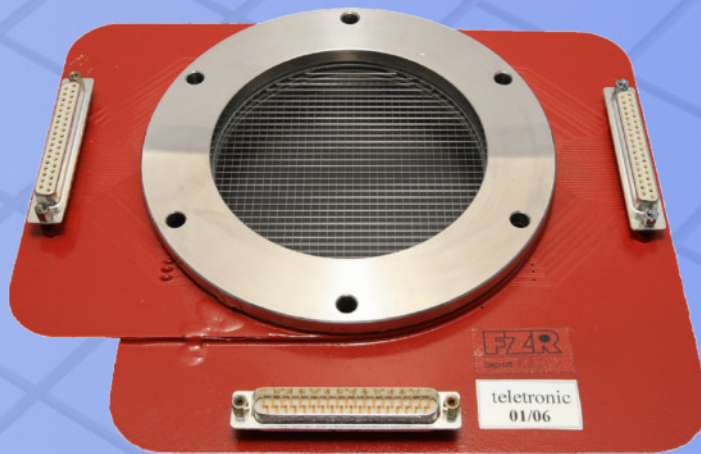


Wire Mesh System WMS 200

For visualization of phase distributions in pipes, columns and reactors on the basis of conductivity measurements.



Technology of measurement of two phase flows

With Wire Mesh System visualized bubble flow.

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Wire Mesh System WMS 200

The wire mesh sensor system allows you to make measurements of the instantaneous electrical conductivity of the fluid in the cross section of the sensor with a high time and spatial resolution.

From those e.g. the following parameters can be derived:

- distribution of void fraction in a liquid face
- distribution of two not mixable liquids
- concentration distributions of salt or other tracers materials, which affect the electrical conductivity.
- determination of the phase portions, averaged over the measurement cross-section.
- evaluation of the dispersion degree of the discontinuous phase.
- velocity measurements (when using several planes of measurement)

Technology of measurement of two phase flows

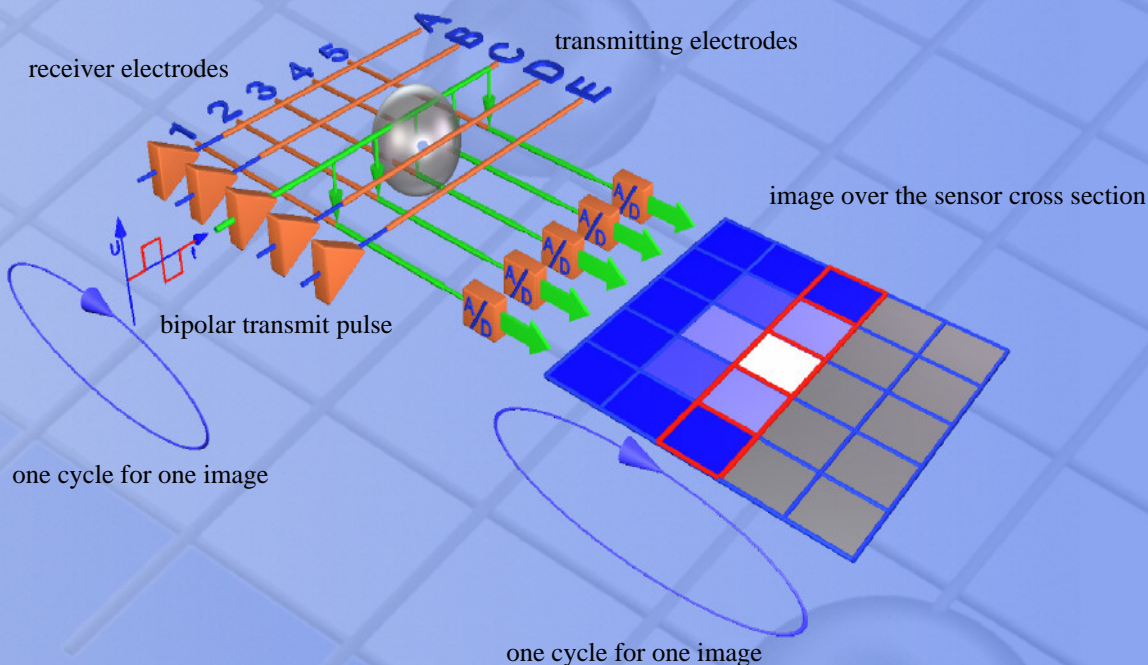
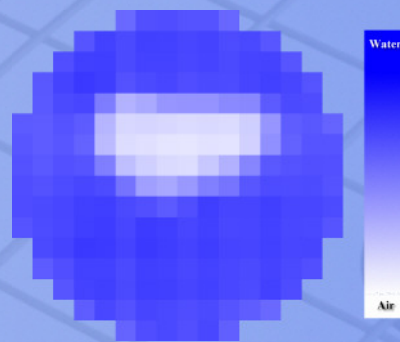
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Wire Mesh System WMS 200

