

**Organisme notifié n°0071**

*Notified body*

## CERTIFICAT D'EXAMEN CE DE TYPE

EC TYPE EXAMINATION CERTIFICATE

**N° LNE - 19549 rév. 0 du 14 Avril 2011**

**Délivré par** : Laboratoire national de métrologie et d'essais

*Issued by*

**En application** : Décret n°2006-447 du 12 avril 2006, arrêté du 28 avril 2006, transposant en droit français, la directive 2004/22/CE du 31 mars 2004

*In accordance with*

*Decree nr 2006-447 dated 12 April 2006 and order dated 28 April 2006, transposing into French law, the European directive 2004/22/EC of 31 March 2004*

**Fabricant** : SATAM - 47 allée des Impressionistes BP 85012 VILLEPINTE - FRANCE - 95931 - ROISSY CH DE GAULLE CEDEX

*Manufacturer*

**Mandataire** : - - - -

*Authorized representative*

**Concernant** : Ensembles de mesurage de liquides autres que l'eau SATAM types ZCE 21 et ZCE 22.

*In respect of*

*Measuring systems for liquids other than water SATAM types ZCE 21 et ZCE 22.*

**Caractéristiques** : Caractéristiques détaillées dans l'annexe au présent certificat.

*Characteristics*

*Characteristics detailed in the appendix.*

**Valable jusqu'au** : 13 Avril 2021

*Valid until*

*April 13th, 2021*

Les principales caractéristiques et conditions d'approbation figurent dans l'annexe ci-jointe qui fait partie intégrante du certificat et comprend 16 page(s). Tous les plans, schémas et notices sont déposés au Laboratoire national de métrologie et d'essais sous la référence de dossier L021652 -D3-1-2.

*The principal characteristics, approval conditions are set out in the appendix hereto, which forms part of the approval documents and consists of 16 page(s). All the plans, schematic diagrams and documentations are recorded by Laboratoire national de métrologie et d'essais under reference file L021652 -D3-1-2.*

Etabli le 13 Avril 2011

*Issued on April 13th, 2011*

Pour le Directeur Général  
On behalf of the General Director  
  
Laurence DAGALLIER  
Directrice Déléguée  
Deputy Director

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*Original wording in French language. In case of (legal) problems refer back to the text in French language. No legal claims or duties can be derived from the translation.*

**Summary :**

Date	Revision	Modification
14/04/2011	Revision 0	Initial

**1. Designation**

SATAM measuring systems ZCE 21 and ZCE 22 are designed for receiving hydrocarbons delivered by vehicle-tanks.

Moreover SATAM measuring system ZCE 22 is able to manage hydrocarbons delivery to vehicle-tanks.

**2. Description**

SATAM measuring systems ZCE 21 and ZCE 22 are fitted with:

- a SATAM meter ZC 17-80/80, subject of the evaluation certificate LNE-11052,
- a centrifugal pump, non self-priming, type 160/5.5 or with equivalent characteristics, whose flowrate is compatible with the maximum flowrate of the measuring system and located between the tank and the meter,
- a EC 41-60 tank, fitted with a gas evacuation device, located upstream from the pump and the meter, composed of a tank, a filter, a sight glass diameter 50mm also used to materialize transfer point in receipt configuration.  
SATAM type EC 41-60 tank guarantees that supply conditions for the pump are respected. This device has two level detectors to control working flowrates and to activate gas evacuation,
- an electric valve permitting 2 flows which are minimum and maximum flowrates of the measuring system and fitted with a non-return valve.

