

INSTALLATION GUIDE


DI 023 EN B

GRAVICOMPT UNI WITH MPLS

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




B	2019/07/23	Pneumatic wiring for flowrate control, Overall drawing, Installation recommendations, Drawings update, New FORM DOC	DSM	MV
A	2017/12/21	Creation [PJV092]	DSM	XS
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.

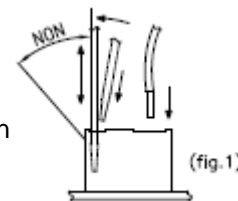
1.1. MECANICAL RECOMMENDATIONS

- ⇒ 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 fig.1).
 - Insert the screwdriver slightly tilted, then push it perpendicularly to the terminal.
 - Do not exceed the upright position when the screwdriver is down in order not to block the spring.
 - Insert or remove the wire and remove the screwdriver.



- ⇒ Do not pinch or clamp the wires when closing the UNI indicator and/or the MPLS.
- ⇒ Do not use wires of section higher than 1.5mm².
- ⇒ 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 (see the documentation delivered with the equipment).
- ⇒ Whenever possible, label the cables and cores according to the installation guide to facilitate the later maintenance operations.
- ⇒ Respect a homogeneous wire color code.

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⇒ Current of the electrical devices:

Electrical devices	Supply voltage	Minimum current	Maximum current
UNI	Powered by lithium batteries VDC min: 3.1V VDC max: 3.7V	0.5 μ A	1000 μ A
MPLS	24VDC +/-10%	1 A	1.5 A
PRINTER	24VDC +/-10%	0.1 A	5.5 A (switch-on)

⇒ 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
Blanc	Bc		WH	White	Bianco	Blanco	Weiß
Marron	Mr		BN	Brown	Marrone	Marrón	Braun
Vert	Vt		GN	Green	Verde	Verde	Grün
Jaune	Jn		YE	Yellow	Giallo	Amarillo	Gelb
Gris	Gr		GY	Grey	Grigio	Gris	Grau
Rose	Rs		PK	Pink	Rosa	Rosa	Lila
Bleu	Bl		BU	Blue	Blu	Azul	Blau
Rouge	Rg		RD	Red	Rosso	Rojo	Rot
Noir	Nr		BK	Black	Nero	Negro	Schwarz
Violet	Vi		VL	Violet	Viola	Violeta	Violett
Orange	Or		OG	Orange	Arancio	Naranja	Orange
Vert/Jaune	V/J		GNYE	Green/Yellow	Verde/Giallo	Verde/Amarillo	Grün/Gelb

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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				
Unités	Bar	PSI	Pascal	kg/cm ²
1 Bar =	1	14,5	100 000 (1x10 ⁵)	1,0197
1 PSI =	0.069	1	6894,5	0,07031
1 Pascal =	1x10 ⁻⁵	14,5x10 ⁻⁵	1	1,0197x10 ⁻⁵
1 kg/cm ² =	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.

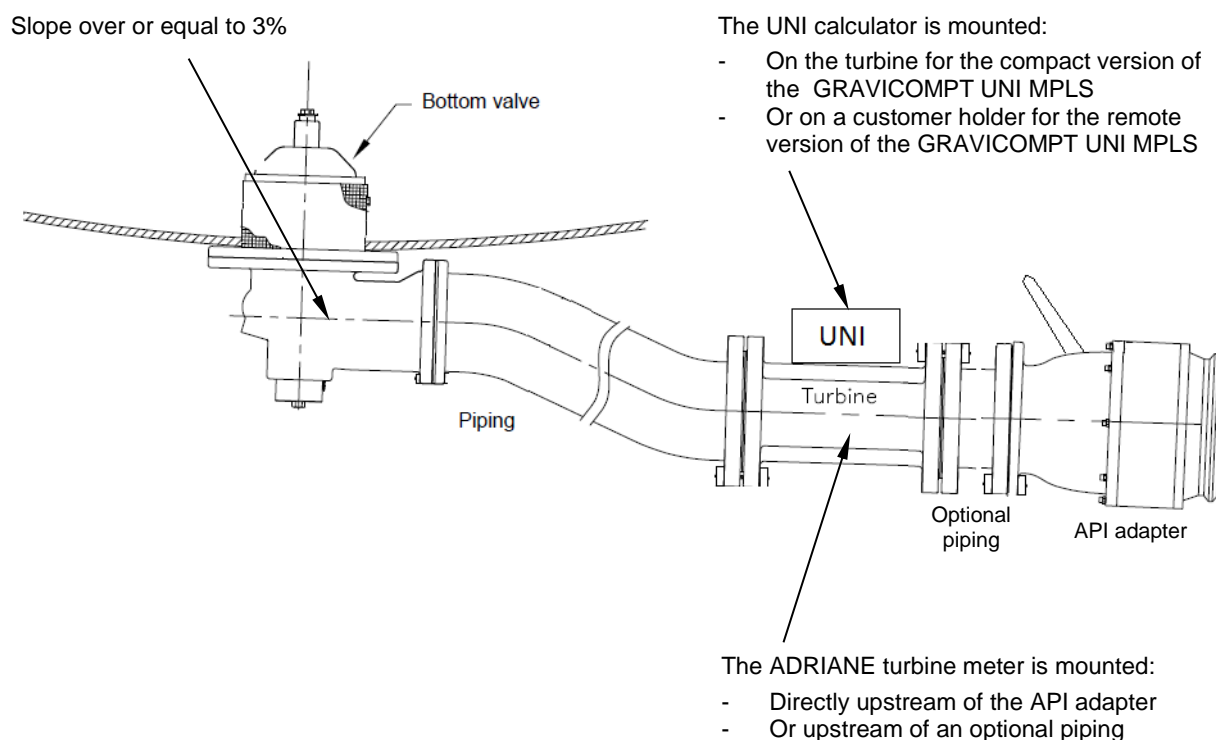
The GRAVICOMPT UNI measuring system is based on a meter made up of the ADRIANE turbine meter and the UNI calculator, associated to an unloading valve (that should be an API-type adapter).


The GRAVICOMPT UNI is a measuring system for gravity measurement of liquids other than water. It measures the product temperature. It can be mono or bi-directional. The MPLS device controls a valve and a printer, it receives an authorization signal.

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



2.2. SPECIAL CONDITIONS FOR INSTALLATION IN ANY CASES

- ⇒ 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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EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA

Item	Equipment	Designation	Qty	Option*
7		PNEUMATIC API ADAPTER	1	●
8		KIT FOR MEASURING SYSTEM IDENTIFICATION PLATE (Plate and sealing device)	1	●
Option*: equipment sold as an option by ALMA, it must be installed on the measuring system if required by the certificate.				

Non-contractual pictures

3.2. GRAVICOMPT UNI MPLS REMOTE VERSION

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA

Item	Equipment	Designation	Qty	Option*
1		GRAVICOMPT UNI MPLS FOR REMOTE INSTALLATION INCLUDING: UNI MPLS ELECTRONIC CALCULATOR INDICATING DEVICE (Supplied with bottom box and a 10 meters cable) ADRIANE TURBINE METER DN100-80 TYPE 241 V-TTMA-DL The system is supplied pre-wired Do not remove the batteries during installation	1	
2		3/2 NC ATEX SOLENOID VALVE to be installed in a box	1	●
3		3/2 NC NON-ATEX SOLENOID to be installed in a box	1	●

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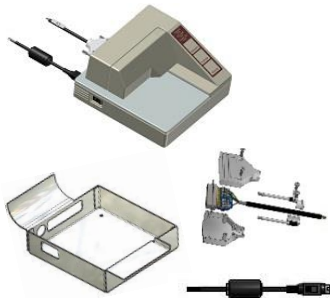







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EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	Equipment	Designation	Qty	Option*
4		PRINTER KIT (Printer holder - Supply cable 24 VDC 1.5 meter - Connector kit SUB-D25 for connection MPLS/printer, to be wired without any tools) Non-ATEX device, not usable in ATEX area	1	●
5		DATA TRANSFER KEY CTD+ Non-ATEX device, not usable in ATEX area	1	●
6		GRAVITY COUPLER (4" API / 3" 1/2 symmetrical coupling – with vacuum breaker)	1	●
7		PNEUMATIC API ADAPTER	1	●
8		KIT FOR MEASURING SYSTEM IDENTIFICATION PLATE (Plate and sealing device)	1	●
Option*: equipment sold as an option by ALMA, it must be installed on the measuring system if required by the certificate.				

