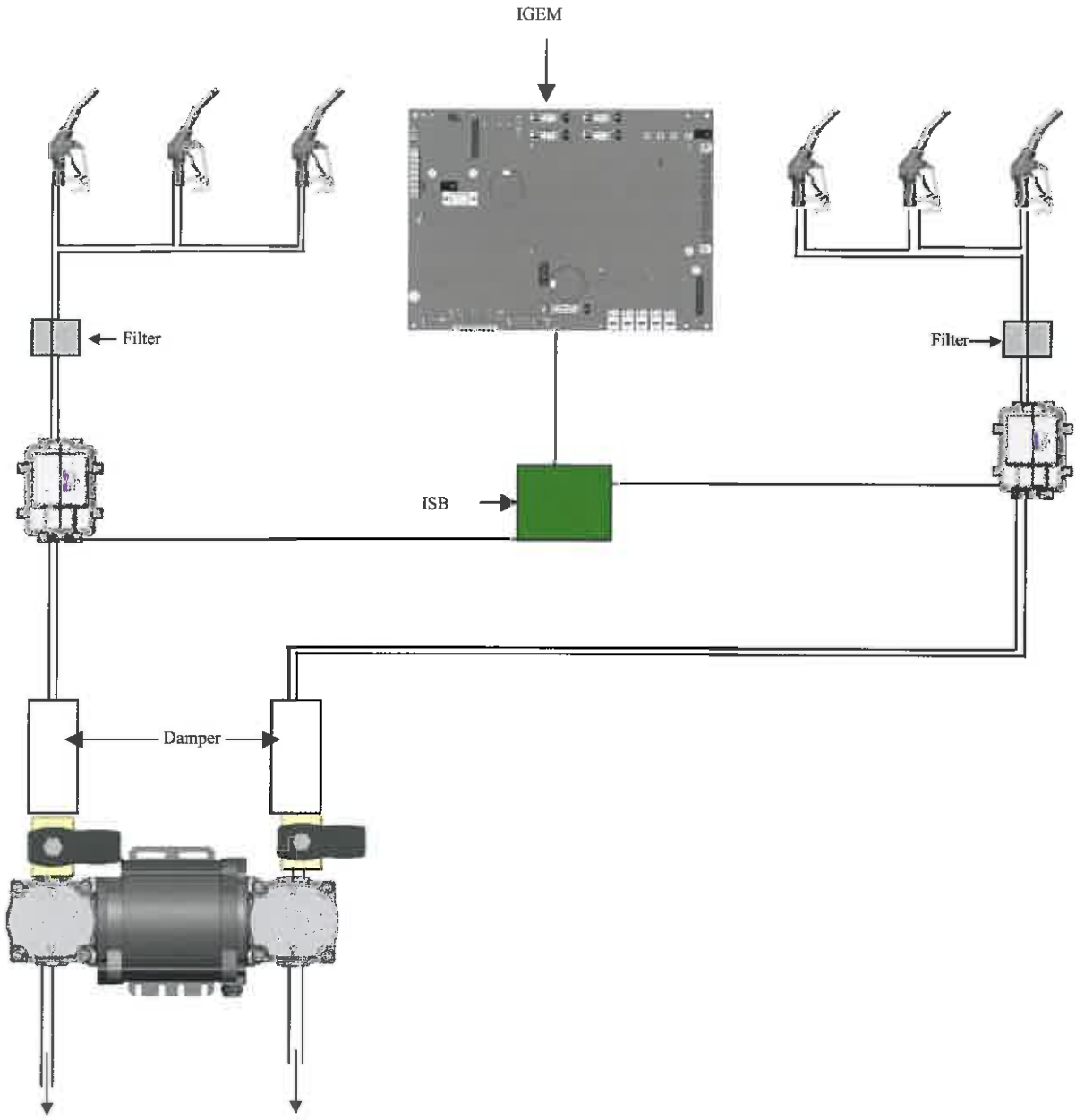


Figure 2 VRM system overview

6 Instructions specific to hazardous area installations

(reference European ATEX Directive 94/9/EC, Annex II, 1.0.6.)

The following instructions apply to the Dresser Wayne AB DWP VR Meter covered by certificate number Sira 06ATEX2266X.

1. The equipment may be used with gases and vapours associated with Group IIB and IIA with temperature classes T1, T2 and T3, in category 1, 2 and 3 locations.
2. The equipment is only certified for use in ambient temperatures in the range -40°C to +70°C and should not be used outside this range.
3. Installation shall be carried out in accordance with the applicable code of practice by suitably-trained personnel in accordance with the System Manual provided.
4. Repair of this equipment shall be carried out in accordance with the applicable code of practice.
5. The certificate number has an 'X' suffix which indicates that special conditions of installation and use apply. See certificate on next page.
6. If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.
   Aggressive substances - e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.
   Suitable precautions - e.g. regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals.
7. There are no special checking or maintenance conditions other than a periodic check
8. Translations into other languages are available on request.

6.1 Approvals

The VR meter fulfils:

- European ATEX directive 94/9/EC
- EMC directive 89/336/EEC

DRESSER Wayne

sira CERTIFICATION

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: Sira 06ATEX2266X

4 Equipment: DWP VR Meter

5 Applicant: Dresser Wayne AB

6 Address: Limhamnsvägen 109
200 61 Malmö
Sweden

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number R52A15320A.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014: 1997
EN 50020: 2002
EN 50284: 1999
EN 13617-1:2004

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

Ex II 1 G
EEx ia IIB T3 (Ta = -40°C to + 70°C)
EN 13617-1

Project Number 52A15320
Date 6 November 2006
C. Index 09

This certificate and its schedules may only be reproduced in its entirety and without change.

C Ellaby
Certification Officer

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England

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Web: www.siracertification.com

Form 9176 Issue 12

sira CERTIFICATION

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE Sira 06ATEX2266X

13 **DESCRIPTION OF EQUIPMENT**

The DWP VR Meter is intended to monitor the flow of recovered petrol/air vapour and comprises an aluminium alloy enclosure with inlet and outlet pipes. The vapour is ducted within the enclosure such as to be indirectly monitored by a sensor mounted in the enclosure cover. This sensor consists of a cylindrical case through which passes two conductors that are potted into place; the sensing element is formed by a platinum wire soldered across the conductors. Connection to the sensor is made by a special, push-on, connector block, which also has screw terminals. The equipment is fitted with an integral lead connected to the terminal connector. A push-on plastic lid protects the terminals.

