

(UK/0126/0072)



MI-005

United Kingdom of Great Britain and Northern Ireland

**Certificate of EC type-examination of a
measuring instrument**

Number: UK/0126/0072

issued by the Secretary of State for Business, Innovation and Skills
Notified Body Number 0126

In accordance with the requirements of the Measuring Instruments (Liquid Fuel delivered from Road Tankers) Regulations 2006 (SI 2006/1259) and the Measuring Instruments (Non-Prescribed Instruments) Regulations 2006 (SI 2006/1270) which implement, in the United Kingdom, Council Directive 2004/22/EC, this certificate of EC type-examination has been issued to:

***Emco Wheaton UK Ltd
Channel Road
Westwood Industrial Estate
Margate
Kent, CT9 4JR
United Kingdom***

in respect of a vehicle mounted liquid fuel meter measuring instrument having the following characteristics:

<i>Model designation</i>	<i>EPMS DataPlus 800 or 400</i>
<i>Maximum rate of flow</i>	<i>800 litres / minute</i>
<i>Minimum rate of flow</i>	<i>40 litres / minute</i>
<i>Maximum operating pressure</i>	<i>10 bar</i>
<i>Minimum delivery</i>	<i>1000 litres bulk 200 litres hose reel</i>
<i>Liquids measured</i>	<i>Derv; Gas oil; Kerosene; Paraffin; Gasoline; Diesel; Domestic heating oils</i>

The necessary data (principal characteristics, alterations, securing, functioning etc) for identification purposes and conditions (when applicable) are set out in the descriptive annex to this certificate.

Signatory: P R Dixon
for Chief Executive
National Weights & Measures Laboratory
(Part of the National Measurement Office)
Stanton Avenue
Teddington
Middlesex TW11 0JZ
United Kingdom

Issue Date: 30 March 2010
Valid Until: 29 March 2020
Reference No: T1121/0012

Descriptive Annex

1 INTRODUCTION

This pattern is a liquid fuel meter measuring system for single and multi-compartment road tankers used for the transport and delivery of low viscosity liquids (<20mPas) other than water.

The system allows:

1. Pumped metered delivery by wet hose up to 400 LPM
2. Pumped metered delivery by dry bulk line up to 800 LPM
3. Product return, including transfer from one compartment to another.
4. Direct delivery without passing through the meter, with and without pumping.
5. Compartment loading without passing through the meter

The instrument is a vehicle-mounted meter measuring system with a wet-line delivery system and a dry-line delivery system, having the following characteristics:

Model designation:	EPMS DataPlus 800 or 400
the maximum rate of flow:	800 litres/minute(Bulk Hose) 400 litres/minute(Hose Reel)
the minimum rate of flow:	40 litres/minute
the minimum delivery:	1000 litres (Bulk) 200 litres (Hose reel)
the liquids measured:	Derv; Gas oil; Kerosene; Paraffin; Gasoline; Diesel; Domestic heating oil

2 SYSTEM COMPONENTS

2.1 Hydraulics

The hydraulic system is shown in Figure 1. Liquid flows from the selected compartment within the tank (1) of the cargo tank via the appropriate foot valve and manifold valve (2) into the manifold pipe (3) and down into the electronically controlled special gas extractor (4). The manifold pipe is modified to include an electronic optical liquid/air detector (5) and the manifold vent pipe (6) directly above the inlet to the special gas extractor. This optical detector (5) detects when the manifold is full of liquid. A filter (7) is located within the special gas extractor. A second electronic optical detector (8) is located in the outlet pipe of the special gas extractor to sense the lowest allowable liquid level. Trapped and extracted air vents from the system via a connection in the manifold tube above the special gas extractor into the vent pipe (18) where it passes through an expansion tank (20), vent valve (19) up to a high level Catchment Tank (21) and vent valve (22).

From the special gas extractor liquid flows to the cargo pump (9), which incorporates a pneumatically operated pressure relief valve (10). Downstream from the pump there is an optional two-way valve (11) which permits selection of a metered delivery or unmetered bulk delivery.

