INSTALLATION GUIDE

DI 005 EN H

LPG-TRONIC

Described in EC-type examination certificate N°: LNE-13621

H	2018/02/12	Integration of the ASKW remote control, new version of the control box *[MDV545]*	DSM/CHR	FDS/MV
Issue	Date	Nature of modifications	Written by	Approved by

CONTENTS

1. GENERAL RECOMMENDATIONS

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

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

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).

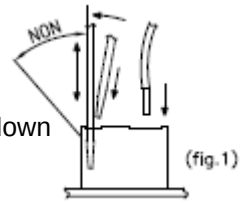
⇨ Connect the supply of the equipment downstream cut-out, on the power supply reserved to the measured distribution.

⇨ 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)

⇨ 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)

2. GENERAL PRESENTATION

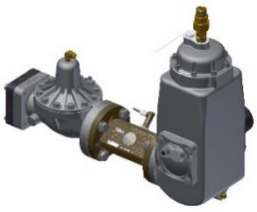
2.1. USE ACCORDING TO MID CERTIFICATE

The LPG TRONIC measuring system is covered by the EC type examination certificate N° LNE-13621.
Refer to this certificate for any precision about its installation.
For the sealing plan, see Annex to EC type examination certificate N° LNE-13621.

2.2. SPECIAL CONDITIONS FOR INSTALLATION IN ANY CASES

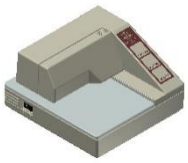
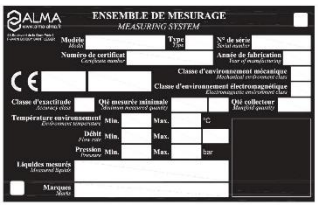
- ⇨ Safety valves may be incorporated in the ALMA LPG-TRONIC measuring system. If they are located downstream of the turbine meter, they must open to the atmosphere or be connected to the receiving tank. In no case may safety valves located upstream of the turbine meter be connected to the valves located downstream by pipes that bypass the turbine meter.
- ⇨ To prevent any hydraulic connection of bottle under pressure, the purge below the gas separator must finish on a smooth stiff pipe, without threading nor join, and which is not take down.

3. PART LIST

EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA				
Item	**Equipment**	**Designation**	**Qty**	**Option***
1		**CALCULATOR INDICATOR MICROCOMPT+ LPG TRONIC** (Provided with a magnetic or RFID supervisor key)	**1**	
2		**GPL TRONIC CONTROL BOX** (Provided with RS232-serial link and power supply for printer)	**1**	•
3	**3.a** 	**METERING LINE GPL-BALC** (Gas separator – ADRIANE turbine meter DN50-30 – differential valve)	**1**	
	3.b 	**ADRIANE TURBINE METER DN50-30 BALC**		

Non-contractual pictures

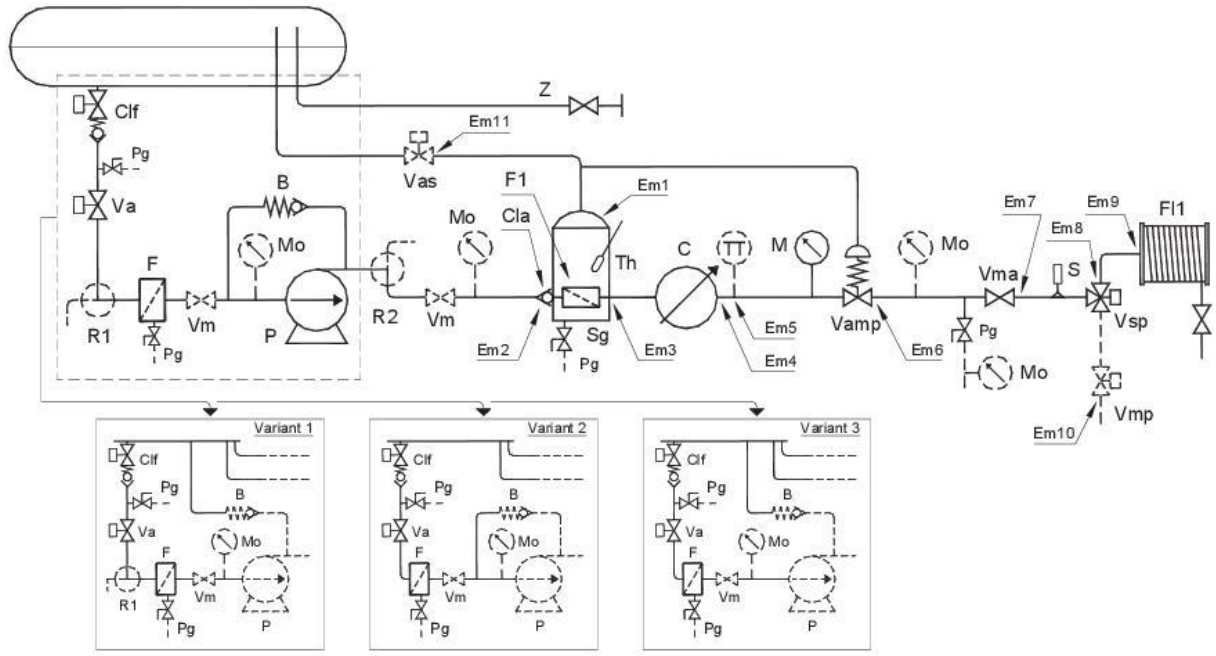
EQUIPMENTS INCLUDED IN THE MEASURING SYSTEM DELIVERED BY ALMA

Item	Equipment	Designation	Qty	Option*
4	4a 	**PRINTER TMU-295** (Printer – printer holder – cable 5 or 10m)	1	
	4b  	**CONVERTER 24VDC/24VDC 2.1A 50W** Provided if there is no control box (With RS232 serial link wire and 24VDC power supply for printer)	1	●
5		**REMOTE CONTROL RCT4**	1	●
6		**Pt100 TEMPERATURE SENSOR – CT1001-Pe** (Supplied with thermowell)	1	
7		**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

4. INSTALLATION AND SEALING DRAWING OF THE LPG-TRONIC



Legend:

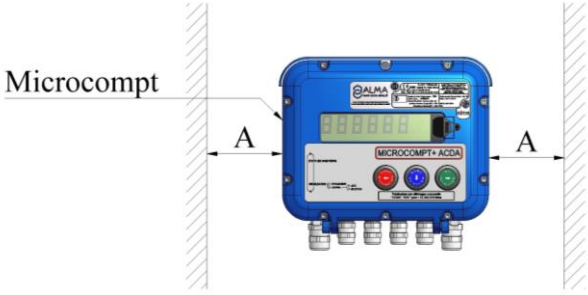
- Clf: Foot valve
- Pg: Line purge in the atmosphere (can be collected between them)
- Va: Control valve allowing liquid to flow.
- R1: Two-way cock for deliveries with meter and for draining or filling tank without meter This device is optional and may be replaced by a direct connection.
- F: Filter
- Vm: Operation valve (optional).
- B: Adjustable bypass connected to tank
- M0: Manometer (optional)
- P: Pump
- R2: Three-way cock (optional) for direct delivery without meter.
- Cla: Non-return valve fitted to block comprising filter and gas separator
- F1: Filter fitted to gas separator
- Sg: Gas separator, connected to gaseous phase of tank. If a safety valve (Vas) is fitted to this device, it must be placed between the tank and the diversion from the pressure control valve (Vamp).
- Vas: Automatic safety valve (optional)
- Th: Thermometer. The thermometer must be located close to the meter, either in the gas separator or at the meter inlet or outlet.
- C: Meter
- TT: Pt100 temperature sensor (optional).
- Vamp: Pressure control valve, regulated to maintain pressure at least 1 bar higher than saturated vapour pressure in the tank
- M: Manometer
- S: Valve of thermal expansion
- Vma: Operation valve
- VSP: Three ways faucet allowing a delivery by two ways of distribution
- Fl1: Full hose
- Z: Gaseous phase piping, to be used only for filling vehicle tank or for draining tank when measuring system is verified.

5. CALCULATOR-INDICATOR MICROCOMPT+

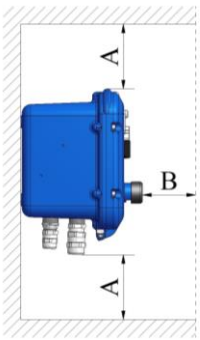
Document available on website alma-alma.fr

5.1. INSTALLATION RECOMMENDATIONS CALCULATOR-INDICATOR MICROCOMPT+

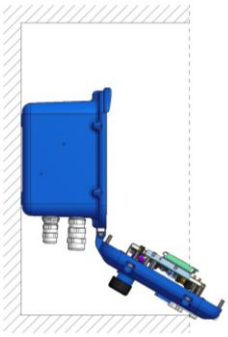
- Fasten the box with 4 M6 screws (holder suitable for vibrations and designed to support the MICROCOMPT). On the box: 4 M6 blind holes tapped length=12 over 185x132).
- Leave an open space around the box in order:
  - To facilitate maintenance operation.
  - To prevent any pressing on pushbuttons and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

