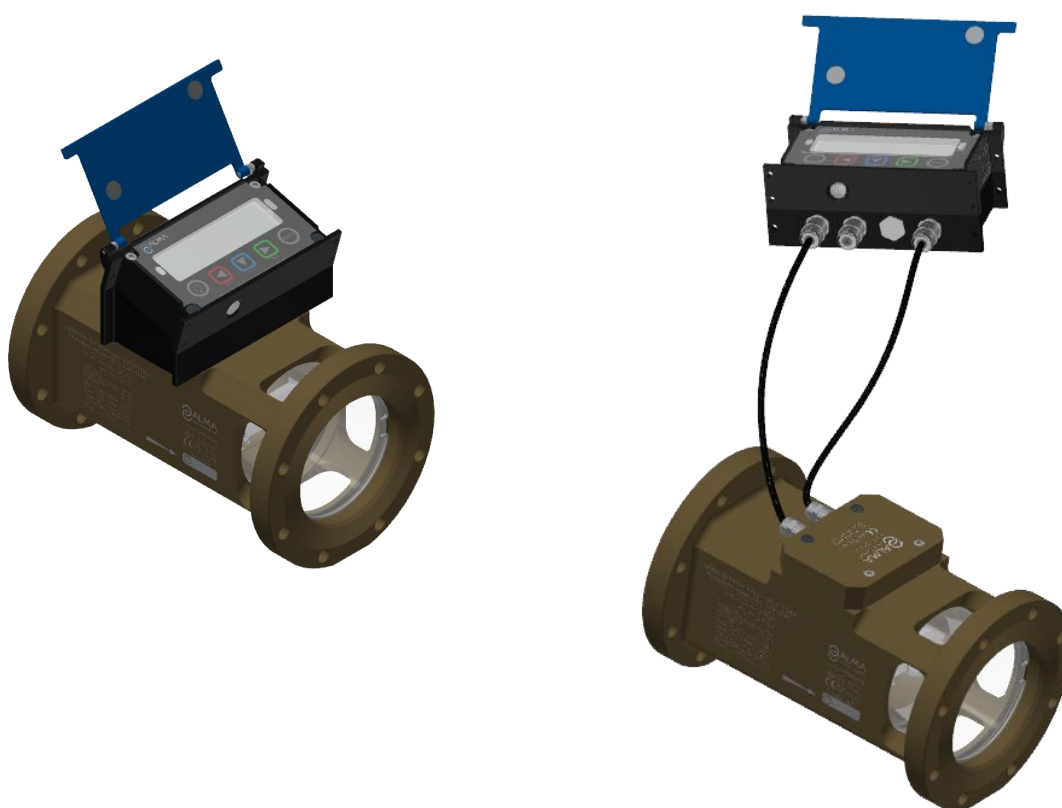


# INSTALLATION GUIDE


## DI 019 EN D

### GRAVICOMPT UNI

Described in EU-type examination certificate N°: LNE-30858




D	2021/10/01	Calculator indicator UNI-2. Connection tables. Removal of CTD+. Converter 24VDC/9.2VDC supplied. Interconnection drawing. Update of drawings	DSM	PJ
Issue	Date	Nature of modifications	Written by	Approved by

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## 1. GENERAL RECOMMENDATIONS

**IN ORDER TO AVOID ALL THE PROBLEMS CONCERNING THE INSTALLATION, THE OPERATION AND THE MAINTENANCE OF THE EQUIPMENTS, BEING ABLE TO CREATE INOPPORTUNE FAILURE,  
PLEASE RESPECT THE FOLLOWING RECOMMENDATIONS.**

**BEFORE ANY WORK, MAKE SURE THAT THE EQUIPMENTS SUPPLIED BY AN EXTERNAL POWER SOURCE ARE TURNED OFF.**

### 1.1. MECANICAL RECOMMENDATIONS

- ⇒ Respect the recommendations of the instruction manual specifying the installation, operation and maintenance conditions of the ATEX equipment (instruction manual supplied with the equipment).
- ⇒ Take care to place the equipment in order to facilitate their installation, operation and maintenance by the technicians (working ergonomics).
- ⇒ Take care to position properly the equipment. The display must be readable without any difficulty.
- ⇒ Apply a tightening torque suitable with size and material of the fixation element except particular specifications mentioned on the presentation drawing or in the installation guides.
- ⇒ Mechanically protect the cables with the corrugated conduit if the cables are not ADR (corrugated conduit adapted to vehicles used for "carriage of dangerous goods of road" - hydrocarbons, LPG ... - and meet the requirements of French standard NF R13-903. Refer to the regulations in force).
- ⇒ Ensure there are a good mechanical strength and a good sealing between cable glands and cables, and between cable glands and corrugated conduit.
- ⇒ Respect cables and corrugated conduit radii of curvature.
- ⇒ Leave enough flexibility to wires in order to avoid any risk of stripping.
- ⇒ Allow the drainage of the water in the lower loop (siphon) of the corrugated conduit (not water retention inside the corrugated conduit).
- ⇒  See § INSTALLATION AND SEALING RECOMMENDATIONS ADRIANE TURBINE METER.

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## 1.2. ELECTRICAL RECOMMENDATIONS

