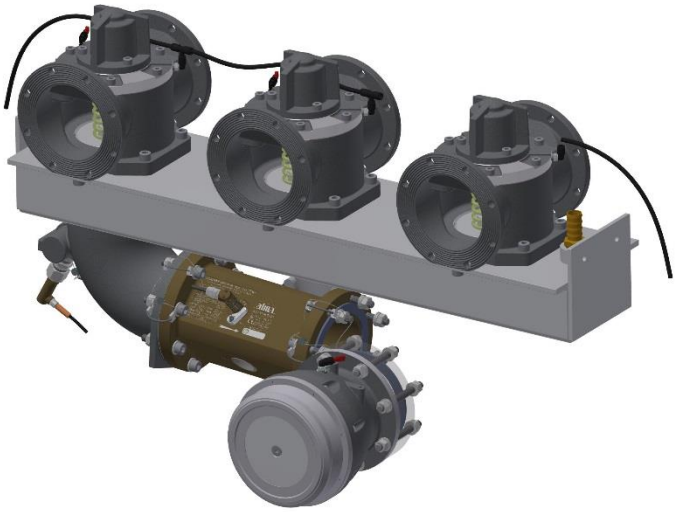
INSTALLATION GUIDE

DI 004 EN F

GRAVICOMPT type MNFLD

Described in EU-type examination certificate N°: LNE-20517



F	2023/01/25	I/O modification for new software platform, Update of drawings	TABTI-BENHARI	NC
Issue	Date	Nature of modifications	Written by	Approved by

CONTENTS

1. GENERAL RECOMMENDATIONS 4

1.1. MECANICAL RECOMMENDATIONS 4
1.2. ELECTRICAL RECOMMENDATIONS 5
1.3. PNEUMATIC RECOMMENDATIONS 7

2. GENERAL PRESENTATION 8

2.1. USE ACCORDING TO MID CERTIFICATE 8
2.2. SPECIAL CONDITIONS FOR INSTALLATION 8

3. PART LIST 8

4. MICROCOMPT+ GRAVICOMPT MANIFOLD 12

4.1. INSTALLATION RECOMMENDATIONS REMOTE CALCULATOR-INDICATOR MICROCOMPT+ 13
4.2. ELECTRICAL WIRING CALCULATOR-INDICATOR MICROCOMPT+ 14
Terminal assignment of the power supply board 15
Connection of plexmi electronic boards for manifold flaps and product returns 18
Connection of the network board – Ethernet, RS232/485, CANBus, LoRa 19
Terminal assignment of the extension board 4DG (IS) 20
4.3. GSM/GPS MODULE EQUIPPED – 2-ANTENNA BOX 21
Mounting and wiring of the GSM and GPS antennas 22
Mounting of the GSM/GPS cables into the cable glands 23
Wiring of the 2-antenna box to the MICROCOMPT+ 23

5. GRAVICOMPT MANIFOLD CONTROL BOX 24

5.1. ELECTRICAL WIRING CONTROL BOX 25
5.2. PNEUMATIC WIRING CONTROL BOX 27

6. DIFFERENTIAL PRESSURE TRANSMITTER – CP3000 28

6.1. INSTALLATION RECOMMENDATIONS CP3000 (ATEX) 29

7. END-OF-METERING PROBE – DG3001/75-CO 30

7.1. INSTALLATION RECOMMENDATIONS DG3001/75 31

8. PNEUMATIC CONTROL VENT VALVE KIT 32

8.1. INSTALLATION RECOMMENDATIONS PNEUMATIC CONTROL VALVE 33

9. ADRIANE TURBINE METER 34

9.1. ADRIANE TURBINE METER DN100-80 243 TTMA 34
9.2. ADRIANE TURBINE METER DN80-80 243 110x110 35
9.3. ADRIANE TURBINE METER DN80-80 373 PN16 AD BLUE® 36
9.4. INSTALLATION AND SEALING RECOMMENDATIONS ADRIANE TURBINE METER 37

10. GRAVICOMPT MANIFOLD EQUIPED 38

11. GRAVITY COUPLER 39

12. PRINTER KIT 40

12.1. INSTALLATION RECOMMENDATIONS PRINTER 41

13. CONVERTER 24VDC/24VDC 2.1A 50W 42

14. TEMPERATURE PROBE PT100 – CT1001 ATEX 43

14.1. INSTALLATION RECOMMENDATIONS TEMPERATURE PROBE.....44

15. KIT FOR MEASURING SYSTEM IDENTIFICATION PLATE.....45

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.

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.

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).

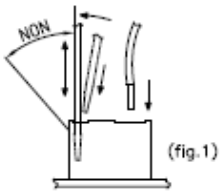
⇨ Connect the supply of the equipment downstream cut-out, on the power supply reserved to the measured distribution.

⇨ Put a delayed protection of 5A upstream the 24VDC supply to protect equipment 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. 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.



⇨ 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.

⇨ 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).

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 color 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: No3 on 'ON' and the 7 others on 'OFF'.

⇨ Current of the electrical devices:

Electrical devices	Supply voltage	Minimum current	Maximum current
MICROCOMPT+	24VDC +/-10%	0.7 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
White	**Bc**		**WH**	White	Bianco	Blanco	Weiβ
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

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/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

2.1. USE ACCORDING TO MID CERTIFICATE

The GRAVICOMPT MANIFOLD measuring system is covered by the EC type examination certificate N° LNE-20517. Refer to this certificate for any precision about its installation.

For the sealing plan, see Annex to EU type examination certificate N° LNE-20517.

2.2. SPECIAL CONDITIONS FOR INSTALLATION

The piping linking each compartment and the transfer valve must have a minimum pitching of 3%. The vehicle on which the measuring system is installed must be fitted with a device to ensure it is horizontal.

When the turbine is placed just upstream of the unloading valve, a flow-sight ring or a flange of at least 40 mm thick must be inserted.

2.3. DUAL TRONIQUE

The DUAL TRONIQUE is a system that can manage one or two measuring systems based on a single calculator-indicator MICROCOMPT+.

These measuring systems are fitted on a road tanker. The maximum number of compartments is 9 with a single measuring system. It measures liquids other than water. They are of same model or of different models.

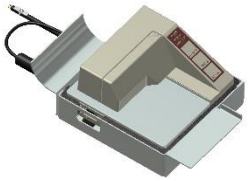
They are called EMA and EMB within this document.

3. PART LIST

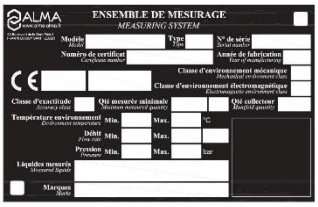
EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	**Equipment**	**Designation**	**Qty**	**Option***
1		**CALCULATOR INDICATOR MICROCOMPT+ GRAVICOMPT MANIFOLD**	1	
		Wi-Fi CONNECTION (As an alternative to Bluetooth)		●
		**RFID SUPERVISOR KEY**		
2		**CONTROL BOX GRAVICOMPT MANIFOLD** (One control box supplied regardless of the number of measuring systems installed on the tank)	1	●

Actual pictures

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	**Equipment**	**Designation**	**Qty**	**Option***
3		**DIFFERENTIAL PRESSURE TRANSMITTER – CP3000** (Supplied if not installed on the manifold)	**1 or 2**	
4		**END OF METERING PROBE – DG3001/75** (Supplied if not installed on the manifold)	**1 or 2**	

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	**Equipment**	**Designation**	**Qty**	**Option***
5		**PNEUMATIC CONTROL VENT VALVE KIT**	**1 or 2**	
6	**6a** 	**ADRIANE TURBINE METER DN100-80 243 TTMA**	**1 or 2**	
	6b 	**ADRIANE TURBINE METER DN80-80 243 110x110**		
	6c 	**ADRIANE TURBINE METER DN80-80 373 PN16 Ad blue®** (For GRAVICOMPT Ad-Blue®)		
7		**GRAVICOMPT MANIFOLD EQUIPPED**	**1 or 2**	●
8		**GRAVITY COUPLER** (4" API / 3" 1/2 symmetrical coupling – with vacuum breaker)	**1 or 2**	●
9		**PRINTER TMU-295** (Printer – printer holder – cable 5 or 10m)	**1**	●

Non-contractual pictures

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	**Equipment**	**Designation**	**Qty**	**Option***
10		**CONVERTER 24VDC/24VDC 2.1A 50W** (Printer power supply 24VDC)	**1**	●
11		**Pt100 TEMPERATURE PROBE – CT1001-Pe ATEX** (Supplied with thermowell)	**1 or 2**	●
12		**2-ANTENNA BOX GSM AND GPS**	**1**	●
13		**KIT FOR MEASURING SYSTEM IDENTIFICATION PLATE** (Plate and sealing device)	**1 or 2**	●
Option*: equipment sold as an option by ALMA. It must be installed on the measuring system if required by the certificate.				

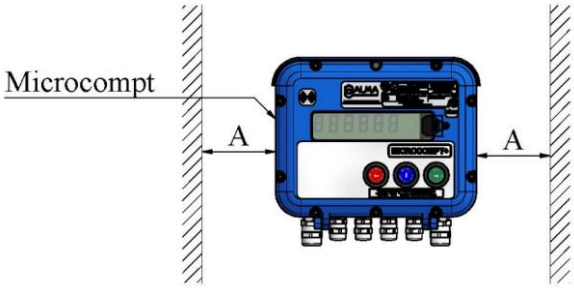
Non-contractual pictures

4. MICROCOMPT+ GRAVICOMPT MANIFOLD

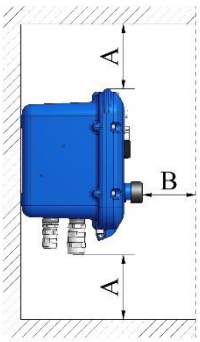
Document available on website alma-alma.fr

4.1. INSTALLATION RECOMMENDATIONS REMOTE CALCULATOR-INDICATOR MICROCOMPT+

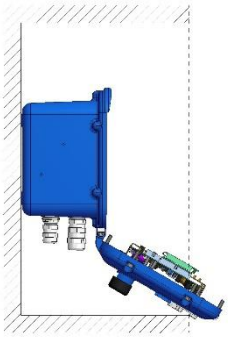
- Fasten the box with 4 M6 screws (holder suitable for vibrations and designed to support the MICROCOMPT). On the box: 4 M6 blind holes tapped length=12 over 185x132).
- Leave an open space around the box in order:
  - To facilitate maintenance operation.
  - To prevent any pressing on pushbuttons and 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.