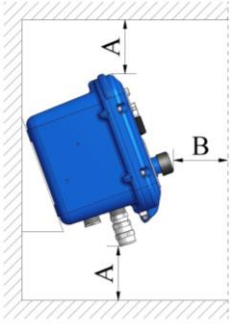


Left hand view
Closed box



Left hand view
open box

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

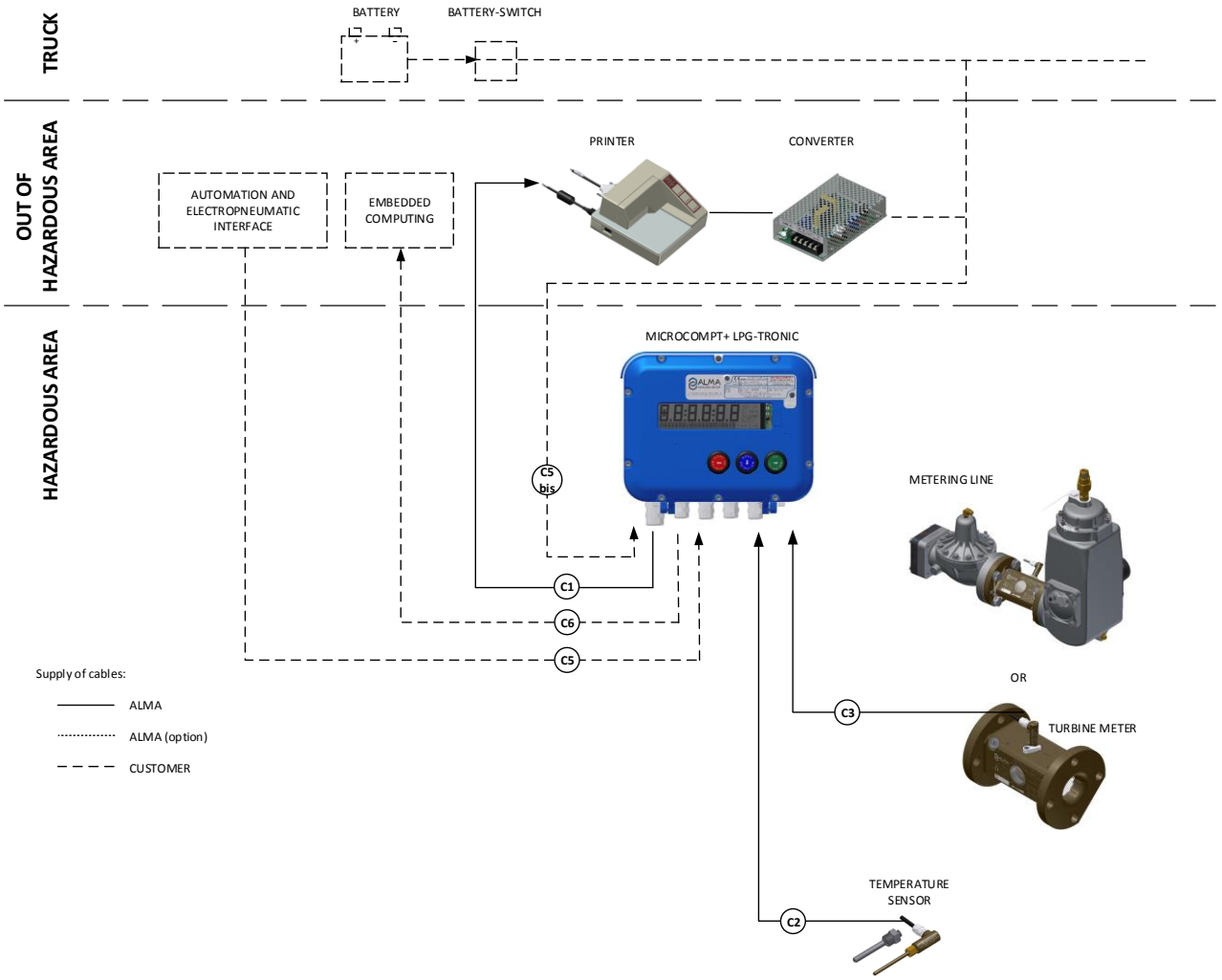


Left hand view
Closed box

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+: BASIC VERSION

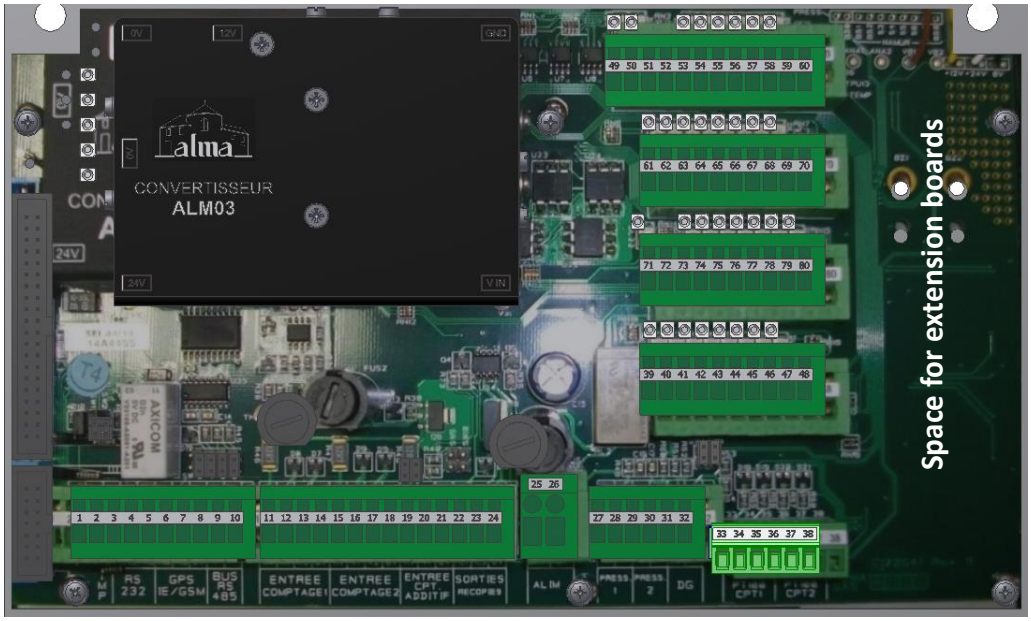


Terminal assignment of the MICROCOMPT+ power supply board basic version

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

TERMINAL ASSIGNMENT OF MICROCOMPT+ BOARDS

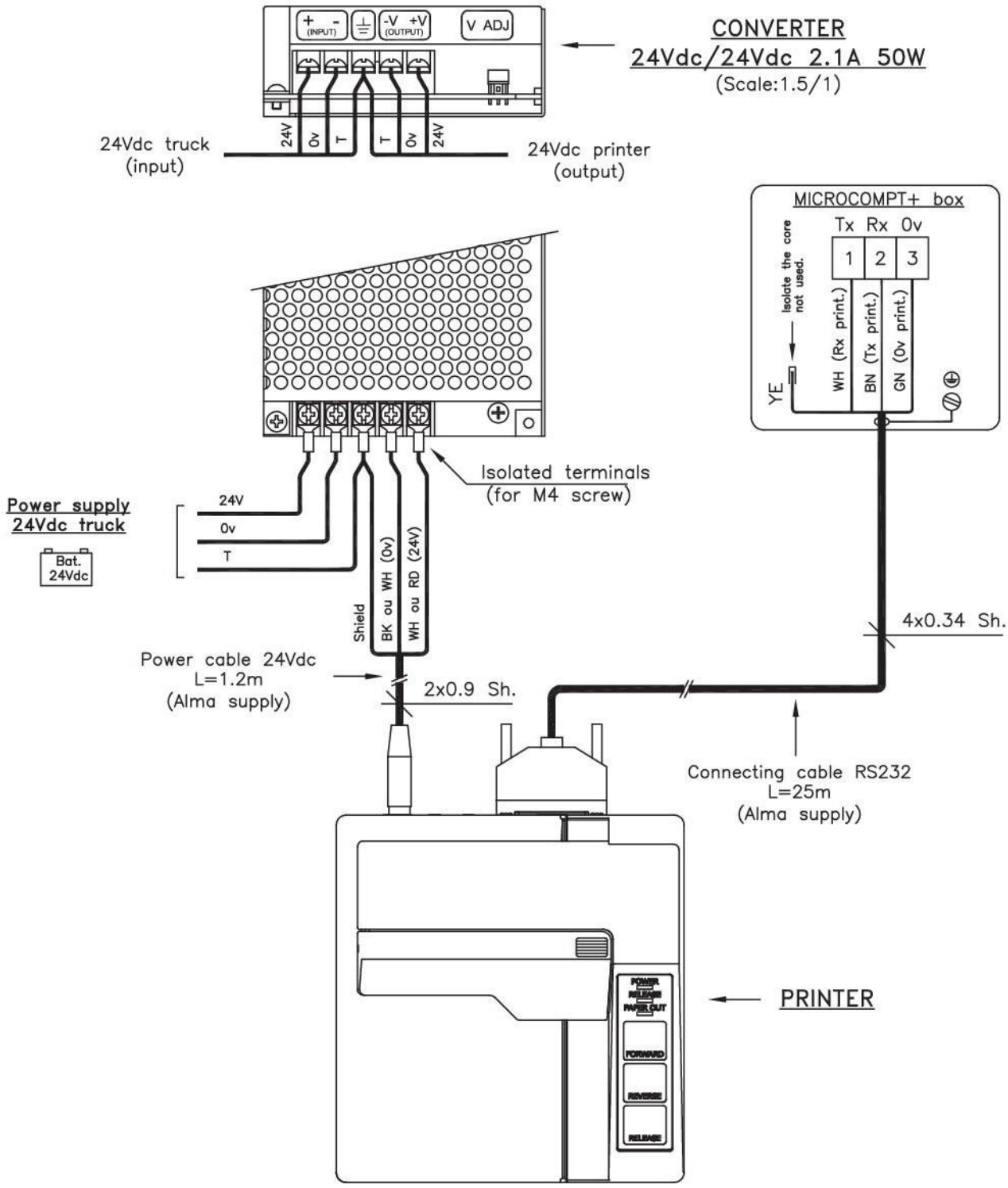
INTERFACE POWER SUPPLY BOARD



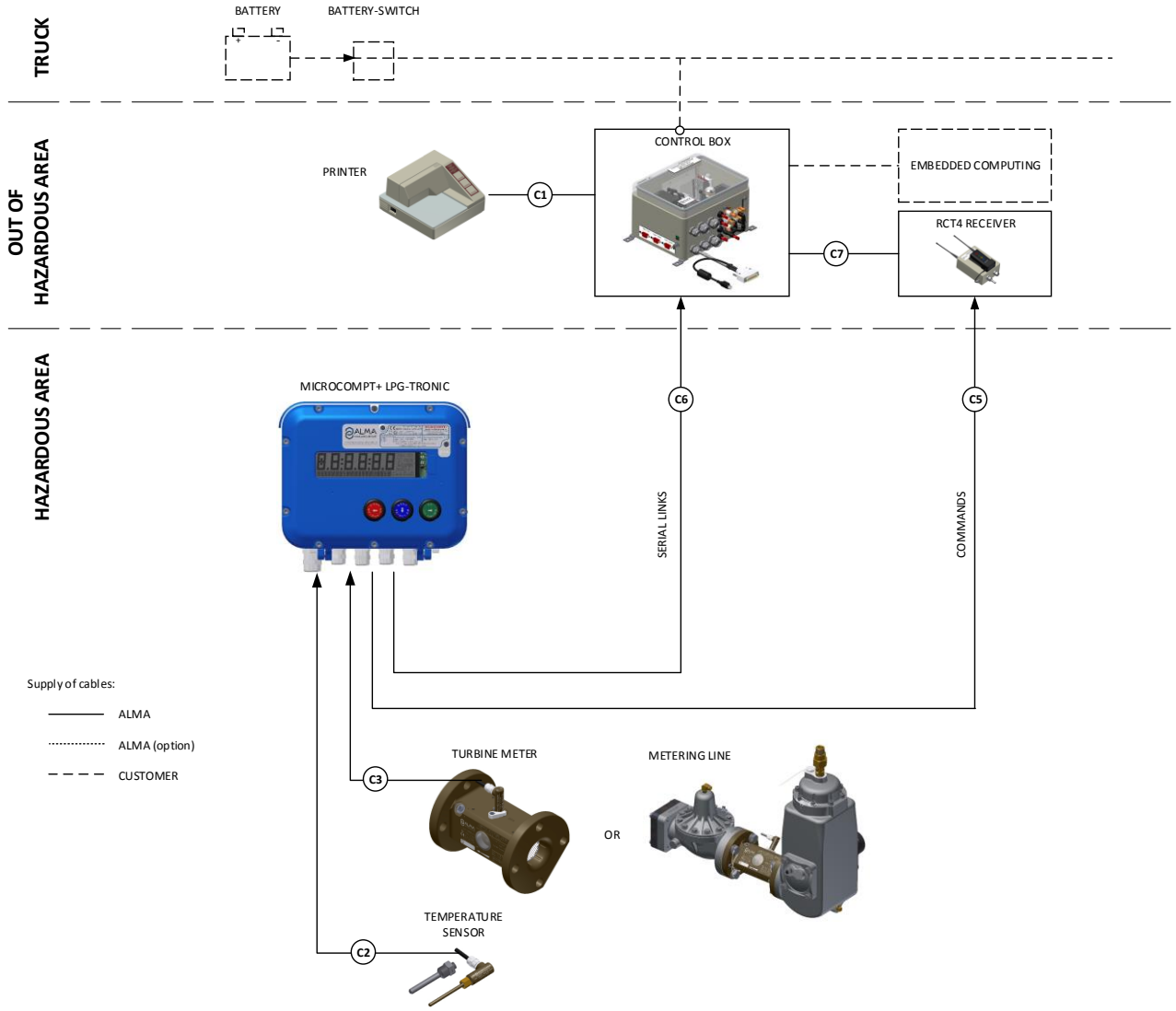
EQUIPMENTS CONNECTED TO THE MICROCOMPT+								INTERFACE POWER SUPPLY BOARD			
Option	Equipment	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	PRINTER	C1	1/2"NPT	●	ADR 4x0.34 sh.	Rx	Bc	1	Tx	PRINTER	Connect the shielding
						Tx	Mr	2	Rx		
						0V	Vt	3	0V		
•	EMBEDDED COMPUTING	C6			3x0.34 sh.	Rx	Bc	6	Tx	GPS / GSM / EC	Connect the shielding
						Tx	Mr	7	Rx		
						0V	Vt	8	0V		
	TURBINE TRANSMITTER	C3	1/2"NPT		ADR 4x0.34 sh.	12V	Jn	11	12V	TURBINE INPUT	Connect the shielding
						V1	Mr	12	V1		
						V2	Vt	13	V2		
						0V	Bc	14	0V		
	24VDC-INPUT truck (battery)	C5 bis			2x1	Bat (+)	1	25	24VDC	POWER SUPPLY 24VDC	
						Bat (-)	2	26	0V		
	INTERMEDIATE STOP	C5			7X1	Interm. Stop	5	49	24VDC	INTERM. STOP	Free contact from the vehicle automatic process
	MEASURING END					Measur. end	6	50	24VDC	MEASURING END	Free contact from the vehicle automatic process
	HIGH FLOWRATE					HF	3	74	24VDC	HIGH SPEED	24VDC- output to the vehicle automatic process
	AUTHORISATION CHANNEL 1					Author.	4	75	24VDC	AUTHOR. CHANNEL 1	Connect the 24VDC- output in series with the vehicle automatic process
	AUTHORISATION CHANNEL 2					Author.	7	63	24VDC	AUTHOR. CHANNEL 2	Connect the 24VDC- output in series with the vehicle automatic process
	Pt100 TEMPERATURE PROBE	C2	1/2"NPT		ADR 3x0.6 sh.	+	Jn	33	+	Pt100	Connect the shielding
						-	Bc	34	-		
						-	Vt	35	-		

**Refer to the Cable Glands Installation Instruction*

Wiring diagram of the 24VDC/24VDC converter for printer:



5.3. ELECTRICAL WIRING WITH CONTROL BOX AND RCT4 REMOTE CONTROL

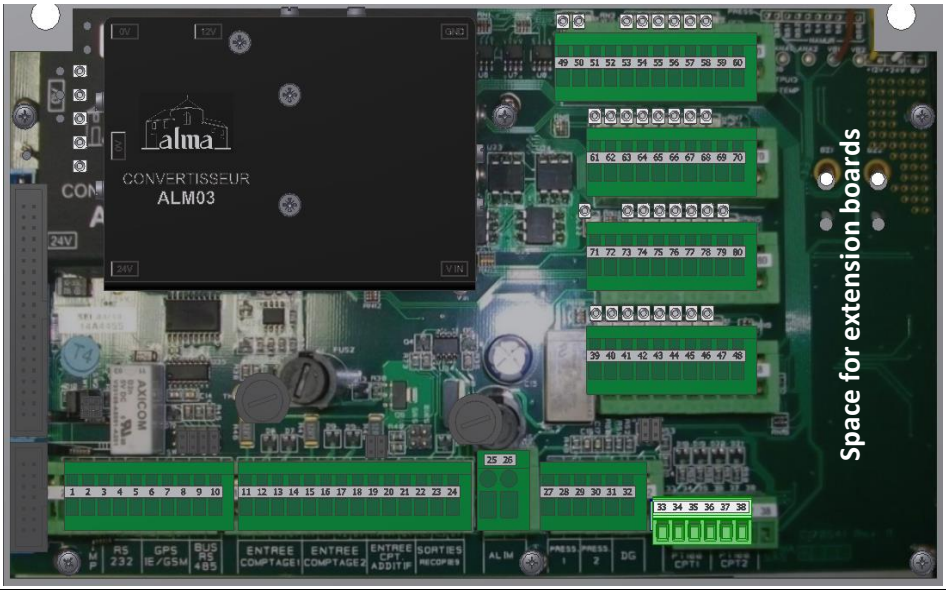


Terminal assignment of the MICROCOMPT+ power supply board RCT4 version

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

TERMINAL ASSIGNMENT OF MICROCOMPT+ BOARDS

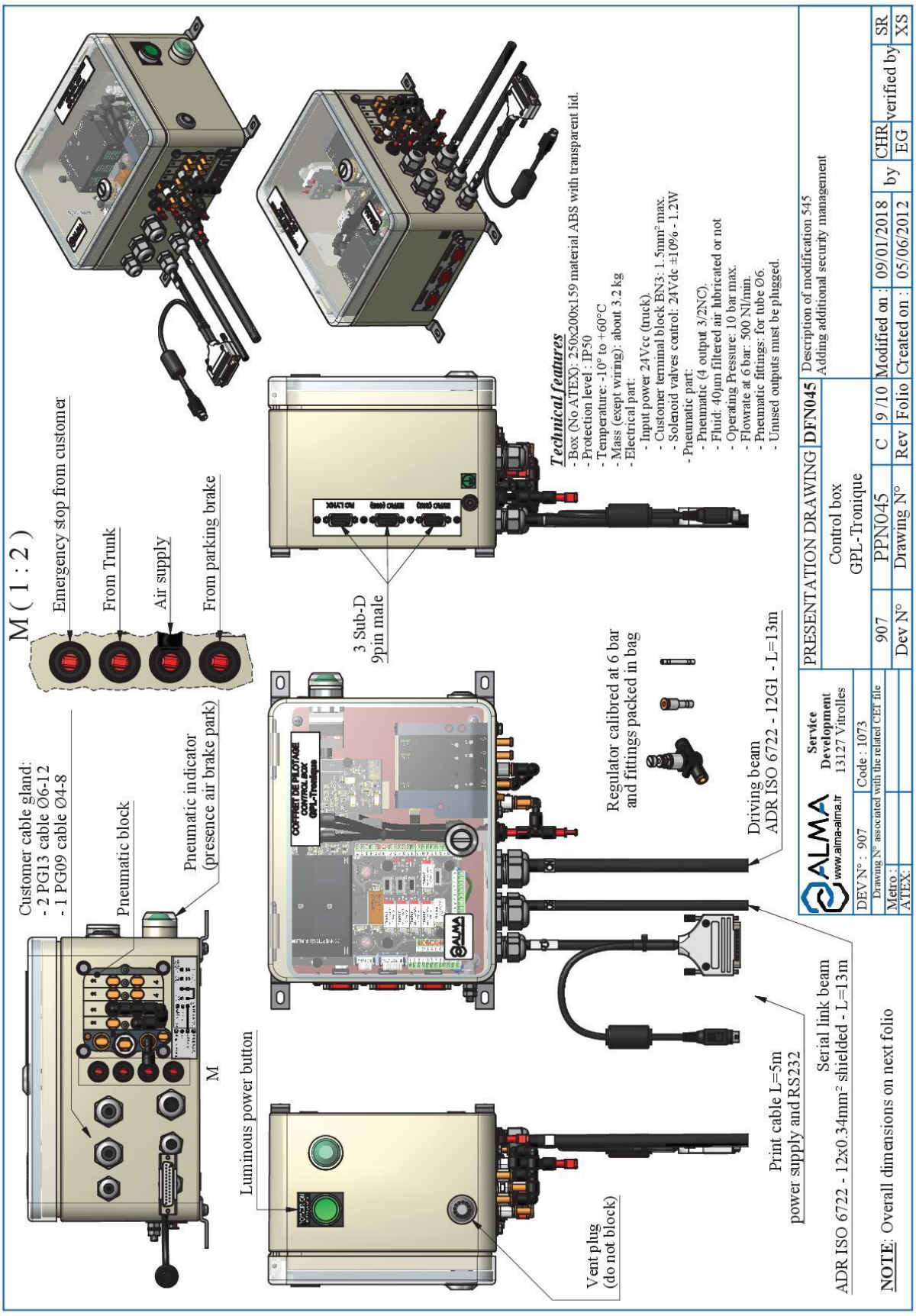
MICROCOMPT+ POWER SUPPLY BOARD



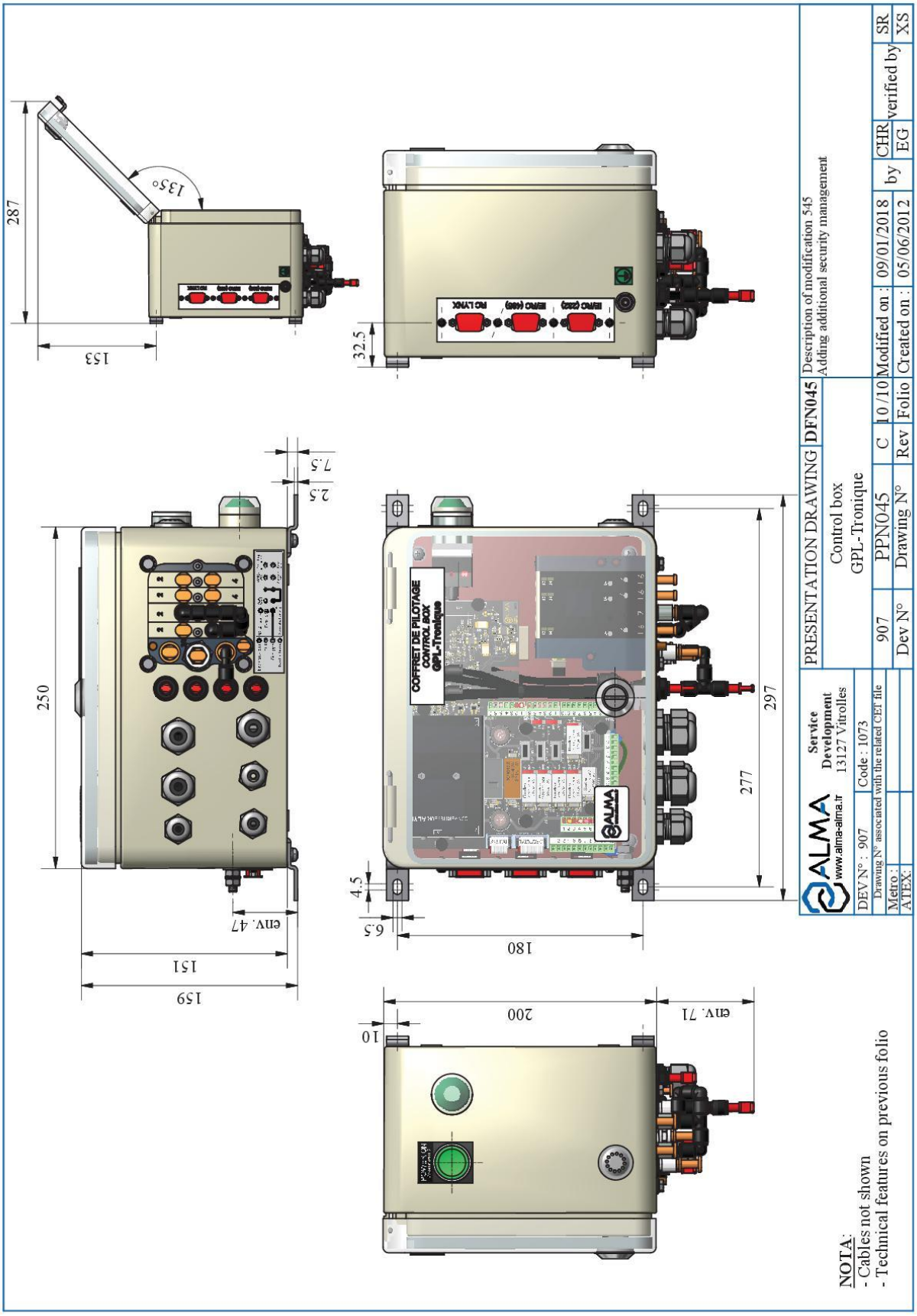
EQUIPMENTS CONNECTED TO THE MICROCOMPT+								MICROCOMPT+ POWER SUPPLY BOARD			
Option	Equipment	Cable (for information) No.	CG*	Alma	Type	Function	Colour or No.	Terminal	Function		Observation
	CONTROL BOX serial links	C6		●	ADR 12x0.34 sh.	Rx	Vt	1	Tx	PRINTER	
						Tx	Jn	2	Rx		
						0V	Nr	3	0V		
						Rx	Bl	4	Tx	RS232 EC + RC	Serial link RS232 Embedded computing (EC) Remote control (RC)
						Tx	Rg/Bl	5	Rx		
						RS485+	Bc	9	RS485+	RS485 EC + RC	Serial link RS485 Embedded computing (EC) Remote control (RC)
						RS485-	Rs	10	RS485-		
						Pulses output +	Rg	22	S	PULSES OUTPUT	
						Pulses output -	Gr	24	0V		
						Mesur. End	Vi	53	24VDC	MEASURING END	Anti-fraud, Final stop
						PTO control	Mr	58	PTO	PTO CONTROL	
	TURBINE TRANSMITTER	C3	1/2"NPT		ADR 4x0.34 sh.	12V	Jn	11	12V	TURBINE INPUT	Connect the shielding
						V1	Mr	12	V1		
						V2	Vt	13	V2		
						0V	Bc	14	0V		
	RECEIVER RCT4 Commands	C5		●	12G1	24VDC	1	25	24VDC	POWER SUPPLY 24VDC	
						0V	2	26	0V		
						HS	3	74	24VDC	HIGH SPEED	High speed
						Author.	4	75	24VDC	AUTHOR.	Authorisation
						Interm. stop	5	49	24VDC	INTERM. STOP	Intermediate stop
						Measuring end	6	50	24VDC	MEASURING END	Measuring end
	Pt1000 TEMPERATURE PROBE	C2	1/2"NPT		ADR 3x0.6 sh.	+	Jn	33	+	Pt100	Connect the shielding
						-	Bc	34	-		
						-	Vt	35	-		

