

Comparator Balances



Comparator Balances

Vacuum Technology

Robotic Solutions

Automated & Manual Operation

Solutions up to 5400 kg

Innovative Solutions
For Lifetime Accuracy

METTLER TOLEDO

Continuous Innovation Accompanying Your Future

METTLER TOLEDO Comparator Balances determine even the smallest differences in mass. They provide highest resolution and excellent repeatability, the critical factors for your comparative weighing performance. We offer several models with readabilities as fine as 0.1 µg and capacities up to 5400 kilograms.

Segments & Applications



Machinery & Electronics

Production oriented, the XP-S line offers the highest accuracy for the smallest tolerances assuring top quality finished components and parts.



Petrochemicals

XP-L line is largely used in gas cylinder filling. Its robustness and highest resolution help reducing uncertainties to a minimum improving the quality of the gas mixes.



Calibration Laboratories

For safe and simple weight calibration ComparatorPac™ is the all-in-one solution, assuring efficient workflow and reliable results.














Bulk Chemicals

Highest yield for highest capacities, XP-K line helps minimizing the waste of bulk chemical components at the time of filling, drastically sinking production costs.



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Best Conditions and Results With Vacuum Weighing Technology

National Metrology Institutes improve their measurement accuracy using the reference in vacuum mass determination: The METTLER TOLEDO M_one and M_10 evaluate various artefacts and results up to 10 ng accuracy and offer unique flexibility features. Determine the mass of weights, artefacts and silicon spheres up to 10 kg from controlled ambient pressure down to vacuum at 10⁻⁶ mbar. Load the artefacts directly through the quick loading door or through the Load-Lock system. The Windows® M_Control software accompanies you during the whole process.



M_10



M_one

Model	Max. Load	Read-ability	Repeat-ability	Weighing Range per OIML Weighing Class (1/3 MPE)				
				E0	E1	E2	F1	F2
M_one	1001.5 g	0.1 ug	0.5 µg	100 g–1 kg	100 g–1 kg	100 g–1 kg	100 g–1 kg	100 g–1 kg
M_10	10011 g	1 ug	8 µg	1 kg–10 kg	1 kg–10 kg	1 kg–10 kg	1 kg–10 kg	1 kg–10 kg



The M_one and M_10 Offer:



Ready for Various Artefacts

Thanks to the unique STAR shaped pan, OIML weight from 100 g up to 1 kg, silicon spheres up 100 mm in diameter or density artefacts can be placed directly on the weighing pan.



Direct Easy Access

The user places weights directly with clear view on the 6-place turntable through the large quick loading door. Ergonomic design allows direct access into the system.



Constant Conditions

The unique Load-Lock System allows exchange of weights into the vacuum chamber without changing constant ambient conditions or vacuum release.



Automated Centering

The Automated Gravimetric Centering (AGC) allows automated centering at all positions before determining the mass for more accurate results.

Accurate and Productive With a_Line Robots

With METTLER TOLEDO's flexible robotic system several models can be used in combination to create a high speed calibration system from 1 µg to 20 kg with a maximum on safety, accuracy and time savings. The Robotic Comparators provide extremely fast results with an outstanding performance up to nano-accuracy. Magazine with up to 100 weights enable efficient calibration of single weights, or in combination of up to three weights, by downward/upward calibration. The process is fully automatic controlled by Windows® based software and allows easy result evaluation and preparation of certificates.



a5 / a100 / a107 / a1000



a5XL / a100XL



AX32004-M10

Model	Max. Load	Read-ability	Repeatability	Weighing Range per OIML Weighing Class (1/3 MPE)				
				E0	E1	E2	F1	F2
a5	6.1 g	0.1 µg	0.1 g: 0.15 µg 1-2 g: 0.25 µg 2-5 g: 0.4 µg	1 mg – 5 g	1 mg – 5 g	1 mg – 5 g	1 mg – 5 g	1 mg – 5 g
a5XL	6.1 g	0.1 µg	0.1 g: 0.15 µg 1-2 g: 0.25 µg 2-5 g: 0.4 µg	1 mg – 5 g	1 mg – 5 g	1 mg – 5 g	1 mg – 5 g	1 mg – 5 g
a107	111 g	0.1 µg	1 µg	1 g – 20 g	1 g – 50 g	1 g – 50 g	1 g – 50 g	1 g – 50 g
a100	111 g	1 µg	1.6 µg	10 g – 100 g	1 g – 100 g	1 g – 100 g	1 g – 100 g	1 g – 100 g
a100XL	111 g	1 µg	1.6 µg	10 g – 100 g	1 g – 100 g	1 g – 100 g	1 g – 100 g	1 g – 100 g
A1000	1109 g	10 µg	10 µg	500 g – 1 kg	100 g – 1 kg	10 g – 1 kg	10 g – 1 kg	10 g – 1 kg
AX32004-M10	21260 g	0.1 mg	0.2 mg	5 kg – 20 kg	2 kg – 20 kg	1 kg – 20 kg	1 kg – 20 kg	1 kg – 20 kg



The Robotic a_Line Offers:



Nano-Accuracy

The separate detached weighing frame eliminates robot vibrations on the balance. This allows outstanding measurement performance with a resolution of up to 110 million points.



Maximum Efficiency

Have up to 4 robot arms work. Simultaneously when combining robots. Together with up to 100 positions per system, this maximizes productivity and minimizes human error.



Proven Technology

Our robots offer highly sophisticated 3-axis ball bearing technology. Ultra precise centering and smooth vibration-free handling of weights within seconds is assured year after year.



Secure Operations

The Control software monitors all your jobs that can be directly imported from LIMS. Autostart several jobs in a row and calculate air buoyancy. Data can be exported to a database giving full traceability at a keystroke.

Unrivalled Mass Comparison

AX Automation Makes it Possible

Ultimate accuracy is achieved with AX fully automatic weighing systems.

A design without compromises, automated weight handler and separate electronics results in extraordinary resolution and incomparable repeatability for weight determinations of OIML E1 and "EO" Mass Standards. The AX automated weighing systems meet highest accuracy requirements up to 0.1 µg and mass determination of weight pieces of up to 64 kg. Human error is eliminated due to fully automatic operation of the 4-place weight handlers controlled by Windows® based software. Measurement data is securely stored and handling effort reduced.



Model	Max. Load	Readability	Repeatability	Weighing Range per OIML Weighing Class (1/3 MPE)				
				EO	E1	E2	F1	F2
AX107H	111 g	0.1 µg	0.5 µg	10 g – 100 g	10 g – 100 g	10 g – 100 g	10 g – 100 g	10 g – 100 g
AX106H	111 g	1 µg	8 µg	10 g – 100 g	10 g – 100 g	10 g – 100 g	10 g – 100 g	10 g – 100 g
AX1006	1001 g	1 µg	2 µg	100 g – 1 kg	100 g – 1 kg	100 g – 1 kg	100 g – 1 kg	100 g – 1 kg
AX10005	10011 g	10 µg	20 µg	1 kg – 10 kg	1 kg – 10 kg	1 kg – 10 kg	1 kg – 10 kg	1 kg – 10 kg
AX64004	64260 g	0.1 mg	0.4 mg	10 kg – 50 kg	5 kg – 50 kg	1 kg – 50 kg	1 kg – 50 kg	1 kg – 50 kg
AX32004	32260 g	0.1 mg	0.2 mg	5 kg – 20 kg	2 kg – 20 kg	1 kg – 20 kg	1 kg – 20 kg	1 kg – 20 kg
AX16004	16260 g	0.1 mg	0.2 mg	2 kg – 10 kg	1 kg – 10 kg	1 kg – 10 kg	1 kg – 10 kg	1 kg – 10 kg



Automatic Comparators Offer:



Unrivalled Accuracy

Our engineers always strive for the perfect mass comparator. By improving them over the last 30 years, the AX automated comparators are the proof by offering peak measurements and reliability in everyday weighing routine.



Continuous Weighing Ranges

The clever continuous range technology enables to use the entire 64 kg range in 0.0001 g steps. This makes it the ideal solution for measuring non-metric weights, pressure discs for force measurements, gas-capsules or small bottles (AX10005 offers Window-Range).



Direct Weight Dissemination

With the automated AX line the efficiency is increased by placing several weights on the turntable for each weighing position. This enables you to calibrate the weight decade 10 g – 64 kg by dissemination without the aid of disc weights (AX1006 and AX10005 offer single weighing positions).



Secure Operation

The Windows® based software controls all your weighing jobs which can be imported directly from LIMS. Autostart several jobs in a row and calculate air buoyancy. Data can be exported to a database giving you full traceability at a keystroke.

Peak Performance up to 520g With XP Micro Comparators

In the field of Mass Metrology weighing to the highest degree of accuracy is required. The XP Micro Comparators offer convenient full weighing ranges with highest precision. Intelligent features such as WeighCom application, for automated guided process, and SmartSens for opening the draft shield doors without a touch make accurate work simpler and even more secure.



XP6U

XP26C & XP56C

XP205CDR & XP505

Model	Max. Load	Read-ability	Repeat-ability	Weighing Range per OIML Weighing Class (1/3 MPE)				
				E1	E2	F1	F2	M1
XP6U	6.1 g	0.1 µg	0.35 µg	1 mg – 5 g	1 mg – 5 g	1 mg – 5 g	1 mg – 5 g	1 mg – 5 g
XP26C	22 g	1 µg	1.5 µg	50 mg – 20 g	1 mg – 20 g	1 mg – 20 g	1 mg – 20 g	1 mg – 20 g
XP56C	52 g	1 µg	3 µg	50 mg – 50 g	1 mg – 50 g	1 mg – 50 g	1 mg – 50 g	1 mg – 50 g
XP205CDR	220 g	10 µg	4 µg	–	100 g – 200 g	1 g – 200 g	50 mg – 200 g	1 mg – 200 g
XP505	520 g	0.01 mg	0.035 mg	200 g – 500 g	20 g – 500 g	500 mg – 500 g	50 mg – 500 g	1 mg – 500 g



The XP-U and XP-C Lines Offer



Automatic Doors

For a faster and more secure workflow, motorized doors with sensors open the draft shield without touching any key.



