EU-type examination certificate

Number **T10428** revision 2
Project number 1900675

Issued by	NMi Certin B.V., designated and notified by the Netherlands to perform tasks with respect to conformity modules mentioned in article 17 of Directive 2014/32/EU, after having established that the Measuring instrument meets the applicable requirements of Directive 2014/32/EU, to:
Manufacturer	SATAM 47 Allée des Impressionistes BP 85012 VILLEPINTE 95931 ROISSY CH DE GAULLE CEDEX France
Measuring instrument	An interruptible **measuring system** on a skid.

Type	:	ZCE28-10 and ZCE28-15
Destined for the measurement of	:	Oil and oil products and potable liquids
Accuracy class	:	0,5
Environment classes	:	M2 / E2
Temperature range liquid	:	-10 °C / 50 °C
Temperature range ambient	:	-25 °C / 55 °C
Q_{min} - Q_{max}	:	See § 1.2 of the description
Minimum measured quantity	:	See § 1.2 of the description

Further properties are described in the annexes:
- Description T10428 revision 2;
- Documentation folder T10428-2.

Valid until	8 December 2021
Remarks	This revision replaces the earlier versions, including its Documentation folder.
Issuing Authority	**NMi Certin B.V., Notified Body number 0122** 20 March 2017

C. Oosterman
Head Certification Board

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Description

1 General information about the measuring system

All properties of this measuring system, whether mentioned or not, shall not be in conflict with the legislation.

1.1 Essential parts

Producer	Type	Evaluation Certificate	Remarks
Measurement transducer			
VAF Instruments BV	Jz010 and Jz015	TC7364	-
Electronic calculating/indicating device			
SATAM	Equalis L	LNE - 6854	-
VAF Instruments BV	Mechanical counter	TC7364	-
SATAM	Equalis S	LNE -25874	
Air separator			
SATAM	FS24	See paragraph 2.1.	-

Each temperature and pressure transmitter having a Parts Certificate may be used. Only applicable for CDN12 calculator indicator.

1.2 Essential characteristics

In addition to the characteristics as is stated on page 1 of this EU-type examination certificate T10428 Revision 2 the following characteristics apply to the measuring system:

- Measuring system
  - The ratio Q_{min} : Q_{max} is: see Evaluation Certificate TC7364;
  - P_{max}: 10 bar(g);
  - MMQ: The minimum measured quantity is the largest value of:
    - The MMQ mentioned for the measurement transducer in paragraph 1.1.
    - 100 times the display scale interval
    - 200 times the printed scale interval
  - Scale interval: see the applicable Evaluation Certificate of the Calculating/Indicating device.

1.3 Essential shapes

1.3.1 Configuration

- The essential parts stated in Paragraph 1.1 can be applied in each desired combination as long as there is no conflict with the concerning Evaluation Certificates.

A schematic drawing of the installation is given in documentation no. 10428/2-02.

1.3.2 Inscriptions

- The following information is clearly visible on the nameplate:
  - CE marking including the supplementary metrological marking (M + last 2 digits of the year in which the instrument has been put into use);
  - Notified Body identification number, following the supplementary metrological marking;
  - EU-type examination certificate number;
  - Manufacturer's name, registered trade name or registered trade mark;
  - Manufacturer's postal address;
  - Type designation;
  - Year of manufacture and serial number;
  - Accuracy class;
  - Minimum and maximum flow rate;
  - Maximum pressure;
  - Name(s) or nature(s) of the product(s) to be measured;
  - Mechanical and electromagnetic environment class;
  - Ambient temperature range;
  - Liquid temperature range;
  - Serial numbers of all Essential parts stated in Paragraph 1.1 (optional).

- Further inscriptions:
  - The inscription "Minimum Measured Quantity … L" in the vicinity of the display of the calculating and indicating device and/or on the nameplate;
  - The inscriptions on the measurement transducer as mentioned in the Evaluation certificate number TC7364;
  - The inscriptions on the calculating and indicating device as mentioned in the Evaluation certificate LNE - 6854, TC7364 or LNE - 25874;
  - If applicable: The inscriptions on the air separator as mentioned paragraph 2.1.3;

- If applicable: The inscriptions of the temperature and/or pressure transmitters as stated in the applicable Parts Certificates.

