

(UK/0126/0026)



MI-005

United Kingdom of Great Britain and Northern Ireland

Certificate of EC type-examination of a measuring instrument

Number: UK/0126/0026

issued by the Secretary of State for Innovation, Universities & 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:

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Italy

in respect of a static or vehicle-mounted meter measuring system for liquids other than water designated the GEM-XXX-XX and having the characteristics as described in the descriptive annex.

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
Department for Innovation, Universities & Skills
Stanton Avenue
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Middlesex TW11 0JZ
United Kingdom

Issue Date: 19th December 2008
Valid Until: 18th December 2018
Reference No: T1121/0021

Descriptive Annex

1 INTRODUCTION

This pattern is a meter measuring system for liquids other than water of low viscosity stored at atmospheric pressure. It comprises a pump, a gas extractor, a meter with a full hose and/or an empty hose. The register may be either electronic or mechanical with a printer. The system may be configured as follows:

- a. Fixed, mounted at ground level.
- b. Fixed, mounted on a frame with a mechanism to allow retraction underground after use.
- c. Fixed, mounted underground.
- d. Mobile, mounted on a metal frame with wheels.
- e. Fitted to a road tanker for the transport and delivery of liquids other than water.

Typical examples are shown in Figures 2, 3, 4, 5, 6 and 7.

2 FUNCTIONAL DESCRIPTION

The system is constructed in various sizes to provide flow between 150-750 litres/minute and consists essentially of three main components housed in a metal enclosure.

- i. Motorized pumping unit which alternatively may be located outside the enclosure close to the storage tank.
- ii. Measuring components comprising of a meter, register and gas elimination device.
- iii. Transfer point comprising of a hose and nozzle.

2.1 Pumping arrangement

The pump may be driven directly by an electric motor or through a reduction gearbox or belt & pulley. Alternatively the pump may be driven by an internal combustion engine (5-10 Hp) through a gearbox or a hydraulic motor directly to the pump drive shaft. The pump is fitted with a by-pass valve to limit the maximum pressure and is adjustable to between 2 and 5 bar. An additional bypass valve may be installed to reduce the flowrate when the user is filling small tanks. A micro filter and separator may be installed down stream of the pump if used with jet fuels to remove dirt and water.

2.2 Gas extractors

Manufacturer	Model designation	Evaluation certificate
Total Control Systems	TCS 740-xx series	GB-1273

2.2.1 The gas removal pipe shall be constructed of a material that shows any evidence of deformation (e.g. metal) and shall be sealed to prevent removal.

2.3 Meters

Manufacturer	Model designation	Evaluation certificate
Total Control Systems	TCS 700-xx series	GB-1273

2.4 Registers and ancillary devices

Manufacturer	Device	Type	Model designation	Evaluation certificate
Veeder Root	Register	Mechanical	7887	Covered by this approval
Veeder Root	Preset (optional)	Mechanical	7889	Covered by this approval
Veeder Root	Printer	Mechanical	7888	Covered by this approval
Veeder Root	Register	Electronic	EMR ³	GB-1285
Any	Simple slip printer	Electronic	Any	Covered by this approval

2.5 Transfer point

2.5.1 Hoses

The hose may be wound onto a hose reel if over two metres in length. The hose type and length shall be selected to ensure that the increase in hose volume from when not under pressure to when under pressure without liquid flow (in the uncoiled hose position) shall not exceed twice E_{min} . For systems without a hose reel the increase in internal volume shall not exceed E_{min} .

2.5.2 Nozzles

A nozzle shall be installed that effectively shuts off the flow of liquid.

3 TECHNICAL DATA

3.1 System

Technical data	Field of operation
Accuracy class	0.5
Minimum rate of flow	See table in section 3.2
Maximum working pressure:	5 bar
Minimum delivery (MMQ):	See table in section 3.2
Climatic environment:	-10 °C to +40 °C Open, condensing
Electromagnetic environment:	E1, E2 or E3
Mechanical environment:	M1 (static installation) M2 (vehicle mounted)
Type of liquid	Liquids other than water of low viscosity (<20mPa.s) except liquefied gases (refer to manufacturers specifications for suitable products)

The maximum rate of flow, however, must not be greater than the maximum rate of flow of any component of the system.