- ⇒ According to the ATEX directive or any other regulations in force in the country of destination, the safety protection level of the equipment must agree with the installation area (potentially explosive atmospheres).
- ⇒ Respect the recommendations of the instruction manual specifying the installation, operation and maintenance conditions of the ATEX equipment (instruction manual supplied with the equipment).
- ⇒ Use ADR specific cable, if it is not the case, use at minimum a cable resisting to hydrocarbons. Mechanically protect this cable with a corrugated conduit (corrugated conduit adapted to vehicles used for "carriage of dangerous goods by road" - hydrocarbons, LPG ... - and meet the requirements of French standard NF R13-903. Refer to the regulations in force).
- ⇒ Take care not to damage the terminals of the different electronic boards while wiring.
  - Screw terminals: do not damage the screw heads of the terminals.
    - Use insulated lugs and insulated wire ferrules adapted to the section of wires.
  - Spring terminals: do not block the springs (if a spring is blocked, the electronic board must be replaced).
    - Use flat screwdriver 0.4x2.5 (see figure)
    - Push in the spring with the screwdriver
    - Insert or remove the wire and remove the screwdriver.
- ⇒ Do not pinch or clamp the wires when closing the UNI-2 indicator.
- ⇒ Do not use wires of section higher than 1.5mm<sup>2</sup>.
- ⇒ Do not insert more than two wires in a terminal, if necessary use an insulated twin wire ferrule (unless otherwise indicated).
- ⇒ Strictly respect the polarities of the input/output when wiring, in accordance with serigraphy on the cards and/or with the installation guide indications.
- ⇒ Whenever possible, perform a wired test, after wiring and before powering.
- ⇒ Whenever possible, respect the locations of the cables specified in the installation guide.
- ⇒ Equipment must be connected to the frame ground (external ground connection).
- ⇒ Whenever possible, use shielded cables with a 360° connection through the metal cable glands.
  - Tighten the cable gland cap about one turn (fig.1)
  - Push in the stripped wire up to the stop on the claw (fig.2)
  - Fully tighten the gland cap (fig.3)

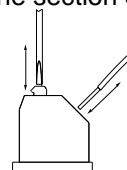


fig.1



fig.2

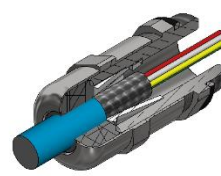



fig.3

- ⇒ Whenever possible, label the cables and cores according to the installation guide to facilitate the later maintenance operations.

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⇒ Respect a homogeneous wire color code.

⇒ Current of the electrical devices:

Electrical devices	Supply voltage	Minimum current	Maximum current
UNI-2 through an intrinsic safety barrier	9.2VDC +/-10%	1 mA	200 mA

⇒ Color code according to DIN 47100.

⇒ Code for designation of colours according to IEC 60757 (except FR codes):

FR				EN	IT	ES	DE
Couleurs	Codes		Standard codes CEI 60757	Colours	Colori	Colores	Farbe
White	<b>Bc</b>		<b>WH</b>	White	Bianco	Blanco	Weiß
Marron	<b>Mr</b>		<b>BN</b>	Brown	Marrone	Marrón	Braun
Vert	<b>Vt</b>		<b>GN</b>	Green	Verde	Verde	Grün
Jaune	<b>Jn</b>		<b>YE</b>	Yellow	Giallo	Amarillo	Gelb
Gris	<b>Gr</b>		<b>GY</b>	Grey	Grigio	Gris	Grau
Rose	<b>Rs</b>		<b>PK</b>	Pink	Rosa	Rosa	Lila
Bleu	<b>Bl</b>		<b>BU</b>	Blue	Blu	Azul	Blau
Rouge	<b>Rg</b>		<b>RD</b>	Red	Rosso	Rojo	Rot
Noir	<b>Nr</b>		<b>BK</b>	Black	Nero	Negro	Schwarz
Violet	<b>Vi</b>		<b>VL</b>	Violet	Viola	Violeta	Violett
Orange	<b>Or</b>		<b>OG</b>	Orange	Arancio	Naranja	Orange
Vert/Jaune	<b>V/J</b>		<b>GYE</b>	Green/Yellow	Verde/Giallo	Verde/Amarillo	Grün/Gelb

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## INSTALLATION GUIDE DI 019 END GRAVICOMPT UNI

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Length: mm  
Angle: degree (° ' ")  
Temperature: °C

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### 1.3. PNEUMATIC RECOMMENDATIONS

- ⇒ Air must be filtered – from 40 to 20µm. Specific recommendations may be added in the installation guides or on the presentation drawings.
- ⇒ The air lubrication must be permanent and correct to avoid any damage on the pneumatic components.
- ⇒ The air supply pressure to the inlet of the equipment must be at least 6 bar and max 8 bar. Specific recommendations may be added in the installation guides or on the presentation drawings.
- ⇒ The pneumatic supply pipes (6/4) must be cut straight (no slanting cut) and should not be crushed after cutting to prevent leakage on fittings.
- ⇒ Respect the radii of curvature of the pneumatic pipes indicated by the manufacturer.
- ⇒ Use colored pneumatic pipes to ease maintenance operation.
- ⇒ In no case the exhaust holes of the pneumatic organs should be plugged, obstructed, unless if that is clearly specified in the installation guides or on presentation drawings.
- ⇒ The use of muffler is not allowed under any circumstances (fouling, frost...). Put a pneumatic pipe of sufficient length, pointed downwards, so that its end is placed in a protected area (L = 100 mm min.).
- ⇒ Pressure unit conversion:

PRESSURE UNIT CONVERSION				
Units	Bar	PSI	Pascal	kg/cm <sup>2</sup>
1 Bar =	1	14,5	100 000 (1x10 <sup>5</sup> )	1,0197
1 PSI =	0.069	1	6894,5	0,07031
1 Pascal =	1x10 <sup>-5</sup>	14,5x10 <sup>-5</sup>	1	1,0197x10 <sup>-5</sup>
1 kg/cm <sup>2</sup> =	0,98	14,22	98066,5	1

PSI = Pound per Square Inch (livre par pouce carré)  
 1 bar = 100 kPa = 0.1 MPa (1 MPa = 10 bar)

