

- **14 temperature measures per module**
RTD PT1000, Thermistor NTC inputs
- **Power supply and communication bus**
Into the DIN rail. up to 32 modules Interconnected
- **1 Ethernet Modbus TCP link**
For the entire BUS, up to 448 measurement points, embedded Web Server
- **ATEX dust zone 21 and 22 :**
Mounting in a box, all certified : II 2 D Ex tb IIIC T80°C Db
- **Application:**
Silo-thermometry, Acquisition Interface for PLC, process monitoring, supervision ...
- **fully compatible:**
With silo sensors: Chopin, Serdia, Tripette and Renaud, JUMO, AMI, Foss, Pfeuffer Advantageously replaces these solutions: no multiplexing, no adjustment, automatic detection and compensation of sensors
- **Upgradable :** introduction of new sensors curves by product update.
Characterization of measuring elements on request (record of the curve).



The CML36 is a compact temperature monitoring unit allowing to concentrate up to 32 modules of 14 channels into one Ethernet connection (Modbus TCP protocol) via the internal bus.

Available configurable inputs:

- 14 RTD PT1000 or NTC / PTC sensors in 2 wires assembly with one common and the possibility of adding new sensors type with firmware update (serial link), USB cable supplied separately.
- support the sensors with embedded diodes (automatic detection of the diode element and its direction with measurement compensation, for multiplexed systems sensors).
- all inputs with common ground (isolated from communication).

Front face:

- Measure display: Green LEDs 7 segments, 3 digits (1100 pts), digits height: 10 mm, resolution 1 °C
- Sensor break detection or scale overflow (display: LO, HI or Err).
- Two push buttons under the cover for the configuration

Feature:

- Mounting on DIN rail, communication bus (built-in DIN rail)
- connection on spring terminal block (max section 1 mm²)
- Conformal coating, protection rating : IP20

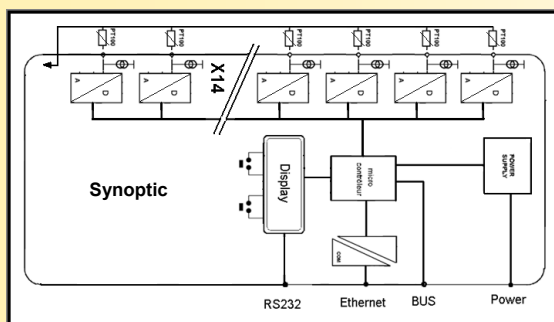
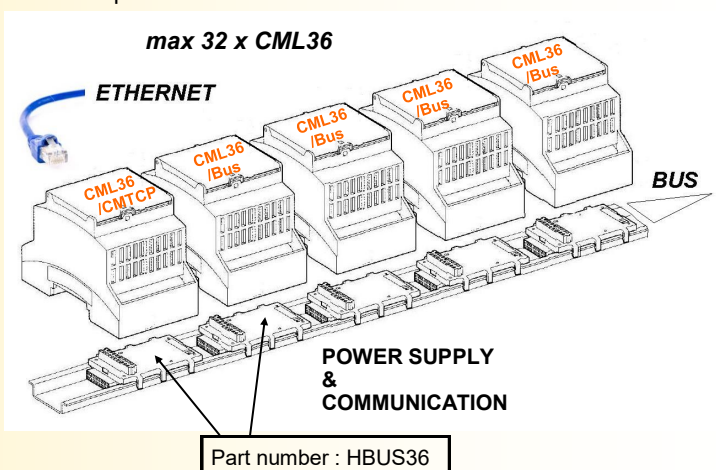
Configuration / update:

- The device can be configured via the front panel,
- Firmware update is possible via serial link.

Communication:

- Modbus TCP over Ethernet 10/100 T base (RJ45 connection)

BUS composition on the DIN rail.



Version and order code:

[Request a quote](#)

CML36/CMTCP
CML36/BUS

Master module with the Ethernet MODBUS TCP link
Slave module on the internal bus

HBUS36

Connecting element for the internal bus.

NAPPE-HBUS

Interconnection ribbon cable (length 50cm)
(for bus continuity on another DIN rail)
only one ribbon cable by Bus

ATEX IP66 Box
reference: 06.25 40 12

400mm x 250 mm x 121 mm, polyester, supply with
20 cable glands M20 for sensor inputs,
1 cable gland M20 for power supply (5..9mm),
1 cable gland M25 for the communication link (10..16mm)
(certification off all CML36 + box)
dust zone, protection by enclosure
can include up to 10 CML36

INPUT (16 bits resolution)

Type	Range	Accuracy
Pt1000 2 wires	-50.....150 °C	+/- 0.8 °C
NTC/PTC 2 wires	-20.....100 °C	+/- 0.8 °C

The accuracy on 2 wires connection depends on the resistance binding the sensor (offset correction possible).

Measure current	< 2 mA
Measurement rate	5 per second

COMMUNICATION

Modbus TCP over Ethernet 10 /100 T Base Port 502
RJ45 socket.

