August 18th, 2016

Monitoring the oil concentration in cooling processes

With LiquiSonic® to the optimum oil circulation ratio

For the lubrication of compressors in air-conditioning systems, refrigerant oils circulate in the refrigeration cycle, however, they reduce the cooling effectiveness. Therefore, continuous monitoring of the oil content is especially important in the development of air-conditioning systems in order to determine the optimum oil circulation ratio that depends on the used refrigerant, compressor and process conditions. The concentration measurement of oil in the refrigerant places high demands on the analysis. On the one hand, there are high pressures, which may be up to 150 bar in case of CO_2. On the other hand, the refrigerant is a gas at ambient pressure, which makes manual sampling and offline analysis almost impossible.

With the LiquiSonic® OCR analyzer by SensoTech, specifically designed for refrigerant applications, the oil circulation ratio in the refrigerant can be monitored online and directly in the process using sonic velocity measurement. Due to the chemical and physical properties of refrigerants, sonic velocity measurement is ideal for determining the concentration. The LiquiSonic® sensor is installed in the pipeline and combined with a pressure transducer. Additionally, two Pt1000 temperature probes are integrated in the sensor, so that from the values sonic velocity, temperature and pressure the temperature- and pressure-compensated oil concentration can be calculated in real time. The measurement accuracy is ± 0.1% m and the sensors are completely maintenance-free due to the robust design.

At temperatures between -30 °C (-20 °F) and 120 °C (250 °F), the sensors can be used in oil/refrigerant mixtures such as polyester oils (POE), polyalkylene (PAG), polyalphaolefins (PAO), hydrofluorocarbons (HFCs) R134a, 1234yf, carbon dioxide R744 or ammonia R717 in various industries like automotive or building air-conditioning. The LiquiSonic® controller displays and stores the real-time information. Via 4-20 mA signal, digital outputs, serial interfaces, fieldbus or Ethernet, the controller can be integrated into the network and control system.

Chillventa, hall 5, stand 119

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SensoTech
In liquids, we set the measure.

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Summary (product write-up)

For the lubrication of compressors in air-conditioning systems, refrigerant oils circulate in the refrigeration cycle, however, they reduce the cooling effectiveness. Therefore, continuous monitoring of the oil content is especially important in the development of air-conditioning systems in order to determine the optimum oil circulation ratio. With the LiquiSonic® OCR analyzer by SensoTech, specifically designed for refrigerant applications, the oil circulation ratio in the refrigerant can be monitored online and directly in the process using sonic velocity measurement. The LiquiSonic® sensor is installed in the pipeline and combined with a pressure transducer. Additionally, two Pt1000 temperature probes are integrated in the sensor, so that the temperature- and pressure-compensated oil concentration can be calculated in real time. The LiquiSonic® controller displays and stores the measurement results. Via 4-20 mA signal, digital outputs, serial interfaces, fieldbus or Ethernet, the controller can be integrated into the network and control system.

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SensoTech:

For more than 25 years SensoTech has been focused on the development, manufacturing and sales of inline analysis systems for process liquids. With worldwide installed, highly precise and innovative measuring systems for monitoring of concentrations, compositions and reactions directly in the process, SensoTech has significantly contributed to the enhancement of the state of the art. In addition to the measurement of concentration and density, the phase interface detection as well as the monitoring of chemical reactions like polymerization and crystallization are typical applications. SensoTech inline analyzers set standards in the technological and qualitative valence, user friendliness and reproducibility of process values. Special calculation methods and sophisticated sensor technologies enable reliable and precise measuring results even under difficult process conditions. The knowledge and experience of highly motivated and committed SensoTech staff are the result of various applications with well-known customers from the chemical and pharmaceutical industry, food technology, semiconductor technology, automotive and metal industry as well as many other industries. In addition, this experience also opens up unimagined solution possibilities for new measuring challenges.

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