**Refer to the Cable Glands Installation Instruction*

Control box LPG-TRONIC

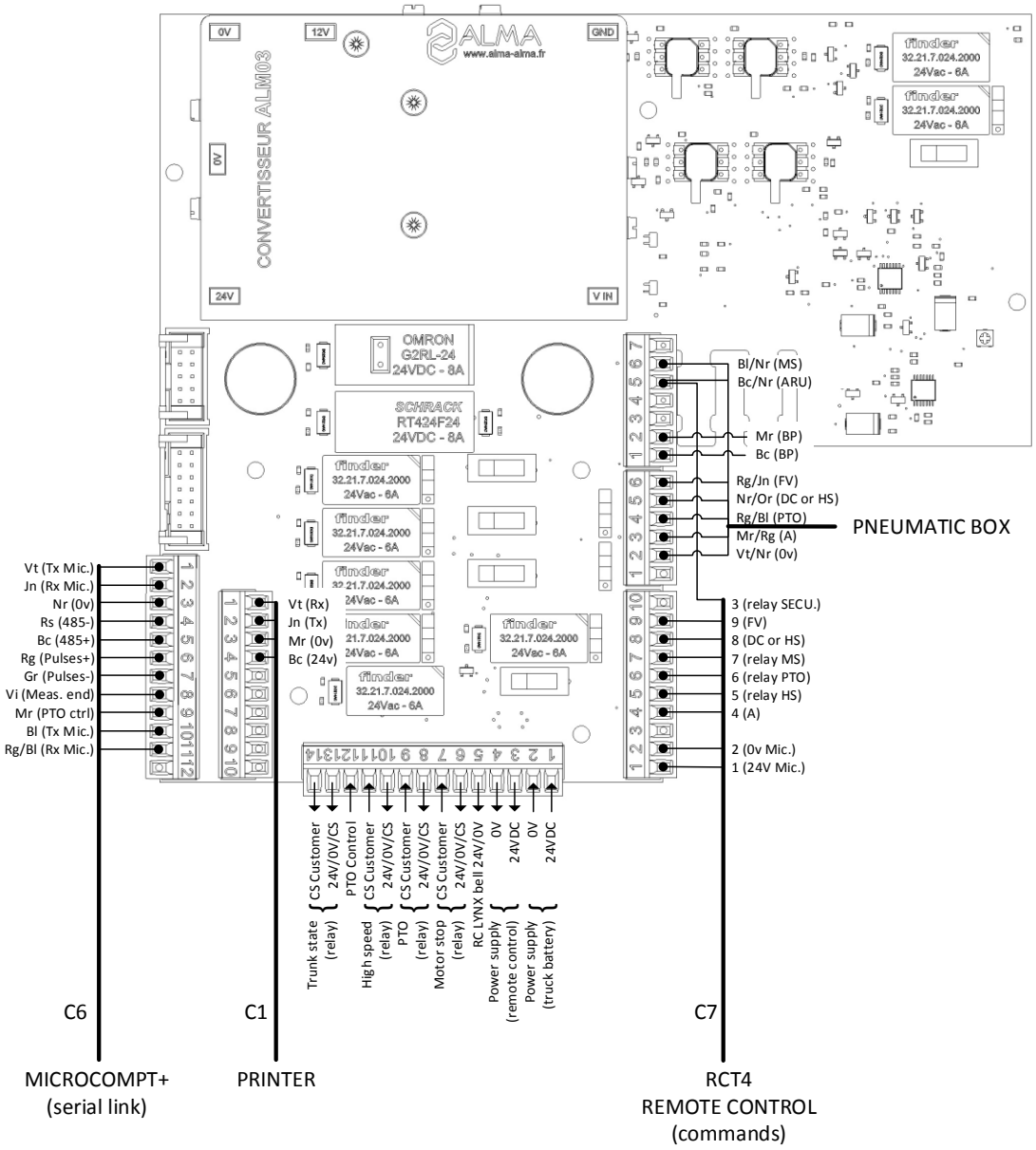


Document available on website alma-alma.fr

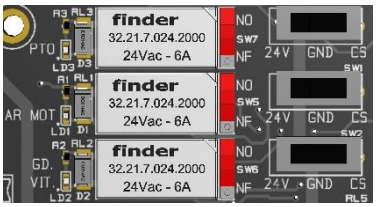


Electrical wiring control box RCT4 version

Wiring diagram of the control box RCT4 version:



Configuration of switches:



Linear switching element for relays NC or NO contact	Three-position switch for common contact: 1→24VDC 2→GND (0V) 3→CS (Free contact)

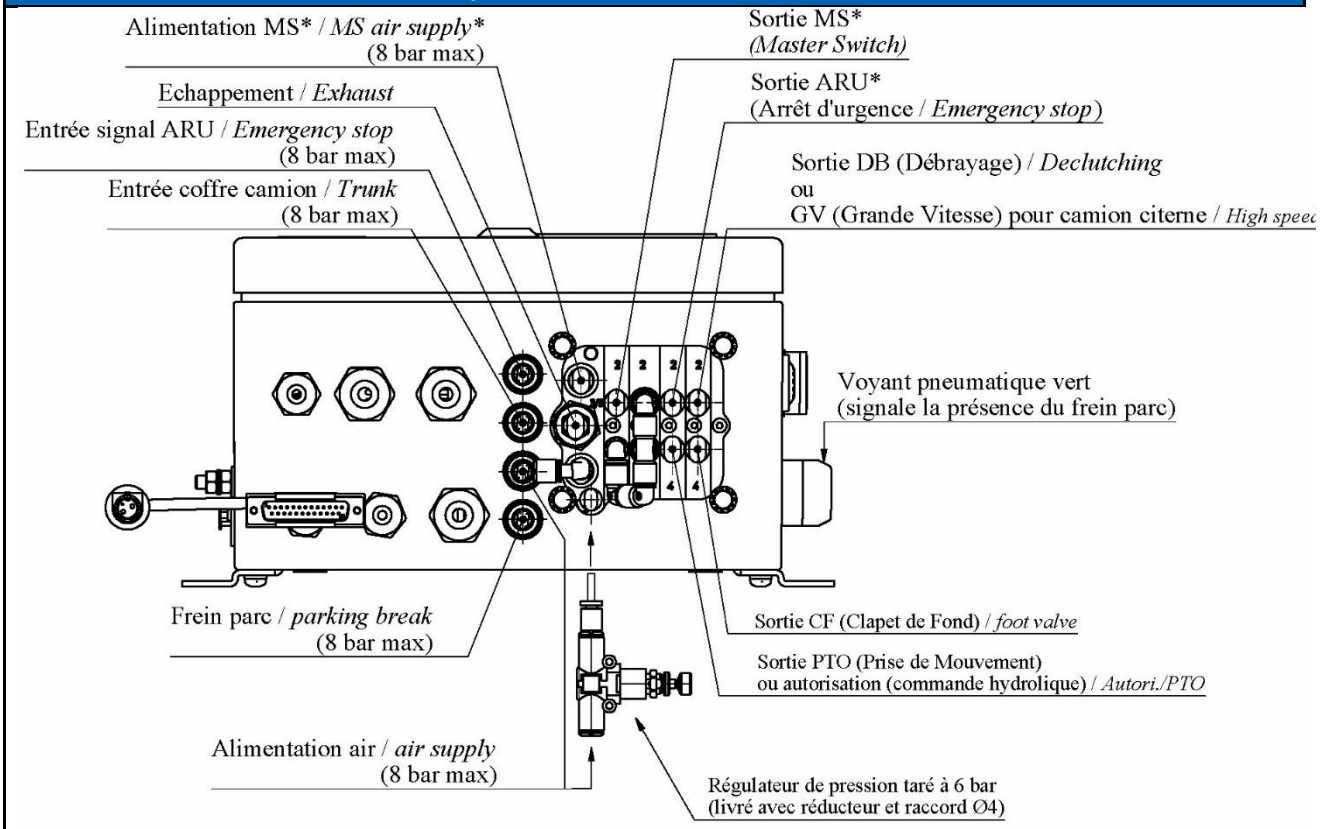
TERMINAL ASSIGNMENT OF THE CONTROL BOX RCT4 VERSION

EQUIPMENT CONNECTED TO THE CONTROL BOX												
Option	Equipement	Cable for information) N°	CG*	Alma	Type	Function	Colour or No.	Block	Terminal	Function		Observation
	MICROCOMPT+ Serial links	C6			12x0.34 sh	Tx	Vt	BN1	1	Rx	PRINTER	
						Rx	Jn		2	Tx		
						0V	Nr		3	0V		
						RS485 -	Rs		4	RS485	EC + RC	RS485 serial link Embedded computing (EC) Remote control (RC)
						RS485 +	Bc		5			
						Tx	Bl		10	RS232	EC + RC	RS232 serial link Embedded computing (EC) Remote control (RC)
						Rx	Rg/Bl		11			
	PRINTER	C1		●	2x1	Rx	Vt	BN2	1	Rx	PRINTER	
						Tx	Jn		2	Tx		
						0V	Mr		3	0V		
						24VDC	Bc		4	24VDC		
	POWER SUPPLY					*24VDC*		*BN3 - Bornier client*	*1*	*24VDC*	*POWER SUPPLY*	*24VDC truck battery (after battery switch and protected by a fuse)*
						0V			*2*	*0V*		
	RC LYNX BELL								*5*	-	-	
	MOTOR STOP								*6*	*24VDC/0V/CS*	*MOTOR STOP*	*Relay (Configuration 24V, 0V or Free contact)*
									7	*CS*		*Only used with configuration Free contact*
	PTO								*8*	*24VDC/0V/CS*	*PTO*	*Relay (Configuration 24V, 0V or Free contact)*
									9	*CS*		*Only used with configuration Free contact*
	HIGH SPEED								*10*	*24VDC/0V/CS*	*HIGH SPEED*	*Relay (Configuration 24V, 0V or Free contact)*
									11	*CS*		*Only used with configuration Free contact*
									12	-	-	
	TRUCK TRUNK								*13*	*24VDC/0V/CS*	*TRUCK TRUNK*	*Relay (Configuration 24V, 0V or Free contact)*
									14	*CS*	*TRUCK TRUNK*	*Only used with configuration Free contact*
	RECEIVER RCT4	C7		●	12G1	24VDC	10	BN3	3	24VDC	SUPPLY CARD AND CRADDLE	Power supply for the remote control card and craddle
						0V	11		4	0V		
						24VDC	1	BN4	1	24VDC	MICROCOMPT+ POWER SUPPLY	Fuse
						0V	2		2	0V		
						Author.	4		4	EV 3/2NC	AUTHOR.	Authorisation
						HS	5		5	RELAY	HS	High speed
						PTO	6		6	EV 3/2NC	PTO	Power take off
						Stop	7		7	RELAY	MS	Motor Stop
						DC	8		8	EV 3/2NC	DC	Declutching (or High Speed)
						FV	9		9	EV 3/2NC	FV	Footvalve
						Security	3	BN6	3	RELAY	SECURITY	Safety request
							V/J					

**Refer to the Cable Glands Installation Instructions*

Pneumatic wiring control box RCT4 version

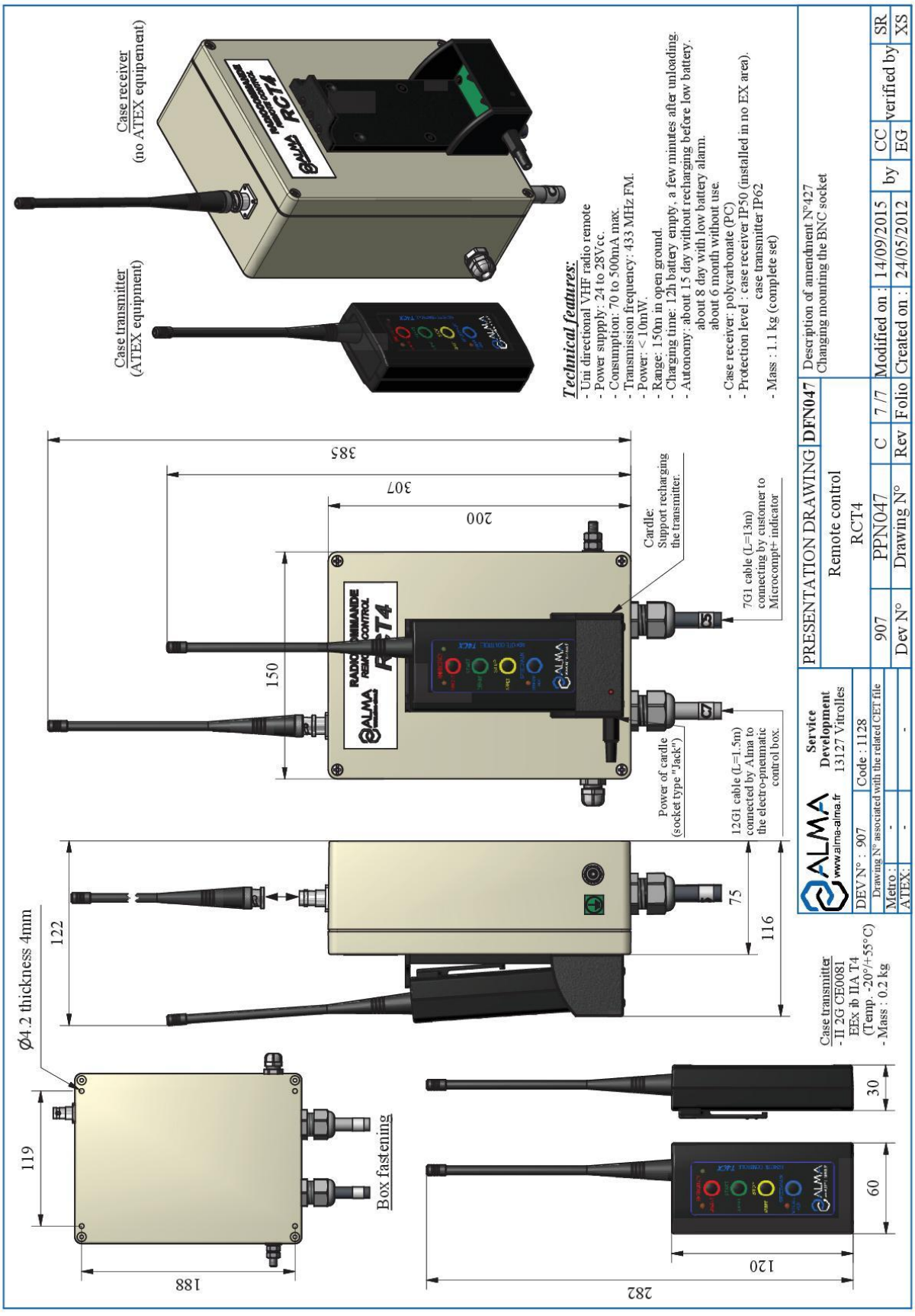
PNEUMATIC INPUT/OUTPUT ASSIGNMENT OF THE CONTROL BOX



Label	Input	Output	Function	Observation
Air supply	X		Main supply of the control box + detector for pressure drop	Pressure >1 bar: green warning light Pressure <1 bar: orange warning light. Disable the security management for trunk, pressure drop and customer ARU
	X		Secondary supply of the control box	The 6 bar-calibrated regulator, the 6/4 reducer and the Ø4 coupling are packed in a bag inside the control box
Air from parking brake	X		Air from parking brake	
Exhaust		X	Exhaust	Put a tube L=100mm min. (no muffler)
Emergency stop*		X	Pneumatic emergency stop	
Declutching		X	Declutching actuator (or High speed)	With pneumatic declutching
Footvalve		X	Footvalve opening	
Power take off PTO or Authorisation		X	Power take off or Authorisation	Power take off: leave the plug in place and don't connect any tube in case of electrical control Authorisation: hydraulic control
ARU Emergency stop input	X		Detection of emergency stop requests	ARU are connected in series in a positive safety loop
Trunk	X		Detection of back trunk openings	No air=trunk opened
MS*		X	Timed Master switch	When using the MS pneumatic output
Supply MS*	X		Master switch air supply	When using the MS pneumatic output

*Unused ports must be plugged.