Auxiliary POWER SUPPLY

8 32 Vdc

consumption:	(CML36/CMTCP)	60 mA typical @ 24V
consumption:	(CML36/BUS)	25 mA typical @ 24V

ENVIRONMENT

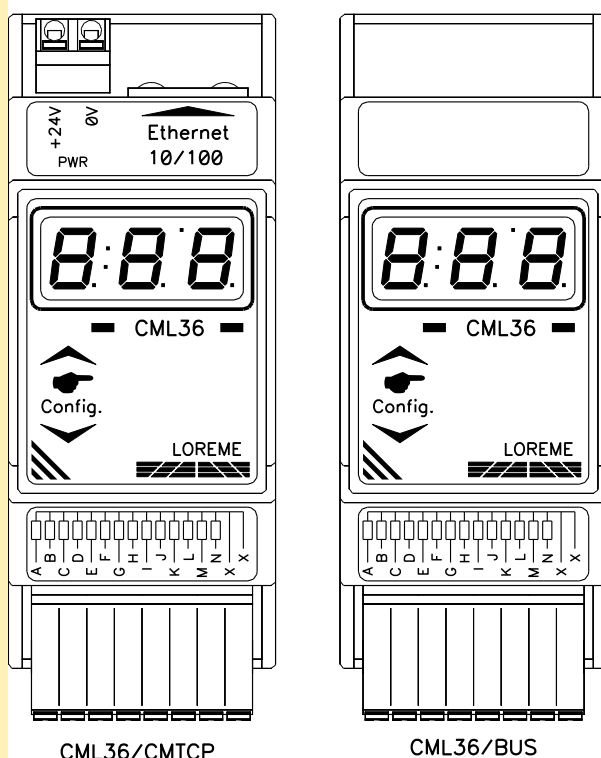
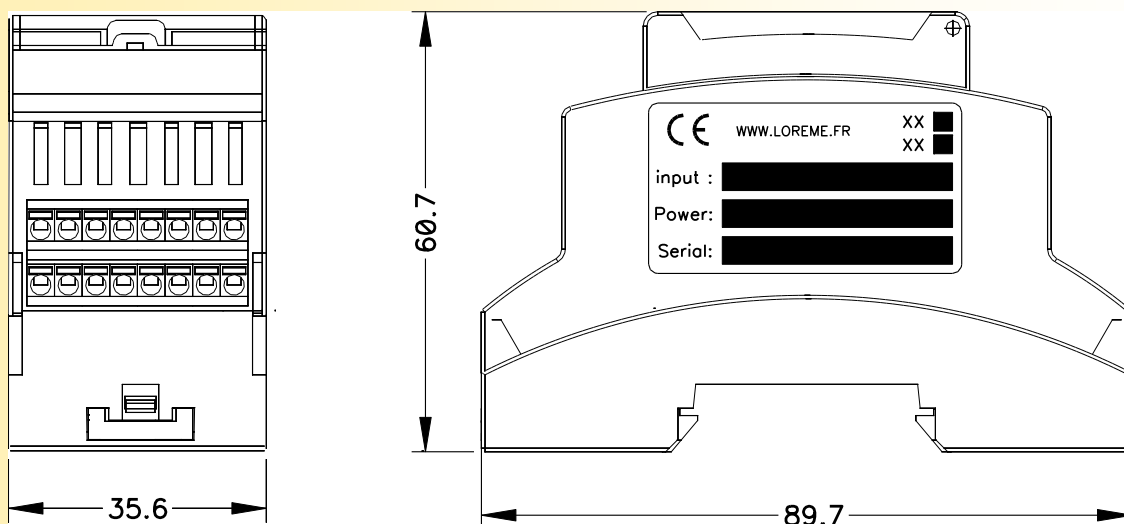
Operating temperature	-20 to 65 °C
Storage temperature	-20 to 85 °C
Thermal drift	< 0.1 % / °C
Humidity	85 % not condensed
Weight	100 g
Protection rating	IP 20
Dielectric strength:	
inputs / power supply:	no isolation
input / input:	no isolation
inputs / Ethernet communication:	500 V

Electromagnetic compatibility 2014/30/UE / Low Voltage Directive 2014/35/UE

Immunity standard for industrial environments EN 61000-6-2		Emission standard for industrial environments EN 61000-6-4
EN 61000-4-2 ESD	EN 61000-4-8 AC MF	EN 55011 group 1 class A
EN 61000-4-3 RF	EN 61000-4-9 pulse MF	
EN 61000-4-4 EFT	EN 61000-4-11 AC dips	
EN 61000-4-5 CWG	EN 61000-4-12 ring wave	
EN 61000-4-6 RF	EN 61000-4-29 DC dips	



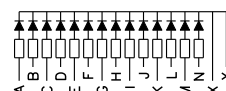
WIRING AND OUTLINE DIMENSIONS:



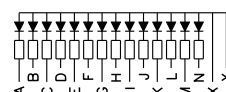
possible use:



Sensor RTD 1000 with common point:



Sensor NTC with common point and internal diode. direct sense:



Sensor NTC with common point and internal diode. reverse sense:

• Direct bus power supply of 8 CML36 Modules

- No wiring to do, 24V distributed directly on the communication bus.
- Ensures perfect isolation of the bus.
- Allows direct 230Vac power supply.
- Low noise linear power supply.
- 24 V / 250 mA output.
- Auxiliary 24 V output terminal.

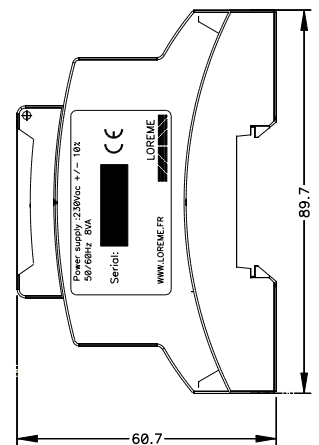
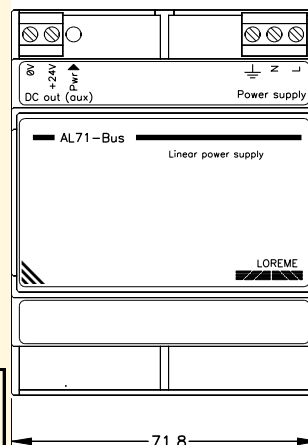


This power supply is particularly suitable for the implementation of CML36 acquisition units, the very high isolation impedance of the output eliminates ground loop problems, and ground currents that can affect measurements or destroy modules in extreme cases. This solution greatly improves the reliability of the installation, and facilitates the implementation of CML36 modules. It contributes to compliance with the recommendations for implementing silothermometry acquisition systems.

