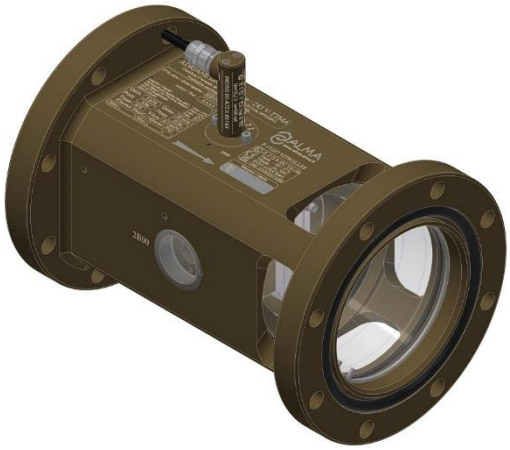
INSTALLATION GUIDE

DI 015 EN I

GRAVITRONIQUE

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



Issue	Date	Nature of modifications	Written by	Approved by
I	2023/01/25	Update of drawings	TABTI-BENHARI	NC
H	2022/04/26	I/O modification for new software platform. Update of drawings	DSM	FDS

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CONTENTS

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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 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).

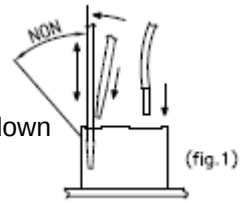
⇨ Connect the supply of the equipment downstream cut-out, on the power supply reserved to the measured distribution.

⇨ 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.



(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.

⇨ 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
Blanc	**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				
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)

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2. GENERAL PRESENTATION

2.1. USE ACCORDING TO MID CERTIFICATE

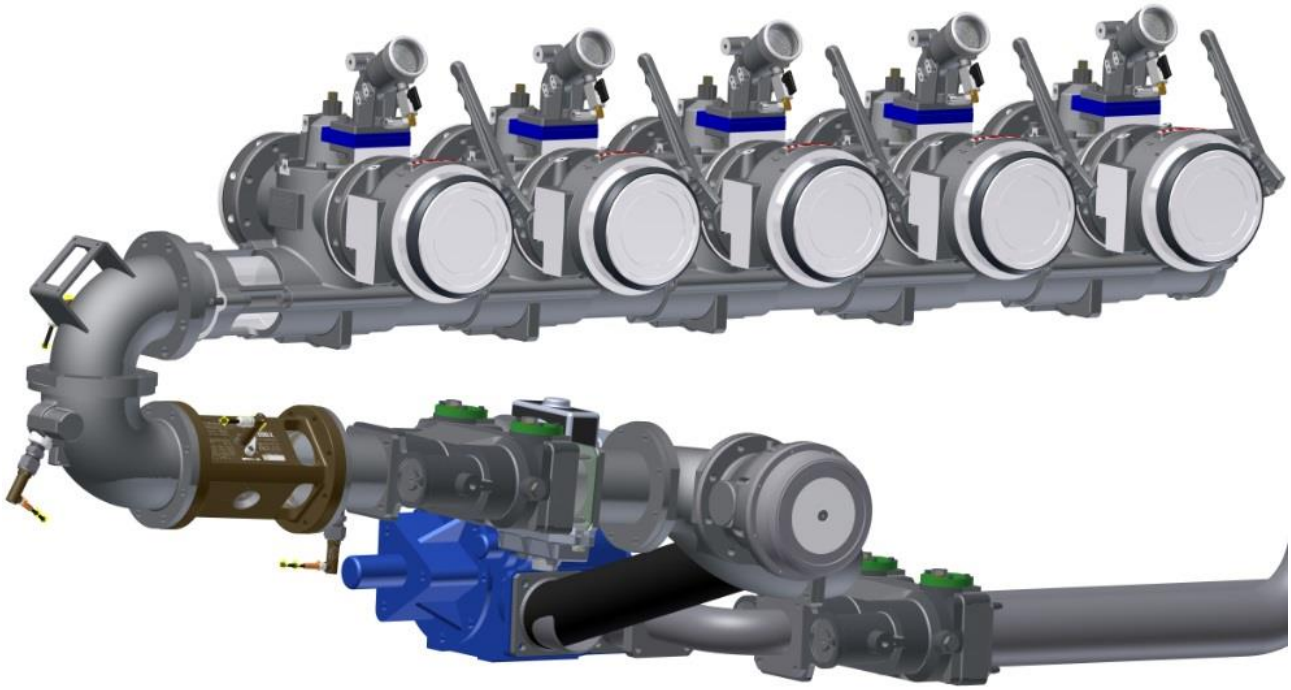
The GRAVITRONIQUE measuring system is covered by the EC type examination certificate N° LNE-27785. Refer to this certificate for any precision about its installation.

For the sealing plan, see Annex to EC type examination certificate N° LNE-27785.

2.2. 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

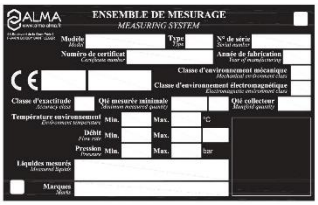
EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	**Equipment**	**Designation**	**Qty**	**Option***
1		**CALCULATOR INDICATOR MICROCOMPT+ GRAVITRONIQUEWITH Bluetooth CONNECTION**	1	
		Wi-Fi CONNECTION (As an alternative to Bluetooth)		●
		MODULE LoRa Communication with RCT5 remote control		●
		**RFID SUPERVISOR KEY**		
2		**CONTROL BOX GRAVITRONIQUE** (Limits the number of flaps and product returns to 6)	1	●
3	3a 	**ADRIANE TURBINE METER DN100-80 243 TTMA with sightglass (Depending on configuration)**	1	
	3b 	**ADRIANE TURBINE METER DN80-80 243 110x110** (Depending on configuration)		
4		**DIFFERENTIAL PRESSURE TRANSMITTER – CP3000 ATEX**	1	
5		**PRINTER TMU-295** (Printer – power supply cable – serial link cable 10m)	1	

Non-contractual pictures

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	**Equipment**	**Designation**	**Qty**	**Option***
6		**CONVERTER 24VDC/24VDC 2.1A 50W** (Printer power supply 24VDC)	**1**	●
7		**DN80 NON-RETURN VALVE KIT 0.03 bar**	**1**	
		DN80 NON-RETURN VALVE KIT 0.3 bar (Supplied with an empty hose)	**1**	●
8		**SIGHTGLASS KIT 110x110 ADRIANE TURBINE METER DN80** (Supplied with pre-drilled screws for sealing)	**1**	
9		**VACUUM BREAKER**	**1**	
10		**NC/NO ATEX SOLENOID VALVES KIT**	**1**	●
11		**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**	
12		**PNEUMATIC CONTROL VENT VALVE**	**1**	
13		**Pt100 TEMPERATURE SENSOR – CT1001-Pe** **(Supplied with thermowell)**	**1**	●

Non-contractual pictures

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA

Item	Equipment	Designation	Qty	Option*
14		**2-ANTENNA BOX GSM AND GPS**	1	●
15		**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

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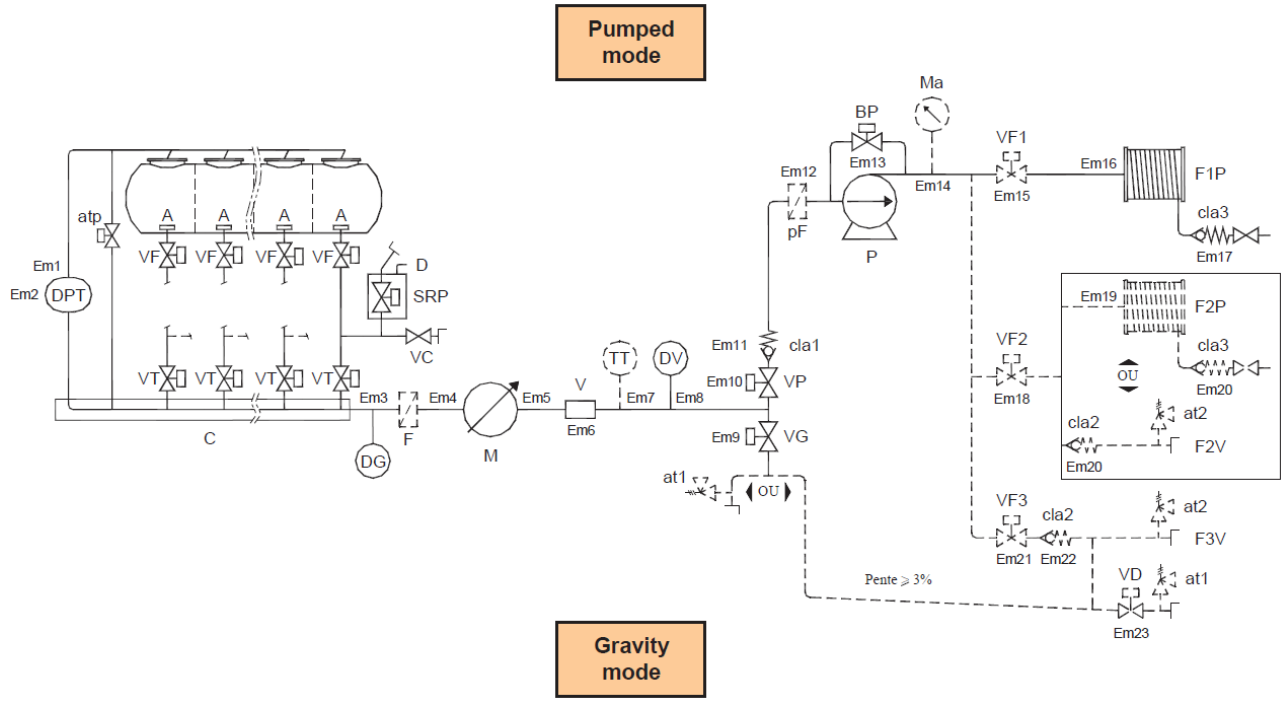
4. INSTALLATION AND SEALING DRAWING OF THE GRAVITRONIQUE



Legend:

A: Anti-swirl device
DPT: Pressure sensor
atp: Guided release to the atmosphere
VF: Compartment bottom flap
VT: Selection valve installed on every compartment pipe and allowing transfer to the manifold
C: Manifold
D: Pressure relief control (secured)
SRP: Liquid Backup System on compartments
VC: Bottom loading valve installed on every compartment pipe (optional)
DG: gas sensor
F: Filter (optional if prefilter pF is installed)
M: Meter
V: sight glass (can be integrated to the meter)
TT: Temperature sensor PT100 (optional, and can be integrated to the meter)
DV: Optical vacuity sensor
VP: Selection valve pumped mode
VG: Selection valve gravity mode
at1, at2: Automatic release to the atmosphere
cla1: Non-return valve
pF: Pump prefilter (optional if filter F is installed)
P: Pump
BP: Pump by-pass
Ma: Manometer indicating the forcing back pressure of the pump (optional)
VF1, VF2, VF3: Device guided by the calculator, allowing, when the measuring system has several pumped delivery paths, to realize deliveries with one or another of theses paths (optional). Changing the delivery path is impossible during the measurement.
F1P, F2P: Full hose(s) on hose reel (F2P optional)
cla3: Valve calibrated with minimum pressure and preventing the emptying of the full hose.
cla2: Valve calibrated with minimum pressure at the maximum flowrate of an empty hose (optional)
F2V, F3V: Connection for empty hose (optional)
VD: Decanting gravity valve (optional)

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Seals:

Em1: prevents the removal of pressure sensor DPT.
Em2: seals the pressure sensor adjustment.
Em3: prevents the removal of optical sensor DG-3001.
Em4: seals the inlet pipe of the meter.
Em5: prevents the removal of the meter.
Em6: prevents the removal of the sight glass (when not integrated into the meter).
Em7: prevents the removal of temperature sensor (TT).
Em8: prevents the removal of vacuity sensor type DG-3001 (DV).
Em9: prevents the removal of selection valve for gravity mode.
Em10: prevents the removal of selection valve for pumped mode.
Em11: prevents the removal of non-return valve for pumped mode.
Em12: prevents the removal of the prefilter.
Em13: prevents the removal of the pump and the bypass.
Em14: prevents the removal of manometer.
Em15, Em18, Em21: prevent the removal of valves allowing the delivery with empty or full hose(s).
Em16, Em19: prevents the removal of full hose(s).
Em17, Em20, Em22: prevents the removal of calibrated non-return valves (transfer point).
Em23: prevents the removal of decanting valve (VD).

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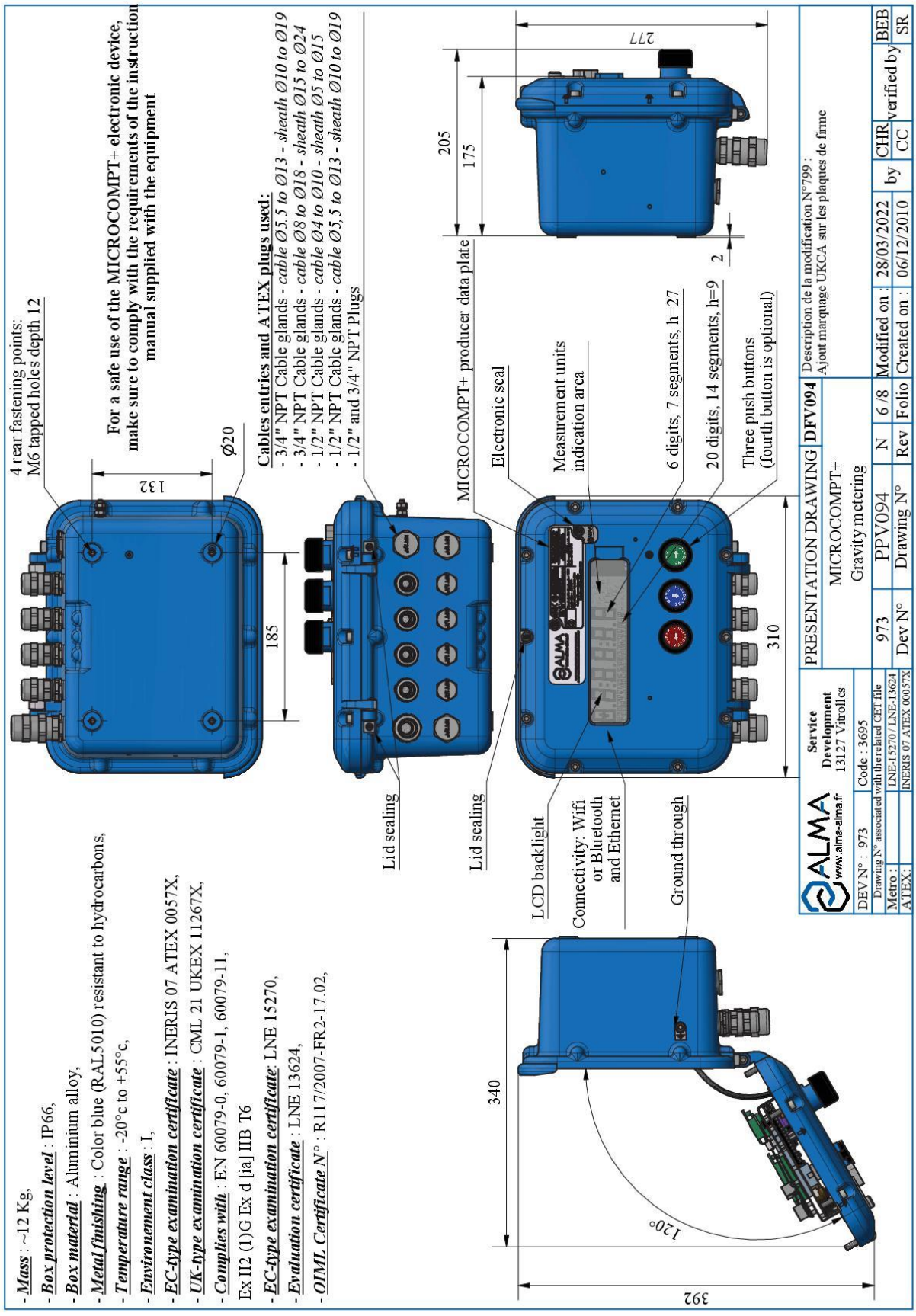
5. CALCULATOR-INDICATOR MICROCOMPT+ GRAVITRONIQUE



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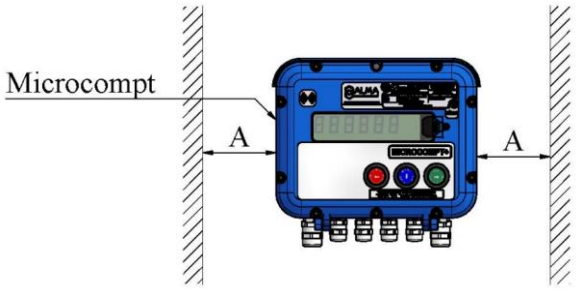
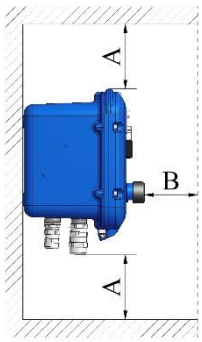
5.1. INSTALLATION RECOMMENDATIONS CALCULATOR-INDICATOR MICROCOMPT+

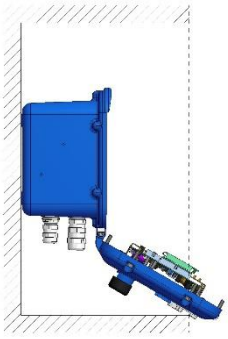
- Fasten the box with 4 M6 screws (holder suitable for vibrations and designed to support the MICROCOMPT). On the box: 4 M6 blind holes tapped length=12 over 185x132).
- Leave an open space around the box in order:
  - To facilitate maintenance operation.
  - To prevent any pressing on pushbuttons and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

