



# PRODUCT Catalogue

LABORATORY BALANCES AND INDUSTRIAL SCALES







# Product Catalogue

LABORATORY BALANCES AND INDUSTRIAL SCALES

# Content

5	XA 4Y.M.A PLUS Microbalances
9	Ultra-Microbalances and Microbalances
28	XA 4Y.M Microbalances
30	XA 4Y.M.A.P PLUS Microbalances for Pipettes Calibration
32	Pipettes Calibration Workstation
35	Pipettes
39	XA 4Y.A PLUS Analytical Balances
43	4Y Series Balances
59	X2 Series Balances
71	R Series Balances
82	PS M High Capacity Precision Balances
85	PM High Capacity Precision Balances
90	PA-04/H Automatic Feeder
92	Defined Weighing Profiles
94	USB Free Link
97	THBR 2.0 Ambient Conditions Monitoring System
101	Moisture Analyzers
120	PMV Microwave Moisture Analyzer
123	Mass Comparators
142	RMC Robotic Mass Comparator
145	AVK-1000 Automatic Vacuum Mass Comparator
149	AGV-4 Automatic Comparator for Determination of Mass Standard's Density



153	UMA Automatic Mass Comparator
157	SM Susceptometer
161	RMCS Radwag Mass Comparator System
165	Terminals and Scales Operated in Industry
170	C315 Platform Scales
172	PUE C32 Weighing Terminal
174	PUE 7.1 Weighing Terminal
176	PUE5 Weighing Terminal
178	HY10 Weighing Terminal
180	HX7 Weighing Terminal
183	HX7 Multifunctional Industrial Scales
190	HX 5.EX Indicator for Hazardous Areas
193	Weighing Solutions for Hazardous Areas
205	High Resolution Platforms and Weighing Modules
218	HRP High Resolution Platforms
220	MW Magnetolectric Weighing Module
222	MAS, MPS, and MUYA Magnetolectric Weighing Module
225	PGC Prepackaged Goods Control
229	Checkweighers
246	DWM HPS Sorting Checkweigher
248	DWM HPE Labelling Checkweigher
250	DWM HPX Checkweigher

Copyright © 2019 RADWAG Wagi Elektroniczne

RADWAG Balances and Scales

Toruńska 5, 26-600 Radom, Poland

Tel. +48 48 3866 000

E-mail: [export@radwag.com](mailto:export@radwag.com)

[www.radwag.com](http://www.radwag.com)

**New quality of small mass weighing**  
**Compliance with USP**  
**Extraordinary performance and operation ergonomics**



## XA 4Y.M.A PLUS Microbalances

INNOVATIVE SOLUTIONS OF THE SYNERGY LAB LINE

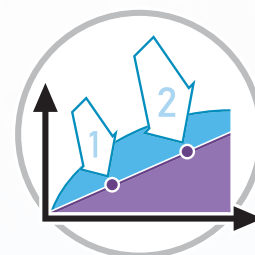


## Innovative solutions applied in SYNERGY LAB microbalances guarantee extraordinary precision of top-class measuring equipment



### Smart Min Weight

- automatic adjustment of range to the weighed mass
- improvement of the minimum sample weight by 30%



### 2-Point Adjustment

- repeatable weighing precision under variable ambient conditions

### Antistatic Ionizer

- electrostatic charge compensation inside the weighing chamber
- compensation of positive and negative ions
- operation signalled via LED diode



### Innovative System of Pressure Equalization

- guarantee of stable measurement
- elimination of errors generated by rapid change of pressure inside the weighing chamber

### Reflex Level System

- ground tilt test
- fully automatic levelling

### Feet of Brand New Design

- better balance stability
- protection against unfavourable level change

### Warnings System

- system warning against potential error occurrence during the weighing process
- sensors for constant monitoring of ambient conditions and level status





### 21 CFR Part 11 Compliance Module

All balances of XA 4Y.A PLUS series are compliant with 21 CFR part 11 regulations and with provisions of EU GMP part 4, annex 11. This means that they support electronic signature and are equipped with a number of security and monitoring functions that control work of particular operators.

#### Full Data Protection

- advanced password settings
- verification of log-in operation correctness
- assigning operators with individual permissions
- auto logout
- electronic signature, e.g. for series of measurements
- granting/denying access to data management
- data backup
- modifications saved to Audit Trail file



#### Completely antistatic weighing chamber

- discharge of electrostatic charges thanks to antistatic glass coating
- elimination of influence of electrostatics onto the weighing results

#### Functionality and Ease of Operation

- 5.7" colour touch panel
- simple and intuitive operation
- numerous weighings functions and applications



Parts counting



Statistics



Statistical quality control



Automatic sliding door



Ambient conditions measurement



Dosing



Animal weighing



Autotest



Cooperation with titrators



Moveable range



Checkweighing



Differential weighing



Density determination



GLP procedures



Replaceable unit



Formulations



Percent weighing



Pipettes calibration



Proximity sensors



Multilingual menu



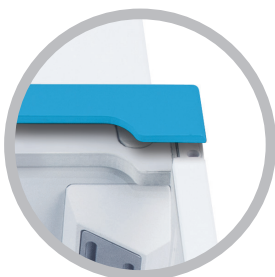
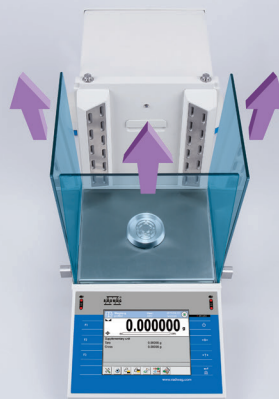
#### RadConnect

- mobile control of the balance
- preview of balance screen on a smartphone or a tablet
- on-line transfer of data from the balance
- iOS and Android app



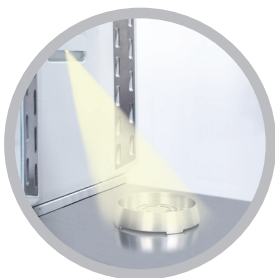
#### Wireless Communication

- wireless communication between the indicator and the weighing instrument enables operating the balance that is placed inside laminar flow hoods and fume cupboards



#### Removable Weighing Chamber

- fully removable weighing chamber components
- uncomplicated and fast disassembly requiring use of no tools
- latch-type system for components assembly
- easy maintenance and cleaning



#### Lit-Up Weighing Pan

- optional weighing pan lit up with use of a LED diode
- no influence onto the temperature in the weighing chamber



#### Automatic Door

- system of auto control of the weighing chamber door opening and closing
- possibility to define how wide the door is to be opened
- elimination of measurement-disturbing vibrations



**XA 4Y.M.A PLUS**



**XA 4Y.M.A.P PLUS**  
(for piston pipettes calibration)

## Technical Specifications

Maximum capacity [Max]	6 g – 52 g	6 g – 52 g
Readability [d]	1 µg – 5 µg	1 µg – 5 µg
Repeatability	1 µg – 2.5 µg	1 µg – 2.5 µg
Linearity	±7 µg – ±20 µg	±9 µg – ±20 µg
Minimum weight USP	2 mg – 5 mg	2.4 mg – 5 mg
Minimum weight	0.2 mg – 0.5 mg	0.24 mg – 0.5 mg
Stabilization time	~ 3.5 s	~ 3.5 s
Adjustment	internal (automatic)	internal (automatic)
Weighing pan dimensions	ø 30 mm (openwork)	ø 26 mm
Communication interfaces	2 × USB-A, 2 × RS 232, Ethernet, 4 × IN / 4 × OUT (digital), Wi-Fi®	

Repeatability is expressed as a standard deviation from 10 weighing cycles (for load value of 5% Max). | Wi-Fi® is a registered trademark of Wi-Fi Alliance.





# Ultra-Microbalances and Microbalances

Micro Scale Measurement – Laboratory Applications

# UYA 4Y Ultra-Microbalances MYA 4Y Microbalances

Extraordinary precision and comfort  
of operation for small mass measurement performed  
with the highest accuracy

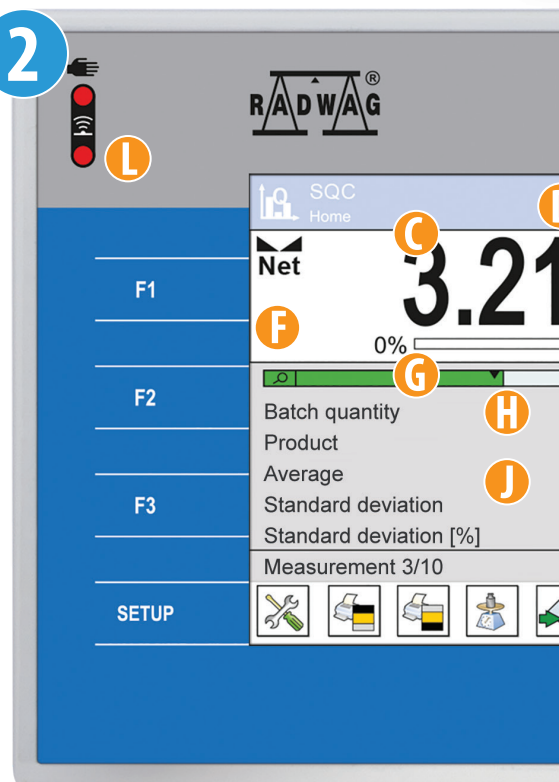
- 5.7" resistive colour touch screen
- Interactive menu
- Wi-Fi®
- Conformity with regulations (GLP, GMP System)
- Database (weighing records, samples, operators, reports)
- Dynamic control of sample weight (bargraph)
- Statistics, SQC
- Printouts, reports (PCL standard)
- Multilingual menu
- Interfaces: Ethernet (network applications), USB, RS 232, IN/OUT
- Wide spectrum of use (industry, laboratories, universities, research and development centres)

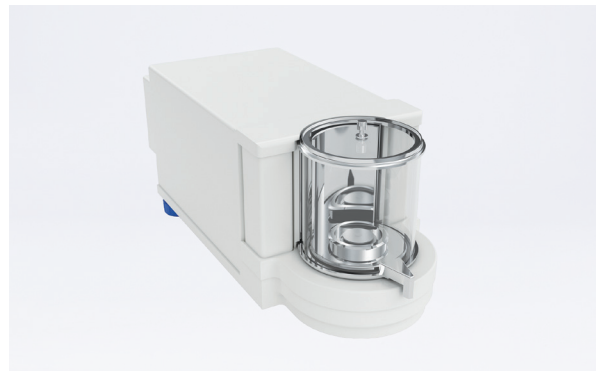
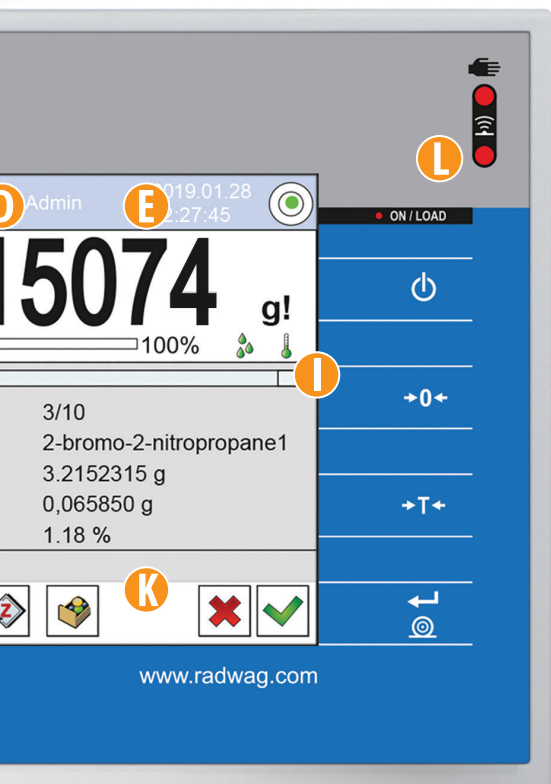
1



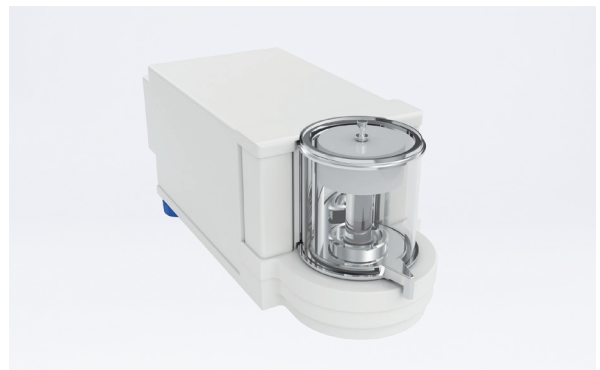
- 1 Weighing module
  - A Automatically opening draft shield
  - B Weighing pan
- 2 Terminal
  - C Information on a selected working mode and on an adopted profile
  - D Information on a logged in operator
  - E Area for date, time, connection type information, battery state, etc.
  - F Measurement indication area
  - G Load bar graph
  - H Checkweighing function bar graph (thresholds)
  - I Pictograms for ambient conditions monitoring
  - J Configurable area for extra information
  - K Quick access bar
  - L Proximity sensors (optimization of operation)

2





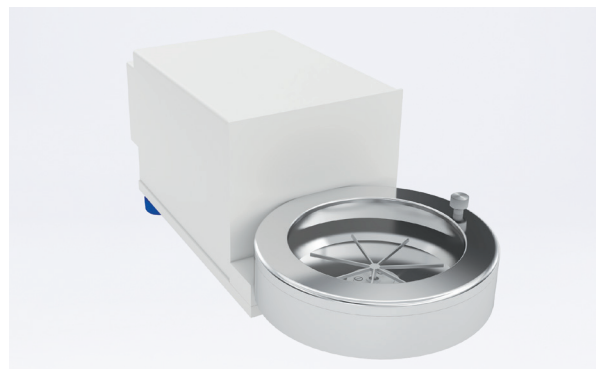
Standard design of UYA 4Y Ultra-microbalance and MYA 4Y Microbalance



MYA 4Y.P Microbalance for pipettes calibration



UYA 4Y.F Ultra-microbalances and MYA 4Y.F Microbalance for filters weighing



MYA 4Y.F1 Microbalance for weighing filters of large-diameter



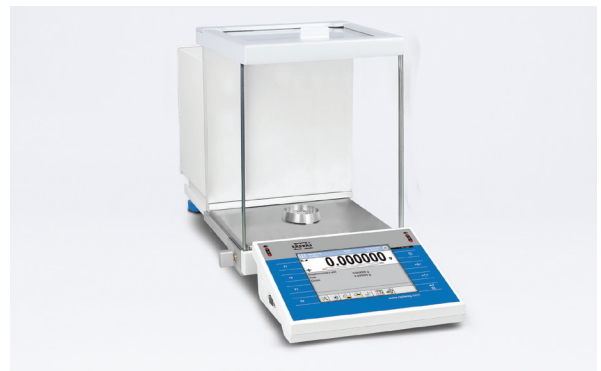
# XA 4Y.M Microbalances

Extraordinary precision and comfort of operation for small mass measurement performed with the highest accuracy

- 5.7" resistive colour touch screen
- Interactive menu
- Wi-Fi®
- Conformity with regulations (GLP, GMP System)
- Database (weighing records, samples, operators, reports)
- Dynamic control of sample weight (bargraph)
- Statistics, SQC
- Printouts, reports (PCL standard)
- Multilingual menu
- Interfaces: Ethernet (network applications), USB, RS 232, IN/OUT
- Wide spectrum of use (industry, laboratories, universities, research and development centres)

- 1** Weighing module
- A** Automatically opening draft shield
- B** Weighing pan
- 2** Terminal
- C** Information on a selected working mode and on an adopted profile
- D** Information on a logged in operator
- E** Area for date, time, connection type information, battery state, etc.
- F** Measurement indication area
- G** Load bar graph
- H** Checkweighing function bar graph (thresholds)
- I** Pictograms for ambient conditions monitoring
- J** Configurable area for extra information
- K** Quick access bar
- L** Proximity sensors (optimization of operation)





XA 4Y.M.A balance with weighing chamber featuring automatic door



XA 4Y.M microbalance

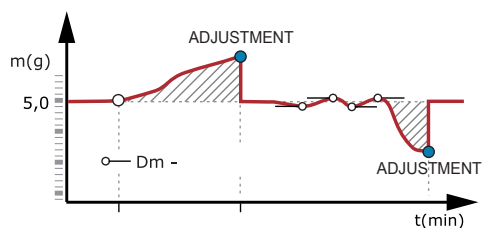


XA 4Y.M.A microbalance with additional adapter for pipettes calibration

# Quality Built into the Product

## Adjustment and an Automatic Cycle

Accuracy of indication for MYA 4Y microbalances is guaranteed owing to automatic adjustment process. This process takes into account the dynamics of temperature variation and time flow. It is possible to generate a report upon each completed adjustment.



Principle of operation for an automatic adjustment

----- Adjustment: Internal -----	
Date	2019.01.26
Time	09:12:38
Balance type	MYA 4Y
Balance ID	234986
Operator	Smith
Level status	Yes
Difference	0.000000
Temperature	25 °C
Signature: _____	



Adjustment history			
	2018.07.26	07:44:28	Triggered by time
240	2018.07.26	08:46:30	Triggered by time
241	2018.07.26	09:12:38	Internal
242	2018.07.26	09:29:07	External
243	2018.07.26	09:53:49	Triggered by temp.
244	2018.07.26	10:14:20	Triggered by temp.

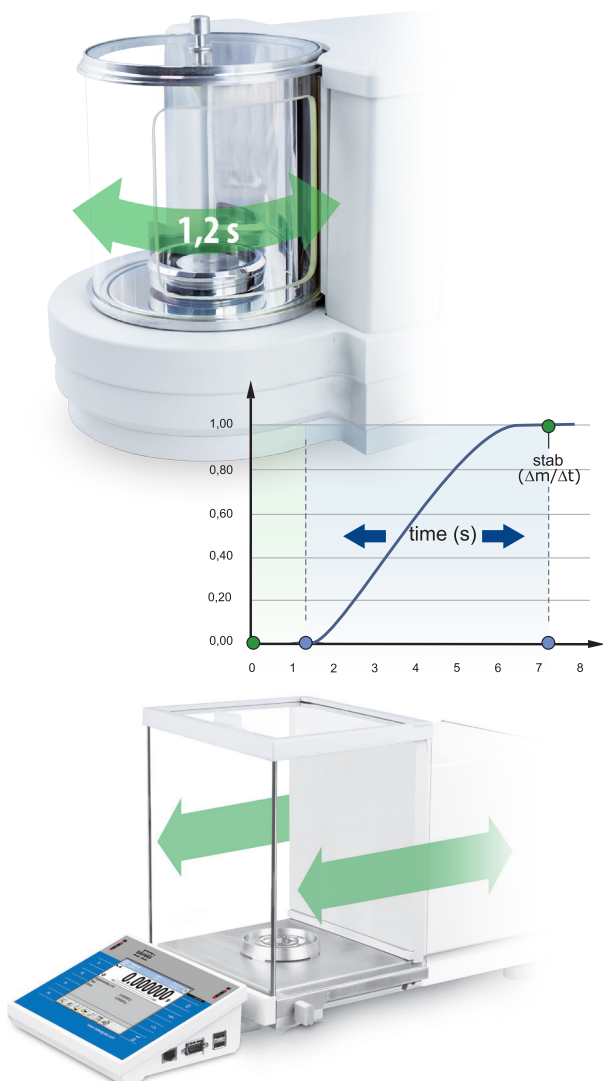
Result of each adjustment is recorded in microbalance memory, it can be previewed

Adjustment history		
1	Date	2018.07.26 09:12:38
2	Adjustment mode	Internal
3	Working mode	Weighing
4	Operator	Smith
5	Level status	Yes
6	Nominal mass	4.897654
7	Current mass	4.897653
8	Difference	0.000000
9	Temperature	25°C

Printout or export of a report on adjustment

## Fast Measurement for any Sample

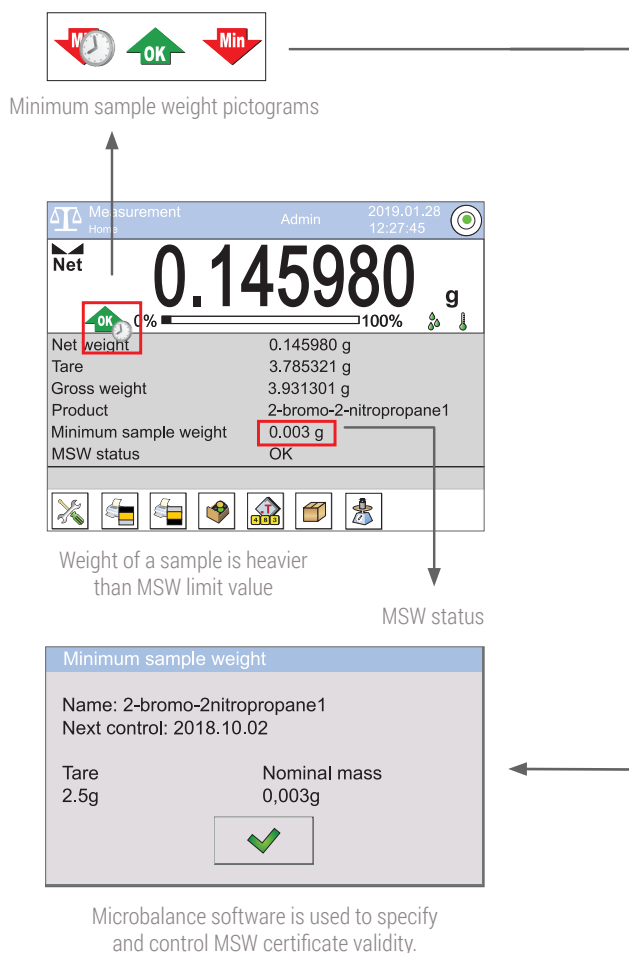
System designed to control process of opening the draft shield provides instant access to the weighing pan. Determining weight of a particular sample takes just a few seconds.



## Conformity with USP Conventions

General Chapters, Apparatus for Tests and Assays <41 „BALANCES”>  
General Information, <1251 „WEIGHING ON AN ANALYTICAL BALANCE”>

Applied design solutions provide the best possible micro scale measurement accuracy. MSW-dedicated software features programmable thresholds for low limit of a weighing range wherein variable tare loads can be used.



## Auto-Level an On-line Control of Balance Level

Each sample requires level control for every single weighing performance, only then precise weighing is guaranteed. Any balance deviation from permissible level tolerance is immediately recorded and signalled by means of respective messages and colour scheme. Monitoring and level recording are fully automatic facilities.





# Universal and Specific Solutions

## Micro and Ultra-Micro Scale Measurement

When it comes to standard solutions, RADWAG offers series of microbalances (MYA 4Y) and ultra-microbalances (UYA 4Y) comprising devices varying in terms of max. capacity, readability and weighing pan size. Each balance features glass draft shield comprising automatically opened door.

XA 4Y.M.A and XA 4Y.M models are an alternative to standard RADWAG microbalances. The balances are equipped with a spacious weighing chamber, which enables fast and convenient access to the weighing pan. The XA 4Y.M.A microbalance features an automatic door.



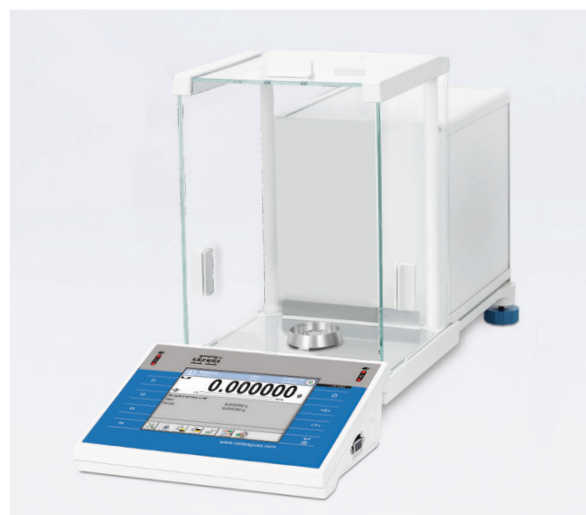
Mass measurement of solids using  
MYA 4Y microbalance



XA 4Y.M.A balance with spacious weighing chamber  
featuring automatic door



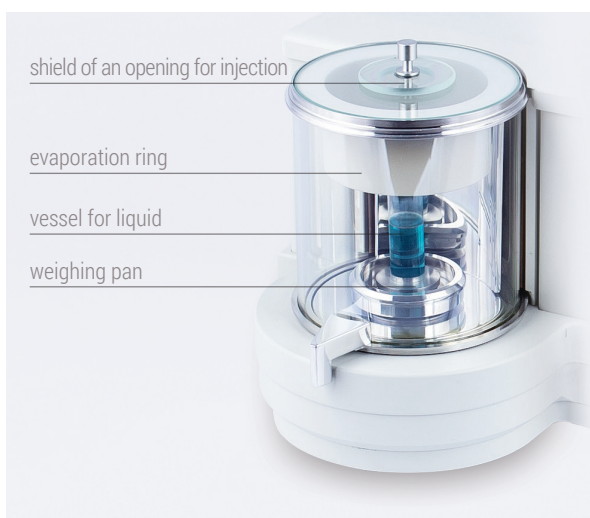
Mass measurement of liquids  
using MYA 4Y microbalance



XA 4Y.M balance with spacious weighing chamber

## Pipettes Calibration - Gravimetric Method for Control of Volume

Dedicated set, installed inside the weighing chamber, allows a microbalance operator to check piston pipettes volume. The procedure is performed in accordance with the respective standard, ISO 8655. Used evaporation ring limits the effect of particular liquid evaporation, this considerably improves measurement accuracy.



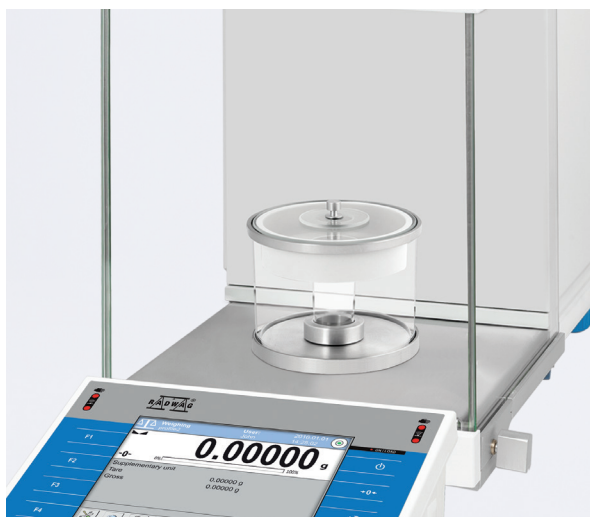
MYA 4Y.P microbalance for pipettes calibration

## Filters Weight Measurement Differential Weighing

Owing to special design of a weighing chamber, precise absorption level may be determined by means of filter weight measurement. F series balances and ultra-microbalances intended to weigh filters comprise specific weighing chamber characterized by airtightness and featuring an open work weighing pan.



MYA 4Y.F microbalance for filters weight measurement



XA 4Y.M.A microbalance with additional adapter for pipettes calibration

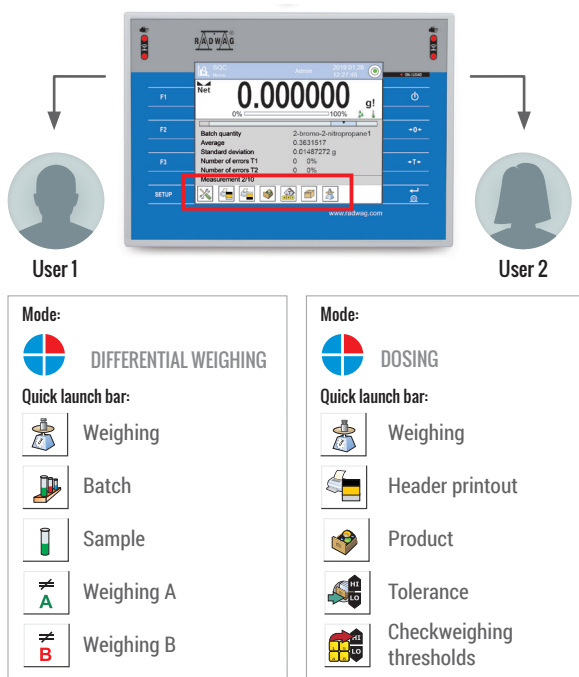


Two different versions of the microbalance enable weighing filters of various diameters.

# Ergonomics and Comfort of Operation

## Customization of Balance Settings and Access Level

Unique user profiles with modifiable settings and access permissions provide flexibility of balance customization. Each profile comprises information, pre-set settings and a quick access shortcut dedicated for a particular operation. Number of operators and profiles is not limited.



## Databases as Support for the Weighing Process

Complex databases are a distinctive feature of the 4Y series. The databases size is dynamically shared within 32 GB memory.

4Y balances offer unlimited databases management options, plus they enable record of advanced reports and graphs carried out for series of weighings.



## Video-Guidance and an On-screen Manuals

4Y balances feature "Media" module providing you with complex guidance, i.e. direct assistance in operating the device. With easily accessed context help you are fully supported when it comes to operation of particular functions and applications. The help is offered in a form of an on-screen displayed user manual, text and drawing instruction and short video guides.





## Programmable Proximity Sensors

Manual abilities of an operator may be limited by characteristics of a workplace or by a required testing methodology (suit, gloves etc.). Owing to proximity sensors, microbalances and ultra-microbalances can be operated hands-free regardless of the said limitations.

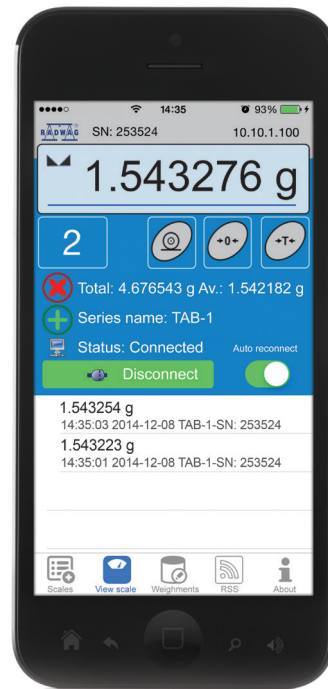
It is possible to assign one of many various operations to a given proximity sensor, e.g. draft shield door opening or closing



## Radwag Connect Cooperation with Portable Devices

Radwag Connect software enables communication between any 4Y series balance and a portable user-owned device. The software allows online transfer of various information, recorded by a balance, to any device featuring iOS or Android system.

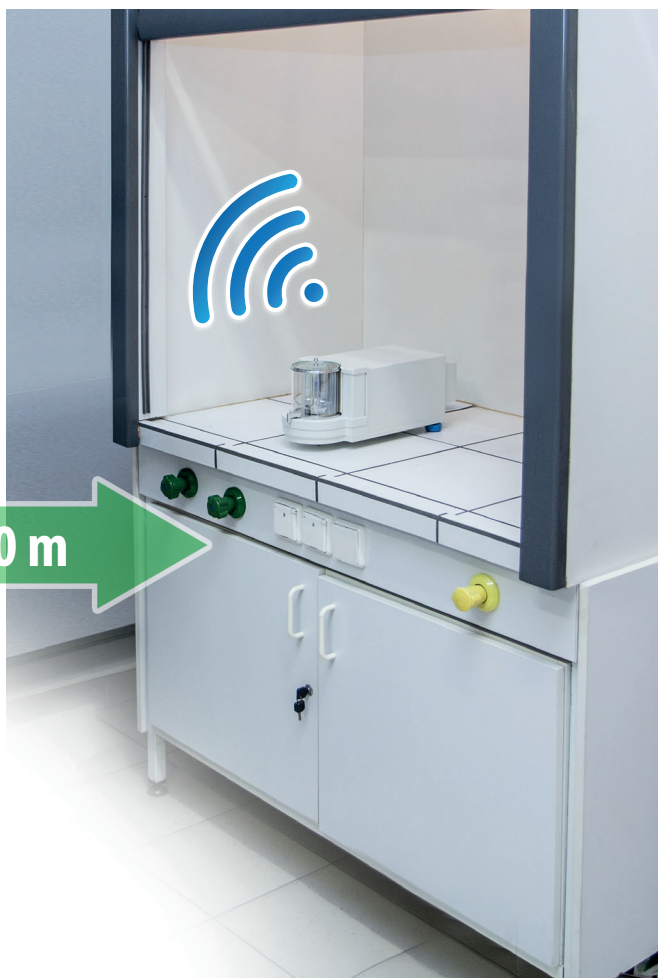
The communication is established via Wi-Fi® or Ethernet interface.



## Portability: Balance - Terminal Wireless Communication

Wireless communication provides possibility of placing the terminal in the vicinity of up to 10 meters distant from a balance. Battery-powered terminal allows 8-hour-long, continuous operation. This is especially convenient solution when placing a balance inside fume cupboard or Glove Box type of chamber.

Standard cable connection is an optional solution allowing for balance-terminal communication.





# Automatic Cycle Optimization

## Autotest GLP Automatic Control of Accuracy

Auto-test function provides the user with possibility of manual confirmation of the performed measurements quality (record, export). Autotest GLP is a perfect solution used in quality management systems (ISO, GMP, GLP, USP, ICH Q10, SOP).

----- Autotest GLP: Report -----	
Balance type	MYA 4Y
Balance ID	544121
User	Admin
Software revision	L1.4.15 K
Date	2019.01.26
Time	13:42:13
-----	
Number of measurements	10
Reading unit	0.000001 g
Internal weight mass	17.673 52 g
Filter	Slow
Value release	Reliable
Temperature: Start	23.99 °C
Temperature: Stop	23.96 °C
Humidity: Start	58 %
Humidity: Stop	58 %
-----	
Deviation for Max.	0.000004 g
Repeatability	0.0000017 g
-----	
Signature	
-----	

## Autotest Filter Automatically Performed Selection of Working Parameters

Some weighing operations need accuracy, other require speed. An indispensable help for both features, speed and accuracy, is Autotest FILTER application. The Autotest FILTER is offered by every 4Y series laboratory balance.

	Slow	0.00005 g
	Fast	3.179 s
10	Slow	0.00007 g
	Fast and reliable	4.392 s
11	Slow	0.00006 g
	Reliable	8.340 s
12		

Autotest Filter		
F1	Average	0.00004 g
	Fast	2.579 s
F2	Average	0.00004 g
	Fast and reliable	3.934 s
F3	Average	0.00005 g
	Reliable	7.265 s
SETUP	Slow	0.00005 g
	Fast	3.179 s
	Slow	0.00007 g
	Fast and reliable	4.392 s
	Slow	0.00006 g
	Reliable	8.340 s

Autotest Filter operation consists in determining standard deviation value and weighing time needed for all possible combinations of settings for Filter/Value release parameter. Upon Autotest Filter procedure completion, the balance presents its results, allowing the user to select the most optimal options, i.e. such that provide the shortest time weighing or the best repeatability.

## On-line Monitoring of Ambient Conditions

Mechanisms implemented in a microbalance are used to facilitate automatic monitoring of elementary ambient conditions (temperature, humidity). Specifying limit values and dynamicity of changes for these values, combined with visualization, provide ergonomic and efficient means of operation.



Ambient conditions			
IS T1:	24.26 °C	THB H:	59%
IS T2:	24.26 °C	THB T:	24.26 °C
IS H:	59%	THB P:	994 hPa
ISP:	994 hPa	P:	1.161 kg/m³
THB T:	23.9 °C		



# Data Monitoring and Safety

## Protecting Data User Authorization Levels

When there is a need for one balance to be operated by several users, the option of customizing access rights for particular functions may turn out to be indispensable. Four access levels ensure many possibilities of supervision over users and provide important data protection (e.g. formulas).