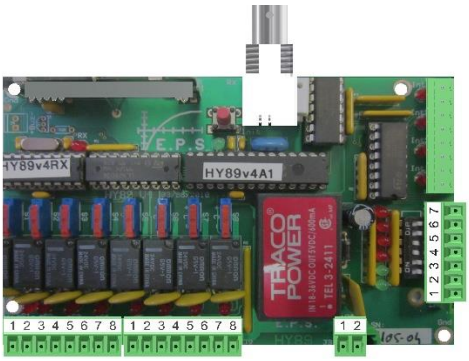
Remote control RCT4



Document available on website alma-alma.fr

Electrical wiring RCT4 remote control receiver

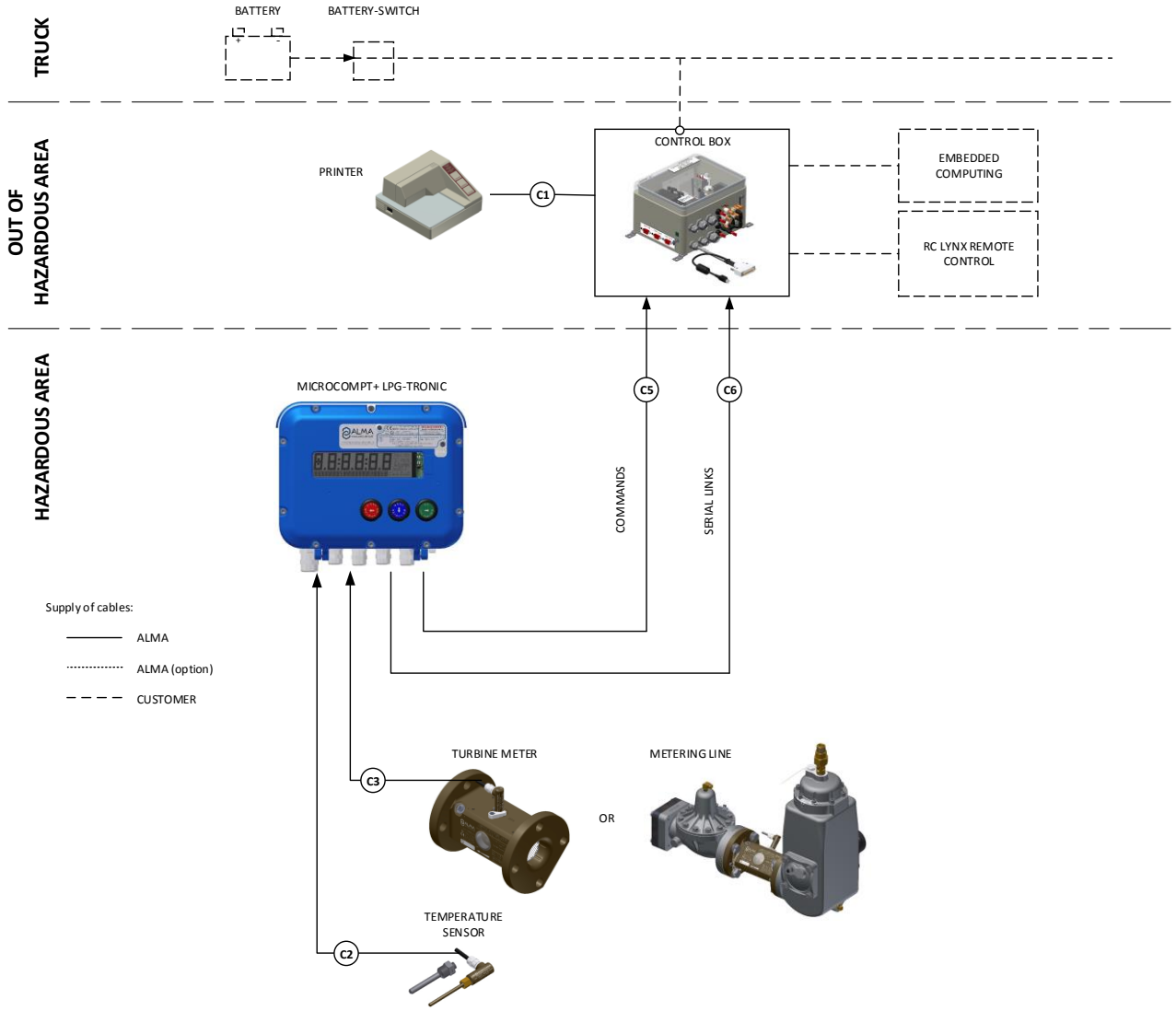
TERMINAL ASSIGNMENT OF THE RCT4 RECEIVER



EQUIPMENT CONNECTED TO THE RCT4 RECEIVER								RCT4 RECEIVER TERMINAL BLOCK				
Option	Equipment	Cable for information) No.	CG*	Alma	Type	Function	Colour or No.	Block	Terminal	Function		Observation
	MICROCOMPT+ Commands	C5			12G1	24VDC	1	BN1	1	24VDC	MICROCOMPT+ POWER SUPPLY	
						0V	2		2	0V		
						IN1 (A)	4		5		AUTHORISATION	
						HS	3	J4	5		HIGH SPEED	
						Author.	4		4		AUTHORISATION	
						Interm. stop	5		3		INTERMEDIATE STOP	
						Measur. end	6		2		MEASURING END	
	CONTROL BOX Commands	C7		●	12G1	Fuse	1	BN1	1		MICROCOMPT+ POWER SUPPLY	
							2		2			
						EV AU	3	J2	5		SAFETY REQUEST	Emergency stop
						EV Author.	4	J4	4		AUTHORISATION	
						Relay HS	5	J1	7		HIGH SPEED	
						EV PTO	6		5		POWER TAKE OFF	
						Relay MS	7	J2	3		MOTOR STOP	
						EV DC	8	J1	1		DECLUTCHING	or High speed
						EV FV	9		3		FOOTVALVE	
						24VDC	10	J3	1	24VDC	SUPPLY RC CARD AND CRADLE	
						0V	11		2	0V		
									V/J			

**Refer to the Cable Glands Installation Instructions*

5.4. ELECTRICAL WIRING WITH CONTROL BOX AND RC LYNX REMOTE CONTROL

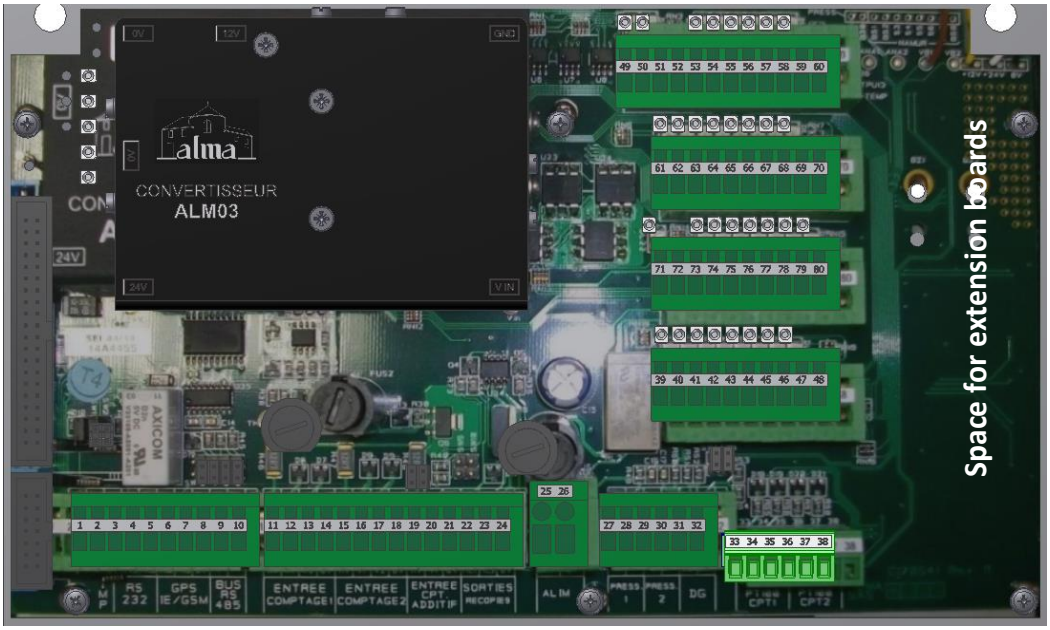


Terminal assignment of the MICROCOMPT+ power supply board RC LYNX version

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

TERMINAL ASSIGNMENT OF MICROCOMPT+ BOARDS

MICROCOMPT+ POWER SUPPLY BOARD

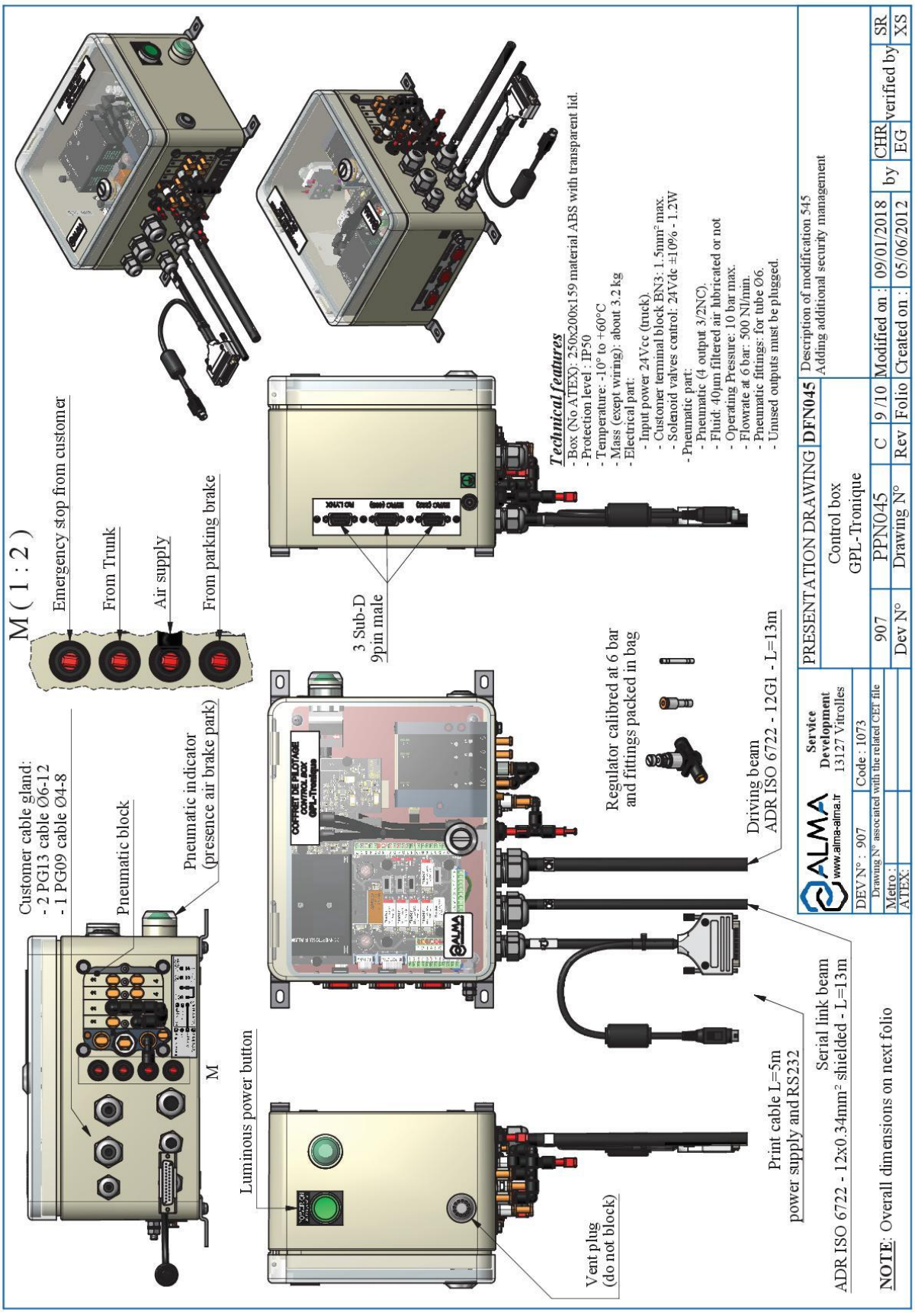


EQUIPMENTS CONNECTED TO THE MICROCOMPT+								MICROCOMPT+ POWER SUPPLY BOARD			
Option	Equipment	Cable (for information)				Function	Colour or No.	Terminal	Function		Observation
		No.	CG*	Alma	Type						
	CONTROL BOX serial links	C6		●	ADR 12x0.34 sh.	Rx	Vt	1	Tx	PRINTER	
						Tx	Jn	2	Rx		
						0V	Nr	3	0V		
							Bl	4	Tx	RS232 EC + RC	Serial link RS232 Embedded computing (EC) Remote control (RC)
							Rg/Bl	5	Rx		
						RS485 +	Bc	9	+	RS485 EC + RC	Serial link RS485 (RC Lynx) Embedded computing (EC) Remote control (RC)
						RS485 -	Rs	10	-		
						Pulses output +	Rg	22	S	PULSES OUTPUT	
						Pulses output -	Gr	24	0V		
						Mesur. End	Vi	53	24VDC	MEASURING END	Anti-fraud, Final stop
						PTO control	Mr	58	PTO	PTO CONTROL	
	TURBINE TRANSMITTER	C3	1/2"NPT		ADR 4x0.34 sh.	12V	Jn	11	12V	TURBINE INPUT	Connect the shielding
						V1	Mr	12	V1		
						V2	Vt	13	V2		
						0V	Bc	14	0V		

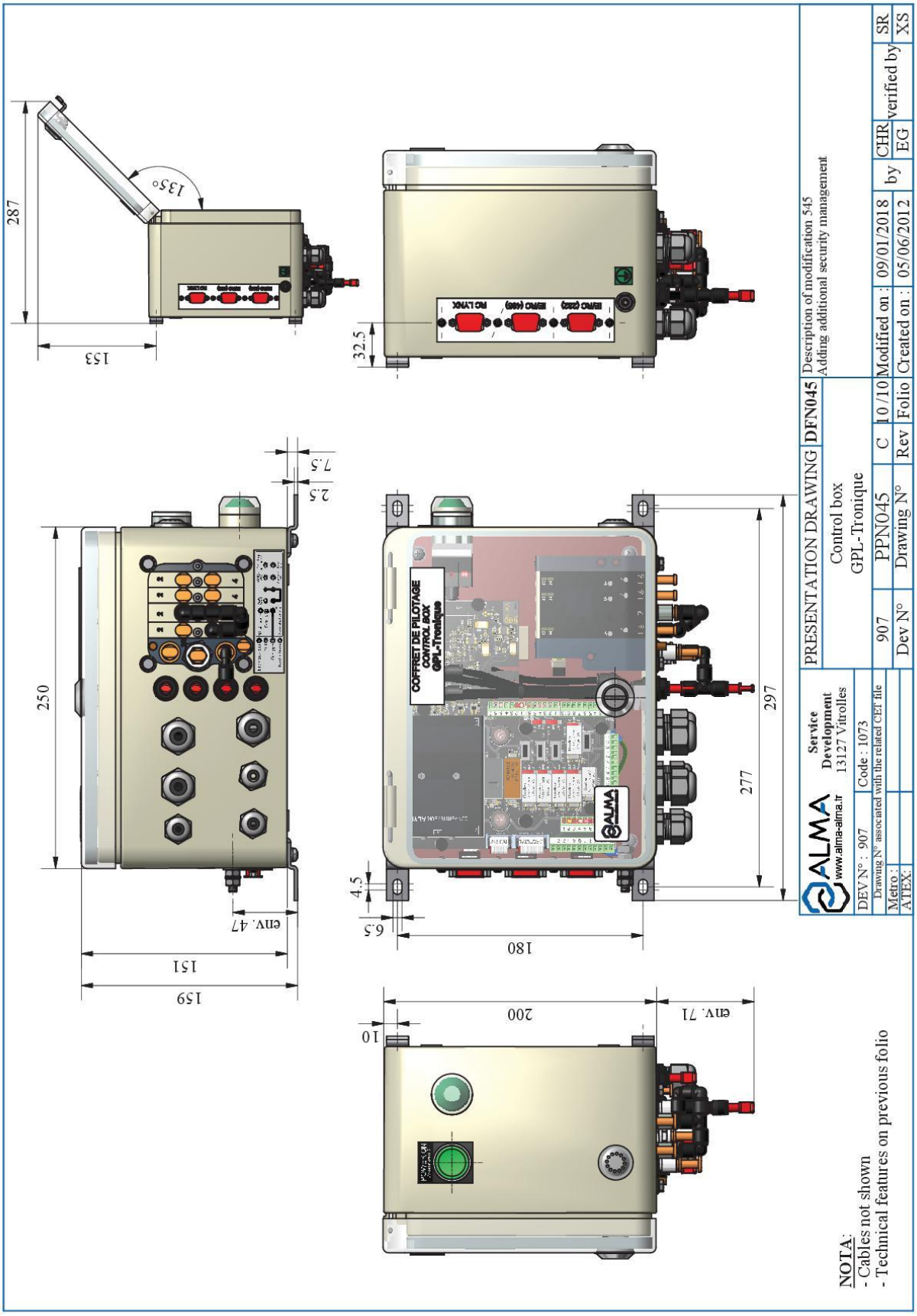
EQUIPMENTS CONNECTED TO THE MICROCOMPT+								INTERFACE POWER SUPPLY BOARD			
Option	Equipment	Cable (for information)				Function	Colour or No.	Terminal	Function		Observation
		No.	CG*	Alma	Type						
	CONTROL BOX Commands	C5		●	12G1	24VDC	1	**25**	24VDC	POWER SUPPLY 24VDC	Ferrite on the supply wire (make a loop)
						0V	2	**26**	0V		
						Security	3	**72**	24VDC	SECURITY	
						Author.	4	**75**	24VDC	AUTHOR.	Authorisation
						HS	5	**73**	24VDC	HS	High speed
						PTO	6	**61**	24VDC	PTO	Power take off
						Stop	7	**62**	24VDC	MS	Motor stop
						DC	8	**76**	24VDC	DC	Declutching (or High speed)
						FV	9	**64**	24VDC	FV	Footvalve
	Pt1000 TEMPERATURE PROBE	C2	1/2"NPT		ADR 3x0.6 sh.	+	Jn	**33**	+	Pt100	Connect the shielding
						-	Bc	**34**	-		
						-	Vt	**35**	-		
				●			-	**71**	0V		Connect 71to 80
							-	**80**	0V		Connect 71to 80