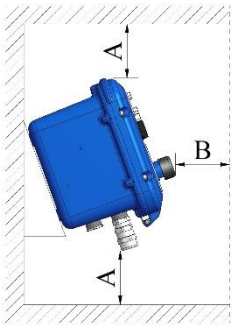


Left hand view
Closed box



Left hand view
open box

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

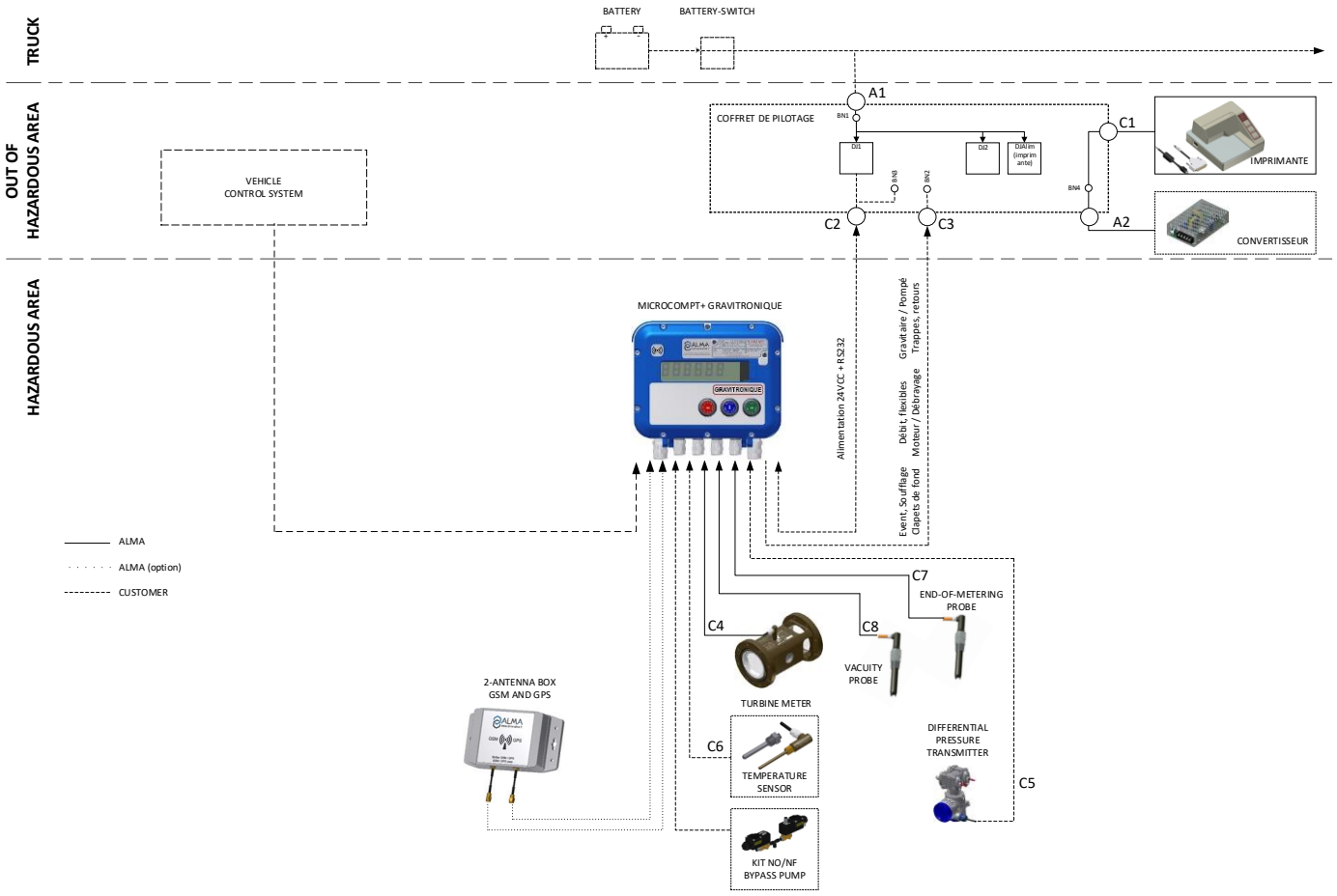


Left hand view
Closed box

Left hand view
open box

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

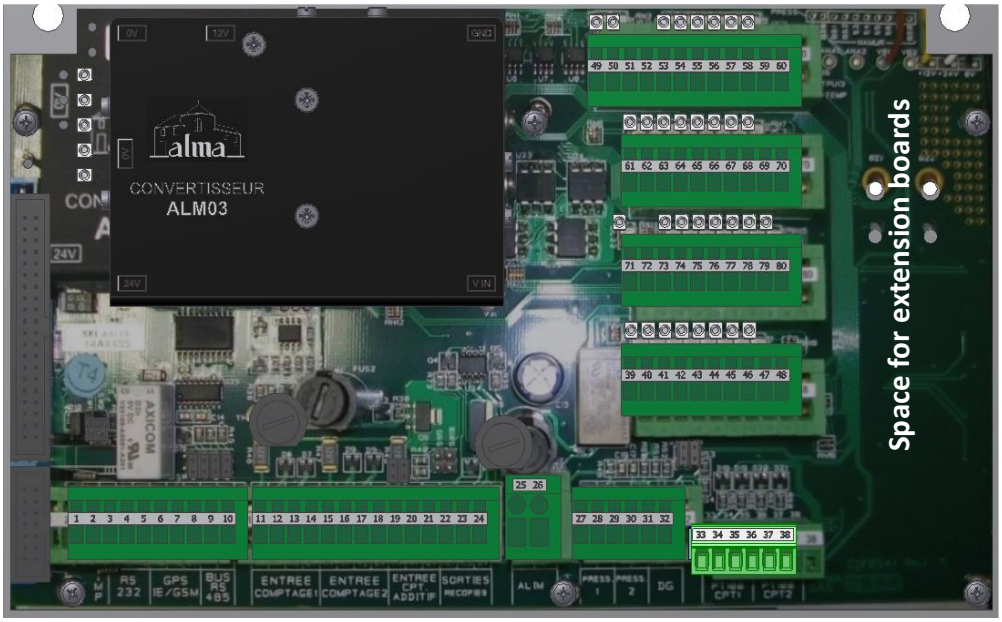
5.2. ELECTRICAL WIRING CALCULATOR-INDICATOR MICROCOMPT+



Terminal assignment of the power supply board

TERMINAL ASSIGNEMENT OF MICROCOMPT+ BOARDS

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		4x1 sh.	24VDC	1	25	24VDC	Supply	Power supply 24VDC MICROCOMPT+
						0V	2	26	0V		
						Rx Printer	3	1	Tx	RS232 Printer	RS232 serial link
						Tx Printer	4	2	Rx		
	SUPPLY 24VDC	A1	1/2"NPT		2x1	Bat. (+)	1	25	24VDC	Power supply	24VDC truck battery (after battery switch and protected by a fuse)
						Bat. (-)	2	26	0V		
	PRINTER		1/2"NPT	•	3x0.34 sh.	Rx Printer	Bc	1	Tx	Printer	Connect the shielding
						Tx Printer	Mr	2	Rx		
						0v	Vt	3	0v		
•	EMBEDDED COMPUTING		1/2"NPT		3x0.34 sh.	0V		3	0V	RS232	Connect the shielding Alma protocol
						Rx E.C.		4	Tx		
						Tx E.C.		5	Rx		
•	DSPGI DEVICE					Rx	Vt	6	Tx	DSPGI	Gauging system for product identification
						Tx	Bc	7	Rx		
						Ground	Nr	8	Ground		
	EMA METERING	C4	1/2"NPT	•	ADR 4x0.34 sh.	12V	Jn	11	12V	EMA Product metering input	Connect the shielding
						V1	Mr	12	V1		
						V2	Vt	13	V2		
						0V	Bc	14	0V		
•	INJECTOR 1 FEEDBACK CONTROL							19	12V	Injector 1 feedback crtl	
								20	V1		
								21	0V		

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EQUIPMENTS CONNECTED TO THE MICROCOMPT+								POWER SUPPLY BOARD			
Option	Equipement	Cable (for information)				Function	Colour or No.	Terminal	Function		Observation
		No.	CG*	Alma	Type						
	MOTOR CONTROL					Start Mot.		22	Start motor	Motor control	Make sure the electronics on the vehicle is compatible with the outputs
						Stop Mot.		23	Stop motor		
						0V		24	0V		
	DIFFERENTIAL PRESSURE SENSOR via 4DG board		*1/2"NPT*	●	*2x0.34 sh.*			*27*		*Pressure*	*Connection according to the extension board 4DG (terminal 28 only)*
						-		*28*	-		
●	TEMPERATURE PROBE	C6	1/2"NPT	●	ADR 3x0.6 sh	+	Jn	33	+	Pt100	Connect the shielding
						-	Bc	34	-		
						-	Vt	35	-		
	MANIFOLD FLAP, PRODUCT RETURN and-or INJECTOR 2 CONTROL				4 to 7x1	See tables page 20		39	24VDC	See tables page 20	Depending on configuration: direct connection or via plexmi electronic board. See the assignment table and the connection table of the relevant plexmi board (page 20)
								40			
								41			
								42			
								43			
								44			
								45			
●	REEL CONTROL				1x1			46	24VDC		Powered output for reel control
●	RC-HEATING OIL RECEIVER				1x1	Start/Stop		49	Start/Stop	RC-Oil_1	
					1x1	LF/HF		50	Low/High flow	RC-Oil_2	
	FLAP CONTROL FEEDBACK				1x1	Flap feedback		51		Flap feedback	With local mode
●	DISTRIBUTION WAY PUMPED COUNTED-NOT COUNTED				2x1	PC/PNC		52	0V	Pumped counted/ not counted	Closed circuit=Pumped counted (end position)
						0V		59	0V	0V (GND)	
●	INJECTOR 1 LEVEL CONTROL				1x1	Ctrl INJ1		53		Injector 1 low level control	
●	INJECTOR 2 LEVEL CONTROL				1x1	Ctrl INJ2		54		Injector 2 low level control	
●	OVERFILL PROBE CONTROL				1x1	Ctrl AD truck		55		Truck overfill probe control	Wiring according to the relevant extension board (5 fils or 2 fils)
●	INJECTOR 2 FEEDBACK CONTROL				1x1	Ctrl INJ2		56		Injector 2 feedback control	
●	CUSTOMER TANK OVERFILL PROBE				1x1	Ctrl AD customer		57		Customer overfill probe control	
	POWER-TAKE-OFF CONTROL				1x1	PTO control		58		PTO control	Power-take-off engaged
	FOOTVALVE CONTROL				1x1	Footvalve		64		24VDC	24VDC truck=opening

**Refer to the Cable Glands Installation Instructions*

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EQUIPMENTS CONNECTED TO THE MICROCOMPT+								POWER SUPPLY BOARD			
Option	Equipement	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	POWER-TAKE-OFF					PTO		61	24VDC	PTO	Outputs Field Effect Transistor 24V 5W max.: applicable to any 24VDC- output (from 61to 69 and from 73 to 79)
	PUMPED ESLECTION					Pumped valve		62	24VDC	Pumped valve control	
	GRAVITY: LOW FLOW or SELECTION VALVE							63	24VDC	Gravity: Low flow control or selection valve	
●	PRODUCT RETURN CONTROL				3 to 6x1	PR1	1	65	24VDC	Return_1	Depending on configuration: direct connection or via plexmi electronic board. See the assignment table and the connection table of the relevant plexmi board (page 20)
						PR2	2	66		Return_2	
						PR3	3	67		Return_3	
						Drain		68		Drain control	
						0V		69	0V	0V (GND)	
						0V		70	0V	0V (GND)	
	INJECTOR 1 CONTROL					Supply		71	NO free contact	Injector 1 control	Closed contact=additivation (Output: NO free potential relay)
						Control		72			
	DECLUTCHING					Declutching		73	24VDC	Declutching	Manual transmission
	or MOTOR ACCELERATION					Acc. Mot.				Motor acceleration	Automatic transmission
	PUMPED HIGH FLOW or INPUT VALVE (NC)					3xG0.75		74	24VDC	Control pumped HF or NC valve	
	GRAVITY HIGH FLOW or HOSE 3							75	24VDC	Control gravity HF or hose 3	
	HOSE 1							76	24VDC	Hose 1 control	
●	HOSE 2							77	24VDC	Hose 2 control	
	MANIFOLD VENT VALVE CONTROL				1x1	Vent valve		78	24VDC	Vent valve control	24VDC=opening
	PUMPED LOW FLOW or EXHAUST VALVE (NO)							79	24VDC	Control pumped LF or NO valve	
								80	0V	0V (GND)	

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

**Refer to the Cable Glands Installation Instructions*

Factory pre-wiring:

								POWER SUPPLY BOARD			
Option	Equipment	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	EXTENSION BOARD 4-RELAIS					Motor control		22	Start Mot.	To extention board 4- relais	(Open collector output)
								23	Stop Mot.		(Open collector output)

Assignments table according to the number of flaps, product returns and depending on the presence or not

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				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 both PLEXMI electronic boards are useful, PLEXMI 1 is fixed to the MICROCOMPT+ frame and PLEXMI 2 (ret#1-ret#7) has to be installed in a 24VDC-supplied independent box.

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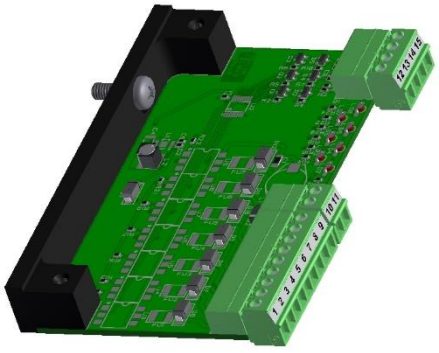
Connection of plexmi electronic boards for manifold flaps and product returns



Multiplexing table:

MULTIPLEXING TABLE									
Input 1 (12)	Input 2 (13)	Input 3 (14)	Output 1 (1)	Output 2 (2)	Output 3 (3)	Output 4 (4)	Output 5 (5)	Output 6 (6)	Output 7 (7)
0	0	0	0	0	0	0	0	0	0
24V	0	0	**24V**	0	0	0	0	0	0
0	**24V**	0	0	**24V**	0	0	0	0	0
24V	**24V**	0	0	0	**24V**	0	0	0	0
0	0	**24V**	0	0	0	**24V**	0	0	0
24V	0	**24V**	0	0	0	0	**24V**	0	0
0	**24V**	**24V**	0	0	0	0	0	**24V**	0
24V	**24V**	**24V**	0	0	0	0	0	0	**24V**

PLEXMI board connection table for manifold flaps:

							PLEXMI ELECTRONIC BOARD								MICROCOMPT+			
CONNECTED EQUIPMENT							OUTPUTS				INPUTS				POWER SUPPLY BOARD			
Option	Equipment	Cable (for information)				Function	Colour or No	Termin	Function		Observation	Observation	Function		Termin	Termin	Function		Observation
		No	CG*	Alma	Type														
•	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	0-24 V	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:

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								PLEXMIELECTRONIC BOARD							MICROCOMPT+			
CONNECTED EQUIPMENT								OUTPUTS			INPUTS				POWER SUPPLY BOARD			
Option	Equipment	Cable (for information)				Function	Colour or No	Termin	Function		Observation	Observation	Function		Termin	Termin	Function	Observation
		No	CG*	Alma	Type													
●	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	0-24 V	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									
													SUPPLY	24VDC	10	S2	24VDC (white)	Supply via Microcompt+	
								8	0V	GND				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

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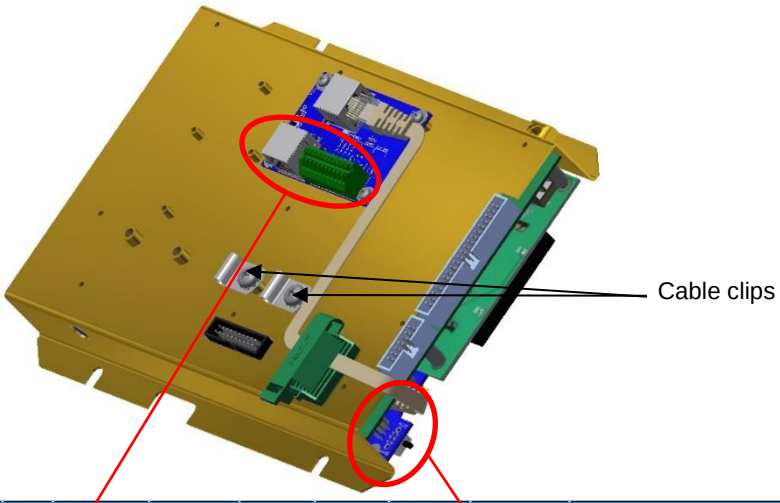
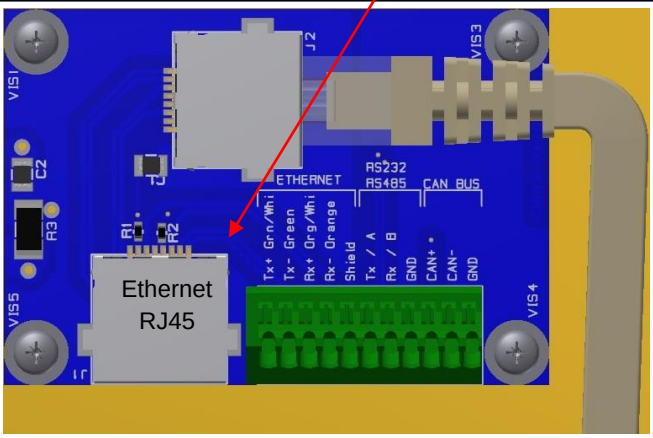
Connection of the network board – Ethernet, RS232/485, CANBus, LoRa

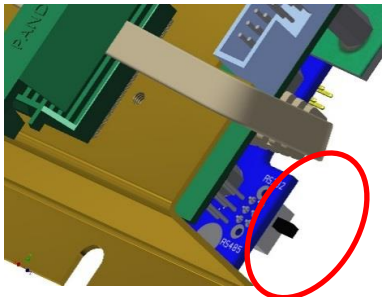
Connection to the Ethernet network:
- With the RJ45 connector according to the EIA/TIA-568 standard
- Or with the screw-terminal: see details in the table below.



NETWORK BOARD



RS232 or RS485 Switch



NETWORK CONNECTION TYPE								NETWORK BOARD			
Option	Connection	Cable (for information)				Function	Coulor or No.	Coulor	Function		Observation
		No.	CG*	Alma	Type						
	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		
	EMERGENCY STOP								24VDC	Emergency stop	
									GND		

**Refer to the Cable Glands Installation Instructions*

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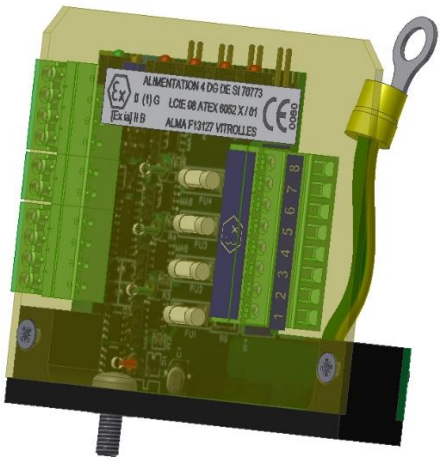
Terminal assignment of the extension board 4DG (IS)

EXTENSION BOARD 4DG (IS)

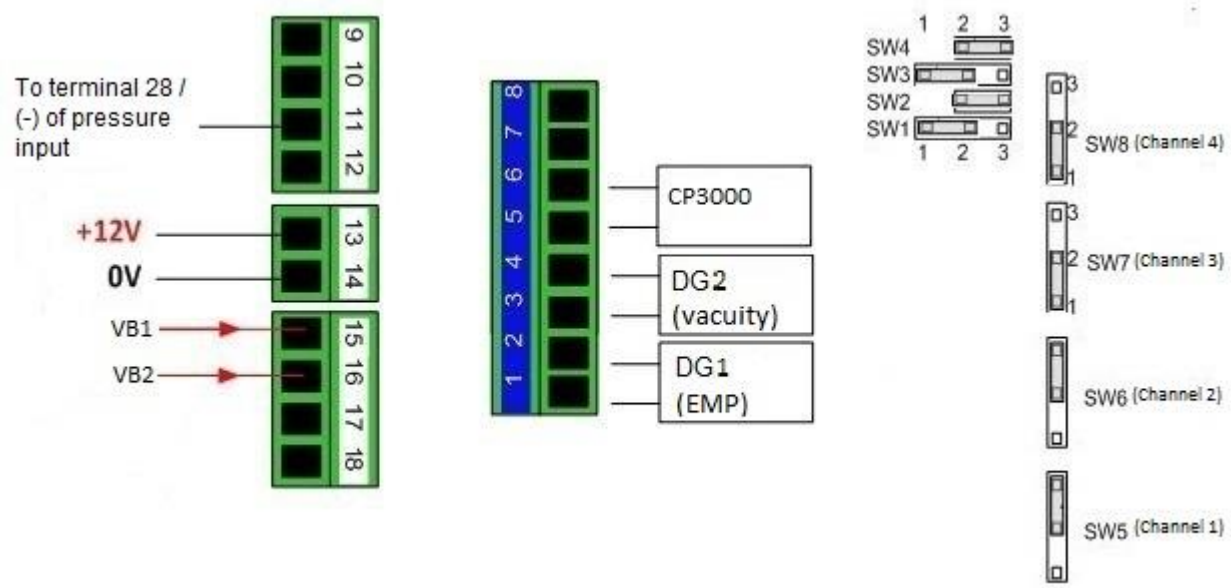


NT IN ATEX 506 C

EQUIPMENTS CONNECTED TO THE MICROCOMPT+								EXTENSION BOARD 4DG (IS)			
Option	Equipment	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	END-OF-METERING PROBE	C7			3x0.34	EMP	Mr	1	+	End of metering	Connect the shielding
							Bl	2	-		
	VACUITY SENSOR	C8			3x0.34	VACUITY	Mr	3	+	Vacuity	Connect the shielding
							Bl	4	-		
	DIFFERENTIAL PRESSURE TRANSMITTER	C5			ADR 2x0.34 sh.	PRESSURE	Bc	5	+	Pressure	Connect the shielding
							Mr	6	-		

