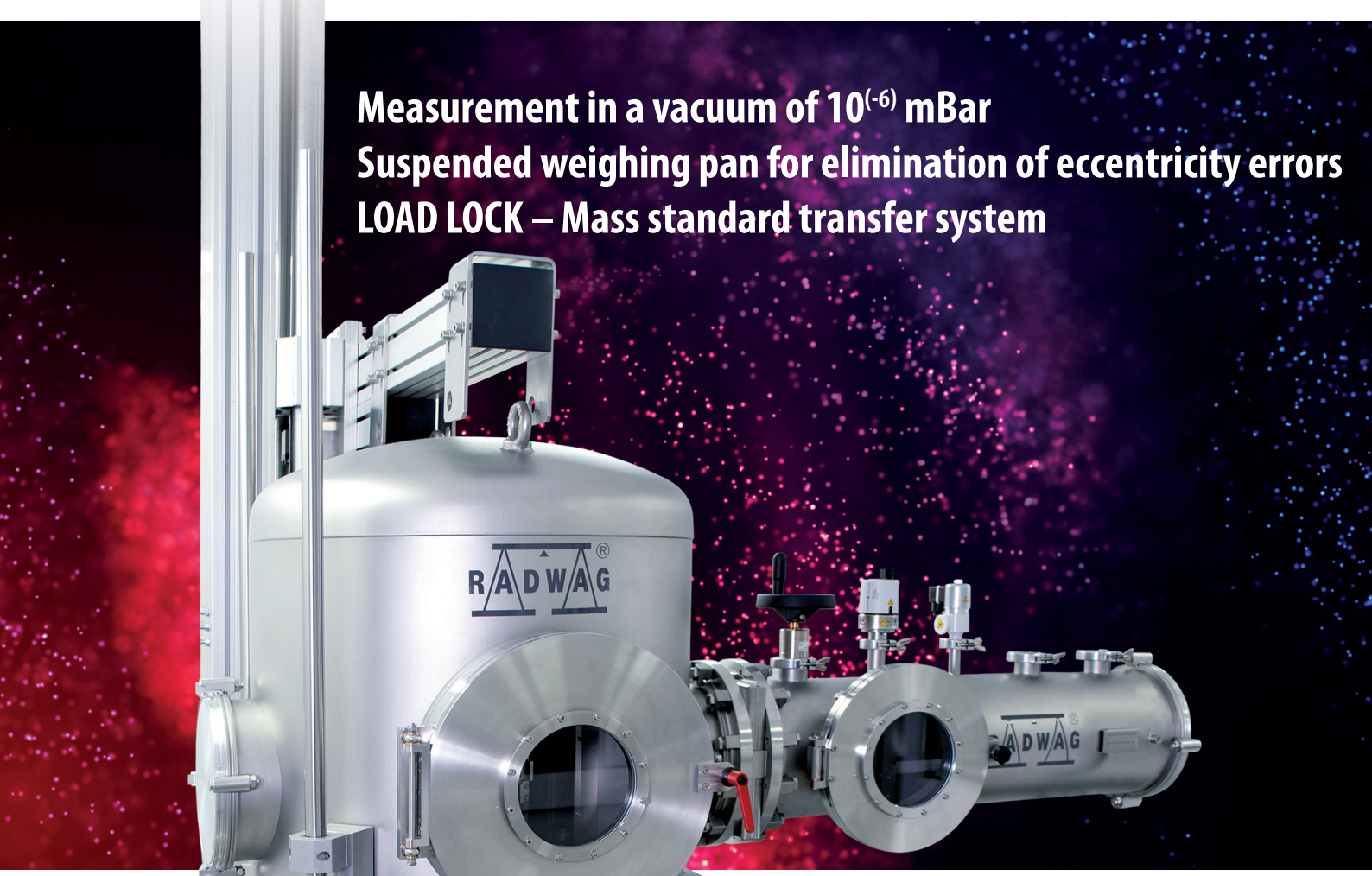
RADWAG BALANCES AND SCALES
ADVANCED WEIGHING TECHNOLOGIES

Measurement in a vacuum of $10^{(-6)}$ mBar
Suspended weighing pan for elimination of eccentricity errors
LOAD LOCK – Mass standard transfer system



