

CERTIFICAT D'ÉVALUATION

EVALUATION CERTIFICATE

N° LNE- 11052 rév. 8 du 21 juillet 2015

Modifie le certificat 11052-7

Délivré par : Laboratoire national de métrologie et d'essais
Issued by

En application : Guide WELMEC n° 8.8 (2008) - OIML R117-1 (2007)
In accordance with

WELMEC guide 8.8 (2008) - OIML R117-1 (2007)

Délivré à : SATAM - 47 allée des Impressionnistes Villepinte BP 85012
Issued to FRANCE - 95931 - ROISSY CH DE GAULLE CEDEX

Producteur : SATAM 47 allée des Impressionnistes Villepinte BP 85012 FRA 95931 ROISSY CH DE GAULLE
Producer CEDEX

Concernant : Compteurs SATAM types ZC 17-12/12, ZC 17-12/24, ZC 17-12/25, ZC 17-24/24, ZC 17-24/48, ZC
In respect of 17-80/80, ZC 17-100, ZC 17-80/150, ZC 17-80/250 et ZC 17-80/330 utilisés comme partie d'un système de mesurage continu et dynamique de quantités de liquides autres que l'eau.

Meters SATAM types ZC 17-12/12, ZC 17-12/24, ZC 17-12/25, ZC 17-24/24, ZC 17-24/48, ZC 17-80/80, ZC 17-100, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330 used as a part of a measuring system for continuous and dynamic measurement of quantities of liquids other than water.

Caractéristiques : Les caractéristiques métrologiques sont détaillées dans l'annexe du présent certificat.
Characteristics

The metrological characteristics are detailed in the appendix of this certificate.

Les principales caractéristiques et conditions d'évaluation figurent dans l'annexe ci-jointe qui fait partie intégrante du certificat et comprend 41 page(s) en annexe. Tous les plans, schémas et notices sont déposés au Laboratoire national de métrologie et d'essais sous la référence de dossier P144439 .

The principal characteristics, evaluation conditions are set out in the appendix hereto, which forms part of the approval documents and consists of 41 pages in annex. All the plans, schematic diagrams and documentations are recorded under reference file P144439 .

Etabli le 21 juillet 2015

Issued on July 21st, 2015

Pour le Directeur général
On behalf of the General Director


Thomas LOMMATZSCH

Responsable du Pôle Certification
Measuring Instruments Division Manager

Remarque : Ce certificat ne peut être cité dans un certificat d'examen CE de type sans l'autorisation du fabricant cité ci-dessus
remark

This evaluation certificate cannot be quoted in an EC Type examination certificate without permission of the manufacturer quoted above.

Laboratoire national de métrologie et d'essais

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Summary

The last revision synthesizes all the precedent ones.

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.

Date	Revision	Modification
27/09/2007	0	Initial
27/09/2007	1	Translation in English ; modification of the sealing plan
27/04/2009	2	Change of the name of the company (SATAM)
19/08/2010	3	<ul style="list-style-type: none">- Adding EQUALIS MPC electronic calculator-indicator- Adding mechanical indicators with indication scale interval 10 L for ZC 17-80/80 et ZC 17-80/150 meters- Adding installations with remote mechanical indicating device, connection box or mechanical differential- Adding conditionally the possibility to not realise accuracy test at intermediate flowrate during verification- Change sealing plans and identification plate- Change meters characteristics (§2)- Change temperature range of products metered
04/04/2011	4	<ul style="list-style-type: none">- Adding electronic calculators-indicators MECI CDN12 and associated pressure and temperature transducers- Adding paragraphs « 1. Designation » and « 3.2 Environment »- Adding assembly of an additional pulse generator- Change meters characteristics (§3)- Change list of products metered (exclusion LPG)
22/11/2013	5	<ul style="list-style-type: none">- Adding electronic calculators-indicators SATAM type EQUALIS S- Adding VEEDER-ROOT 7890 mechanical volume indicating device and ticket printer
30/03/2015	6	<ul style="list-style-type: none">- Adding electronic calculators-indicator VEEDER ROOT type EMR3.- Simplifying the wording.
23/06/2015	7	Adding meter type ZC 17-80/330
21/07/2015	8	Adding ELTOMATIC type 01-08 or 01-09 pulse transmitter

1. Designation

This evaluation certificate relates to meters SATAM types ZC 17 17-12/12, ZC 17-12/24, ZC 17-12/25, ZC 17-24/24, ZC 17-24/48, ZC 17-80/80, ZC 17-100, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330 used for measuring liquids other than water.

2. Description

2.1. Meters description

SATAM meters ZC 17-12/12, ZC 17-12/24 and ZC 17-12/25 consist of the following components:

- a volumetric measurement transducer MA21-12.
- a mechanical indicator or an electronic calculator-indicator device (see § 2.2).
- a drive system AB40 including the adjustment device AB35 or a direct link with sprocket adjustment (for meters fitted with an electronic calculator-indicator device, a pulse generator replaces the drive system AB40).
- if required, the following accessories may be connected to the meter:
 - o a ticket printer (accumulative or zero-start) with or without electric safety,
 - o a pre-setting device with a control valve (mechanical, pneumatic or electrical),
 - o a three-way valve fitted with a no-return valve,
 - o a non-metrological mechanical rate-of-flow indicator (displaying L/min or m3/h),
 - o an additional pulse generator type AC30 which may be part of another measurement chain.

SATAM meters ZC 17-24/24 and ZC 17-24/48 consist of the following components:

- a volumetric measurement transducer MA21-24 or MA21-48.
- a mechanical indicator or an electronic calculator-indicator device (see § 2.2).
- a drive system.
- an adjustment device AB35 or a direct link with sprocket adjustment (for meters fitted with an electronic calculator-indicator device, a pulse generator replaces the drive system and adjustment device AB35).
- if required, the following accessories may be connected to the meter :
 - o a ticket printer (accumulative or zero-start) with or without electric safety,
 - o a pre-setting device with a control valve (mechanical, pneumatic or electrical),
 - o a three-way valve fitted with a no-return valve,
 - o a non-metrological mechanical rate-of-flow indicator (displaying L/min or m³/h),
 - o an additional pulse generator type AC30 which may be part of another measurement chain.

SATAM meters ZC 17-80/80, ZC 17-100, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330 consist of the following components:

- a volumetric measurement transducer MA21-80, MA21-100, MA21-150 or MA21-250 or MA21-330.
- an adjustment device AB21 (for meters fitted with an electronic calculator-indicator device, a pulse generator replaces adjustment device AB21).
- a mechanical indicator or an electronic calculator-indicator device (see § 2.2).
- if required, the following accessories may be connected to the meter:
 - o a ticket printer (accumulative or zero-start) with or without electric safety,
 - o a pre-setting device with a control valve (mechanical, pneumatic or electrical),
 - o an additive injector XAD41,
 - o a non-metrological mechanical rate-of-flow indicator (displaying L/min or m³/h),
 - o flow limiters,
 - o strainers,
 - o air separators or gas extractors.
- in some configurations with mechanical indicating device, the following accessories may be connected to the meter:
 - o an extension, fixed or adjustable, straight or oblique, in case of a remote mechanical indicating device,
 - o a connection box, including an impulsion generator, without metrological function,
 - o a mechanical differential,
 - o an additional pulse generator type AC30 which may be part of another measurement chain.

2.2. Description of mechanical indicators and electronic calculator-indicator devices

Mechanical indicating devices

SATAM meters ZC may be fitted with the following mechanical indicating devices:

- a VEEDER-ROOT **7887** mechanical volume indicating device, whose first element may have 2 figures, and which may be used with :

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- a VEEDER-ROOT 7889 pre-setting device,
- a VEEDER-ROOT type 7498 or 7951 ticket printer,
- a VEEDER-ROOT type 7888.11-901 or 7888.10-902 ticket printer.

Connection of a VEEDER-ROOT type 7887 indicating device with a VEEDER-ROOT type 7888.11-901 or 7888.10-902 ticket printer is referenced 7890.01-900 or 7890.00-900.

- a KIENZLE **M** mechanical volume indicating device, which may be used with :
 - a KIENZLE pre-setting device
 - a KIENZLE ticket printer.

Electronic calculators-indicators :

SATAM meters ZC may be fitted with the following electronic calculators-indicators:

- SATAM **EQUALIS L** covered by evaluation certificate **LNE-6854**,
- SATAM **EQUALIS MPC** covered by evaluation certificate **LNE-17045**,
- SATAM **EQUALIS S** covered by evaluation certificate **LNE-25874**,
- MECI **CDN12** covered by evaluation certificate **LNE-15088**,
- VEEDER-ROOT **EMR3** covered by evaluation certificate **GB-1285**.

The conditions applying to the calculator are described in the calculator certificate or the certificates covering the measuring systems.

When fitted with calculators-indicators devices SATAM or VEEDER ROOT, SATAM meters ZC are fitted with a pulse generator described into the evaluation certificate of the calculator device.

When fitted with calculators-indicators devices MECI types CDN12, SATAM meters ZC are fitted with a pulse generator type AC30 and can be composed with following components:

- a temperature transducer with platinum probes :
 - for temperature conversion of volumes in metering conditions,
 - for temperature indication.

Only first point does need use of a temperature transducer EMERSON PROCESS MANAGEMENT type 3144P in compliance with part certificate n°TC7458.