An example of the name plate is given in documentation no. 10428/2-01.

Remarks:
The nameplate must be clearly visible without removing the covers.

1.4 Conditional parts

- Temperature sensors (if applicable)
  If applicable a 4-Wire Class A PT-100 sensors to measure the liquid temperature. Each line has at least one temperature sensor. The temperature sensor is installed in a thermo well;
- Flow control valve
  The metering section has its own flow control valve to regulate the flow rate through the line;
- Printer (if applicable)
  A printer is connected to the flow computer and is used for printing the reports (deliveries), events and alarms.
  The printer can be of any brand and type under the condition that it is equipped with a paper out detection and that the communication with the printer is safe guarded;
- A non-return valve
  This non-return valve materialize the transfer point for the metering unit.

1.5 Conditional characteristics

Before a delivery is started, the system shall be free of air.
If the flow is not automatically stopped in case of a power failure, the system shall be provided with an emergency power supply device to safeguard all measuring functions.

1.6 Conditional shapes

The construction shall be such that no air pockets remain after the air is released by the vent-off valves.
If the measuring system is not equipped with a FS24 gas separator, ZCE 28-15 systems must be installed so that during normal operation neither air intake nor gas release can occur in the liquid upstream of the meter, and the pumped flow of the measuring systems must be such that the pressure at the pump inlet is always greater than the atmospheric pressure and the saturated vapour pressure of the liquid.

1.7 Non-essential parts

- Pipe work and connections;
- Valves;
- Drain valves;
- Hoses.

2 Information on the main components of the measuring system

2.1 Air separator of make SATAM, type FS24

2.1.1 Essential parts of the air separator

- Main body
  The air separator mainly consists of a cylinder with transverse inlet and outlet. The inlet and outlet are at the same level, and the volume between inlet and outlet is the effective volume of the air separator. The inlet of the separator results in a filter cartridge in a horizontal position. It removes any particle that may affect the operation of the measuring system;
- Release valve
- If there is an air inlet or gas in the separator, the level of liquid in its tank drops and the float has, through the set of rods, traction on the pilot valve causing opening the differential piston. The gases then escape through the gas outlet and can be optionally sent to a recycling bin. The discharge valve closes when the liquid level rises.

2.1.2 Essential characteristics of the air separator

- Q_{max} : 400 L/min;
- Effective volume : 11 L;
- Total volume : 11 L;
- $Viscosity_{max}$: 20 cSt;
- P_{max} : 10 bar(g).

2.1.3 Essential shapes of the air seperator

Inscriptions:

- The name of the manufacturer;
- The type;
- Maximum flow rate;
- Maximum pressure.

2.1.4 Non-essential characteristics of the air separator

- The separated air/gas is released to the supply tank or to a recovery tank;
- The separator FS24 has a non-return valve at the outlet;

2.1.5 Sealing of the air separator

- The air separator is sealed against opening.

3 Seals

The following items of the meter are sealed (see also documentation no. 10428/2-03):

