INSTALLATION GUIDE

DI 015 EN A

GRAVITRONIQUE

Described in EC-type examination certificate N°: LNE-27785

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Issue	Date	Nature of modifications	Written by	Approved by

CONTENTS

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 ARE NOT POWERED.

MECANICAL RECOMMENDATIONS

- Respect the recommendations of the instruction manual specifying the installation, operation and maintenance conditions of the ATEX equipments (instruction manual supplied with the equipments).
- Take care to place the equipments 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).
- 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).

ELECTRICAL RECOMMENDATIONS

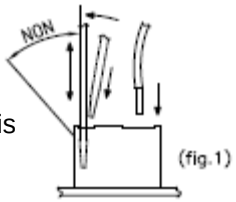
- Respect the recommendations of the instruction manual specifying the installation, operation and maintenance conditions of the ATEX equipments (instruction manual supplied with the equipments).

- Connect the supply of the equipments downstream cut-out, on the power supply reserved to the measured distribution.

- Put a delayed protection of 5A upstream the 24VDC supply to protect equipments in case of reverse polarity or overcurrent.

- 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).

- 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.



(fig.1)

- Pass the power supply cores (24Vdc truck) through the ferrites by carrying out a loop (ALMA supply).

- 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.

- Equipments 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 equipments).
  Otherwise, connect the shields to devices inside the equipment (ground terminal, earth bar, earth boss…).

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

- Respect a homogeneous wire colour code.

- Printer TMU295: before positioning the printer on its support, check that configuration switches of the data link protocol, located under the printer, are well positioned: No 3 on "ON" and the 7 others on "OFF".

- Current of the MICROCOMPT+ and printer:

ALMA equipment	Supply voltage	Current mini.	Current maxi.
MICROCOMPT+	24VDC +/-10%	0.7 A	1.5 A
IMPRIMANTE	24VDC +/-10%	0.1 A	5.5 A (switch-on)

- Colour 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

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 equipments 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/cm²**
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/cm² =	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)

2. GENERAL PRESENTATION

Measuring system installed according to MID certificate

The GRAVITRONIQUE measuring system is covered by the EC type examination certificate N° LNE-27785. Refer to this certificate for any precision about its installation.
For the sealing plan, see Annex to EC type examination certificate N° LNE-27785.

Special conditions for installation in any cases

Connection pipework between the compartments and the manifold, as between the manifold and the selection valves must have a minimum gradient of 3%.

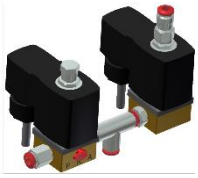
Pumped mode: Connection pipework between the selection valve for pumped mode and the pump entry should not include reverse slopes.
If the measuring system is fitted with several delivery points, it needs to be equipped with a device allowing a liquid delivery by only one point at once.

Gravity mode: If appropriate, the connection pipework between the selection valve for gravity mode and decanting valve must have a minimum gradient of 3%. The vehicle on which the measuring system is installed should have a device to check its horizontality.

3. PART LIST

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	**Equipment**	**Designation**	**Qty**	**Option***
1		**CALCULATOR INDICATOR MICROCOMPT+ GRAVITRONIQUE** (Provided with a magnetic supervisor key)	**1**	
2		**CONTROL BOX GRAVITRONIQUE**	**1**	
3		**ADRIANE TURBINE METER DN100-80 243 TTMA with sightglass**	**1**	
4		**DIFFERENTIAL PRESSURE TRANSMITTER – CP3000** (Supplied with hydraulic shock absorber)	**1**	

Non-contractual pictures

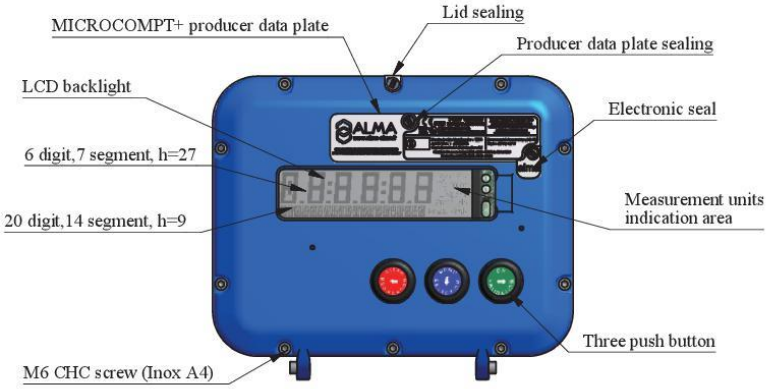
MATERIELS CONSTITUANT L'ENSEMBLE DE MESURAGE LIVRE PAR ALMA				
5		**NC/NO ATEX SOLENOID VALVES KIT**	1	
6		**END-OF-METERING PROBE – DG3001/75** (Supplied if not mounted on the manifold)	1	
		VACUITY SENSOR – DG3001/75 (Supplied if not mounted on the manifold)	1	
7		**PRINTER TMU-295** (Printer – power supply cable – serial link cable 10m)	1	
8		**CONVERTER 24VDC/24VDC 2.1A 50W** (Printer power supply 24VDC)	1	
9		**PNEUMATIC CONTROL VENT VALVE**	1	
10		**VACUUM BREAKER**	1	
11		**DN80 NON-RETURN VALVE KIT** (The second kit is supplied with an empty hose)	1	
			1	●
12		**PT100 TEMPERATURE SENSOR – CT1001** (Supplied with thermowell)	1	●

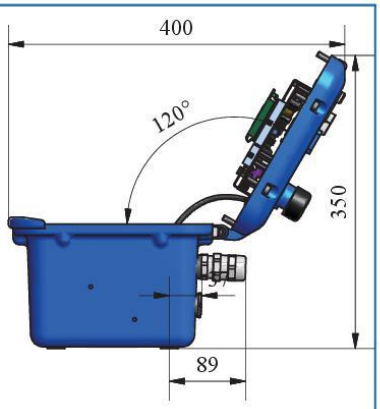
Non-contractual pictures

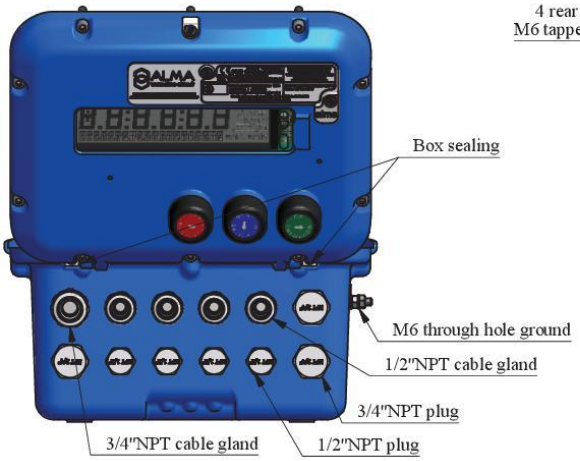
MATERIELS CONSTITUANT L'ENSEMBLE DE MESURAGE LIVRE PAR ALMA				
Item	**Matériel**	**Désignation**	**Qté**	**Option***
13		**ADRIANE TURBINE METER DN80-80**	**1**	●
14		**SIGHTGLASS KIT FOR ADRIANE TURBINE METER DN80 110x110** (Supplied with pre-drilled screws for sealing)	**1**	●
15		**KIT FOR MEASURING SYSTEM IDENTIFICATION PLATE** (Plate and sealing device)	**1**	●
Option*: equipment sold as an option by ALMA. Must be installed on the measuring system if required by the certificate.				

Non-contractual pictures

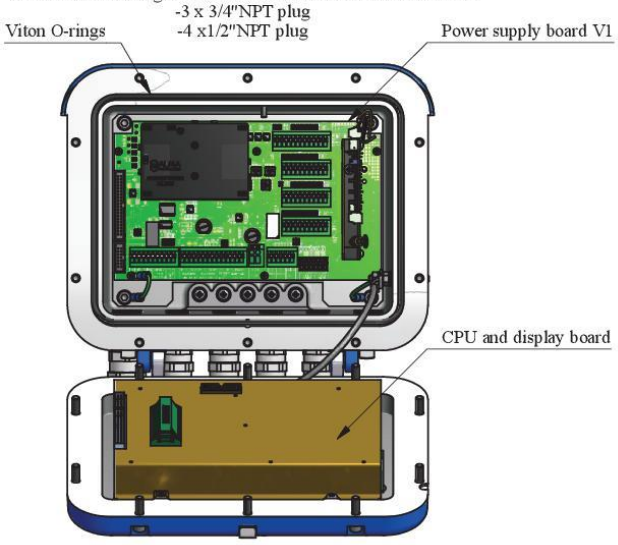
4. MICROCOMPT+ GRAVITRONIQUE







Configuration cable entries configuration:
-1 x 3/4"NPT cable gland - *Cable Ø5.5 to Ø13 - sheath Ø10 to Ø19*
-4 x 1/2"NPT cable gland - *Cable Ø4 to Ø10 - sheath Ø5 to Ø15*
-3 x 3/4"NPT plug
-4 x1/2"NPT plug



- ***Mass*** : ~12 Kg,
- ***Box protection level*** : IP66,
- ***Box material***: Aluminum alloy
- ***Metal finishing***: Color blue (RAL5010) resistant to hydrocarbons
- ***Temperature range*** : -20°c to +55°c,
- ***Environment class*** : I,
- ***EC-type examination certificate*** : INERIS 07 ATEX 0057X
- ***Complies with*** : EN 60079-0, 60079-1, 60079-11, Ex II2 (1)G Ex d [ia] IIB T6
- ***EC-type examination certificate***: LNE 15270, in conformity with 2001-387 decree and OIML R117,
- ***Evaluation certificate*** : LNE 13624, in conformity with 8.8 WELMEC guide

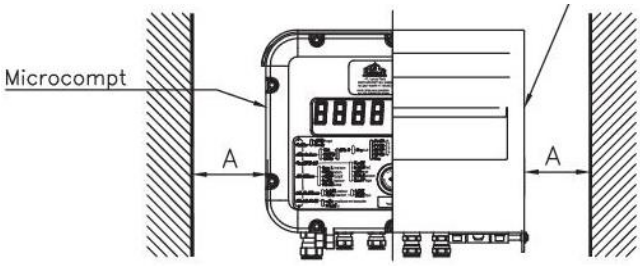
For a safe use of the MICROCOMPT+ electronic device, make sure to comply with the requirements of the instruction manual supplied with the equipment

ALMA www.alma-alma.fr Service Development 13127 Vitrolles		PRESENTATION DRAWING	**DFV094**			Description of the amendment N°396 Passage to interface power supply board V1 rev 11 New logo						
DEV N° : 973	Code : 3695	Microcompt+ Gravity metering										
Drawing N° associated with the related CET file		973	PPV094	I	7 /9	Modified on :	17/03/2015	by	CC	verified by	SR	
Metro :	LNE-15270 / LNE13624	Dev N°	Drawing N°	Rev	Folio	Created on :	06/12/2010		CC		SR	
ATEX:	INERIS 07 ATEX 00057X											

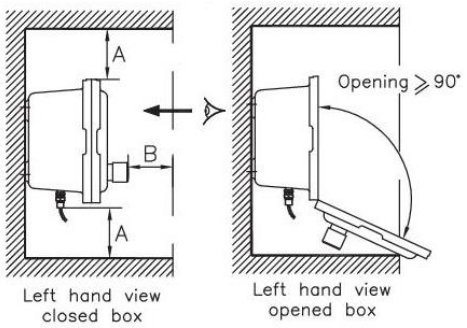
Document available on website alma-alma.fr

5. INSTALLATION RECOMMENDATIONS MICROCOMPT+

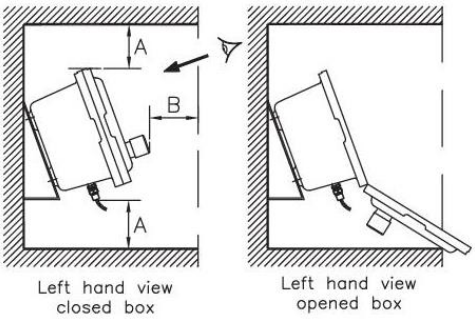
- Fasten the box with 4 M6 screws (holder suitable for vibrations and designed to support the MICROCOMPT). On the box: 4 M6 blind holes tapped length=12 over 185x132).
- Leave an open space around the box in order:
  - To facilitate maintenance operation.
  - To prevent any pressing on pushbuttons and on the glass.
- The space between the front face of the box and the cabinet door shall be sufficient.
- Dimensions: A > 100mm and B > 60mm



- SOLUTION 1: straight box if it's a breast height.

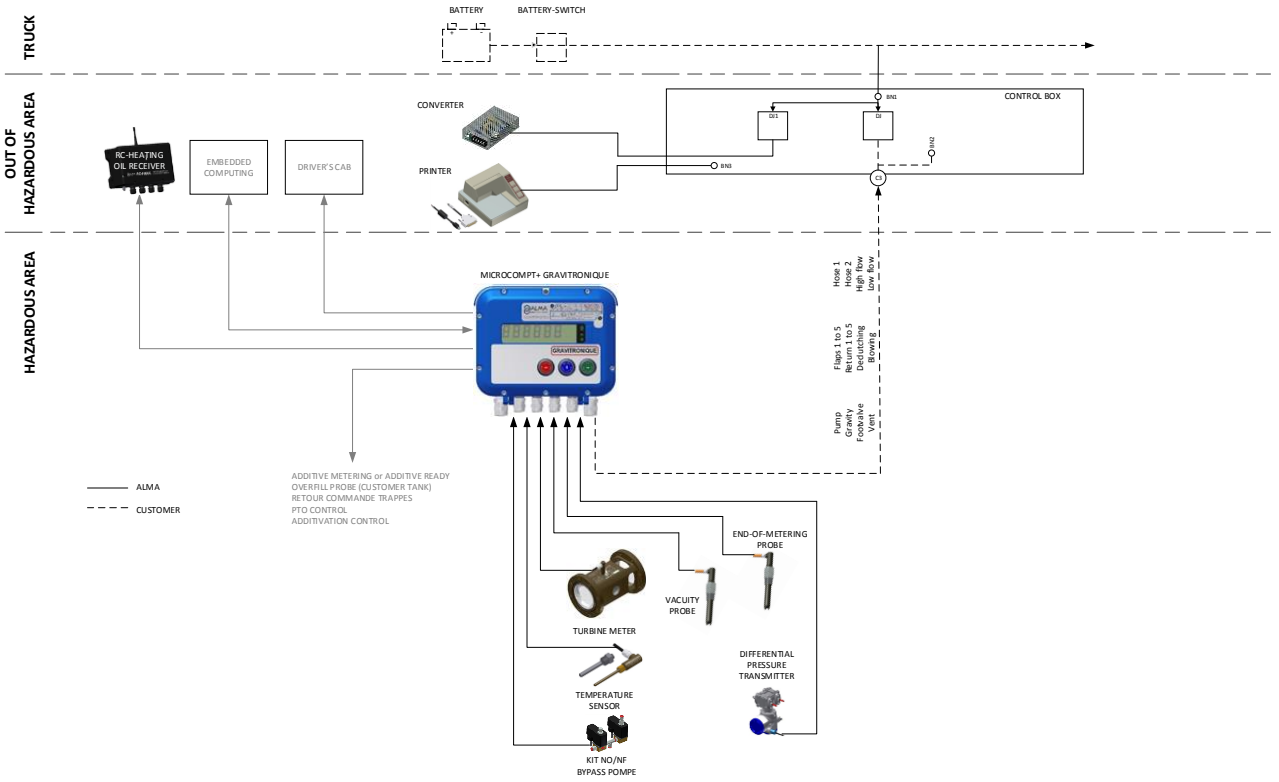


- SOLUTION 2: 20° angle if it's not a breast height.



