INSTALLATION GUIDE

DI 021 EN A

ELECTROMAGNETIC TURBOTRONIQUE TYPE MEMP-xx

Described in EU-type examination certificate N°: LNE-26664

Issue	Date	Nature of modifications	Written by	Approved by
A	2017/09/11	Creation *[PJV126]*	DSM	PJ

CONTENTS

1. GENERAL RECOMMENDATIONS

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

BEFORE ANY WORK, MAKE SURE THAT THE EQUIPMENTS ARE NOT POWERED.

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).

⇨ 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).

1.2. ELECTRICAL 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).

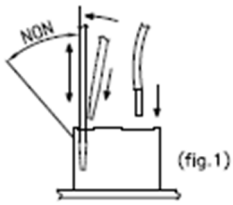
⇨ Connect the supply of the equipment downstream cut-out, on the power supply reserved to the measured distribution.

⇨ 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).

⇨ 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)
METER	24VDC +/-10%	-	0.7 A (switch-on)

⇨ Color code according to DIN 47100.

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

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

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)

2. GENERAL PRESENTATION

2.1. USE ACCORDING TO MID CERTIFICATE

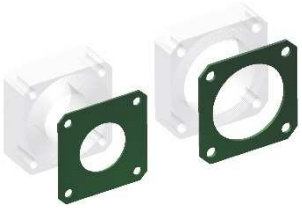
The measuring system TURBOTRONIQUE type MEMP-xx is covered by the EU type examination certificate N° LNE-26664. Refer to this certificate for any precision about its installation.
For the sealing plan, see Annex to EU type examination certificate N° LNE-26664.

2.2. SPECIAL CONDITIONS FOR INSTALLATION

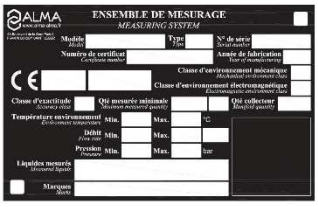
- ⇨ The ALMA model TURBOTRONIQUE measuring systems should be installed on road tankers.
- ⇨ The installation of the measuring system covered by this certificate must be in conformity with the plan which is presented in § “securing and sealing” of the certificate.
- ⇨ If the measuring system is fitted with two delivery points, it has to be equipped with a positive security device enabling a liquid delivery by only one point at once.
- ⇨ The measuring system can be equipped with an additive injection device. This injection has to occur upstream of the meter. If the additive injection is situated downstream of the gas elimination device, the installation has to avoid air injection by means of positive safety detection device, sealed and placed at the low level of the additive tank, which stops injection in case of additive lack.
- ⇨ The measuring system may be fitted with OPW, ALPECO, or EMCO WHEATON product return devices, as well as with a magnetic valve for venting, associated with the wind concentrator enabling product transfers towards the compartments. This has to be installed so that no air or venting of the wind concentrator may occur during delivery.
- ⇨ If a printing device not covered by an evaluation certificate is connected to the ALMA electronic calculator-indicator, a notice stating that the data printed is not subject to legal control must be clearly printed on the delivery notes.
- ⇨ The special installation conditions of the gas elimination devices FSGB48E, SG 80.1 AL, SG 80 IN PERNIN EQUIPEMENTS and FS24 SATAM are defined in the relevant evaluation certificates.
- ⇨ It is mandatory to install a non-return valve on the pipe between the gas elimination device and the transfer point. The non-return valve may be placed and sealed upstream of the meter or downstream as well.

  Otherwise, if the liquid level in the gas elimination device may be lower than the liquid level in the meter, a non-return valve has to be installed at the device outlet, or placed and sealed between the device and the meter.
- ⇨ The hose allowing gas removal at the outlet of the gas elimination device has to be non-pinchable or keep the deformation mark.
- ⇨ The special installation conditions of the meters are defined in evaluation certificate NoTC-7204.

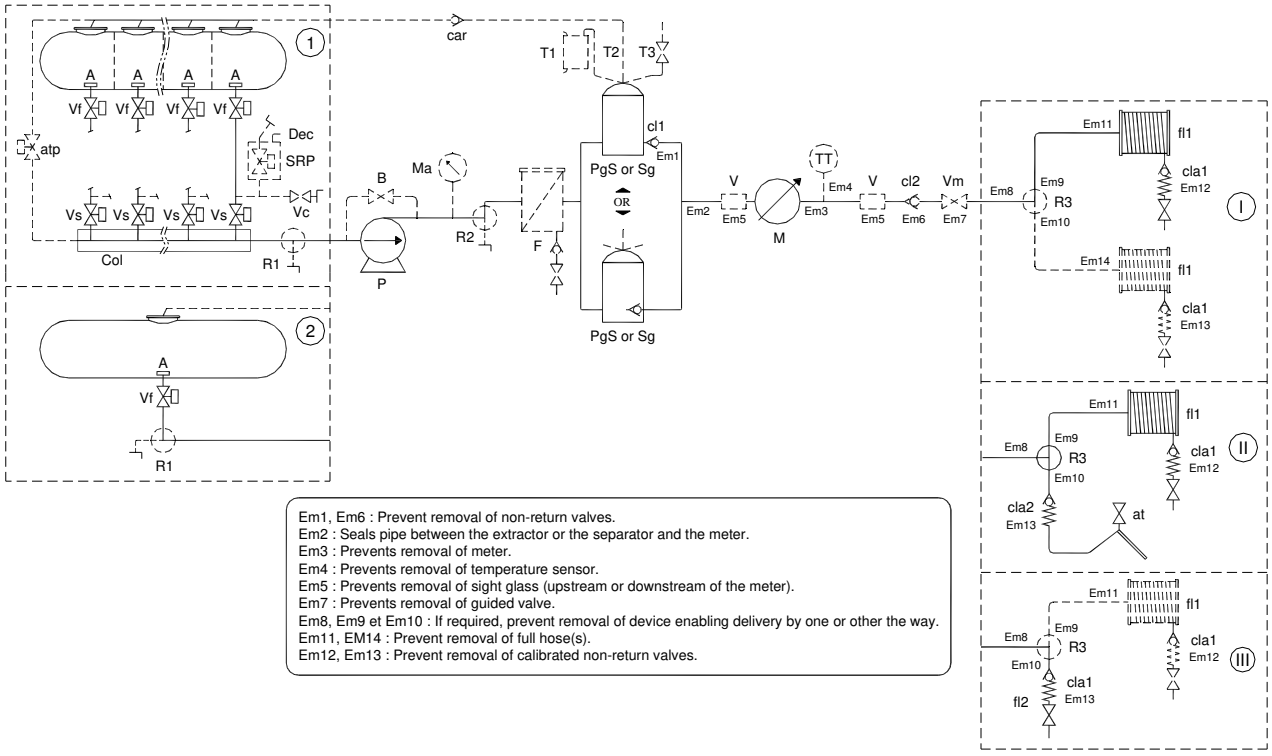
3. PART LIST

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	**Equipment**	**Designation**	**Qty**	**Option***
1		**CALCULATOR INDICATOR MICROCOMPT+ TURBOTRONIQUE** NON ATEX (Provided with a magnetic or RFID supervisor key)	1	
2		**ELECTROMAGNETIC METER PD340 C51 or PD340 C63** (Depending on configuration)	1	
3		**PRINTER TMU-295** (Printer – power supply cable – serial link cable 10m)	1	
4		**CONVERTER 24VDC/24VDC 2.1A 50W** (Printer power supply 24VDC)	1	
5		**NON-RETURN VALVE INOX KIT DN50 or DN80** (Depending on configuration)	1	●
6		**SIGHTGLASS KIT DN50 or DN80** (Depending on configuration) (Supplied with pre-drilled screws for sealing)	1	●

Non-contractual pictures

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	**Equipment**	**Designation**	**Qty**	**Option***
7		**CONNECTION CARBON STEEL KIT DN50 or DN80** (Depending on configuration) (Supplied with pre-drilled screws for sealing)	**1**	●
8		**NC/NO SOLENOID VALVES KIT** NON ATEX	**1**	●
9		**Pt100 TEMPERATURE PROBE – CT1001-Pe** (Supplied with thermowell)	**1**	●
10		**KIT FOR MEASURING SYSTEM IDENTIFICATION PLATE** (Plate and sealing device)	**1**	●
Option*: equipment sold as an option by ALMA must be installed on the measuring system if required by the certificate.				

4. OVERALL DRAWING OF THE TURBOTRONIQUE MEASURING SYSTEM



A: Anti-swirl device.
R1: Two-way cock enabling delivery per meter, draining and filling of the tank without using the meter (optional).
P: The pump may be reversible. In that case, a non-return valve has to be added between cock R2 and gas separator Sg.
B: Pump bypass
Ma: Manometer indicating the forcing back pressure of the pump (optional).
R2: Two-way cock for pumped delivery without meter (optional).
F: Filter which, when external to the separator or the extractor, may be fitted with a draining cock.
Sg: Gas separator.
PgS: Specific gas extractor.
cl1: Non-return valve (compulsory when the gas elimination device is not fitted with internal non-return valve).

T1, T2, T3: Variants authorized for gas evacuation device:
T1: Use of a container to retrieve the liquid particles carried along by gas,
T2: Foam going back to the tank,
T3: Use of a valve for draining.

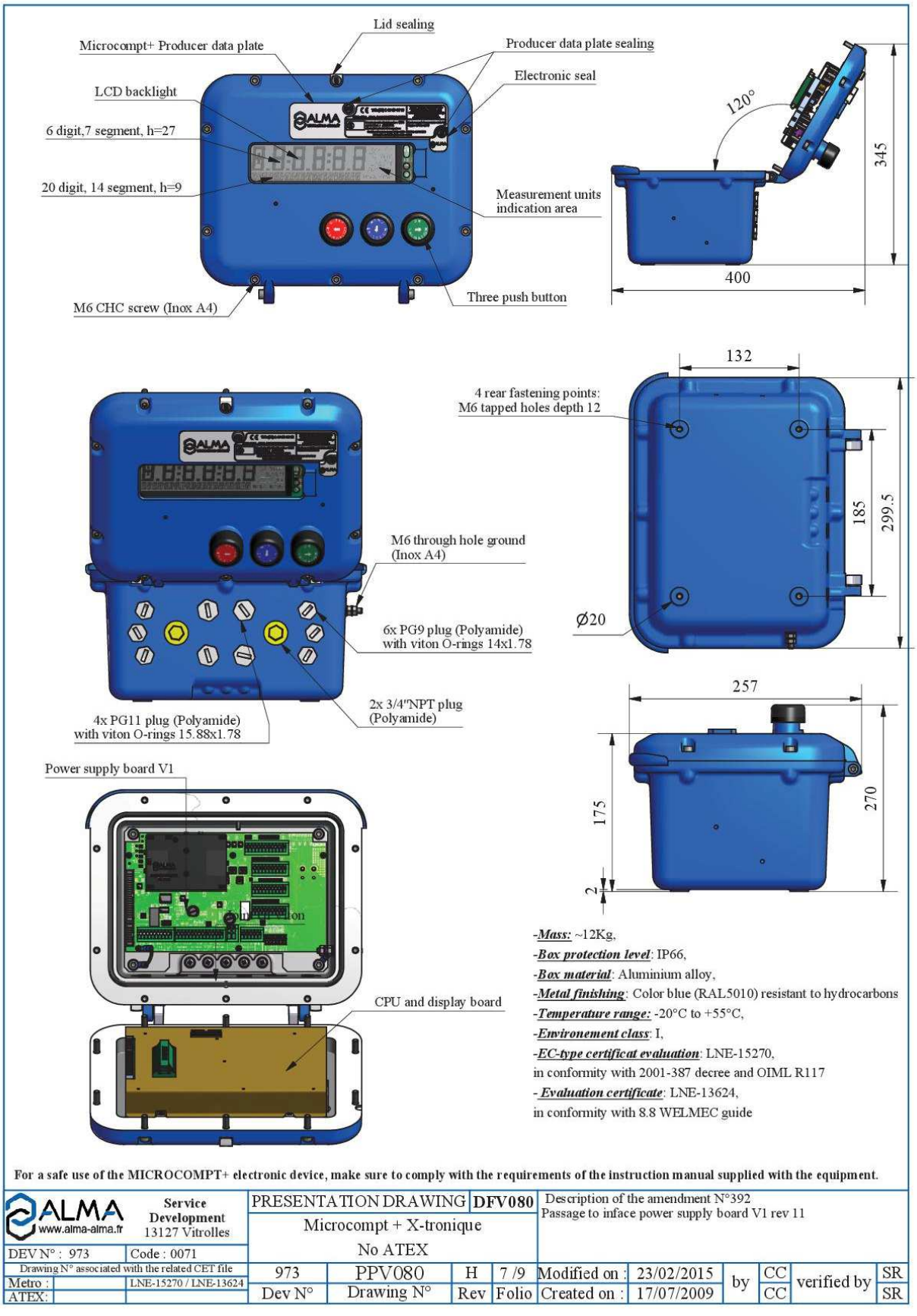
car: Non-return valve on foam return (optional).
M: Meter
V: Sight glass (compulsory with a specific gas extractor (gas indicator), optional with a gas separator).
cl2: Non-return valve (optional).
TT: Temperature sensor Pt100 (optional).
Vm: Guided valve (optional).
R3: Device enabling, when the measuring system has two delivery paths, to make deliveries one or the other way.
fl1: Full hose on hose reel
fl2: Very short full hose enabling delivery with flowrate (optional).
cla1: Calibrated non-return valve preventing draining of the full hose.
cla2: Calibrated non-return valve preventing draining of the empty hose.

