



MONITOR YOUR INDUSTRIAL PROCESSES



**FOOD
HEALTH
BIOTECHNOLOGY**



VALIDATE, MONITOR, CONTROL YOUR PROCESSES



FOOD

In order to give the most accurate results, our specifications are based on a comprehensive analysis of the uncertainty parameters.

The specified uncertainties take into account all significant sources of error, including the calibration standard (probe and thermometer), the equipment (oil baths, dry wells), the environmental conditions (room temperature stability), the influence of the logger (sensors, electronics), temperature of the electronic during calibration, repeatability, etc...

The uncertainties are specified at two standard deviations.

Each logger can be calibrated and verified at the temperature points needed by the user.

● PicoVACQ Temperature

Operating range from -70°C to 140°C and up with thermal shield, length depends on the battery pack.

Diameter 15 mm.

Uncertainty: +/- 0.1°C from 0°C to 140°C (+/-0.05 from 0°C to 140°C upon request) ● +/- 0.2°C from -70°C to 0°C

Resolution and noise: 0.02°C ● Memory capacity: 16 000 acquisitions

● PicoVACQ Temperature - Thermocouple

Operating range from 0°C to 140°C and up with thermal shield.

Diameter 15 mm ● Height: 105 mm

Uncertainty: +/- 0.1°C from 0°C to 140°C

Resolution and noise: 16 bit converter, resolution: $\pm 0.1^\circ\text{C}$

Memory capacity: 32 500 acquisitions

● PicoVACQ Pressure and Temperature

Operating range from -30°C to 140°C and from 30 mbar to 30 bar, length depends on the battery pack.

Diameter 16 mm.

Uncertainty: +/- 0.1°C from 0°C to 140°C (+/- 0.05°C upon request)

+/- 30 mbar from 30 mbar to 15bar ● +/- 100 mbar at 30 bar

Resolution and noise: 0.02°C ● 0.7 mbar

Memory capacity: 8 000 acquisitions per channel

● PicoVACQ Humidity and temperature

Operating range from 0°C to 80°C and from 2 to 98% RH, length depends on the battery pack.

Diameter 15 mm.

Uncertainty: +/- 0.1°C from 0°C to 80°C (+/- 0.05°C upon request)

+/- 0.2°C from -30°C to 0°C ● +/- 3 %RH (1% upon request)

Resolution and noise: 0.02°C ● 0.01 %RH

Memory capacity: 8 000 acquisitions per channel

● PicoVACQ Rotation

Operating range from -40°C to 140°C, length depends on the battery pack.

Diameter 15 mm ● Maximum speed : 150 rotations per minute

Resolution: 1/2 rotation. Resolution by rotation: 8 ms

Rotation axis: horizontal. Acquisitions based on a physical rotation of the logger, not on a previously setup acquisition rate.

Rotation direction: clockwise and counterclockwise

Memory capacity: 16 000 acquisitions

● NanoVACQ Temperature

Operating range and length of loggers vary with battery.

Diameter 31 mm.

from -80°C to +140°C (and more with thermal shield)

Uncertainty: +/- 0.1°C from -80°C to +140°C (+/- 0.05°C upon request)

Resolution and noise: 0.04°C

Memory capacity: 48 000 acquisitions divided by number of measurement channels.

● NanoVACQ Temperature - Thermocouples

Operating range from 0°C to 140°C and up with thermal shield.

Diameter 31 mm ● Height: 75 mm

Uncertainty: +/- 0.1°C from 0°C to 140°C

Resolution and noise: 16 bit converter, resolution: $\pm 0.1^\circ\text{C}$

Memory capacity: 65 160 acq. divided by number of channels

REAL TIME

Validating, monitoring and even controlling your processes in real time is possible with Radio 2.4 GHz option available for VACQ xFlat and VACQ Autoclave loggers, as well as most NanoVACQ models.

YOUR PROCESSES

Sterilization

PicoVACQ, NanoVACQ and VACQ Autoclave loggers, with their numerous models and custom probe configurations, measure temperature and pressure inside autoclaves and food packaging. QLEVER software enables analysis and validation of processes.

Rotation

PicoVACQ Rotation measures rotation inside any rotating process (such as retorts...) from -45°C to 140°C, up to 150 rpm.

Pasteurization

PicoVACQ, MiniVACQ and NanoVACQ are also used in pasteurization processes for temperature and pressure measurements and PU calculation.

Packaging deformation

NanoVACQ Deformation enables the control of cans, caps or containers deformation in static autoclaves or retorts.

Drying

Humidity data loggers, PicoVACQ HT and NanoVACQ HT monitor drying processes. NanoVACQ Ad-Td enables airflow and temperature measurement in dryers.

Cooking

Cooking temperature can be measured with PicoVACQ, NanoVACQ and VACQ xFlat, with thermal shield beyond 140°C.