3.2 Meters

Model designation	Size	Flow rate range		MMQ
		Qmin	Qmax	
	(mm)	(L/min)	(L/min)	(L)
TCS 682-15	38	10	187	10
TCS 700-15	38	32	226	10
TCS 700-20	50	50	380	50
TCS 700-25	50	50	550	50
TCS 700-30	75	100	760	100
TCS 700-35	75	100	1155	100
TCS 700-40	100	151	1893	200
TCS 700-45	100	151	2271	200

4 APPROVAL CONDITIONS

The certificate is issued subject to the following conditions:

4.1 Legends and inscriptions

4.1.1 The instrument bears the following legends (see Figure 5 for an example):

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

5 LOCATION OF SEALS AND VERIFICATION MARKS

5.1 The CE marking shall be impossible to remove without damaging it. The labels shall be impossible to remove without them being destroyed.

The markings and inscriptions shall fulfil the requirements of Paragraph 9 of Annex I of the Directive 2004/22/EC.

5.2 Components that may not be dismantled or adjusted by the user will be secured by either a wire and seal or tamper evident label and securing mark. The securing mark may be either:

- a mark of the manufacturer and/or manufacturer's representative, or
- an official mark of a verification officer.

5.2.1 The following items shall be secured:

- the meter against removal and as described in the applicable evaluation certificate.
- the gas extractor against removal and as described in the applicable evaluation certificate
- the mechanical connections between the meter sensor and the pulser (if applicable)
- the electronic calculating/indicating device against removal and as described in the applicable evaluation certificate.

6 RECOMMENDED TESTS

6.1 The meter measuring system should be tested at a minimum of two substantially different rates of flow between the maximum and minimum rates of flow.

The meter measuring system shall be tested by a minimum of three repeat runs at each flow rate. Each run shall have a minimum duration of one minute.

Due regard should be paid to the viscosity of the liquid used for the verification tests to ensure that the permitted limits of error are not likely to be exceeded when other liquids which the system is intended to measure are metered.

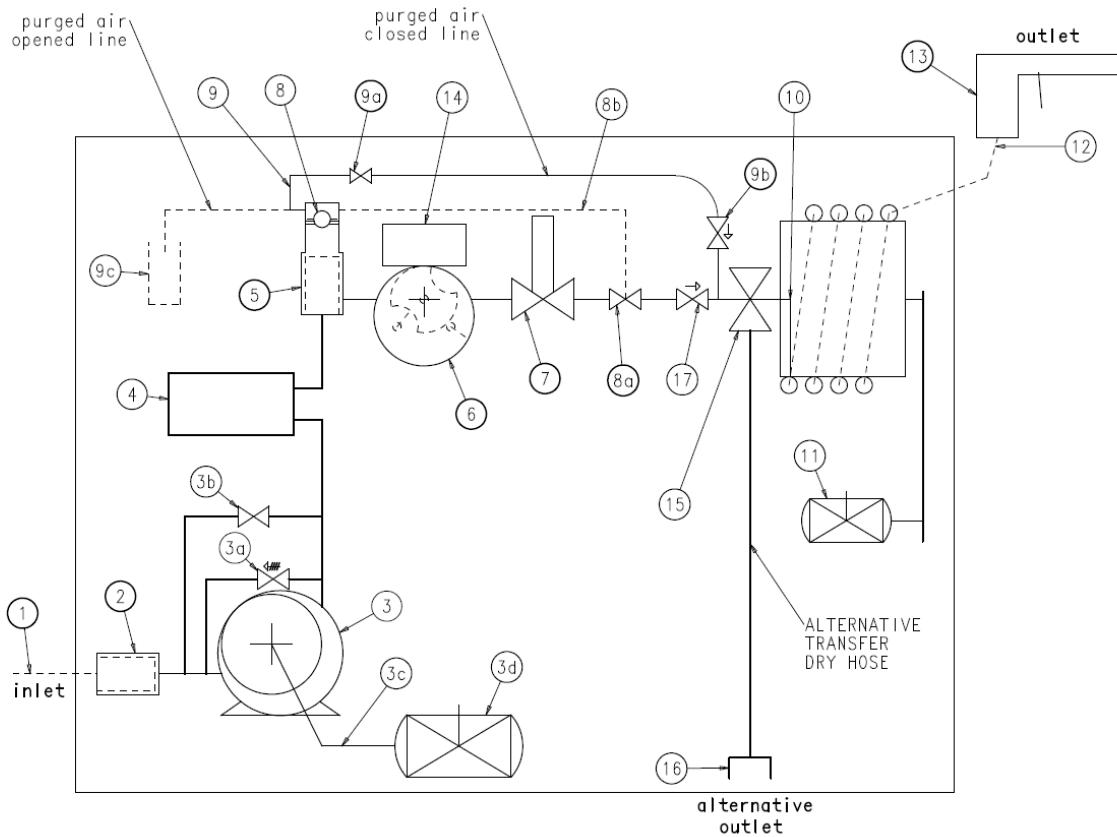
6.2 Check the hose expansion volume, for hoses wound onto a reel the test should be conducted with the hose fully unwound. This can be carried out by stopping the flow using the pre-set valve, then close the nozzle, note the indication and then apply full pumping pressure. The indication will change to show the hose expansion. Other suitable methods may be used.

