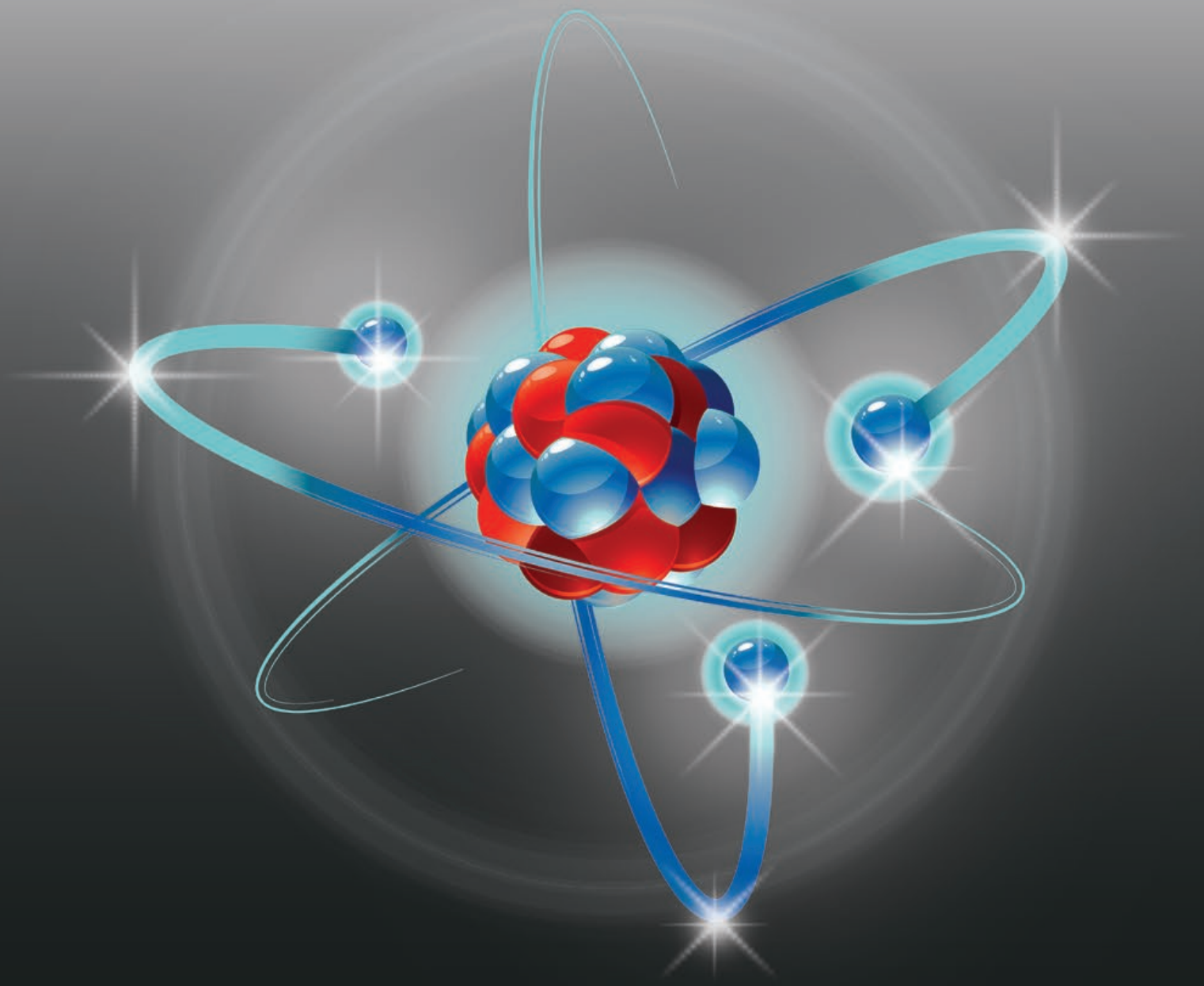
developing solutions

FISCHER
MESS- UND REGELTECHNIK



Measurement technology
for nuclear and conventional applications

Nuclear Power Plant Technology

- Capturing process variables safely
- Safeguarding of international standards

THE COMPANY

For more than 65 years, we have been impressing
with innovative product concepts for industrial requirements

LOCATION

FISCHER Mess- und Regeltechnik GmbH is headquartered in Bad Salzuflen in the heart of East Westphalia. This region belongs to Germany's strongest industrial locations and is conveniently situated between the exhibition locations Hanover and Düsseldorf. The economy is predominantly characterized by medium-sized companies and oriented towards machinery and plant engineering. From the cultural point of view, the Hermann Monument (Hermannsdenkmal) is one of Germany's nationwide known landmarks.

