

## COMMISSION DIRECTIVE

of 1 July 1982

adapting to technical progress Council Directive 77/313/EEC on the approximation of the laws of the Member States relating to measuring systems for liquids other than water

(82/625/EEC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,

Having regard to Council Directive 71/316/EEC of 26 July 1971 on the approximation of the laws of the Member States relating to common provisions for both measuring instruments and methods of metrological control <sup>(1)</sup>, as last amended by the Act of Accession of Greece, and in particular Article 17 thereof,

Whereas, in view of technical developments in the field in question, Directive 77/313/EEC <sup>(2)</sup> should be amended;

Whereas the measures provided for in this Directive are in accordance with the opinion of the Committee on the Adaptation to Technical Progress of the Directives for the Elimination of Technical Barriers to Trade in Measuring Instruments,

HAS ADOPTED THIS DIRECTIVE:

*Article 1*

The Annex to Directive 77/313/EEC is hereby amended as follows:

1. Item 2.2.6.2.3 is replaced by the following:
  - '2.2.6.2.3. The compartments of the tank shall be fitted with an anti-swirl device, except where the measuring system has a gas

separator in conformity with item 1.6.2.1.4.'

2. The following item is inserted after item 3.1.2.4.2:
  - '3.1.3. In the case of the measuring systems referred to in 2.2 and 2.4, EEC pattern approval may be granted on the basis of drawings and diagrams, provided that they comply with the provisions of section 4.'
3. A section 4 is added in accordance with the Annex.

*Article 2*

Member States shall bring into force the laws, regulations and administrative provisions necessary in order to comply with this Directive on 1 May 1983. They shall forthwith inform the Commission thereof.

*Article 3*

This Directive is addressed to the Member States.

Done at Brussels, 1 July 1982.

*For the Commission*

Karl-Heinz NARJES

*Member of the Commission*

<sup>(1)</sup> OJ No L 202, 6. 9. 1971, p. 1.

<sup>(2)</sup> OJ No L 105, 28. 4. 1977, p. 18.

## ANNEX

## 4. MEASURING SYSTEMS FITTED TO ROAD TANKERS

## 4.1. General requirements

The measuring systems fitted to road tankers referred to in items 2.2 and 2.4 may obtain EEC pattern approval solely on the basis of an examination of the documents produced, if the latter are in conformity with one of the standard schemes referred to in item 4.2 and meet the requirements set out below:

4.1.1. Indication of the standard scheme adopted must be added to the markings specified in item 1.16.

4.1.2. The components of the measuring system must have received EEC pattern approval when such approval is specified either in Directive 71/319/EEC of 26 July 1971 relating to meters for liquids other than water, Directive 71/348/EEC of 12 October 1971 relating to ancillary equipment for meters for liquids other than water or in this Directive.

4.1.3. If a tank has several compartments, the outlet pipes from the compartments may be connected to a measuring system separately or through a manifold, unless otherwise specified in the relevant standard scheme. The provisions of the second paragraph of item 2.2.1 shall apply in all cases.

Where a measuring system is connected to several compartments through a manifold, there shall be a device for preventing several compartments from communicating with the measuring system simultaneously. This requirement does not, however, apply if the measuring system has a gas separator in conformity with item 1.6.2.1.4.

4.1.4. If a road tanker has two measuring systems which can be connected as required to one or more specific compartments, the pipes and valves must be arranged so that the two measuring systems cannot be connected to the same compartments simultaneously. In addition, the connections between compartments and measuring systems must be clearly marked so as to prevent a compartment being mistakenly connected to a measuring system not designed to measure the product which it contains.

4.1.5. If an anti-swirl device is specified requirement, it may be combined with the valve in the bottom of the compartment.

4.1.6. The pipework, valves and taps between compartments and measuring systems must be arranged in such a way that it is impossible to connect a measuring system to a tank separate from the road tanker.

4.1.7. The filter normally provided immediately upstream of the meter or the degassing equipment may be incorporated in the latter.

4.1.8. It must be possible to seal devices which allow delivery without passing through the meter in order to comply with any national requirements.

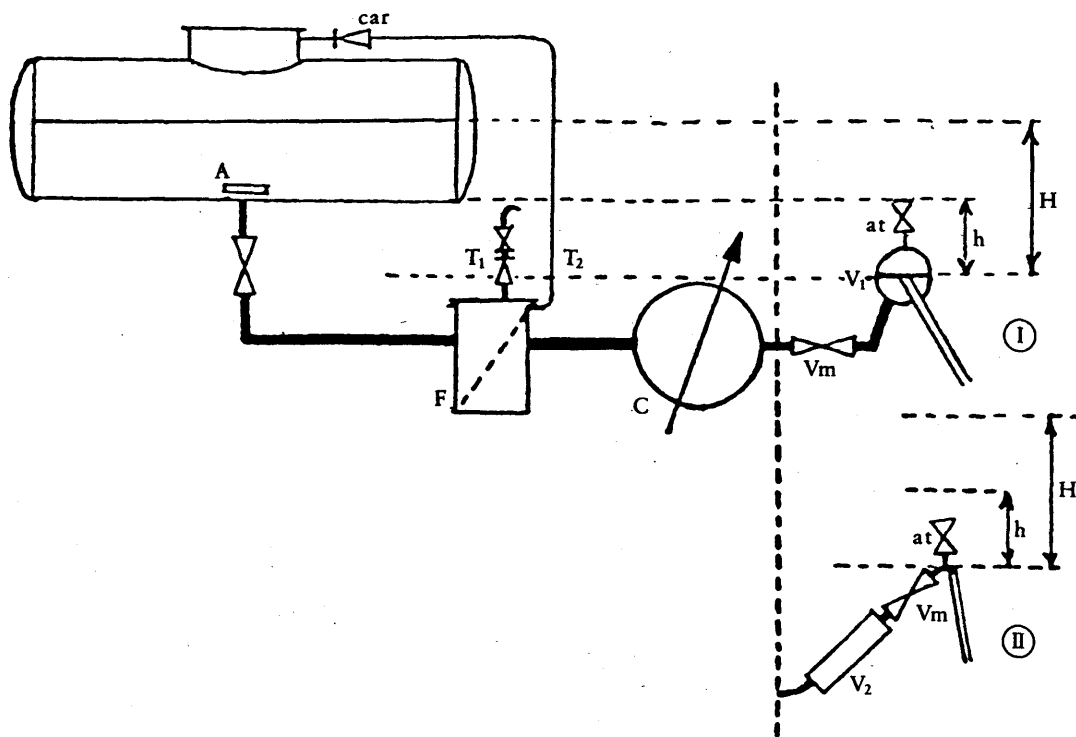
4.1.9. Where measuring systems include two-way valves, the latter must be so designed as to render simultaneous communication between the three orifices impossible.