Roasting

Roasting temperature can be measured with PicoVACQ 1TH or NanoVACQ 3TH, TMI-ORION small thermocouple loggers.

Micro-wave

Picoμwave has been specially designed to validate in-product temperature inside microwave ovens. Depending on the needs, it is either inserted inside a product or immersed.





HEALTH - BIOTECHNOLOGY

Steam sterilization

PicoVACQ and NanoVACQ families of data loggers with platinum sensors, as well as VACQ Autoclave with thermocouples channels enable validation, operational qualification and routine control of autoclave cycles.

Ethylene oxide sterilization

NanoVACQ Ex and PicoVACQ Ex are the solution to validate EtO sterilization.

Depending on the models, they measure temperature, humidity and temperature, or pressure and temperature. They meet the specifications of the Ex intrinsic security standards and are also suitable for autoclaves.

Freeze-drying processes

All NanoVACQ Temperature models can operate at very low temperatures, making them suitable for freeze-drying validation process. Yet, the NanoVACQ 1Tc-2Td or NanoVACQ 1Tc-2TdI (one rigid probe + 2 interchangeable probes) are preferred solutions for such application.

Aerosol spray

Easily inserted inside a spray can, the PicoVACQ PT combined with a PicoVACQ 1Td helps you get process information during hot filling, crimping, water bath leakage test and transportation.

Freezer mapping

NanoVACQ Temperature can operate for days at low temperature (down to -80°C).

Depyrogenation

For dry-heat sterilization processes, TMI-Orion offer two solutions: PicoVACQ with platinum or thermocouple sensors and VACQ xFlat with up to 16 thermocouples.

Both solutions are combined with custom-designed thermal shields.

Washing - Disinfection

MiniVACQ has the perfect features for washing disinfection processes.

● NanoVACQ Deformation

Operating range: from 0 to 20 mm and from -30°C to 150°C.
Dimensions: height 39 mm,
diameter 31 mm + 23 mm of movement sensor
Uncertainty: +/- 0.1 mm from 0 to 20 mm
Memory capacity: 24 000 acquisitions per channel.

● NanoVACQ Pressure and temperature

Diameter 31 mm. • Length 39 mm
Operating range from -55°C to +140°C and up with thermal shield and from 30 mbar to 15 bar
Uncertainty:
+/- 0.1°C from -55°C to 140°C (+/- 0.05°C upon request)
+/- 10 mbar from 0°C to 140°C and from 30 mbar to 5 bar (1Hz or 10Hz)
+/- 12 mbar from 0°C to 140°C and from 30 mbar to 15 bar (1Hz)
+/- 17 mbar from 0°C to 140°C and from 30 mbar to 15 bar (10Hz)
Unspecified from -30°C to 0°C
Not functional from -55°C to -30°C
Resolution and noise: 0.04°C • 0.8 mbar (5 bar) and 2.6 mbar (15 bar)
Memory capacity: 48 000 acquisitions, divided by number of channels

● NanoVACQ Humidity and temperature

Operating range:
From -60°C to +140°C depending on needs
From 2 % to 98 %RH
Dimensions : diameter 31 mm, height 55 mm.
Uncertainty:
+/- 0.1°C from 0°C to 140°C (+/- 0.05°C upon request)
3,5 % from 2 % to 98 %RH
Resolution and noise: 0.04°C • 0.06 %RH
Memory capacity: 48 000 acquisitions divided by number of channels

● VACQ xFlat

Operating range without thermal protection: from 0°C to 140°C, for temperatures beyond 140°C, thermal protection upon request
Dimensions: depending on number of channels, from 82 mm x 11 mm x 107 mm.
Resolution: 0.1°C for type K thermocouples (full scale 1300°C)
Memory capacity: 260 000 acquisitions, divided by number of channel

● MiniVACQ

Operating range: from -40°C to +100°C
Dimensions: Height 39.5 mm / Diameter 15 mm
Uncertainty: +/- 0.5°C • Resolution: 0.02°C
Memory capacity: 16 000 acquisitions