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## 2. GENERAL PRESENTATION

### 2.1. USE ACCORDING TO MID CERTIFICATE

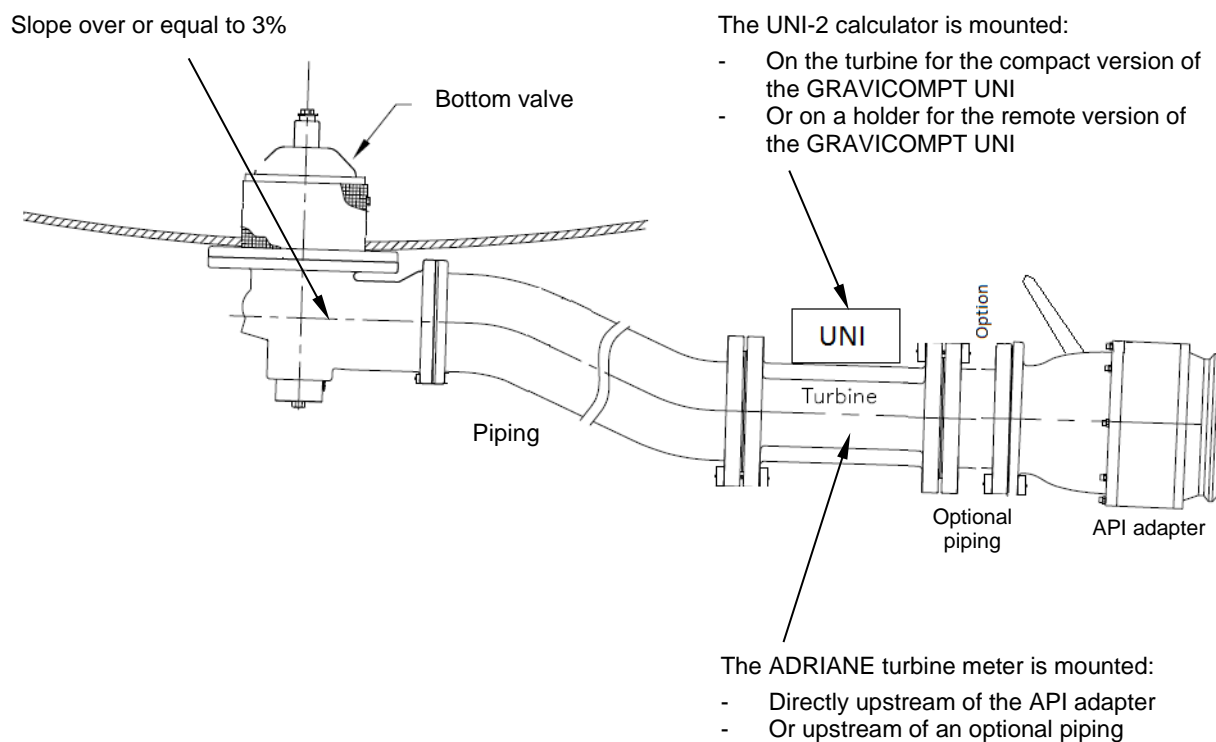
The GRAVICOMPT UNI measuring system is covered by the EU type examination certificate N° LNE-30858. Refer to this certificate for any precision about its installation.


The GRAVICOMPT UNI measuring system is based on a meter made up of the ADRIANE turbine meter and the UNI-2 calculator, associated to an unloading valve (that should be an API-type adapter)

For the sealing plan, see Annex to EU type examination certificate N° LNE-30858.

### 2.2. SPECIAL CONDITIONS FOR INSTALLATION

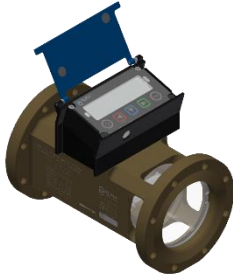

- ⇒ The GRAVICOMPT UNI measuring system must be installed so that air intakes upstream of the meter, and gas releases inside the liquid are avoided during routine operation. The tank must have a device which allows the reference position to be located
- ⇒ In the reference position, the tank must have a single drain pipe without bypass or reverse slope. Along the entire length, this pipework must have a slope over or equal to 3%
- ⇒ In case that a printing device with no assessment is connected to the electronic calculating-indicating device, a label mentioning that the printed information are not subject to legal control must be visibly affixed to the printing device
- ⇒ If necessary, a vacuum breaker not subject to legal control could be installed on the removable coupler coming to plug on the unloading valve.




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### 3. PART LIST

#### 3.1. GRAVICOMPT UNI COMPACT VERSION

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	Equipment	Designation	Qty	Option*
1		<b>GRAVICOMPT UNI FOR COMPACT INSTALLATION</b>	1	
		<b>INTRINSIC SAFETY BARRIER</b> (For UNI-2 power supply)		
2		<b>CONVERTER 24VDC/9.2VDC.</b> Set the converter to 9.2V, supply voltage of the intrinsic safety barrier (For UNI-2 power supply)	1	
3		<b>GRAVITY COUPLER</b> (4" API / 3" 1/2 symmetrical coupling – with vacuum breaker)	1	•
4		<b>KIT FOR MEASURING SYSTEM IDENTIFICATION PLATE</b> (Plate and sealing device)	1	•
<b>Option*: equipment sold as an option by ALMA. It must be installed on the measuring system if required by the certificate.</b>				

Non-contractual pictures


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## 3.2. GRAVICOMPT UNI REMOTE VERSION

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	Equipment	Designation	Qty	Option*
1		<b>GRAVICOMPT UNI FOR REMOTE INSTALLATION INCLUDING:</b>  <b>REMOTE UNI-2 ELECTRONIC CALCULATOR INDICATING DEVICE</b> (Supplied with bottom box) <b>ADRIANE TURBINE METER DN100-80 TYPE 241 V-TTMA-DL</b> (Supplied with two 5 meters cables)  <b>The wiring is the responsibility of the installer</b>	1	
		<b>INTRINSIC SAFETY BARRIER</b> (For UNI-2 power supply)		
2		<b>CONVERTER 24VDC/9.2VDC.</b> Set the converter to 9.2V, supply voltage of the intrinsic safety barrier (For UNI-2 power supply)	1	
3		<b>GRAVITY COUPLER</b> (4" API / 3" 1/2 symmetrical coupling – with vacuum breaker)	1	●
4		<b>KIT FOR MEASURING SYSTEM IDENTIFICATION PLATE</b> (Plate and sealing device)	1	●
<b>Option*: equipment sold as an option by ALMA. It must be installed on the measuring system if required by the certificate.</b>				

Non-contractual pictures

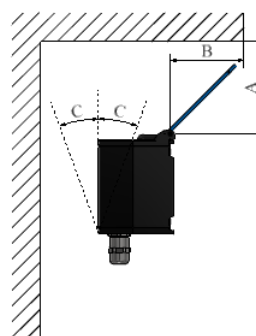
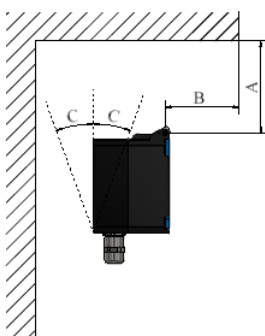
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#### 4. INSTALLATION RECOMMENDATIONS CALCULATOR-INDICATOR UNI-2

- Fasten the calculator UNI-2 with 4 M5 screws (M5 length 10 over 65 x 126)
- Leave an open space above the calculator in order:
  - o To ease the cover opening
  - o To ease connection to the GPS signal
- Dimensions:  $A \geq 100\text{mm}$ ,  $B \leq 100\text{mm}$ ,  $C = \pm 20^\circ$ .