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

6. ELECTRICAL WIRING MICROCOMPT+



Any mass braids and shielding must be connected to the MICROCOMPT+ ground bar

TERMINAL ASSIGNEMENT OF MICROCOMPT+ BOARDS

INTERFACE POWER SUPPLY BOARD

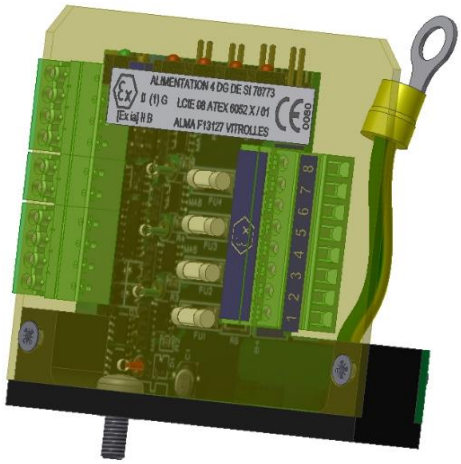
EQUIPMENTS CONNECTED TO THE MICROCOMPT+								INTERFACE POWER SUPPLY BOARD			
Option	Equipment	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	GRAVITRONIQUE CONTROL BOX	C2	1/2"NPT	●	2x1 sh.	Rx Printer		1	Tx	RS232 PRINTER	RS232 serial link
						Tx Printer		2	Rx		
●	EMBEDDED COMPUTING				3x0.34 sh.	0V		3	0V	RS232	Connect the shielding
						Rx E.C.		4	Tx		
						Tx E.C.		5	Rx		
●	EMBEDDED COMPUTING					Rx		9	+	BUS RS485	
						Tx		10	-		
	TURBINE TRANSMITTER	C1	1/2"NPT	●	ADR 4x0.34 sh.	12V	Jn	11	12V	METERING INPUT 1	Connect the shielding
						V1	Mr	12	V1		
						V2	Vt	13	V2		
						0V	Bc	14	0V		
●	ADDITIVE METERING INPUT or ADDITIVE READY					12V		19	12V	METERING INPUT 2	Connect the shielding
						V1		20	V1		
						0V		21	0V		
●	PT100 TEMPERATURE PROBE			●	ADR 3x0.6 sh.	+	Jn	33	+	PT100	Connect the shielding
						-	Bc	34	-		
						-	Vt	35	-		

EQUIPMENTS CONNECTED TO THE MICROCOMPT+								INTERFACE POWER SUPPLY BOARD			
Option	Equipement	Cable (forr information)				Function	Colour or No.	Terminal	Function		Observation
		No.	CG*	Alma	Type						
	GRAVITRONIQUE CONTROL BOX	C3	3/4"NPT		20x1	Pump	1	73	FET=Field Effect Transistor Outputs 24VDC (outputs FET 24V 5W max.)		Selection valve pumped distribution
						Gravi	2	79			Selection valve gravity distribution (in case of a double-stage API adaptor, Low Flow is operated with the gravity output control)
						Footvalve	3	44		Footvalve	
						Vent	4	45		Vent	Manifold vent control
						Flap 1	5	39		EV manifold flaps 1to 5	Opening-control flap 1
						Flap 2	6	40			Opening-control flap 2
						Flap 3	7	41			Opening-control flap 3
						Flap 4	8	42			Opening-control flap 4
						Flap 5	9	43			Opening-control flap 5
						Return 1	10	63		Product Return 1to 5	Opening-control return 1
						Return 2	11	64			Opening-control return 2
						Return 3	12	65			Opening-control return 3
						Return 4	13	66			Opening-control return 4
						Return 5	14	67			Opening-control return 5
						Declutching	15	62		Declutching	Pump declutching or Motor acceleration (if automatic transmission)
						Blowing	16	68		Blowing	Product return blowing
						Hose 1	17	76		Valve hose 1	Selection valve hose 1(pumped)
						Hose 2	18	77		Valve hose 2	Selection valve hose 2 (pumped)
						HF	19	78		API	High flow of an API adaptor or Selection valve hose 3 (pumped) or Opening-control flap 6 or Special return
						LF	20	79			Low flow of an API adaptor
•	RC-HEATING OIL RECEIVER				2x1	Start/Stop	1	49	Start/Stop	RC-Oil_1	
						LF/HF	2	50	LF/HF	RC-Oil_2	
•	OVERFILL PROTECTION (customer tank)							53			Overfill protection probe (customer tank)
	FLAP-CONTROL FEEDBACK							54		Flaps manual control	Flap-control feedback (if manual control of flaps)
•	PTO CONTROL				1x1	PTO Ctrl		58		PTO control	Power-take-off engaged
•	DRIVER'S CAB CONTROL				3x1	Start Mot.	1	22	Start Mot.	Start motor	(Open collector output)
						Stop Mot.	2	23	Stop Mot.	Stop motor	(Open collector output)
						PTO	4	61	24VDC= PTO	PTO	(Output FET 24V 5W max.) *FET=Field Effect Transistor*
•	ADDITIVATION CONTROL				2x1	Supply	1	71	NC free contact	Additivation contol	Closed contact=additivation (Output: NO free-potential relay)
						Control	2	72			
	KIT SOLENOID VALVES NC/NO (ATEX) - PUMP BYPASS	C4			3xG0.75	NC valve Pump bypass	1 / Mr	74	24VDC	NC or HF	24VDC = opening NC solenoid valve or HF control
							2 / Bl	80	0V		
						NO valve Exhaust	1 / Mr	75	24VDC	NO or LF	24VDC = closing NO solenoid valve or LF control
							2 / Bl	80	0V		

SOME EXTENSION BOARDS MAY BE SET ON TO THE INTERFACE POWER SUPPLY BOARD

**Refer to the Cable Glands Installation Instruction*

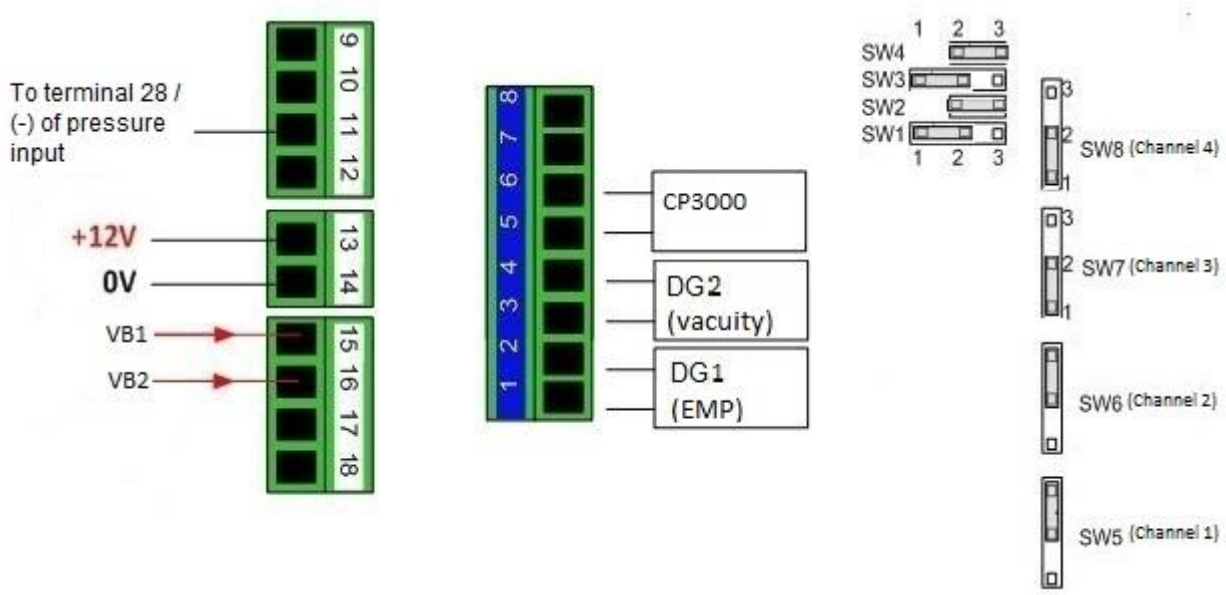
EXTENSION BOARD 4DG (SI)



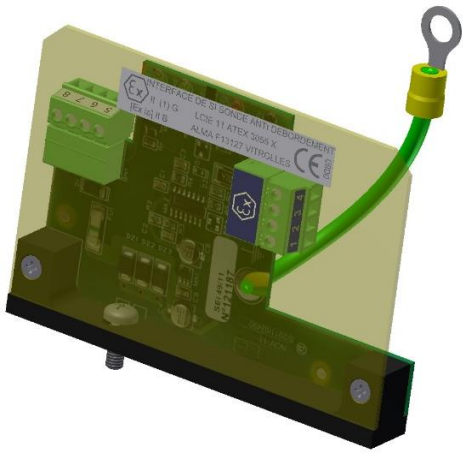
EQUIPMENTS CONNECTED TO THE MICROCOMPT+								CARTE EXTENSION 4DG (SI)			
Option	Equipment	Cable (for information)				Function	Colour or No.	Terminal	Function		Observation
		No.	CG*	Alma	Type						
	END-OF-METERING PROBE				3x0.34	EMP	Mr	1	+	EMP	Connect the shielding
							Bl	2	-		
	VACUITY SENSOR				3x0.34	VACUITY	Mr	3	+	VACUITY	Connect the shielding
							Bl	4	-		
	DIFFERENTIAL PRESSURE TRANSMITTER				ADR 2x0.34 sh.	PRESSURE	Bc	5	+	PRESSURE	Connect the shielding
							Mr	6	-		

**Refer to the Cable Glands Installation Instruction*

Jumper configuration on the extension board 4DG:



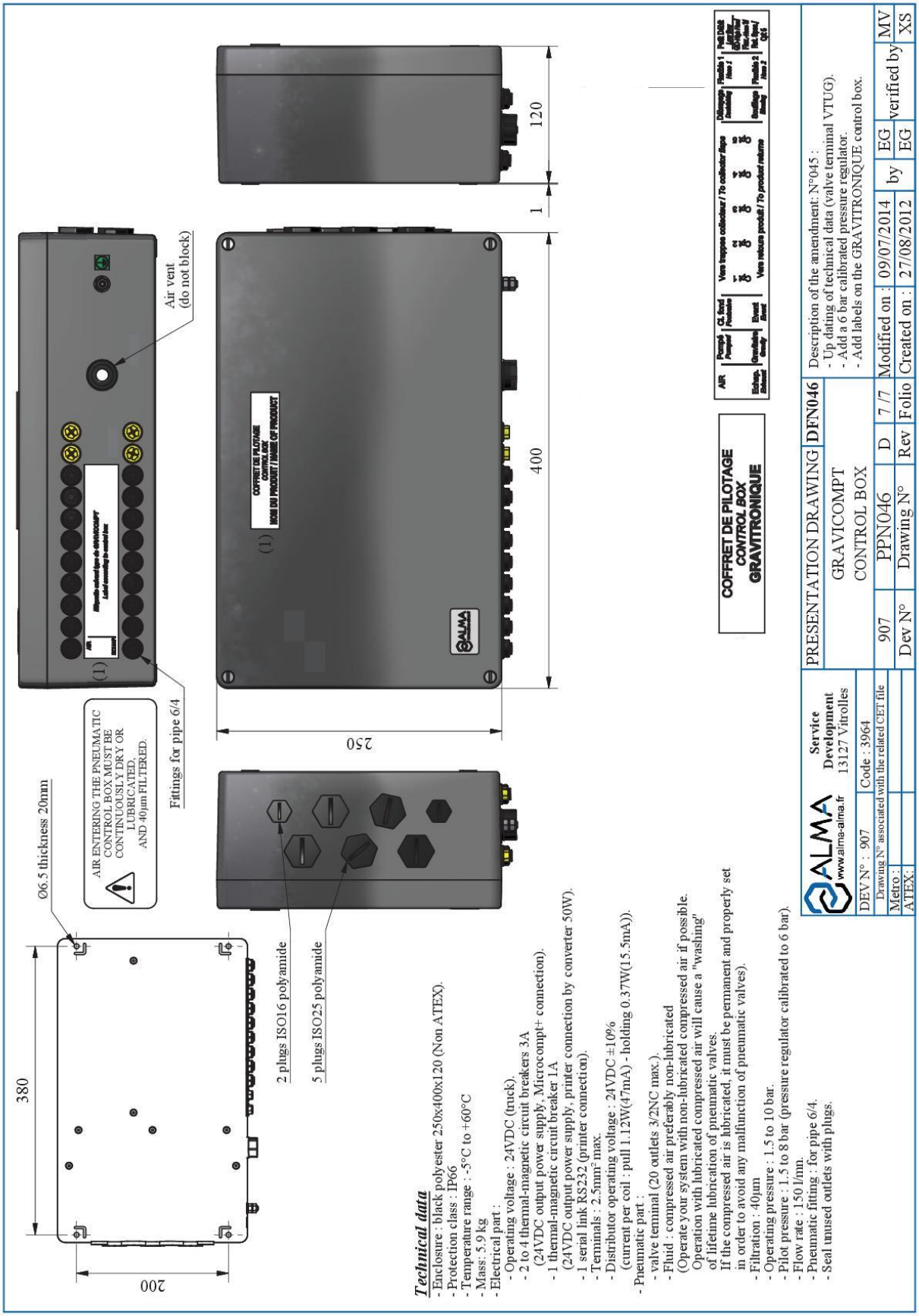
EXTENSION BOARD SI SONDE AD



EQUIPEMENTS CONNECTED TO THE MICROCOMPT+								EXTENSION BOARD SI SONDE AD			
Option	Equipement	Cable (for information)				Function	Colour or No.	Terminale	Function		Observation
		No.	CG*	Alma	Type						
	OVERFILL PROTECTION PROBE PLUG				*[6x1]*	Common	*[Nr]*	1	-	OVERFILL PROTECTION PROBES	*[if supplying by ALMA]*
						Supply	*[Rg]*	2	+		
						From probe	*[Or]*	3	From probe		
						To probe	*[Jn]*	4	To probe		