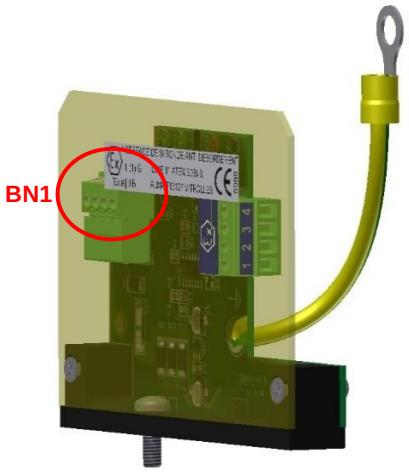
**Refer to the Cable Glands Installation Instruction*

Jumper configuration on the extension board 4DG:



Terminal assignment of the extension board ‘sonde AD’ 5wires (IS)

EXTENSION BOARD SONDE AD 5 wires (IS)

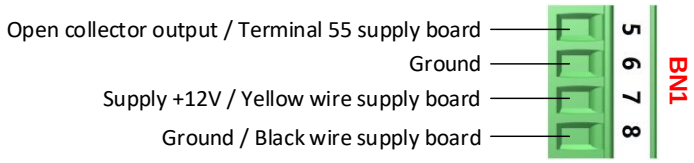


NT IN ATEX 510 C

EQUIPMENTS CONNECTED TO THE MICROCOMPT+								EXTENSION BOARD SONDE AD (IS)			
Option	Equipement	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
•	OVERFILL PREVENTION PROBE	C7			*[6x1]*	Common	*[Nr]*	1	-	Overfill prevention probes	*[If cable are supplied by ALMA]*
						Supply	*[Rg]*	2	+		
						From probe	*[Or]*	3	From probe		
						To probe	*[Jn]*	4	To probe		

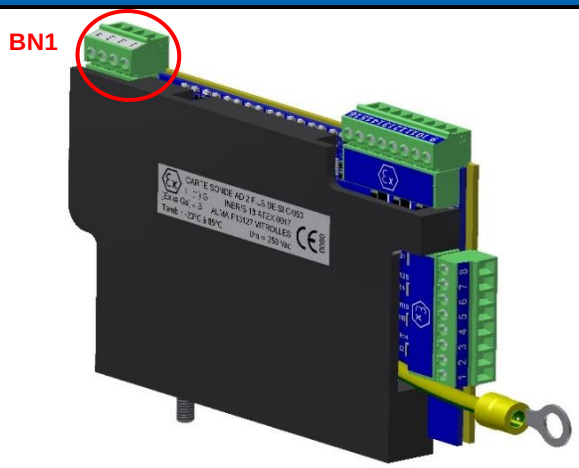
**Refer to the Cable Glands Installation Instructions*

Connection of the BN1-terminal to the MICROCOMPT+ power supply board (non-IS area):



Terminal assignment of the extension board “sonde AD” 2 wires (IS)

EXTENSION BOARD SONDE AD 2 wires (IS)



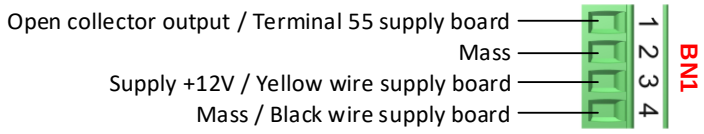
NT IN ATEX 15

EQUIPMENT CONNECTED TO THE MICROCOMPT+							EXTENSION BOARD SONDE AD (IS)				
Option	Equipment	Cable (for information) No.	CG*	Alma	Type	Function	Terminal	Function		Colour	Observation
•	OVERFILL PREVENTION PROBE 1					Supply	1	Supply +	SIGNAL PROBE 1	Mr	
						Common	2	Common		Bc	
•	OVERFILL PREVENTION PROBE 2					Supply	3	Supply +	SIGNAL PROBE 2	Rg	
						Common	4	Common		Bc	
•	OVERFILL PREVENTION PROBE 3					Supply	5	Supply +	SIGNAL PROBE 3	Or	
						Common	6	Common		Bc	
•	OVERFILL PREVENTION PROBE 4					Supply	7	Supply +	SIGNAL PROBE 4	Jn	
						Common	8	Common		Bc	
•	OVERFILL PREVENTION PROBE 5					Supply	9	Supply +	SIGNAL PROBE 5	Vt	
						Common	10	Common		Bc	
•	OVERFILL PREVENTION PROBE 6					Supply	11	Supply +	SIGNAL PROBE 6	Bl	
						Common	12	Common		Bc	
•	OVERFILL PREVENTION PROBE 7					Supply	13	Supply +	SIGNAL PROBE 7	Vi	
						Common	14	Common		Bc	
•	OVERFILL PREVENTION PROBE 8					Supply	15	Supply +	SIGNAL PROBE 8	Gr	
						Common	16	Common		Bc	

**Refer to the Cable Glands Installation Instructions*

- This extension board only works with two-wire optic overfill prevention probes.
- A Dummy device is a two-wire dry probe simulator. Channels that are not connected to overfill prevention probes must be connected to a Dummy device. None of the 8 channels must be open.
- Do not install the Dummy into the MICROCOMPT housing.
- If the MICROCOMPT is off, the probes and the Dummy device shall be electrically isolated.

Connection of the BN1-terminal to the MICROCOMPT+ power supply board (non-IS area):



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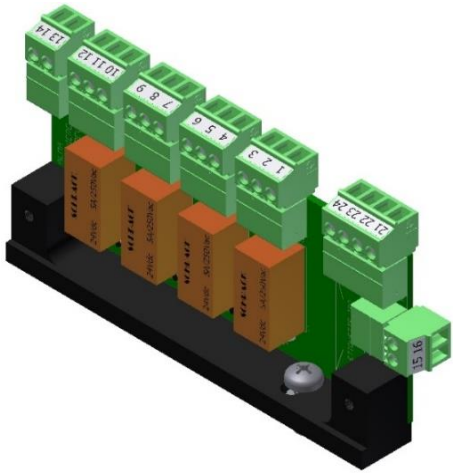
Terminal assignment of the relay extension board

RELAY EXTENSION BOARD (used to control a minimum 5W spool valve)



EQUIPEMENT CONNECTED TO THE MICROCOMPT+								RELAY EXTENSION BOARD			
Option	Equipement	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
•	DRIVER' CAB CONTROL		3x1			Start engine		1	NC	Start engine	Dry contact
								2	Common		
								3	NO		
			3x1			Stop engine		4	NC	Stop engine	Dry contact
								5	Common		
								6	NO		

**Refer to the Cable Glands Installation Instructions*

Factory pre-wiring:

INTERFACE POWER SUPPLY BOARD								EXTENSION BOARD 4-RELAIS			
Option	Equipment	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	POWER SUPPLY					Supply	Bl	15	24VDC	Supply	
						Mass	N	16	0V		
	MOTOR CONTROL					Engine control	22	21		Engine control	
							23	22			

On the extension board 4-relays, cut the diodes D3 and D4 off.

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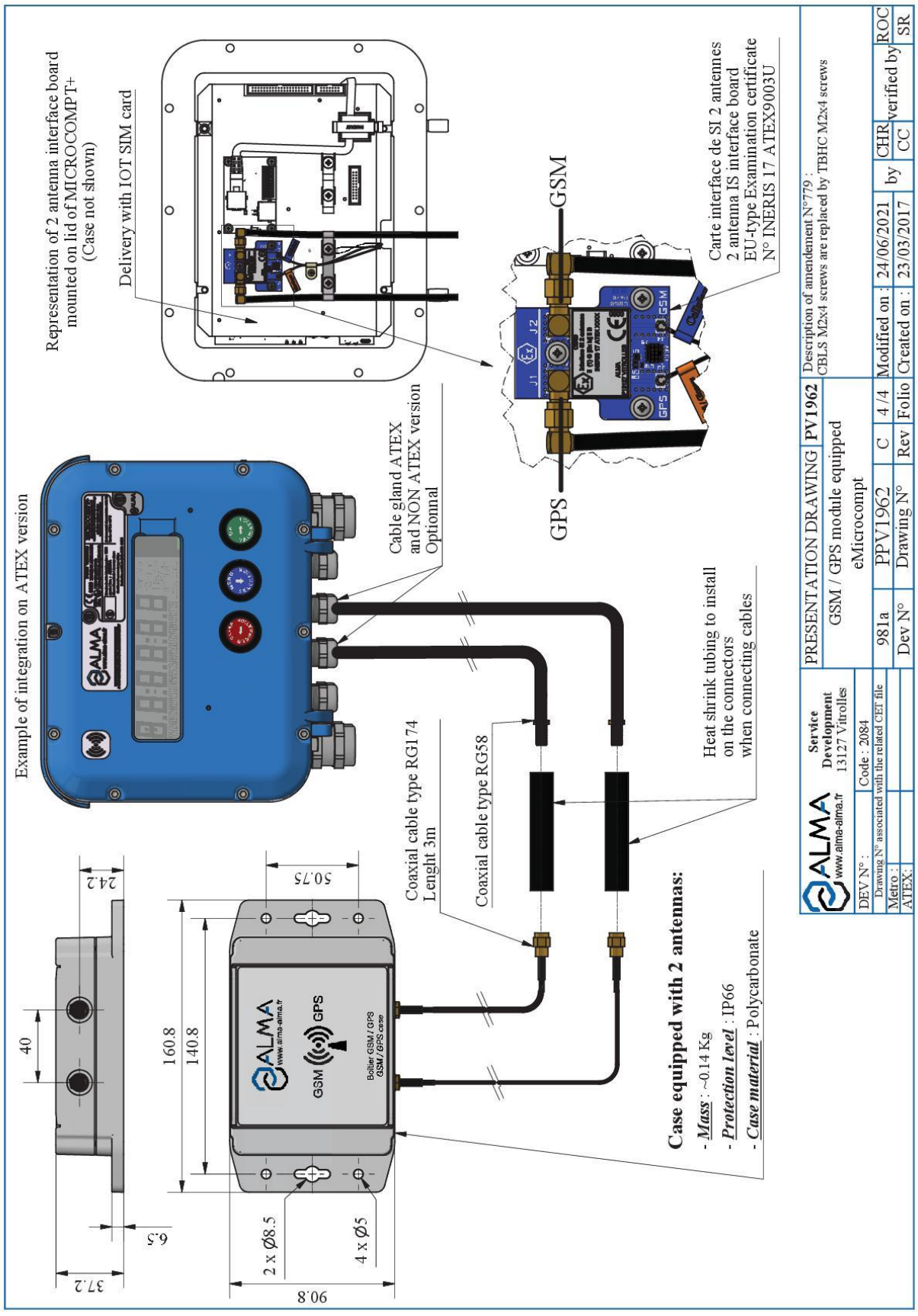
5.3. GSM/GPS MODULE EQUIPPED – 2-ANTENNA BOX



Document available on website alma-alma.fr

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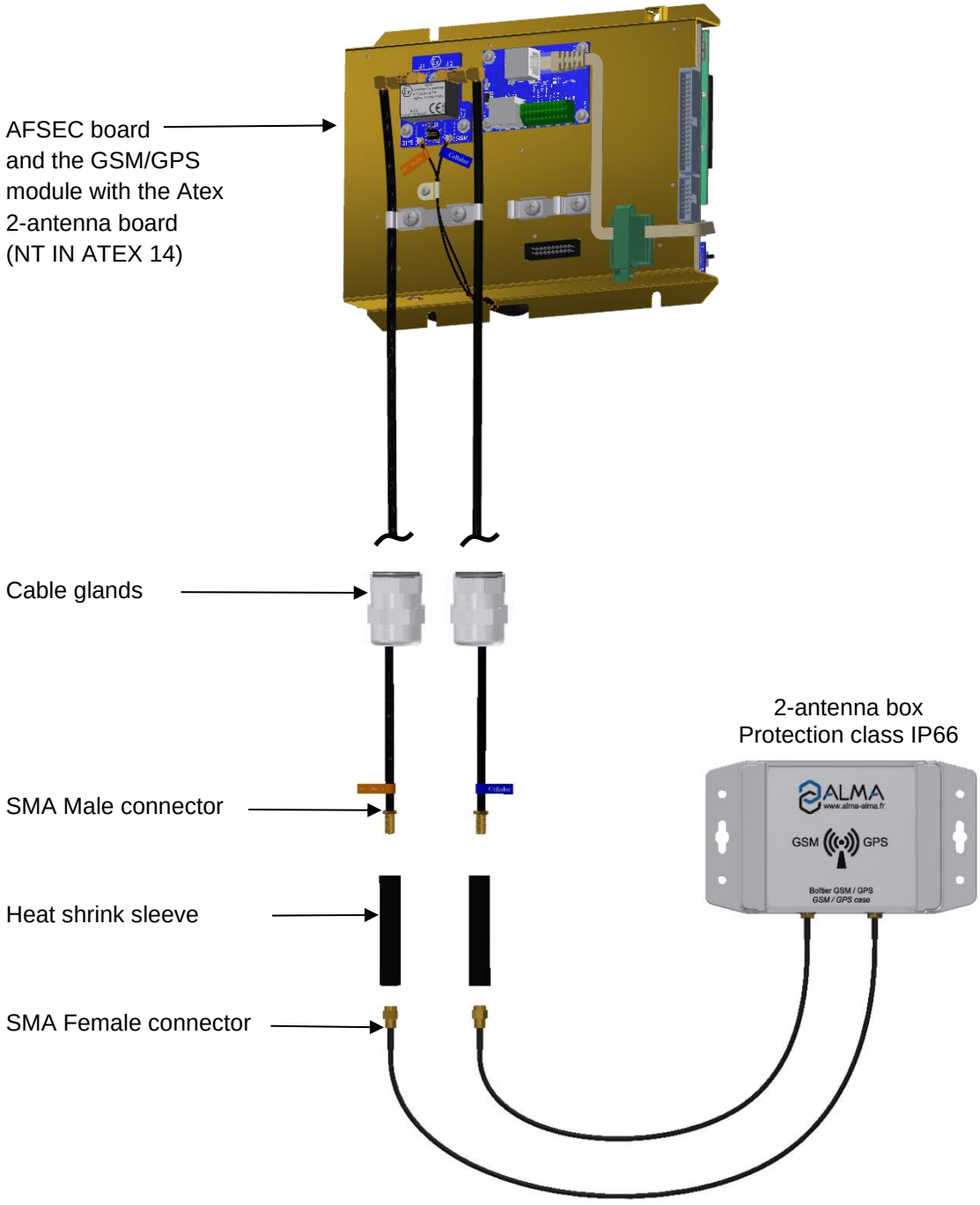
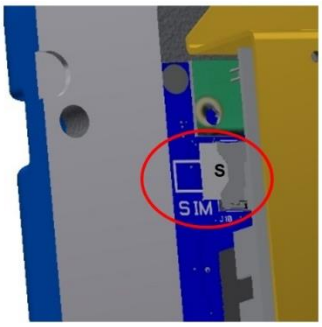
Mounting and wiring of the GSM and GPS antennas



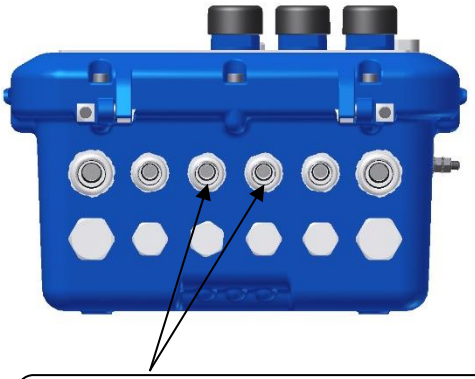
The 2-antenna board is supplied with a micro-SD card mounted as follows:



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.



RECOMMENDED CABLE GLANDS
(FOR INFORMATION ONLY)

Into the MICROCOMPT+, adjust the cable length to easily open and close the cover. Make sure to prevent damage to the cable.

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).

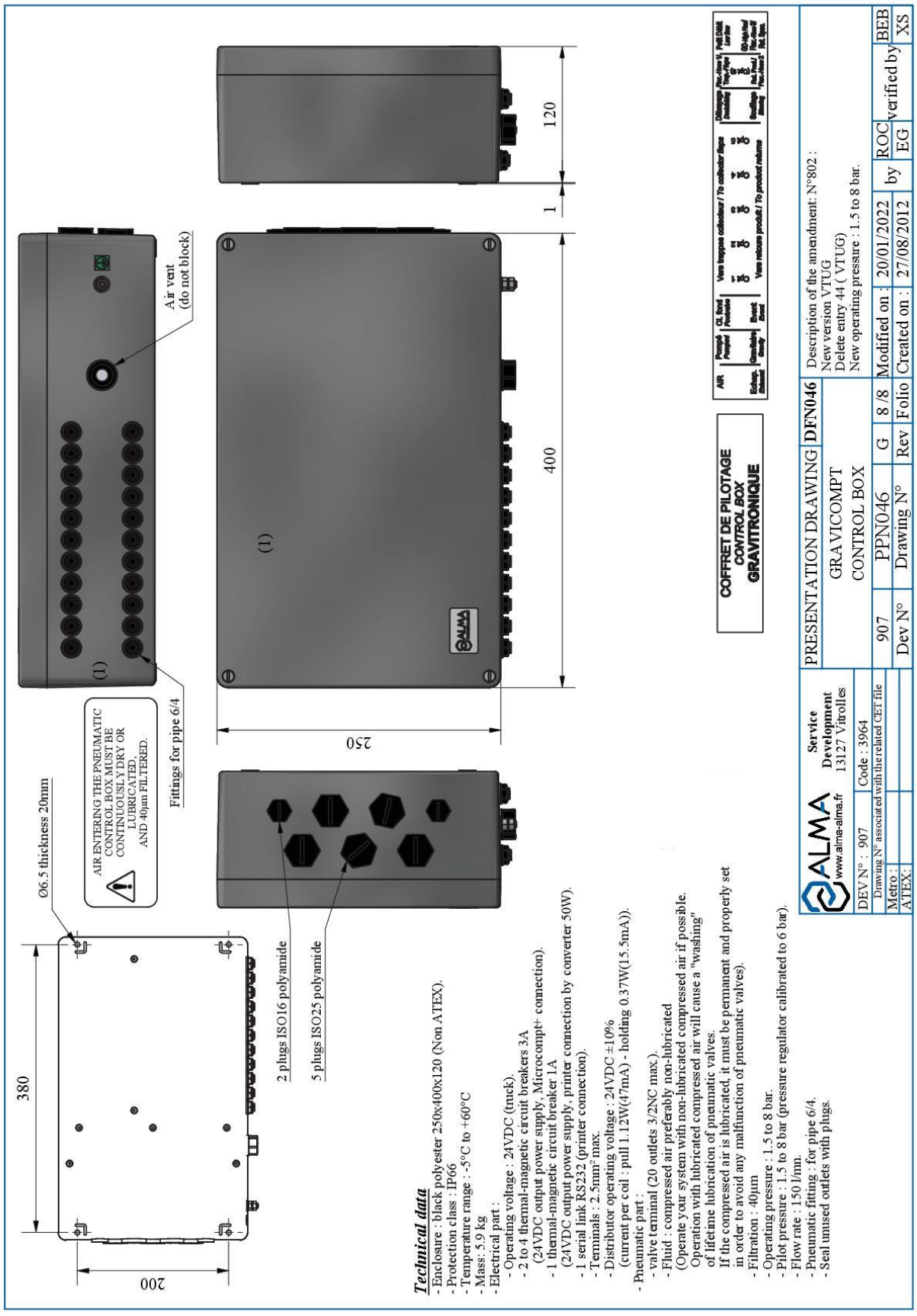
Position and heat up the sleeve on the connectors to prevent corrosion and humidity.