The DWP VR Meter has the following entity parameters:

Ui = 9.1 V
Ii = 104 mA
Pi = 0.24 W
Ci = 10 nF
Li = 10 µH

14 **DESCRIPTIVE DOCUMENTS**

14.1

Drawing No.	Sheet	Rev.	Date (Sira stamp)	Description
WM010817	1 of 1	01	13 Oct 06	Sensor
WM010839	1 to 3	01	13 Oct 06	Housing, Raw Casting, Lower Part
WM010942	1 of 1	01	13 Oct 06	Washer, Waved ID=17 OD=22,5 T=0, 7 H=3,9
WM010952	1 of 1	01	13 Oct 06	Vapour Meter
WM012763	1 of 1	01	13 Oct 06	Identification Label DWP VR Meter
WM017161	1 of 1	01	13 Oct 06	Approval Drawing VR Meter Electrical Connection
WM009077	1 of 1	01	13 Oct 06	Housing Machined, Upper Part
WM009079	1 of 1	01	13 Oct 06	Housing, Machined, Lower Part
WM010479	1 of 1	01	13 Oct 06	Sensor, Sensor Body
WM010757	1 of 1	01	13 Oct 06	Cover, Moulded, Lower Part
WM010759	1 of 1	01	13 Oct 06	Cover, Moulded, Upper Part
WM010765	1 to 3	01	13 Oct 06	Housing, Meter Housing
WM010811	1 of 1	01	13 Oct 06	Cover, Moulded
WM010835	1 to 3	01	13 Oct 06	Housing, Raw Casting, Upper Part

14.2 Report number R52A15320A

Date 6 November 2006

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sira CERTIFICATION

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE Sira 06ATEX2266X

15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)

15.1 Parts of the outer enclosure are non-conducting and may generate an ignition-capable level of electrostatic charge under certain extreme conditions. The user should ensure that the equipment is not installed or used in a location where it may be subjected to external conditions (such as high-pressure steam), which might cause a build-up of electrostatic charge on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.

15.2 As aluminium is used at the accessible surface of this equipment, in the event of rare incidents, ignition sources due to impact and friction sparks could occur. This shall be considered when the DWP VR Meter is being installed in locations that specifically require group II, category 1G equipment.

15.3 The equipment shall only be used when fitted into a vapour recovery system complying with clause 5.3.5 of EN 13617-1: 2004.

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in report number R52A15320A.

17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

Date 6 November 2006

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7 Parts

7.1 VR Meter

The VR meter measures the volume of gasoline vapours sucked by the vapour recovery system.

7.2 Tubes

All mechanical components are connected by 10 mm tubes with cutting ring connections or with Wayne double bump connections.

7.3 Damper

A damper is connected via tubes between the vapour recovery pump and the VR meter to reduce fluctuations in flow from the pump.

7.4 ISB

The VR meter will be connected to the pump computer via an certified ISB (Instrinsic safe barrier) with suitable entity parameters corresponding to the VR meter entity parameters. (see pictures in section 8.2).

7.5 Cable

The VR meter is delivered with a 2,5 meter cable (HD 21.13 S1) connected.

8 Installation

8.1 Mechanical

Place the meter on its location. Tighten, with a torque of approximately 5 Nm, the two MC6S screws with a 6 mm hexagonal key. Make sure that the meter sits tight on its shelf.

Figure 3 Assembling of meter to support metal.

8.1.1 Cutting ring connections

The meter is delivered as shown in Figure 4 with assembled cable and Ø10 mm cutting ring connections.

Figure 4 Status of delivered meter with cutting ring connections

Mount the pipes in the couplings. Tighten the nuts on the couplings with a torque of approximately 23 Nm, with a 19 mm wrench key. Hold the couplings with a 17 mm wrench key while the nuts are tightened.

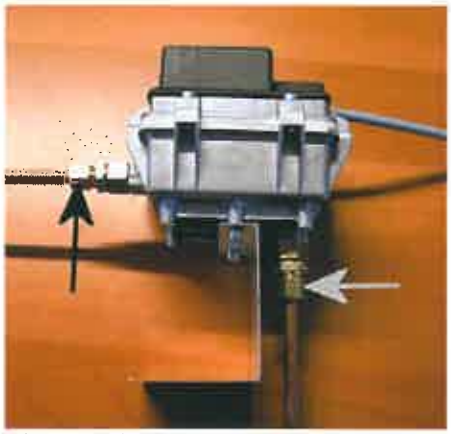

Figure 5 Pipes are connected via cutting ring connections to the meter.

8.1.2 Wayne doubel bump connection

The VR meter is connected to 10 mm tubes via Wayne double bump connections. Before connecting the meter to the tubes check that the o-ring of the double bump connection is intact. The meter is delivered as shown in Figure 6 with assembled cable.

Figure 6 Status of delivered meter with Wayne double bump connection

Check the o-ring on the pipes. If there is any kind of damage they must be exchanged.

Figure 7 O-ring on pipe

Mount the pipes into the bump connections. Make sure that the o-rings are not damaged during this operation.

Figure 8 The pipe is assembled into the outlet of the meter

Mount the pins into the bump connections. Make sure that the pins are new and that the pins are pressed all the way through the bump connection.

Figure 9 The pin shall be mounted into the bump connection on the outlet of the meter

Figure 10 The pin shall be pressed all the way through the bump connection

8.2 Electrical connections

Cable connection at the VR meter

Before installing the VR meter, remove the plastic cover on the VR meter and verify that the cable is connected as in picture to the right.

Make sure that the Protective Earth (yellow/green) is connected to the meter chassis firmly ***(a)***. Also make sure that the strain relief of the cable is tightly clamped over the shield of the cable ***(b)*** so that the cable doesn't follow when pulled with mild force.