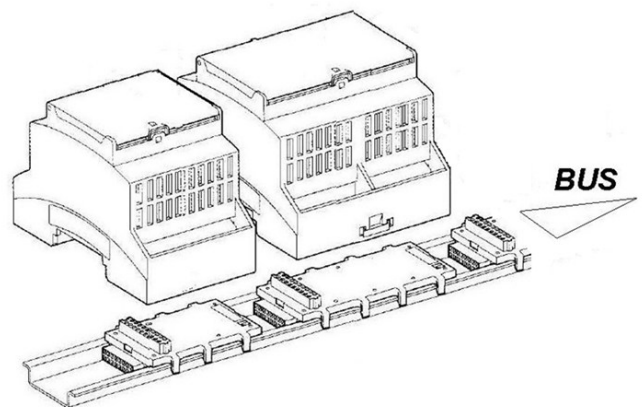
Features :

- Auxiliary 24Vdc output (the power used on the auxiliary output is subtracted from the power available on the Bus)
- Short Circuit Protection, Overload Protection.
- Thermal protection (output power limitation).
- Cooling by natural convection
- Built-in EMC filter conforming to EN55022 class A
- Regulated output voltage
- DIN rail mounting, IP20 protection rating
- Protection of the electronics by tropicalization varnish
- Green mains voltage presence LED,
- Connection by screw terminal block (section of wires up to 2.5 mm²).

Alimentation des CML36 directement par le bus
+ sortie 24V auxiliaire



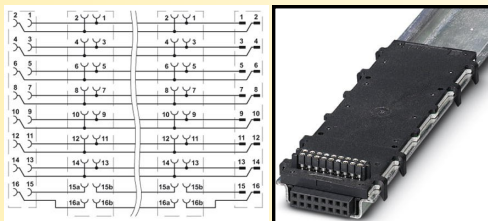
1 x AL71-BUS + 8 x CML36 maximum. The power supply can be inserted at any location on the bus



Power supply	
Input voltage	230 Vac or 115 Vac
Input frequency	45....65 Hz
Power consumption	10 VA max
Output	
Output voltage	24 V (±2 %)
Output current	250 mA max (6 W)
Load regulation	0.1 % max
Output ripple	< 20 mVpp (10 Hz to 10 kHz BW)
ENVIRONMENT	
Operating temperature	-25 °C to 60 °C (natural convection)
Thermal protection	100 °C internal
Storage temperature	-25 °C to 85 °C
Humidity	85 % (not condensed)
Thermal drift	±0.02 %/°C (-2 mV/°C typically)
Insulation resistance	> 500 MΩ min.
Dielectric strength	2500 VAC (input / output)
Weight	400 g

HBUS70 : Bus connecting element for AL71-Bus

Technical data:
Colour black
Length 37,1 mm
Width 71,6 mm
Nominal voltage UN 60 V
Nominal current IN 2 A
Indicator1 CUL1 Flamma-
bility rating according to
UL 94 V0



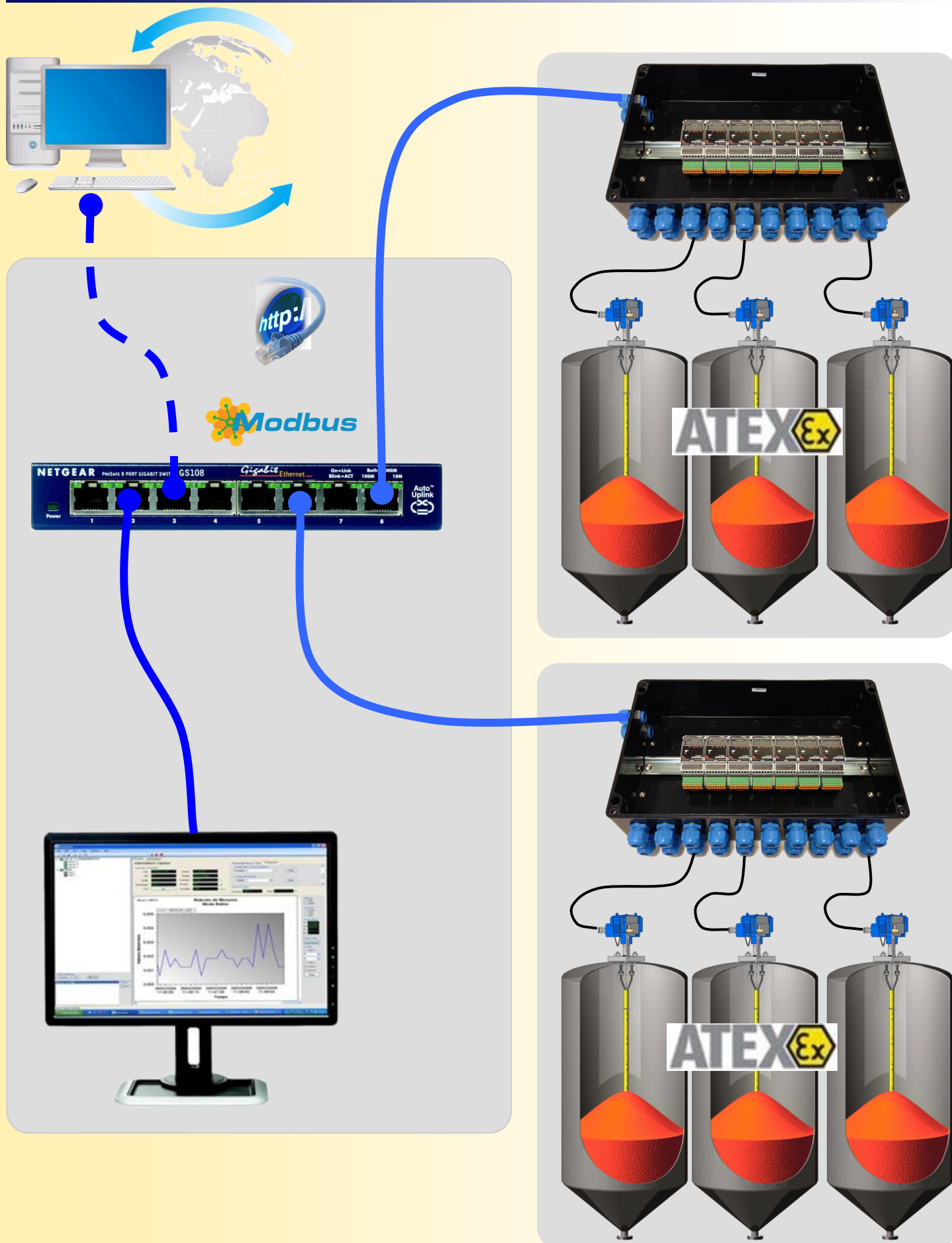
Version and order code:

AL71-Bus

Isolated power supply on internal bus allowing the supply of 8 CML36

HBUS70

Connecting element for the internal bus.



characteristic of embedded sensor types measurement record

The device can measure sensor like PT1000 or NTC or PTC.

The CTN sensors can have a diode in series with temperature sensor (multiplexed application).

The CML36 is able to eliminate the influence of this diode in order to have the temperature of the sensor only.

Measurement process

For each point, the CML36 make measurement in direct and reverse polarity.

The presence of a diode is detected if the circuit is open in one of this two polarity.

The CML36 calculate the resistance of the sensor alone by eliminating the influence of diode impedance.

The temperature is calculate via a resistance -> temperature table.

NOTE:

For the PT1000, CTN2, CTP6 and CTN7, the measure is made only in one polarity.

So, this sensor type must not include diode!

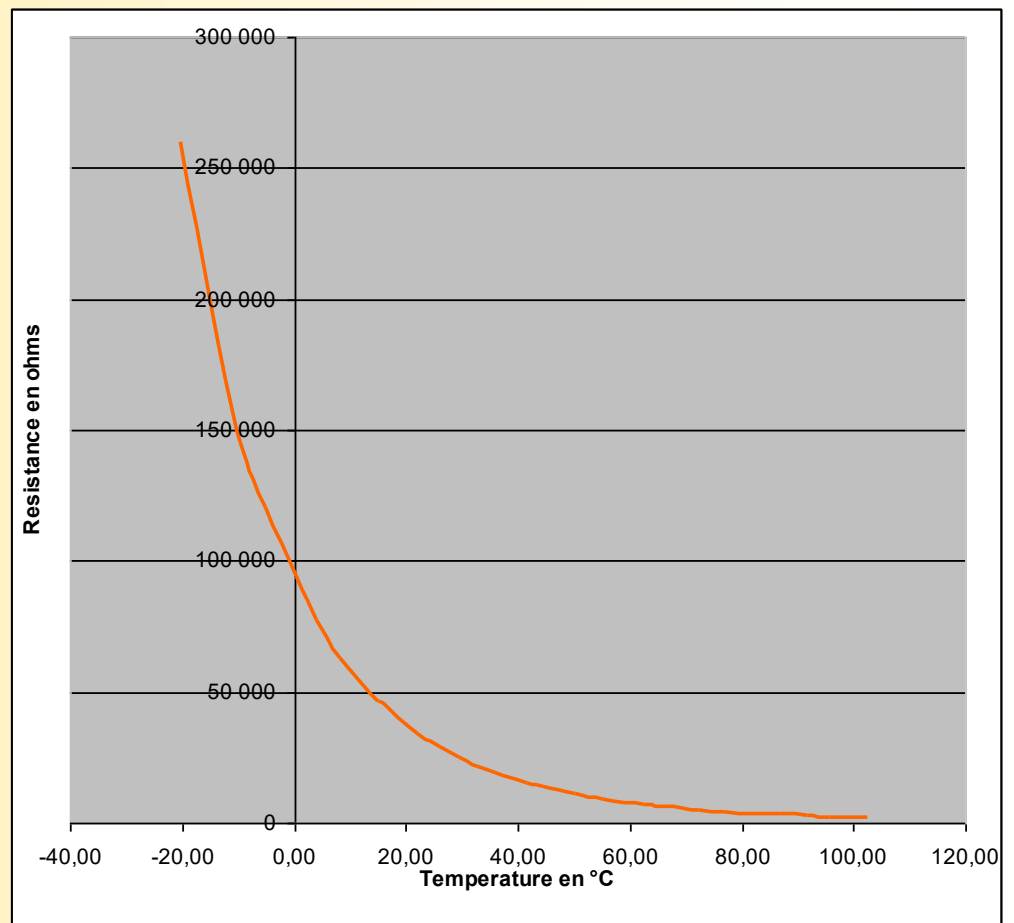
NTC / PTC characteristics

Type "CTN1" (compatible with temperature sensors like "CHOPIN", ex "SERDIA"):

With this element, the CML36 measures are not influence by presence of diode.