For other uses, temperature transducer does not need to be absolutely evaluated.

- a MECI DIR12 remote indicating device, associated with the electronic calculator-indicator MECI CDN12 included in a measuring system.
- a pressure transducer:
 - for pressure conversion of volumes in metering conditions,
 - for pressure indication.

Only first point does need use of a pressure transducer EMERSON PROCESS MANAGEMENT type 3051S in compliance with part certificate n°TC7457.

For other uses, pressure transducer does not need to be absolutely evaluated.

2.3. Metrological functions

When SATAM meters ZC are fitted with one of electronic calculators-indicators listed in § 2.2, they perform metrological functions described respectively in their evaluation certificates.

When SATAM meters ZC are fitted with a VEEDER-ROOT 7887 volume indicating device, they perform the following functions:

- they display volume in metering conditions, including in some configurations a first element with 2 figures,
- if used with a VEEDER-ROOT 7889 pre-setting device, they pre-set the volume to be delivered,

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- if used with a VEEDER-ROOT 7498 or 7951 printer, they print measurement results.

A pulse transmitter may also be used with VEEDER-ROOT mechanical indicator type 7887 through an ELTOMATIC 01-08 or 01-09 pulse transmitter.

Connection of a VEEDER-ROOT 7887 indicating device with VEEDER-ROOT printer 7888.11-901 or 7888.10-902 is referenced 7890.01-900 or 7890.00-900.

When SATAM meters ZC are fitted with a KIENZLE M volume indicating device, they perform the following functions:

- they display volume in metering conditions,
- if used with a KIENZLE pre-setting device, they pre-set the volume to be delivered,
- if used with a KIENZLE printer, they print measurement results.

2.4. Non-metrological functions

When SATAM meters ZC are fitted with one of electronic calculators-indicators listed in § 2.2, they perform non-metrological functions described respectively in their evaluation certificates.

A pulse transmitter may also be used:

- either with VEEDER-ROOT mechanical indicator type 7887 through a VEEDER-ROOT 1871 or 7671 pulse transmitter,
- either downstream from the meter through a connection box,
- either a measurement transducer by adding a second pulse generator AC30.

In both first cases data coming from these transmitters are non-metrological and can't be used for commercial transactions.

In third case, data coming from the pulse generator AC30 can be used in another measurement chain.

2.5. Software

When SATAM meters ZC are fitted with one of electronic calculators-indicators listed in § 2.2, the software application checksum for the metrological functions is specified respectively in their evaluation certificates.

3. Characteristics

3.1. Metrological characteristics

The metrological characteristics of SATAM meters ZC are as follows:

- **SATAM meters types ZC 17-12/12, ZC 17-12/24, ZC 17-12/25 or ZC 17-24/24**

Meter type	ZC 17-12/12 ZC 17-12/24 ZC 17-12/25	ZC 17-24/24	ZC 17-12/12 ZC 17-12/24 ZC 17-12/25	ZC 17-24/24
Indicator type	Mechanical indicating device VEEDER ROOT type 7887 or KIENZLE type M		Electronic calculator-indicator (see § 2.2)	
Indication/printing scale interval	0.1 l Figure: 1 l	1 l or 0.1 l	see evaluation certificate	
Maximum indication/printing level	99 999 or 99 999.9	99 999 or 99 999.9	see evaluation certificate	
Minimum quantity metered (litres)	10 / 50 / 50	100	10	100 or 1000
Minimum flowrate (m ³ /h)	1.2 / 2.4 / 1.2	2.4	1.2 / 2.4 / 1.2	2.4
Maximum flowrate (m ³ /h)	12 / 24 / 24	24	12 / 24 / 24	24
Maximum relative pressure (bar)	8	6 (petrol, oil) 8 (domestic oil, diesel oil, ethanol)	8	6 (petrol, oil) 8 (domestic oil, diesel oil, ethanol)
Temperature range of products metered	- 10 °C to + 90 °C (*)		- 10 °C to + 80 °C (*)	
Products metered	Liquid hydrocarbons with kinematic viscosity under 20 mm ² /s at metering conditions (except LPG) industrial oils and fatty acid methyl esters for diesel engines ; ethanol			
Accuracy class	0.5 or 1			

(*) The maximum temperature range can be reduced

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- SATAM meters types ZC 17-24/48 or ZC 17-100**

Meter type	ZC 17-24/48	ZC 17-100	ZC 17-24/48	ZC 17-100
Indicator type	Mechanical indicating device VEEDER ROOT type 7887 or KIENZLE type M		Electronic calculator-indicator (see § 2.2)	
Indication/printing scale interval	0.1 l Figure: 1 l	1 l or 0.1 l	see evaluation certificate	
Maximum indication/printing level	99 999 or 99 999.9	99 999 or 99 999.9	see evaluation certificate	
Minimum quantity metered (litres)	100	100	100	100 or 1000
Minimum flowrate (m ³ /h)	4.8	10	4.8	10
Maximum flowrate (m ³ /h)	48	100	48	100
Maximum relative pressure (bar)	6 (petrol, oil) 8 (domestic oil, diesel oil, ethanol)	10	6 (petrol, oil) 8 (domestic oil, diesel oil, ethanol)	10
Temperature range of products metered	- 10 °C to + 90 °C (*)		- 10 °C to + 80 °C (*)	
Products metered	Liquid hydrocarbons with kinematic viscosity under 20 mm ² /s at metering conditions (except LPG) industrial oils and fatty acid methyl esters for diesel engines ; ethanol			
Accuracy class	0.5 or 1			

(*) The maximum temperature range can be reduced

- SATAM meters types ZC 17-80/80 or ZC 17-80/150**

Meter type	ZC 17-80/80 / ZC 17-80/150		
Indicator type	Mechanical indicating device VEEDER ROOT type 7887 or KIENZLE type M		Electronic calculator-indicator (see § 2.2)
	VR type 7887 or KIENZLE type M	VR type 7887 (first element with 2 figures)	-
Indication/printing scale interval	0.1 l Figure: 1 l	10 l	see evaluation certificate
Maximum indication/printing level	99 999 or 99 999.9	999 990	see evaluation certificate
Minimum quantity metered (litres)	100	1000	100 or 1000
Minimum flowrate (m ³ /h)	8 / 15	8 / 15	8 / 15
Maximum flowrate (m ³ /h)	80 / 150	80 / 150	80 / 150
Maximum relative pressure (bar)	10		
Temperature range of products metered	- 10 °C to + 90 °C (*)		- 10 °C to + 80 °C (*)
Products metered	Liquid hydrocarbons with kinematic viscosity under 20 mm ² /s at metering conditions (except LPG) industrial oils and fatty acid methyl esters for diesel engines ; ethanol		
Accuracy class	0.5 or 1		

(*) The maximum temperature range can be reduced

- SATAM meter type ZC 17-80/250**

Meter type	ZC 17-80/250	
Indicator type	Mechanical indicating device VEEDER ROOT type 7887 (first element with 2 figures) or KIENZLE type M	Electronic calculator-indicator (see § 2.2)
Indication/printing scale interval	0.01 m ³ or 10 l	see evaluation certificate
Maximum indication/printing level	999.99 or 999 990	see evaluation certificate
Minimum quantity metered (litres)	1000	
Minimum flowrate (m ³ /h)	25	
Maximum flowrate (m ³ /h)	250	
Maximum relative pressure (bar)	10	
Temperature range of products metered	- 10 °C to + 90 °C (*)	- 10 °C to + 80 °C (*)
Products metered	Liquid hydrocarbons with kinematic viscosity under 20 mm ² /s at metering conditions (except LPG) industrial oils and fatty acid methyl esters for diesel engines ; ethanol	
Accuracy class	0.5 or 1	

(*) The maximum temperature range can be reduced

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- **SATAM meter type ZC 17-80/330**

Meter type	ZC 17-80/330	
Indicator type	Mechanical indicating device VEEDER ROOT type 7887 (first element with 2 figures) or KIENZLE type M	Electronic calculator-indicator (see § 2.2)
Indication/printing scale interval	0.01 m ³ or 10 l	see evaluation certificate
Maximum indication/printing level	999.99 or 999 990	see evaluation certificate
Minimum quantity metered (litres)	2500	
Minimum flowrate (m ³ /h)	33	
Maximum flowrate (m ³ /h)	330	
Maximum relative pressure (bar)	10	
Temperature range of products metered	- 10 °C to + 90 °C (*)	- 10 °C to + 80 °C (*)
Products metered	Liquid hydrocarbons with kinematic viscosity under 68 mm ² /s at metering conditions (except LPG) industrial oils and fatty acid methyl esters for diesel engines ; ethanol	
Accuracy class	0,3 (with kinematic viscosity under 32 mm ² /s at metering conditions) 0.5 or 1	

(*) The maximum temperature range can be reduced

3.2. Environment

SATAM meters ZC 17 have the following environmental characteristics:

- Mechanical class :
 - **M1** when the meter is fitted with an electronic calculator-indicator device MECI CDN12 and if required with MECI DIR12 device,
 - **M2** for other configurations.
- Electromagnetic class :
 - **E2** when the meter is fitted with an electronic calculator-indicator device MECI CDN12 and if required with MECI DIR12 device,
 - **E3** for other configurations.
- Temperature range :
 - for mechanical parts : **- 40°C to + 55°C** ,
 - for electronic parts installed on site : **- 25°C to + 55°C** ,
 - for electronic calculator-indicator device MECI CDN12 installed in technical room: **- 10°C to + 40°C** .