**Refer to the Cable Glands Installation Instruction*

Control box LPG-TRONIC



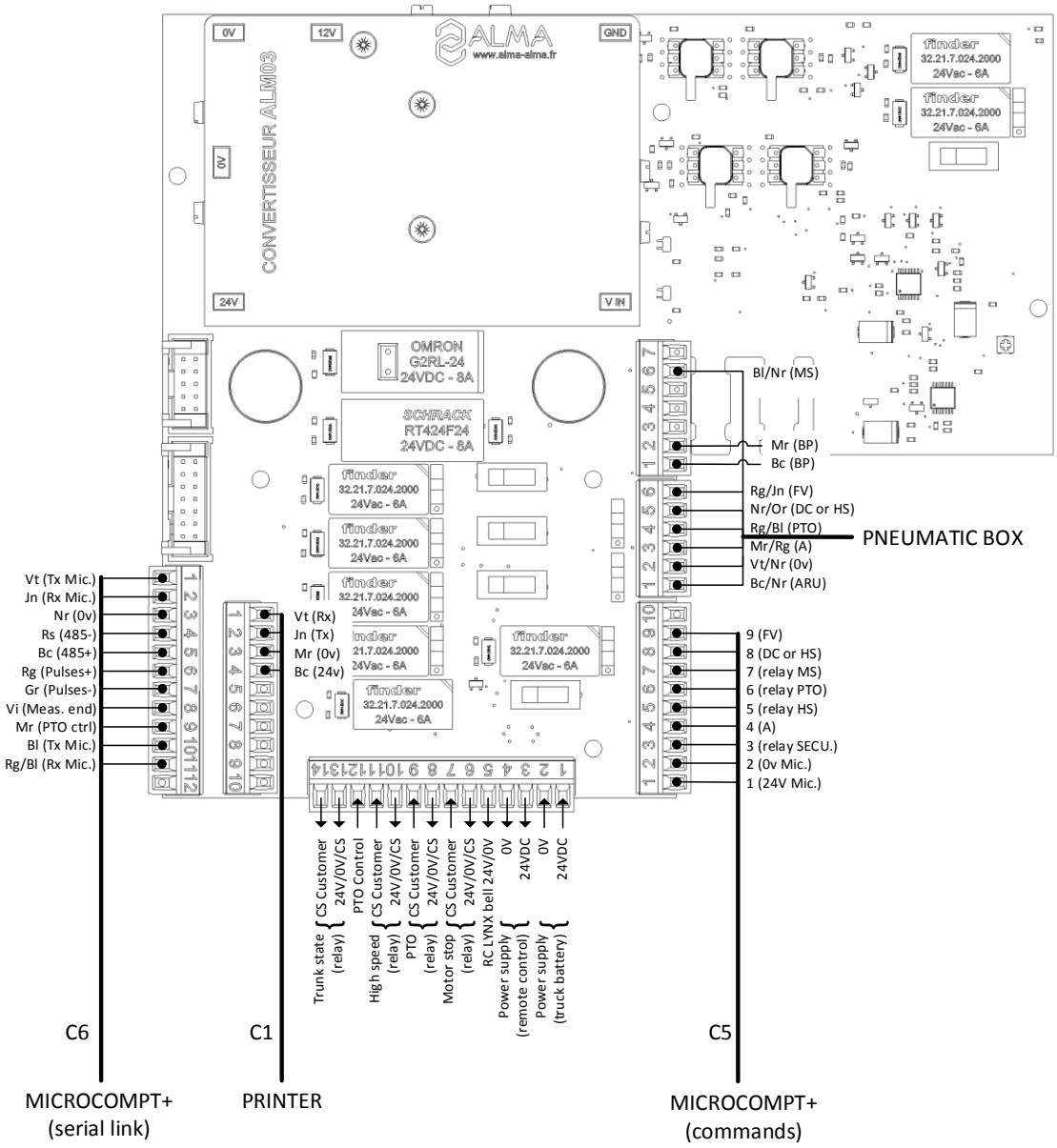
Document available on website alma-alma.fr



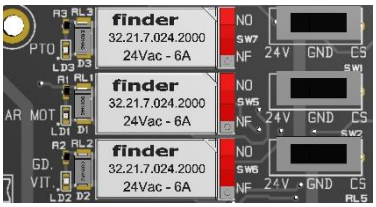
Document available on website alma-alma.fr

Electrical wiring control box RC LYNX version

Wiring diagram of the control box RC LYNX version:



Configuration of switches:



Linear switching element for relays NC or NO contact	Three-position switch for common contact: 1→24VDC 2→GND (0V) 3→CS (Free contact)

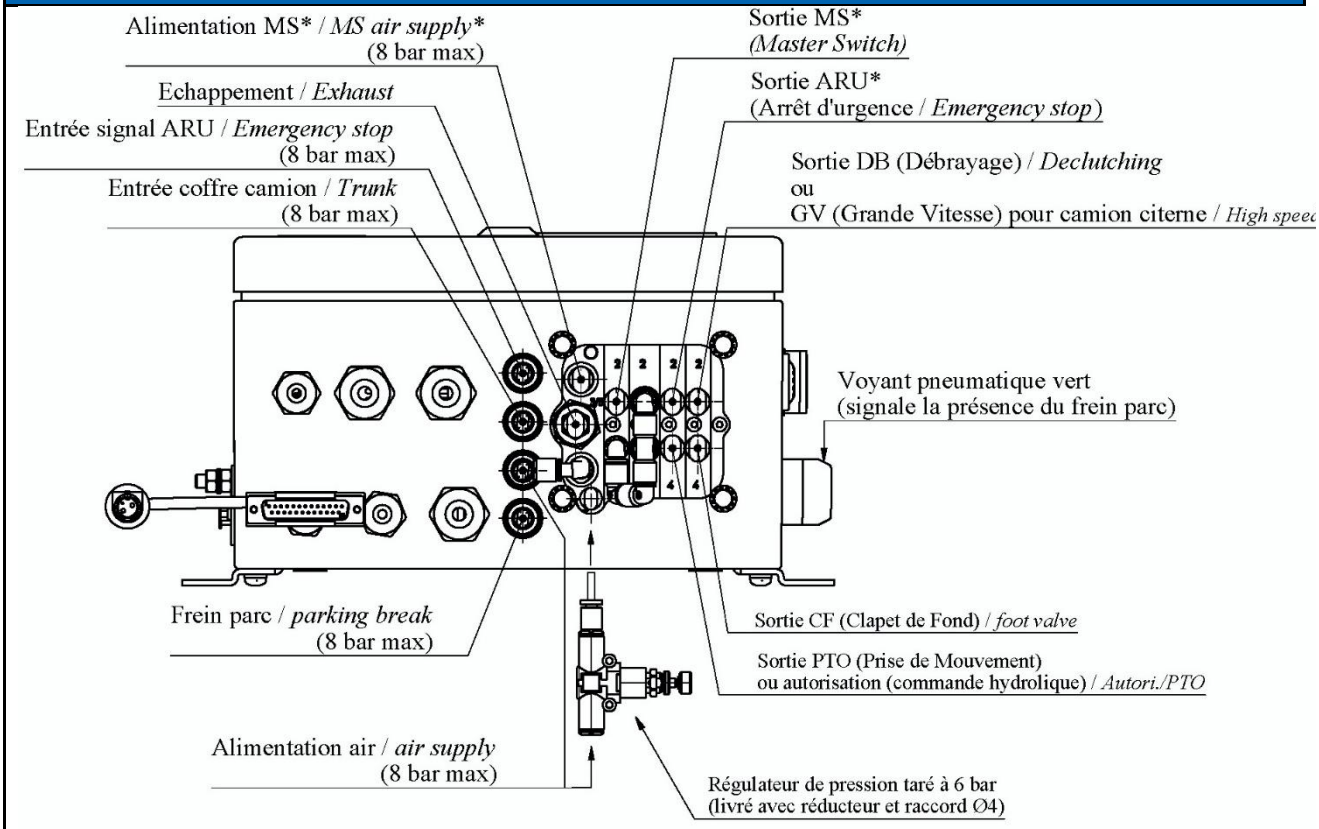
TERMINAL ASSIGNMENT OF THE CONTROL BOX RC LYNX VERSION

EQUIPMENT CONNECTED TO THE CONTROL BOX								CONTROL BOX TERMINAL BLOCKS				
Option	Equipement	Cable for information) N°	CG*	Alma	Type	Function	Colour or No.	Block	Terminal	Function		Observation
	MICROCOMPT+ Serial links	C6			12x0.34 sh	Tx	Vt	BN1	1	Rx	PRINTER	
						Rx	Jn		2	Tx		
						0V	Nr		3	0V		
						RS485 -	Rs		4	RS485	EC + RC	RS485 serial link Embedded computing (EC) Remote control (RC)
						RS485 +	Bc		5			
						Recop +	Rg		6	Recop +	RECOPIE	
						Recop -	Gr		7	Recop -		
						Measur. end	Vi		8		MEASURING END	
						PTO	Mr		9		PTO CONTROL	
						Tx	Bl		10	RS232	EC + RC	RS232 serial link Embedded computing (EC) Remote control (RC)
						Rx	Rg/Bl		11			
	PRINTER	C1		●	2x1	Rx	Vt	BN2	1	Rx	PRINTER	
						Tx	Jn		2	Tx		
						0V	Mr		3	0V		
						24VDC	Bc		4	24VDC		
	POWER SUPPLY					*24VDC*		BN3 - Bornier client	*1*	*24VDC*	*POWER SUPPLY*	*24VDC truck battery (after battery switch and protected by a fuse)*
						0V			*2*	*0V*		
	POWER SUPPLY REMOTE CONTROL					*24VDC*			*3*	*24VDC*	*POWER SUPPLY RC*	
						0V			*4*	*0V*		
	RC LYNX BELL								*5*	-	-	
	MOTOR STOP								*6*	*24VDC/0V/CS*	*MOTOR STOP*	*Relay (Configuration 24V, 0V or Free contact)*
									7	*CS*		*Only used with configuration Free contact*
	PTO								*8*	*24VDC/0V/CS*	*PTO*	*Relay (Configuration 24V, 0V or Free contact)*
									9	*CS*		*Only used with configuration Free contact*
	HIGH SPEED								*10*	*24VDC/0V/CS*	*HIGH SPEED*	*Relay (Configuration 24V, 0V or Free contact)*
									11	*CS*		*Only used with configuration Free contact*
	PTO CONTROL								*12*	-	-	
	TRUCK TRUNK								*13*	*24VDC/0V/CS*	*TRUCK TRUNK*	*Relay (Configuration 24V, 0V or Free contact)*
									14	*CS*	*TRUCK TRUNK*	*Only used with configuration Free contact*
	MICROCOMPT+ Commands	C5			12G1	24MC	1	BN4	1	24VDC	MICROCOMPT+ POWER SUPPLY	Fuse
						0MC	2		2	0V		
						Security	3		3	RELAY	SECURITY	Safety request
						Author.	4		4	EV 3/2NC	AUTHOR.	Authorisation
						HS	5		5	RELAY	HS	High speed
						PTO	6		6	EV 3/2NC	PTO	Power take off
						Stop	7		7	RELAY	MS	Motor Stop
						DC	8		8	EV 3/2NC	DC	Declutching (or High Speed)
						FV	9		9	EV 3/2NC	FV	Footvalve
							V/J					

**Refer to the Cable Glands Installation Instructions*

Pneumatic wiring control box RC LYNX version

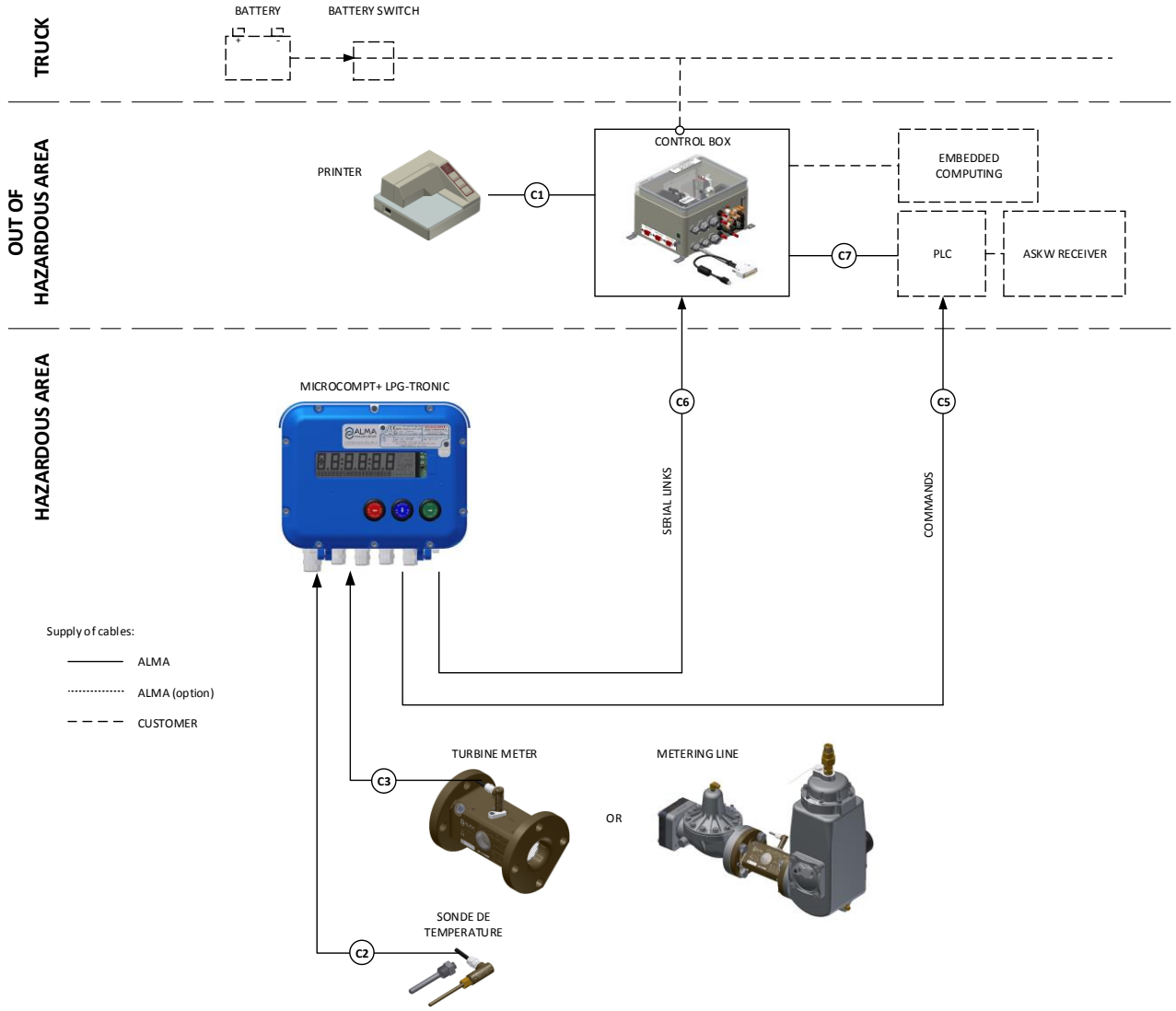
PNEUMATIC INPUT/OUTPUT ASSIGNMENT OF THE CONTROL BOX



Label	Input	Output	Function	Observation
Air supply	X		Main supply of the control box + detector for pressure drop	Pressure >1 bar: green warning light Pressure <1 bar: orange warning light. Disable the security management for trunk, pressure drop and customer ARU
	X		Secondary supply of the control box	The 6 bar-calibrated regulator, the 6/4 reducer and the Ø4 coupling are packed in a bag inside the control box
Air from parking brake	X		Air from parking brake	
Exhaust		X	Exhaust	Put a tube L=100mm min. (no muffler)
Emergency stop*		X	Pneumatic emergency stop	
Declutching		X	Declutching actuator (or High speed)	With pneumatic declutching
Footvalve		X	Footvalve opening	
Power take off PTO or Authorisation		X	Power take off or Authorisation	Power take off: leave the plug in place and don't connect any tube in case of electrical control Authorisation: hydraulic control
ARU Emergency stop input	X		Detection of emergency stop requests	ARU are connected in series in a positive safety loop
Trunk	X		Detection of back trunk openings	No air=trunk opened
MS*		X	Timed Master switch	When using the MS pneumatic output
Supply MS*	X		Master switch air supply	When using the MS pneumatic output

*Unused ports must be plugged.

