National Measurement Office

UK/0126/0061

MI-005

EC type-examination certificate UK/0126/0061 Revision 1

issued by:
The National Measurement Office
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 which implement, in the United Kingdom, Council Directive 2004/22/EC, this EC type-examination certificate has been issued to:

Isoil Impianti S.p.A
74, Via Madonna delle Rose
ITA – 24061
Albano S.
Alessandro BG, Italy

in respect of an interruptible measuring system for liquids other than water and having the characteristics described below.

Model designation:	50 mm (2”) / 75 mm (3”)
Maximum rate of flow:	500 litres / minute (2” system) 1300 litres / minute (3” system)
Minimum rate of flow:	40 litres / minute (2” system) 100 litres / minute (3” system)
Maximum operating pressure:	10 bar (3” system), 20 bar (2” system)
Minimum delivery:	50 litres (2” system), 100 litres (3” system)
	Liquids measured: Liquids other than water with viscosity between 0.3 mPa.s. and 750 mPa.s, except Non - Newtonian and food liquids

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.

This revision replaces previous versions of the certificate.

Issue Date: **06 May 2011**
Valid Until: **08 March 2020**
Reference No: **T1121/0026**

Signatory: **P R Dixon**
for **Chief Executive**

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UKAS PRODUCT CERTIFICATION 0135

BIS Department for Business Innovation & Skills

Descriptive Annex

1 INTRODUCTION

This pattern is a meter measuring system fitted to a road tanker for the transport and delivery of liquids with low viscosity stored at atmospheric pressure. It comprises a pump, a gas extractor and a meter with a full or empty hose reel and mechanical or electronic meter. The system allows:

(a) metered delivery by pumping (full or empty hose)
(b) metered delivery by gravity (empty hose)
(c) direct delivery, with or without pumping, without passing through the meter.

2 CONSTRUCTION

2.1 Hydraulics

One example of the system configuration is shown in Figure 1, accompanied by a key at Section 9.1. Variations of the system are one or two full hoses, one empty hose or a combination of one full and one empty hose. Other systems could be considered with other variations as different input connections, and additional supply hoses.

2.2 List of gas extractors

	Manufacturer	**Model designation**	**EEC pattern approval number**
a)	Isoil Impianti S.p.A	75 FDS	I 95.07.01.0001
b)	Isoil Impianti S.p.A	FDS 150	I 95.07.01.0002

2.3 List of meters

System	**Manufacturer**	**Model designation**	**EEC pattern approval number**
75 mm	Isoil Impianti S.p.A	SBM 150	D 79.5.243.01
50 mm	Isoil Impianti S.p.A	SBM 75	D 81.5.243.19

2.4 List of electronic and mechanical meter registers

System	**Manufacturer**	**Model designation**	**EEC pattern approval number/ Evaluation certificate**
50 mm	Veeder-Root	Counter 7887	D 79.5.243.01
75 mm	Veeder-Root	Counter 7887	D 81.5.243.19
Both	Veeder-Root	Preset 7889	D 83.5.531.12
Both	Veeder-Root	Ticket Printer 7888	D83.5.521.09
Both	Isoil Impianti S.p.A	Vega T	LNE - 13954
Both	Isoil Impianti S.p.A	Vega II	LNE - 12081

2.5 Optional Equipment

- Preset valve
- Pulse emitter
- Flow rate indicator

2.6 Peripheral devices

The printer is typically an Epson TM-U295 slip printer. It is used for printing delivery tickets showing the date and time of a delivery, the ticket number, the quantity delivered, the price and other operator entered details. The nature and format of the ticket record is set up using the Register menu system.

Any simple recipient printer may be used in place of the Epson TM-U295 printer provided:

(i) it bears the CE mark for conformity to the EMC Directive 89/336/EEC;

(ii) it is not capable of transmitting any data or instructions into the Vega T other than for releasing the printout, checking for correct data transmission;

(iii) it prints delivery results and other data as received from the Vega T without any modification or further processing.