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4. GRAVICOMPT UNI MPLS COMPACT VERSION

Calculator-indicator type UNI
 - ATEX Certification N°: INERIS 07 ATEX 0012X
 - Legal Metrology Certification CEV N°: LNE-25603
 For more information see PPV063

ALMA measuring device type
 ADRIANE DNI100-80 241 V-TTMA-DL
 - ATEX Certification N°: DCET ATEX 009
 - Legal Metrology Certification CEV N°: LNE-12393

Flange DNI100 TTMA
 (8 holes Ø11 on Ø149.3)


2H00 pulse emitter control well

Dimensions:
 - Total height: 293 mm
 - Base width: 170 mm
 - Body width: 265.5 mm

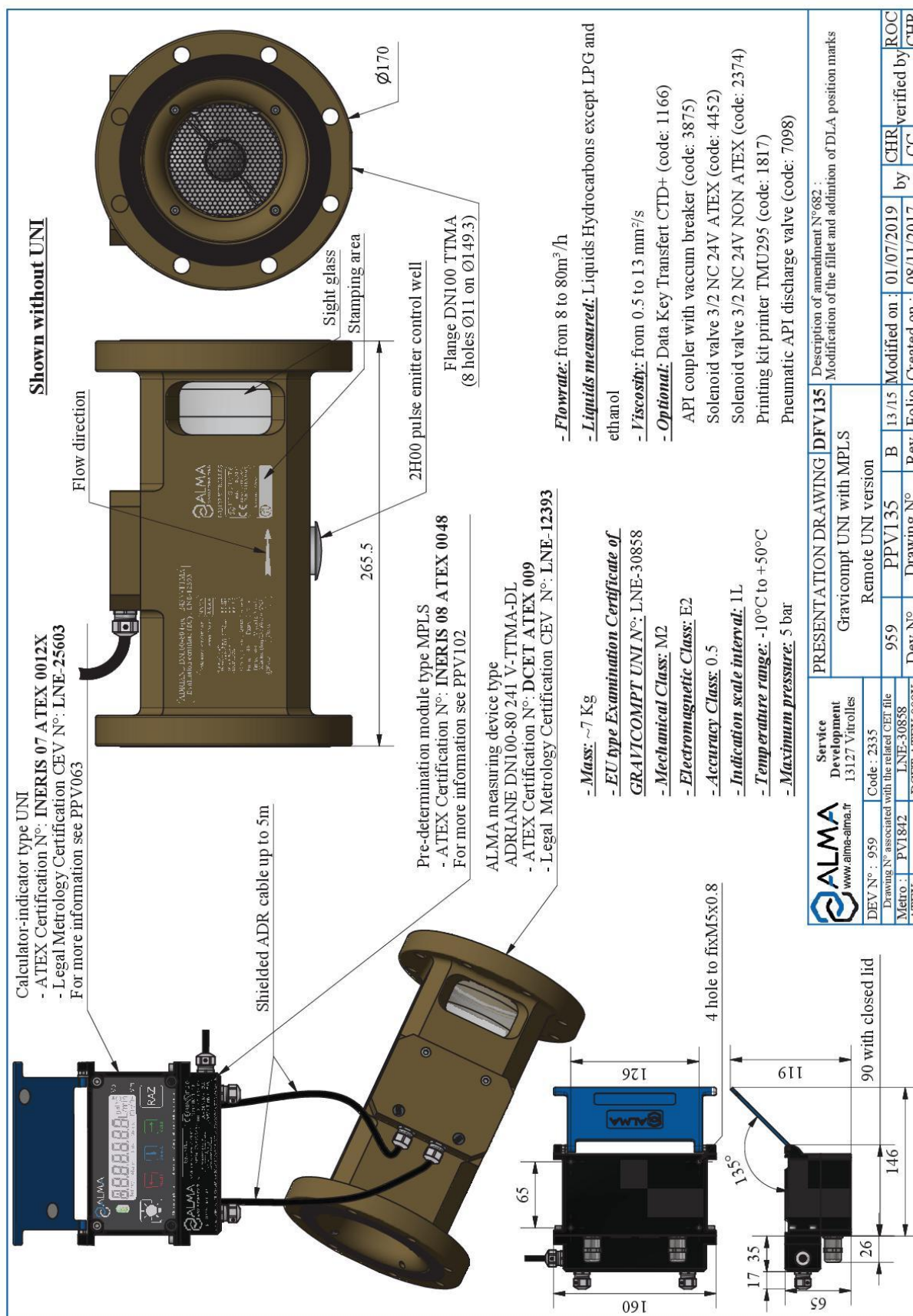
Other features:
 - Sight glass
 - Stamping area
 - Flow direction

Specifications:
 - Mass: ~7 Kg
 - EU type Examination Certificate of
GRAV/COMPT 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: Data Key Transfert CTD+ (code: 1166)
 API coupler with vacuum breaker (code: 3875)
 Solenoid valve 3/2 NC 24V ATEX (code: 4452)
 Solenoid valve 3/2 NC 24V NON ATEX (code: 2374)
 Printing kit printer TMU295 (code: 1817)
 Pneumatic API discharge valve (code: 7098)

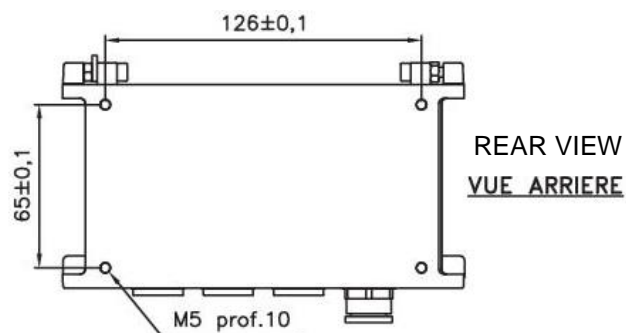
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5. GRAVICOMPT UNI MPLS REMOTE VERSION



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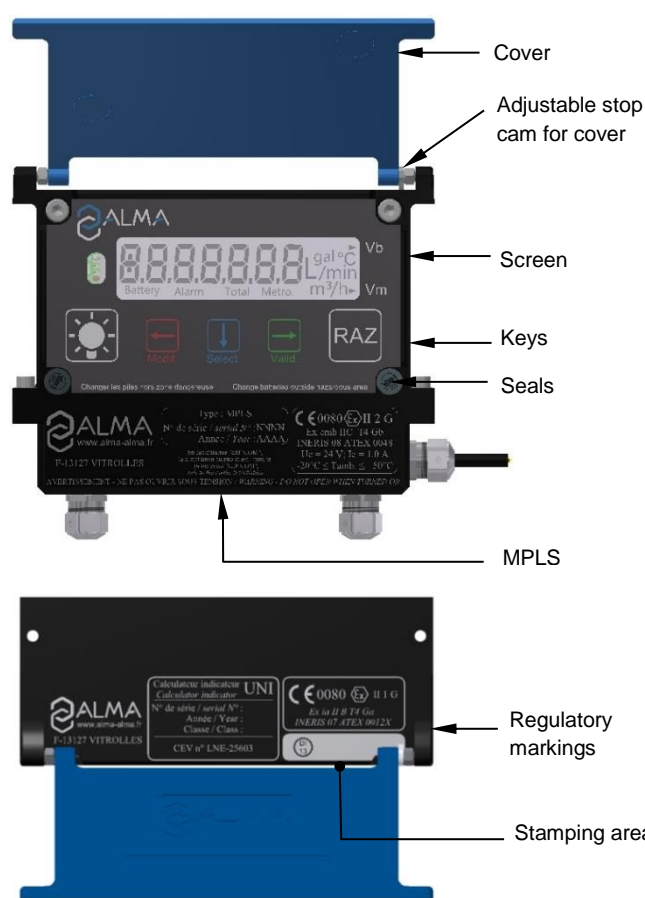
5.2. INSTALLATION RECOMMENDATIONS REMOTE CALCULATOR-INDICATOR UNI MPLS

Mounted on a turbine or a holder, the UNI 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, the turbine and the 2B00 pulse transmitter (stamping, seals).
- The using of the UNI with its cover in open position
- The easy implementation and holding of the CTD+ key. **Since the key is not ATEX, it must be used with the UNI outside potentially explosive area.**

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

- Avoid excessive vibration.



