

(UK/0126/0075)



MI-005

United Kingdom of Great Britain and Northern Ireland

Certificate of EC type-examination of a measuring instrument

Number: UK/0126/0075

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

**Compact Metering Solutions
47 Redford Road
Cullybackey
N Ireland
BT43 5PR**

in respect of vehicle-mounted meter measuring systems for liquids other than water, designated the CMS DD400 and CMS BD1100, 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 Dixon
for Chief Executive
National Weights & Measures Laboratory
(part of the National Measurement Office)
Department for Business, Innovation and Skills
Stanton Avenue
Teddington
Middlesex, TW11 0JZ
United Kingdom

Issue Date: 17 March 2010
Valid Until: 16 March 2020
Reference No: T1121/0027

Descriptive Annex

1 INTRODUCTION

This pattern is a meter measuring system for fitting to a road tanker for the transport and delivery of liquids other than water of low viscosity stored at atmospheric pressure. It comprises a pump, a gas extractor, a meter with a full hose reel and/or an empty hose according to type (paragraph 2). The register may be either electronic or mechanical with a printer.

The system allows:

- i. Metered delivery by pumping (full or empty hose)
- ii. Direct delivery, with or without pumping, without passing through the meter.

2 FUNCTIONAL DESCRIPTION

The designation CMS DD400 applies to assemblies with one or more full hoses only. The designation CMS BD1100 applies to assemblies with one empty hose and one full hose. The hydraulic systems for both types are shown in Figures 1 and 2 respectively. Both types may be either 50mm or 75mm systems. Typical layout for truck applications is shown in Figure 3.

2.1 List of gas extractors

Manufacturer	Model designation	Evaluation certificate
Total Control Systems	TCS 740-xx series	GB-1273
Total Control Systems	TCS 745-xx series	GB-1273

2.2 List of meters

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

2.3 List of registers and ancillary devices

Manufacturer	Device	Type	Model designation	EEC pattern approval / Evaluation certificate
Veeder Root	Register	Mechanical	7887	D 79.5.243.01 D 81.5.243.19
Veeder Root	Preset (optional)	Mechanical	7889	D 83.5.531.12
Veeder Root	Printer	Mechanical	7888	D83.5.521.09
Veeder Root	Register	Electronic	EMR ³	GB-1285
Any	Simple slip printer	Electronic	Any	(as described in an EEC pattern approval / Evaluation certificate)

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:	10.5 bar
Minimum delivery (MMQ):	See table in section 3.2
Climatic environment:	-10°C to +40°C Open, condensing
Electromagnetic environment:	E3 (vehicle mounted)
Mechanical environment:	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 (mm)	Flow rate range		MMQ (L)
		Q _{min} (L/min)	Q _{max} (L/min)	
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

4 APPROVAL CONDITIONS

The certificate is issued subject to the following conditions:

4.1 Legends and inscriptions

The following legends are durably and legibly marked on a plate attached to the system (see Figure 5):

Manufacturer's name:	Compact Metering Solutions
Manufacturers designation:	CMS DD400 or CMS BD1100
Serial number:	
Date of manufacture:	
Accuracy class:	0.5
Liquids measured:	
Flow rate range:	L/min
Minimum delivery:	50 or 100 litres
Maximum operating pressure:	10.5 bar
Environment	-10°C/+40°C, M3 Vehicle mount
Metrology markings:	CE-mark Supplementary metrology marking Notified Body verification mark
Type Examination certificate	UK/0126/0075

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 Annex I Paragraph 9 of 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:

- (i) the components of the system in accordance with the requirements of the relevant pattern approvals.
- (ii) the components of the system as described below and shown in Figures 5 and 6.

5.2.1.1 Meter Assembly

The following sealing arrangement is common to both the CMS DD400 (Figure 5) and the CMS BD1100 (Figure 6) systems:

- P1 – Sealing of the screws fixing air eliminator to filter housing.
- P2 – Sealing air eliminator (front/rear) cover screws to gas removal pipe fitting.
- P3 – Sealing of the screws fixing filter to meter housing.
- P4 – Sealing of the screws fixing front cover to meter housing.
- P5 – Sealing of the screws fixing rear cover to meter housing.
- P6 – Sealing of the screws at preset's side cover (cut-off adjuster).
- P7 – Sealing of the front cover screws at adjuster/transmission assembly housing (head support).
- P8 – Sealing of the screws fixing register head enclosure to its support.
- P9 – Sealing of the screws fixing preset valve to meter housing.
- P10 – Sealing of the screws fixing register enclosure (and printer when installed) to preset enclosure.
- P11 – Sealing of the preset valve top cover screws.
- P12 – Sealing of the screws fixing air-check valve to preset valve.
- P13 – Sealing of the air-check valve screws to gas removal pipe fitting toward air eliminator.
- P14 – Sealing of the air eliminator (front/rear) cover screws on side not attached to gas removal pipe (typically used for vapour recovery or venting purposes).