**Refer to the Cable Glands Installation Instruction*

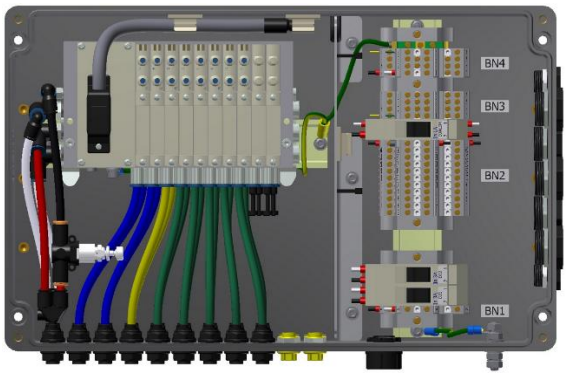
7. CONTROL BOX GRAVITRONIQUE



Document available on website alma-alma.fr

8. ELECTRIQUE WIRING CONTROL BOX

TERMINAL ASSIGNMENT OF CONTROL BOX



EQUIPMENTS CONNECTED TO THE CONTROL BOX								CONTROL BOX TERMINAL BLOCKS				
Option	Equipement	Cable (for information) No.	CG*	Alma	Type	Fnction	Colour or No.	Block	Terminal	Function		Observation
	SUPPLY	A1			2x1	24VDC	1	BN1	1	24VDC	Supply	24VDC truck battery (after battery switch and protected by a fuse)
						0V	2		2	0V		
	MICROCOMPT+	C3	3/4"NPT		20x1	24VDC	2	BN2	1	Gravity		Selection valve gravity distribution (in case of a double-stage API adaptor, Low Flow is operated with the gravity output control)
						24VDC	4		3	Vent		Vent valve control
						24VDC	10		5	Return 1	Product return	Product return 1to 5
						24VDC	11		7	Return 2		
						24VDC	12		9	Return 3		
						24VDC	13		11	Return 4		
						24VDC	14		13	Return 5		
						24VDC	16		15	Blowing		Product return blowing
						24VDC	18		17	Hose 2		Selection valve hose 2 (pumped)
						24VDC	19		19	HF / Hose 3 / Flap 6 / Special return		High flow of an API adaptor or Selection valve hose 3 (pumped) or flap control compartment 6 or Special return
						24VDC	1		2	Pump		Selection valve pumped distribution
						24VDC	3		4	Footvalve		Footvalve control
						24VDC	5		6	Trappe 1	Flap opening	Flap control compartments 1to 5
						24VDC	6		8	Trappe 2		
						24VDC	7		10	Trappe 3		
						24VDC	8		12	Trappe 4		
						24VDC	9		14	Trappe 5		
						24VDC	15		16	Declutch.		Pump declutching or Motor acceleration
						24VDC	17		18	Hose 1		Selection valve hose 1(pumped)
						24VDC	20		20	Low flow	LF	Lox flow of an API adaptor (in case of a double-stage API adaptor, Low Flow is operated with the gravity output control)

**Refer to the Cable Glands Installation Instructions*

EQUIPMENTS CONNECTED TO THE CONTROL BOX								CONTROL BOX TERMINAL BLOCKS				
Option	Equipment	Cable (for information)				Function	Colour or No.	Block	Terminal	Function		Observation
		No.	CG*	Alma	Type							
	MICROCOMPT+	C2				Rx		BN3	8		RS232 Printer	
						Tx			7			
	PRINTER		1/2"NPT		4x1 sh.	24VDC	Jn	BN4	8	24VDC	Microcompt supply	
						0V	Vt		7	0V		
						Rx	Bc		1	Rx	RS232 Printer	
						Tx	Mr		2	Tx		

**Refer to the Cable Glands Installation Instructions*

9. PNEUMATIC WIRING CONTROL BOX

PNEUMATIC INPUT/OUTPUT ASSIGNMENT OF THE CONTROL BOX

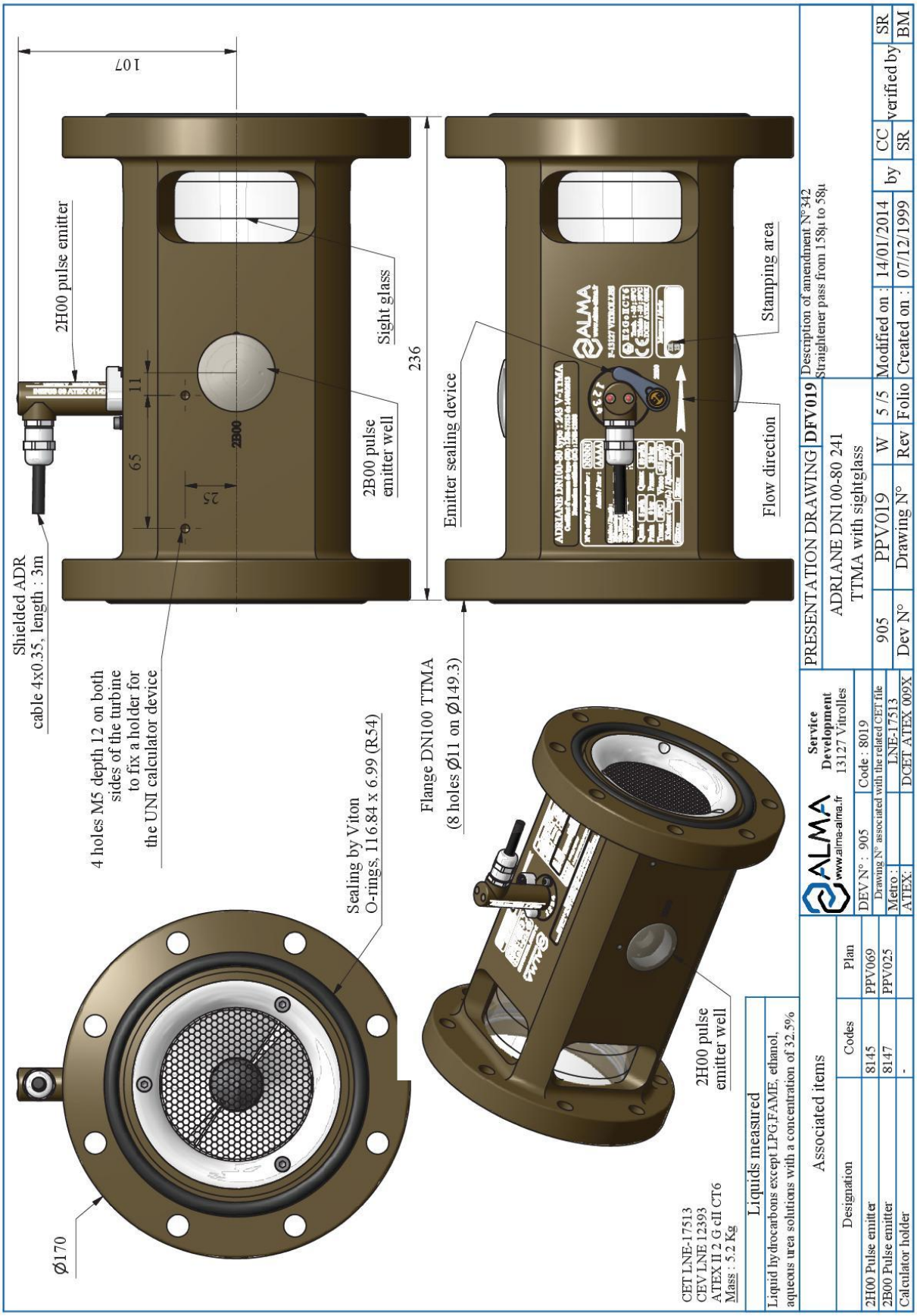
Label	Input	Output	Function	Observation
AIR	X		Air supply of the box	Air if: all footvalves opened and valve bar locked
Exhaust		X	Exhaust	Put a tube L=100mm min. (no muffler)
Pump		X	Pumped way selection	
Gravity		X	Gravity way selection	
Footvalve		X	Opening footvalve	
Vent		X	Opening manifold vent	Connection to the vent valve
Manifold flap Cpt 1		X	Opening flaps	Connection to the manifold flaps
Manifold flap Cpt 2		X		
Manifold flap Cpt 3		X		
Manifold flap Cpt 4		X		
Manifold flap Cpt 5		X		
Product return Cpt 1		X	Product returns	Connection to the product returns
Product return Cpt 2		X		
Product return Cpt 3		X		
Product return Cpt 4		X		
Product return Cpt 5		X		
Declutching		X	Declutching pneumatic cylinder	If pneumatic declutching
Blowing		X	Product return blowing	Use "&" cells to connect with each return product control
Hose 1		X	Hose 1 valve control	
Hose 2		X	Hose 2 valve control	
GD – High Flow/ Flex. – Hose 3/ Ret. Spec./ Cpt 6		X	API adaptor open in high flow	Connection to the API adaptor (HF – LF)
Low Flow		X	API adaptor open in low flow	

Unused ports must be plugged.

CONDITIONS FOR AIR SUPPLY OF THE CONTROL BOX:

- The pneumatic "&" cells of all footvalves are open.
- The bar is in its locked position (compartment API adapters are locked).

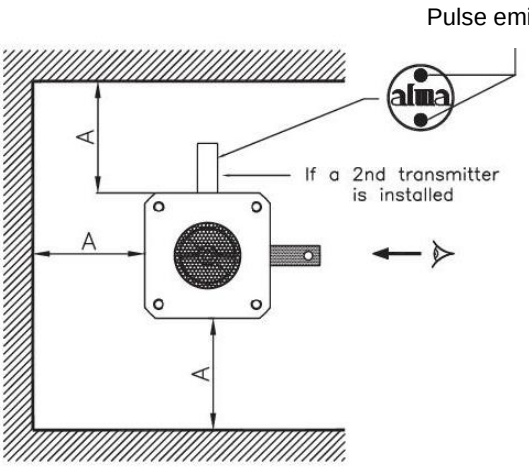
10. ADRIANE TURBINE METER DN100-80 243 TTMA



Document available on website alma-alma.fr

11. INSTALLATION RECOMMENDATIONS ADRIANE TURBINE METER

- The identification plate and the led of the pulse emitter(s) shall be visible and accessible.



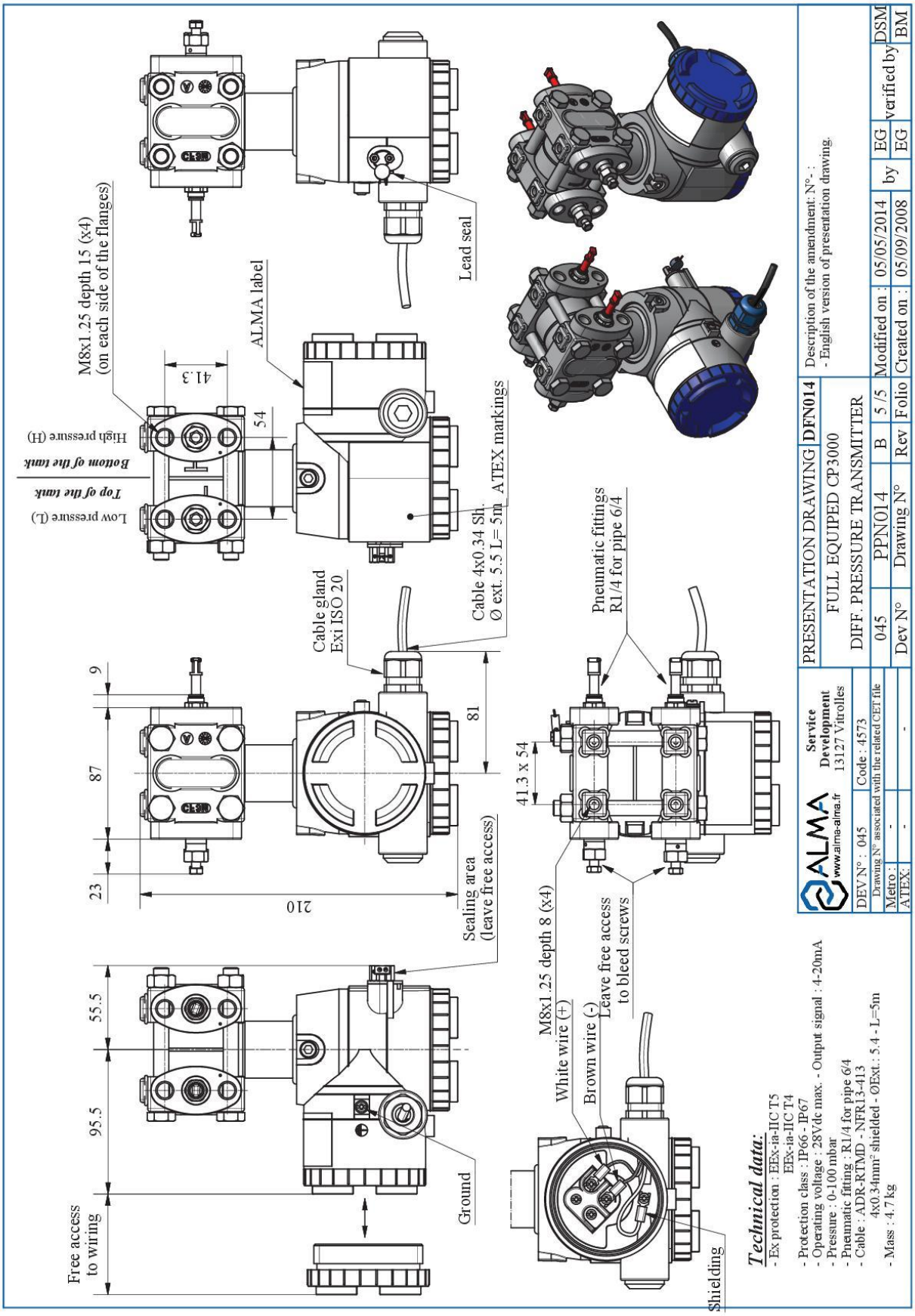
- The turbine must be installed with respect to the flow direction.
- Put sealing rings each other sides between the turbine and the backflanges.
- Leave an open space all around the turbine in order to ease maintenance.
- Install a 400µ filter (mini) on the pipe upstream from the turbine meter.
- After installation or during the commissioning period, if the new or modified pipes have not been perfectly cleaned or pickled and passivated, the turbine should be protected by a honeycomb sieve – max. 1mm mesh. It must be placed between two flanges upstream from the turbine.
- Dimensions: A > 100mm.

