nanodac™

Recorder/Controller Steriliser Application Block

The ultimate in graphical recording combined with PID control and setpoint programs
We combined our extensive expertise in absolute data security and world class control to bring you the best in recording and control in a space-saving, small box with a superb full colour display and it is called the nanodac™ recorder/controller. Add to this an absolute commitment to technological innovation, constant reinvestment in research and development, and a team of engineering oriented salesmen who understand your process requirements.

The nanodac recorder/controller offers the ultimate in graphical recording combined with PID control and setpoint programs for a box of its size. The compact ¼ DIN panel mount unit offers four high accuracy universal inputs for data recording and PID control. This secure data recording device with accurate control is enhanced by a full colour, ¼ VGA, 320 x 240 pixel display to bring a crystal clear operator interface to even the smallest of machines.

In order to assist with the Decontamination process the Eurotherm R&D resource worked with a number of Steriliser manufacturers to develop a solution for the Independent Monitoring System (IMS). The resulting Sterilisation Application provides cycle based data logging and monitoring. In addition the intuitive display provides instantaneous information on the status of the Sterilisation cycle. The Steriliser Application supports up to four process variables, (Chamber Temperature, Chamber Pressure and Air Detector being the three primary variables) and is suitable for use with Porous Load, Dry Heat, Flash, and LTS Sterilisers or for those sterilisers requiring no more than four process variables.

The recording functionality within the nanodac instrument contains decades of knowledge and understanding of the requirements of capturing and storing electronic data. We understand that different applications have different needs and the nanodac recorder can store your information in either open CSV format or in a secure, check summed format to protect data integrity. Whichever format you choose for your process we have the tools to help you keep this data safe, get it to the place you need, and in the format you require.
**F0 (Lethality)**

F0 is a means of calculating the ‘equivalent time at sterilising temperature’ for temperatures below, at, and above sterilising temperature, using the equation below.

To calculate the equivalent time at sterilising temperature (for temperatures below, at and above sterilising temperature) both in dry (FH) and steam (FO) sterilising environments, we use the following equation:

\[ F_{\text{val}} = F_{\text{val},t-1} + T \times \frac{m_a - \text{Target temp}}{Z} \]

Where:
- \( F_{\text{val},t} \) = F value at time t (minutes)
- \( F_{\text{val},t-1} \) = F value last iteration
- \( T \) = Internal recorder iteration interval (minutes)
- \( m_a \) = Value of temperature measuring channel
- Target temp = 121°C for FO; 170°C for FH
- \( Z \) = Temperature interval representing a factor-of-10 reduction in killing efficiency
  - 10°C for FO; = 20°C for FH

Where:
- **Sterilisation time** Depends on the application, typically 1 minute at \( T_s = 121^\circ C \).
- **Temp** The value of the temperature measuring input.
- **Ts** Desired sterilising temperature.
- \( Z \) Temperature interval representing a factor of ten reduction in killing efficiency, \( Z = 10 \) for steam sterilising (F0); \( Z = 20 \) for dry heat sterilising (FH); \( Z = 10 \) for thermal disinfection (A0).

To ensure that steriliser loads that contain materials with different thermal inertias are thoroughly sterilised, a number of sensors are located within the load. The ‘F’ value should be calculated using the sensor closest to that part of the load which has the highest thermal inertia. For maximum accuracy, the temperature sensor should be calibrated and the input adjust function used to compensate for any inaccuracy found.