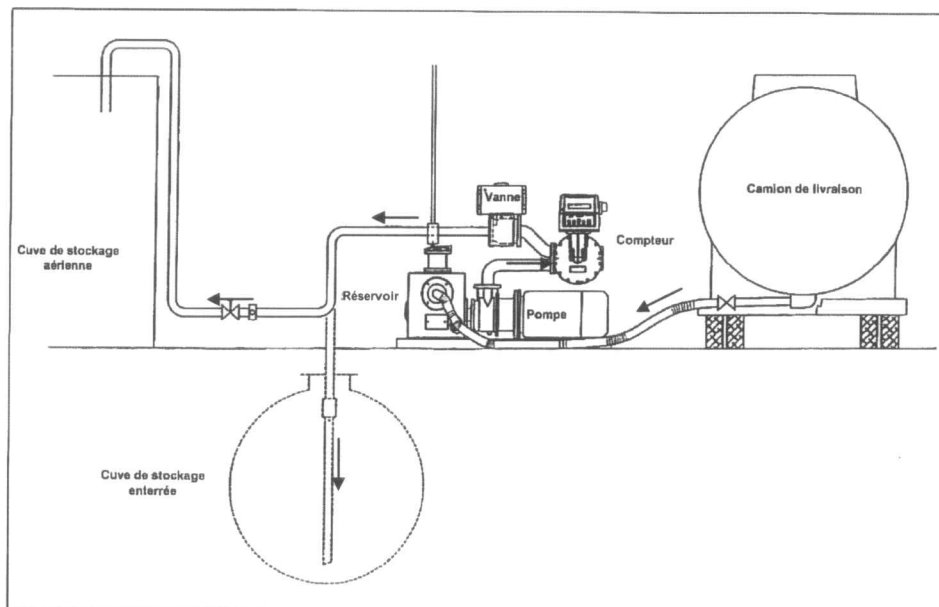


Fig.1 : Measuring system ZCE 21 for vehicle-tank unloading into a stock tank (buried or not).

For SATAM type ZCE 22 measuring system which can be used for receipt and delivery, SATAM type ZC 17 80/80 meter is fitted with a three-way valve SATAM type AD 46. In a delivery configuration, transfer point is situated on loading hose.

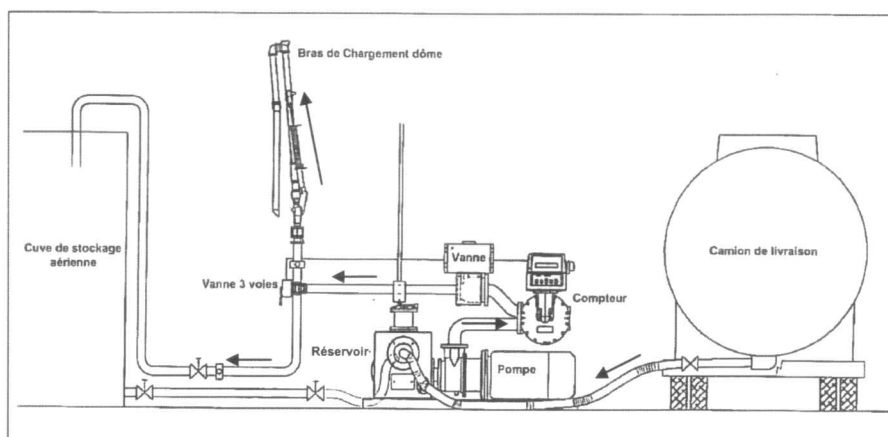


Fig.2 : Measuring system ZCE 22 :

- for vehicle-tank unloading into a stock tank,
- for vehicle-tank loading (high level loading for instance) from either a stock tank or another vehicle-tank.

## 2.1 Metrological functions

SATAM measuring systems ZCE 21 and ZCE 22 perform metrological functions described :

- in the evaluation certificate LNE-11052 related to the SATAM meter ZC 17-80/80,
- if required, in the evaluation certificate related to the relevant electronic calculator-indicator device.

## 2.2 Non-metrological functions

SATAM measuring systems ZCE 21 and ZCE 22 perform non-metrological functions described :

- in the evaluation certificate LNE-11052 related to the SATAM meter ZC 17-80/80,
- if required, in the evaluation certificate related to the relevant electronic calculator-indicator device.