## 4.2. Standard schemes

Standard scheme S 1

Operation by gravity with permanent vent at point of transfer

Allows : metered delivery only (empty hose).



*Key to standard scheme S 1*

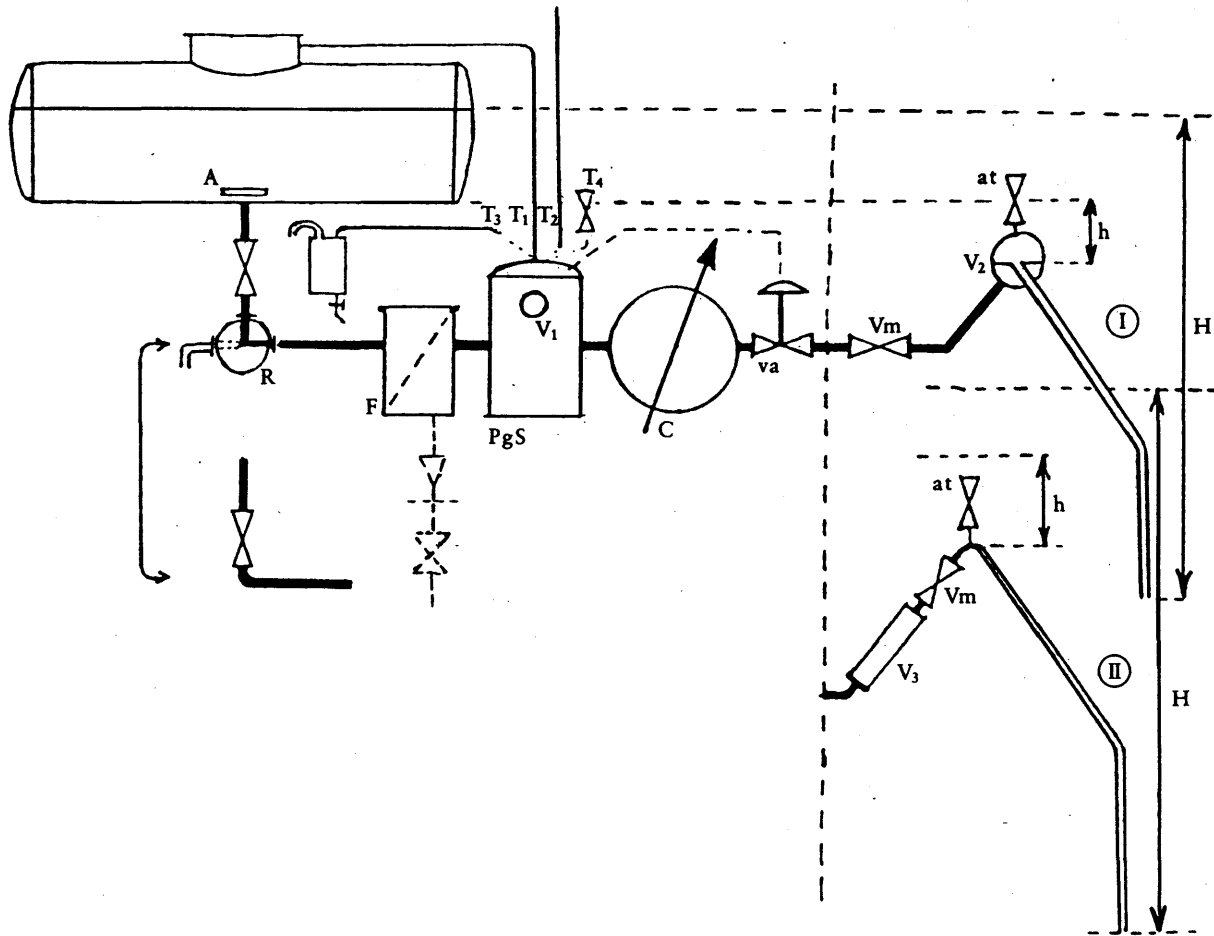
If the tank has several compartments, the measuring system must be directly and permanently connected to a specific compartment without a manifold.

- A: Anti-swirl device.
- F: Filter. The filter must be designed and installed in such a way that it can be cleaned without emptying the meter or the sight-glass ( $V_1$  or  $V_2$  respectively).  
The whole of the filter must be situated below the level of the point of transfer.
- $T_1, T_2$ : Variants authorized for gas evacuation.  
 $T_1$ : blow-off valve and non-return valve to prevent admission of gas into the measuring system.  
 $T_2$ : return to the gaseous phase in the tank compartment.
- car: Non-return valve to prevent gas flow in the event of thermal overpressure in the tank.
- C: Meter.
- $V_m$ : Operating valve.
- I and II: Variants of the empty-hose delivery system.
- $V_1$ : Weir-type sight glass.
- $V_2$ : Sight glass as defined in item 1.1.8, also serving as a gas indicator.
- at: Permanent air vent of sufficient cross-section to ensure that pressure in the meter is at least equal to atmospheric pressure.  
Permanent venting may be provided by a vertical tube without a valve. If this tube is connected to the top of the tank, the 'car' non-return valve is not needed.
- H: Head of liquid.
- h: Height of bottom of tank above point of transfer. This must be sufficient to ensure a flow rate at least equal to the meter's minimum flow rate until the tank is completely empty.

Standard scheme S 2

Operation by gravity without permanent vent at point of transfer during delivery

- Allows : (a) metered delivery (empty hose);  
 (b) direct unmetered delivery, emptying and filling of the tank without passing through the meter.



