

**DFM**

Danish National Metrology Institute

## ABOUT DFM

DFM is Denmark's National Metrology Institute (NMI).

DFM is a signatory to the CIPM-MRA arrangement that ensures mutual recognition of measurements worldwide

## TRACEABILITY

All measurements are traceable to recognised national and international standard.

## ISO CERTIFICATION

All services are covered by DFM's ISO 9001 certification

## CONTACT DFM

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# Calibration of conductivity sensors and measurement systems



## Advantages

A DANAK accredited, direct calibration of conductivity sensors and measurement systems, traceable to SI, covering the full conductivity range from "Ultra-Pure Water" to medium conductivity levels.

## Applications

Electrolytic conductivity is an easy, quick, cheap, and reliable parameter for process monitoring and regulation and is, therefore, used widely in industry. Conductivity is especially suited for the detection of non-specific ionic contamination in water, dilution of concentrates, and controls of mixtures.

Reliability of measurements is increased significantly by establishment of metrological traceability to SI, and DFM can offer traceability to the highest international level for measurements of conductivity.

DFM offers a fully traceable, direct calibration of conductivity sensors in aqueous solutions at low to medium conductivity levels ( $\kappa < 1000 \mu\text{S/cm}$ ).

Consequently, it becomes simpler to document requirements for FDA, Pharmacopoeias and other authorities.



**CONSULTANCY SERVICES**

Do you need new measurement capabilities, does a method call for a bit of scrutiny, or are you perhaps seeking to acquire new equipment? Take advantage of the consultancy services we provide in addition to our calibration services.

As an independent institute deeply rooted within research and metrology, DFM has gained the reputation of being an agile, solid, and valuable partner. Contact us and find out why.

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# Services and specifications

Measurement by comparison in a flow-loop system against a calibrated reference. For low conductivities ( $\kappa < 1 \mu\text{S/cm}$ ), a gas tight enclosure is necessary (a flow cell).

Flow rate, typical: ..... 0.1 – 1 L/min  
Reference temperature: ..... 25 °C  
Nominal measurement points: ..... 0.05, 0.6, 1.3, 5 or 15  $\mu\text{S/cm}$

Minimum 3 measurement points per calibration. Other values by request.  
True 3/4-electrode cells are only calibrated in connection with measurement systems.

High value conductivity ( $\kappa > 15 \mu\text{S/cm}$ ) is only available together with low conductivity value measurement (calibration package).

## Measurement capability

Determination of cell constant for conductivity sensor:
Cell constant, K, 0.01 – 1 $\text{cm}^{-1}$ : 0.5 %
Conductivity, $\kappa$ , 0.05 – 15 $\mu\text{S/cm}$ : 0.5 %
Conductivity, $\kappa$ , 100, 1000, 10000 $\mu\text{S/cm}$ : 0.3 %

Conductivity measurement systems: *)
Conductivity, $\kappa$ , 0.05 – 15 $\mu\text{S/cm}$ : 0.5 %
Conductivity, $\kappa$ , 100, 1000, and 10000 $\mu\text{S/cm}$ : 0.3 %

Relative uncertainty (95% confidence,  $k = 2$ )

\*) *The measurement uncertainty achieved will depend on the stability, the display resolution and the design of the measurement system. Contact DFM for details.*

## Service

- K03.101 Calibration of conductivity sensor cell constant or conductivity measurement system, per measurement point,  $\geq 3$  points \*\*)

## Related services in electrolytic conductivity

- K03.001 Characterisation of solution at 24°C-26°C \*\*)
- K03.002 Subsequent measurement of same solution at 24°C-26°C \*\*)
- K03.003 Characterisation of solution at 24°C-26°C without certificate
- K03.004 Characterisation of solution 15-35°C \*\*)
- K03.005 Conductivity characterisation of solution 10°C-60°C
- K03.006 Subsequent measurement of same solution at 15°C-35°C \*\*)
- K03.102 Calibration in CRM fluids at 10 mS/m, 100 mS/m and 1 S/m in connection with calibration of conductivity sensor cell, per point, incl. CRM \*\*)

\*\*) *Under DANAK accreditation*

