

# DATA SHEET

# TMI-Orion

# NanoVACQ Temperature FullRadio



**Real time wireless temperature measurement inside processes.**

NanoVACQ Temperature FullRadio is a data logger with one to three sensors; some models are watertight under pressure up to 30 bar.

Its ruggedness allows temperature measurement in harsh industrial environments.

There are many models available, answering most industrial needs. The models vary by the number and type of probes, temperature operating range, and battery capacity.

NanoVACQ Temperature FullRadio is equipped with a 2.4 GHz radio transceiver as the unique communication interface. In addition to its data logger functionalities, it is designed for remote set up and radio data transmission, in real time or after the process, through a TMI-Orion radio transceiver connected to a PC. The PC is equipped with the Qlever software platform for logger setup and process data collection, management and display.

## METROLOGY

Operating range	Batteries	Resolution	Uncertainty*
From -55°C to +140°C	Radio HE	<math>\leq \pm 0.008^\circ\text{C}</math>	+/- 0.1°C from -80°C to +140°C (+/- 0.05°C upon request) Except for NanoVACQ with Tdi probe: +/- 0.2°C after adjustment**
From -90°C to +85°C	014ZFL		
From -70°C to +140°C	Wide HE		
From -90°C to +85°C	Cold HE		

(\* ) The specified uncertainties correspond to two standard deviations. The uncertainties are calculated taking into account the various significant error sources, including the calibration probes, the equipment, the environmental conditions, the influence of the logger, repeatability, etc. . .

(\*\* ) +/- 0.5 before adjustment.

Each logger can be calibrated and adjusted at the temperature points corresponding to the user's needs.



## TECHNICAL SPECIFICATIONS

Model	Number of channels	Probe type*	Probe dimensions	Water tightness**
<b>NanoVACQ 1Tc FullRadio</b>	1	Rigid (316L SS)	D. 3 mm, L. up to 200 mm or D. hybrid 3 > 1.9 mm, L. 30 mm	●
<b>NanoVACQ 2Tc FullRadio</b>	2	Rigid (316L SS)	D. 3 mm, L. up to 200 mm or D. hybrid 3 > 1.9 mm, L. 30 mm	●
<b>NanoVACQ 1Td FullRadio</b>	1	Semi-rigid (316L SS)	D. 2 mm, L. from 60 mm to 1150 mm with tip D.2 or 2.5 mm	●
	1	1 rigid tip at the end of 1 flexible probe (Teflon®PFA)	D.3 or 3.4 mm, L. from 30 to 100 mm D. from 2.2 to 5 mm, L. from 100 to 1000 mm	● <sup>(1)</sup>
	1	1 rigid tip at the end of 1 flexible probe (Viton®)	D.3 mm, L. from 20 to 100 mm D.5 mm, L. from 100 to 1000 mm	
<b>NanoVACQ 2Td FullRadio</b>	2	Semi-rigid (316L SS)	D. 2 mm, L. from 60 mm to 1150 mm with tip D.2 or 2.5 mm	●
	2	2 rigid tips at the end of 2 flexible probes (Teflon®PFA)	D.3 or 3.4 mm, L. from 30 to 100 mm D. from 2.2 to 5 mm, L. from 100 to 1000 mm	● <sup>(1)</sup>
	2	2 rigid tips at the end of 2 flexible probes (Viton®)	D.3 mm, L. from 20 to 100 mm D.5 mm, L. from 100 to 1000 mm	
<b>NanoVACQ 3Td FullRadio</b>	3	Semi-rigid (316L SS)	D. 2 mm, L. from 60 mm to 1150 mm with tip D.2 or 2.5 mm	●
	3	3 rigid tips at the end of 3 flexible probes (Viton®)	D.3 mm, L. from 20 to 100 mm D.5 mm, L. from 100 to 1000 mm	
<b>NanoVACQ 1Tdi FullRadio</b>	1	1 connector (Fischer Connectors®)	Interchangeable probes specifications according to customer request	
<b>NanoVACQ 2Tdi FullRadio</b>	2	2 connectors (Fischer Connectors®)		
<b>NanoVACQ 1Tc-1Td FullRadio</b>	2	1 rigid (316L SS)  1 semi-rigid (316L SS)	D. 3 mm, L. 30 mm or D. hybrid 3>1,9 mm, L.30 mm D. 2 mm, L. from 100 mm to 1150 mm with tip D.2 or 2.5 mm	●
	2	1 rigid (316L SS)  1 rigid tip at the end of 1 flexible probe (Viton®)	D. 3 mm, L. 30 mm or D. hybrid 3>1,9 mm, L.30 mm D. 3 mm, L.20 to 100 mm D.5 mm, L. 100 mm to 1000 mm	
	2	1 rigid (316L SS)  1 rigid tip at the end of 1 flexible probe (Teflon®PFA)	D. 3 mm, L. 30 mm or D. hybrid 3>1,9 mm, L.30 mm D. 3 or 3.4 mm, L.30 to 100 mm D. from 2.2 to 5 mm, L. 100 mm to 1000 mm	● <sup>(1)</sup>
<b>NanoVACQ 1Tc-2Td FullRadio</b>	3	1 rigid (316L SS)  2 semi rigid (316L SS)	D. 3 mm, L. up to 200 mm or D. hybrid 3 > 1.9 mm, L. 30 mm D. 2 mm, L. from 100 mm to 1150 mm with tip D.2 or 2.5 mm	●
	3	1 rigid (316L SS)  2 rigid tips at the end of 2 flexible probes (Viton®)	D.3 mm, L. up to 200 mm or D. hybrid 3 > 1.9 mm, L. 30 mm D.3 mm, L. 20-100 mm D.5 mm, L. from 100 to 1000 mm	
	3	1 rigid (316L SS)  2 rigid tips at the end of 2 flexible probes (Teflon®PFA)	D.3 mm, L. up to 200 mm or D. hybrid 3 > 1.9 mm, L. 30 mm D.3 or 3.4 mm, L. 30 to 100 mm D. from 2.2 to 5 mm, L. from 100 to 1000 mm	● <sup>(1)</sup>
<b>NanoVACQ 1Tc-2Tdi FullRadio</b>	3	1 rigid (316L SS)  2 connectors (Fischer Connectors®)	D. 3 mm, L. up to 200 mm or D. hybrid 3 > 1.9 mm, L. 30 mm According to customer request	

(\* ) Probes to be chosen depending on the application. (\*\*) The non-watertight models must not be immersed or used in an autoclave.