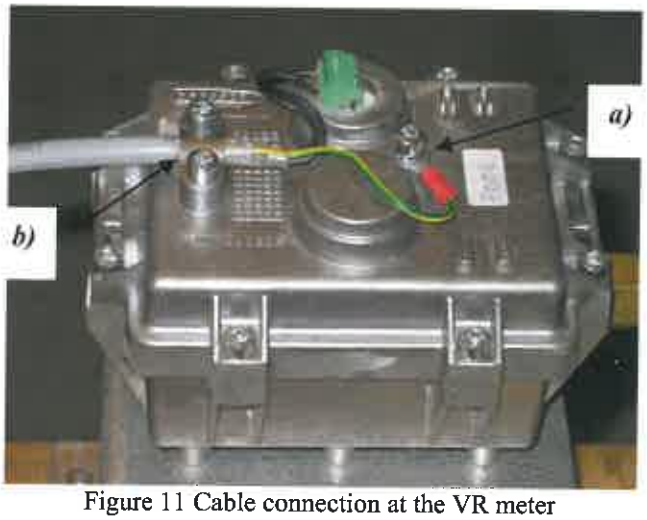

Figure 11 Cable connection at the VR meter

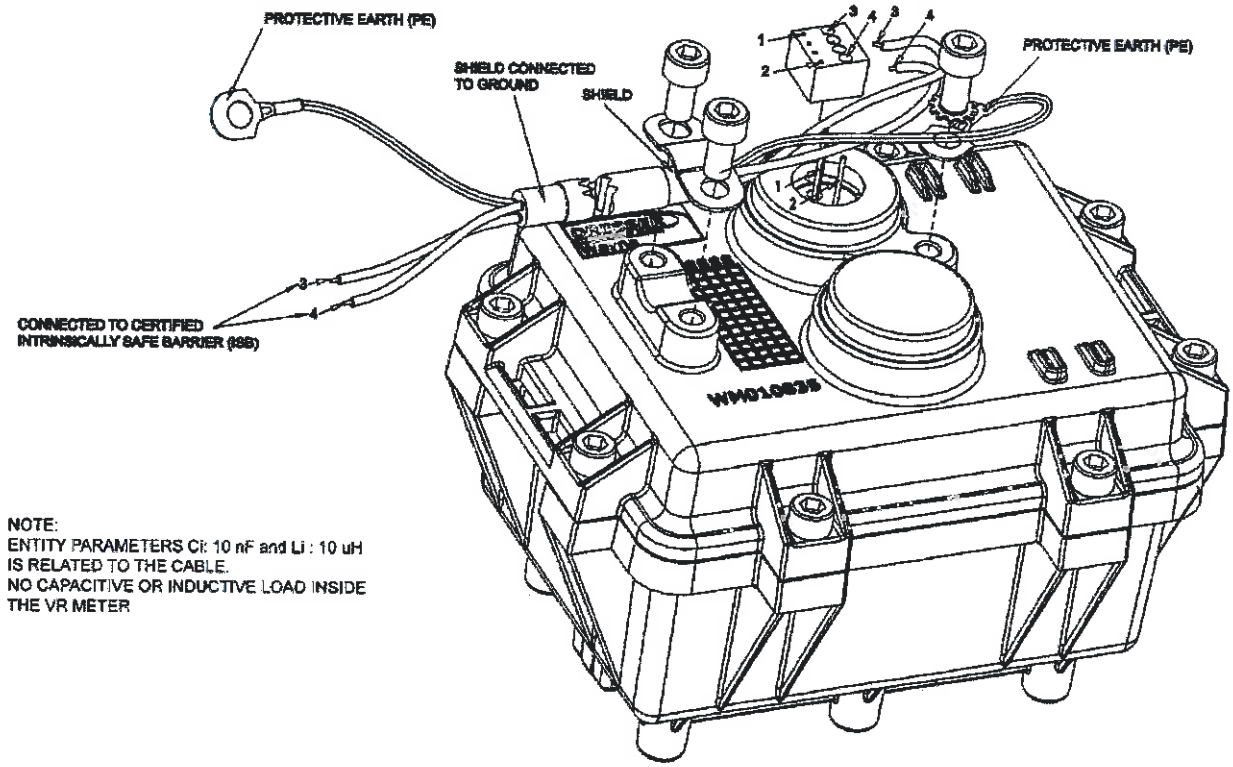

Figure 12 VR meter electrical connection

Cable connection at the ISB

Make sure that the VR meter cable is firmly fastened by clamp **(c)** to chassis of the electronic compartment for strain relief but also to gain as good protection against EMC disturbance as possible.

Figure 13 Strain relief of VR meter cable

Check that the safety critical parameters on the ISB used are as shown on figure 14.

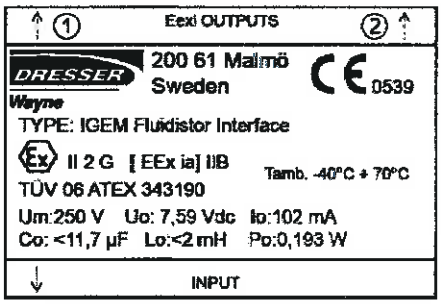

Figure 14 ISB parameters

Make sure that the housing containing the ISB is mounted with nylon lock nuts **(d)** and that the nuts are firmly tightened to obtain earth connection between the housing and the electronic compartment.

The VR meter cable is connected with a connector **(e)** to the ISB.

Figure 15 Installed ISB with its housing.

9 Spare Parts

Part number	Description
	Vapour meter
WM019233-0002	Without cable
WM019233-0001	With cable, 5m
WM019233	With cable, 2.5m
WM018634	Damper
	Solenoid valve
WM021576-0001	On/off, single, female r 1/4, cable = 3m
WM021576-0002	On/off, single, female r 1/4, cable = 5m
WM021571	Strainer 200 microns
WM018523	Intrinsically safe barrier and interface for DWP VR meter
WM018584-0001	Cable multi, 4x0.34 L=800, 1x0.75 RD L=600, 1x0.75 BK L=600

10 Appendix A, Exploded view of VR meter

Figure 14 Exploded view of VR meter

11 Notes

12 Market & Service

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More than a century of experience
Über 100 Jahre Erfahrung
Mer än 100 års erfarenhet
Более, чем столетний опыт работы

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- Обслуживание на местах, техническая поддержка и поставка запасных частей.

Wayne Dresser makes it easier for the motorist to fill up and make his motoring purchases, while effectively meeting the needs of the service station owner for operating supervision and for conforming to the demands of the authorities for measurement accuracy, minimising pollution and ensuring safety.

Wayne Dresser erleichtert dem Fahrer die Betankung und damit verbundene Einkäufe, unterstützt gleichzeitig den Stationär bei der übersichtlichen Führung seines Betriebes unter Berücksichtigung der behördlichen Vorschriften hinsichtlich Messgenauigkeit, Umwelt- und Sicherheitsauflagen.

Wayne Dresser gör det lättare för bilisten att tanka och handla. Samtidigt tillgodoses stationsägarens krav på en effektiv driftskontroll och myndighetskraven på mätnoggrannhet, miljövänlighet och driftssäkerhet.

Wayne Dresser упрощает процесс заправки и приобретения покупок при эффективном согласовании потребностей владельца АЗС для оперативного управления и для соблюдения требований государственных и метрологических служб, а также уменьшения загрязнения окружающей среды и обеспечения безопасности.

DRESSER Wayne

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3814 Jarrett Way
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Phone: +1 512.388.8311
Fax: +1 512.388.8302
www.wayne.com