ORGANISATION

FISCHER Mess- und Regeltechnik GmbH is positioned as a leading manufacturer of innovative products and customer-specific application solutions in different industrial sectors. As an owner-operated company we are completely independent.

This independence is also reflected in our high level of vertical manufacturing. Traditionally, about 10% of the annual turnover is invested for research and development.

Short decision paths and flat hierarchies guarantee prompt implementation of requirements in development, production and sales at the central production and administration site.

PRODUCT RANGE

Measuring instruments are essentially used for monitoring the process variables pressure, differential pressure, temperature, flow rate, filling level and humidity. The range of products covers everything from simple pressure switches up to multifunctional measuring converters. The product range is extended by control systems partly elaborated with customers. Monitoring primary and secondary loops for neutral gases and fluids, in special executions for aggressive media is paramount.

MEASUREMENT TECHNOLOGY FOR NUCLEAR TECHNICAL APPLICATIONS

In the course of the cooperative partnership with German plant manufacturers and operators FISCHER Mess- und Regeltechnik GmbH has developed special measuring converters complying with the high and sensitive requirements in this area. Monitoring filter functions, flow rates and filling levels is paramount. Moreover, measuring devices for non-safety-relevant applications are available.

FISCHER Mess- und Regeltechnik GmbH is certified as a supplier for nuclear technical power plants according to KTA (Nuclear Safety Standards Commission) rules and standards 1401 in Germany. For safety-critical applications in the field of annular spaces FISCHER Mess- und Regeltechnik GmbH provides measuring converters without microprocessor technology. This ensures that the operational capability and reliability of the devices is not impaired by radiation or intervention on the processor.

Apart from these requirements (KTA 3505 and KTA 3507) applicable in line with the German KTA (Nuclear Safety Standards Commission) regulations there are also measuring devices available without such approvals.

DEVICE OVERVIEW

Function Classification according to: IEEE	**Measurement devices**						
1E	 ME05 KTA approval			 DE05 KTA approval			
2E and 3E	 ME05			 DE05			
2E and 3E	 DE50			 DE13			
No requirements	 DA55	 DA03/DA01	 DA09	 TW39	 NC57	 NC56	 MA15
Monitoring	 EA14 LCD			 EA15			

E1: Electrical function class 1E (Electrical safety functions - may give an increase in radioactive emissions from the plant in the event of a malfunction after disturbances or incidents)
E2: Electrical function class 2E (Operational functions - cannot cause an increase in radioactive emissions to the environment in the event of a fault, but are important for the trouble free operation of the plant)
E3: Electrical function class 3E (Service functions – have no effect on reactor safety or production availability)

FISCHER MESS- UND REGELTECHNIK

DEVICE PROFILES

Differential Pressure Transmitter DE05

Level measurement
Flow measurement
Monitoring filters, pumps and compressors

- Highly corrosion-resistant materials
- Wear-resistant meter movement
- Rinsable pressure chambers
- Also for aggressive media

Measurement ranges:
0 … 100 mbar, 0 … 25 bar
Measurement accuracy: ≤ 0.75 %
Max. stat. pressure: 250 bar
Operating temperature: –10°C … +70°C
Technology: Analogue
Electrical connection type:
4-wire, galvanically isolated
Operating voltage: 24V DC
Output signal: 0/4 … 20 mA
Characteristic curve: Linear, increasing or decreasing (switchable); root-extracting

Pressure Transmitter ME05

Pressure measurement of liquids and gases up to 250 bar

- Highly corrosion-resistant materials
- Wear-resistant meter movement
- Also for aggressive media

Measurement ranges:
0 … 1 bar to 0 … 250 bar
Measurement accuracy: ≤ 0.75 %
Operating temperature:
–10°C … +70°C
Technology: Analogue
Electrical connection type:
4-wire, galvanically isolated
Output signal: 0/4 … 20 mA
Characteristic curve: Linear, increasing or decreasing (switchable)

Differential Pressure Transmitter DE50

Air-conditioning, ventilation and environmental technology, ventilator regulation
Monitoring of extraction systems etc.

