Mass Comparators

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The new Cubis® MCM manual mass comparators are the first devices on the market that combine metrological weighing expertise and integrated control of workflows in line with the recommendations of the International Organization of Legal Metrology (OIML). In the OIML R111-1 International Recommendation, this organization defines metrological and technical requirements.

A total of 14 Cubis® MCM manual mass comparators are available with maximum capacities from 6.1 g to 64 kg and readabilities from 0.1 µg to 10 mg. All models with draft shields are supplied standard with a climate module equipped with climate sensors for temperature, humidity and air pressure. For mass comparator models without a draft shield, an external climate module with the appropriate sensors is included as part of the equipment supplied. A DAkkS* calibration certificate can be provided for the climate sensors on request.

* DAkkS is the Germany's national accreditation body; DAkkS calibration certificates are internationally recognized

Cubis® MCM

Integrated Workflow Control
Integrated workflow control in the Cubis® MCM manual mass comparators minimizes operating error rates: During a measurement process, the mass comparator provides user guidance prompts and instructions about the next step to perform. This significantly reduces the "human" factor that can compromise the accuracy of mass determination, making results more reliable. At the same time, the Cubis® MCM ensures optimal, user-friendly workflows to reduce stress on operators.

Integrated Climate Sensors
The sensors integrated in the mass comparator automatically log climate data like temperature, air pressure and humidity for calculating the air buoyancy correction at the site of measurement. This climate data can be documented on a computer so that you can check at any time that the limits on temperature, air pressure and humidity for the respective calibration levels are in compliance for accuracy classes E1, E2, F1 or F2.

The Fastest Mass Comparison Cycles
Compared with conventional units, Cubis® MCM mass comparators are by far the fastest in completing ABA, ABBA or AB1...BnA cycles to determine the conventional mass and its combined standard uncertainty.

The manual mass comparators can seamlessly be integrated in the infrastructure of mass standards laboratory. Based on the Cubis® Q-Com communication concepts, they can be integrated in existing networks and any type of data desired can be transferred to other devices.

Specifications and Ordering Information

Cubis® MCM up to 1 kg				
Order number, with calibrated climate sensors and DAkkS certificate	**MCM6.7-DAkkS**	**MCM36-DAkkS**	**MCM66-DAkkS**	**MCM106-DAkkS**
Order number, with uncalibrated climate sensors	**MCM6.7**	**MCM36**	**MCM66**	**MCM106**
Design	1	2	2	2
Maximum capacity	6.1 g	31 g	61 g	111 g
Readability	0.1 µg	1 µg	1 µg	1 µg
Range of use	0 to 6 g	0 to 30 g	0 to 60 g	0 to 111 g
Repeatability "s"				
– under optimal conditions [1]	0.15 µg	1 µg	1 µg	1 µg
– under standard conditions E [2]	0.3 µg	1.5 µg	2 µg	2 µg
– at 1/3 load [2]	0.2 µg			
– at 1/10 load [2]		0.7 µg	0.7 µg	0.7 µg
– under standard conditions F [3]	0.6 µg	4 µg	5 µg	5 µg
Electronic weighing | tare range	6.1 g	31 g	61 g	61 g
Substitution weights				50 g
Linearity	1 µg	6 µg	8 µg	8 µg
Eccentric (off-center) load deviation	0.25 µg / mm	1 µg / mm	1 µg / mm	1 µg / mm
Stabilization time	10 s	3 s	3 s	5 s
Cycle time (ABA)	90 s	90 s	90 s	90 s
Standard Accessories				
Data interfaces	RS-232C, USB, Ethernet, SD card (optional RS-232C, PS2, *Bluetooth*®)			
Draft shield	•	•	•	•
Additional application programs	Weighing, mass unit conversion, individual identifiers, density determination, statistics			
Port for below-balance weighing hook	•	•	•	•
Climate sensors	Integrated into draft shield			

Cubis® MCM up to 1 kg				
Optional Accessories				
Calibration weight	5 g | E2 YCW352-00	20 g | E2 YCW422-00	50 g | E2 YCW452-00	50 g | E2 YCW452-00
2nd draft shield	YDS20C	YDS24C	YDS24C	YDS24C
Balance table	YWT03	YWT03	YWT03	YWT03
Dimensions				
Weighing pan size	16 mm dia.	30 mm dia.	30 mm dia.	50 mm dia.
Maximum object size (D × H)	16 × 70 mm	30 × 120 mm	30 × 120 mm	50 × 120 mm
Weigh cell (W × D × H)	122 × 343 × 141 mm	222 × 431 × 301 mm	222 × 431 × 301 mm	222 × 431 × 301 mm
Electronic unit (W × D × H)	239 × 320 × 56 mm	239 × 320 × 56 mm	239 × 320 × 56 mm	239 × 320 × 56 mm