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SE-200 61 Malmö Sweden
Phone: +46 40 360500
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126-Bonsucesso
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Phone: +55-21-2598-7711
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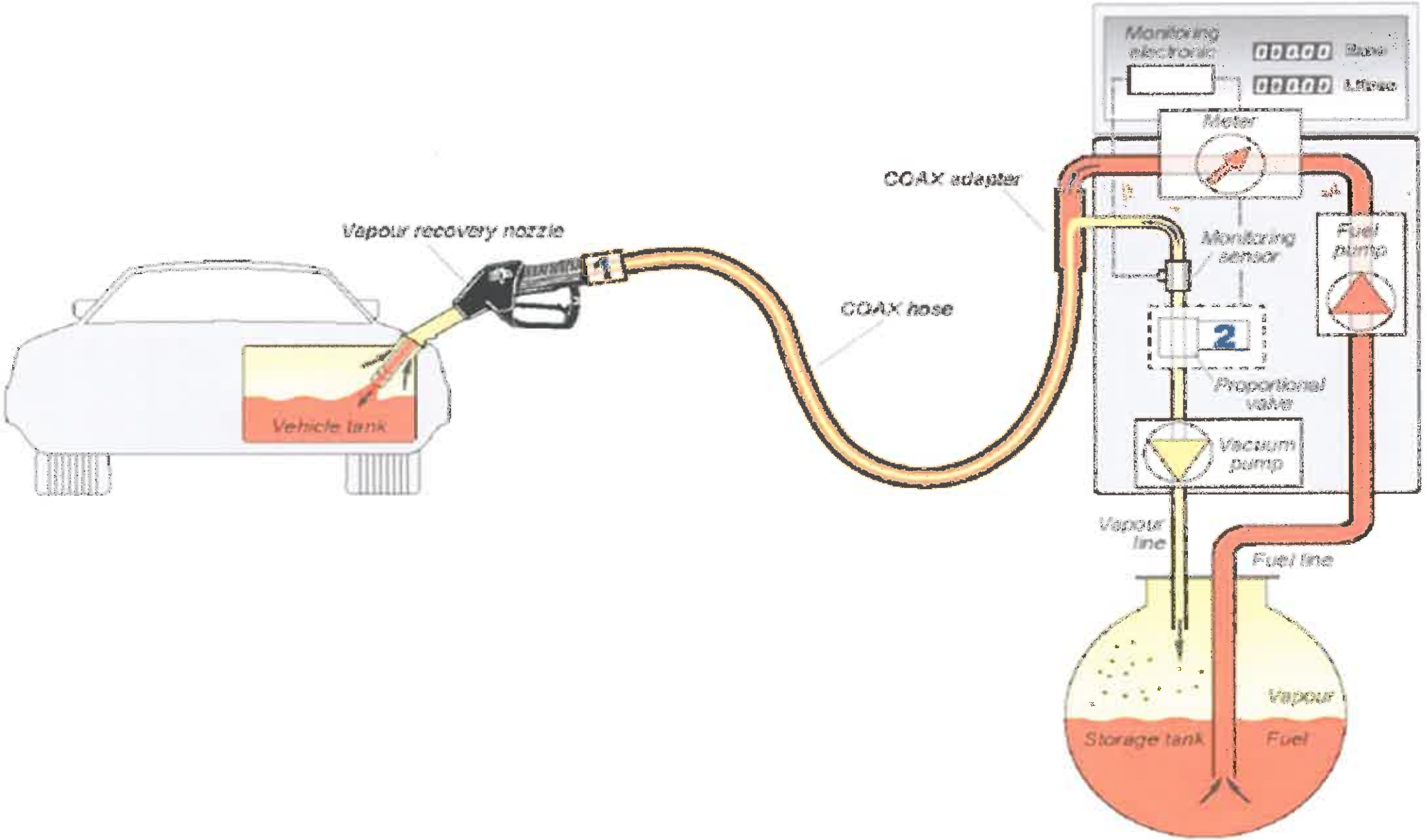
1221 Dong Lu Road
Pudong, Shanghai 200135
China
Phone: +8 21-5899-3976
Fax: +8 21-5899-0974

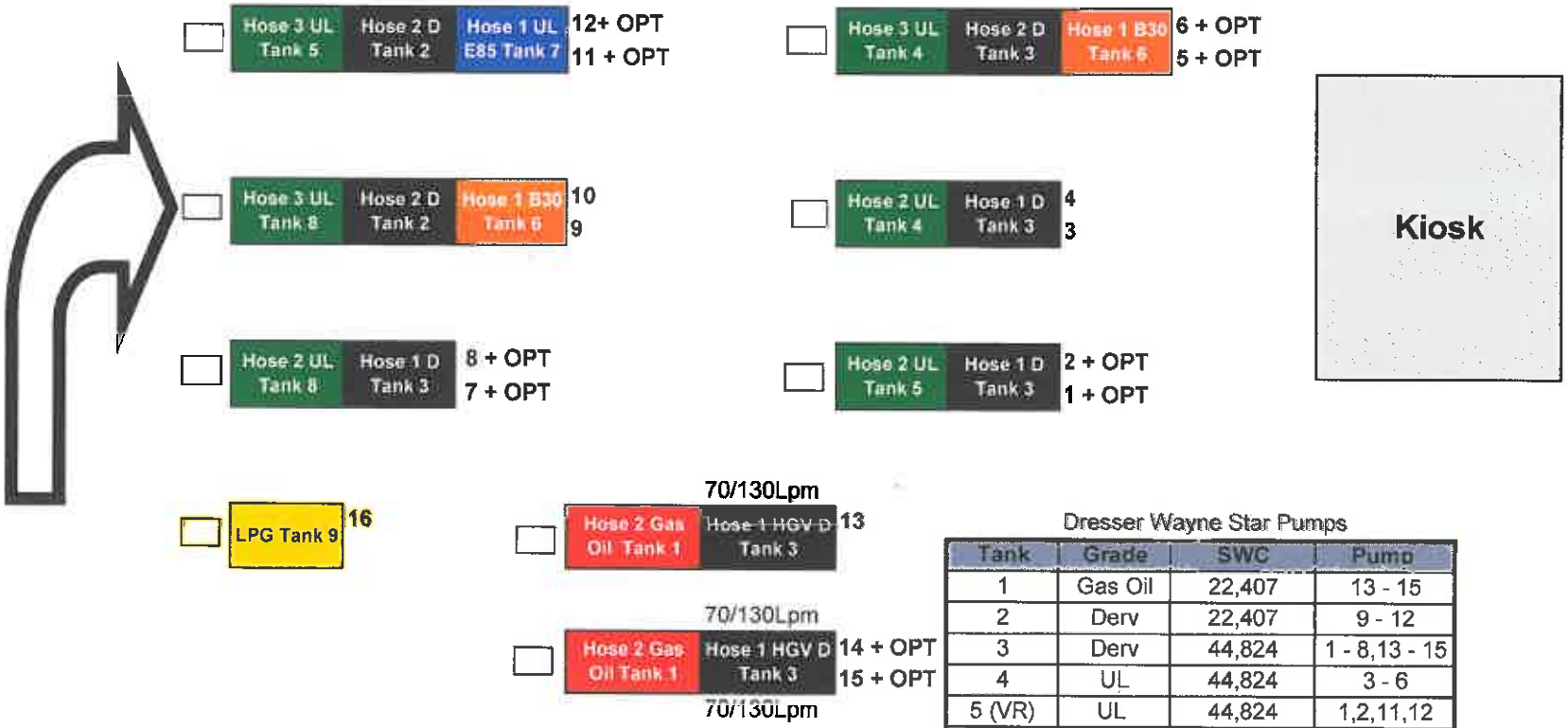

Monitoring electronic
Meter
COAX adapter
Vapour recovery nozzle
Monitoring sensor
Fuel pump
COAX hose
2
Proportional valve
Vacuum pump
Vehicle tank
Vapour line
Fuel line
Vapour
Storage tank
Fuel

MORRISONS

DRESSER Wayne

Morrisons Ipswich PFS
Store No 081

Tank to Pump Map



Dresser Wayne Star Pumps

Tank	Grade	SWC	Pump
1	Gas Oil	22,407	13 - 15
2	Derv	22,407	9 - 12
3	Derv	44,824	1 - 8,13 - 15
4	UL	44,824	3 - 6
5 (VR)	UL	44,824	1,2,11,12
6 F	B30	22,407	5,6,9,10
7 F	UL E85	22,407	11, 12
8	UL	44,824	7 - 10
9	LPG	4,400	16