NTC parameters: Beta = 3780, R0 = 30 kOhms.

Temp (°C)	NTC (ohms)	
-20,28 °C	260 000 Ohms	
-14,78 °C	197 100 Ohms	
-9,54 °C	145 000 Ohms	
-5,10 °C	120 000 Ohms	
0,60 °C	94 200 Ohms	
4,07 °C	77 600 Ohms	
8,42 °C	63 100 Ohms	
15,00 °C	46 600 Ohms	
15,30 °C	46 000 Ohms	
22,15 °C	33 900 Ohms	
26,06 °C	28 800 Ohms	
29,69 °C	24 700 Ohms	
33,03 °C	21 600 Ohms	
41,63 °C	15 200 Ohms	
44,62 °C	13 610 Ohms	
50,21 °C	11 020 Ohms	
55,30 °C	9 120 Ohms	
62,81 °C	7 220 Ohms	
66,60 °C	6 060 Ohms	
72,51 °C	4 970 Ohms	
76,77 °C	4 320 Ohms	
82,37 °C	3 600 Ohms	
86,91 °C	3 120 Ohms	
91,67 °C	2 690 Ohms	
95,70 °C	2 380 Ohms	
102,60 °C	1 920 Ohms	

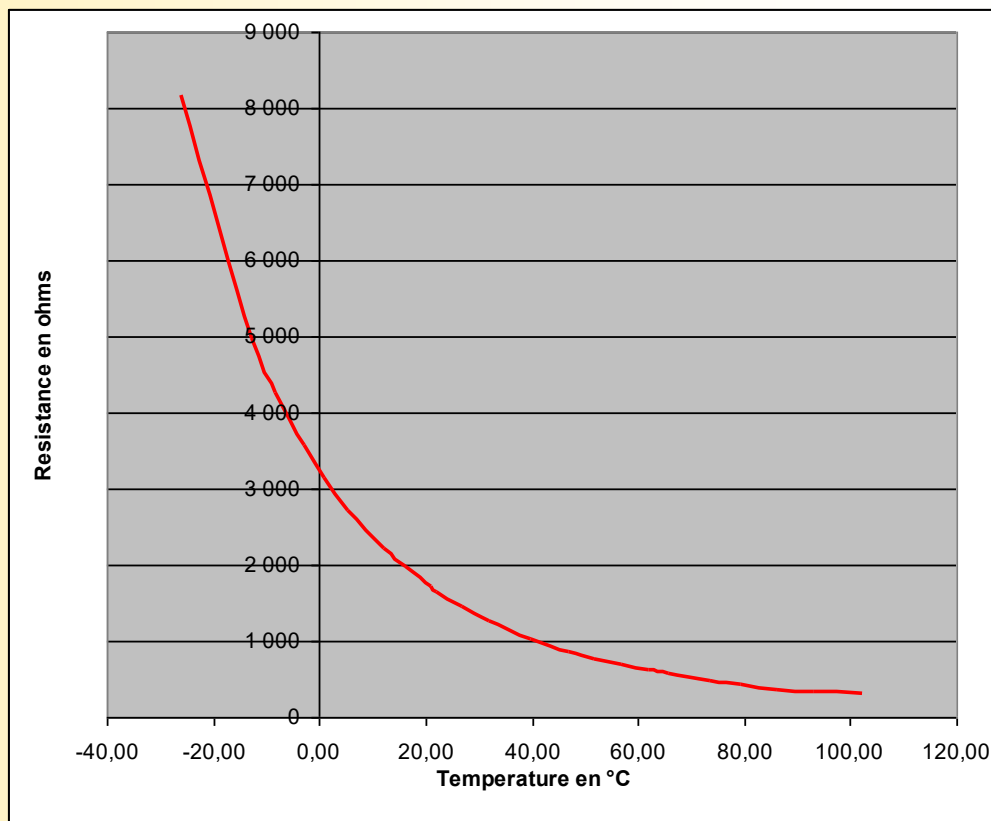


characteristic of embedded sensor types measurement record

Type "CTN2" (compatible with temperature sensors like "A/S Foss Electric"):

With this element, the sensor must not include diode.
NTC parameters: Beta = 2400, R0 = 1,5 kOhms.