Numerous operations such as defining language of the menu, selecting a desired working mode or personalizing main screen layout may be limited according to the access level, with respective password protection.

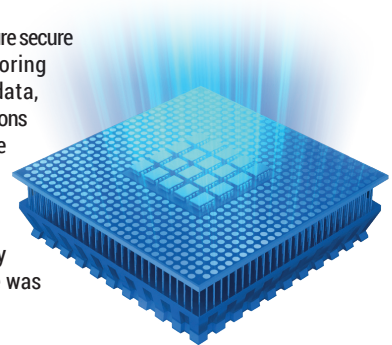
Access level	
1 Anonymous operator	Guest
2 Date and time	Administrator
3 Printouts	Administrator
4 Database	

Edit record	
1 Name	Admin EN
2 Code	
3 Password	*****
4 Access level	Administrator
5 Language	English
6 Default profile	Fast filters

Possibility of associating a given profile with a particular user allows such balance personalization, that upon log in, a given working mode and filters are automatically selected

## Alibi Secure Data Storage Partition

4Y series balances feature secure partition for data storing where all weighing data, reports, ambient conditions measurements are recorded and secured for a specified amount of time. All these can be easily restored in case there was such a need.



## Data Archiving and Exchange

The 4Y series offers complex archiving of databases, user profiles and data stored in the memory. All the data can be exported, imported, copied and transferred between balances.



Exemplary information to be found in a weighing record

WEIGHING RECORD	
Date	Operator
Mass	Customer
Tare	Working mode
Air buoyancy compensation	Magazyn
Product	Packaging



Exchange of databases between balances via USB port by means of standard storage devices

# Reports and Printouts

## Printouts Flexibility of Configuration

Upon completion of each process, a respective report is generated and recorded in a proper report database. The users have possibility to preview, print, export or archive reports but not only. They can also freely configure them.

There are two printout types for 4Y series balances: standard (generated according to a fixed template) and non-standard, customized ones.

Standard printout comprises three sections: header [A], weighing data [B] and footer [C]. Each section can be freely adjusted by a user, it can also be extended with a non-standard printout.

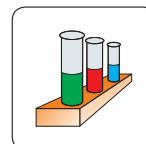
Technology used for 4Y series enables free exchange of printouts and labels (TXT or LB file format) between balances.

Weighing	
Date	2019.01.26
Time	14:07:43
Balance ID	419036
Operator	Admin
Level status	Yes
Product	Calcium
Packaging	Blister
Temperature during measurements: 26.79 °C	
Humidity during measurements: 24 %	
Pressure during measurements: 994 hPa	
Net weight	0.1118376 g
Tare	0.5000000 g
Gross weight	0.6118376 g
Supplementary unit	0.5591880 ct
Minimum sample status	OK
Net weight	0.1118071 g
Tare	0.5000000 g
Gross weight	0.6118071 g
Supplementary unit	0.5590355 ct
Minimum sample status	OK
Net weight	0.1118071 g
Tare	0.5000000 g
Gross weight	0.6118071 g
Supplementary unit	0.5590355 ct
Minimum sample status	OK
Signature	

# Differential Weighing

## Analysis of Sample Weight Variation

"Differential Weighing" module facilitates analysis of weight changes of a particular sample subjected to various processes. Two key components are of significant importance for the module operation, these are databases and methods.



## Measurement Specification

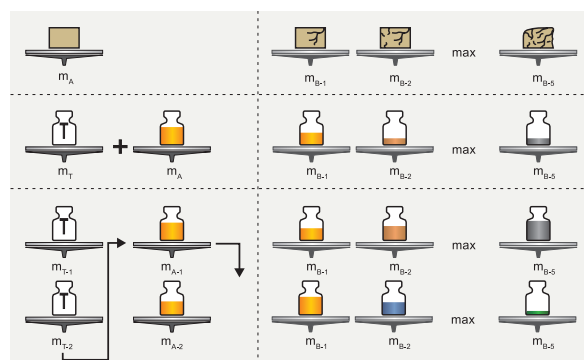
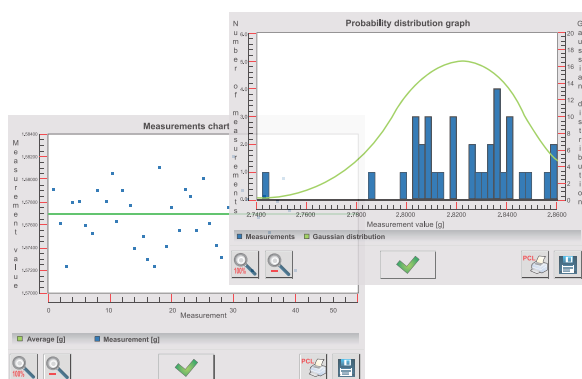
Ambient conditions prevailing in the course of a particular measurement are recorded automatically. Comparison of respective data registered for various cycles lets the user prove conformity with standard guidelines.

## Measuring Methods

Diversity of measuring methods requires maximum flexibility of differential weighing function. The said function has to do with measuring methods used for weighing samples, even those that are grouped within one batch.

## Graphs Measurements Visualization and Statistics

Selected working modes (Statistics, SQC) apart from generating report offer possibility of creating a chart for a particular completed weighing. The balance allows to generate weighing graphs (with mean value calculated) and probability distribution graph out of series of measurements. Each graph can be freely scaled, printed or saved to BMP file.



Methods are understood as sequence of steps. Any batches and samples may be selected and measured and measured using any weighing cycle, e.g. mixed system

# SQC Statistics on a Micro Scale

## SQC Automatic Data Analysis

SQC statistics module is an excellent operating mode for complete control over measurement series of a particular sample. The control may be carried out in the course of a manufacturing process (warning and critical limits) and during other tests.



## SQC Reports Homogeneous and Clear Information

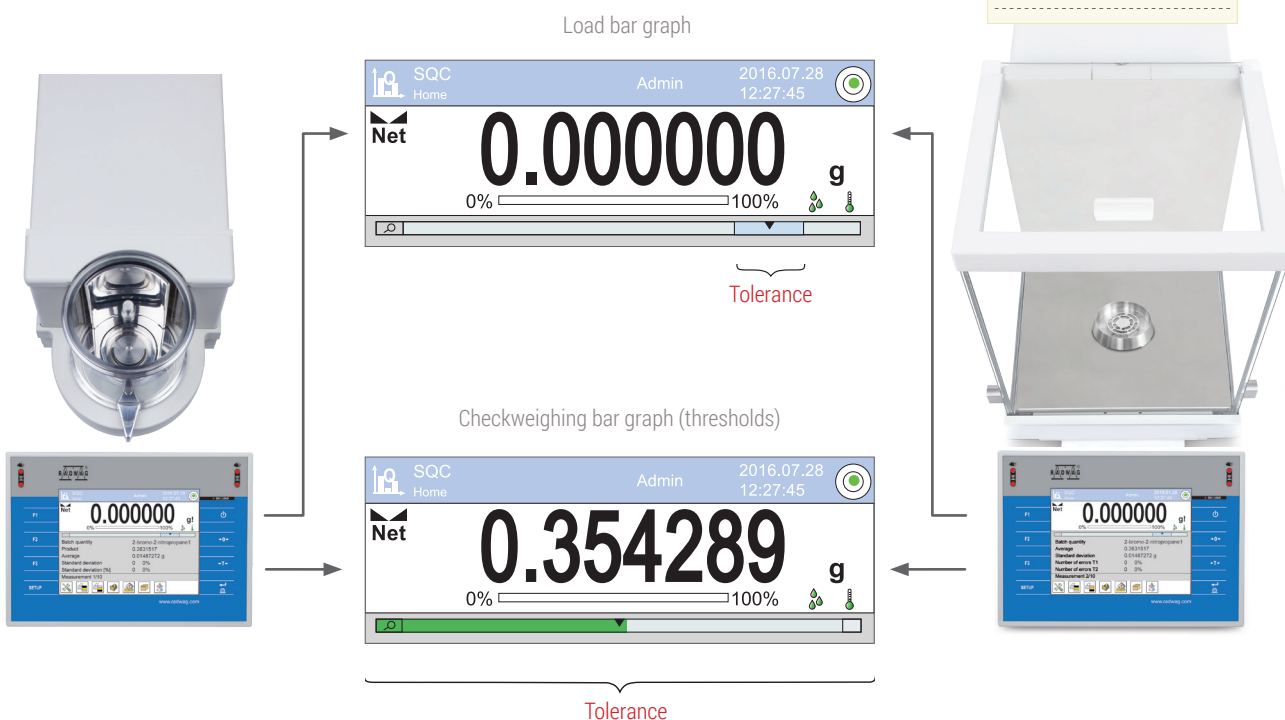
SQC Reports is a modern tool for collecting information on carried out measurements, measurement numbers, names, statistic data, information data etc. The collected data is recorded in a database.



## Viewer Graph Automatic Tolerance Scaling

Viewer graph facilitates automatic scaling of checkweighing thresholds online, thus providing possibility of comparing current sample weight to a reference value. This tool permits safe and quick sampling wherein optimal accuracy is maintained.

SQC		
User		Lab
Product		caps
Start date	2019.01.26	10:10:18
End date	2019.01.26	10:14:41
Batch number		1\A
Batch quantity		10
Nominal mass		0.361 g
Limit T2-	0.0361 g	10 %
Limit T1-	0.01805 g	5 %
Limit T1+	0.01805 g	5 %
Limit T2+	0.0361 g	10 %
----- Measurement 1 -----		
Net		0.366185 g
----- Measurement 2 -----		
Net		0.369271 g
----- Measurement 3 -----		
Net		0.385184 g
----- Measurement 4 -----		
Net		0.324771 g
----- Measurement 5 -----		
Net		0.356942 g
----- Measurement 6 -----		
Net		0.368712 g
----- Measurement 7 -----		
Net		0.355558 g
----- Measurement 8 -----		
Net		0.368694 g
----- Measurement 9 -----		
Net		0.368100 g
----- Measurement 10 -----		
Net		0.368100 g
Number of T2- errors	1	10 %
Number of T1- errors	1	10 %
Number of T1+ errors	1	10 %
Number of T2+ errors	0	0 %
Average		0.3631517 g
Standard deviation		0.01487272 g
Signature		



# Technical Specifications



UYA 2.4Y



UYA 2.4Y.F



UYA 6.4Y



MYA 0.8/3.4Y



MYA 2.4Y



MYA 5.4Y

Maximum capacity [Max]	2.1 g	2.1 g	6.1 g	0.8 g / 3 g	2.1 g	5.1 g
Readability [d]	0.1 µg	0.1 µg	0.1 µg	1 µg / 10 µg	1 µg	1 µg
Tare range	-2.1 g	-2.1 g	-6.1 g	-3 g	-2.1 g	-5.1 g
Repeatability *	0.25 µg	0.25 µg	0.4 µg	1 µg	0.5 µg	1 µg
Linearity	±1.5 µg	±1.5 µg	±1.5 µg	±3 µg / ±10 µg	±3 µg	±5 µg
Eccentricity	1.5 µg	1.5 µg	1.5 µg	3 µg / 10 µg	3 µg	5 µg
Sensitivity time drift	$1 \times 10^{-6} / \text{Year} \times \text{Rt}^{**}$	$1 \times 10^{-6} / \text{Year} \times \text{Rt}^{**}$	$1 \times 10^{-6} / \text{Year} \times \text{Rt}^{**}$	$1 \times 10^{-6} / \text{Year} \times \text{Rt}^{**}$	$1 \times 10^{-6} / \text{Year} \times \text{Rt}^{**}$	$1 \times 10^{-6} / \text{Year} \times \text{Rt}^{**}$
Sensitivity temperature drift	$1 \times 10^{-6} / ^\circ\text{C} \times \text{Rt}^{**}$	$1 \times 10^{-6} / ^\circ\text{C} \times \text{Rt}^{**}$	$1 \times 10^{-6} / ^\circ\text{C} \times \text{Rt}^{**}$	$1 \times 10^{-6} / ^\circ\text{C} \times \text{Rt}^{**}$	$1 \times 10^{-6} / ^\circ\text{C} \times \text{Rt}^{**}$	$1 \times 10^{-6} / ^\circ\text{C} \times \text{Rt}^{**}$
Minimum sample weight	0.05 mg	0.05 mg	0.08 mg	0.2 mg	0.1 mg	0.2 mg
Minimum sample weight USP	0.5 mg	0.5 mg	0.8 mg	2 mg	1 mg	2 mg
Stabilization time	10-20 s	10-20 s	10-20 s	max 8 s	max 8 s	max 8 s
Adjustment	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)
Display	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen
Communication interfaces	USB-A (x2)	USB-A (x2)	USB-A (x2)	USB-A (x2)	USB-A (x2)	USB-A (x2)
	RS 232 (x2)	RS 232 (x2)	RS 232 (x2)	RS 232 (x2)	RS 232 (x2)	RS 232 (x2)
	Wi-Fi®	Wi-Fi®	Wi-Fi®	Wi-Fi®	Wi-Fi®	Wi-Fi®
	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet
	IN (x 4) OUT (x 4)	IN (x 4) OUT (x 4)	IN (x 4) OUT (x 4)	IN (x 4) OUT (x 4)	IN (x 4) OUT (x 4)	IN (x 4) OUT (x 4)
Working temperature	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C
Relative humidity	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%
Weighing pan dimension	ø 16 mm	ø 50 mm	ø 16 mm	ø 16 mm (+ 60 mm for filters)	ø 16 mm	ø 26 mm
Automatic sliding door	●	–	●	●	●	●
Filter weighing	–	●	–	●	–	–
Pipettes calibration	–	–	–	–	–	–

## PC Software



### R-Lab

Collecting, presenting and statistical analysis of measurements.



### Label Editor R02

Designing labels for multi-functional scales and for scales operating in labelling, counting, dosing and formulation making systems.



### Pipettes

Determining errors of pipette volume measurement (volumetric instruments) in accordance with the ISO 8655 standard.






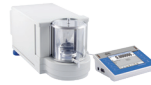

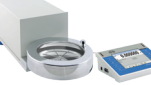


### E2R Weighing Records

Record of weighings carried out on RADWAG-designed workstations.

The full software range is available on the [www.radwag.com](http://www.radwag.com) website

The software is compatible only with RADWAG-designed weighing instruments and is not available as a box version - the presented packages are for information purposes only.

							
<b>MYA 11.4Y</b>	<b>MYA 11/52.4Y</b>	<b>MYA 21.4Y</b>	<b>MYA 21/52.4Y</b>	<b>MYA 31.4Y</b>	<b>MYA 21.4Y.P</b>	<b>MYA 5.4Y.F</b>	<b>MYA 5.4Y.F1</b>
11 g	11 g / 52 g	21 g	21 g / 52 g	31 g	21 g	5.1 g	5.1 g
1 µg	1 µg / 10 µg	1 µg	1 µg / 10 µg	1 µg	1 µg	1 µg	1 µg
-11 g	-52 g	-21 g	-52 g	-31 g	-21 g	-5.1 g	-5.1 g
1.2 µg	2 µg	1.2 µg	2 µg	2 µg	1.2 µg	1 µg	1 µg
±6 µg	±10 µg / ±30 µg	±7 µg	±10 µg / ±30 µg	±8 µg	±7 µg	±5 µg	±5 µg
6 µg	6 µg / 10 µg	7 µg	6 µg / 10 µg	8 µg	7 µg	5 µg	5 µg
1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **
1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **
0.24 mg	0.4 mg	0.24 mg	0.4 mg	0.4 mg	0.24 mg	0.2 mg	0.2 mg
2.4 mg	4 mg	2.4 mg	4 mg	4 mg	2.4 mg	2 mg	2 mg
max 10 s	max 10 s	max 10 s	max 10 s	max 10 s	max 10 s	max 8 s	max 8 s
internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)
5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen
USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)
+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C
40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%
ø 26 mm	ø 26 mm ø 40 mm	ø 26 mm	ø 26 mm ø 40 mm	ø 26 mm	ø 26 mm	ø 100 mm (for filters) ø 26 mm	ø 160 mm (for filters) ø 26 mm
●	●	●	●	●	●	—	—
—	—	—	—	—	—	●	●
—	—	—	—	—	●	—	—

Wi-Fi® is a registered trademark of Wi-Fi Alliance.

\* Repeatability is expressed as a standard deviation from 10 weighing cycles of a particular load

\*\* Rt - Net weight



#### E2R PGC

Synchronization of databases  
and weighing records  
registering in PGC processes.



#### THB-R

Monitoring and registering  
of ambient conditions.

**RADWAG provides free software to be downloaded  
from [www.radwag.pl](http://www.radwag.pl) website:**

- Parameter Editor
- RADWAG Development Studio
- Lab View
- RADWAG Connect
- RADWAG Remote Desktop
- Rad KEY
- R.Barcode
- Audit Trail Reader

# Technical Specifications



XA 6.4Y.M



XA 6/21.4Y.M



XA 21.4Y.M



XA 21/52.4Y.M

Maximum capacity [Max]	6.1 g	6/21 g	21 g	21/52 g
Readability [d]	1 µg	1/2 µg	2 µg	2/5 µg
Tare range	-6.1 g	-21 g	-21 g	-52 g
Repeatability *	1.3 µg	1.8 µg	1.8 µg	2.5 µg
Linearity	±7 µg	±9 µg	±9 µg	±20 µg
Eccentricity	7 µg	15 µg	15 µg	20 µg
Sensitivity time drift	$1 \times 10^{-6} / \text{Year} \times \text{Rt}^{**}$	$1 \times 10^{-6} / \text{Year} \times \text{Rt}^{**}$	$1 \times 10^{-6} / \text{Year} \times \text{Rt}^{**}$	$1 \times 10^{-6} / \text{Year} \times \text{Rt}^{**}$
Sensitivity temperature drift	$1 \times 10^{-6} / ^\circ\text{C} \times \text{Rt}^{**}$	$1 \times 10^{-6} / ^\circ\text{C} \times \text{Rt}^{**}$	$1 \times 10^{-6} / ^\circ\text{C} \times \text{Rt}^{**}$	$1 \times 10^{-6} / ^\circ\text{C} \times \text{Rt}^{**}$
Minimum sample weight	0.26 mg	0.36 mg	0.36 mg	0.5 mg
Minimum sample weight USP	2.6 mg	3.6 mg	3.6 mg	5 mg
Stabilization time	~ 3.5 s	~ 3.5 s	~ 3.5 s	~ 3.5 s
Adjustment	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)
Display	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen
Communication interfaces	USB-A (x2)	USB-A (x2)	USB-A (x2)	USB-A (x2)
	RS 232 (x2)	RS 232 (x2)	RS 232 (x2)	RS 232 (x2)
	Wi-Fi®	Wi-Fi®	Wi-Fi®	Wi-Fi®
	Ethernet IN (x 4) OUT (x 4)	Ethernet IN (x 4) OUT (x 4)	Ethernet IN (x 4) OUT (x 4)	Ethernet IN (x 4) OUT (x 4)
Working temperature	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C
Relative humidity	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%
Weighing pan dimension	ø 30 mm	ø 30 mm	ø 30 mm	ø 30 mm
Automatic sliding door	-	-	-	-

Read QR code and view complete  
technical specification

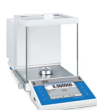


4Y series microbalances

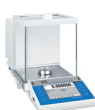




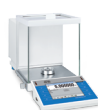
XA 52.4Y.M



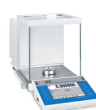
XA 6.4Y.M.A



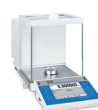
XA 6/21.4Y.M.A



XA 21.4Y.M.A



XA 21/52.4Y.M.A



XA 52.4Y.M.A

52 g	6.1 g	6/21 g	21 g	21/52 g	52 g
5 µg	1 µg	1/2 µg	2 µg	2/5 µg	5 µg
-52 g	-6.1 g	-21 g	-21 g	-52 g	-52 g
3.5 µg	1.3 µg	1.8 µg	1.8 µg	2.5 µg	3.5 µg
±20 µg	±7 µg	±9 µg	±9 µg	±20 µg	±20 µg
20 µg	7 µg	15 µg	15 µg	20 µg	20 µg
1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **	1 × 10 <sup>-6</sup> / Year × Rt **
1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **	1 × 10 <sup>-6</sup> / °C × Rt **
0.7 mg	0.26 mg	0.36 mg	0.36 mg	0.5 mg	0.7 mg
7 mg	2.6 mg	3.6 mg	3.6 mg	5 mg	7 mg
~ 3.5 s	~ 3.5 s	~ 3.5 s	~ 3.5 s	~ 3.5 s	~ 3.5 s
internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)
5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen
USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)	USB-A (×2) RS 232 (×2) Wi-Fi® Ethernet IN (× 4) OUT (× 4)
+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C
40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%w
ø 30 mm	ø 30 mm	ø 30 mm	ø 30 mm	ø 30 mm	ø 30 mm
—	●	●	●	●	●

Wi-Fi® is a registered trademark of Wi-Fi Alliance.

\* Repeatability is expressed as a standard deviation from 10 weighing cycles of a particular load

\*\* Rt - Net weight

## Additional equipment

- Antivibration tables,
- Thermal and impact printers,
- Computer cables, printer cables,
- Laboratory ware holders,
- Ambient conditions modules,
- Barcode readers,
- Adapter for pipettes calibration,
- Workstation for pipettes calibration.

Complete range of additional equipment  
on [www.radwag.com](http://www.radwag.com)

## Additional services

- Calibration of electronic balances,
- Calibration of mass standards,
- PQ/QQ/IQ,
- Calibration of piston pipettes.

Complete range of additional services  
on [www.radwag.com](http://www.radwag.com)

Vibrations level monitoring  
Defined profiles  
Combined weighing pan shield



www.radwag.com

## XA 4Y.M Microbalances

INNOVATIVE SOLUTIONS

# XA 4Y.M

## Spacious weighing chamber Innovative solutions



### The highest measurements accuracy

XA 4Y.M microbalance features the highest measurements accuracy, excellent repeatability and is compliant with USP requirements (Chapter 41 and 1251).

### Intuitive operation and large touch screen

5.7" colour touch screen enables intuitive operation and easy access to numerous applications and functions of the weighing instrument.

### Combined weighing pan shield

The new weighing pan shield design reduces disturbances caused by air drafts, and provides easy access to the weighing pan making dispensing of the samples comfortable.

### Vibrations sensor

Continuous monitoring of vibrations informs the operator about vibrations level during operation. The solution improves reliability of carried out measurements, this is due to elimination of an accidental error caused by ground vibrations.

### New door opening automatics (only for XA 4Y.M.A)

The innovative weighing chamber system for door opening and closing guarantees smooth and quiet door movement, and eliminates vibrations that may disturb the measurement. The solution also enables to define door opening angle.

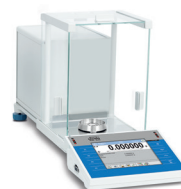
### Defined profiles

Four predefined profiles enable automatic balance parameters customization.

- FAST: the measurement is carried out within a very short period of time, result stabilization takes up to 2 s,
- FAST DOSING: very fast reaction to mass change,
- PRECISION: balance settings providing the minimum standard deviation  $sd \leq 0.7$ ,
- USER: profile customized by the operator.



**XA 4Y.M.A**



**XA 4Y.M**

Maximum capacity [Max]	6 g – 52 g	6 g – 52 g
Readability [d]	1 µg – 5 µg	1 µg – 5 µg
Repeatability*	2.5 µg – 6 µg	2.5 µg – 6 µg
Linearity	±7 µg – ±20 µg	±7 µg – ±20 µg
Minimum sample weight	0.26 mg – 0.7 mg	0.26 mg – 0.7 mg
Minimum sample weight USP	2.6 mg – 7 mg	2.6 mg – 7 mg
Stabilization time	~3.5 s	~3.5 s
Adjustment	Internal (automatic)	Internal (automatic)
Communication interfaces	2×USB, 2×RS232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	2×USB, 2×RS232, Ethernet, Wi-Fi®, 4×IN, 4×OUT
Weighing pan dimensions	ø 30 mm	ø 30 mm
Weighing chamber dimensions	199 × 170 × 217 mm	168 × 163 × 228 mm
Automatic door	YES	-
Integrated Antistatic Ionizer	YES	-

\* Repeatability is expressed as a standard deviation from 10 weighing cycles. | Wi-Fi® is a registered trademark of Wi-Fi Alliance.



**Weighing of the highest accuracy**  
**Integrated antistatic ionizer**  
**Automatically opened adapter's chamber**



www.radwag.com

# XA 4Y.M.A.P PLUS Microbalances for Pipettes Calibration

SPEED, ACCURACY AND AUTOMATION OF THE MEASUREMENT



## XA 4Y.M.A.P PLUS

## Weighing of the highest standard Excellent measurement accuracy



### The Best Measurement Accuracy

XA 4Y.M.A.P PLUS microbalances guarantee the highest measurement accuracy, excellent repeatability and are compliant with USP requirements (Chapter 41 and 1251).

### Integrated Antistatic Ionizer

The antistatic ionizer, an in-built component of XA 4Y.M.A.P PLUS analytical balance, neutralizes electric charges inside the weighing chamber upon placing the sample in it.

### Intuitiveness and Comfort of Operation

XA 4Y.M.A.P PLUS microbalances are equipped with 5.7" colour touch panel which enables quick access to many functions and applications. With this, the operation is uncomplicated and intuitive.

### Touch-Free Operation

In order to increase comfort of microbalance operation it is possible to use two programmable proximity sensors to which any function can be assigned. The sensors enable touch-free operation of the weighing instrument.

### Vibrations Monitoring

An integrated vibration sensor allows user to constantly monitor ground vibrations. The solution improves reliability of carried out measurements, this is due to elimination of an accidental error caused by ground vibrations.

### Defined Profiles

The function allows the user to quickly start operation with convenient profile selected.

### Data Management

Complex memory enables storing great quantity of measurements as reports and time and statistical graphs.

### Automatically Opened and Closed Adapter with Evaporation Ring

Evaporation ring in automatic adapter for pipettes calibration enables maintaining respective humidity of the sample. Automatically opened and closed chamber guarantees fast and comfortable operation when maintaining the highest accuracy.



### XA 4Y.M.A.P PLUS for pipettes calibration

Maximum capacity [Max]	6 g – 52 g
Readability (d)	1 µg – 5 µg
Repeatability*	4 µg – 6 µg
Linearity	±9 µg – ±20 µg
Minimum sample weight (USP)	3.6 mg – 7 mg
Minimum sample weight	0.36 mg – 0.7 mg
Stabilization time	~ 3.5 s
Adjustment	Internal (automatic)
Communication interfaces	2 × USB-A, 2 × RS 232, Ethernet, 4 × IN / 4 × OUT, Wi-Fi®
Weighing pan dimensions	ø 26 mm
Automatic weighing chamber door	YES

\* repeatability is expressed as a standard deviation from 10 weighing cycles | Wi-Fi® is a registered trademark of Wi-Fi Alliance.

Anti-vibration weighing table  
equipped with balance,  
PC and PC software for pipetting



# Pipettes Calibration Workstation

FULL-FEATURED SOLUTION

# Pipettes Calibration Workstation



**FULL-FEATURED Workstation**



**MYA 21.4Y.P Microbalance**



**XA 52.4Y.M.A.P PLUS Microbalance**



**XA 82/220.4Y.A Analytical Balance**

#### The Highest Measurement Accuracy

An integral part of the pipettes calibration workstation is either MYA 21.4Y.P microbalance, XA 52.4Y.M.A.P PLUS microbalance or XA 82/220.4Y.A analytical balance, both featuring a special adapter for pipettes calibration. The devices are characteristic for their evaporation rings limiting pipette calibration errors to the minimum. After dismantling of the adapter, each device can be used for standard weighing processes.

#### High Resistance to Ground Vibrations

An in-built anti-vibration table featuring granite top prevents potential ground vibrations from being transferred to the microbalance. With this solution stabilization time shortens considerably. Separation of chipboard-made table components from anti-vibration frame blocks vibrations being an effect of user operation.

#### Ambient Conditions Monitoring

Set of probes, used to measure humidity, atmospheric pressure and temperature of air and distilled water, uninterruptedly monitors ambient conditions. This guarantees absolute reliability of carried out measurements.

#### Computer Support for Pipettes Calibration Process

Pipettes PC Software facilitates automation of pipettes calibration process carried out using gravimetric method, accordant with an international standard, ISO 8655-6. In compliance with ISO 10012 Standard, the software enables generating reports on calibration, archiving measurements' results and overall pipettes' management.

Anti-vibration weighing table	Max capacity [Max]: 21 g	Max capacity [Max]: 52 g	Max capacity [Max]: 82 g / 220 g
Sink and container for used liquid	Radability [d]: 1 µg	Radability [d]: 5 µg	Radability [d]: 0.01 mg / 0.1 mg
Temperature, humidity and pressure probes	Minimum Sample Weight by USP: 2.4 mg	Minimum Sample Weight by USP: 8 mg	Minimum Sample Weight by USP: 14 mg
Distilled water temperature probe	Weighing pan ø 26 mm + adapter for pipettes calibration	Weighing pan ø 26 mm + automatic adapter for pipettes calibration	Weighing pan ø 90 mm + adapter for pipettes calibration
PC with keyboard, mouse and LCD	Automatic door opening system	Automatic door opening system	Automatic door opening system
Pipettes PC Software: Calibration of adjustable volume pipettes(channels quantity:1, 8, 12) Automated measurement procedures Pipettes database and Calibration Results database Result calculation based on: mean pipette volume (channel), systematic error e (error of accuracy A), random error CV (error of repeatability P)	5.7" resistive colour touchscreen	5.7" resistive colour touchscreen	5.7" resistive colour touchscreen
	Internal adjustment	2-point internal adjustment	2-point internal adjustment
	Interfaces: 2×USB-A, 2×RS 232, Wi-Fi*, Ethernet, 4×IN/OUT	Interfaces: 2×USB-A, 2×RS 232, Wi-Fi*, Ethernet, 4×IN/OUT	Interfaces: 2×USB-A, 2×RS 232, Wi-Fi*, Ethernet, 4×IN/OUT

\*Wi-Fi® is a registered trademark of Wi-Fi Alliance.



**SINGLE:** full-featured workstation + a selected balance (MYA 21.4Y.P or XA 52.4Y.M.A.P PLUS or XA 82/220.4Y.A)

**COMBO:** full-featured dual workstation + MYA 21.4Y.P microbalance + a selected balance (XA 52.4Y.M.A.P PLUS or XA 82/220.4Y.A)



# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)

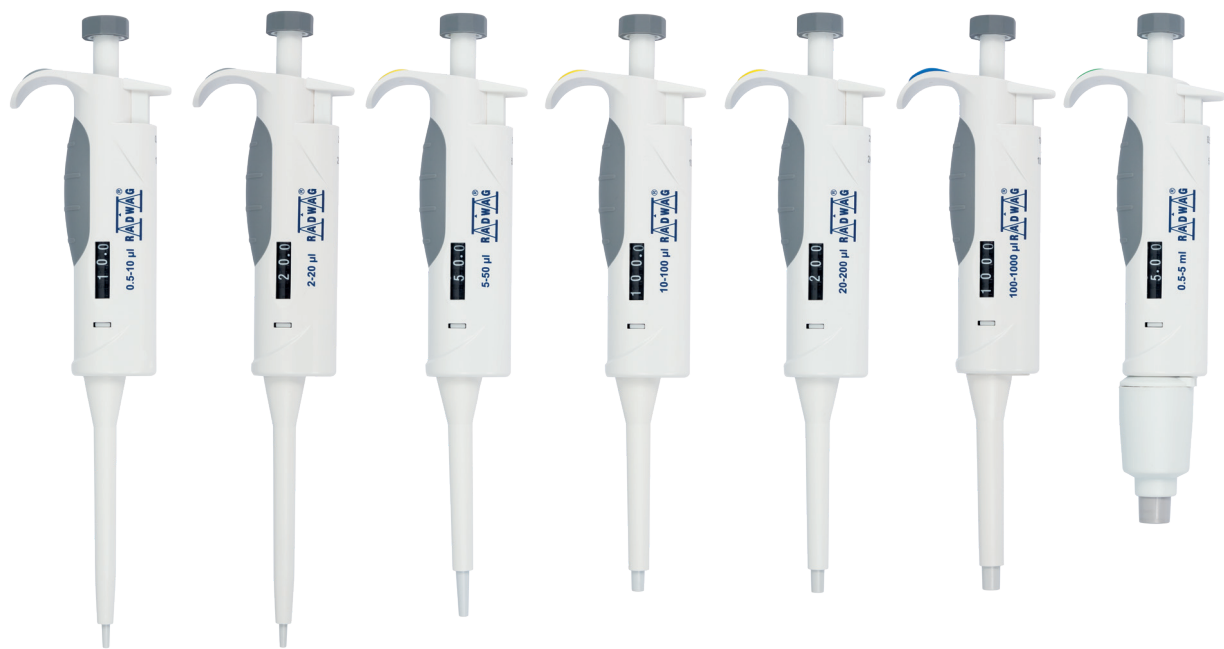




# PIPETTES

Cutting-edge measuring equipment  
Quick dispensing of small volume liquids  
Highly precise dispensing

# Pipettes



RW8-101-20-9    RW8-102-20-9    RW8-103-20-9    RW8-104-20-9    RW8-105-20-9    RW8-106-20-9    RW8-107-20-9

Volume	0.5 µl ÷ 10 µl	2 µl ÷ 20 µl	5 µl ÷ 50 µl	10 µl ÷ 100 µl	20 µl ÷ 200 µl	100 µl ÷ 1000 µl	500 µl ÷ 5000 µl
Error of accuracy (systematic)*	2.5 % / 1.0 %	3.0 % / 0.9 %	2.0 % / 0.6 %	3.0 % / 0.8 %	2.0 % / 0.6 %	2.0 % / 0.6 %	2.0 % / 0.5 %
Error of repeatability (random)**	1.5 % / 0.8 %	2.0 % / 0.4 %	2.0 % / 0.3 %	1.5 % / 0.15 %	0.8 % / 0.15 %	0.7 % / 0.2 %	0.6 % / 0.15 %
Tips	10 µl	300 µl	300 µl	300 µl	300 µl	1000 µl	5000 µl
Colours							

\* Error determined as difference between the mean value obtained for a series of 10 measurements and the expected value.  
\*\* Error determined as standard deviation for the series of 10 measurements.



# Pipettes calibration workstation

Pipettes calibration workstation is a complex solution characterised with excellent operation ergonomics, which guarantees precise measurements.

Additional, built-in anti-vibration table with a stone top prevents transmission of ground vibrations onto the balance, with this the stabilization time is significantly reduced. Due to separation of the table frame from the anti-vibration construction, the operator-generated vibrations are not transferred onto the balance.

Ambient conditions are monitored with use of a set of measuring probes: temperature, air and distilled water, humidity and atmospheric pressure.

The probes monitor workstation's ambient conditions in an ongoing manner, this guarantees reliable weighing results.

Pipettes calibration process is supported by a PC software, "Pipettes", which software due to automation improves the procedure of calibration carried out using gravimetric method accordant with ISO 8655-6 standard. "Pipettes" PC software facilitates calibration reports generation, measurement results archiving, and complex pipettes management, compliant with ISO 10012 standard.



## Balances intended for pipettes calibration

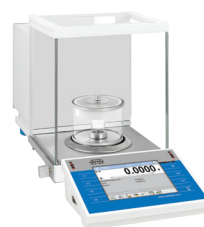
The highest measurement accuracy is ensured using microbalances and analytical balances of 4Y series, equipped with a special adapter for pipettes calibration. The adapter is characteristic for an evaporation ring which minimizes occurrence of errors in the course of pipettes calibration. Both the instruments, a microbalance and an analytical balance, can be used for performance of standard weighing processes. For this purpose, all the operator needs to do, is to disassemble the adapter.