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

5.4. CONTROL BOX GRAVITRONIQUE

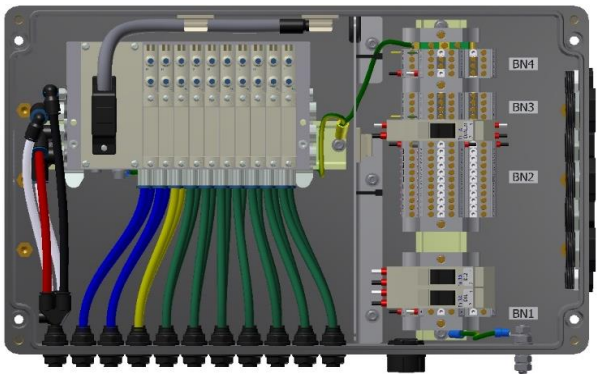


Document available on website alma-alma.fr

Electrical wiring control box

The control box limits the number of flaps and product returns to 6.

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
	LOW FLOW				Bc	BN2	1	Low flow	63	C3	3/4"NPT	20x1	Lox flow of an API adaptor (in case of a double- stage API adaptor, Low Flow is operated with the gravity output control)
	GRAVITY SELECTION VLAVE							Gravity					Selection valve gravity distribution
	PUMPED SELECTION VALVE				Mr		2	Pumped	62				Selection valve pumped distribution
	CONROL MANIFOLD VENT VALVE				Vt		3	Vent valve	78				Vent valve control
	FOOTVALVES				Jn		4	Footvalves	64				Footvalves control
	PRODUCT RETURN CONTROL				Gr		5	Return 1	65				Product return 1to 5
					Bl		7	Return 2	66				
					Nr		9	Return 3	67				
					Gr/Rs		11	Return 4	44				
					Bc/Vt		13	Return 5	45				
	FLAPS CONTROL				Gr		6	Flap 1	39				Flap control compartments 1to 5
					Rg		8	Flap 2	40				
					Vi		10	Flap 3	41				
					Rg/Bl		12	Flap 4	42				
					Mr/Vt		14	Flap 5	43				
	BLOWING				Bc/Jn		15	Blowing	68				Product return blowing
	MOTOR ACCELERATION or DECLUTCHING				Jn/Mr		16	Motor acceleration or pump declutching	73				
	HOSE 1				Bc/Gr		17	Hose 1 or Flap 6	76				Selection valve hose 1(pumped) or Flap control compartment 6
	HOSE 2				Gr/Mr		18	Hose 2 or Return 6	77				Selection valve hose 2 (pumped) or product return compartment 6
	GRAVITY HIGH FLOW or HOSE 3				Bc/Rs		19	High flow or Flexible 3	75				High flow of an API adaptor or Selection valve hose 3 (pumped)

**Refer to the Cable Glands Installation Instructions*

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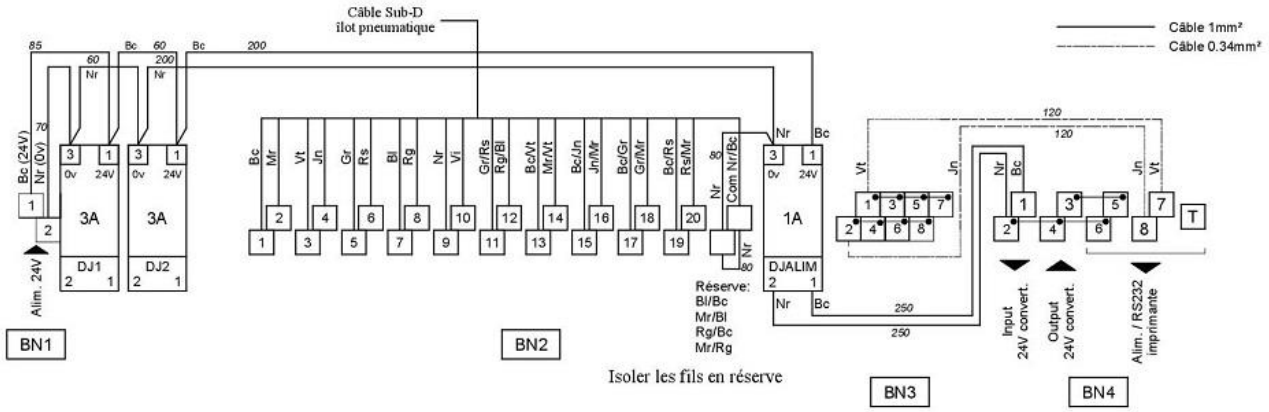
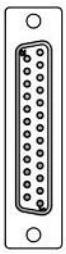


EQUIPMENTS CONNECTED TO THE CONTROL BOX								TERMINAL BLOCKS OF THE CONTROL BOX			
Option	Equipments	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Block	Terminal	Function	Observation
	SUPPLY	A1			2x1	24VDC	1 / Bc	BN1	1	24VDC	Supply	24VDC truck battery (after battery switch and protected by a fuse)
						0V	2 / Nr		2	0V		
	MICROCOMPT+ (Supply and RS232)	C2			4x1 bl.	24VDC	1 / Bc	DJ1	1	24VDC	Supply Microcompt	Supply DJ1circuit 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 îlot*	*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	-	-



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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)
Pumped		X	Pumped way selection	
Gravity		X	Gravity way selection	
Footvalve		X	Opening footvalve	
Vent		X	Opening manifold vent	Connection to the vent valve
Collector flap Cpt 1		X	Opening flaps compartments 1 to 5	Connection to the manifold flaps compartments 1 to 5
Collector flap Cpt 2		X		
Collector flap Cpt 3		X		
Collector flap Cpt 4		X		
Collector flap Cpt 5		X		
Product return Cpt 1		X	Product returns compartments 1 to 5	Connection to the product returns compartments 1 to 5
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/ Collector flap Cpt 6		X	Hose 1 valve control or Opening flap compartment 6	Connection to the product return compartment6
Hose 2/ Product return Cpt 6		X	Hose 2 valve control or Product return compartment 6	Connection to the manifold flap compartment 6
Low Flow		X	API adaptor open in low flow	Connection to the API adaptor (HF – LF)
High Flow/ Hose 3/ Ret. Spec.		X	API adaptor open in high 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).

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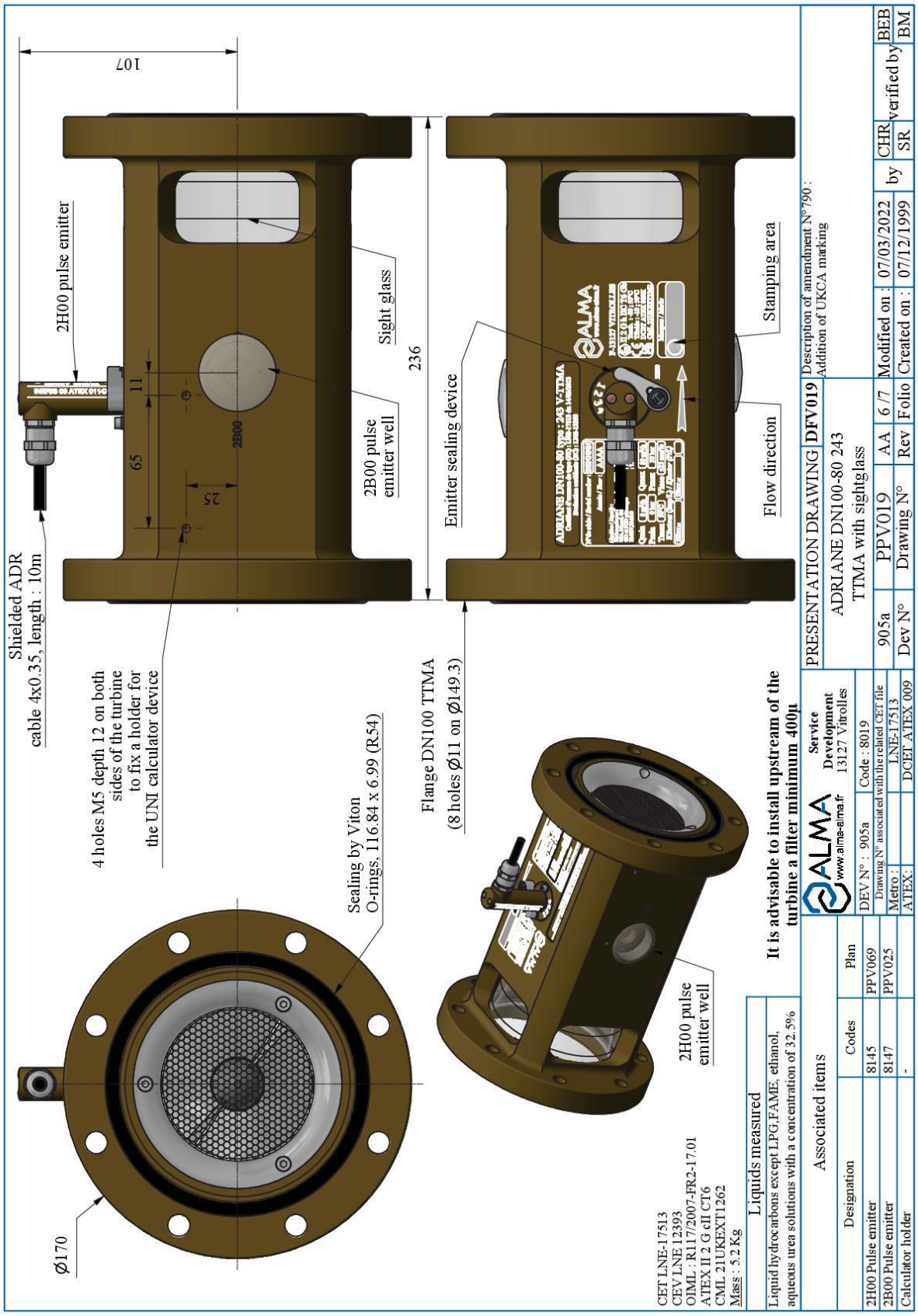
6. ADRIANE TURBINE METER

6.1. TURBINE METER ADRIANE DN100-80 243 TTMA WITH SIGHTGLASS



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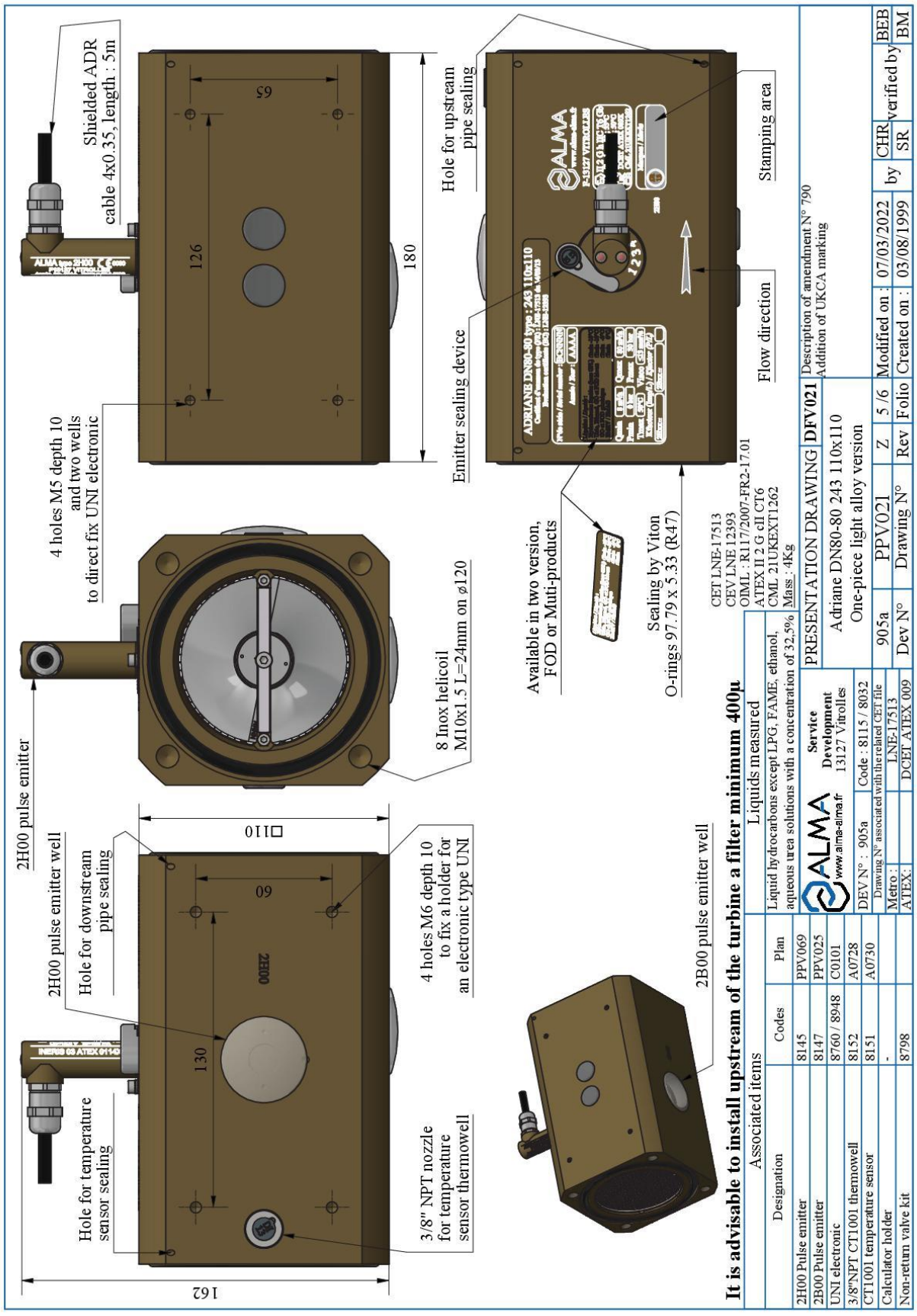
6.2. TURBINE ADRIANE DN80-80 243 110x110



It is advisable to install upstream of the turbine a filter minimum 400µ

Associated items

Designation	Codes	Plan
2H00 Pulse emitter	8145	PPV069
2B00 Pulse emitter	8147	PPV025
UNI electronic	8760 / 8948	C0101
3/8"NPT CT1001 thermowell	8152	A0728
CT1001 temperature sensor	8151	A0730
Calculator holder	-	
Non-return valve kit	8798	

Liquids measured

Liquid hydrocarbons except LPG, FAME, ethanol, aqueous urea solutions with a concentration of 32,5%

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

DEV N° : 905a — Code : 8115 / 8032
Drawing N° associated with the related CET file
Metro : LNE-17513
ATEX : DCET ATEX 009

PRESENTATION DRAWING **DFV021**

Adriane DN80-80 243 110x110
One-piece light alloy version

905a	PPV021	Z	5 /6
Dev N°	Drawing N°	Rev	Folio

Description of amendment N° 790
Addition of UKCA marking

Modified on :	07/03/2022	by	CHR	verified by	BEB
Created on :	03/08/1999		SR		BM

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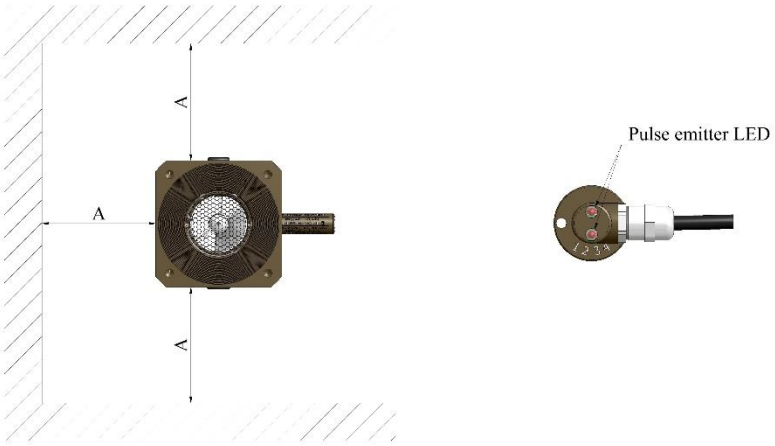
6.3. INSTALLATION AND SEALING RECOMMENDATIONS ADRIANE TURBINE METER

- 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.



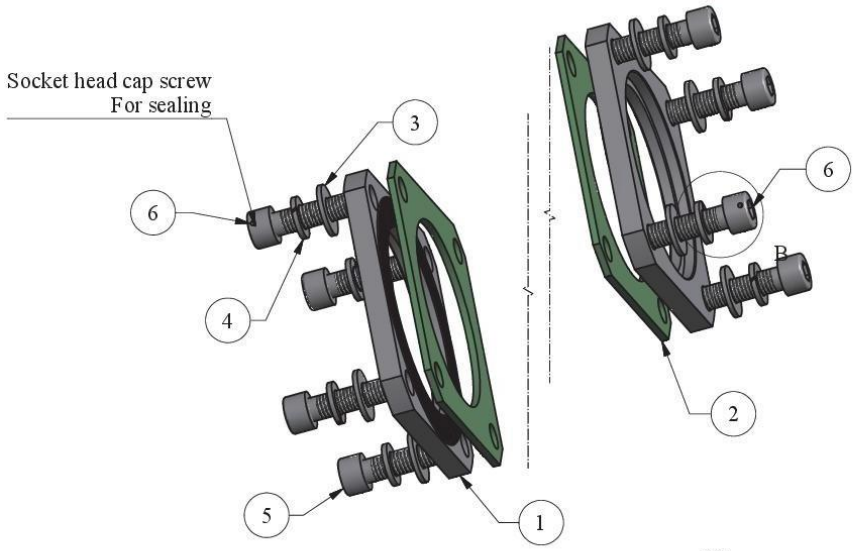
- Refer to the certificate written on the identification plate of the measuring system to suit the sealing requirements
- No loose lead wire on the sealing devices

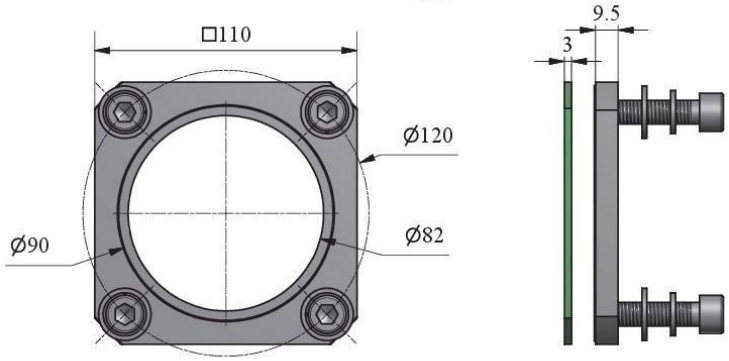
For accuracy class 0.5 and 1.0 measuring systems, the pipes and equipment upstream or downstream the turbine meter must have the same nominal diameter as the meter on a length at least equal to 10 times this diameter upstream and 5 times this diameter downstream.

