

Pasteurizing plant

KS 98 application

Calculation of formula for pasteurization value



Determination of the holding time

Computing, control, sequencing, and visualization in a single unit

KEY WORDS

Pasteurization, pasteurizing plants, degeneration

DESCRIPTION

Pasteurizing plays an important role in many processes of the foodstuffs industry. During pasteurizing, the process-dependent "pasteurizing value" (PV) must be maintained accurately, in order to ensure reliable results.

Previously, the process was controlled by means of a PLC with integrated loop-control software. Computation of "PV" in the PLC required considerable programming expense and placed a high working load on the PLC, because the computation is complex and includes natural logarithms. Moreover, a local operating terminal is necessary.

The multi-function units KS 98 and KS 98plus now enable the manufacturer to install a single device that provides loop control, sequencing, visualization, and operation of all the process values concerned.

IMPLEMENTATION

The KS 98 computes "PV" quickly and accurately, and handles the complex control tasks. Due to its graphic display, no local operating and visualization terminal is required.

Similarly, the PLC functions and the communication with supervisory systems via a field bus (PROFIBUS-DP, INTERBUS) are standard features of the KS 98 and the KS 98plus.

For the manufacturer, this solution has two main advantages: Firstly, the hardware costs are greatly reduced because a single unit replaces several PLC versions with operating terminals. Secondly, the consistent automation concept enables the pasteurizing equipment to be installed even in small dairies. Larger plants are fitted with the KS 98plus and its flexible I/O extension facilities.

Furthermore, the engineering is quicker and simpler, because both controller versions are matched to the required task by means of the same convenient, graphical engineering tool.

CONFIGURATION

The following values are used in the formula:

tv	Holding time
T	Product temperature 60...100 °C
v	Flow speed 1...2,5 m/s
V	System contents 10...1000l

The term 1,393 (T-60) cannot be used directly. A small mathematical conversion is necessary, by raising to the power "e". The result produces the same values as the original formula, and can be computed using the functions of the KS 98. There are no deviations. An operating screen (Fig. 1) has been configured for test purposes, in which the necessary constants are entered and displayed, together with the result W (pasteurizing value).



Fig. 1: Entry page for test data

Two standard inputs provided by the KS 98 are used for temperature and flow speed. Both inputs are calibrated for 0...20 mA, and scaled 0...100.

Application-specific measurement ranges are configured during plant commissioning, together with the required engineering units, so that meaningful results are obtained.

UNLIMITED VERSATILITY

The flexible configurability of the KS 98 enables the above application to be extended with pre-configured library functions such as password protection, timer, programmer, etc., or even „homemade“ partial Engineerings.

With additional operating screens, for example 6-line text display, trend display, and bargraphs, the projecting engineer is able to increase the plant's operational functions. Moreover, by means of a user-specific menu structure, the transparency of the process data can be adapted precisely to individual requirements.



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