**Microbalance  
MYA 21.4Y.P**



**Microbalance  
XA 52.4Y.M.A.P PLUS**



**Analytical balance  
XA 82/220.4Y.A**

<b>Maximum capacity [Max]</b>	21 g	52 g	82 g / 220 g
<b>Readability [d]</b>	1 µg	0.01 mg	0.01 mg
<b>Minimum sample weight USP</b>	2.4 mg	20 mg	20 mg
<b>Weighing pan dimensions</b>	ø 26 mm	ø 90 mm + ø 85 mm (option)*	ø 90 mm + ø 85 mm (option)*
<b>Pipettes calibration adaptor</b>	11 ml	17 ml	17 ml, 100 ml
<b>Automatic door</b>	YES	YES**	YES**
<b>Display</b>	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen
<b>Adjustment</b>	Internal	Internal	Internal
<b>Communication interfaces</b>	2×USB-A, Ethernet, Wi-Fi®, 4×IN, 4×OUT	2×USB-A, Ethernet, Wi-Fi®, 4×IN, 4×OUT	2×USB-A, Ethernet, Wi-Fi®, 4×IN, 4×OUT

\* ø 85 mm regular weighing pan on purchase order.

\*\* Automatic door for XA 52.4Y.A and XA 82/220.4Y.A balances.

Wi-Fi® is a registered trademark of Wi-Fi Alliance.



# Characteristics

RADWAG pipettes are modern measuring equipment designed and manufactured in accordance with strict standards concerning manufacturing cleanliness and biodegradability of the product.

The pipettes represent a new line of the 'liquid handling' product group, designed to quickly batch and transport liquids of small volume. They enable highly precise dispensing, and are characterized by ergonomic, solid design. The pipette mechanism ensures exceptional precision and repeatability with less intense pressure applied onto the push button.

All the pipettes are inspected for conformity with the requirements of PN-EN ISO 8655 standard regarding precise and repeatable dispensing. Each pipette is delivered with a test report featuring measurements results.

Calibration certificates, issued by the accredited calibration laboratory, are available on request.

# Features

- Large and readable volume display that is fully visible during pipetting;
- Innovative soft grip preventing heat transfer to the pipette inside;
- Low pressure required while using the pipette reduces the risk of RSI;
- Simple click mechanism for changing pipette volume;
- Option of autoclaving the pipette in one piece (disassembling not required). Recommended autoclaving process: 15 minutes at 121°C temperature, 1.05 bar pressure;
- Tip ejector collar is made of PVDF which has a high chemical resistance (also at high temperatures) and low susceptibility to microorganisms expansion;
- Ultra UV resistance;
- Convenient in use tip ejector;
- Compatibility with majority of tips available on the market.



**New quality of small mass weighing**  
**Compliance with USP**  
**Extraordinary performance and operation ergonomics**



## **XA 4Y.A PLUS** **Analytical Balances**

INNOVATIVE SOLUTIONS OF THE SYNERGY LAB LINE



# Innovative solutions applied in **SYNERGY LAB** analytical balances guarantee extraordinary precision of top-class measuring equipment



## Smart Min Weight

- automatic adjustment of range to the weighed mass
- improvement of the minimum sample weight by 30%



## 2-Point Adjustment

- repeatable weighing precision under variable ambient conditions

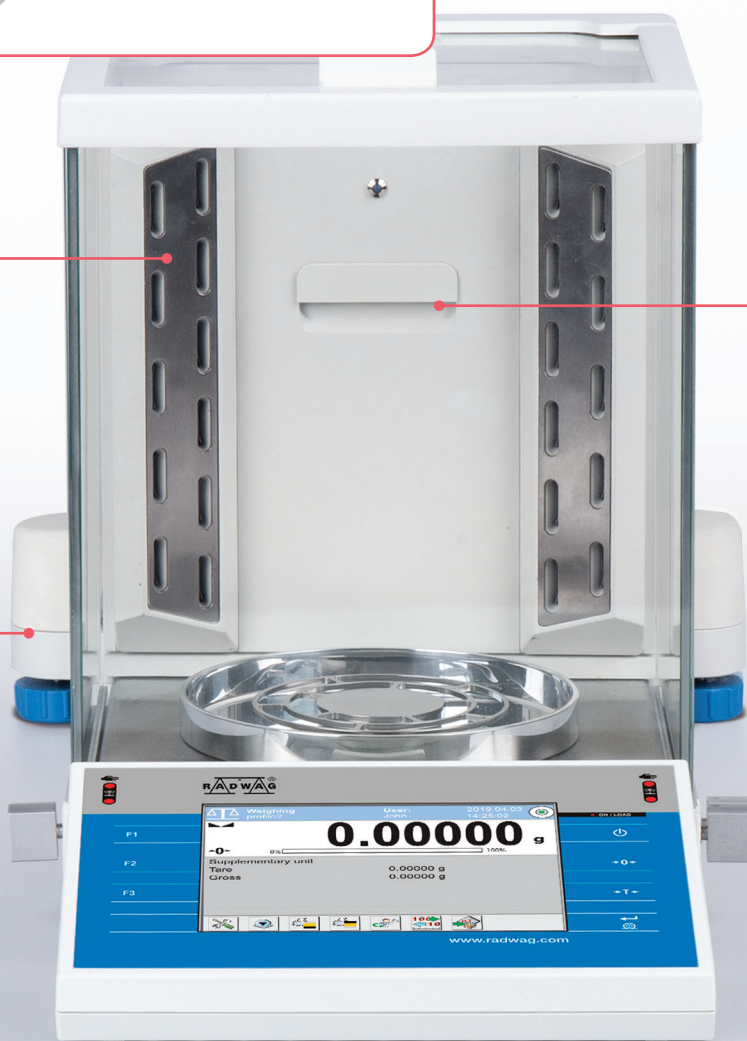
## Antistatic Ionizer

- electrostatic charge compensation inside the weighing chamber
- compensation of positive and negative ions
- operation signalled via LED diode



## Innovative System of Pressure Equalization

- guarantee of stable measurement
- elimination of errors generated by rapid change of pressure inside the weighing chamber

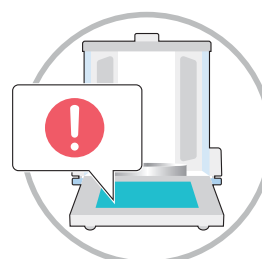


## Reflex Level System

- ground tilt test
- fully automatic levelling

## Feet of Brand New Design

- better balance stability
- protection against unfavourable level change



## Warnings System

- system warning against potential error occurrence during the weighing process
- sensors for constant monitoring of ambient conditions and level status



### 21 CFR Part 11 Compliance Module

All balances of XA 4Y.A PLUS series are compliant with 21 CFR part 11 regulations and with provisions of EU GMP part 4, annex 11. This means that they support electronic signature and are equipped with a number of security and monitoring functions that control work of particular operators.

#### Full Data Protection

- advanced password settings
- verification of log-in operation correctness
- assigning operators with individual permissions
- auto logout
- electronic signature, e.g. for series of measurements
- granting/denying access to data management
- data backup
- modifications saved to Audit Trail file



#### Completely antistatic weighing chamber

- discharge of electrostatic charges thanks to antistatic glass coating
- elimination of influence of electrostatics onto the weighing results

#### Functionality and Ease of Operation

- 5.7" colour touch panel
- simple and intuitive operation
- numerous weighings functions and applications



Parts counting



Statistics



Statistical quality control



Automatic sliding door



Ambient conditions measurement



Dosing



Animal weighing



Autotest



Cooperation with titrators



Moveable range



Checkweighing



Differential weighing



Density determination



GLP procedures



Replaceable unit



Formulations



Percent weighing



Pipettes calibration



Proximity sensors



Multilingual menu



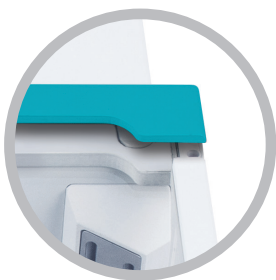
#### RadConnect

- mobile control of the balance
- preview of balance screen on a smartphone or a tablet
- on-line transfer of data from the balance
- iOS and Android app

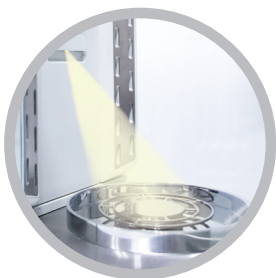


#### Wireless Communication

- wireless communication between the indicator and the weighing instrument enables operating the balance that is placed inside laminar flow hoods and fume cupboards



- Removable Weighing Chamber**
- fully removable weighing chamber components
  - uncomplicated and fast disassembly requiring use of no tools
  - latch-type system for components assembly
  - easy maintenance and cleaning



- Lit-Up Weighing Pan**
- optional weighing pan lit up with use of a LED diode
  - no influence onto the temperature in the weighing chamber



- Automatic Door**
- system of auto control of the weighing chamber door opening and closing
  - possibility to define how wide the door is to be opened
  - elimination of measurement-disturbing vibrations

## XA 4Y.A PLUS Technical Specifications



Maximum capacity [Max]	52 g - 210 g	220 g - 310 g
Readability [d]	0.01 mg	0.1 mg
Repeatability	0.005 mg	0.05 mg – 0.06 mg
Linearity	±0.03 mg – ±0.3 mg	±0.03 mg – ±0.3 mg
Minimum weight USP	10 mg	100 mg – 120 mg
Minimum weight	1 mg	10 mg – 12 mg
Stabilization time	~ 2.5 s – ~ 4 s	~ 2.5 s – ~ 4 s
Adjustment	internal (automatic)	internal (automatic)
Weighing pan dimensions	ø 90 mm (openwork)	ø 100 mm
Communication interfaces	2 × USB-A, 2 × RS 232, Ethernet, 4 × IN / 4 × OUT (digital), Wi-Fi®	

Repeatability is expressed as a standard deviation from 10 weighing cycles (for load value of 5% Max). | Wi-Fi® is a registered trademark of Wi-Fi Alliance.





# 4Y Series Balances

Optimisation, Accuracy, Safety

# 4Y Series



Checkweighing



Dosing



Formulations





## Innovative Adjustment System

The new 2-point adjustment system guarantees the highest measurement accuracy and it also minimizes linearity errors, providing reliable results over the entire weighing range.

## Second to None Measurement Accuracy

The newest Tegra series processor and original solutions designed to enable adjusting filters to environmental conditions ensure excellent working conditions repeatability and quick result stabilization

## New Data Management Experience

Memory expandable up to 32 GB allows recording measurement data in a form of complex reports and graphs presenting statistics and more.

## Maximum Repeatability and Adherence to USP

The best weighing accuracy and  $sd \leq 1d$  repeatability along with adherence to USP requirements (chapter 41 and 1251) set a new benchmark for mass measurement quality.

## Removable Weighing Chamber Components

Uncomplicated and fast disassembly requiring use of no tools. Latch-type system for components assembly.

## Ergonomics and Safety for Operation

Wireless communication established between the terminal and the weighing unit enables utilization of the balances in laminar flow cabinets and in fume cupboards.

## Operation via Mobile Devices

Wi-Fi® option supports transfer of data from a balance to a mobile device featuring iOS or Android system.

## Data Safety

With automatically performed measurement record possible due to ALIBI memory your data is safe and can be analysed whenever you need.



Statistics



Differential weighing



Percent weighing



Pipettes calibration



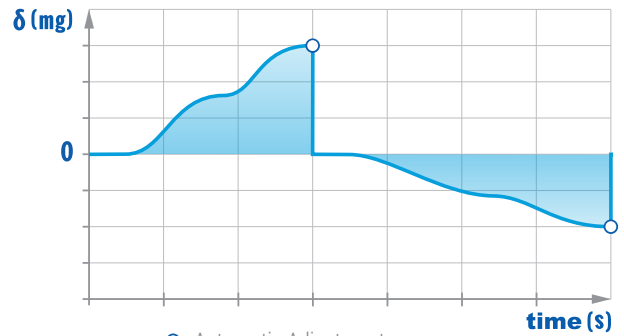
Parts counting

# Optimisation of Operation in a Laboratory

## Adjustment Accuracy for Any Conditions

Automatic adjustment is a warrant for accuracy of each weighing process. It is carried out at specified time intervals or upon temperature variation. A sheer novelty here is a schedule function. With it you can plan when to adjust your device, specify adjustment type (internal, external) and determine by means of which mass standard the adjustment is to be carried out

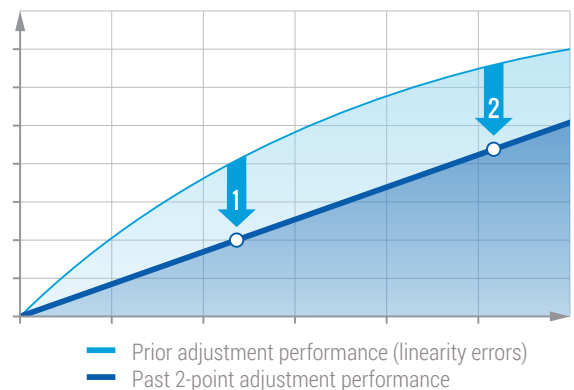
----- Adjustment: Internal -----  
 Date 2019.01.19  
 Time 09:12:38  
 Balance type MYA 4Y  
 Balance ID 392543  
 User Smith  
 Level status Yes  
 Difference 0.000000  
 Temperature 25 °C  
 -----  
 Signature



## Dual Point Adjustment System

Innovative 2-point adjustment system has been designed to provide you with maximum measurement accuracy and to minimize linearity errors. With the system you are guaranteed that your results are reliable for the entire weighing range.

You can take it for granted that your device when monitored with Dual Point Adjustment system shall provide precise indications even for changing working environment. The DPA system is an integral part of XA 4Y and XA 4Y.A balances.



## Yes for Speed and Accuracy No for Compromise

4Y balances with a new powerful processor redefine the speed of operation. Needless to say, the processor delivers noticeable performance improvements including faster operation and shorter stabilization time retaining high repeatability values.

Weighing chamber opening time takes just 1 second, whereas weighing operation takes less than 5 seconds. For measurements with readability of 0.1 mg you need just about 2.2 seconds!

**XA 4Y**  $d=0.1\text{ mg}$  **2.2 s**

**XA 4Y**  $d=0.01\text{ mg}$  **3.5 s**

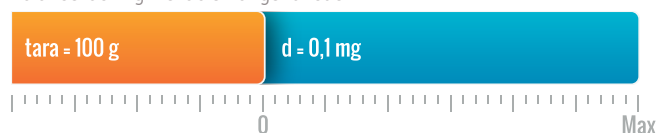
**MYA 4Y**  $d=0.001\text{ mg}$  **4.5 s**

Time taken to reach stable weighing result

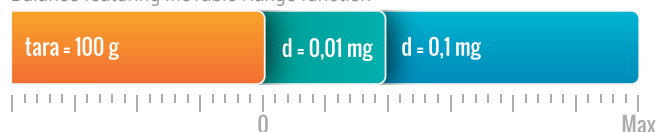
An exemplary dual range balance



Balance lacking Movable Range function



Balance featuring Movable Range function



## Movable Weighing Range

Dual range balances of 4Y series offer Movable Range function. With this, maximum accuracy for weighing of even small samples is guaranteed regardless of applied tare container.

Movable Range function, which is activated automatically, means green light for extremely precise weighing of milligram heavy samples put in a several tens of grams heavy container.

## Load Bargraph Graphic Presentation of Indication

Balance load visualization presented in a graphic form, i.e. in a form of graph displaying per cent load as compared to max balance capacity.

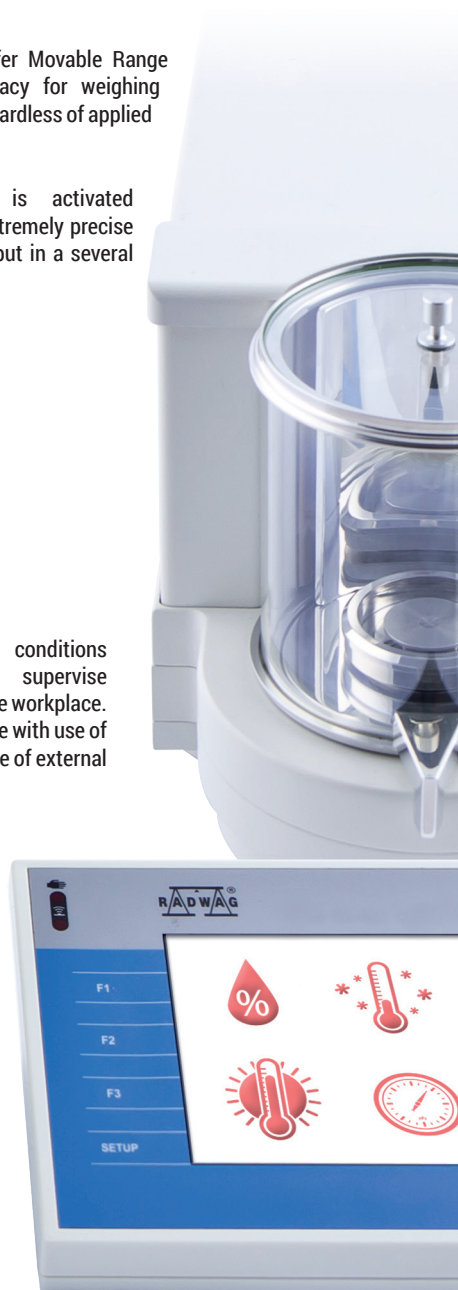
When sample weight increase results with preset threshold exceeding, Zoom function activates automatically. The function enlarges particular bargraph section, which in effect becomes as wide as the whole bargraph. This option lets you observe sample weight variation in a greater scale thus making it clearer.



## Ambient Conditions Monitoring

4Y balances offer unique ambient conditions monitoring solution, applied to supervise environmental conditions at the balance workplace. The monitoring is carried out in real time with use of internal sensors (and optionally with use of external THB sensors).

The system has been designed to monitor several different parameters: temperature, humidity, atmospheric pressure and air density. To enable that, numerous sensors have been applied. Upon either detection of variation or when weight is out of permissible range, respective message is automatically displayed on a balance screen. With this message, being a result of AutoCal system operation, you are informed on need for balance adjustment performance. Trying to make it even more convenient for you, each readout is saved to balance memory





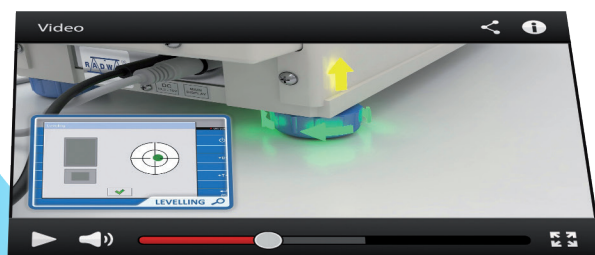
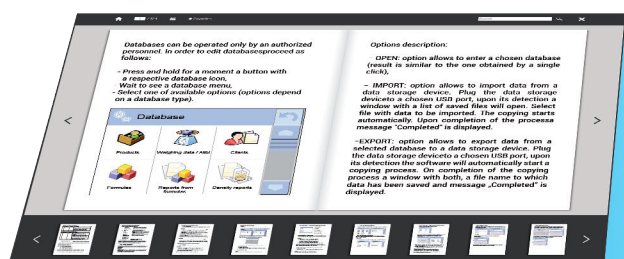
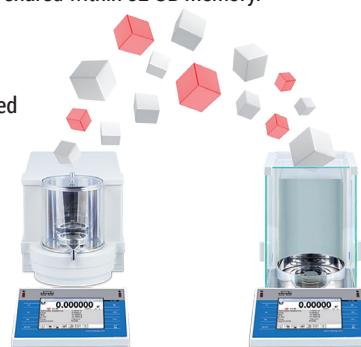


## Databases As Support for the Weighing Process

Complex databases are a distinctive feature of the 4Y series. The databases size is dynamically shared within 32 GB memory.

4Y balances offer unlimited databases management options, plus they enable record of advanced reports and graphs carried out for series of weighings.

Option of databases import and export enables ease of databases management as well as their copying and archiving.



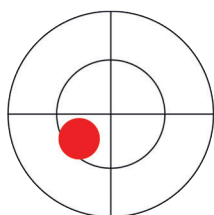
## Video-Guidance And an On-screen Manuals

4Y balances feature "Media" module providing you with complex guidance, i.e. direct assistance in operating the device. With easily accessed context help you are fully supported when it comes to operation of particular functions and applications.

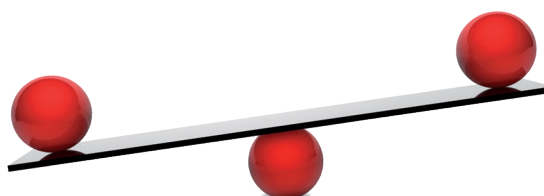
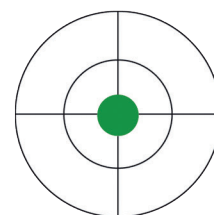
The help is offered in a form of an on-screen displayed user manual, text and drawing instruction and short video guides.



## AutoLevel an On-line Control of Balance Level



Each sample requires level control for every single weighing performance, only then precise weighing is guaranteed. Any balance deviation from permissible level tolerance is immediately recorded and signalled by means of respective messages and colour scheme. Monitoring and level recording are fully automatic facilities.





## Proximity Sensors Comfort of Touch-free Operation

Either workplace characteristics or required testing methodology may limit operator and his mobility (e.g. need for suit or gloves use). For such an instance, proximity sensors turn out to be an indispensable asset. They support touch-free balance operation thus allowing access to particular functions regardless of potential limitations.

Each sensor may be assigned with any freely selected action, e.g. with weighing, tarring, opening or closing the draft shield. Purchase any 4Y model, each of them is equipped with proximity sensors.



## RadConnect Mobile Balance Operation

RadConnect software has been designed to enable bi-directional communication between 4Y series balances and a portable device featuring iOS or Android system.

Using the software, it is possible to transfer weighing operation data on-line (measurement results, statistical data etc.) from the balance to a tablet or a smartphone. By means of the particular mobile device you can start tarring or zeroing operation on your balance, plus you can record weighing results.

Bi-directional communication may be established via Wi-Fi® or Ethernet interface.



## Wireless Connection Flexibility for Balance Application

With wireless communication it is possible to place the terminal anywhere in the vicinity of a weighing chamber, the terminal can be located at a distance of up to 10 meters. Use this convenient option when placing your balance inside Glove Box type of a chamber. Battery power supply provides 8-hour-long, continuous operation



# Weighing Processes Control and Analysis

## Autotest Control Procedures

GLP Autotest is a fully automatic control procedure. It has been designed to allow balance repeatability tests.

The GLP Autotest applies an internal adjustment system for testing purposes and it is a perfect solution used in quality management systems (ISO, GMP, GLP, USP, ICH Q10, SOP). The GLP Autotest provides quick and objective feedback when it comes to operated balance quality. There is an option of generating control procedure report, which is permanently stored in balance memory and which can be either printed or exported.



----- Autotest GLP: Report -----  
Balance type XA 4Y.A  
Balance ID 544121  
User Admin  
Software revision L1.4.15 K  
Date 2019.01.03  
Time 13:42:13

-----  
Number of measurements 10  
Reading unit 0.00001 g  
Internal weight mass . 201.03411 g  
Filter Slow  
Value release Reliable  
Temperature: Start 23.99 °C  
Temperature: Stop 23.96 °C  
Humidity: Start 5 %  
Humidity: Stop 58 %

-----  
Deviation for Max. 0.00004 g  
Repeatability 0.000006 g  
-----

Signature  
-----





#### ----- Autotest Filter Report -----

Filter Fast  
Value release Fast  
Repeatability 0.00008 g  
Stabilization time 1.688 s



Filter Fast  
Value release Fast and Reliable  
Repeatability 0.00006 g  
Stabilization time 2.255 s

Filter Fast  
Value release Reliable  
Repeatability 0.00008 g  
Stabilization time 2.760 s

Filter Average  
Value release Fast  
Repeatability 0.00007 g  
Stabilization time 2.760 s

Filter Average  
Value release Fast and Reliable  
Repeatability 0.00005 g  
Stabilization time 2.423 s



Filter Slow  
Value release Fast and Reliable  
Repeatability 0.00004 g  
Stabilization time 2.533 s



**The fastest measurement**  
The shortest measurement time



**The most accurate measurement**  
Maximum repeatability



**Optimal measurement**  
Optimal time and repeatability settings

## Autotest Filter Balance settings and diagnostics

4Y series balances offer vast range of settings optimisation possibilities – with this the balance can be adjusted to any workplace. In order to ease setup of countless number of parameters, Autotest Filter function has been designed.

The function is used to enable automatic test performance for all possible setup combinations, it provides you with information on weighing duration and repeatability. Upon completed procedure your balance displays results of carried out tests, allowing you to decide on optimal solution complying to your needs.



SQC		
User		Lab
Product		Pill
Start date	2019.01.02 10:10:18	
End date	2019.01.02 10:14:41	
Batch number		1\
Batch quantity		10
Nominal mass		0.361 g
Limit T2-	0.0361 g	10 %
Limit T1-	0.01 05 g	5 %
Limit T1+	0.01805 g	5 %
Limit T2+	0.0361 g	10 %

Measurement 1		
Net		0.366185 g
Measurement 2		
Net		0.369271 g
Measurement 3		
Net		0.385184 g
Measurement 4		
Net		0.324771 g
Measurement 5		
Net		0.356942 g
Measurement 6		
Net		0.368712 g
Measurement 7		
Net		0.355558 g
Measurement 8		
Net		0.368694 g
Measurement 9		
Net		0.368100 g
Measurement 10		
Net		0.368100 g

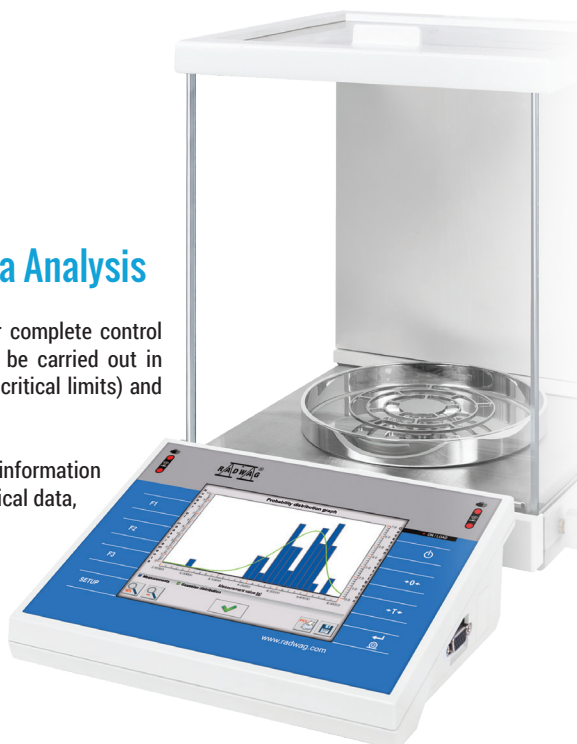
Number of T2- errors	1	10 %
Number of T1- errors	1	10 %
Number of T1+ errors	1	10 %
Number of T2+ errors	0	0 %
Average	0.3631517 g	
Standard deviation	0.01487272 g	

Signature

## SQC Automatically Carried Out Data Analysis

SQC statistics module is an excellent facility for complete control of a particular sample weight. The control may be carried out in course of a manufacturing process (warning and critical limits) and during other tests.

SQC Reports is an precise tool intended to acquire information on carried out tests, their numbers, names, statistical data, etc., and to record it into a particular database.



# Data Safety

## Monitored Data Access and Protection

Particular balance can be operated by numerous users whereas no risk of individual operator's data loss is taken, all this owing to customized permissions levels allowing access to specified functions.

Four access levels offer unlimited monitoring options, especially when it comes to supervision over operators, and protection of especially sensitive data. Each access level is secured with an individual password.



## Alibi Memory Secure

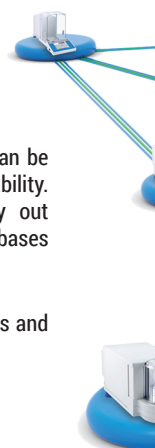
Alibi Memory is a special partition for measurement data storing. The memory content can be viewed by means of free computer software, Alibi Reader.



## Synchronizing and Archiving Data

4Y series provide data transfer and copying option. Your data can be exchanged between any balances regardless of their type or readability. With export/import function at your disposal you can carry out balance-to-balance synchronization of profiles and databases (operators, products, printouts, formulations, packaging, etc.).

The 4Y series offers complex archiving of databases, user profiles and memory stored data.



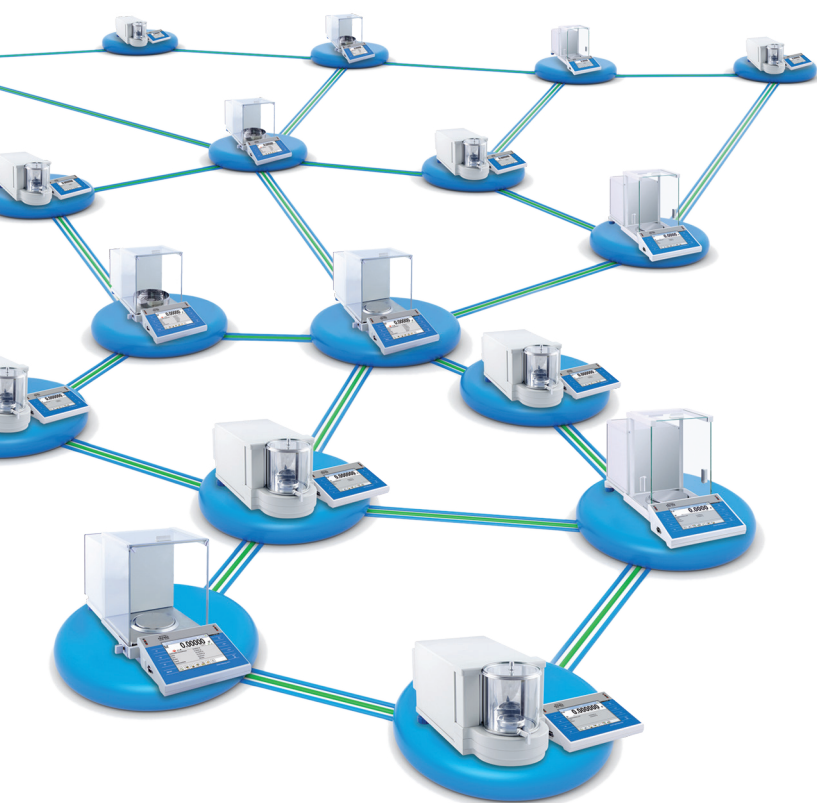




## Settings Customization as Working Environment Optimisation Tool

The 4Y series offers balance customization option, with this, any balance can be adjusted to individual requirements of yours. The customization option allows you to match balance functionality to scope of tests you carry out.

You and other operators likewise, can be assigned with an individual profile featuring language version, quick access keys, working modes settings, filters, printout types, etc. of your choice.



## Managing Data of IT Systems

Your balance data can be managed on-line, this useful option is conditioned by remote access to a particular balance and its databases. Another practical alternative when it comes to data management is USB interface. With the USB it is easy to copy or transfer results of your work, e.g. measurements, reports, databases, from balance to a computer.

All weighing processes can be supported by external PC software. E2R SYSTEM is an example of such application. This multi-module program, designed by RADWAG, is a convenient tool providing complex management and control of data transferred between a weighing workstation and a computer.

E2R SYSTEM may serve you as a handy tool for archiving and analysing your weighing results. Its core is SQL database along with PC software, which is integrated with weighing workstations linked via ETHERNET and Wi-Fi.

# Reports and Printouts

## Documentation on Weighing Processes

Upon each completed weighing process, carried out using 4Y balance, you are provided with an automatically generated report which is next recorded into a database.

As a user operating reports database you are allowed to carry out the following practical report-related operations: preview, printout, export, archiving and free setup. .



## Flexibility of Printout Setup

4Y balances facilitate two printout types. At your disposal there are standard printouts generated on the basis of fixed template and customized non-standard printouts.

The standard printout comprises three sections: a header, a data section and a footer. Each section content can be freely adjusted thus ensuring that any demand of yours is faced. When it comes to a non-standard printout you can design it in a way reflecting your wish as it is not limited by any templates. The printout of your design may contain personal data, freely selected sections and variables.

Header Measurement Data Footer	----- Weighing -----	
	Date	2019.01.02
	Time	14:07:43
	Balance ID	419036
	User	Admin
	Level status	Yes
	Product	Calcium
	Packaging	Blister
	Temperature during measurements	26.79 °C
	Humidity during measurements	24 %
	Pressure during measurements	994 hPa
	Net	0.11137 g
	Tare	0.50000 g
	Gross	0.61183 g
	Supplementary unit	0.55918 ct
Minimum sample status	OK	
Net	0.11180 g	
Tare	0.50000 g	
Gross	0.61180 g	
Supplementary unit	0.55903 ct	
Minimum sample status	OK	
Net	0.11180 g	
Tare	0.50000 g	
Gross	0.61180 g	
Supplementary unit	0.55903 ct	
Minimum sample status	OK	
-----		
Signature		
-----		



# Regulations and conformity



## OIML Legal Metrological Control

Legal metrological control is one of numerous means of supervision over measuring equipment. It is intended for control of devices featuring type approval. If a balance has been positively evaluated you may be sure that it complies to requirements of legal regulations.

Please note that OIML specified tolerance for max permissible errors is several times higher than GMP RADWAG tolerance.



## WELMEC 2.3 Software Protection

Software for each application management adheres to all requirements for reliability and for data safety. This is true for every single balance.

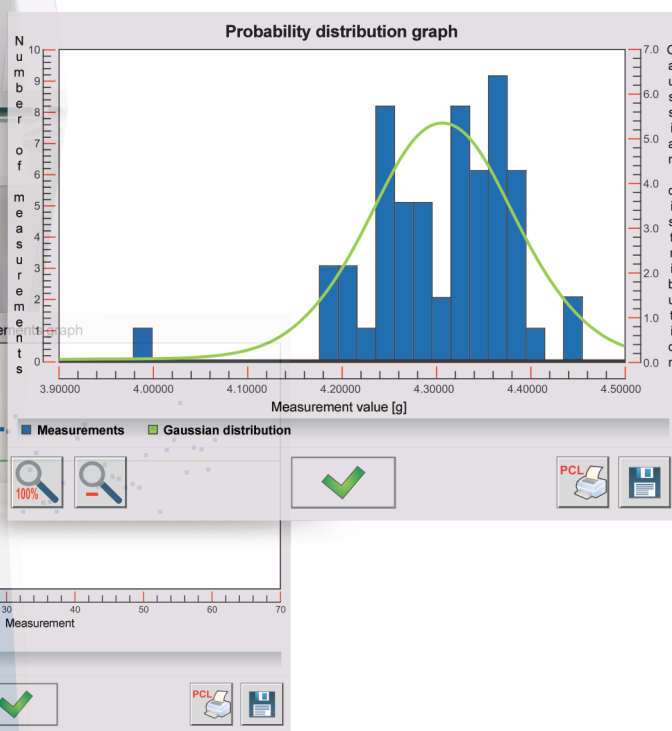
Software structure is protected against intrusion by means of system of passwords and permissions levels. Metrological settings as well as settings of operational nature can be restored (verified) when such need occurs.



## USP, CFR 21 Mass Measurement Accuracy

Each balance accuracy is an effect of use of extremely stable weighing system which guarantees correct operation even when ambient conditions change.