- Capsule-type measuring system for over-, low and differential pressure measurements
- Integrated LC display

Measurement ranges:
0 … 4 mbar, 0 … 600 mbar
Measurement accuracy: ±1 %
Max. stat. operating pressure: 3 bar
Adm. media temperature:
–20°C … +70°C
Operating voltage: 24V AC/DC
Output signal: 0 … 10 V / 0/4 … 20 mA
Display: 3½-digit LC display
2 contacts: 250/30V AC/DC, 2 A

Differential Pressure Transmitter DE13

Filter monitoring
Flow monitoring
Δ p monitoring at valves
Pump control

- Highly corrosion-resistant materials
- Wear-free meter movement
- Low hysteresis
- Rinsable pressure chambers
- Resistant to pollution

Measurement ranges:
0 … 40 mbar, 0 … 25 bar
Linearity: < 1% FS
Max. stat. operating pressure: 100 bar
Adm. media temperature: 70°C
Operating voltage: 24V AC/DC
Electrical connection:
Two-wire/three-wire
0 … 10 V / 0/4 … 20 mA
Display: 3½-digit LC display

Diaphragm Pressure Gauge MA15

Pressure measurement under severe conditions
Corrosion-resistant materials for aggressive media and aggressive environment

- Corrosion-resistant
- High overpressure protection
- Suitable for open-air installation
- Connection flanges conforming to standards are available for viscous media or media containing solids

Measurement ranges:
0 … 25 mbar, 0 … 25 bar
Measurement accuracy:
±1.6 % resp. ±2.5 %
Adm. media temperature: +100°C
Display accuracy: Class 1.6 / class 2.5 for devices with PTFE-protective film
Overpressure protection:
5-fold, max. 40 bar
Measurement display:
Bayonet ring casing Ø 100 or 160 mm
Safety casing Ø 100 or 160 mm

Absolute Pressure Gauge DA55

Absolute manometer for aggressive and non aggressive gaseous and liquid media

Additional equipment on request:
- Liquid filling
- Contact devices
- Execution for oxygen applications

Measurement ranges:
0 … 25 mbar abs, 0 … 6 bar abs
Measurement accuracy:
±1.6 % resp. ±2.5 %
Adm. media temperature:
–10°C … +80°C
Housing:
NG100 or NG160 of 1.4404
Media-contacting parts:
of 1.4404 or Hastelloy C 276

Differential Pressure Gauge DA03 and DA01

Level measurement
Flow measurement
Monitoring pumps, compressors, filters and valves

- Highly corrosion-resistant materials
- Wear-resistant meter movement
- Resistant to pollution
- Rinsable pressure chambers

Additional equipment on request:
- Slow action and magnetic snap action contacts
- NAMUR inductive contacts

Measurement ranges:
0 … 40 mbar, 0 … 25 bar
Measurement accuracy: ±1.6 %
Operational pressures:
40, 100, 250, 400 bar
Adm. media temperature: max. +100°C
Overload capacity: On one side safe against overpressure up to nominal pressure of measurement system, at (+) and (–) safe against underpressure

Differential Pressure Gauge DA09

Level measurement
Flow measurement
Monitoring pumps, compressors, filters, valves

- Highly corrosion-resistant materials
- Variable connection technology
- Application in aggressive media

Optional supplementary equipment:
- Contact devices
- Liquid filling
- Free of grease and oil for oxygen applications

Measuring ranges:
0 … 25 mbar to 0 … 250 mbar/10 bar
Characteristics deviation: ±2.5 %
Nominal pressure of measuring system:
25 bar
Pressure connections: Internal thread G¼, various connection ports and connecting branches with internal thread
Medium-contacted parts: 1.4404, 1.4571
Sealing: Viton®, FEP-coated

TW3x Screw-in / TW4x Weld-in Resistance Thermometer

Process technology
Power plant technology
Boiler construction

for direct measurement of gaseous and liquid media

- High measuring accuracy
- Exchangeable measurement inserts
- Easy to exchange
- Economic measuring principle
- Application possible even for great-distance measurements to point of measuring
- Installation of double Pt 100 possible
- Head transmitter on request for high medium temperatures
- Sheath measurement inserts available

Capacitive Filling Level Probe NC56, NC57

For measuring tank filling levels in plastic and metal tanks for fresh, process and wastewater

- Sturdy device execution, IP67
- Integrated electronics
- Very easy comparison

Operating voltage:
9-32 V DC / 12-32 V DC
Output signal:
0 … 10 V / 0/4 … 20 mA
Housing:
Plastic (NC56), stainless steel (NC57)
Media-contacting:
Stainless steel 1.4404, ECTFE, Shrink hose (polyolefin), Special coating PFA

Level Gauge EA14 with LCD Display and Colour changer

Differential pressure measurements
Filter monitoring
Level measurement
Monitoring of pumps and compressors

The EA14 is applied as a transmitter and display device. The device evaluates an external transmitter signal