*Key to standard scheme S 2*

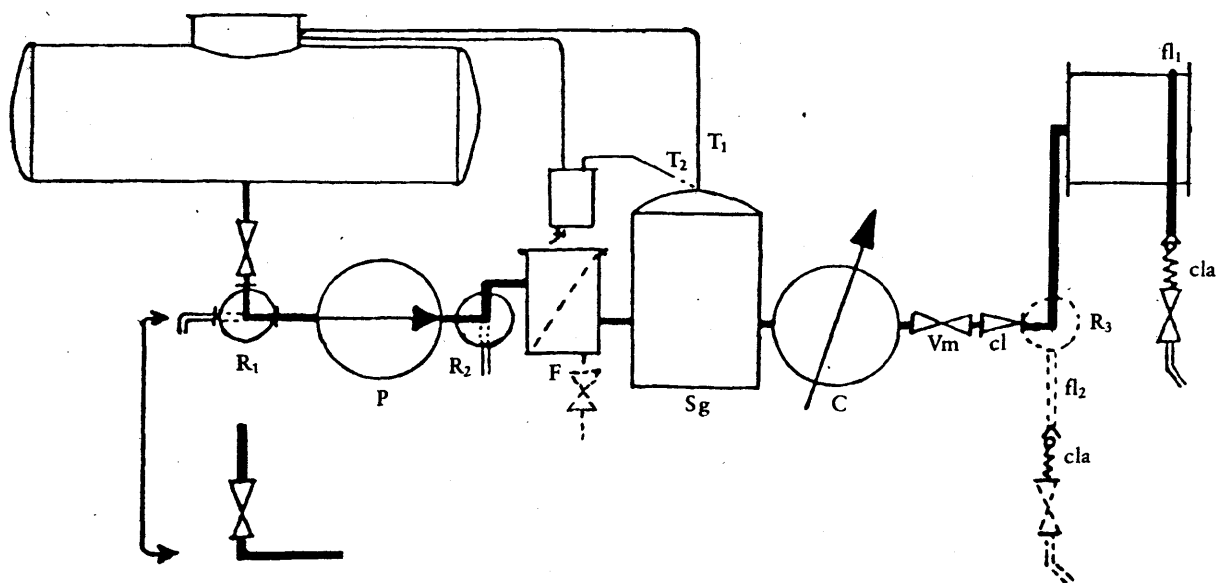
The pipework between compartments and measuring systems must be such as to ensure permanent connections.

- A : Anti-swirl device.
- R : Two-way valve allowing metered delivery, unmetered delivery and emptying and filling of the tank without passing through the meter.  
This valve is optional. It may be replaced by a direct connection.
- F : Filter. A drain valve is authorized only if it includes a non-return valve preventing any admission of gas to the measuring system.
- PgS: Special gas extractor as defined in item 1.1.5.
- V<sub>1</sub>: Sight glass of special gas extractor.
- T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub>: Variants authorized for the venting device.  
T<sub>1</sub>: return to tank.  
T<sub>2</sub>: vent to the atmosphere.  
T<sub>3</sub>: vessel to catch liquid particles entrained by the gases.  
T<sub>4</sub>: blow-off valve.
- C : Meter.
- va: Valve automatically closed by the special gas extractor when the pressure is insufficient to prevent vaporization in the meter or when a gas pocket accumulates in this special gas extractor. In addition, this valve must close in the event of a failure in its control system.
- I and II: Variants of the empty-hose delivery system.  
Variant I: weir-type sight glass V<sub>2</sub>.  
Variant II: sight glass as defined in item 1.1.8, also performing the function of a gas indicator V<sub>3</sub>.
- Vm: Operating valve.  
The automatic valve va and the operating valve Vm may be combined in a special valve performing both functions. In that case, the two functions must be independent of each other.  
In Variant II, this special valve must be placed after the sight glass V<sub>3</sub>.
- at: Manual vent. It may be automatic (e.g., automatically closed during the measuring operation and opened on completion thereof).
- H: Head of liquid.
- h: Height of bottom of tank above point of transfer. This must be sufficient to ensure a flow rate at least equal to the meter's minimum flow rate until the tank is completely empty.

## Standard scheme S 3

The measuring system includes a pump, a gas separator and one or two full hoses.

- Allows:*
- (a) metered delivery by pump (full hose);
  - (b) direct unmetered delivery (with or without pump), emptying and filling of the tank without passing through the meter.



*Key to standard scheme S 3*

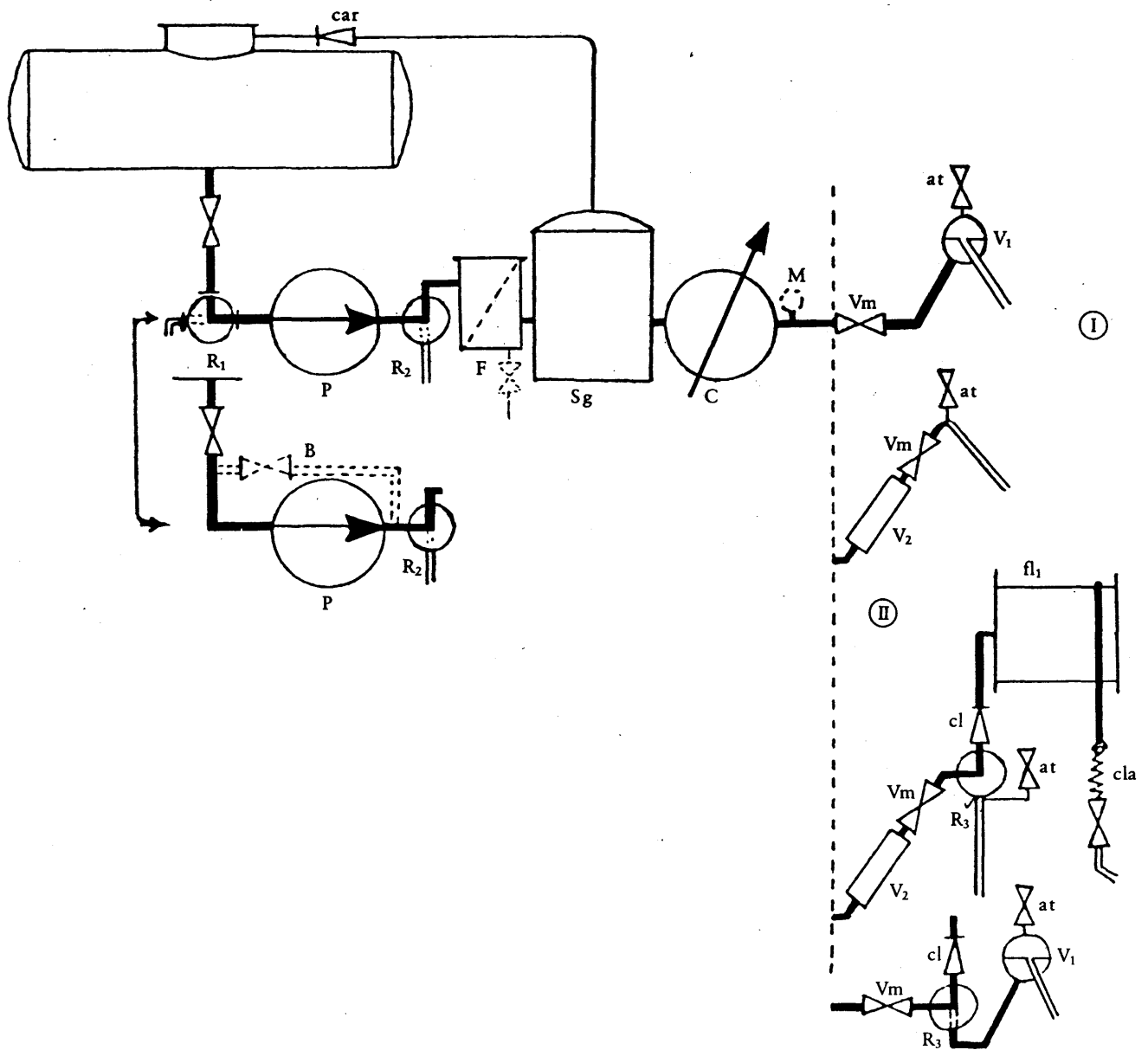
- R<sub>1</sub>:** Two-way valve allowing metered delivery, unmetered delivery and filling and emptying of the tank without passing through the meter.  
This valve is optional. It may be replaced by a direct connection.
- P:** Pump. The pump may be reversible. In that case, a non-return valve must be added between the valve R<sub>2</sub> and the gas separator Sg.
- R<sub>2</sub>:** Optional two-way valve, for direct unmetered delivery.
- F:** Filter. The filter may be fitted with a drain valve.
- Sg:** Gas separator as defined in item 1.6.2.1.4. The liquid level in the separator must be higher than that in the meter.
- T<sub>1</sub>, T<sub>2</sub>:** Variants authorized for the venting device.  
T<sub>1</sub>: direct return to the tank.  
T<sub>2</sub>: return to the tank via a vessel to catch liquid particles entrained by the gases.
- C:** Meter.
- Vm:** Operating valve.
- cl:** Non-return valve.
- fl<sub>1</sub>:** Full hose on reel.
- fl<sub>2</sub>:** Optional second full hose (very short) for delivery at high flow rates.
- cla:** Valve to prevent the full hose from emptying.
- R<sub>3</sub>:** Device allowing deliveries to be made with either hose in a two-hose measuring system. This device must be in conformity with the first paragraph of item 1.10.1 and the second paragraph of item 2.2.4.