5.5. ELECTRICAL WIRING WITH CONTROL BOX AND ASKW REMOTE CONTROL

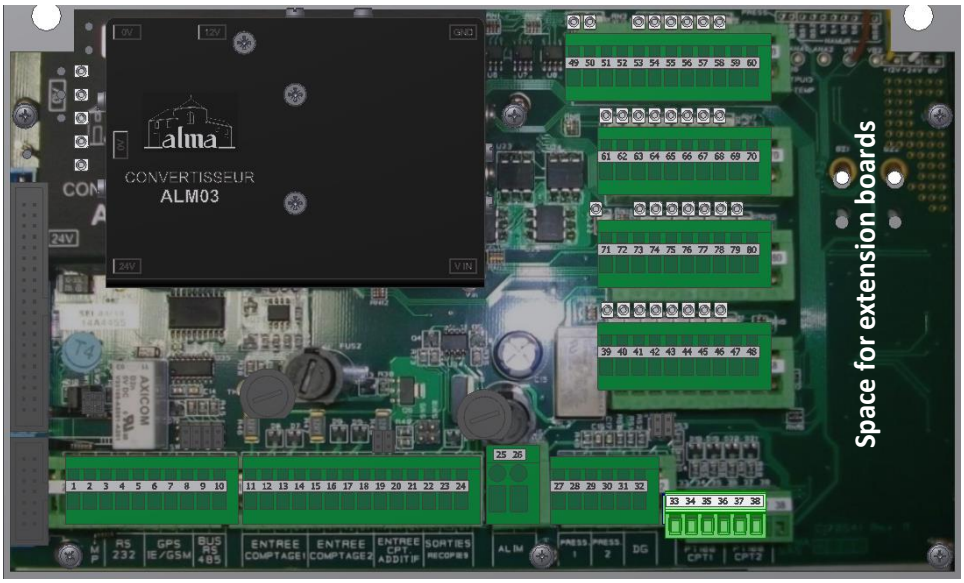


Terminal assignment of the MICROCOMPT+ power supply board ASKW version

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

TERMINAL ASSIGNMENT OF MICROCOMPT+ BOARDS

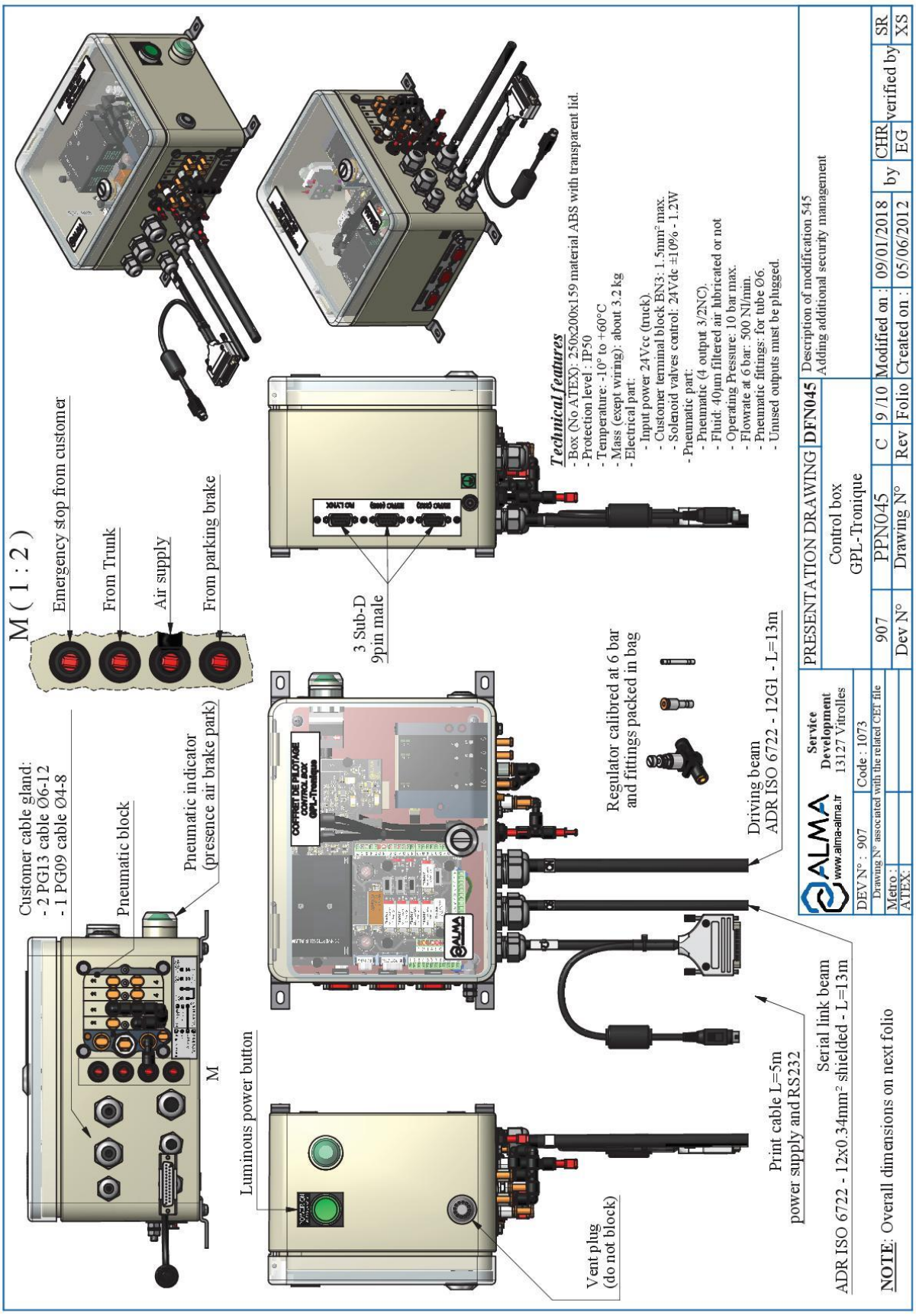
MICROCOMPT+ POWER SUPPLY BOARD



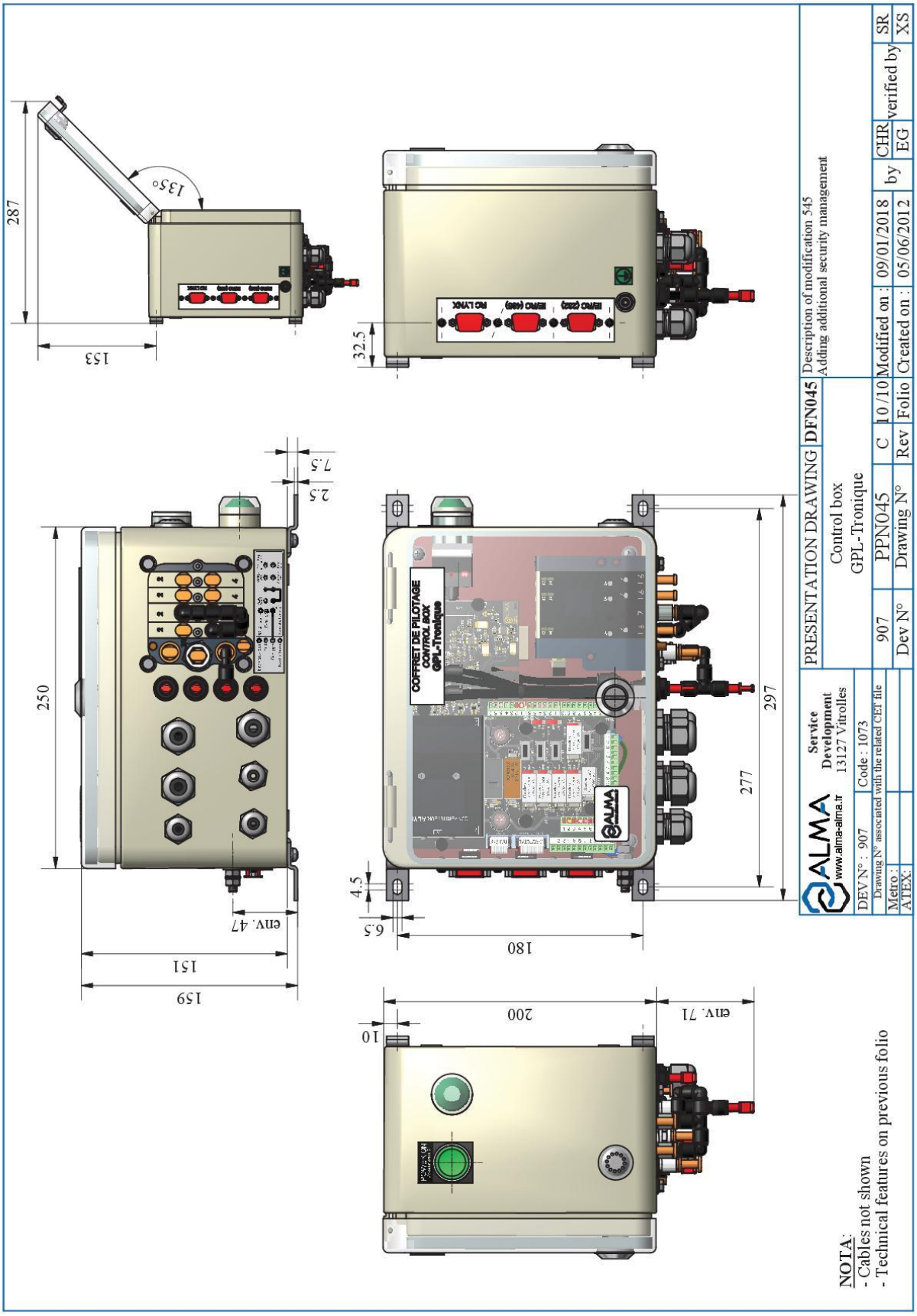
EQUIPMENTS CONNECTED TO THE MICROCOMPT+								MICROCOMPT+ POWER SUPPLY BOARD			
Option	Equipment	Cable (for information)				Function	Colour or No.	Terminal	Function		Observation
		No.	CG*	Alma	Type						
	CONTROL BOX serial links	C6		●	ADR 12x0.34 sh.	Rx	Vt	1	Tx	PRINTER	
						Tx	Jn	2	Rx		
						0V	Nr	3	0V		
						Rx	Bl	4	Tx	RS232 EC + RC	Serial link RS232 Embedded computing (EC) Remote control (RC)
						Tx	Rg/Bl	5	Rx		
						RS485 +	Bc	9	RS485+	RS485 EC + RC	Serial link RS485 Embedded computing (EC) Remote control (RC)
						RS485 -	Rs	10	RS485-		
						Pulses output +	Rg	22	S	PULSES OUTPUT	
						Pulses output -	Gr	24	0V		
						Mesur. End	Vi	53	24VDC	MEASURING END	Anti- fraud, Final stop
						PTO control	Mr	58	PTO	PTO CONTROL	
	TURBINE TRANSMITTER	C3	1/2"NPT		ADR 4x0.34 sh.	12V	Jn	11	12V	TURBINE INPUT	Connect the shielding
						V1	Mr	12	V1		
						V2	Vt	13	V2		
						0V	Bc	14	0V		
	RECEIVER ASKW (PLC) Commands	C5		●	12G1	24VDC	1	25	24VDC	POWER SUPPLY 24VDC	
						0V	2	26	0V		
						HS	3	74	24VDC	HIGH SPEED	High speed
						Author.	4	75	24VDC	AUTHOR.	Authorisation
						Intermediate stop	5	49	24VDC	INTERM. STOP	Intermediate stop
						Measuring end	6	50	24VDC	MEASUR ING END	Measuring end
	Pt1000 TEMPERATURE PROBE	C2	1/2"NPT		ADR 3x0.6 sh.	+	Jn	33	+	Pt100	Connect the shielding
						-	Bc	34	-		
						-	Vt	35	-		

**Refer to the Cable Glands Installation Instruction*

Control box LPG-TRONIC

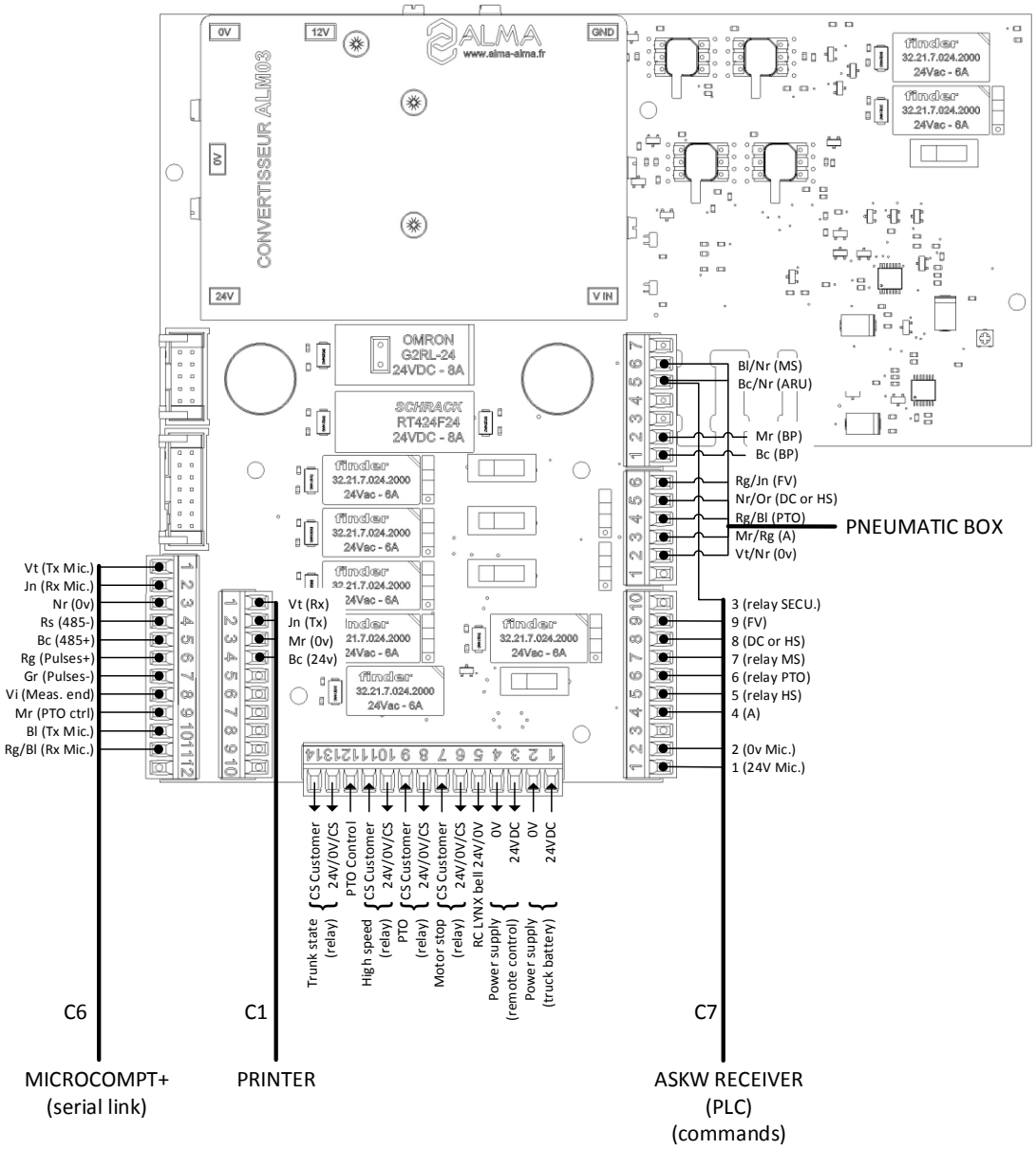


Document available on website alma-alma.fr

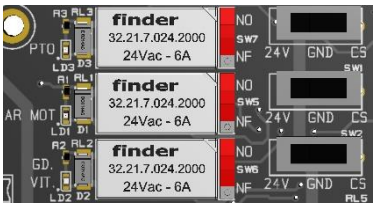


Electrical wiring control box ASKW version

Wiring diagram of the control box ASKW version:



Configuration of switches:



Linear switching element for relays NC or NO contact	Three-position switch for common contact: 1→24VDC 2→GND (0V) 3→CS (Free contact)

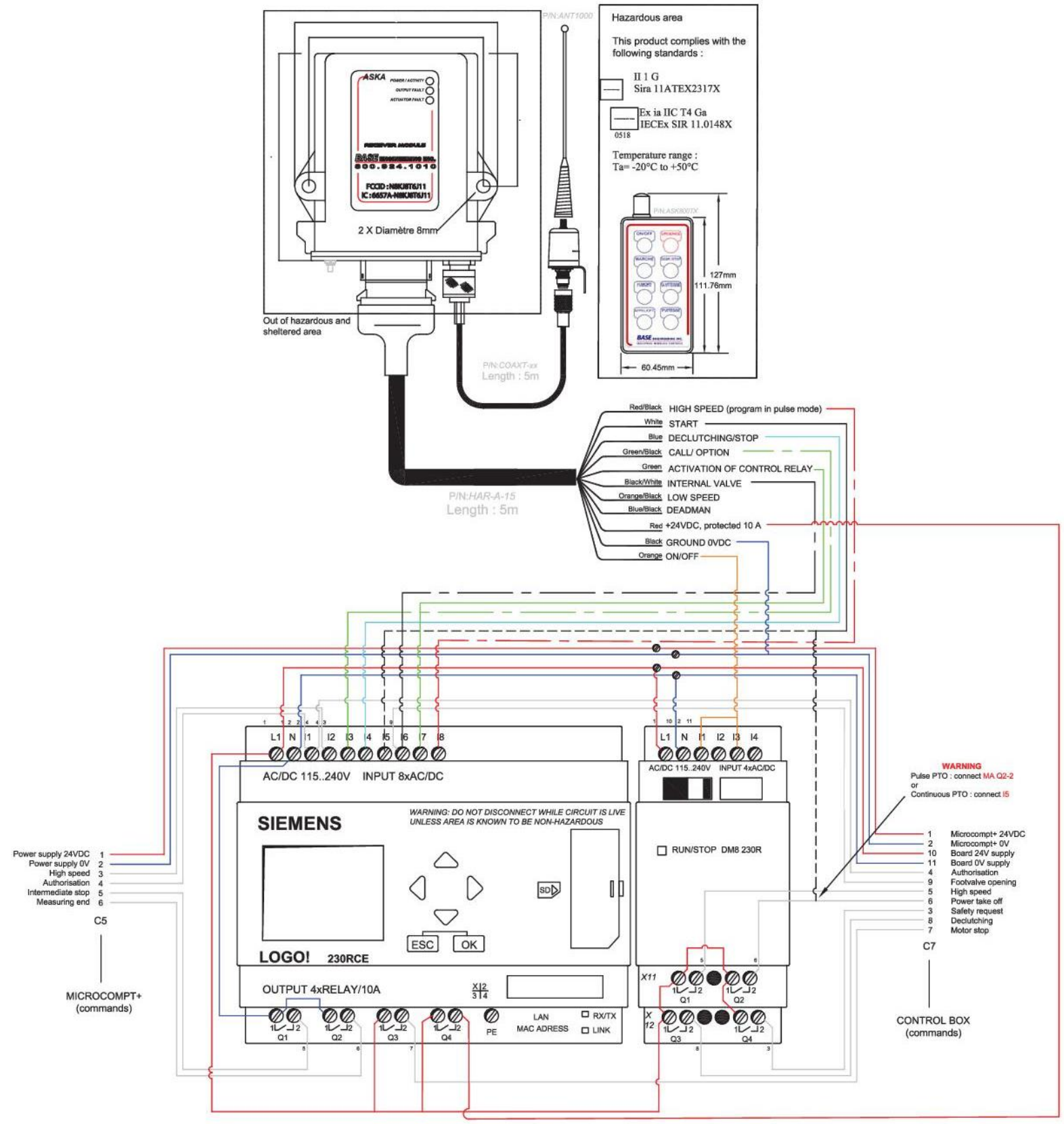
TERMINAL ASSIGNMENT OF THE CONTROL BOX ASKW VERSION

EQUIPMENT CONNECTED TO THE CONTROL BOX								CONTROL BOX TERMINAL BLOCKS				
Option	Equipement	Cable for information) N°	CG*	Alma	Type	Function	Colour or No.	Block	Terminal	Function		Observation
	MICROCOMPT+ Serial links	C6			12x0.34 sh	Tx	Vt	BN1	1	Rx	PRINTER	
						Rx	Jn		2	Tx		
						0V	Nr		3	0V		
						RS485 -	Rs		4	RS485	EC + RC	RS485 serial link Embedded computing (EC) Remote control (RC)
						RS485 +	Bc		5			
						Tx	Bl		10	RS232	EC + RC	RS232 serial link Embedded computing (EC) Remote control (RC)
						Rx	Rg/Bl		11			
	PRINTER	C1		●	2x1	Rx	Vt	BN2	1	Rx	PRINTER	
						Tx	Jn		2	Tx		
						0V	Mr		3	0V		
						24VDC	Bc		4	24VDC		
	POWER SUPPLY					*24VDC*		BN3 - Bornier client	*1*	*24VDC*	*POWER SUPPLY*	*24VDC truck battery (after battery switch and protected by a fuse)*
						0V			*2*	*0V*		
	POWER SUPPLY REMOTE CONTROL					*24VDC*			*3*	*24VDC*	*POWER SUPPLY RC*	
						0V			*4*	*0V*		
	RC LYNX BELL								*5*	-	-	
	MOTOR STOP								*6*	*24VDC/0V/CS*	*MOTOR STOP*	*Relay (Configuration 24V, 0V or Free contact)*
									7	*CS*		*Only used with configuration Free contact*
	PTO								*8*	*24VDC/0V/CS*	*PTO*	*Relay (Configuration 24V, 0V or Free contact)*
									9	*CS*		*Only used with configuration Free contact*
	HIGH SPEED								*10*	*24VDC/0V/CS*	*HIGH SPEED*	*Relay (Configuration 24V, 0V or Free contact)*
									11	*CS*		*Only used with configuration Free contact*
	PTO CONTROL								*12*	-	-	
	TRUCK TRUNK								*13*	*24VDC/0V/CS*	*TRUCK TRUNK*	*Relay (Configuration 24V, 0V or Free contact)*
									14	*CS*	*TRUCK TRUNK*	*Relay Only used with configuration Free contact*
	RECEIVER ASKW (PLC)	C7		●	12G1	24VDC	10	BN3	3	24VDC	POWER SUPPLY RC	
						0V	11		4	0V		
						24VDC	1	BN4	1	24VDC	MICROCOMPT+ POWER SUPPLY	Fuse
						0V	2		2	0V		
						Author.	4		4	EV 3/2NC	AUTHOR.	Authorisation
						HS	5		5	RELAY	HS	High speed
						PTO	6		6	EV 3/2NC	PTO	Power take off
						Stop	7		7	RELAY	MS	Motor Stop
						DC	8		8	EV 3/2NC	DC	Declutching (or High Speed)
						FV	9		9	EV 3/2NC	FV	Footvalve
						Security	3	BN6	3	RELAY	SECURITY	Safety request
							V/J					