3 SUPPORTING DOCUMENTATION

MA 027-10-EN:	3" system with electronic counter
MA 027-05-EN:	3" system mechanical
MA 026-04-EN:	2" system with electronic counter
MA 026-03-EN:	2" system mechanical

4 TECHNICAL DATA

Technical data	**50 mm system**	**75 mm system**	**unit**
Nominal bore:	50	75	mm
Maximum rate of flow*[1]:	500	1300	litres / minute
Minimum rate of flow:	40	100	litres / minute
Maximum working pressure:	20	10	bar
Minimum delivery :	50	100	litres

Liquids measured:	Liquids other than water with viscosity Between 0.3 mPa.s. and 750 mPa.s,except Non - Newtonian and food liquids
Liquid Temperature Range*[2]:	(The temperature range is always 60 °C)
Climatic environment:	-25 °C to +55 °C Open, condensing
Electromagnetic environment:	E3
Mechanical environment:	M2 (vehicle mounted)
Accuracy class:	0.5

*[1] The maximum rate of flow, however, must not be greater than the maximum rate of flow of any component of the system

*[2] The minimum temperature of the range varies in steps of 10 °C, the minimum and maximum temperature must be between -40°C and +170 °C.
e.g. -40 °C to +20 °C up to +110 °C to +170 °C.

5 APPROVAL CONDITIONS

The certificate is issued subject to the following conditions:

5.1 Legends and inscriptions

5.1.1 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

6 SECURING

6.1 Sealing

The following shall be sealed to prevent unauthorised adjustment or dismantling:

a) the components of the system in accordance with the requirements of the relevant approvals as listed in section 2. Examples are shown in Figures 2 to 5.

b) the plate referred to in 5 shall be sealed or welded to a support of the system.

7 ALTERNATIVES

There are no alternatives.

8 RECOMMENDED TESTS

8.1 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.

8.2 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.

8.3 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.

9 ILLUSTRATIONS

9.1 Key to Figure 1

If the tank has several compartments and if a manifold is used, the foot valves in compartments and valves located on the suction pipe must be "all or nothing" type. The pipeline between compartments and the measuring system must ensure permanent links.

A: Anti swirl device

R1: two-way valve that allows delivery through a meter, delivery without meter, emptying and filling the tank without going through the meter. This valve is optional and can be replaced by a direct connection.

P: pump. The pump may be reversible. In this case, it must be added a non-return valve between the R2 tap the special gas extractor Pgs.

B: Derivation optional allowing delivery by gravity through the meter (empty hose). This derivation is authorized only if there is no tap R1.

R2: two-way valve, allowing optional direct grants without meter.

F: Filter. An evacuation tap is permitted only if it involves a check valve that prevents the introduction of gas into the measuring system.

PGS: special gas extractor for gas.

V1: sight glass of the special gas extractor

T1, T2, T3: Variations authorized for the exhaust gases device.

T1: use of a container with a recovery of liquid particles conveyed by the gas.

T2: return to the tank.

T1: use of a vent valve.

C: Meter.

Va: valve that is automatically closed by the special gas extractor for gas when the pressure is insufficient to prevent any evaporation in the meter, or if it appears a pocket of gas in the gas extractor. This valve should close in the event of a failure of its system of command.

I, II, III; Variations of the delivery system:

Variant I: one or two full hoses
Variant II: empty hose.
Variant III: Combination of one full and one empty hoses.

Vm: operating valve .

The automatic valve "Va" and the valve control "Vm" can be combined to form a special valve that performs both functions. The latter, in which case, they must be independent from each other.

In variants II and III involving the sight glass V3, this special valve must be mounted after the sight glass V3.

cl.: non-return valve.

V2: overflow sight glass

V3: sight glass also function as tracer of gas.

FL1: full hose rolled on the hose reel.

FL2: Possible second full hose, very short, which allows delivery to high flow.

cla: valve that prevents emptying of the full hose at: automatic or manual device for placing in communication with the atmosphere.