● NanoVACQ Ad-Td

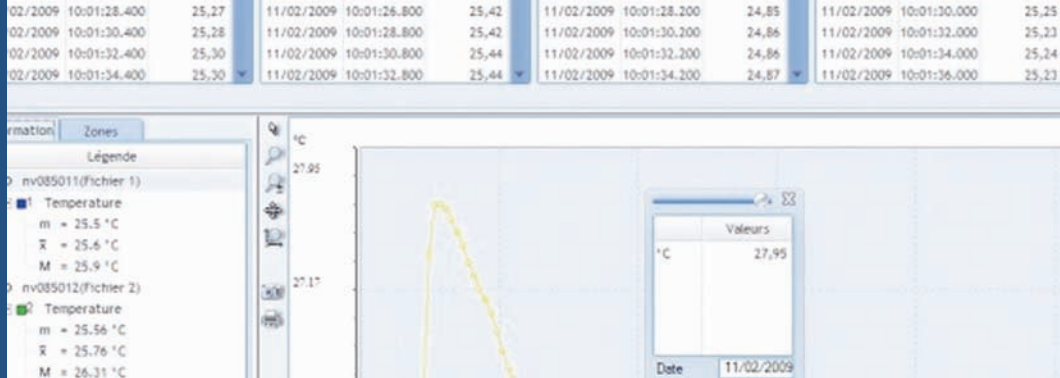
Operating range: from -55°C to 140°C
From 0 m/s to 20 m/s
Dimensions: Height 39 mm, diameter 31 mm
Uncertainty: +/- 0.1°C from 0°C to 140°C • 5% FS (+/- 1 m/s)
Resolution and noise: 0.04°C • 0.01 m/s
Memory capacity: 48 000 acquisitions divided by number of channels

● VACQ Autoclave

Operating range: from 0°C to 140°C (peaks at 150°C).
For temperatures beyond 140°C: thermal protection upon request.
Dimensions: Height 250 mm / Diameter 96 mm
Measurement range: up to 1300°C depending on thermocouple type (T or K)
Resolution and noise: ≤ +/- 0.1%
Memory capacity: 232 000 acquisitions divided by number of channels
Watertight up to 15 bar.



DATA PROCESSING



QLEVER

TMI-Orion has developed specific software to enable optimized reading and processing of your data.

QLEVER software is available in different versions depending on the needs of the industries, as detailed below.

QLEVER is an acquisition, analysis and data management software. It provides raw data downloaded from TMI-ORION loggers, calculation results and specific measurement reports.

Customizable, with numerous ergonomics and flexibility features, it is an outstandingly powerful software that is also easy to use.

These are just some of the features you will enjoy:

File management: Data storage in database, with a simple interface for easy file management, including recordings, calibration files, etc... This database can be shared with several users.

Configuration: Configuration menu enables the selection of communication ports and measurement units, as well as management of calibration files and directories.

Communication ports: All available communication ports on the PC can be used simultaneously with TMI-Orion communication interfaces.

Loggers management: A single window shows all the status information for every connected logger (identification, battery and memory status, configuration file date, real time data, etc...).

Programming: Creation of a Set up library. Programming, starting and reading of loggers on a single or multi-logger mode.

Recordings: Raw data, graph and statistics displayed in a single window.

Many available functions for enhanced graphical analysis (zoom, cursor, limits, scales, etc...), recorded files merger, zoning of schemes.

Many calculation functions available per zone and on each channel (F0, A0, Pu, offset, slope, %, ax+b, ...).

QLEVER Pharma compliant with FDA 21CFR Part 11

Collects, analyses, displays data and edits reports, using security and integrity functions such as:

- User accounts and security access management (3 levels: administrator, approval, operator).
- 3 audit trail levels (administrative files, software and data).
- Secure management of TMI-ORION database, including recordings and programming files.
- Electronic signature of reports.
- Process description (sterilizer type, service providers, comments...), customized pictures of the process and positioning of probes in the load.
- Creation of a Setup including all process information.
- Validation cycles management, dividing cycles in 3 stages, and applying calculation per stage.
- Calculation of the Min/Max/average, standard deviation, F0, A0, time above a temperature, equivalence temperature-pressure in saturated steam...

QLEVER Manual mode calibration (optional compliance with FDA 21 CFR part 11): Manual generation of the steps allowing calibration: as found calibration, adjustment and as left calibration of TMI-ORION temperature loggers, with creation of a report.

QLEVER Automatic mode calibration (optional compliance with FDA 21 CFR part 11): Thanks to the control by QLEVER of the bath and reference probe, automatic generation of the steps allowing calibration: as found calibration, adjustment and as left calibration of TMI-ORION temperature loggers, with creation of a report.

QLEVER Autoclave validation compliant with ISO 17665 norm (optional compliance with FDA 21 CFR part 11): Setup and detailed analysis of the sterilization cycle, validation report editing in compliance with ISO 17665 norm. This software allows autoclave cycles validation for hospitals and pharmaceutical industry.

QLEVER Washing-disinfection validation compliant with ISO 15883 norm (optional compliance with FDA 21 CFR part 11): Set up and detailed analysis of washing and disinfection cycles, validation report creation in compliance with ISO 15883 norm.

QLEVER Mapping : compliant with NFX15-140 norm (optional compliance with FDA 21 CFR part 11). Set up, analysis and report of climatic chamber mapping in compliance with the norms NFX-140 and IEC 60068.3.11.