## 2.3 Software

When the SATAM measuring systems ZCE 21 and ZCE 22 are fitted with an electronic calculator-indicator device, the software checksum is defined in the evaluation certificate related to the relevant calculator device.

# 3. Characteristics

## 3.1 Metrological characteristics

Metrological characteristics of measuring systems SATAM ZCE 21 and ZCE 22 are described in the following documents :

- in the evaluation certificate LNE-11052 related to the SATAM meter ZC 17-80/80,
- if required, in the evaluation certificate related to the relevant electronic calculator-indicator device.

Metrological characteristics of SATAM measuring systems ZCE 21 and ZCE 22 are as follows:

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	<b>ZCE 21</b>	<b>ZCE 22</b>
Accuracy class	0.5	
Indication scale	1 L for mechanical indicators 1 L, 0.1 L ou 0.01 L for electronic calculator-indicator devices	
Liquids measured	Hydrocarbons with cinematic viscosity under 20 mm <sup>2</sup> /s, industrial oils and fatty acid methyl esters for diesel engines and ethanol	
Minimum flowrate	8 m <sup>3</sup> /h	
Maximum flowrate	60 m <sup>3</sup> /h	
Temperature range of metered liquids	- 10 °C to + 90 °C when fitted with mechanical indicating device - 10 °C to + 80 °C when fitted with an electronic calculator-indicator device	
Maximum pressure (P <sub>max</sub> )	3.5 bars	
Minimum delivery	500 litres *	
Power supply	220 VAC for electronic calculator-indicator devices	

\* The minimum delivery of a measuring system can be higher than the value defined in tables above and shall have the form 1.10<sup>n</sup>, 2.10<sup>n</sup> or 5.10<sup>n</sup> authorized units of volume, where n is a positive or negative whole number, or zero.

### **3.2 Environment**

SATAM measuring systems ZCE 21 or ZCE 22 have the following environmental characteristics:

Mechanical class: M1

Electromagnetic class: E2

Temperature range:

- - 40 °C ; + 55 °C for mechanical parts of the measuring system SATAM types ZCE 21 and ZCE 22, especially for measuring systems with mechanical indicator
- for measuring systems fitted with electronic parts, temperature range of those elements are mentioned in evaluation certificate LNE-11052 and in evaluation certificate of the concerned electronic calculator.

When fitted with an electronic calculator-indicator, parts installed outdoor of the SATAM measuring systems ZCE 21 and ZCE 22 are designed to operate in condensing humidity.

### **4. Interfaces and compatibility**

When fitted with an electronic calculator-indicator device, SATAM measuring systems ZCE 21 and ZCE 22 perform the functions described :

- in the evaluation certificate LNE-11052 related to SATAM meter ZC 17-80/80,
- in the evaluation certificate related to the relevant electronic calculator-indicator device.

### **5. Special manufacture and installation conditions**

SATAM measuring systems ZCE 21 and ZCE 22 are not intended for direct sales trading transactions.

When they are installed, SATAM measuring systems ZCE 21 and ZCE 22 are intended to one product only.

For SATAM measuring systems type ZCE 22, the conformity of the measuring system to requirements relative to temperature variation influence upon the pipes must be checked (§ 2.13.2 - OIML R117-1).

### **5.1 Supply conditions**

For SATAM measuring systems type ZCE 22, a non-return valve is fitted at the end of the delivery hose.

Transfer point is situated downstream from the three-way valve :

- for a low level loading, this valve is installed at the coupler level,
- for a high level loading, this valve is installed in the high part of the hose.

The meter and the pipework between the meter and the transfer point shall be kept full of liquid during measurement and during shutdown periods.

### **5.2 Installation of an electronic calculator-indicator device**

If required, installation conditions for the electronic calculator-indicator devices fitting ZCE 21 and ZCE 22 measuring systems are detailed in conformity evaluation certificate covering the relevant electronic calculator-indicator device.