I, II, III: Variant of the delivery device:
Variant I: One or two full hoses with reel,
Variant II: Combination of full hose on reel and empty hose,
Variant III: Combination of short full hose and full hose on reel, if applicable.

Vf: Valve for compartment bottom.
Col: Wind concentrator.
atp: Guided venting (optional).
Vs: Selection valve, installed on pipe of each compartment, enabling communication with wind concentrator (guided or manual).
Vc: Valve for source loading, installed on pipe of each compartment (optional).
SRP: Return Product System on one or more compartment(s) (optional).
Déc: Decompression control (secured).

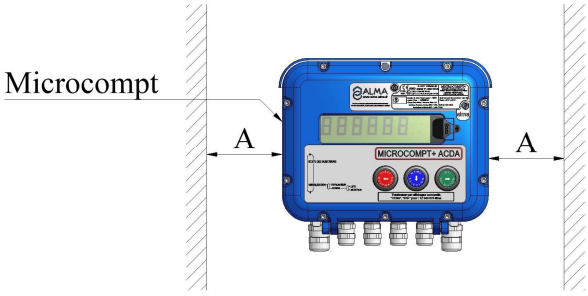
1, 2: Variants of devices associated with the tank
Variant 1: Tank with several compartments and wind concentrator,
Variant 2: Single compartment tank.

5. MICROCOMPT+ TURBOTRONIQUE (NON ATEX)

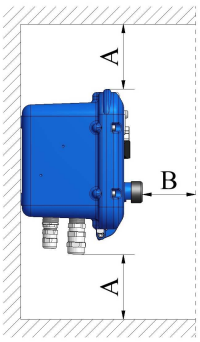


5.1. INSTALLATION RECOMMENDATIONS CALCULATOR-INDICATOR MICROCOMPT+

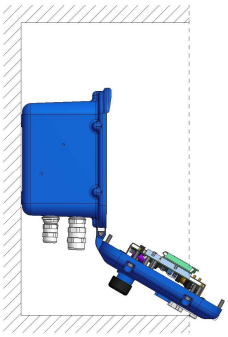
- Fasten the box with 4 M6 screws (holder suitable for vibrations and designed to support the MICROCOMPT). On the box: 4 M6 blind holes tapped length=12 over 185x132).
- Leave an open space around the box in order:
  - To facilitate maintenance operation.
  - To prevent any pressing on pushbuttons and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

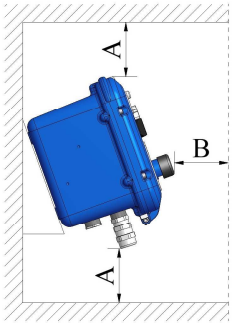


Left hand view
Closed box

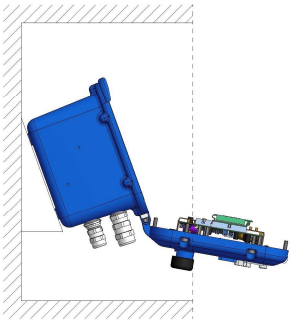


Left hand view
open box

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



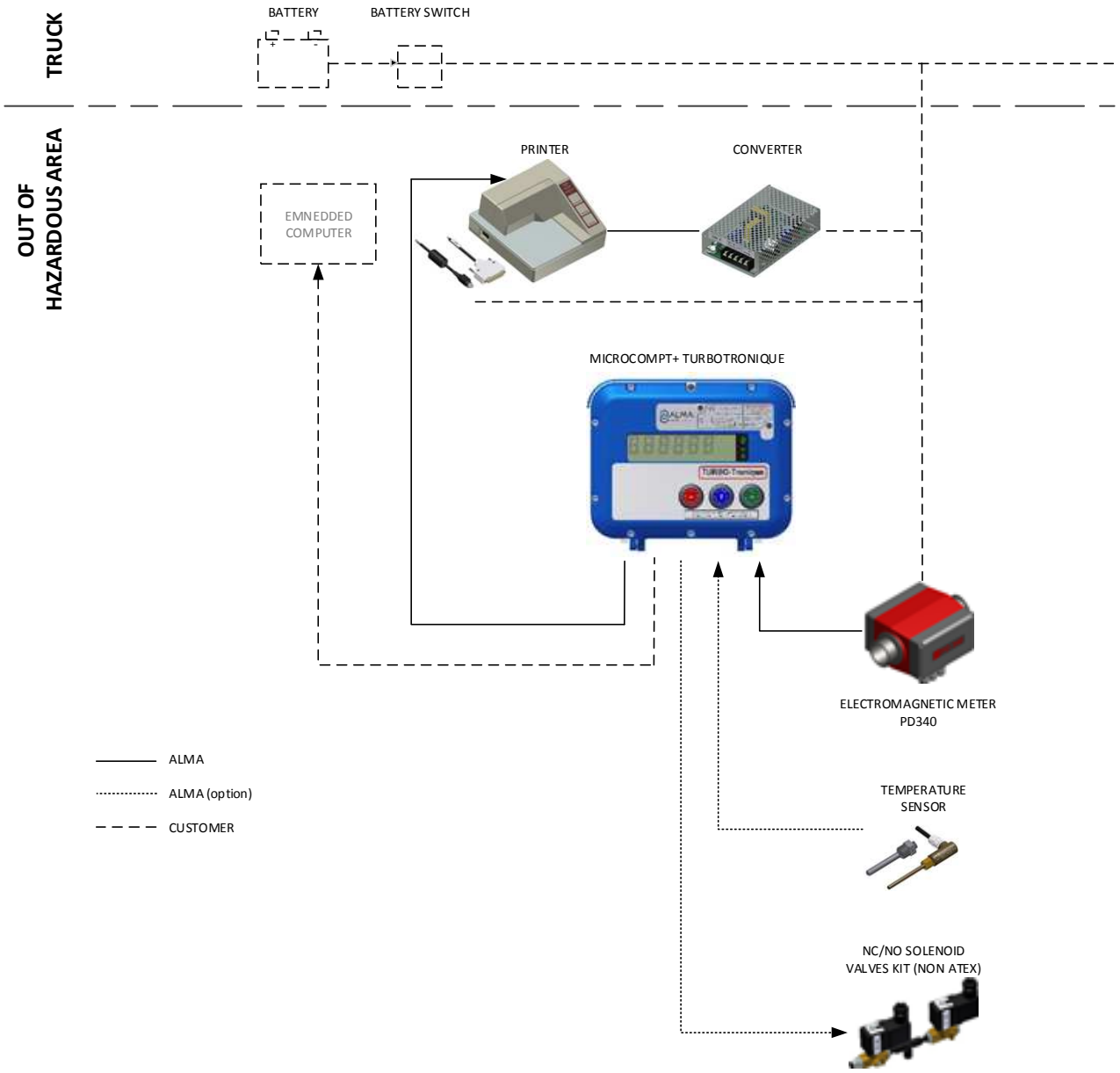
Left hand view
Closed box



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+

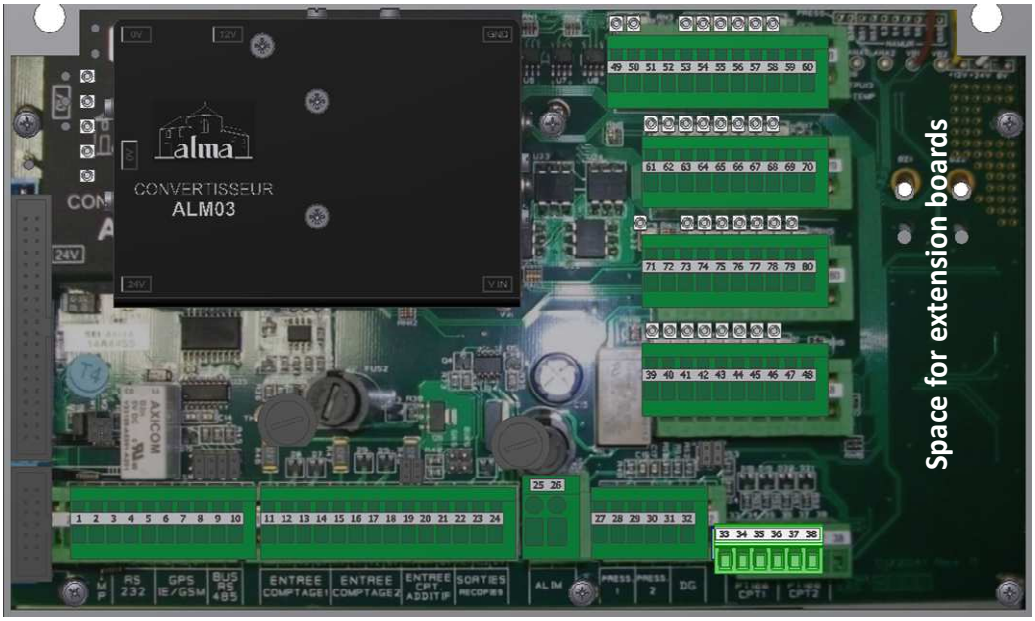


Terminal assignment of the interface power supply board

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

TERMINAL ASSIGNEMENT OF MICROCOMPT+ BOARDS

INTERFACE POWER SUPPLY BOARD



EQUIPMENTS CONNECTED TO THE MICROCOMPT+								INTERFACE POWER SUPPLY BOARD			
Option	Equipment	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	PRINTER	C1	1/2"NPT	●	ADR 4x0.34 sh.	Rx Printer	Bc	1	Tx	PRINTER	Connect the shielding
						Tx Printer	Mr	2	Rx		
						0V	Vt	3	0V		
●	EMBEDDED COMPUTING	C8	1/2"NPT		3x0.34 sh.	0V		3	0V	RS232	Connect the shielding. ALMA or FTL Light Protocol
						Rx E.C.		4	Tx		
						Tx E.C.		5	Rx		
●	REMOTE DISPLAY					Tx		9	+	RS485	Remote display type SREI TC5-10-24 Ext Use an RS485/RS232 converter
						Rx		10	-		
	ELECTROMAGNETIC METER	C2	1/2"NPT	●	ADR 4x0.34 sh.	V1		12	V1	METER INPUT EMA	Connect the shielding
						V2		13	V2		
						0V		14	0V		
●	PULSES OUTPUT		1/2"NPT			PO EMA		22	12V	PULSES OUTPUT	
						PO EMB		23	V1		
						0V		24	0V		
	SUPPLY 24VDC	A1	1/2"NPT		2x1	Bat. (+)	1	25	24VCC	POWER SUPPLY	24VDC truck battery (after battery switch and protected by a fuse)
						Bat. (-)	2	26	0V		
●	Pt100 TEMPERATURE PROBE	C4	1/2"NPT	●	ADR 3x0.6 sh.	+	Jn	33	+	Pt100	Connect the shielding
						-	Bc	34	-		
						-	Vt	35	-		