The meter may be installed:

- Between two straight pipe sections that have the same nominal diameter as the meter and which lengths is at least equal to 10 times this diameter upstream and 5 time downstream.
- Between two pipes that have the same nominal diameter as the meter, with shorter or no straight sections, provided that no flowrate adjustment device (eg. a variable-opening valve) is located upstream at a distance less than 10 times the nominal diameter.

Provision contained in EC Type Examination or Evaluation Certificate.

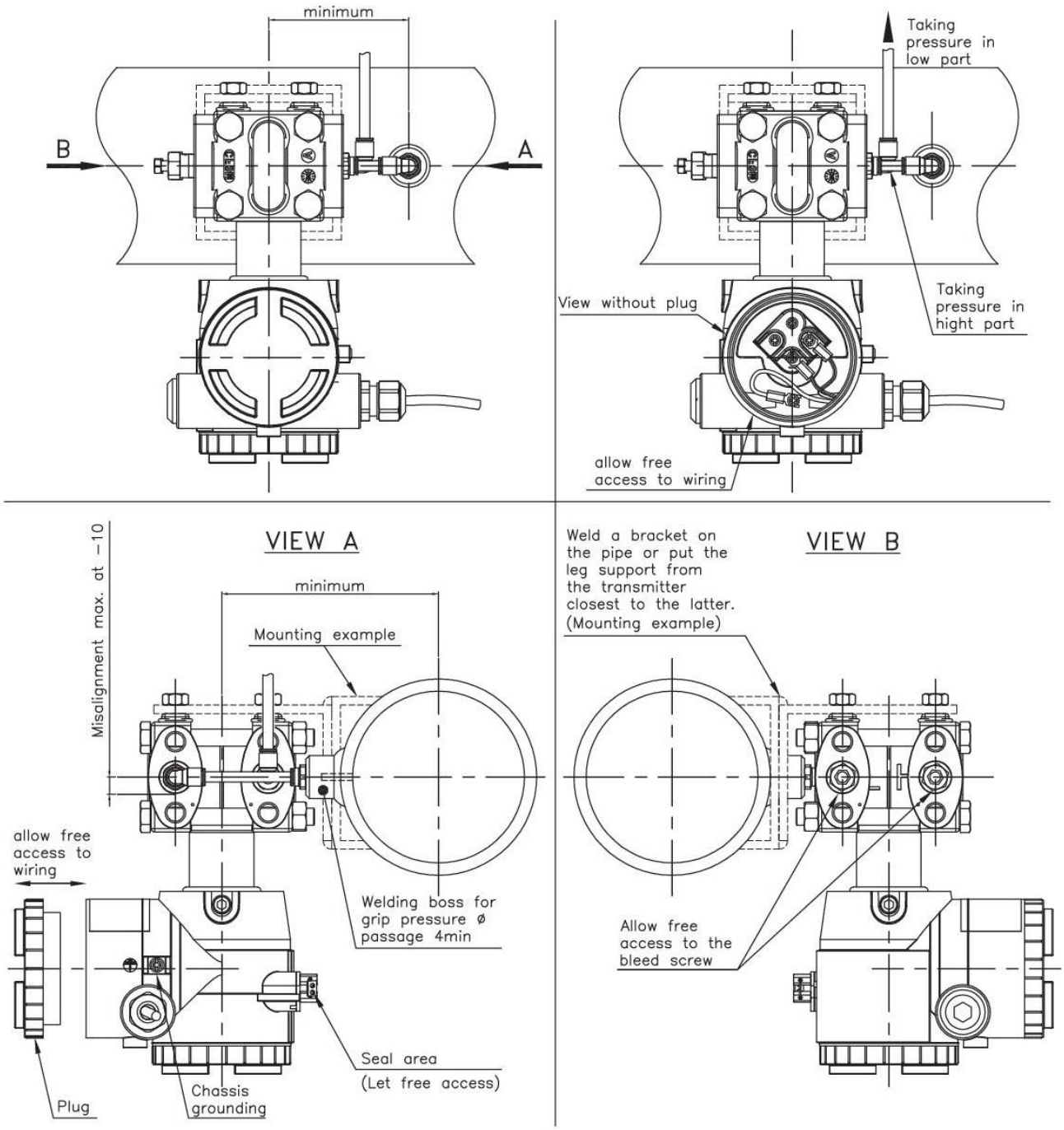
12. DIFFERENTIAL PRESSURE TRANSMITTER CP3000



Document available on website alma-alma.fr

13. INSTALLATION RECOMMENDATIONS CP3000 (ATEX)

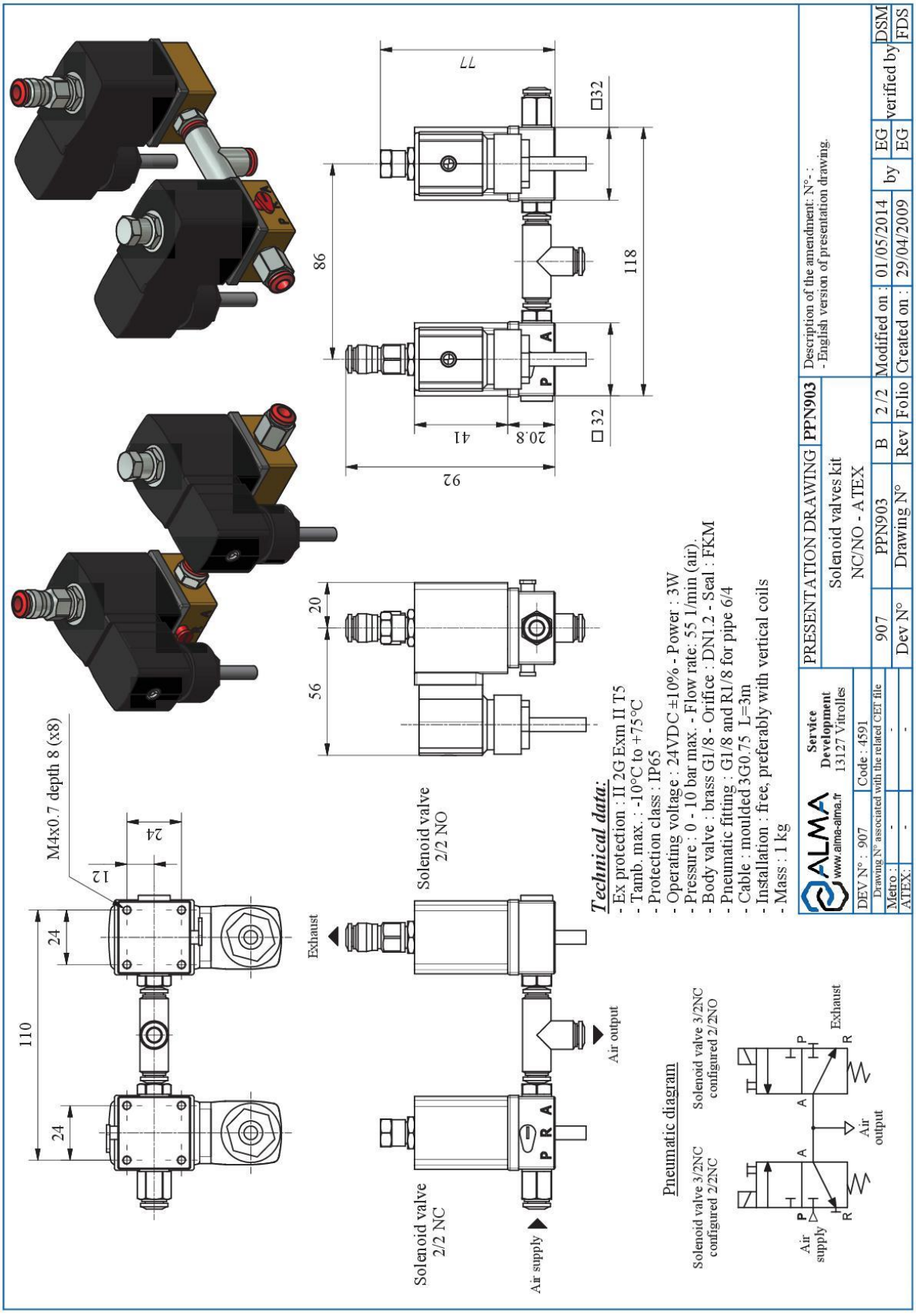
THE PRESSURE TRANSMITTER MUST BE INSTALLED IN UPRIGHT POSITION



REFER TO INSTRUCTION MANUAL

(DELIVERED WITH THE EQUIPMENT AND AVAILABLE ON ALMA WEBSITE)

14. NC/NO SOLENOID VALVES KIT (ATEX)



Document available on website alma-alma.fr

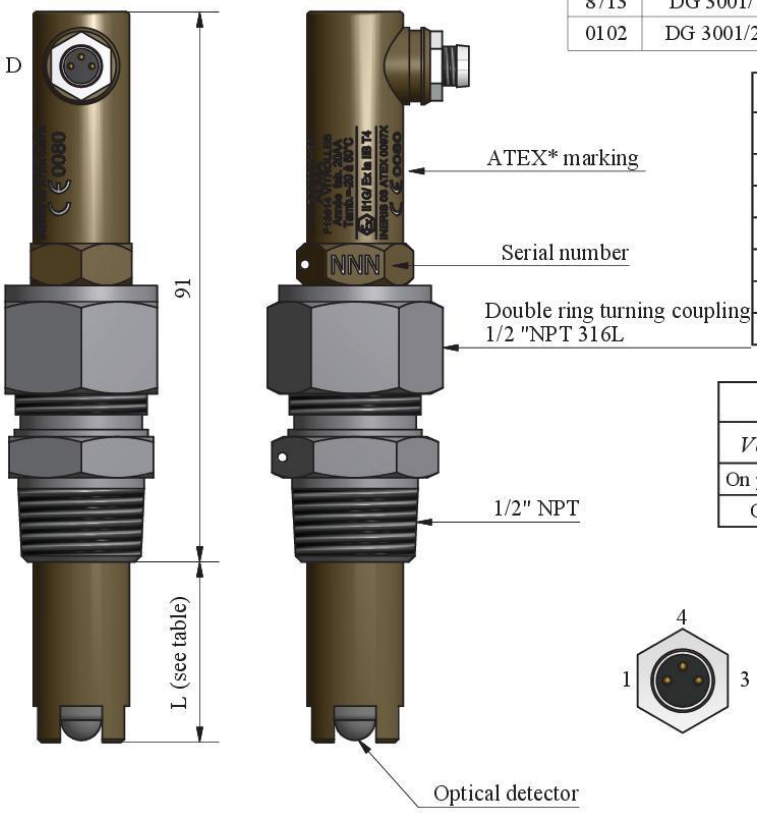
15. END-OF-METERING PROBE / VACUITY SENSOR – DG3001/75-Co

Codification of marking :

DG3001/LLL-Co material

LLL = Maximum Lenght under connection
Co = Connector
Material : - 316L means: Inox
- no indication means:Aluminium

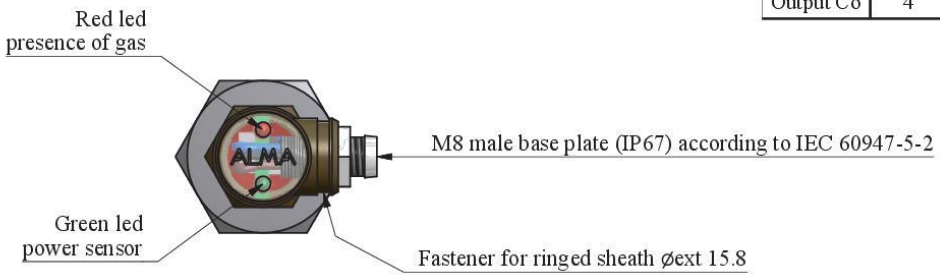
Dimensions				
Codes	Types	Lengths under connector (mm)		Materials
		L min	L max	
0513	DG 3001/30-Co	0	26	Aluminium
8133	DG 3001/75-Co	30	71	Aluminium
8134	DG 3001/205-Co	75	201	Aluminium
8713	DG 3001/75-Co Inox	30	71	Inox 316 L
0102	DG 3001/205-Co Inox	75	201	Inox 316 L



Operation		
Conditions	Gas	Liquid
Output (mA)	35±2	15±1
Open collector output	Saturated	Blocked
Imax on output Co (mA)	30	
Vce (V) for Is=10mA	< 0.4	
State of the red led	On	Off
State of the green led	On	On

Supply			
Voltage VDC	NSI	SI II B	SI II C
On power supply +	7 to 27	7 to 18*	7 to 15*
On output Co	< 27	< 13.2*	

Connection of the connector		
Function	Pin	Wire Color
Power supply +	1	Brown
Power supply -	3	Blue
Output Co	4	Black



NOTE:
- The detector body is made of anodized aluminum alloy of bronze color, or Inox 316L.
- The optical sensor in contact with the liquid or gas is of polysulfone.
- The O-ring between the body and the detector is made of Viton.
- The sensor dis supplied with any cable, 3 lengths are available: 5m cables (8138), 10m (8139) and 25m (8140).

