

The world's most copied Pentronic sensor

The majority of Pentronic's production consists of temperature sensors that have been specially developed to solve the measurement problems of individual customers.

Over time, some sensors become standard products which are also made by other manufacturers. The process is the same as what happens with new drugs: when the patent expires, other companies who lack their own R&D resources produce their own versions of the product.

One of the most widely disseminated product designs from Pentronic was made for hygienic applications and was developed at the beginning of the 1970s. It all started with a measurement problem for two customers who produced and packaged liquid foods.

A packaging machine and a processing line for liquid foods both consist of many stainless steel tubes, inside which the temperature must be measured. For hygienic reasons the sensors were welded in place. At that time type T thermocouples were used.

The high temperatures produced by the welding process destroyed a component in the sensors. Pentronic was therefore asked to manufacture the entire steel tube complete with the sensor.

"We felt that the task was unnecessary and that it should be possible to solve the problem by using a replaceable sensor," explains Leif Jansson, manager for mechanical R&D at Pentronic.

The customers were hesitant. A replaceable sensor can cause gaps where bacteria can collect. But Pentronic believed the problem could be solved and began development work.

"The two most important factors were to have a small contact surface between the sensor and the weld-in boss and that everything was leakproof," Leif says.

CLOSE TOLERANCE REQUIREMENTS

The solution was to use a conical seal for the sensor and secure it in place with a gland nut. As long as the machining is done with sufficiently close tolerances the result is a hygienic and sealed installation.

"We tried to subcontract the work but it was hard to find anyone who could meet the tolerance requirements," Leif explains. "That was one of the factors that led Pentronic to do the machining itself."

Over time the sensor design has been refined. Type T thermocouples turned out to be unsuitable in moist environments because moisture makes copper oxidize and turn green. Today Pt100 detectors are used but thermocouples still occur in some cases.

"Pt100s are preferable because they allow you to increase the measurement accuracy," says Pentronic CEO Lars



Leif Jansson, manager for mechanical R&D at Pentronic.



This is Pentronic's original hygienic sensor for use in e.g. dairies. The sensor mounting is approved by the EHEDG and the Russian hygiene rules, Sanitary-Epidemiological Conclusion.



Persson, who was involved in the development work.

COPIES AREN'T THE SAME

Other refinements are turned down tips for shorter response times. The tolerances in the machining process have also been improved. At first a reamer was supplied with each sensor to do fine adjustments after the weld-in boss had been welded fast.

Like many successful products, this type of sensor has been widely copied. However, just because the copies resemble Pentronic's original does not at all mean that they have the same characteristics.

"We've studied the competing sensors that customers have given us," Leif says. "Their construction is not the same as ours – and the differences are not improvements."

Those differences are the reason why Pentronic currently exports its liquid food temperature sensor around the world. 