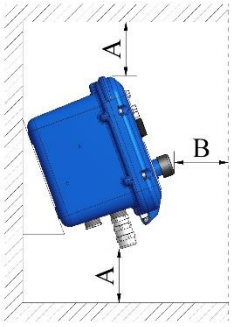


Left hand view
Closed box



Left hand view
open box

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

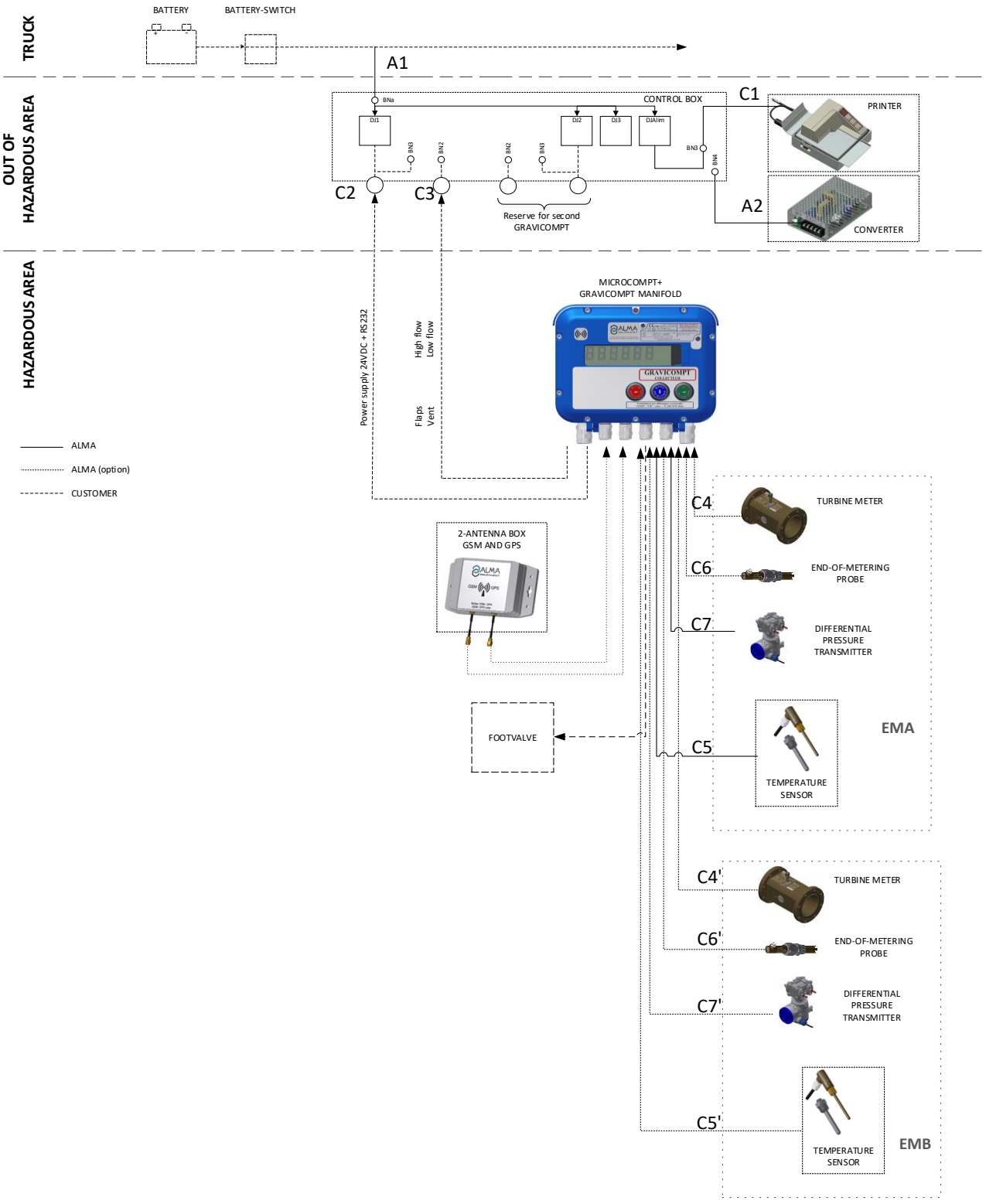


Left hand view
Closed box

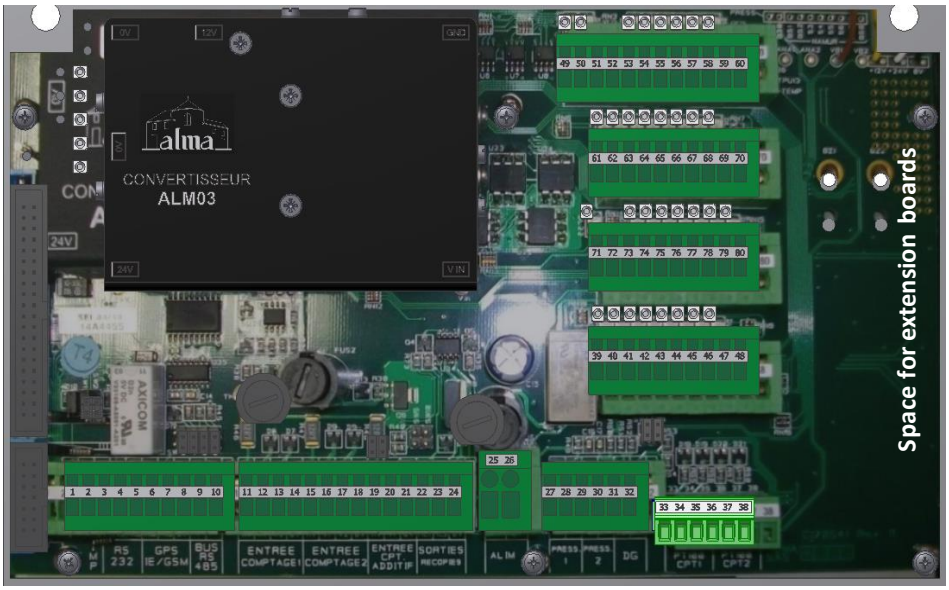
Left hand view
open box

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

4.2. ELECTRICAL WIRING CALCULATOR-INDICATOR MICROCOMPT+



Terminal assignment of the power supply board



EQUIPMENTS CONNECTED TO THE MICROCOMPT+								POWER SUPPLY BOARD			
Option	Equipments	Cable (for information)				Function	Colour or No.	Terminal	Function		Observation
		No.	CG*	Alma	Type						
	GRAVICOMPT CONTROL BOX	C2	1/2"NPT		4x1 sh.	24VDC	1	25	24VDC	Supply	Power supply 24VDC MICROCOMPT+
						0V	2	26	0V		
						Rx Printer	3	1	Tx	RS232 Printer	Serial link RS232
						Tx Printer	4	2	Rx		
	EMA TURBINE TRANSMITTER	C4	1/2"NPT	●	ADR 4x0.34 sh.	12V	Jn	11	12V	Metering input	Connect the shielding
						V1	Mr	12	V1		
						V2	Vt	13	V2		
						0V	Bc	14	0V		
•	Pt100 TEMPERATURE PROBE		1/2"NPT	●	ADR 3x0.6 sh.	+	Jn	33	+	Pt100	Connect the shielding
						-	Bc	34	-		
						-	Vt	35	-		
	GRAVICOMPT CONTROL BOX	C3	3/4"NPT (left)		5x1(min) 13x1(max)	HF EMA	1	74	Outputs 24VDC (Outputs FET 24V 5W max.) FET=Field Effect Transistor	API EMA	High flow of an API adaptater EMA
						LF EMA	2	79			Low flow of an API adaptater EMA
						HF EMB	3	75			High flow of an API adaptater EMB
						LF EMB	4	63			Low flow of an API adaptater EMB
						Vent EMA	5	78		Vent	Manifold vent EMA
						Vent EMB	6	78			Manifold vent EMB
						Flap 1	7	39		Manifold flaps solenoid valves 1to 9	Opening- control flap 1
						Flap 2	8	40			Opening- control flap 2
						Flap 3	9	41			Opening- control flap 3
						Flap 4	10	42			Opening- control flap 4
						Flap 5	11	43			Opening- control flap 5
						Flap 6	12	44			Opening- control flap 6
						Flap 7	13	65			Opening- control flap 7
						Flap 8	14	66			Opening- control flap 8
						Flap 9	15	67			Opening- control flap 9
	EMA FOOTVALVES				1x1	EMA Footvales		64	24VDC	EMA Footvalves	24VDC = opening
	EMB FOOTVALVES				1x1	EMB Footvalves		76	24VDC	EMB Footvalves	24VDC = opening

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

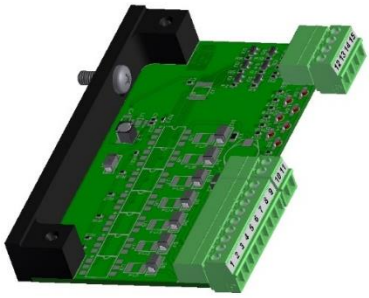
EQUIPMENTS CONNECTED TO THE MICROCOMPT+								POWER SUPPLY BOARD			
Option	Equipement	Cable (for information)				Function	Colour or No.	Terminal	Function		Observation
		No.	CG*	Alma	Type						
	PULSES OUTPUT		1/2"NPT			PO EMA		22	EMA Pulses output	Pulses output	Control system / Display Put SW9 and SW10 to have a 0-24V signal
						PO EMB		23	EMB Pulses output		
						0V		24	0V		
•	EMA Pt100 TEMPERATURE PROBE	C5	1/2"NPT	●	ADR 3x0.6 sh.	+	Jn	33	+	EMA Pt100	Connect the shielding
						-	Bc	34	-		
						-	Vt	35	-		
•	EMB Pt100 TEMPERATURE PROBE	C5'	1/2"NPT	●	ADR 3x0.6 sh.	+	Jn	36	+	EM B Pt100	Connect the shielding
						-	Bc	37	-		
						-	Vt	38	-		
•	RC-HEATING OIL RECEIVER				1x1	Start/Stop	1	49	Start/Stop	RC-Oil_1	
					1x1	LF/HF	2	50	Low/High flow	RC-Oil_2	
	EMB METERING	C4'	1/2"NPT	●	ADR 4x0.34 sh.	12V	Jn	15	12V	EMB Product metering input	Connect the shielding
						V1	Mr	16	V1		
						V2	Vt	17	V2		
						0V	Bc	18	0V		
SOME EXTENSION BOARDS MAY BE SET ON TO THE POWER SUPPLY BOARD											

Assignments table according to the number of flaps, product returns and depending on the presence or not of a second additive injector:

				Terminal number (PF) Power supply board V1 REV11									
Nb of Flaps	Nb of Returns	Addit. #1	Addit. #2	45 (PF14)	44 (PF13)	43 (PF12)	42 (PF11)	41 (PF10)	40 (PF9)	39 (PF8)	67 (PF6)	66 (PF5)	65 (PF4)
0	0-9	ON	ON/OFF	Addit #2	9th Return	8th Return	7th Return	6th Return	5th Return	4th Return	3rd Return	2nd Return	1st Return
1-5	0-5	ON	OFF	5th Return	4th Return	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	3rd Return	2nd Return	1st Return
1-5	6-9	ON	OFF	9th Return	8th Return	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	PLEXMI (1st to 7th Return)		
1-5	0-4	ON	ON	Addit #2	4th Return	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	3rd Return	2nd Return	1st Return
1-5	5-8	ON	ON	Addit #2	8th Return	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	PLEXMI (1st to 7th Return)		
1-5	9	ON	ON	Addit #2		9th Return	8th Return	PLEXMI (1st to 5th Flap)			PLEXMI (1st to 7th Return)		
6	0-4	ON	OFF	4th Return	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	3rd Return	2nd Return	1st Return
6	5-8	ON	OFF	8th Return	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	PLEXMI (1st to 7th Return)		
6	9	ON	OFF			9th Return	8th Return	PLEXMI (1st to 6th Flap)			PLEXMI (1st to 7th Return)		
6	0-3	ON	ON	Addit #2	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	3rd Return	2nd Return	1st Return
6	4-7	ON	ON	Addit #2	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	PLEXMI (1st to 7th Return)		
6	8-9	ON	ON	Addit #2		9th Return	8th Return	PLEXMI (1st to 6th Flap)			PLEXMI (1st to 7th Return)		
7	0-3	ON	OFF	7th Flap	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	3rd Return	2nd Return	1st Return
7	4-7	ON	OFF	7th Flap	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	PLEXMI (1st to 7th Return)		
7	8-9	ON	OFF			9th Return	8th Return	PLEXMI (1st to 7th Flap)			PLEXMI (1st to 7th Return)		
7	0-2	ON	ON	Addit #2	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	7th Flap	2nd Return	1st Return
7	3-6	ON	ON	Addit #2	6th Return	5th Return	4th Return	PLEXMI (1st to 7th Flap)			3rd Return	2nd Return	1st Return
7	7-9	ON	ON	Addit #2		9th Return	8th Return	PLEXMI (1st to 7th Flap)			PLEXMI (1st to 7th Return)		
8	0-2	ON	OFF	7th Flap	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	8th Flap	2nd Return	1st Return
8	3-6	ON	OFF	6th Return	5th Return	4th Return	8th Flap	PLEXMI (1st to 7th Flap)			3rd Return	2nd Return	1st Return
8	7-9	ON	OFF		9th Return	8th Return	8th Flap	PLEXMI (1st to 7th Flap)			PLEXMI (1st to 7th Return)		
8	0-1	ON	ON	Addit #2	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	8th Flap	7th Flap	1st Return
8	2-5	ON	ON	Addit #2	5th Return	4th Return	8th Flap	PLEXMI (1st to 7th Flap)			3rd Return	2nd Return	1st Return
8	6-9	ON	ON	Addit #2	9th Return	8th Return	8th Flap	PLEXMI (1st to 7th Flap)			PLEXMI (1st to 7th Return)		
9	0-1	ON	OFF	7th Flap	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	9th Flap	8th Flap	1st Return
9	2-5	ON	OFF	5th Return	4th Return	9th Flap	8th Flap	PLEXMI (1st to 7th Flap)			3rd Return	2nd Return	1st Return
9	6-9	ON	OFF	9th Return	8th Return	9th Flap	8th Flap	PLEXMI (1st to 7th Flap)			PLEXMI (1st to 7th Return)		
9	0	ON	ON	Addit #2	6th Flap	5th Flap	4th Flap	3rd Flap	2nd Flap	1st Flap	9th Flap	8th Flap	7th Flap
9	1-4	ON	ON	Addit #2	4th Return	9th Flap	8th Flap	PLEXMI (1st to 7th Flap)			3rd Return	2nd Return	1st Return
9	5-8	ON	ON	Addit #2	8th Return	9th Flap	8th Flap	PLEXMI (1st to 7th Flap)			PLEXMI (1st to 7th Return)		

If two PLEXMI electronic boards are used, the first one is fixed to the MICROCOMPT+ frame, the second one is installed in a 24VDC-supplied independent box.

Connection of plexmi electronic boards for manifold flaps and product returns



PLEXMI board connection table for manifold flaps:

	CONNECTED EQUIPMENT							PLEXMI ELECTRONIC BOARD							MICROCOMPT+			
								OUTPUTS				INPUTS			POWER SUPPLY BOARD			
Option	Equipment	Cable (for information) No	CG*	Alma	Type	Function	Colour or No	Termin	Function		Observation	Observation	Function	Termin	Termin	Function		Observation
●	MANIFOLD FLAP CONTROL				4 to 7x1	Flap#1	1	1	Outputs 24VDC (24VDC = opened flap)	Flap#1	500 mA max	Multiplexing** for flap#1 to flap#7	Input 1	12	39	Outputs 24VDC (24VDC = opened flap) outputs FET 24V 5W max	Flap#1 to Flap#7	
						Flap#2	2	2		Flap#2			Input 2	13	40			
						Flap#3	3	3		Flap#3			Input 3	14	41			
						Flap#4	4	4		Flap#4								
						Flap#5	5	5		Flap#5								
						Flap#6	6	6		Flap#6								
						Flap#7	7	7		Flap#7								
								8	0V	GND			SUPPLY	24VDC 10	S2	24VDC (white)	Supply via Microcompt+	
														0V 11	S4	0V (black)		
					1x1	0V		9	0V	GND			GND	0V 15	47	0V		

*Refer to the Cable Glands installation instructions
**Refer to the multiplexing table

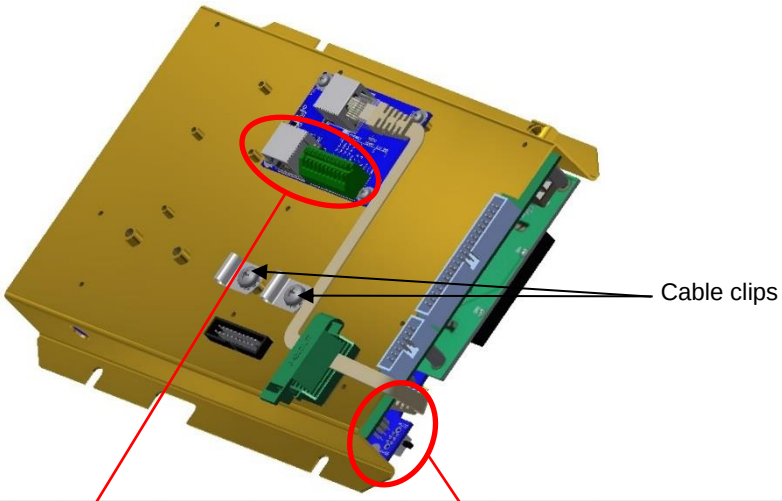
PLEXMI board connection table for product returns:

	CONNECTED EQUIPMENT							PLEXMIELECTRONIC BOARD							MICROCOMPT+			
								OUTPUTS				INPUTS			POWER SUPPLY BOARD			
Option	Equipment	Cable (for information) No	CG*	Alma	Type	Function	Colour or No	Termin	Function		Observation	Observation	Function	Termin	Termin	Function		Observation
●	PRODUCT RETURN CONTROL				4 to 7x1	Return#1	1	1	Outputs 24VDC (24VDC = opened return)	Return#1	500 mA max	Multiplexing** from return#1 to return#7	Input 1	12	65	24VDC = authorisation	Product return compartment 1 to 7	Output FET 24V 5W max
						Return#2	2	2		Return#2			Input 2	13	66			
						Return#3	3	3		Return#3			Input 3	14	67			
						Return#4	4	4		Return#4								
						Return#5	5	5		Return#5								
						Return#6	6	6		Return#6								
						Return#7	7	7		Return#7								
								8	0V	GND			SUPPLY	24VDC 10	S2	24VDC (white)	Supply via Microcompt+	
														0V 11	S4	0V (black)		
					1x1	0V		9	0V	GND			GND	0V 15	47	0V		

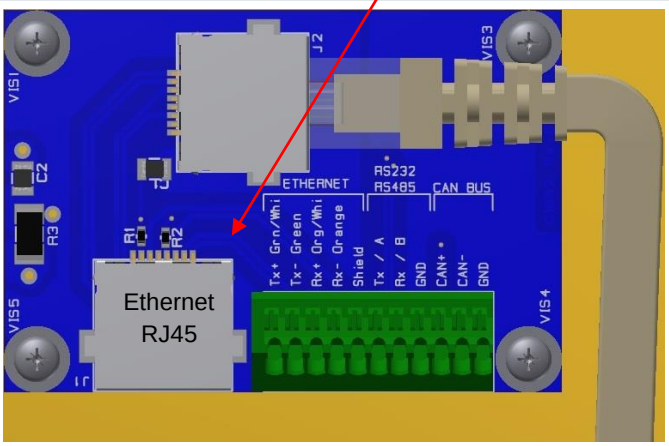
*Refer to the Cable Glands installation instructions
**Refer to the multiplexing table

Connection of the network board – Ethernet, RS232/485, CANBus, LoRa

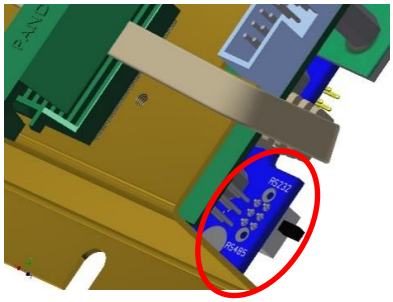
Connection to the Ethernet network:
- With the RJ45 connector according to the EIA/TIA-568 standard
- Or with the screw-terminal: see details in the table below.