Hose 1 nearest pump head
F = Future Grade

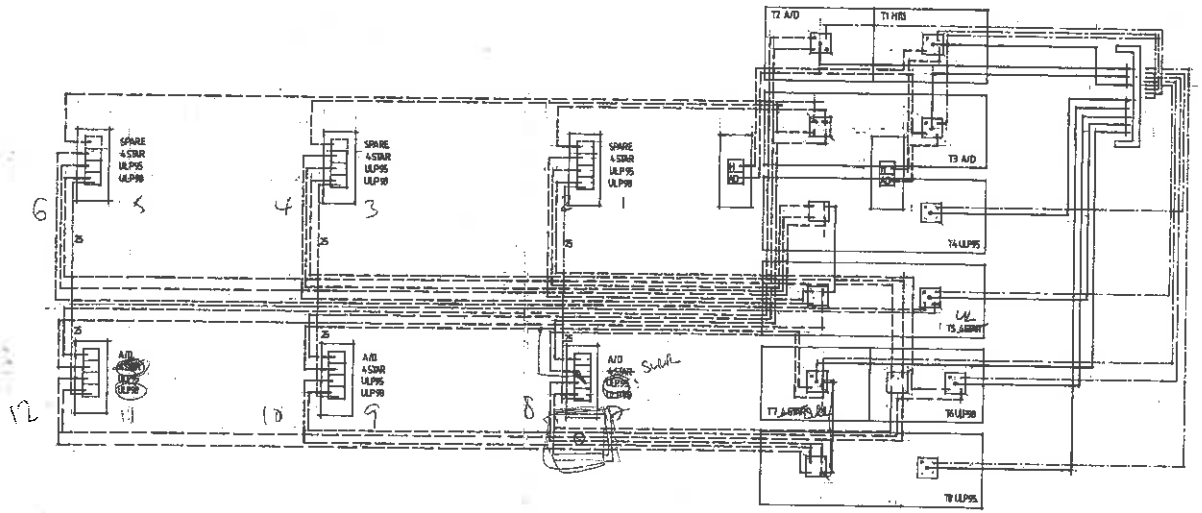
replacement filling station SOLAR CENTRE Sproughton Road IPSWICH
PIPELINES SCHEMATIC LAYOUT

IPSWICH & NORWICH COOPERATIVE SOCIETY Ltd.

KEY all pipework to fall back to tanks min 1 in 120

- 100 Φ offset fills
- 50 Φ vent pipes
- 50 Φ suction lines
- 50Φ suction lines blanked off for future use
- 50 Φ vapour/suction from pumps 25 Φ branches blank off for future use

KIOSK



PLAN 1 : 100

A Sept 94 REVISE A/D suction connections

CLIENT: Ipswich & Norwich Coop. Society Ltd.	THIS DRAWING IS COPYRIGHT. FIGURED DIMENSIONS ONLY ARE TO BE USED. DO NOT SCALE
PROJECT: replacement filling station Sproughton Road IPSWICH PIPELINE SCHEMATIC LAYOUT	
DATE: Sept. 94	SCALE: 1:100
DRAWING NO.: 028/93/16 A.	

Griffiths McAllister Designs Ltd. ©
Cornfields Wicks Lane Forward Green STOWMARKET Suffolk IP14 5HL. Tel: 0449 711542 Fax: 0449 711650

MORRISONS

Wm MORRISON SUPERMARKETS PLC

03 JUL 2000

WAKEFIELD 41 INDUSTRIAL ESTATE • WAKEFIELD • WEST YORKSHIRE WF2 0XF
Telephone WAKEFIELD (01924) 870000 • Fax (01924) 875260

Our Ref: Your Ref: Date:

SUFFOLK COUNTY COUNCIL
TRADING STANDARDS DEPT.
-5 JUL 2000
ST. EDMUND HOUSE
IPSWICH

Dear Sir,

Please find enclosed an application form and cheque for £121.00 for transfer of a Vapour Recovery Authorisation to Wm Morrison Supermarkets Plc. The site currently being operated by the Co-op on the Boss Hall Business Park. The date for take over of the site will be early November 2000.

N/T Discussed with Mr Atkinson. Explained Sheila Sear of Finance had returned the cheque. He will contact me in due course with a date for the transfer. Letter confirming so typing. [initials]

Frank Atkinson
Company petrol Manager.

IPSWICH BOROUGH COUNCIL
LOCAL TAX OFFICE
11 JUL 2000
RECEIVED

→ B.F. "Solar forecourt", Sproughton

Mr Atkinson
01924 870000.

To: SUFFOLK C.C.

APPLICATION TO TRANSFER TO :-

Environmental Protection Act 1990
Application for Authorisation, Part I

Section A: General Information

1. **Name and address of premises where process is/will be carried out**

WM MORRISON SUPERMARKETS PLC
SPROUGHTON ROAD IPSWICH SUFFOLK IP1-5AS.

Post Code: IPS-5AS.

Telephone No: TO FOLLOW FOR SITE (HOWEVER SHORT TERM 01924 875313)

Contact Name: FRANK ATKINSON.

Position: COMPANY PETROL MANAGER

2. **Name and address of applicant[s]**

WM MORRISON SUPERMARKETS PLC
HILMORE HOUSE THORNTON ROAD BRADFORD

Post Code: BD8 9AX

Telephone No: 01924 875313

Contact Name: FRANK ATKINSON

Position: COMPANY PETROL MANAGER

3. **Name and address of registered office [if applicable].** ***In the case of partnerships, names and home addresses of the partners.***

AS NO2

Post Code:

Telephone No:

Contact Name:

Position:

IPSWICH BOROUGH COUNCIL
LOCAL TAX OFFICE
11 JUL 2000
RECEIVED

Section B: Process and Control Information

9. Volume of petrol unloaded into the service station in each of the last three calendar years, *[see Clause 9 of this Note for the relevant time-scales]*; in cubic metres [i.e. litres divided by 1000]. Circle the appropriate band. ESTIMATE.

Year	Volume of Petrol/m³			
1999	<100	100 - 500	501 - 1000	(>1000)
	<100	100 - 500	501 - 1000	>1000
	<100	100 - 500	501 - 1000	>1000

10. Are deliveries "Driver Controlled"?

Yes ☐ No ☑

11. At a maximum, how many tanker compartments discharge into storage tanks at any one time, or will do so one a vapour balancing system is in place. If the latter information is not known, a statement of what assessment will be made to determine this information and within what timescale. The information supplied under Item 11 should be supplemented by a site specific assessment. *[See Clause 17]*

MAX TWO HOSES.

12. Measures taken or to be taken for vapour emission control, both during unloading and in storage.

SEE NOTE 081/002

13. **Please attach process diagrams and plans of vapour balancing equipment [including height and location of tank vent pipes].**

SEE NOTE 081/003

THIS IS A SCHEMATIC DRAWING & WE WILL BE CHANGING TANK GRADES ONCE WE TAKE POSSESSION OF THE SITE

14. **Unloading procedure and instructions [please attach].**

SEE NOTE 081/004

15. **Details of Supervision, Training and Qualifications of Operating Staff.** ***[Details should be specific to on-site staff and include general statements concerning delivery drivers.]***

ALL TRAINED TO ITEMS CONTAINED ON SHEETS 081/002/4

SEE NOTE 081/002 & 081/004

16. **Schedule of maintenance of vapour balancing controls. [Please attach].**

ANNULAR TESTING &

SEE NOTE 081/005

17. **Schedule of examination and testing for vapour balancing controls. [Please attach]**

SEE NOTE 081/005

18. **Procedures or contingency measures in the event of vapour containment equipment failure. [Please attach]**

SEE NOTE 081/002

You may also supply any other information you wish the Local Authority to take into account when considering your application.

