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Contactless Flow Rate Sensor for Heavy Liquid Metals / Berührungsloser Durchflussmesser für Flüssigmetallströmungen

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Commercial electromagnetic flow meters are typically based on flow-induced electrical voltage measurements by electrodes in direct contact with the molten mass in a steady magnetic field. In view of the typical problems coming along with applications at liquid metal flows such as high temperatures, interfacial effects and corrosion, the main disadvantage of this type of flow meter is the electrical contact to the liquid metal, which is necessary to measure the electric potential difference. Therefore, contactless operating measurement techniques are very attractive for liquid metal applications.
The SAAS Corporation together with the Institute of Fluid Dynamics of the Helmholtz-Center Dresden-Rossendorf e.V. developed a contactless flow meter which uses the measuring principle of transmitting an alternating current voltage over a transformer with a large head gap. The measuring signal is generated by the phase shift of two sinusoidal voltages. The geometry of the applied magnetic field in proportion to the selected pipe cross section has a significant impact on the sensitivity of the measuring device.

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