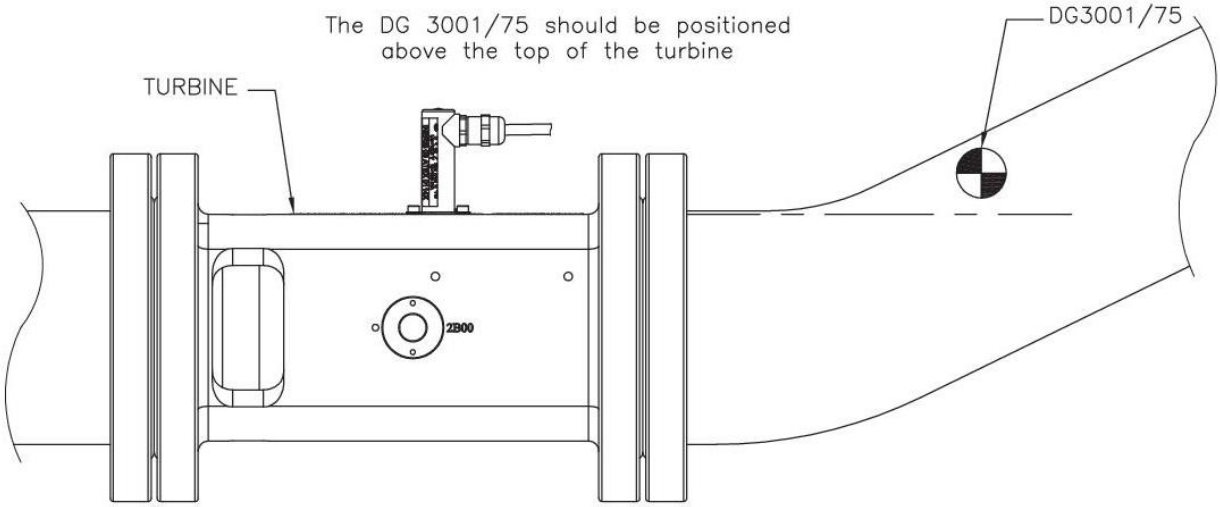
*Refer to § 2 ATEX descriptive notice

ALMA www.alma-alma.fr Service Development 13127 Vitrolles	PRESENTATION DRAWING DFV014					Description of amendment MDV333 Adding tolerance on the inside diameter of the body					
DEV N° : 981 Code : Voir plan de présentation	Gas detector output connector DG3001, DG3001/75, DG3001/205										
Drawing N° associated with the related CET file	981	PPV014	T	5 /6	Modified on :	14/01/2014	by	CC	verified by	SR
Metro :	Dev N°	Drawing N°	Rev	Folio	Created on :	01/04/1999		BM		BM
ATEX: INERIS 03 ATEX 0097X										

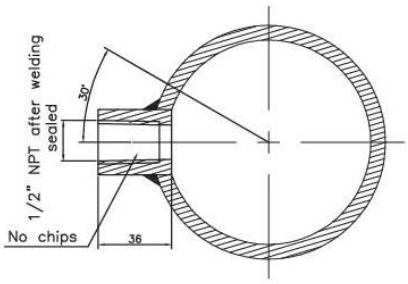
16. INSTALLATION RECOMMENDATIONS DG3001/75

POSITION OF THE END-OF-METERING PROBE:

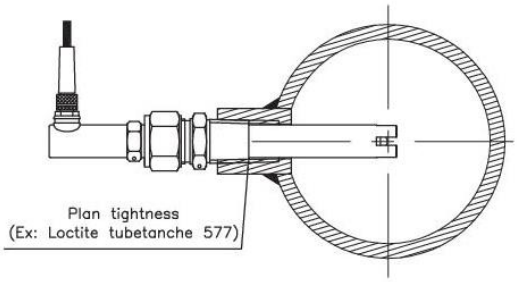
The DG3001/75 should be positioned above the top of the turbine, as close as possible to the turbine



Position of the welding boss for DG3001 – horizontal position or until 30°



Mounting DG3001



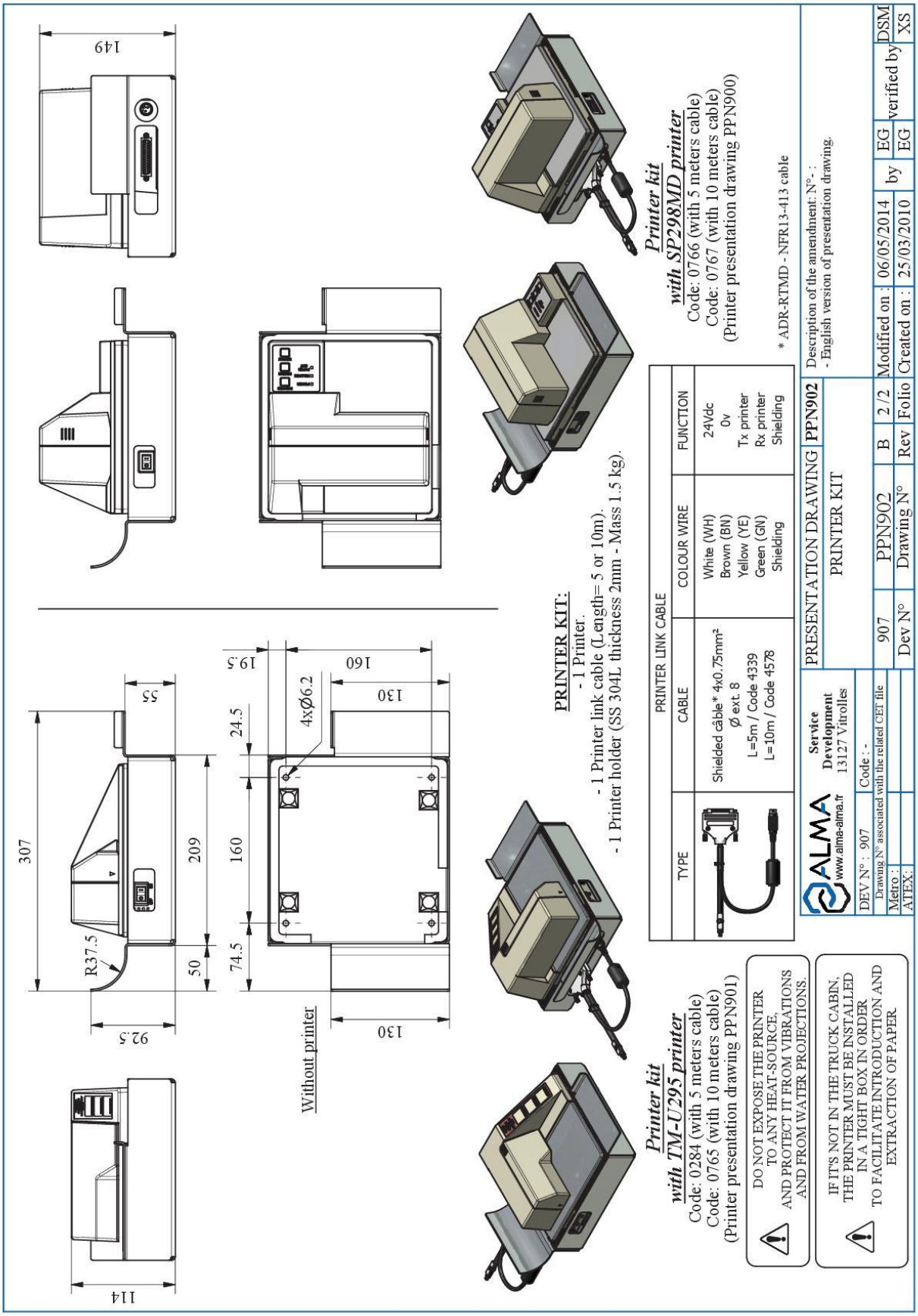
POSITION OF THE END-OF-THE VACUITY SENSOR:

The vacuity sensor must be placed as close as possible to the entry of the selection valve for pumped mode (VP)

REFER TO INSTRUCTION MANUAL

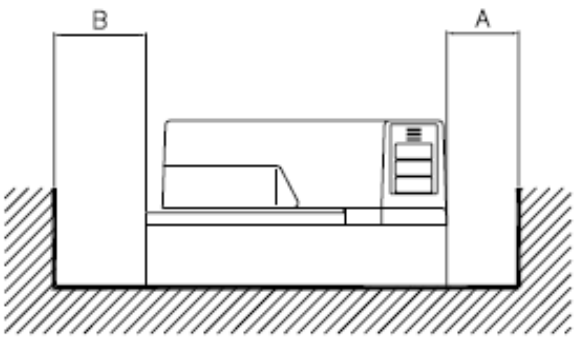
(DELIVERED WITH THE EQUIPMENT AND AVAILABLE ON ALMA WEBSITE)

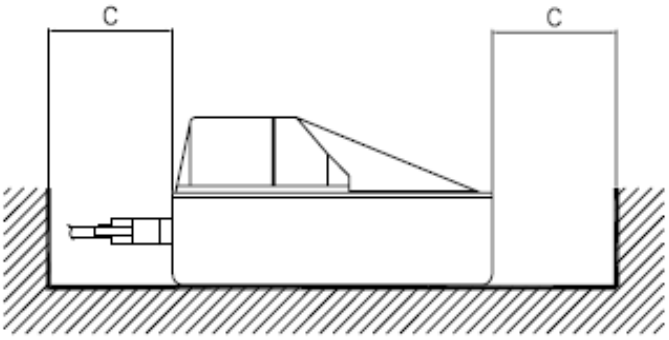
17. PRINTER

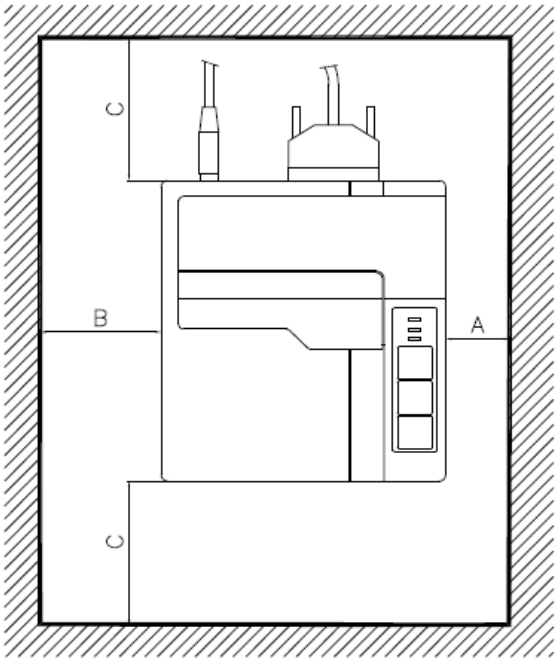


18. INSTALLATION RECOMMENDATIONS PRINTER

- Do not store anything above the printer.
- Leave an open space all around the printer to ease maintenance.
- Dimensions: A ≥ 50mm and B ≥ 100mm.





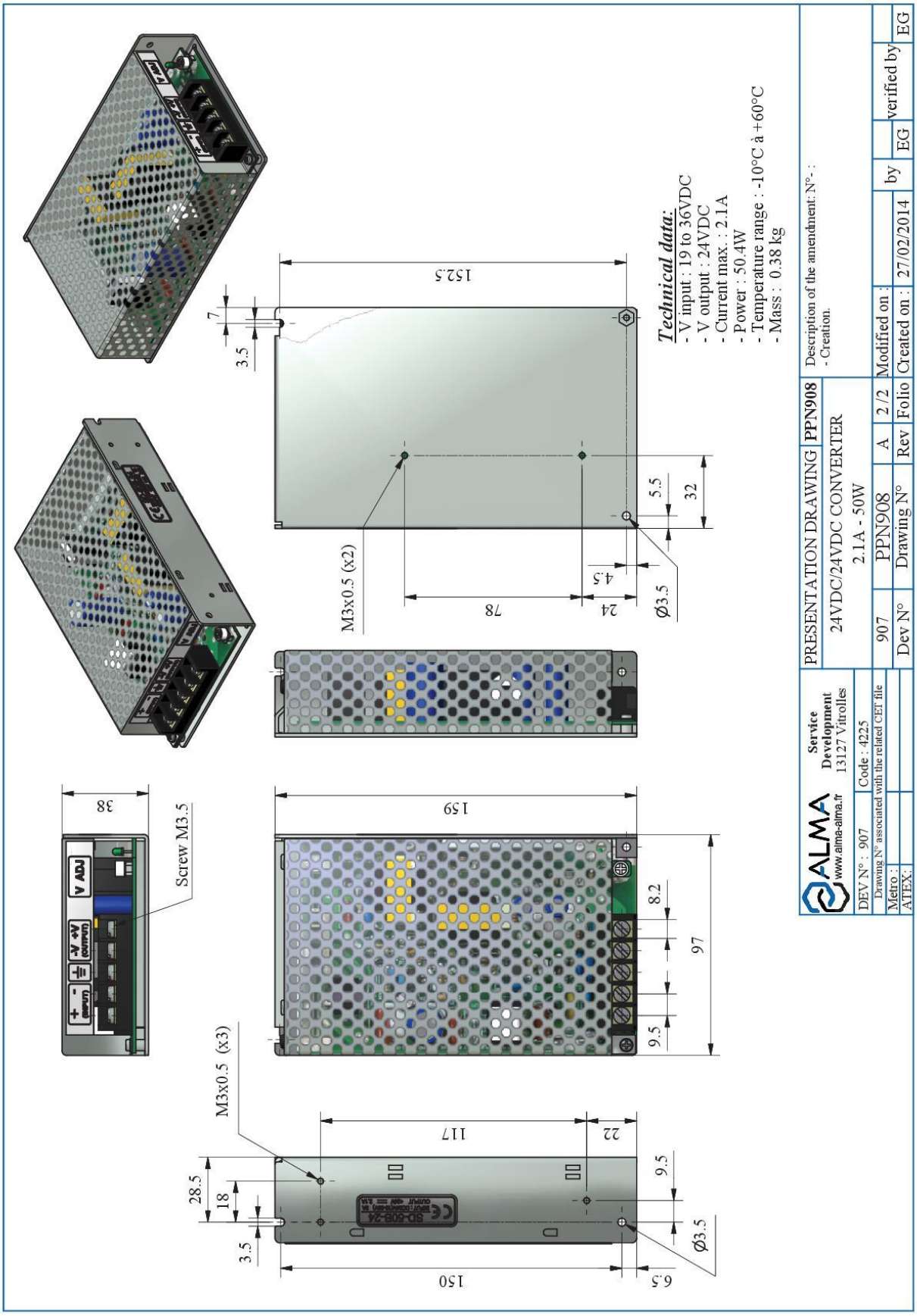


BOTTOM VIEW

The printer must be installed in a tight box and be laid out so as not to obstruct the introduction and the extraction of paper.