If required, environmental characteristics of the transaction module unit of the calculator are defined in the evaluation certificate of the concerned calculator.

When fitted with an electronic calculator-indicator device, SATAM ZC meters elements which are installed outdoor are designed to operate in condensing humidity.

Electronic calculators-indicators devices MECI CDN12 are designed to operate in no-condensing humidity and must be installed in a technical room.

4. Interfaces and compatibility

When SATAM meters ZC are fitted with one of electronic calculators-indicators listed in § 2.2, they perform the functions described respectively in their evaluation certificates.

5. Special manufacture and installation conditions

There are no special manufacture or installation conditions for the mechanical version of SATAM meters ZC.

Special manufacture and installation conditions for the calculator-indicator device used with the meter are described in the calculator's evaluation certificate or in the certificate covering the measuring system in which the meter is installed.

When fitted with a calculator MECI CDN12, they cannot be installed on vehicles.

Electronic calculator MECI CDN12 and associated measuring systems which are described in « § 2. Description », make it possible to assembly a conversion device. Some of the parameters which

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characterize the measured liquid may be not measured and put manually in the calculator or delivered by measuring devices measuring devices not subject to control if these parameters do not influence significantly error on converted indications (see paragraph 3.7.3 OIML R117-1:2007 edition).

6. Special conditions for putting meters into service

There are no special conditions for putting the meters into service.

7. Special conditions of use

Volume is corrected to base temperature by the electronic calculators-indicators listed in § 2.2. This calculation is described in the evaluation certificate for the calculator used with the meter.

8. Special conditions of verification

Verification of the conformity of SATAM meters ZC includes the following tests and examinations:

- an examination to check that the meter meets the requirements of this certificate or of the certificate covering the measuring system in which it is installed,
- if the meter is fitted with an electronic calculator-indicator listed in § 2.2, the tests and examinations described in its evaluation certificate LNE-6854,
- if the meter is fitted with MECI CDN12 electronic calculator-indicator, accuracy tests of the associated measuring devices:
 - o measurement chain for temperature at three measuring points (used for conversion device) ;
 - o measurement chain for pressure at three measuring points (used for conversion device).
- an accuracy test performed at the minimum and maximum flowrates of the measuring system in which the meter is installed, as well as at an intermediate flowrate.

For SATAM meters types ZC 17-80/80, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330 realisation of the accuracy test at intermediate flowrate in workshop can be facultative if this measure is followed up through a continuous statistical sampling check. This sampling check should meet the requirements of a procedure validated by the notified body which evaluate the Quality System.

9. Securing and sealing

Meters are sealed by means of threaded rods with lead seals or sealing devices pressed onto spiral wire unless evaluation certificates provides other means for sealing.

When SATAM meters ZC are fitted with a MECI CDN12 electronic calculator-indicator, and eventually with the following devices :

- pressure transducer EMERSON PROCESS MANAGEMENT type 3051S,
- temperature transducer EMERSON PROCESS MANAGEMENT type 3144P.

These devices are sealed in compliance with measures defined in their respective evaluation certificate.

Temperature and pressure signals used in the conversion device or in the monitoring device, so as measure pulse signals, are protected by seals on intermediate connection boxes.

If the second pulse generator AC30 is used in another measurement chain, it must be sealed.

10. Marking

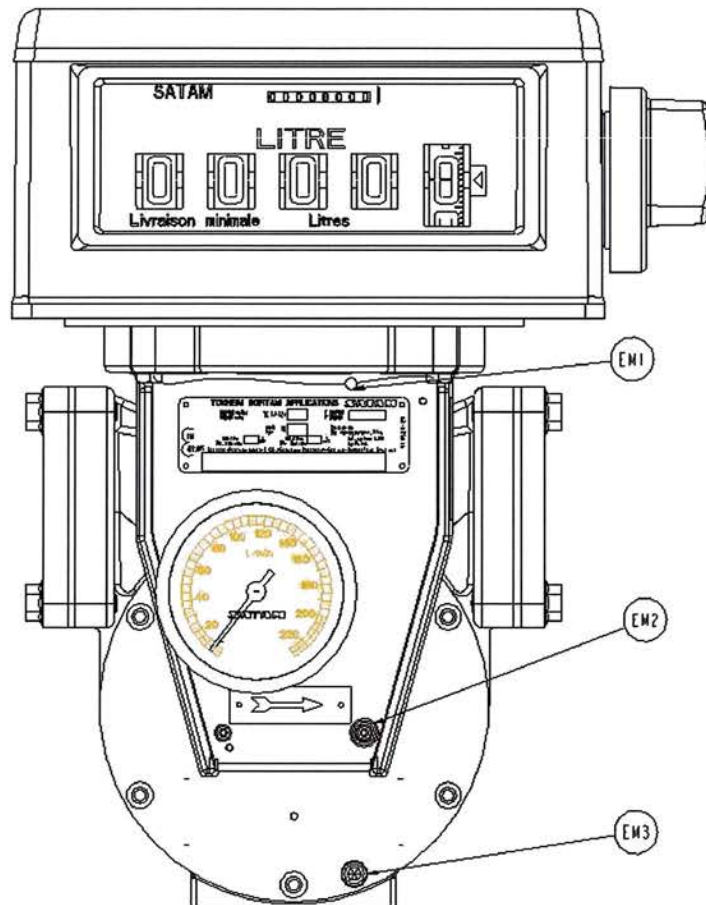
The data plate appears as below:

Compteur continu / Flow meter		SATAM	
Modele / Model : ZC17		N. []	
CE	II 2G cT4	Annee / Year : 20 []	
Certificat/Certificate number: LNE-11052			
Pression maxi / max. working pressure :		[] bar	
Debit maxi / max. flow rate :		[] m ³ /h	
Debit mini / min. flow rate :		[] m ³ /h	

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SATAM meters types
ZC 17-12/12, ZC 17-12/24 and ZC 17-12/25
fitted with a VEEDER-ROOT 7887 indicating device

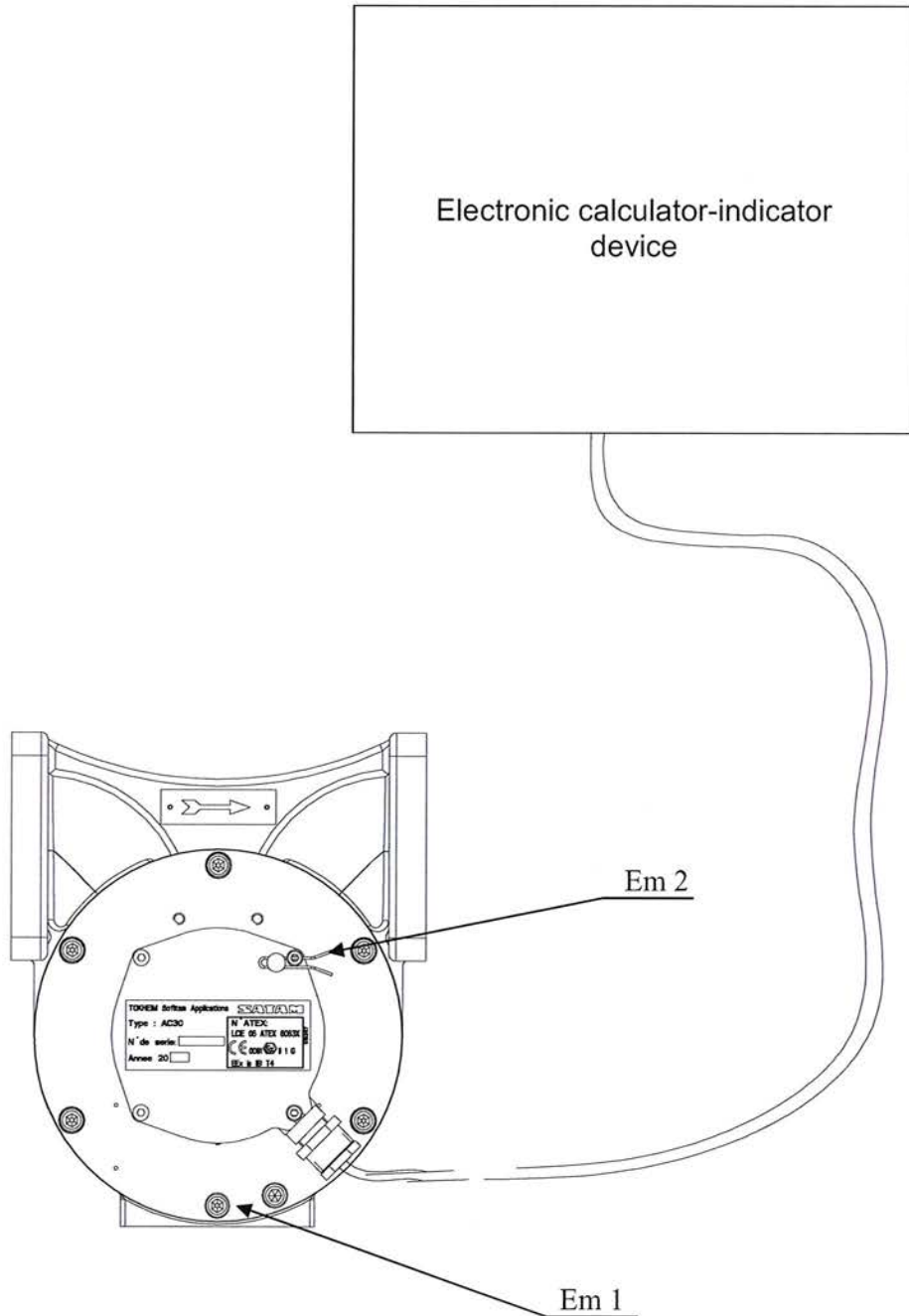
Sealing plan



- Em1 : Protects indicator
- Em2 : Protects adjustment device
- Em3 : Protects measuring device