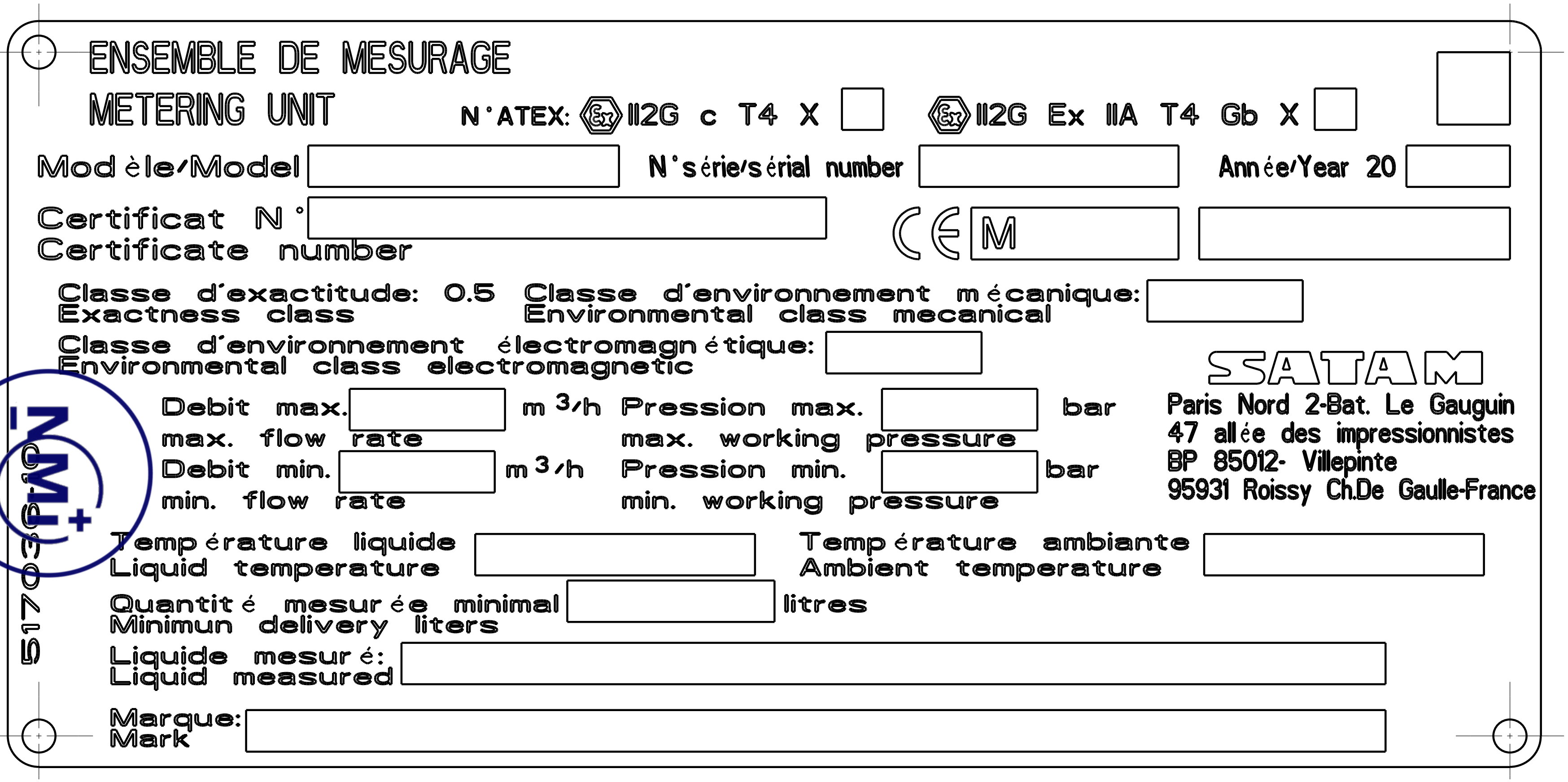
- Nameplate of the frame of the measurement system. Removal of the nameplate without destroying it or without breaking a seal shall not be possible;
- For sealing of the measurement transducer, see the applicable Evaluation certificate no. TC7364;
- For sealing of the Calculating/Indicating device, see the applicable Evaluation certificate no. LNE - 6854, TC7364 or LNE -25874 (Equalis S);
- For sealing of the air separator, see paragraph 2.1.5;

The mechanical connections between the meter sensor and the pulser.