These lengths can be straight or bent.

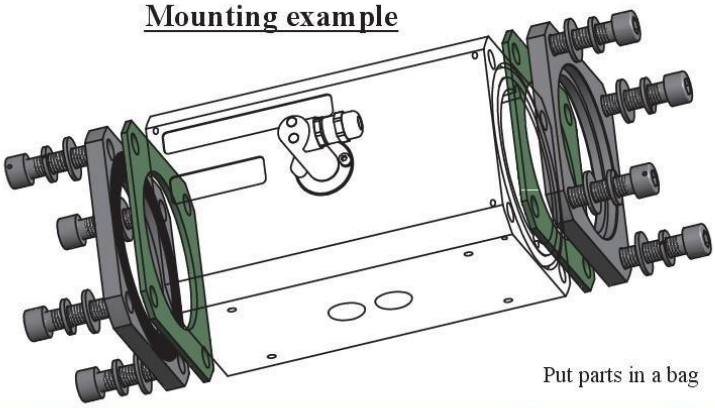
It is mandatory that no flowrate adjustment device (e.g. a variable-opening valve) is located upstream at a distance less than 10 times the nominal diameter of the meter. Do not create derivation circuits with sample or bypass, specially make sure that no nozzle is present on this pipe.

6.4. CONNECTION KIT ADRIANE DN80





Mounting example



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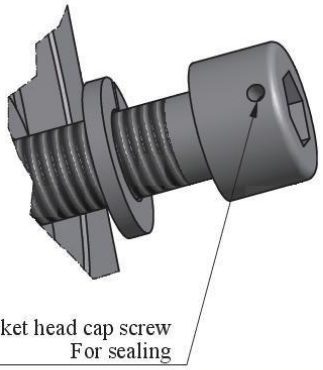

Rep	Qty	Item description	Material	Reference	Rev.	Mdf	Code	Observation
1	2	Steel backflange DN80 110x110	E24 steel	PN0159	A		9205	
2	2	Flat gasket DN80 110x110	Kingersil C-4430	PN0158	A		9206	
3	8	Washer M M10 (NFE 25-514)	Stainless A4-70				8430	
4	8	WasherW M10 (DIN 127)	Stainless A4-70				8474	
5	6	CHC screw M10 x 40 (ISO 4762)	Stainless A4-70				8630	
6	2	CHC screw M10 x 40 (ISO 4762) with head pierced	Inox A4-70	PN0030	B	A	8237	

ALMA www.alma-alma.fr Service Development 13127 Vitrolles		Connection kit 110 x 110 Adriane DN80 24X			Description of amendment N°530 Integration of drill head screws						
Mat:											
Tol : ± 0.2	Code : 0389										
Drawing N° associated with the related CET file		905	PV1675	B	2 /2	Modified on :	17/02/2017	by	CC	verified by	SR
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on :	30/03/2016		CC		SR
ATEX:											

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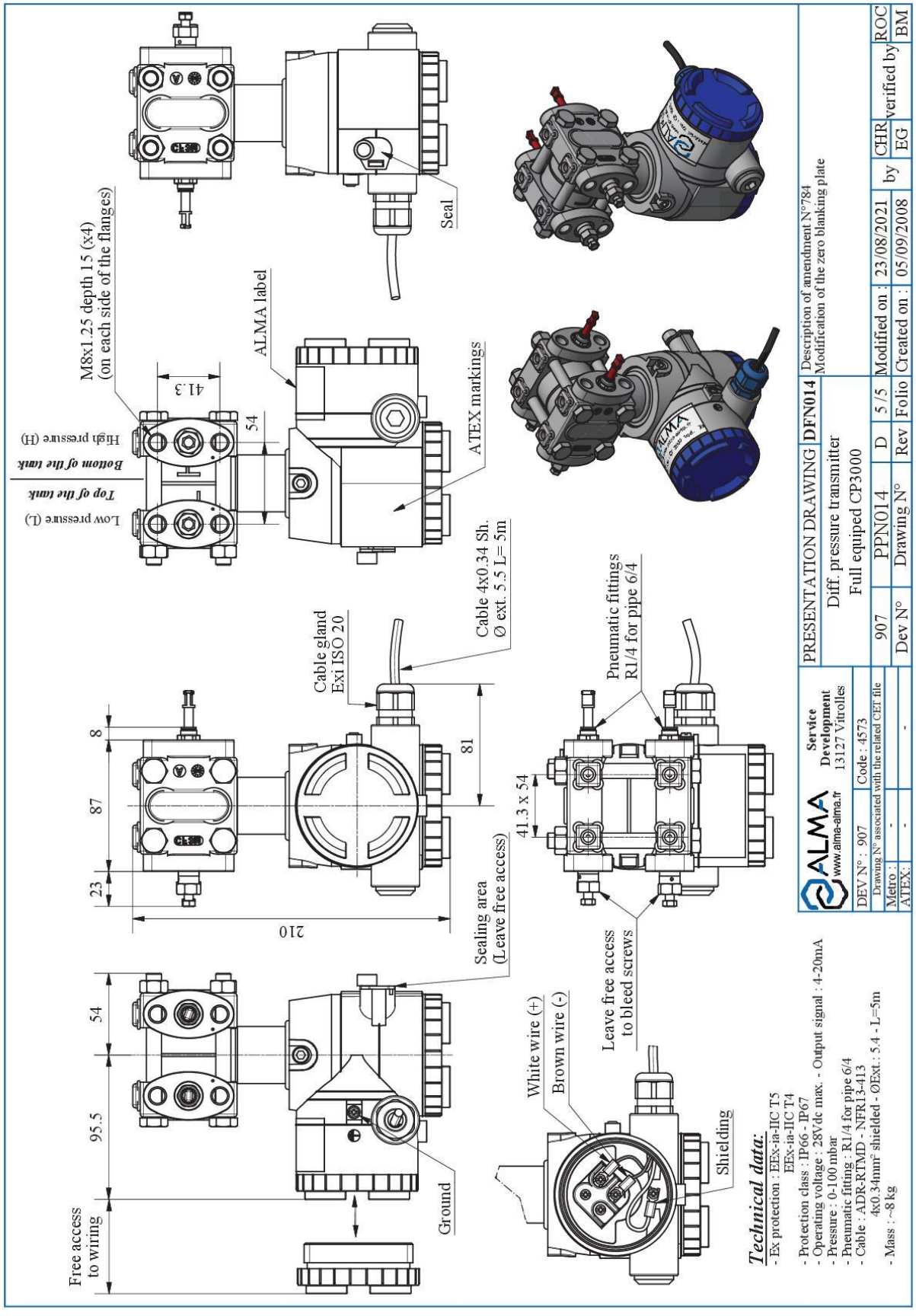
7. DIFFERENTIAL PRESSURE TRANSMITTER CP3000 ATEX



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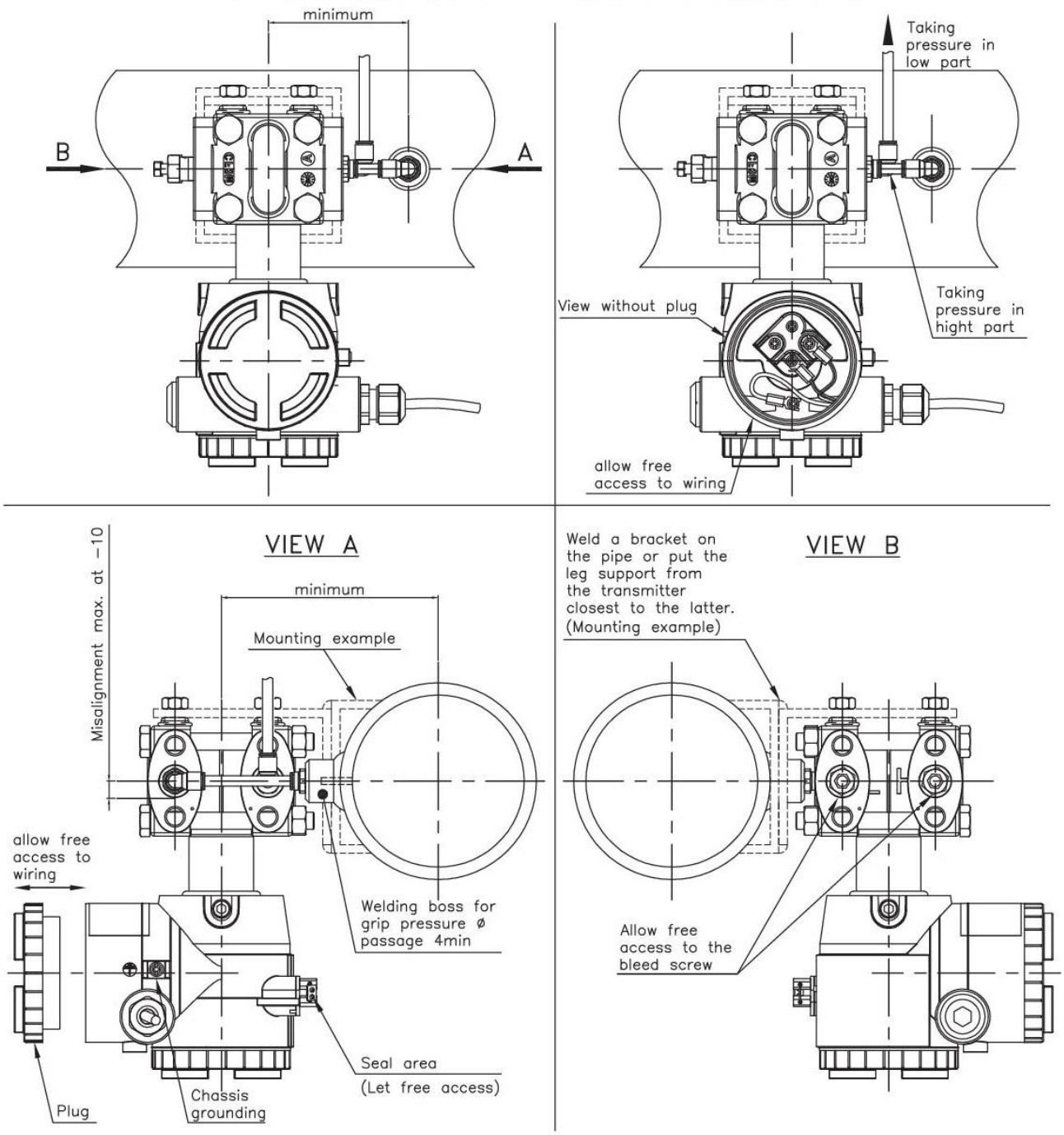
7.1. INSTALLATION RECOMMENDATIONS CP3000 ATEX

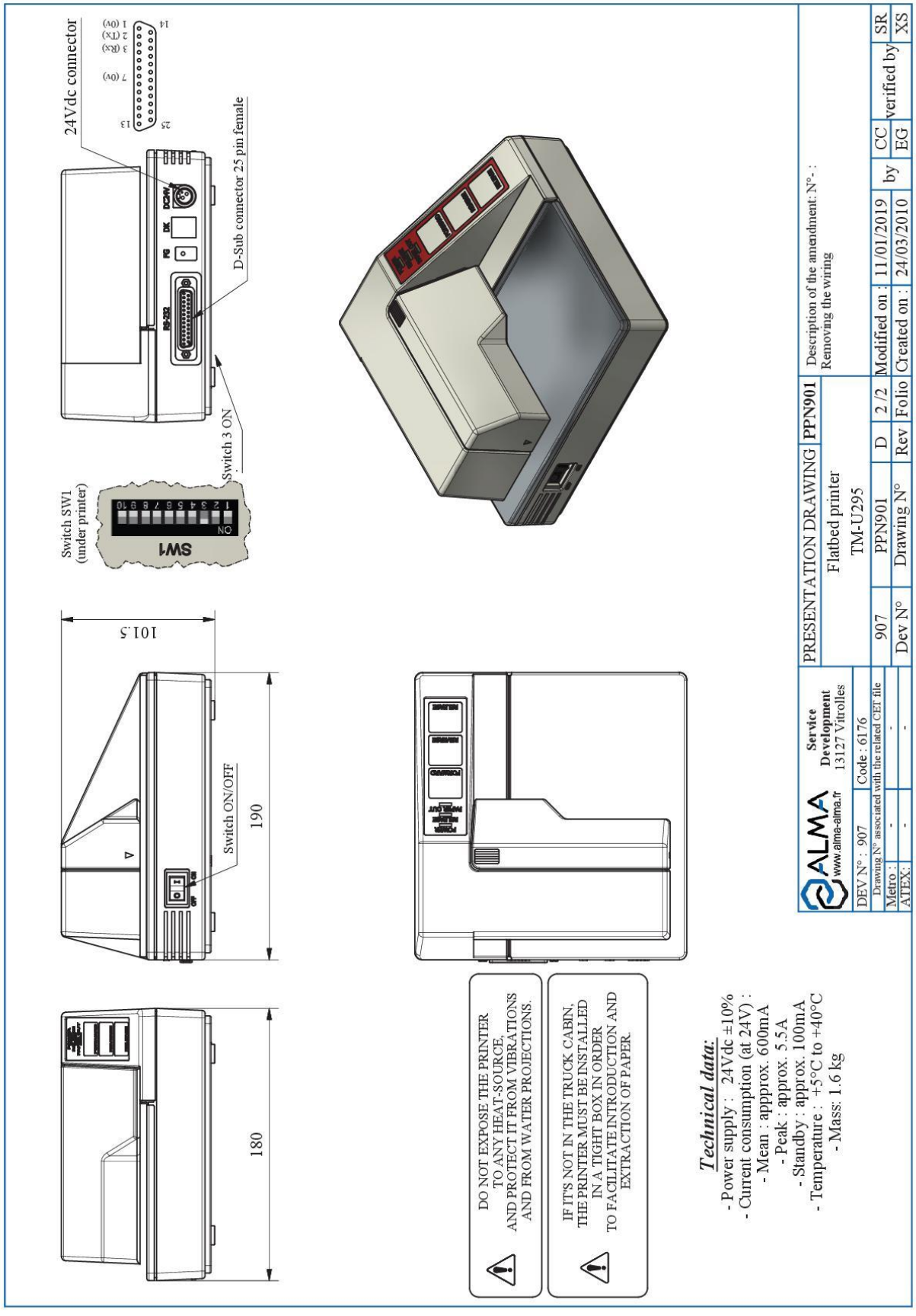
THE PRESSURE TRANSMITTER MUST BE INSTALLED IN UPRIGHT POSITION



REFER TO INSTRUCTION MANUAL

(DELIVERED WITH THE EQUIPMENT AND AVAILABLE ON ALMA WEBSITE)

8. PRINTER KIT



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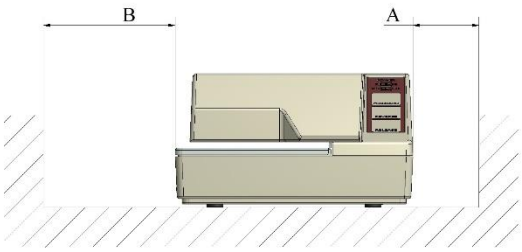
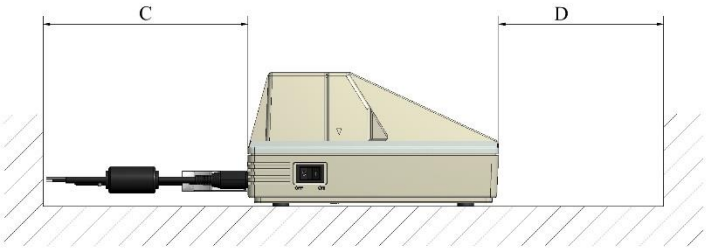
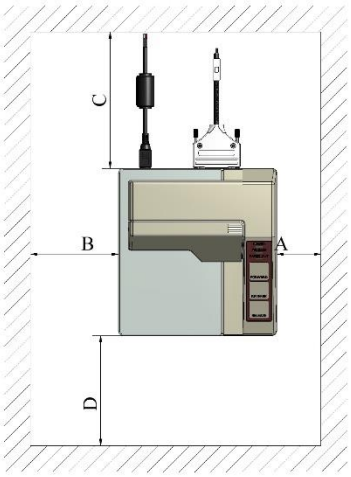
8.1. INSTALLATION RECOMMENDATIONS PRINTER

- 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.