SATAM meters types
ZC 17-12/12, ZC 17-12/24 and ZC 17-12/25
fitted with an electronic calculator-indicator

Sealing plan



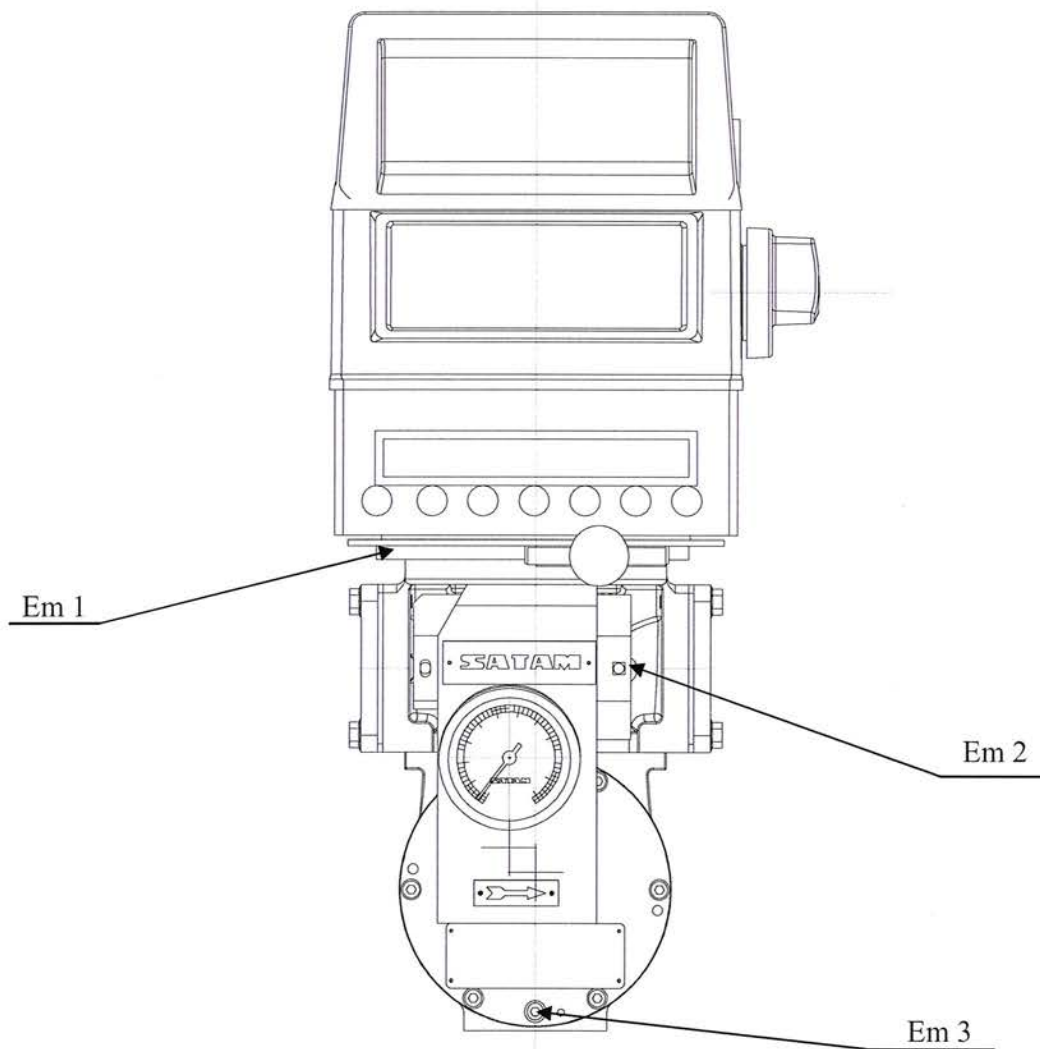
- Em1 : Protects measuring device
- Em2 : Seals pulse generator on measuring device

The sealing plans for electronic calculators-indicators listed in § 2.2 are detailed in their evaluation certificate.

Intermediate connection boxes between measuring transducer and CDN12 calculator are also sealed.

SATAM meters types
ZC 17-12/12, ZC 17-12/24, ZC 17-12/25, ZC 17-24/24 and ZC 17-24/48
fitted with a VEEDER-ROOT 7887 indicating device,
a VEEDER-ROOT 7498 or 7951 printer
and a VEEDER-ROOT 7889 pre-setting device

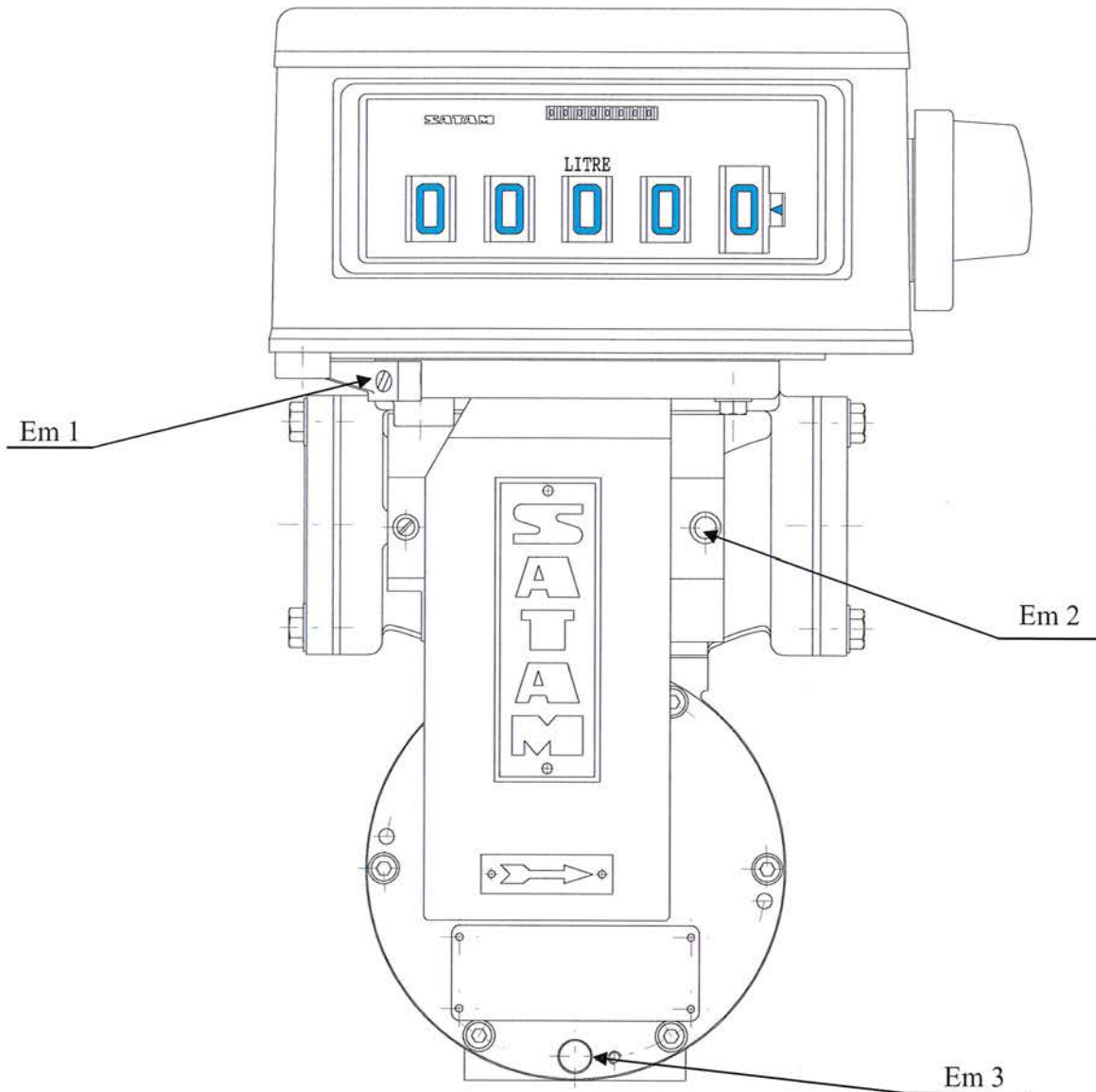
Sealing plan



- Em1 : Protects indicator
- Em2 : Protects adjustment device
- Em3 : Protects measuring device

SATAM meters types
ZC 17-24/24 and ZC 17-24/48
fitted with a VEEDER-ROOT 7887 indicating device