R3: Device that allows delivery for one or the other way when the measuring system has two delivery way.

Figure 1 **Hydraulic diagram**
Figure 2 **Sealing diagram: SBM 75 – MECHANICAL COUNTER**
Figure 3 **Sealing diagram: SBM 75 – ELECTRONIC COUNTER**
Figure 4 **Sealing diagram: SBM 150 – MECHANICAL COUNTER**
Figure 5 **Sealing diagram: SBM 150 – ELECTRONIC COUNTER**

10 CERTIFICATE HISTORY

ISSUE NO.	DATE	DESCRIPTION
UK/0126/0061	09 March 2010	Type examination certificate first issued.
UK/0126/0061 Revision 1	06 May 2011	Section 2.1 Reworded to highlight Figure 1 is an example of one possible configuration and other configurations are possible. Section 2.6 added

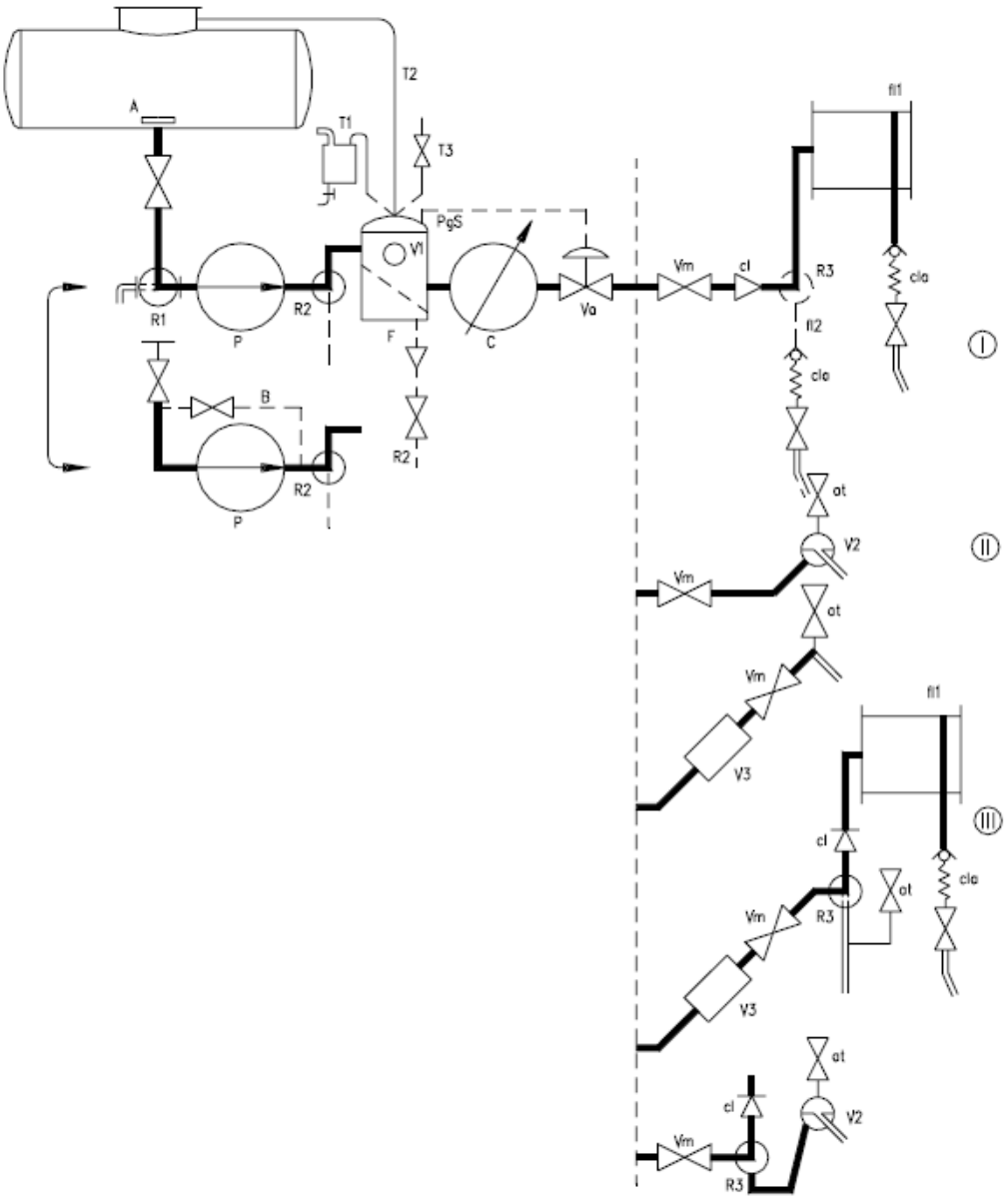
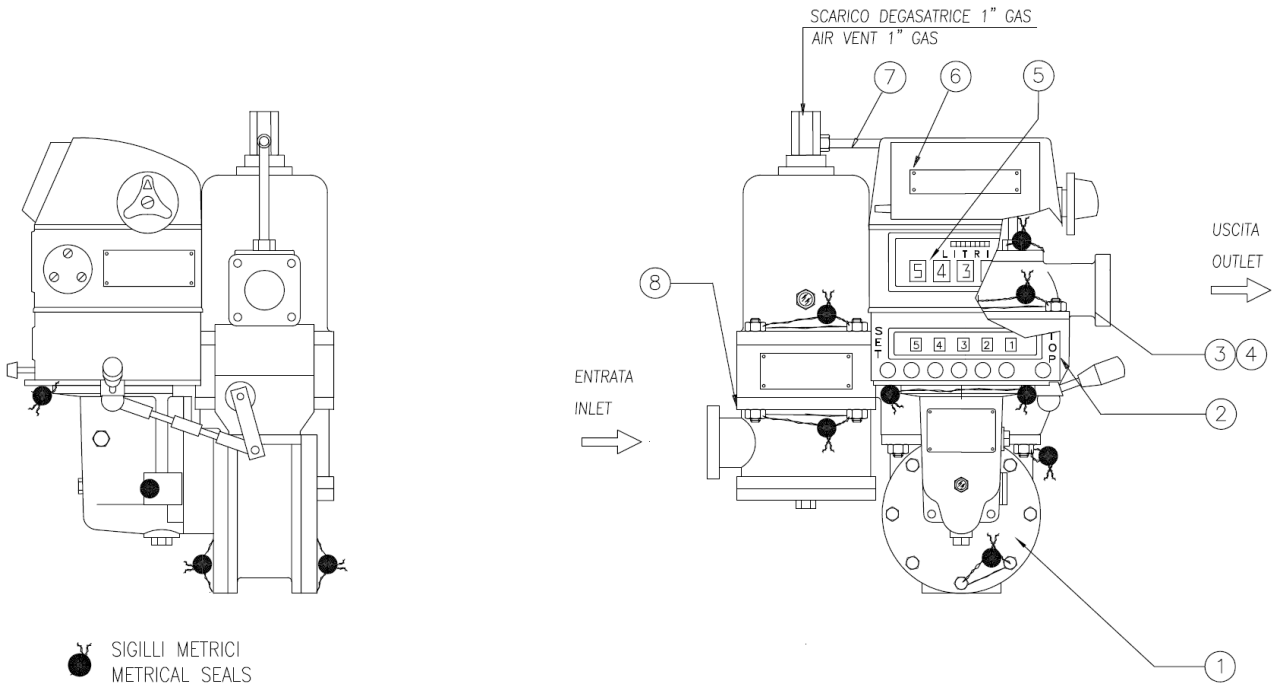
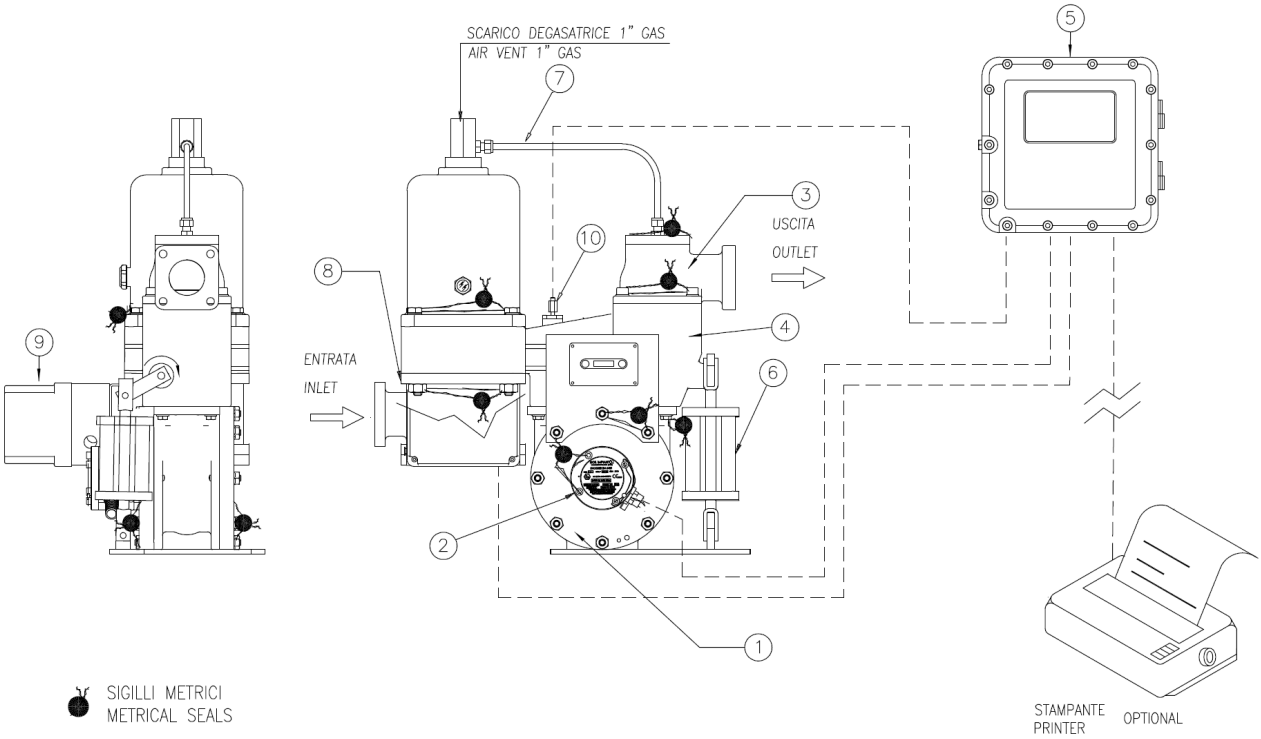