Hanging Pan

More reliability thanks to the hanging pan technology, which reduces corner load errors to a very minimum.



Straight Forward Results

At a push of a button, secure results are obtained. The selection of processes, references and air buoyancy corrections is easily accessible through a state-of-the-art touchscreen.



Easy Weight Handling

With the patented hook weighing pan, smallest wire weights are handled safely and easily. With its hanging weight approach, eccentricity is reduced to a minimum.

Highest Accuracy Manually Handled AX Comparators up to 12 kg

Highest performance when manually weighing is achieved with the AX Comparators. Sophisticated features such as the continuous window range technology allow a wide mass determination range also of objects with no nominal weight. State-of-the-art mechanics with a hanging weighing pan, full metal housing and separate electronics, the AX offers world-class performance.



Model	Max. Load	Read-ability	Repeat-ability	Weighing Range per OIML Weighing Class (1/3 MPE)				
				E1	E2	F1	F2	M1
AX106	111 g	1 μ g	3 μ g	1 g – 100 g	50 mg – 100 g	1 mg – 100 g	1 mg – 100 g	1 mg – 100 g
AX206	211 g	1 μ g	4 μ g	2 g – 200 g	100 mg – 200 g	1 mg – 200 g	1 mg – 200 g	1 mg – 200 g
AX1005	1109 g	0.01 mg	0.02 mg	200 g – 1 kg	20 g – 1 kg	1 g – 1 kg	100 mg – 1 kg	1 mg – 1 kg
AX1004	1109 g	0.1 mg	0.07 mg	1 kg	500 g – 1 kg	100 g – 1 kg	10 g – 1 kg	200 mg – 1 kg
AX2005	2109 g	0.01 mg	0.04 mg	500 g – 2 kg	100 g – 2 kg	10 g – 2 kg	1 g – 2 kg	20 mg – 2 kg
AX12004	12111g	0.1 mg	0.25 mg	2 kg – 10 kg	1 kg – 10 kg	500 g – 10 kg	500 g – 10 kg	500 g – 10 kg



The AX Manual Line Offers:



Hanging Pan

Eccentricity influences are eliminated accurately and efficiently. The large surface allows easy weights placement for dissemination.



2-position Manual Turntable

The unique weight exchanging design of the AX12004 allows easy and safe weights handling at lowest environmental influences allowing more efficient and accurate mass determination with higher loads.



Faster Results

With the motorized and integrated draft shield, environmental influences and stabilization time are reduced and measurement performance as well as efficiency increased obtaining faster and more reliable results.



Touchscreen

With the integrated WeighCom application trustworthy results are immediately generated. The interface guides the user through the process with audible and visual information.

For Versatile Applications up to 10 kg

The XP-S Comparator Line

METTLER TOLEDO XP-S comparators guarantee every day top performance and reliability with the most accurate measurement results up to 10 kg. With the weighing MonoBloc cell technology and a resolution of up to 23 million points, accuracy is peak at shortest process times fulfilling the highest demands in routine mass determination. The LevelMatic weighing pan eliminates eccentricity influences guaranteeing an even better performance. LevelControl automatically warns if the balance must be leveled assuring best results. An ergonomic draft shield allows secure handling whilst reducing air draft influences to a minimum.



XP2003S



XP2004S & XP5003S



XP10003S

Model	Max. Load	Read-ability	Repeat-ability	Weighing Range per OIML Weighing Class (1/3 MPE)				
				E1	E2	F1	F2	M1
XP2004S	2300 g	0.1 mg	0.1 mg	1 kg – 2 kg	500 g – 2 kg	100 g – 2 kg	10 g – 2 kg	200 mg – 2 kg
XP2003S	2300 g	1 mg	1 mg	–	–	1 kg – 2 kg	500 g – 2 kg	200 g – 2 kg
XP5003S	5100 g	1 mg	0.8 mg	–	5 kg	1 kg – 5 kg	500 g – 5 kg	100 g – 5 kg
XP10003S	10100 g	1 mg	1 mg	10 kg	5 kg – 10 kg	1 kg – 10 kg	500 g – 10 kg	200 g – 10 kg



The XP-S Line Offers:



LevelMatic

Eccentricity influences are eliminated accurately and efficiently. The large weighing pan surface allows easy weights' placement for dissemination.



Straight Forward Results

At a push of a button, secure results are obtained. The selection of processes, references and air buoyancy corrections is easily accessible through a state-of-the-art touchscreen.



Faster Results

With the integrated draft shield, environmental influences are reduced and measurement performance increased. Stabilization time is reduced to minimum allowing fast and reliable results.



Full Connectivity

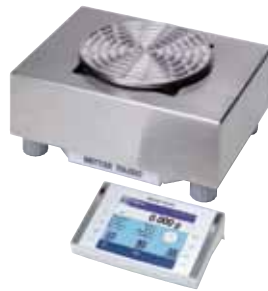
With up to 8 interface options and the built in RS232 interface, any communication requirement can be fulfilled. Data is exchanged securely and without human influences to the final results and ready for external data handling systems.

High Capacity Performance Using the XP-L Comparator Line

In the higher mass ranges handling becomes more critical. Easy handling and highest accuracy is granted with the built in LevelMatic system. WeighCom, the built-in application in the touchscreen terminal for mass determination, guides you step by step through the process and includes air buoyancy correction for best results. Secure and accurate results are achieved at one fingertip. For Ex Zone applications, specific models are available as ATEX II 3G approved versions. Due to the high versatility, XP-L models are the best choice for mass calibration, gas filling or any other demanding high capacity and high accuracy weighing application.



XP32003L & XP64002L



XP26003L & XP64003L



XP64002L-T

Model	Max. Load	Read-ability	Repeat-ability	Weighing Range per OIML Weighing Class (1/3 MPE)				
				E1	E2	F1	F2	M1
XP26003L	26.1 kg	1 mg	3 mg	20 kg	10 kg – 20 kg	2 kg – 20 kg	1 kg – 20 kg	500 g – 20 kg
XP32003L	32.1 kg	5 mg	10 mg	–	–	20 kg	5 kg – 20 kg	2 kg – 20 kg
XP64003L	64.1 kg	5 mg	8 mg	50 kg	20 kg – 50 kg	5 kg – 50 kg	2 kg – 50 kg	1 kg – 50 kg
XP64002L	64.1 kg	10 mg	25 mg	–	–	50 kg	10 kg – 50 kg	5 kg – 50 kg
XP64002L-T	64.1 kg	10 mg	30 mg	–	–	50 kg	10 kg – 50 kg	5 kg – 50 kg



The XP-L Line Offers:



LevelMatic

Utmost reliability and accuracy thanks to the LevelMatic, an innovative mechanism that reduces corner load effects to the very minimum.



LevelControl

Work under leveled conditions. LevelControl alerts you when the balance is not correctly leveled, avoiding incorrect results.



Draft Shield

For enhanced measurement stability in demanding environments due to the elimination of air draft influences (applies to XP26003L & XP64003L).



ATEX II 3G Approved

For hazardous environments, specific models are available with Ex Zone II approvals.

The Ultimate Solution up to 5 Tons

XP-K Comparators for Extreme Challenges

The XP-K is made to conquer extreme challenges with highest precision, such as filling gas cylinders, calibrating flow-meters, weighing high-speed train wheels or mass pieces up to 5 tons for truck or rail scales. Besides full weighing ranges, all platforms have an integrated centering aid for an easier and more precise placement of artifacts and are all fully made of high-grade steel for long lasting every day precision. Furthermore, the standard touchscreen operation makes working with these comparators as easy as with any other ones.



XP155KS



XP604KM & XP1003KM



XP2003LK & XP6002KL

Model	Max. Load	Read-ability	Repeat-ability	Weighing Range per OIML Weighing Class (1/3 MPE)				
				E2	F1	F2	M1	M2
XP155KS	150 kg	0.05 g	0.15 g	–	–	100 kg	50 kg – 100 kg	10 kg – 100 kg
XP604KM	600 kg	0.1 g	0.3 g	–	–	500 kg	200 kg – 500 kg	100 kg – 500 kg
XP1003KM	1100 kg	0.5 g	3 g	–	–	1000 kg	500 kg – 1000 kg	100 kg – 1000 kg
XP2003KL	2500 kg	1 g	10 g	–	–	–	500 kg – 2000 kg	500 kg – 2000 kg
XP6002KL	5400 kg	10 g	100 g	–	–	–	–	5000 kg



The XP-K Line Offers:



Unrivalled Performance
Accomplish demanding calibrations and weight determination at peak accuracy. The XP-K Comparators offer top resolution and excellent repeatability for highest loads.



Precise Centering
With the integrated centering aid, precise placement of weights is supported and reproducibility improved.



Utmost Reliability
The innovative mechanism LevelMatic eliminates corner load effects thus increasing the accuracy of your weighing results.



ATEX Approved Versions
With the ATEX II 3G EEx nI IIC T5 approved versions, demanding mass determinations can be performed in hazardous environments at peak accuracy.

Volume & Density Determination To Eliminate Significant Influences

According to OIML, mass determination above 400 meters altitudes requires the knowledge of the volume and densities using E2-Class weights. At higher altitudes, also in lower class weights, the volume and density play a more significant role in the uncertainties' calculations.

With measuring buoyancy forces of in liquid immersed artifacts, the density can be determined. METTLER TOLEDO offers easy and reliable systems up to 20 kg. The VMS systems use standard XP Comparators, which can still be used as stand-alone Mass Comparators.