CTD+ KEY OPTION

The CTD+ key must be placed flat and in abutment in the bottom left-hand corner of the indicating device.



SUPPLY

The UNI is powered by two 3.6 Volts lithium batteries.

The UNI ATEX certification requires the following batteries:

- Lithium battery SAFT LS14500 C or SAFT LS 14500 Ex
- Lithium battery TADIRAN SL-760 (ex-SONNENSCHNEIN)

REFER TO THE INSTRUCTION MANUAL

(DELIVERED WITH THE EQUIPMENT OR AVAILABLE ON ALMA WEBSITE)

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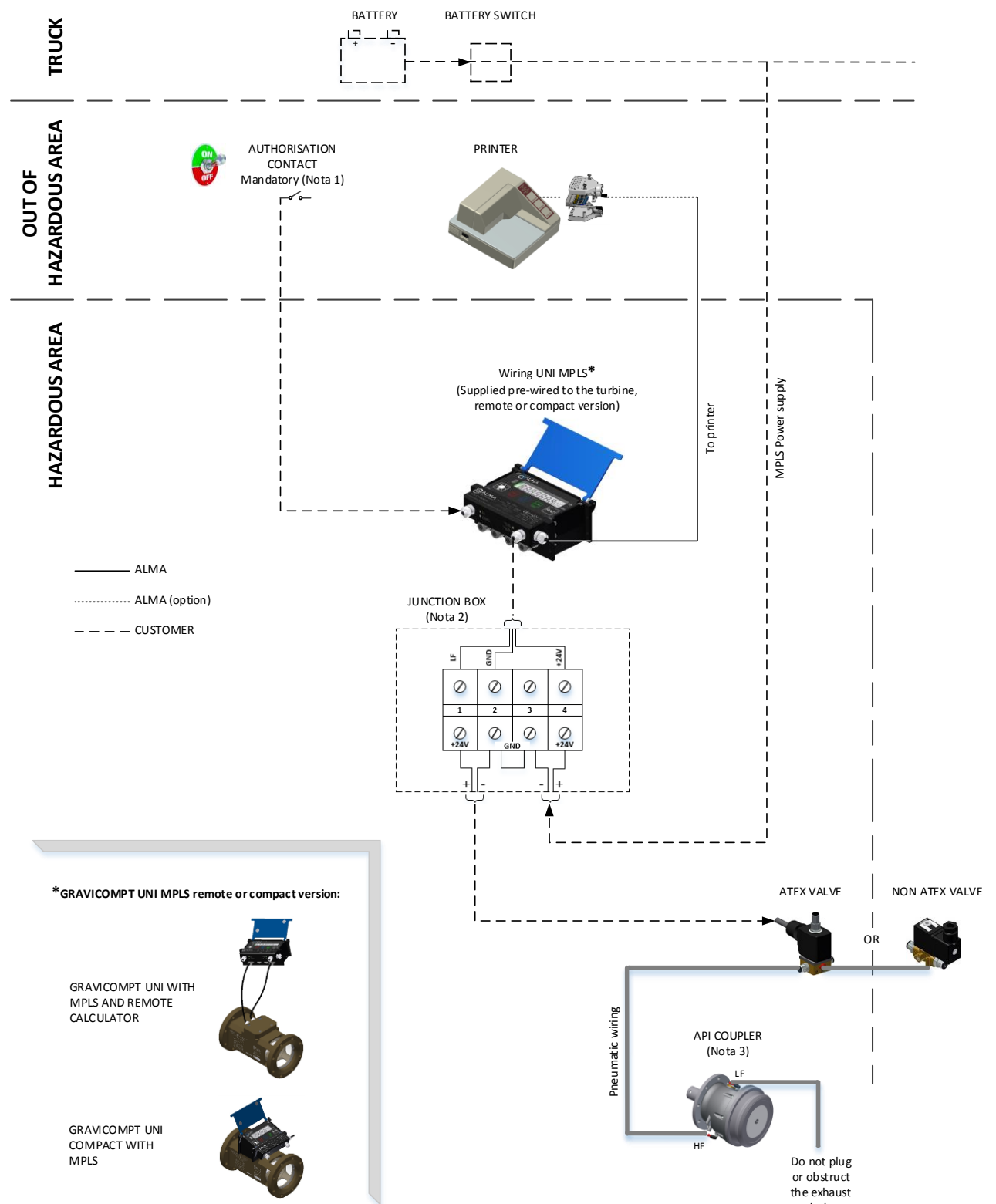
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6. ELECTRICAL AND PNEUMATIC WIRING



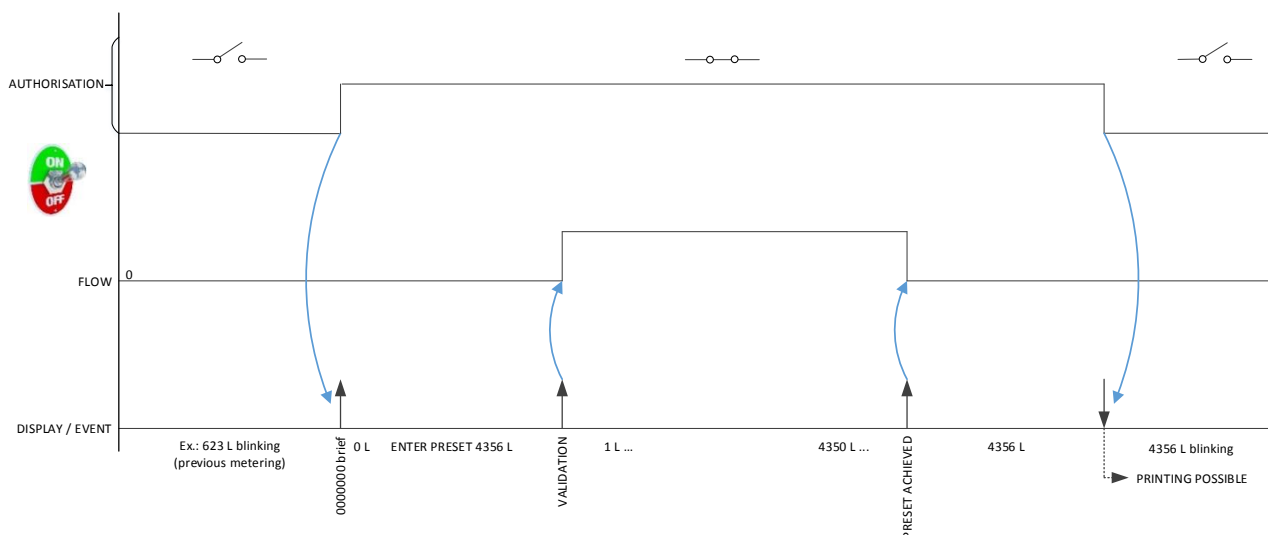
Note 1: To make sure that the GRAVICOMPT UNI MPLS will operate, an authorization contact is necessary (see next page § Operating sequence).


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Note 2: According to the ATEX directive or any other regulations in force in the country of destination, the safety protection level of the junction boxes must agree with the installation area.