NETWORK BOARD



RS232 or RS485 Switch

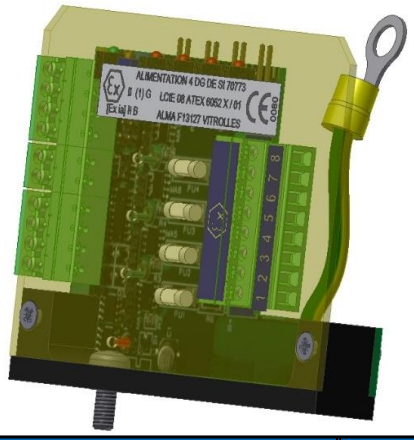


NETWORK CONNECTION TYPE								NETWORK BOARD			
Option	Connection	Cable (for information) No.	CG*	Alma	Type	Function	Coulor or No.	Coulor	Function		Observation
●	ETHERNET NETWORK							Vt/Bc	Tx+	Ethernet	Or connection with RJ45 according to EIA/TIA-568
								Vt	Tx-		
								Or/Bc	Rx+		
								Or	Rx-		
									Sh		
●	RS232 or RS485								Tx / A	RS232 or RS485	Depending on the switch configuration See above
									Rx / B		
									GND		
●	CANBus NETWORK								CAN+	CANBus	
									CAN-		
									GND		

**Refer to the Cable Glands Installation Instructions*

Terminal assignment of the extension board 4DG (IS)

EXTENSION BOARD 4DG (IS)

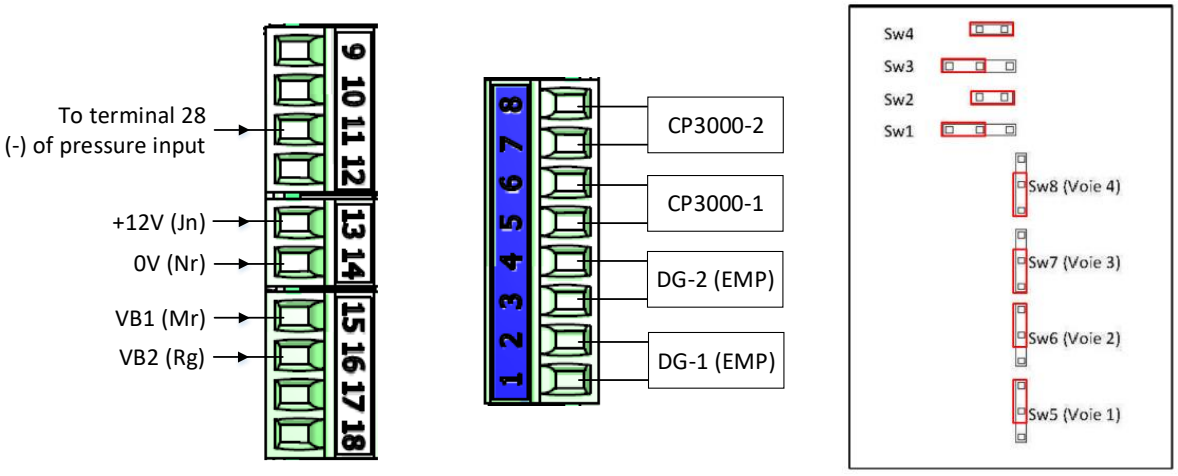


NT IN ATEX 506 C

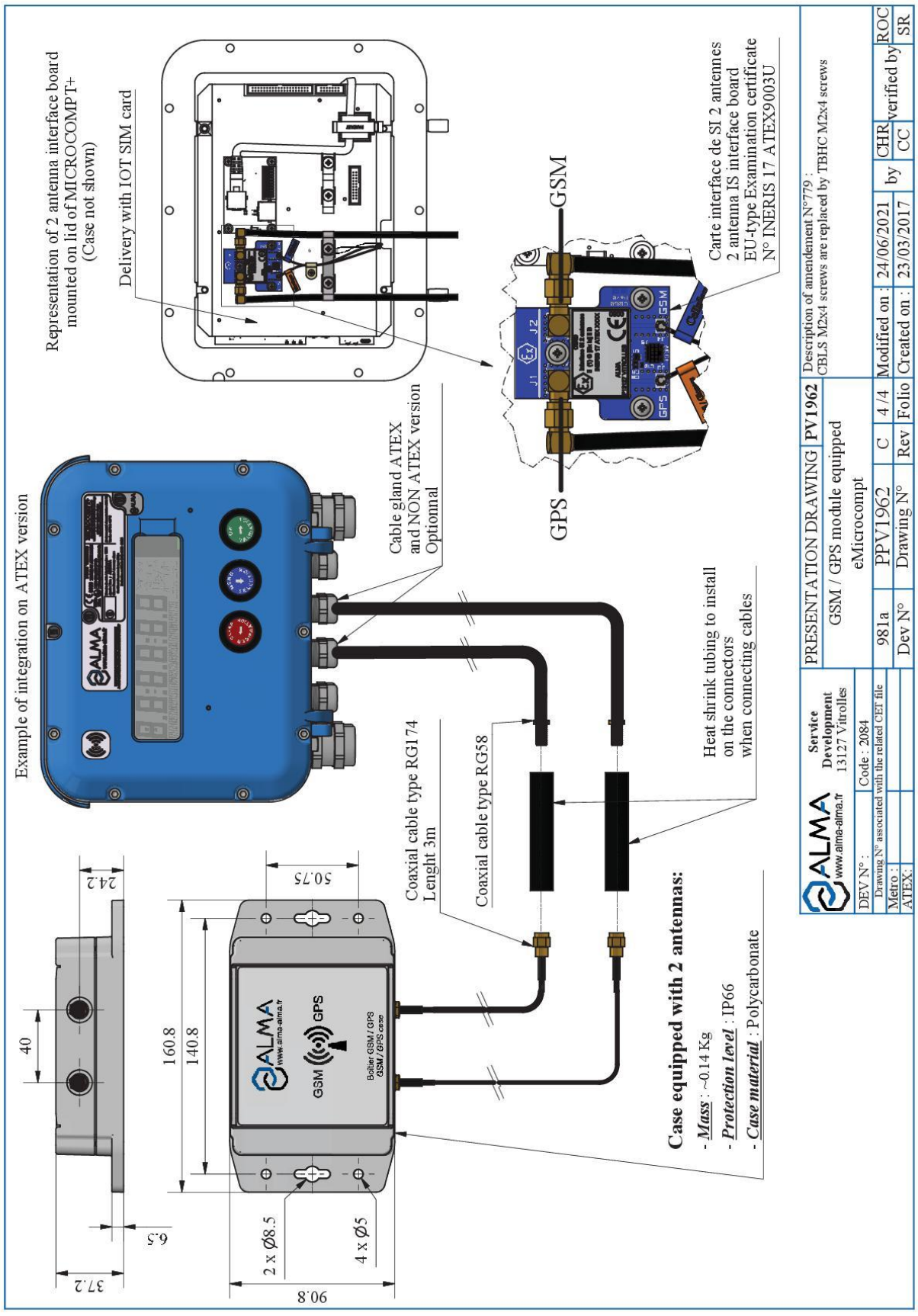
EQUIPEMENT CONNECTED TO THE MICROCOMPT+								EXTENSION BOARD 4DG (IS)			
Option	Equipement	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	DG-1 END-OF-METERING PROBE	C6	1/2"NPT	●	3x0.34	EMP EMA	Mr	1	+	DG-1	Connect the shielding
							Bl	2	-		
	DG-1 END-OF-METERING PROBE	C6'	1/2"NPT	●	3x0.34	EMP EMB	Mr	3	+	DG-2	Connect the shielding
							Bl	4	-		
	CP3000-1 DIFFERENTIAL PRESSURE TRANSMITTER	C7	1/2"NPT	●	ADR 2x0.34 sh.	PRESSURE EMA	Bc	5	+	CP3000-1	Connect the shielding
							Mr	6	-		
	CP3000-2 DIFFERENTIAL PRESSURE TRANSMITTER	C7'	1/2"NPT	●	ADR 2x0.34 sh.	PRESSURE EMB	Bc	7	+	CP3000-2	Connect the shielding
							Mr	8	-		

**Refer to the Cable Glands Installation Instructions*

Jumper configuration on the extension board 4DG:

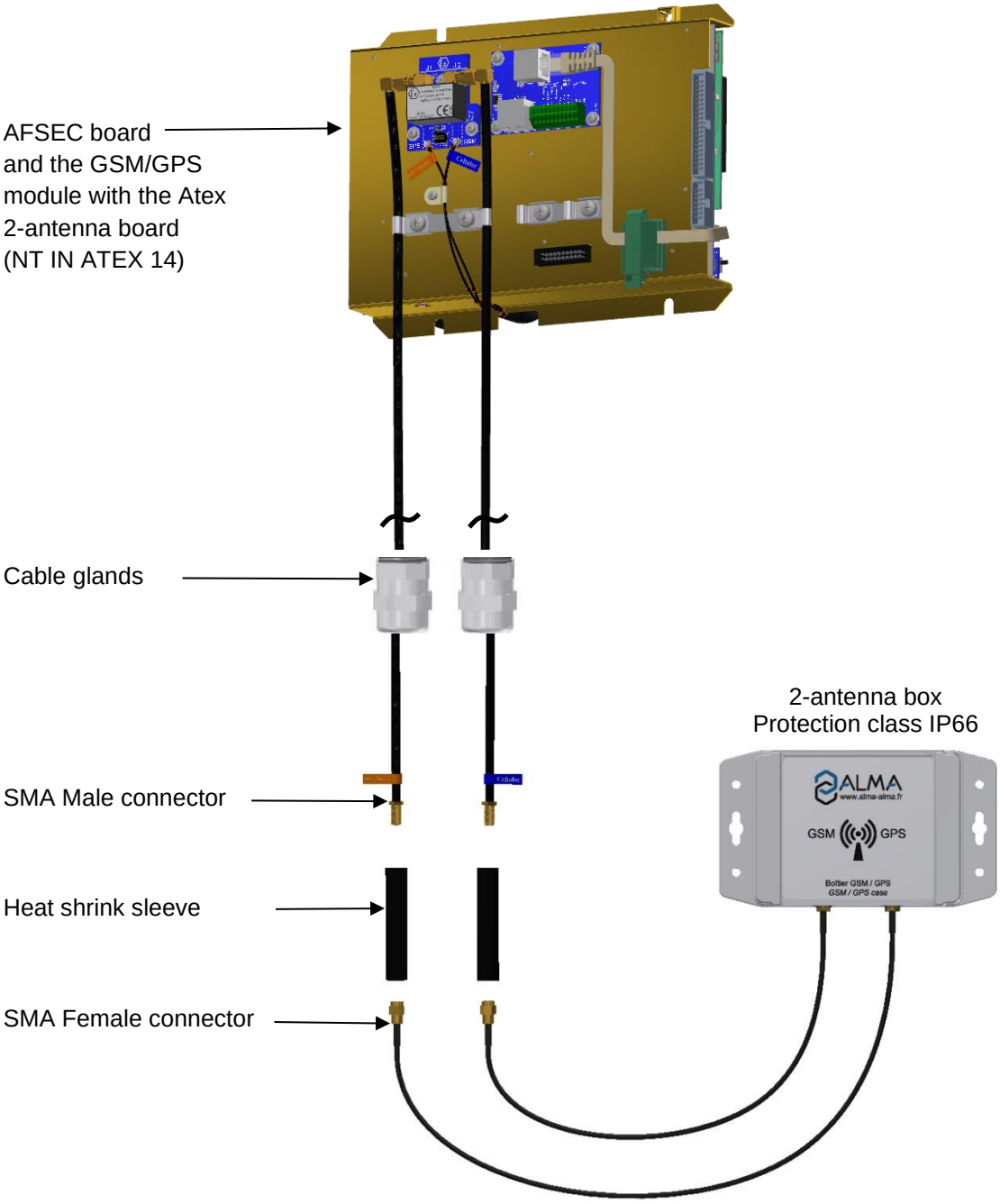


4.3. GSM/GPS MODULE EQUIPPED – 2-ANTENNA BOX

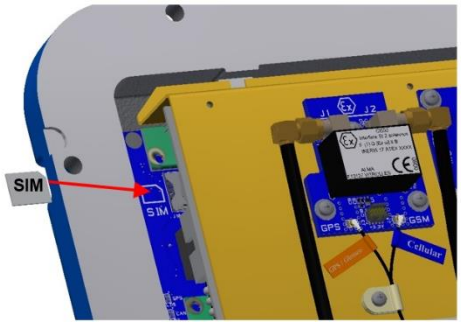


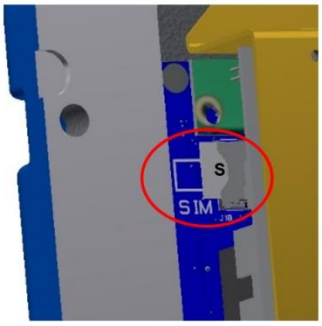
Document available on website alma-alma.fr

Mounting and wiring of the GSM and GPS antennas



The 2-antenna board is supplied with a micro-SD card mounted as follows:

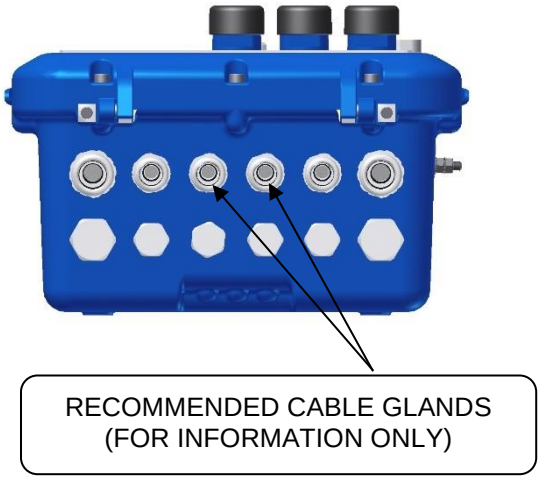




Mounting of the GSM/GPS cables into the cable glands

ALMA connects the GSM and GPS antenna to the MICROCOMPT+ (2-antenna board).

At the outlet of the MICROCOMPT+ box, you must pass both cables through cable glands. In case of an ATEX MICROCOMPT+, cable glands must be ATEX.



Into the MICROCOMPT+, adjust the cable length to easily open and close the cover.

Tighten both cable glands.

Wiring of the 2-antenna box to the MICROCOMPT+

Fasten the box. You must install it in an area free of metallic cover to have a good reception and broadcasting of signal. You can install the box in a horizontal or vertical position.

Put each coaxial cable through the heat shrink sleeve.

Plug the RG58(1) cable from the MICROCOMPT+ with the RG174(2) cable from the antenna box and tighten them. Isolate the male/female SMA connectors with the supplied heat shrink sleeve (both antennas in the box are the same, cables don't have to be labelled).