VC1005X



VMS2



VMS20

Model	Max. Load	Read-ability	Density Uncertainty (k=2)	Volume Uncertainty (k=2)	Scientific	E1	E2	F1	F2
VC1005X	1 kg	0.01 mg	1.2 kg/m ³	0.00015 cm ³	1 g – 1 kg	1 g – 1 kg	1 g – 1 kg	1 g – 1 kg	1 g – 1 kg
VMS2	2 kg	0.1 mg	25...400 kg/m ³	0.0063...0.781 cm ³	1 g – 2 kg	1 g – 2 kg	1 g – 2 kg	1 g – 2 kg	1 g – 2 kg
VMS20	20 kg	1 mg	1...5 kg/m ³	0.0781...0.3125 cm ³	1 kg – 20 kg	1 kg – 20 kg	1 kg – 20 kg	1 kg – 20 kg	1 kg – 20 kg



The Volume Comparators Offer:



Unrivalled Performance
 VC1005X is fully automatic system leading to fast and accurate volume and density determination of weights in the range of 1 mg to 1 kg.



Dual Use
 Both VMS systems integrate comparators and a weight exchanger, allowing the buoyancy force measurement for the density determination and a fast and easy mass determination with higher loads.



Air Bubbles Removal
 Advanced water jet system to spill off the residual air bubbles is included in both VMS systems.

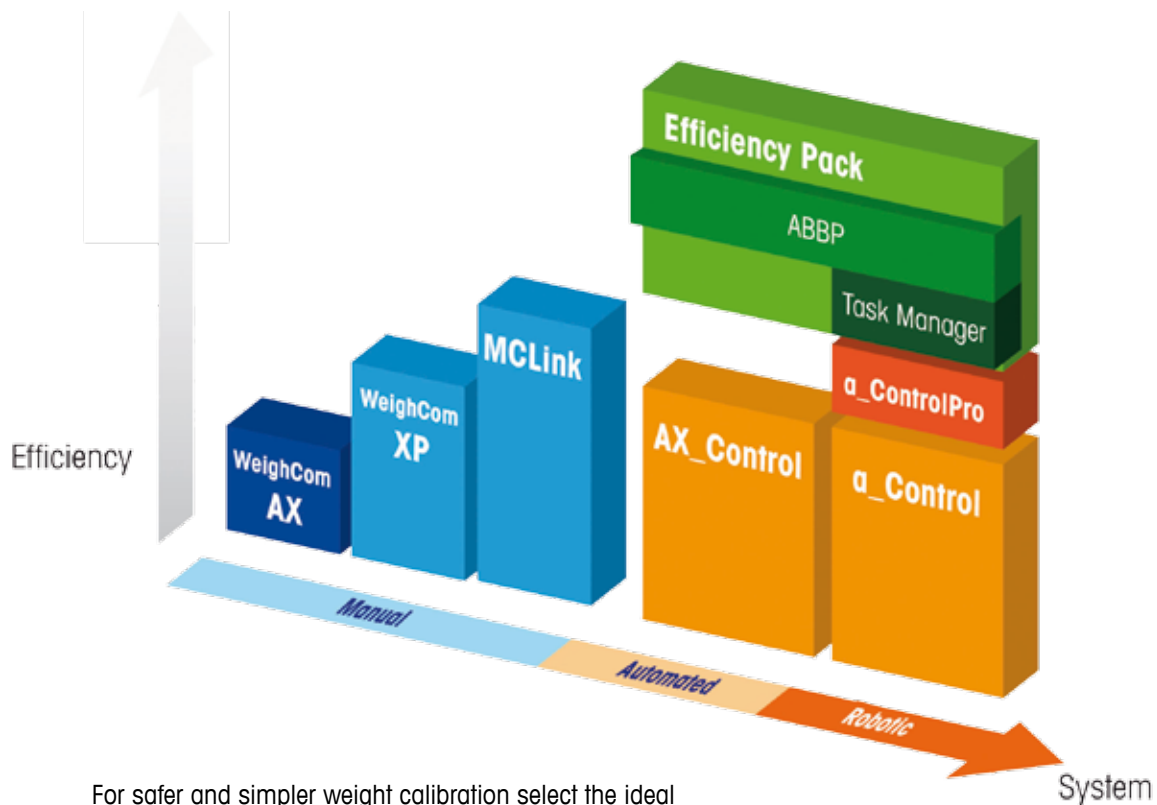


Straight Forward Results
 With the supplied software, the highly complex theory of density determination and the generation of the most accurate and detailed reports have never been easier.

Software Solutions For Efficient Mass Determination

For a flawless traceability of weights to the International Prototype Kilogram it takes the most accurate Mass Comparator and a highly efficient software solution to exclude any error caused by human factor.

When comparing weights with references, you can best rely on METTLER TOLEDO's unique expertise in the world of mass determination: Tailored software solutions for Mass Comparators guarantee efficient workflows and accurate and secure results, assuring full traceability at all times.



For safer and simpler weight calibration select the ideal software solution for your mass comparator line.



Our Software Solutions Offer:



Connectivity

Up to 7 different interfaces can be flexibly used to connect your balances in to your network. From wireless Bluetooth to Ethernet state of the art solutions.



Traceable Results

Using METTLER TOLEDO software, all weighing results can be sent directly to a PC or database for safe storage. Herewith all calibration data is fully traceable and available at any time for quality or accreditation purposes



Ease of Use

The WeighCom with touch screen operation makes daily weight calibrations as easy, fast and secure as can be. Just one touch to start and the on-screen instructions guide and secure the process.



Professional Reports

Calibration reports at a keystroke. All parameters, processes used, references and results, with or without calculations, can easily be transferred into a certificate for a professional sign-off.

Enhanced Usability Through Specially Designed Accessories

To meet your individual requirements and improve your laboratory's overall performance METTLER TOLEDO offers an aligned range of innovative accessories. These ergonomically designed solutions improve your Mass Comparator performance while significantly increasing your process safety, accuracy and efficiency.



S50-K Susceptometer

Determination of magnetic characteristics is an important precondition to ensure quality of high end materials. The S50-K Susceptometer measures susceptibility and permanent magnetization of materials up to 50 kg with highest accuracy.



Guided Workflow

The user guided Susceptometer Software calculates magnetic properties of artifacts according to OIML R111.



Complete Traceability

Recalibratable gauge blocks and susceptibility reference secure the traceability to international standards anytime.



Intelligent SmartGeo

Select OIML standard shapes or define specific weights geometries for automatic calculation of geometry correction factors.

Description	Part No.	XP6U	XP26C / XP56C	AX106	AX206	XP505 / XP205CDR	AX1005/A / AX2005	XP2004S / XP2003S	XP5003S / XP10003S	AX12004	XP26003L / XP32003L	XP64003L / XP64002L	XP64002L-T	XP155KS	XP604KM	XP1003KM	XP2003KL / XP6002KL	
Susceptometer																		
Hardware (S50-K)	11116880	•																
Susceptibility Reference	11116858	•																
Susceptibility Software	11116870	•																
Draft Shields																		
Draft Shield AX	11115915			•	•		•											
Draft Shield XP W5	11116043	•																
Draft Shield W12	11134430		•			•		•	•									
Draft Shield XP W64	11134470										•	•						
Draft Shield XP-WKS	11116556												•					
Draft Shield XP-WKM	11116557													•		•		
Draft Shield XP-WKL	11116558																	•
Inner Draft Shield AX1004	222159						•											
Self Centering Pan																		
LevelMatic for XP2003S	11131123							•										
LevelMatic 1000	22001940												•	•				
LevelMatic 5000	11116554															•	•	
Software Solutions																		
MCLink	11116504	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Printer / Interfaces																		
BT-P42 Printer	11132540	•	•	•	•	•	•	•	•	•	•	•	•					
Bluetooth Interface	11132530	•	•	•	•	•	•	•	•	•	•	•	•					
Ethernet Interface	11132515	•	•	•	•	•	•	•	•	•	•	•	•					
Terminals																		
IND690	22011901													•	•	•	•	
IND690XX	22011903													•	•	•	•	

More accessories for Automated and Robotic Mass Comparators available at: ► www.mt.com/comparators

More solutions for Weights handling available at: ► www.mt.com/weights



Climate Stations

Stand-alone or integratable to all comparators software for direct data processing. Klimet A30 and ClimaLog 30 climate measurement stations collect air temperature, humidity and pressure for the calculation of the air density and buoyancy corrections.



MCLink Software

The weighing results of up to four Mass Comparators are automatically sent and safely stored into a PC or server and are calculated with air buoyancy to give ready-to-use certificates results.



Draft Shield XP W12



LevelMatic 1000



Optional Bluetooth or Ethernet Interface

An Extensive Weight Portfolio For Consistent Performance



To meet your individual requirements and improve your laboratory's overall performance METTLER TOLEDO offers a comprehensive range of highest quality weights. These ergonomically designed solutions improve your Mass Comparator performance while significantly increasing your process safety, accuracy and efficiency.

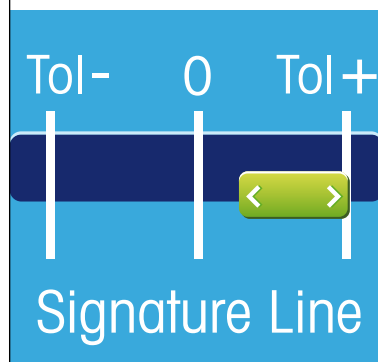
See the complete Weight Portfolio at:
www.mt.com/weights

Signature Line, OIML E1, E2 and F1



The Signature Line offers more than perfection. Hand selected weights with guaranteed positive tolerances and a lifetime guarantee make these weights the first choice for ambitious testing purposes.

Guaranteed Positive Tolerances



The unique electrolytic adjustment procedure combined with robotic calibrations allows selective production of weights in the positive tolerance range.

Full Lifetime Guarantee



The "Stay-in-tolerance" lifetime guarantee means that if ever a weight should be found out of tolerance it will be replaced free of charge.