I hereby certify that I am authorised to sign this application and all the information contained in this application is correct to the best of my knowledge and belief.

Name:
(BLOCK CAPITALS) SIMON DAVIS.

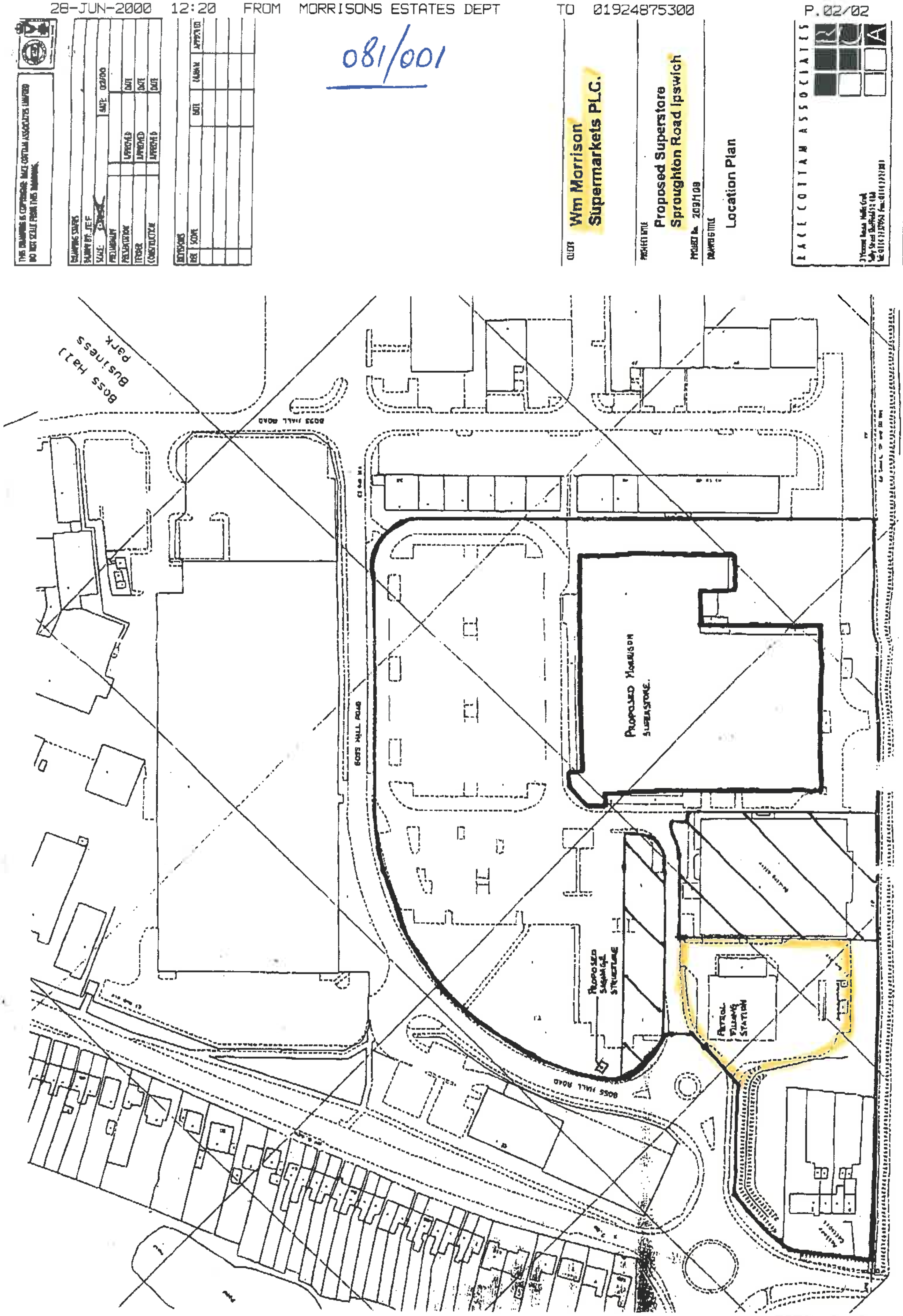
Signature: [signature]

Designation: FORECOURT DIRECTOR

Date: 30/06/00

Fee attached (cheques made payable to, SUFFOLK CC £121-00

081/001



THIS DRAWING IS COPYRIGHT: RACE COTTAM ASSOCIATES LIMITED
DO NOT SCALE FROM THIS DRAWING.
Wm Morrison Supermarkets PLC.
Proposed Superstore Sproughton Road Ipswich
Location Plan
RACE COTTAM ASSOCIATES
Boss Hall Business Park
BOSS HALL ROAD
PROPOSED MORRISON SUPERSTORE.
PROPOSED SIGNAGE STRUCTURE
PETROL FILLING STATION

From: TRDPETRC--MORRISON Date and time 27/07/99 12:58:15
To: TRDPETRC--MORRISON Atkinson, Frank

081/002 1 OF 3

*** Resending note of 29/09/98 11:25
From: Atkinson, Frank

Subject: VAPOUR RECOVERY

To Petrol Station Manager.

Could you please ensure that ALL trained Competent Persons for Tanker Acceptance, are made aware of the following legislation. They MUST adhere to this whilst accepting Petroleum Deliveries on sites that have Vapour Recovery Systems. All Morrison sites have Vapour Recovery Systems fitted.

These Regulations are additional to any training that these staff may have had in the past for Tanker Acceptance, and must be read used in conjunction with the Petroleum Licence and the actual Authorisation issued by the Local Environmental Department.

Please give Frank Atkinson a call if you/they have any queries/doubts about the legislation.

THE REGULATIONS FOR ENVIRONMENTAL ACT 1990 PART 1.

TO BE READ IN CONJUNCTION WITH ROAD TRAFFIC REGULATIONS 1992 SCHEDULE 12

All reasonably practical steps shall be taken to prevent uncontrolled leaks of vapour from vent pipes and connections. The local Authority will be advised without delay of such vapour leak/s, and a follow up letter sent. The Authority MUST be contacted within 1 Hour (and followed by a facsimile) if there is likely to be an effect on the local community. These cases and any minor abnormalities MUST be recorded in the "Site Register" on the pages provided.

REGULATIONS:-

A) The person who accepts a delivery of fuel on a site with "Vapour Recovery will be a Competent Person and will have knowledge of the Petroleum Licence conditions Carriage of Dangerous Goods by Road Regulations 1996. (these can be found in the Petrol Station Training and information packs).

B) The Vapour Recovery Hose MUST be connected first, and the Vapour Recovery hose MUST be connected to the Tanker first and then to the Storage Tank.

C) Deliveries made to the site will use the maximum of 2 delivery hoses supplying fuel to the tanks. (One Hose only, can be used at Store 100)

D) The Competent Person will remain near the tanker and keep a constant watch on the hoses and connections during the unloading process.

E) Whilst a delivery is in progress a dip of any tank compartment shall not be performed.

F) Tanks not being filled will have the fill caps clipped in position to maintain the integrity of the Vapour Recovery System.