For metered deliveries liquid flows from the two-way valve through the flow meter (12) to a pneumatically actuated two-way valve (13). An optional non-return valve (14) may be installed in the line before the inlet or just after the outlet of the two-way valve. The two-way valve (13) will in one position divert the liquid flow to the wet-line hose reel (15) and trigger nozzle (16) with integral non-return valve (17). In the other position it diverts liquid to the dry-line bulk hose.

For product return, the hose reel nozzle may be connected to the product return valve (23) of the appropriate compartment.

2.2 Special gas extractor

The Special Gas Extractor is the Emco Wheaton type F0361XXX.

2.3 Pump

Any cargo pump that is fitted with a pneumatically operated relief valve and is capable of producing the required maximum and minimum flow rates and pressures may be used. The pump may be driven directly via truck PTO or via hydraulic pump or via other suitable means.

2.4 Flow Meter

The meter shall be a Satam flow meter ZC17 24/24 (400LPM system) or ZC17 24/48 (800LPM system) with pulse transmitter as described in LNE Evaluation Certificate number 11052

Alternative flow meter options are:

Alma turbine meter model Adriane DN 50-50 as described in LNE Evaluation Certificate number 12393

2.5 Electronic Register

The electronic register is the Sam System LC2005 type that includes the Sam System DKM Display Keypad Module. The DKM will be connected to the LC2005 electronic Register by a cable not more than 10m long.

The register is as described in Evaluation Certificate: DK-0200-MI005-001 issued by FORCE Certification, Denmark.

The relevant software versions and security are as described in the evaluation certificate.

The Emco Wheaton part numbers for the LC2005 electronic register and DKM Display Keypad Module are to be F1031-XXX and F1032-XXX respectively.

2.6 Printer

A ticket printer such as the Epson TM-U295 shall be connected to the electronic register directly or via an inter-connection box. The printer will comply with EMC Directive.

The ticket printer is used for printing delivery tickets that show the ticket number, date and time of delivery, quantity and type of product delivered. Format of the text on the ticket is set up

using the Electronic register. Additional non-legal information may also be included. Alternative printers meeting the above requirements may be used.

2.7 Electro/Pneumatic Control Panel

There is an Electro/Pneumatic Control panel that contains the controls for operating the tank bottom loading system and manifold. It will also house the pressure switches and electro-pneumatic solenoid valves that control the operation of meter system valves. These pressure switches and solenoid valves will be connected to the electronic register.

2.8 Peripheral Devices

Additional peripheral devices may be connected such as Remote/Stop Start controls, GPS and modems providing they do not interfere with the legal metrology operation of the system and printing of tickets.

3 APPROVAL CONDITIONS

The certificate is issued subject to the following conditions:

3.1 Legends and inscriptions

3.1.1 The instrument bears the following legends:

- Manufacturers mark or name
- Accuracy class
- Maximum operating pressure
- Operating temperature range
- Minimum delivery
- Flow rate range
- Serial number
- Certificate number
- 'CE' marking
- Supplementary metrology marking
- Notified body identification number

3.2 Sealing

The following parts of the system shall be sealed to prevent unauthorised adjustment or dismantling:

3.2.1 The LC2005 Electronic Register shall be sealed as shown in Figure 4 using wire and lead seals.

3.2.2 The Signal Interface Box shall be sealed as shown in Figure 5

3.2.3 The Flow Meter and Pulse Transmitter shall be sealed using wire and lead seals as shown in Figures 9 & 10.

3.2.4 Any flexible pipe work fitted between the special gas extractor and pump shall be sealed using wire and lead seals.

4 AUTHORISED ALTERNATIVES

- 4.1** Having the manifold controlled via electronic DKM keypad .
- 4.2** Having any number of compartments up to 12.
- 4.3** Having no product return system.
- 4.4** Having volume data but no pricing data on the delivery ticket.
- 4.5** Having no two-way valve after the pump.
- 4.6** Having the product return controlled via the DKM keypad
- 4.7** Having no 400LPM meter hose reel outlet
- 4.8** Having no 800LPM meter bulk outlet
- 4.9** Having the lower vent valve located before the expansion tank.