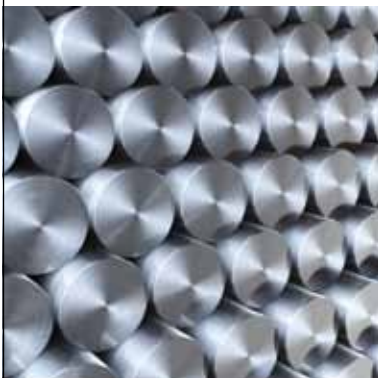
Premium Line, OIML E2 and F1



Uncompromising selection of steel and rigorous control of manufacturing processes make Premium Line weights the excellent choice for balance calibration and testing. The proven one-piece design (monobloc) guarantees best long term stability and accurate testing results.



Premium Stainless Steel



Premium, vacuum melted stainless steel ensures an anti-corrosive surface with low magnetization and susceptibility values.


Made in Switzerland




The one-piece construction and electrolytically polished surface offer best long term stability. Unmatched Swiss quality!


High-grade stainless steel, vacuum melted
Density: 8.0 kg/dm³
Magnetic susceptibility < 0.01
One-piece design (Monobloc)


 Weight and Box

 Weight and Box, including Certificate

 Wire weight

 Marked wire weight

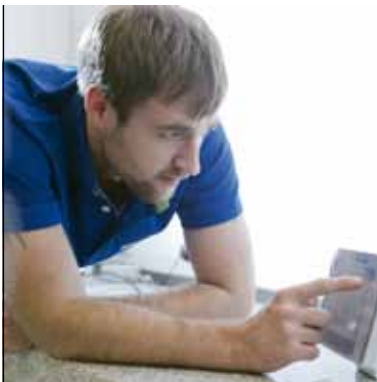
 Cylindrical weight with knob

 Marked cylindrical weight with knob

Lifetime Accuracy With Comparator Services

Besides supplying the most accurate mass comparators products, we also ensure that your investment keeps its value and performance over lifetime thanks to our professional service offering worldwide. Our service solutions also maximize equipment uptime, ensure traceability and regulatory compliance of results. In addition we can provide installation and training support or offer tailored service plans to your needs. Get the maximum out of your equipment with minimum risk and cost over a long lifetime. Our qualified specialists are trained to provide the highest level of service and improve your processes.

Service Offerings:



Installation & Training

Professional installation & training by an authorized, factory-trained Service Professional ensures your instrument is set to perform best specifications and is optimized to your application tasks.

- Operator training on site
- Installation certificate
- After sales support



Maintenance

Quality maintenance according to manufacturer's instructions. Instruments are cleaned, worn-out parts exchanged, aligned to the manufacturer's specifications, and tested to ensure that our highest quality standards are reached and maintained.

- Ad-hoc Maintenance
- Agreement Maintenance



Support

Our Technical Support Staff helps to resolve operating or application questions. We isolate difficulties and suggest the right course of action to return your instrument to top performance. In case of Repair our factory-trained service professionals, use only factory original parts and solve problems in short time.



Benefits to Your Business:



Safety & Reliability

- Ensure best performance
- Enhance lifetime accuracy
 - Ensure safe equipment
 - Maintain reliable results
- Take over responsibility
- Peace of mind



Time Saving

- Optimized instrument settings
 - Efficient workflow
 - Application support
 - Avoid downtimes
- Plan Service downtime yourself



Cost Saving

- No costly breakdown time
 - No unplanned maintenance
- Fix budgets with contracts
 - Enhance product lifetime
- Minimize cost of ownership
- Tailored preventative maintenance

Select the Right Comparator For the Calibration of Your Weights

In Mass Metrology, weights are used according guideline of OIML or ASTM that are categorized into accuracy classes E1, E2, F1, F2, M1, M2 and M3 or class 1 to 7 respectively. When determining the mass of a weight, the maximum allowed measurement uncertainty of the whole process must be equal or less than $\frac{1}{3}$ of the maximum tolerance (mpe) of the weight under test with level of confidence $k=2$ or 95%. The main uncertainty contribution factors when calibrating weights are the following:

Uncertainty of the Weighing

$$u_w(\overline{\Delta m_c}) = \frac{s(\Delta m_{ci})}{\sqrt{n}}$$

is the repeatability of the comparator with a defined number of weight comparisons per process. The more repetitions of ABA / ABBA are performed, the lower repeatability influence to the weighing uncertainty. METTLER TOLEDO is performing the calculations of the weighing ranges upon the guaranteed load dependent repeatabilities in ABA weighing mode.

Uncertainty of the Reference Weight

The reference weight being used should be at least one class higher than the test object, e.g. E2 standard weights should be used to calibrate weight pieces in class F1. The uncertainty contribution of the mass standard is herewith only $\frac{1}{9}$ of the MPE of the calibrated test weight.

Uncertainty of Air Buoyancy

Correction

The density of the weights (standard and test weight) and air should be close as possible to the conventional density of weights (8000 kg/m^3) and air (1.2 kg/m^3) to achieve smallest uncertainties.

Uncertainty of the Balance

Smallest readability and good repeatability qualities ensure a minimum effect on the uncertainty.

METTLER TOLEDO Definitions

The Weight Calibration ranges of Mass Comparators are defined to typical customer process using OIML.

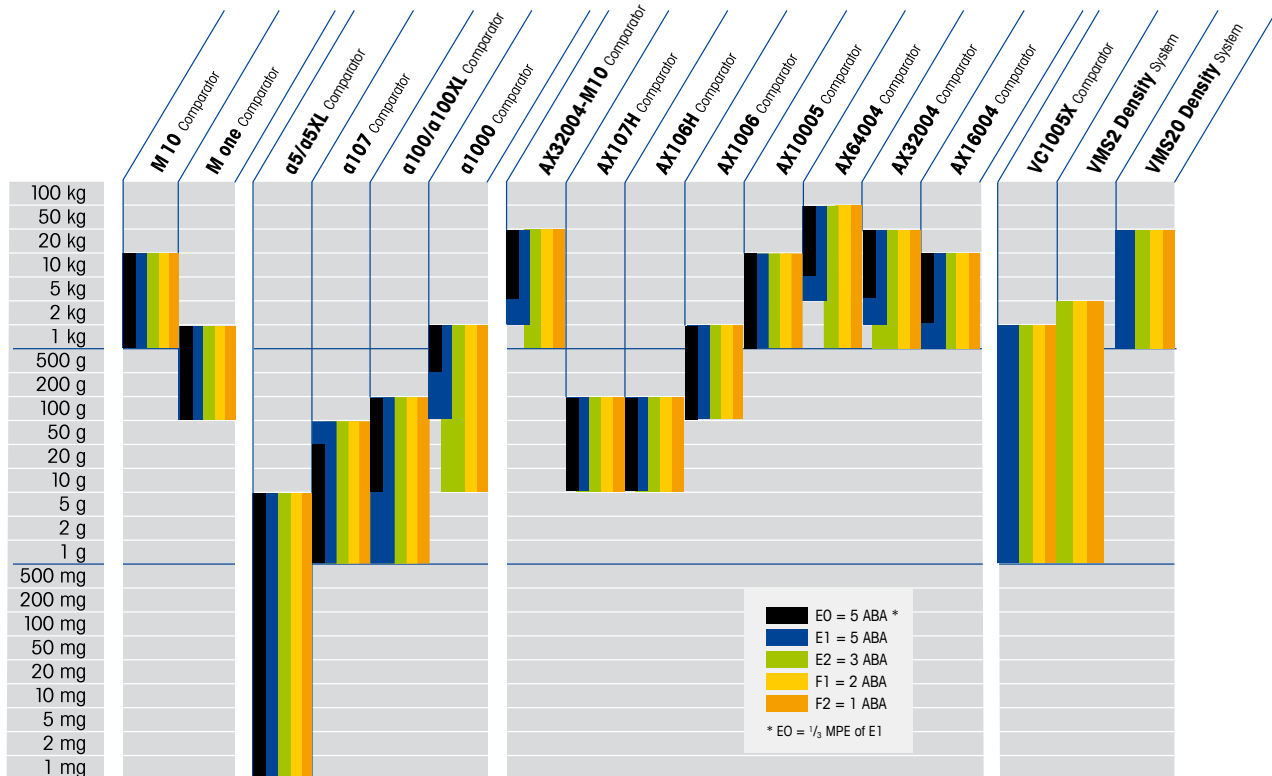
- Number of repetitions according realistic OIML calibration processes for
E1: 5 ABA,
E2: 3 ABA,
F1: 2 ABA,
F2 - M3: 1 ABA
- Repeatability depends on Weight Mass

Tolerance Limits – The maximum possible errors on verification for conventional masses are:

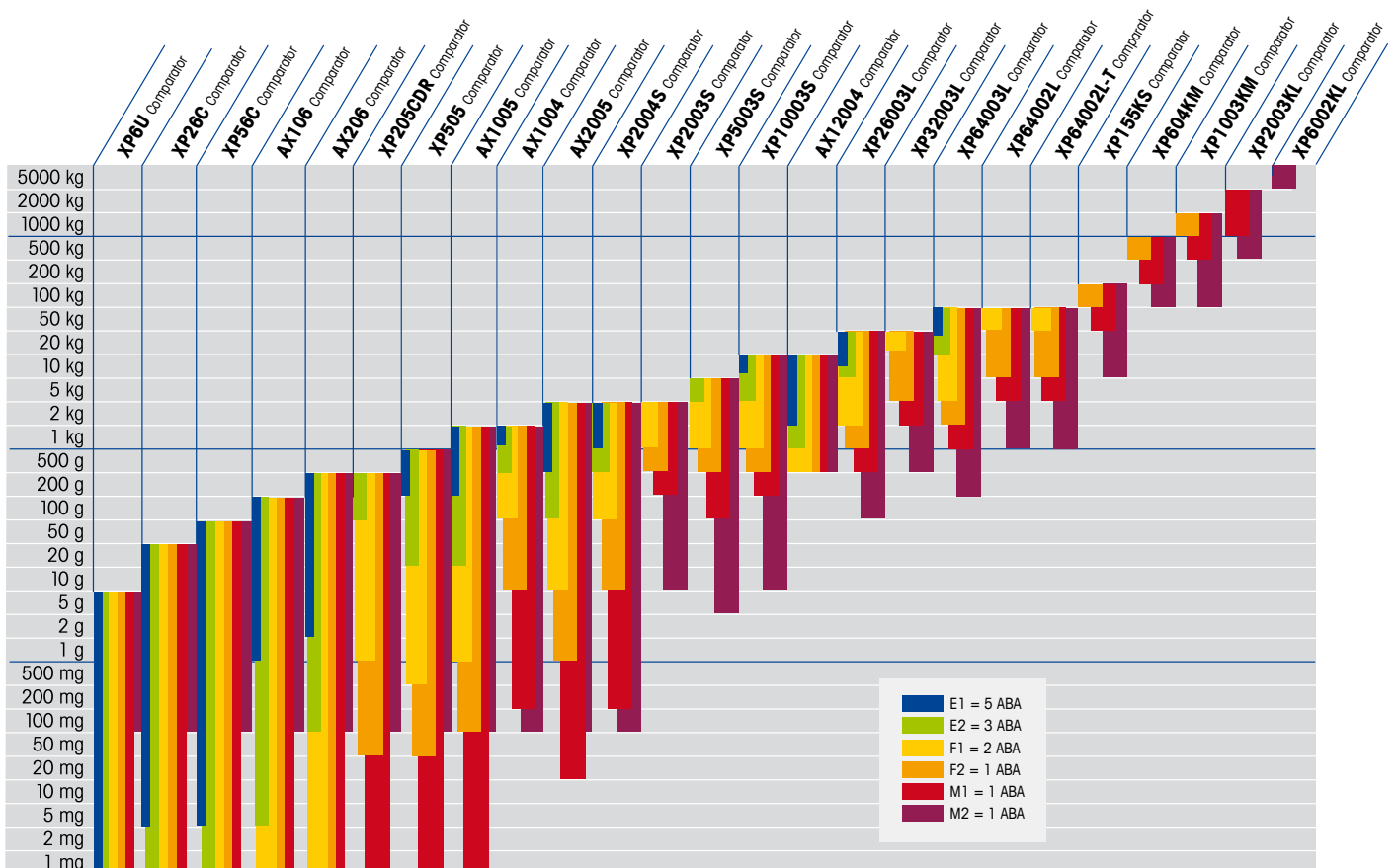
Weight	E1 ± mg	E2 ± mg	F1 ± mg	F2 ± mg	M1 ± mg	M2 ± mg	M3 ± mg
1 mg	0.003	0.006	0.02	0.06	0.2		
2 mg	0.003	0.006	0.02	0.06	0.2		
5 mg	0.003	0.006	0.02	0.06	0.2		
10 mg	0.003	0.008	0.025	0.08	0.5		
20 mg	0.003	0.01	0.03	0.1	0.3		
50 mg	0.004	0.012	0.04	0.12	0.4		
100 mg	0.005	0.016	0.05	0.16	0.5	1.6	
200 mg	0.006	0.02	0.06	0.2	0.6	2	
500 mg	0.008	0.025	0.08	0.25	0.8	2.5	
1 g	0.01	0.03	0.1	0.3	1	3	10
2 g	0.012	0.04	0.12	0.4	1.2	4	12
5 g	0.016	0.05	0.16	0.5	1.6	5	16
10 g	0.02	0.06	0.2	0.6	2	6	20
20 g	0.025	0.08	0.25	0.8	2.5	8	25
50 g	0.03	0.10	0.3	1	3	10	30
100 g	0.05	0.16	0.5	1.6	5	16	50
200 g	0.1	0.3	1	3	10	30	100
500 g	0.25	0.8	2.5	8	25	80	250
1 kg	0.5	1.6	5	16	50	160	500
2 kg	1	3	10	30	100	300	1000
5 kg	2.5	8	25	80	250	800	2500
10 kg	5	16	50	160	500	1600	5000
20 kg	10	30	100	300	1000	3000	10000
50 kg	25	80	250	800	2500	8000	25000
100 kg		160	500	1600	5000	16000	50000
200 kg		300	1000	3000	10000	30000	100000
500 kg		800	2500	8000	25000	80000	250000
1000 kg		1600	5000	16000	50000	160000	500000
2000 kg			10000	30000	100000	300000	1000000
5000 kg			25000	80000	250000	800000	2500000

Comparator Application Ranges

The illustrations below show the calculated weighing ranges for OIML weights according OIML R111, as on the previous page specified, for simplified comparison of performance and weighing ranges of different models. To select the right Comparator just take the OIML Class of your Test Weights and the weighing ranges you are willing to calibrate and look them up on the tables below.



Vacuum, Robotic, Automated, and Volume Comparators



Manual Comparators



	M_one Comparator	M_10 Comparator	a5 Comparator a5XL	a107 Comparator	a100 Comparator a100XL	a1000 Comparator
Article No.	On request	On request	11107540 11147560	11107547	11107541 11147660	11107542
OIML Calibration Range E0	100 g – 1 kg	1 kg – 10 kg	1 mg – 5 g	1 g – 20 g	10 g – 100 g	500 g – 1 kg
OIML Calibration Range E1	100 g – 1 kg	1 kg – 10 kg	1 mg – 5 g	1 g – 50 g	1 g – 100 g	100 g – 1 kg
OIML Calibration Range E2	100 g – 1 kg	1 kg – 10 kg	1 mg – 5 g	1 g – 50 g	1 g – 100 g	10 g – 1 kg
OIML Calibration Range F1	100 g – 1 kg	1 kg – 10 kg	1 mg – 5 g	1 g – 50 g	1 g – 100 g	10 g – 1 kg
OIML Calibration Range F2	100 g – 1 kg	1 kg – 10 kg	1 mg – 5 g	1 g – 50 g	1 g – 100 g	10 g – 1 kg
Maximum load	1001.5 g	10011 g	6.1 g	111 g	111 g	1109 g
Readability	0.1 µg	1 µg	0.1 µg	0.1 µg	1 µg	10 µg
Repeatability at nominal load (5x ABA, measured at)	0.5 µg	8 µg	0–1 g: 0.15 µg 1–2 g: 0.25 µg 2–5 g: 0.4 µg	1 µg	1.6 µg	10 µg
Repeatability typical ABA	0.3 µg	4 µg	0–1 g: 0.05 µg 1–2 g: 0.25 µg 2–5 g: 0.35 µg	0.9 µg	1.3 µg	5 µg
Electrical weighing range	1.5 g	11 g	0...6.1 g	0...11 g	0...11 g	0...109 g
Dial weights	External	External	-	50, 30, 10, 10 g	50, 30, 10, 10 g	500, 300, 100, 100 g
Linearity (electrical weighing range)	2 µg	±8 µg	±4 µg	±8 µg	±8 µg	±12 µg
Eccentric load deviation (at test load)	0.0 ng (1 g)	0.0 ng (10 g)	0.0 ng (5 g)	0.0 µg (10 g)	0.0 µg (10 g)	0.0 µg (100 g)
Settling time*	30 s	30 s	20 s	30 s	20 s	20 s
Adjustment built-in	Motorized	Motorized	Motorized	Motorized	Motorized	Motorized
Adjustment with external weight	1 g	10 g	5 g	10 g	10 g	100 g
Standard Equipment						
Weight handler	Turntable, 4 or 6 positions	Turntable, 4 positions	3-axis robot	3-axis robot	3-axis robot	3-axis robot
Weight magazin	-	-	36 positions 100 positions	30 positions	30 positions 56 positions	18 positions
Software and controller	Windows®, standard	Windows®, standard	Windows®, standard	Windows®, standard	Windows®, standard	Windows®, standard
Vacuum chamber	Round bell jar	Round bell jar	-	-	-	-
Draft shield	-	-	Motorized	Motorized	Motorized	Motorized
Self centering pan	Integrated	Integrated	-	-	-	-
Weighing pan	Hanging pan	Hanging pan	Fork-shaped	Fork-shaped	Fork-shaped	Fork-shaped
SmartScreen	Touchscreen	Touchscreen	Touchscreen	Touchscreen	Touchscreen	Touchscreen
SmartSens	Standard	Standard	Standard	Standard	Standard	Standard
LevelControl	-	-	-	-	-	-
Separate display	Standard	Standard	Standard	Standard	Standard	Standard
Admissible Ambient Conditions						
Temperature (°C)	17–27	17–27	17–27	17–27	17–27	17–27
Max. temperature change (°C /12h)	0.1	0.1	0.5	0.5	0.5	0.5
Relative humidity (%)	45–60	45–60	45–60	45–60	45–60	45–60
Dimensions						
Balance (WxDxH, mm)	4-Pl.: 274x409x620 6-Pl.: 344x440x620	315x720x850	1430x890x1730 1680x320x1855	1430x890x1730	1430x890x1730 1680x320x1855	1430x890x1730
Display unit (WxDxH, mm)	226x370x155	226x370x155	224x366x94	224x366x94	224x366x94	224x366x94
Balance weight (kg)	300	350	290	290	290	290
Object diameter (D, mm)	Cylindrical: 22–90 mm Spherical: 40–100 mm	Cylindrical: 18–105 mm Spherical: 18–110 mm	Cylindrical: 4–14 mm Wire weight: 5.5–18 mm Sheet weight: 4–14 mm	6–26 mm	6–26 mm	10–60 mm
Object height (H, mm)	100 mm	195 mm	Cylindrical: 16 mm Wire weight: 6 mm	50 mm	50 mm	85 mm
Control unit for weight handler (WxDxH, mm)	202x197x92	202x197x92	-	-	-	-
Vacuum chamber (WxDxH, mm)	684x884x930	684x884x930	-	-	-	-
Rack for control & display unit	Optional	Optional	-	-	-	-

