

On the requirements for new-generation process instruments

Jens Baar

The requirements of today's developments are characterized by "miniaturisation", "intuitive operation", "compatibility" or "price-performance optimisation". Buzzwords with positive implications for the customer which have long been discussed within consumer electronics and communications technology. With products for industrial processes, it is therefore often possible to find parallels. Read more about a resistance thermometer as a trendsetter for the process industry.

As against the rapid pace of development in the field of "consumer electronics", the process and machine-building industries are rather sluggish with innovation. At first, this may sound negative, but this is not the case. In the face of the complex requirements, and also with an eye on the existing systems and installations which are still working properly, both industries put greater emphasis on proven technology. This is particularly true for devices that are used in large quantities in production or which do not need to be seen as high-end.

The difficulty in the conceptual design and the development of new products for these industries lies in amalgamating "requirements of the 21st century", mentioned initially, with the sector-specific characteristics: Safety, accuracy, but also backward compatibility — a very important aspect that, since it is self-evident, is rarely mentioned explicitly. In addi-



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tion, the integration of approval-related parameters must be considered. Without the appropriate certificates or market-specific approvals, the door to these specific industry sectors remains closed.

Example of new development: resistance thermometer

The change process that the process and the machine-building industries have put into place in recent years with respect to equipment for plant technology can be understood with the example of the new TR33/34 resistance thermometer from Wika — a compact instrument with an integrated digital transmitter.

Keyword 'standardisation': In the process industry, the standard 4-20 mA signal, with which the resistance thermometer works, is now widely used. This acceptance also leads to a rethink in machine building, where for historical reasons the 0-10V output plays a greater role. The 4-20 mA signal with its various advantages, such as two-wire connection and power supply for the end device over the signal circuit (loop-powered), is becoming more and more accepted here.

Compact and highly functional

As with consumer electronics, the miniaturisation of devices or components must not, under any circumstances, be at the expense of performance or functionality. What is wanted is, in fact, the opposite. To stick with the example of the TR33/34: A miniature thermometer with a 19 mm housing, integrated sensor and a 4-20 mA output would still, on its own, not constitute sufficient basis for being widely used. For this reason, some innovations have been incorporated in the instrument, such as an EMC concept with two separate printed circuit boards. The main board, containing the measurement circuit, the Ex-relevant components and the microprocessor, is separate from an EMC board. The thermometer



01 The resistance thermometers of the series TR33/34 are used as universal thermometers for the measurement of liquid and gaseous media in the range of -50 ... +250 °C

therefore has the best possible protection against electromagnetic interference. Far more important for the scope of use is another characteristic of the PCB design: In spite of the minimum space, the electronic components were able to be arranged in an explosion-protection compliant way. Thus, the TR34 features an ATEX approval.

Intuitive operation

In order to fully exploit the benefits of an integrated digital transmitter, dedicated configuration software is required. With the requirements associated with this, the process industry is also orientating itself to an increasing extent to the consumer electronics model. Programs such as "Wikasoft_TT" should be available to download (at all times in the latest release) and working with them should be made as easy as possible through the appealing design of the user interface and their intuitive operation.



About

Company: Wika Alexander Wiegand SE & Co. KG

Headquarters: Klingenberg, Germany

Turnover: 750 Mio. Euro (Wika Group)

Employees: 7.900 (Wika Group)

Products: pressure, temperature and level measurement technology



02 Individually parameterisable for integrated transmitter with free PC configuration software WikaSoft-TT

Speaking of usability, there are still a wide diversity of interfaces in the process industry. However, through its ease of operation and mobility, USB is increasingly on the rise. Similarly, suppliers are equipping their electronic instrumentation with this communication standard. Thus, the TR33/34 can be

towards the M12 circular connector. The main reasons for this are obvious: tool-free assembly, significant space saving in the design and high flexibility. The M12 connectors are robust and, with a range of different designs and materials, they can be used in almost any application.



“In discussions with process engineers and plant operators, the talk points us clearly in one direction: more functions in a single device.”

Jens Baar; wika

configured easily and quickly with any computer through the PU448 programming unit, its status queried and possible errors discovered.

Technical and economic aspects

The will for price-performance optimisation becomes noticeable in the design of the instruments, not just in their functionality. An indicator of this is the shift in electrical connection preference: away from the angular connector per DIN EN 175301-803,

A combination of small size and M12 connector significantly reduces the space required for the measuring point. The measuring instrument can be incorporated perfectly into any plant construction and with its small dimensions it is also very vibration resistant. Therefore, Wika has developed something new for the market; a universal adapter for its miniature thermometers, so they can be fitted or retrofitted to any kind of installation.

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