

# Cubis<sup>®</sup> MCM5004

## Manual Mass Comparator

### User Benefits

- Complete mass standard laboratory in a single unit
- Integrated climate sensors for recording all data relevant for determining measurement uncertainty
- Integrated workflow control for efficient and error-free mass comparison
- Fast measurement cycles according to the ABA, ABBA or AB<sub>1</sub>...B<sub>n</sub>A method

### Highlighted Performance Features

- Cubis<sup>®</sup> MSA color touch screen for fast and simple configuration of parameters and workflows
- Sensor-equipped climate module integrated into the draft shield for recording the temperature, humidity and air pressure
- Integrated calibration workflows for ABA, ABBA, AB<sub>1</sub>...B<sub>n</sub>A cycles to ensure efficient, error-free mass comparison
- Fully integrated function for determining the measurement uncertainty in accordance with OIML and ASTM recommendations
- Filters for optimal adaptation of the mass comparator to ambient conditions
- Monolithic weighing technology
- For display and evaluation, complete electronics and power supply separated from the weighing system to prevent heat from affecting the results



- This MCM mass comparator features digital eccentric (off-center) load compensation, instead of a moving centering pan, facilitating easier loading of weights
- Additional applications for density determination, statistics and individual identifiers are integrated as standard programs
- Automatic, motorized leveling
- Built-in SD card slot for storage and transfer of all data and settings
- Easy logging of reference weight data
- Continuous weighing range display: any weight between 0 g and the maximum capacity can be displayed
- USB, RS-232C and Ethernet interface ports to integrate the mass comparator into networks or to enable it to communicate with external software via third-party protocols, standardized communication protocols or web services

# Technical Specifications

## Metrological Specifications

Maximum capacity	5100 g
Application range	0 – 5100 g
Readability	0.1 mg
Repeatability, optimal <sup>1)</sup>	0.3 mg
Repeatability, standard E <sup>2)</sup>	0.5 mg
Repeatability, E 1/10 load <sup>2)</sup>	0.3 mg
Repeatability standard, F <sup>3)</sup>	0.8 mg
Electronic weighing range and tare range	5100 g
Linearity	2 mg
Eccentric load deviation	151 µg   mm
Stabilization time	3 s
Cycle time, ABBA in s	90 s

## Basic Equipment

Interfaces	RS232C   USB   LAN
isoCAL	✓
Draft shield	✓
Application programs	Basic weighing, mass unit conversion, individual identifiers, density determination, statistics
Below-comparator weighing port	✓
Air temperature sensor	✓
Air humidity sensor	✓
Air pressure sensor	✓
PC connecting cable	USB

## Ambient Conditions

Permissible operating temperature range	10 – 30 °C
Recommended operating temperature	22 °C
Temperature fluctuations	0.3°C/h   0.5°C/12h
Max. air current	< 0.2 m/s
Humidity range	40 – 70 %
Humidity fluctuations	5%   4 h
Power supply	100 – 240 V AC/50 – 60 Hz
Power consumption	< 35 VA

## Dimensions

Weighing pan diameter	136 × 136 mm
Sample size (D × H)	130 × 200 mm
Weigh cell (W × D × H)	240 × 276 × 373 mm
Electronic unit (W × D × H)	239 × 320 × 56 mm
Net weight	15 kg
Gross weight	22.5 kg
Number of packages	1
Packaging data 1	83 × 45 × 59 cm
Optimal height for setup	800 mm

The standard deviation "s" is the repeatability calculated from 5 ABA cycles under the following conditions:

- 1) Optimal conditions: automatic measurement without operator influence measured in a laboratory under E1 conditions, on a decoupled weighing stone no drafts from above
- 2) Standard conditions E: measured by hand in a laboratory under E1 conditions, on a decoupled weighing stone; no drafts from above
- 3) Standard conditions F: measurement performed manually in a laboratory under at least F1 conditions, on a non-decoupled weighing stone, air conditioning and minimal drafts from above

## Applications

OIML calibration range RS	-
OIML calibration range E1	5 kg
OIML calibration range E2	2 kg – 5 kg
OIML calibration range F1	500 g – 5 kg
OIML calibration range F2	200 g – 5 kg
OIML calibration range M1	20 g – 5 kg
OIML calibration range M2	500 mg – 5 kg
OIML calibration range M3	1 g – 5 kg
ASTM E617 calibration range Class 000	-
ASTM E617 calibration range Class 00	5 kg
ASTM E617 calibration range Class 0	2 kg – 5 kg
ASTM E617 calibration range Class 1	1 kg – 5 kg
ASTM E617 calibration range Class 2	300 g – 5 kg
ASTM E617 calibration range Class 3	200 g – 5 kg
ASTM E617 calibration range Class 4	200 g – 5 kg
ASTM E617 calibration range Class 5	20 g – 5 kg
ASTM E617 calibration range Class 6	20 g – 5 kg
ASTM E617 calibration range Class 7	300 mg – 5 kg

## Optional Accessories

External calibration weight	5 kg   E2 YCW652-02
Climate module, uncalibrated, for all MCM models	YCM20MC
Calibration of a YCM20MC climate module with DAkkS calibration certificate	YCM20DAkkS
Climate module with DAkkS calibration certificate for all MCM models	YCM20MC-DAkkS
Optional secondary draft shield	YDS24C
Weighing table	YWT03

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