081/002 2 OF 3

G) The Competent Person will remain with the delivery whilst the unloading is taking place. They will watch for slow delivery of the product and also listen for excessive noise from the vent pipes. The Competent Person will watch/listen for any occurrence that is abnormal to the delivery. If in any doubt as to the operation of the Vapour Recovery system, STOP THE DELIVERY, contact the Service Company.

H) On completion of the delivery the Vapour Recovery Hose MUST be the last hose to be disconnected and MUST be disconnected from the Storage Tank End first.

I) In the event of any failure or malfunction of the Vapour Recovery System, STOP THE DELIVERY and call the service Company.

J) The following occurrences will be recorded in the "Site Register" and reported to the local Authority :-

1) VAPOUR LOCK.
2) VAPOUR LEAKS.
3) REPAIRS TO THE VAPOUR RECOVERY SYSTEM
4) ANY OTHER OCCURRENCE THAT FALLS OUT SIDE A NORMAL DELIVERY.

K) The following will be recorded in the "Site Register" :-

1) MAINTENANCE OF THE SYSTEM.
2) EXAMINATION OF THE SYSTEM.
3) TESTING OF THE SYSTEM.

Wm Morrison Supermarkets Plc.

I have read, understand and will fulfil the above legislation.

	NAME	SIGNATURE	DATE
01			
02			
03			
04			
05			
06			
07			
08			
09			

10			

081/002

STORE NUMBER _____ STORE NAME _____

PERSONNEL OFFICERS SIGNATURE _____

Thanking you in anticipation.

Frank Atkinson. tel: 01924 578313 (0973 805066)
Grandstand Trading Hall.

RESPONSIBILITIES.

1) It is the responsibility of the General Manager/Duty Manager to ensure that all personnel who are, or are likely to be, involved in the acceptance of fuel deliveries to Company premises, are trained and fully competent in the acceptance of fuel deliveries.

2) It is the responsibility of the General Manager/Duty Manager to ensure that a full list of trained and fully competent persons is displayed in the kiosk of the petrol station.

3) It is the responsibility of all trained and fully competent persons to ensure that they fully understand and comply with at all times, all Company and legal procedures relevant to the acceptance of fuel deliveries.

4) It is the responsibility of all trained and fully competent persons to ensure that any failure to comply, or inability to comply with the relevant procedures, reports the matter immediately to the Store General Manager/Duty Manager.

5) It is the responsibility of the General Manager/Duty Manager to react with the required urgency where failures to or comply or inability to comply with the relevant procedures is reported, and he/she must ensure that the relevant corrective action is instigated, and that such corrective action is fully undertaken and completed.

6) It is the responsibility of the General Manager/Duty Manager to inform the "Petroleum Head Office Department". immediately of the full details of events if the procedure requires them to do so.

7) It is the responsibility of all trained and fully competent persons to take all reasonably practical steps to prevent uncontrolled leaks of vapour from vent pipes and connections. The Local Authority will be advised without delay of such vapour leak/s by phone and follow-up letter. However they must be contacted within one hour (And followed by a facsimile) if the leak is likely to effect the local community. The incidents above and any minor abnormalities MUST be recorded in the "Site Register" on the pages provided.

A) The following occurrences will be recorded in the "Site Register" and reported to the Local Authority:-

1) VAPOUR LOCK.
2) VAPOUR LEAKS.
3) REPAIRS TO THE VAPOUR RECOVERY SYSTEM.
4) ANY OTHER OCCURRENCE THAT FALLS OUTSIDE A NORMAL DELIVERY.

B) The following will be recoreded in the "Site Register".

1) MAINTENANCE OF THE SYSTEM.
2) EXAMINATION OF THE SYSTEM.
3) TESTING OF THE SYSTEM.

ROAD TRAFFIC REGULATIONS 1992 SCHEDULE 12.

THE ROAD TRAFFIC (CARRIAGE OF DANGEROUS SUBSTANCES IN ROAD TANKERS AND TANK CONTAINERS) REGULATIONS 1992-SCHEDULE 12 DELIVERIES OF PETROLEUM SPIRIT.

1) THE 'PERSON IN CHARGE'.

1.1 The fire safety in respect of the above act states:-

The person in charge of accepting the delivery shall be over 18 years of age, be trained and competent.

The Company also requires that person to hold a Management position. Not to carry matches/lighters and must not wear any item of clothing which could cause static electricity when accepting a tanker delivery.

1.2 There will be on show a sign, with a list of names and signatures of all personnel trained and fully competent in the acceptance of fuel deliveries.

2. PRE-DELIVERY REQUIREMENTS.

2.1. PARAGRAPH 9 - SUB-SECTION a) to d).

Paragraph 9 states that the competent person shall be in charge of the storage tanks for the purpose of the delivery, and shall not permit delivery into the tank to commence:-

a) Unless the tanks have immediately before the delivery, been measured with a dip-stick or tank gauge system, and the measurement has shown that the quantity of petroleum proposed to be delivered, can safely be received by that tank, and:-

b) until:-

i) The Vapour Recovery Hose is connected in the following sequence:-

A) Tanker End First.
B) Storage Tank End Second.

ii) The hose through which the petrol will be delivered is connected to the filling point of that tank.

c) (In any case where there is a separate dipping opening in the storage tank) until that dipping opening has been securely closed, and

d) (Where siphon pipes link storage tanks at the licensed premises and none of the linked tanks is fitted with a mechanical over-fill prevention device), until that tank has been isolated from the other storage tanks by the closure of suitable valves. AND SHALL NOT AS RESPECTS THAT TANK SIGN HIS/HER NAME ON THE CERTIFICATE UNTIL HE/SHE HAS COMPLIED WITH THE APPROPRIATE REQUIREMENTS OF SUB-PARAGRAPHS a) TO d) OF THIS PARAGRAPH.

COMPANY PROCEDURE FOR ACCEPTANCE OF FUEL DELIVERIES.

PURPOSE/OVERVIEW.

To ensure that all stores follow the correct procedure regarding the acceptance of deliveries of petroleum spirit and that all the required paperwork is completed according to legal and Company requirements.

METHOD.

1) PRE-DELIVERY REQUIREMENTS.

1.1 It is the responsibility of the competent person to ensure "Vapour Recovery Log Sheets" are completed if the delivery is taking place when the site is operational, Please refer to page 5/6/7.

1.2 It is the responsibility of the competent person accepting the tanker delivery to ensure only the legal amount of fuel hoses are connected from the tanker to the receiving tanks during the fuel acceptance procedures.

1.3 On arrival of the tanker, the competent person must ensure that the tanks are measured with a dip stick or tank gauge system and that the readings obtained show that the quantity of fuel proposed to be delivered can safely be received by the tanks.

1.4 The Petrol Station Manager/Supervisor or their deputy must hand the Petroleum Certificate Forms to the competent person together with the keys for the locks on the infill pipes.

1.5 The competent person must ensure that he/she removes the tank coverings and unlocks the infill pipes.

1.6 Ensure the tanker driver dips each compartment of the tanker and reads out what each compartment contains. The competent person must verify this by checking the tanker dip sticks. This is achieved by the tanker driver lowering the dip stick over the side of the vehicle in a controlled manner.

1.7 The competent person must ensure the total volume shown by the 'WET' dips equals the total delivery figure on the delivery note. If any discrepancy is discovered, the General Manager/Duty Manager must be informed immediately.