To have an optimal GPS signal, follow the requirements below:

- Do not close the trunk
- Make sure that the installation is in an open environment.



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## 5. GRAVICOMPT UNI COMPACT VERSION

**ALMA measuring device type**  
ADRIANE DN100-80 241 V-TTMA-DL  
- ATEX Certification N°: DCET ATEX 009  
- Legal Metrology Certification CEV N°: LNE-12393

**Calculator-indicator type UNI**  
- ATEX certification N°: INERIS 19 ATEX 0029X  
- IECEx certification N°: IECEx INE 19.0030X  
- Legal metrology certification CEV N°: LNE-25603

Power supply of UNI through an NSI/SI barrier Ref.: BZG761+ (supplied)  
Barrier power supply 9.2V

2H00 pulse emitter control well

Flange DN100 TTMA  
(8 holes Ø11 on Ø149.3)

265.5

Flow direction

Sight glass

Stamping area

Ø170

291

**- Mass:** ~7 Kg

**- EU type Examination Certificate of GRAVICOMPT UNI N°:** LNE-30858

**- Mechanical Class:** M2

**- Electromagnetic Class:** E2

**- Accuracy Class:** 0.5

**- Indication scale interval:** 1L

**- Temperature range:** -10°C to +50°C

**- Maximum pressure:** 5 bar

**- Flowrate:** from 8 to 80m³/h

**- Liquids measured:** Liquids Hydrocarbons except LPG and ethanol


**- Viscosity:** from 0.5 to 13 mm²/s

**- Optional:** Pre-determination module type MPLS (code: 1237)  
API coupler with vacuum breaker (code: 3875)

For a safe use of the UNI electronic device, make sure to comply with the requirements of the instruction manual supplied with the equipment

ALMA Service Development www.alma-alma.fr 13127 Vitrolles		PRESENTATION DRAWING DFW135		Description of amendment N°758	
DEV N° : 959	Code : 3049	Gravicompt UNI	Compact version	Transition to UNI-2, Integration of waterproof screws, Spare M12 threads on turbine cover, Replacement of JT 87x2.00 by 95x2.00 on the DLA spacer and body	
Drawing N° associated with the related CEI file		959	PPV135	8/16	Modified on : 29/06/2021
Metro : PV1842	LNE-30858	Dev N°	Drawing N°	Rev	Folio
ATEX:	INERIS 19 ATEX 0029X				
				by	BEB verified by
				08/11/2017	CC
					CHR

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## 6. GRAVICOMPT UNI REMOTE VERSION

**Shown without UNI**

Calculator-indicator type UNI  
- ATEX certification N°: INERIS 19 ATEX 0029X  
- IECEx certification N°: IECEx INE 19.0030X  
- Legal metrology certification CEV N°: LNE-25603

Power supply of UNI through an NSI/SI barrier Ref.: BZG761 + (supplied)  
Barrier power supply 9.2V

5m Shielded ADR cable

Flow direction

Sight glass

Stamping area

2H00 pulse emitter control well

Ø170

265.5

ALMA measuring device type  
ADRIANE DNI00-80 241 V-TTMA-DL  
- ATEX Certification N°: DCET ATEX 009  
- Legal Metrology Certification CEV N°: LNE-12393

4 hole to fix M5x0.8

126

65

119

90 with closed lid

135°

26

146

65

**Mass:** ~7 Kg

**- EU type Examination Certificate of GRAVICOMPT UNI N°:** LNE-30858

**- Mechanical Class:** M2

**- Electromagnetic Class:** E2

**- Accuracy Class:** 0.5

**- Indication scale interval:** 1L

**- Temperature range:** -10°C to +50°C

**- Maximum pressure:** 5 bar

**- Flowrate:** from 8 to 80m³/h

**- Liquids measured:** Liquids Hydrocarbons except LPG and ethanol

**- Viscosity:** from 0.5 to 13 mm²/s

**- Optional:** Pre-determination module type MPLS (code: 1237)  
API coupler with vacuum breaker (code: 3875)

**For a safe use of the UNI electronic device, make sure to comply with the requirements of the instruction manual supplied with the equipment**

PRESENTATION DRAWING DFW135		Description of amendment N°758	
Gravicompt UNI	Remote UNI version	Transition to UNI-2, integration of waterproof screws, Spare M12 threads on turbine cover, Replacement of IT 8x2.00 by 95x2.00 on the DLA spacer and body	
DEV N° : 959	Code : 3051	10/16	Modified on : 29/06/2021
Drawing N° : 959	Code : 3051	Rev	Folio
Metro : PV1842	LNE-30858	Dev N°	Created on : 08/11/2017
ATEX:	INERIS 19 ATEX 0029X		
		BEB	verified by
		CC	CHR

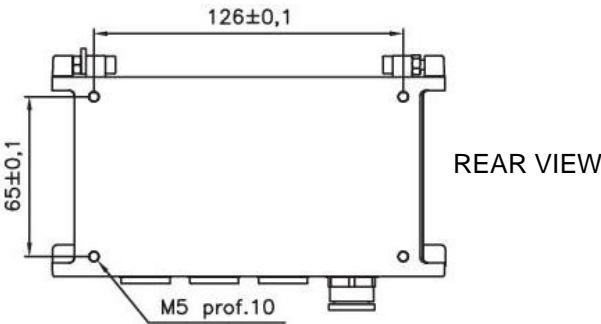
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6.1. INSTALLATION RECOMMENDATIONS GRAVICOMPT UNI REMOTE VERSION

The remote UNI-2 is fastened on a holder which is the responsibility of the installer.