Owing to very stable electronics, A/D converter signal is properly interpreted thus providing desirable metrological parameters. Weighing system accuracy is subjected to control and periodical verification realized by means of so called automatic adjustment operation.



## Visualization and statistics

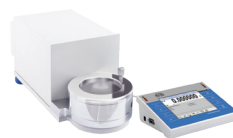
Selected working modes of the 4Y series (Statistics, SQC) feature chart function. The chart is generated for a particular weighing upon its completion.

The aforementioned modes enable you to generate charts presenting average value determined for set of measurements, additionally you can create probability distribution charts for particular measurement series. Each chart can be scaled, printed or saved to a BMP file.

# Technical specification



**UYA 4Y  
MYA 4Y**



**UYA 4Y.F  
MYA 4Y.F**



**MYA 4Y.P**

Maximum capacity [Max]	0.8 g - 52 g	2.1 g - 5.1 g	21 g
Readability [d]	0.1 µg - 10 µg	0.1 µg - 1 µg	1 µg
Minimum weight	0.05 mg - 0.4 mg	0.05 mg - 0.2 mg	0.24 mg
Minimum weight USP	0.5 mg - 4 mg	0.5 mg - 2 mg	2.4 mg
Weighing pan dimensions	ø 16 mm, ø 26 mm, ø 40 mm, ø 60 mm (for filters)	ø 26 mm, ø 50 mm, ø 100 mm, ø 160 mm	ø 26 mm
Stabilization time	8 - 20 s	8 - 20 s	10 s
Adjustment	internal (automatic)	internal (automatic)	internal (automatic)
Display	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen
Communication interfaces	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN/4×OUT (digital)	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN/4×OUT (digital)	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN/4×OUT (digital)
Automatic sliding door	●	–	●
Pipettes calibration	–	–	●
Filters weighing	–	●	–



Read QR code  
and view complete  
technical specification  
of all 4Y series balances







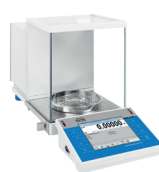
**XA 4Y.M**



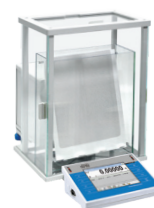
**XA 4Y.M.A**



**XA 4Y**



**XA 4Y.A**



**XA 4Y.F**

6 g - 52 g	6 g - 52 g	52 g - 520 g	52 g - 310 g	52 g - 110 g
1 µg - 5 µg	1 µg - 5 µg	0.01 mg - 0.1 mg	0.01 mg - 0.1 mg	0.01 mg
0.26 mg - 0.7 mg	0.26 mg - 0.7 mg	1.2 mg - 16 mg	1.2 mg - 14 mg	1.2 mg - 1.4 mg
2.6 mg - 7 mg	2.6 mg - 7 mg	12 mg - 160 mg	12 mg - 140 mg	12 mg - 14 mg
ø 30 mm	ø 30 mm	ø 90 mm, ø 100 mm, ø 85 mm(option)	ø 90 mm, ø 100 mm, ø 85 mm(option)	210 × 254 mm (for filters), ø 90 mm, ø 85 mm (option)
~ 3.5 s	~ 3.5 s	2.5 - 4 s	2.5 - 4 s	~ 5 s 30 s (for filters)
internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)	internal (automatic)
5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen	5.7" colour resistive touchscreen
2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN/4×OUT (digital)	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN/4×OUT (digital)	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN/4×OUT (digital)	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN/4×OUT (digital)	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN/4×OUT (digital)
—	●	—	●	—
—	—	—	●*	—
—	—	—	—	●

\* pipette calibration possible exclusively with use of a dedicated adapter for calibration of pipettes | Wi-Fi® is a registered trademark of Wi-Fi Alliance.

## 4Y Balances Accessories

- Antivibration tables
- Thermal and impact printers
- Computer cables, printer cables
- Laboratory ware holders
- Density determination kit
- Additional external display
- Ambient conditions modules
- Barcode reader
- Adapter for pipettes calibration
- Workstation for pipettes calibration



**R-Lab**

Collecting, presenting and statistical analysis of measurements.



**Label Editor R02**

Designing labels for multi-functional scales and for scales operating in labeling, counting, dosing and formulation making systems..



**Pipettes**

Determining errors of pipette volume measurement (volumetric instruments) in accordance with the ISO 8655 standard.



**E2R Weighing Records**

Record of weighings carried out on RADWAG-designed workstations.



**E2R PGC**

Synchronization of databases and weighing records registering in PGC processes.



**THB-R**

Monitoring and registering of ambient conditions.

The full software range is available on the [www.radwag.com](http://www.radwag.com) website

The software is compatible only with RADWAG-designed weighing instruments and is not available as a box version - the presented packages are for information purposes only.



# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)



**RADWAG BALANCES AND SCALES**  
ADVANCED WEIGHING TECHNOLOGIES



# X2 Series Balances

Innovative Functional Solutions

## X2 Synergy

The X2 series embodies the synergy between conventional solutions characteristic of high quality balances, and technology intended mainly for professional standards.

The combination provides you with a high-tech instrument offering pinpoint accuracy and maximum ease of operation at a price typical of lesser devices.

- 5" color capacitive touchscreen
- Display customization with widgets
- Multilingual, interactive menu
- Sensors for touch-free operation
- Conformity with GLP and GMP regulations
- Dynamically controlled sample weight (bar graph)
- Statistics, formulations, reports and printouts
- Unlimited communication possibilities
- Alibi memory with record of measurements
- Complex databases
- Maximum comfort of operation
- Internal adjustment (excluding MA X2.A)

## Home screen

- A** Home screen button
- B** Exit (returning to the previous screen) button
- C** Taring button
- D** On/Off button
- E** Enter/Print button
- F** Zeroing button
- G** Status bar (working mode, metrologically important parameters)
- H** Measurement indication area
- I** Information desktop
- J** Quick access toolbar for the direct operation of balance functions and settings
- K** Current working mode setup
- L** Sensors for touch-free operation



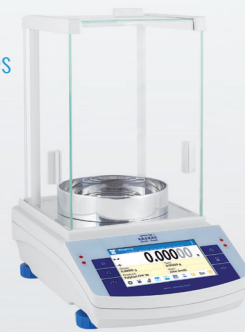
# X2 S





# ERIE

## AS X2 analytical balances



Maximum capacity [Max]: up to 310 g  
 Readability [d]: from 0.01 mg  
 Weighing pan dimensions: ø90 mm, ø100 mm, ø85 mm (option)

## PS X2 precision balances



Maximum capacity [Max]: up to 10.1 kg  
 Readability [d]: from 1 mg  
 Weighing pan dimensions: 128 × 128 mm, 195 × 195 mm

## WLC X2 precision balances



Maximum capacity [Max]: up to 21 kg  
 Readability [d]: from 1 mg  
 Weighing pan dimensions: 128 × 128 mm, 195 × 195 mm, ø100 mm

## MA X2.A, MA X2.IC.A moisture analyzers



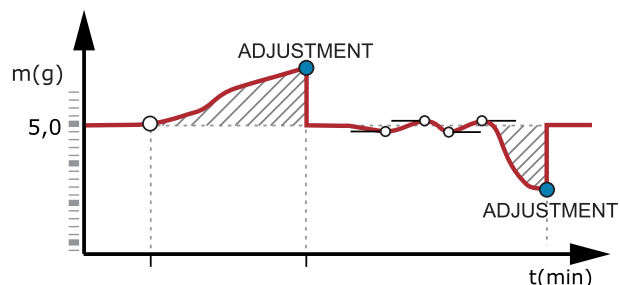
Maximum capacity [Max]: up to 210 g  
 Readability [d]: from 0.1 mg  
 Weighing pan dimensions: ø 90 mm, h = 8 mm

# The X2 series as a standard for quality



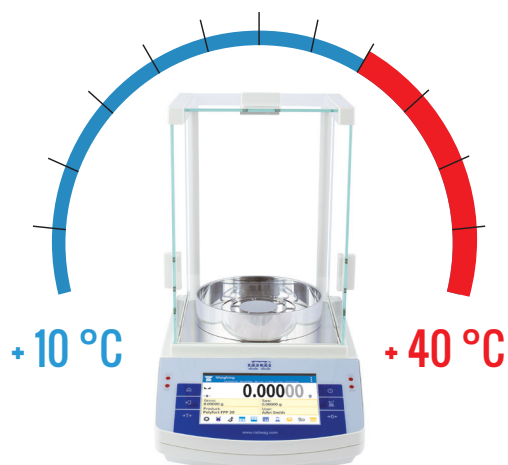
## Accuracy of each weighing indication

X2 series balances with an automatic adjustment system, using an internal adjustment weight, guarantee reliable measurement. Regardless of ambient conditions, the system provides effective elimination of any balance sensitivity deviations.



## Accuracy for any temperature

Accuracy is one of the most significant parameters influencing metrological characteristics of the weighing device. The production and control system designed for X2 balances monitors and adjusts for accuracy in changing temperatures. With minimized deviation of results, the X2 series ensures great measurement stability for wide temperature range.



## Accuracy for any conditions

The multi-shield mechanical design of X2 series balances offers effective protection against the influence of ambient conditions. With such design, the X2 series stands for the fast and reliable measurement of either light or heavy loads, even when ambient conditions pose challenges.



## Quality begins with precision



The optimization of X2 structural components provides measurements repeatability – the pivotal parameter for several analytical processes.

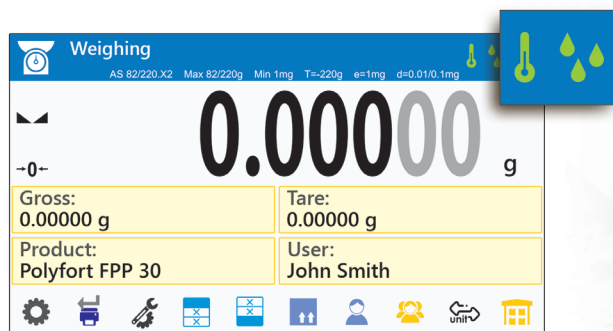
## Speed operation time optimization



The X2 series is a product of both, measuring systems development, and progress when it comes to measuring signals monitoring methodology. With our X2 series balances, you are offered solutions that guarantee a full range of settings providing the right sensitivity for measurements performed within seconds.

## Ambient conditions monitoring

Information on fluctuating ambient conditions is essential in measuring devices characterized by high resolution. For your comfort, X2 series balances have been equipped with system that signals the dynamics of temperature changes with a special symbol. This is especially useful while installing your device (acclimatization period), and when the working environment shows its changeable nature.

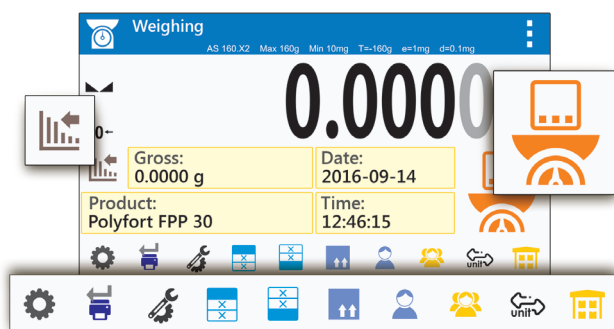




# Redefined functionality

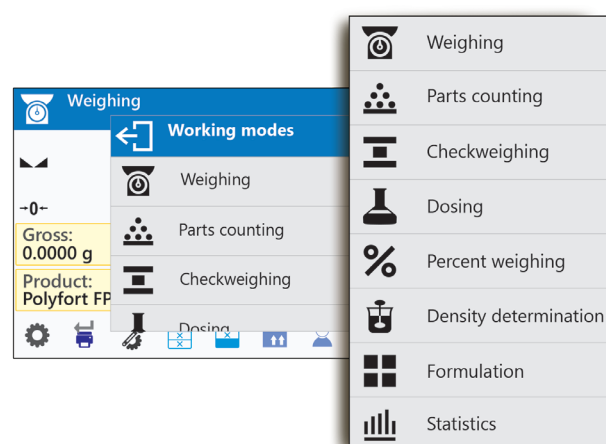
## Buttons customization

Customized buttons facilitate the selection of weighing units, packaging, customers, and variable tare values adding to the fast and solid performance of the weighing process. User-designed key, tailored to the user's needs, can be assigned to a particular working mode, boosting your balance's functionality.



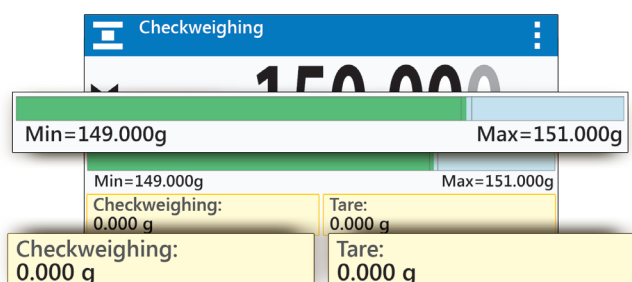
## Clear information arrangement even greater ease of operation

Priority for our X2 series balances is ease of operation and intuitive communication with the user. Clear information presented by symbols provides even more user-friendly operation.



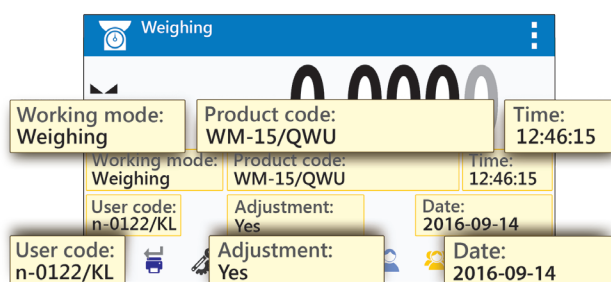
## Labels adapt your own onscreen labels

X2 balances feature labels – pre-defined information fields providing various data, e.g. product name, user, date and time or bar graph. Labels names and values are not intended for modification but it is the user who decides which labels are to be displayed.



## Text fields adapt the text field to your own needs

Text fields and labels feature similar characteristics, but text fields, unlike labels, can be freely created and configured by a user. It is possible to provide each text field with an individual name, function and value. In addition, you can decide on the particular text field size and location.





## Databases

### ergonomics for your weighing process

The IT structure of X2 series balances is based on structural databases. Freely programmed database content favours the creation of a dedicated information network, wherein the network precisely suits the nature of any performed process.



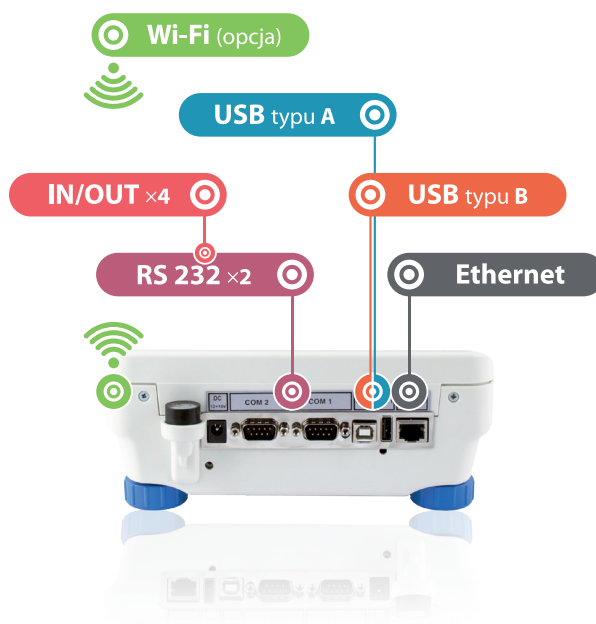
Databases comprise the following components:

- 100 users
- 100 packaging types
- 100 warehouses
- 100 formulations
- 200 formula reports
- 500 density reports
- 1 000 customers
- 5 000 products
- 50 000 weighings
- 500 000 ALIBI records

## Communication

### interfaces

With various means of communication, the possibilities of X2 series balances are even more enhanced when it comes to information storage. Standard cable connections are realized via USB-A and USB-B or RS 232 ports. Every single RADWAG-manufactured software offers option of Wi-Fi®.



# Data safety and monitoring

## Protecting data user authorization levels

Three different authorization levels provide restricted access to confidential information for particular groups of users. An administrator manages authorization levels.



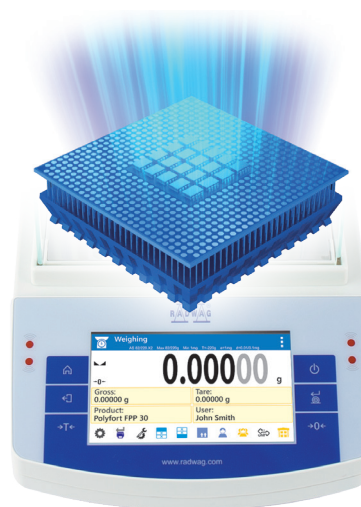
## Data archiving and exchange

The USB interface facilitates the transfer of reports on processes and partial weighing to peripheral devices. This is especially useful for archiving and monitoring purposes. In addition, the USB interface allows copying of input databases.

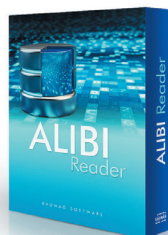


## ALIBI memory secure storage of measurements

ALIBI memory offers effective data protection, and it allows 500 000 weighings. This guarantees safety and continuity of your vital data stored over long period of time.



Option of exporting data from ALIBI memory to your balance.



ALIBI Reader PC software enables the user to overview all weighings recorded in balance memory. The software allows printout of selected data and preparation of PDF and CSV (Excel) reports.

No.	Date and time	Serial number	User code	Product code	Result	Unit	Time	Precision	Number of last digit number	Last digit number	Stability
1111	2014.01.02 12:19:18	12310000	U48D4	13.1042	104	g	0.0000	4	0	No	No
1112	2014.01.02 12:19:18	12310000	U48D4	17.1291	104	g	0.0000	4	0	No	No
1113	2014.01.02 12:19:19	12310000	U48D4	17.1273	104	g	0.0000	4	0	No	No
1114	2014.01.02 12:19:19	12310000	U48D4	17.1273	104	g	0.0000	4	0	No	Yes
1115	2014.01.02 12:19:20	12310000	U48D4	17.1273	104	g	0.0000	4	0	No	Yes
1116	2014.01.02 12:19:20	12310000	U48D4	9.9895	ad1	g	0.0000	4	0	No	Yes
1117	2014.01.02 12:19:20	12310000	U48D4	9.9895	ad1	g	0.0000	4	0	No	Yes
1118	2014.01.02 12:19:21	12310000	U48D4	9.9890	ad1	g	0.0000	4	0	No	No
1119	2014.01.02 12:19:22	12310000	U48D4	399.50	ad2	g	0.01	2	0	No	No
1120	2014.01.02 12:19:22	12310000	U48D4	399.50	ad2	g	0.01	2	0	No	No
1121	2014.01.02 12:19:23	12310000	U48D4	399.50	ad2	g	0.01	2	0	No	Yes
1122	2014.01.02 12:19:23	12310000	U48D4	399.52	ad2	g	0.01	2	0	No	Yes
1123	2014.01.02 12:19:23	12310000	U48D4	399.52	ad2	g	0.01	2	0	No	No
1124	2014.01.02 12:19:24	12310000	U48D4	199.79	g	g	0.01	2	0	No	No
1125	2014.01.02 12:19:24	12310000	U48D4	199.81	g	g	0.01	2	0	No	No
1126	2014.01.02 12:19:25	12310000	U48D4	199.82	g	g	0.01	2	0	No	No
1127	2014.01.02 12:19:25	12310000	U48D4	199.80	g	g	0.01	2	0	No	No
1128	2014.01.02 12:21:09	12310000	T85E	U48D4	199.79	g	0.01	2	0	No	No
1129	2014.01.02 12:21:09	12310000	T85E	U48D4	199.79	g	0.01	2	0	No	No
1130	2014.01.02 12:21:09	12310000	T85E	U48D4	199.79	g	0.01	2	0	No	No
1131	2014.01.02 12:21:10	12310000	T85E	U48D4	199.74	g	0.01	2	0	No	No
1132	2014.01.02 12:21:12	12310000	T85E	U48D4	0.19075	kg	0.00000	5	0	No	Yes
1133	2014.01.02 12:21:12	12310000	T85E	U48D4	0.19075	kg	0.00000	5	0	No	Yes
1134	2014.01.02 12:21:13	12310000	T85E	U48D4	0.19075	kg	0.00000	5	0	No	No
1135	2014.01.02 12:21:13	12310000	T85E	U48D4	0.19076	kg	0.00000	5	0	No	No
1136	2014.01.02 12:21:13	12310000	T85E	U48D4	0.19076	kg	0.00000	5	0	No	Yes
1137	2014.01.02 12:21:14	12310000	T85E	U48D4	0.19076	kg	0.00000	5	0	No	No

# Reports and printouts

## Customized reports

X2 series balances offer reports comprising three customized sections. As a user you have the green light for free modification of each section content.

-----	
Working mode	Weighing
Date	18.01.2019
Time	11:36:36
Balance type	AS X2
Balance ID	2035
Product	PILL
User	John Smith
Net weight	0.8020 g
Tare	0.5000 g
Gross weight	1.3010 g
----- Calibration Report -----	
Calibration type	Internal
User	John Smith
Project	124/SGW/2019
Date	18.01.2019
Time	12:56:10
Balance ID	1035
Calibration difference	0.0000 g
Signature	
-----	

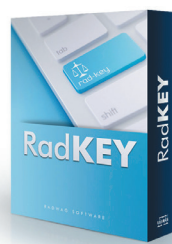
Sample report divided into three configurable sections: header, GLP printout and footer.

All X2 balances cooperate with computer printers supporting PCL standard. Communication between the devices is established via USB or RS 232 interface.

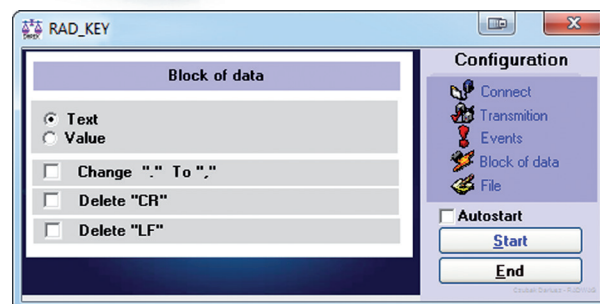
## Printouts

### of measurements sent to PC software

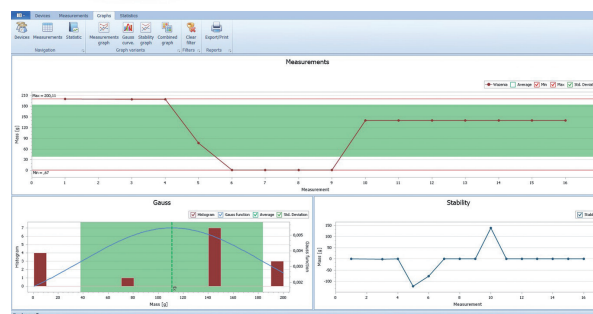
Measurements carried out by X2 series balance can be transferred directly to R-Lab and RAD-KEY PC software.



RAD-KEY PC Software is designed to acquire your balance data, with the use of special HotKey, which is then entered into an active spreadsheet cell.



R-Lab software enables scale preview and generating both weighings and statistics graphs.









# Technical specification



**AS X2**



**PS X2**



**WLC X2**

Maximum capacity [Max]	60 g - 310 g	0.2 kg - 10.1 kg	0.2 kg - 21 kg
Readability [d]	0.01 mg - 0.1 mg	1 mg - 100 mg	1 mg - 1000 mg
Weighing pan dimensions	ø90 mm, ø100 mm, ø85 mm (option)	128 × 128 mm, 195 × 195 mm	ø100 mm, 128 × 128 mm, 195 × 195 mm
Stabilization time	3.5 s - 6 s	1.5 s - 2 s	2 s - 4 s
Adjustment	Internal	Internal	Internal
Display	5" colour capacitive touchscreen	5" colour capacitive touchscreen	5" colour capacitive touchscreen
Communication Interfaces	USB-A, USB-B, 2×RS232, Ethernet, Wi-Fi®	USB-A, USB-B, 2×RS232, Ethernet, Wi-Fi®	USB-A, USB-B, 2×RS232, Ethernet, Wi-Fi®



**MA X2.A, MA X2.IC.A**

Maximum capacity [Max]	50 g - 210 g
Readability [d]	0.1 mg - 1 mg
Weighing pan dimension	ø90 mm, h = 8 mm
Moisture readout accuracy	0,0001 % - 0,001 %
Drying temperature range	max 160°C, max 250°C (optional)
Adjustment	External (MA X2.A), Internal (MA X2.IC.A)
Heating module	IR emitter, halogen (option), metal heater (option)
Display	5" colour capacitive touchscreen
Communication Interfaces	USB-A, USB-B, RS232, Ethernet, Wi-Fi®
Automatically opened drying chamber	YES

## Optional equipment

- Barcode readers,
- PCL printers,
- USB keyboard,
- PC Software: R-Lab, RAD-KEY and ALIBI Reader,
- Under-pan weighing rack,
- Anti-vibration tables,
- Draft shield,
- LCD WD-6 display,
- Density determination kit for solids and liquids.

Optional equipment accessibility is conditioned by a particular model.

## PC Software

- R-Lab - Scales preview, weighings graphs and statistics graphs.
- RAD-KEY - Capturing balance data, inserting the data into a spreadsheet cell.
- ALIBI Reader - Capturing balance data recorded in ALIBI memory.

Read QR code

and view complete  
technical specification  
of all X2 series balances





# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)



# R Series Balances

Innovative Technology - Even More Possibilities



## R series balances

Examine the enhanced possibilities of the innovative high-tech R series balances when it comes to balance operation and presentation of measurement results.

R series balances represent the standard level of precision balances. The series has been equipped with an easily readable LCD display providing you with even clearer result presentation. To maximize comfort of operation, the display has been enriched with an extra text line supplying you with either information or prompts on the weighing process (product name, tare value, etc.).

A pioneering innovation of R series balances is a set of symbols showing you a current working mode, type of connection with a computer, battery state, weighing and service functions. Additionally now there are even more weighing units at your disposal (g, mg, etc.). Weighing results are recorded in ALIBI memory.

The new series features plastic housing and a stainless steel weighing pan. With the possibility of weighbridge-free weighing (so called, under-pan weighing), wherein the load is suspended under the balance, the R series balances are an indispensable tool for any user.

## Home screen

- A** Symbols
- B** Extra text line
- C** Direct access to databases
- D** Access to a particular working mode functions
- E** Working mode selection
- F** Direct start-up of balance adjustment procedure
- G** Transfer of display state to a peripheral device
- H** Navigation buttons



# RSE



### AS R2 analytical balances



Maximum capacity [Max]: up to 310 g  
 Readability [d]: from 0.01 mg  
 Weighing pan dimensions: ø90 mm, ø100 mm, ø85 mm (option)

### PS R1 precision balances



Maximum capacity [Max]: up to 6100 g  
 Readability [d]: from 1 mg  
 Weighing pan dimensions: 128 × 128 mm, 195 × 195 mm

### PS R2 precision balances



Maximum capacity [Max]: up to 10100 g  
 Readability [d]: from 1 mg  
 Weighing pan dimensions: 128 × 128 mm, 195 × 195 mm

### MA R moisture analyzers

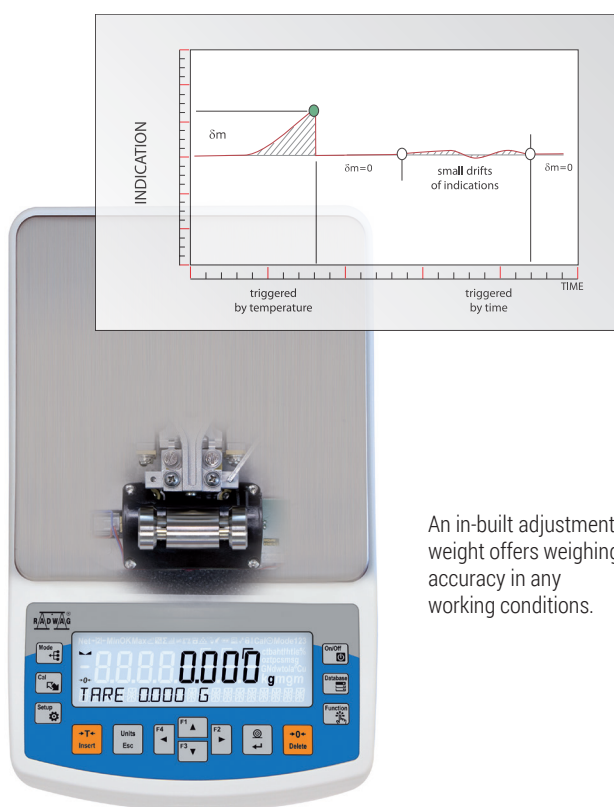


Maximum capacity [Max]: up to 210 g  
 Readability [d]: from 0.1 mg  
 Weighing pan dimensions: ø90 mm, h = 8 mm

# Quality and precision

## Auto-Cal automatic system of adjustment procedure

Auto-Cal system is a tool for control and correction. It provides accurate weighing regardless of temperature variation, the position of the balance or changing environmental conditions. This allows the R series balances to offer accuracy in all conditions.

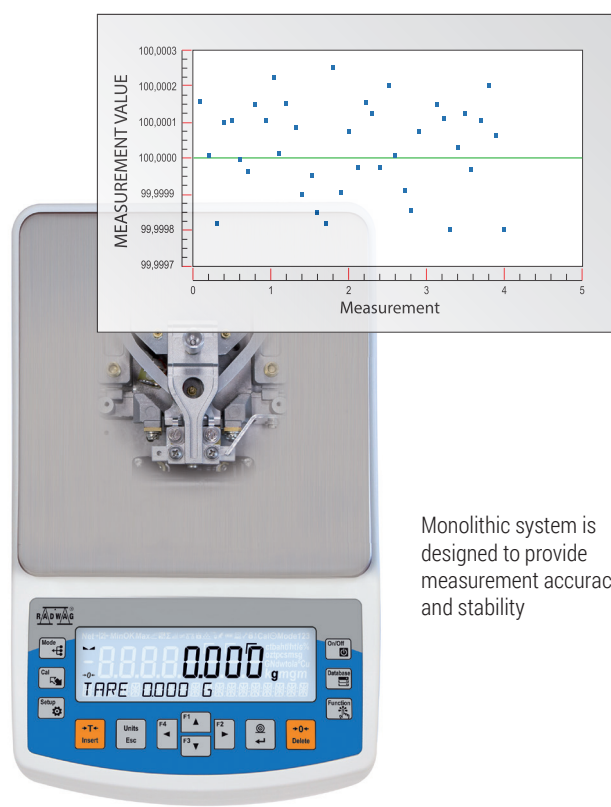


An in-built adjustment weight offers weighing accuracy in any working conditions.

The built-in adjustment weight has been designed to maintain accurate indications. Discover that with our automatic or semi-automatic adjustment procedure, performed periodically, you may grow confident about your weighing results' accuracy. The adjustment system guarantees that accurate weighing results are obtained even for challenging working conditions. It is used for GLP, GMP control procedures.

## Repeatability of indications

The monolithic system ensures even greater accuracy and repeatability of weighing due to consolidation of elements of the balance's mechanical design. Using such technology results in higher quality balances.



Monolithic system is designed to provide measurement accuracy and stability

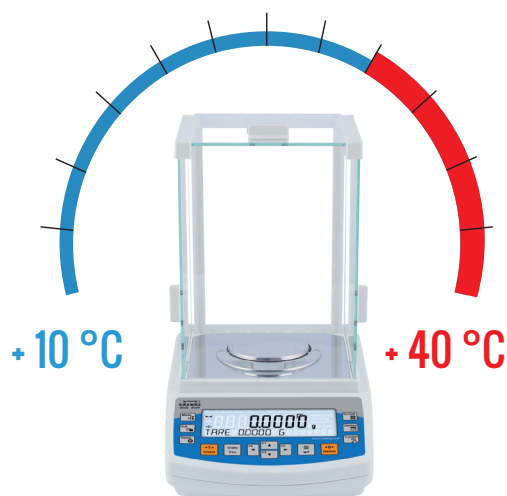
Owing to the monolithic systems, R series balances offer fast measurement and excellent repeatability. These up-to-date design solutions, being highly resistant to transport shocks, are characterized by good metrological parameters.



# Accuracy in all conditions

## Operating temperature range

Now, owing to a wider working temperature range, you don't have to monitor and adjust the room temperature, affecting your balance stability, over and over again.



## Resistance to ambient conditions

Increased resistance to fluctuating ambient conditions such as breezes and changes in humidity provides more accurate measurements.



## Ambient conditions monitoring

Stable ambient temperature is a key factor when it comes to accuracy of balance indications. The R series balances feature an ergonomic diagnostic tool, namely, automatic monitoring of your balance temperature. Dynamics of balance temperature variation is registered online. When limit values have been exceeded, a thermometer symbol is displayed on the balance screen. In these cases, it is advisable to stabilize the balance.

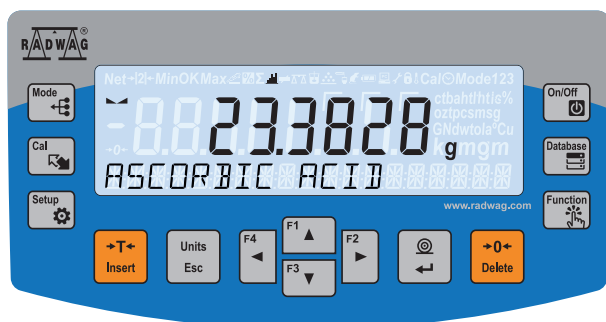
You may find ambient conditions monitoring especially useful when installing the balance at its place of use. This solution may also turn out to be exceptionally valuable when observing ambient temperature variation.



# Functionality and ergonomics

## Direct access to information

Direct access to functions and databases is possible through the quick access buttons on the display.



**Database** - direct access to database,  
**Function** - direct access to basic functions,  
**F1 to F4** - programmable function buttons and menu navigation.

## An extra text line

An extra text line provides you with either information or prompts on the weighing process, e.g. product name or tare value.



## Communication interface



The exchange of database information between the devices has become even easier thanks to two USB ports (type A and B) and Wireless Module technology.

## Databases ergonomics for your weighing process



You certainly will appreciate information system of R series balances. The system is based on 5 databases: users database (10 different operators), products database (1000 different products), weightings database (1000 different measurements), tares database (10 different packaging weights). When operating the new R series balances you can analyze particular measurements in details, export or import any data and exchange.

# Weighing process visualization

## Symbols and units

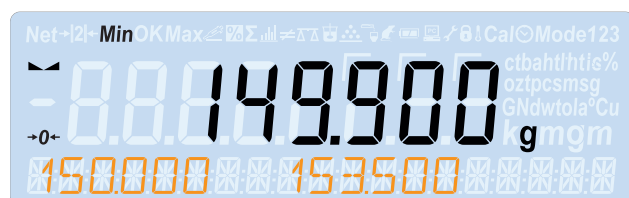
The R series offers a priceless set of intuitive symbols signalling current working mode, computer connection type, battery status, function that is in operation and much more. The symbols add to readout clarity, they provide maximum comfort of operation and increase of ergonomics. These symbols are not only helpful but offer a wider choice of units.



## Bar Graph visual representation of load capacity

The bar graph indicates the load capacity change in real time. The bar graph can be operated for various working modes with

threshold markers, e.g. parts counting, dosing, percent weighing, animal weighing, statistics, totaling, peak hold or checkweighing.