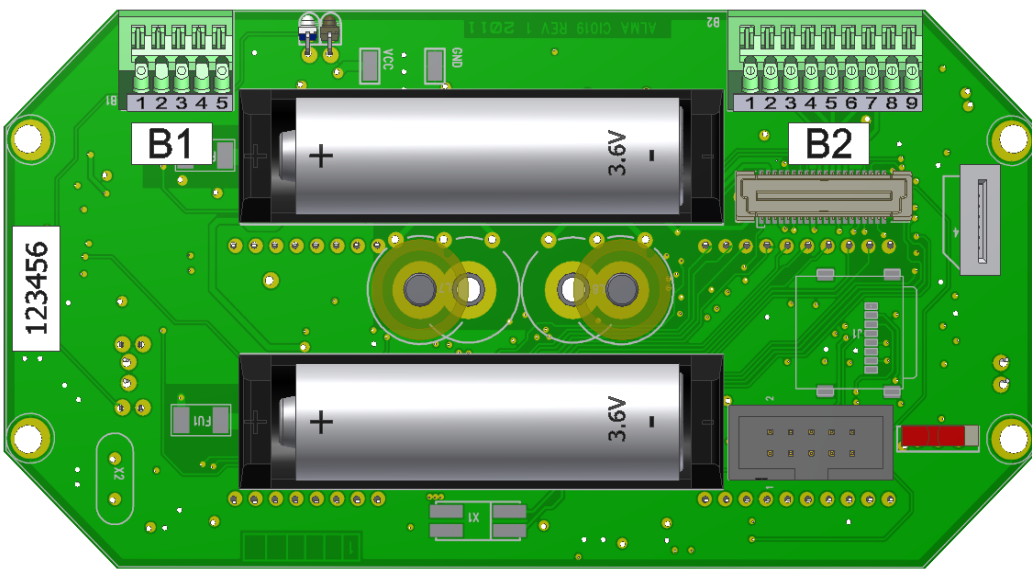
Note 3: The 'High flow (HF)' of the API coupler is controlled by the MPLS 'low flow' output using the solenoid valve. Therefore, the 'Low flow (LF)' fitting of the API coupler is not used. It must be equipped with a pneumatic tube which exhaust hole is facing downwards. The exhaust hole must not be plugged nor obstructed.

Operating sequence




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Terminal assignment of the UNI electronic board

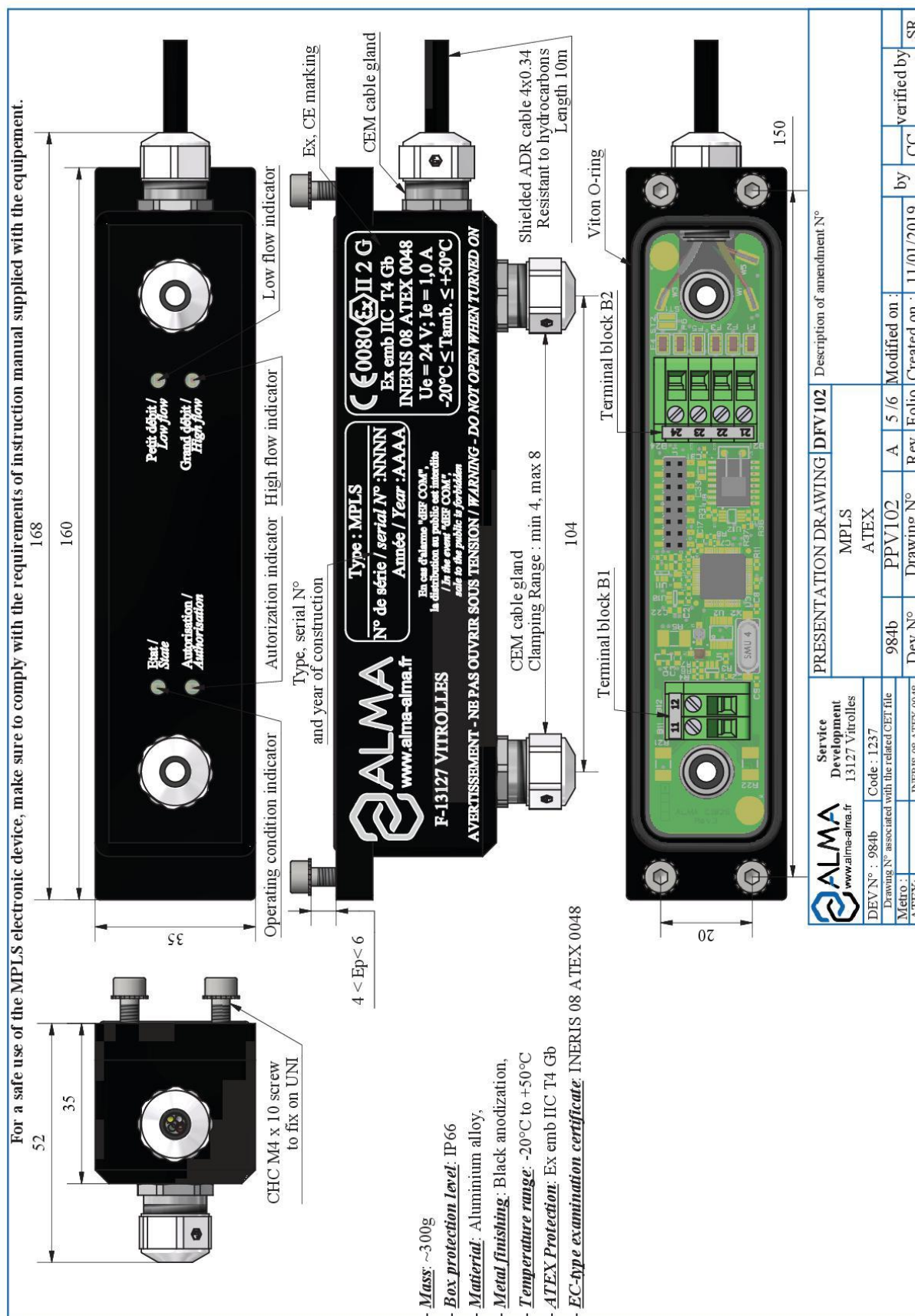
TERMINAL ASSIGNMENT OF THE UNI ELECTRONIC BOARD										
										
EQUIPMENTS CONNECTED TO THE UNI							UNI ELECTRONIC BOARD			
Option	Equipment	Cable (for information)				Function	Colour or No.	Block	Terminal	Observation
		No.	CG*	Alma	Type					
	TURBINE INDUCTIVE COILS	C1	PG9	•	ADR 7x0.34 sh. L=5m	Coil 1	YE	B1	1	Indications for GRAVICOMPT UNI REMOTE VERSION The shielding braid of the cable must be connected to the ATEX cable gland
						Coil 1	WH		2	
						Coil 2	GN		3	
						Coil2	BN		4	
	Pt100 TEMPERATURE PROBE					+	GY	B2	1	METERING
						-	PK		2	
						-	BU		3	
	GAS DETECTOR 1	C2	1/2"NPT	•	ADR 7x0.34 sh. L=5m	+	YE	B2	4	The shielding braid of the cable must be connected to the ATEX cable gland
						-	WH		5	
						Shielding	GN		6	
	GAS DETECTOR 2					+	GY		7	
						-	PK		8	
						Shielding	BN		9	

*Refer to the Cable Glands installation instructions

Conductors must be 8mm-stripped and spread before being pushed into the terminals.