5 RECOMMENDED TESTS

The following tests shall be carried out:

5.1 The meter measuring system shall be tested at a minimum of two substantially different rates of flow between the specified maximum and minimum rates of flow using a liquid other than water such as gas oil, diesel or kerosene with a viscosity less than 20mPas.

The meter measuring system shall be tested for a minimum of three repeat runs at each rate of flow and the minimum duration for any run shall be one minute.

The meter system shall be tested above with a liquid from each family type to be carried and discharged using the meter system, i.e. Gas Oil / Diesel family and Kerosene / Parafin

Check that compartments are prevented from communicating their contents simultaneously.

5.2 Check that the system prints a ticket at the end of a delivery.

5.3 Check that for a Product Return operation the printer prints a ticket with Product Return on it.

5.4 Check that if more than one receipt per transaction is printed the second and subsequent ones are marked as Duplicates.

5.5 Check that if the vehicle battery is isolated the litre counter/control box display retains transaction data.

5.6 Check that a normal delivery is halted and a ticket is printed if the product transfer master control switch is pulled.

5.7 Check the security features and interlocks above, as appropriate.

5.8 Open guard-bar method - Check that the product transfer guard bar cannot be closed and locked with the hose attached to the product transfer connector.

5.9 Closed guard-bar method - Check that the product transfer guard bar cannot be opened and the hose removed from the product transfer connector.

5.10 The special gas extractor operation shall be tested by the emptying of just one of the compartments.

6 ILLUSTRATIONS

Figure 1	Hydraulic System Schematic
Figure 2	Manifold with Product Return – Front View
Figure 3	F0361 type Special Gas Extractor
Figure 4	Sealing of F1031 LC2005 Electronic Register Enclosure
Figure 5	Sealing of Meter Signal Interface Enclosure
Figure 6	F1032 DKM Display Keypad Module
Figure 7	Electro/Pneumatic Control Panel
Figure 8	EPMS DataPlus System Schematic
Figures 9 & 10	Sealing of Satam with Meter Pulser

7 CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
UK/0126/0072	30 March 2010	Type examination certificate first issued.