Minimum value

Maximum value



Mass value lower than the value of minimum threshold



Minimum value

Maximum value



Mass value contained within thresholds



Minimum value

Maximum value



Mass value higher than the value of maximum threshold



# Databases security

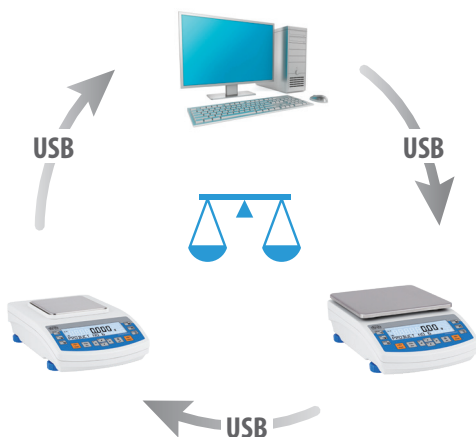
## Data protection

Access to the secured sensitive data is only possible when logged in. The access rights for each operator are set up at the administrator level.



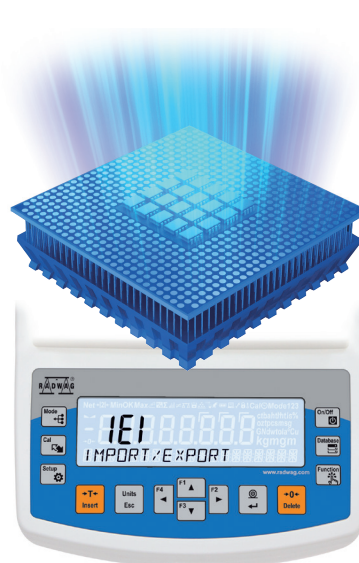
## Archiving and data exchange

Save your data and transfer reports on performed processes and partial measurements to external devices via USB interface. This interface allows you to control the working process. Not only can you restore the data but also copy your settings from one balance to another.



## ALIBI memory

ALIBI memory is non-deletable storage, protecting weighing data. It has the capacity of up to 100 000 weighing records. This ensures both, security and flexibility of storing data over longer periods of time.



Export of data recorded in balance Alibi memory



Recording data on the USB flash drive.

C:\Users\USER\Desktop\12310000.ali

	No	Date and time	Serial number	User code	Product code	Result	Unit	Tare	Precision	Number of last digit marker	Last digit motion	Stability
[x]	1111	2014.01.03 12:19:18	12310000		U48D4	13.1048	baht	0.0000	4	0	No	No
[x]	1112	2014.01.03 12:19:18	12310000		U48D4	17.1281	tolu	0.0000	4	0	No	No
[x]	1113	2014.01.03 12:19:19	12310000		U48D4	17.1273	tolu	0.0000	4	0	No	No
[x]	1114	2014.01.03 12:19:19	12310000		U48D4	17.1273	tolu	0.0000	4	0	No	Yes
[x]	1115	2014.01.03 12:19:20	12310000		U48D4	17.1273	tolu	0.0000	4	0	No	Yes
[x]	1116	2014.01.03 12:19:20	12310000		U48D4	9.9885	def1	0.0000	4	0	No	Yes
[x]	1117	2014.01.03 12:19:20	12310000		U48D4	9.9885	def1	0.0000	4	0	No	Yes
[x]	1118	2014.01.03 12:19:21	12310000		U48D4	9.9885	def1	0.0000	4	0	No	No
[x]	1119	2014.01.03 12:19:22	12310000		U48D4	399.50	def2	0.00	2	0	No	No
[x]	1120	2014.01.03 12:19:22	12310000		U48D4	399.50	def2	0.00	2	0	No	No
[x]	1121	2014.01.03 12:19:23	12310000		U48D4	399.50	def2	0.00	2	0	No	Yes
[x]	1122	2014.01.03 12:19:23	12310000		U48D4	399.52	def2	0.00	2	0	No	Yes
[x]	1123	2014.01.03 12:19:23	12310000		U48D4	399.52	def2	0.00	2	0	No	Yes
[x]	1124	2014.01.03 12:19:24	12310000		U48D4	199.79	g	0.00	2	0	No	No
[x]	1125	2014.01.03 12:19:24	12310000		U48D4	199.81	g	0.00	2	0	No	No
[x]	1126	2014.01.03 12:19:25	12310000		U48D4	199.82	g	0.00	2	0	No	No
[x]	1127	2014.01.03 12:19:25	12310000		U48D4	199.80	g	0.00	2	0	No	No
[x]	1128	2014.01.03 12:21:09	12310000	TSGE	U48D4	199.73	g	0.00	2	0	No	No
[x]	1129	2014.01.03 12:21:09	12310000	TSGE	U48D4	199.78	g	0.00	2	0	No	No
[x]	1130	2014.01.03 12:21:09	12310000	TSGE	U48D4	199.71	g	0.00	2	0	No	No
[x]	1131	2014.01.03 12:21:10	12310000	TSGE	U48D4	199.74	g	0.00	2	0	No	No
[x]	1132	2014.01.03 12:21:12	12310000	TSGE	U48D4	0.19975	kg	0.00000	5	0	No	Yes
[x]	1133	2014.01.03 12:21:12	12310000	TSGE	U48D4	0.19975	kg	0.00000	5	0	No	Yes
[x]	1134	2014.01.03 12:21:13	12310000	TSGE	U48D4	0.19978	kg	0.00000	5	0	No	No
[x]	1135	2014.01.03 12:21:13	12310000	TSGE	U48D4	0.19978	kg	0.00000	5	0	No	No
[x]	1136	2014.01.03 12:21:13	12310000	TSGE	U48D4	0.19978	kg	0.00000	5	0	No	Yes
[x]	1137	2014.01.03 12:21:13	12310000	TSGE	U48D4	0.19978	kg	0.00000	5	0	No	No

☐ Show selected records

Find out how useful ALIBI Reader PC software is. This application offers preview of all measurements recorded in balance Alibi memory. In addition, the software provides you with an option of printing and exporting selected data and with an option of generating reports in PDF and CSV format (MS Excel).

# Reports and printouts

## Configurable printouts

In the new R series balances the weighing reports are divided into 3 configurable sections, each of which can be fully customized.

Working mode	Weighing
Date	18.09.2016
Time	11:36:36
Balance type	AS R2
Balance ID	2035
Product	PILL
Tare	0.5000 g
Gross weight	1.3020 g
Net weight	0.8020 g
User	Tom Smith
----- Calibration Report -----	
Calibration type	Internal
User	Tom Smith
Project	124/SGW/2016
Date	18.09.2016
Time	12:56:10
Balance ID	1035
Calibration difference	0.0000 g
Signature	

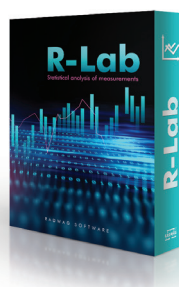
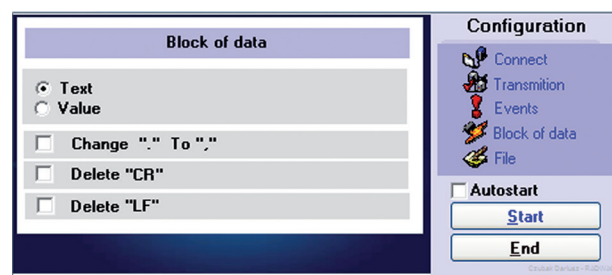
The new R series balances work with the printers that support PCL protocol. The printers are connected with the balances via USB interface.

## Cooperation with R-Lab / RAD-KEY PC Software

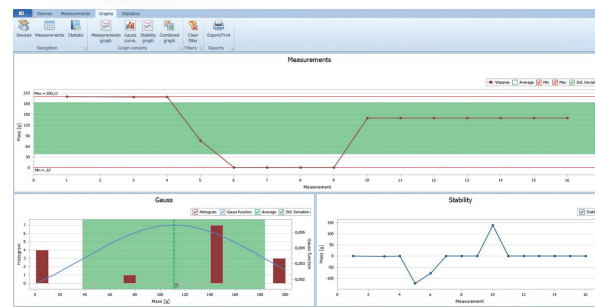
R series balances offer the possibility of sending printouts directly to R-Lab and RAD-KEY PC Software. The measurements can be transferred via Wi-Fi®, RS232 or USB interface. Decide which one suits your needs the best and go.



RAD-KEY PC Software is designed to capture your balance data which is next inserted into a spreadsheet cell, for example.



R-Lab software enables scale preview and generating both weighings and statistics graphs.



# Technical specification



AS R2



PS R1



PS R2

Maximum capacity [Max]	60 g - 310 g	200 g - 6100 g	200 g - 10100 g
Readability [d]	0.01 mg - 0.1 mg	1 mg - 10 mg	1 mg - 10 mg
Minimum weight (USP)	30 mg - 160 mg	1 g - 10 g	1 g - 10 g
Stabilization time	2 s - 2.5 s	1.5 s - 2 s	1.5 s - 2 s
Weighing pan dimensions	ø90 mm, ø100 mm, ø85 mm (option)	128 × 128 mm, 195 × 195 mm	128 × 128 mm, 195 × 195 mm
Adjustment	internal	external	internal
Display	LCD (backlit)	LCD (backlit)	LCD (backlit)
Communication Interfaces	USB-A, USB-B, 2 × RS 232, Wi-Fi® (option)	USB-A, USB-B, 2 × RS 232, Wi-Fi® (option)	USB-A, USB-B, 2 × RS 232, Wi-Fi® (option)

## Optional equipment

- Barcode readers,
- PLC printers,
- USB keyboards,
- Rack for under-pan weighing,
- Anti-vibration table,
- Anti-draft shield,
- LCD WD-6 display,
- Density determination kit (for solids and liquids)

## Services

In order to support the R series balances, RADWAG range includes:

- balances adjustment,
- validation IQ/PP/PQ
- periodic verification audits.



## MA R

Maximum capacity [Max]	50 g - 210 g
Readability [d]	0.1 mg - 1 mg
Weighing pan dimensions	ø90 mm, h = 8 mm
Moisture readout accuracy	0.0001 % - 0.001 %
Drying temperature range	max 160°C (option: max 250°C)
Heating module	IR emitter, halogen (option), metal heater (option)
Display	LCD (backlit)
Communication Interfaces	USB-A, USB-B, 2 × RS 232, Wi-Fi® (option)

Wi-Fi® is a registered trademark of Wi-Fi Alliance.

## PC Software

- **R-Lab:**  
Scales preview, weighing graphs and statistics graphs
- **Database Editor:**  
Readout, databases editing and record of computer stored databases on balance
- **RAD Key:**  
Balance data readout carried out by means of Hot Key



## READ QR CODE

and view complete  
technical specification  
of all R series balances





Maximum capacity of 10 kg with readability of  $d=0.01\text{g}$   
Innovative, single-point weighing pan fastening  
RADWAG MonoBLOCK technology



**RADWAG MONOBLOCK**®

www.radwag.com

# PS M

## High Capacity Precision Balances

GUARANTEED STABILITY AND REPEATABILITY

# PS M

## Internal adjustment within the whole measuring range Minimized eccentricity error



Draft shield guarantees repeatability and eliminates influence of air drafts on measurement result.



Single-point weighing pan fastening ensures excellent balance geometry and minimizes eccentricity errors.



RADWAG MonoBLOCK technology guarantees unrivalled repeatability and stability of measurement over time.

### Technical Specifications for the Most Demanding Users

New series of PS M balances enables weighing loads of 10kg with readability of  $d = 0.01$  g. PS M balance ensures resolution of million reading units. With this, measurements are carried out with accuracy that was not feasible before for precision balances. The stability of the weighing system and great resistance to shocks when weighing large loads is provided by an additional stiffening of the balance base.

### RADWAG MonoBLOCK Technology

RADWAG MonoBLOCK enables precision balance to obtain unrivalled repeatability and stability of measurement over time.

### Innovative Weighing Pan Fastening

A new, single-point weighing pan fastening minimizes eccentricity errors and ensures excellent geometry of the balance. The labyrinth-shape solution guarantees excellent resistance to contamination. Specially-designed pins for positioning of the weighing pan and draft shield fastening facilitate its assembly and disassembly.

### Draft Shield

A specially-designed draft shield eliminates the influence of air drafts on the balance and ensures repeatability of measurement.

### Internal Adjustment

Leverage of internal weight mass enables adjustment within the whole measuring range. With use of leverage, mass standard weight is minimized and, as a consequence, mass of the balance is significantly reduced. The system guarantees precision and excellent repeatability of measurement.



PS 3Y.M



PS X2.M



PS R2.M

Maximum capacity [Max]	4500 g – 10100 g	4500 g – 10100 g	4500 g – 10100 g
Readability [d]	0.01 g	0.01 g	0.01 g
Repeatability (5% Max)*	0.005 g	0.005 g	0.005 g
Repeatability (Max)*	0.008 g – 0.012 g	0.008 g – 0.012 g	0.008 g – 0.012 g
Linearity	$\pm 0.03$ g	$\pm 0.03$ g	$\pm 0.03$ g
Minimum sample weight	1 g	1 g	1 g
Minimum sample weight USP	10 g	10 g	10 g
Stabilization time	1.5 s	1.5 s	1.5 s
Adjustment	Internal	Internal	Internal
Display	5.7" resistive colour touch screen	5" capacitive colour touch screen	LCD (backlit)
Ingress protection	IP 43	IP 43	IP 43
Communication interfaces	2×USB-A, 2×RS 232, Ethernet, Wireless Connection, 4×IN, 4×OUT	USB-A, USB-B, 2×RS 232, Ethernet, Wireless Connection	USB-A, USB-B, 2×RS 232, Wireless Connection (option)
Weighing pan dimensions	195 × 195 mm	195 × 195 mm	195 × 195 mm

\* repeatability is expressed as a standard deviation from 10 weighing cycles



# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)



New sensor: Radwag MonoBLOCK™  
Unrivalled repeatability  
Weighing heavy loads with the maximum accuracy



RADWAG MONOBLOCK®

www.radwag.com

**PM**

**High Capacity  
Precision Balances**

THE HIGHEST LEVEL OF PERFORMANCE



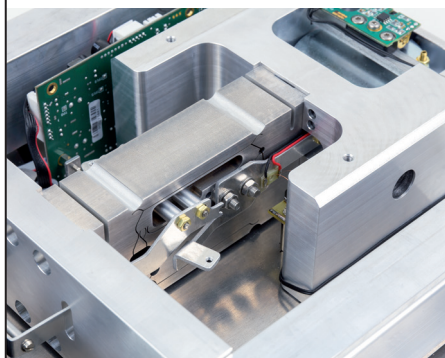
# RADWAG MonoBLOCK™ solution facilitates weighing 10 mg - 50 kg sample weights with the highest accuracy.

## Unrivalled Repeatability

PM balances are characterized by the highest measurement accuracy for particular maximum capacities. These instruments guarantee readability of 0.01 g at capacity of 15 kg and readability of 0.1 g at capacity of 50 kg.

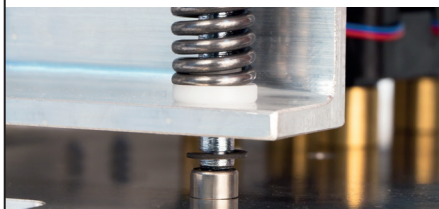
## RADWAG MONOBLOCK®

The PM series has been equipped with an up to date innovative measuring system RADWAG MonoBLOCK™. Use of brand-new RADWAG-patented technology guarantees stability of repeatability over time at a range  $sd < 1d$ . The unique measuring system solution is characteristic for great resistance to ambient conditions change.

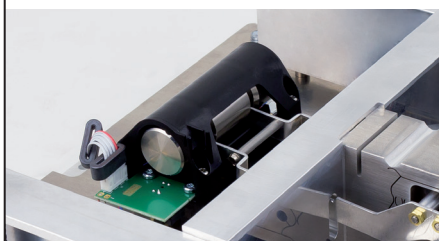


## High Quality Design

Housing made of ABS thermoplastic polymer and stainless steel weighing pan effectively protect the weighing sensor and electronics against water, dust and damage. Both the housing and the weighing pan function also as a protection against chemical substances.



An in-built 4-point protection system prevents balance overloading, this ensures safety in case too heavy load is applied onto the weighing pan. Robust design allows device operation even in the most challenging ambient conditions.



## Work Optimisation

Large weighing pan facilitates weighing or dosing of many recipe ingredients using one balance and one container only.



With this process optimisation is guaranteed both in a laboratory and on a production line. Application of one weighing instrument for a number of various purposes considerably reduces costs and improves performance.

## Wide Range of Functions and Applications

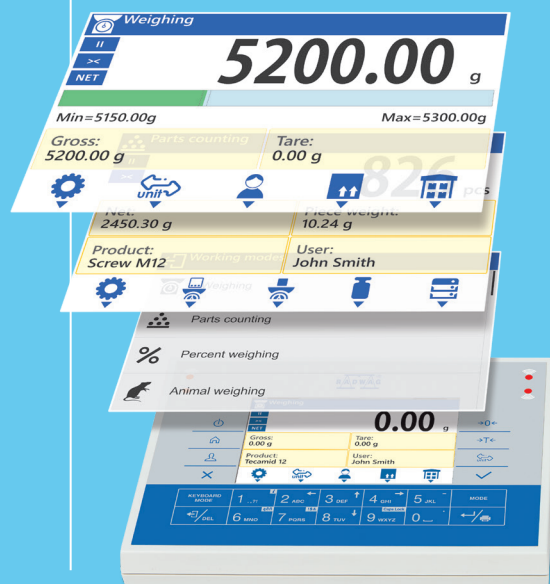
PM series balances offer plenty of advanced weighing applications improving their functionality.

Wide range of useful functions ensures comfort of operation.



## More Than Weighing!

As hi-tech weighing instruments PM balances offer not only regular weighing but also a wide range of professional working modes. Large color screens simplify operation of any working mode making it easy and intuitive.



## PM series balances offer good ergonomics, wide range of applications and comfort of operation.

### Usage Ergonomics

With use of long cable it is possible to locate the terminal in a place facilitating convenient operation.

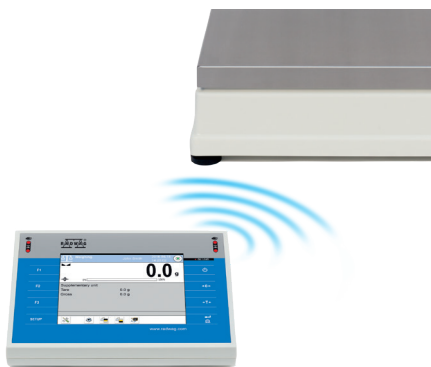
The terminal design allows to mount it on a wall at suitable level.



PM series is equipped with only 11-centimetre high weighing platform, the lowest permissible solution for instruments of this class. The unique measuring system solution is characterized with great resistance to ambient conditions change.



communication between the balance and the terminal ensures safe operation of the instrument in a fume cupboard or glove box chamber in the course of weighing of toxic substances (chemicals, poisonous vapour etc.).



### Settings Customization and Accordance with CFR21

Modern weighing terminals used along with PM series balances enable adjusting balance settings to individual requirements of particular operators. Additionally they guarantee data safety and limited access which prevents unauthorized users against entering the balance program.

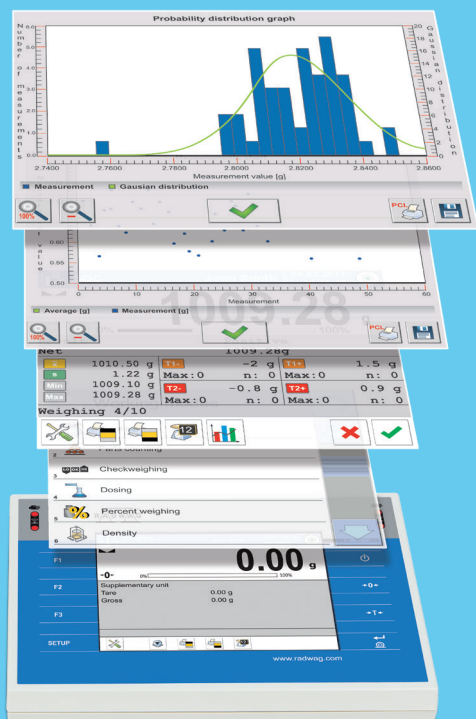
Large display with clear menu layout offers even more comfortable operation making your work enjoyable like never before.

PM series balances comply with CFR21 standard. This is pioneer solution available on the market that adheres to CFR21 requirements implemented in the balance firmware (4Y series).



### Cooperation with External Devices

PM series is equipped with complete range of communication interfaces enabling connection of numerous peripheral devices.



PC Computer



Printer



Keyboard



Additional display



Barcode scanner



Thermo hygrometer



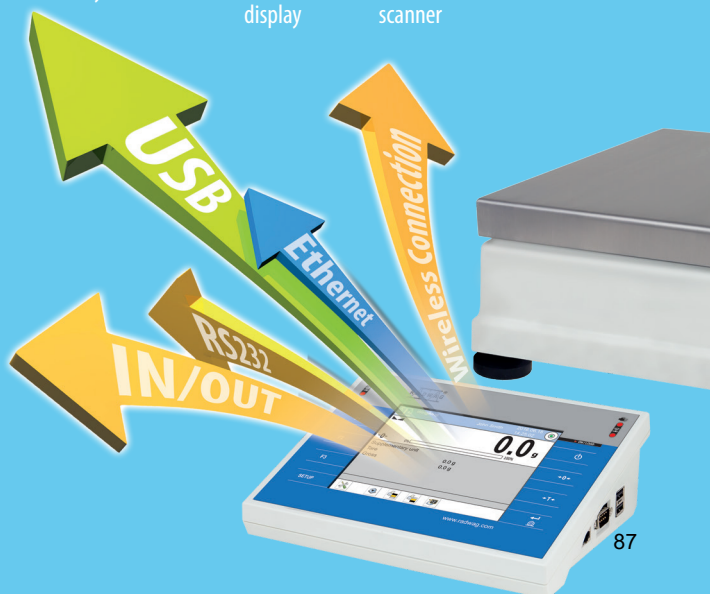
RFID reader

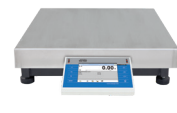


PLC



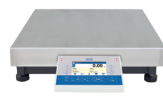
Tower lights



**PM 10.4Y****PM 15.4Y****PM 35.4Y****PM 50.4Y****PM 60.05.4Y****PM 60.1.4Y**

Maximum capacity [Max]	10 kg	15 kg	35 kg	50 kg	60 kg	60 kg
Minimum load	0.5 g	0.5 g	5 g	5 g	—	—
Preload	1 kg	1.5 kg	3.5 kg	5 kg	—	—
Readability [d]	0.01 g	0.01 g	0.1 g	0.1 g	0.5 g	1 g
Tare range	-10 kg	-15 kg	-35 kg	-50 kg	-60 kg	-60 kg
Linearity	±0.03 g	±0.03 g	±0.3 g	±0.3 g	±1.5 g	±3 g
Repeatability (5% Max)*	0.004 g	0.004 g	0.04 g	0.04 g	0.2 g	0.4 g
Repeatability (Max)*	0.01 g	0.015 g	0.1 g	0.15 g	0.4 g	0.8 g
Stabilization time	3 s	3 s	3 s	3 s	3 s	3 s
Minimum weight (U=1%, k=2)	0.82 g	0.82 g	8.2 g	8.2 g	41 g	82 g
Minimum weight USP	8.2 g	8.2 g	82 g	82 g	410 g	820 g
Adjustment	Internal	Internal	Internal	Internal	Internal	Internal
Weighing pan dimension	200 × 185 mm	200 × 185 mm	347 × 260 mm	347 × 260 mm	500 × 400 mm	500 × 400 mm
Display	5.7" colour touch screen	5.7" colour touch screen	5.7" colour touch screen	5.7" colour touch screen	5.7" colour touch screen	5.7" colour touch screen
Interfaces	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	2×USB-A, 2×RS 232, Ethernet, Wi-Fi®, 4×IN, 4×OUT
Working temperature**	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C

\* Repeatability is expressed as a standard deviation from 10 weighing cycles | \*\* Balance maintains parameters in accordance with type approval in temperatures +15 ÷ +35 °C | Wi-Fi® is a registered trademark of Wi-Fi Alliance.

**PM 10.C32****PM 15.C32****PM 25.C32****PM 35.C32****PM 50.C32****PM 60.05.C32****PM 60.1.C32**

Maximum capacity [Max]	10 kg	15 kg	25 kg	35 kg	50 kg	60 kg	60 kg
Minimum load	0.5 g	0.5 g	5 g	5 g	5 g	—	—
Preload	1 kg	1.5 kg	2.5 kg	3.5 kg	5 kg	—	—
Readability [d]	0.01 g	0.01 g	0.1 g	0.1 g	0.1 g	0.5 g	1 g
Tare range	-10 kg	-15 kg	-25 kg	-35 kg	-50 kg	-60 kg	-60 kg
Linearity	±0.03 g	±0.03 g	±0.3 g	±0.3 g	±0.3 g	±1.5 g	±3 g
Repeatability (5% Max)*	0.004 g	0.004 g	0.04 g	0.04 g	0.04 g	0.2 g	0.4 g
Repeatability (Max)*	0.01 g	0.015 g	0.1 g	0.1 g	0.15 g	0.4 g	0.8 g
Stabilization time	3 s	3 s	3 s	3 s	3 s	3 s	3 s
Minimum weight (U=1%, k=2)	0.82 g	0.82 g	8.2 g	8.2 g	8.2 g	41 g	82 g
Minimum weight USP	8.2 g	8.2 g	82 g	82 g	82 g	410 g	820 g
Adjustment	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Weighing pan dimension	200 × 185 mm	200 × 185 mm	347 × 259 mm	347 × 259 mm	347 × 259 mm	500 × 400 mm	500 × 400 mm
Display	5" colour graphic	5" colour graphic	5" colour graphic	5" colour graphic	5" colour graphic	5" colour graphic	5" colour graphic
Interfaces	USB-A, USB-B, 2 × RS232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	USB-A, USB-B, 2 × RS232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	USB-A, USB-B, 2 × RS232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	USB-A, USB-B, 2 × RS232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	USB-A, USB-B, 2 × RS232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	USB-A, USB-B, 2 × RS232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	USB-A, USB-B, 2 × RS232, Ethernet, Wi-Fi®, 4×IN, 4×OUT
Working temperature**	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C

\* Repeatability is expressed as a standard deviation from 10 weighing cycles | \*\* Balance maintains parameters in accordance with type approval in temperatures +15 ÷ +35 °C | Wi-Fi® is a registered trademark of Wi-Fi Alliance.





# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)

Professional statistical control  
Easy operation  
Measurement automation



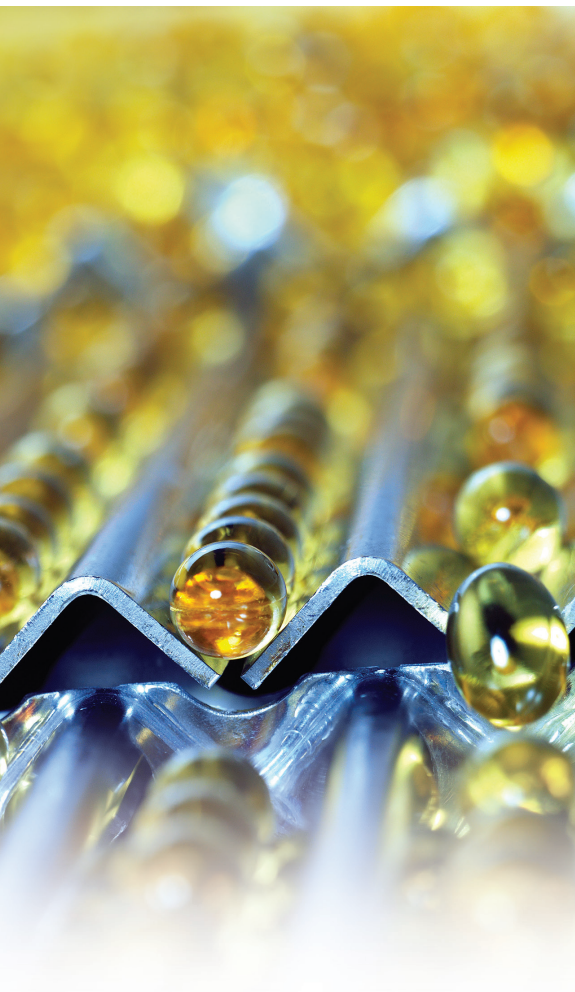
www.radwag.com

# PA-04/H Automatic Feeder

CUTTING-EDGE CONTROL SYSTEM FOR PHARMACY

# PA-04/H

## High throughput Easy cleaning



### Intended Use

The automatic feeder is dedicated for automatic dispensing of small objects onto the weighing pan of RADWAG-manufactured balance to which it is connected. The feeder ensures regular feeding of the elements in accordance with determined time intervals.

### Operation and Compatibility

The PA-04/H feeder cooperates with XA 4Y and AS 3Y analytical balances and PS 3Y precision balances. Both the feeder and the balance are automated devices. The balance carries out analysis of dosed elements and sends signal to the feeder to dispense subsequent element. The feeder features diodes, signalling its operation, and keypad allowing to control the process. Automatic feeder is equipped with function of automatic emptying of the storage bin.

### Vibrating Feeder

Cylindrical vibrating feeder with storage bin enables safe and precise dosing of elements. The storage bin has a conical and stepped shape and is continuously welded. The stainless steel surface of adequate roughness reduces elements grating during dosing process.

### Variety of Applications

The feeder is appropriate for dosing pills of diameter ranging from 3 to 25 mm, round and oblong, as well as details of similar shapes and dimensions.

### Design

The device is equipped with powder-coated steel housing and stainless steel cover. The storage bin features transparent lid that allows verifying quantity of remaining elements.



**PA-04/H**

Dispensed element dimensions	ø 3 mm – ø 10 mm, length = 25 mm
Feeder diameter	ø 180 mm
Dispensing speed	1 – 15 pcs / min.
Operating temperature	+5 ° – +40 °C
Ingress protection	IP 34
Control	External via balance and feeder's keys
Communication Interfaces	RS 232



Perfect precision  
Short indication stabilization time  
Four weighing profiles



www.radwag.com

## Defined Weighing Profiles

A UNIQUE SOLUTION  
FOR LABORATORY BALANCES

## DEFINED WEIGHING PROFILES

## Solution available for 4Y, X2 and R laboratory balances



### FAST

The measurement is carried out within a very short period of time, and result stabilization takes 2 s at the longest



### FAST DOSING

Very fast reaction to mass change



### PRECISION

Focus on the best measurement repeatability

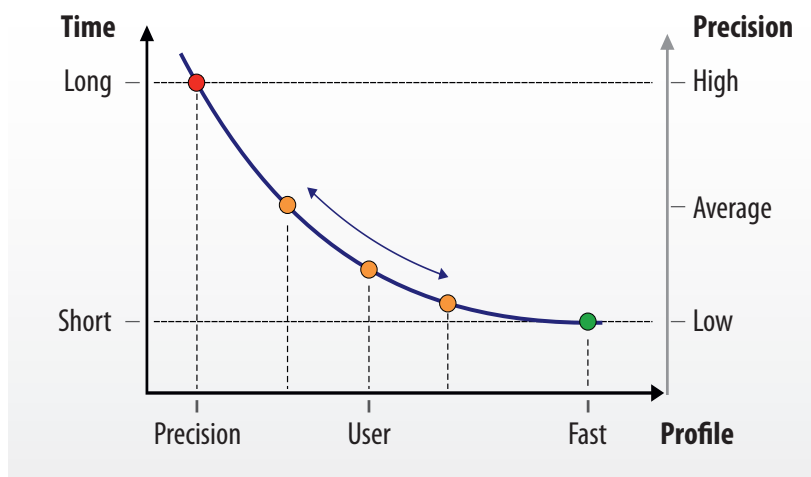


### USER

Operator-customized profile

#### Profile Selection

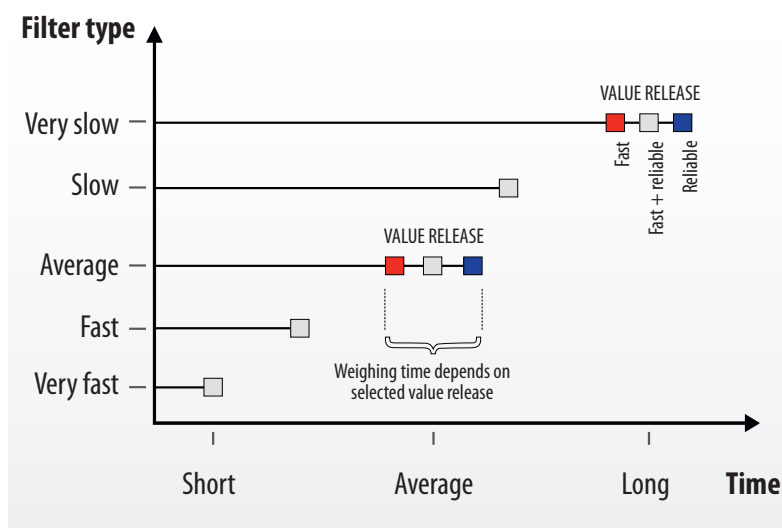
The operator can customize balance parameters by selecting one of four available profiles. The PRECISION profile is focused on measurement repeatability and enables accurate weighing of a small amount of the sample. The FAST profile assures measurement speed and enables carrying out mass determination of several samples in a short time. The FAST DOSING profile increases balance sensitivity, due to which the balance quickly reacts to mass changes. This function is recommended for dispensing and batching portions of the weighed sample. The USER profile offers five filter levels and three value release options.



*Interrelation of weighing precision and weighing time.*

#### Balance Customization

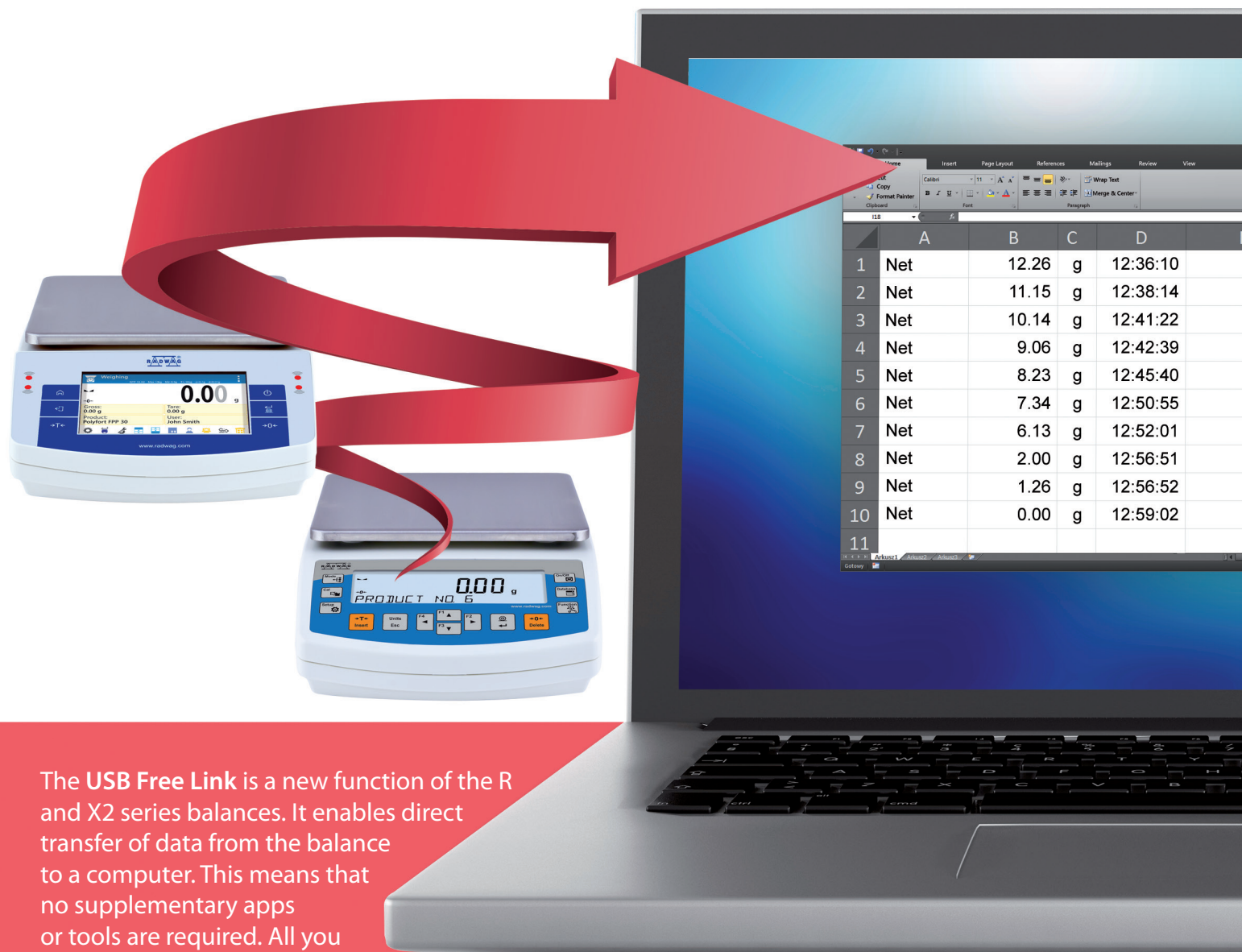
The USER profile allows the operator to determine weighing time by selecting one of five filter levels and one of three value release options. The filter has to be selected on the basis of an assessment of ambient conditions in the place where weighing is carried out. In unfavourable conditions it is recommended to select a very slow filter, and the better the ambient conditions, the faster the filter may be. Selecting one of the three value release options yields a small change within the total sample weighing time for the selected filter value. The advantage of the USER profile is individually optimized weighing time and balance precision for each operator.



