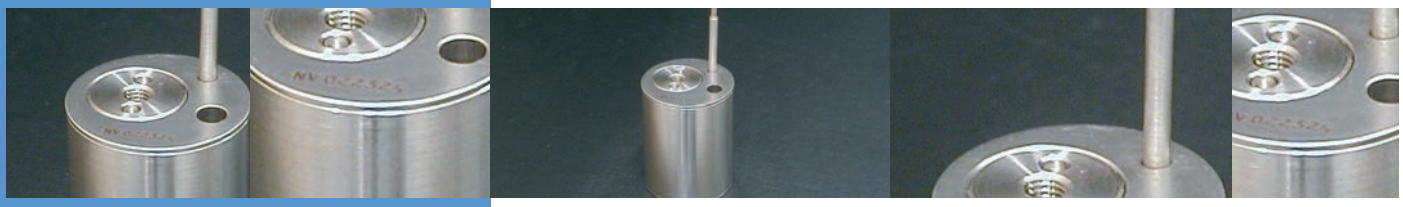
Pressure and temperature data logger

NanoVACQ Pressure

Control of pressure and temperature inside packages, autoclaves...

NanoVACQ Pressure enabling the use of 1 pressure sensor and 1 or 2 temperature sensors on the same logger, thus answering a lot of industrial needs.

The combination of pressure and temperature is the best way to control saturated steam as in sterilization validation.
Following is a list of standard models for temperature and pressure, which can vary by shape and length of the probes if necessary:



NanoVACQ PT

- 1 piezoresistive pressure sensor
- 1 internal platinum temperature sensor for pressure sensor compensation.

NanoVACQ PT-Tc

- 1 piezoresistive pressure sensor
- 1 internal platinum temperature sensor for pressure sensor compensation
- 1 platinum temperature sensor at the end of a rigid probe diameter 3 mm>1.9 mm (hybrid) or diameter 3 mm and length 30 mm (possible from 10 mm to 120 mm)

NanoVACQ PT-Td

- 1 piezoresistive pressure sensor
- 1 internal platinum temperature sensor for pressure sensor compensation
- 1 platinum temperature sensor at the end of a rigid probe (diameter 3 mm, length to be defined between 20 mm and 100 mm), at the end of a flexible probe (diameter max 5 mm, length to be defined between 100 mm and 1000 mm), or also at the end of a semi-rigid probe coated with stainless steel (diameter 2 mm and length to be defined between 100 mm and 1000 mm).

10Hz Version

All the above models are available in 10 Hz version (10 acquisitions per second) for fast pressure gradients measurement.

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NanoVACQ Pressure

Operating range

All pressure values specified in this document are meant absolute

- In temperature ..... from -30°C to +140°C (optional: down to -55°C).

Batteries to be used depending on operation range and height of the logger (diameter 31 mm)

Operation range	from -55°C to +85°C	from 0°C to +125°C	from 0°C to +140°C
Height 31 mm		014Z	
Height 39 mm	Routine TLH	Routine TLH	Routine TLH
Height 125 mm	014ZFL		

To benefit of greater temperature ranges, it is possible to exchange batteries on the same device.

Metrology

- In pressure ..... from 30 mbar to 5 bar or 15 bar from -30°C to 140°C (optional: down to -55°C). possibility of higher pressure.

- **Calibration uncertainties:**
  - In temperature..... +/- 0.1°C from -55°C to 140°C (+/-0.05°C upon request)
  - In pressure ..... +/- 10 mbar from 0°C to140°C and from 30 mbar to 5 bar (1Hz or 10Hz mode)
  - ..... +/- 12 mbar from 0°C to 140°C and from 30 mbar to 15 bar (1Hz mode)
  - ..... +/- 17 mbar from 0°C to 140°C and from 30 mbar to 15 bar (10Hz mode)
  - ..... unspecified from -30°C to 0°C
  - ..... not functional from -55°C to -30°C

The uncertainties correspond to 2 standard deviations.
The uncertainties are calculated taking into account the various significant sources of error, including calibration sensors, the equipment, the environmental conditions, the influence of the logger, repeatability, etc…

- **Resolution and noise:**
  - In temperature..... 0.04°C
  - In pressure ..... 0.8 mbar (5 bar) 2.6 mbar (15 bar)
- Annual recalibration and check-up recommended.
- Each logger can be calibrated and checked up at the temperature points needed by the users.