5.2.2 Transfer points

The remaining seals downstream of the meter assembly shall be specific for each system outflow alternative, which will obviously depend on the desired transfer point(s).

As detailed above, any connection installed between the outflow of the meter assembly and the final transfer point(s) at any measuring system shall be protected from tampering or fraudulent use. In order to achieve this, the general premise shall be to seal every joint, flange, valve, pipework, etc. downstream of the meter assembly up to the end delivery point(s) installed.

For that purpose, the additional seals for every type of measuring system shall match precisely the following description:

5.2.2.1 CMS DD400 measuring system with one full hose

- P15 – Sealing of the air-check valve screws to pipework inlet flange.
- P16 – Sealing of the pipework outlet flange to full hose assembly inlet flange (hose reel, etc.).
- P17 & P18 – Sealing of the additional flanges along full hose layout as required (long pipework, curves, elastic joints, etc.)

5.2.2.2 CMS DD400 measuring systems with two full hoses

- P15 – Sealing of the air-check valve screws to pipework inlet flange.
- P16 – Sealing of the pipework outlet flange to 3-way valve inlet flange.
- P17 – Sealing of the 3-way valve first outlet flange to full hose assembly #1 inlet flange.
- P18 – Sealing of the 3-way valve second outlet flange to full hose assembly #2 inlet flange.
- P19 & P20 – Sealing of the additional flanges along full hoses layouts as required (long pipework, curves, elastic joints, etc.)

5.2.2.3 CMS BD1100 measuring systems with one empty hose and one full hose.

- P15 – Sealing of the air-check valve screws to pipework inlet flange.

6 **RECOMMENDED TESTS**

The meter measuring system shall 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 rate of flow. Each run shall have a minimum duration of one minute.

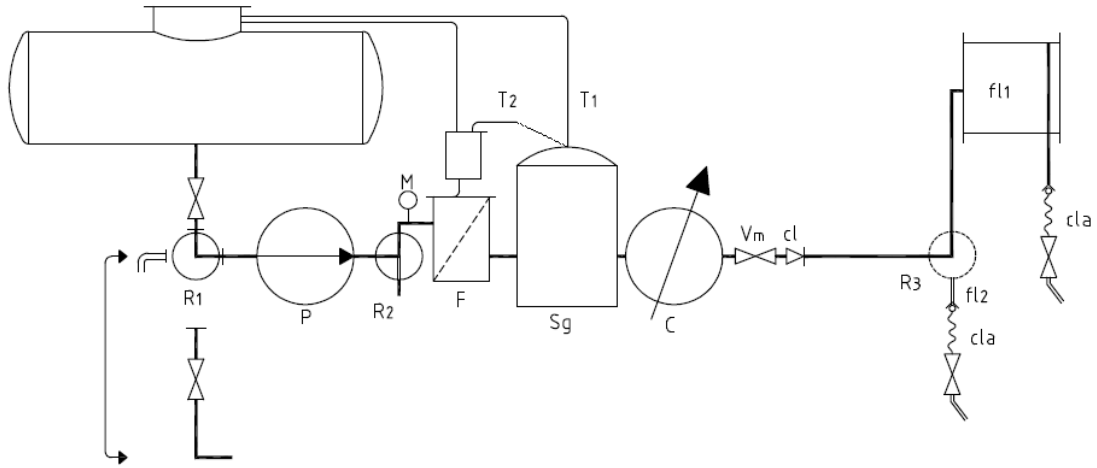
Due regard shall be paid to the viscosity of the liquid used for the verification tests to ensure that the permitted limits of error are not likely to be exceeded when other liquids which the system is intended to measure are metered.