8.2. ELECTRICAL WIRING PRINTER

Supply cable

PRINTER SUPPLY CABLE						
						
CONVERTER 220VAC/24VCC					**PRINTER**	
Option	**Equipment**	**Function**	**Colour**		**Function**	**Observation**
●	CONVERTER 220VCC/24VDC	24VDC	Nr	White- coated (Bc)	PRINTER SUPPLY	Cable: 2x9mm2 External diameter: 5mm Length : 1,50m
		0V	Bc	Red- coated (Rg)		
		Shielding	Braid			

Serial link cable

PRINTER SERIAL LINK CABLE											
											
								PRINTER			
Option	**Equipment**	**Cable (for information)**				**Function**	**Colour or No.**	**Colour**	**Function**		**Observation**
		No.	**CG***	**Alma**	**Type**						
					ADR 4x0.34 sh.			**Bc**	Rx	PRINTER SERIAL LINK	External diameter: 5.4mm Length: 10m or 25m
								Mr	Tx		
								Vt	0V		
								Jn	Not used		
								Braid	Shielding		

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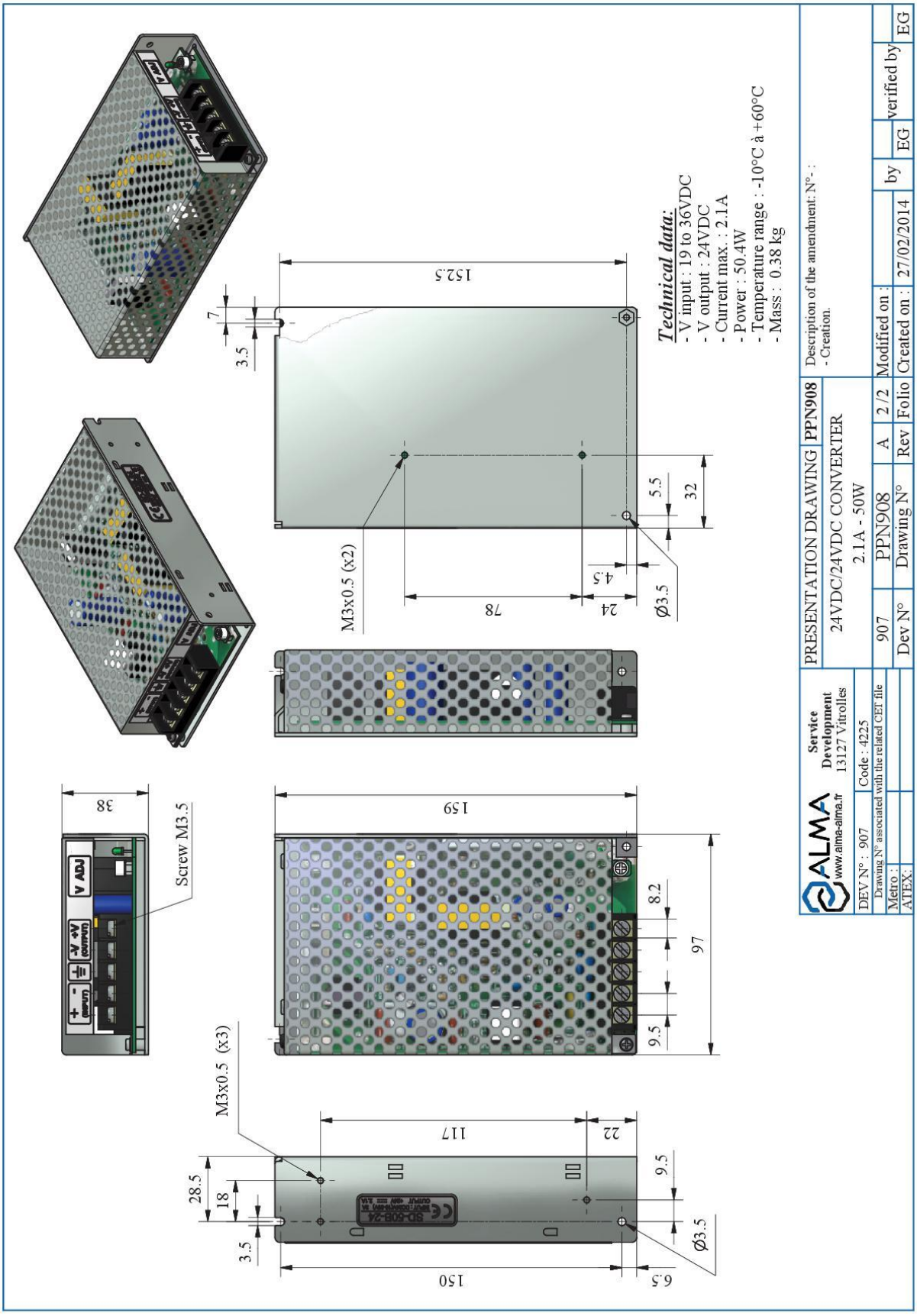
9. CONVERTER 24VDC/24VDC 2.1A 50W



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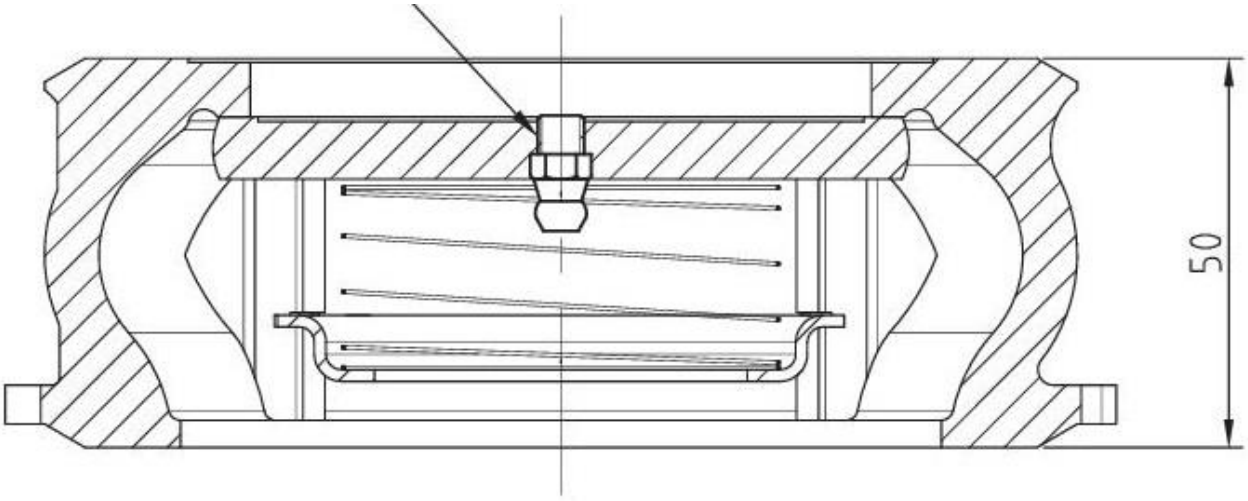
10. DN80 NON-RETURN VALVE KITS

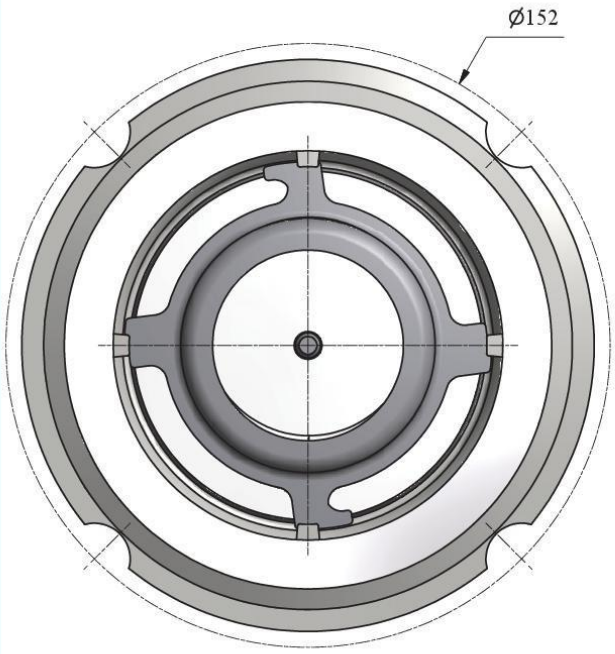
10.1. DN80 NON RETURN VALVE KIT, 0.03 BAR CALIBRATED

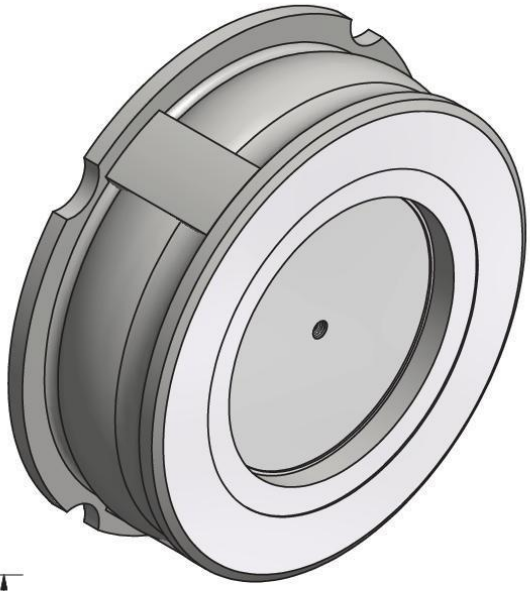
DIMENSIONS FOR DN80 NON-RETURN VALVE KIT – 0.03 bar calibrated:

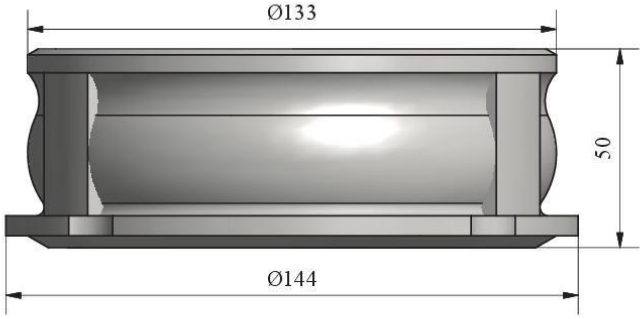
∅144



10.2. DN80 NON RETURN VALVE KIT, 0.3 BAR CALIBRATED (EMPTY HOSE OPTION)







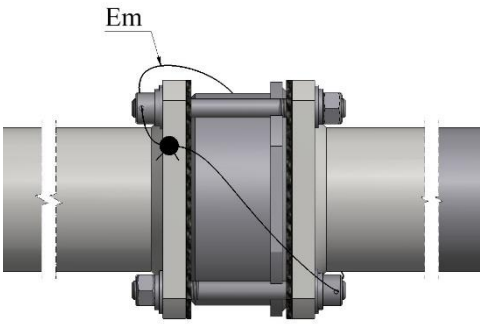
- ***Mass*** : ~ 2.5Kg
- ***Material*** : Inox 316L
- ***Operating temperature*** : -10°C to +350°C
- ***Permissible operating pressure*** : 40 bar
- ***Maximum permissible pressure*** : - Liquid 1: 25 bar - Liquid 2: 40 bar
  - Gas 1: 12 bar - Gas 2: 40 bar
- ***Pressure drop*** : 0.2 bar at 50 m3/h
- ***Mounting*** : Between downstream flange of the turbine
- ***Tightness*** : Flat gasket
- ***Standards*** : - CE conformity directive 97/23/CE
  - CE ATEX conformity directive 94/9/CE

ALMA www.alma-alma.fr Service Development 13127 Vitrolles		Kit non return valve, calibrated at 0.3 bar Adriane DN80 24X				Description of amendment N°					
Mat:											
Tol : ± 0.2	Code : 8798										
Drawing N° associated with the related CET file		905a	PV1908	A	2 /2	Modified on :		by		verified by	
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on :	29/03/2016		CC		SR
ATEX:											

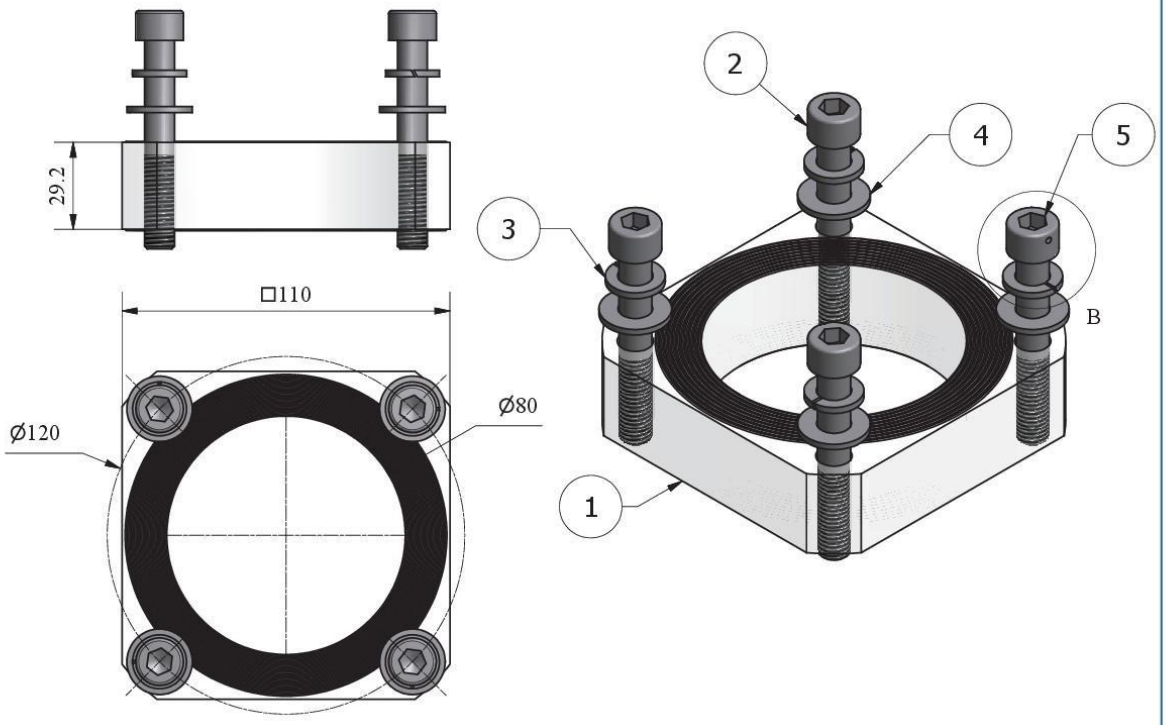
Document available on website alma-alma.fr

10.3. INSTALLATION RECOMMENDATIONS DN80 NON-RETURN VALVE KIT

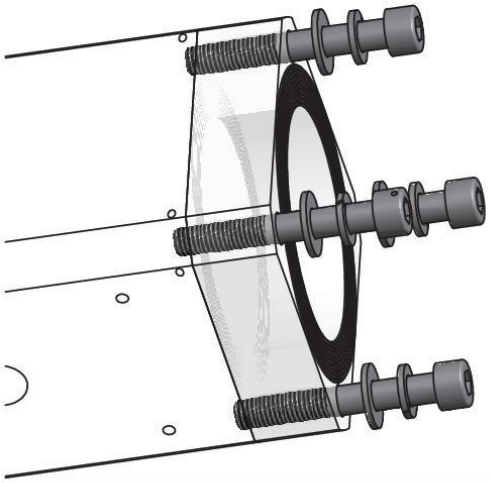
- Refer to the certificate written on the identification plate of the measuring system to suit the sealing requirements
- No loose lead wire on the sealing devices



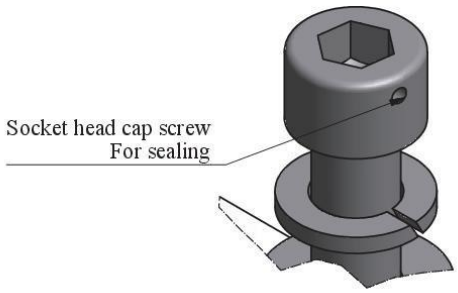
11. SIGHTGLASS KIT 110x110 ADRIANE TURBINE METER DN80



Mounting example



B (1.5 : 1)



Put parts in a bag

Rep	Qty	Item description	Material	Reference	Rev.	Mdf	Code	Observation
1	1	Sightglass DN80 110X110	Moulded PMMA	A0533	B		0908	
2	3	CHC screw M10 x 70 (ISO 4762)	Stainless A4-70				8595	
3	1	Washer W M10 (DIN 127)	Stainless A4-70				8474	
4	1	Washer M M10 (NFE 25-514)	Stainless A4-70				8430	
5	1	CHC screw M10 x 70 (ISO 4762) with head pierced	Stainless A4-70	PN0030	B	A	3465	

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Mat:
Tol : ± 0.2 | Code : 1091
Drawing N° associated with the related CET file
Metro :
ATEX:

Sightglass kit 110 x 110

Adriane turbine meter DN80 24X

Description of amendment N°530
Integration of drill head screws

905	PV1674	B	2 /2	Modified on :	17/02/2017	by	CC	verified by	SR
Dev N°	Drawing N°	Rev	Folio	Created on :	30/03/2016		CC		SR

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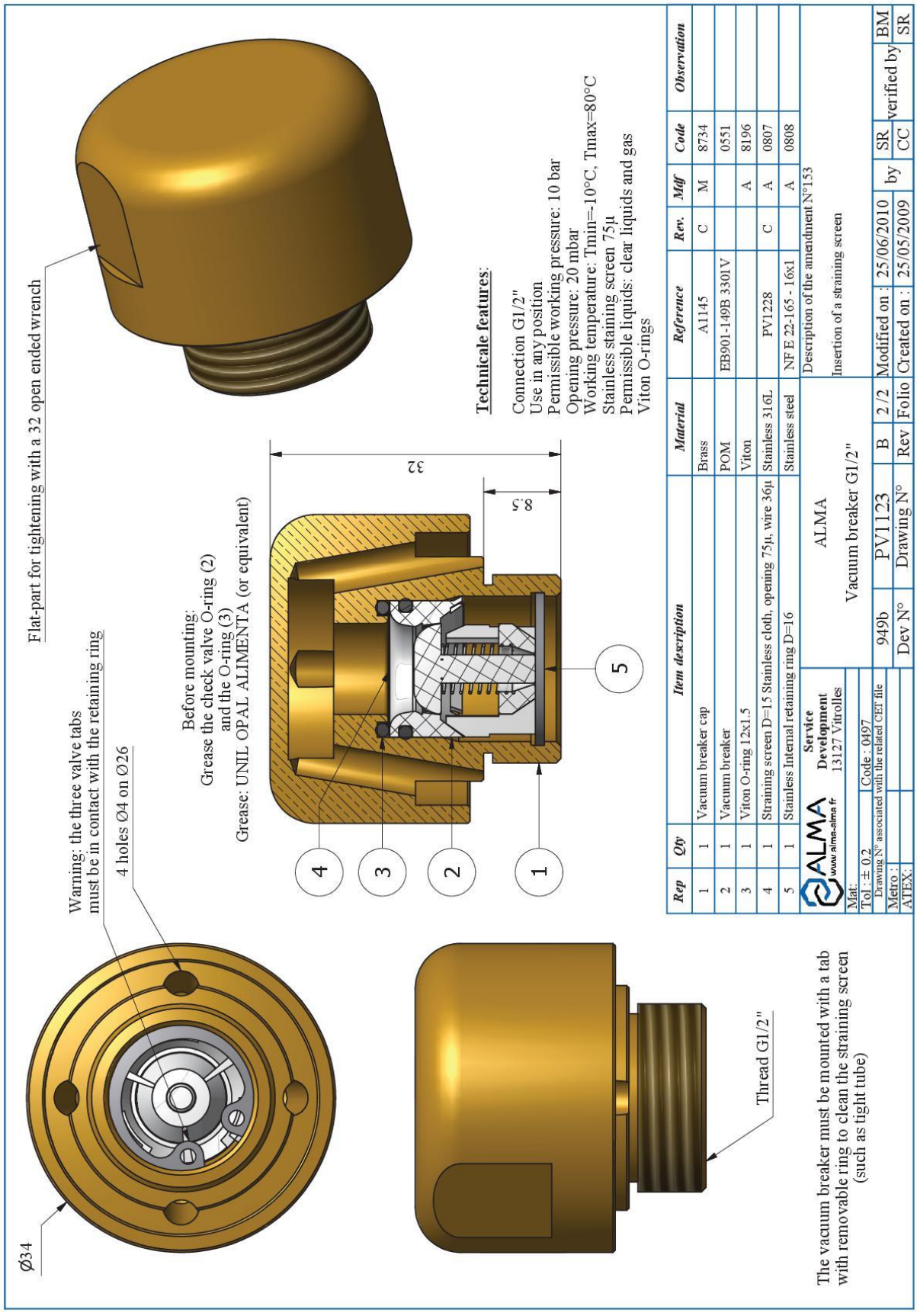
11.1. INSTALLATION RECOMMENDATIONS SIGHTGLASS KIT DN80

- 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

12. VACUUM BREAKER



Rep	Qty	Item description	Material	Reference	Rev.	Mdf	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 13127 Vitrolles
www.alma-alma.fr

ALMA
Vacuum breaker G1/2"

Description of the amendment N°153
Insertion of a straining screen

Mat:		949b	PV1123	B	2 / 2	Modified on :	25/06/2010	by SR
Tol : ± 0.2	Code : 0497	Dev N°	Drawing N°	Rev	Folio	Created on :	25/05/2009	verified by CC
Drawing N° associated with the related CET file								SR
Metro :								BM
ATEX:								

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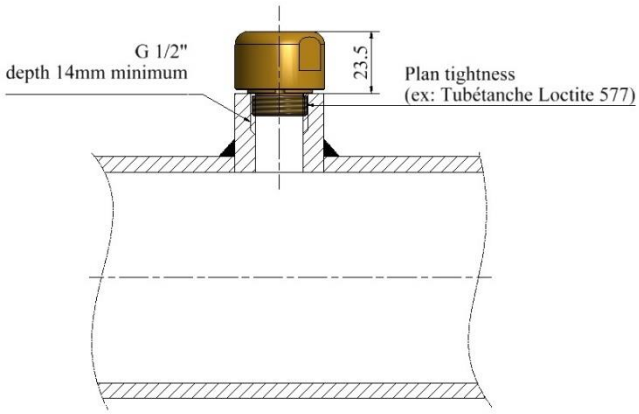
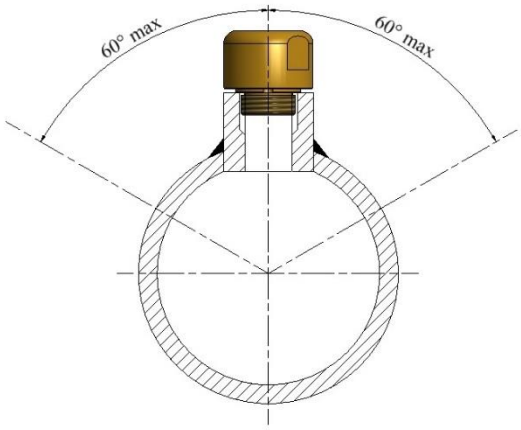
12.1. INSTALLATION RECOMMENDATIONS VACUUM BREAKER

When associated to a measuring device, the vacuum breaker must be installed downstream.