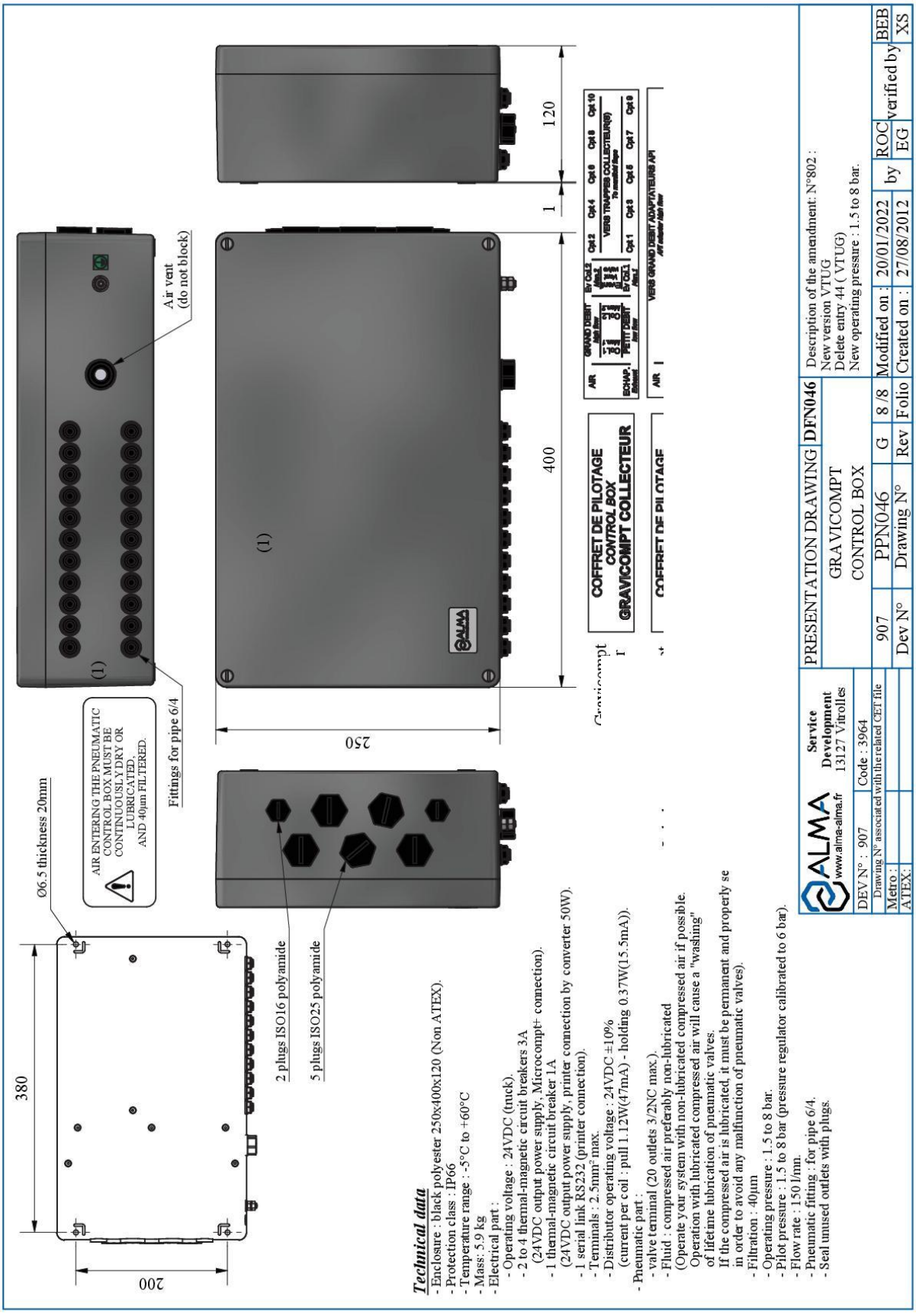
Position and heat up the sleeve on the connectors to prevent corrosion and humidity.

WARNING: The cables of this box can be **neither shortened nor extended**

(1) RG58: Semi-rigid coaxial cable, 5mm diameter

(2) RG174: Flexible coaxial cable, 2.7mm diameter

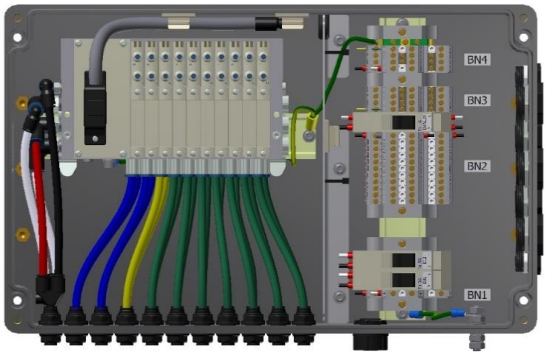
5. GRAVICOMPT MANIFOLD CONTROL BOX



Document available on website alma-alma.fr

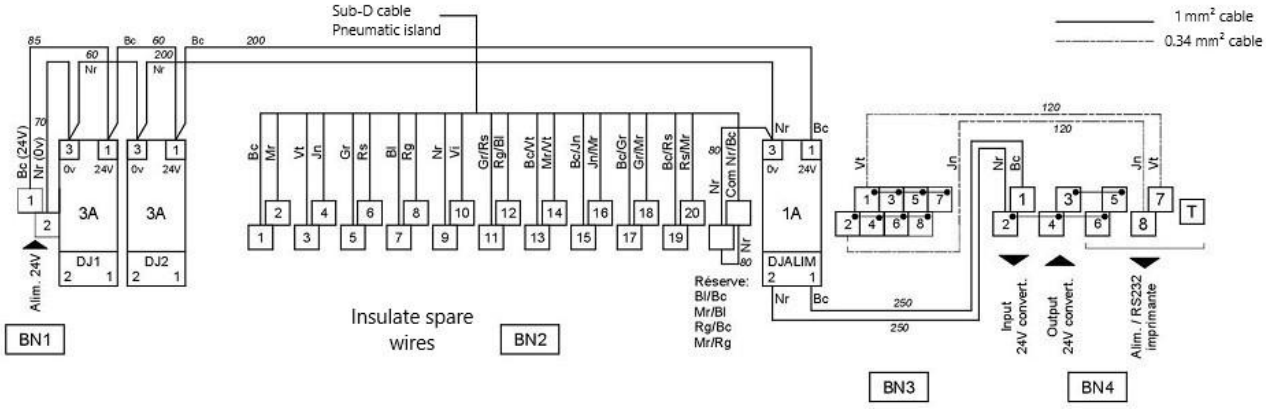
5.1. ELECTRICAL WIRING CONTROL BOX

TERMINAL ASSIGNMENT OF CONTROL BOX



INTERNAL FUNCTIONS PNEUMATIC VALVE ISLAND						CONTROL BOX			MICROCOMPT+ supply board				
		Cable (for information)								Cable (for information)			
Option	Internal function	No.	CG*	Type	Color	Control box block	Control box terminal	Fonction	Microcompt+ terminal	No.	CG*	Type	Observation
	HIGH FLOW EMA				Bc	BN2	1	High flow	74	C3	3/4"NPT	15x1	Flow of an API adaptor EMA
	LOW FLOW EMA				Mr		2	Low flow	79				
•	HIGH FLOW EMB				Vt		3	High flow	75				Flow of an API adaptor EMB
•	LOW FLOW EMB				Jn		4	Low flow	63				
	CONTROL MANIFOLD VENT VALVE EMA				Gr		5	Vent valve	78				Vent valve control EMA
•	CONTROL MANIFOLD VENT VALVE EMB				Rs		6	Footvalves	78				Vent valve control EMB
	FLAPS CONTROL				Bl		7	Flap 1	39				Flap control compartments 1to 9
					Rg		8	Flap 2	40				
					Nr		9	Flap 3	41				
					Vi		10	Flap 4	42				
					Gr/Rs		11	Flap 5	43				
					Rg/Bl		12	Flap 6	44				
					Bc/Vt		13	Flap 7	65				
					Mr/Vt		14	Flap 8	66				
					Bc/Jn		15	Flap 9	67				

**Refer to the Cable Glands Installation Instructions*

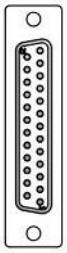


EQUIPMENTS CONNECTED TO THE CONTROL BOX								TERMINAL BLOCKS OF THE CONTROL BOX				
Option	Equipments	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Block	Terminal	Function		Observation
	SUPPLY	A1			2x1	24VDC	1 / Bc	BN1	1	24VDC	Supply	24VDC truck battery (after battery switch and protected by a fuse)
						0V	2 / Nr		2	0V		
	MICROCOMPT+ (Supply and RS232)	C2			4x1 bl.	24VDC	1 / Bc	DJ1	1	24VDC	Supply Microcompt	Supply DJ1 circuit breaker 3A
						0V	2 / Nr		2	0V		
						Rx	3 / Vt	BN3	1	Rx	RS232 Printer	Printer
						Tx	4 / Jn		2	Tx		
•	CONVERTER 24VDC 5W (Printer supply)	A2			4x1	24VDC (in)	1	BN4	1	24VDC	Printer supply	Converter INPUT
						0V (in)	2		2	0V		
						24VDC (out)	3		3	24VDC		Converter OUTPUT
						0V (out)	4		4	0V		
•	PRINTER CABLE (Supply and RS232)	C1		•	4x0.75 bl.	24VCC	Bc	BN4	5	24VDC	RS232 Printer	
						0V	Mr		6	0V		
						Rx	Vt		7	Rx		
						Tx	Jn		8	Tx		
						Shielding	Braid		T	Sh.		
	GROUND (tank frame)				1x2.5		V/J					Connect to the through-hole-ground of the control box

**Refer to the Cable Glands installation instructions*

CABLAGE SUB-D 25pts

PIN Sub-	Bobine ilot	Couleur	Borne BN2	Sortie	Distrib
1	0/14	Bc	1	4	1
2	0/12	Mr	2	2	1
3	1/14	Vt	3	4	2
4	1/12	Jn	4	2	2
5	2/14	Gr	5	4	3
6	2/12	Rs	6	2	3
7	3/14	Bl	7	4	4
8	3/12	Rg	8	2	4
9	4/14	Nr	9	4	5
10	4/12	Vi	10	2	5
11	5/14	Gr/Rs	11	4	6
12	5/12	Rg/Bl	12	2	6
13	6/14	Vt/Bc	13	4	7
14	6/12	Mr/Vt	14	2	7
15	7/14	Jn/Bc	15	4	8
16	7/12	Mr/Jn	16	2	8
17	8/14	Gr/Bc	17	4	9
18	8/12	Mr/Gr	18	2	9
19	9/14	Bc/Rs	19	4	10
20	9/12	Mr/Rs	20	2	10
21	-	Bl/Bc	-	-	-
22	-	Mr/Bl	-	-	-
23	-	Rg/Bc	-	-	-
24	-	Mr/Rg	-	-	-
25	Com	Nr/Bc	vierge	-	-



5.2. PNEUMATIC WIRING CONTROL BOX

PNEUMATIC INPUT/OUTPUT ASSIGNMENT OF THE CONTROL BOX

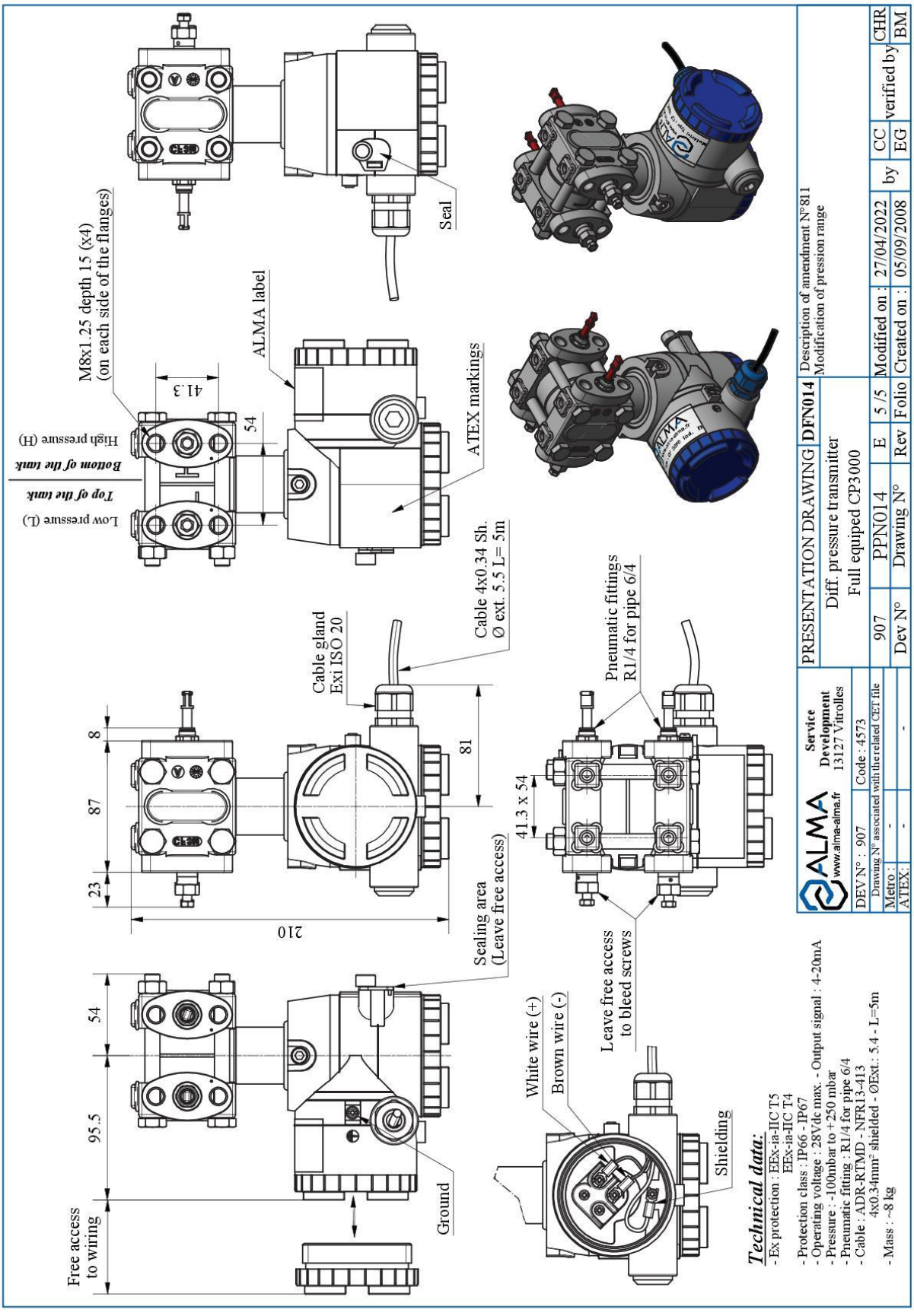
Label	Input	Output	Function	Observation
AIR	X		Air supply of the box	Air if: all footvalves opened and valve bar locked et barre de vannes fermée
ECHAP.		X	Exhaust	Put a tube L=100mm min. (no muffler)
GRAND DEBIT – Col.1		X	Opening of the API adapter for high flow	Connection to the API adapter manifold EMA (HF – LF)
PETIT DEBIT – Col.1		X	High to low flow position API adapter	
GRAND DEBIT – Col.2		X	Opening of the API adapter for high flow	Connection to the API adapter manifold EMB (HF – LF)
PETIT DEBIT – Col.2		X	High to low flow position API adapter	
Ev Col.1 – Event		X	Vent valve opening	Connection to the vent valve manifold EMA
Ev Col.2 – Event		X	Vent valve opening	Connection to the vent valve manifold EMB
Cpt 1		X	Opening of the manifold flap compartment 1	Connection to the manifold flaps
Cpt 2		X	Opening of the manifold flap compartment 2	
Cpt 3		X	Opening of the manifold flap compartment 3	
Cpt 4		X	Opening of the manifold flap compartment 4	
Cpt 5		X	Opening of the manifold flap compartment 5	
Cpt 6		X	Opening of the manifold flap compartment 6	
Cpt 7		X	Opening of the manifold flap compartment 7	
Cpt 8		X	Opening of the manifold flap compartment 8	
Cpt 9		X	Opening of the manifold flap compartment 9	

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)