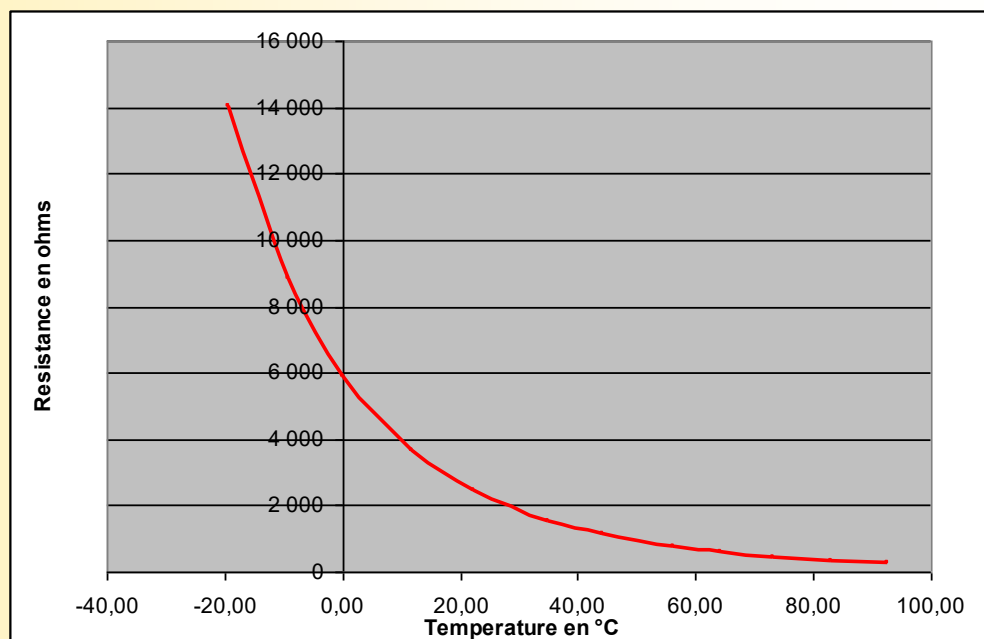
Temp (°C)	NTC (ohms)
-26,09 °C	8 155 ohms
-12,56 °C	4 985 ohms
-8,16 °C	4 272 ohms
-2,93 °C	3 576 ohms
1,06 °C	3 139 ohms
5,54 °C	2 716 ohms
12,28 °C	2 215 ohms
16,31 °C	1 982 ohms
21,19 °C	1 715 ohms
22,16 °C	1 644 ohms
26,88 °C	1 453 ohms
32,13 °C	1 265 ohms
39,72 °C	1 035 ohms
47,09 °C	862 ohms
51,89 °C	770 ohms
56,76 °C	692 ohms
61,90 °C	620 ohms
65,89 °C	565 ohms
73,45 °C	484 ohms
79,27 °C	425 ohms
86,18 °C	365 ohms
92,99 °C	344 ohms
102,30 °C	299 ohms



Type "CTN3" (compatible with temperature sensor like "SERDIA"):

With this element, the CML36 measures are not influence by presence of diode.
NTC parameters: Beta = 3320, R0 = 2,2 kOhms.

Temp (°C)	CTN (ohms)
-19,37 °C	13 968 ohms
-9,18 °C	8 693 ohms
0,08 °C	5 857 ohms
11,88 °C	3 632 ohms
22,22 °C	2 457 ohms
35,08 °C	1 519 ohms
44,24 °C	1 112 ohms
56,07 °C	764 ohms
64,18 °C	595 ohms
73,31 °C	458 ohms
83,12 °C	346 ohms
92,72 °C	269 ohms

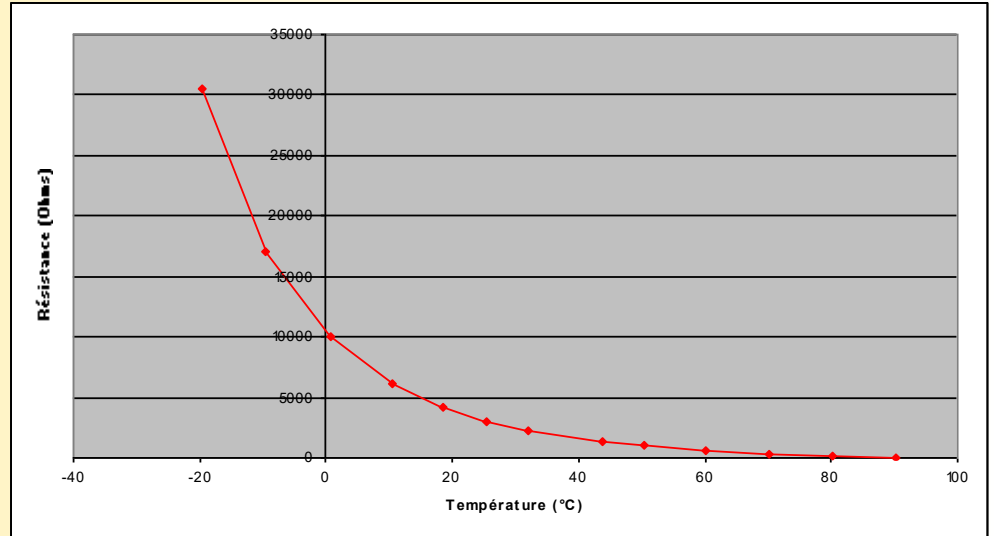


characteristic of embedded sensor types measurement record

Type "CTN4" (compatibles with temperature sensor like "AMI")

With this element, the CML36 measures are not influence by presence of diode.
NTC parameters: Beta = 3950, R0 = 3,0 kOhms.