AVK-1000 – Automatic Vacuum Mass Comparator

COMPARISON IN VACUUM WITH THE HIGHEST ACCURACY

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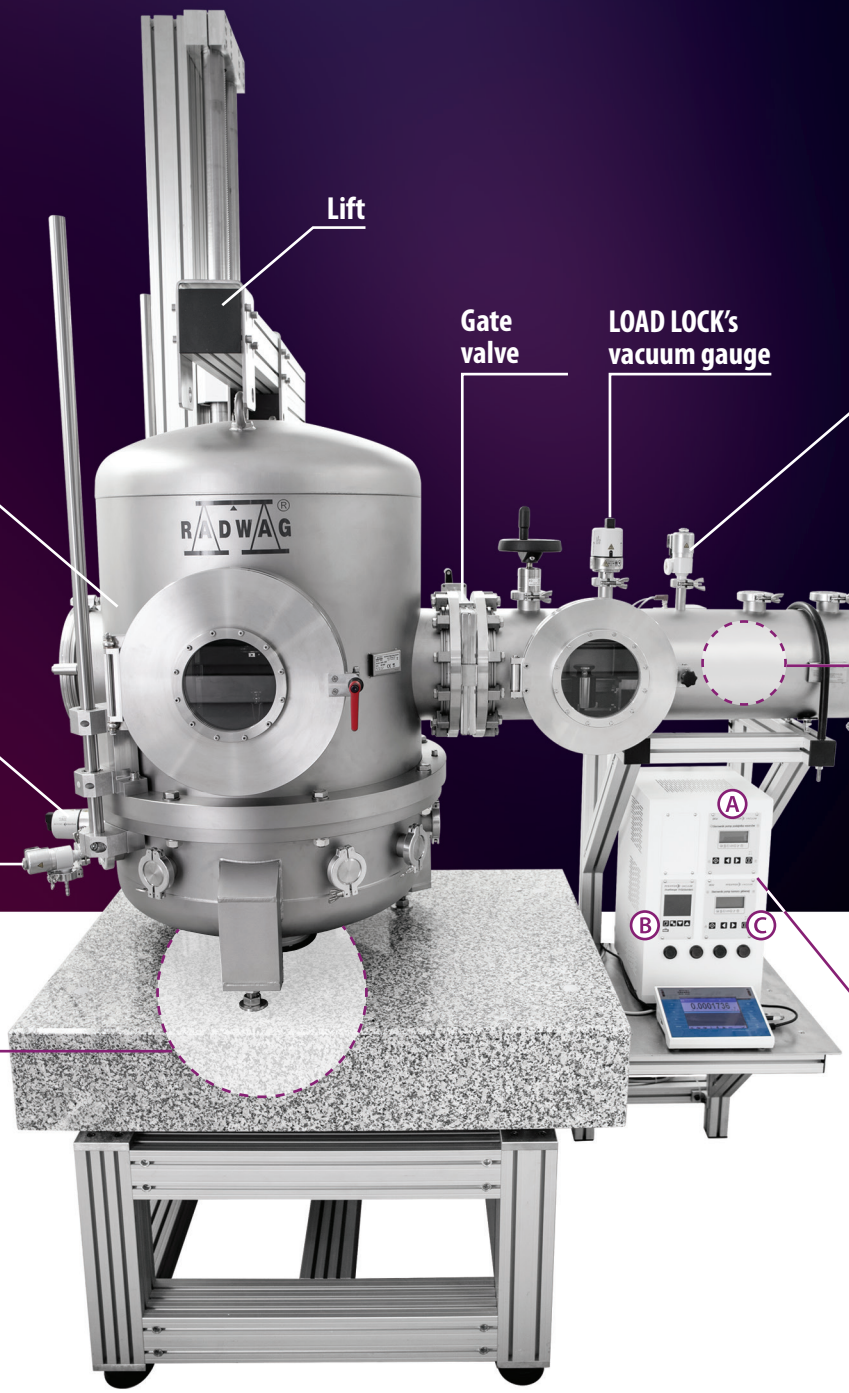
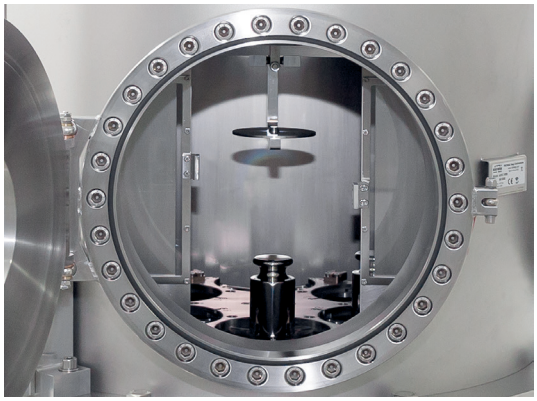
AVK-1000