7 ILLUSTRATIONS

- Figure 1 Hydraulic diagram GEM
- Figure 2 GEM 150R-KX
- Figure 3 GEM300R-SE
- Figure 4 GEM 300S-SE
- Figure 5 GEM 150-C
- Figure 6 GEM500R-KX
- Figure 7 GEM500R-KXS
- Figure 8 Example of system identification plate

8 CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
UK/0126/0026	17 December 2008	Type examination certificate first issued.
-	-	-



components

1) inlet 2"-3"-4"	8b) air check pipe
2) pump strainer 1.5"-2.5"-3"	9) purged air pipe 1/2"
3) volumetric pump 1.5"-2.5"-3"	9a) 1/2" valve
3a) internal adjustable bypass	9b) 1/2" back-check valve
3b) external adjustable bypass (option)	9c) container (for diesel oil applications)
3c) gearbox or belt+pulley	10) hose reel 2"-2.5"-3" (option)
3d) electric motor 2-3-5.5-7.5-10-15 Hp	11) hose reel rewinder (option)
4) filter separator (option for jet fuels)	12) up to 100 mt of hose DN32-40-50-80 (option)
5) meter strainer 1.5"-2"-3"	13) nozzle up to 2.5" (option)
6) meter 1.5"-2"-3"	14) mechanical head + preset & ticket printer (options)
7) preset valve 1.5"-2"-3" (option)	14) electronic head+pulsar and ticket printer (option)
8) air eliminator 1.5"-2"-3"	15) diverter valve + 16) quick coupler (options)
8a) air check 1.5"-2"-3"	17) check valve

The maximum pressure of the system is determined from the pump bypass. it is adjustable between 2 and 5 bar