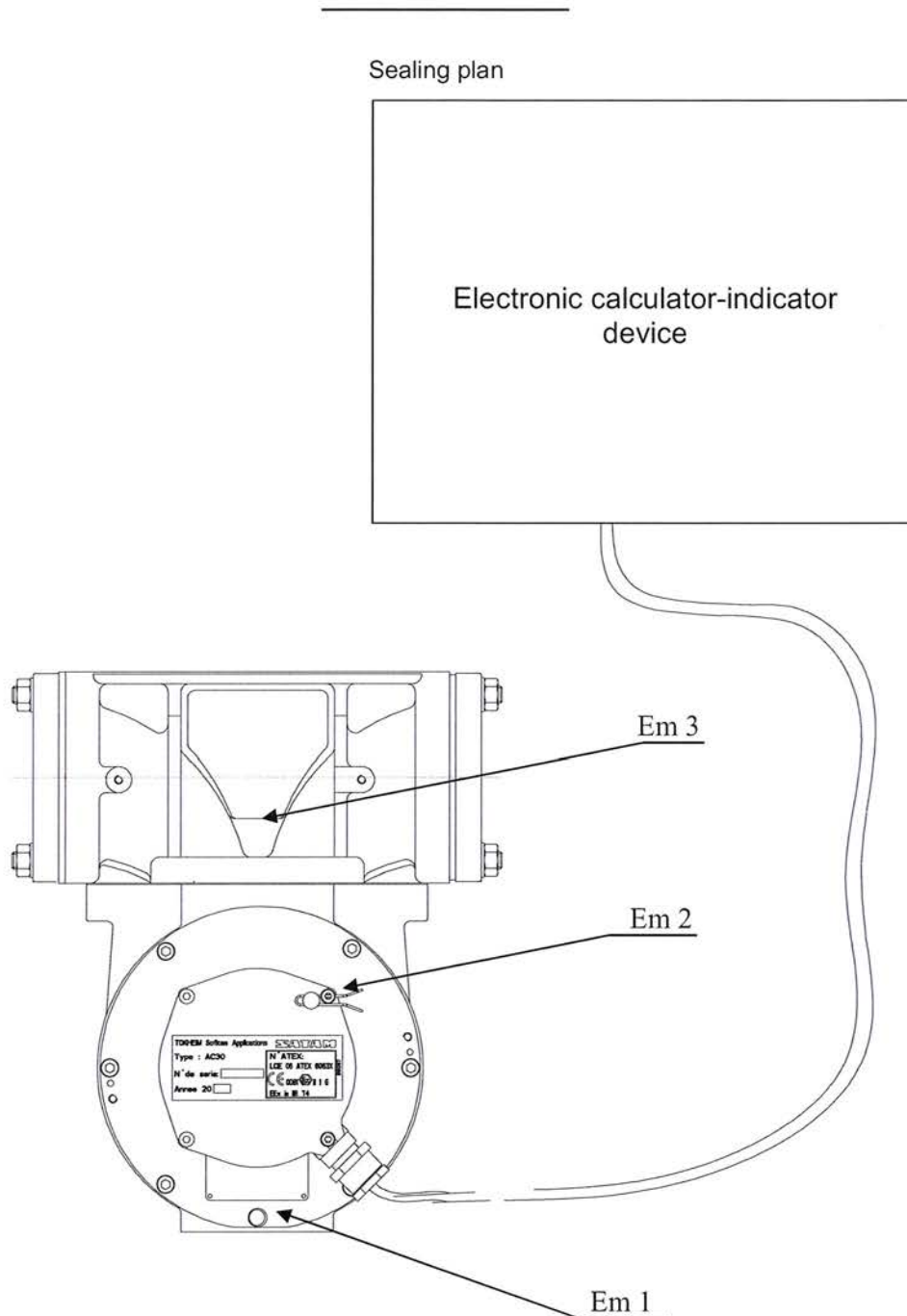
Sealing plan



- Em1 : Protects indicator
- Em2 : Protects adjustment device
- Em3 : Protects measuring device

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SATAM meters types ZC 17-24/24 and ZC 17-24/48 fitted with an electronic calculator-indicator



- Em1 : Protects measuring device
- Em2 : Seals pulse generator on measuring device
- Em3 : Seals manifold

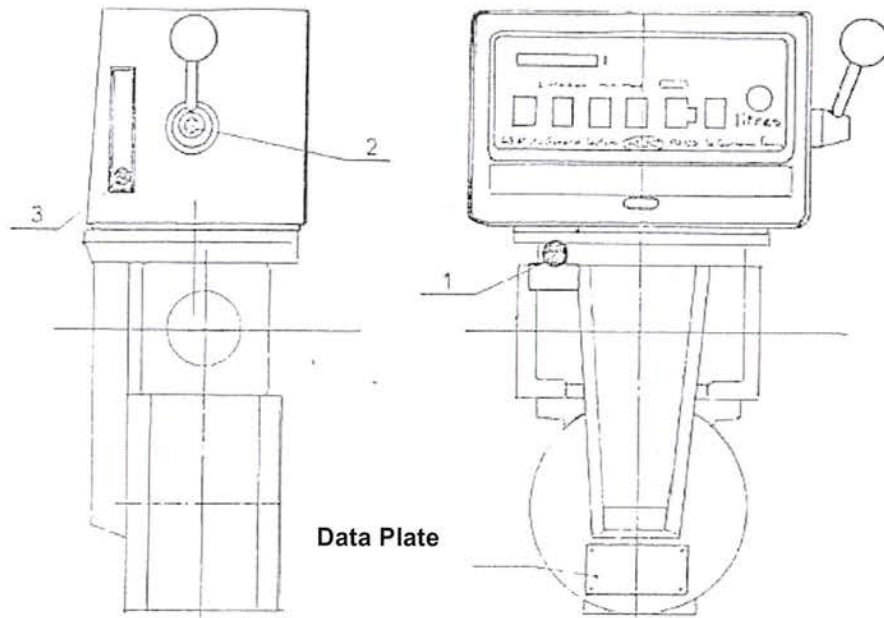
The sealing plans for electronic calculators-indicators listed in § 2.2 are detailed in their evaluation certificate.

Intermediate connection boxes between measuring transducer and CDN12 calculator are also sealed.

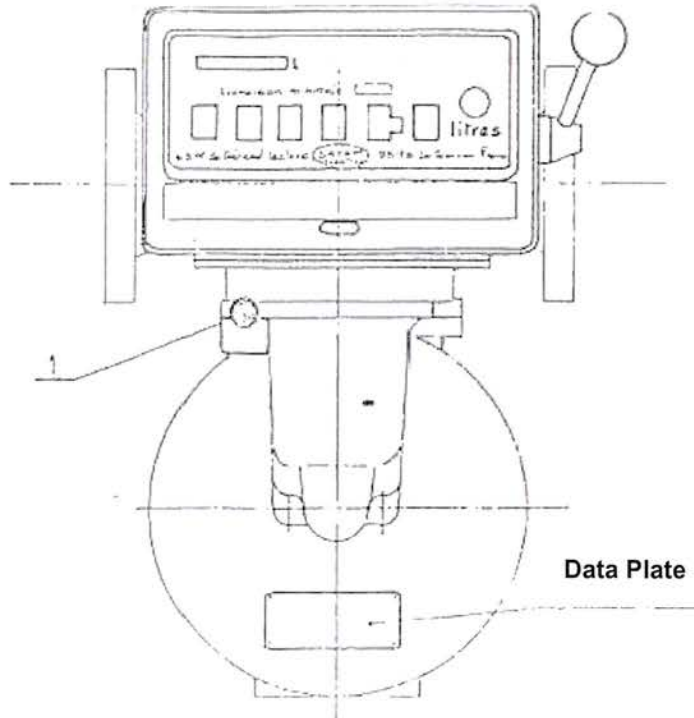
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SATAM meters types
ZC 17-12/12, ZC 17-12/24, ZC 17-12/25, ZC 17-24/24, ZC 17-24/48,
ZC 17-80/80, ZC 17-100, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330
fitted with a KIENZLE M indicating device

Sealing plan for meters ZC 17-12/12, ZC 17-12/24, ZC 17-12/25, ZC 17-24/24 and ZC 17-24/48