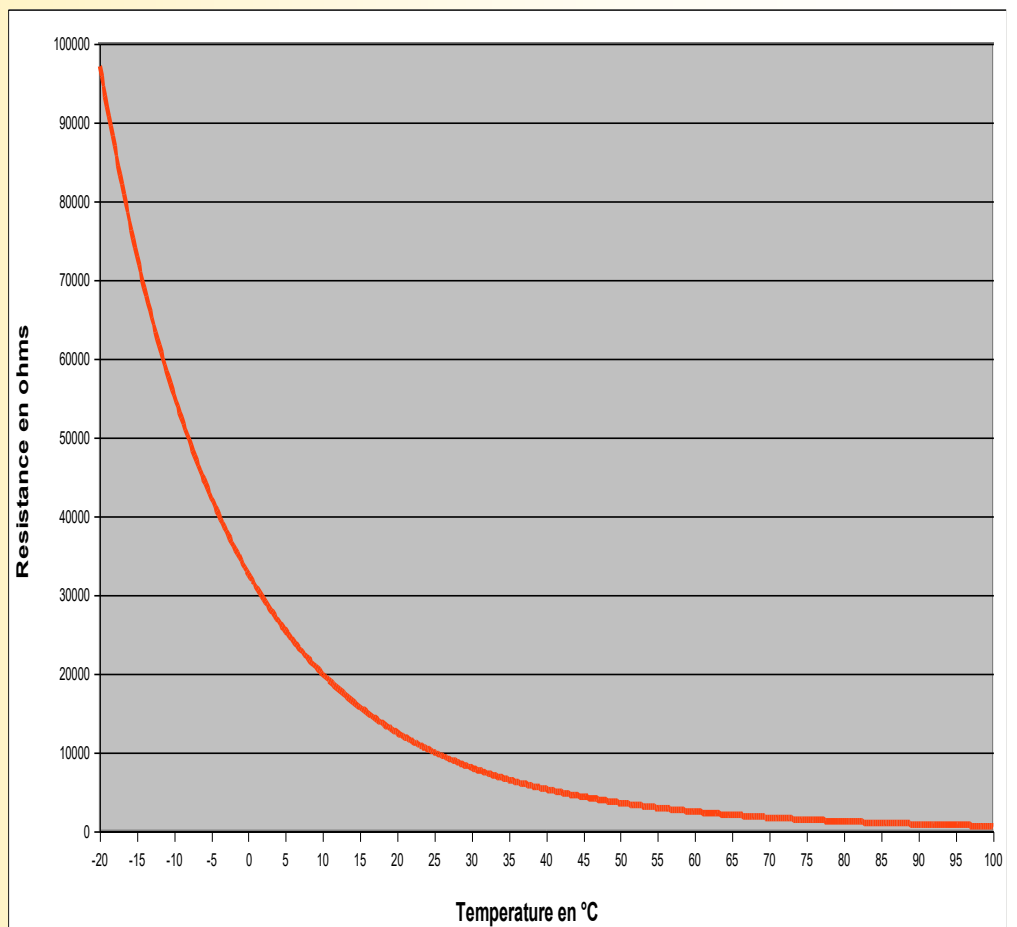
Temp (°C)	NTC
-19,61 °C	30474 ohms
-9,62 °C	17061 ohms
0,86 °C	9972 ohms
10,43 °C	6135 ohms
18,45 °C	4183 ohms
25,27 °C	3064 ohms
32,04 °C	2262 ohms
43,63 °C	1342 ohms
50,24 °C	1005 ohms
60,25 °C	615 ohms
70,27 °C	344 ohms
80,27 °C	152 ohms



Type "CTN5" (sensitive element **US SENSOR 103JM1A**): With this element, the CML36 measures are not influence by presence of diode.

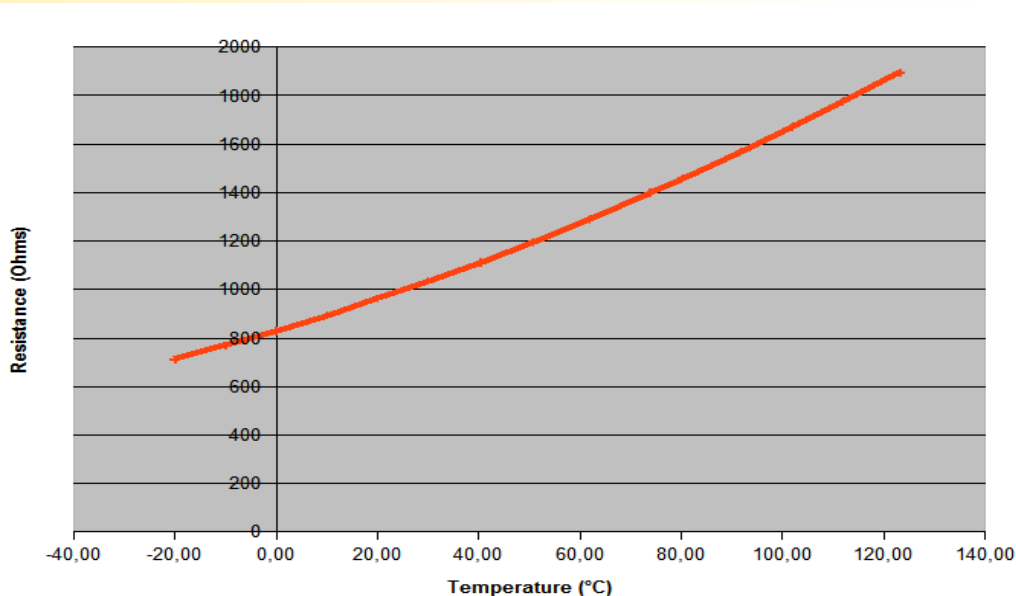
NTC parameters: Beta = 3890, R0 = 10 kOhms.