Standard scheme S 4

The measuring system has a pump, a gas separator, one empty hose or one full and one empty hose.

- Allows:
- (a) metered delivery by pump (full or empty hose);
  - (b) metered gravity-feed delivery (empty hose);
  - (c) direct unmetered delivery (which or without pump), emptying and filling of the tank without passing through the meter.



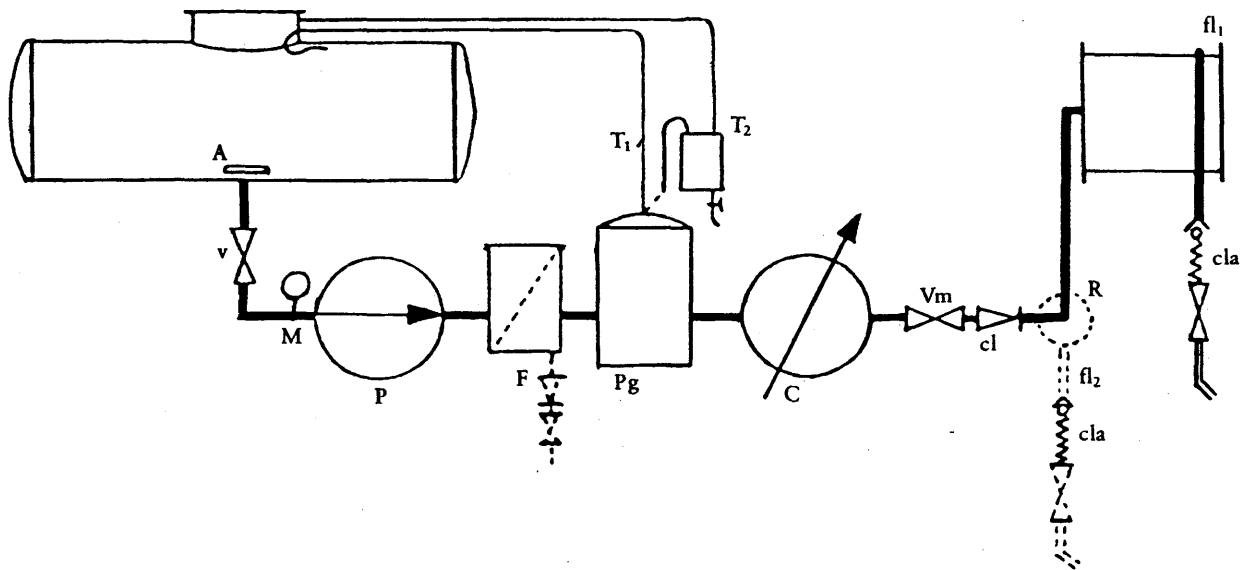
*Key to standard scheme S 4*

- R<sub>1</sub>** Two-way valve for metered delivery, unmetered delivery and emptying and filling of the tank without passing through the meter.  
This valve is optional. It may be replaced by a direct connection.
- P:** Pump. The pump may be reversible. In that case, a non-return valve must be added between valve R<sub>2</sub> and the gas separator Sg.
- B:** Optional bypass allowing metered gravity-feed delivery (empty hose). This bypass is authorized only if there is no valve R<sub>1</sub>.
- R<sub>2</sub>:** Optional two-way valve for direct unmetered delivery.
- F:** Filter. The filter may be fitted with a drain valve.
- Sg:** Gas separator as defined in item 1.6.2.1.4. The liquid level in the gas separator must be above that in the meter.
- car:** Non-return valve preventing gas flow (in the case of empty hose delivery).
- C:** Meter.
- M:** Pressure gauge take-off; this is only compulsory when there is a bypass B.  
This take-off makes it possible to check, during initial verification, that the pressure in the meter is at least equal to atmospheric pressure during gravity-feed delivery.
- at:** Automatic or manual vent. When there is a bypass B, this vent must be automatic and of sufficient cross-section to ensure that the pressure in the meter is at least equal to atmospheric pressure.
- Vm:** Operating valve.
- I and II:** Variants of the delivery device:  
Variant I: empty hose.  
Variant II: combinations of one full and one empty hose.
- cl:** Non-return valve.
- V<sub>1</sub>:** Weir-type sight glass.
- V<sub>2</sub>:** Sight glass as defined in item 1.1.8, also serving as a gas indicator.
- fl<sub>1</sub>:** Full hose on reel.
- cla:** Valve to prevent the full hose from emptying.
- R<sub>3</sub>:** Device allowing deliveries to be made via either the full or empty hose. This device must be in conformity with the first paragraph of item 1.10.1 and the second paragraph of item 2.2.4.