Figure 1 Hydraulic diagram



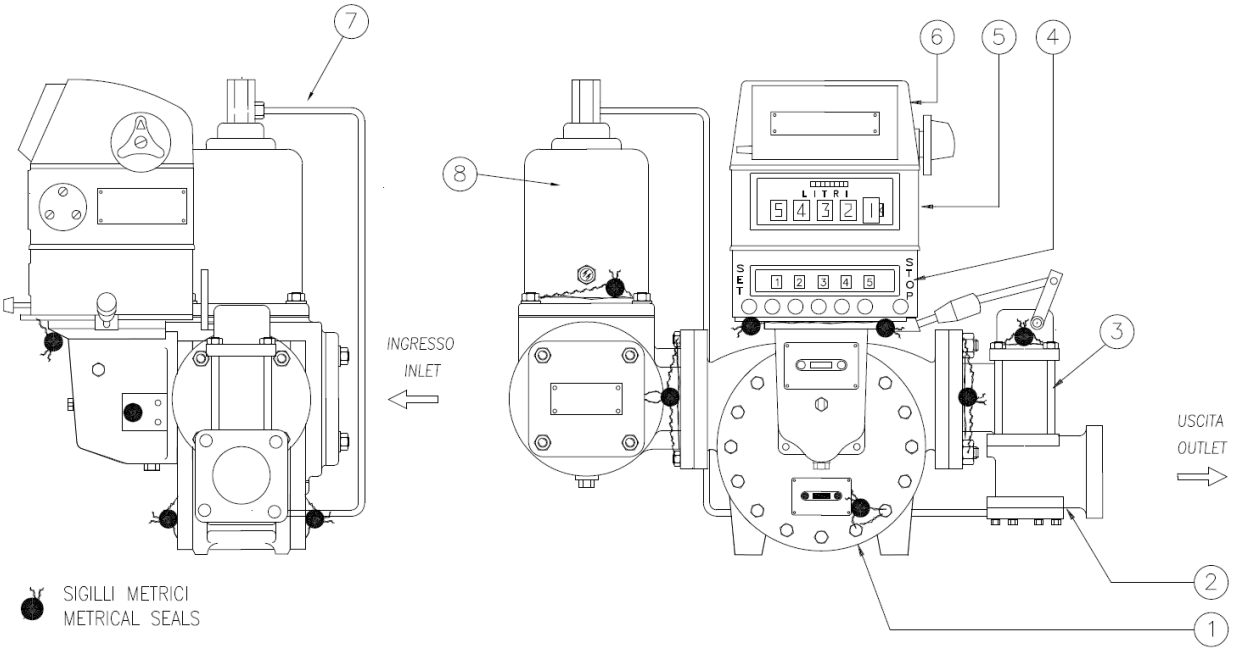
1	CONTATORE SBM 75	P.D. METER SBM 75
2	PREDETERMINATORE V.R. 7889	PRESET REGISTER V.R. 7889
3	VALVOLA CHECK	CHECK VALVE
4	VALVOLA PRESET	PRESET VALVE
5	TESTATA INDICATRICE V.R. 7887	COUNTER V.R. 7887
6	STAMPATORE V.R. 7888	TICKET PRINTER V.R. 7888
7	TUBO	PIPE
8	FILTRO / DEGASATORE SPECIALE	STRAINER / SPECIAL GAS EXTRACTOR