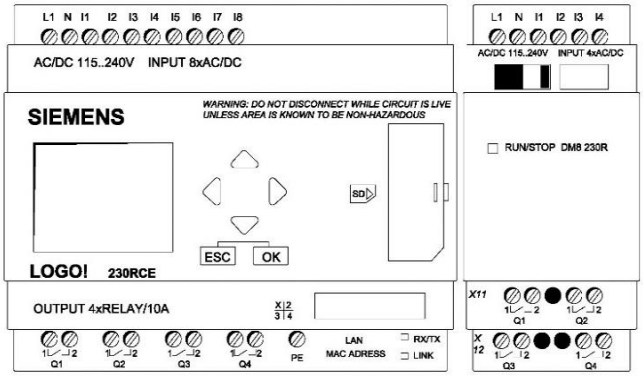
**Refer to the Cable Glands Installation Instructions*

Electrical wiring ASKW remote control receiver/PLC

Wiring diagram ASKW receiver/PLC:



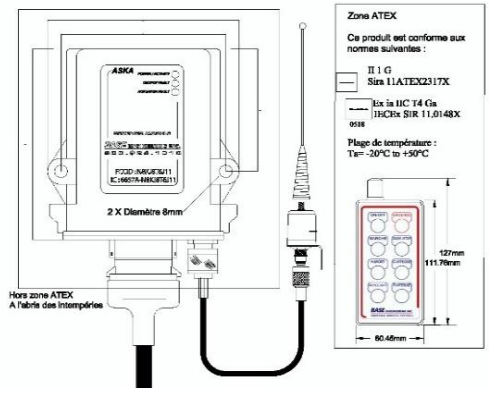
TERMINAL ASSIGNMENT OF THE ASKW RECEIVER (PLC)



EQUIPMENT CONNECTED TO THE ASKW								TERMINAL BLOCK OF THE PLC FOR ASKW				
Option	Equipement	Cable (for information) N°	CG*	Alma	Type	Function	Colour or No.	Block	Terminal	Function		Observation
	MICROCOMPT+ Commands	C5			12G1	24VDC	1	C7	1		24VDC	Connect to C7
						0V	2	C7	2		0V	Connect to C7
						HS	3		I2		HS	High speed
						Author.	4		I1		AUTHOR.	Authorisation
						Interm. Stop	5	Q1	1		INTERMEDIATE STOP	Intermediate stop
						Measur. End	6	Q2	2		MEASURING END	Measuring end
	CONTROL BOX Commands	C7			12G1	EV Emergency	3	MAQ4	2		SAFETY REQUESTT	Emergency stop
						EV Author.	4		I1		AUTHOR.	Authorisation
						Relay HS	5	MAQ1	2		HS	High speed
						EV PTO	6	MAQ2	2		PTO	Power take off
						Relay MS	7	Q3	2		MS	Motor Stop
						EV DC	8	MAQ3	2		DC	Declutching
						EV FV	9		I6		FV	Footvalve
						24VDC	10		L1	24VDC	BOARD 24V- SUPPLY	
								Q3	1			
								Q4	1			
								MAQ1	1			
								MAQ2	1			
								MAQ3	1			
								MAQ4	1			
								MA	L1			
						0V	11		N	0V		
								Q1	1			
								Q2	1			
								MA	N			
						Parking brake		MA	I2	24VDC	Parking brake	Present: +24VDC Absent: No authorisation
									I4			

Refer to the Cable Glands Installation Instructions

TERMINAL ASSIGNMENT OF THE ASKW RECEIVER (REMOTE CONTROL)

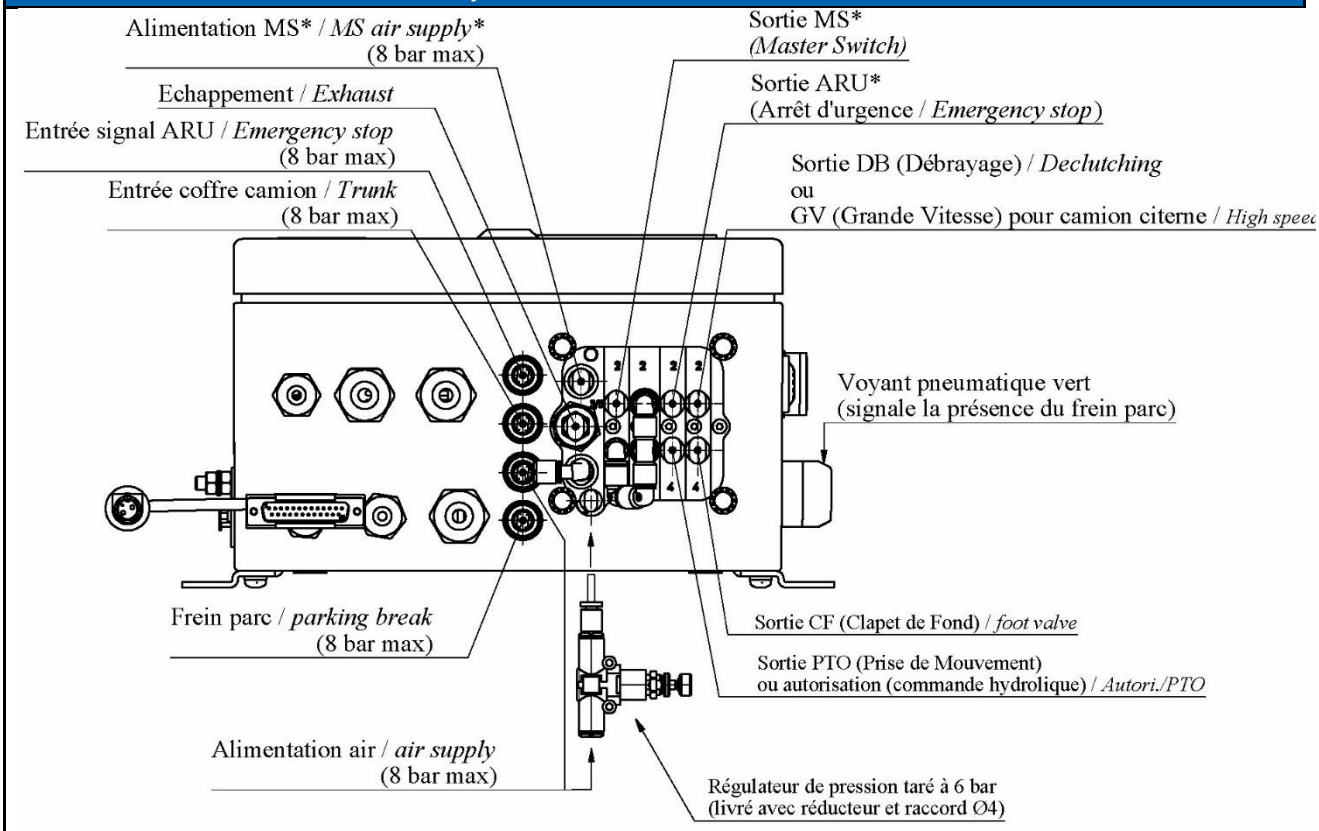


EQUIPMENT CONNECTED TO THE ASKW								ASKW REMOTE CONTROL CABLE		
Option	Equipement	Cable (for information) N°	CG*	Alma	Type	Terminal	Block	Cable		Observation
	ASKW PLC					I3		**Vt/Nr**	CALL/OPTION	
						I4		**Bl**	DECLUTCHING/STOP	
						Refer to Observation		**Bc**	START	If pulse PTO: MAQ1-2 If continuous PTO: I5
						I6		**Nr/Bc**	INTERNAL VALVE	
						I7		**Vt**	ACTIVATION OF CONTROL-RELAY	
						I8		**Rg/Nr**	HIGH SPEED	Program in pulse mode
						2	Q4	**Rg**	24VDC	Protected 10A
						I1	MA	**Or**	ON/OFF	
						I3				
	MICROCOMPT+	C5		•			2	**Nr**	GROUND 0V	
	CONTROL BOX	C7		•			2			

Refer to the Cable Glands Installation Instructions

Pneumatic wiring control box ASKW version

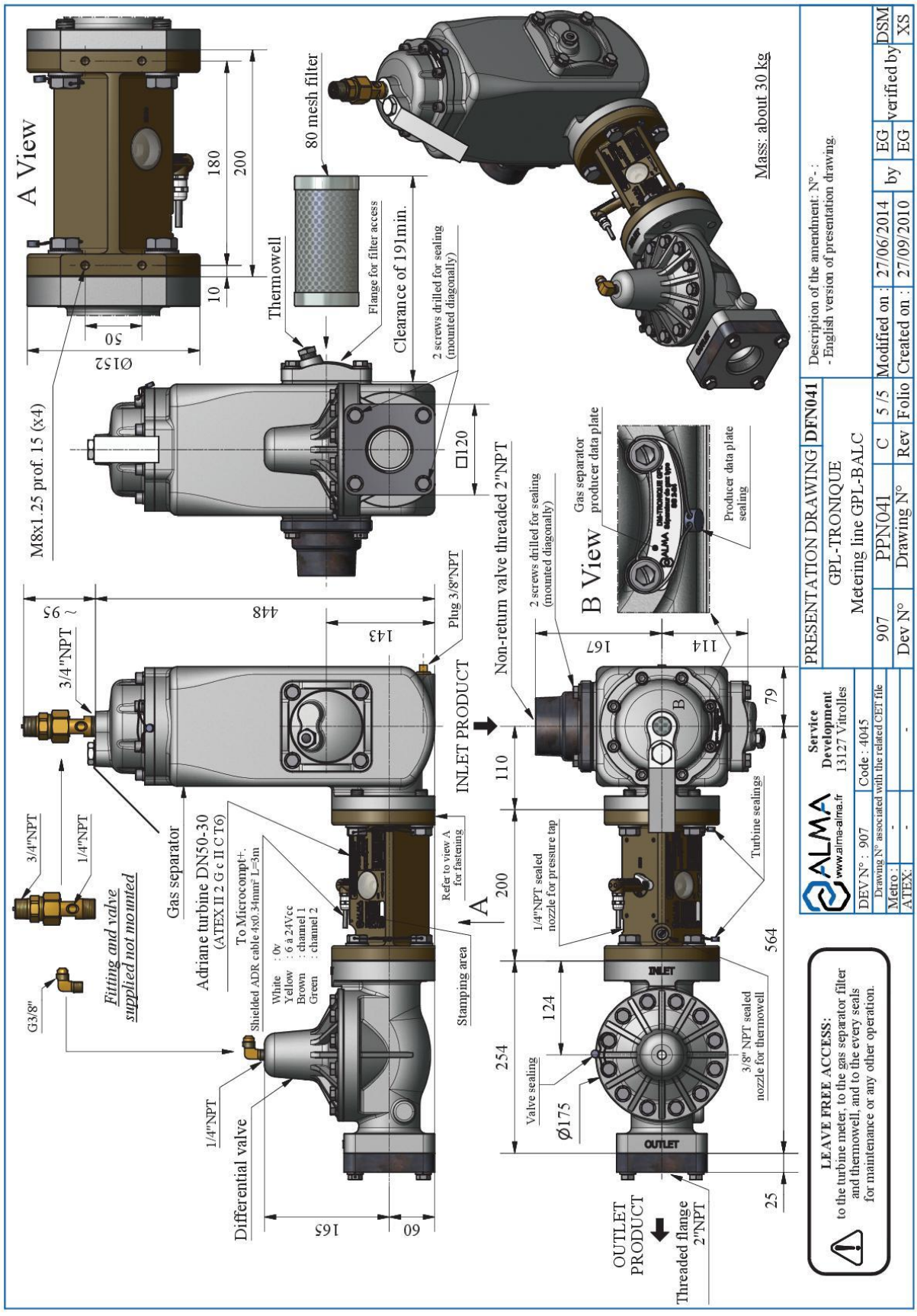
PNEUMATIC INPUT/OUTPUT ASSIGNMENT OF THE CONTROL BOX



Label	Input	Output	Function	Observation
Air supply	X		Main supply of the control box + detector for pressure drop	Pressure >1 bar: green warning light Pressure <1 bar: orange warning light. Disable the security management for trunk, pressure drop and customer ARU
	X		Secondary supply of the control box	The 6 bar-calibrated regulator, the 6/4 reducer and the Ø4 coupling are packed in a bag inside the control box
Air from parking brake	X		Air from parking brake	
Exhaust		X	Exhaust	Put a tube L=100mm min. (no muffler)
Emergency stop*		X	Pneumatic emergency stop	
Declutching		X	Declutching actuator (or High speed)	With pneumatic declutching
Footvalve		X	Footvalve opening	
Power take off PTO or Authorisation		X	Power take off or Authorisation	Power take off: leave the plug in place and don't connect any tube in case of electrical control Authorisation: hydraulic control
ARU Emergency stop input	X		Detection of emergency stop requests	ARU are connected in series in a positive safety loop
Trunk	X		Detection of back trunk openings	No air=trunk opened
MS*		X	Timed Master switch	When using the MS pneumatic output
Supply MS*	X		Master switch air supply	When using the MS pneumatic output

*Unused ports must be plugged.

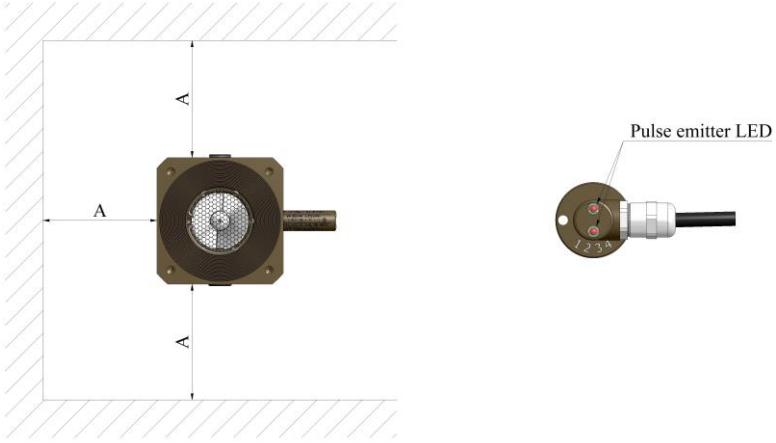
6. METERING LINE GPL-BALC



Document available on website alma-alma.fr

6.1. 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

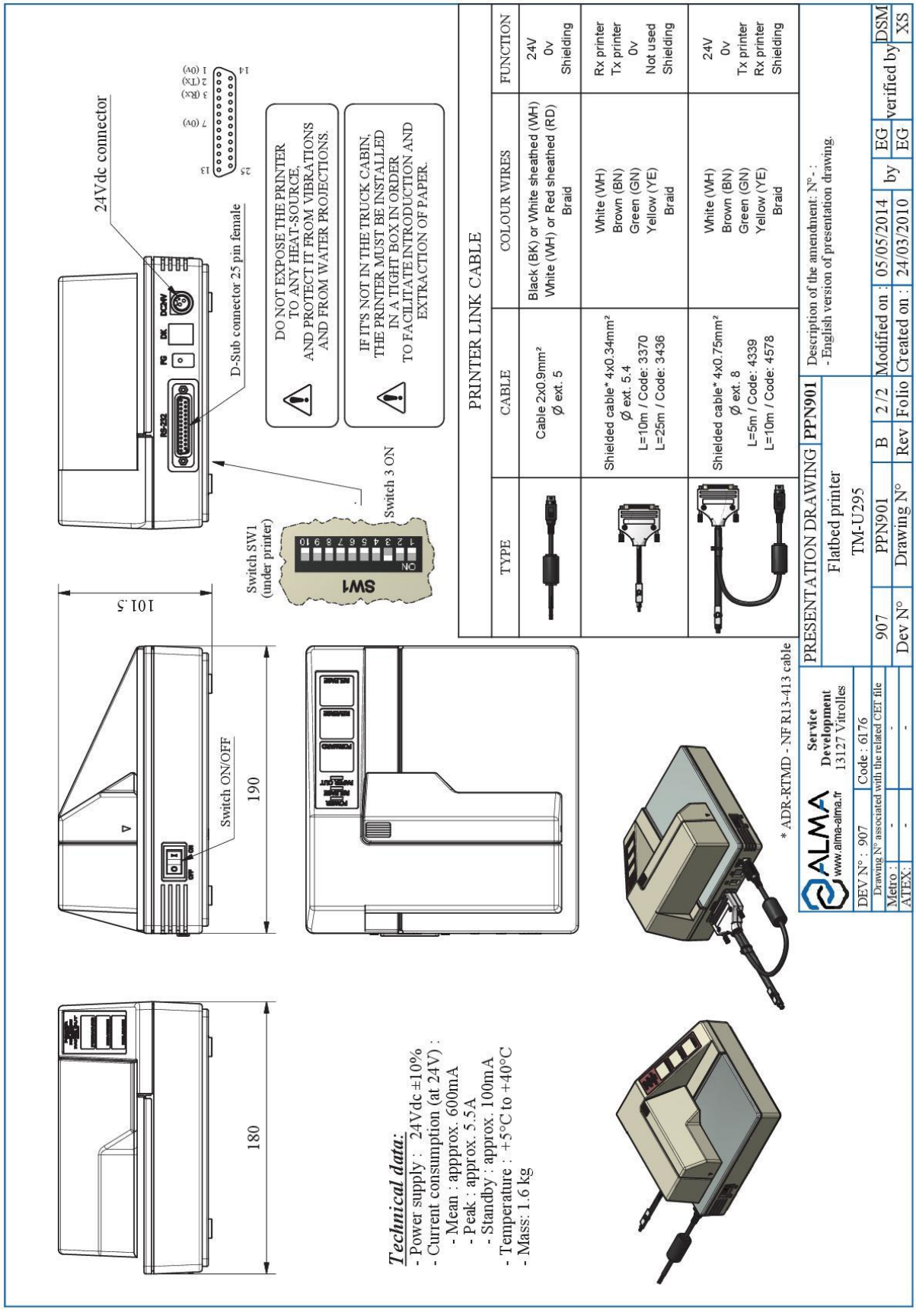
For accuracy class 0.5 and 1.0 measuring systems, the pipes and equipment upstream or downstream the turbine meter must have the same nominal diameter as the meter on a length at least equal to 10 times this diameter upstream and 5 times this diameter downstream.

