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INTELLECTUAL SYSTEM FOR MEASUREMENT OF PRESSURE

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The modern equipment and new methods of automatic control allow to lower expenses for repair and equipment service, to receive economic benefit of rational use of power resources owing to optimum control of technological process.

Pressure is one of the major physical parameters of chemical both petrochemical processes, and its measurement is necessary both in the settlement purposes, and in the technological purposes, for example for the control and forecasting of safe and effective hydraulic modes of the pressure head pipelines used at the enterprise. External pressure P upon surface S of the liquid or gaseous environment, equal to the relation of the normal making sum of forces F enclosed from the outside, to the area of surface S, is transferred in Wednesday without changes and in regular intervals extensively.

That is generated internal pressure is directed perpendicularly to any internal platform of environment ΔS, irrespective of its form and position in the environment, and the pressure size in the environment is proportional to size of the allocated platform (the law of Pascal).

It is obvious that $P = F/S = \Delta F / \Delta S$, where F — external force, S — a free surface (area) of environment, ΔF — a pressure force on an internal platform ΔS.

The wide circulation was received by digital report HART (Highway Addressable Remote Transducer). The open standard hybrid report of two-forked communication provides transfer of the digital information over a standard analogue signal 4-20 мА.

Usually in analogue ACSTP (Automatization Control System for Technical Process) there is a set of the intellectual field devices working in a mode 4-20мА + HART. In this case remote adjustment and configuring gauges by means of HART-communicator or the HART-modem demands consecutive connection of the communication device to each line 4-20 мА, going from corresponding devices. For the task in view decision it is offered to use the HART-multiplexer. At such approach devices continue to hand over the measuring information in system an exit 4-20 мА, and their configuration can be changed from one digital output of operating system. Communication of the multiplexer with a control system is carried out on interface RS485 or RS232. Thus it is possible to unite in a network about 500 devices.
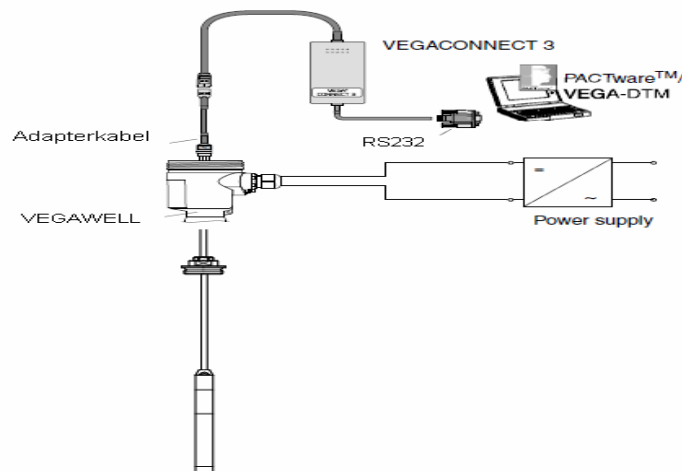

Fig.1. The Function chart of measurement of pressure in capacity.

Measurements it is spent by means of software package PACT ware. PACT ware (Process Automation Configuration Tool) is a program environment for adjustment of any types of

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devices, irrespective of their manufacturer or the used tyre. Experiments it has been spent in laboratory to installation to capacity which function chart it is shown in drawing 1.