- Switchable pressure units
- Signal output with characteristic curve spread and reverse
- Characteristic curve implementation via table with max. 30 measuring points
- Optional PC parameterization adapter

Input signal: 0 … 10 V / 0/4 … 20 mA
Operating voltage: 12 … 32 V AC/DC
Type of connection: Three-wire
Output signal: 0 … 10 V / 0/4 … 20 mA
Connection: 2 M12 panel plug
External transmitter: M12 plug
Switch contacts: 2 potential-free relay contacts, freely adjustable

Measurement Indicating Device with 2.8" Touch LCD EA15

For measuring converters with standard output signals, up to four measuring converters connectable in two or three-wire circuit

- 2.8" (7.2 cm) touch LCD colour display
- 2 … 4 analogue inputs for standard signals (0/4 … 20 mA, 0 … 10 V)
- 2 … 4 analogue outputs capable of parameterization, spreading and inversion of characteristic curve with any kind of offset
- 2 … 4 switchpoints capable of parameterization
- Digital interfaces for I²C, SPI, Modbus
- Mathematical functions
- Data logger function on SD cards
- Setting of all parameters as well as a measuring point protocol are possible

Analogue input signals:
0 … 10 V / 0/4 … 20 mA
Operating voltage: 12 … 32 V AC/DC
Output signal: 0 … 10 V / 0/4 … 20 mA
Interfaces: USB, SD card slot

PROCESS SAFETY

Our devices are produced in line with the requirements of **DIN EN ISO 9001:2008**.

Devices for safety-relevant applications in nuclear-technical plants are subject to the extended requirements according to **KTA* 1401** standards and rules.

The job of KTA is to provide for establishing safety-technical rules and for supporting their application in fields of nuclear technology where due to experience an uniform opinion of manufacturers, creators and operators of nuclear plants, experts and authorities is becoming apparent.

* KTA (Kerntechnischer Ausschuss) = Nuclear Safety Standards Commission

High quality standard thanks to specifically developed testing facilities

In pre-fabrication, the considerable production steps contain processing raw material at modern production centers.

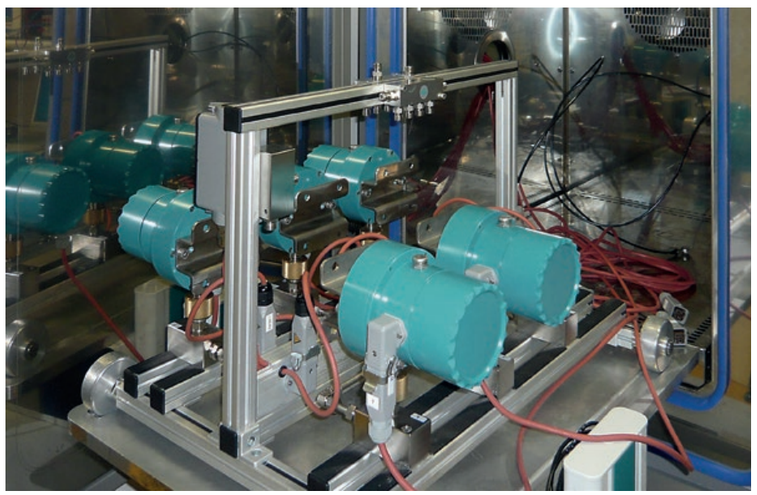
High manufacturing penetration aims at expressing an almost autarkic production, high quality standard and short-term response to customer needs.

Assembly and testing of measuring devices is ensured at especially provided production facilities.

Considerable aspects are separately applicable processes, reproducibility and stamping of especially qualified procurement material as well as testing devices and documentation of test results on testing equipment especially developed for the high requirements.