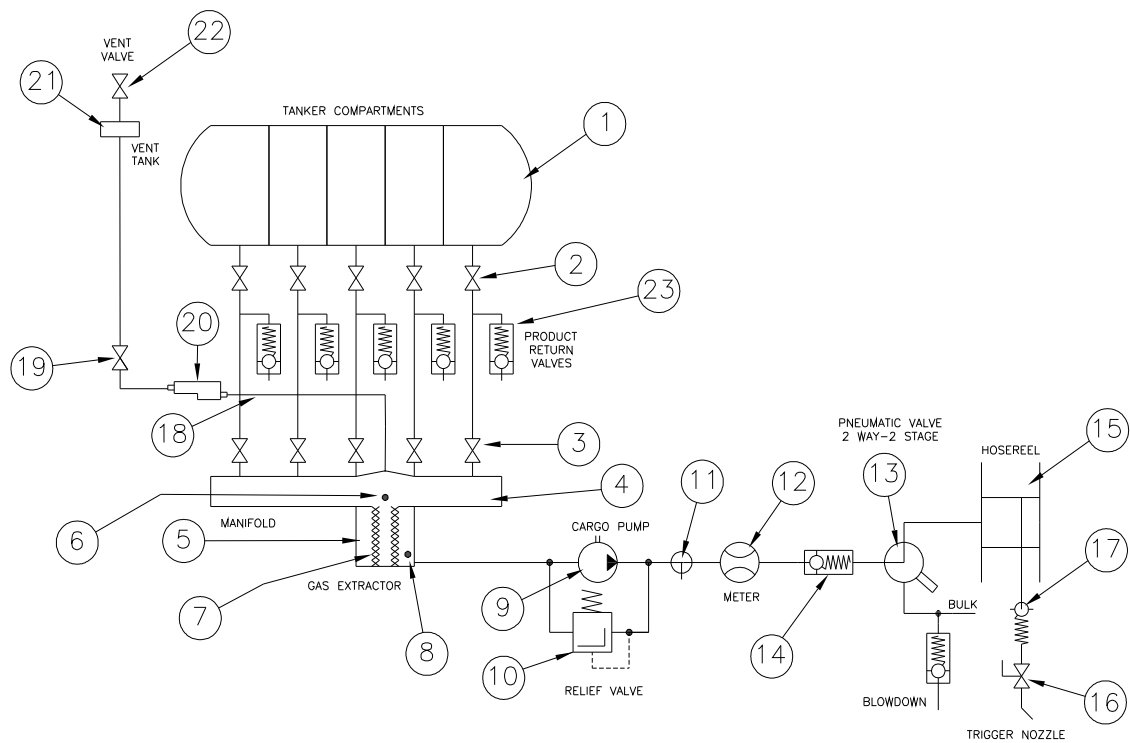


Figure 1 - Hydraulic System Schematic

- 1 Tank with 5 compartments**
- 2 Foot Valve**
- 3 Manifold Valve**
- 4 Manifold Tube**
- 5 Special Gas Extractor**
- 6 Optical liquid sensor (upper)**
- 7 Filter screen**
- 8 Optical liquid sensor (lower)**
- 9 Cargo pump**
- 10 Air operated relief valve**
- 11 Manual 2-way valve**
- 12 Flow Meter with pulser**
- 13 2-way Diverter Valve**
- 14 Non-return valve (optional)**
- 15 Hose Reel**
- 16 Delivery Nozzle**
- 17 Non-return valve**
- 18 Vent tube**
- 19 Vent Valve (lower)**
- 20 Intermediate Expansion Tank**
- 21 Catchment Tank**
- 22 Vent valve (upper)**
- 23 Product Return Valve**