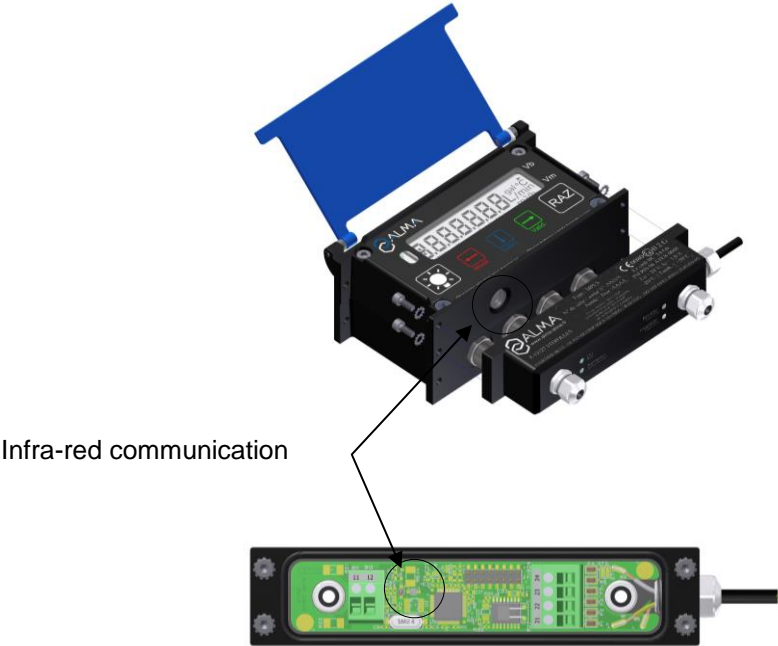
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7.1. INSTALLATION RECOMMENDATIONS MPLS ELECTRONIC DEVICE

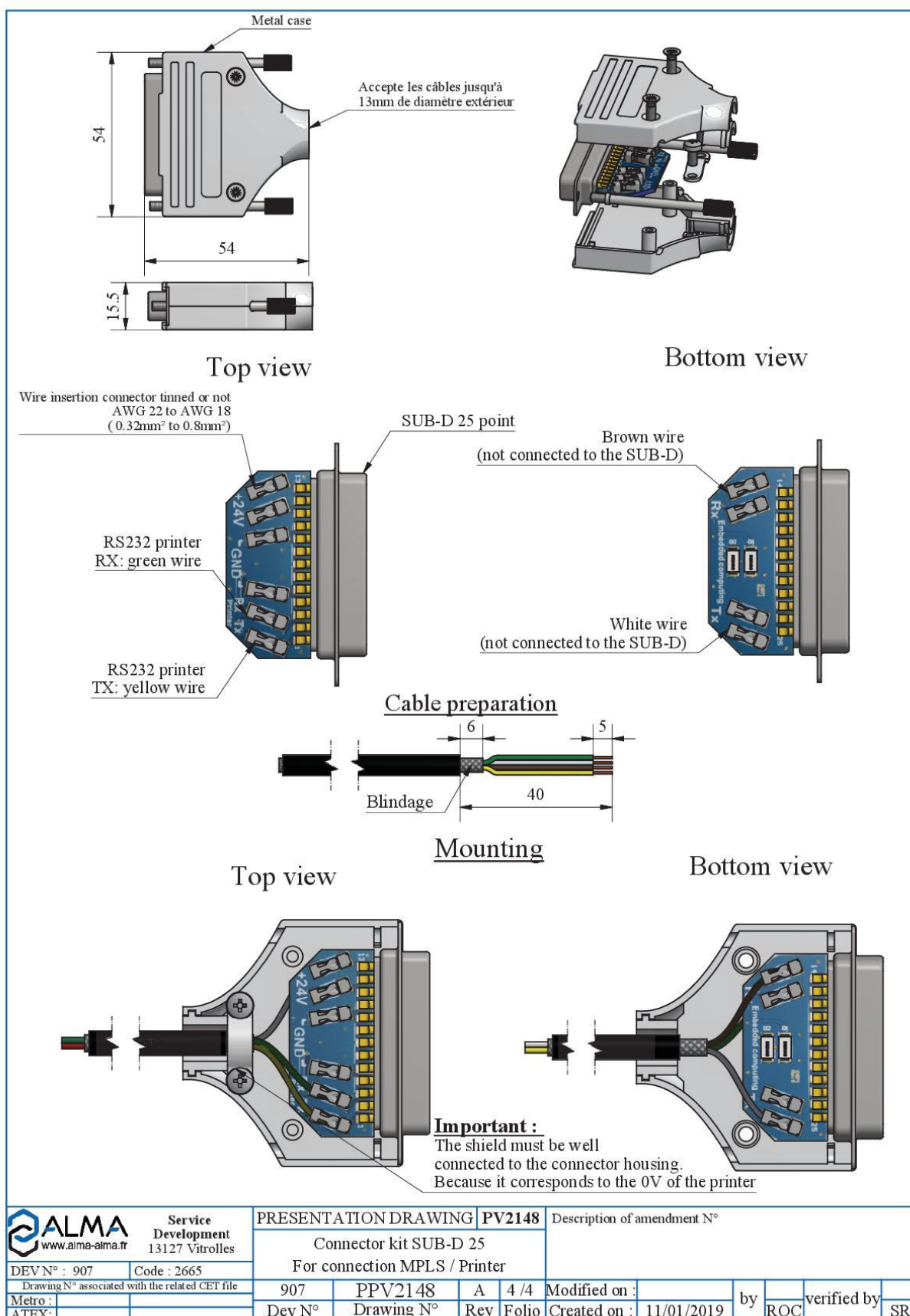



Make sure that any wire obstruct the infra-red communication zone

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**Refer to the Cable Glands installation instructions*

Connector kit SUB-D 25 for connection MPLS/printer




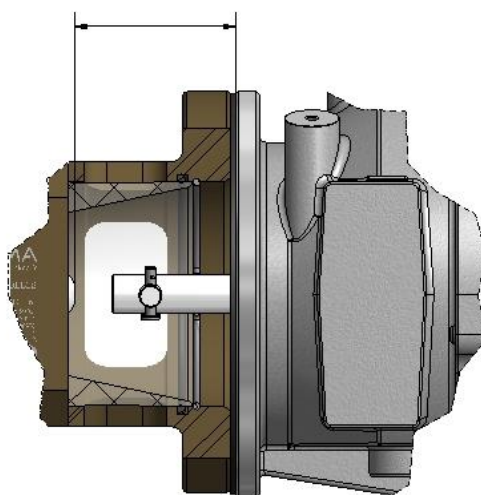
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8. TURBINE ADRIANE DN100-80 TYPE 241 V-TTMA-DL

8.1. INSTALLATION AND SEALING RECOMMENDATIONS ADRIANE TURBINE METER

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

- 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 and 10 times this diameter downstream.