Measuring device VEGAWELL 52 multipurpose, is used as the device of measurement of pressure, and for ambient temperature measurement. The temperature and pressure in capacity (fig. 2) is defined. T=19.3, P=0.665 (bar). Accordingly the analogue signal on pressure is 14.03 mA.
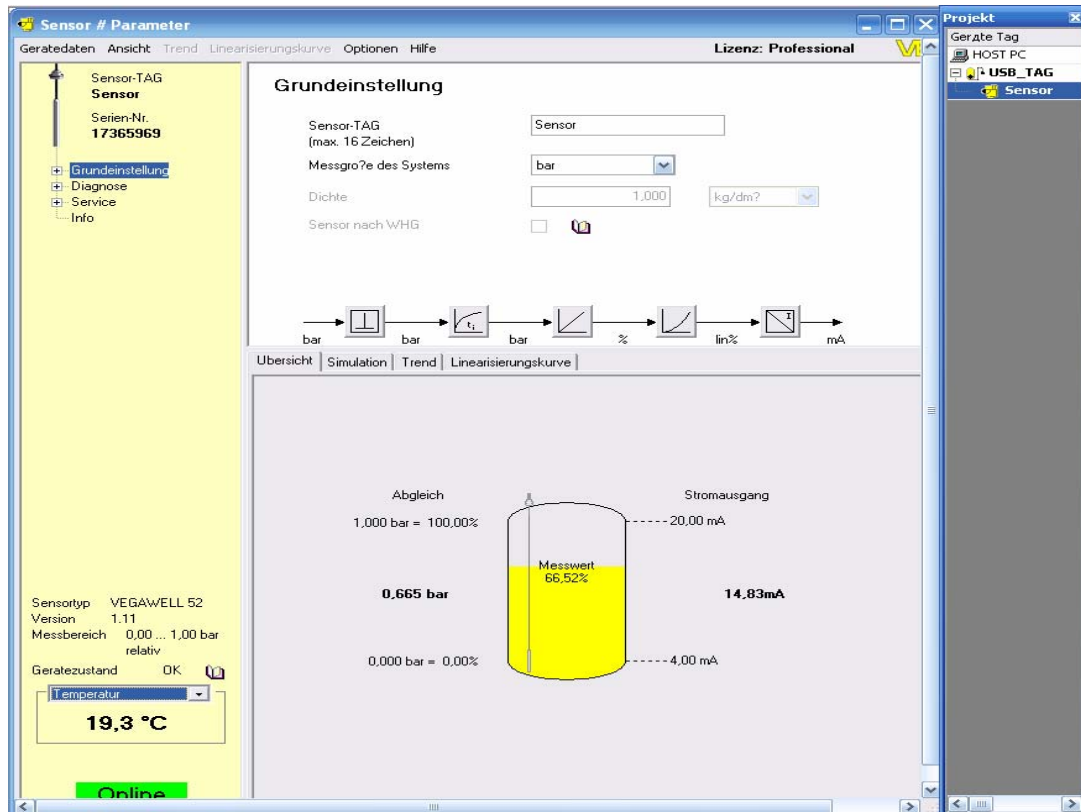

Fig.2. The supervision panel.

In drawing 3 visualization of system of the automatic control of pressure in capacity by means of system PACT ware.
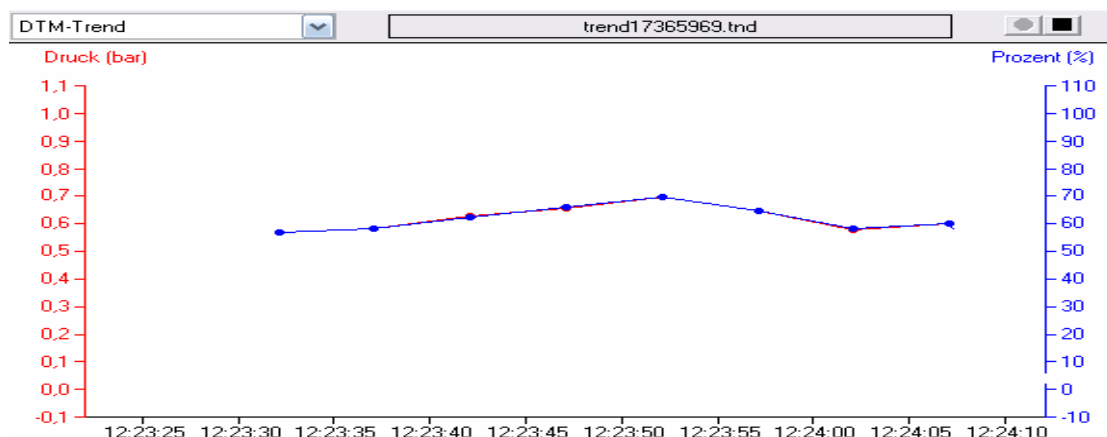

Fig.3. Visualization of system of the automatic control of pressure

References

1. H. Winter. Prozessleittechnik in Chemieanlagen, Verlag. Europa-Lehrmittel, Nourney, 2007.
2. N. Grosse, W. Schorn. Prozessleittechnik, Copyriigt, Fh: Koeln, 2003.