7 **ILLUSTRATIONS**

- Figure 1 Hydraulic diagram CMS DD400
- Figure 2 Hydraulic diagram CMS BD1100
- Figure 3 Typical layout for truck application
- Figure 4 Example of system identification plate
- Figure 5 CMS DD400 seals
- Figure 6 CMS BD1100 seals

8 **CERTIFICATE HISTORY**

ISSUE NO.	DATE	DESCRIPTION
UK/0126/0075	17 March 2010	Type examination certificate first issued



R1	TWO WAY VALVE (OPTIONAL)
P	PUMP
M	MANOMETER
R2	TWO WAY VALVE (OPTIONAL)
F	FILTER
Sg	AIR ELIMINATOR/GAS EXTRACTOR
T1,T2	GAS EVACUATION DEVICE
C	METER
Vm	HANDLING VALVE (PRESET) OPTIONAL
cl	AIR CHECK/BACK PRESSURE CHECK/NDN-RETURN VALVE
V1	SIGHT GLASS/EMPTY HOSE
fl1	FULL HOSE #1
fl2	FULL HOSE #2 (OPTIONAL)
cl a	NDN-RETURN VALVE (KEEP HOSE FULL OF LIQUID)
Re	HOSE SELCTION DEVICE (OPTIONAL)


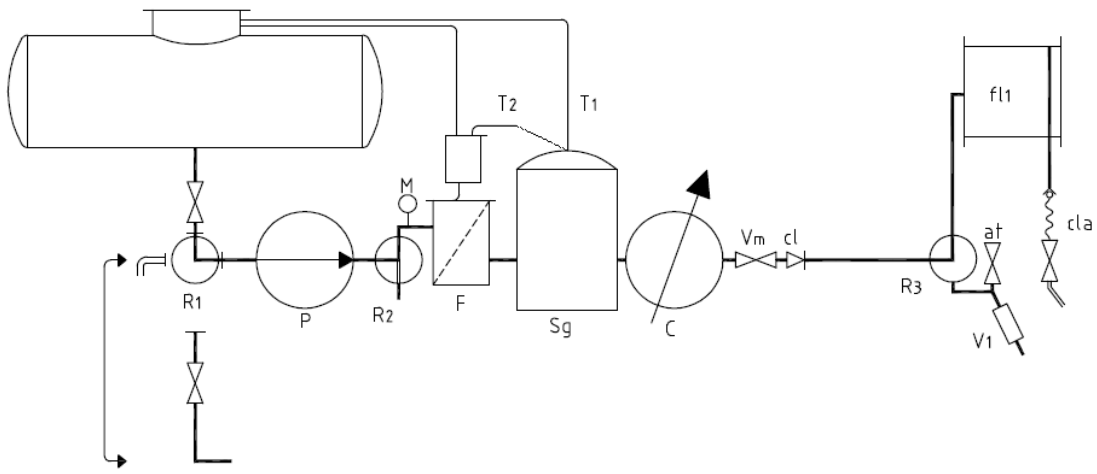
Rev	Detail	Filename	Drawn by	Date
		MT.01.00	S. Paul	02/02/10
<p>THE COPYRIGHT IN THIS DRAWING IS THE PROPERTY OF COMPACT METERING SOLUTIONS AND MAY NOT BE REPRODUCED IN WHOLE OR PART, IN ANY FORM, WITHOUT THE PERMISSION OF THE OWNER</p> <p>COMPACT METERING SOLUTIONS</p> <p>47 Redford Road Ballymena, Co. Antrim, BT43 5PR Tel: 02825 882882 Fax:02825 882880</p>		 1st Angle Projection	Project Title	
			Drawing Title Hydraulic Schematic Full Hose & Optional Full Hose	
		Scale	Drawing Number	Edition
		NTS	DD400	0
		Sheet		Sheet
		A4		1/1

Figure 1 Hydraulic diagram CMS DD400



R1	TWO WAY VALVE (OPTIONAL)
P	PUMP
M	MANOMETER
R2	TWO WAY VALVE (OPTIONAL)
F	FILTER
Sg	AIR ELIMINATOR/GAS EXTRACTOR
T1,T2	GAS EVACUATION DEVICE
C	METER
at	VENTING VALVE (EMPTY HOSE)
Vm	HANDLING VALVE (PRESET) OPTIONAL
cl	AIR CHECK/BACK PRESSURE CHECK/NON-RETURN VALVE
V1	SIGHT GLASS/EMPTY HOSE
fl1	FULL HOSE
cla	NON-RETURN VALVE (KEEP HOSE FULL OF LIQUID)
R3	HOSE SELCTION DEVICE