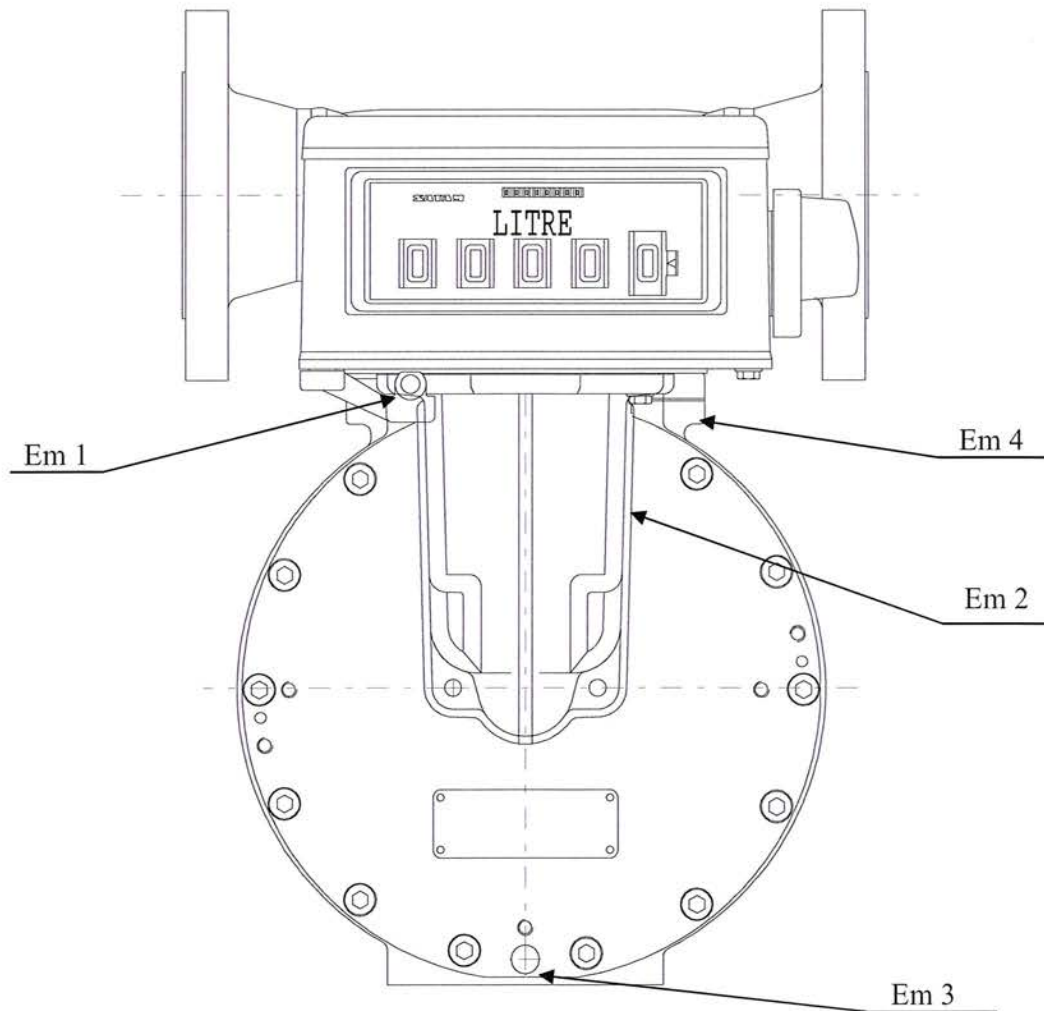


Sealing plan for meters ZC 17-80/80, ZC 17-100, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330



SATAM meters types
ZC 17-80/80, ZC 17-100 and ZC 17-80/150
fitted with a VEEDER-ROOT 7887 indicating device

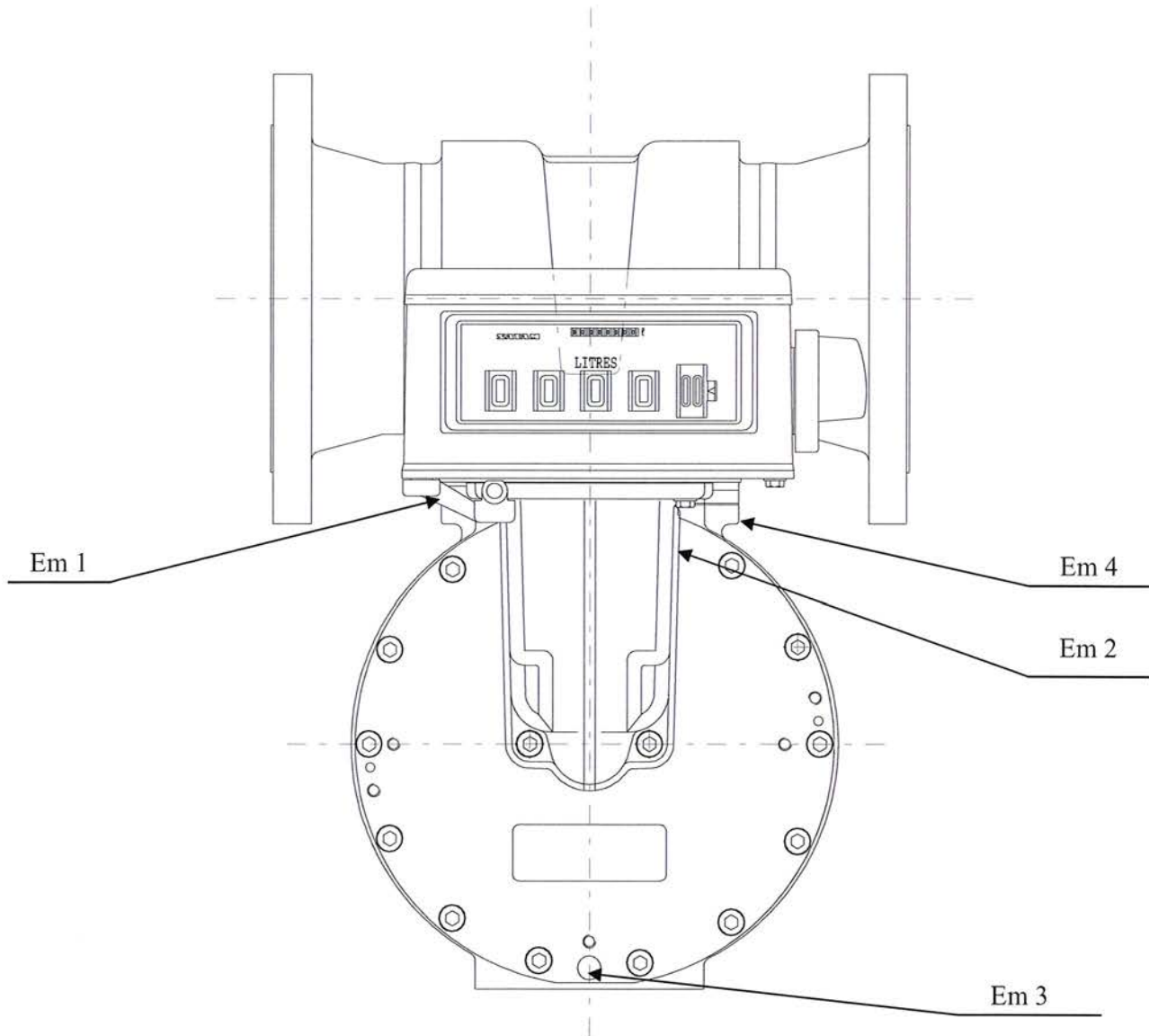
Sealing plan



- Em1 : Protects indicator
- Em2 : Protects adjustment device
- Em3 : Protects measuring device
- Em4 : Protects manifold

SATAM meters types
ZC 17-80/80, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330
fitted with a VEEDER-ROOT 7887 indicating device
(first element with 2 figures)

