DURAG GROUP

GRIMM FCE 5705 – Faraday cup electrometer
All-in-one solution, including the controller

The reliable reference for nanoparticle counting

- **Traceability to the International System of Units:** Ensures precise and reproducible measurements for aerosol science and nanotechnology applications.
- **Stable measurements with low noise:** Internal rinsing air flow and optimized design ensure low noise levels and eliminate leakage currents.
- **Trusted instrument:** In use in national metrology institutes as reference.

GRIMM AEROSOL TECHNIK
DURAG GROUP

As a member of DURAG GROUP since 2015, GRIMM AEROSOL TECHNIK combines over 40 years of expertise in optical aerosol particle measurement with the strength of a global leader, offering comprehensive solutions and prompt local support through an extensive international network.

FEATURES AND BENEFITS

- **Modular, ready-to-use system**
  Complete solution for quick setup and precise flow adjustment to operating conditions.
- **User-friendly operation with large touchscreen display**
  Enables intuitive control, clear data visualization, and easy configuration.
- **No consumables required**
  Minimizes operating costs and simplifies maintenance for continuous, long-term use.
- **Traceable calibrations for consistent accuracy**
  Calibration factors can be stored in internal memory to ensure reliable, reproducible measurements.
- **Extremely precise flow control**
  Minimizes measurement uncertainties of the particle number concentration.
- **High-resolution data acquisition**
  Adjustable sampling rates from 1 to 64 Hz provide detailed insights for dynamic processes.
- **Flexible data communication**
  Supports Modbus TCP/RTU, USB, Ethernet, and WiFi for seamless integration into modern data systems.
- **Stand-alone functionality with internal memory**
  32 GB memory and .csv download to USB allow easy data handling without external PC connection.
- **Wide power supply range**
  Operates from 110 to 240 V, 50/60 Hz, for global compatibility in various lab and industrial environments.
- **Compatible with other GRIMM products**
  The FCE 5705 controller fits all FCE generations for easy upgrade and FCE 5705 can be used in an SMPS+E setup when combined with DMA controller 5706.

TECHNICAL DATA

Detector type	Faraday cup electrometer
Measuring variable	Electric current (fA) and particle number concentration (particles/cm³)
Max. current	±4,000 fA
Max. particle concentration	1.5 x 10^6 singly charged particles/cm³
Current measurement resolution	±0.01 fA
Average noise level	0.35 fA
Response time t_{10} ... t_{90}	< 0.25 s
Data sampling rate	1 ... 64 Hz adjustable in 2^n Hz (n = 0 ... 6)
Sample flow rate	0.3 ... 10 l/min adjustable in 0.1 l/min increments
Sample flow accuracy	±1.5% (over full flow range)
External vacuum	≤ 350 hPa at NPT
Compliance and certifications	• ISO 27891:2015 (calibration of condensation particle counters (CPCs)) • ISO 15900:2020 (aerosol particle number size distribution) • EN 16976:2024 and CEN/TS 17434:2020 (standard methods for determining the particle number concentration and size distribution in ambient air) • UN R No. 49 and 83 (PMP, motor vehicle emissions) • UN GTR No. 24 (brake emissions)

Operation and display	5“ touchscreen display Optional: GRIMM FCE 5705 software on PC
Connectivity	USB, Ethernet, WiFi*, USB flash drive, analog input for T/p/RH sensor
Internal memory	32 GB (28.8 GB useable)
Sensors	Internal and external T, p_{abs} and RH of sample air
Power supply	110 ... 240 VAC; 50/60 Hz; max. 20 W
Aerosol conditions	• Temperature: 0 ... 40 °C (32 ... 104 °F) • Humidity: 0 ... 95% RH, non-condensing • Absolute pressure range: 600 ... 1,100 hPa
Aerosol carrier gas	Air and inert gases
Operating conditions	• Temperature: 10 ... +40 °C (50 ... 104 °F) • Humidity: 0 ... 95% RH, non-condensing • Ambient pressure range: 790 ... 1,100 hPa
System components	FCE 5705 FCE 5705 controller
Dimensions (h x w x d)	FCE 5705: 19 x 9 x 9 cm (7.5 x 3.5 x 3.5“) FCE 5705 controller: 20 x 26.5 x 24.5 cm (7.87 x 10.43 x 9.65“)
Weight	FCE 5705: 2.0 kg (4.4 lbs) FCE 5705 controller: 5.2 kg (11,5 lbs)

* With optional external WiFi module

OPTIONAL ACCESSORIES

FCE 5705 BNC Adapter for directly supplying a reference current to the electrometer (calibration)

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