Rev	Detail	Filename	Drawn by	Date	
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COMPACT METERING SOLUTIONS 47 Redford Road Ballymena, Co. Antrim, BT43 5PR Tel: 02825 882882 Fax:02825 882880		 1st Angle Projection		Project Title	
		Scale NTS		Drawing Title Hydraulic Schematic Full Hose & Empty Hose	
		Sheet A4	Drawing Number BD1100	Edition 0	Sheet 1/1

Figure 2 Hydraulic diagram CMS BD1100

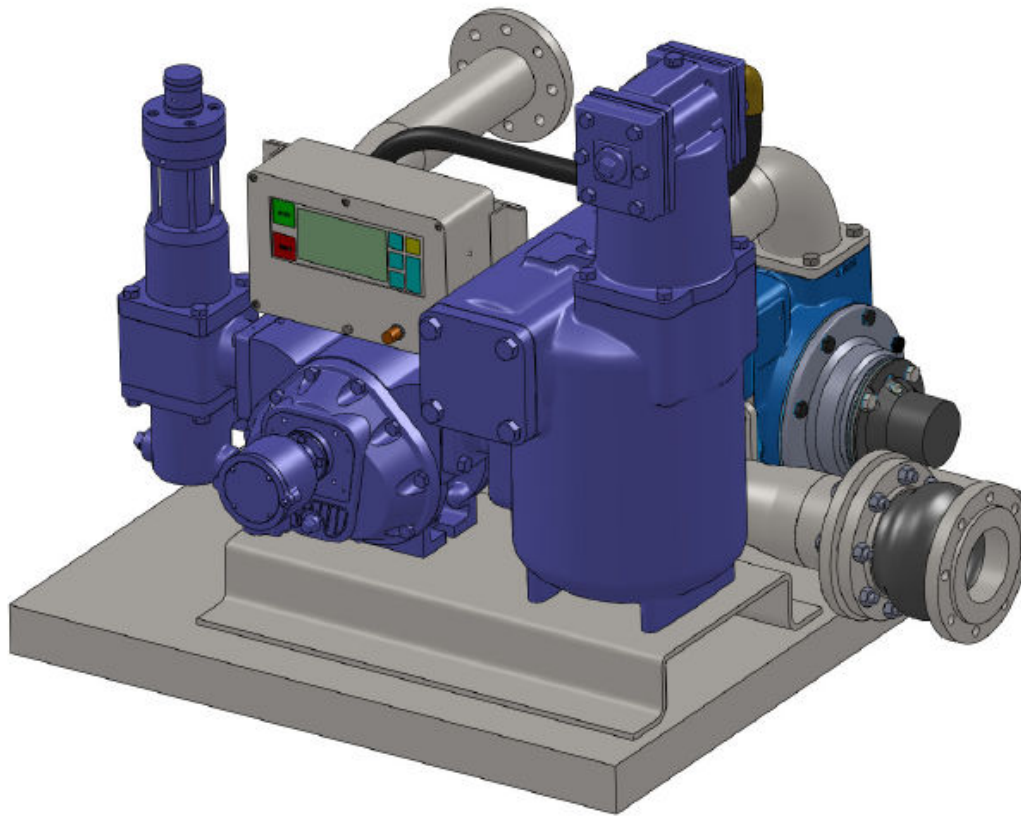




Figure 3 Typical layout for truck application



CMS
Compact Metering Solutions

Measuring System

Compact Metering Solutions
47 Redford Road
Cullybackey
N. Ireland
BT43 5PR
TEL: 02825 882 882
www.compactmetering.com

Model:	CMS DD 400
Serial number:	
Manufacturing date:	
Liquids measured:	PETROLEUM PRODUCTS
Accuracy class:	0.5 LIQUIDS < 20mPa.s
Measuring range:	0-99,999.9 LITRES
Flow rate range:	50-550 L/MIN
Minimum delivery:	50 LITRES
Maximum pressure:	10.5 BAR
Environment:	-10°C / +40°C , M3
Electrical supply:	12/24 V DC , 10A
Metrology approvals:	 M 10 xxxx Type Examination Certificate UK0126/XXXX