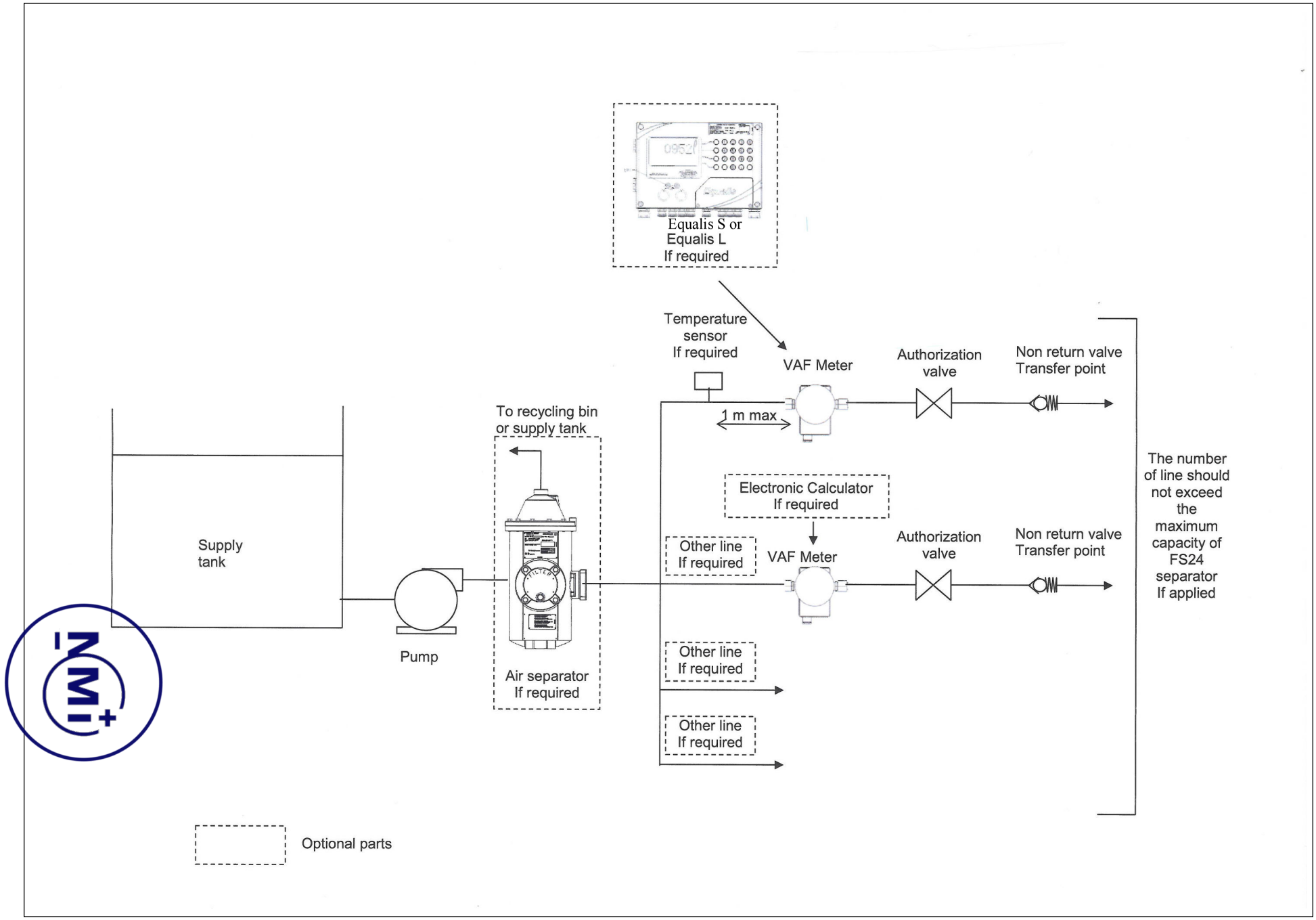
Documentation folder

Number **T10428-2**
Project number 1900675

Number	Pages	Description	Remark
10428/2-01	1	Name plate	Example, replaces 10428/0-01.
10428/2-02	1	Schematic drawing	Example, replaces 10428/0-02
10428/0-03	1	Sealing ZCE 28 mechanics	-
10428/2-03	1	Sealing ZCE 28 Equalis electronic calculator	-
10428/0-06	6	Air separator FS24	-