Temp (°C)	NTC
-20 °C	97080 ohms
-15 °C	72960 ohms
-10 °C	55330 ohms
-5 °C	42330 ohms
0 °C	32650 ohms
5 °C	25390 ohms
10 °C	19900 ohms
15 °C	15710 ohms
20 °C	12490 ohms
25 °C	10000 ohms
30 °C	8060 ohms
35 °C	6530 ohms
40 °C	5330 ohms
45 °C	4370 ohms
50 °C	3600 ohms
55 °C	2990 ohms
60 °C	2490 ohms
65 °C	2080 ohms
70 °C	1750 ohms
75 °C	1480 ohms
80 °C	1260 ohms
85 °C	1070 ohms
90 °C	920 ohms
95 °C	790 ohms
100 °C	680 ohms



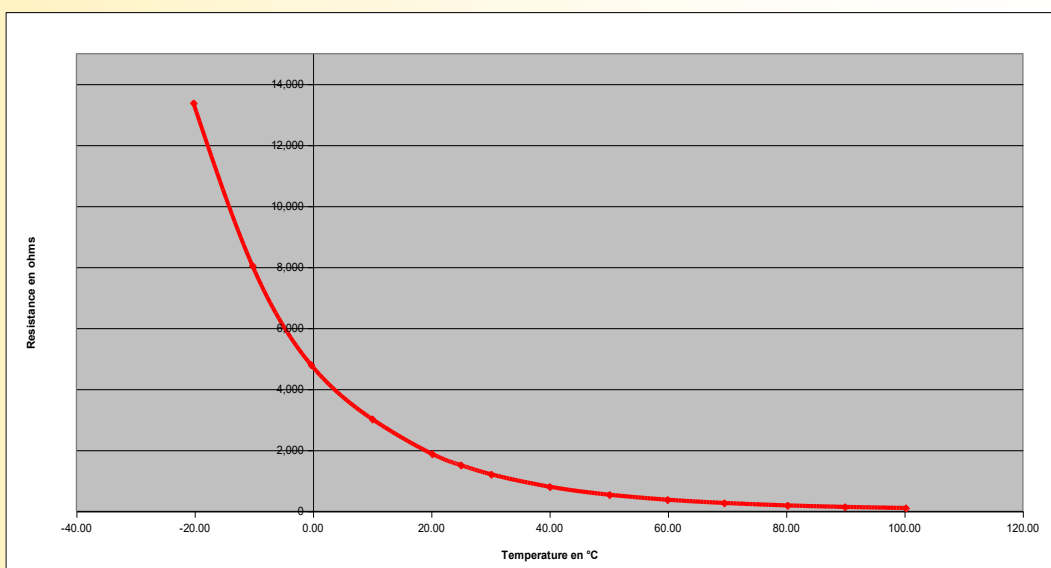
Type "CTP6":

Temp (°C)	CTP (ohms)
-20,00 °C	693
-10,00 °C	761
0,00 °C	827
10,00 °C	894
20,00 °C	963
30,00 °C	1035
40,40 °C	1112
50,80 °C	1194
61,80 °C	1290
73,80 °C	1399
80,20 °C	1459
91,80 °C	1569
101,90 °C	1670
112,00 °C	1775
123,20 °C	1895



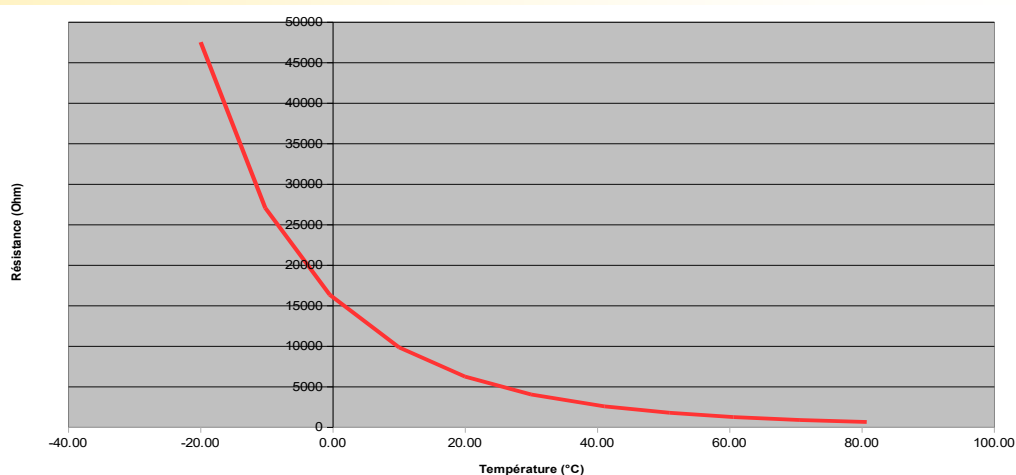
Type "CTN7": With this element, the sensor must not include diode.
NTC parameters: Beta = 3900, R0 = 1,5 kOhms.

Temp (°C)	CTN (ohms)
-20.22 °C	13379
-10.25 °C	8052
-0.35 °C	4800
10.00 °C	3021
20.12 °C	1881
24.98 °C	1513
30.10 °C	1211
40.00 °C	804
50.10 °C	541
59.90 °C	378
69.50 °C	271
80.20 °C	191
89.90 °C	142
100.20 °C	105



Type "CTN8" (compatible with sensor like "PFEUFFER"): With this element, the CML36 measures are not influence by presence of diode. NTC parameters: Beta = 4000, R0 = 5000 Ohms.

Temp (°C)	NTC(ohms)
-19.94 °C	47485
-10.17 °C	27030
-0.41 °C	16298
10.07 °C	9815
20.03 °C	6212
30.03 °C	4007
41.13 °C	2537
50.99 °C	1743
60.64 °C	1217
70.68 °C	853
80.78 °C	612



Type "CTN9": With this element, the CML36 measures are not influence by presence of diode.
NTC parameters: Beta = 3500, R0 = 2.8 kOhms.

Temp (°C)	CTN (ohms)
-19.93°C	20393
-9.97°C	12493
0.00°C	7908
10.28°C	5063
20.28°C	3365
32.14°C	2134
43.87°C	1390
50.89°C	1085
60.04°C	800
70.56°C	585
80.70°C	425