Dimensions of the UNI-2 bottom box:

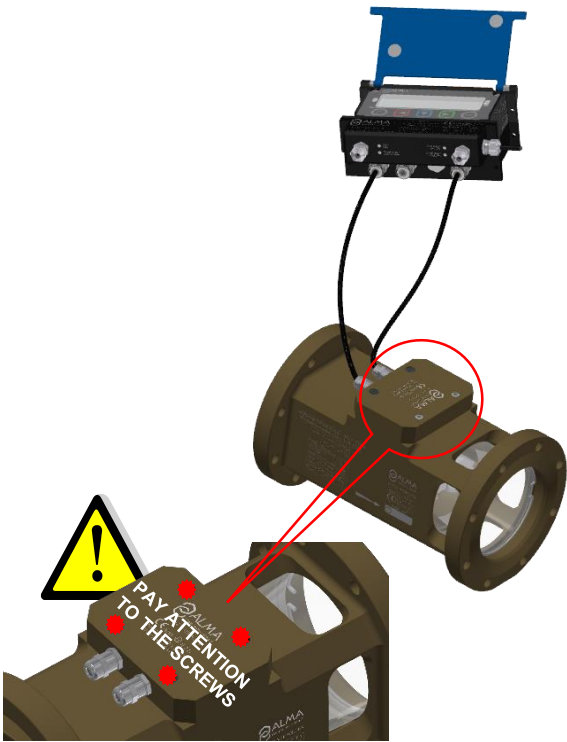


The wiring of the UNI-2 on the turbine parts of the GRAVICOMPT UNI REMOTE VERSION, is the responsibility of the Customer. It must be done in accordance with the connection table.




If you need to unwire the turbine, please read the following instructions carefully:

The security screws of the turbine cover supplied by Alma are specific, they are equipped with an integrated seal. They must be used to make sure the sealing is done.



**Make sure the sealing is done,  
use the 4 screws supplied Alma**

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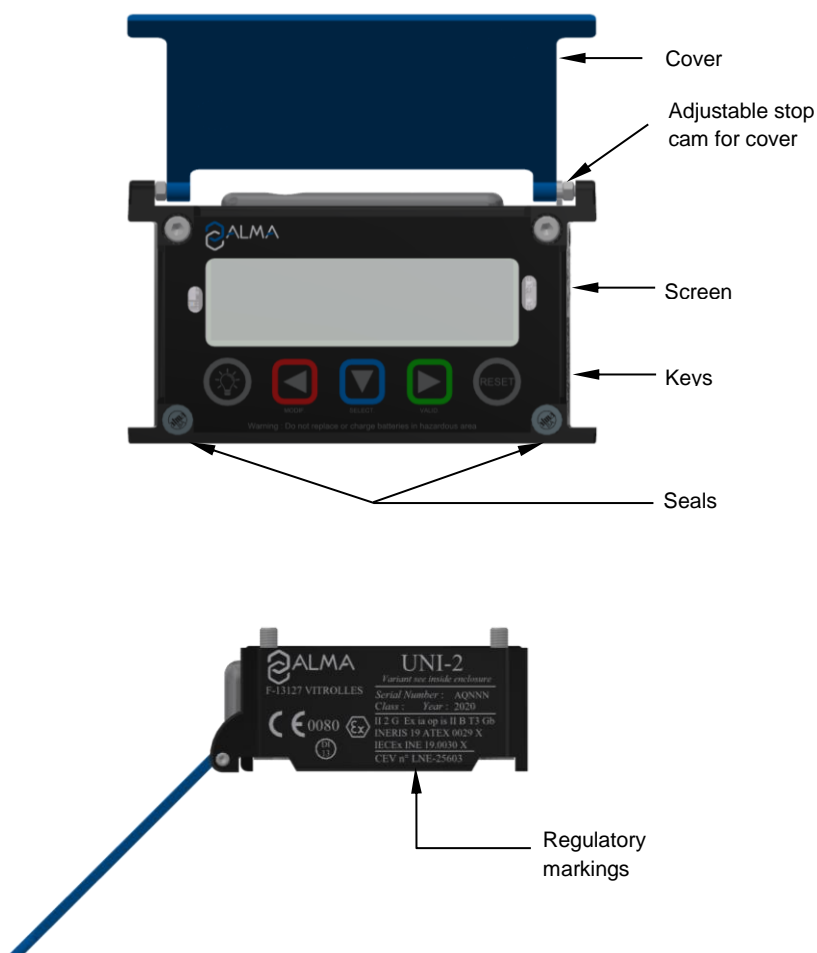
## 6.2. INSTALLATION RECOMMENDATIONS REMOTE CALCULATOR-INDICATOR UNI-2

Mounted on a turbine or a holder, the UNI-2 indicator shall be positioned to allow:

- A good visualization of the screen.
- Easy access to the keys of the keyboard
- Free access to the box for connection and maintenance operation.
- Free access to regulatory markings of the UNI-2 and the turbine (stamping, seals).
- The using of the UNI-2 with its cover in open position

When the UNI-2 indicator is mounted on a holder, ensure the holder is secured and well-fastened

- Avoid excessive vibration.