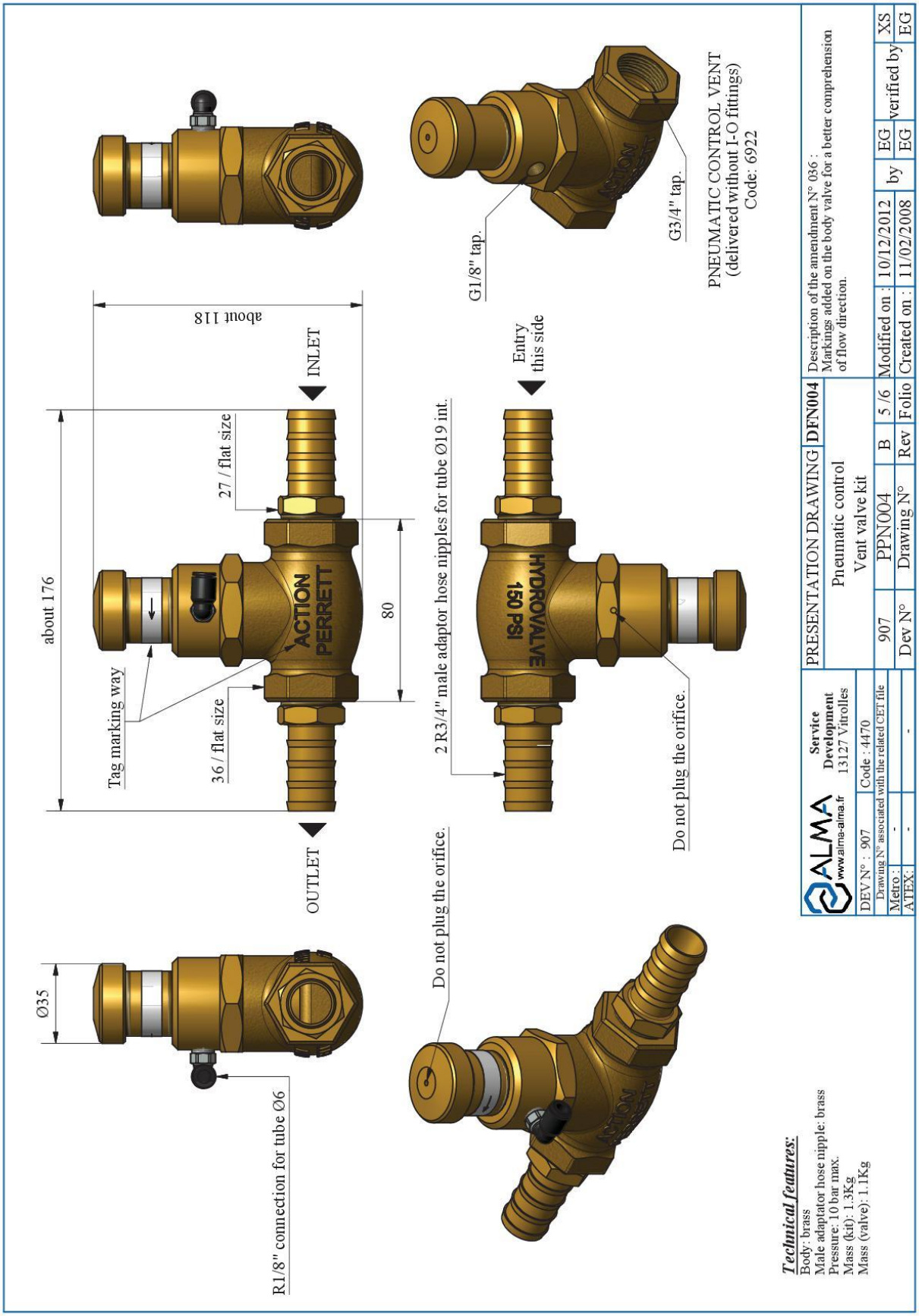
DO NOT EXPOSE THE PRINTER TO ANY HEAT-SOURCE.
PROTECT IT FROM VIBRATIONS AND WATER PROJECTIONS.

19. CONVERTER 24VDC/24VDC 2.1A 50W



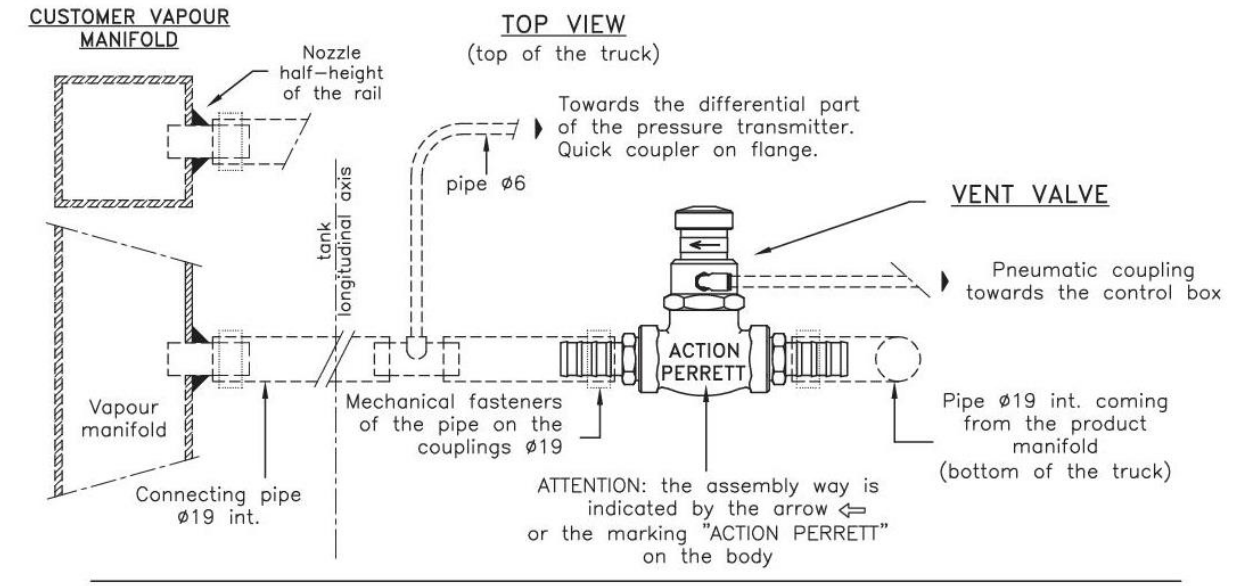
Document available on website alma-alma.fr

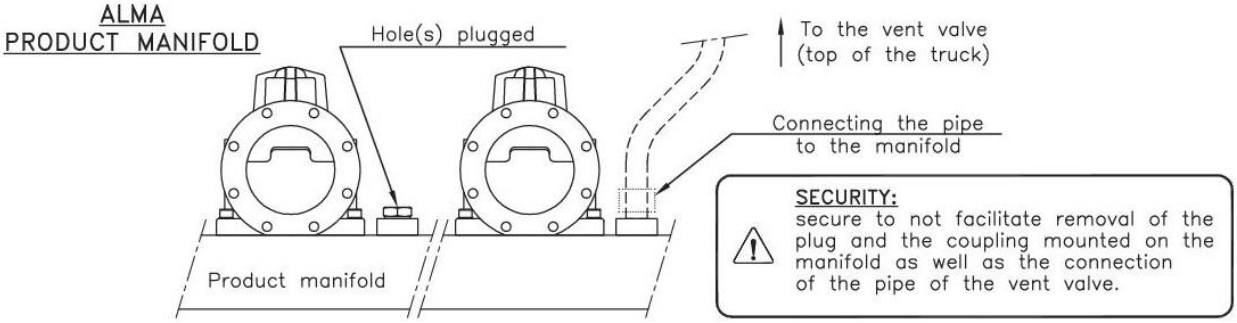
20. PNEUMATIC CONTROL VENT VALVE KIT



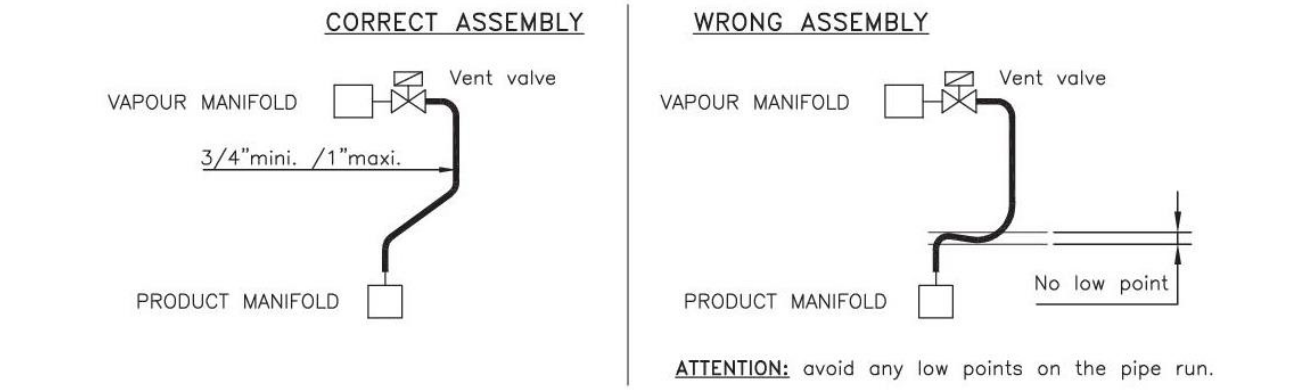
Document available on website alma-alma.fr

21. INSTALLATION RECOMMENDATIONS PNEUMATIC CONTROL VALVE

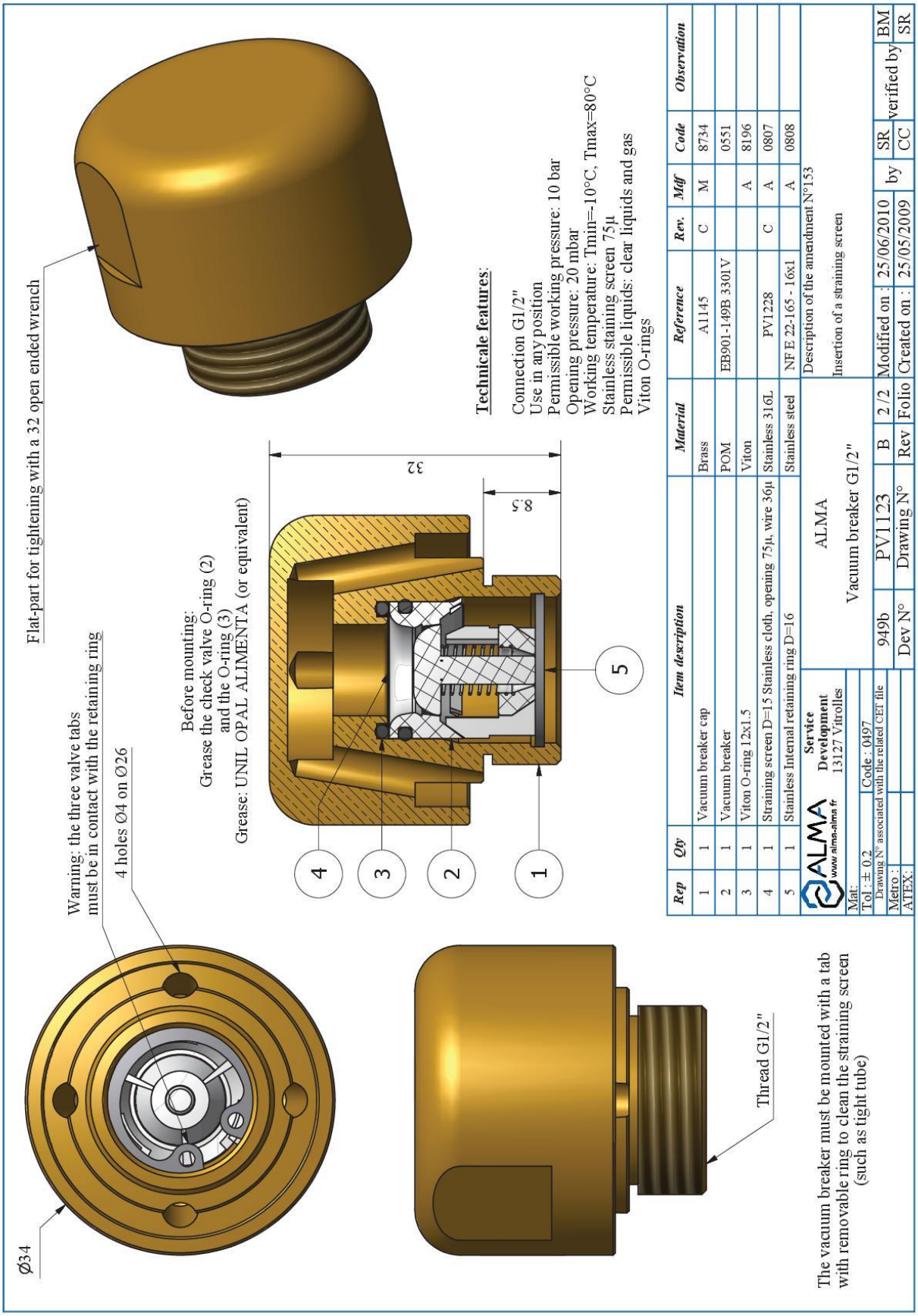




ASSEMBLY OF THE VENT PIPE (not supplied by Alma)