*Interrelation of filter type and weighing time.*

# USB Free Link

**DIRECT BALANCE – PC COMMUNICATION**  
NO ADDITIONAL PROGRAMS REQUIRED

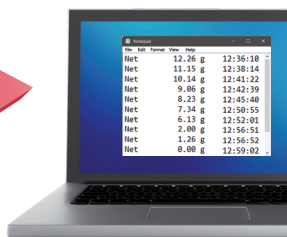


The **USB Free Link** is a new function of the R and X2 series balances. It enables direct transfer of data from the balance to a computer. This means that no supplementary apps or tools are required. All you need to do is simply to connect your balance and the computer using USB cable.

With the **USB Free Link** the data is transferred automatically to a currently operated computer app (e.g. Word, Excel, Notepad, etc.) upon pressing any balance key (e.g. Enter - printout, F1 - header, F3 - footer). The transferred text format remains unchanged.



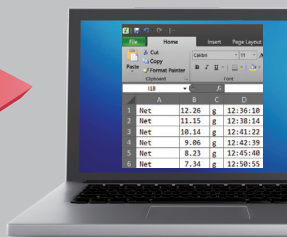
## Transfer of data to a currently operated application



Net	12.26 g	12:36:10
Net	11.15 g	12:38:14
Net	10.14 g	12:41:22
Net	9.06 g	12:42:39
Net	8.23 g	12:45:40
Net	7.34 g	12:50:55
Net	6.13 g	12:52:01
Net	2.00 g	12:56:51
Net	1.26 g	12:56:52
Net	0.00 g	12:59:02

Automatically carried out transfer of data to Wordpad, MS Word and other text editors.

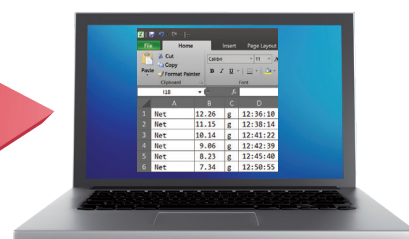
## Transfer of data to a spreadsheet program



1	Net	12.26 g	12:36:10
2	Net	11.15 g	12:38:14
3	Net	10.14 g	12:41:22
4	Net	9.06 g	12:42:39
5	Net	8.23 g	12:45:40
6	Net	7.34 g	12:50:55
7	Net	6.13 g	12:52:01
8	Net	2.00 g	12:56:51
9	Net	1.26 g	12:56:52
10	Net	0.00 g	12:59:02

Automatically carried out transfer of data to Excel, Open Office Calc and other spreadsheet programs.

## Transfer of data to CSV and TXT files



Import of data to a freely selected spreadsheet program.



# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)

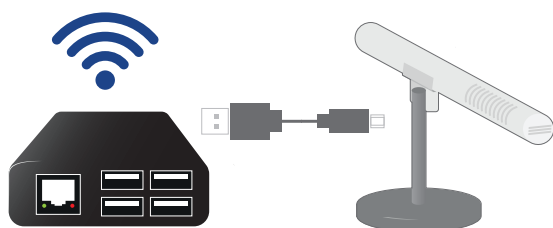
**Autonomous system with remote data access**  
**One sensor monitoring temperature, pressure, air humidity, air density and vibrations**





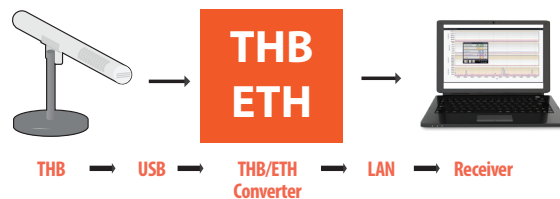
## THBR BOX LOCAL AREA NETWORK

THBR Box has been designed to collect measurements of ambient conditions, store data, send alerts and warnings. The device enables direct display of measured parameters via a mobile app or with use of a computer. This requires either entering an IP address and running a selected web browser, or using HDMI interface.



## THB/ETH LOCAL AREA NETWORK

THB/ETH is a solution enabling direct connection of the sensor to ETHERNET. With the option of sensor search by its unique serial number, the user can monitor ambient conditions from any place within local area network.



THBR software offers user interface facilitating presentation, archiving and reporting of recorded measurement data plus configuration of measuring devices. It comprises THB Single application, designed to support one sensor, and THB Multi application, intended to support numerous sensors concurrently.



## THBR Mobile Application LOCAL AREA NETWORK

THBR Box recorder can be operated and configured using special THBR mobile app, intended for Android system. The application enables display of real-time measured values of ambient conditions. It stores archive measurements in a form of lists and graphs.

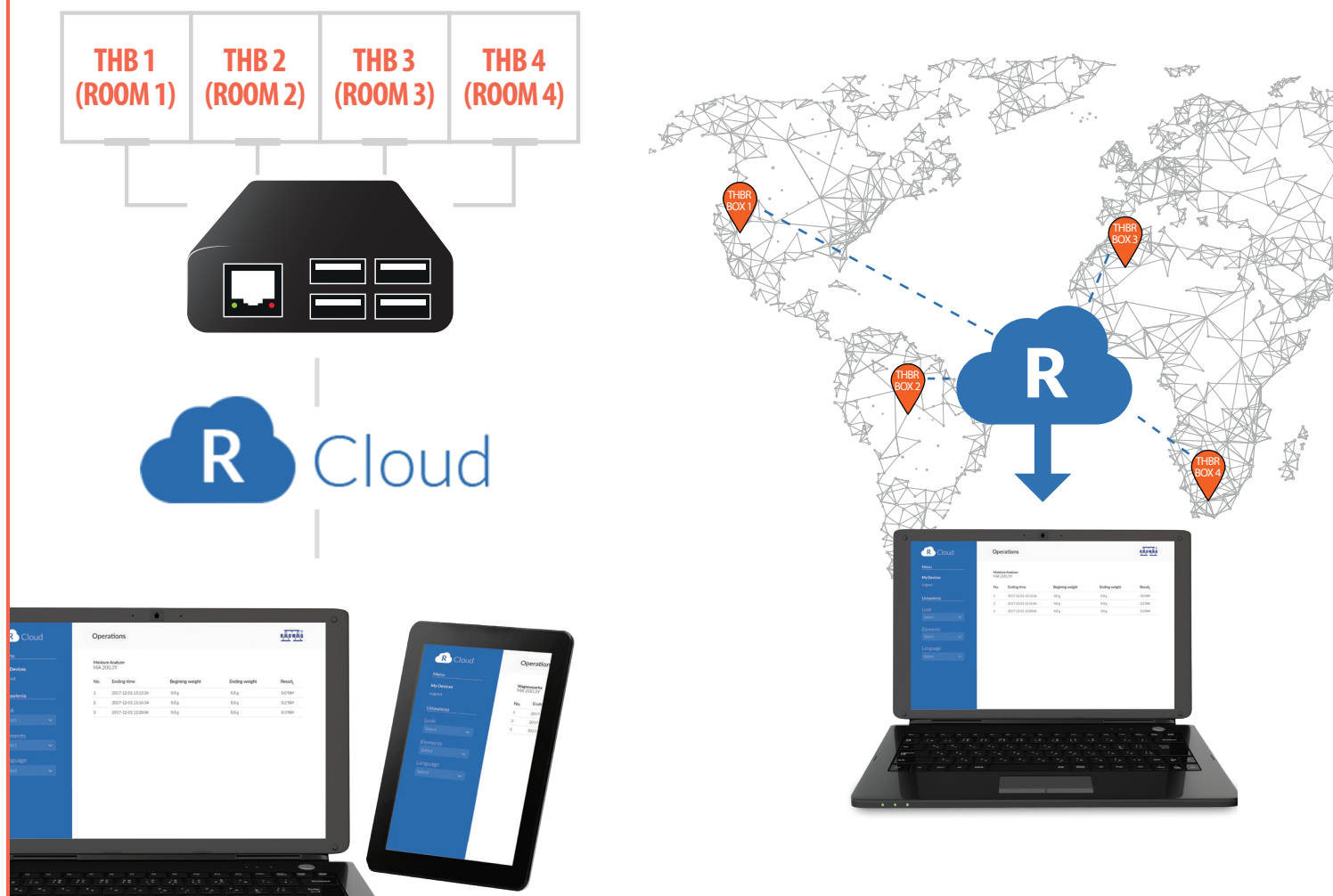
With use of THBR mobile application the user can configure modules names, sensors and both warnings and alerts. This mobile app allows the users to switch between THBR Box recorders and sensors operating in a local area network. Due to an intuitive operation it is possible to easily and quickly access measurements from various devices, and configure them according to individual needs. Monitoring of ambient conditions via THBR interface requires connection with local area network within which the recorder operates.

THBR mobile app can be downloaded from Google Play Store.



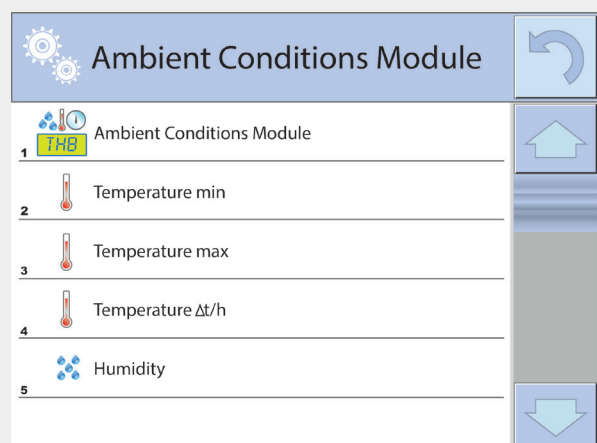
## R CLOUD INTERNET

R Cloud service offers record and preview of measurement results from few sensors concurrently which can be done from any place in the world with Internet access.



## THB + BALANCE DIRECT CONNECTION

THB S, THB P and THB W sensors may be connected directly to the balance via USB port. In such a case readout of ambient conditions is carried out using the balance display. The sensors cooperate with RADWAG balances of 3Y, 4Y, WPY, WLY and HY10 series.



## THBR 2.0 System

## Absolute control Precisely accurate measurements



### THB S – Standard Ambient Conditions Sensor

THB S sensor is a measuring device of standard class that cooperates with a computer and a weighing device directly or via THBR Box. THB S is used to measure temperature, pressure, air humidity, air density and ground vibrations. Each sensor has its own identification number that is assigned to measurements saved to the database.

### THB P – Precise Ambient Conditions Sensor

THB P sensor is a precise device for measurement of ambient conditions. Range of measured parameters for both THB S and THB P sensors is the same, however in case of THB P the parameters are monitored with greater accuracy.

### THB W – Liquid Temperature Sensor

THB W sensor is a sensor designed to measure temperature of liquid. Readout of temperature from THB sensor requires connecting to a computer or THBR Box ambient conditions recorder. THB W is used at pipettes calibration workstation, it measures water temperature in gravimetric method, which is done in order to determine „Z“ coefficient in accordance with ISO 8655.

### Results

The measurement results can be observed using:

- Balance display
- Web page (THBR Box)
- Windows OS application: THB Single or THB Multi
- Android system application (THBR Box).



**THB S**



**THB P**



**THB W (for liquids)**

	THB S	THB P	THB W (for liquids)
Measured temperature range	+5 – +45 °C	+5 – +45 °C	+5 – +45 °C
Temperature readability [d]	0.01 °C	0.001 °C	0.01 °C
Temperature measurement accuracy	+/- 0.1 °C	+/- 0.1 °C	+/- 0.1 °C
Measured pressure range	850 - 1050 hPa	850 - 1050 hPa	–
Pressure readability [d]	0.1 hPa	0.001 hPa	–
Pressure measurement accuracy	1 hPa	1 hPa	–
Measured humidity range	0-100%	0-100%	–
Humidity readability [d]	0.1 %	0.01 %	–
Humidity measurement accuracy	+/- 1.8 %	+/- 1.8 %	–
Operating temperature	+5 – +45 °C	+5 – +45 °C	–
Communication interface	USB 2.0	USB 2.0	USB 2.0
Vibrations detection	YES	YES	–
Air density determination	YES	YES	–





# Moisture Analyzers

New Methods of Moisture Content Analysis

## Moisture Analyzers of 3Y Series

The best possible functionality and professionalism for a drying process and moisture content analysis!

- 5.7" touch screen display
- Interactive menu
- Wi-Fi
- Control and adjustment system for a drying chamber (GMP)
- Compliance with regulations (GLP System)
- Databases (products, weighings, customers, drying programs, drying processes reports, control and statistics for drying processes reports)
- Dynamic control of sample weight (bar graph)
- Drying parameters optimisation (Test)
- Drying process visualisation (%M, %R, %D, graph)
- Statistics (trend of sample humidity over time)
- Printouts, reports (standard PCL)
- Multilingual menu
- Interfaces: Ethernet (network applications), USB, RS 232
- Wide spectrum of applications (industry, laboratories, universities, research and development institutes)

### Home Screen

- A** Information on a selected working mode and on a current drying mode
- B** Information on a logged in user
- C** Area for date, time, information on connection, battery level, etc.
- D** Pictogram informing on levelling status
- E** Moisture analyzer indication area
- F** Weight bar graph
- G** Bar graph for sample weight control
- H** Configurable area for supplementary information
- I** Drying mode / temperature selection
- J** Auto switch-off option
- K** Printout interval
- L** Temperature and elapsed analysis time
- M** Area defining the drying chamber (Opened / Closed / Drying Process)
- N** Quick launch bar providing access to functions
- O** Proximity sensors (optimization of operation)



MMA



# 3Y



Maximum efficiency and productivity. Arranging work through databases. History of moisture content variations for a given sample. Easy data exchange between devices. Data protection and access control. Fully configurable screen menu.



## Moisture Analyzers of X2 Series

Professional design assuring the highest quality of drying process and maximum comfort of operation.

- 5.7" colour touch screen
- Free customization of menu elements
- Wi-Fi
- Control and adjustment system for a drying chamber (GMP)
- Compliance with regulations (GLP System)
- Databases (products, customers, users, packaging, drying programs, drying reports)
- Dynamic control of sample weight (bar graph)
- Drying parameters optimisation (test)
- Drying process visualisation
- Statistics (trend of sample humidity over time)
- Printouts, reports (standard PCL)
- Multilingual menu
- Wide spectrum of applications (industry, laboratories, universities, research and development institutes)

### Home Screen

- A** Displaying home screen
- B** Exit (return to the previous screen)
- C** Tare button
- D** Display shutdown
- E** Enter/Print button
- F** Zero button
- G** Status bar (working mode, moisture analyzer metrological data)
- H** Area with drying/weighing result
- I** Information panel
- J** Quick access key triggering functions and settings
- K** Current working mode settings
- L** Proximity sensors
- M** Drying mode / temperature selection
- N** Drying process automatic shutdown
- O** Printout interval
- P** Temperature and analysis time
- R** Area defining the drying chamber (Opened / Closed / Drying Process)



MA



# X2.A

Clear information arrangement. Uncomplicated and intuitive operation as a result of free customization of the menu. Automatically opened and closed drying chamber.



## Moisture Analyzers of R Series

Advanced technology for a drying process and moisture content analysis!

- LCD display
- Cascading menu
- Wi-Fi
- Control and adjustment system for a drying chamber (GMP)
- Compliance with regulations (GLP System)
- Databases (users, products, programs, tares)
- Drying parameters optimisation (Test)
- Drying process visualisation (%M, %R, %D, graph)
- Printouts, reports (standard PCL)
- Multilingual menu
- Wide spectrum of applications (industry, laboratories, universities, research and development institutes)

### Home Screen

- A** Elapsed drying time
- B** Drying temperature
- C** Area defining the drying chamber (Opened / Closed / Drying Process)
- D** Moisture content result for a given sample
- E** Automatic shutdown
- F** Drying mode
- G** Measuring unit %M, %D, %R
- H** Information area
- I** Direct access to reports on performed drying processes
- J** Direct access to databases
- K** Switching drying mode and changing drying temperature
- L** Selecting sample out of the database







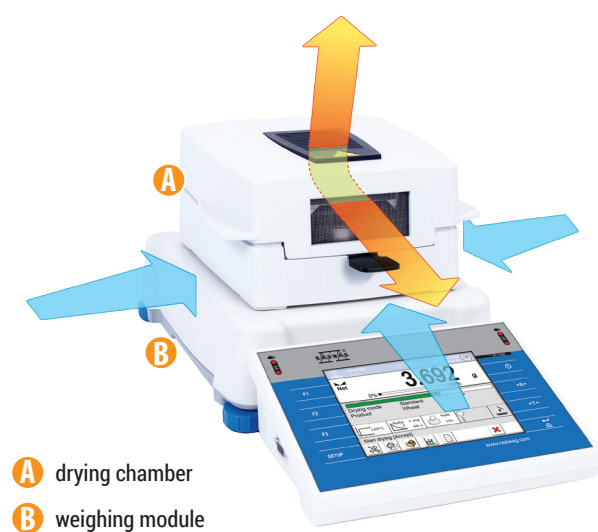
Compact size and design. Easy and intuitive operation. Direct access to reports and product databases. Ease of data exchange between devices. Versatility of applications in various workstations.



# Design and Construction

## Measurements Precision in all Thermal Conditions

Moisture analyzer comprises precision balance and a drying chamber joined together. High resolution weighing module is designed to provide quick and precise measurement of a particular sample weight, independently from its thermal condition. Module stabilisation is obtained using special algorithm controlling halogen lamp operation.



For precise determination of sample weight it is necessary to perform adjustment procedure using external mass standard characterised by a respective accuracy class.

Date	2019.01.12
Time	14:06:27
Balance type	MA 3Y
Balance ID	365661
Operator	Admin
Level status	Yes
Nominal mass	50 g
Current mass	50.0001 g
Difference	0.0001 g
Temperature	22 °C

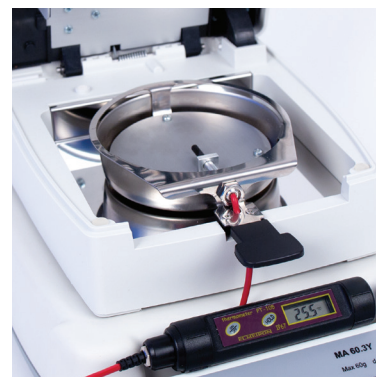
Signature

Accuracy is confirmed by a report presenting value of deviation.

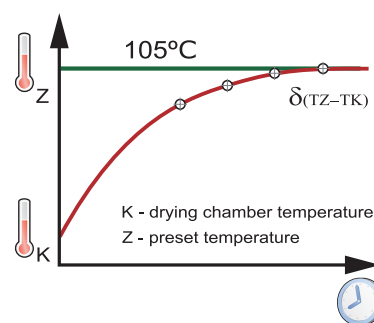
## Drying Temperature Stability

Drying temperature stabilization is ensured by a heating element (IR emitter) coupled with a temperature sensor. Proper operation of this system is possible owing to adjustment performed in the course of a manufacturing process.

The emitter, as a heat source, is effective when carrying out analysis of various materials: powders, liquids, paste, semi-liquid substances, solid bodies etc.



Graduating drying temperature means comparing and correcting indications of moisture analyzer thermometer. The correction is referred to indications of control thermometer, three measuring points are used for comparison. During the test, the control thermometer replaces a weighing pan.



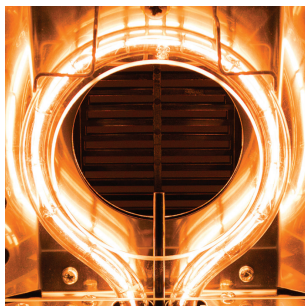
Correctness of thermometer indications (GLP) is checked periodically in the course of operation.

A specific algorithm controlling heating elements operation is needed in order to maintain a particular temperature throughout the drying process. **RADWAG has designed such an algorithm thus ensuring quickness and accuracy of operation independently from analysis duration.**



# Drying Temperature

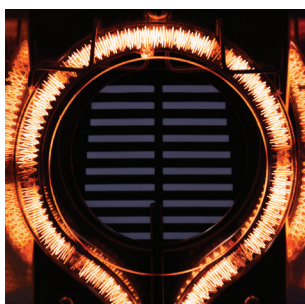
## Heat Source Types and Intended Use



### IRS Halogen

Infrared short  
 $\lambda = \sim 1,2 \mu\text{m}$   
mainly convection,  
surface heating.

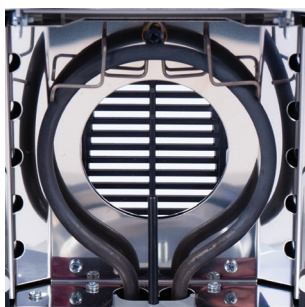
**Intended for:**  
powder, semi-liquids,  
liquids.



### IRM Emitter

Infrared medium  
 $\lambda = \sim 3,0 \mu\text{m}$   
convection and radiation,  
deeper layers heating.

**Intended for:**  
most samples of liquid  
or semi-liquid consistence,  
powders, crushed solids.



### IRL Emitter

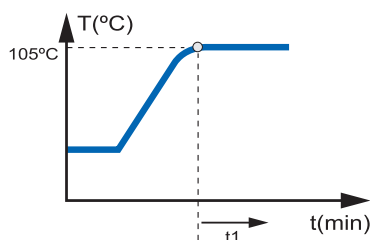
Infrared long  
 $\lambda = \sim 5,0 \mu\text{m}$   
mostly radiation, sample  
volume heating.

**Intended for:**  
bodies of thick consistence  
and for solids.

IR emitter is one of the moisture analyzer heat sources, it operates in a feedback loop. This ensures thermal conditions stability for the time of analysis. **RADWAG-designed method for dynamic control of drying chamber temperature is one of the factors allowing to obtain short time for analysis process and repeatability within drying series.**

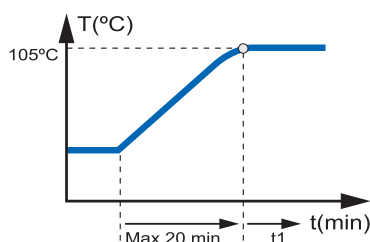


## Methods for Obtaining the Preset Temperature



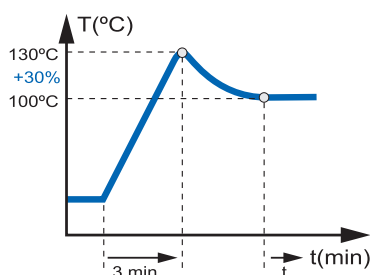
### Standard Mode

**Intended use:**  
Solid, powder and semi-liquid samples. Temperature grows until the determined value is reached.  
**99% of applications.**



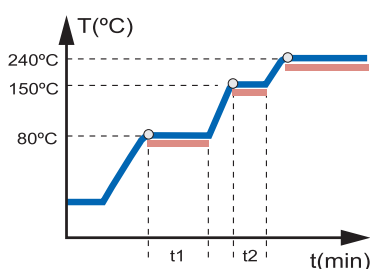
### Mild Mode

**Intended use:**  
Mild mode shall be applied when too fast temperature growth eliminates components other than water.  
**Possibility of adjusting the speed of temperature growth.**



### Quick Mode

**Intended use:**  
Samples of high humidity. In case of overadjustment the temperature drops until the determined value is reached.  
**Temperature drop caused by heat coming from evaporation is eliminated.**



### Step Mode

**Intended use:**  
Drying minerals. Chemically bound water and surface bound water is eliminated.  
**Sample analysis for various temperature values is possible.**



# Drying Methods

## Samples Types and Preparation

Size of the sample and its preparation shall provide the following: sample structure homogeneity, short time of drying, good repeatability of measurement within a measurement series and drying process result comparable to a reference result (standardised method).



### Solid bodies

- light sample,
- requires grinding

### Samples of low humidity

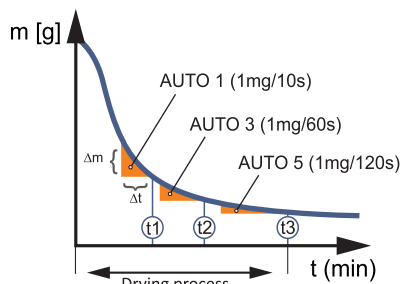
- heavy sample
- (10 - 15 g)

### Liquids

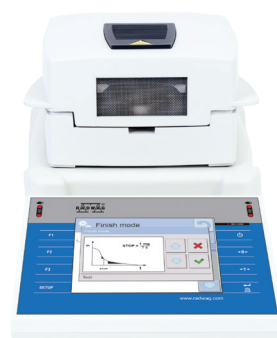
- increasing active surface of evaporation is recommended

## Methods of Analysis Completion

TEST function analyses weight variation for a particular sample, occurring during the drying process. There are 5 different options for automatic shutdown. The user shall select option allowing him to end the drying process in a way ensuring that the obtained humidity value is as close as possible to a reference value. Among other automatic shutdown possibilities there are time-defined, manual and user-defined options, the latest one being the best adjusted to a particular sample characteristics.

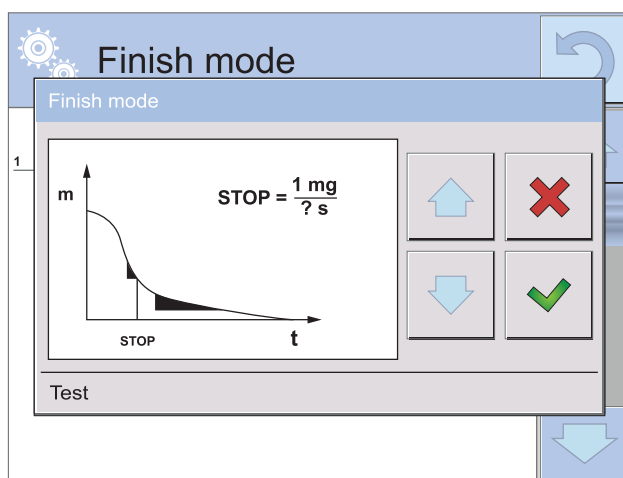


Relations of weight decrease within a specified time interval.



Initial mass	2.7548 g
0:00:10	0.1503% M
0:00:20	0.6258% M
----- Auto switch off -----	
0:08:08	Auto 1
Result	11.4789% M
----- Auto switch off -----	
0:11:05	Auto 2
Result	11.9058% M
----- Auto switch off -----	
0:13:55	Auto 3
Result	12.0502% M
----- Auto switch off -----	
0:15:20	Auto 4
Result	12.0858% M
----- Auto switch off -----	
0:18:10	Auto 5
Result	12.1526% M

Demonstrative printout of TEST function.



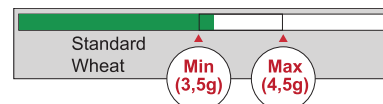
Obtained humidity value depends on start mass of a particular sample – an optimal mass value shall be selected prior running the tests.



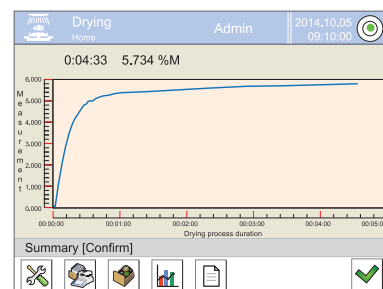
# Drying Process Optimization

## Automatic Control of Sample Weight

Obtaining optimal results for a drying process depends on samples quantity and weight. Too heavy sample lengthens duration of the drying process. Too light sample works against repeatability of the results. This proves that control of the sample weight is inevitable.



**A WEIGHT CONTROL** (checkweighing thresholds)



**B GRAPH** (drying process curve, registered for dynamic state)

Edit record	
1	Name: Candied Chokeberry
2	Code: 12345
3	Drying mode: Standard
4	Auto switch-off: Auto 3
5	Result: %M
6	Printout time interval: 0:00:30

**C DRYING PROGRAMS** (drying mode type, temperature, auto switch-off)

Products	
33	Coal as a mixture of different size
34	Coal dust
35	Com
36	Com starch
37	Comsilage
38	Cotton

**D SAMPLES** (name, code, end mass, tolerance, etc.)

Sample description	
Equipment related to a sample:	Aluminum disposable pan
Sample preparation:	Spread a sample evenly on the whole surface of the drying pan,
Recommended sample size:	~10 g

**E SAMPLE DESCRIPTION** (information on how to prepare a sample for a drying process)

## Sample Structure Transformation

Unfavorable physical processes, affecting the sample structure, may occur during the drying process. These are caused by dispersion of indications and mistakes made when undertaking assessment of actual moisture content for a particular sample.

Respective method for a particular sample drying, shall be selected based on tests optimizing the sample size, drying temperature and method of analysis end procedure.



### Crust Formation

It is a process where an impermeable layer is formed on a sample surface. This makes removal of humidity from the sample impossible. As a result the indication being an outcome of an analysis is lower than the sample reference value.



### Sample Burning

Such a process is a consequence of too high drying temperature. It results in a change of sample colour. When sample burning occurs then the sample humidity value is greater than its reference value.



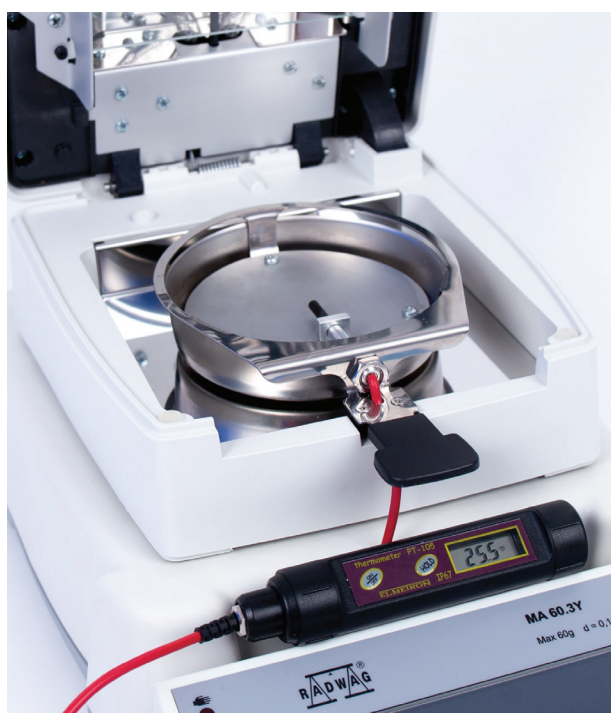
### Heat Absorption

Dark in colour samples absorb more heat than the light ones. this accounts for application of lower drying temperatures while drying light in colour samples. Tests need to be carried out in order to select the right temperature value.

# GLP and the Drying Process

## Drying Temperature Control

Drying temperature is a decisive factor for moisture content of a particular sample. The temperature is controlled periodically according to an adopted timetable, wherein the said timetable is specified for a particular temperature value.



----- Temperature test -----	
Start time	2019.01.30 13:57:05
Balance type	MA 3Y
Balance ID	1352
Adjustment kit no.	489/13
Preset temperature	120 °C
Target temperature	119 °C
Measured temperature	121 °C
Permissible error	+/- 3 °C
Status	OK

The temperature test is performed by means of a special control thermometer.



### Drying Mode

Temperature test is performed for standard drying mode, the most frequently used mode for moisture content analysis.



### Temperature

The test is performed for a preset temperature.



### Tolerance

Maximum permissible error for a drying process.



### Calibration Kit Number

Serial number of a control thermometer.



Time interval for test of both stability and drying temperature accuracy is merely 8-minute long!



# Reports and Statistics

## Report on Drying Process

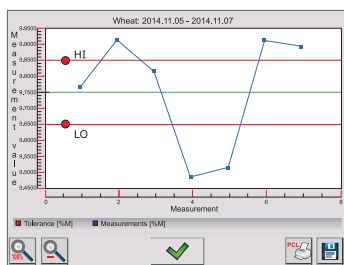
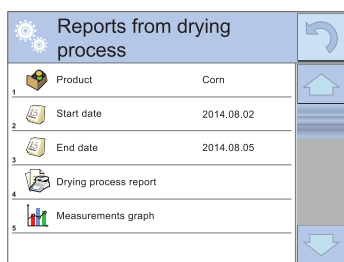
RADWAG moisture analyzers allow the user to make self-configured reports. Analysis, summaries, etc. may be printed by means of any office printer (PCL).

The report comprises three sections: the header (A), the data area (B) and the footer (C). Each section can be freely configured by a user.



## Drying Process Statistics

Moisture content analyses performed for the same sample are used to determine the sample moisture content variation within a specified time interval (Trend). Trend graph is calculated automatically. Calculating moisture content variation is required wherever manufacturing process and control is performed in a permanent manner. The obtained data is used by systems controlling the manufacturing process. It helps to determine optimal moisture content for a particular sample, required for a finished product prior its packing.



In order to determine trend graph, open a database and specify reference value for sample humidity and permissible tolerance for humidity determination.

Statistics – trend for moisture content variation over time, calculated automatically for each product.

Drying	
Date	05.01.2019
Time	6:32:18
Operator	Admin
Product	Prod-01
Program	MAR-1
Drying profile	Standard
Drying profile parameters	90 °C
Finish mode	Manual
Start mass	0.674 g
0:00:30	
0:01:00	
0:01:30	
0:02:00	
0:02:30	
0:03:00	
Status	Completed
Drying time	0:03:00
End mass	0.499 g
Result	25.964% M

Example of a simple drying report, generated by MA R moisture analyzer.