Measurement principle:

The measurement of the instantaneous conductivity distribution is carried out by two grids of a count of electrodes placed into the flow in a short axial distance behind each other. The angle between the electrodes of the two grids is 90 deg. During the measurement cycle, each individual electrode of the first plane (transmitter electrodes) is supplied with short voltage pulses in a successive order by a multiplex circuit. All other transmitter electrodes are held on ground. All currents, arriving at the electrodes of the second plane (receiver electrodes), are measured at the same time. After a cycle, with successively transmission on all electrodes, an image of the conductivity over the sensor cross section is completed.



Technology of measurement of two phase flows

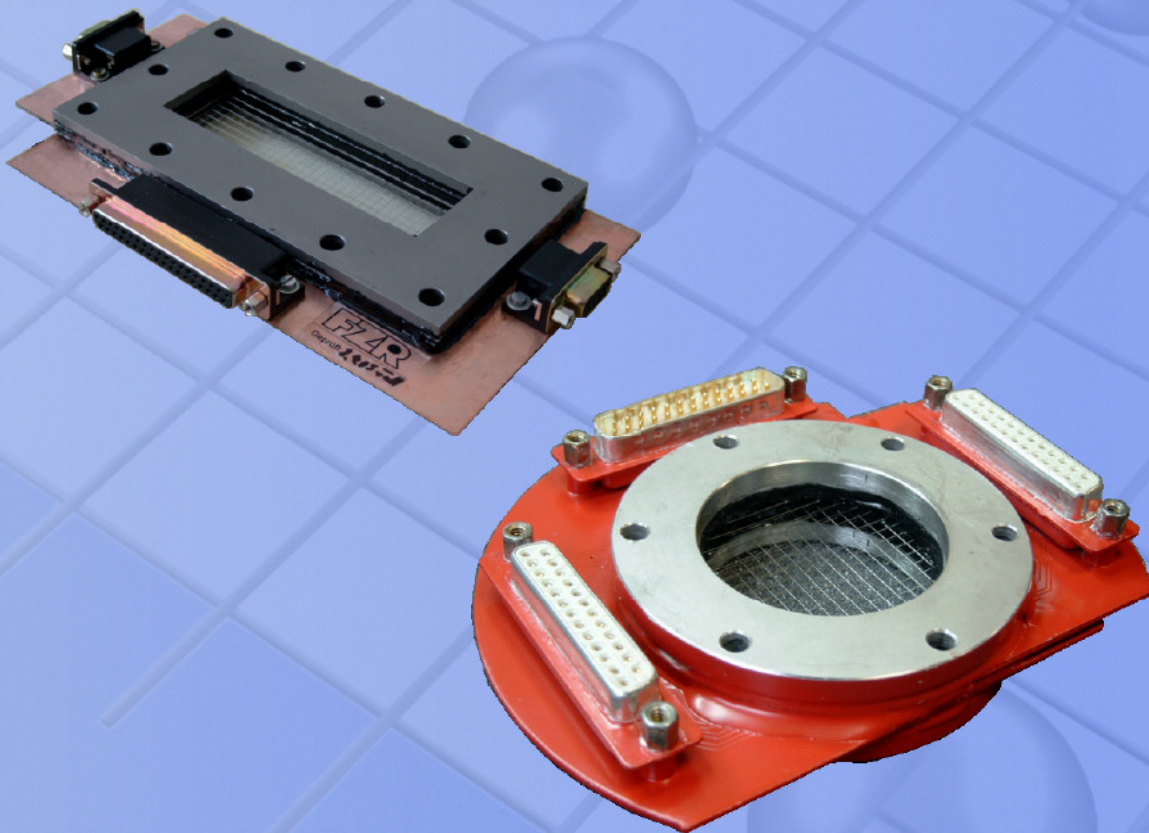
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Wire Mesh System WMS 200