*Shortest settling time of weighing pan



AX32004-M10 Comparator	AX107H Comparator	AX106H Comparator	AX1006 Comparator	AX10005 Comparator	AX16004 Comparator	AX32004 Comparator	AX64004 Comparator
11116962	11115765	11115755	11115725	11115785	11115815	11115845	11115875
5 kg – 20 kg	10 g – 100 g	10 g – 100 g	100 g – 1 kg	1 kg – 10 kg	2 kg – 10 kg	5 kg – 20 kg	10 kg – 50 kg
2 kg – 20 kg	10 g – 100 g	10 g – 100 g	100 g – 1 kg	1 kg – 10 kg	1 kg – 10 kg	2 kg – 20 kg	5 kg – 50 kg
1 kg – 20 kg	10 g – 100 g	10 g – 100 g	100 g – 1 kg	1 kg – 10 kg	1 kg – 10 kg	1 kg – 20 kg	1 kg – 50 kg
1 kg – 20 kg	10 g – 100 g	10 g – 100 g	100 g – 1 kg	1 kg – 10 kg	1 kg – 10 kg	1 kg – 20 kg	1 kg – 50 kg
1 kg – 20 kg	10 g – 100 g	10 g – 100 g	100 g – 1 kg	1 kg – 10 kg	1 kg – 10 kg	1 kg – 20 kg	1 kg – 50 kg
21260 g	111 g	111 g	1011 g	10011 g	16260 g	32260 g	64260 g
0.1 mg	0.1 µg	1 µg	1 µg	10 µg	0.1 mg	0.1 mg	0.1 mg
0.2 mg	0.8 µg	1.5 µg	2 µg	20 µg	0.2 mg	0.2 mg	0.4 mg
0.1 mg	0.6 µg	1.2 µg	1.5 µg	15 µg	0.1 mg	0.1 mg	0.2 mg
0...260 g	0...11 g	0...11 g	0...11 g	0...11 g	0...260 g	0...260 g	0...260 g
0.25, 0.25, 0.25, 0.25, 0.5, 0.5, 2, 2, 2, 4, 4, kg	50, 30, 10, 10 g	50, 30, 10, 10 g	500, 300, 100, 100, 50, 30, 10, 10 g	5, 3, 1 kg	0.25, 0.25, 0.25, 0.25, 0.5, 0.5, 2, 2, 2, 4, 4 kg	0.25, 0.25, 0.25, 0.25, 0.5, 0.5, 2, 2, 2, 8, 8, 4, 4, kg	0.25, 0.25, 0.25, 0.25, 0.5, 0.5, 2, 2, 2, 8, 8, 8, 8, 8, 8 kg
±0.5 mg	±8 µg	±8 µg	±8 µg	±0.05 mg	±0.5 mg	±0.5 mg	±0.5 mg
0.0 mg (260 g)	0.0 ng (10 g)	0.0 µg (10 g)	0.0 µg (10 g)	0.0 µg (10 g)	0.0 mg (260 g)	0.0 mg (260 g)	0.0 mg (260 g)
20 s	10 s	10 s	10 s	15 s	25 s	25 s	25 s
Motorized	Motorized	Motorized	Motorized	Motorized	Motorized	Motorized	Motorized
200 g	10 g	10 g	10 g	10 g	200 g	200 g	200 g
3-axis robot	Turntable, 4 positions	Turntable, 4 positions	Turntable, 4 positions	Turntable, 4 positions	Turntable, 4 positions	Turntable, 4 positions	Turntable, 4 positions
10 positions	–	–	–	–	–	–	–
Windows®, standard	Windows®, standard	Windows®, standard	Windows®, standard	Windows®, standard	Windows®, standard	Windows®, standard	Windows®, standard
–	–	–	–	–	–	–	–
Standard	Motorized	Motorized	Motorized	Standard	Standard	Standard	Standard
Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
LevelMatic	Hanging pan	Hanging pan	Hanging pan	Hanging pan	LevelMatic	LevelMatic	LevelMatic
Touchscreen	Touchscreen	Touchscreen	Touchscreen	Touchscreen	Touchscreen	Touchscreen	Touchscreen
Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
–	–	–	–	–	–	–	–
Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
17–27	17–27	17–27	17–27	17–27	17–27	17–27	17–27
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
45–60	45–60	45–60	45–60	45–60	45–60	45–60	45–60
2700x1400x2158	346x514x432	346x514x432	346x514x432	315x720x850	1200x1200x1500	1200x1200x1500	1200x1200x1500
224x366x94	226x370x155	226x370x155	226x370x155	226x370x155	224x366x94	224x366x94	224x366x94
480	23	23	25	85	290	290	290
Cylindrical: 48–200 Block weights: 234x200	8–30 mm	8–30 mm	12–60 mm	16–110 mm	40–340 mm	40–340 mm	40–340 mm
235 mm	70 mm	70 mm	95 mm	200 mm	350 mm	350 mm	350 mm
–	226x370x155	226x370x155	226x370x155	226x370x155	–	–	–
–	–	–	–	–	–	–	–
Standard	–	–	–	–	Standard	Standard	Standard

Important

The stated specifications and technical data apply only under good ambient conditions. Disruptive factors at the place of installation such as strong drafts (especially from air conditioning equipment), excessive vibrations, physical effects of the items being weighed (e.g. magnetic fields or electrostatic charges), or ambient conditions outside the allowable tolerances, may have adverse effects on the specifications.



	XP6U Comparator	XP26C Comparator	XP56C Comparator	AX106 Comparator	AX206 Comparator	XP505 Comparator
Article No.	11122400	11106022	11106023	11115635	11115935	11140137
OIML Calibration Range E1	1 mg – 5 g	50 mg – 20 g	50 mg – 50 g	1 g – 100 g	2 g – 200 g	200 g – 500 g
OIML Calibration Range E2	1 mg – 5 g	1 mg – 20 g	1 mg – 50 g	50 mg – 100 g	100 mg – 200 g	20 g – 500 g
OIML Calibration Range F1	1 mg – 5 g	1 mg – 20 g	1 mg – 50 g	1 mg – 100 g	1 mg – 200 g	500 mg – 500 g
OIML Calibration Range F2	1 mg – 5 g	1 mg – 20 g	1 mg – 50 g	1 mg – 100 g	1 mg – 200 g	50 mg – 500 g
OIML Calibration Range M1	1 mg – 5 g	1 mg – 20 g	1 mg – 50 g	1 mg – 100 g	1 mg – 200 g	1 mg – 500 g
OIML Calibration Range M2	100 mg – 5 g	100 mg – 20 g	100 mg – 50 g	100 mg – 100 g	100 mg – 200 g	100 mg – 500 g
Maximum load	6.1 g	22 g	52 g	111 g	211 g	520 g
Readability	0.1 µg	1 µg	1 µg	1 µg	1 µg	0.01 mg
Repeatability at nominal load (5x ABA, measured at)	0.35 µg (6 g)	1.5 µg (20 g)	3 µg (50 g)	3 µg (100 g)	4 µg (200 g)	0.035 mg (500 g)
Repeatability at low load (5x ABA, measured at)	0.2 µg (0.2 g)	0.7 µg (1g)	0.7 µg	–	–	0.01 mg (50 g)
Repeatability typical ABA	0.15 µg + 1.7E ⁻⁰⁸ • Rgr	0.5 µg + 4x10 ⁻⁸ • Rgr	0.5 µg + 4x10 ⁻⁸ • Rgr	2 µg (100 g)	2.5 µg (200 g)	0.008 mg + 4.5x10 ⁻⁰⁸ • Rgr
Electrical weighing range	0...6.1 g	0...22 g	0...52 g	0...11 g	0...11 g	520 g
Dial weights	–	–	–	50, 30, 10, 10 g	50, 30, 10, 10 g; 100 g disc weight	–
Linearity (electrical weighing range)	4 µg (6 g)	±0.006 mg	±0.02 mg	±8 µg	±8 µg	0.2 mg
Eccentric load deviation (at test load)	2 µg (2 g)	0.00 mg (20 g)	0.00 mg (50 g)	0.0 µg (10 g)	0.0 µg (10 g)	0.2 mg (200 g)
Settling time*	≤ 15 s	3.5 s	3.5 s	5 s	5 s	5 s
Adjustment built-in	ProFACT	ProFACT	ProFACT	ProFACT	ProFACT	ProFACT
Adjustment with external weight	1...6 g	5...20 g	10...50 g	10 g	10 g	100...500 g
Standard Equipment						
Application software	Weighing	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom
Draft shield	Motorized	2 x motorized	2 x motorized	Motorized	Motorized	Motorized
Self centering pan	–	Hanging pan	Hanging pan	Hanging pan	Hanging pan	–
Below the balance weighing	Standard	Standard	Standard	Standard	Standard	Standard
Weighing pan	Round & grid pan	Hanging & grid pan	Hanging & grid pan	Hanging	Hanging	Grid Pan
SmartScreen	Color touchscreen	Color touchscreen	Color touchscreen	Touchscreen	Touchscreen	Color touchscreen
SmartSens	Standard	Standard	Standard	Standard	Standard	Standard
LevelControl	–	Standard	Standard	–	–	Standard
Separate display	Standard	Standard	Standard	Standard	Standard	Standard
Admissible Ambient Conditions						
Temperature (°C)	10...30	10...30	10...30	10...30	10...30	10...30
Max. temperature change (°C /12h)	0.5	0.5	0.5	0.5	0.5	0.5
Relative humidity (%)	40–70	40–70	40–70	40–70	40–70	40–70
Dimensions						
Balance (WxDxH, mm)	128 x 287 x 113	263 x 487 x 322	263 x 487 x 322	241 x 353 x 291	241 x 353 x 291	263 x 487 x 322
Display unit (WxDxH, mm)	224 x 366 x 94	194 x 133 x 58	194 x 133 x 58	224 x 366 x 94	224 x 366 x 94	194 x 133 x 58
Weighing pan (mm)	∅ 14 Hook / 16	∅ 35 / 40 x 40	∅ 35 / 40 x 40	∅ 60 (45)	∅ 60 (45)	78 x 73
Balance weight (kg)	4.9 kg	11.5 kg	11.5 kg	13.5 kg	13.5 kg	10.0 kg
Object diameter (D, mm)	0...9 / 13	0...35	0...35	0...45	0...45	0...73
Object height (H, mm)	0...26 / 50	0...72 (235)	0...72 (235)	0...85 (120)	0...85 (120)	235

*Shortest settling time of weighing pan

Important

The stated specifications and technical data apply only under good ambient conditions. Disruptive factors at the place of installation such as strong drafts (especially from air conditioning equipment), excessive vibrations, physical effects of the items being weighed (e.g. magnetic fields or electrostatic charges), or ambient conditions outside the allowable tolerances, may have adverse effects on the specifications.