2) COMPLETING THE FIRE CERTIFICATE.

2.1 Part "A" of the certificate.

1st column:-	Site Address.
2nd column:-	Name of licensee ie WM. MORRISONS SUPERMARKETS PLC.
3rd column:-	Storage Tank Number.
4th column:-	Quantity of Petrol to be Delivered.
5th column:-	Grade of Petrol to be Delivered.
6th column:-	Signature of the Competent Person. -To certify that the appropriate requirements of the Road Traffic Regulations have been complied with. -Refer to reference sections of these procedures:- REFERENCE - ROAD TRAFFIC REGULATIONS 1992-SCHEDULE 12
7th column:-	Date/start and finish times of this part of the certificate.

2) COMPLETING THE FIRE CERTIFICATE (Continued)

2.2 Part "B" of the certificate. Must be completed by the Tanker Driver, line by line AS EACH HOSE IS CONNECTED and must NOT be written and signed all at once.

3 DELIVERY OF THE FUEL.

3.1 The competent person must ensure that whiles the delivery is in progress tanks not currently being filled will have the fill caps clipped in position. (This is to stop vapour escaping to the atmosphere).

3.2 The competent person must ensure that the correct grade of petrol is being delivered into the correct storage tank, by simply looking at the grade indicator situated directly adjacent to the tankers outlet valves. Each outlet valve will have its own grade indicator which shows the grade of petrol held in each compartment of the tanker.

3 The competent person must ensure that the tankers engine is switched off.

3.4 The competent person must ensure they know how to stop the petrol flowing through the hoses in an emergency.

3.5 The competent person will:-

(A) Remain with the delivery while the unloading is taking place, watch for slow delivery of the product and also listen for excessive noise from the vent pipes.

(B) Watch/Listen for any occurrence that is abnormal to the delivery. If in doubt as to the operation of the vapour recovery system, STOP THE DELIVERY, contact the service company.

(C) Remain vigilant at all time for any other incidents or occurrences.

(D) Will not permit the dipping of tanker compartments whilst the fuel delivery is in progress.

3.6 On completion of the delivery the vapour recovery hose must be the last hose to be removed and must be disconnected from the storage tank end first.

3.7 Replace the locks on the infill pipes and replace the tank covers.

AT COMPANY SITES WHICH HAVE AN OVERFILL PREVENTION SYSTEM INSTALLED THE COMPETENT PERSON MUST BE FULLY AWARE OF THE PROCEDURE TO BE FOLLOWED SHOULD THE OVERFILL PREVENTION SYSTEM ACTIVATE-
PLEASE REFER TO PAGE 18 EMERGENCY INFORMATION & TRAINING PACK.

4) POST-DELIVERY REQUIREMENTS.

4.1 THE COMPETENT PERSON MUST ENSURE THAT EACH SITE GLASS NEXT TO THE OUTLET VALVE ON THE TANKER IS EMPTY, AND THE SMALL BALL HAS DROPPED TO THE BOTTOM OF THE SITE GLASS.

If any site glass is still full the General Manager/Duty Manager must be asked to attend at the Petrol Station.

4.2 Once in attendance at the Petrol Station, the General Manager/Duty Manager must supervise the dipping of the relevant compartments of the tanker.

5) RE-CONNECTION OF THE HOSE/S.

5.1 If the dip stick shown is still wet, under the supervision of the General Manager/Duty Manager the hose/s must be reconnected to the relevant compartments of the tanker and the relevant infill pipe/s as can be determined from the entries already made on the fire certificate.

5.2 The competent person must place a second signature on the fire certificate on the line relevant to the hose/s that have been reconnected.

5.3 If the second attempt to 'deliver' the fuel from the tanker proves to be UNSUCCESSFUL, than a further 'wet' dip must be provided by the tanker driver and the quantity of fuel remaining on the tanker must be agreed by the tanker driver/competent person and the General Manager/Duty Manager.

5.4 The competent person must documentise in the Sites Duplicate Book, the Date/Time/Site Address and the quantity of fuel received. And the book must be singed by the competent person/tanker driver & the General Manager/Duty Manager.

5.5 The tanker driver will receive the top copy, the second copy will be stapled to the 'DP10' for that delivery.

5.6 The original delivery note must be retained by the tanker driver, and the fuel supplying company must send a replacement delivery note with the correct quantities received on it.

5.7 Ensure the 'Administration Department' send the 'New Delivery Note' to 'Head Office DP Control'.

5.8 The competent person must complete a NEW fire certificate, the new certificate must reflect the quantity of fuel received into the storage tanks, the General Manager/Duty Manager & Tank Driver must agree with the quantities received.

6) DELIVERY COMPLETED.

6.1 Upon completion of the delivery of fuel to the site, the competent person must stamp and sign the delivery note, (If the quantity on the delivery note were received) in accordance with Company procedures, and give relevant copies to the tanker driver along with the top copy of the completed fire certificate.

6.2 The competent person must return the "Petroleum Certificate Forms" and the keys to the infill pipes to the kiosk after ensuring that all the infill pipes are securely locked.

6.3 The "Delivery Note" and DP-10 should then be taken to the Warehouse Office/Checkers bench by the competent person for processing according to Company procedures.

6.4 If the original copy of the "Delivery Note" has been retained by the Tank Driver due to incorrect quantities being "Quoted" on it the carbon copy from the "Duplicate Book" will be used in place of the "Delivery Note"

081/005

Wm MORRISON PFS
Stage 1b Vapour Recovery Maintenance

Proposal to carry out the maintenance of Stage 1b Vapour Recovery systems by Wayne Dresser comprising the following works -

a) Pressure/Vacuum Relief Vent Valve

1. Remove the PV valve from the top of the vent riser.
2. Check the pressure poppet inside the pressure/vacuum relief valve moves freely when pushed and that it reseats correctly when released.
3. Check that the vacuum poppet inside the valve moves freely when pulled and released and also reseats.
4. Check that the flame arrestor mesh is in tact and is clear of debris.

b) Vapour Adaptor

1. Remove the adaptor and check that the poppet seal is not damaged in any way.
2. Check that the vapour adaptor poppet mechanism is working correctly.
3. Check that the flame arrestor is not damaged and clear of debris.

c) Drain Down

1. Remove the plug from the drain valve (if fitted) and drain off any condisent contained in vapour return pipe.

d) Labels

1. Check all signs/labels on site ensure all clearly visible.
2. Check all appropriate signs/labels are fitted eg. Vapour Hookup/Vent labels

Details of the type of system installed will be included with the test certificate eg.

1. High/Low level manifold.
2. No of tanks incorporated in vapour system.
3. Stage 2 vapour recovery installed.
4. Model of vapour adaptor/PV valve installed.

Please Note:

If any item installed in the vapour recovery system fail, then the repair must be classed as urgent.

Items such as vapour adaptors, lockable caps, PV valves and appropriate warning signs will be replaced at the time of inspection if found to be faulty.

This test is only valid at the time of testing.

A CERTIFICATE WILL ONLY BE ISSUED IF THE VAPOUR RECOVERY SYSTEM CONFORMS TO THE ABOVE AND IS APPROVED BY THE MAINTENANCE ENGINEER.