Sensors:

The wire mesh sensors are manufactured according to the respective customized application. Current temperatures up to 286 °C and pressures up to 7 MPa and diameters up to 200 mm are possible. The conductivity of the liquid phase which can be detected should amount 0.5 to 1000 $\mu\text{S}/\text{cm}$. The exact possible conductivity range is depending on the sensor geometry (wire length, wire diameter). In addition rectangular or square cross sections are possible. Sensors with several planes of measurement for the measurement of the spatial conductivity distribution in the space volume between the levels and/or the measurement of the flow rate can be manufactured. As material of the sensor body stainless steel or plastic material can be used.



Technology of measurement of two phase flows

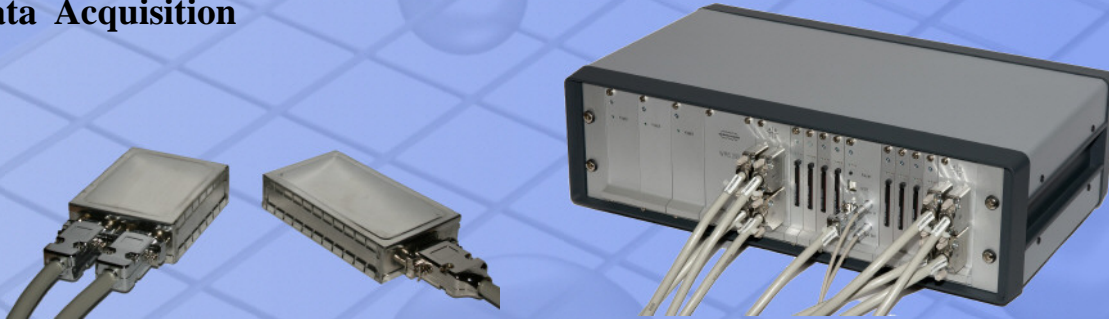


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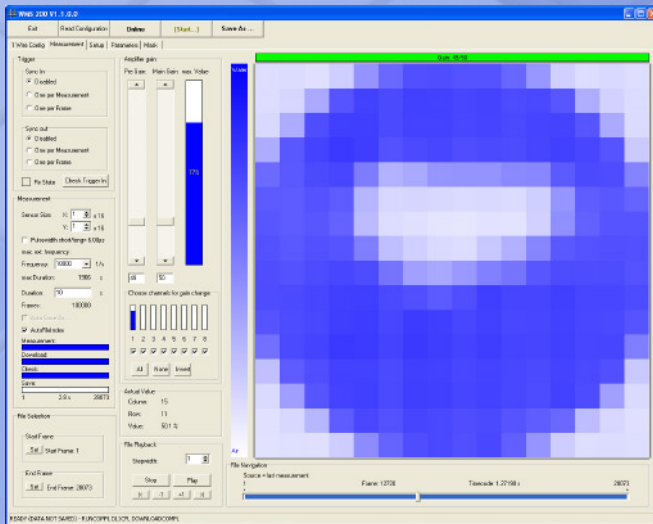
Wire Mesh System WMS 200

Data Acquisition



The data acquisition unit WMS200 consists of a basic unit, transmission amplifiers and receive amplifiers. Transmission and receive amplifiers are placed near to the sensor.

The system is developed modularly and expandable up to 128 transmitting electrodes and 128 receiver electrodes in steps of 16 electrodes. The sampling rate depends on the number of used transmission electrodes. When using 16 transmission electrodes a sampling rate of 10 kHz is possible. In the case of a duplication of the number of transmission electrodes, the possible sampling rate halves accordingly. The maximum recording duration, by using the the highest sampling rate, is 30 minutes. The connection to the PC is made by a high speed USB interface. The wire mesh system is supplied with a data acquisition software for Windows®.



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Wire Mesh System WMS 200

Technology of measurement of two phase flows

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