Drying	
Start date	2019.01.28
Start time	11:34:44
Operator	Admin
Product	Corn
Drying mode	Corn-PRG01
Drying mode	Standard
Drying mode parameters	100 °C
Auto switch-off mode	Auto
Finish mode parameters	1 mg/60 s
Printout interval	0:00:30
Start mass	0.590 g
Date and time	2019.01.28 11:35:14
Drying time	0:00:30
Product	Corn
Current result	5.085% M
0:00:30	5.085% M
Humidity content	5.085% M
Dry mass content	94.915% D
Humid / Dry	5.357% R
Tare	0.007 g
Gross	0.567 g
Set temperature	100 °C
Current temperature	99 °C
Date and time	2019.01.28 11:35:44
Drying time	0:01:00
Current result	7.795% M
Date and time	2019.01.28 11:39:14
Drying time	0:04:30
Current result	14.237% M
Status	Completed
End date	2019.01.28
End time	11:39:22
Drying time	0:04:38
Operator	Admin
Product	Corn
End mass	0.506 g
Humidity content	14.237% M

Example of a complex drying report, generated by MA 3Y moisture analyzer.

# Databases

## Managing and Editing

### Databases Drying Process Ergonomics

Drying parameters such as temperature and automatic shutdown are optimally selected for every single sample. Trying to remember the parameters for just a few samples requires considerable effort. It is more convenient to record the parameters in a database than attempting to learn them by heart.



#### Product Database Contains any Data Relating to a Sample:

- name and description,
- EAN code: searching a sample in a database by means of a scanner,
- target value (%): value used for automatic control of sample weight (bar graph) and for determining moisture content variation over time (trend),
- Min, Max: value used for automatic control of sample weight (bar graph),
- tolerance: value used for determining moisture content variation over time (trend),
- drying program.



#### Drying Programs Database Contains any Data Relating to a Drying Process:

- name, code,
- drying mode, drying temperature,
- automatic shutdown (auto / time-defined / user-defined),
- start mass control (none / optional / essential),
- equipment intended for a sample (methodology),
- instruction on sample preparation for a drying process (methodology),
- required sample size (methodology).

### Database Editor

Database Editor PC software is designed to support users dealing with a vast number of samples. Clear structure of the program ensures quickness when it comes to specifying drying parameters and other information relating to a sample. Data is transferred from the software to a moisture analyzer by means of Ethernet (3Y) or RS 232 (3Y, R).

Users	Code	Name	Desc
Users	12	Mustard	Musta
Databases	13	Powdered Soya Drink	Powd
Products	14	Pistachio Nut	Pistac
Weighing Records	15	Walnut	Waln
Clients	16	Wheat Bran	Whea
Drying Programs	17	PA 6	PA 6
Drying Process Reports	18	Fodder	Fodd
	19	Soya Pate With Mushrooms	Soya
	20	PC (polycarbonate)	PC (p
	21	Pellet	Pellet
	22	Gingerbread	Ginge
	23	Corn Flakes	Corn
	24	Washing-up Detergent	Wash

Available databases: Products, Weighing Records, Customers, Drying Programs, Drying Process Records, Ambient Conditions, Packaging, Warehouses, Printouts, Universal Variables.

Name:	Walnut		
Description:	Walnut		
Code:	3	Code EAN:	9854327
Target value:	4,23	Unit:	%M
Drying program:	<div> <div>Min:</div> <div>Tolerance:</div> <div>Density:</div> <div>Price:</div> <div>Date:</div> <div>Printout:</div> </div> <div> <div>Powdered Soya Drink</div> <div>Pistachio Nut</div> <div>Walnut</div> <div>Wheat Bran</div> <div>Candied Papaya</div> <div>Granulated Fodder</div> <div>Soya Pate With Mushrooms</div> </div> <div> <div>Tare:</div> <div>Max:</div> <div>Shelf life-time:</div> <div>VAT:</div> </div>		

Detailed information concerning the product.



Export / import of databases between moisture analyzers.

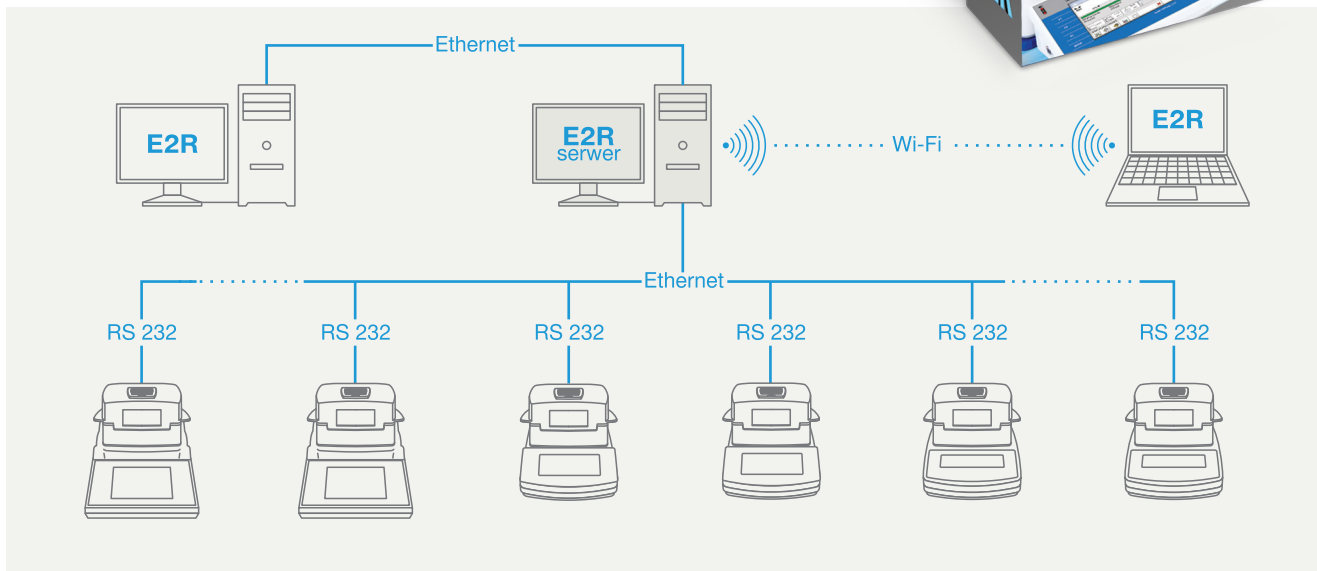
# E2R

## Results Analysis Performed Online

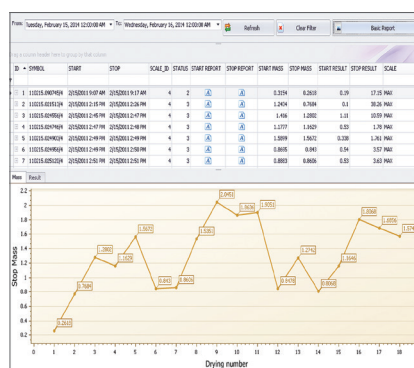
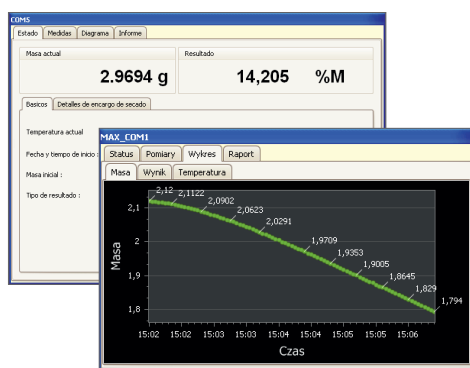
### Databases Drying Processes Ergonomics

Production processes for which moisture content of a particular sample is a crucial parameter, require quick reaction. This may be carried out using so called weighing networks comprising MA 3Y and MA R moisture analyzers. Each drying process is monitored on-line regardless of workstations location.

E2R Moisture Analyzer PC software is designed to record measurements performed by means of RADWAG moisture analyzers cooperating in a network, using RS 232 and Ethernet interfaces for connection. The software enables monitoring and reporting of collected measurements.



Software functions: on-line monitoring of moisture analyzer operation, possibility of configuring reports and graphs, analysis of data collected from many drying workstations, data protection.



E2R Moisture Analyzer is a module of integrated system for managing E2R weighing processes. E2R System comprises various programs ensuring continuous control of balances and their databases together with both, complete managing of the manufacturing process and the process optimisation.



# Intended Use and Applications

## Area of Use

Moisture content analysis and dry mass measurement of a particular product are both crucial for various branches of industry and science. Vast area of use and diversity of analyzed samples structure require individual approach to different substances.



### Dairy Industry

Samples:  
cheese, buttermilk, yoghurt, powdered milk, etc.

Samples are dried directly on a weighing pan or by means of glass fiber filters or silica sand (increasing surface of evaporation).



### Fruit and Vegetable Industry

Samples:  
dried vegetables, fruits and mushroom, nuts etc.

Samples shall be cut into smaller pieces (the analyzed samples cannot be too thick).



### Food Industry

Samples:  
sugar, flour, pasta, spices, gelatin, etc.

Thin layer of semi-liquid samples shall be distributed on a weighing pan (silica sand or glass fiber filters may be used). Other kinds of samples shall be crushed.



### Chemical Industry

Samples:  
emulsion, gel and lotions used for cleaning, paints, film, graphite, etc.

Thin layer of semi-liquid samples shall be distributed on a weighing pan (Silica sand or glass fiber filters may be used). Other kinds of samples shall be crushed.



### Agricultural Industry

Samples:  
grain, seeds, hay, biomass, etc.

Grain needs to be crushed prior drying.

## PC Software

RADWAG PC software supports moisture analyzers expanding their functionality.

### R-Lab

Scales preview, weighings graphs and statistics graphs.

### Database Editor

Readout, databases editing and record of computer stored databases on balance.

### Rad Key

Readout of balance data by means of defined Hot Key.

### E2R Moisture Analyzers

Record of weighments carried out by moisture analyzers cooperating in a network.

## Additional Equipment

- Anti-vibration weighing tables,
- Disposable weighing pans,
- Thermal and dot matrix printers,
- Barcode scanners (for 3Y series),
- Control thermometer,
- Water vapor permeability set.

Complete offer is to be found on [www.radwag.com](http://www.radwag.com) website.

# Moisture Analyzers Comparison

## MA 3Y

First-class professional moisture analyzers intended for the most challenging applications. They assure excellent accuracy and wide range of functions.



### Display

5.7" colour resistive touch screen.

### Databases

10 databases (users, products, customers, packaging, warehouses, universal variables, drying modes, weighing reports, ambient conditions).

### Level system

Electronic

### Bar graph

Bar graph of maximum capacity,  
Bar graph for control of sample mass.

### Proximity sensors

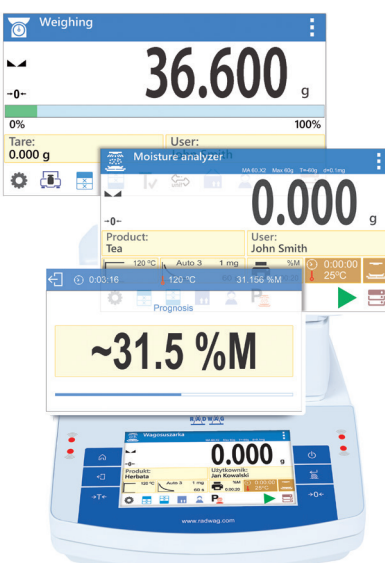
2 independently programmable IR sensors.

### Graphs

Drying process visualisation.

## MA X2.A

Advanced moisture analyzers intended for most applications. They guarantee high quality measurements along with easy and convenient operation.



### Display

5" colour capacitive touch screen.

### Databases

8 databases (users, products, customers, packaging, drying programs, drying reports, weighing reports, ambient conditions).

### Level system

Bull's eye level.

### Bar graph

Bar graph of maximum capacity.

### Proximity sensors

2 independently programmable IR sensors.

### Automatic drying chamber

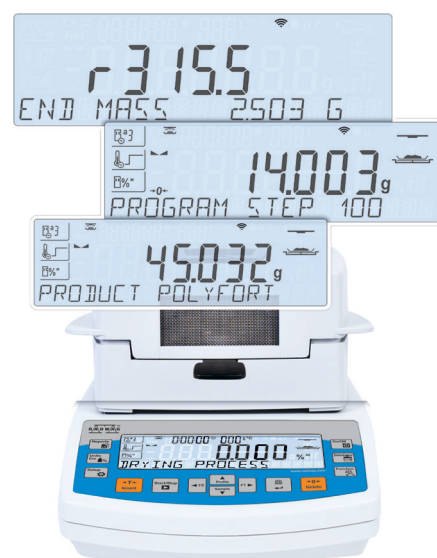
Automatically opened and closed drying chamber.

### Prognosis of the drying process result

Prognosis function (max. 6-fold reduction of the drying time).

## MA R

Versatile and reliable standard moisture analyzers. They are characterized by high measurements accuracy, uncomplicated operation and robust design.



### Display

Large, monochrome LCD with backlight.

### Databases

6 databases (users, products, packaging, drying programs, drying reports, weighing reports).

### Level system

Bull's eye level.

# Technical specification



MA 60.3Y



MA 200.3Y



MA 50/1.X2.A  
MA 50/1.IC.X2.A\*









MA 50.X2.A  
MA 50.IC.X2.A\*



MA 110.X2.A  
MA 110.IC.X2.A\*

Maximum capacity [Max]	60 g	200 g	50 g	50 g	110 g
Readability [d]	0.1 mg	1 mg	0.1 mg	1 mg	1 mg
Tare range	-60 g	-200 g	-50 g	-50 g	-110 g
Maximum sample weight	60 g	200 g	50 g	50 g	110 g
Moisture readout accuracy	0.0001 %	0.001 %	0.0001 %	0.001 %	0.001 %
Moisture content repeatability for ~ 2g sample.	0.05 %	0.05 %	0.05 %	0.05 %	0.05 %
Moisture content repeatability for ~ 10g sample.	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %
Adjustment	external	external	external (MA X2.A), internal (MA X2.IC.A)	external (MA X2.A), internal (MA X2.IC.A)	external (MA X2.A), internal (MA X2.IC.A)
Drying temperature range	max 160°C, max 250°C (option)	max 160°C, max 250°C (option)	max 160°C, max 250°C (option)	max 160°C, max 250°C (option)	max 160°C, max 250°C (option)
Heating element	IR emitter, halogen (option), metal heater (option)	IR emitter, halogen (option), metal heater (option)	IR emitter, halogen (option), metal heater (option)	IR emitter, halogen (option), metal heater (option)	IR emitter, halogen (option), metal heater (option)
Power of heating element	450 W	450 W	450 W	450 W	450 W
Drying mode	standard, quick, step, mild	standard, quick, step, mild	standard, quick, step, mild	standard, quick, step, mild	standard, quick, step, mild
Drying shutdown options	manual, automatic, time-defined, user-defined	manual, automatic, time-defined, user-defined	manual, automatic, time-defined, user-defined	manual, automatic, time-defined, user-defined	manual, automatic, time-defined, user-defined
Touch-free operation	programmable sensors	programmable sensors	programmable sensors	programmable sensors	programmable sensors
Automatically opened drying chamber	—	—	YES	YES	YES
Additional functions	sample identification, drying process graph	sample identification, drying process graph	control of sample weight before drying process	control of sample weight before drying process	control of sample weight before drying process
Operating temperature	+10°C - + 40°C	+10°C - + 40°C	+10°C - + 40°C	+10°C - + 40°C	+10°C - + 40°C
Weighing pan dimensions	ø90 mm, h = 8 mm	ø90 mm, h = 8 mm	ø90 mm, h = 8 mm	ø90 mm, h = 8 mm	ø90 mm, h = 8 mm
Display	5.7" resistive colour touchscreen	5.7" resistive colour touchscreen	5" capacitive colour touchscreen	5" capacitive colour touchscreen	5" capacitive colour touchscreen
Communication interfaces	2×USB-A, RS 232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	2×USB-A, RS 232, Ethernet, Wi-Fi®, 4×IN, 4×OUT	USB-A, USB-B, RS 232, Ethernet, Wi-Fi®	USB-A, USB-B, RS 232, Ethernet, Wi-Fi®	USB-A, USB-B, RS 232, Ethernet, Wi-Fi®

					
<b>MA 200/1.X2.A</b> <b>MA 200/1.IC.X2.A*</b>	<b>MA 210.X2.A</b> <b>MA 210.IC.X2.A*</b>	<b>MA 50/1.R</b>	<b>MA 50.R</b>	<b>MA 110.R</b>	<b>MA 210.R</b>
200 g	210 g	50 g	50 g	110 g	210 g
0,1 mg	1 mg	0.1 mg	1 mg	1 mg	1 mg
-200 g	-210 g	-50 g	-50 g	-110 g	-210 g
200 g	210 g	50 g	50 g	110 g	210 g
0.001 %	0.001 %	0.0001 %	0.001 %	0.001 %	0.001 %
0.05 %	0.05 %	0.05 %	0.05 %	0.05 %	0.05 %
0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %
external (MA X2.A), internal (MA X2.IC.A)	external (MA X2.A), internal (MA X2.IC.A)	external	external	external	external
max 160°C, max 250°C (option)	max 160°C, max 250°C (option)	max 160°C, max 250°C (option)	max 160°C, max 250°C (option)	max 160°C, max 250°C (option)	max 160°C, max 250°C (option)
IR emitter, halogen (option), metal heater (option)	IR emitter, halogen (option), metal heater (option)	IR emitter, halogen (option), metal heater (option)	IR emitter, halogen (option), metal heater (option)	IR emitter, halogen (option), metal heater (option)	IR emitter, halogen (option), metal heater (option)
450 W	450 W	450 W	450 W	450 W	450 W
standard, quick, step, mild	standard, quick, step, mild	standard, quick, step, mild	standard, quick, step, mild	standard, quick, step, mild	standard, quick, step, mild
manual, automatic, time-defined, user-defined	manual, automatic, time-defined, user-defined	manual, automatic, time-defined, user-defined	manual, automatic, time-defined, user-defined	manual, automatic, time-defined, user-defined	manual, automatic, time-defined, user-defined
programmable sensors	programmable sensors	–	–	–	–
YES	YES	–	–	–	–
control of sample weight before drying process	control of sample weight before drying process	sample identification	sample identification	sample identification	sample identification
+10°C - + 40°C	+10°C - + 40°C	+10°C - + 40°C	+10°C - + 40°C	+10°C - + 40°C	+10°C - + 40°C
ø90 mm, h = 8 mm	ø90 mm, h = 8 mm	ø90 mm, h = 8 mm	ø90 mm, h = 8 mm	ø90 mm, h = 8 mm	ø90 mm, h = 8 mm
5" capacitive colour touchscreen	5" capacitive colour touchscreen	LCD (backlit)	LCD (backlit)	LCD (backlit)	LCD (backlit)
USB-A, USB-B, RS 232, Ethernet, Wi-Fi®	USB-A, USB-B, RS 232, Ethernet, Wi-Fi®	USB-A, USB-B, RS 232, Wi-Fi®	USB-A, USB-B, RS 232, Wi-Fi®	USB-A, USB-B, RS 232, Wi-Fi®	USB-A, USB-B, RS 232, Wi-Fi®

Wi-Fi® is a registered trademark of Wi-Fi Alliance.



**Ultra-short drying time**  
**Uniform heating of the sample**  
**Complex database of drying programs**



[www.radwag.com](http://www.radwag.com)

# PMV 50 Microwave Moisture Analyzer

MEASUREMENT OF SAMPLES OF HIGH MOISTURE CONTENT

# PMV 50

## High accuracy analysis, fast drying process Intuitive operation



### Microwaves in Moisture Content Measurement

Samples humidity measurement performed using an innovative system, operation of which system is based on microwaves, requires much less time for drying of weighed materials. This solution is an excellent choice for measuring products containing significant amount of moisture (8-100%), i.e. dairy products, meat, fish, syrups, creams, liquid resin.

### Ultra-Short Drying Time

The PMV 50 moisture analyzer enables to significantly reduce drying time. Depending on the type and mass of a sample, the process takes 1 to 10 minutes. In contrast, drying using the traditional halogen moisture analyzer takes 5 to 40 minutes.

### Uniform Heating of the Sample

In contrast to traditional moisture analyzers which heat samples on the side of the heating element, the PMV 50 moisture analyzer heats the whole sample's volume due to the use of  $\varnothing 90$  filter.

### Temperature Sensor

The PMV 50 microwave moisture analyzer is equipped with a temperature sensor which enables to select optimum power for a given sample and prevents exceeding the boiling point during the process. Preset microwave power is displayed on the indicator throughout the drying procedure.

### Complex Databases

Measuring processes are supported by complex databases with numerous management options. Expanded 32 GB memory enables saving and storing advanced reports and time and statistical graphs.

### Verification of Operation

When purchasing the PMV 50 moisture analyzer a sample of sodium chloride 10% is provided by the manufacturer. This enables determining whether the device operates correctly at the workstation.



**PMV 50**

Maximum capacity [Max]	50 g
Readability [d]	0.1 mg
Tare range	- 50 g
Maximum sample weight	50 g
Moisture content readability	0.05 %
Measuring range	8 % – 100 % moisture content
Displayed result	Moisture content – %, ppm; dry mass content – %, ppm, g; loss – mg; proportion – %
Sample holder	$\varnothing 90$ mm glass fibre filter
Heating module	Microwave radiation emitter
Finish mode	Manual, automatic, time-defined, user-defined
Microwave power regulation	2 % – 100% (every 1%)
Display	5.7" resistive colour touch screen
Communication Interfaces	2×USB-A, RS 232, Ethernet, 4×IN, 4×OUT, Wi-Fi®*

\*Wi-Fi® is a registered trademark of Wi-Fi Alliance.



# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)





**RADWAG BALANCES AND SCALES**  
ADVANCED WEIGHING TECHNOLOGIES



# Mass Comparators

Advanced Radwag solutions for traceability of measurement





# Automatic Mass Comparators



# Automatic Mass Comparators

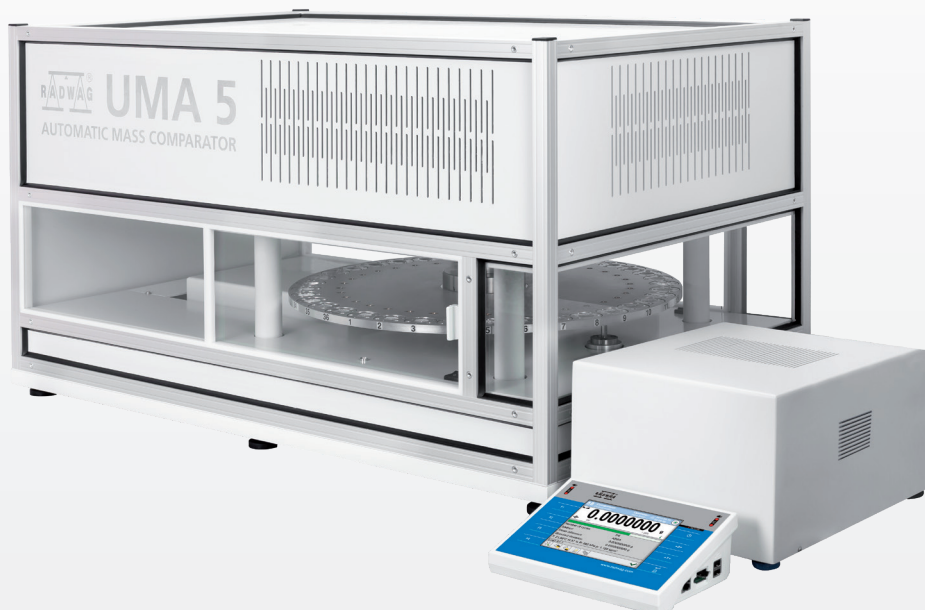
## UMA

Mass comparators of UMA series stand for the highest standard of professional automatic mass comparators. They provide comparison of 1 mg – 1000 g weights of E1 and lower classes.

The device is equipped with 18 or 36 magazine positions allowing to deposit up to 36 weights. This solution allows to perform either comparison for complete set of weights carried out within one process or comparison for just a few weights of the same mass.

Owing to elimination of human factor and with temperature changes and air drafts reduced to zero, UMA automatic mass comparators provide the highest possible measurement repeatability.

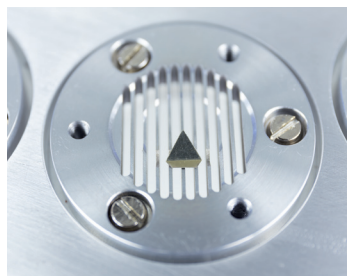
The UMA series, thanks to a vibration sensor inside the electronics, analyses and recognises vibrations origin. The sensor allows to determine whether the vibrations come from ground or other sources affecting the measurement result.



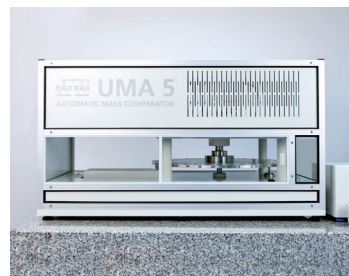
The weighing pan has been designed to enable measurement of very small samples with very high precision. This also secures a weight against wedging.



User-friendly and functional software guides you through preparation process of complete calibration plan within just a few minutes.



Comparison can be carried out for weights of all shapes with use of just one universal weighing pan.



Compact size guarantees operation of the device at any laboratory workstation. Possibility of comparison of many weights at a time adds to comparator's versatility.

		UMA-5	UMA-100	UMA-1000
Calibration range	E1	1 mg – 5 g	1 g – 100 g	100 g – 1000 g
	E2	1 mg – 5 g	1 g – 100 g	10 g – 1000 g
	F1	1 mg – 5 g	1 g – 100 g	10 g – 1000 g
	F2	1 mg – 5 g	1 g – 100 g	10 g – 1000 g
	M1	1 mg – 5 g	1 g – 100 g	10 g – 1000 g
	M2	1 mg – 5 g	1 g – 100 g	10 g – 1000 g
Max capacity [Max]		5.1 g	110 g	1100 g
Readability [d]		0.0001 mg	0.001 mg	0.005 mg
Repeatability [S]*		0.2 µg (0-1 g); 0.3 µg (1-2 g); 0.4 µg (2-5 g)	0.002 mg	0.012 mg

\* Standard deviation of 6 ABBA cycles (acc. to R111 OIML) for maximal mass being subjected to comparison when stable laboratory conditions are maintained.

# Automatic Mass Comparators

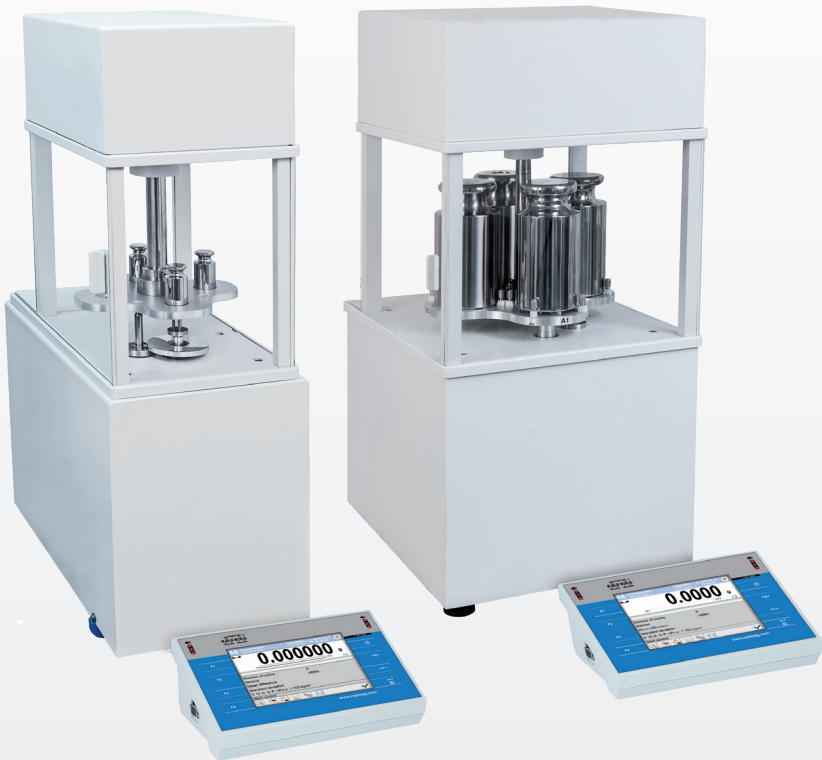
## AK-4

Mass comparators of AK-4 series stand for the highest standard of professional automatic mass comparators. They provide comparison of 10 g – 10 kg weights of E1 and lower classes. The comparators are offered in two versions:

- 4-positional weight alternator: for 1 reference mass standard and 3 tested weights
- 2-positional weight alternator: for reference weight being a combination of mass value of 3 separate weights.

Owing to elimination of human error and with temperature change and air drafts reduced to zero, AK-4 automatic mass comparators provide the highest possible measurement repeatability, incomparable to repeatability offered by manual comparators.

A supplementary external anti-draft chamber comes standard with each AK-4 comparator.



Weight positioning of sliding nature prevents errors of eccentricity.



RADWAG solutions intended for automatic comparators, i.e. positioning mechanism, guarantee extremely precise setting of weight on a weighing pan, performed each time the turntable has been rotated.



Extraordinary design of the weighing pan enables both, comparison of mass being combination of 3 weights, and standard comparison of 1 weight.



Weighing range switch allows you to select different load ranges for weights comparison. Regardless of selected option, constant comparator resolution is maintained.

		AK-4/100	AK-4/1000	AK-4/1001	AK-4/2000	AK-4/5000	AK-4/10000
Calibration range	E1	10 g – 100 g	100 g – 1 kg	100 g – 1 kg	200 g – 2 kg	1 kg – 5 kg	1 kg – 10 kg
	E2	10 g – 100 g	100 g – 1 kg	100 g – 1 kg	200 g – 2 kg	1 kg – 5 kg	1 kg – 10 kg
	F1	10 g – 100 g	100 g – 1 kg	100 g – 1 kg	200 g – 2 kg	1 kg – 5 kg	1 kg – 10 kg
	F2	10 g – 100 g	100 g – 1 kg	100 g – 1 kg	200 g – 2 kg	1 kg – 5 kg	1 kg – 10 kg
	M1	–	–	–	–	–	–
	M2	–	–	–	–	–	–
Max capacity [Max]		110 g	1.02 kg	1.02 kg	2.02 kg	5.05 kg	10.02 kg
Readability [d]		0.001 mg	0.005 mg	0.001 mg	0.01 mg	0.01 mg	0.01 mg
Repeatability [S]*		0.002 mg	0.012 mg	0.002 mg	0.015 mg	0.015 mg	0.02 mg

126 Standard deviation of 6 ABBA cycles (acc. to R111 OIML) for maximal mass being subjected to comparison when stable laboratory conditions are maintained.

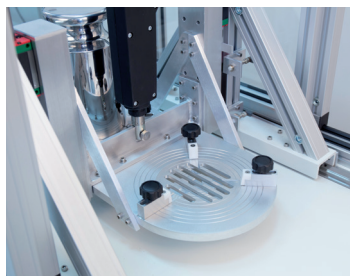
## Automatic Mass Comparators

# AKM-2

Mass comparators of AKM-2 series stand for the highest standard of professional automatic mass comparators. They provide comparison of 500 g – 50 kg weights of E1 and lower classes. The comparator is offered in a form of 2-positional weight alternator: for 1 reference mass standard and 1 tested weight.

For maximum comfort of operation, the AKM-2 has been equipped with automatic sliding feeding mechanism allowing easy placement of heavy weights.

Owing to elimination of human error and with temperature change and air drafts reduced to zero, AKM-2 automatic mass comparators provide the highest possible measurement repeatability, incomparable to repeatability offered by manual comparators.



Weight positioning of sliding nature prevents errors of eccentricity.



Dedicated weighing pan design facilitates extremely precise weights comparison, no matter how light the weights are.



Weighing range switch allows you to select different load ranges for weights comparison. Regardless of selected option, constant comparator resolution is maintained.



Sturdy design of the table, featuring heavy granite stone and robust rubber shock absorbers, reduces effect of vibrations to the absolute minimum.

		AKM-2/10	AKM-2/20.1	AKM-2/20.5	AKM-2/50
Calibration range	E1	2 kg – 10 kg	5 kg – 20 kg	5 kg – 20 kg	20 kg – 50 kg
	E2	500 g – 10 kg	1 kg – 20 kg	5 kg – 20 kg	5 kg – 50 kg
	F1	500 g – 10 kg	1 kg – 20 kg	5 kg – 20 kg	5 kg – 50 kg
	F2	500 g – 10 kg	1 kg – 20 kg	5 kg – 20 kg	5 kg – 50 kg
	M1	500 g – 10 kg	1 kg – 20 kg	5 kg – 20 kg	5 kg – 50 kg
	M2	500 g – 10 kg	1 kg – 20 kg	5 kg – 20 kg	5 kg – 50 kg
Max capacity [Max]		10.2 kg	20.5 kg	20.5 kg	51 kg
Readability [d]		0.1 mg	0.1 mg	0.1 mg	1 mg
Repeatability [S]*		0.2 mg	0.4 mg	0.4 mg	2 mg

\* Standard deviation of 6 ABBA cycles (acc. to R111 OIML) for maximal mass being subjected to comparison when stable laboratory conditions are maintained.





# Manual Mass Comparators

## Manual Mass Comparators UYA 4Y.KO

Mass comparators of UYA 4Y.KO series stand for high standard of professional manual mass comparators. They provide comparison of 1 mg – 5 g weights of E1 and lower classes.

The UYA 4Y.KO series is characteristic for 0.1 µg readability. Significant feature of UYA 4Y.KO comparator is the automatically opened transparent weighing chamber providing maximum resistance to air drafts.

A supplementary external anti-draft chamber comes standard with each UYA 4Y.KO comparator.

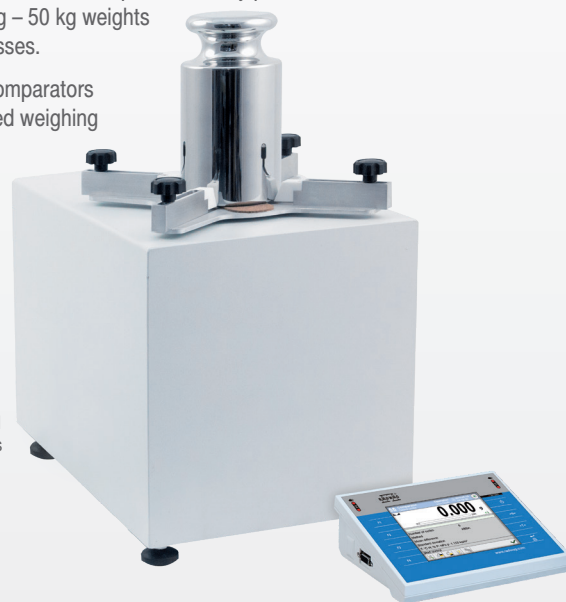


## Manual Mass Comparators APP 4Y.KO

Mass comparators of APP 4Y.KO series stand for high standard of professional manual mass comparators. They provide comparison of 100 g – 50 kg weights of E1 and lower classes.

APP 4Y.KO mass comparators feature model-related weighing pan type, it is either self-centering pan or weighing pan with mechanical centering aid, the former one allowing for dissemination of weights.

A supplementary external anti-draft chamber comes standard with each APP 4Y.KO comparator.



Automatically opened transparent weighing chamber of UYA 4Y.KO mass comparator provides utmost visibility of the weight subjected to comparison.



Complex databases offer unlimited access to information on mass standards, customers and tasks along with preview of reports on carried out comparisons.



Weighing pan with mechanical centering system facilitates precise placing of mass standards, plus it reduces effect of eccentricity to zero.



Optional "floating" self-centering pan offers reduction of eccentricity effect, plus it supports dissemination of reference mass to more than one weight.