## Standard scheme S 5

The measuring system includes a pump, a gas extractor and one or two full hoses.

It only allows metered deliveries by pump (full hose).



*Key to standard scheme S 5*

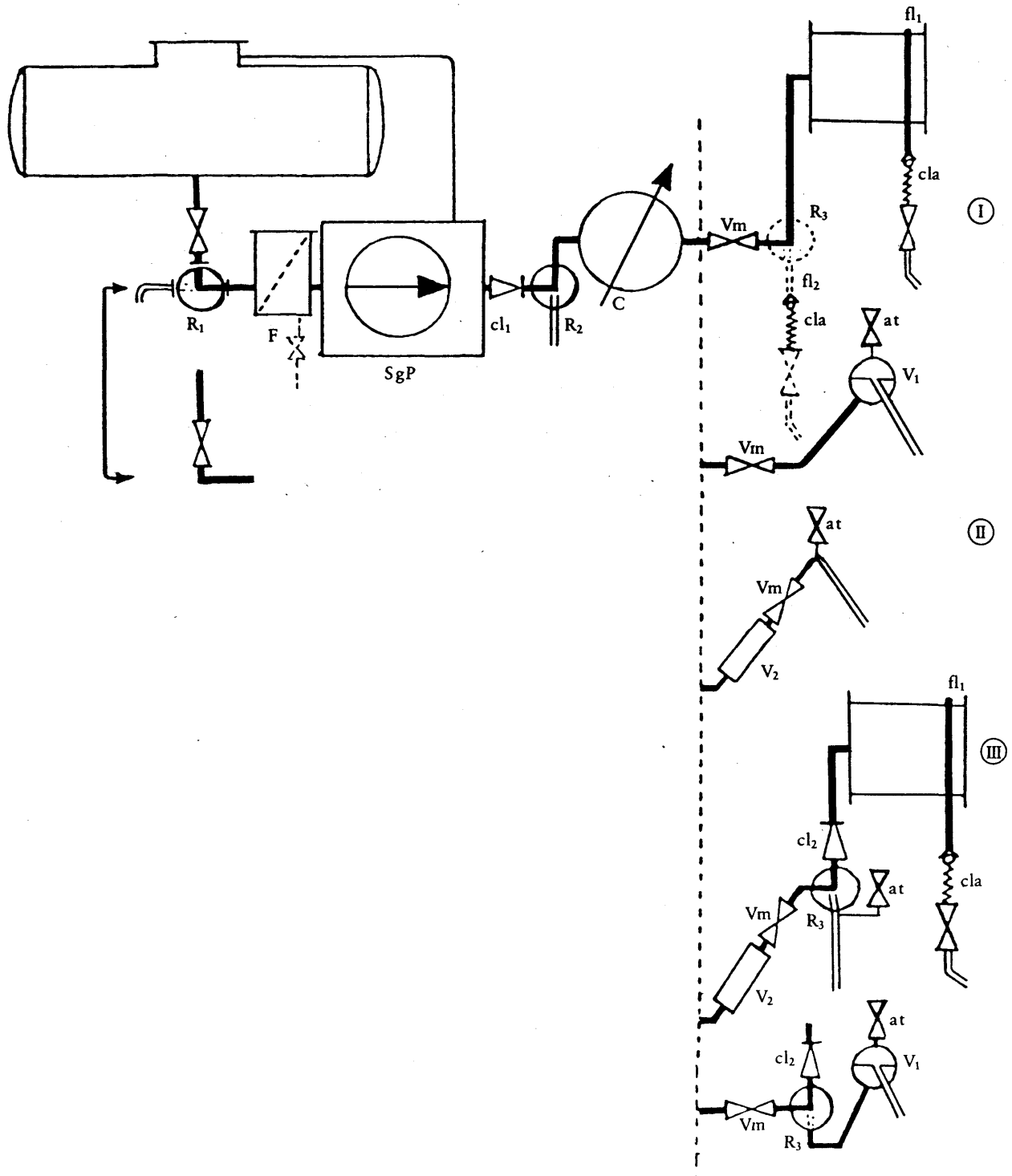
If the tank has several compartments, the measuring system must be directly and permanently connected to a specific compartment without a manifold.

- A: Anti-swirl device.
- V: 'Open or closed' type valve rendering any slowing-down at the pump intake practically impossible.
- M: Pressure gauge to check that the pressure at the pump intake is never less than atmospheric pressure
- P: Pump.
- F: Filter.
- A drain valve is authorized only if it includes a non-return valve preventing any admission of gas to the measuring system.
- Pg: Gas extractor. Two variants, T<sub>1</sub> and T<sub>2</sub>, and authorized for the venting device.
- T<sub>1</sub>: Direct link between the gas extractor and the tank. In this case the pipework must lead into the tank along the wall in order to facilitate separation of liquid particles and gases.
- T<sub>2</sub>: Gas extractor connected to the tank by a vessel to catch liquid particles entrained by the gases.
- C: Meter.
- Vm: Operating valve.
- cl: Non-return valve.
- f<sub>1</sub>: Full hose on reel.
- f<sub>2</sub>: Optional full second hose (very short) for deliveries at high flow rates.
- cla: Valve to prevent the full hose from emptying.
- R: Device allowing deliveries to be made with either hose in a two-hose measuring system. The device must be in conformity with the first paragraph of item 1.10.1 and the second paragraph of item 2.2.4.

Standard scheme S 6

The measuring system includes a gas separator combined with the supply pump, one or two full hoses, or one empty hose, or one full and one empty hose.

- Allows:
- (a) metered delivery by pump (full or empty hose);
  - (b) direct delivery with or without pump, without passing through the meter, and emptying and filling of the tank without passing through the meter.