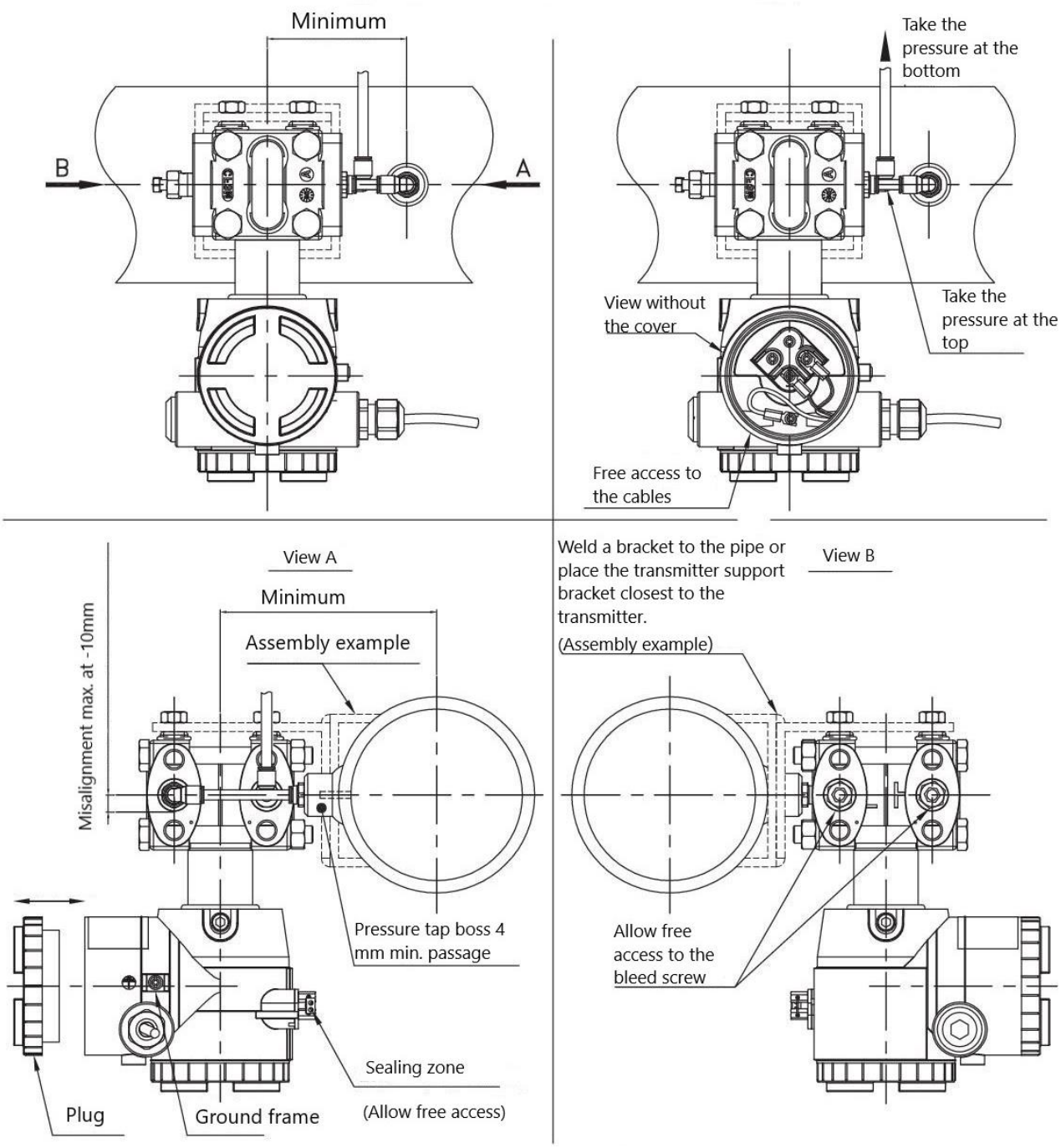
6. DIFFERENTIAL PRESSURE TRANSMITTER – CP3000



Document available on website alma-alma.fr

6.1. INSTALLATION RECOMMENDATIONS CP3000 (ATEX)

THE PRESSURE TRANSMITTER MUST BE INSTALLED IN UPRIGHT POSITION



REFER TO THE INSTRUCTION MANUAL

(DELIVERED WITH THE EQUIPMENT OR AVAILABLE ON ALMA WEBSITE)

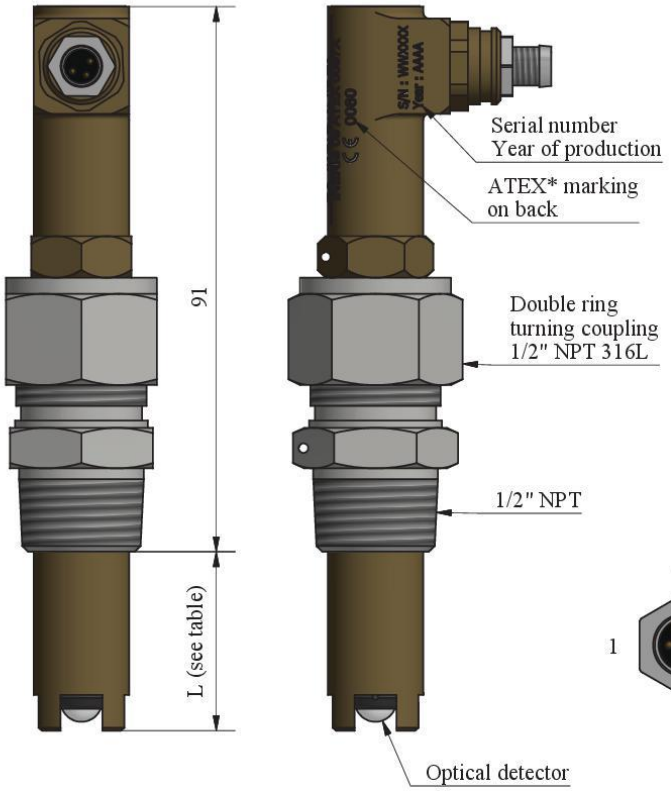
7. END-OF-METERING PROBE – DG3001/75-Co

Codification of marking :

DG3001/LLL-Co

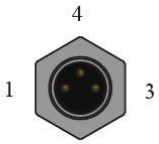
LLL = Maximum Lenght under connection
Co = Connector version

Dimensions				
Codes	*Types*	*Length under thread (mm)*		*Material*
		L min	*L max*	
0513	DG 3001-Co	0	26	Alloy 6082
8133	DG 3001/75-Co	30	71	Alloy 6082
8134	DG 3001/205-Co	75	201	Alloy 6082

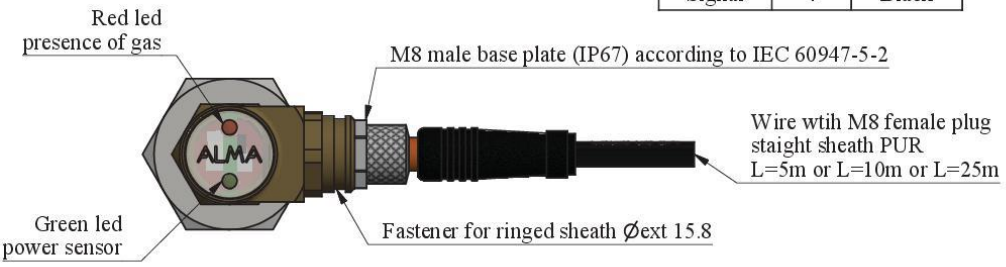


Operation		
Conditions	*Gas*	*Liquid*
Output (mA)	35±2	15±1
Open collector output	Saturated	Blocked
Imax on signal (mA)	30	
Vce (V) for Is=10mA	< 0.4	
State of the red led	On	Off
State of the green led	On	On

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



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



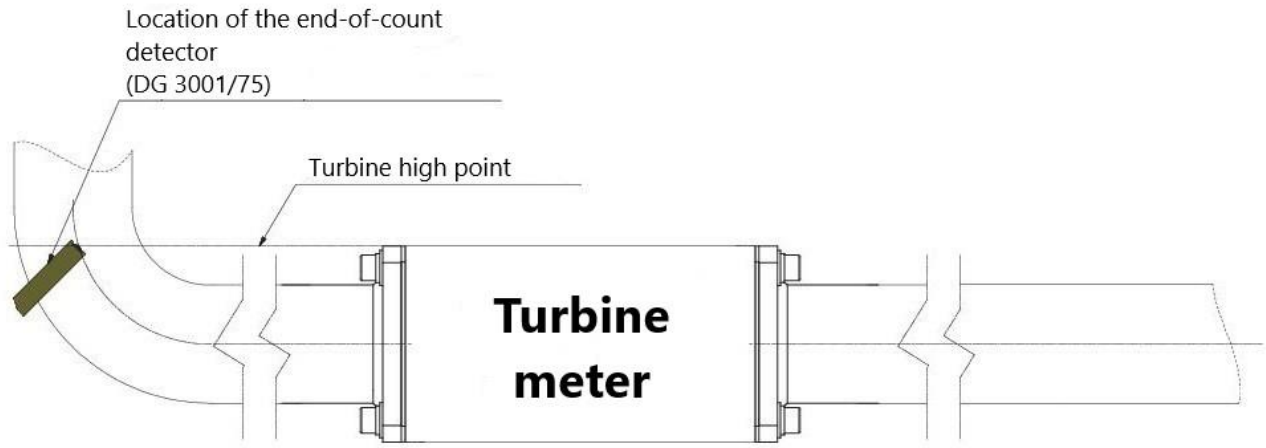
NOTE:
- The detector body is made of anodized aluminum alloy of bronze color.
- The optical sensor in contact with the liquid or gas is made of glass.
- The O-ring between the body and the detector is made of Viton.
- 3 lengths are available: 5m cables (8138), 10m (8139) and 25m (8140).

*Refer to § 2 ATEX descriptive notice

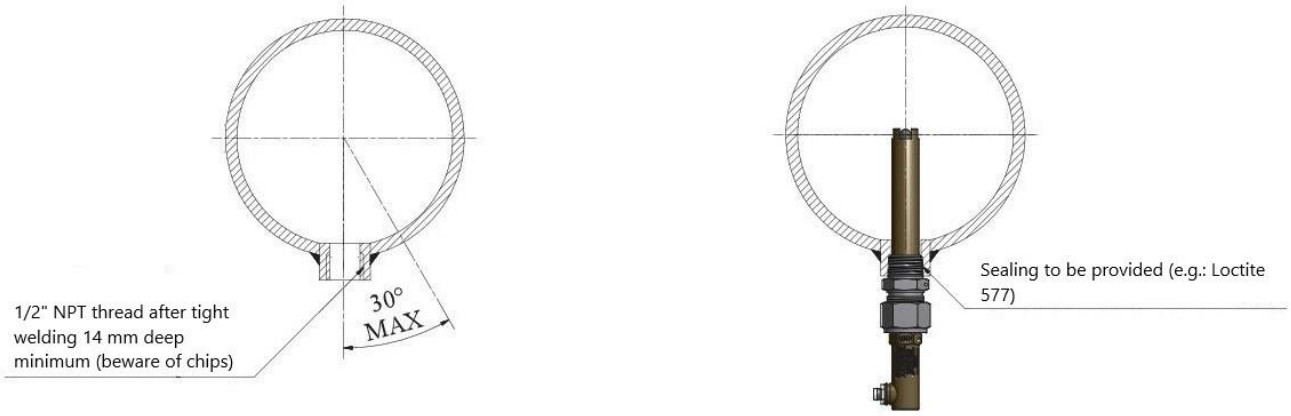
ALMA www.alma-alma.fr Service Development 13127 Vitrolles		PRESENTATION DRAWING	DFV014			Description of amendment N° 793 Modification of version Co-Inox, remove of DG3001/205 inox					
DEV N° : 981b	Code : See presentation drawing	Gas detector DG3001, DG3001/75, DG3001/205									
Drawing N° associated with the related CET file		981b	PPV014	AA	9/17	Modified on :	17/11/2021	by	BEB	verified by	CHR
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on :	04/01/1999		SR		BM
ATEX:	INERIS 03 ATEX 0097X										

7.1. INSTALLATION RECOMMENDATIONS DG3001/75

POSITION OF THE END-OF-METERING PROBE:

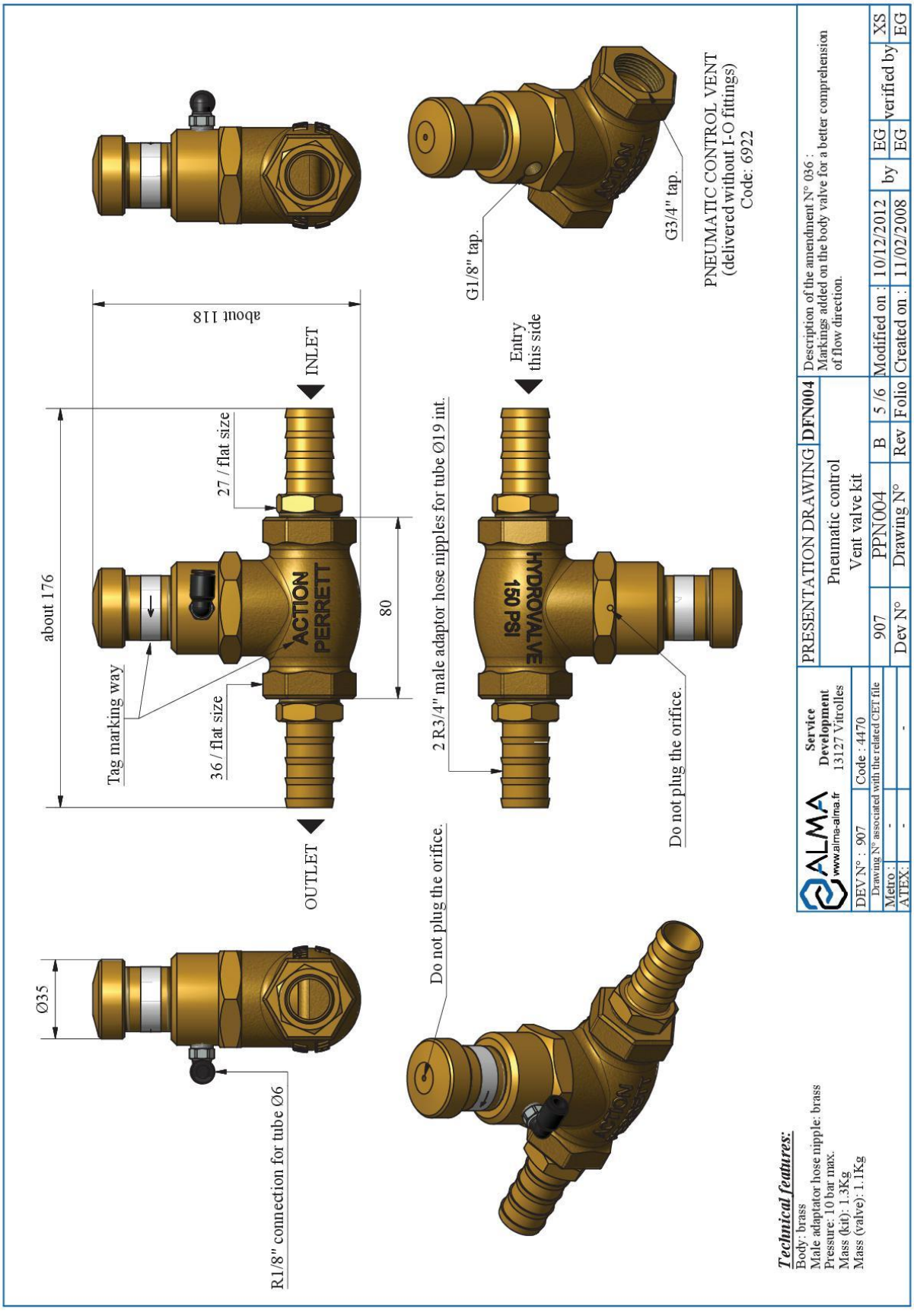


INSTALLATION OF THE END-OF-METERING PROBE ON THE PIPE:



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

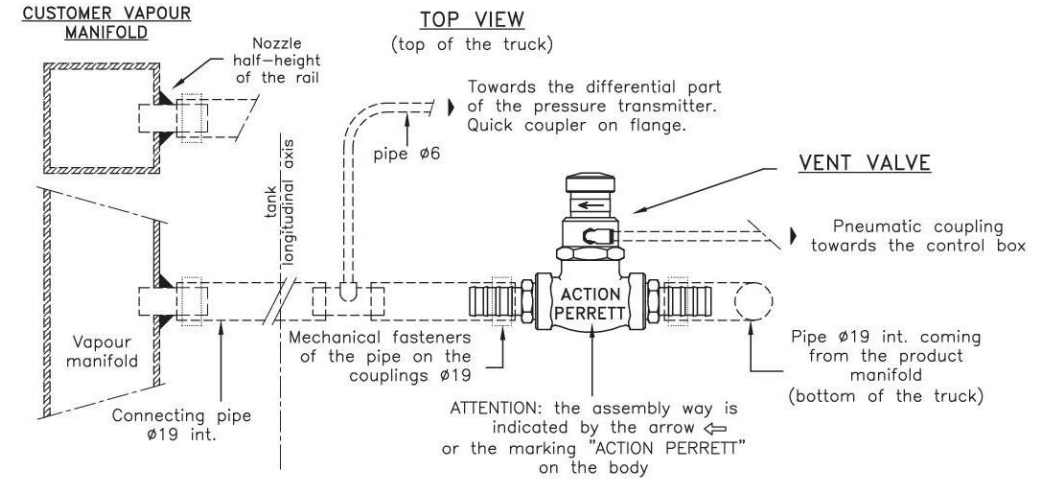
8. PNEUMATIC CONTROL VENT VALVE KIT

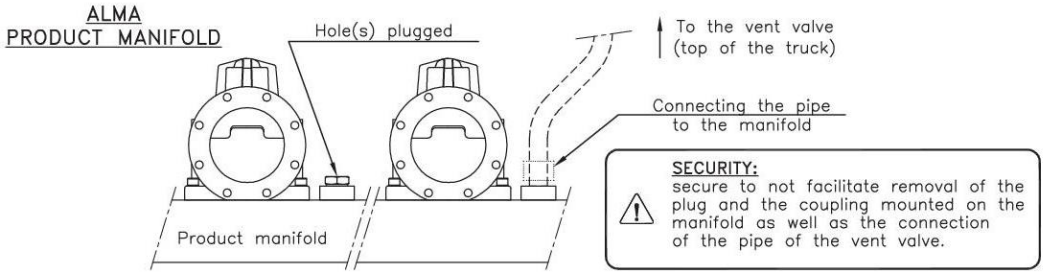


Document available on website alma-alma.fr

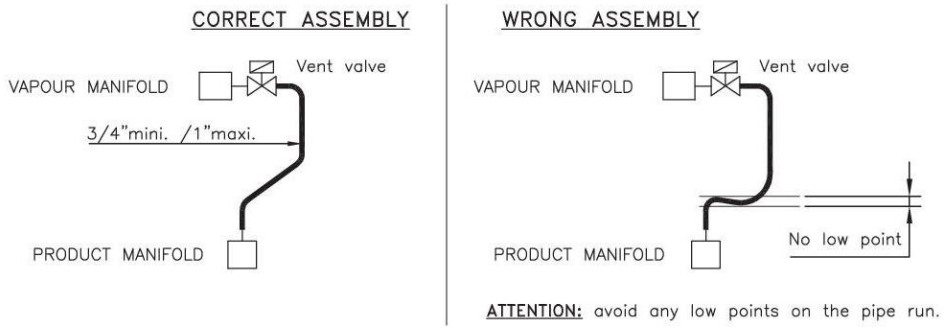
8.1. INSTALLATION RECOMMENDATIONS PNEUMATIC CONTROL VALVE

PNEUMATIC CONTROL VENT VALVE



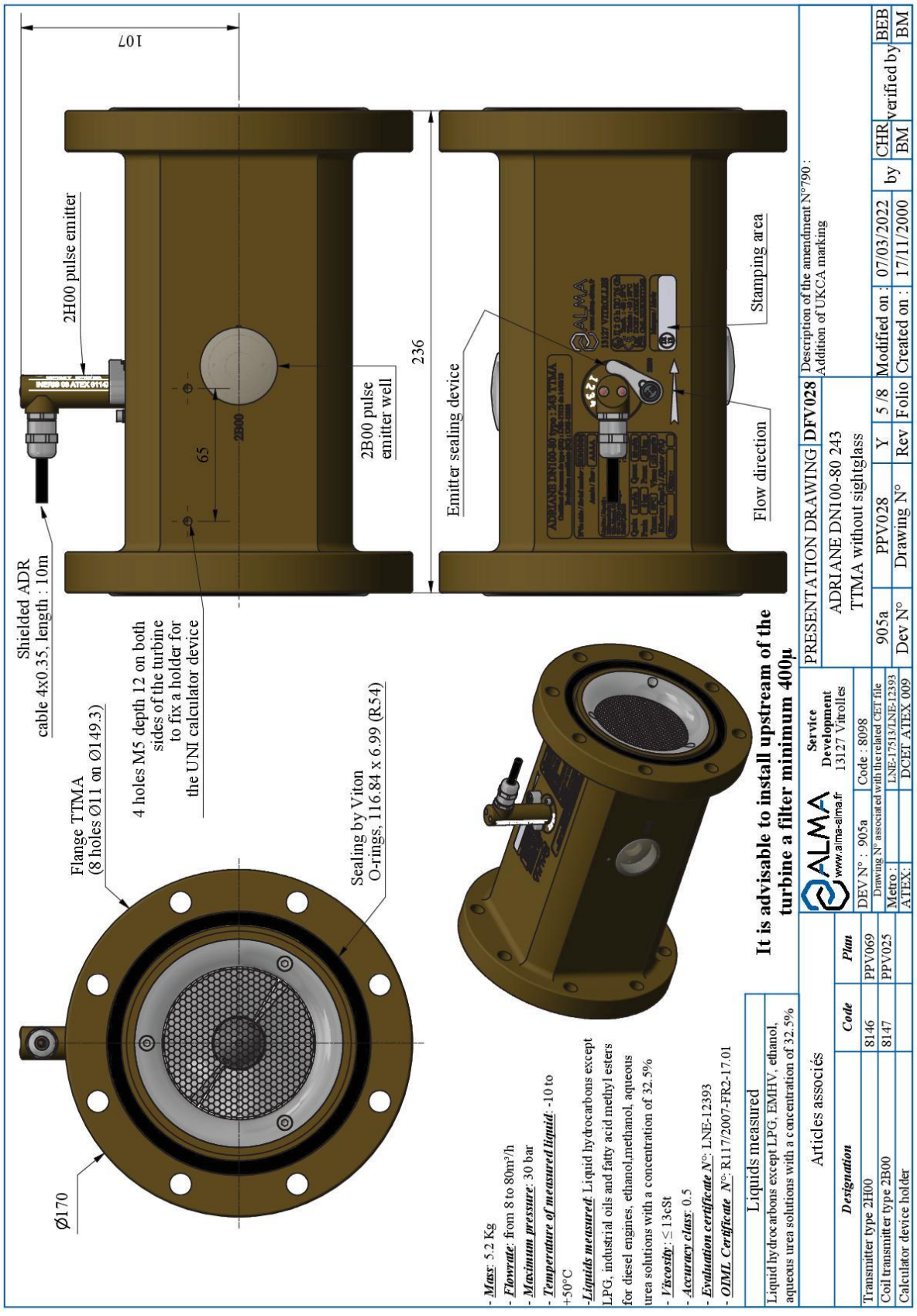


ASSEMBLY OF THE VENT PIPE (not supplied by Alma)



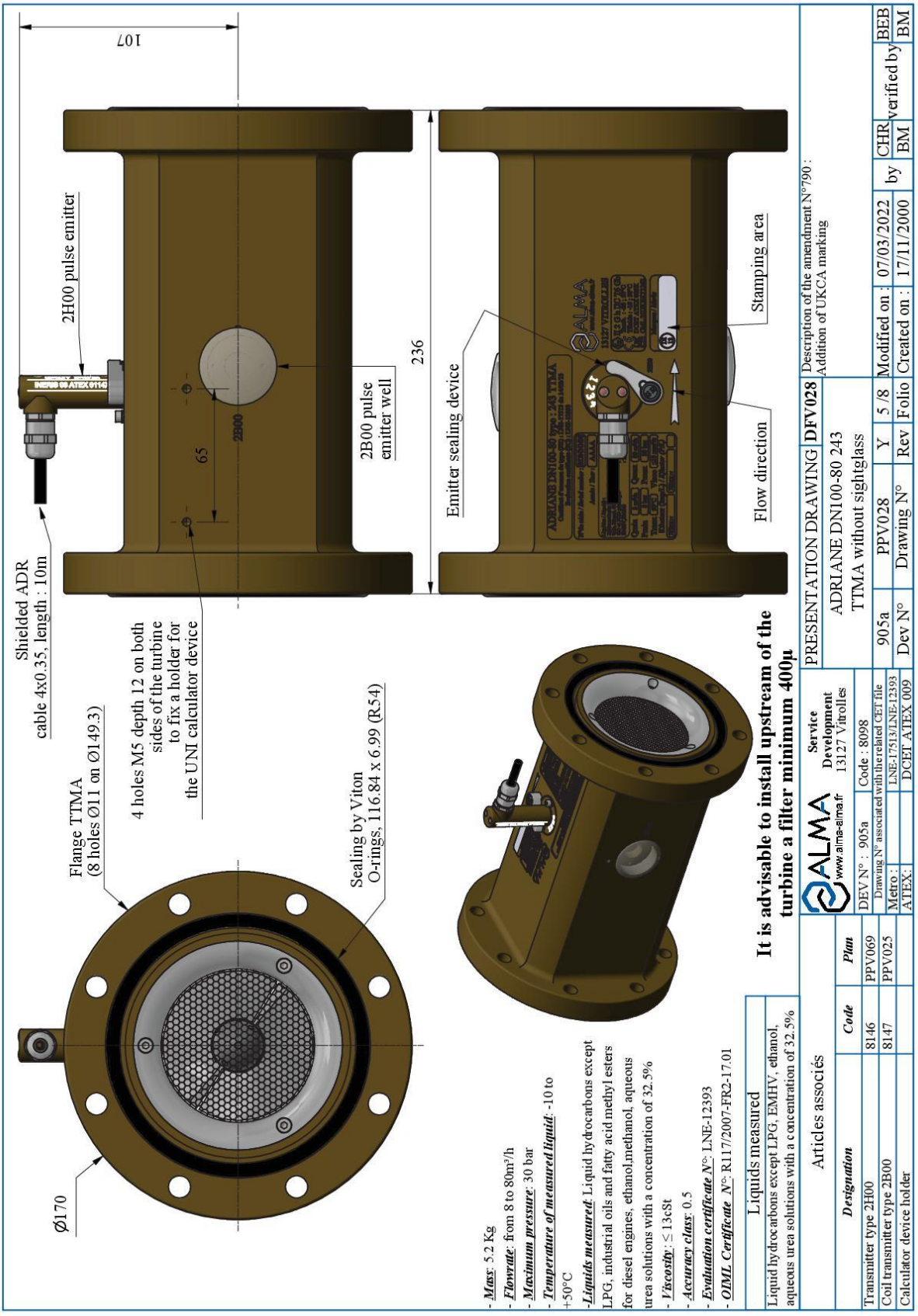
9. ADRIANE TURBINE METER

9.1. ADRIANE TURBINE METER DN100-80 243 TTMA



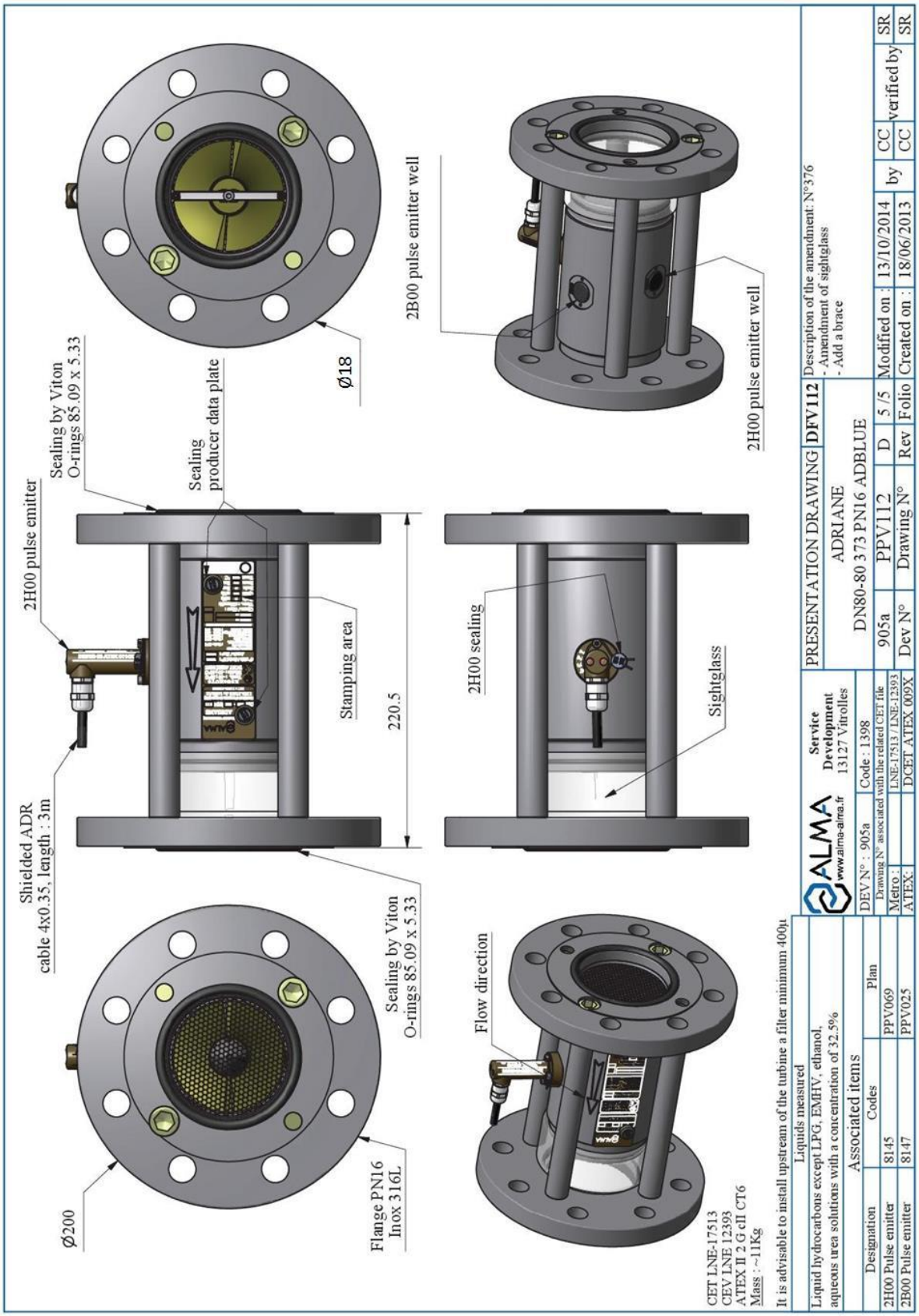
Document available on website alma-alma.fr