**REFER TO THE INSTRUCTION MANUAL**  
(DELIVERED WITH THE EQUIPMENT OR AVAILABLE ON ALMA WEBSITE)

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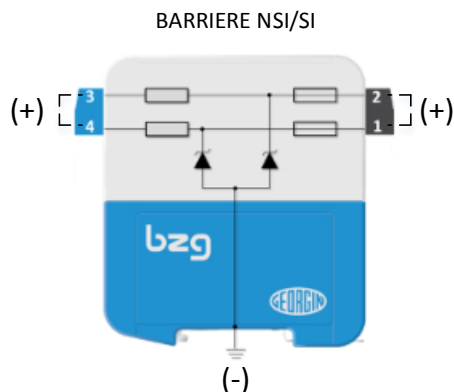
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## 7. ELECTRICAL WIRING

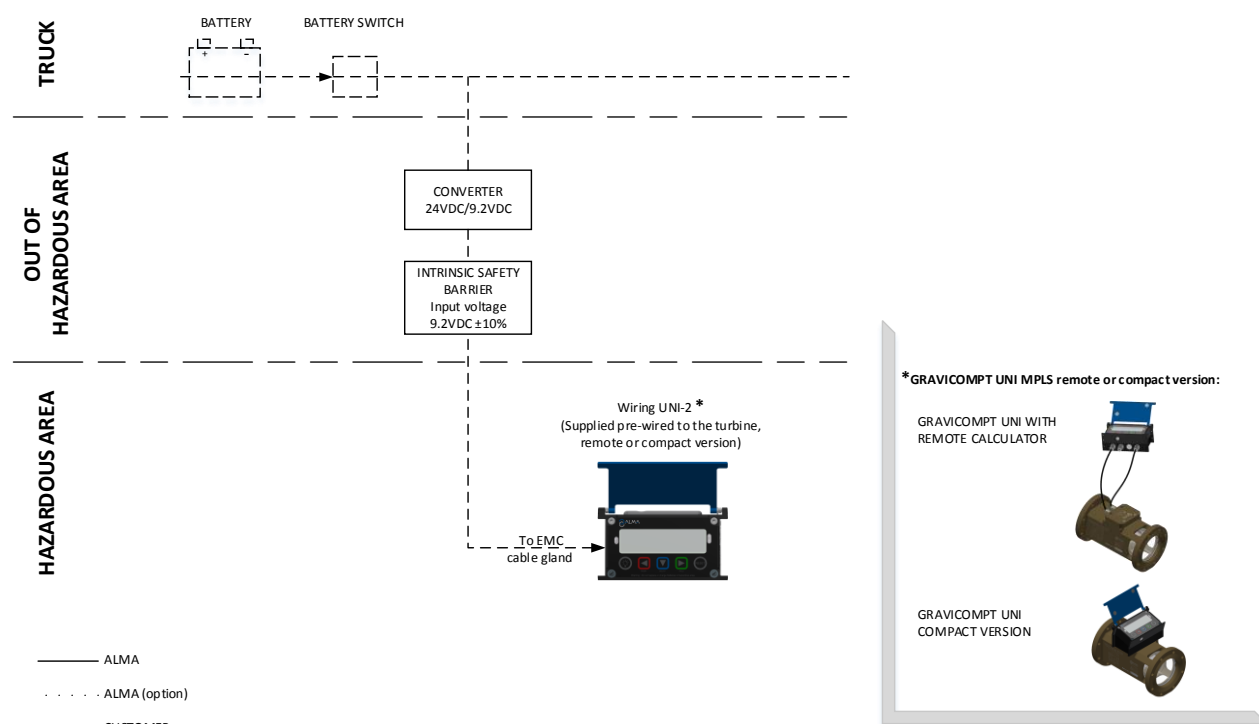
### 7.1. PRECONDITIONS


Before wiring the GRAVICOMPT UNI, it is necessary to prepare the intrinsic safety barrier to ensure power supply to the indicator.

- ⇒ Make a loop on terminals 1-2 and on terminals 3-4 of the barrier. Connect the (+) of the power supply to these terminals,
- ⇒ Connect the (-) of the power supply to the earth terminal on the lower part of the barrier.



### 7.2. INTERCONNECTION DIAGRAM

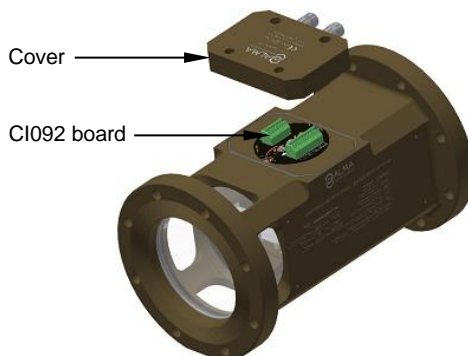


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### 7.3. CONNECTION TABLES

The connection of the sensors to the UNI-2 is done through the CI092 board located on the turbine. This board is protected by a sealed cover. To make the connection, follow the steps below:

- Remove the seal protecting the access to the turbine cover
- Unscrew the 4 screws. Make sure to put these 4 screws aside
- Wire the different elements according to the connection tables that follow
- When the wiring is completed, reposition the cover and make sure to fix it using the original screws to ensure the sealing of the assembly.
- Seal the turbine in accordance with regulations in force.



#### 7.3.1.Connecting the sensors to the CI092-interface board (coils, gas detection, temperature)

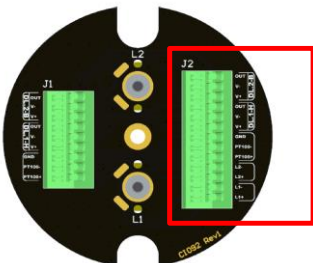

TERMINAL ASSIGNMENT OF THE CI092-INTERFACE BOARD											
EQUIPMENT CONNECTED TO THE TURBINE								CI092-INTERFACE BOARD			
Option	Equipment	Cable (for information)				Function	Colour or No.	Block	Terminal	Function	Observation
		No.	CG*	Alma	Type						
	Pt100 TEMPERATURE PROBE			•		+	Bc	J1	1	Pt100 +	Pt100
						-	Rg		2	Pt100 -	
						-	Rg		3	Pt100 GND	
	GAS DETECTION 1 (HIGH)			•		+	Jn	J1	4	DL1-H (V+)	DG1 (HIGH)
						-	Nr		5	DL1-H (V+)	
						OUT	Bc		6	DL1-H (OUT)	
	GAS DETECTION 2 (LOW)					+	Rg		7	DL2-B (V+)	DG2 (LOW)
						-	Bl		8	DL2-B (V+)	
						OUT	Vt		9	DL2-B (OUT)	

\*Refer to the cable glands installation instructions

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### 7.3.2.Connecting the CI092-interface board (coils, gas detection, temperature) to the UNI-2