### **6. Special conditions of use**

Measuring systems SATAM ZCE 21 and ZCE 22 can only be connected with a pipe having an upstream head of liquid. The part of the liquid to be transferred has to be above the level of the liquid inside the measuring system SATAM ZCE 21 or ZCE 22.

Special conditions of use for the SATAM ZC 17-80/80 meter are detailed in conformity evaluation certificate n°LNE-11052.

If required, special conditions of use for the electronic calculator-indicator devices fitting ZCE 21 and ZCE 22 measuring systems are detailed in conformity evaluation certificate covering the relevant electronic calculator-indicator device.

### **7. Special conditions of verification**

The verification of the conformity of the SATAM measuring systems ZCE 21 and ZCE 22 comprises :

- tests and examinations described in conformity evaluation certificate covering the electronic calculator-indicator device
- tests and examinations performed on site on the complete installed measuring system :
  - a) an examination to check that the instrument meets the requirements of the certified type
  - b) an accuracy test performed at the minimum and maximum flowrates of the measuring system, as well as at an intermediate flowrate. These tests are performed with the intended liquid.

Accuracy tests may be performed on the meter before installation at minimum, maximum and intermediate flowrates. In this case, the on-site test performed at an intermediate flowrate on the complete measuring system is optional.
  - c) a shortage test at the maximum flowrate,
  - d) if required, a test to check the accuracy of the temperature measurement(s) used for conversion (Pt 100 sensor(s))
  - e) if required, a presetting test
  - f) if the measuring system is fitted with a three-way outflow valve downstream of the meter, verification that the delivery path cannot be changed during a measuring operation
  - g) for measuring system SATAM ZCE 22, verification of supply conditions (§5.1),
  - h) verification that the flow is interrupted when the measuring system's power supply is cut, even if the pump is already running.

If appropriate, tests above can also be used for in-service control.

#### **8. Securing and sealing**

The measuring system is sealed by means of threaded rods with lead seals, by sealing devices pressed onto spiral wire or by inviolable labels.