9.2. ADRIANE TURBINE METER DN80-80 243 110x110



Document available on website alma-alma.fr

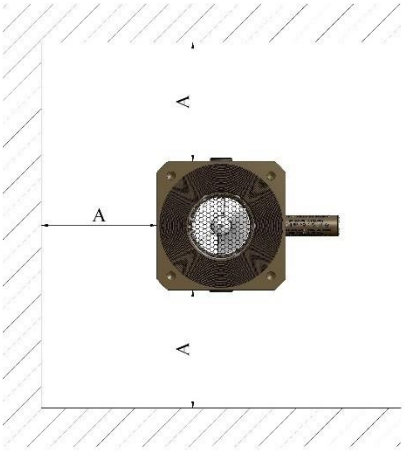
9.3. ADRIANE TURBINE METER DN80-80 373 PN16 Ad blue®

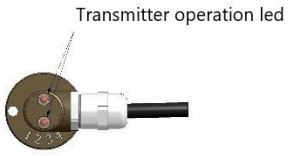


Document available on website alma-alma.fr

9.4. INSTALLATION AND SEALING 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.

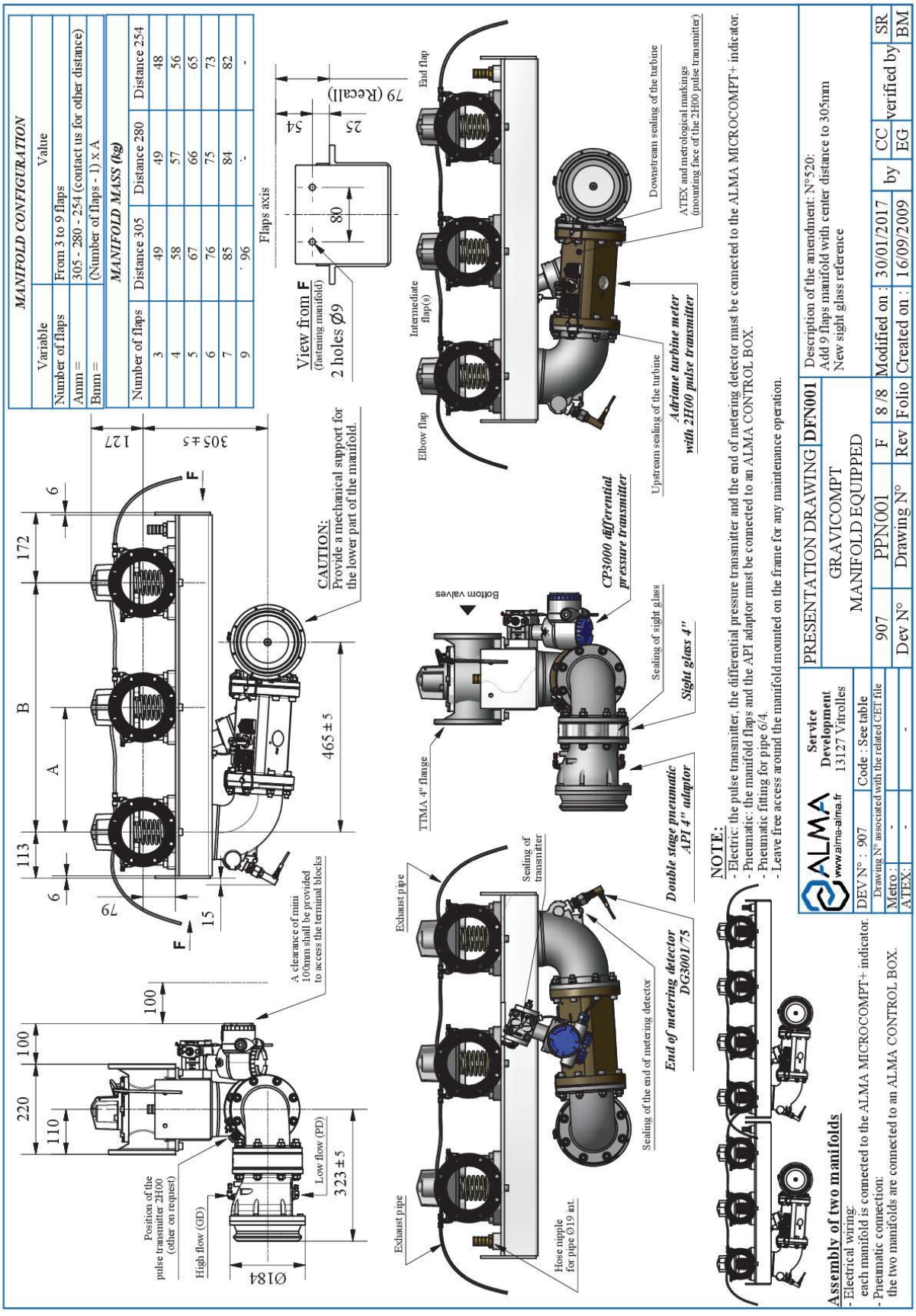




- Refer to the certificate written on the identification plate of the measuring system to suit the sealing requirements
- No loose lead wire on the sealing devices

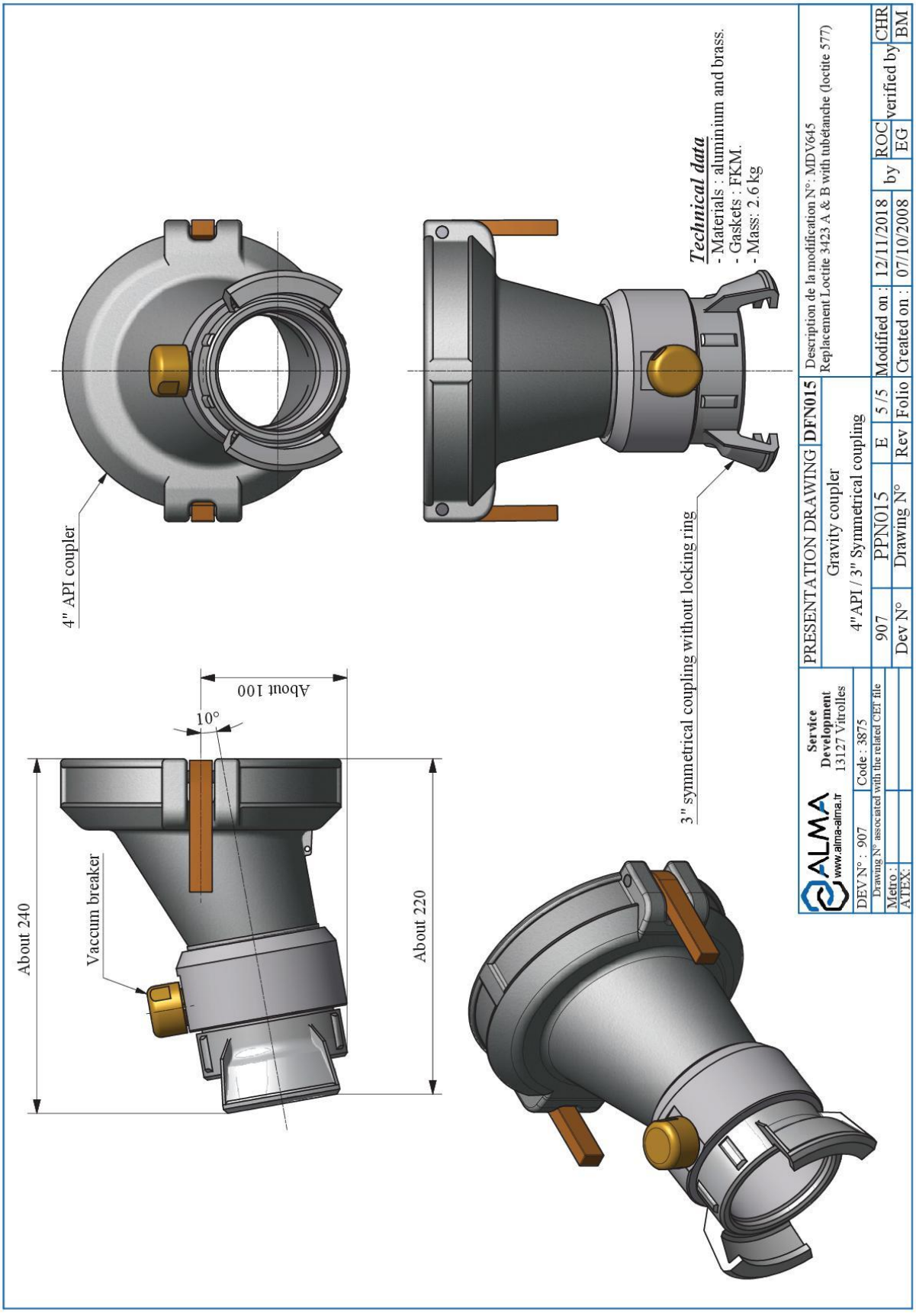
Within measuring systems of accuracy class 0.5 and 1.0, the pipes and equipment located upstream or downstream of the turbine must have a nominal diameter identical to that of the turbine over a length at least equal to 10 times the nominal diameter upstream and at least equal to 5 times the nominal diameter downstream. These lengths can be straight or angled.
It is imperative that no control device (for example valve with variable opening) is located on the pipe upstream of the turbine over a length at least equal to 10 times its nominal diameter. In particular, there must be no tapping to create bypass circuits (sample, valve bypass, etc.) in this area of the pipework.

10. GRAVICOMPT MANIFOLD EQUIPED



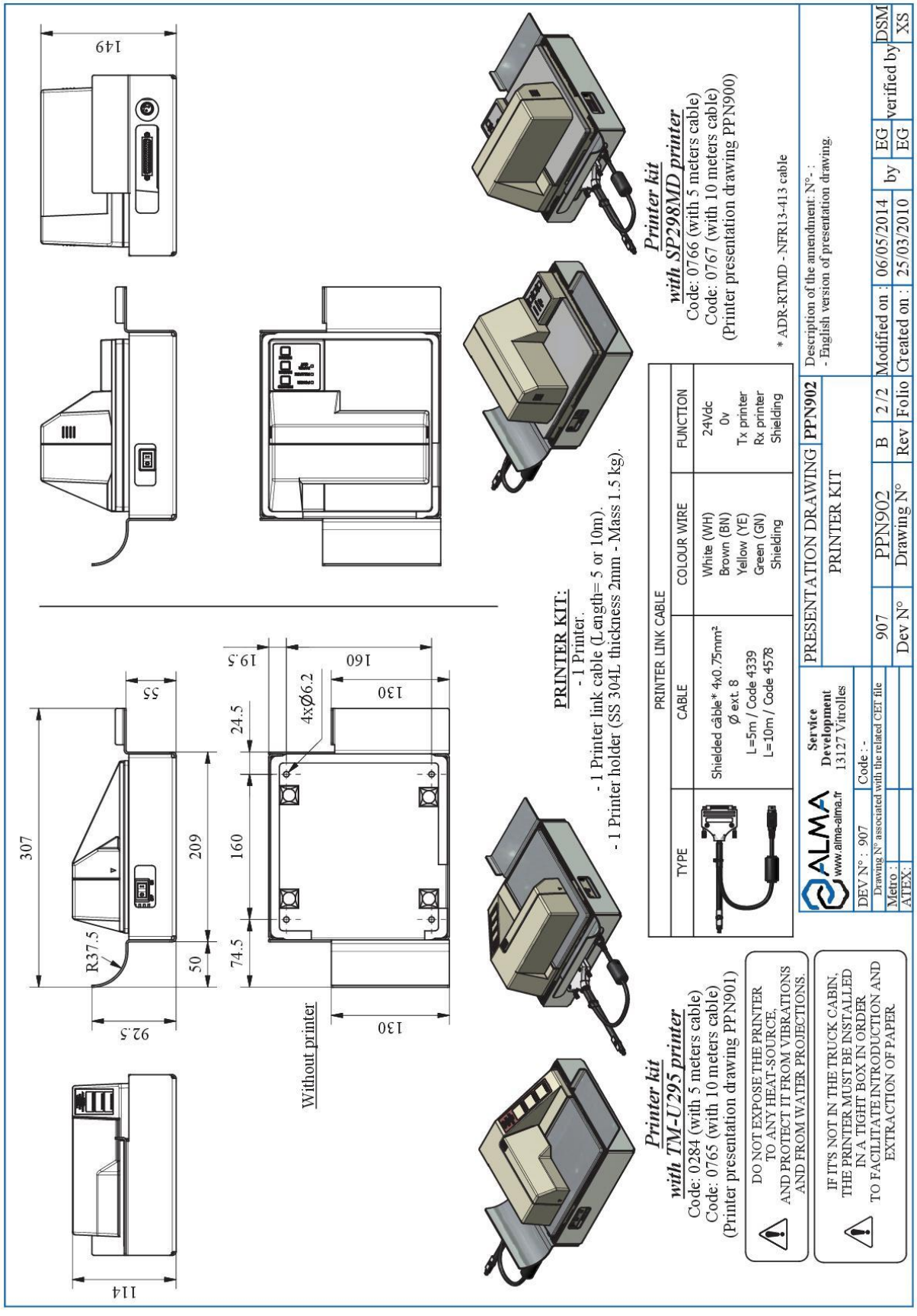
Document available on website alma-alma.fr

11. GRAVITY COUPLER



Document available on website alma-alma.fr

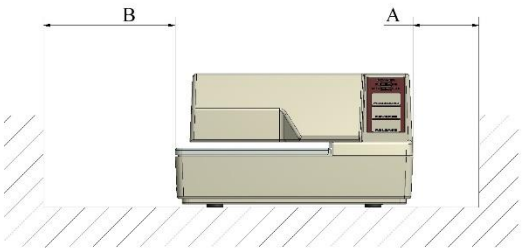
12. PRINTER KIT

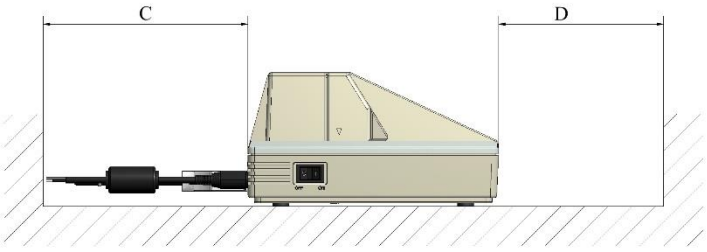


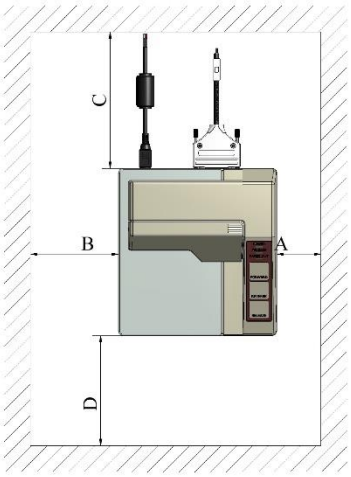
Document available on website alma-alma.fr

12.1. INSTALLATION RECOMMENDATIONS PRINTER

- The printer must be installed in a tight box and be laid out so as not to obstruct the introduction/extraction of sheet of paper (Dimension D).
- Do not store anything above the printer.
- Leave an open space all around the printer to ease maintenance.
- Dimensions: A ≥ 50mm, B ≥ 100mm, C ≥ 120mm.