Sealing plan

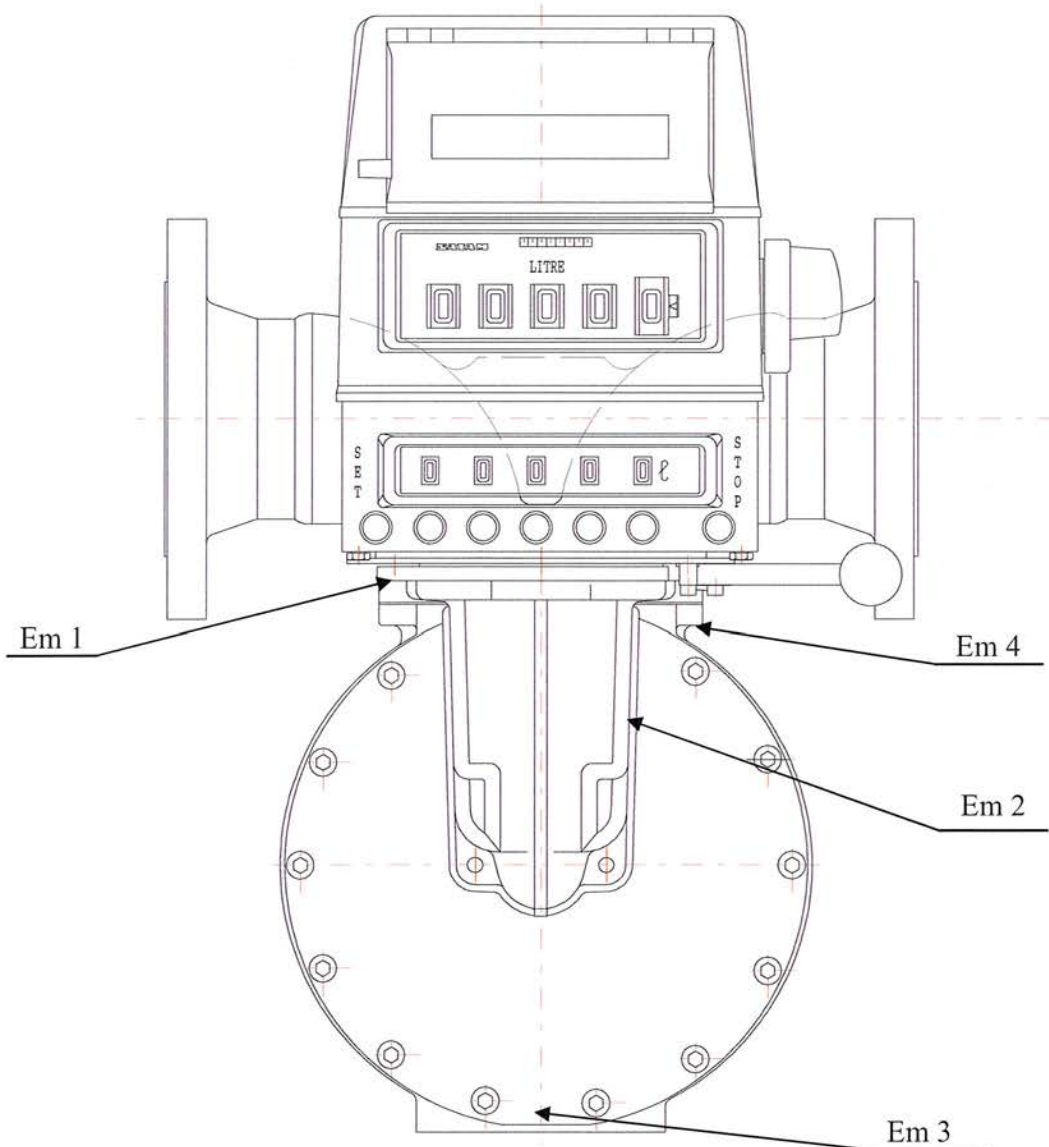


- Em1 : Protects indicator
- Em2 : Protects adjustment device
- Em3 : Protects measuring device
- Em4 : Protects manifold

Annex to evaluation certificate LNE-11052 revision 8

SATAM meters types
ZC 17-80/80, ZC 17-100, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330
fitted with a VEEDER-ROOT 7887 indicating device,
a VEEDER-ROOT 7498 or 7951 printer
and a VEEDER-ROOT 7889 pre-setting device

Sealing plan

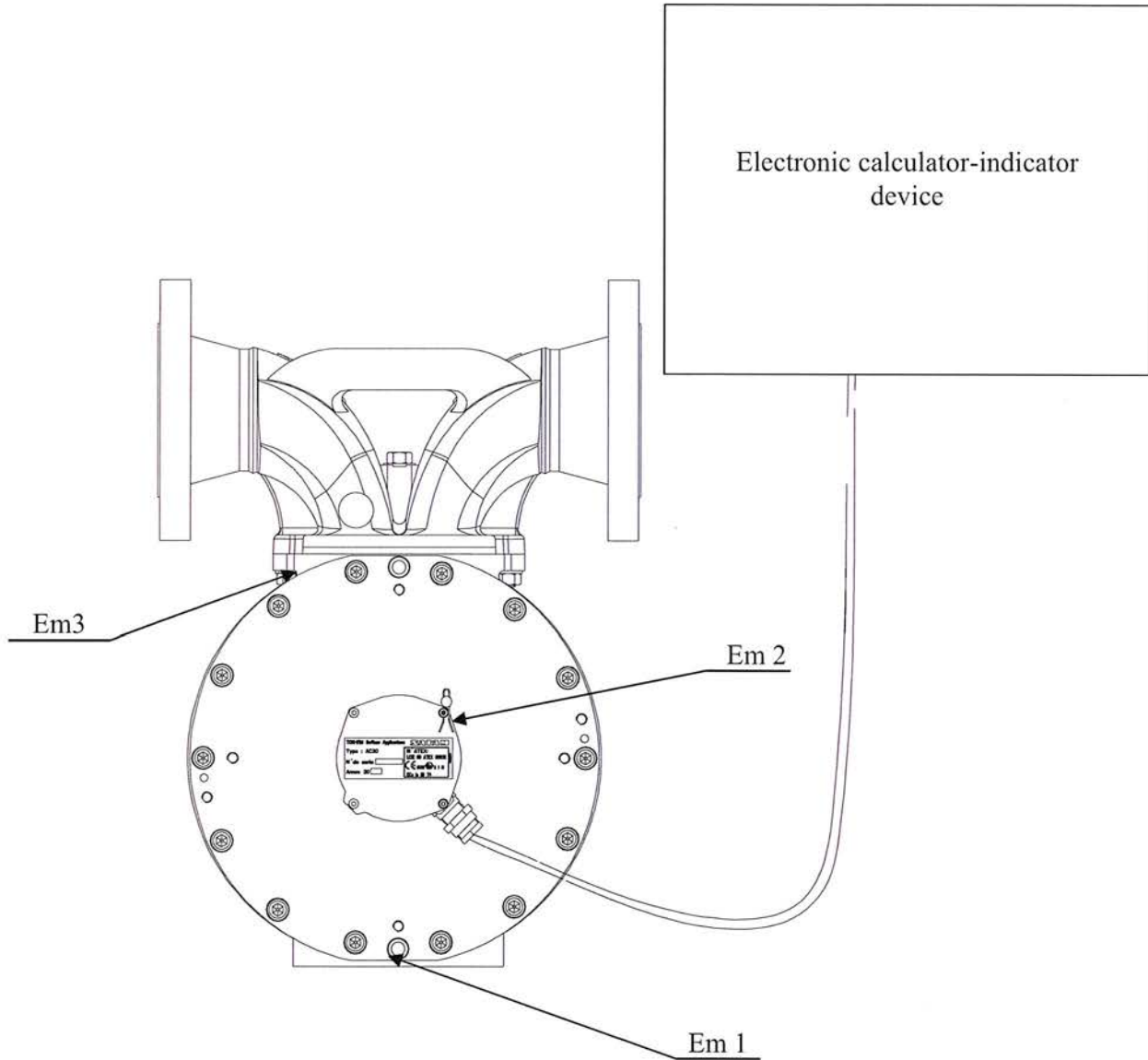


- Em1 : Protects indicator
- Em2 : Protects adjustment device
- Em3 : Protects measuring device
- Em4 : Protects manifold

Annex to evaluation certificate LNE-11052 revision 8

SATAM meters types ZC 17-80/80, ZC 17-100, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330 fitted with an electronic calculator-indicator

Sealing plan

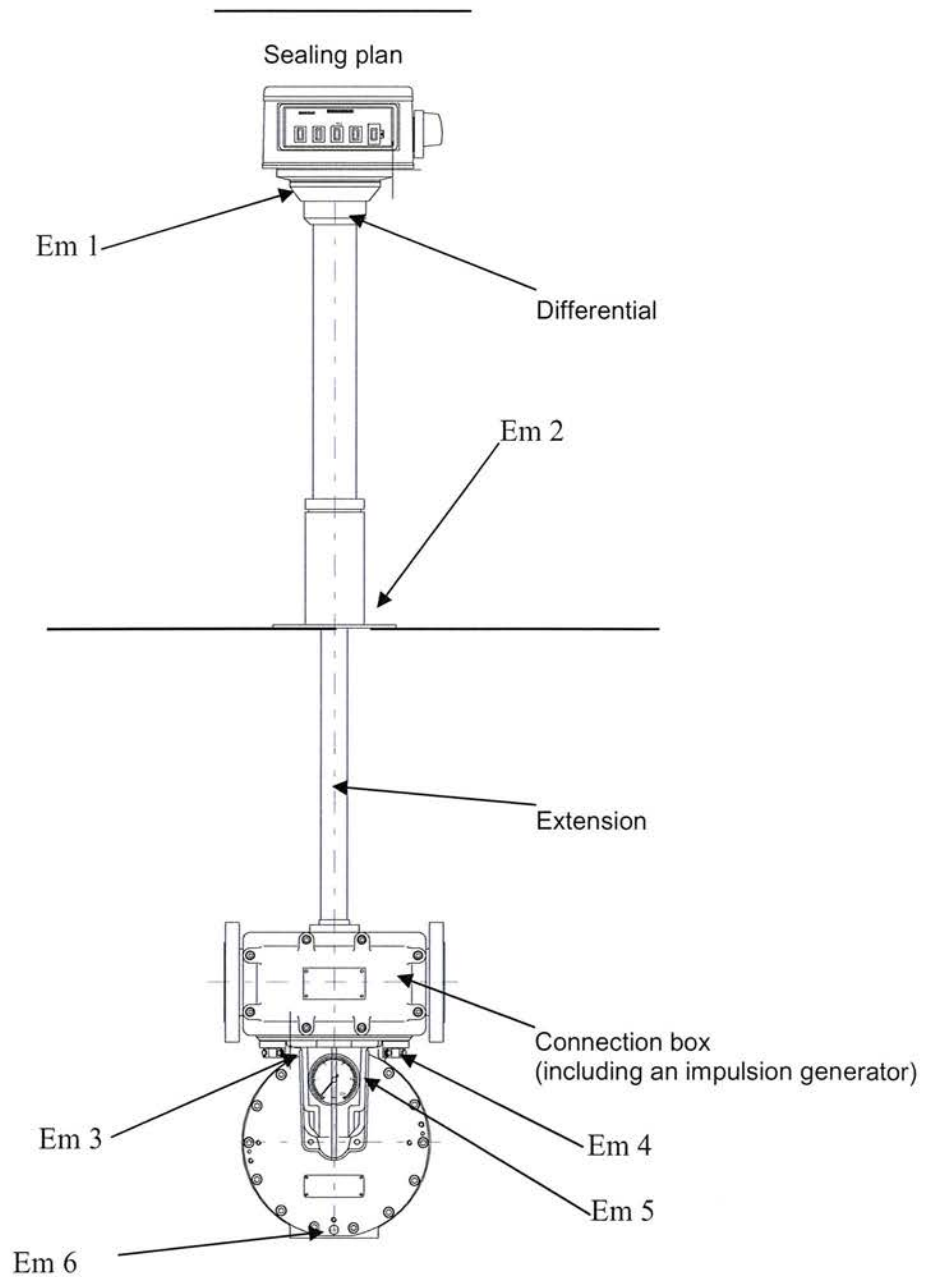


- Em1 : Protects measuring device
- Em2 : Seals pulse generator on measuring device
- Em3 : Seals manifold

The sealing plans for SATAM electronic calculators-indicators listed in § 2.2 are detailed in their evaluation certificate.