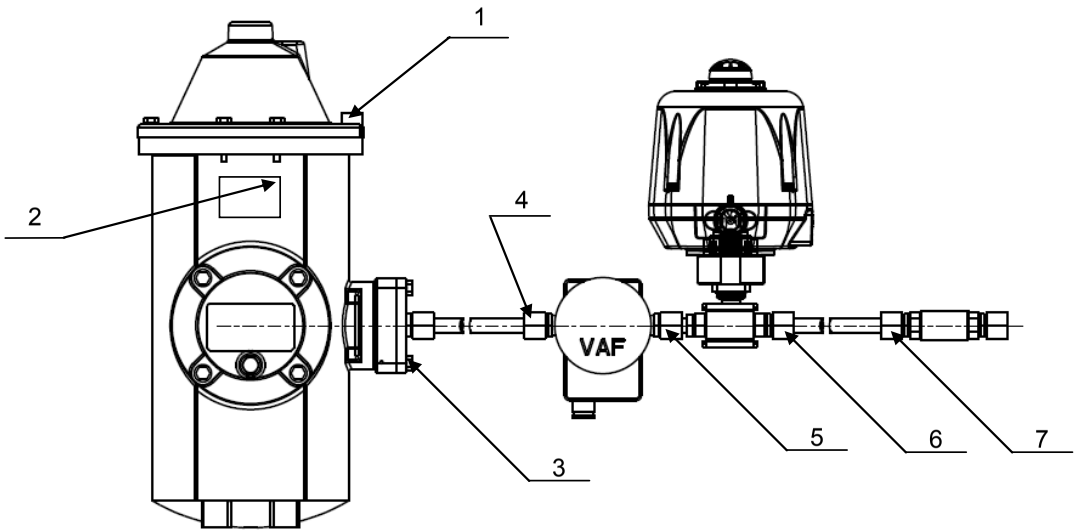


ENSEMBLE DE MESURAGE
METERING UNIT
N°ATEX: II2G c T4 X
II2G Ex IIA T4 Gb X
Modèle/Model
N°série/sérial number
Année/Year 20
Certificat N°
Certificate number
CE M
Classe d'exactitude: 0.5
Exactness class
Classe d'environnement mécanique:
Environmental class mecanical
Classe d'environnement électromagnétique:
Environmental class electromagnetic
SATAM
Paris Nord 2-Bat. Le Gauguin
47 allée des impressionnistes
BP 85012- Villepinte
95931 Roissy Ch.De Gaulle-France
Debit max.
max. flow rate
m 3/h
Debit min.
min. flow rate
m 3/h
Pression max.
max. working pressure
bar
Pression min.
min. working pressure
bar
Température liquide
Liquid temperature
Température ambiante
Ambient temperature
Quantité mesurée minimal
Minimun delivery liters
litres
Liquide mesuré:
Liquid measured
Marque:
Mark
5170350-10


Equalis S or
Equalis L
If required
Temperature
sensor
If required
VAF Meter
Authorization
valve
Non return valve
Transfer point
1 m max
To recycling bin
or supply tank
Supply
tank
Pump
Air separator
If required
Electronic Calculator
If required
Other line
If required
VAF Meter
Authorization
valve
Non return valve
Transfer point
Other line
If required
Other line
If required
The number
of line should
not exceed
the
maximum
capacity of
FS24
separator
If applied
Optional parts

Metering unit SATAM Types ZCE 28

Sealing drawing of metering units SATAM type ZCE 28 including a mechanical indicator