Comparison in vacuum or noble gases

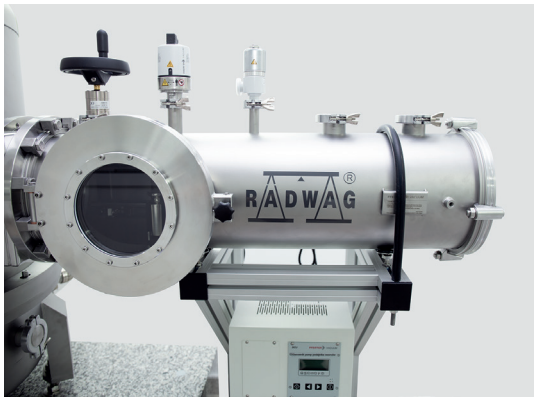
RADWAG-manufactured AVK-1000 automatic vacuum mass comparator is intended mainly for national metrological institutes that transport and maintain the national reference mass standard of 1 kg.

The comparator is intended for weighing mass standards and silicone spheres of 100 mm diameter. It enables comparison of up to 6 artefacts of maximum 1kg mass. The readability of the process is 0.1 µg. The comparator is placed inside a specially designed vacuum chamber which enables carrying out measurements in a vacuum of 10(-6) mBar capacity or in atmosphere containing noble gases.

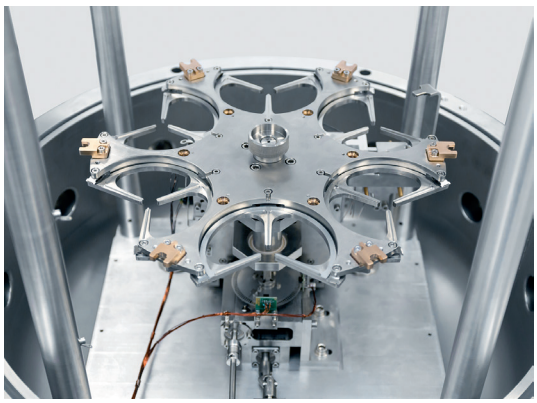




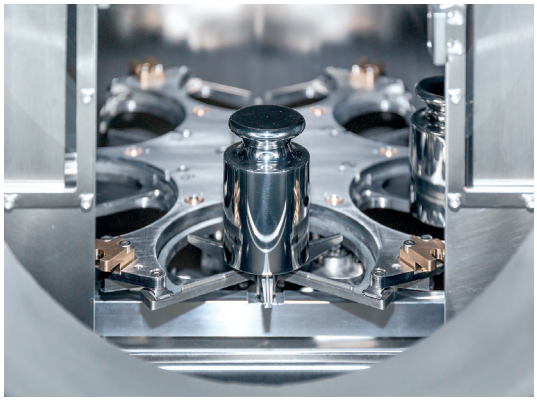
Used chamber enables comparison in vacuum of maximum $10^{(-6)}$ mBar or in noble gases such as argon.



The LOAD LOCK system for transfer of mass standards enables switching and adding artefacts without changing the atmosphere inside the main chamber.



The mass comparator features magazine for 6 cylindrical objects of Ø (22 - 95) x 110 mm or sphere objects of maximum diameter of Ø 100 mm.



Suspended weighing pan of custom design eliminates eccentricity errors and facilitates dropping the weight onto the magazine insert correctly.

Resolution of 10 billion units
Repeatability of 0.5 µg

Effective and Excellent Measurement
Resolution of 10 billion units plus elimination of human error and other external factors due to the use of vacuum chamber effectively prevent any potential errors that may occur during the measurement.

Mass Standard Maintenance
The AVK-1000 automatic vacuum mass comparator is mainly intended for national metrological institutes that transport and maintain the national reference mass standard of 1 kg.

Excellent Measurement Accuracy
The comparator enables comparison of up to 6 artefacts of cylinder or sphere shape, and of max 1 kg mass, with repeatability of 0.5 µg and readability of 0.1 µg. Thanks to a suspended weighing pan, the eccentricity error being an effect of incorrectly positioned mass standard is eliminated.