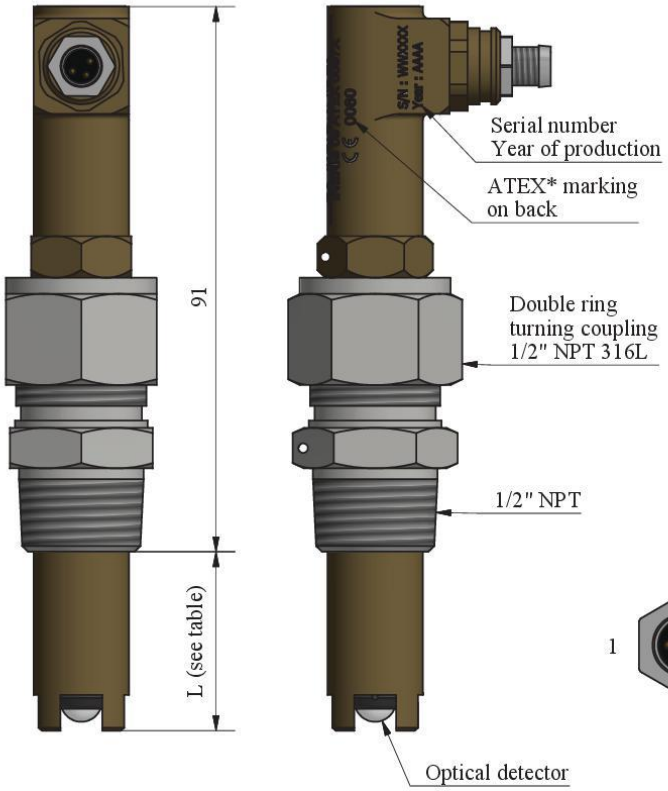
13. END-OF-METERING PROBE / VACUITY SENSOR – DG3001/75

Codification of marking :

DG3001/LLL-Co

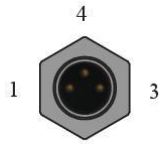
LLL = Maximum Lenght under connection
Co = Connector version

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

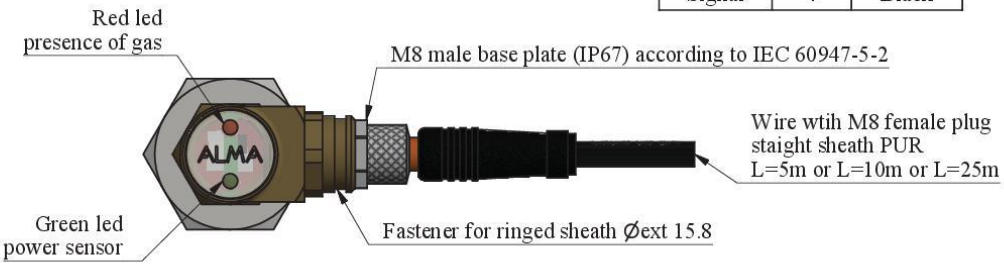


Operation		
Conditions	*Gas*	*Liquid*
Output (mA)	35±2	15±1
Open collector output	Saturated	Blocked
Imax on signal (mA)	30	
Vce (V) for Is=10mA	< 0.4	
State of the red led	On	Off
State of the green led	On	On

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										

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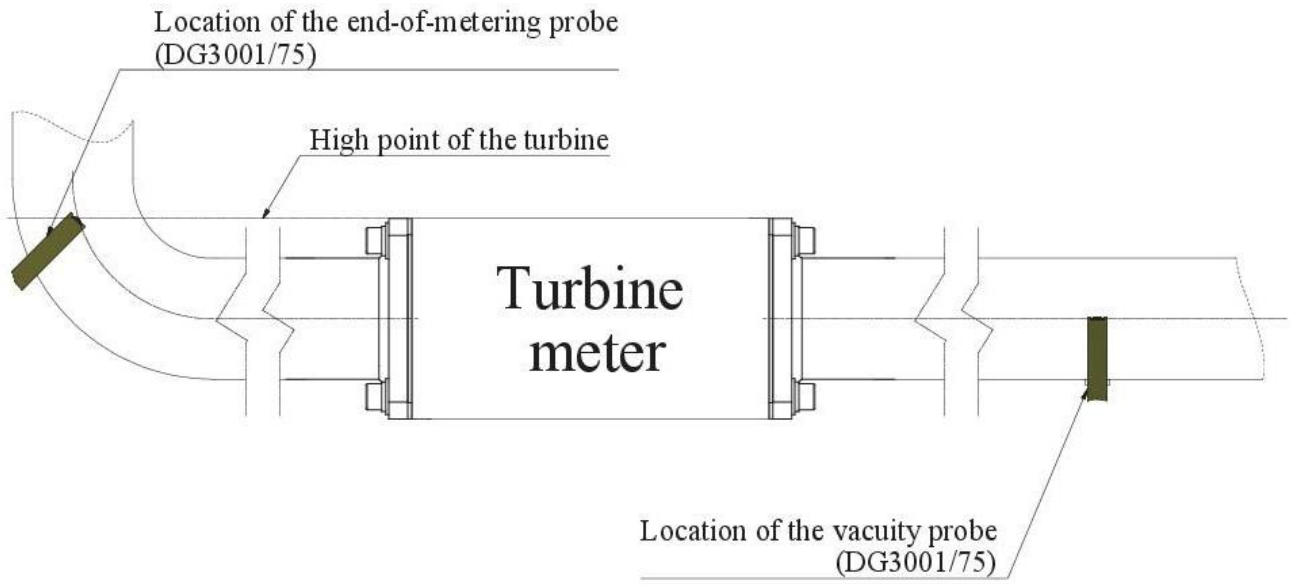
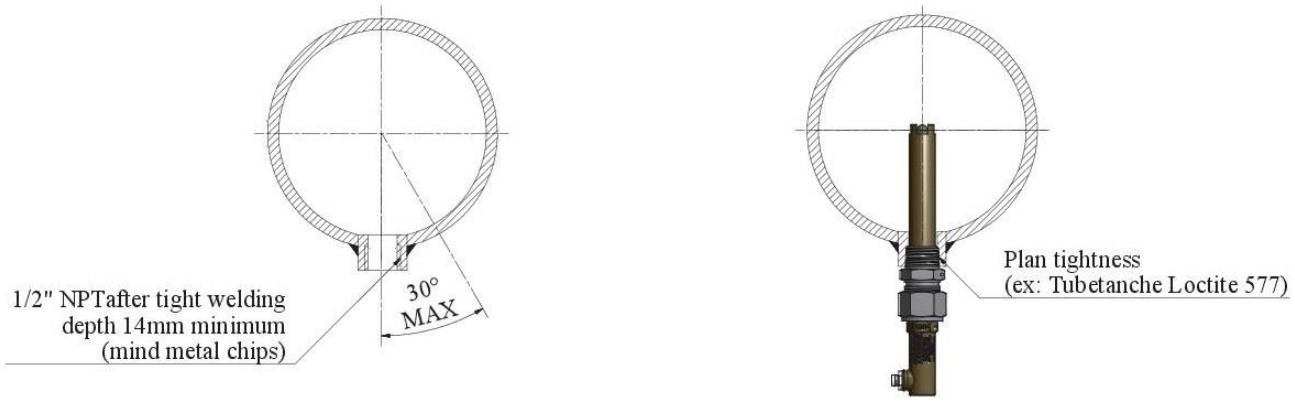
13.1. INSTALLATION RECOMMENDATIONS DG3001/75

POSITION OF THE END-OF-METERING AND VACUITY PROBES:



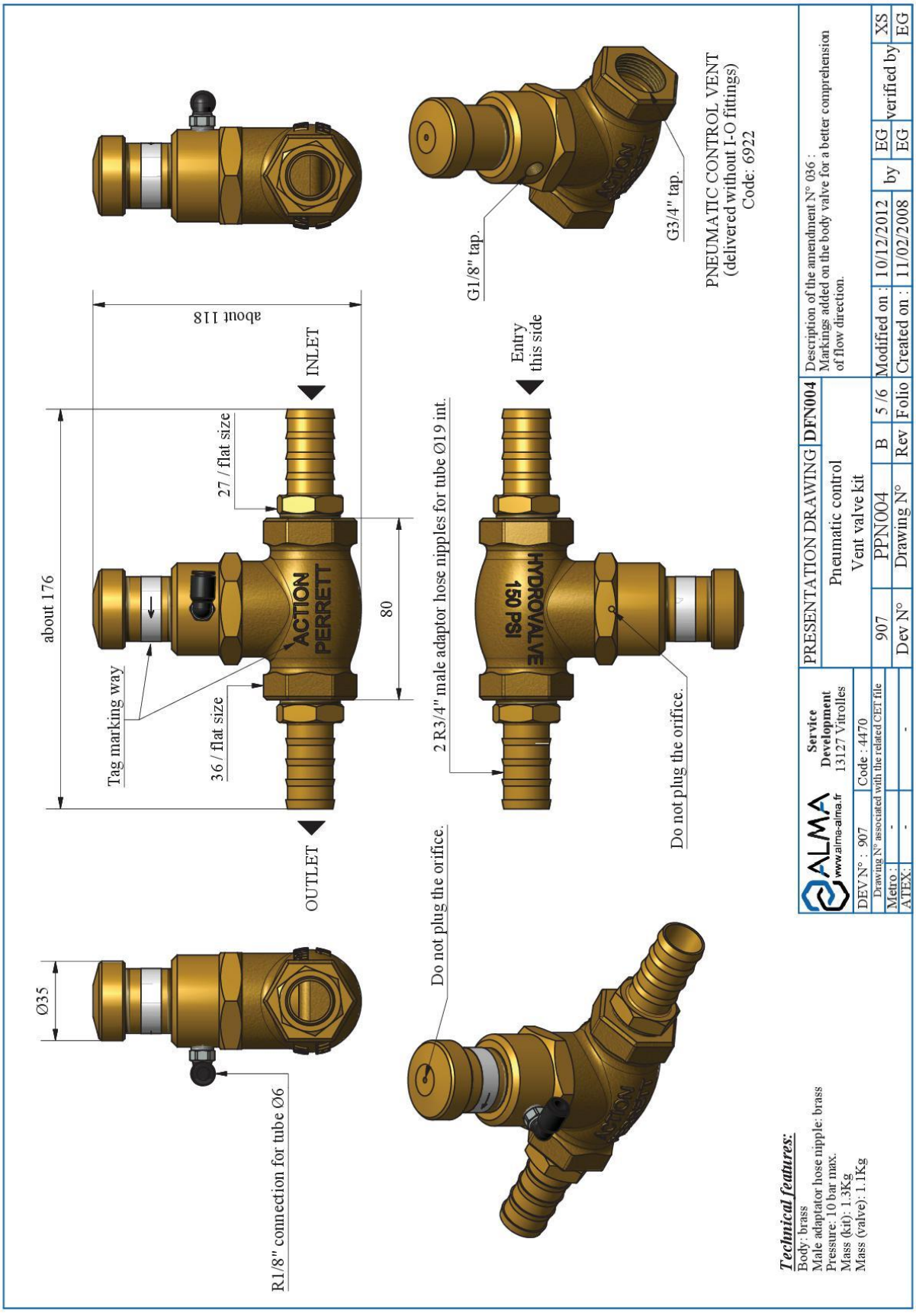
INSTALLATION OF THE END-OF-METERING AND VACUITY PROBES ON THE PIPE:



REFER TO INSTRUCTION MANUAL

(DELIVERED WITH THE EQUIPMENT AND AVAILABLE ON ALMA WEBSITE)

14. PNEUMATIC CONTROL VENT VALVE



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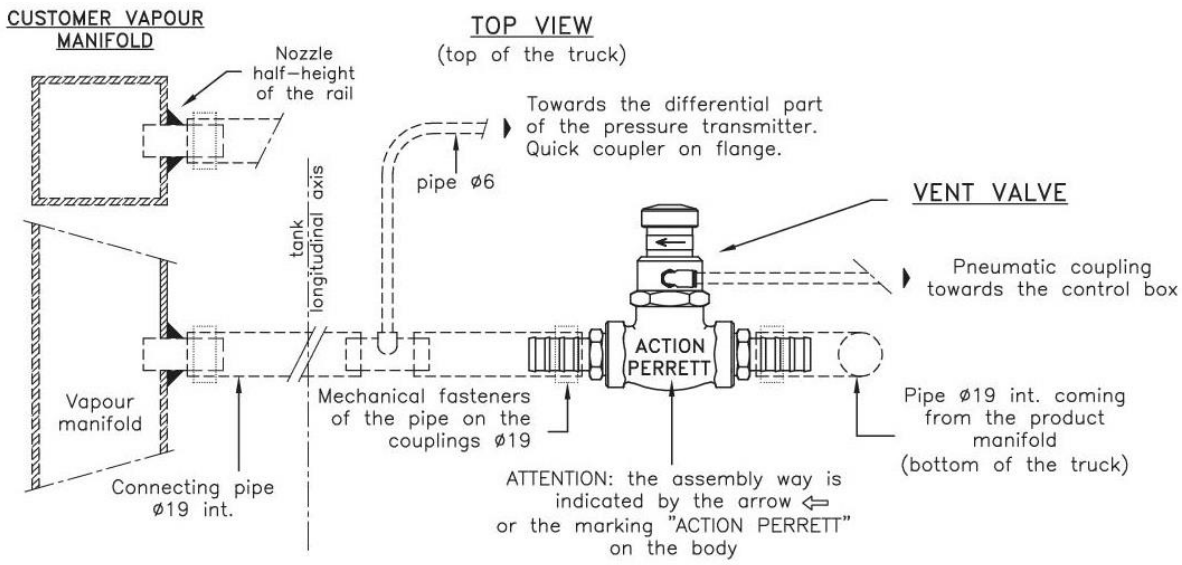
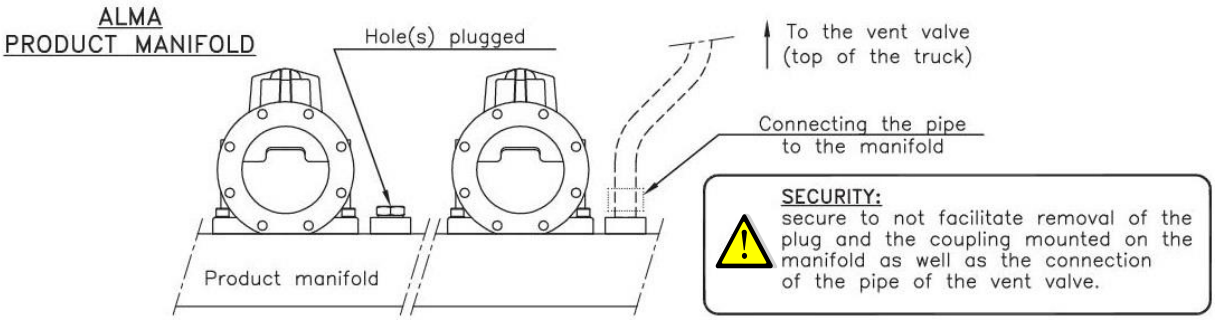
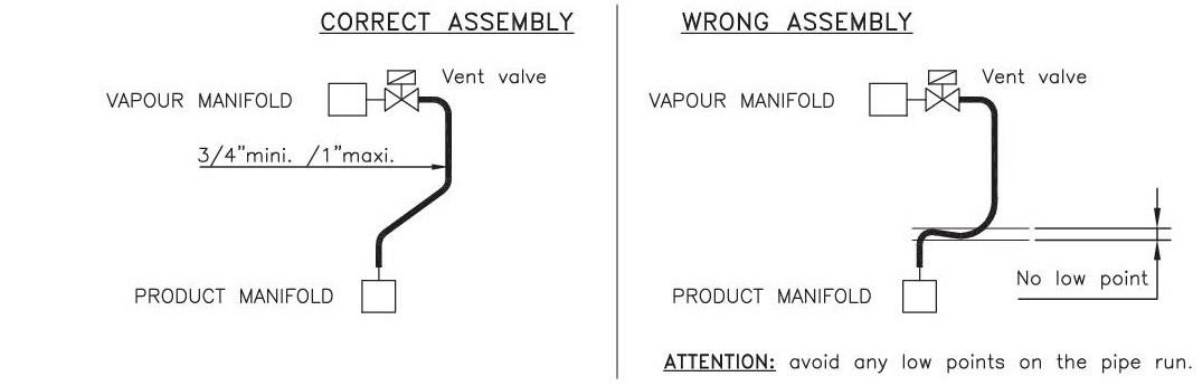
14.1. INSTALLATION RECOMMENDATIONS PNEUMATIC CONTROL VENT VALVE