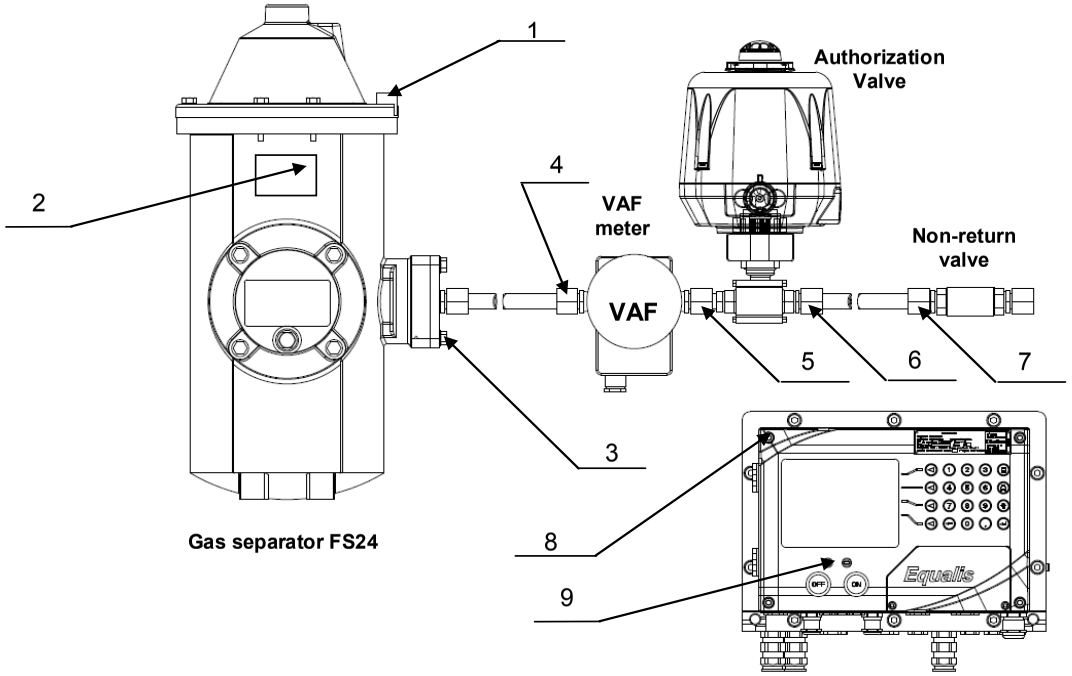


Em 1 : Seals FS24 separator head
Em 2 : Seals FS24 separator nameplate
Em 3 : Seals FSS24 outlet connection to the pipe
Em 4 : Seals VAF meter inlet connection to the pipe
Em 5 : Seals VAF meter outlet connection to authorization valve
Em 6 : Seals authorization valve to the pipe
Em 7 : Seals Non-return valve inlet to the pipe

Seals of VAF meter are defined in drawing 0900-0246-3

Metering unit SATAM Types ZCE 28

Sealing drawing of metering units SATAM type ZCE 28 including electronic calculator indicator EQUALIS L or EQUALIS S



Em 1 : Seals FS24 separator head
Em 2 : Seals FS24 separator nameplate
Em 3 : Seals FSS24 outlet connection to the pipe
Em 4 : Seals VAF meter inlet connection to the pipe
Em 5 : Seals VAF meter outlet connection to authorization valve
Em 6 : Seals authorization valve to the pipe
Em 7 : Seals Non-return valve inlet to the pipe
Em 8 : Seals unit cover
Em 9 : Seals Weight and measurement button access

Seals of Equalis L are detailed in LNE - 6854 certificate – Seals of VAF meter are defined in drawing 0900-0246-3
Seals of Equalis S are detailed in LNE - 25874 certificate

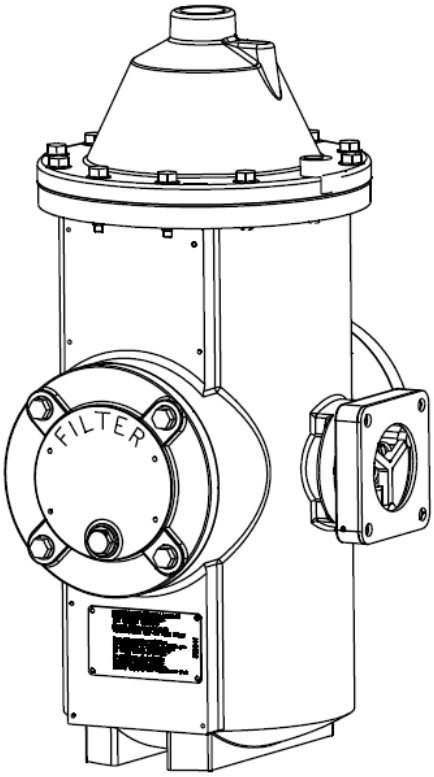
The measuring system is sealed by means of threaded rods with lead seals or sealing devices pressed onto spiral wire.
Following components fitted between the metering unit and transfer point(s) must be protected by a seal : piping joint or flanges or coupling (unless coupling can be removed only with a special tool), non-return valve, calibrated valve, temperature sensor, sight glass, valve, manometer, pressure tap, drain nozzle, hose, depressurization valve, flexible coupling, expansion sleeve, flow detector

SATAM

STRAINER AIR ELIMINATOR
TYPE FS 24

Description – Installation

U517278-e – Révision 0 – 29 novembre 2011



This document consists of 5 pages, including the flyleaf

SATAM may modify this document without prior notice

In conformity with the European directive 94/9/CE-ATEX

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SIRET 495 233 124 000 17 – Code APE 2813 Z – N° TVA FR 49 495 233 124

SATAM

Description :

The filter air eliminator FS24 is composed of a cylindrical tank with flanges for collector input / output. The reservoir is closed at its top by a head of air separator.
The flow inlet strainer eliminator air is going through a filter cartridge (ref 510748 for a 200 µ filter and 510748-10 filter for a 450 µ) and is placed horizontally to the elimination of any foreign object that may perturb its operation.
The outlet is equipped with a non return valve.