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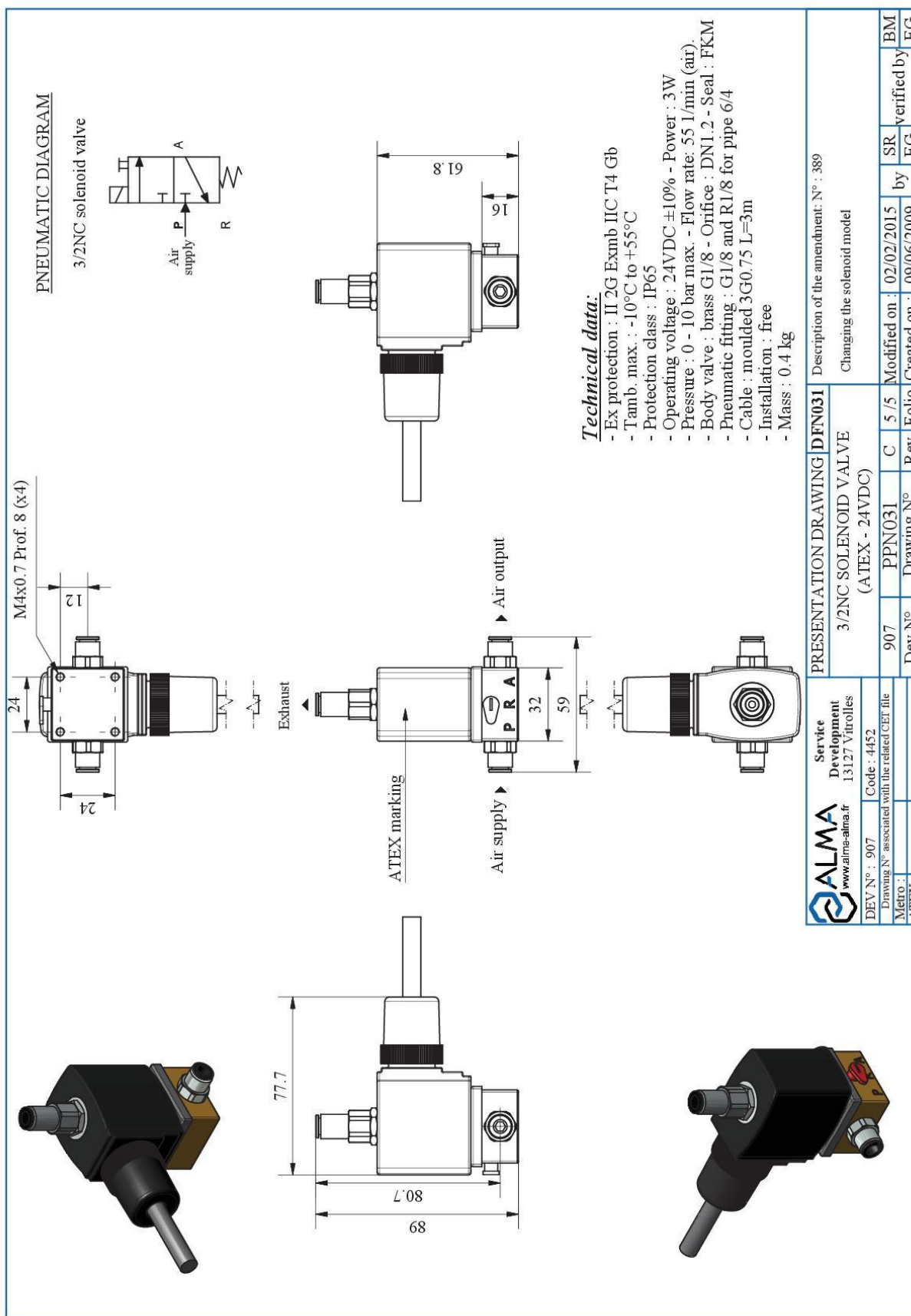
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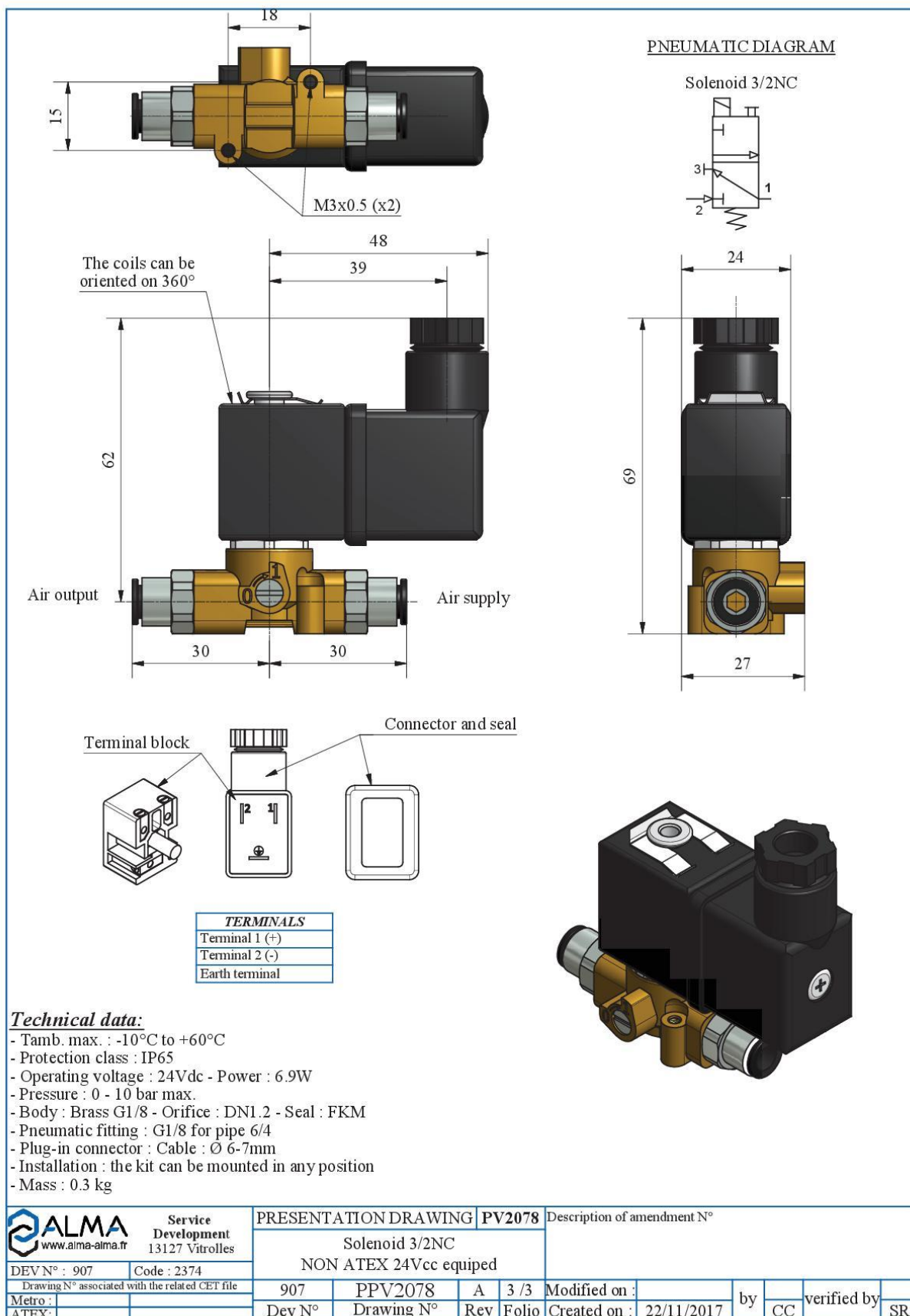
Units of measure:
Length: mm
Angle: degree (° ' ")
Temperature: °C

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9. 3/2 NC ATEX SOLENOID VALVE



10. 3/2 NC NON ATEX SOLENOID VALVE



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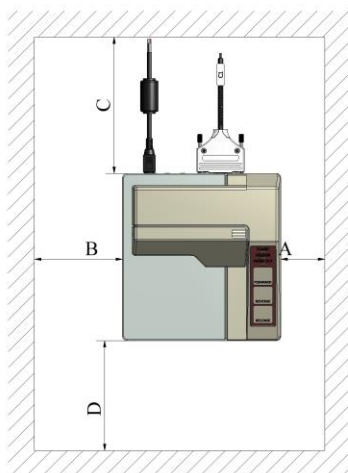
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Length: mm
Angle: degree (° '' ''')
Temperature: °C


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-
- Technical drawings of the 3D printer showing dimensions A, B, C, and D. Dimension A is the height of the printer. Dimension B is the width of the printer. Dimension C is the length of the printer with the filament spool holder. Dimension D is the length of the printer without the filament spool holder.



DO NOT EXPOSE THE PRINTER TO ANY HEAT-SOURCE.
PROTECT IT FROM VIBRATIONS AND WATER PROJECTIONS.