EQUIPMENTS CONNECTED TO THE MICROCOMPT+								INTERFACE POWER SUPPLY BOARD			
Option	Equipement	Cable (for information)				Function	Colour or No.	Terminal	Function		Observation
		No.	CG*	Alma	Type						
	MANIFOLD FLAP CONTROL OR PRODUCT RETURN AUTHORISATION AND/OR ADDITIVATION 2 CONTROL				4 to 7x1	Flap 1	1	39	24VDC = opened flap (outputs FET 24V 5W max.) FET: Field Effect Transistor	EV Flaps or Product return additivation	
						Flap 2	2	40			
						Flap 3	3	41			
						Flap 4	4	42			
						Flap 5	5	43			
						Flap 6	6	44			Or Product return compartment 4
						Flap 7	7	45			Or Product return compartment 5
								46			
					1x1	0V		47	0V		
								48			
	RC-HEATING OIL RECEIVER				2x1	Start/Stop	1	49	Start/Stop	RC- Oil_1	
						LF/HF	2	50	LF/HF	RC- Oil_2	
	COUNTED / PUMPED DISTRIBUTION WAY (with additional commands)				3x1	Gravi/Pmp	1	51	0V	Gravity / Pumped	Closed circuit=product pumped (end position)
						Pct/Pnc	2	52	0V	Pumped counted/ no counted	Closed circuit=product counted
						0V	3	59	0V	0V (GND)	51, 52 and 59 are shunted if manual valves are not instrumented
	PTO CONTROL				1x1	PTO Ctrl		58		PTO control	Power- take- off engaged
	FOOTVALVE CONTROL				1x1	Footvalve		64	24VDC= cde	FOOTVALVE	24VDC=opening (Outputs FET 24V 5W max.) *FET=Field Effect Transistor*
	PRODUCT RETURN CONTROL				3 to 6X1	PR1	1	65	24VDC= author.	Return_1	Product return compartments 1to 3
						PR2	2	66		Return_2	(Outputs FET 24V 5W max.)
						PR3	3	67		Return_3	*FET=Field Effect Transistor*
						Chasse		68		Cde chasse	
	HOSES 1 AND 2 AUTHORISATION CONTROL	C6			3x1	0V	1	70	0V	0V (GND)	Hoses 1and 2 authorisation control
						Hose 1	2	75	24VDC= distrib.	Hose_1ctrl	(Outputs FET 24V 5W max.)
						Hose 2	3	63		Hose_2 ctrl	*FET=Field Effect Transistor*
	ADDITIONAL COMMANDS				5X1	PTO	1	61	24VDC= pto	PTO	
						Stop Mot.	2	62	24VDC= stop	Stop motor	(Outputs FET 24V 5W max.)
						Acc. Mot.	3	73	24VDC= acc.	Motor acceleration	*FET=Field Effect Transistor*
						Clutching	4	76	24VDC= clutchin	Clutching	
						Start Mot.	5	77	24VDC= start	Start motor	
	ADDITIVATION 1 CONTROL				2x1	Power	1	71	NO free contact	Additivation 1	Closed contact=additivation
						Control	72	72			(Output: NO free potential relay)
•	KIT SOLENOID VALVES NC/NO (NON ATEX or ATEX)	C5		•	*[3xG0.75]*	NC valve Pump bypass	1 / [Mr]	74	24VDC	NC control	
							2 / [Nl]	80	0V		24VDC= opening NC solenoid valve
						NO valve Exhaust	1 / [Mr]	79	24VDC	NO control	24VDC= closing NO solenoid valve
							2 / [Nl]	80	0V		*[cable supplied by ALMA for ATEX version]*
	MANIFOLD VENT VALVE CONTROL				1x1	Vent valve		78	24VDC	Vent valve control	24VDC=opening (Outputs FET 24V 5W max.) *FET=Field Effect Transistor*

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

**Refer to the Cable Glands Installation Instructions*

Terminal assignment of the extension board 'sonde AD' 5 wires (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)				Function	Colour or No.	Terminal	Function		Observation
		No.	CG*	Alma	Type						
•	OVERFILL PREVENTION PROBE	C7			*[6x1]*	Common	*[Nr]*	1	-	OVERFILL PREVENTION PROBES	*[If cable are supplied by ALMA]*
						Power	*[Rg]*	2	+		
						From probe	*[Or]*	3	From probe		
						To probe	*[Jn]*	4	To probe		

**Refer to the Cable Glands Installation Instructions*

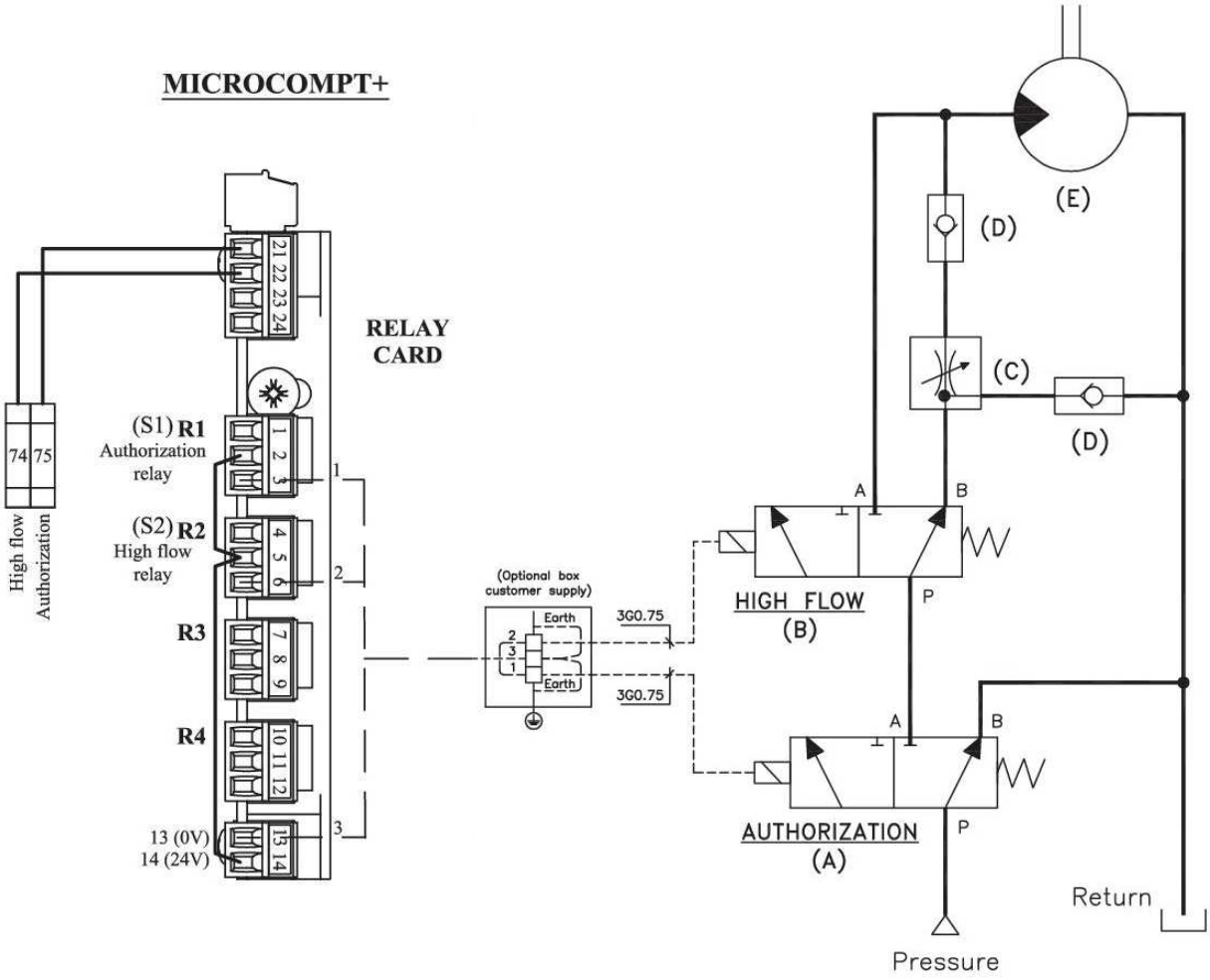
5.3. SPOOL VALVE CONTROL: ELECTRICAL AND HYDRAULIC WIRING

EQUIPMENTS CONNECTED TO THE MICROCOMPT+								INTERFACE POWER SUPPLY BOARD			
Option	Equipement	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	MANIFOLD FLAP CONTROL OR PRODUCT RETURN AUTHORISATION AND/OR ADDITIVATION 2 CONTROL				4 to 7x1	Flap 1	1	39	24VDC = opened flap (outputs FET 24V 5W max.) FET:Field Effect Transistor	EV Flaps or Product return autorisation and/or Additivation 2	Depending on configuration: direct connection or via plexmi electronic board. Refer to the assignment table and to the connection table of the relevant plexmi board
						Flap 2	2	40			
						Flap 3	3	41			
						Flap 4	4	42			
						Flap 5	5	43			
						Flap 6	6	44			
						Flap 7	7	45			
								46			
					1x1	0V		47	0V		
								48			
	RC-HEATING OIL RECEIVER				2x1	Start/Stop	1	49	Start/Stop	RC-Oil_1	
						LF/HF	2	50	LF/HF	RC-Oil_2	
	COUNTED / PUMPED DISTRIBUTION WAY (with additional commands)				3x1	Gravi/Pmp	1	51	0V	Gravity / Pumped	Closed circuit=product pumped (end position)
						Pct/Pnc	2	52	0V	Pumped counted/ no counted	Closed circuit=product counted
						0V	3	59	0V	0V (GND)	51, 52 and 59 are shunted if manual valves are not instrumented
	PTO CONTROL				1x1	PTO Ctrl		58		PTO control	Power-take-off engaged
	FOOTVALVE CONTROL				1x1	Footvalve		64	24VDC= cde	FOOTVALVE	24VDC=opening (Outputs FET 24V 5W max.) *FET=Field Effect Transistor*
	PRODUCT RETURN CONTROL				3 to 6X1	PR1	1	65	24VDC= author.	Return_1	Depending on configuration: direct connection (Outputs FET Field Effect Transistor 24V 5W max.) or via plexmi electronic board. Refer to the assignment table and to the connection table of the relevant plexmi board
						PR2	2	66		Return_2	
						PR3	3	67		Return_3	
						Chasse		68		Cde chasse	
	ADDITIONAL COMMANDS				5X1	PTO	1	61	24VDC= pto	PTO	(Outputs FET 24V 5W max.) *FET=Field Effect Transistor*
						Stop Mot.	2	62	24VDC= stop	Stop motor	
						Acc. Mot.	3	73	24VDC= acc.	Motor acceleration	
						Clutching	4	76	24VDC= clutchin	Clutching	
						Start Mot.	5	77	24VDC= start	Start motor	
	ADDITIVATION 1 CONTROL				2x1	Power	1	71	NO free contact	Additivation 1 control	Closed contact=additivation
						Control	2	72			(Output: NO free potential relay)
	SPOOL VALVE CONTROL				2x1	HF		74	HF solenoid valve	Spool valve (hydraulic motor)	
						Author.		75	Author. Solenoid valve		
	MANIFOLD VENT VALVE CONTROL				1x1	Vent valve		78	24VDC	Vent valve control	24VDC=opening (Outputs FET 24V 5W max.) *FET=Field Effect Transistor*