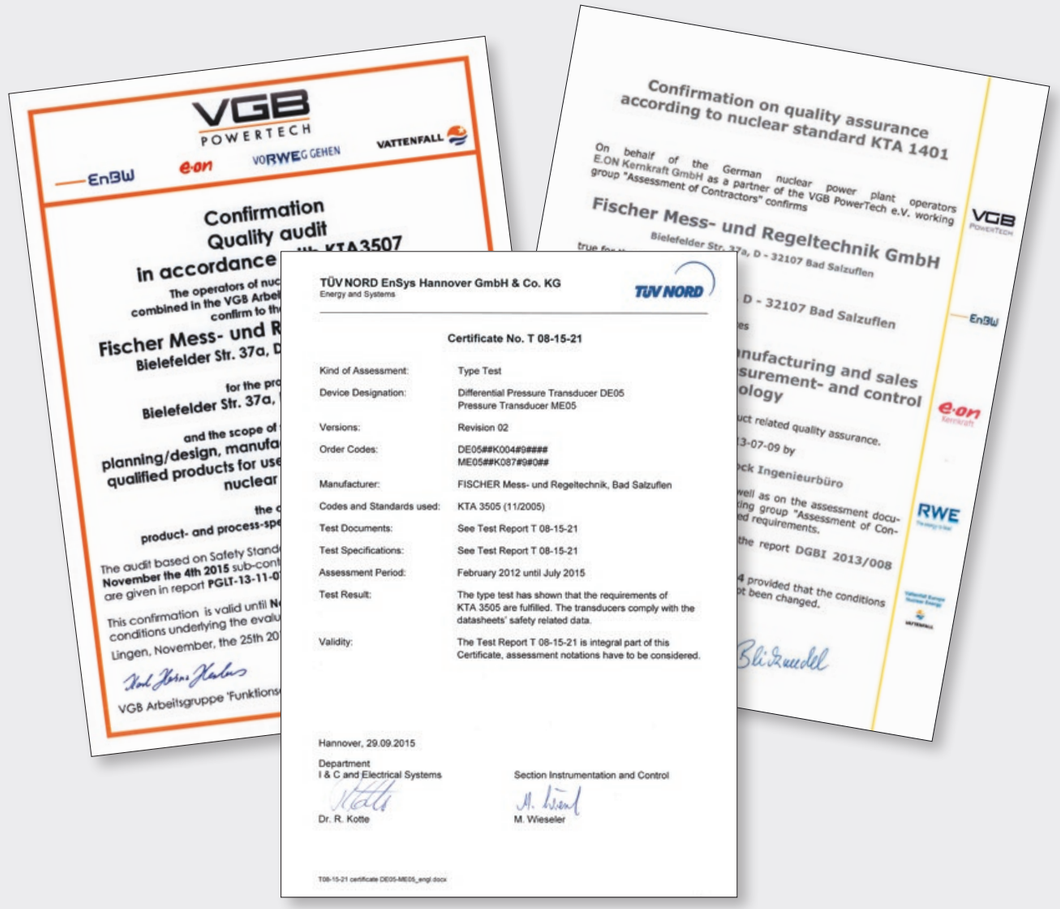
All devices are subject to an entire testing procedure in the course of a testing mode according to certain pressure and temperature processes in special calibration furnaces. In addition, artificial ageing is created for ensuring the interaction of components.

Finally, the devices are calibrated and test documents issued in the testing laboratory at the end of the production chain.



SAFEGUARDING OF INTERNATIONAL STANDARDS

All processes are subject to the statutes of standards **KTA 1401**, **3505** and **3507**. They attest the successful qualification of FISCHER Mess- und Regeltechnik GmbH as an executing company (contractor assessment), type testing of devices for safety-relevant processes, execution of relevant testing as well as evidence of operational reliability of assemblies. Implementation was carried out together with involved bodies of certification companies, operators and authorized bodies.



IAEA International Atomic Energy Agency

Kerntechnischer Ausschuss (KTA)

IEC International Electrotechnical Commission

In this process, international standards are increasingly incorporated in KTA (Nuclear Safety Standards Commission) work, essentially of IAEA (International Atomic Energy Agency) and of IEC (International Electrotechnical Commission).

For further information about our products and contact data please refer to www.fischermesstechnik.de/en/solutions/nuclear-power.

developing solutions

FISCHER
MESS- UND REGELTECHNIK

FISCHER Mess- und Regeltechnik GmbH provides a perfectly tailored range of models for power plants (nuclear and conventional), as well as for many other applications.

The measuring instruments are distinguished by:

- Families of measuring instruments for various measuring tasks
- Comfortable user prompt
- Some instruments with extended proofs (EAC, SIL, GL, KTA, structural testing, etc.)
- Industry-compliant equipment for housings and process connections
- Special instruments with colour-change displays for visualisation of operating conditions (e.g. warnings, alarms)
- Customer-specific system solutions

Numerous references prove the quality of our products.

FISCHER Mess- und Regeltechnik GmbH offers individual concept solutions for your application.

We are an owner-operated family business with efficient decision-making processes.

We offer our customers tailored systems and product solutions, as well as OEM products.

Our devices and solutions are optimally suited for a variety of applications, such as:

- Pressure measurement (under- and over-pressure)
- Differential pressure measurement
- Flow measurement
- Temperature measurement
- Level measurement
- Humidity measurement
- Control systems

Our sales engineers are available for a detailed consultation regarding our products and solutions.

www.fischermesstechnik.de

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