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11.3. ELECTRICAL WIRING PRINTER

PRINTER SUPPLY CABLE					
					
CONVERTER 220VAC/24VCC				PRINTER	
Option	Equipment	Function	Colour	Function	Observation
•	CONVERTER 220VCC/24VDC	24VDC	BK or white- coated	PRINTER SUPPLY	Cable: 2x9mm2 External diameter: 5mm Length : 1,50m
		0V	WH or red- coated		
		Shielding	Braid		

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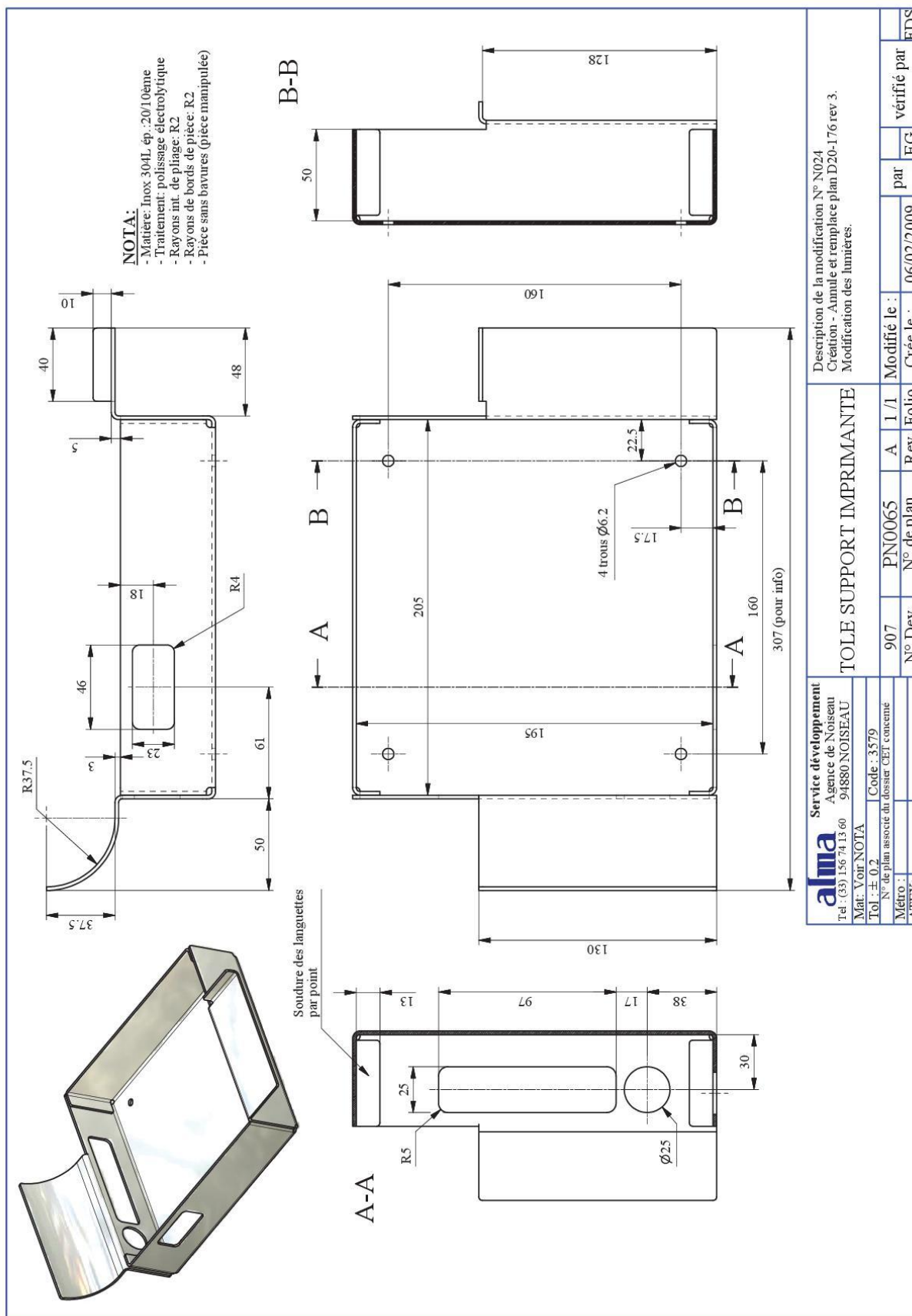
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11.4. PRINTER HOLDER

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12. DATA TRANSFER KEY CTD+

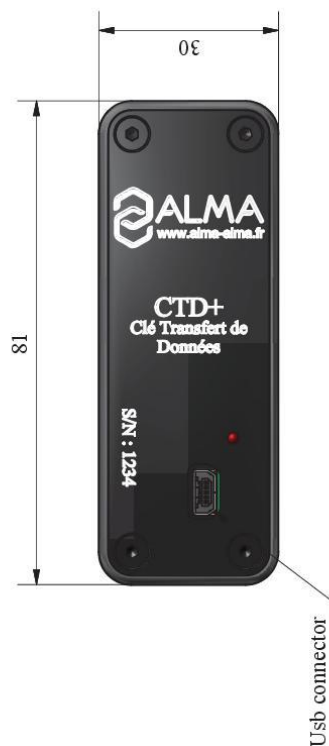
The key is powered by a 3.6V lithium battery of AA size

Once the key positioned on the front of UNI, the transfer of UNI parameters and load reports of "n" last day, start after key "Select" and "RAZ" has been pressed simultaneously. The number of days "n" is defined in Supervision menu of UNI. During data transfer, UNI displays the percentage of progress.

One can also download only the list of UNI configuration settings, as soon as demand display in the Supervision menu of UNI while the key is placed on UNI.


The file name in the key is composed of UNI name followed by "M" for measurement report and by "P" for parameters.

The files can then be read in Excel on PC connected via a USB cable.