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

**Refer to the Cable Glands installation instructions*

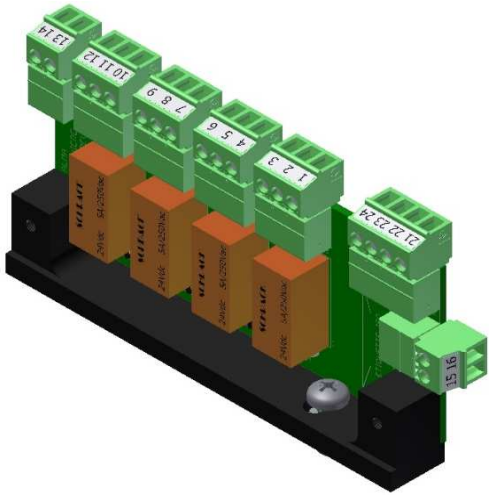
HYDRAULIC DIAGRAM



(A) : AUTHORISATION 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)

Terminal assignment of the relay extension board

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

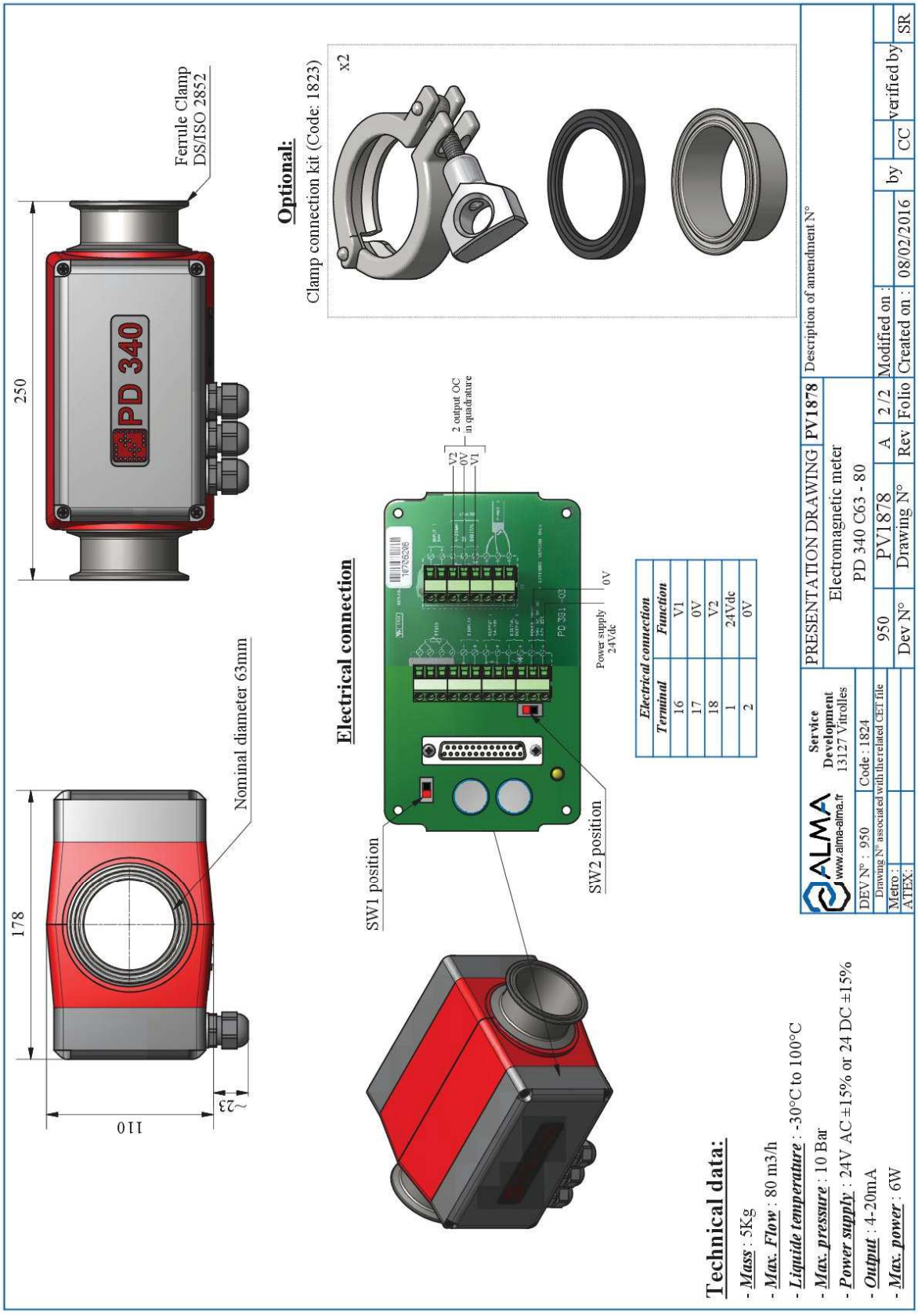


EQUIPEMENT CONNECTED TO THE MICROCOMPT+								RELAY EXTENSION BOARD			
Option	Equipement	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	AUTHORISATION SOLENOID VALVE					Author.		1	NC free contact	RELAY 1	Hydraulic control of hydraulic pump
								2	0V/24VDC		
								3	NO free contact		
	HIGH FLOW SOLENOID VALVE					High flow		4	NC free contact	RELAY 2	High flow control of hydraulic pump
								5	0V/24VDC		
								6	NO free contact		

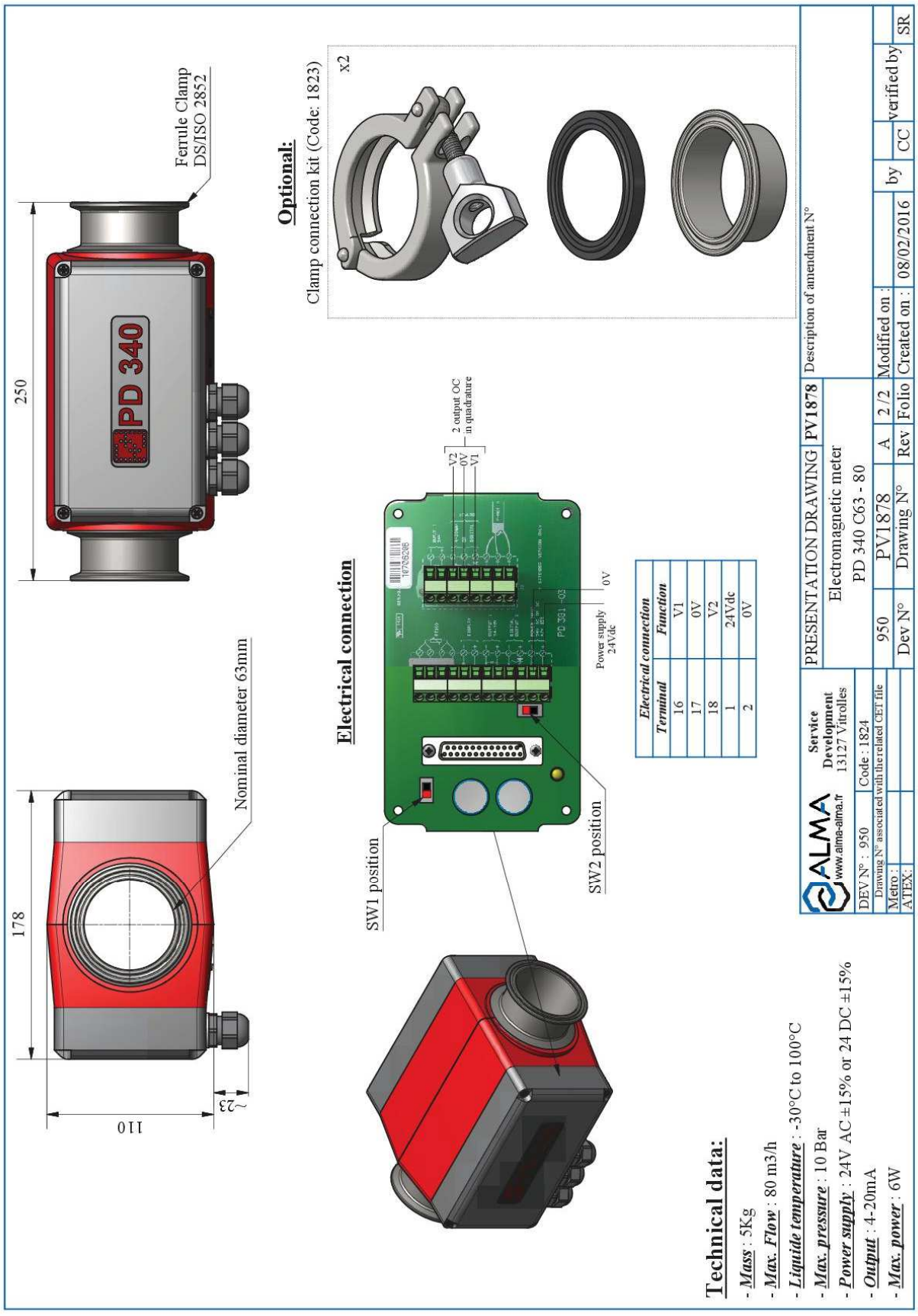
**Refer to the Cable Glands Installation Instructions*

6. ELECTROMAGNETIC METER PD340

6.1. ELECTROMAGNETIC METER PD340 C51 - 40



6.2. ELECTROMAGNETIC METER PD340 C63 - 80



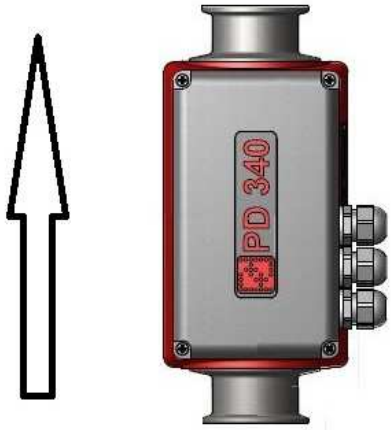
Document available on website alma-alma.fr

6.3. INSTALLATION RECOMMENDATIONS ELECTROMAGNETIC METER PD340

To function properly, the PD340 electromagnetic meter must be filled with liquid ; otherwise pulses are automatically generated.
To ensure a correct filling, ALMA recommends the installation of a sightglass nearby the meter.