AX1004/1005 Comparator AX2005 Comparator



XP2003S Comparator



XP2004S Comparator



XP5003S Comparator



XP10003S Comparator



AX12004 Comparator

11115695 / 11115665	11115975	11130120	11130124	11130121	11130122	11137811
1 kg / 200 g – 1 kg	500 g – 2 kg	–	1 kg – 2 kg	–	10 kg	2 kg – 10 kg
500 g – 1 kg / 20 g – 1 kg	100 g – 2 kg	–	500 g – 2 kg	5 kg	5 kg – 10 kg	1 kg – 10 kg
100 g – 1 kg / 1 g – 1 kg	10 g – 2 kg	1 kg – 2 kg	100 g – 2 kg	1 kg – 5 kg	1 kg – 10 kg	500 g – 10 kg
10 g – 1 kg / 1 mg – 1 kg	1 g – 2 kg	500 g – 2 kg	10 g – 2 kg	200 g – 5 kg	500 g – 10 kg	200 g – 10 kg
200 mg – 1 kg / 1 mg – 1 kg	1 g – 2 kg	200 g – 2 kg	200 mg – 2 kg	100 g – 5 kg	200 g – 10 kg	100 g – 10 kg
100 mg – 1 kg	1 g – 2 kg	10 g – 2 kg	100 mg – 2 kg	5 g – 5 kg	10 g – 10 kg	100 g – 10 kg
1109 g	2109 g (min. 998 g)	2300 g	2300 g	5100 g	10100 g	12111 g
0.1/0.01 mg	0.01 mg	1 mg	0.1 mg	1 mg	1 mg	0.1 mg
0.07/0.02 mg (1kg)	0.04 mg (2kg)	1 mg (2 kg)	0.1 mg (2 kg)	0.8 mg (5 kg)	1 mg (10 kg)	0.25 mg (10 kg)
–	–	0.8 mg (100 g)	0.08 mg (100 g)	0.6 mg (200 g)	0.8 mg (500 g)	–
0.05/0.015 mg (1kg)	0.025 mg (2kg)	0.6mg + 9x10 ⁻⁸ • Rgr	0.06mg + 9x10 ⁻⁹ • Rgr	0.4mg + 4x10 ⁻⁸ • Rgr	0.6mg + 1.7x10 ⁻⁸ • Rgr	0.15 mg (10 kg)
0...109 g	0...109 g	0...2300 g	0...2300 g	0...5100 g	0...10100 g	0...111 g
500, 300, 100, 100 g	500, 300, 100, 100 g	–	–	–	–	5, 3, 2, 1, 1 kg
±0.15/0.12 mg	±0.12 mg	±5 mg	±1 mg	±3 mg	±7 mg	±0.6 mg
0.0 µg (100 g)	0.0 µg (100 g)	4.0 mg (1 kg)	0.0 mg (1 kg)	0.0 mg (2 kg)	0.0 mg (5 kg)	0.0 mg (10 kg)
5 s	5 s	3.5 s	3.5 s	3.5 s	3.5 s	10 s
ProFACT	ProFACT	proFACT	proFACT	proFACT	proFACT	Built in 100g E2
100 g	100 g	1...2 kg	1...2 kg	1...5 kg	2...10 kg	100 g
Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom
Motorized	Motorized	Standard	Standard	Standard	Standard	Standard
Hanging pan	Hanging pan	Optional	LevelMatic	LevelMatic	LevelMatic	Hanging pan
Standard	Standard	Standard	Standard	Standard	Standard	–
Hanging	Hanging	Square	LevelMatic	LevelMatic	LevelMatic	Hanging
Touchscreen	Touchscreen	Color touchscreen	Color touchscreen	Color touchscreen	Color touchscreen	Touchscreen
Standard	Standard	Standard	Standard	Standard	Standard	Standard
–	–	Standard	Standard	Standard	Standard	–
Standard	Standard	Standard	Standard	Standard	Standard	Standard
10...30	10...30	10...30	10...30	10...30	10...30	10...30
0.5	0.5	0.5	0.5	0.5	0.5	0.5
40–70	40–70	40–70	40–70	40–70	40–70	40–70
241 x 353 x 291	241 x 353 x 291	214 x 260 x 363	214 x 260 x 363	214 x 260 x 363	390 x 480 x 620	837 x 614 x 952
224 x 366 x 94	224 x 366 x 94	194 x 133 x 58	194 x 133 x 58	194 x 133 x 58	194 x 133 x 58	224 x 366 x 94
∅ 100	∅ 100	125x125	∅ 130	∅ 130	∅ 130	∅ 220
13.5 kg	13.5 kg	8.3 kg	8.3 kg	8.3 kg	17.2 kg	62.5 kg
0...80	0...80	0...125	0...130	0...130	0...130	34...220
0...135	0...135	0...248	0...228	0...228	0...335	0...230



XP26003L Comparator

XP64003L Comparator



XP32003L Comparator

XP64002L Comparator

Article No.	11120685	11120687	11120686	11120688
OIML Calibration Range E1	20 kg	50 kg	–	–
OIML Calibration Range E2	10 kg – 20 kg	20 kg - 50 kg	20 kg	50 kg
OIML Calibration Range F1	2 kg – 20 kg	5 kg - 50 kg	20 kg	50 kg
OIML Calibration Range F2	1 kg – 20 kg	2 kg - 50 kg	5 kg – 20 kg	10 kg – 50 kg
OIML Calibration Range M1	500 g – 20 kg	1 kg - 50 kg	2 kg – 20 kg	5 kg – 50 kg
OIML Calibration Range M2	100 g – 20 kg	200 g - 50 kg	500 g – 20 kg	1 kg – 50 kg
Maximum load	26.1 kg	64.1 kg	32.1 kg	64.1 kg
Readability	1 mg	5 mg	5 mg	10 mg
Repeatability at nominal load (5x ABA, measured at)	3 mg (26 kg)	8 mg (60 kg)	10 mg (30 kg)	25 mg(60 kg)
Repeatability at low load (5x ABA, measured at)	2 mg (1kg)	4 mg (5 kg)	5 mg (2 kg)	10 mg (5 kg)
Repeatability typical ABA	1.5mg + 6x10 ⁻⁵ •Rgr	3.5 mg + 8x10 ⁻⁵ •Rgr	4 mg + 2x10 ⁻⁷ •Rgr	8 mg + 3x10 ⁻⁷ •Rgr
Electrical weighing range	0...26100 g	0...64100 g	0...32100 g	0...64100 g
Linearity (electrical weighing range)	±25 mg	±50 mg	±40 mg	±50 mg
Eccentric load deviation (at test load)	0.0 g (10 kg)	0.0 g (25 kg)	0.25 g (10 kg)	0.4 g (25 kg)
Settling time*	8 ...12 s	8 ...12 s	8 ...12 s	8 ...12 s
Adjustment built-in	proFACT	proFACT	proFACT	proFACT
Adjustment with external weight	5...25 kg	10...64 kg	5...30 kg	10...64 kg
Standard Equipment				
Application software	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom
Draft shield	Standard	Standard	Optional	Optional
Self centering pan	Integrated	Integrated	–	–
Below the balance weighing	Standard	Standard	Standard	Standard
Weighing pan	LevelMatic	LevelMatic	Square	Square
SmartScreen	Standard	Standard	Standard	Standard
SmartSens	Standard	Standard	Standard	Standard
LevelControl	Standard	Standard	Standard	Standard
Separate display	Standard	Standard	Standard	Standard
Admissible Ambient Conditions				
Temperature (°C)	10...30	10...30	10...30	10...30
Max. temperature change (°C/12h)	0.5	0.5	0.5	0.5
Relative humidity (%)	40–70	40–70	40–70	40–70
Dimensions				
Balance (WxDxH, mm)	360 x 280 x 185	360 x 280 x 185	360 x 280 x 130	360 x 280 x 130
Display unit (WxDxH, mm)	194 x 133 x 58	194 x 133 x 58	194 x 133 x 58	194 x 133 x 58
Weighing pan (mm)	∅ 220	∅ 220	360 x 280	360 x 280
Balance weight (kg)	15.7 kg	15.7 kg	10.7 kg	10.7 kg
Object diameter (D, mm)	0...220	0...220	0...280	0...280
Object height (H, mm)	0...395	0...395	–	–

* Shortest settling time of weighing pan

Important

The stated specifications and technical data apply only under good ambient conditions. Disruptive factors at the place of installation such as strong drafts (especially from air conditioning equipment), excessive vibrations, physical effects of the items being weighed (e.g. magnetic fields or electrostatic charges), or ambient conditions outside the allowable tolerances, may have adverse effects on the specifications.