EQUIPMENT CONNECTED TO THE UNI-2									UNI-2 ELECTRONIC BOARD							
Option	Equipment	Cable (for information)				Block	Function or Terminal	Colour or No.	Block	Terminal	Function	Observation				
		No.	CG*	Alma	Type											
	POWER SUPPLY		PG9				V- Ext V+ Ext		B3	5 6	V- Ext V+ Ext	SUPPLY The UNI-2 is powered through an intrinsic safety barrier				
CI092-INTERFACE BOARD									UNI-2 ELECTRONIC BOARD							
<div><p>Connection of the CI092-board to the UNI-2 from J2</p></div>									<div></div>							
TURBINE INDUCTIVE COIL		C1	Only for remote version:  M12 on Turbine and PG9 on UNI-2	•	Only for remote version:  ADR 7x0.34 sh.  L=5m	J2	L1+	Jn	B1	1	L1+	METERING	The shielding braid of the cable must be connected to the ATEX cable gland			
							L1-	Bc		2	L1-					
							L2+	Vt		3	L2+					
							L2-	Mr		4	L2-					
Pt100 TEMPERATURE PROBE							Pt100 +	Gr	B2	1	Pt100+	Pt100				
						Pt100 -	Rs	2		Pt100-						
						GND	Bl	3		GND						
GAS DETECTION 1 (HIGH)		C2	Only for remote version:  M12 on Turbine and PG9 on UNI-2	•	Only for remote version:  ADR 7x0.34 sh.  L=5m	J2	DL1-H (V+)	Jn	B2	4	1 V+	DG1 (HIGH)		The shielding braid of the cable must be connected to the ATEX cable gland		
							DL1-H (V-)	Bc		5	1 V-					
							DL1-H (OUT)	Vt		6	1-OUT					
							DL2-B (V+)	Gr		B2	7	2 V+			DG2 (LOW)	
							DL2-B (V-)	Rs			8	2 V-				
							DL2-B (OUT)	Mr			9	2-OUT				
GAS DETECTION 2 (LOW)																

\*Refer to the cable glands installation instructions

\*Refer to the cable glands installation instructions

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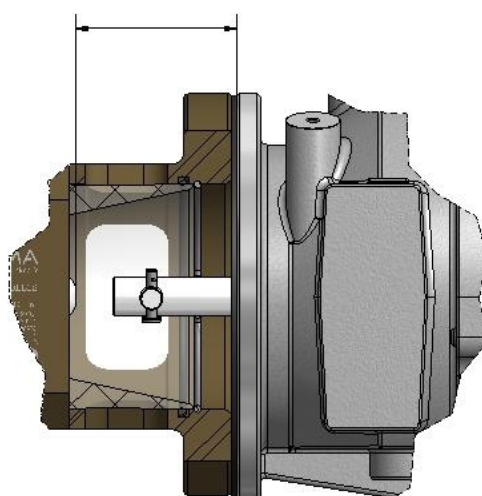
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## 8. TURBINE ADRIANE DN100-80 TYPE 241 V-TTMA-DL

### 8.1. INSTALLATION AND SEALING RECOMMENDATIONS ADRIANE TURBINE METER

For overall dimensions of the turbine meter, please refer to the drawings PPV135: GRAVICOMPT UNI REMOTE VERSION or GRAVICOMPT UNI COMPACT VERSION.

- The identification plate and the led of the pulse emitter(s) shall be visible and accessible.
- The turbine must be installed with respect to the flow direction.
- Put sealing rings each other sides between the turbine and the backflanges.
- Leave an open space all around the turbine in order to ease maintenance.
-  The position or the movement of moving parts of the API adapter inside the turbine cannot exceed 60 mm of the downstream face of the flange of the turbine.



- Refer to the certificate written on the identification plate of the measuring system to suit the sealing requirements
- No loose lead wire on the sealing devices



For accuracy class 0.5 measuring systems, the pipes and equipment upstream or downstream the turbine meter must have the same nominal diameter as the meter on a length at least equal to 10 times this diameter upstream.

These lengths can be straight or bent.

It is mandatory that no flowrate adjustment device (e.g. a variable-opening valve) is located upstream at a distance less than 10 times the nominal diameter of the meter. Do not create derivation circuits with sample or bypass, specially make sure that no nozzle is present on this pipe.