22. VACUUM BREAKER



Rep	Qty	Item description	Material	Reference	Rev.	Mfg	Code	Observation
1	1	Vacuum breaker cap	Brass	A1145	C	M	8734	
2	1	Vacuum breaker	POM	EB901-149B 3301V			0551	
3	1	Viton O-ring 12x1.5	Viton			A	8196	
4	1	Straining screen D=15 Stainless cloth, opening 75µ, wire 36µ	Stainless 316L	PV1228	C	A	0807	
5	1	Stainless Internal retaining ring D=16	Stainless steel	NF E 22-165 - 16x1		A	0808	

ALMA Service Development www.alma-alma.fr 13127 Vitrolles

ALMA

Vacuum breaker G1/2"

Description of the amendment N°153

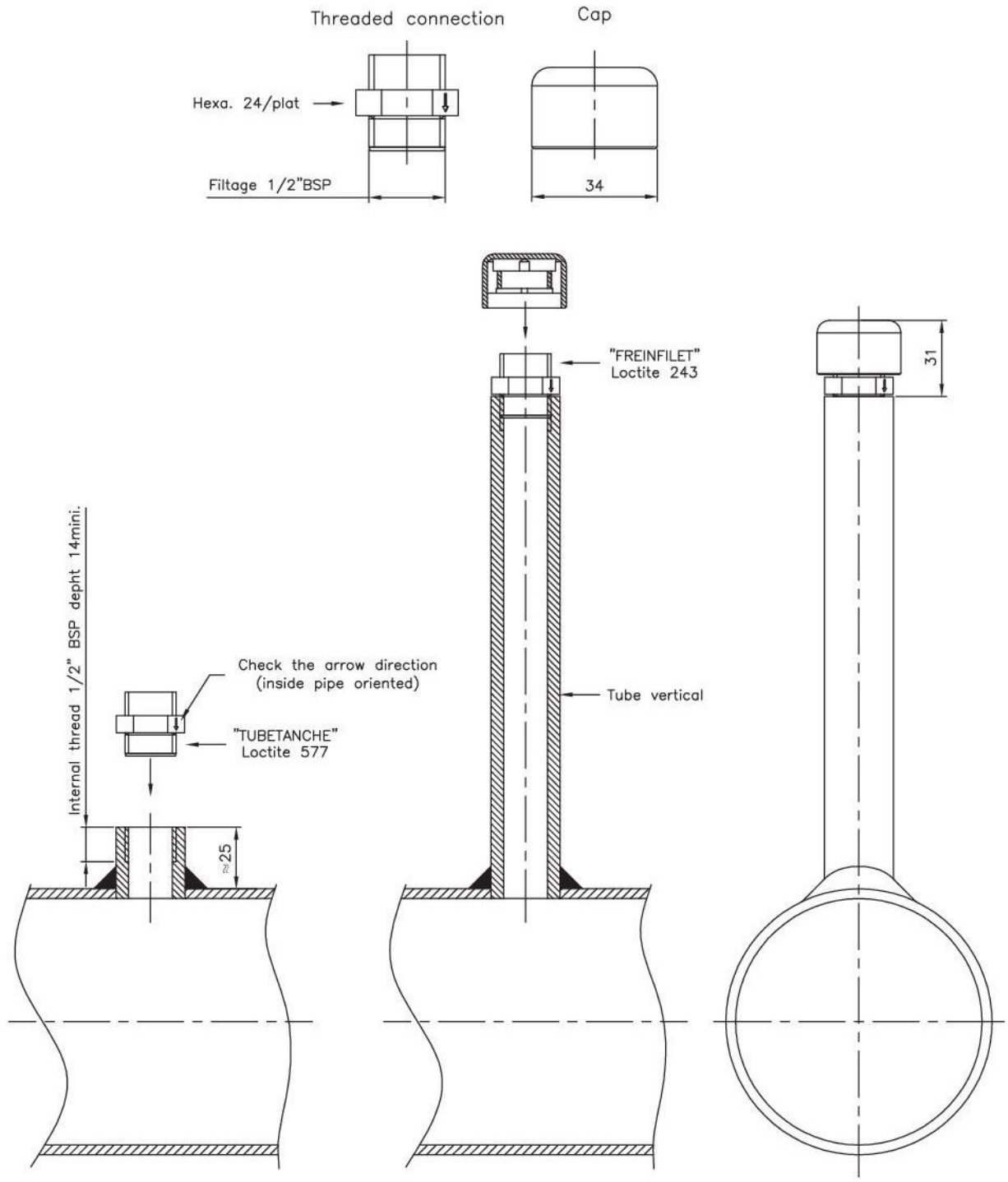
Insertion of a straining screen

Mat:
Tol : ± 0.2
Code : 0497
Drawing N° associated with the related CEI file
Metro :
ATEX:

949b | PV1123 | B | 2 /2
Dev N° | Drawing N° | Rev | Folio

Modified on : 25/06/2010 by SR verified by BM
Created on : 25/05/2009 CC SR

23. INSTALLATION RECOMMENDATIONS VACCUM BREAKER



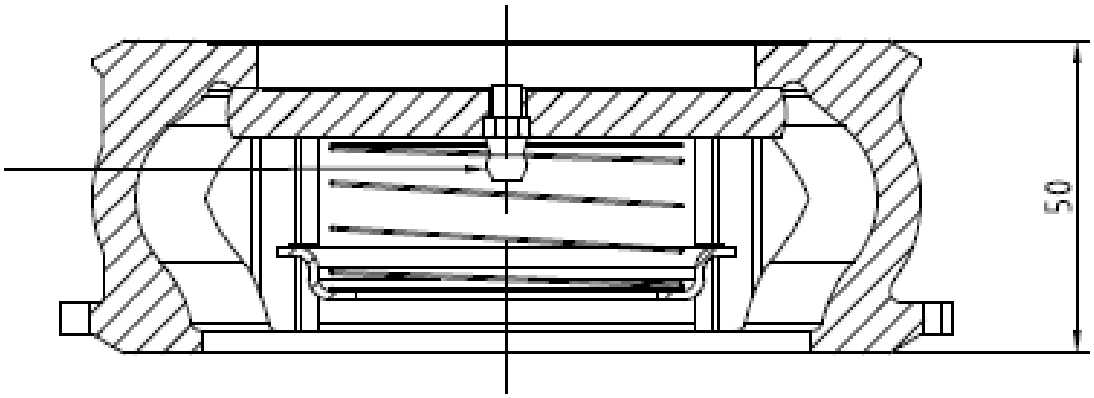
1) Screw the threaded connection of the vaccum breaker (with loctite 577) on the welded boss with respect to the arrow direction

2) Screw manually (tighten strongly with loctite 243) the vaccum breaker cap on the connection.

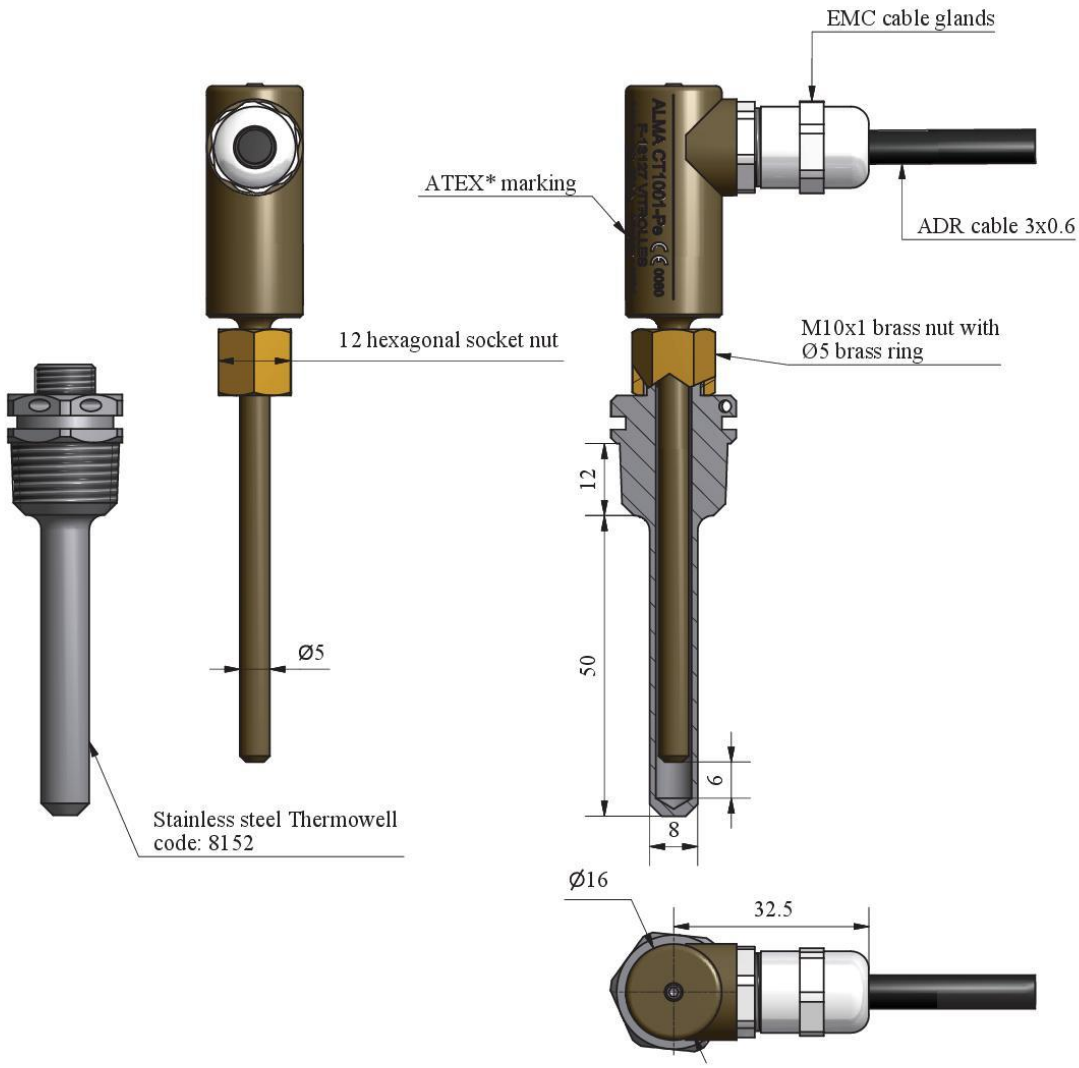
24. DN80 NON-RETURN VALVE KIT

DIMENSIONS DN80 NON-RETURN VALVE KIT:

∅144



25. PT100 TEMPERATURE PROBE – CT1001



The sensor body is made of bronze color anodized aluminum alloy;
The ring and the nut are made of brass.
The probe can be be mounted either on a ALMA thermowell or on a thimble connection 1/4 "BSP (M10x1 n5).
Before installation, lubricate the parts in contact with the thermowell or the boss, to prevent corrosion

PT100 features:

- 3 wires
- 1/3 DIN

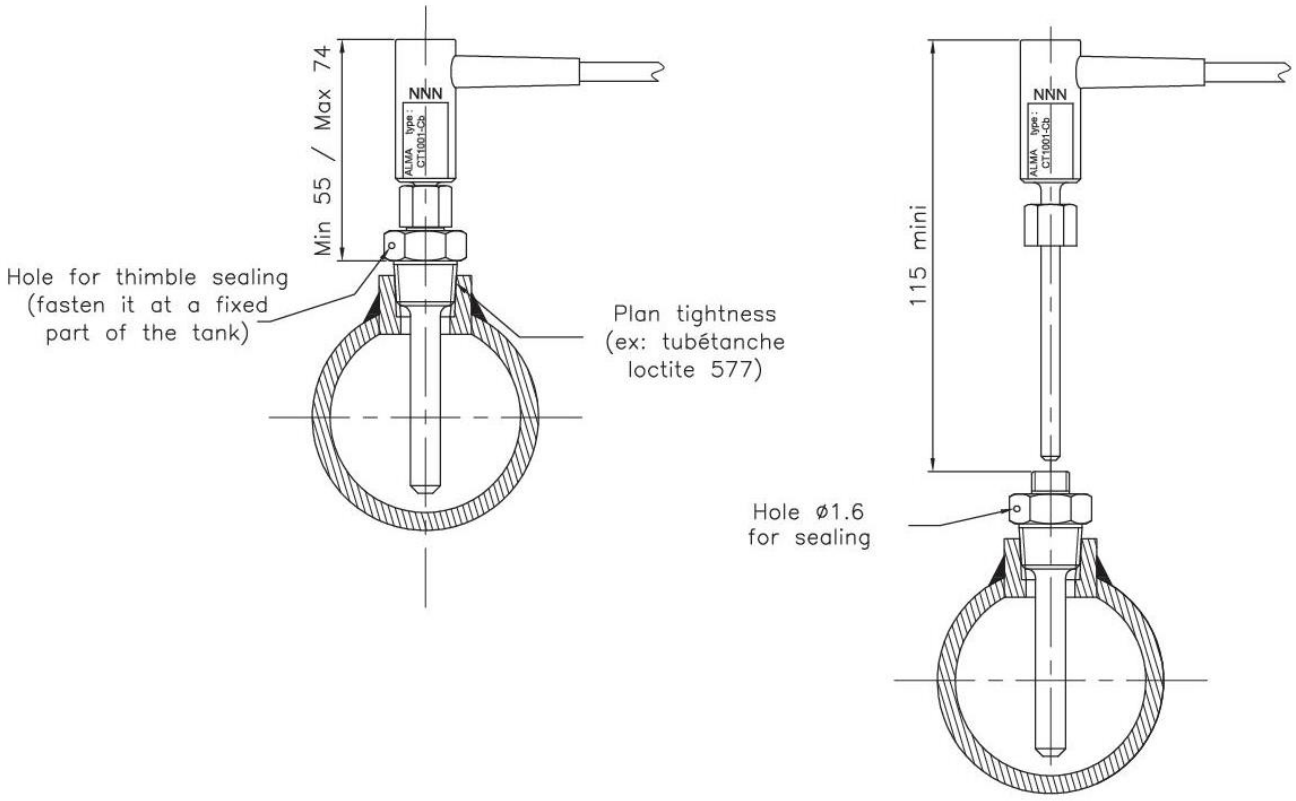
*ATEX "ia" and "ma" certification.
For installation and use in hazardous areas see Instruction manual