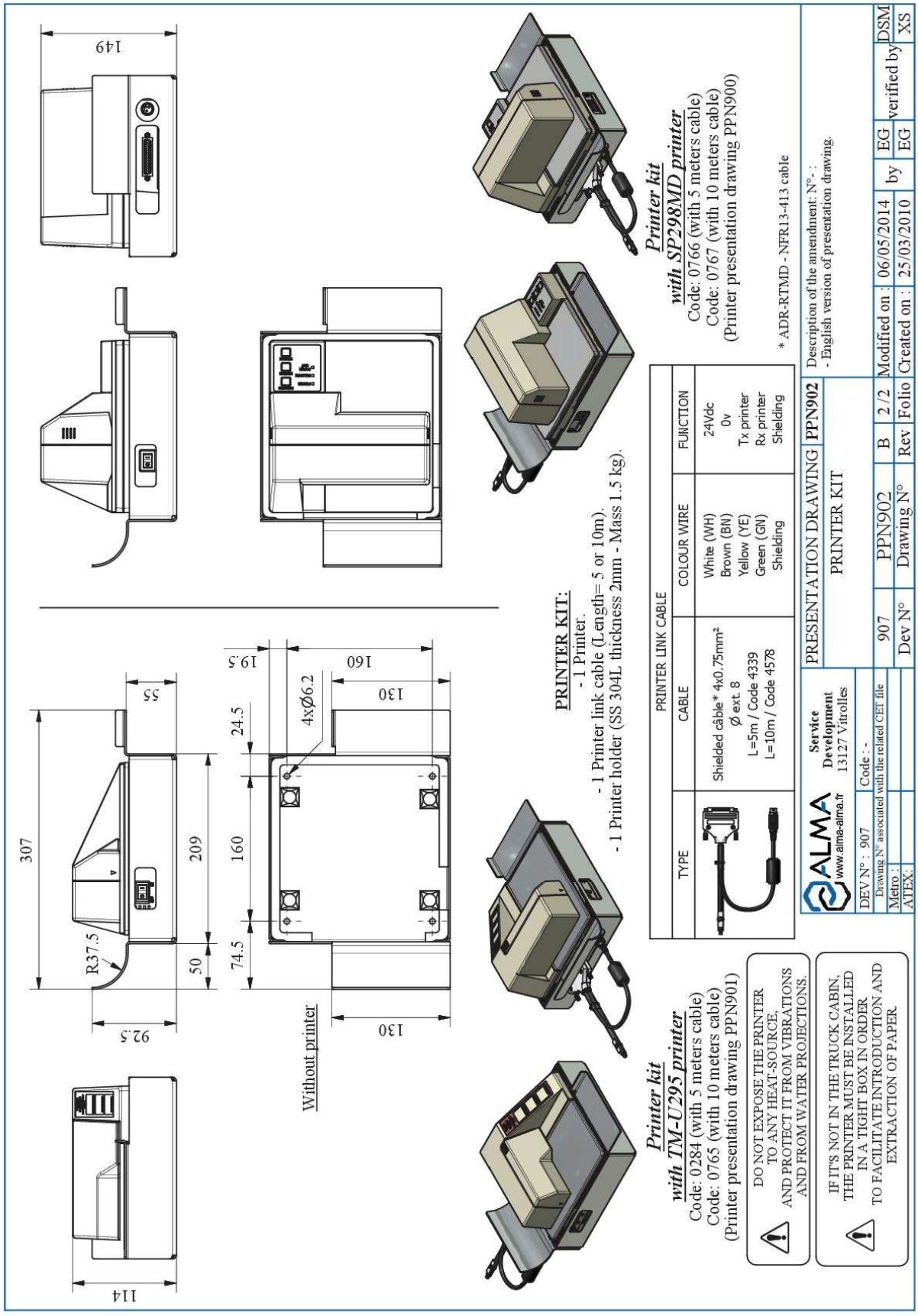
- Orientating the meter so that the identification plate is visible and accessible. The meter must be laid flat with horizontal pipe, and cable glands pointing downwards:

(Or optionally: the meter can be installed with vertical pipe with upward flow):



- Leave an open space all around the meter in order to ease wiring, maintenance and verification.
- In the unique situation using very hot products with large flowrate, the meter must be installed between straight pipe sections which length is at least equal to 3 times the nominal diameter of the meter. This is aimed at avoiding cavitation problems.

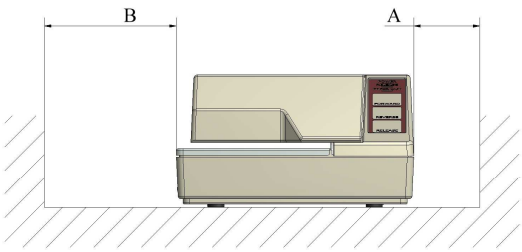
7. PRINTER

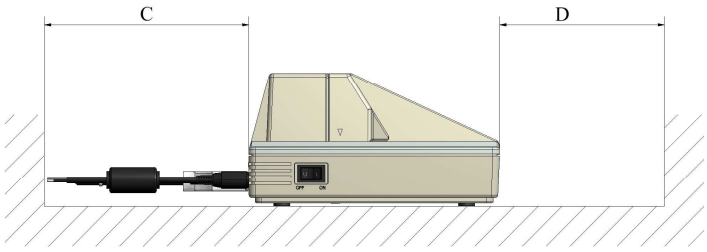


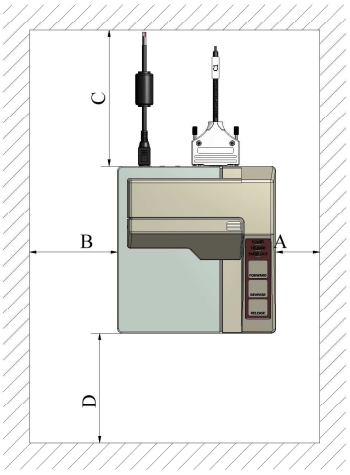
Document available on website alma-alma.fr

7.1. 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.

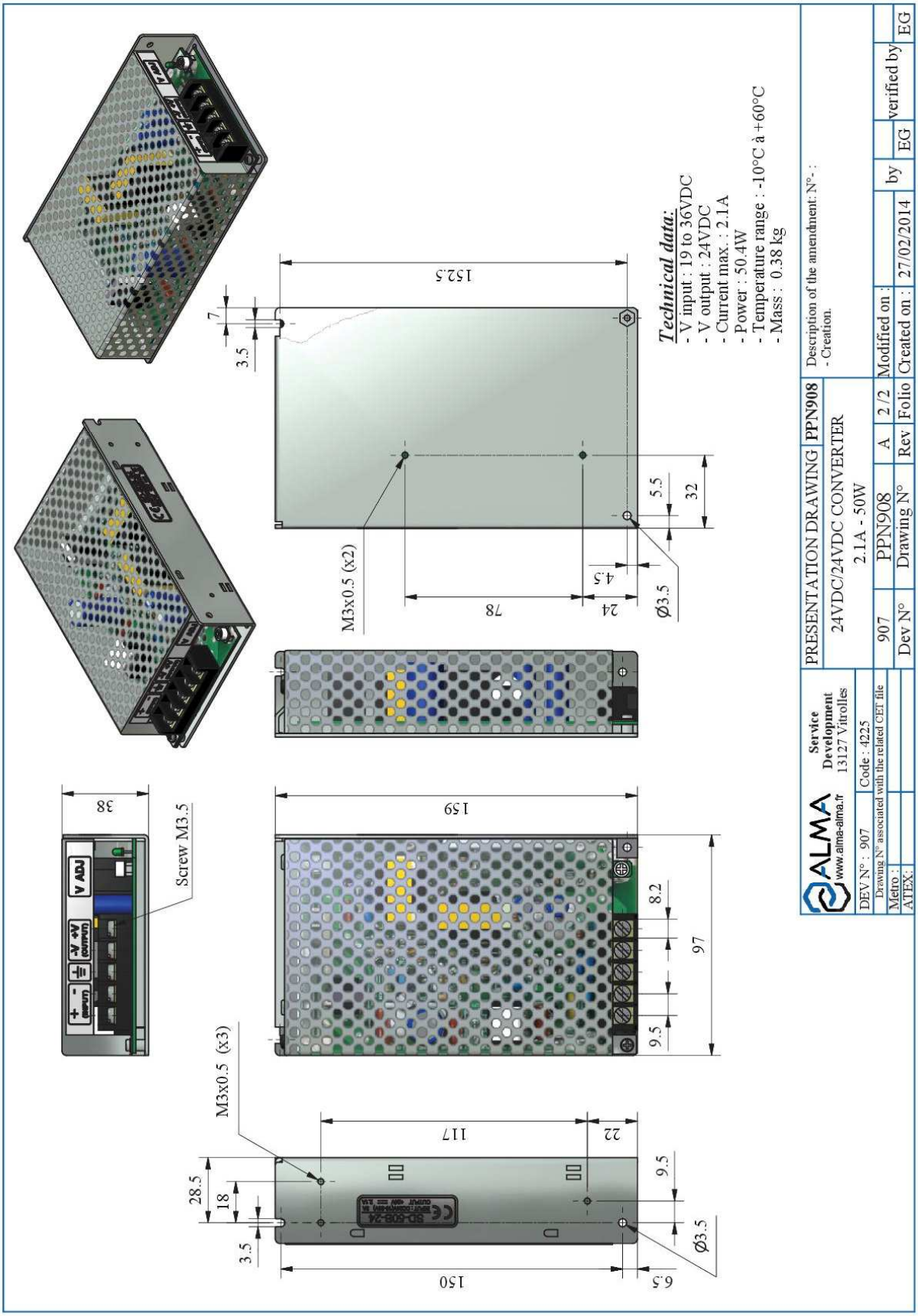






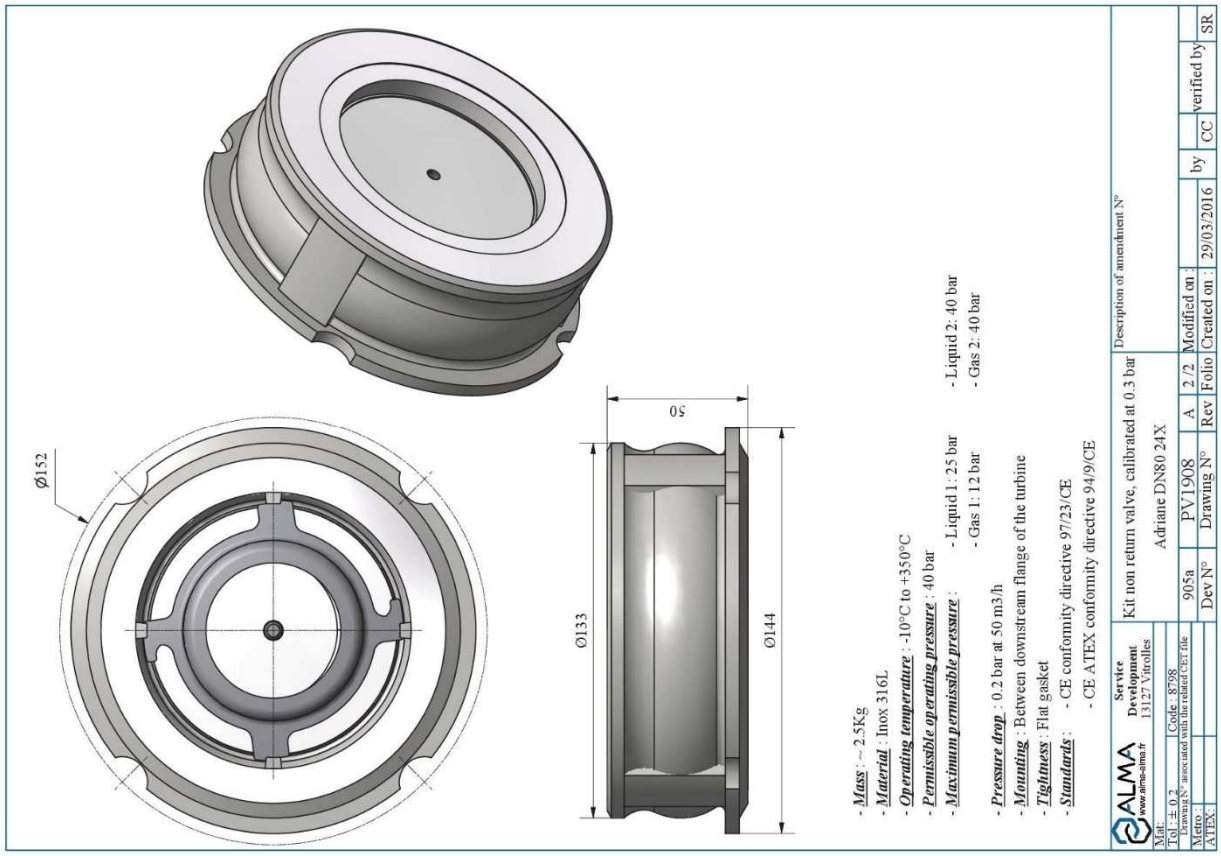
DO NOT EXPOSE THE PRINTER TO ANY HEAT-SOURCE.
PROTECT IT FROM VIBRATIONS AND WATER PROJECTIONS.