<sup>(1)</sup> The Teflon®PFA flexible probes of the Td models are watertight. Do not immerse into oil or ethanol. This would damage the probes and make them non watertight.

## TECHNICAL SPECIFICATIONS

<b>Material</b>	Logger body: 316L Stainless steel	
<b>Dimensions of the body</b>	With Radio HE battery pack	D.31 mm x H.52.2 mm
	With 014ZFL battery pack	D.31 mm x H.129 mm
	With Wide HE battery pack	D.31 mm x H. 76 mm
	With Cold HE battery pack	D.31 mm x H. 76 mm
<b>Temperature sensor</b>	Pt 1000 or Pt 100	
<b>Memory capacity</b>	48 000 acquisitions divided by number of measurement channels	
<b>Memory capacity with BigMemory</b>	294 500 acquisitions divided by number of measurement channels	
<b>Acquisition rate</b>	Programmable: minimum 1 second, maximum 59 minutes and 59 seconds	
<b>Program duration</b>	Programmable: days, hours, minutes	
<b>Recording</b>	Programmable start: by date, hour, minute or on temperature threshold	
<b>Power</b>	User replaceable battery pack	
<b>Connectivity</b>	2.4 GHz bidirectional radio transceiver and embedded 2.4 GHz radio transceiver module	
<b>Connectable antenna models for</b>	Standard	length 49 mm, medium range - line of sight: 25 meters
	Short	length 25 mm, short range - line of sight: 15 meters
<b>NanoVACQ Temperature FullRadio (*)</b>	Long	length 79 mm, long range - line of sight: 30 meters
	Remote	see catalog for accessories and options

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

## FUNCTIONS

- Radio set up, start and reading of data
- 2.4 GHz bidirectional radio communication
- Radio transceiver set up: transmission duration and rate
- Start set up: immediate or delayed
- Memory set up: stop at maximum capacity/loop writing
- Real time or after the fact radio data transmission
- Time stamped measurement data
- Battery level alert with Qlever software



**NanoVACQ 1Tc FullRadio, short antenna**



**NanoVACQ 1Tc FullRadio, standard antenna**



**NanoVACQ 1Td FullRadio with Teflon® PFA probe**



**NanoVACQ 2Td FullRadio with semi-rigid probes**



**NanoVACQ 1Tdi with connector Fischer Connectors® and connectable Teflon® PFA probe**

### Examples of NanoVACQ Temperature FullRadio models



**NanoVACQ 1Tc FullRadio for freezing processes and TMI-Orion radio transceiver**



## RADIO-FREQUENCY COMMUNICATION

- 2.4 GHz ISM band (frequency range 2.405 GHz to 2.475 GHz) / Can be used without license / Universal band for industrial, scientific and medical devices with low radio transmission power / Maximum radiated power +5 dBm (3,2 mW).
- Radio transmission range depends on the environment.
- TMI-Orion 2.4 GHz bidirectional radio protocol, based on IEEE 802.15.4 standard / 14 RF channels for the user / Able to manage several pieces of equipment connected in star configuration in the same space.

## AUTONOMY

The NanoVACQ Temperature FullRadio is powered by a battery pack; its autonomy depends on the environment and the operational conditions of the application (extreme temperatures, radio range, electromagnetic disturbances, data acquisition and transmission rate).

As a result of the variety of environments and operational conditions, TMI-Orion does not guaranty the battery lifetime and recommends that the user determine the battery lifetime according to his own process conditions and experience.

## SOFTWARE AND RELATED PRODUCTS

**NanoVACQ Temperature FullRadio is used with Qlever software platform and a TMI-Orion radio transceiver.**

**Qlever software platform:** data acquisition, management and visualization of data from TMI-Orion data loggers. Qlever is installed on a PC and operates under Windows® Vista/7/8/10/11. Data transmission and visualization are done after the industrial process or in real time.

**TMI-Orion radio transceiver:** this transmitting device connects to the PC in order to ensure radio link with the NanoVACQ Temperature FullRadio. Several antennas are available to optimize radio communications in the operational environment.

## DELIVERABLES

**The NanoVACQ Temperature FullRadio solution usually includes the following items:**

- The NanoVACQ Temperature FullRadio data logger with a battery pack
- A TMI-Orion radio transceiver (to be ordered separately)
- The NanoVACQ Temperature FullRadio calibration certificate
- The NanoVACQ Temperature FullRadio configuration and calibration file
- Qlever software (to be ordered separately)
- A case for storage and transport (optional - to be ordered separately)
- An opening wrench for NanoVACQ Temperature FullRadio (optional - to be ordered separately)

## SERVICES

**Maintenance:** TMI-Orion recommends annual preventative maintenance and calibration service for the replacement of o-rings, functional checking, calibration and adjustment.

**Accessories:** The battery packs, engineered by TMI-Orion, are replaceable by the user and are referenced in our products list.

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