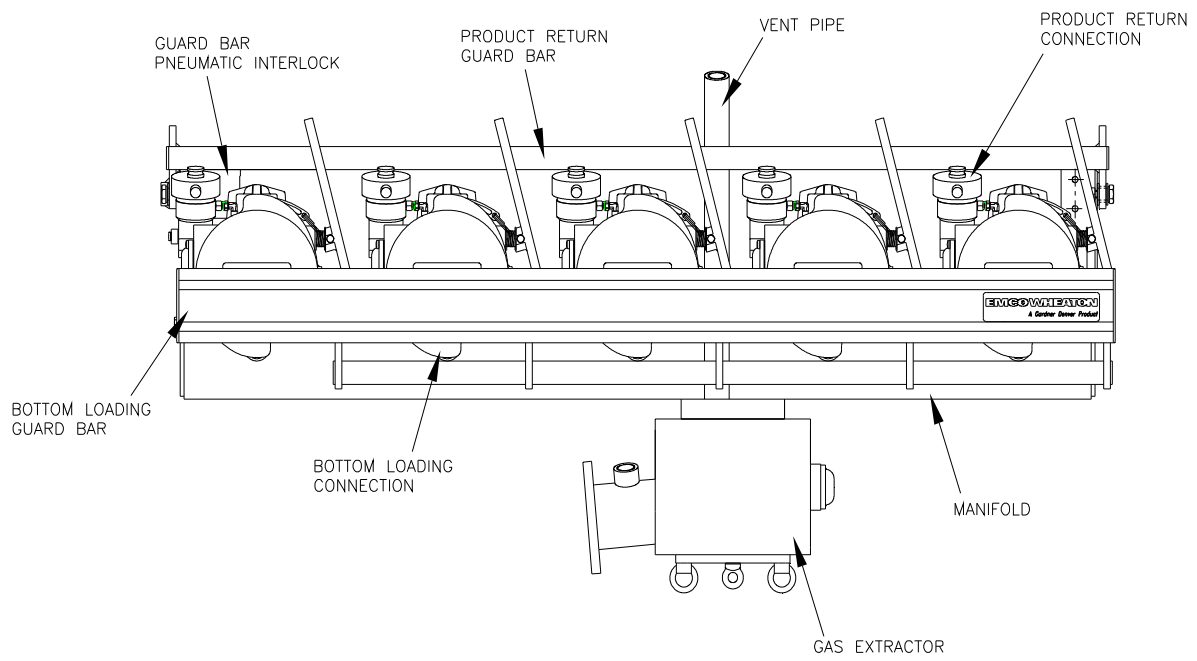


Figure 2 - Manifold with Product Return – Front View

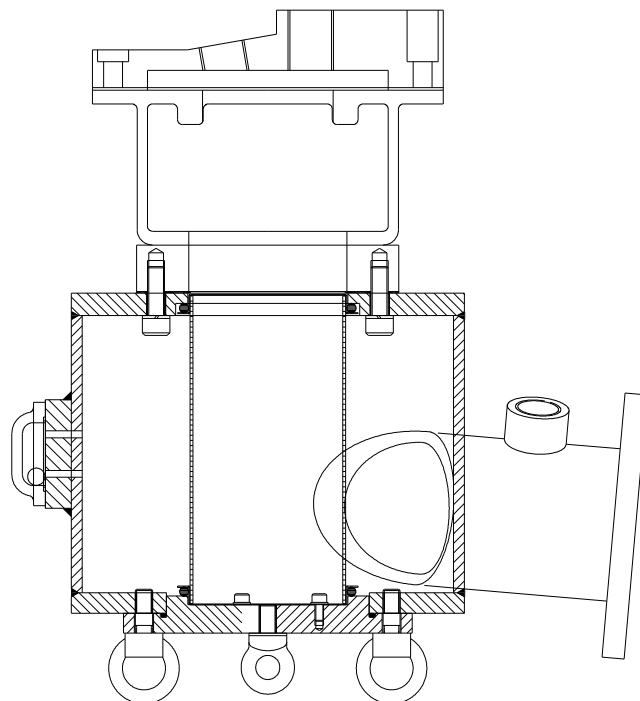


Figure 3 - F0361 type Special Gas Extractor



Figure 4 – Sealing of F1031 LC2005 Electronic Register Enclosure

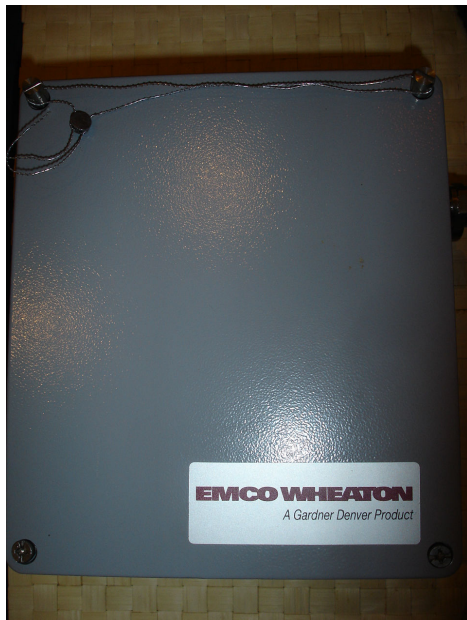


