Qualifications

Qualification and test reports available according to IEEE 323, IEEE 344 and RCC-E, others on request.

KROHNE has capabilities for:

- Definition of qualification programmes
- Qualification and test reports
- Qualification management
- Surveillance of laboratories and tests

Certifications

KROHNE is certified in the nuclear field:

- For design and manufacturing in accordance with nuclear standards (e.g. ASME Section III, KTA)
- By local nuclear authorities for design and manufacturing (e.g. by Russia, Romania)
- By local nuclear authorities for importing safety-related products (e.g. for China)
- By operators for supplying safety-related products (e.g. France, China, South Africa)
- By contractors for supplying safety-related products (e.g. France, Canada)

KROHNE Nuclear – Your partner for the right measurement solution

With more than 40 years experience in the nuclear industry, KROHNE offers a complete instrumentation portfolio designed for safety-related and non-safety-related applications of flow, level, temperature and pressure measurement.

KROHNE Nuclear is a dedicated expert division for:

- Project management
- Design and calculations
- Testing and examination
- Product qualification
- Fabrication
- Documentation

with the highest consideration of safety.

Mass flow measurement of main feed water

POWERSONIC series – high-performance ultrasonic flowmeters

- Ultrasonic transit time 7 or 11 paths, DN200...1,000, with flow processor and flow computer
- High accuracy up to ± 0.3 % of measured value (mass flow)
- Representative average temperature of the fluid determined using the speed of sound on each path

Level measurement in spent fuel pool

POWERFLEX 2200 – two-wire loop powered HART® TDR (time-domain reflectometry) level transmitter

- Agrees with nuclear standards, conforms with IEC 61513 qualification reports acc. to IEEE 323, 344 and RCC-E
- High resistance to radiation (probe and cable), remote converter up to 400 m/1,312 ft away from probe, seismic qualification up to 300 m/s² / 984 ft/s²

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Safety culture

KROHNE Nuclear division offers appropriate solutions for nuclear process applications around the world with the highest consideration for safety.

The definition of nuclear safety at KROHNE:

- Assuming responsibilities
- Adopting a self-critical attitude
- Adopting a rigorous and mindful approach
- Communicating clearly

Training modules are available on the KROHNE eLearning platform in English, German and French.

http://academy-online.krohne.com

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Liquids:

- Acid and alkalic decontamination solutions, active concentrate, ammonia, anti-foaming agent, borated water, boric acid, condensate, condensed water, demineralised deaerated water, deuterium oxide, diesel, feed water, HNO₃, Na₂CO₃, NaOH, MoO₃, H₂O₂, Ni, OH, H₂, OH, KOH, heavy water, hydrogenated waste, iron sulfate, kerosene, lubricants, oil, primary coolant, radioactive waste, reactor coolant, seawater, sewage water, spent resins, waste slurries, wastewater, water

Gases and steam:

- Air, argon, carbon dioxide, compressed air, helium, mixed gas with radioactivity, nitrogen, oxygen, steam water
Electromagnetic flowmeters for conductive liquids (≥ 5 µS/cm)
- DN2.5...1,000
- Measuring accuracy: up to ±0.2 % of measured value + 2.5 mm/s
- Remote version up to 200 m/656 ft
- Analogue versions

Variable area flowmeters for liquids, gases and steam
- DN8...100
- Measuring accuracy: up to 1.6 % (VDI/VDE 3513-2)
- Local indicator or transmitter
- Metal or glass tubes

Ultrasonic flowmeters for liquids, gases and steam
- DN25...4,000
- Measuring accuracy: up to ±0.3 % of measured value + 2 mm/s
- Remote version up to 30 m/98 ft

Mass flow and density meters for fluids, gases and solids
- DN1...250
- Measuring accuracy: up to ±0.1 % of measured value + zero stability
- Continuous flow measurement, even with entrained gas of up to 100% (EGM™)
- Remote version up to 20 m/66 ft

Vortex flowmeters for liquids, gases and steam
- DN15...300
- Measuring accuracy: up to ±0.75 % for liquids (Re > 20,000)
- Remote version up to 50 m/164 ft
- Gross and net heat measurement

Flow controllers for liquids, gases and steam
Disc actuated
- DN15...200
- Measuring accuracy: up to ±15 % of switching point
- Sight glass
- DN15...50
- With or without flap

TDR guided radar level transmitters
- Measuring range: up to 40 m/131 ft
- Measuring accuracy: ±0.1 % of measured distance, ±10 mm/0.4” if measured distance > 10 m/33 ft
- Remote version up to 400 m/1,312 ft

FMCW radar level transmitters
- Measuring range: up to 30 m/98 ft
- Measuring accuracy: ±0.05 % of measured distance, ±5 mm/0.2” if measured distance > 10 m/33 ft
- Remote version up to 30 m/98 ft

Magnetic bypass level transmitters
- Measuring range: 0.3...3.5 m/1...18 ft
- Measuring accuracy: ± 10 mm/0.4”
- Remote version up to 50 m/164 ft

Displacer level transmitters
- Measuring range: 0.3...3.5 m/1...18 ft
- Measuring accuracy: ±1.5 % of full scale
- Local indicator or transmitter

Level switches
- Electromagnetic or vibration devices
- Probe length OPTISWITCH 5X00: 80...6,000 mm/3.1...236.2
- Probe length LS 10: max. 2,000 mm/78.8”
- Hysteresis: approx. 2 mm/0.8”

Temperature assemblies and transmitters
- RTD or thermocouple devices
- Measuring range: -50...+1,600 °C/-58...+2,912 °F
- Head- or rail-mounted transmitters
- Analogue versions

Pressure transmitters
- Measuring range: from vacuum up to 1,000 bar/14,504 psi
- Gauge, absolute and differential pressure measurement
- Primary elements, flow computers and accessories
- 3D calibration, extremely robust against static pressure effects

Excerpt from KROHNE product portfolio – nuclear devices