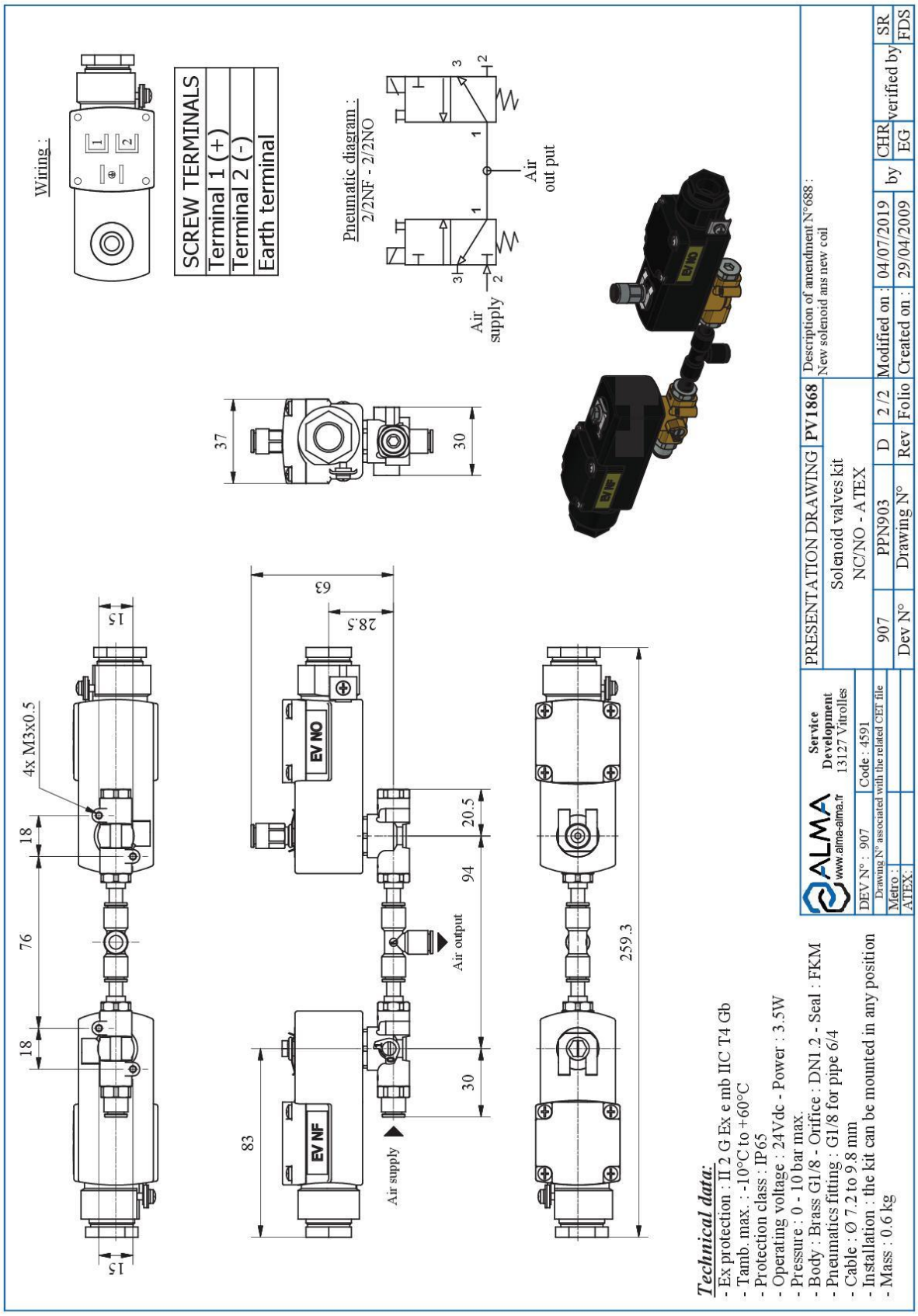


ASSEMBLY OF THE VENT PIPE (not supplied by Alma)



15. CONTROL OF THE PUMP

15.1. NC/NO SOLENOID VALVES KIT NON ATEX



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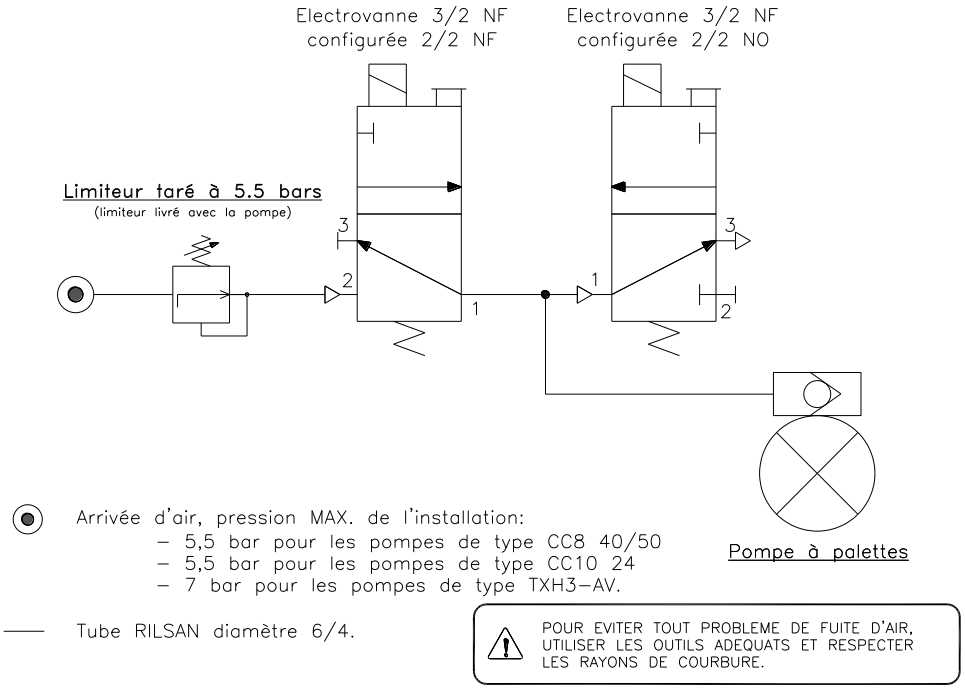
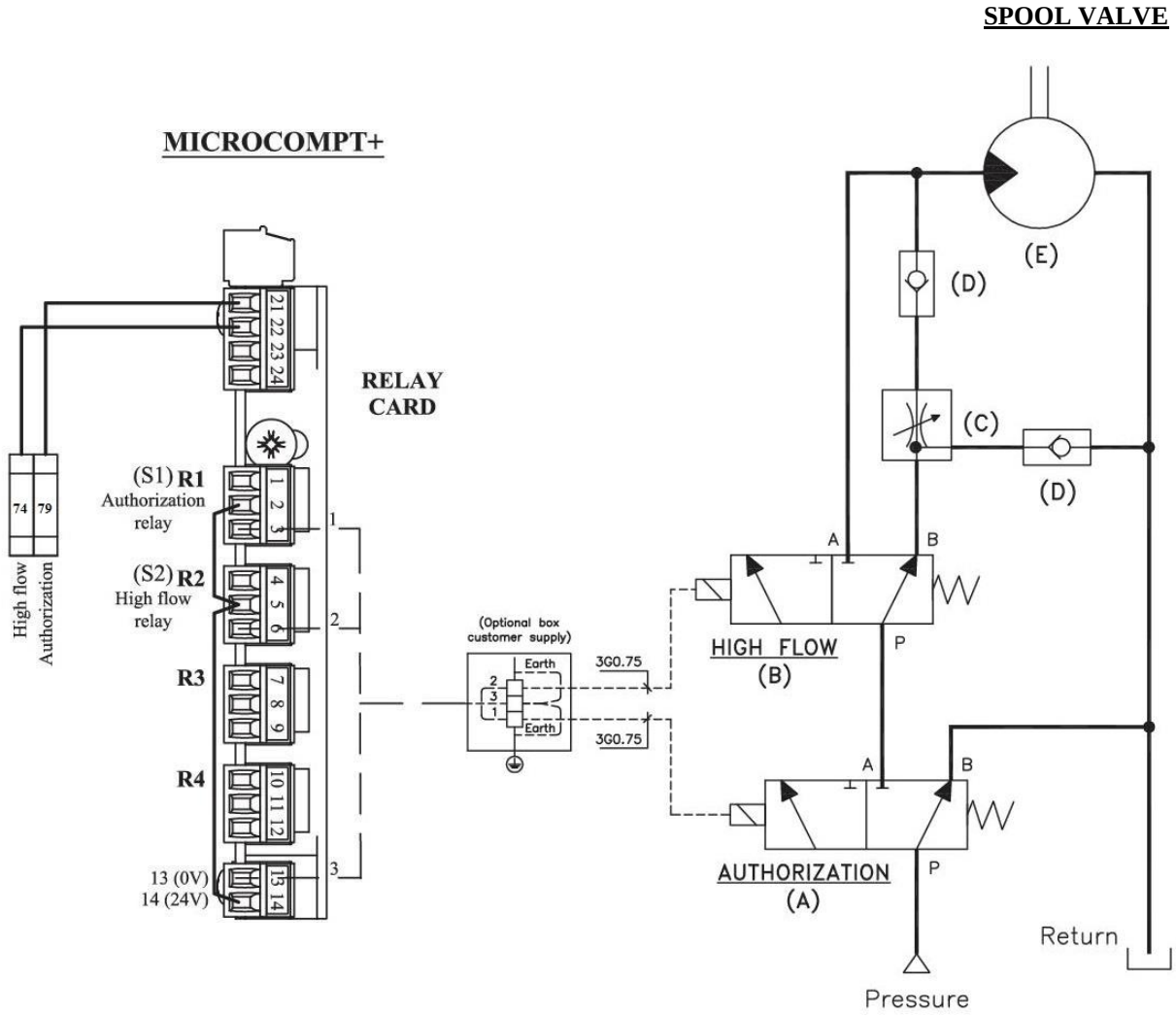
15.2. PNEUMATIC DIAGRAM PROPORTIONAL CONTROL OF THE BY-PASS

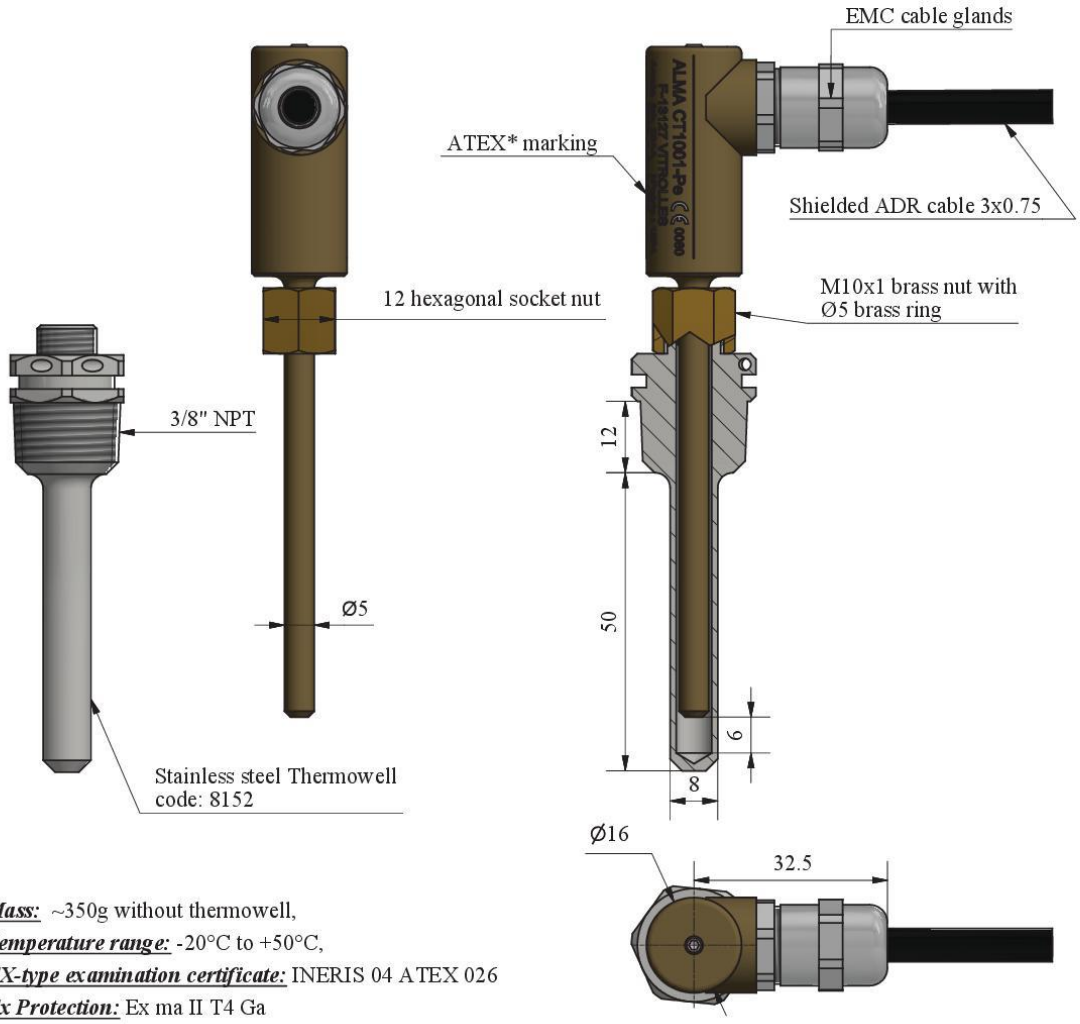


15.3. HYDRAULIC SPOOL VALVE CONTROL DIAGRAM



(A): AUTHORIZATION solenoid valve (not supplied by ALMA)
(B): HIGH FLOW solenoid valve (not supplied by ALMA)
(C): Flow regulator (not supplied by ALMA)
(D): Non return valve (not supplied by ALMA)
(E): Hydraulic motor (not supplied by ALMA)

16. 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°787 Modification of the reinforcement of the lower body							
DEV N° : 949d	Code : 8151	Temperature probe CT1001-Pe										
Drawing N° associated with the related CET file		949d	PPV042	M	5 /6	Modified on :	25/08/2021	by	CHR	verified by	BEB
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on :	13/09/2003		BM		BM
ATEX:	INERIS 04 ATEX 0026											

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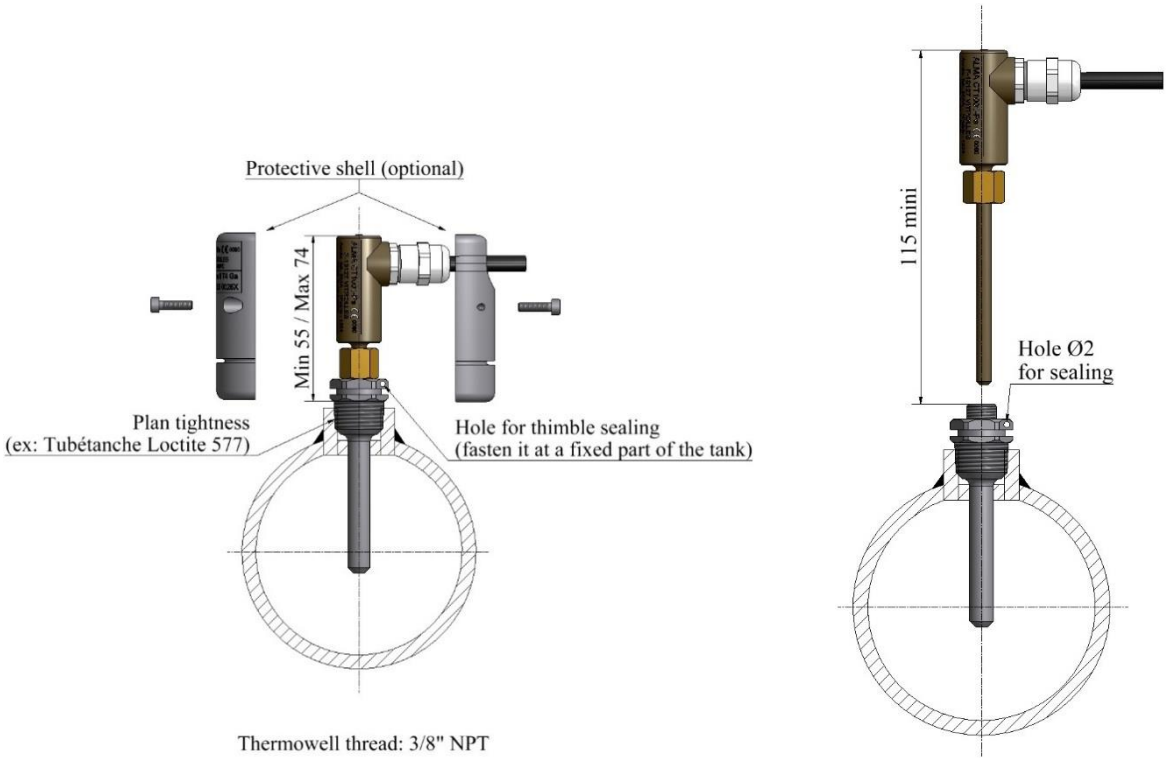
16.1. INSTALLATION RECOMMENDATIONS TEMPERATURE PROBE



REFER TO INSTRUCTION MANUAL

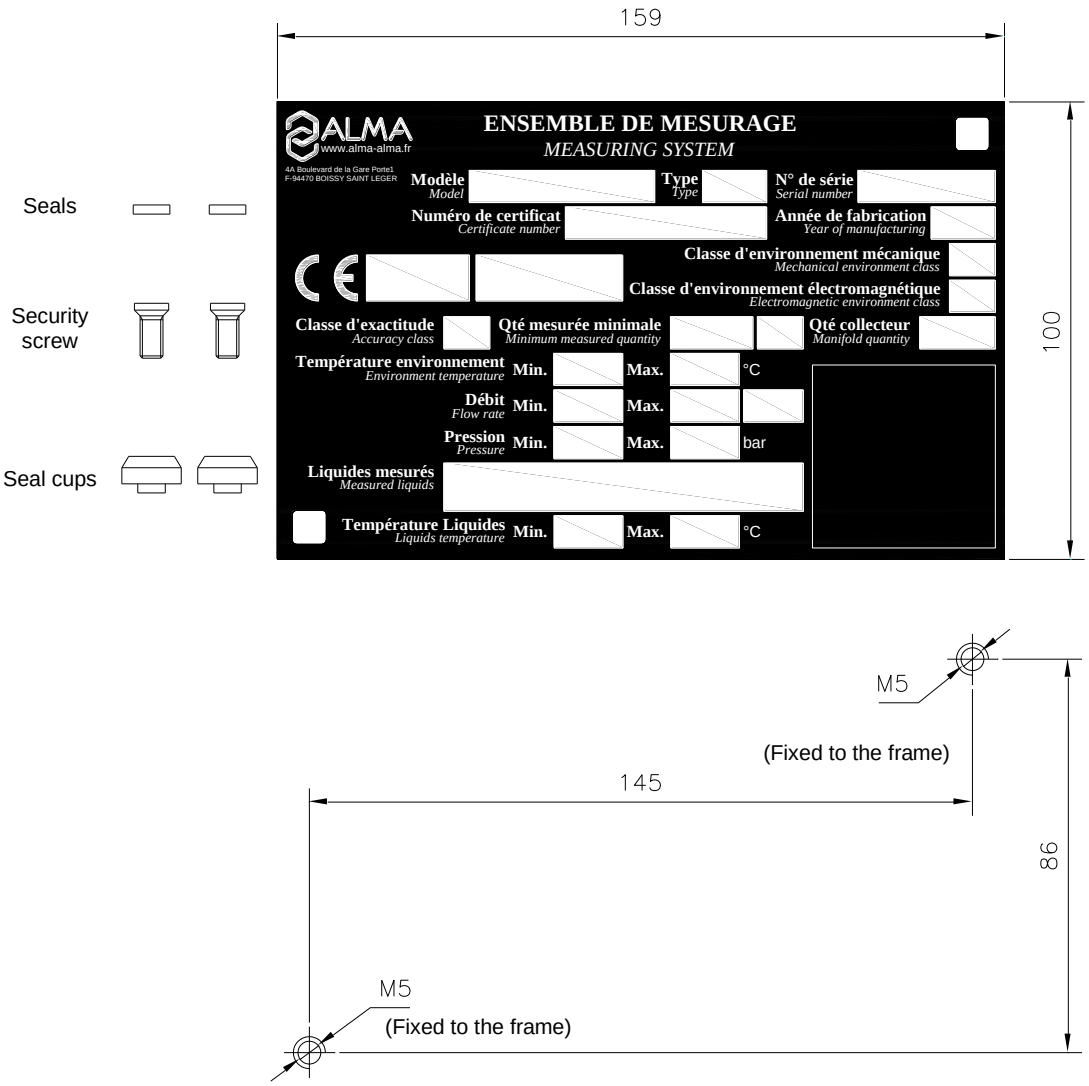
(DELIVERED WITH THE EQUIPMENT AND AVAILABLE ON ALMA WEBSITE)

INSTALLATION OF THE TEMPERATURE SENSOR

ON THE ALMA TURBINE METER:

17. 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).