Figure 1 Hydraulic diagram GEM



Figure 2 **GEM 150R-KX**

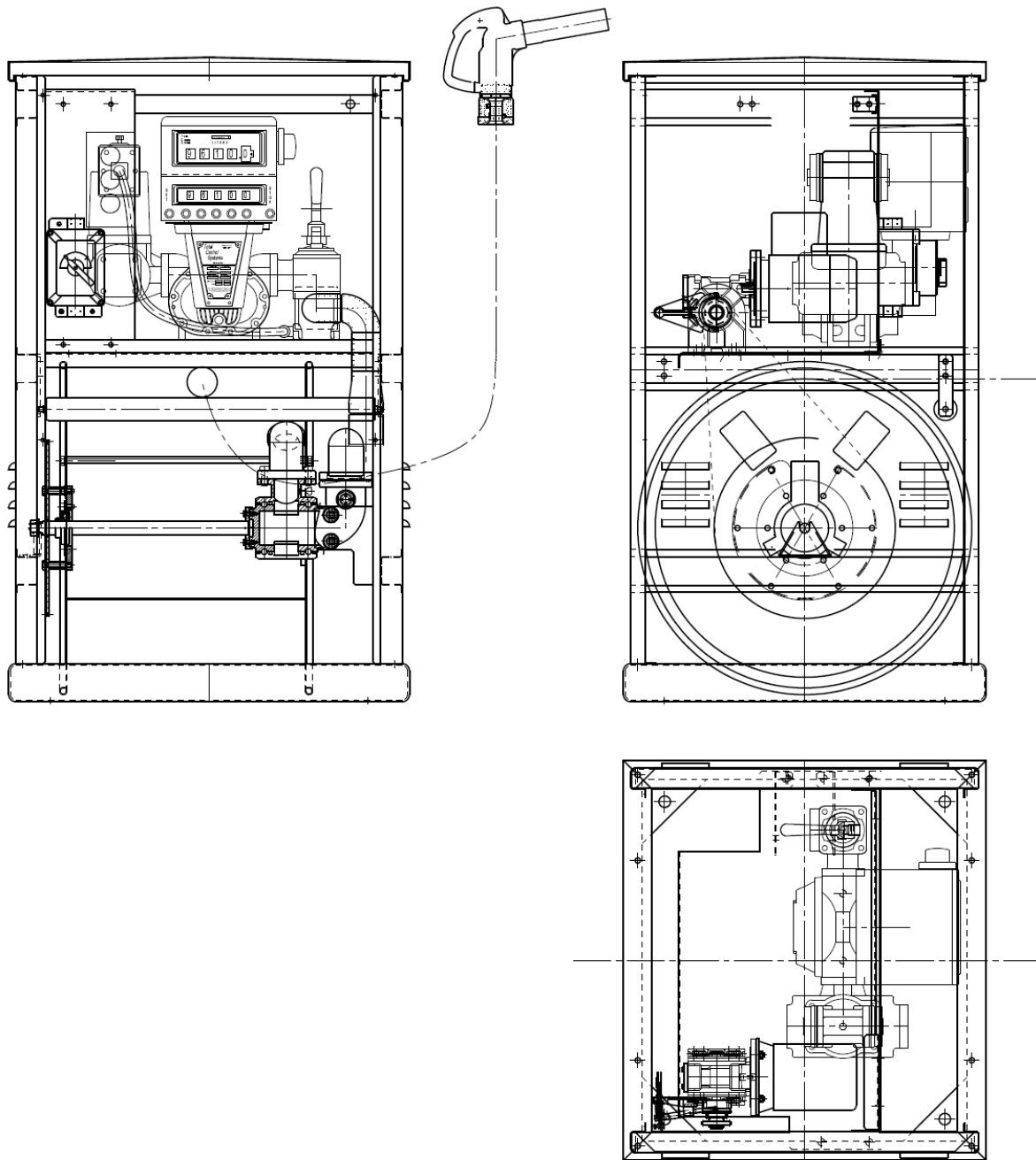


Figure 3 **GEM300R-SE**

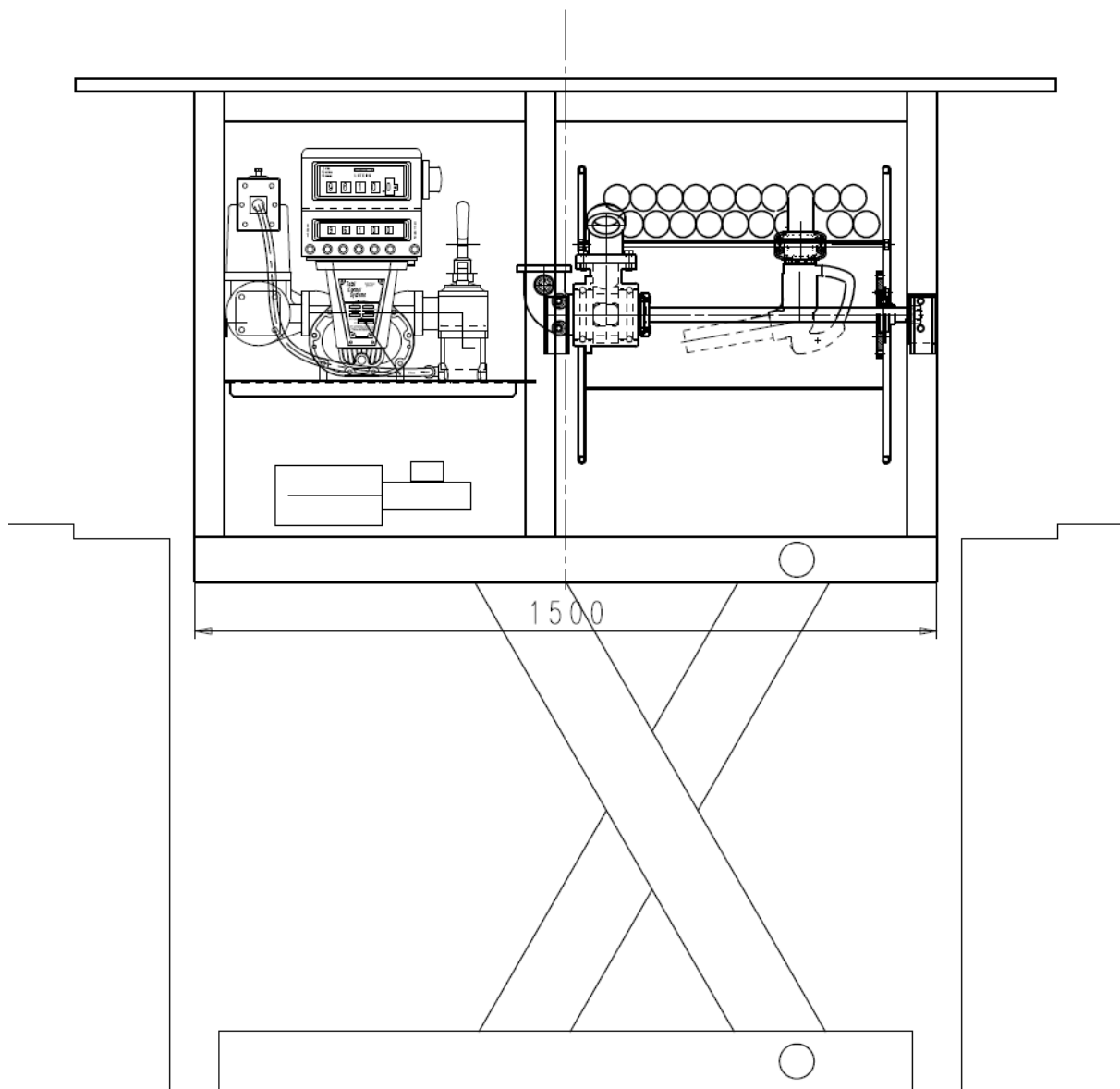