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



Document available on website alma-alma.fr

9. NON-RETURN VALVE KIT DN50 OR DN80



- ***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				Description of amendment N°
Mat:		Adriane DN80 24X				
Tol: ± 0.2	Code : 8798					
Drawing N° associated with the related CE? file		905a	PV1908	A	2/2	Modified on :
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on : 29/03/2016
ATEX :						by CC verified by SR

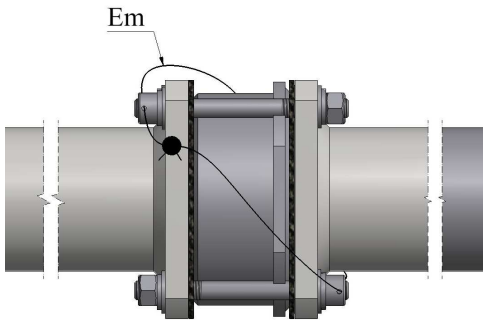
- ***Mass*** : ~ 1Kg
- ***Material*** : - Valve: Inox 316L - Screws: inox A4-70
  - Flat gasket: KINGLERSIL
- ***Operating temperature*** : -10°C to +350°C
- ***Permissible operating pressure*** : 40 bar
- ***Maximum permissible pressure*** : - Liquid 1: 40 bar - Liquid 2: 40 bar
  - Gas 1: 20 bar - Gas 2: 40 bar
- ***Pressure drop*** : 0.4 bar at 25 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				Description of amendment N°
Mat:		Adriane DN50 24X				
Tol: ± 0.2	Code : 6932					
Drawing N° associated with the related CE? file		902	PV1909	A	2/2	Modified on :
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on : 29/03/2016
ATEX :						by CC verified by SR

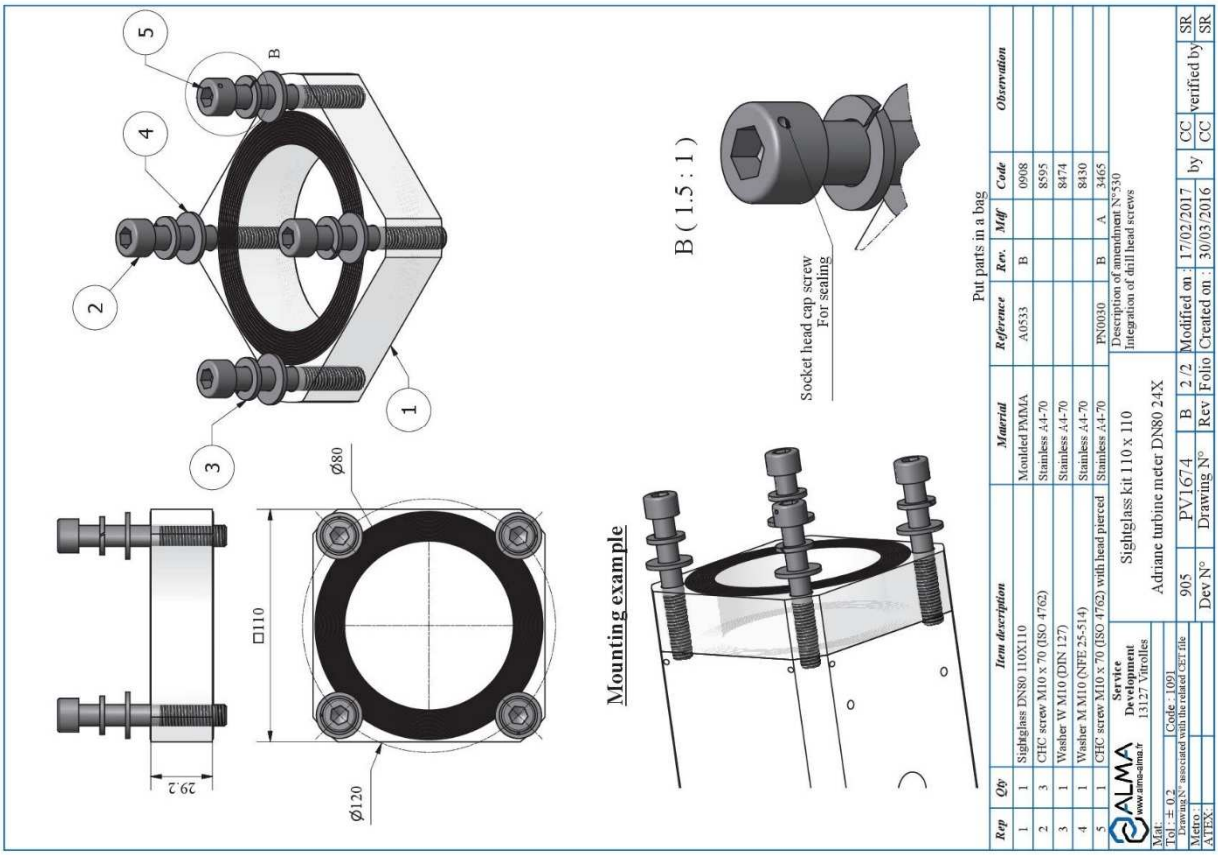
Document available on website alma-alma.fr

9.1. INSTALLATION RECOMMENDATIONS NON-RETURN VALVE KIT DN50 OR 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



10. SIGHTGLASS KIT DN50 OR DN80



Rep	Qty	Item description	Material	Reference	Rev.	Mfg	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	

Put parts in a bag

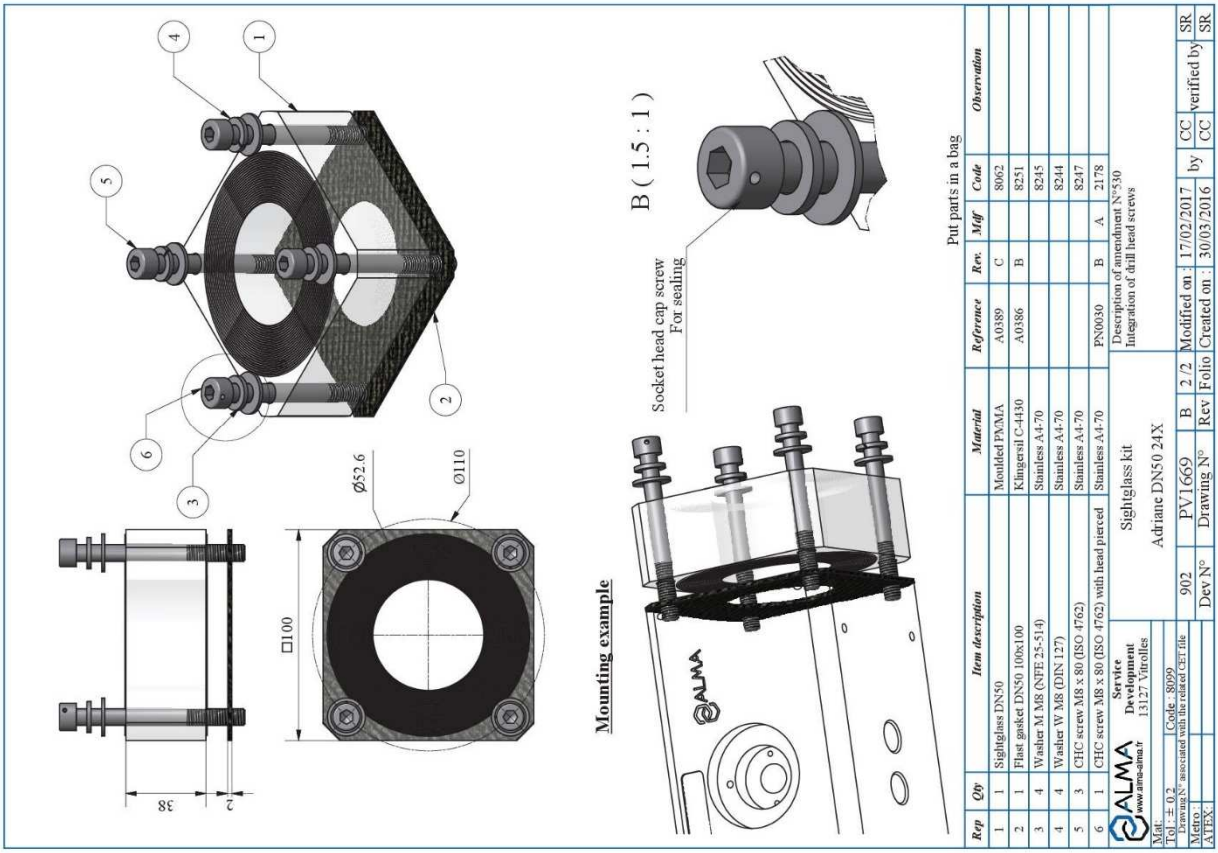
ALMA Service Development 13127 Vitrolles www.alma-alma.fr

Sightglass kit 110 x 110
Adriane turbine meter DN80 24X

Description of amendment N°530
Integration of drill head screws

Mat: | Tol : ± 0.2 | Code : 109 | Drawing N° associated with the related CET file | Metro: | ATEX:

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 | by | CC | verified by | SR



Rep	Qty	Item description	Material	Reference	Rev.	Mfg	Code	Observation
1	1	Sightglass DN50	Moulded PMMA	A0389	C		8062	
2	1	Flat gasket DN50 100x100	Klingersil C-4430	A0386	B		8251	
3	4	Washer M M8 (NFE 25-514)	Stainless A4-70				8245	
4	4	Washer W M8 (DIN 127)	Stainless A4-70				8244	
5	3	CHC screw M8 x 80 (ISO 4762)	Stainless A4-70				8247	
6	1	CHC screw M8 x 80 (ISO 4762) with head pierced	Stainless A4-70	PN0030	B	A	2178	

Put parts in a bag

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

Sightglass kit
Adriane DN50 24X

Description of amendment N°530
Integration of drill head screws

Mat: | Tol : ± 0.2 | Code : 8099 | Drawing N° associated with the related CET file | Metro: | ATEX:

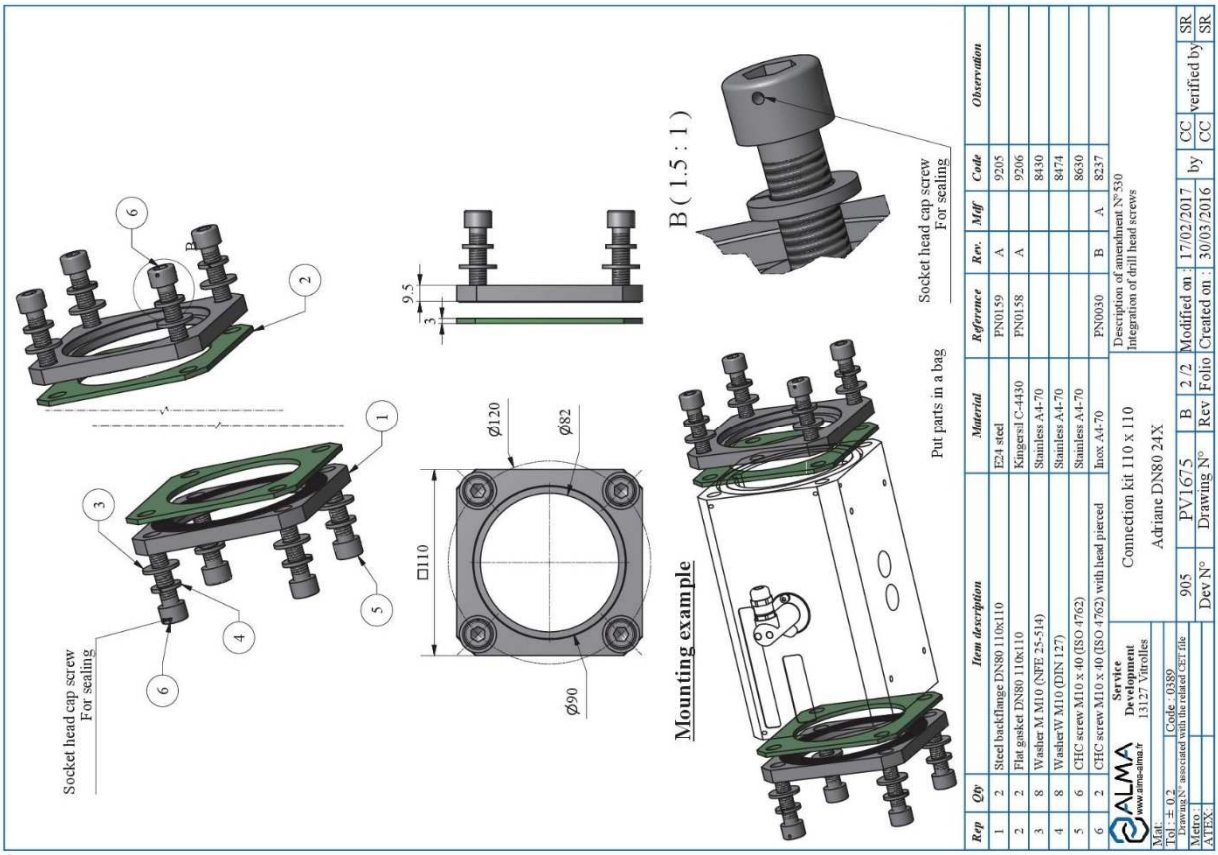
902 | PV1669 | B | 2/2 | Modified on : 17/02/2017 | by | CC | verified by | SR
Dev N° | Drawing N° | Rev | Folio | Created on : 30/03/2016 | by | CC | verified by | SR

Document available on website alma-alma.fr

10.1. INSTALLATION RECOMMENDATIONS SIGHTGLASS KIT DN50 OR DN80

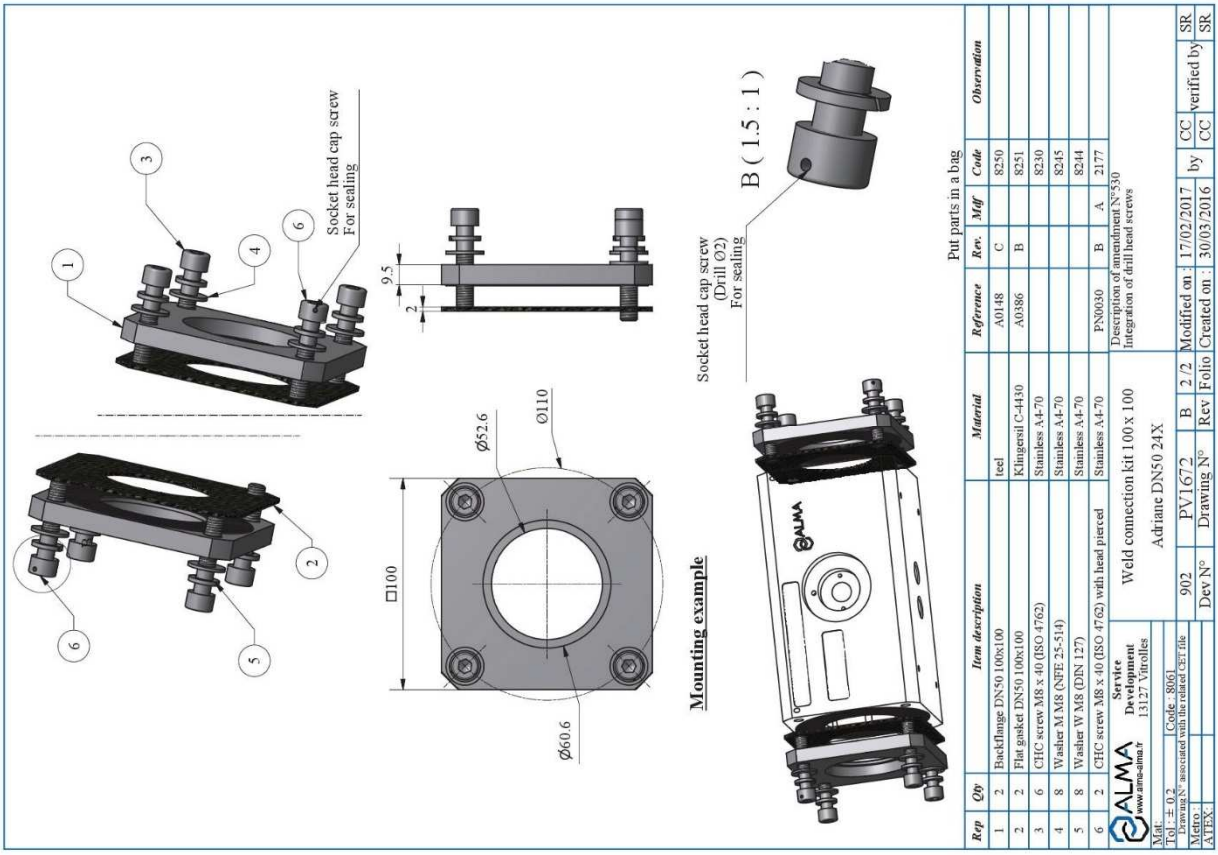
- Refer to the certificate written on the identification plate of the measuring system to suit the sealing requirements
- No loose lead wire on the sealing devices

11. CONNECTION KIT 100x100 DN50 OR DN80



Rep	Qty	Item description	Material	Reference	Rev.	Mfg	Code	Observation
1	2	Steel backflange DN80 110x110	E24 steel	PN0159	A		9205	
2	2	Flat gasket DN80 110x110	Klingersil C-4430	PN0158	A		9206	
3	8	Washer M M10 (NFE 25-514)	Stainless A4-70				8430	
4	8	Washer W 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 Service Development 13127 Vitrolles www.alma-alma.fr
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
Metric
ATEX
905 | PV1675 | B | 2/2 | Modified on : 17/02/2017 | by | CC | verified by | SR
Dev N° | Drawing N° | Rev | Folio | Created on : 30/03/2016 | by | CC | verified by | SR

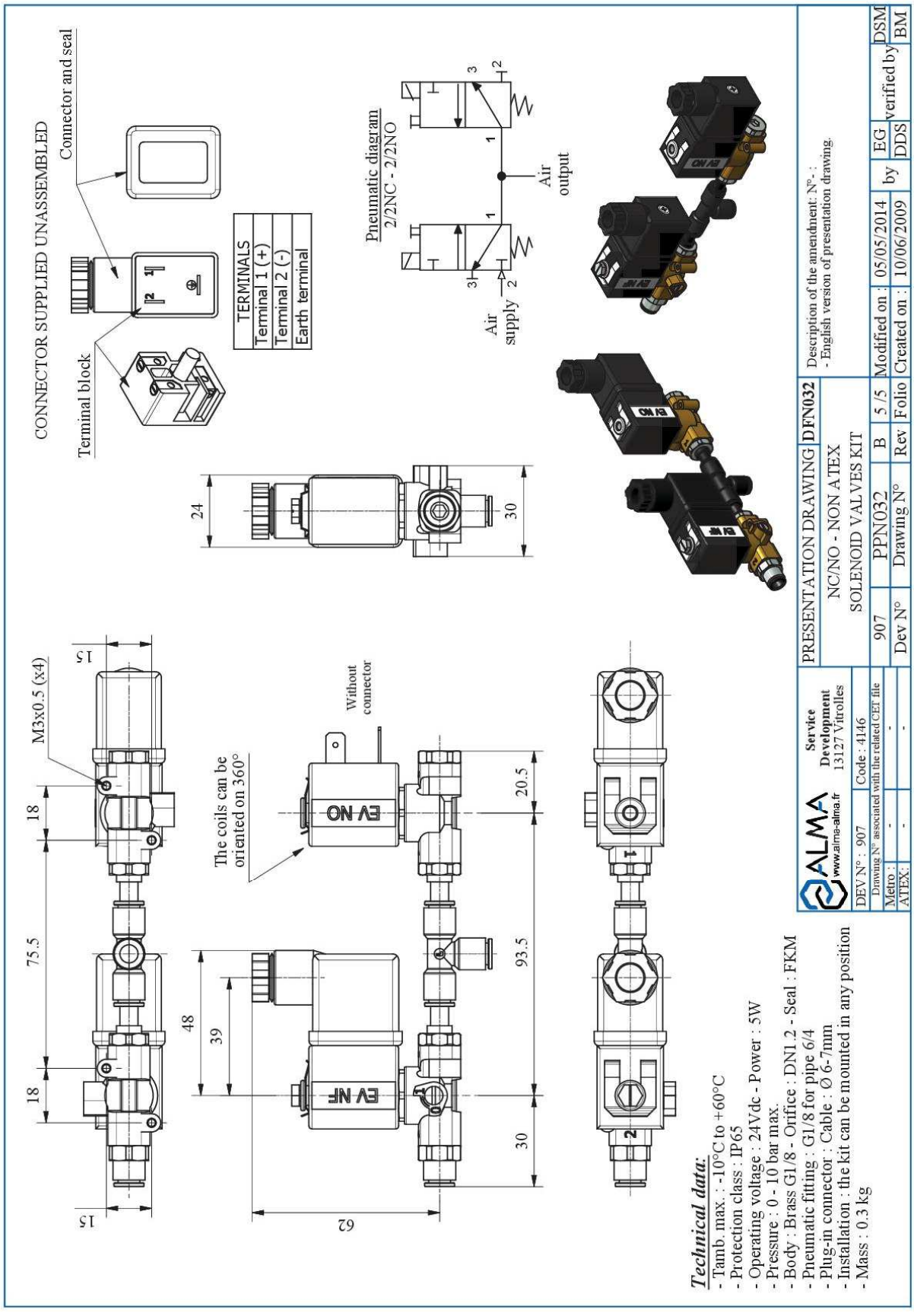


Rep	Qty	Item description	Material	Reference	Rev.	Mfg	Code	Observation
1	2	BackFlange DN50 100x100	teel	A0148	C		8250	
2	2	Flat gasket DN50 100x100	Klingersil C-4430	A0386	B		8251	
3	6	CHC screw M8 x 40 (ISO 4762)	Stainless A4-70				8230	
4	8	Washer M M8 (NFE 25-514)	Stainless A4-70				8245	
5	8	Washer W M8 (DIN 127)	Stainless A4-70				8244	
6	2	CHC screw M8 x 40 (ISO 4762) with head pierced	Stainless A4-70	PN0030	B	A	2177	

ALMA Service Development 13127 Vitrolles www.alma-alma.fr
Weld connection kit 100 x 100
Adriane DN50 24X
Description of amendment N°530
Integration of drill head screws
Mat:
Tol : ± 0.2
Code : 8061
Drawing N° associated with the related CET file
Metric
ATEX
902 | PV1672 | B | 2/2 | Modified on : 17/02/2017 | by | CC | verified by | SR
Dev N° | Drawing N° | Rev | Folio | Created on : 30/03/2016 | by | CC | verified by | SR