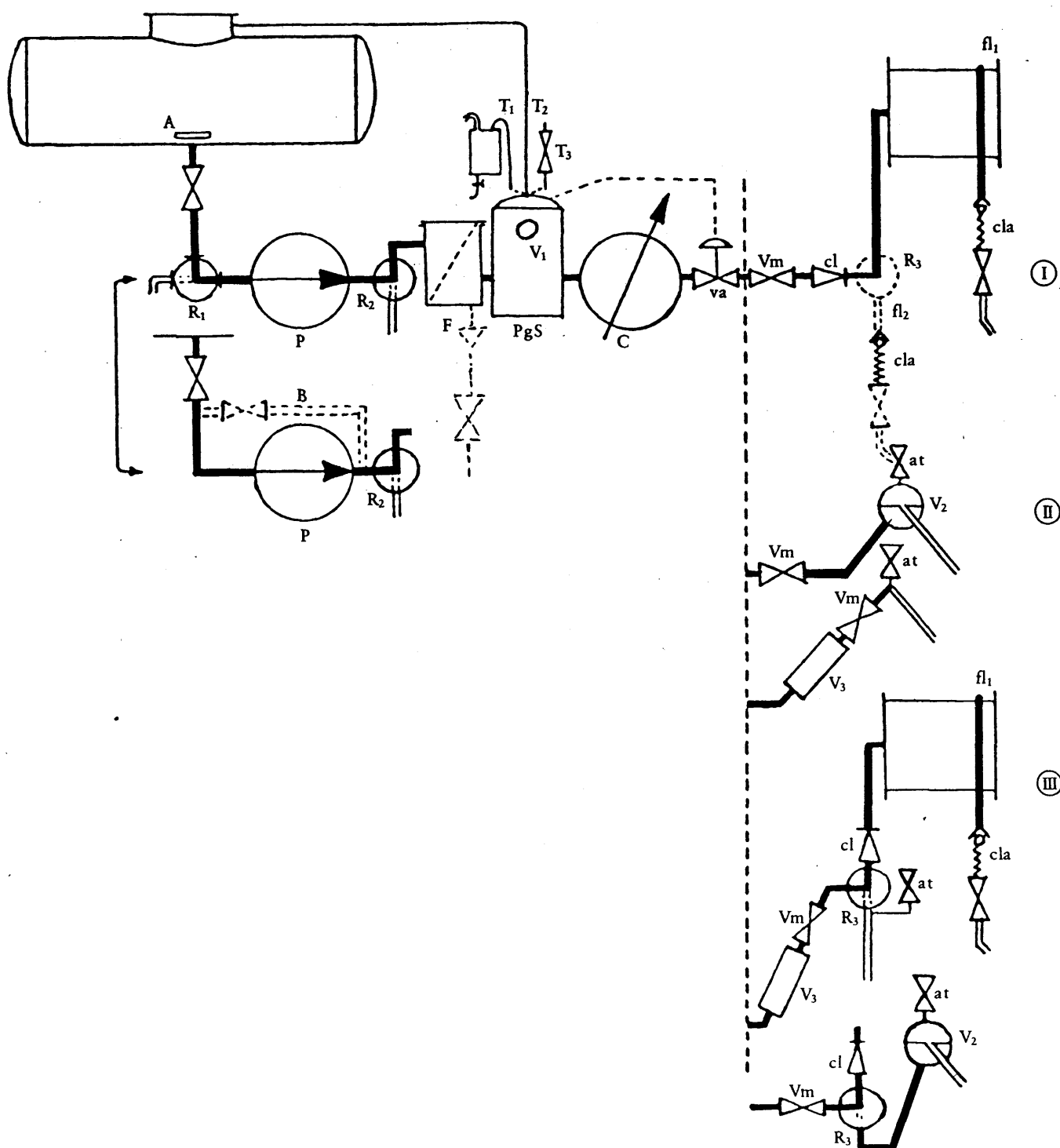
*Key to standard scheme S 6*

- R<sub>1</sub>: Two-way valve allowing metered delivery, unmetered delivery and emptying and filling of the tank without passing through the meter.  
This valve is optional. It may be replaced by a direct connection.
- F: Filter. The filter may be fitted with a drain valve.
- SgP: Gas separator combined with the supply pump as described in the first paragraph of item 1.6.2.1.2. This subassembly must satisfy the requirements laid down in item 1.6.2.1.4. It must have received EEC pattern approval.
- cl<sub>1</sub>: Non-return valve. This valve may be located downstream of the meter.
- R<sub>2</sub>: Optional two-way valve for direct unmetered delivery.
- C: Meter.
- I, II, III: Variants of the delivery device:  
Variant I: one or two full hoses;  
Variant II: empty hose;  
Variant III: combinations of one full and one empty hose.
- Vm: Operating valve.
- V<sub>1</sub>: Weir-type sight glass.
- V<sub>2</sub>: Sight glass as defined in item 1.1.8, also serving as a gas indicator.
- fl<sub>1</sub>: Full hose.
- fl<sub>2</sub>: Optional second full hose (very short) for deliveries at high flow rates.
- cla: Valve to prevent the full hose from emptying.
- cl<sub>2</sub>: Non-return valve.
- at: Automatic or manual air vent.
- R<sub>3</sub>: Device allowing deliveries to be made by either of two available delivery methods. This device must be in conformity with the first paragraph of item 1.10.1 and the second paragraph of item 2.2.4.

Standard scheme S 7

The measuring system includes a pump, a special gas extractor, one or two full hoses, or one empty hose or one full hose and one empty hose.

- Allows:*
- (a) metered delivery by pump (full or empty hose);
  - (b) metered gravity-feed delivery (empty hose);
  - (c) direct delivery with or without pump, without passing through the meter, and emptying and filling of the tank without passing through the meter.



*Key to standard scheme S 7*

If the tank has several compartments and if it is possible to use a manifold, the valves in the bottom of the compartments and the valves on the intake pipe must be of the 'open or closed' type. Pipes between compartments and the measuring system must be permanently connected.