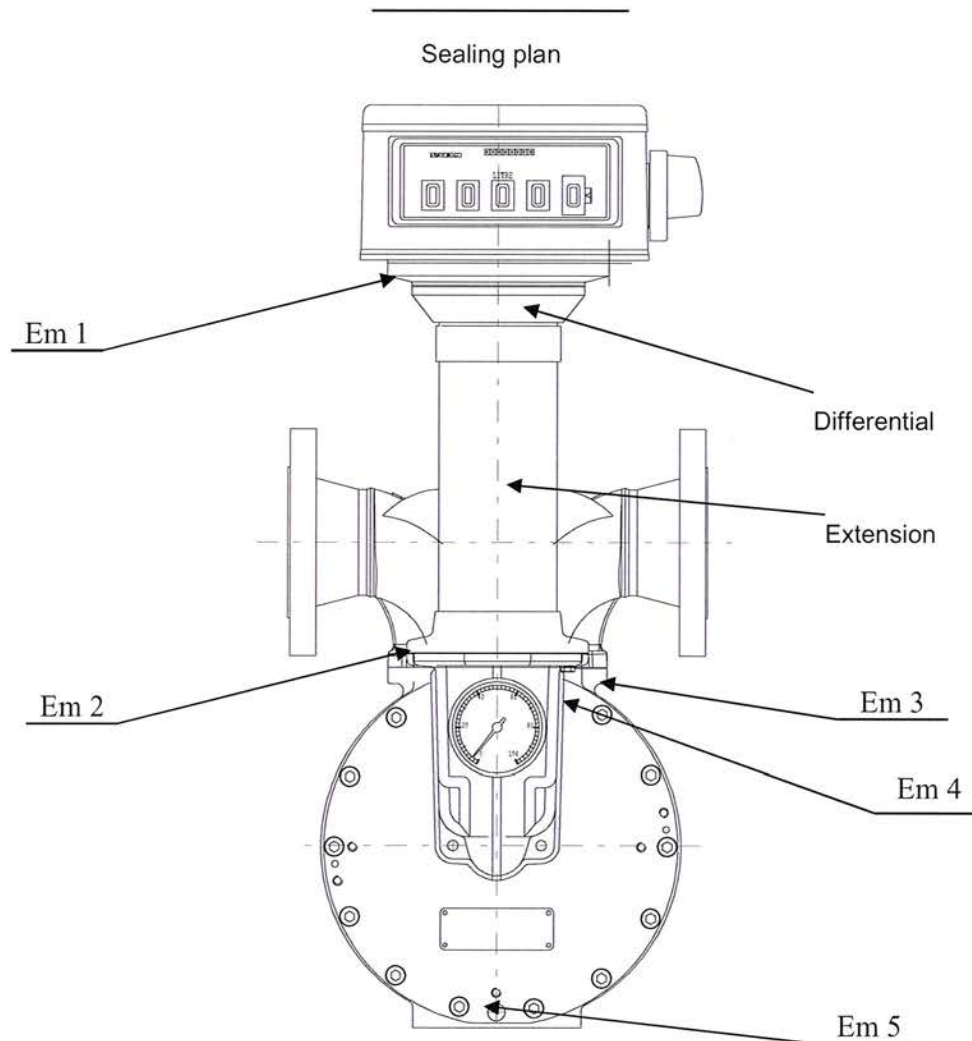
Intermediate connection boxes between measuring transducer and CDN12 calculator are also sealed.

SATAM meters types
ZC 17-80/80, ZC 17-100, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330
fitted with a VEEDER-ROOT 7887 indicating device,
a differential, a connection box
and an extension fixed or adjustable, straight or oblique



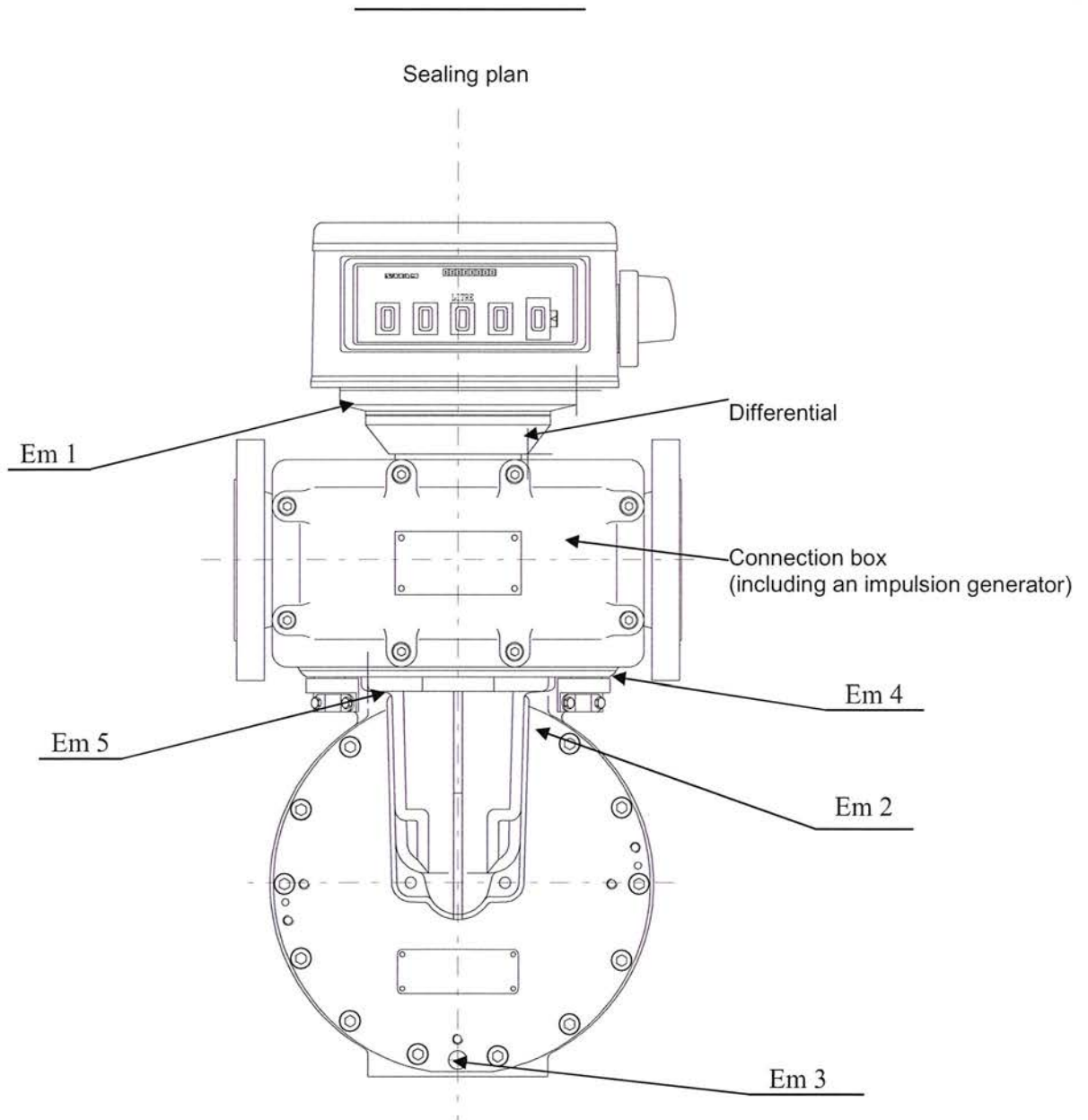
- Em 1 : Seals indicating device
- Em 2 : Seals base of the extension
- Em 3 : Seals connection box
- Em 4 : Seals pipe
- Em 5 : Protects adjustment device
- Em 6 : Seals measuring device

SATAM meters types
ZC 17-80/80, ZC 17-100, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330
fitted with a VEEDER-ROOT 7887 indicating device,
a differential and an extension fixed or adjustable, straight or oblique



- Em 1 : Seals indicating device
- Em 2 : Seals base of the extension
- Em 3 : Seals pipe
- Em 4 : Protects adjustment device
- Em 5 : Seals measuring device

SATAM meters types
ZC 17-80/80, ZC 17-80/150, ZC 17-80/250 and ZC 17-80/330
fitted with a VEEDER-ROOT 7887 indicating device,
a differential and a connection box



- Em 1 : Seals indicating device
- Em 2 : Protects adjustment device
- Em 3 : Seals measuring device
- Em 4 : Seals pipe
- Em 5 : Seals connection box