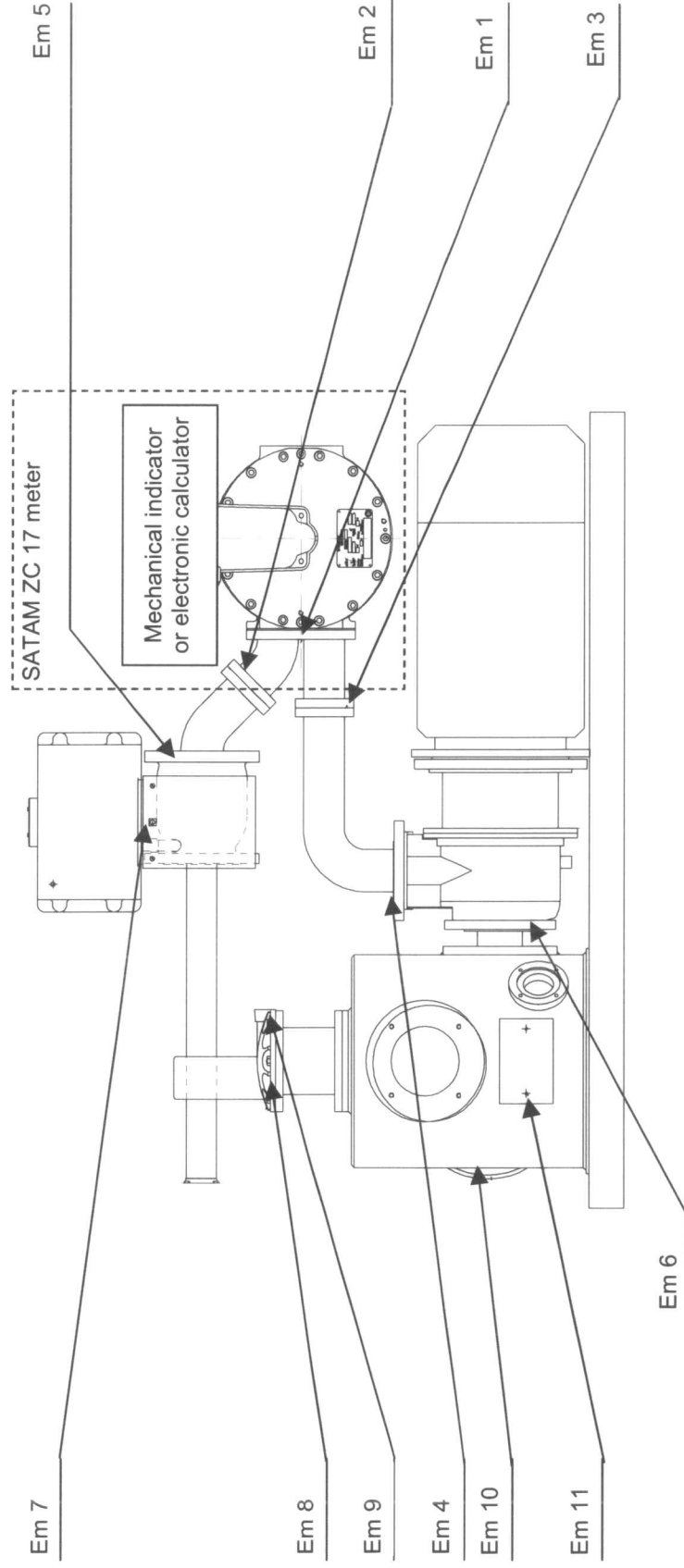
When the SATAM measuring systems ZCE 21 or ZCE 22 are fitted with an electronic calculator-indicator device, calculators seals are defined in the evaluation certificate related to the relevant calculator device.

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.

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## Sealing plan for SATAM measuring systems ZCE 21 for receipt