Technical specifications

- External material biocompatible and sterilizable: 316 L stainless steel
- **Dimensions:** diameter 31 mm, height from 31 mm to 125 mm depending on the battery used.
- **Sensors:**
  - In temperature..... Pt1000 or Pt100
  - In pressure ..... piezoresistive
- **Memory capacity:** 48 000 acquisitions, divided by the number of measurement channels
- **Programmable acquisition rate:**
  - minimum 1 second, maximum 59 minutes and 59 seconds for 1Hz version
  - minimum 100 ms to maximum 59 minutes and 59 seconds for 10Hz version
- Programmable acquisition duration.
- Programmable recording start by date, hour, minute or on temperature threshold.
- High temperature battery replaceable by the user.
- Non volatile memory (EEPROM).

Software operating conditions

- Data transfer with a communication interface connected to the USB port.
- Operates under **Windows® XP (SP3)/Vista/7/8**

NOTA :
Annual maintenance is recommended for replacement of o-rings, calibration and adjustment.

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Pressure and temperature data logger

NanoVACQ FullRadio Option

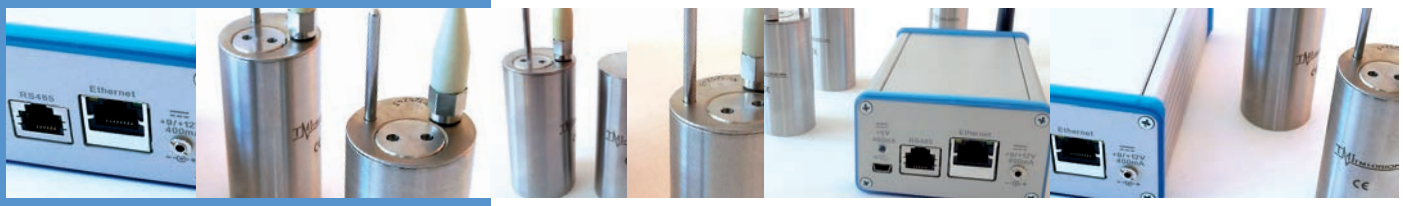
Real time data: wireless and contactless communication

NanoVACQ FullRadio loggers are entirely autonomous. They are equipped with sensors and do not require any wire connection.

They offer the following functionalities:
- wireless and contactless remote setup, starting and reading of data,
- radio recording and transmitting of data during measurement,
- starting and stopping the recording (or radio transmission) on a date or a temperature threshold.

NanoVACQ FullRadio loggers use the technology based on the IEEE 802.15.4 standard, which enables the management of numerous loggers.

All NanoVACQ Pressure and Temperature are available with FullRadio option.
10 Hz version for recording is also available with FullRadio.



Operating range

- from -30°C to +140°C (-55°C optional)
- Batteries to be used depending on operation range and height of the logger (diameter 31 mm)

Operating range	from -20°C to +140°C	from -30°C to +125°C	from -30°C to +85°C high autonomy
Height 52,2 mm	RADIOHE	RADIOHEF	
Height 131,5 mm			014ZFL

Radio transmission

- Connectable antenna models for NanoVACQ:
  - Standard antenna: length 49 mm, medium range (25 meters in clear field).
  - Short antenna: length 25 mm, short range (15 meters in clear field).
  - Long antenna: length 79 mm, long range (30 meters in clear field).

A preliminary test is recommended to validate the hertzian transmission in the user's application.

- ZigBeeBase transmitter with connectable antenna. Optional remote antenna for sterilizators.
- Connection of the ZigBeeBase radio transmitter with one of the following:
  - USB,
  - RS485 long distance,
  - Ethernet.
- Frequency: ISM 2.4 GHz (2.405 GHz to 2.475 GHz) bandwidth. This bandwidth can be used without license (industrial, scientific or medical devices).
- Output power: maximum 5 dBm (3.2 mW)
- NanoVACQ FullRadio option is compliant with the following regulations: R&TTE Directive 1999/5/CE (EU), FCC Part 15.247 (USA), RSS-210 (Canada), ARIB TELEC (Japan), KCC RWA 58-2 (Korea).

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