The mechanical air separator head is fitted with a float which goes down in presence of gas. Through the set of rods, it applies traction on the pilot valve which drives the master piston and opens the vent valve. The gas goes out through the evacuation outlet located at the top of the head and can be either directed the supply tank or sent to a collecting tank.
After the complete evacuation of the gas, the air separator fills up again raising up the float and causing the closure of the vent valve. The counting can be resumed.

Instructions for mounting :

Components supplied separately, fitting into a metering unit must comply with an existing approval certificate or be integrated into a measuring unit subject to an authorization for use or installation.
Ensure proper coaxial flange inlet and outlet of the separator which is mounted.
Make sure of the coaxility of the input /output flanges on which the strainer eliminator will be installed.
Make sure of the good positioning and maintaining of the flat gaskets for flanges (provided separately or mounted).
Connect the evacuation outlet of the air separator head onto the supply tank or a collecting tank.

Instructions for use :

The installation must be equipped with pressure relief device to prevent pressure exceeding the recommendations of the equipment SATAM.
The installation and the operation must avoid any pressure hammer and vibrations on the equipment.
It is also necessary that the purge is done gradually when bringing the installation into service.
The owner of the installation must be sure that the users know and will respect the conditions of use and security of the material SATAM under current regulations.

The operating pressure must never exceed 10 bar.

Instructions for maintenance :

The installation must be regularly checked and controlled by skilled and qualified staff. The conditions of the current regulations must be respected.
Any intervention which involves the break of a sealing must be made according to the current regulation in legal metrology.

Before any maintenance operation, isolate the gas strainer eliminator with valves installed upstream and downstream of it and then purge the strainer by opening the cork located at the bottom on its body.
Periodically, verify the state of the strainer (every 3 months). As this strainer is in stainless steel, a cleaning is enough.
Every year, verify the state of the non return valve surface 364985. If need be, change these gaskets during the verifications.
Every year, verify the good functioning of the valve mechanism 364178. If need be, change this component during the verifications.
Every year, verify the good state of the float 510758. If need be, change this component during the verifications.
Every year, verify the good state of the valve surface 510888 and the housing 510754. If need be, change these components during the verifications.
Use exclusively screw class 8.8 for the assembly of the air separator head, the cover and the inlet flange.
Change the following spare parts every year or during maintenance or verifications :

- ring 362779
- gasket 364479
- valve gasket 510887
- gasket 510880
- head gasket 353609
- square flange gasket 356815

Use exclusively screw size 8.8 for all fixation screws.

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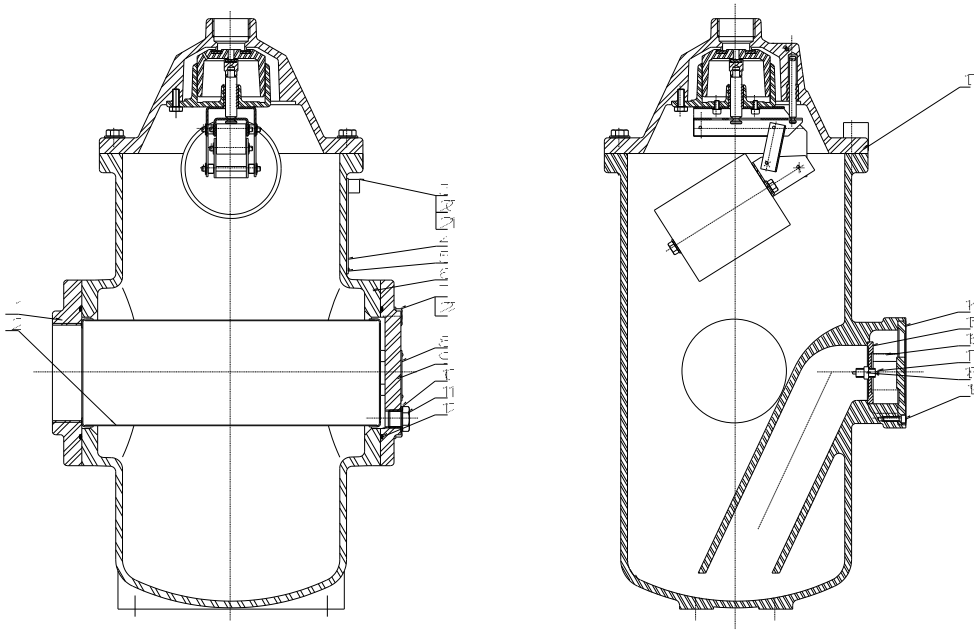
STRAINER AIR ELIMINATOR FS 24