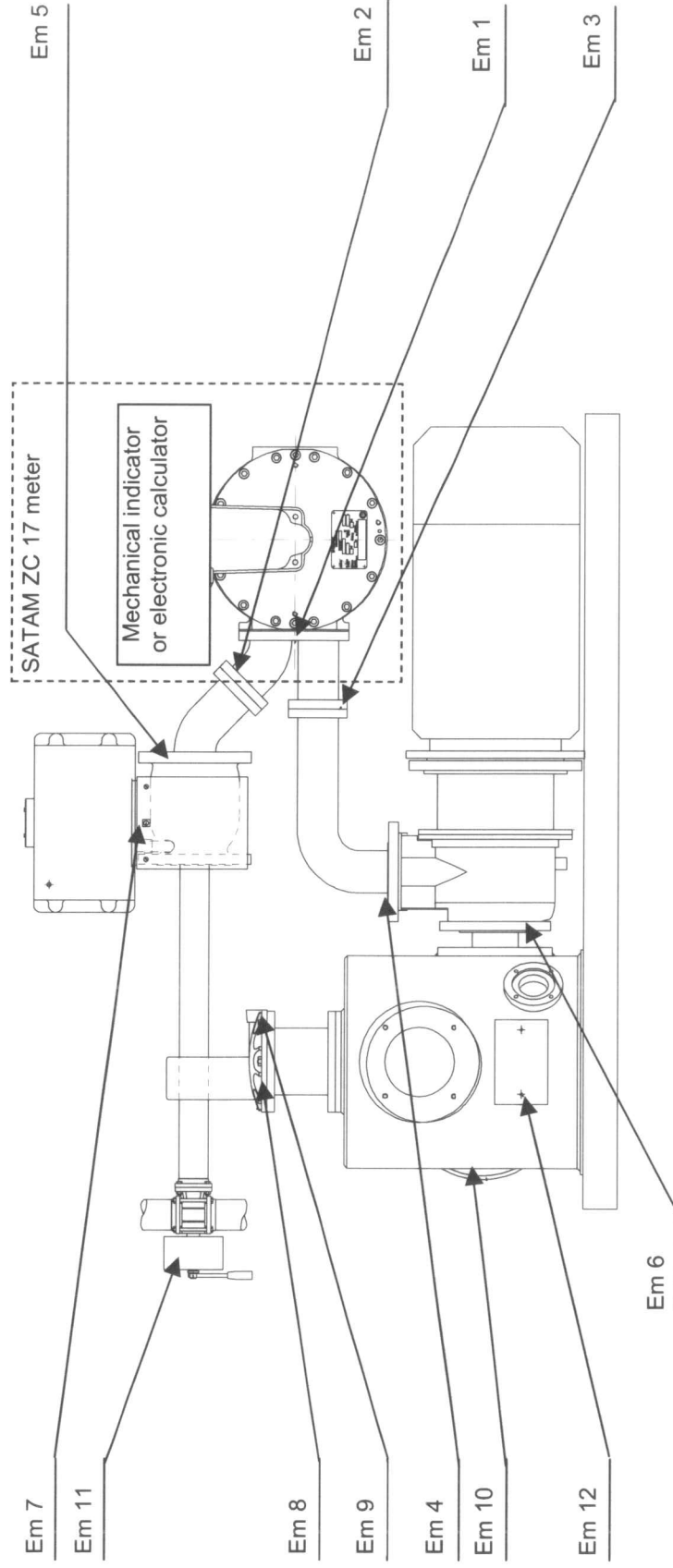
Em 1, 2, 3, 4, 5 : Protects inlet and outlets of the meter  
Em 6 : Protects link between EC 41-60 tank and pump  
Em 7 : Protects valve control box  
Em 8 : Protects evacuation gas device

Em 9 : Protects device to detect level High  
Em 10 : Protects device to detect level Low  
Em 11 : Protects data plate

Sealing plan for SATAM ZC 17 meter are detailed in the evaluation certificate n° LNE-11052.

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## Sealing plan for SATAM measuring systems ZCE 22 for receipt and delivery



Em 1, 2, 3, 4, 5 : Protects inlet and outlets of the meter  
Em 6 : Protects link between EC 41-60 tank and pump  
Em 7 : Protects valve control box  
Em 8 : Protects evacuation gas device

Em 9 : Protects device to detect level High  
Em 10 : Protects device to detect level Low  
Em 11 : Protects three-way valve  
Em 12 : Protects data plate

Sealing plan for SATAM ZC 17 meter are detailed in the evaluation certificate n° LNE-11052.



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9. Marking and inscriptions

SATAM measuring systems ZCE 21 and ZCE 22 are fitted with a data plate on which the marking is displayed.

ENSEMBLE DE MESURAGE		SATAM	
Modele / Model : ZCE <input type="text"/>			
N° DE SERIE : <input type="text"/>		Annee: 20 <input type="text"/>	
Serial number		Year	
Certificat LNE - 19549			
Certificate number			
CE	M <input type="text"/>	<input type="text"/>	Ex II G CT4
Classe exactitude: 0.5 Exactness class			
Classe environnement mecanique : M1 Environmental class mecanical			
Classe environnement electromagnetique : E2 Environmental class electromagnetic			
Debit Max : <input type="text"/> m³/h max. flow rate		Pression Max : <input type="text"/> bar max. working pressure	
Debit Min : <input type="text"/> m³/h min. flow rate		Pression Min : <input type="text"/> bar min. working pressure	
Quantite mesuree minimale : <input type="text"/> Litres Minimum delivery liters			
Liquide mesure/Liquid measured : <input type="text"/>			
Marque/Mark : <input type="text"/>			

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