XP64002L-T Comparator

XP155KS Comparator

XP604KM Comparator

XP1003KM Comparator

XP2003KL Comparator

XP6002KL Comparator

11120689	11120800	11120805	11120810	11120815	11120820
–	–	–	–	–	–
–	–	–	–	–	–
50 kg	–	–	–	–	–
10 kg – 50 kg	100 kg	500 kg	1000 kg	2000 kg	–
5 kg – 50 kg	50 kg – 100 kg	200 kg – 500 kg	500 kg – 1000 kg	1000 kg – 2000 kg	–
1 kg – 50 kg	100 kg – 500 kg	100 kg – 500 kg	100 kg – 1000 kg	500 kg – 2000 kg	5000 kg
64.1 kg	150 kg	600 kg	1100 kg	2500 kg	5400 kg
10 mg	0.05 g	0.1 g	0.5 g	1 g	10 g
30 mg (60 kg)	0.12 g (100 kg)	0.23 g (500 kg)	1.5 g (1000 kg)	7 g (2000 kg)	70 g (5000 kg)
15 mg (5 kg)	0.09 g (5 kg)	0.15 g (20 kg)	1 g (50 kg)	4 g (100 kg)	50 g (500 kg)
12 mg + 6x10 ⁻⁷ •Rgr	0.06 g + 3.2E-07•Rgr	0.11 g + 6.3E-08 •Rgr	0.6 g + 4.2E-07 •Rgr	3 g + 1.3E-06 •Rgr	40 g + 4.2E-06 •Rgr
0...64100 g	0...150 kg	0...600 kg	0...1100 kg	0...2500 kg	0...5400 kg
±50 mg	2 g	10 g	20 g	100 g	300 g
0.5 g (25 kg)	5 g (50 kg)	40 g (200 kg)	40 g (200 kg)	120 g (1000 kg)	240 g (2000 kg)
8 ...12 s	5 s	5 s	5 s	5 s	5 s
proFACT	proFACT	proFACT	proFACT	proFACT	proFACT
10...64 kg	50...150 kg	200...600 kg	200...1000 kg	500...2500 kg	1000...5000 kg
Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom	Weighing, WeighCom
–	Optional	Optional	Optional	Optional	Optional
–	Optional	Optional	Optional	Optional	Optional
–	–	–	–	–	–
Round	Square	Square	Square	Square	Square
Standard	Standard	Standard	Standard	Standard	Standard
Standard	Standard	Standard	Standard	Standard	Standard
Standard	–	–	–	–	–
integrated	Standard	Standard	Standard	Standard	Standard
10...30	10...30	10...30	10...30	10...30	10...30
0.5	1	1	1	1	1
40–70	40–70	40–70	40–70	40–70	40–70
845 x 445 x 295	800 x 600 x 130	1000 x 800 x 115	1000 x 800 x 115	1500 x 1250 x 182	1500 x 1250 x 182
194 x 133 x 58	194 x 133 x 58	194 x 133 x 58	194 x 133 x 58	194 x 133 x 58	194 x 133 x 58
∅ 220	800 x 600	1000 x 800	1000 x 800	1500 x 1250	1500 x 1250
22 kg	40 kg	91 kg	91 kg	353 kg	353 kg
0...220	0...600	0...800	0...800	0...1250	0...1250
–	–	–	–	–	–


VC1005X

VMS2

VMS20

Susceptometer S50-K

Article No.	11115965	30047443	30047444	11116880
OIML Calibration Range E0	–	–	–	–
OIML Calibration Range E1	1 g – 1 kg	–	1 kg – 20 kg	1 g – 50 kg
OIML Calibration Range E2	1 g – 1 kg	1 g – 2 kg	1 kg – 20 kg	1 g – 50 kg
OIML Calibration Range F1	1 g – 1 kg	1 g – 2 kg	1 kg – 20 kg	1 g – 50 kg
OIML Calibration Range F2	1 g – 1 kg	1 g – 2 kg	1 kg – 20 kg	1 g – 50 kg
OIML Calibration Range M1	–	–	–	1 g – 50 kg
Recommended comparator balance	build-in	XP2004S	XP26003L	XP6U, XP6 or XS3DU
Weight handler	Turntable, 4 positions	Manual, 1 position	Manual, 2 positions	–
Readability	10 µg	0.1 mg	1 mg	0.1 µg, 1 µg or 1/10 µg
Electrical range	109 g	2300 g	26100 g	6.1 g, 6.1 g or 0.8/3 g
Dial weights	500, 300, 100, 100 g	–	–	–
Disc weights (support weight <100 g)	4 pieces	–	–	–
Measuring time	15 s	15 s	15 s	15 s
External adjustment	100 g	1...2 kg	10...25 kg	5 g, 5 g or 2 g
Object diameter (D, mm)	12...94	6...70	45...140	≤ 260
Object height (H, mm)	1...94	5...130	70...270	≤ 500
Sphere diameter (mm)	12...94	–	–	–
Susceptometer Specific				
Dipole moment of magnets	–	–	–	≤0.1Am ²
Distance platform / center of magnet Z ₀	–	–	–	18.8...60.0
Magnetizing field strength (max.)	–	–	–	2000, 800, 200 A/m
Res. magnetization for 1 digit µT (E1)	–	–	–	≥ 0.001 / 0.01 / 0.1
Res. susceptibility x for 1 digit (E1)	–	–	–	≥ 0.000001 / 0.00001 / 0.0001
Operation				
Comparator balance	Standard, build-in	Optional	Optional	Optional
Operating software - user guided	Standard	Standard, Windows®	Standard, Windows®	Optional
Controller – storage of processes	Standard, Windows®	–	–	Optional
SmartGeo – weight geometries database	–	–	–	With optional software
Touchscreen with SmartSens	Standard	With XP Comparator	With XP Comparator	With XP Comparator
Precision thermometer	Standard	Standard	Standard	–
Fluid	Standard	–	–	–
Suceptometer hardware bridge	–	–	–	Standard
Low permeability /susceptibility reference	–	–	–	Optional
Admissible Ambient Conditions				
Temperature (°C)	17–27	17–27	17–27	17–27
Max. temperature change (°C/12 h)	0.5	0.5	0.5	0.5
Relative Humidity (%)	40–70	40–70	40–70	40–70
Dimensions				
Equipment (W x D x H, mm)	810 x 760 x 1500	380 x 810 x 890	765 x 1000 x 1840	270 x 360 x 160
Display unit (W x D x H, mm)	224 x 366 x 94	194 x 133 x 58	194 x 133 x 58	–
Equipment net weight	94 kg	44 kg	215 kg	5 kg

* Shortest settling time of weighing pan

Important

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Climate Stations



Klimet A30



ClimaLog 30

Temperature	Klimet A30	ClimaLog 30
Resolution	0.001 [°C]	0.1 [°C]
Range	15..25 [°C]	-20...50 [°C]
Accuracy	±0.05 [°C]	±0.3 [°C]

Relative humidity

Resolution	0.01 [%]	±0.5 [%]
Range	20..80 [%]	±2 [%]
Accuracy	±0.15 [%]	±2 [%]

Pressure

Resolution	0.001 [hPa]	0.1 [hPa]
Range	600...1060 [hPa]	±0.5% [hPa]
Accuracy	±0.04 [hPa]	±0.5% [hPa]

Klimet A30 sensing system includes

- Air pressure sensor
- Dew point mirror system
- Air temperature sensor
- 4 temperature sensor inputs
- Data logging software including
 - Air density calculation CIPM 81/91
 - Serial communication
 - Direct data link for specific METTLER TOLEDO mass comparator software

ClimaLog 30 sensing system includes

- Air pressure sensor
- Relative humidity sensor
- Air temperature sensor
- USB and LAN interface
- PC-Windows® software SmartGraph 3:
 - Graphical and numerical representation of measured values
 - Export-ready data in csv format
 - Data-recording mode

Optional for Klimet A30

- Pressure tight system Klimet A30V for special applications as vacuum (e.g. M_one)
- CO₂ content sensor calibrated
- Temperature sensor 2.5 m or 5.0 m cable length
- MCLink mass comparator control software for online air buoyancy correction

Optional for ClimaLog 30

- DKD calibration certificate
- Power over Ethernet (POE)

Special Weight Sets

for AX1006 (Part No. 222404)

Nominal weight	Contents
100 g	•
200 g	••
–	

for AX10005 (Part No. 222420)

Nominal weight	Contents
1 kg	•
2 kg	••
5 kg	•



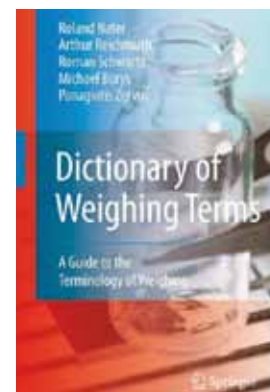
Special Weight Sets

Weight set for AX1006, for determination of the first weight decade kg to 100 g, comprising 2x200 g and 1x100 g disk weights.

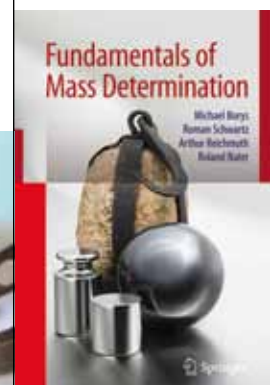
Weight set for AX10005, for determination of the first weight decade 1 kg to 10 kg, comprising 1x5 kg, 2x2 kg and 1x1 kg cylindrical weights.

Cumulated Expertise

We are happy to make our users technical experience as well as ours available to you.



Dictionary of Weighing Terms
A Practical Guide to the Terminology of Weighing.
(Part No. 11116539)



Fundamentals of Mass Determination
Compiled under the auspices of Prof. Dr. M. Kochsiek, Federal Institute of Physics and Technology PTB, Braunschweig and Berlin.
(Part No. 30043868)

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Environment management system under ISO 14001.

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With this mark we declare that our products comply with all applicable directives.