Rep	Reference	Qty	Designation
1	364309	1	Entry flange
	364353		Entry flange
2	510748	1	Filter
	510748-10		Filter 450 micron
	510748-20		Filter 50 micron
3	901276	1	Lead seal housing
4		1	Identification plate not supplied as spares
5	9680	1	Pin rivet
6	364984	1	Body
7	900016-008	8	Screw
8		1	Information plate not supplied as spares
9	364308	1	Closing cover
10	362779	1	Ring
11	361643	1	Plug
12	364479	2	Gasket
13	510745	1	Air eliminator head
14	364918-11	1	Washer
15	364985	1	Valve
16	364322	1	Spring
17	364178	1	Valve mechanism
18	364330	1	Valve body
19	27442	3	Screw
20	26863	1	Screw
21	903177-002	1	Lead seal

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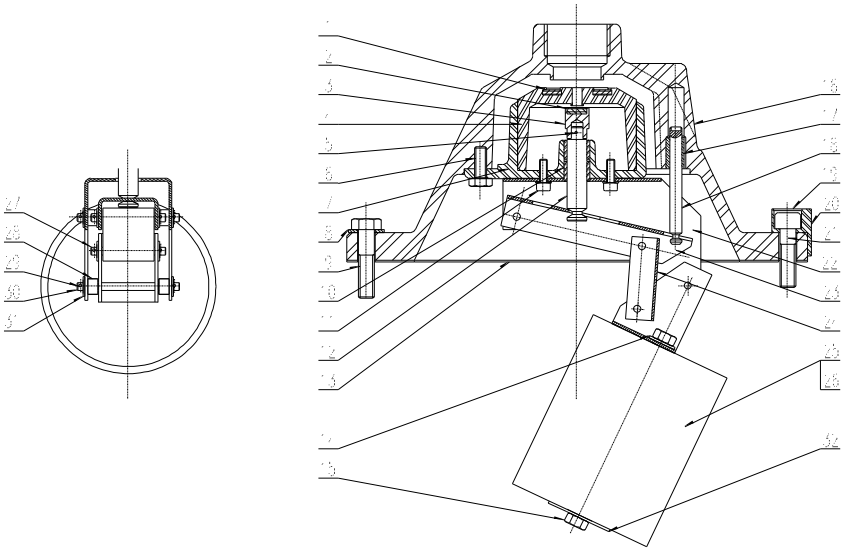
22	903437-001	8	Washer

AIR ELIMINATOR HEAD FS 24



Rep	Reference	Qty	Designation
1	510887	1	Gasket
2	510880	1	Gasket
3	510886	1	Body
4	510888	1	Piston
5	353784	1	Pin
6	27094	3	Screw
7	510754	1	Cylinder sleeve
8	903437-001	11	Washer
9	21095	11	Screw
10	27018	2	Pillow
11	27442	2	Screw
12	510759	1	Axle
13	353609	1	Gasket
14	20579	2	Washer
15	361841	2	Nut nylstop M6
16	510753	1	Body
17	510885	1	Ring
18	510889	1	Axle
19	903177-002	1	Lead seal
20	357047	1	Lead seal housing
21	26332	1	Screw
22	510757	1	Support
23	510756	1	Lever
24	510891	1	Arm
25	510758	1	Floater
26	515734	1	Screw
27	510881	2	Axle
28	510883	4	Spacer

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29	20120	8	Pin
30	510882	2	Axle
31	20514	8	Washer

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