Repeatability is the standard deviation "s"; it is 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: Measurement performed manually under a laboratory under E1 conditions, on a decoupled weighing stone, no drafts from above

[3] Standard conditions F: Measurement performed manually under a laboratory under at least F1 conditions, on a non-decoupled weighing stone, air conditioning and minimal drafts from above

Cubis® MCM up to 1 kg			
Order number, with uncalibrated climate sensors	**MCM605**	**MCM1005**	**MCM1004**
Order number, with calibrated climate sensors and DAkkS certificate	**MCM605-DAkkS**	**MCM1005-DAkkS**	**MCM1004-DAkkS**
Design	3	3	3
Maximum capacity	610 g	1,110 g	1,110 g
Readability	0.01 mg	0.01 mg	0.1 mg
Range of use	0 to 610 g	0 to 1,110 g	0 to 1,110 g
Repeatability "s"			
– under optimal conditions [1)]	10 µg	15 µg	0.05 mg
– under standard conditions E [2)]	20 µg	20 µg	0.07 mg
– at 1/3 load [2)]	15 µg		
– at 1/10 load [2)]	10 µg	15 µg	0.05 mg
– under standard conditions F [3)]	30 µg	50 µg	0.2 mg
Electronic weighing | taring range	610 g	610 g	610 g
Substitution weights		500 g	500 g
Linearity	100 µg	100 µg | 600 g	0.1 mg | 600 g
Eccentric (off-center) load deviation	10 µg / mm	15 µg / mm	30 µg / mm
Stabilization time	5 s	5 s	3 s
Cycle time (ABA)	90 s	90 s	90 s
Standard Accessories			
Data interfaces	RS-232C, USB, Ethernet, SD card (optional RS-232C, PS2, *Bluetooth*®)		
Draft shield	•	•	•
Additional application programs	Weighing, mass unit conversion, individual identifiers, density determination, statistics		
Port for below-balance weighing hook	•	•	•
Climate sensors	Integrated into draft shield		

Cubis® MCM up to 1 kg			
Optional Accessories			
Calibration weight	500 g | E2 YCW552-00	500 g | E2 YCW552-00	500 g | E2 YCW552-00
2nd draft shield	YDS24C	YDS24C	YDS24C
Balance table	YWT03	YWT03	YWT03
Dimensions			
Weighing pan size	90 mm dia.	90 mm dia.	90 mm dia.
Maximum object size (D × H)	135 × 140 mm	135 × 140 mm	135 × 140 mm
Weigh cell (W × D × H)	222 × 431 × 301 mm	222 × 431 × 301 mm	222 × 431 × 301 mm
Electronic unit (W × D × H)	239 × 320 × 56 mm	239 × 320 × 56 mm	239 × 320 × 56 mm

Repeatability is the standard deviation "s"; it is 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: measurement performed manually 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

Cubis® MCM 2 kg to 10 kg				
Order number, with uncalibrated climate sensors	**MCM2004**	**MCM5004**	**MCM5003**	**MCM10K3**
Order number, with calibrated climate sensors and DAkkS certificate	**MCM2004-DAkkS**	**MCM5004-DAkkS**	**MCM5003-DAkkS**	**MCM10K3-DAkkS**
Design	4	4	4	5
Maximum capacity	2,500 g	5,100 g	5,100 g	11 kg
Readability	0.1 mg	0.2 mg	1 mg	1 mg
Range of use	0 to 2,500 g	0 to 5,100 g	0 to 5,100 g	0 to 11 kg
Repeatability "s"				
– under optimal conditions [1]	0.05 mg	0.3 mg	0.5 mg	0.8 mg
– under standard conditions E [2]	0.1 mg	0.5 mg	0.8 mg	1 mg
– at 1/3 load [2]				
– at 1/10 load [2]	0.07 mg	0.3 mg	0.5 mg	0.8 mg
– under standard conditions F [3]	0.3 mg	0.8 mg	1.5 mg	3 mg
Electronic weighing | tare range	2,500 g	5,100 g	5,100 g	11 kg
Substitution weights		50 g		
Linearity	1 mg	2 mg	3 mg	6 mg
Eccentric (off-center) load deviation	30 µg / mm	151 µg / mm	300 µg / mm	0.5 mg / mm
Stabilization time	3 s	3 s	3 s	3 s
Cycle time (ABA)	90 s	90 s	90 s	90 s
Standard Accessories				
Data interfaces	RS-232C, USB, Ethernet, SD card (optional RS-232C, PS2, *Bluetooth*®)			
Draft shield	•	•	•	
Additional application programs	Weighing, mass unit conversion, individual identifiers, density determination, statistics			
Port for below-balance weighing hook	•	•	•	•
Climate sensor	Integrated into draft shield			Can be connected externally