Figure 2 Sealing diagram: SBM 75 – MECHANICAL COUNTER



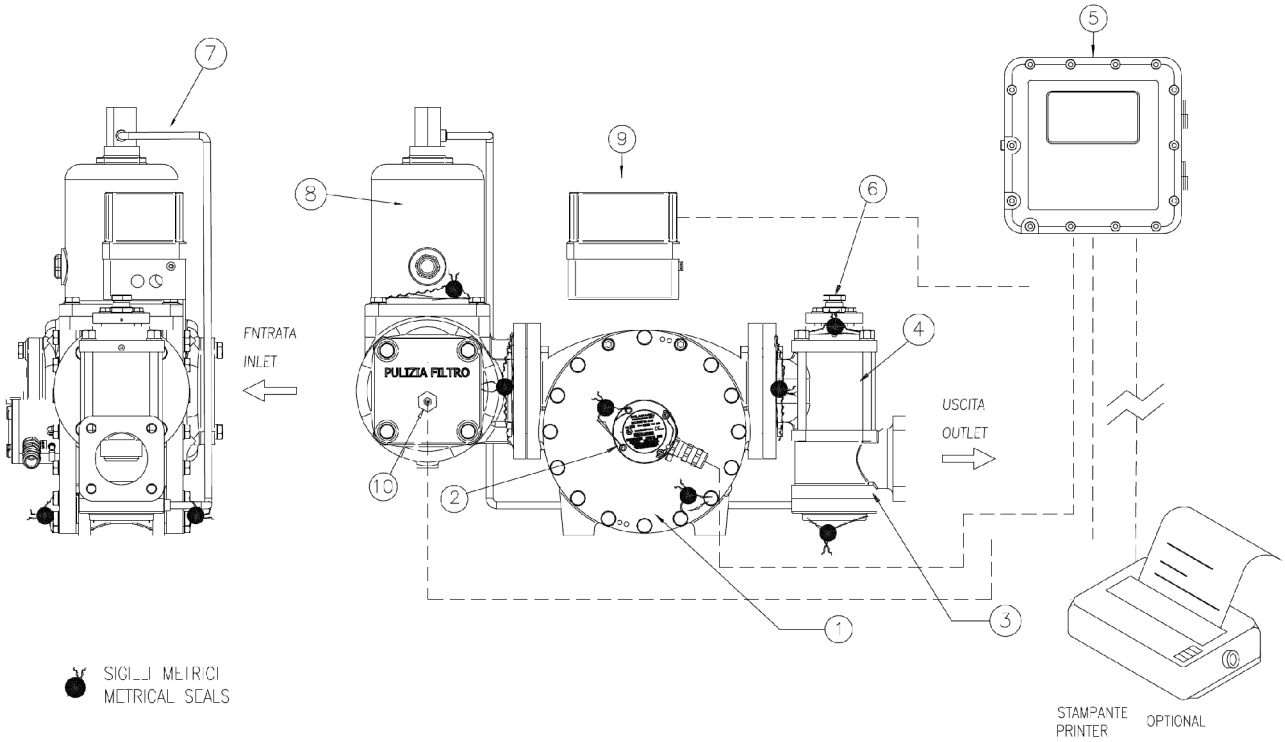
1	CONTATORE SBM 75	P.D. METER SBM 75
2	EMETTITORE D'IMPULSI	PULSE EMITTER
3	VALVOLA CHECK	CHECK VALVE
4	VALVOLA PRESET	PRESET VALVE
5	TESTATA ELETTRONICA VEGA T	VEGA T ELECTRONIC COUNTER
6	PISTONE PNEUMATICO	PNEUMATIC ACTUATOR
7	TUBO	PIPE
8	FILTRO / DEGASATORE SPECIALE	STRAINER / SPECIAL GAS EXTRACTOR
9	CONTENITORE ELETTROVALVOLE	SOLENOID VALVES BOX
10	TERMORESISTENZA Pt100 (OPTIONAL)	Pt100 TEMPERATURE PROBE (OPTIONAL)

Figure 3 Sealing diagram: SBM 75 – ELECTRONIC COUNTER



1	CONTATORE SBM 150	P.D. METER SBM 150
2	VALVOLA CHECK	CHECK VALVE
3	VALVOLA PRESET	PRESET VALVE
4	PREDETERMINATORE V.R. 7889	PRESET REGISTER V.R. 7889
5	TESTATA INDICATRICE V.R. 7887	COUNTER V.R. 7887
6	STAMPATORE V.R. 7888	TICKET PRINTER V.R. 7888
7	TUBO	PIPE
8	FILTRO / DEGASATORE SPECIALE	STRAINER / SPECIAL GAS EXTRACTOR

Figure 4 Sealing diagram: SBM 150 – MECHANICAL COUNTER



1	CONTATORE SBM 150	P.D. METER SBM 150
2	EMETTITORE D'IMPULSI	PULSE EMITTER
3	VALVOLA CHECK	CHECK VALVE
4	VALVOLA PRESET	PRESET VALVE
5	TESTATA ELETTRONICA VEGA T	VEGA T ELECTRONIC COUNTER
6	PISTONE PNEUMATICO	PNEUMATIC ACTUATOR
7	TUBO	PIPE
8	FILTRO / DEGASATORE SPECIALE	STRAINER / SPECIAL GAS EXTRACTOR
9	CONTENITORE ELETTROVALVOLE	SOLENOID VALVES BOX
10	TERMORESISTENZA Pt100 (OPTIONAL)	Pt100 TEMPERATURE PROBE (OPTIONAL)

Figure 5 Sealing diagram: SBM 150 – ELECTRONIC COUNTER