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:

Provision contained in EU Type Examination or Evaluation Certificate.

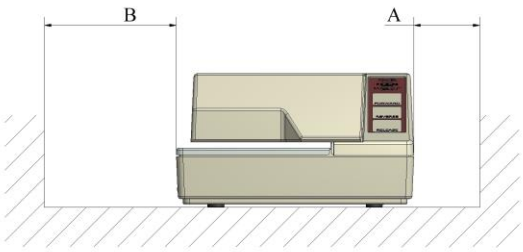
7. PRINTER

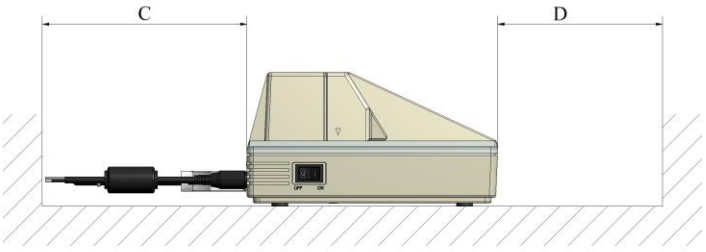


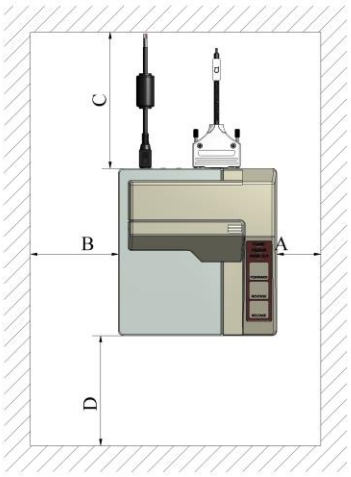
Document available on website alma-alma.fr

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.

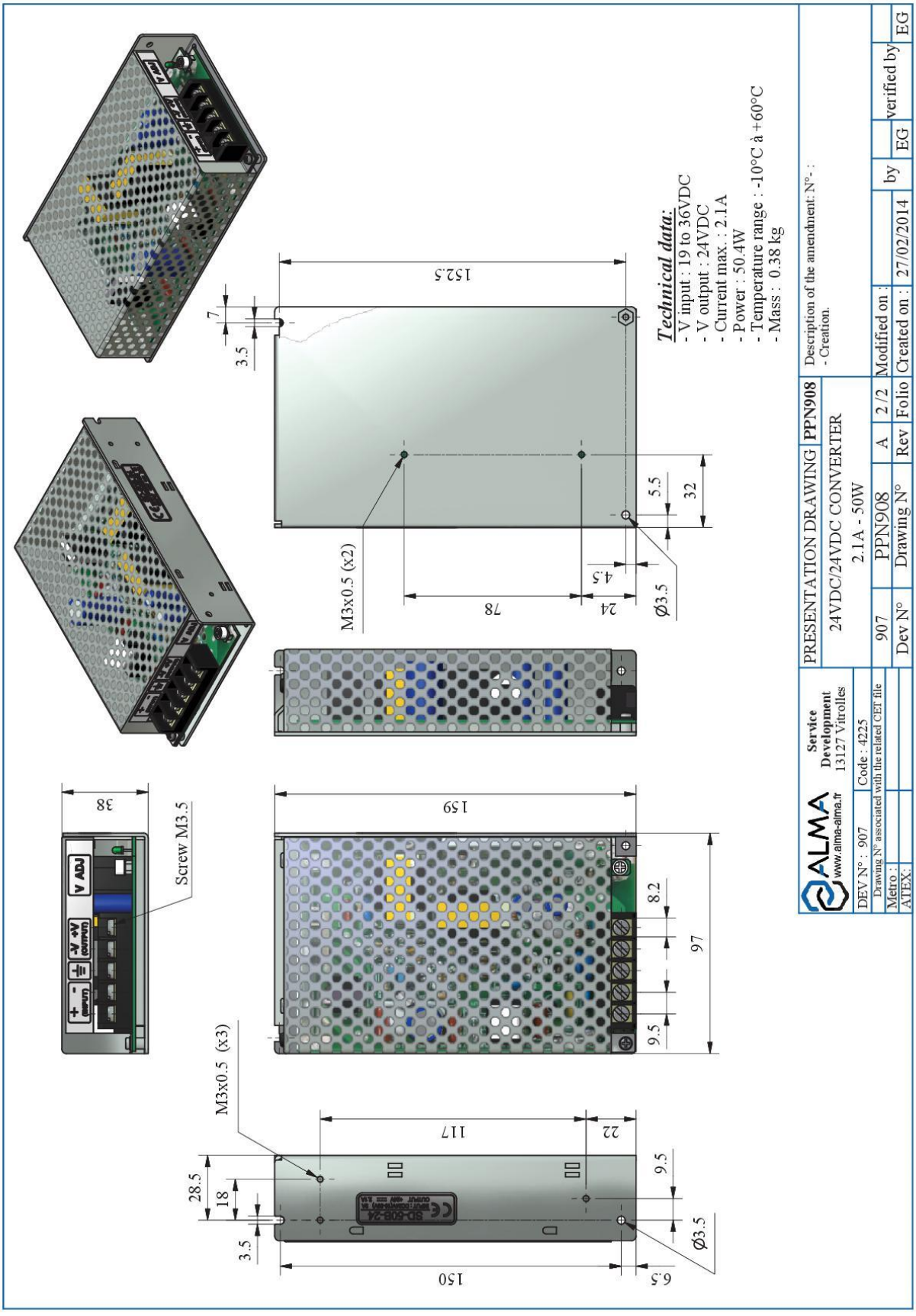






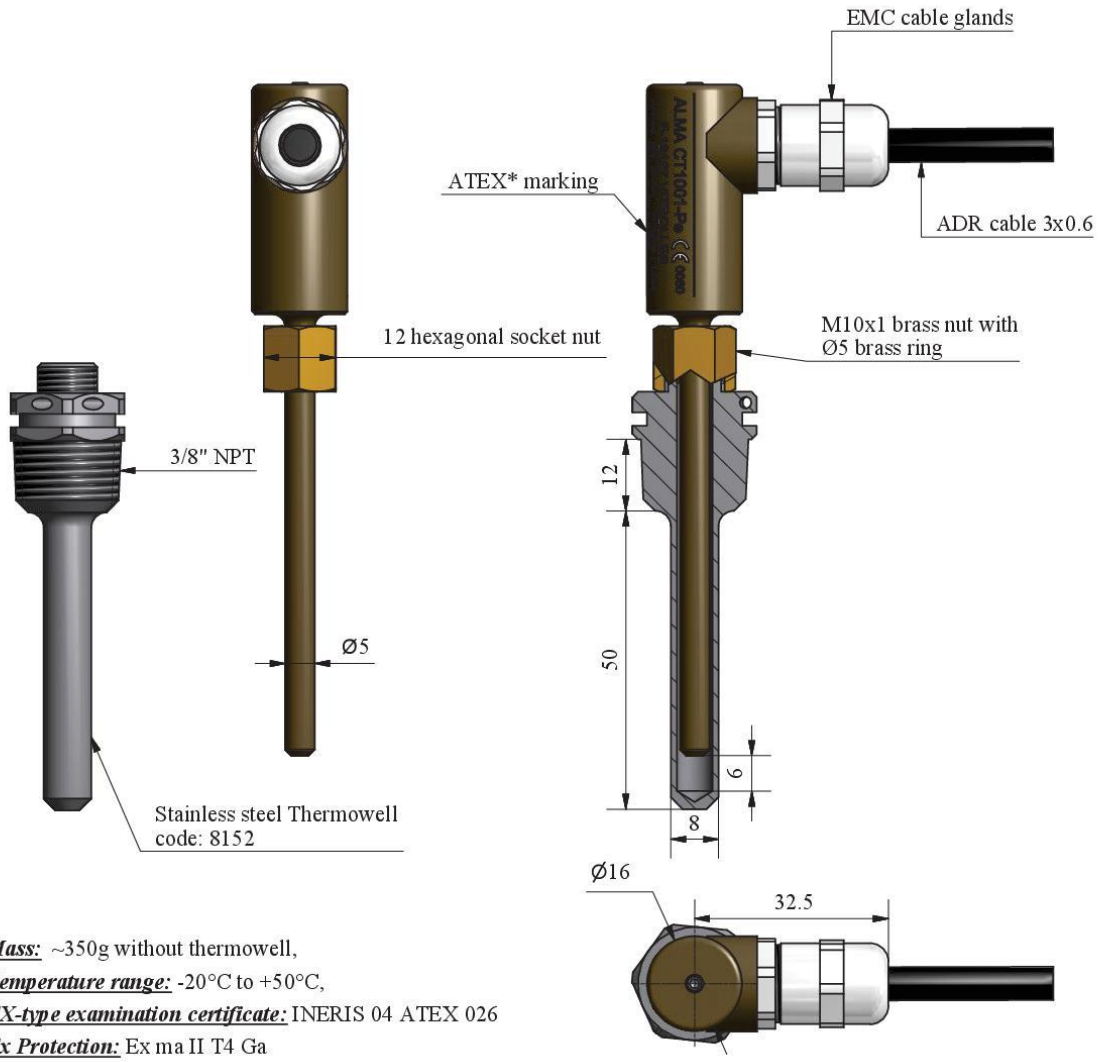
DO NOT EXPOSE THE PRINTER TO ANY HEAT-SOURCE.
PROTECT IT FROM VIBRATIONS AND WATER PROJECTIONS.

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



Document available on website alma-alma.fr

9. 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 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

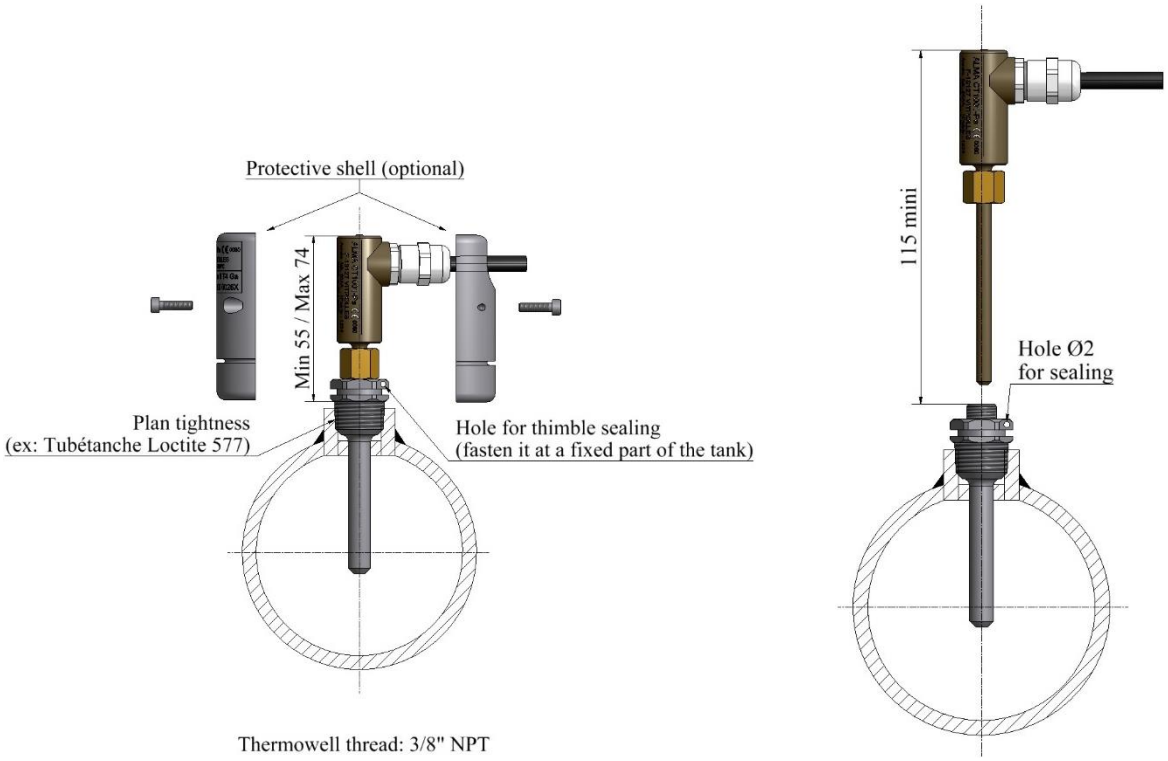
*ATEX "ma" certification.
For installation and use in hazardous areas see Instruction manual

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 MDV596 Compliance with ATEX marking						
		Temperature probe CT1001-Pe									
DEV N° : 949d	Code : 8151										
Drawing N° associated with the related CET file		949d	PPV042	K	5 /7	Modified on :	12/01/2018	by	ROC	verified by	CC
Metro :		Dev N°	Drawing N°	Rev	Folio	Created on :	13/09/2003		BM		BM
ATEX:	INERIS 04 ATEX 0026										

9.1. INSTALLATION RECOMMENDATIONS TEMPERATURE PROBE



REFER TO INSTRUCTION MANUAL

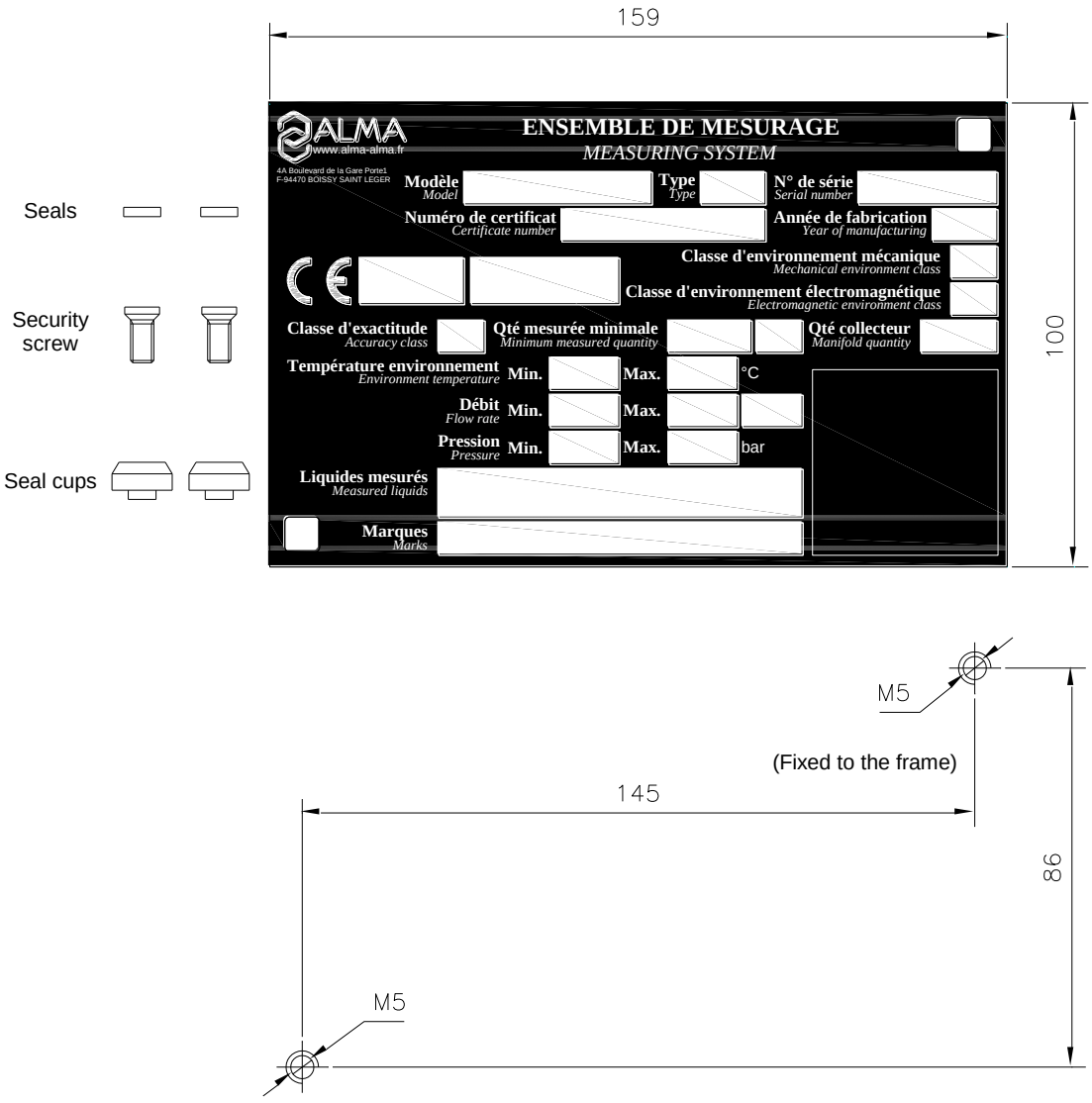
(DELIVERED WITH THE EQUIPMENT AND AVAILABLE ON ALMA WEBSITE)

INSTALLATION OF THE TEMPERATURE SENSOR

ON THE ALMA TURBINE METER:

10. 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).