Cubis® MCM 2 kg to 10 kg




Optional Accessories				
Calibration weight	2 kg | E2 YCW622-00	5 kg | E2 YCW652-00	5 kg | E2 YCW652-00	10 kg | E2 YCW712-00
2nd draft shield	YDS24C	YDS24C	YDS24C	YDS24C
Balance table	YWT03	YWT03	YWT03	YWT03
Lifting device for 10 kg				YAW51
Lifting device for 20 kg				

Dimensions				
Weighing pan size (W × D)	136 × 136 mm	136 × 136 mm	136 × 136 mm	200 × 200 mm
maximum object size (D × H)	130 × 200 mm	130 × 200 mm	130 × 200 mm	
Weigh cell (W × D × H)	240 × 276 × 373 mm	240 × 276 × 373 mm	240 × 276 × 373 mm	240 × 276 × 102 mm
Electronic unit (W × D × H)	239 × 320 × 56 mm	239 × 320 × 56 mm	239 × 320 × 56 mm	239 × 320 × 56 mm

Repeatability is the standard deviation "s"; it is 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: measurement performed manually 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

Cubis® MCM 2 kg to 10 kg			
Order number, with uncalibrated climate sensors	**MCM40K3**	**MCM60K3**	**MCM60K2**
Order number, with calibrated climate sensors with DAkkS certificate	**MCM40K3-DAkkS**	**MCM60K3-DAkkS**	**MCM60K2-DAkkS**
Design	6	6	6
Maximum capacity	41 kg	64 kg	64 kg
Readability	1 mg	2 mg	10 mg
Range of use	0 kg to 41 kg	0 kg to 64 kg	0 kg to 64 kg
Repeatability s			
– under optimal conditions [1]	2 mg	4 mg	6 mg
– under standard conditions E [2]	3 mg	6 mg	10 mg
– at 1/3 load [2]			
– at 1/10 load [2]	2 mg	4 mg	
– under standard conditions F [3]	6 mg	10 mg	25 mg
Electronic weighing | tare range	41 kg	64 kg	64 kg
Linearity	20 mg	40 mg	50 mg
Eccentric (off-center) load deviation	3.5 mg / mm	3.5 mg / mm	3.5 mg / mm
Stabilization time	5 s	5 s	5 s
Cycle time (ABA)	120 s	120 s	120 s
Standard Accessories			
Data interfaces	RS-232C, USB, Ethernet, SD card (optional RS-232C, PS2, *Bluetooth*®)		
Additional application programs	Weighing, mass unit conversion, individual identifiers, density determination, statistics		
Port for below-balance weighing hook	with opt. accessories 69EA0040	with opt. accessories 69EA0040	with opt. accessories 69EA0040
Climate sensor	Can be connected externally		

Cubis® MCM 40 kg to 60 kg



Optional Accessories

Calibration weight	20 kg | E2 YCW722-00	50 kg | E2 YCW752-00	50 kg | E2 YCW752-00
2nd draft shield	YDS05C | YDS03C	YDS05C | YDS03C	YDS05C | YDS03C
Lifting device for 10 kg	YAW51	YAW51	YAW51
Lifting device for 20 kg	YAW52	YAW52	YAW52
Lifting device for 50 kg		YAW53	YAW53
Crane with chain hoist		YLD01C	YLD01C
Gripper for weights with handle		YLD02C	YLD02C
Floor-mounted column, stainless steel			

Dimensions

Weighing pan size (W × D)	400 × 300 mm	400 × 300 mm	400 × 300 mm
Weigh cell (W × D × H)	400 × 326 × 126 mm	400 × 326 × 126 mm	400 × 326 × 126 mm
Electronic unit (W × D × H)	239 × 320 × 56 mm	239 × 320 × 56 mm	239 × 320 × 56 mm

Repeatability is the standard deviation "s"; it is 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: measurement performed manually 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

Accessories for Cubis® MCM Mass Comparators

Replacement climate module, uncalibrated, for all MCM models	YCM20MC
Calibration of a climate module YCM20MC with DAkkS calibration certificate	YCM20DAkkS
Replacement climate module with DAkkS calibration certificate for all MCM models	YCM20MC-DAkkS
Hook for below-balance weighing, for models MCM40K3, MCM60K3, MCM60K2, MCM40K3-DAkkS, MCM60K3-DAWKS and MCM60K2-DAkkS	69EA0040
Tower for climate module, for mounting YCM20MC; can be ported to the following models: MCM10K3, MCM40K3, MCM60K3, MCM60K2, MCM10K3-DAkkS, MCM40K3-DAkkS, MCM60K3-DAkkS and MCM60K2-DAkkS, connecting cable included	YCM20MC Tower