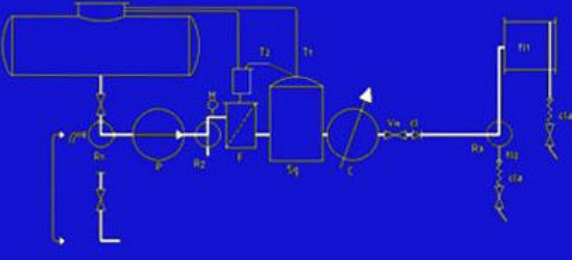


Figure 4 Example of system identification plate

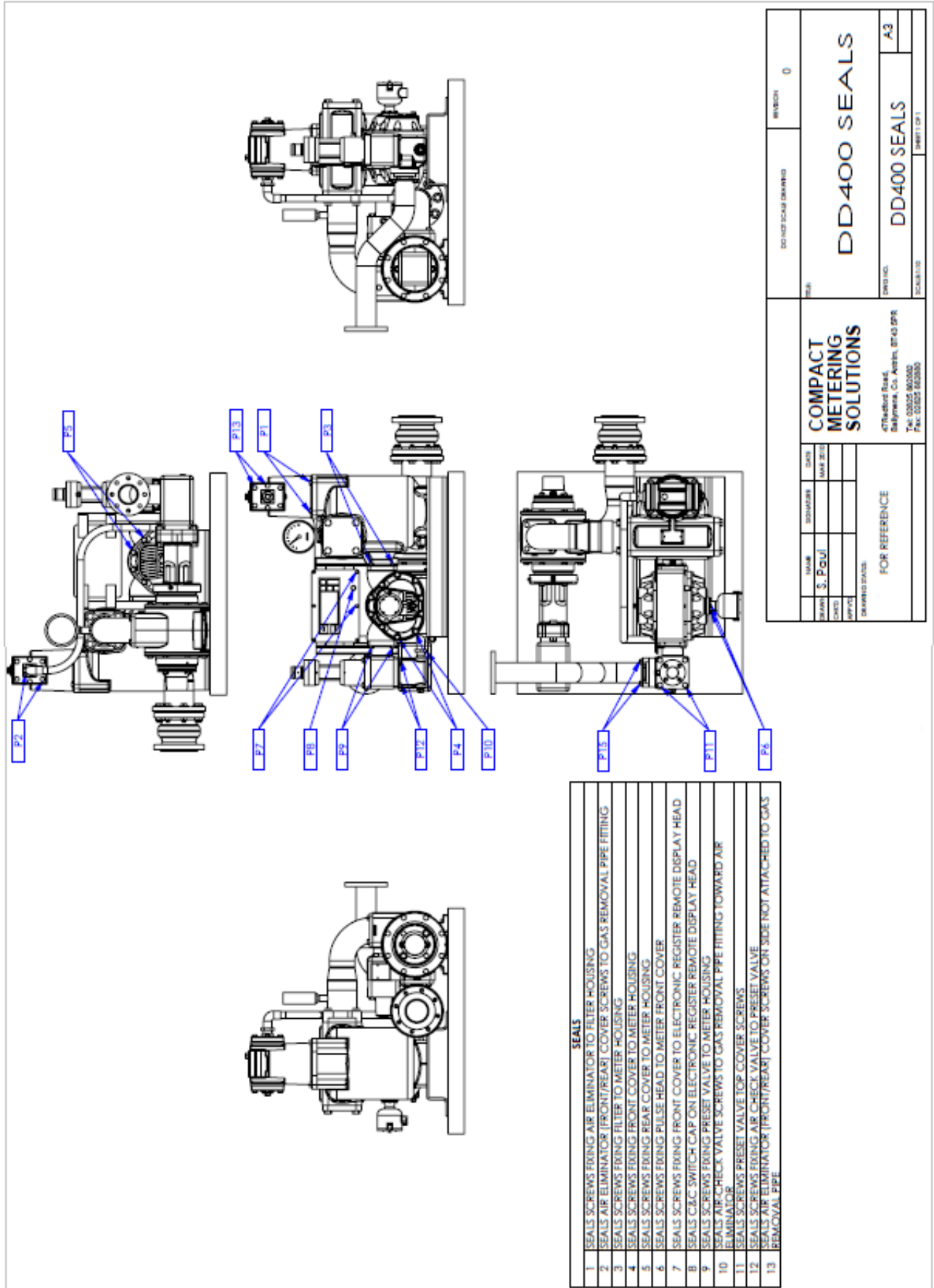


Figure 5 CMS DD400 sealing

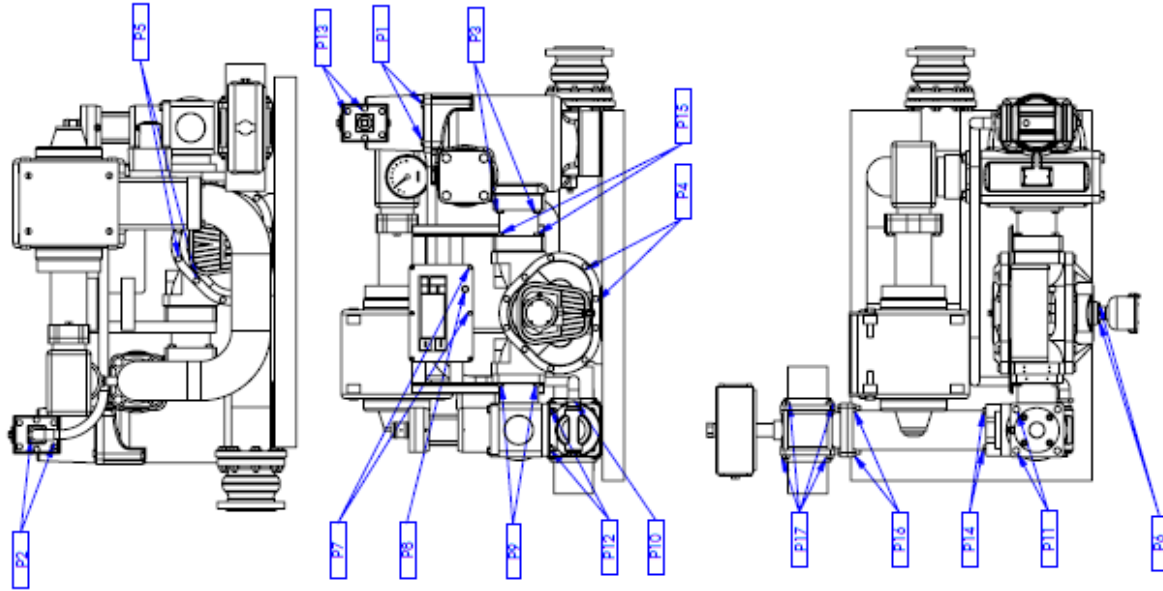


Figure 6 CMS BD1100 sealing

SEALS	
1	SEALS SCREENS FIXING AIR ELIMINATOR TO FILTER HOUSING
2	SEALS AIR ELIMINATOR FRONT/REAR COVER SCREWS TO GAS REMOVAL PIPE FITTING
3	SEALS SCREENS FIXING FILTER TO METER ADAPTOR PIPE
4	SEALS SCREENS FIXING FRONT COVER TO METER HOUSING
5	SEALS SCREENS FIXING REAR COVER TO METER HOUSING
6	SEALS SCREENS FIXING PULSE HEAD TO METER FRONT COVER
7	SEALS SCREENS FIXING FRONT COVER TO ELECTRONIC REGISTER REMOTE DISPLAY HEAD
8	SEALS C/B SWITCH CAP ON ELECTRONIC REGISTER REMOTE DISPLAY HEAD
9	SEALS SCREENS FIXING PRESSURE VALVE TO METER HOUSING