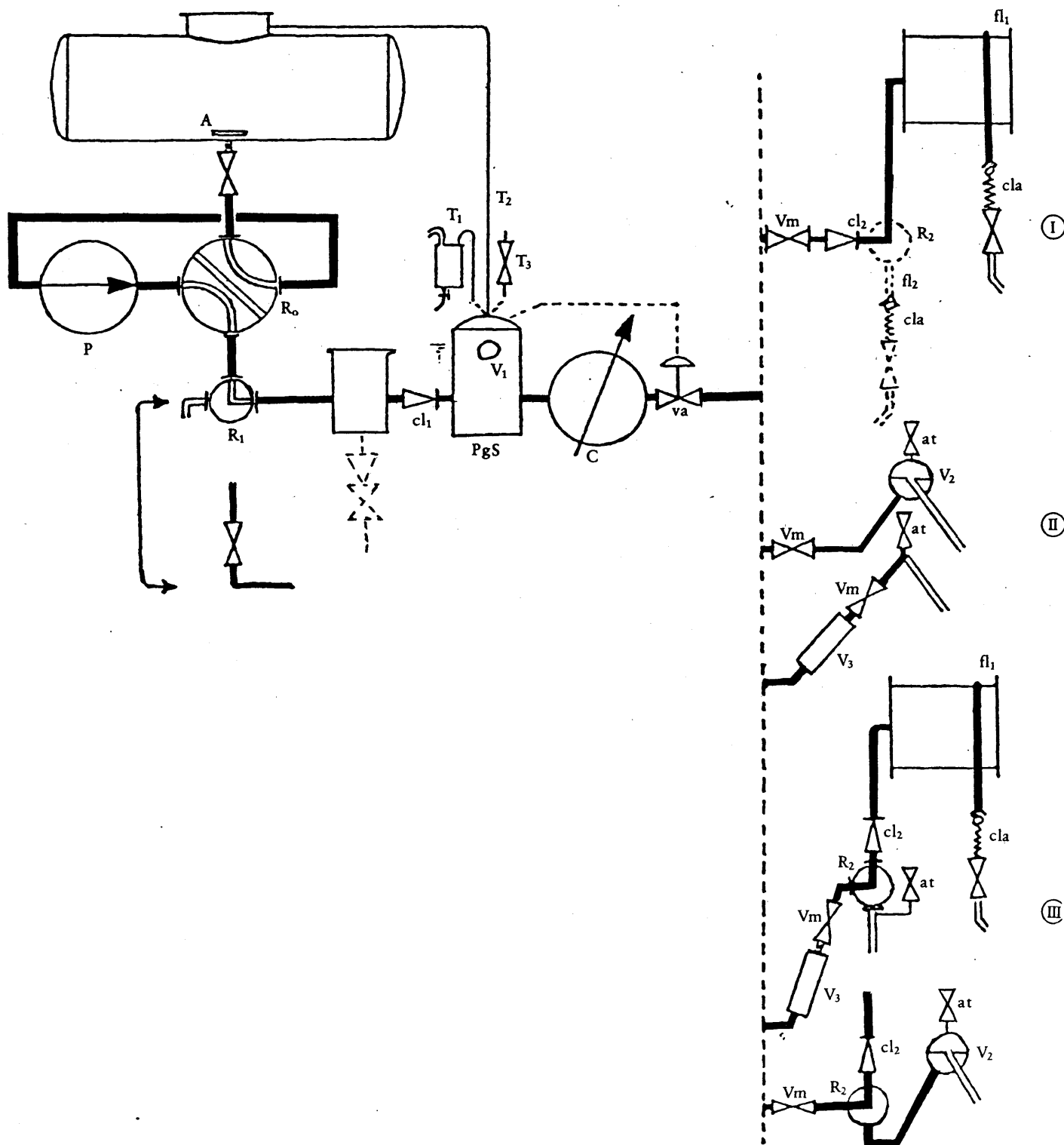
- A: Anti-swirl device.
- R<sub>1</sub>: Two-way valve allowing metered delivery, unmetered delivery and emptying and filling of the tank without passing through the meter.  
This valve is optional. It may be replaced by a direct connection.
- P: Pump. The pump may be reversible. In that case, a non-return valve must be incorporated between the valve R<sub>2</sub> and the special gas extractor PgS.
- B: Optional bypass allowing metered gravity-feed delivery (empty hose). This bypass is authorized only if there is no valve R<sub>1</sub>.
- R<sub>2</sub>: Optional two-way valve for direct unmetered delivery.
- F: Filter. A drain valve is authorized only if it includes a non-return valve preventing any admission of gas to the measuring system.
- PgS: Special gas extractor as defined in item 1.1.5.
- V<sub>1</sub>: Sight glass of special gas extractor.
- T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>: Variants authorized for the venting device.  
T<sub>1</sub>: vessel to catch liquid particles entrained by the gases.  
T<sub>2</sub>: return to the tank.  
T<sub>3</sub>: blow-off valve.
- C: Meter.
- va: Valve automatically closed by the special gas extractor when the pressure is insufficient to prevent vaporization in the meter or when a gas pocket accumulates in the extractor. In addition, this valve must close in the event of a failure in its control system.
- I, II, III: Variants of the delivery device.  
Variant I: one or two full hoses;  
Variant II: empty hose;  
Variant III: combinations of one full and one empty hose.
- Vm: Operating valve.  
The automatic valve va and the operating valve Vm may be combined in a special valve performing both functions. In that case, the two functions must be independent of each other. This special valve must be placed downstream of the sight glass V<sub>3</sub> in those variants (II and III) which include the latter.
- cl: Non-return valve.
- V<sub>2</sub>: Weir-type sight glass.
- V<sub>3</sub>: Sight glass as defined in item 1.1.8, also serving as a gas indicator.
- f<sub>1</sub>: Full hose on reel.
- f<sub>2</sub>: Optional second full hose (very short) for delivery at high flow rates.
- cla: Valve preventing the full hose from emptying.
- at: Automatic or manual air vent.
- R<sub>3</sub>: Device allowing deliveries to be made by either of two available delivery methods. This device must be in conformity with the first paragraph of item 1.10.1 and the second paragraph of item 2.2.4.



Standard scheme S 8

The measuring system includes a pump, a three-way valve, a special gas extractor, one or two full hoses, or one empty hose or one full and one empty hose.

- Allows:
- (a) metered delivery by pump (full or empty hose);
  - (b) gravity-feed metered delivery (empty hose);
  - (c) direct delivery with or without pump, without passing through the meter, and emptying and filling of the tank without passing through the meter.