Also available with output connector according to IEC 60947-5-2

Connecting the cable		
Function	***Marking on the wire***	***Color wire***
PT100/1	1	Yellow
PT100/2	2	White
PT100/3	3	Green

ALMA www.alma-alma.fr Service Development 13127 Vitrolles		PRESENTATION DRAWING	DFV042			Description of the amendment N°312: Adding a strengthening part					
DEV N° : 949c	Code : 8151	Temperature probe CT1001-Pe									
Drawing N° associated with the related CET file		949c	PPV042	I	5 /7	Modified on :	13/06/2013	by	CC	verified by	SR
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on :	13/09/2003		BM		BM
ATEX:	INERIS 04 ATEX 0026										

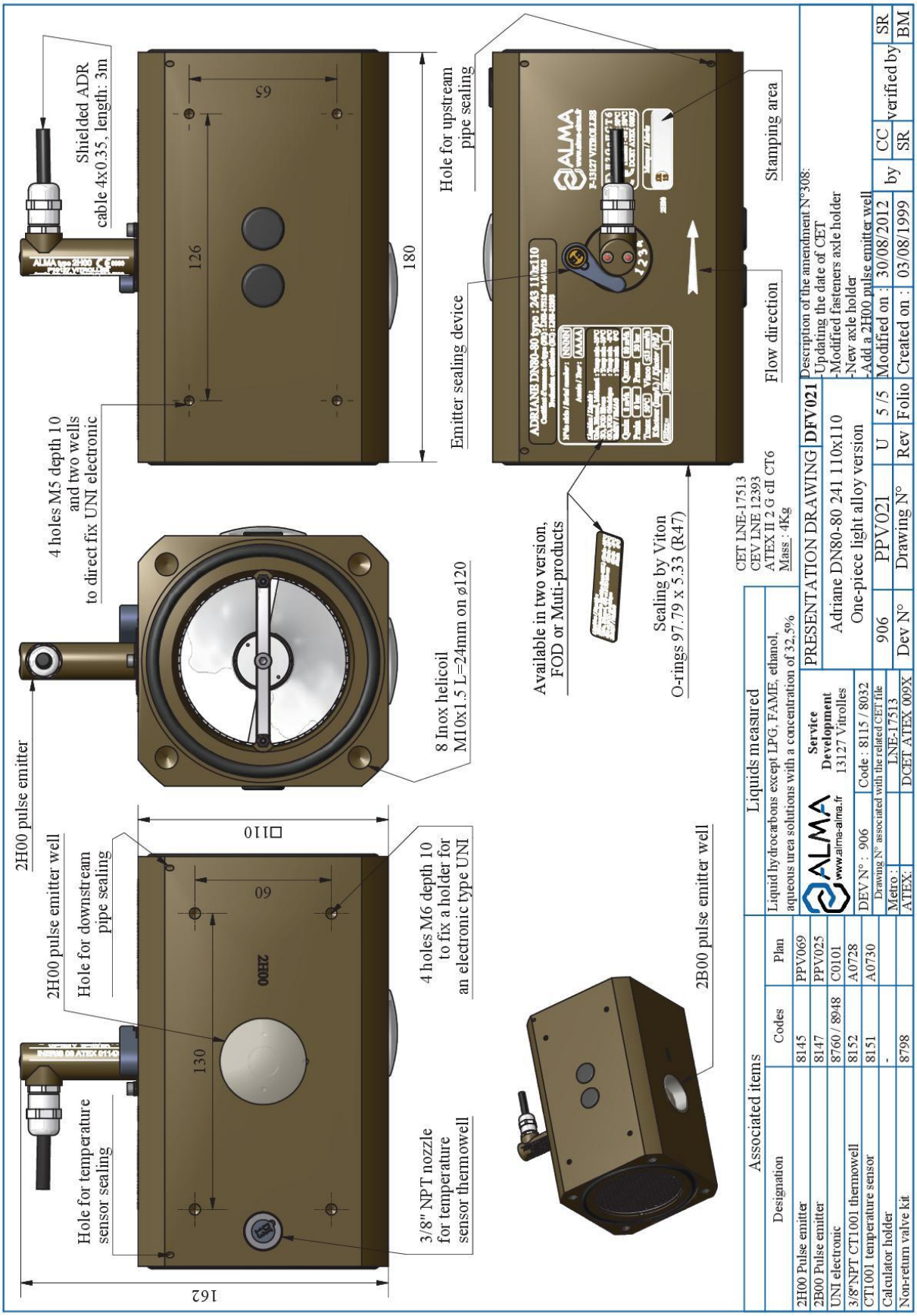
26. INSTALLATION RECOMMENDATIONS TEMPERATURE SENSOR



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

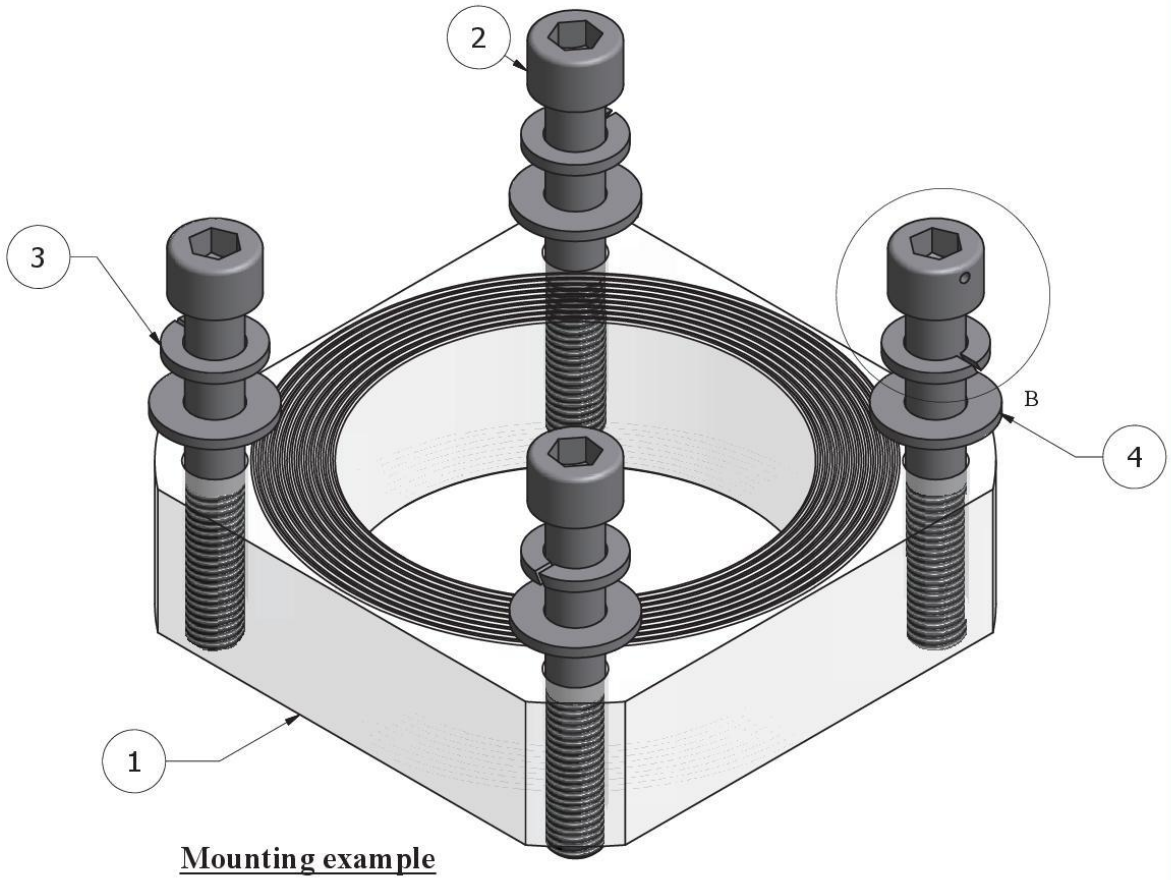
INSTALLATION OF THE TEMPERATURE SENSOR ON THE ALMA TURBINE METER:

27. ADRIANE TURBINE METER DN80-80 241 110x110

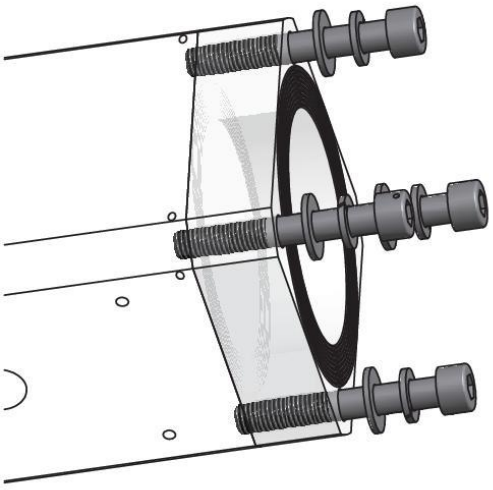


Document available on website alma-alma.fr

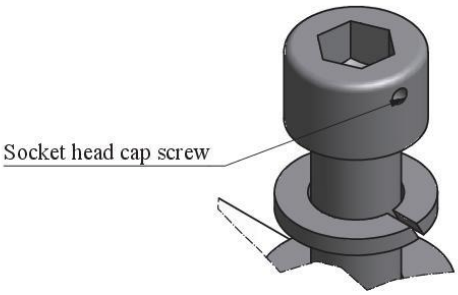
28. SIGHTGLASS FOR ADRIANE TURBINE METER DN80 110x110



Mounting example



B (1.5 : 1)

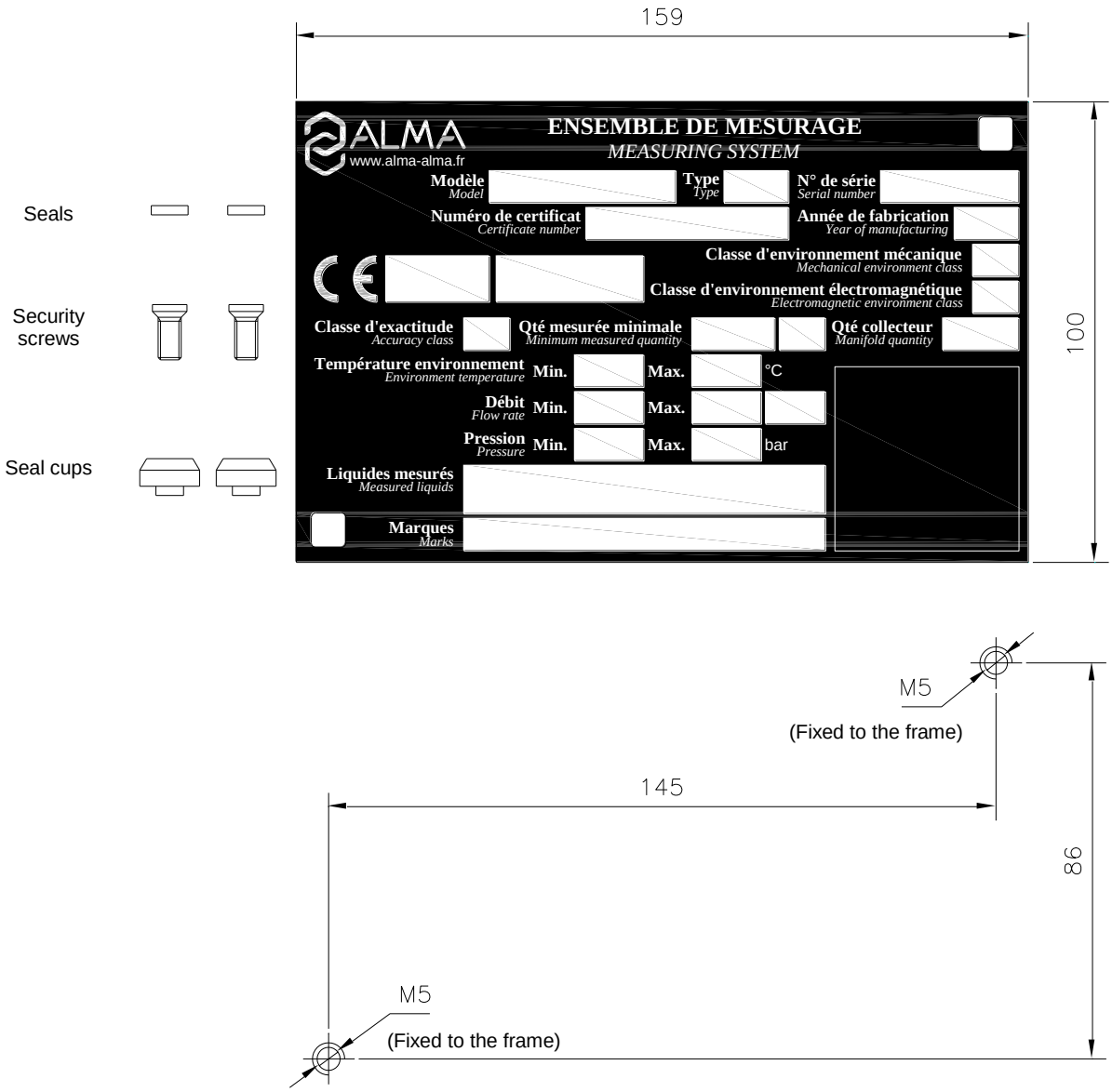


Rep	Qty	Item description	Material	Reference	Rev.	Mdf	Code	Observation
1	1	Sightglass DN80 110X110	Moulded PMMA	A0533	B		0908	
2	1	CHC screw M10 x 70 (ISO 4762)	Stainless A4-70				8595	1 socket head cap screw
3	1	Washer W M10 (DIN 127)	Stainless A4-70				8474	
4	1	Washer M M10 (NFE 25-514)	Stainless A4-70				8430	

ALMA www.alma-alma.fr Service Development 13127 Vitrolles		Sight kit 110 x 110 Adriane turbine meter DN80 24X				Description of amendment N°					
Mat:											
Tol : ± 0.2	Code : 1091										
Drawing N° associated with the related CET file		905	PV1674	A	2 /2	Modified on :		by		verified by	
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on :	23/01/2014		CC		SR
ATEX:											

29. 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).