10	SEALS AIR-CHECK VALVE SCREWS TO GAS REMOVAL PIPE FITTING TOWARD AIR ELIMINATOR
11	SEALS SCREENS PRESSURE VALVE TOP COVER SCREWS
12	SEALS SCREENS FIXING AIR CHECK VALVE TO PRESSURE VALVE
13	SEALS AIR ELIMINATOR FRONT/REAR COVER SCREWS ON SIDE NOT ATTACHED TO GAS REMOVAL PIPE
14	SEALS SCREENS FIXING DISCHARGE PIPEWORK TO AIR CHECK VALVE
15	SEALS SCREENS FIXING METER ADAPTOR PIPE TO METER
16	SEALS SCREENS FIXING OUTLET PIPEWORK TO 4-WAY VALVE INLET
17	SEALS SCREENS FIXING VALVE OUTLET FLANGES TO VALVE BODY

NAME		DATE		REVISION	
S. POUJ		MAY 2010		0	
DRAWING SCALE		DRAWING SCALE		REVISION	
FOR REFERENCE		COMPACT METERING SOLUTIONS		BD1100 SEALS	
DRAWING SCALE		47Hedford Road, Balgynna, Co. Aghem, B143 5PH Tel: 02045 802802 Fax: 02045 802800		DWS NO. A3	
				SHEET 1 OF 1	

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