THE ADVANTAGE OF USING A MULTITUBE:

One hole for nine measuring points

With its multiple thermocouple points, the multitube is one of Pentronic's more complex sensors. It is used when customers want a single sensor to measure temperatures at a number of different physical locations within chemical processes.

"The multitube sensor is not complicated in itself – the challenge is to ensure that it is rugged enough to continue functioning well in a difficult measuring environment," comments Per Wilén, sales engineer at Pentronic.

The sensor was developed for a chemical reactor. In the specific case in question, so many temperature sensors were needed that using normal individual ones would have created a huge tangle of sensors and cables. All in all, the process required 90 measuring points.

The solution was a six-metre-long tube. It is six millimetres in diameter and contains nine sheathed thermocouples. The tube itself is made of a material which is thin enough that it can be bent, thereby making the installation easier.

The challenge lies in ensuring that the tube is completely sealed so that the chemicals cannot adversely affect the thin thermocouples. In addition, the thin sheathed thermocouples are in themselves sensitive, and so special routines must be used in their manufacture and final inspection.

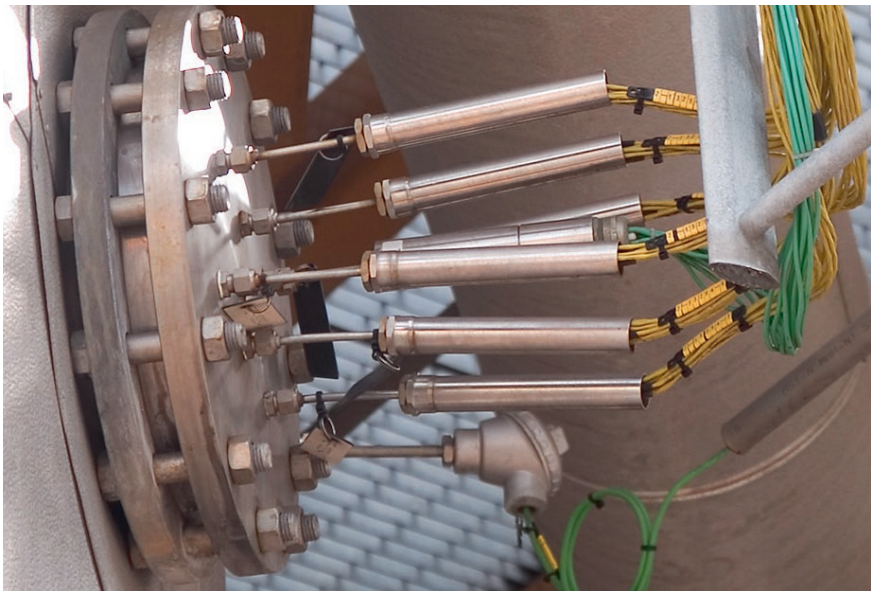
"There cannot be any damage to the sheaths or wires," Per explains. "That would put at risk the whole concept of combining a number of thermocouples within one unit."

To protect them during shipment, the multitubes are shipped fully extended in long, narrow, sturdy wooden boxes.

"The multitubes are an interesting solution for measuring at multiple points in processes, tanks, and so on," Per says.

Inside Pentronic's original multitube, the probe tips are located at 100-125 mm intervals but longer or shorter intervals can be used with equal success. A tube that is 6 mm in diameter can contain a maximum of 10 thermocouples but wider tubes will hold more. However, the bending moment of the tube will decrease as the diameter increases.

The big advantage of the multitube is that the temperature can be measured at multiple positions by using just one insertion point. This means less installation time and fewer holes that can weaken process vessels and other containers.



The multitubes in the photo were designed and manufactured by Pentronic. They allow for multiple measuring points with fewer insertion holes. In this case, six tubes are being used to monitor the process inside a tank at a chemical plant. About 50 measuring points are accessed via a single opening in the tank.