*Key to standard scheme S 8*

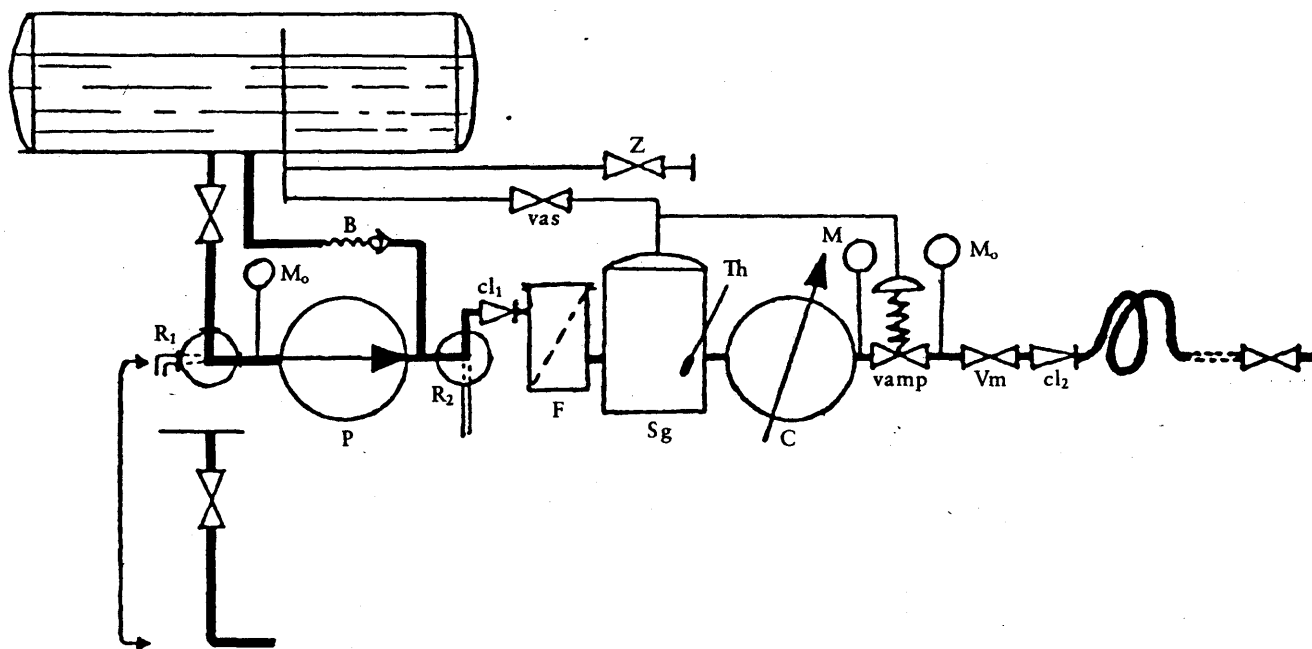
If the tank has several compartments and if it is possible to use a manifold, the valves in the bottom of the compartments and the valves on the intake pipe must be of the 'open or closed' type. Pipes between compartments and the measuring system must be permanently connected.

- A: Anti-swirl device.
- P: Pump.
- R<sub>0</sub>: Three-way valve which, in conjunction with valves R<sub>1</sub> and R<sub>2</sub>, enables the following operations to be carried out:
1. Metered or unmetered delivery by pump (full or empty hose);
  2. Gravity-feed metered or unmetered delivery (empty hose), emptying and filling of the tank;
  3. Filling of the tank with the aid of pump P.
- R<sub>1</sub>: This two-way valve is optional. It may be replaced by a direct connection.
- F: Filter:  
A drain valve is authorized only if it includes a non-return valve preventing any admission of gas to the measuring system
- cl<sub>1</sub>: Non-return valve.
- PgS: Special gas extractor as defined in item 1.1.5.
- V<sub>1</sub>: Sight glass for special gas extractor.
- T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>: Variants authorized for the venting device.  
T<sub>1</sub>: vessel to catch liquid particles entrained by the gases.  
T<sub>2</sub>: return to the tank.  
T<sub>3</sub>: blow-off valve.
- C: Meter.
- va: Valve automatically closed by the special gas extractor when the pressure is insufficient to prevent vaporization in the meter or when a gas pocket accumulates in the extractor. In addition, this valve must close in the event of a failure in its control system.
- I, II, III: Variants of the delivery device.  
Variant I: one or two full hoses.  
Variant II: empty hose.  
Variant III: combinations of one full and one empty hose.
- Vm: Operating valve.  
The automatic valve va and the operating valve Vm may be combined in a special valve performing both functions. In that case, the two functions must be independent of each other. This special valve must be placed downstream of the sight glass V<sub>3</sub> in those variants (II and III) which include the latter.
- cl<sub>2</sub>: Non-return valve.
- V<sub>2</sub>: Weir-type sight glass.
- V<sub>3</sub>: Sight glass as defined in item 1.1.8 also acting as a gas indicator.
- fl<sub>1</sub>: Full hose on reel.
- fl<sub>2</sub>: Optional second full hose (very short) for delivery at high flow rates.
- cla: Valve preventing the full hose from emptying.
- at: Automatic or manual venting.
- R<sub>2</sub>: Device allowing deliveries to be made by either of two available delivery methods. This device must be in conformity with the first paragraph of item 1.10.1 and the second paragraph of item 2.2.4.

## Standard scheme S 9

The measuring system includes a pump, a gas separator, a pressure-maintaining valve and a full hose.

- Allows:*
- (a) metered delivery by pump (full hose);
  - (b) delivery with or without pump, without passing through the meter, and emptying and filling of the tank without passing through the meter.



*Key to standard scheme S 9*

- R<sub>1</sub>:** Two-way valve for metered delivery, emptying and filling of the tank without passing through the meter.  
This valve is optional. It may be replaced by a direct connection.
- P:** Pump.
- B:** Adjustable pump bypass connected to the tank.
- R<sub>2</sub>:** Optional two-way valve for direct unmetered delivery.
- cl<sub>1</sub>:** Non-return valve stipulated in item 2.4.1. It may also be positioned between the filter and gas separator.
- F:** Filter.
- Sg:** Gas separator in conformity with either item 1.6.2.1.4 or the second paragraph of item 2.4.3.1. The venting device is connected to the gaseous phase of the tank. For safety reasons, a valve may be fitted to this device; in that case, it must be fitted between the tank and the branch to the valve 'vamp'.
- C:** Meter.
- vamp:** Automatic pressure-maintaining valve adjusted to maintain a pressure at least 100 kPa higher than the saturated vapour pressure in the tank.
- Vm:** Operating valve.
- cl<sub>2</sub>:** Non-return valve.
- Z:** Gaseous-phase pipe which may be used only to fill the vehicle tank and recover the product during checking of the measuring system.
- Th:** Thermometer. This thermometer must be situated near the meter, either in the gas separator or at the meter inlet or outlet.
- M:** Compulsory pressure gauge.
- M<sub>0</sub>:** Optional pressure gauges.
- Note:** (a) to ensure that the requirements stipulated in item 2.4.5 are observed, it must be clearly stated on a plate that the gaseous phases in the vehicle tank and customer's tank must not be connected.  
(b) Safety valves may be incorporated; in that case, they must comply with the requirements of item 2.4.6.
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