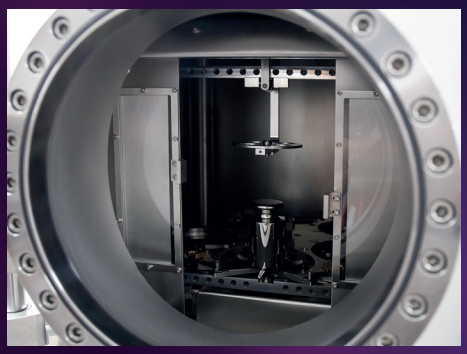
Vacuum Chamber Measurement
A specially designed vacuum chamber enables carrying out measurements in a vacuum of 10(-6) mBar capacity or in atmosphere containing noble gases, also in constant pressure upon closing the system with use of the top-class quality valves.

Ambient Conditions Monitoring
The AVK-1000 automatic mass comparator is equipped with a vacuum gauge and a thermo-hygro-barometer which enables ambient conditions monitoring to be carried out with very high accuracy (0.001 hPa for pressure, 0.01% for humidity and 0.001 °C for temperature).

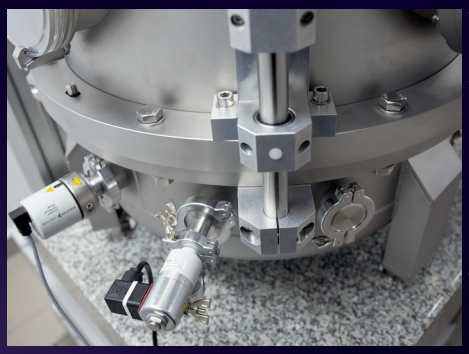
LOAD LOCK Mass Standard Transfer System
The system enables switching or adding artefacts without changing the atmosphere inside the main chamber. Use of mass standard transfer chamber reduces time required for obtaining the respective value of vacuum to ca. 4 hours. The LOAD LOCK is equipped with a high-efficiency pump system and a top-class vacuum gauge. A specially designed inspection hole enables monitoring of the whole transfer process. Supplementing the AVK-1000 vacuum mass comparator with LOAD LOCK system significantly improves the comparison performance.

Modular Construction
Mass comparator is a modular device therefore it can operate both with and without the LOAD LOCK system. Equipping the vacuum mass comparator with mass standard transfer system facilitates comparison optimisation.

Pump Separation
Mechanical design of the vacuum mass comparator and LOAD LOCK enables to place the pumps of the preliminary vacuum away from the mass comparator, this prevents transfer of vibrations onto the measuring device.



The mass comparator features second, integrated weighing pan. It is used to compensate mass during calibration of mass standards lighter than 1 kg.



The main chamber of mass comparator is equipped with 8 flanges (DN 40 ISO KF) for connecting devices such as vacuum gauge, solenoid valves, CO2 sensors etc. LOAD LOCK chamber features 2 such flanges.

AVK-1000

	AVK-1000
OIML calibration range E1	100 g ÷ 1 kg
OIML calibration range E2	100 g ÷ 1 kg
OIML calibration range F1	100 g ÷ 1 kg
OIML calibration range F2	100 g ÷ 1 kg
OIML calibration range M1	–
OIML calibration range M2	–
Maximum capacity [Max]	1002 g
Readability [d]	0.1 µg
Repeatability for nominal load *	0.5 µg
Stabilization time	60 s
Adjustment	External
Electric compensation range	−1 g ÷ + 2 g
External supplementary weights	500 g; 800 g; 900 g
Comparison object dimensions	Cylindrical ø (22-95) × 110 mm; spherical ø (40-100) mm
Magazine positions	6
Display	5.7″ colour resistive touch screen
Communication interfaces	2×USB-A, Ethernet, 2×RS 232, 4×IN, 4×OUT, Wi-Fi® ***
Operating temperature	+15 ÷ +30 °C
Operating temperature change rate	±0,1 °C / 12 h
Pressure in the vacuum chamber	10^{-6} mBar
Relative humidity **	45 ÷ 60%
Transport and storage temperature	−20 ÷ +50 °C
Weighing pan dimensions	ø 100 mm
Indicator dimensions (L×W×H)	206 × 140 × 70 mm
Overall dimensions (L×W×H)	1025 × 2600 × 1080 mm

*Repeatability in vacuum for model ambient conditions | **Non-condensing conditions | ***Wi-Fi® is a registered trademark of Wi-Fi Alliance.