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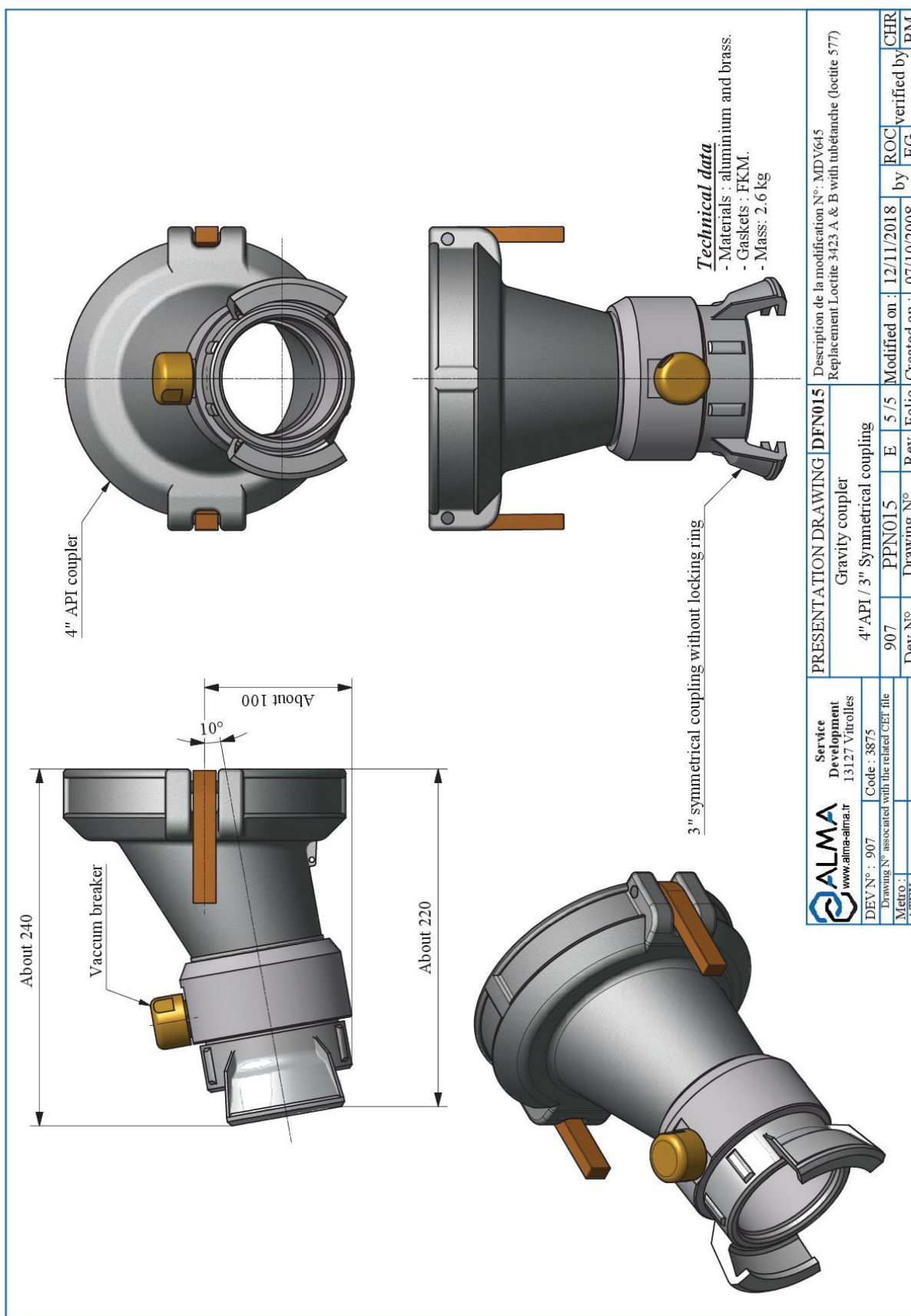
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## 9. GRAVITY COUPLER

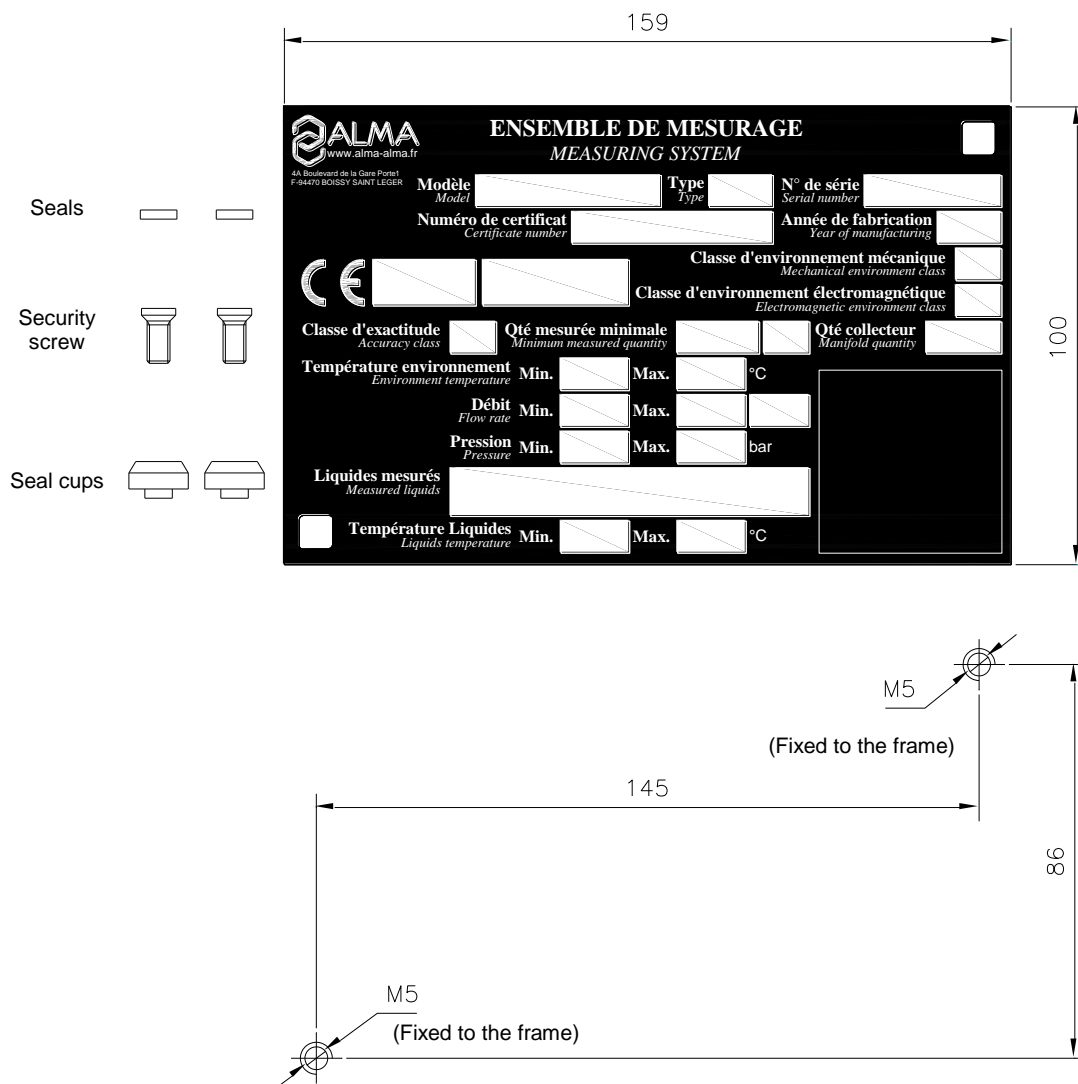


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## 10. KIT FOR MEASURING SYSTEM IDENTIFICATION PLATE

The identification plate shall be clearly installed, near the associated indicator device, and of easy access in order to be able to read features and to stamp the regulatory marks.



The security screws of the cups (provided by ALMA) must be screwed in the tap of the frame (do not use removable nuts).

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