Figure 4 **GEM 300S-SE**



Figure 5 **GEM 150-C**



Figure 6 **GEM500R-KX**



Figure 7 GEM500R-KXS

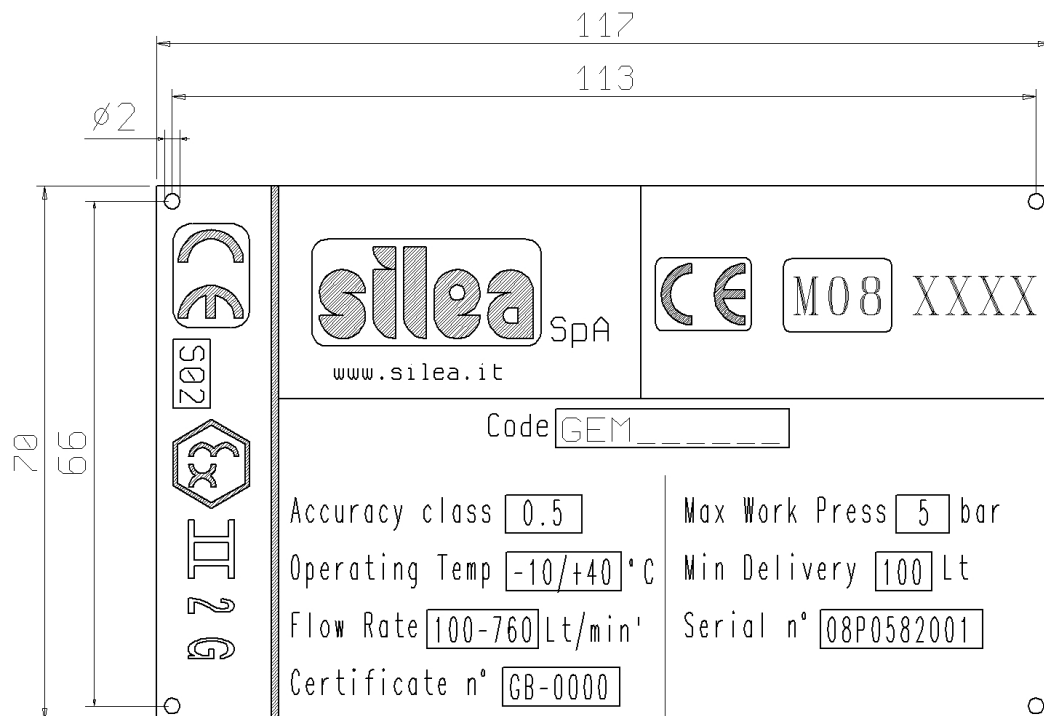


Figure 8 Example of system identification plate