Led IR for communication with UNI

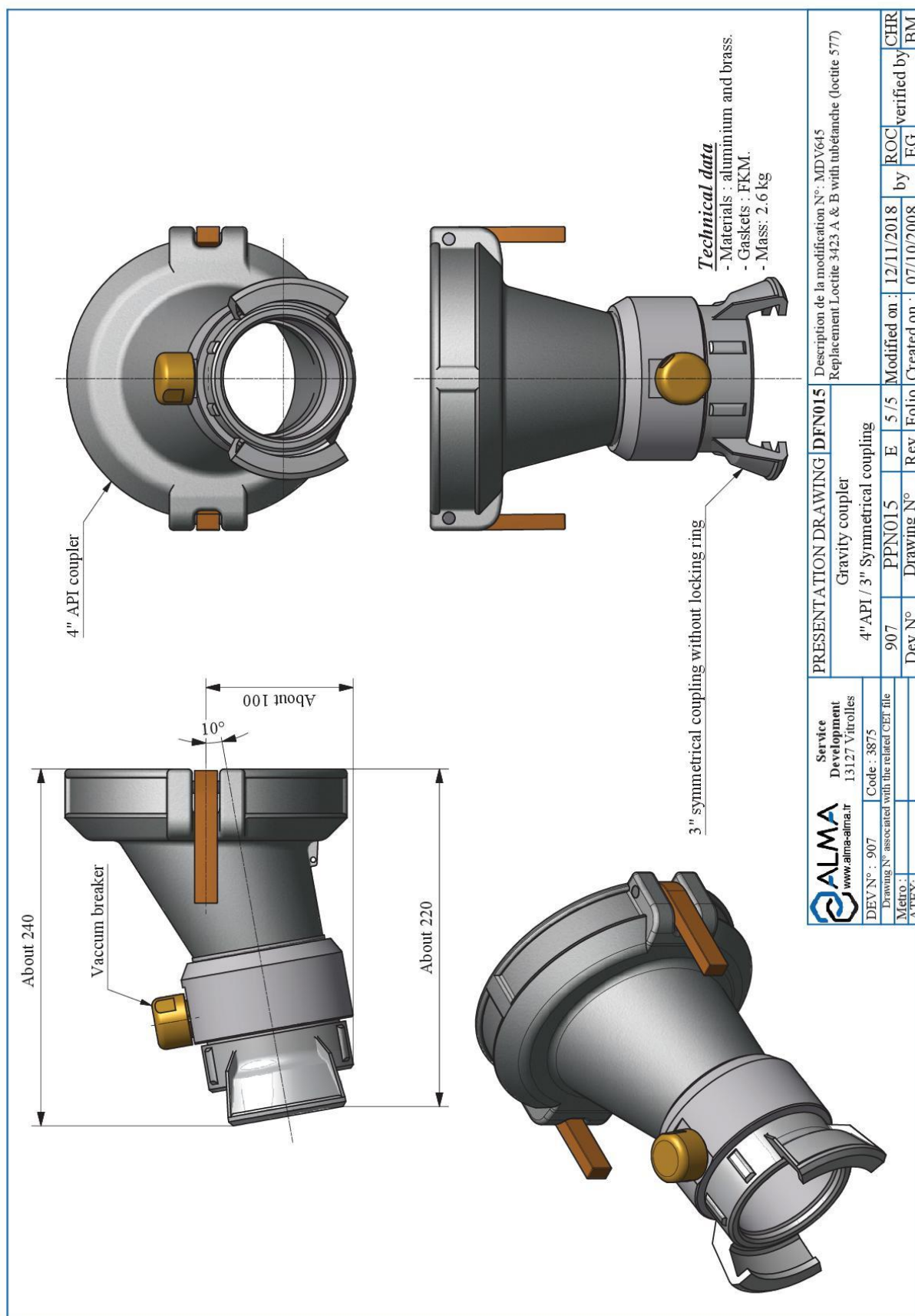



 Service Development 13127 Vitrolles www.alma-alma.fr	DEV N° : 984c		Code : 1166		PRESENTATION DRAWING DFV099 Data Key Transfer CTD+	Description of amendment N°449 - Modification Machining USB connector			
	Drawing N° associated with the related CET file								
	Metro :								
	ATFV :								
	984c	PPV099	D	5 / 6	Modified on : 17/03/2016	CC	verified by	SR	
	Dev N°	Drawing N°	Rev	Folio	Created on : 17/10/2011	BM		SR	

Document available on website alma-alma.fr

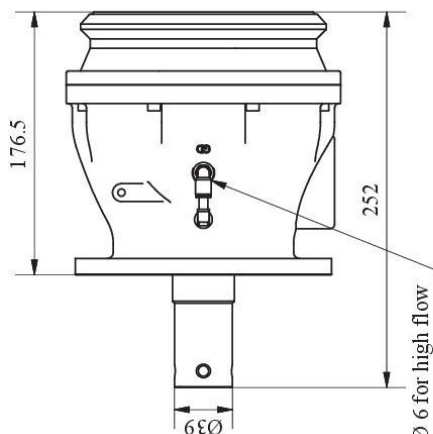
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13. GRAVITY COUPLER

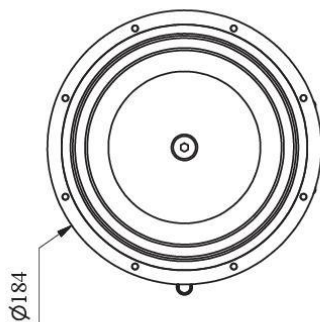
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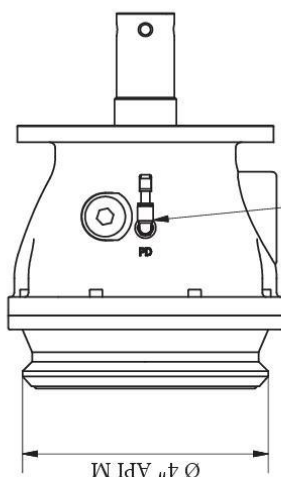
14. PNEUMATIC API ADAPTER



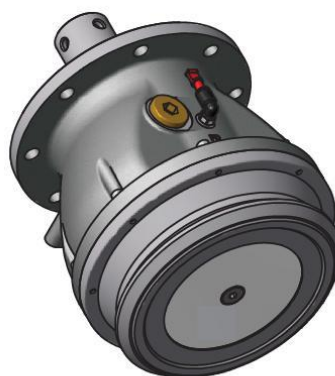
Pneumatic connection Ø 6 for high flow




Pneumatic connection Ø6 for low flow



Ø 4" API M



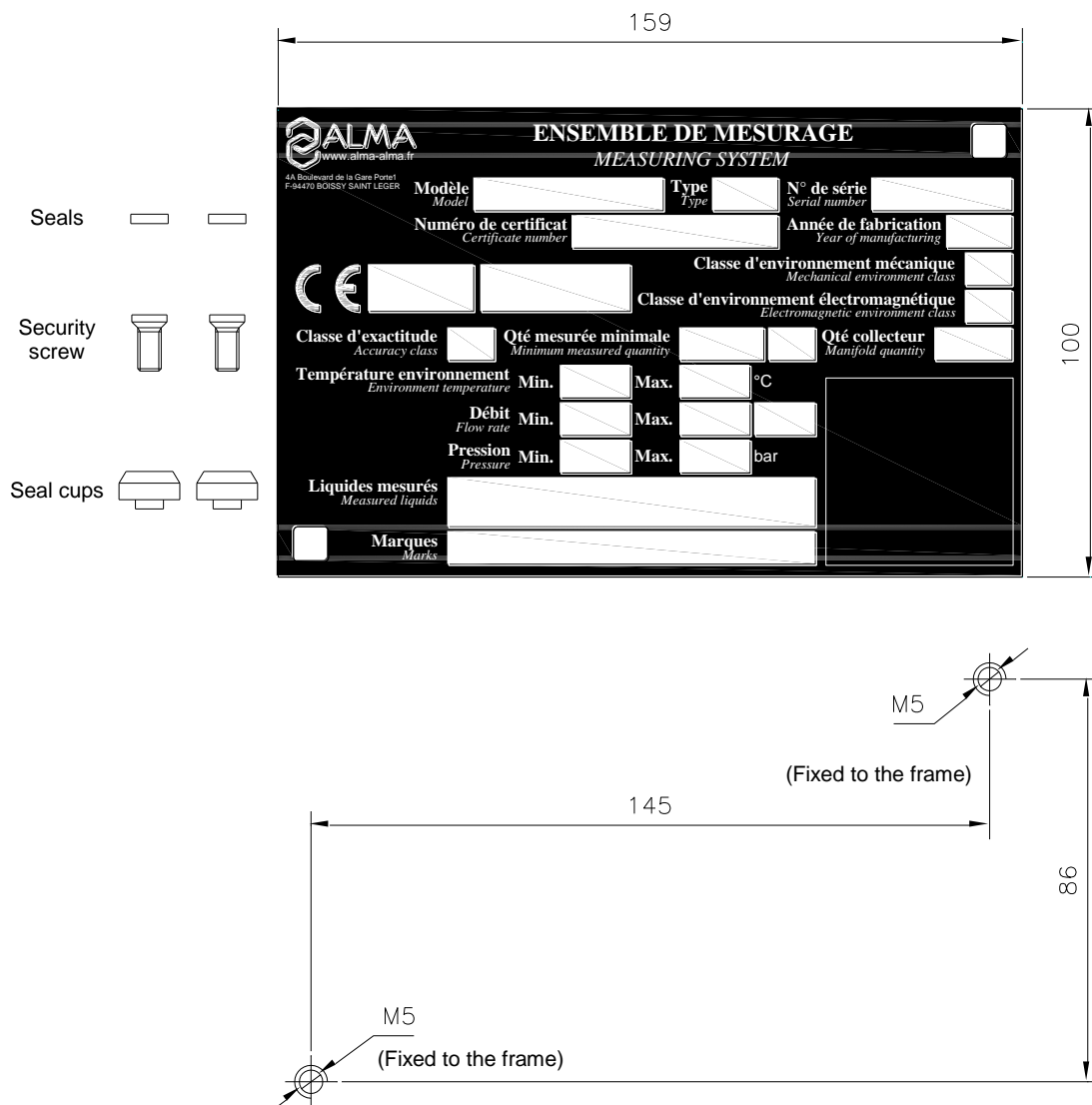
Technical data:
- Aluminium alloy
- Mass : 3 kg

 Service Development 13127 Vitrolles www.alma-alma.fr	Code : 7098		PRESENTATION DRAWING PPN703 API adaptor Double stage pneumatic				Description of the amendment: N°					
	DEV N° : 907											
	Drawing N° associated with the related CET file		907	PPN703	A	2 / 2	Modified on :		by		verified by	SR
	Metro :		Dev N°	Drawing N°	Rev	Eolio	Created on :	13/10/2014				

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15. 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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