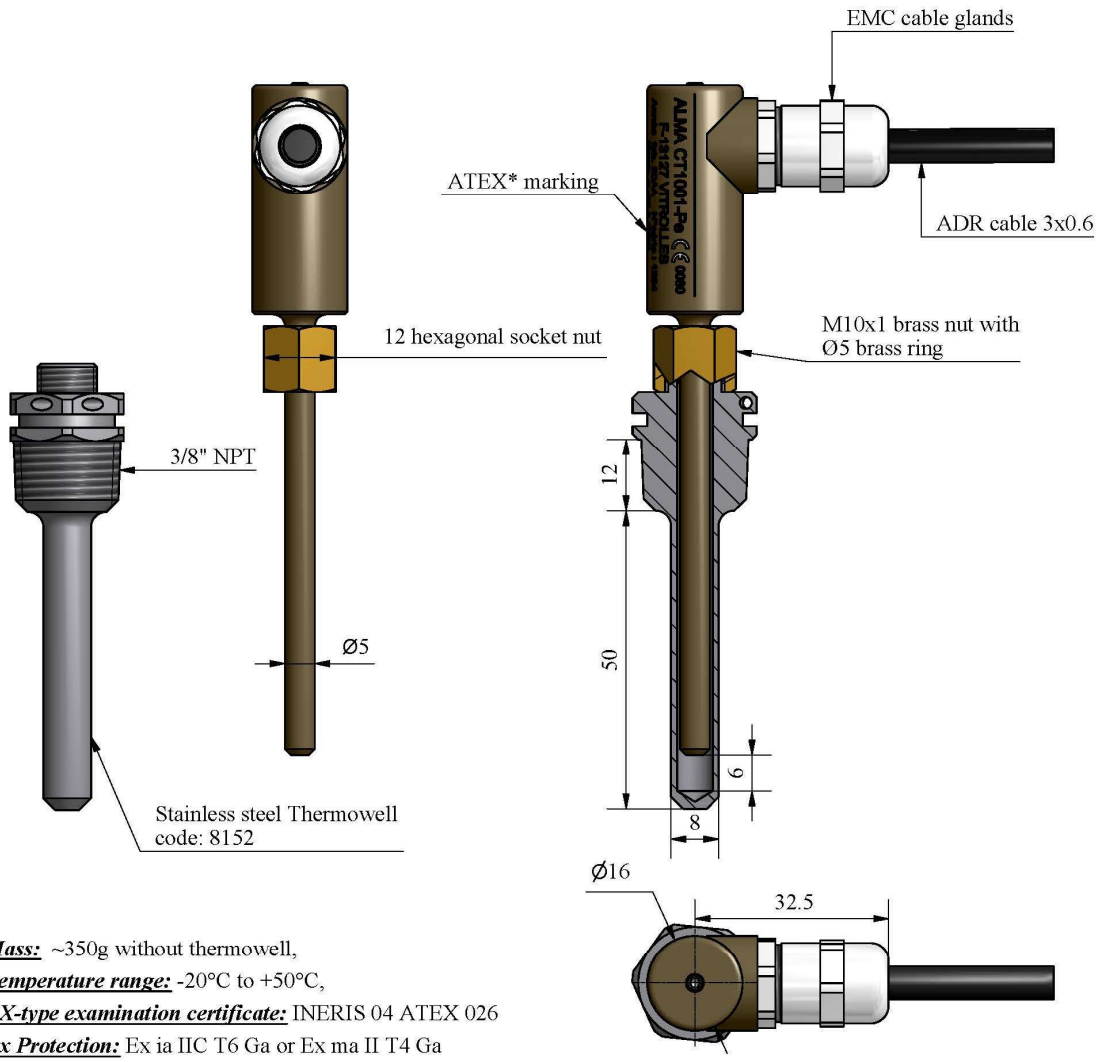
Document available on website alma-alma.fr

12. NC/NO SOLENOID VALVES KIT (NON ATEX)



Document available on website alma-alma.fr

13. TEMPERATURE PROBE Pt100 – CT1001



- ***Mass:*** ~350g without thermowell,
- ***Temperature range:*** -20°C to +50°C,
- ***EX-type examination certificate:*** INERIS 04 ATEX 026
- ***Ex Protection:*** Ex ia IIC T6 Ga or 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

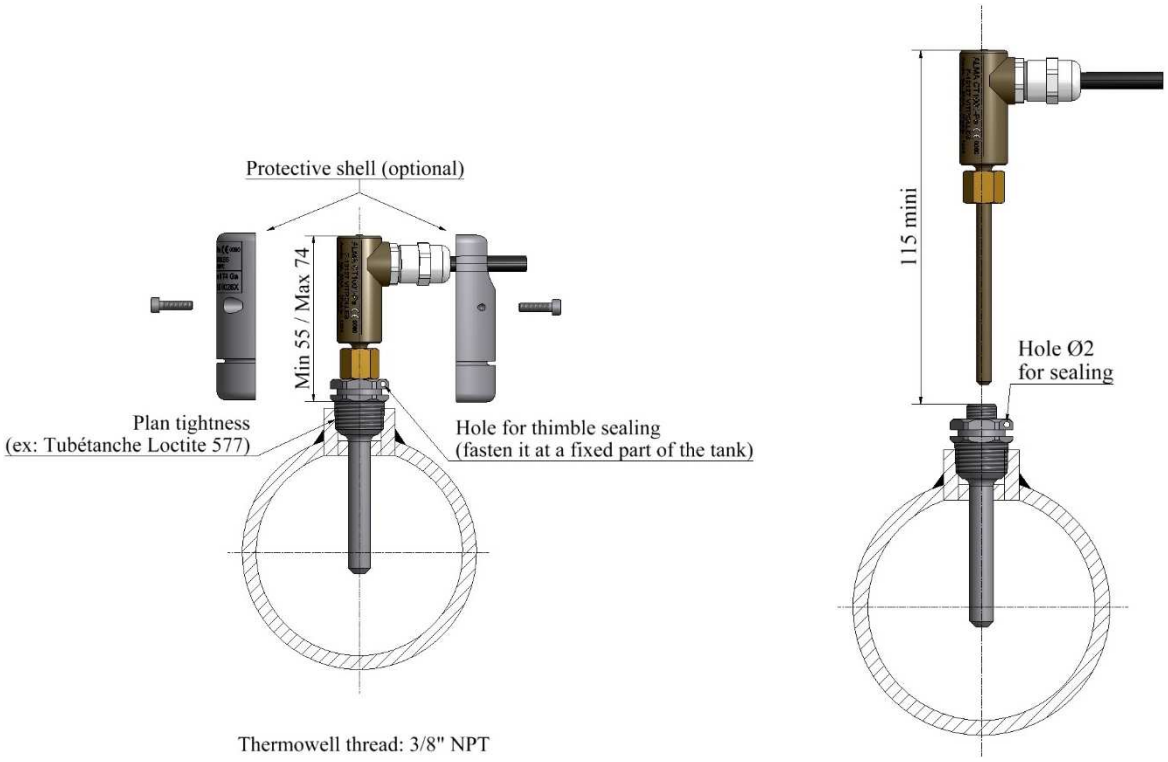
*ATEX "ia" and "ma" certification.
For installation and use in hazardous areas see Instruction manual

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

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

ALMA www.alma-alma.fr Service Development 13127 Vitrolles		PRESENTATION DRAWING	**DFV042**			Description of the amendment MDV489 Circuit optimized for more efficient assembly					
		Temperature probe CT1001-Pe									
DEV N° : 949d	Code : 8151										
Drawing N° associated with the related CET file		949d	PPV042	J	5 /7	Modified on :	04/10/2016	by	CHR	verified by	SR
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on :	13/09/2003		BM		BM
ATEX:	INERIS 04 ATEX 0026										

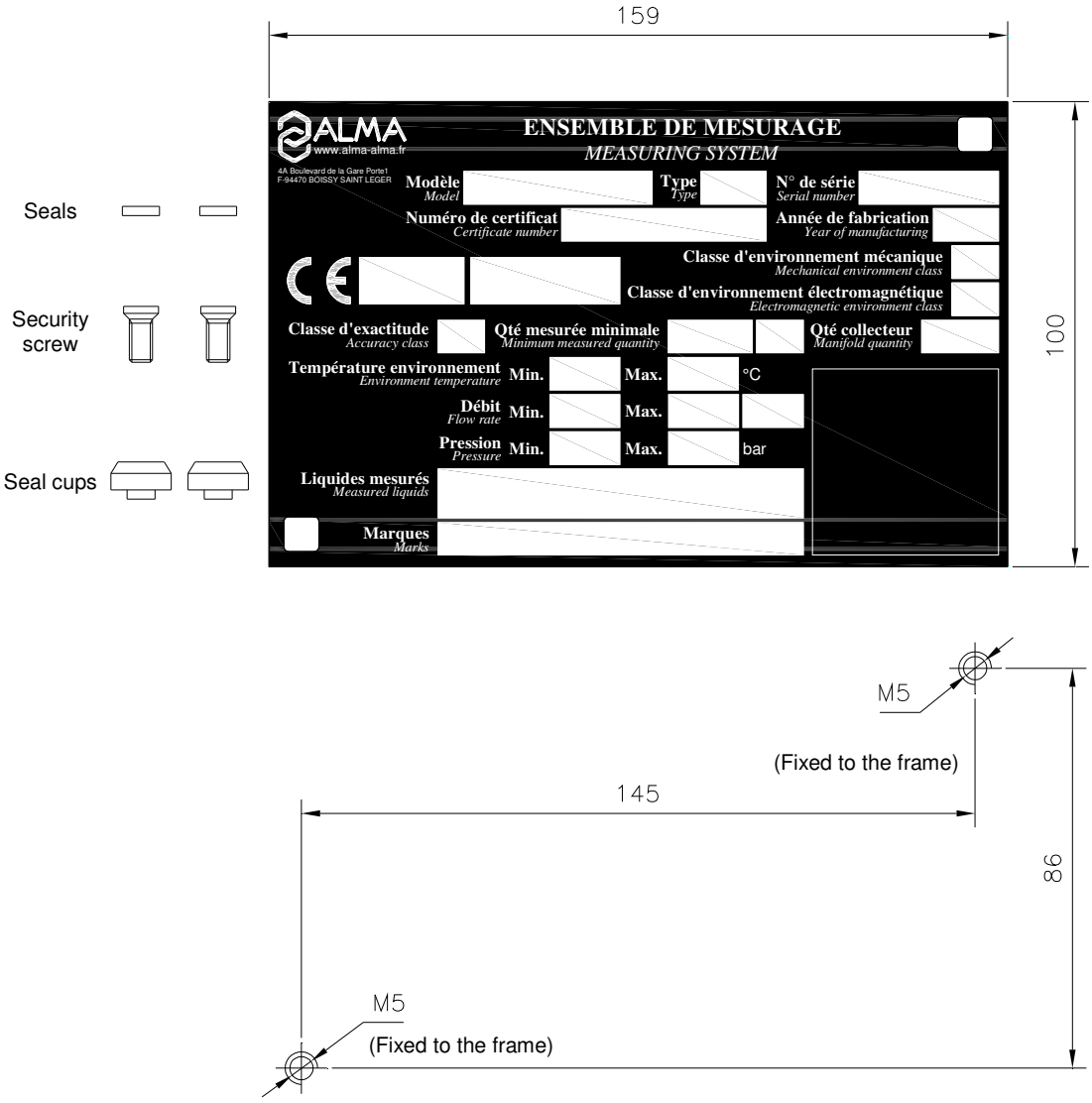
13.1. INSTALLATION RECOMMENDATIONS TEMPERATURE PROBE



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

14. 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).