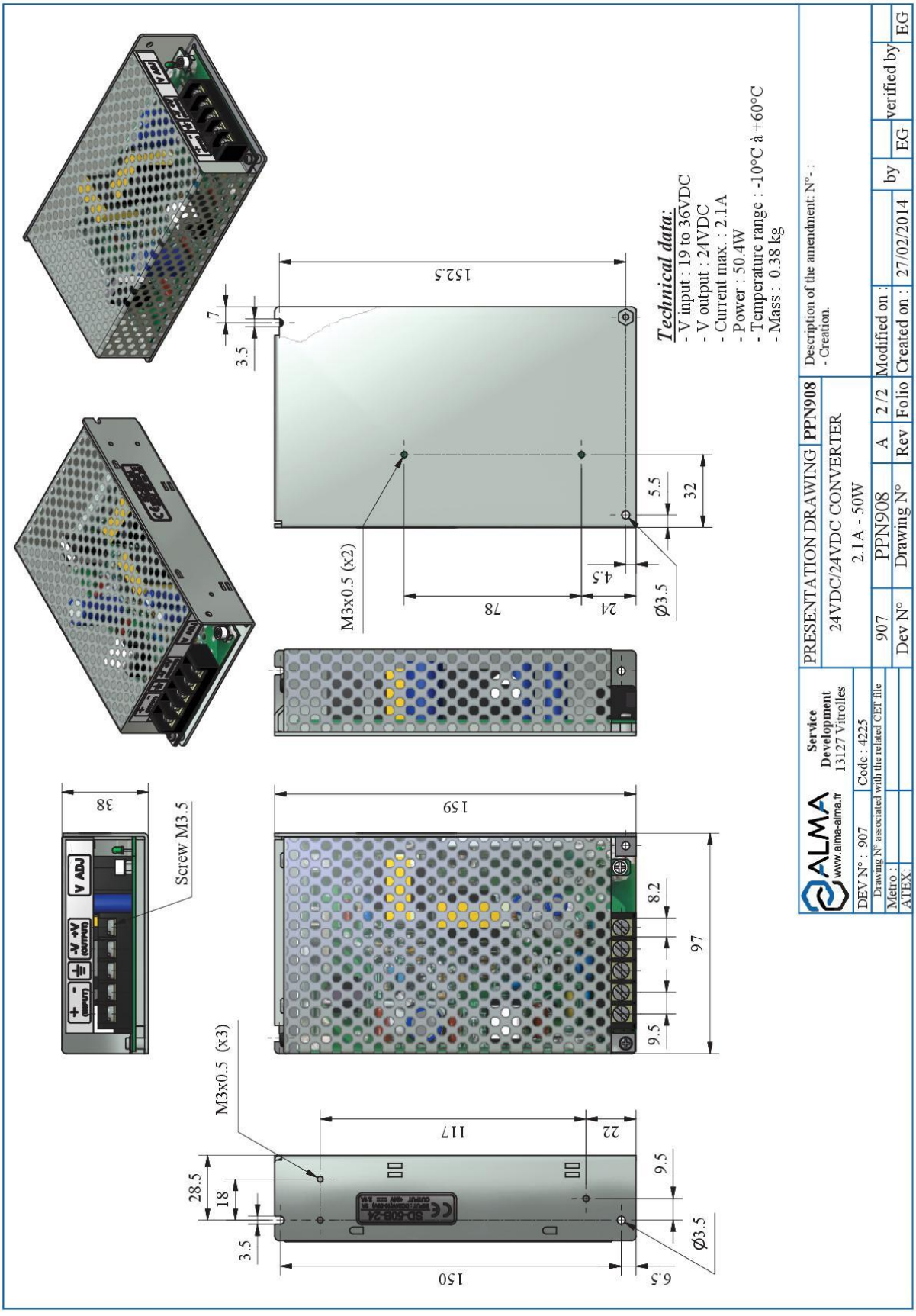






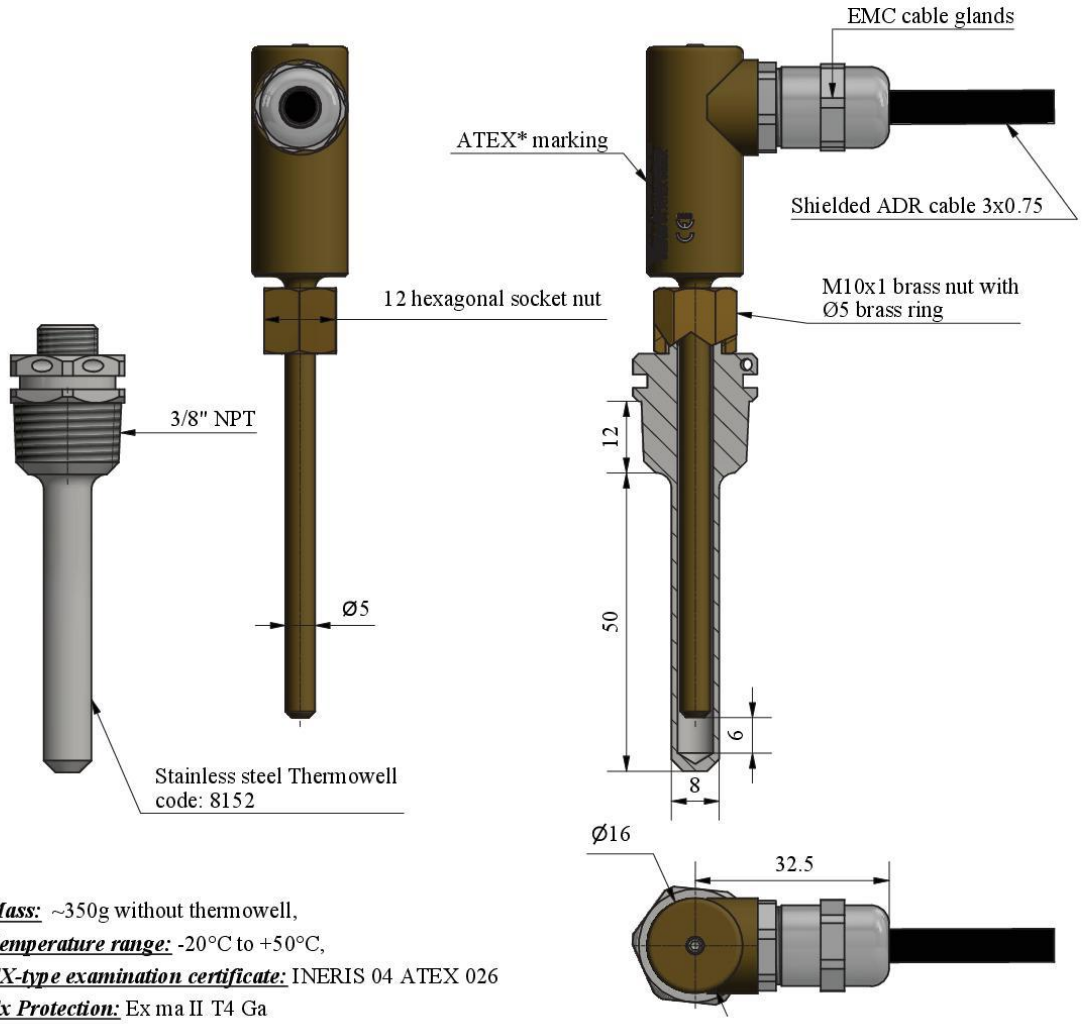
DO NOT EXPOSE THE PRINTER TO ANY HEAT-SOURCE.
PROTECT IT FROM VIBRATIONS AND WATER PROJECTIONS.

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



Document available on website alma-alma.fr

14. TEMPERATURE PROBE Pt100 – CT1001 ATEX



- ***Mass:*** ~350g without thermowell,
- ***Temperature range:*** -20°C to +50°C,
- ***EX-type examination certificate:*** INERIS 04 ATEX 026
- ***Ex Protection:*** Ex ma II T4 Ga

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

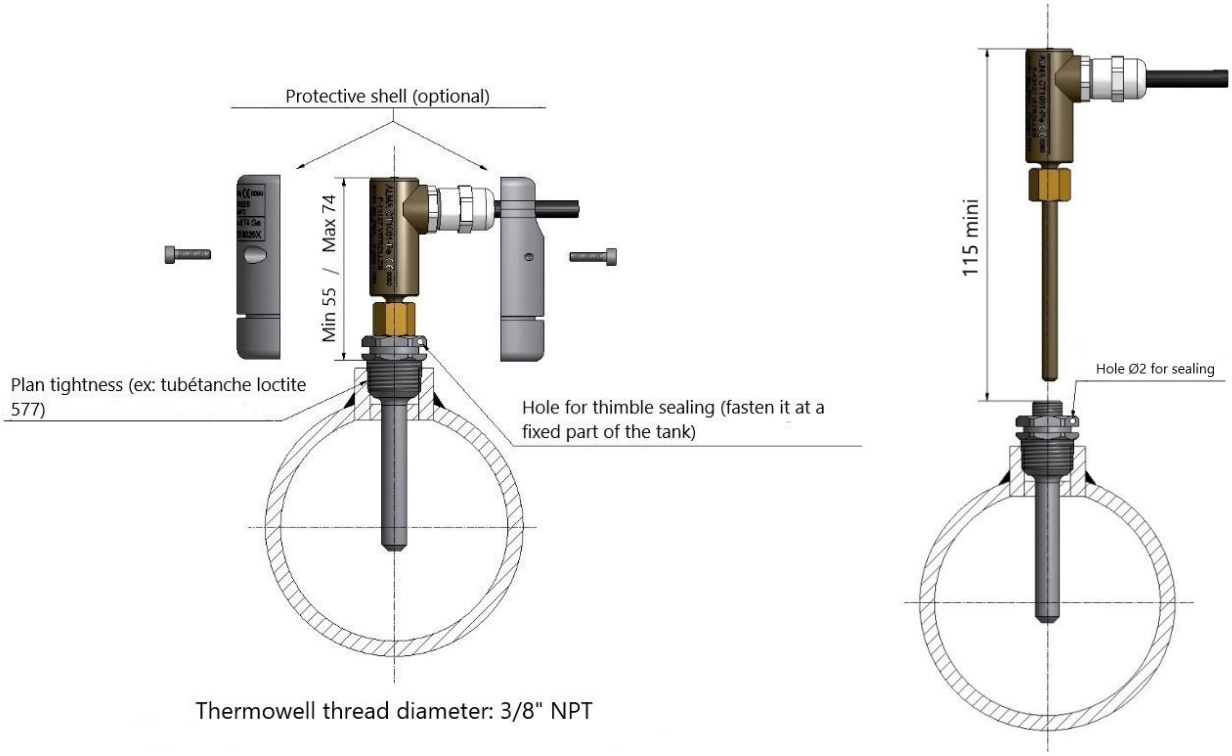
*ATEX "ma" certification.
For installation and use in hazardous areas see Instruction manual

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°809 : Modification engraving (preparation for UKCA certificate)						
DEV N° : 949d	Code : 8151	Temperature probe CT1001-Pe									
Drawing N° associated with the related CET file		949d	PPV042	N	5 /6	Modified on :	02/05/2022	by	CHR	verified by	CC
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on :	13/09/2003		BM		BM
ATEX:	INERIS 04 ATEX 0026										

14.1. INSTALLATION RECOMMENDATIONS TEMPERATURE PROBE

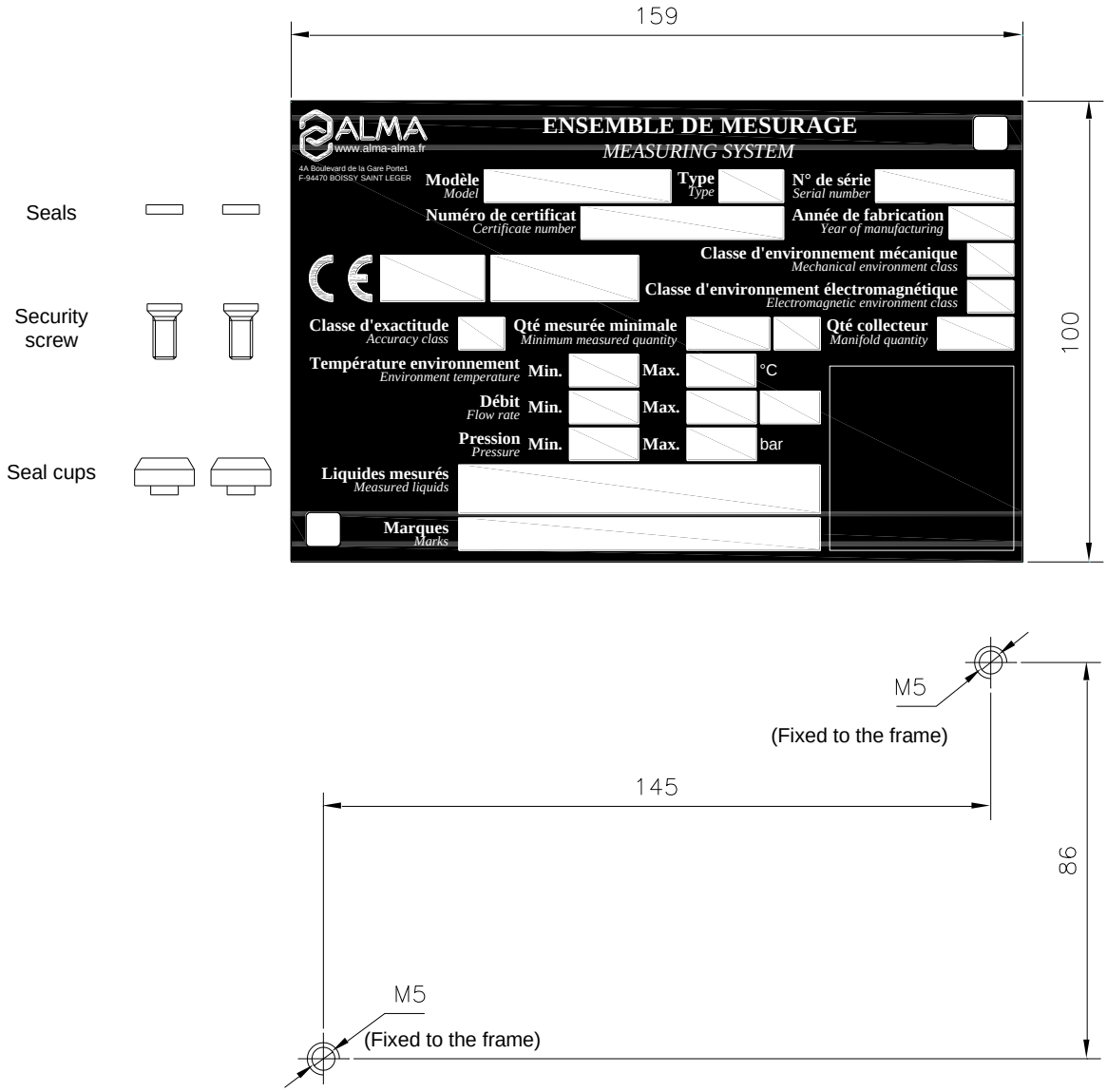


REFER TO THE INSTRUCTION MANUAL
(DELIVERED WITH THE EQUIPMENT OR AVAILABLE ON ALMA WEBSITE)

INSTALLATION OF THE TEMPERATURE SENSOR ON THE ALMA TURBINE METER:

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).