Figure 5 – Sealing of Meter Signal Interface Enclosure



Figure 6 – F1032 DKM Display Keypad Module

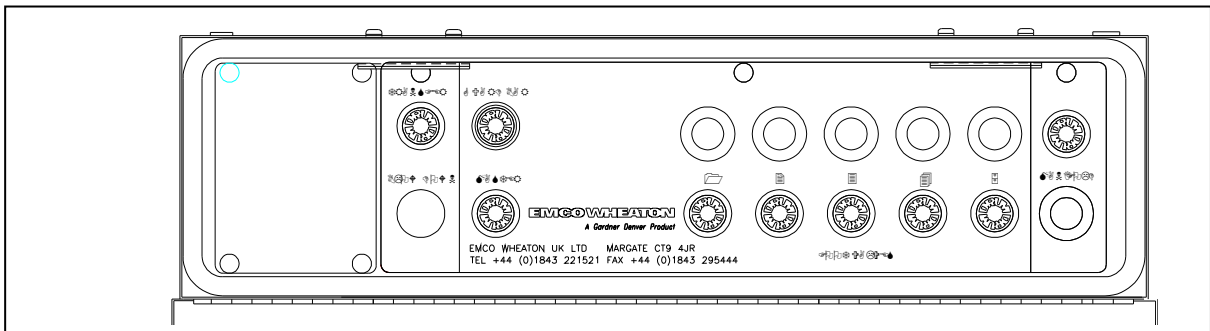


Figure 7 – Electro/Pneumatic Control Panel

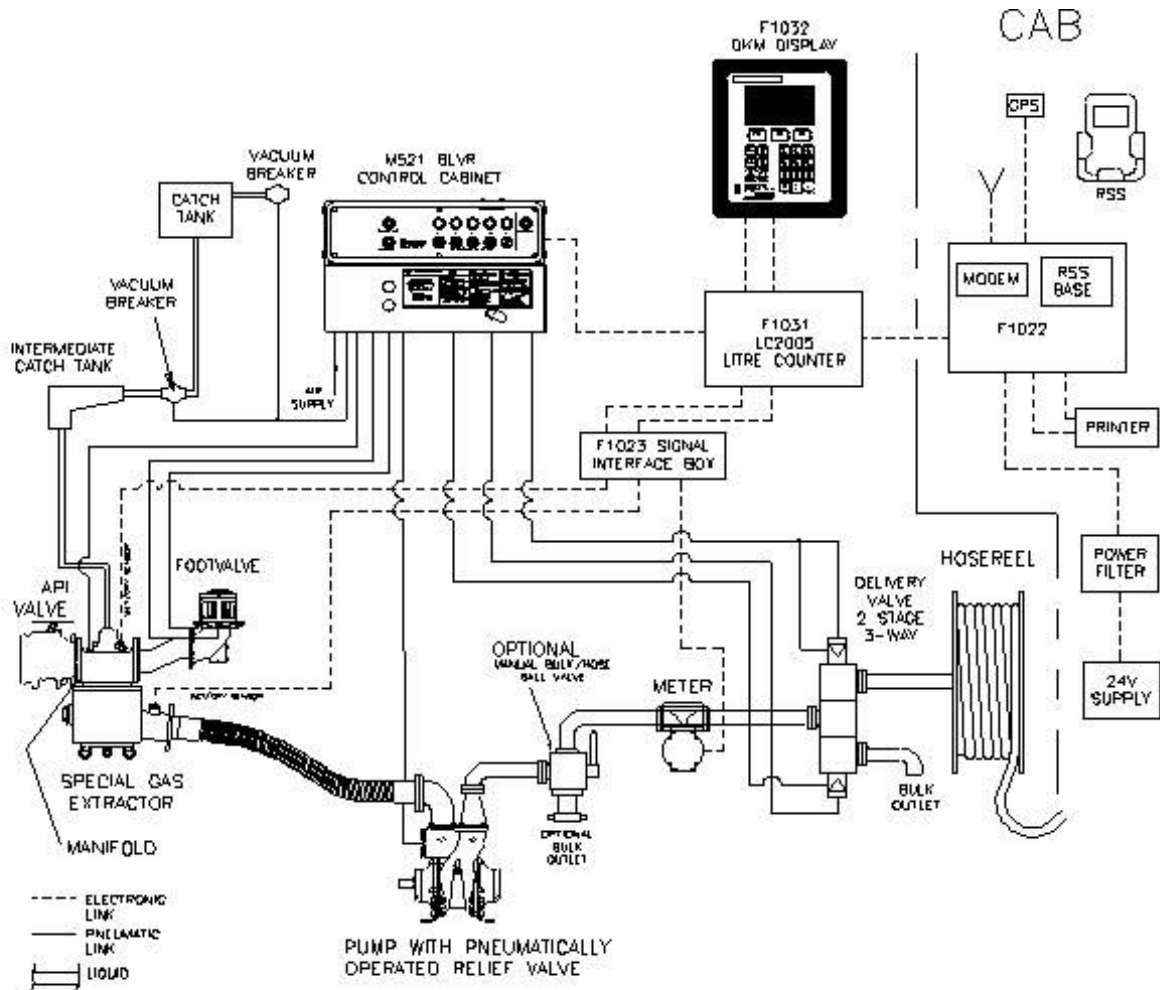


Figure 8 – EPMS DataPlus System Schematic