		UYA 5.4Y.KO	APP 10.4Y.KO	APP 30.4Y.KO	APP 64.4Y.KO
Calibration range	E1	1 mg – 5 g	5 kg – 10 kg	20 kg	–
	E2	1 mg – 5 g	1 kg – 10 kg	5 kg – 20 kg	50 kg
	F1	1 mg – 5 g	100 g – 10 kg	2 kg – 20 kg	20 kg – 50 kg
	F2	1 mg – 5 g	100 g – 10 kg	1 kg – 20 kg	5 kg – 50 kg
	M1	1 mg – 5 g	100 g – 10 kg	1 kg – 20 kg	2 kg – 50 kg
	M2	1 mg – 5 g	100 g – 10 kg	1 kg – 20 kg	1 kg – 50 kg
Max capacity [Max]		5.1 g	10.2 kg	30.5 kg	64 kg
Readability [d]		0.0001 mg	0.1 mg	1 mg	10 mg
Repeatability [S]*		0.0003 mg	0.5 mg	2 mg (1 kg); 3 mg (30 kg)	18 mg

\* Standard deviation of 6 ABBA cycles (acc. to R111 OIML) for maximal mass being subjected to comparison when stable laboratory conditions are maintained.



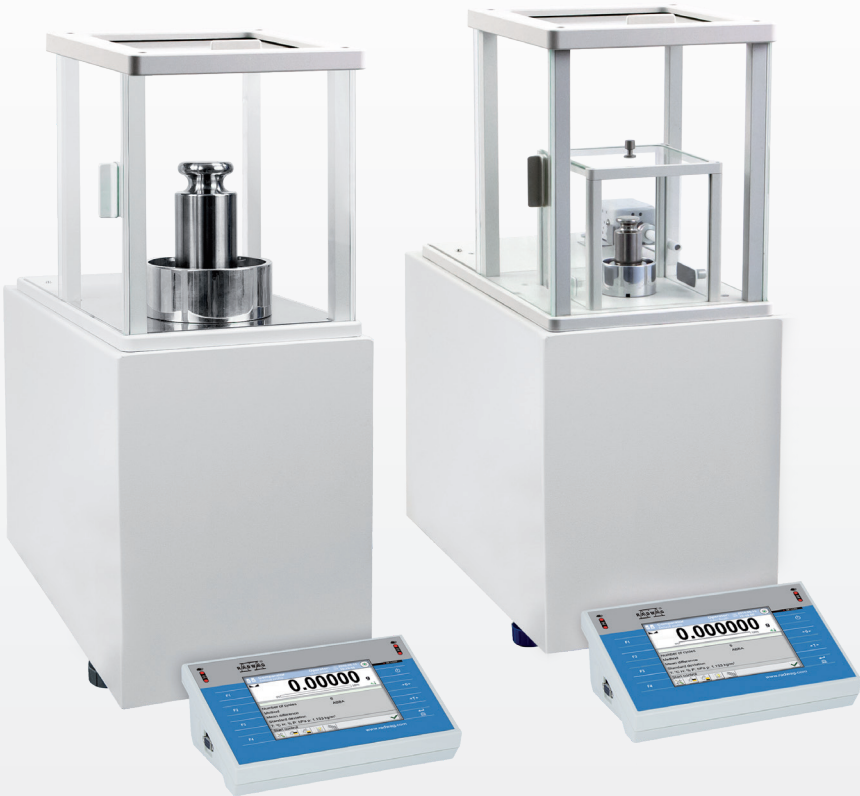
# Manual Mass Comparators

## WAY 4Y.KO

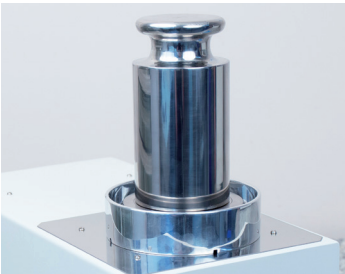
Mass comparators of WAY 4Y.KO series stand for high standard of professional manual mass comparators. They provide comparison of 1 mg – 5 kg weights of E1 and lower classes.

WAY 4Y.KO mass comparators feature transparent weighing chamber and ring-shaped draft shield encircling the weighing pan. Models characterized with the highest accuracy additionally comprise an internal box-shaped draft shield made of glass.

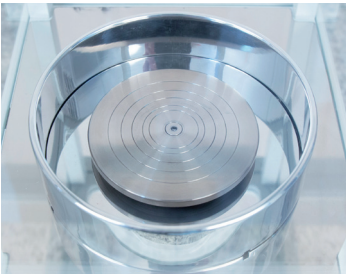
A supplementary external anti-draft chamber comes standard with each WAY 4Y.KO comparator\*.



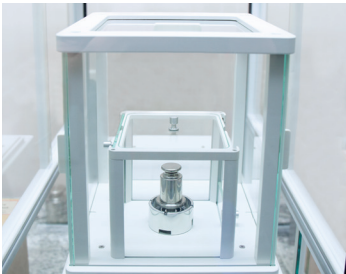
\* Not applicable to WAY 1200.4Y.KO comparator.



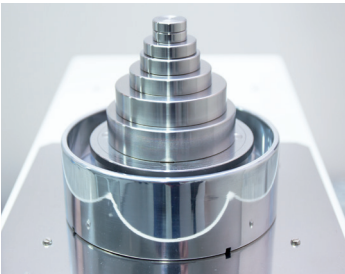
Ring-shaped draft shield encircling the weighing pan, apart from protecting the pan against air drafts, prevents potential shocks that could be applied accidentally to the weighing pan while loading the weight.



Weighing pan, made of the best quality non-magnetic stainless steel, features centrally positioned markings allowing easy and precise weights placement.



Glass draft shield minimizes influence of air drafts on comparison process. The glass with special conductive coating supports discharge of static electricity.



Selected WAY 4Y.KO models allow use of supplementary external loads, with this it is possible to carry out comparison of non-standard weights.

		WAY 100.4Y.KO	WAY 500.4Y.KO	WAY 1.4Y.KO	WAY 2.4Y.KO	WAY 5.4Y.KO
Calibration range	E1	5 g – 100 g	200 g – 500 g	500 g – 1 kg	1 kg – 2 kg	2 kg – 5 kg
	E2	100 mg – 100 g	10 g – 500 g	100 g – 1 kg	500 g – 2 kg	500 g – 5 kg
	F1	1 mg – 100 g	1 g – 500 g	10 g – 1 kg	100 g – 2 kg	100 g – 5 kg
	F2	1 mg – 100 g	1 g – 500 g	1 g – 1 kg	10 g – 2 kg	10 g – 5 kg
	M1	1 mg – 100 g	1 g – 500 g	1 g – 1 kg	1 g – 2 kg	1 g – 5 kg
	M2	1 mg – 100 g	1 g – 500 g	1 g – 1 kg	1 g – 2 kg	1 g – 5 kg
Max capacity [Max]		110 g	520 g	1.02 kg	2.3 kg	5.05 kg
Readability [d]		0.001 mg	0.01 mg	0.01 mg	0.1 mg	0.1 mg
Repeatability [S]*		0.003 mg	0.02 mg	0.035 mg	0.1 mg	0.2 mg

130 Standard deviation of 6 ABBA cycles (acc. to R111 OIML) for maximal mass being subjected to comparison when stable laboratory conditions are maintained.



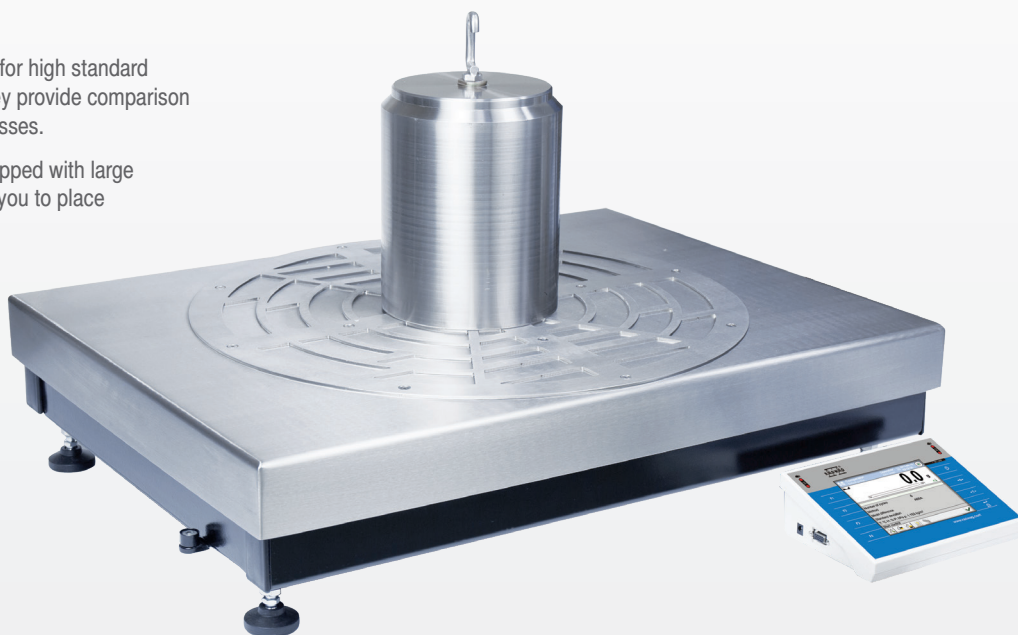
## Manual Mass Comparators

# HRP 4Y.KO

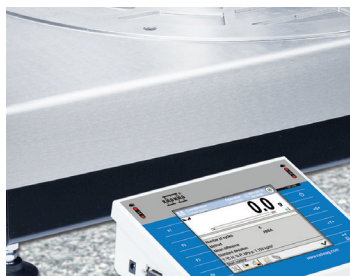
Mass comparators of HRP 4Y.KO series stand for high standard of professional manual mass comparators. They provide comparison of 50 kg – 2000 kg weights of F2 and lower classes.

HRP 4Y.KO mass comparators have been equipped with large weighing platform featuring markings allowing you to place the weights centrically and precisely.

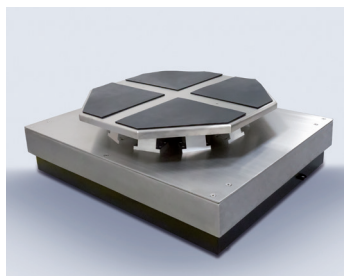
HRP 4Y.KO mass comparators serve not only comparison purposes, they can be used for weighing processes and other related operations.



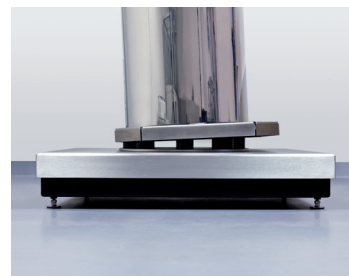
Precisely marked weighing platform of HRP 4Y.KO comparator is of great help when trying to place the weight accurately in the center.



Colour 5.7" touchscreen comes standard with all RADWAG manufactured comparators.



HRP mass comparators have been equipped with special self-centering weighing pan to provide both greater comfort of operation and reduced off-center load error.



The self-centering weighing pan has been designed in order to enable stabilising and levelling of weights that are put off the center, plus to allow comparison of weights of atypical shape.

		HRP 200.4Y.KO	HRP 500.4Y.KO	HRP 1000.4Y.KO	HRP 2000.4Y.KO
Calibration range	E1	–	–	–	–
	E2	–	–	–	–
	F1	–	–	–	–
	F2	100 kg – 200 kg	200 kg – 500 kg	500 kg – 1000 kg	1000 kg – 2000 kg
	M1	50 kg – 200 kg	100 kg – 500 kg	200 kg – 1000 kg	500 kg – 2000 kg
	M2	50 kg – 200 kg	50 kg – 500 kg	100 kg – 1000 kg	200 kg – 2000 kg
Max capacity [Max]		210 kg	510 kg	1050 kg	2100 kg
Readability [d]		0.2 g	0.5 g	1 g	2 g
Repeatability [S]*		0.5 g (50 kg); 0.6 g (200 kg)	0.5 g (50 kg); 1.6 g (500 kg)	1.5 g (100 kg); 2.5 g (1000 kg)	2.5 g (200 kg); 5 g (2000 kg)

\* Standard deviation of 6 ABBA cycles (acc. to R111 OIML) for maximal mass being subjected to comparison when stable laboratory conditions are maintained.

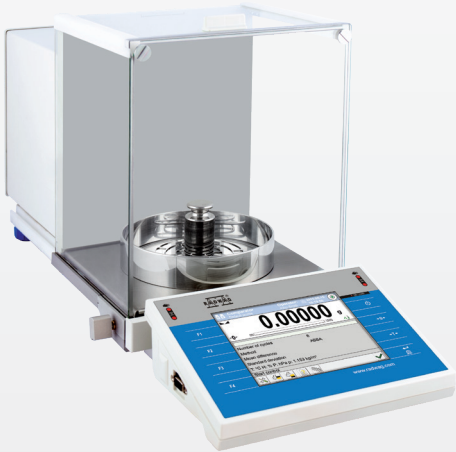
# Manual Mass Comparators

## XA 4Y.A.KB

Mass comparators of XA 4Y.A.KB series are standard manual mass comparators. They provide comparison of 1 mg – 200 g weights of F2 and lower classes.

XA 4Y.A.KB mass comparators have been equipped with transparent weighing chamber featuring automatically opened door.

XA 4Y.A.KB mass comparators serve not only comparison purposes, they can be used for weighing processes and other related operations that are typical for standard analytical balances of XA 4Y.A series.



# Manual Mass Comparators

## PS 4Y.KB

Mass comparators of PS 4Y.KB series are standard manual mass comparators. They provide comparison of 100 g – 1 kg weights of class F2 and lower classes.

PS 4Y.KB mass comparators have been equipped with spacious transparent weighing chamber.

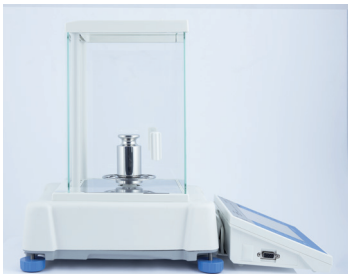
PS 4Y.KB mass comparators serve not only comparison purposes, they can be used for weighing processes and other related operations that are typical for standard precision balances of PS 4Y series.



Spacious and airtight weighing chamber of XA 4Y.A.KB mass comparator features automatically opened door.



Openwork weighing pan significantly reduces ambient conditions influence on the measurement.



Transparent weighing chamber of PS 4Y.KB mass comparator, protecting the weighing pan, provides utmost visibility of the tested weight.



Semi-automatic levelling system is a standard feature of each 4Y series mass comparator.

XA 200.4Y.A.KB			PS 1.4Y.KB		
Calibration range	E1	–	–		
	E2	–	–		
	F1	–	–		
	F2	100 mg – 200 g	500 g – 1 kg		
	M1	1 mg – 200 g	100 g – 1 kg		
	M2	1 mg – 200 g	100 g – 1 kg		
Max capacity [Max]		210 g	1.05 kg		
Readability [d]		0.01 mg	1 mg		
Repeatability [S]*		0.035 mg	1 mg		

132 Standard deviation of 6 ABBA cycles (acc. to R111 OIML) for maximal mass being subjected to comparison when stable laboratory conditions are maintained.

# Manual Mass Comparators

## PM 4Y.KB

Mass comparators of PM 4Y.KB series are standard manual mass comparators. They provide comparison of 1 kg – 50 kg weights of F2 and lower classes.

PM 4Y.KB mass comparators have been equipped with an open-work weighing pan featuring centering holders that facilitate precise weights placement.

PM 4Y.KB mass comparators serve not only comparison purposes, they can be used for weighing processes and other related operations that are typical for standard precision balances of PM 4Y series.



Centering holders of the openwork weighing pan allow precise placement of the weights, it is especially helpful when working with heavy and large mass standards.



Dedicated box for PM 4Y.KB mass comparator is a warranty for safe transport. With in-built interfaces you have a green light for immediate operation right after opening the box.

		PM 25.4Y.KB	PM 50.4Y.KB
Calibration range	E1	–	–
	E2	–	–
	F1	–	–
	F2	5 kg – 20 kg	50 kg
	M1	2 kg – 20 kg	10 kg – 50 kg
	M2	1 kg – 20 kg	10 kg – 50 kg
Max capacity [Max]		25.5 kg	51 kg
Readability [d]		10 mg	100 mg
Repeatability [S]*		15 mg	100 mg

\* Standard deviation of 6 ABBA cycles (acc. to R111 OIML) for maximal mass being subjected to comparison when stable laboratory conditions are maintained.

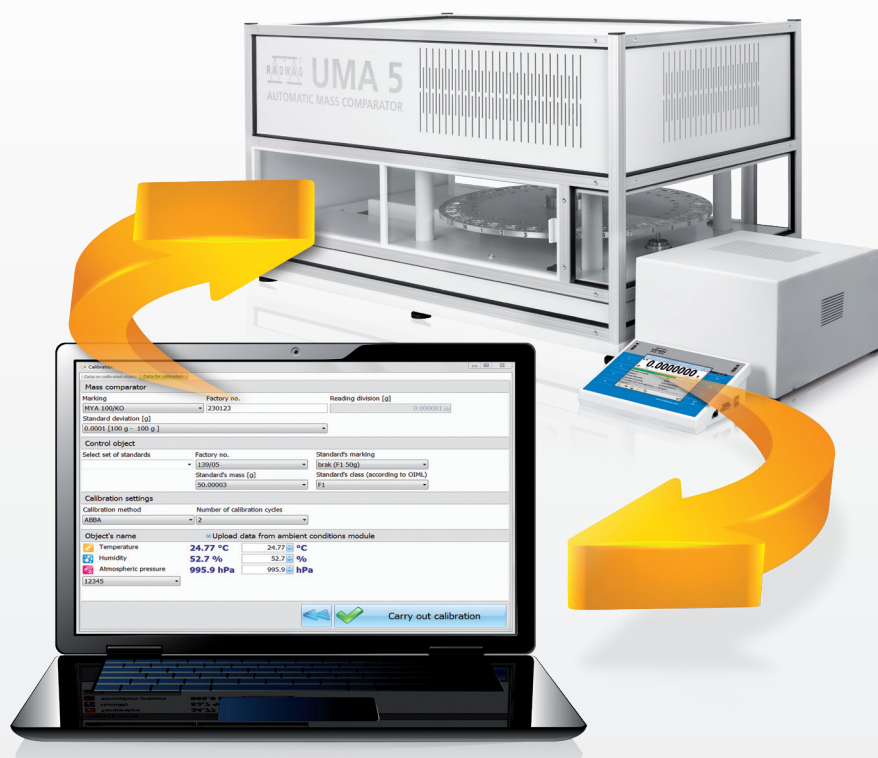


# PC Software RMCS

Radwag Multiple Comparator Software, RMCS, has been designed to enable management of laboratory-performed calibration procedures, starting from the moment of accepting an order, through its progress, until issuing a calibration certificate.

The calibration process supported by means of RMCS provides improved efficiency, reliable measurement results and complete documentation on calibration process, together with lower labour costs.

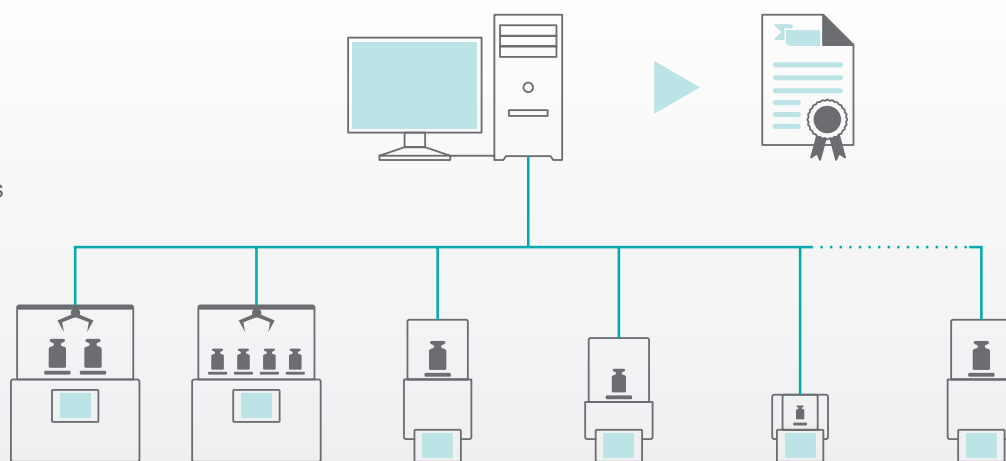
RMCS PC Software is intended for cooperation with RADWAG manufactured mass comparators. With the software you can carry out calibration processes using ABBA and ABA methods.



## Radwag Multiple Comparator Software – operation scheme

RMCS PC software makes it possible to initiate the calibration procedure by means of task sent to a particular mass comparator. Additionally it features option for autonomous performance of calibration process, triggered by the mass comparator itself.

In both cases, data is transferred to the software for the purpose of registering, controlling and finally issuing a calibration certificate.



## RMCS System functions

Complete management of a calibration laboratory calibrating mass standards and weights
Complex management of RADWAG comparators
Calibration using ABBA and ABA methods
Cooperation with monitoring system for ambient conditions
Databases support: comparators, mass standards, users and calibration orders
Bilateral data synchronization with RADWAG mass comparators
Archiving orders, calibration certificates and ambient conditions records
Record of events and calibration process reporting
Export of report results and calibration certificates

Mass comparators linked in the RMCS system autonomously cooperate with THB ambient conditions modules recording ambient conditions state (temperature, humidity and atmospheric pressure) throughout the whole control process.

Measurement results are displayed and sent, in real time, to RMCS software for the purpose of process control and data archiving.

# Ambient Conditions Monitoring

## THB

Maintaining optimal ambient conditions at a workplace is a warranty of precise results for comparison processes.

THB monitoring system has been designed to offer option of constant ambient conditions supervision provided at the place of mass comparator operation or in any laboratory room. The system performs real-time measurement of air temperature, relative humidity and atmospheric pressure. The measured values are then used for calculation of air density and dew point temperature.

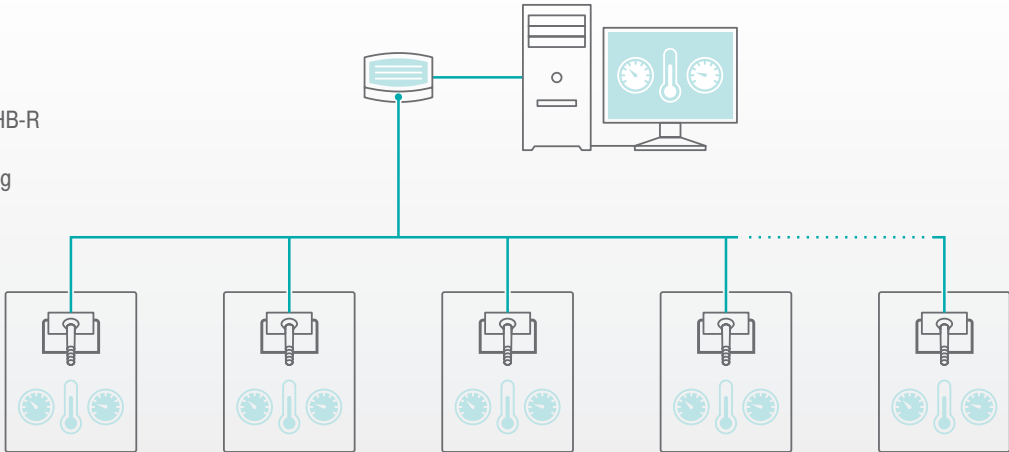
The measurements carried out for a particular workstation are performed by means of its local sensors – THB Ambient Conditions Modules. Current state of given measurements is displayed on the comparators terminal along with messages informing on critical values, all this thanks to connection established between the THB module and the comparator.



### Ambient Conditions Monitoring performed for separate laboratory rooms - operation scheme

Measurements results of particular THB modules are transferred in real time to THB-R recorder. The recorder supports up to 16 modular sensors, thus allowing monitoring of ambient conditions in multiple points in the proximity of up to 1200 m.

THB-Multi software enables displaying the measurements results on the computer screen. Additionally it offers data analysis, reports and graphs preparation and measurements record in database.



### Basic parameters for THB Ambient Conditions Modules

Measured temperature range	+5 °C – +45 °C
Temperature measurement accuracy	d = 0.01 °C / error ± 0.1 °C
Measured pressure range	850 – 1050 hPa
Pressure measurement accuracy	d = 0.1 hPa / error ± 2 hPa
Measured humidity range	0 – 100 %
Humidity measurement accuracy	d = 0.1 % / error ± 2 % (from 0 % to 10 % and from 90 % to 100 % the accuracy is 5 %)

# Errors for weights according to OIML and ASTM

According to OIML and ASTM guidelines mass standards and weights, used for mass measurement purposes, are divided into accuracy classes: E1, E2, F1, F2, M1, M2 and M3 (OIML classification) or 1 – 7 (ASTM classification).

In the course of calibration of mass standards and weights the measurement uncertainty for coverage factor  $k = 2$  (with confidence of about 95%) shall not be greater than 1/3 of maximum error value specified for a particular mass standard or weight of a given class or nominal value.

## Maximum permissible errors according to OIML R 111-1

±δm in mg

Nominal value	Class E1	Class E2	Class F1	Class F2	Class M1	Class M1–2	Class M2	Class M2–3	Class M3
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	0.25				
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	0.1	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		1 000
5 kg	2.5	8	25	80	250		800		2 500
10 kg	5	16	50	160	500		1 600		5 000
20 kg	10	30	100	300	1 000		3 000		10 000
50 kg	25	80	250	800	2 500	5 000	8 000	16 000	25 000
100 kg		160	500	1 600	5 000	10 000	16 000	30 000	50 000
200 kg		300	1 000	3 000	10 000	20 000	30 000	60 000	100 000
500 kg		800	2 500	8 000	25 000	50 000	80 000	160 000	250 000
1 000 kg		1 600	5 000	16 000	50 000	100 000	160 000	300 000	500 000
2 000 kg			10 000	30 000	100 000	200 000	300 000	600 000	1 000 000
5 000 kg			25 000	80 000	250 000	500 000	800 000	1 600 000	2 500 000

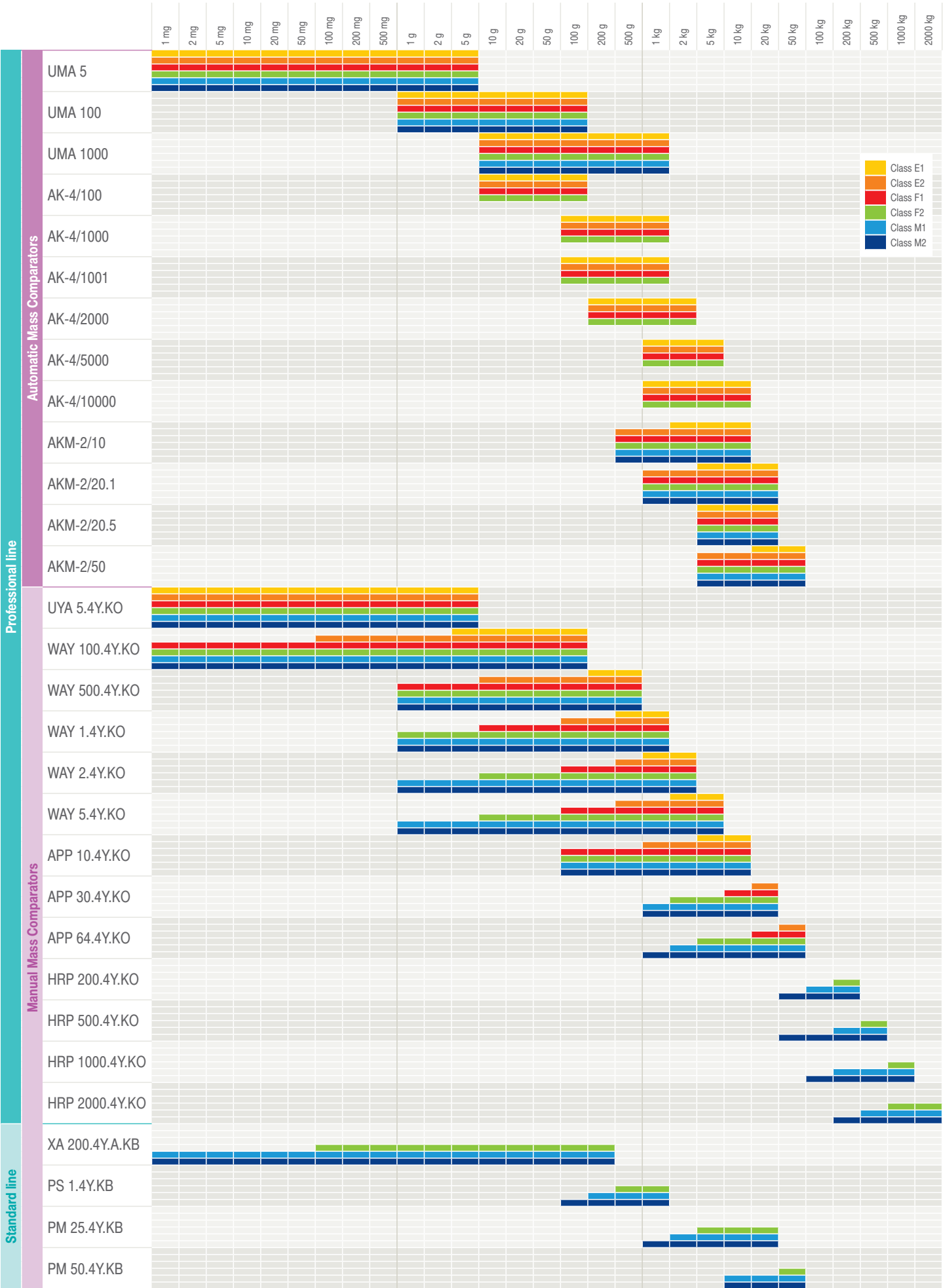


## Maximum permissible errors according to ASTM E617 - 13

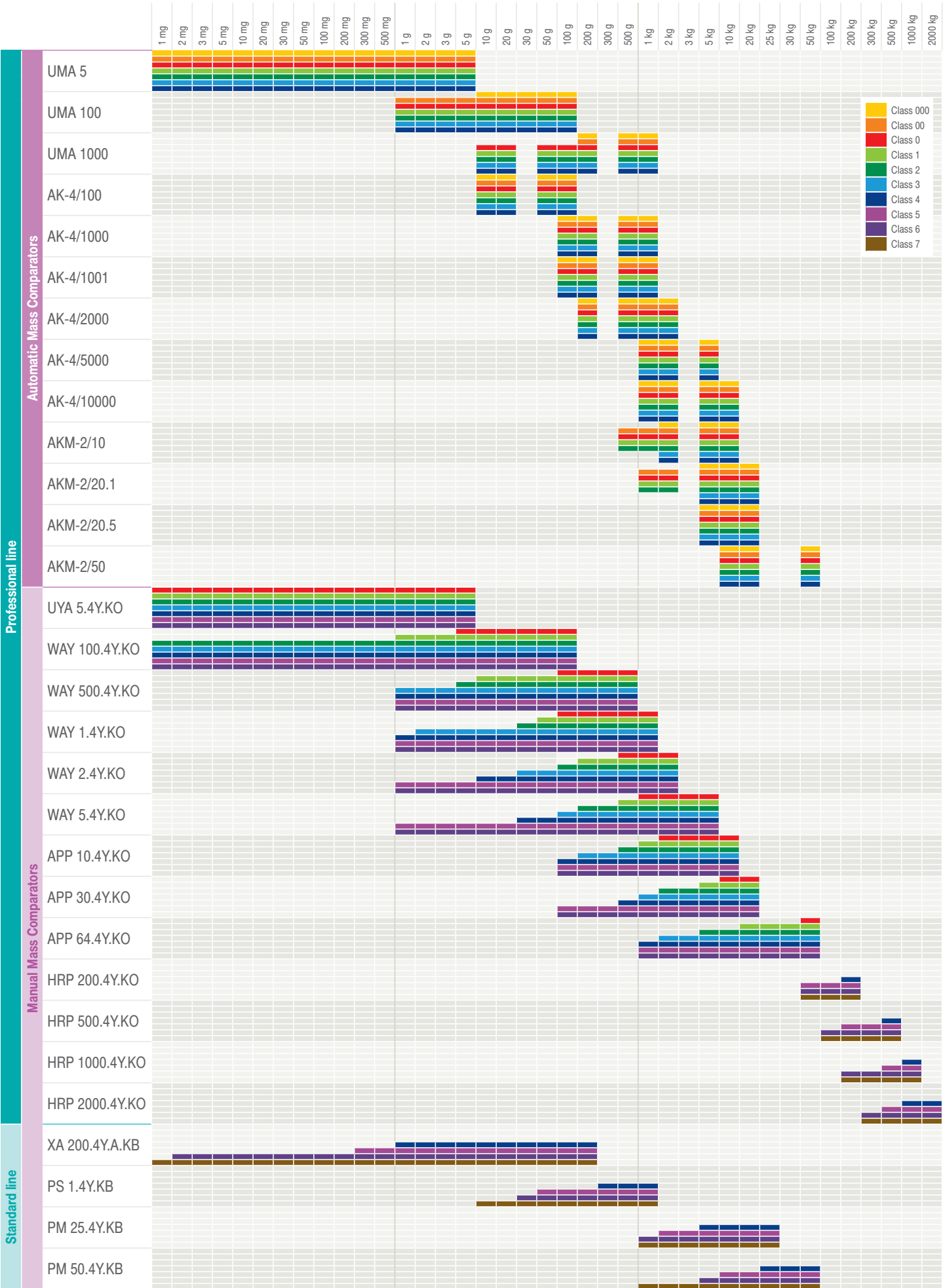
±δm in mg

Nominal value	Class 000	Class 00	Class 0	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
0.05 mg	0.002	0.003	0.005							
0.1 mg	0.002	0.003	0.005	0.01						
0.2 mg	0.002	0.003	0.005	0.01	0.014					
0.3 mg	0.002	0.003	0.005	0.01	0.014	0.025				
0.5 mg	0.002	0.003	0.005	0.01	0.014	0.025	0.05	0.05	0.1	
1 mg	0.002	0.003	0.005	0.01	0.014	0.025	0.05	0.05	0.1	
2 mg	0.002	0.003	0.005	0.01	0.014	0.025	0.05	0.06	0.2	
3 mg	0.002	0.003	0.005	0.01	0.014	0.026	0.052	0.07	0.2	
5 mg	0.002	0.003	0.005	0.01	0.014	0.028	0.055	0.08	0.2	
10 mg	0.002	0.003	0.005	0.01	0.014	0.03	0.06	0.1	0.5	0.4
20 mg	0.002	0.003	0.005	0.01	0.014	0.035	0.07	0.12	0.5	0.56
30 mg	0.002	0.003	0.005	0.01	0.014	0.038	0.075	0.14	0.5	0.68
50 mg	0.002	0.003	0.005	0.01	0.014	0.042	0.085	0.16	0.5	0.88
100 mg	0.002	0.003	0.005	0.01	0.025	0.05	0.1	0.2	1	1.2
200 mg	0.002	0.003	0.005	0.01	0.025	0.06	0.12	0.26	1	1.8
300 mg	0.002	0.003	0.005	0.01	0.025	0.07	0.14	0.3	1	2.2
500 mg	0.002	0.003	0.005	0.01	0.025	0.08	0.16	0.38	1	3
1 g	0.005	0.01	0.017	0.034	0.054	0.1	0.2	0.5	2	4.5
2 g	0.005	0.01	0.017	0.034	0.054	0.13	0.26	0.75	2	7
3 g	0.005	0.01	0.017	0.034	0.054	0.15	0.3	0.95	2	9.4
5 g	0.005	0.01	0.017	0.034	0.054	0.18	0.36	1.3	2	13
10 g	0.01	0.02	0.025	0.050	0.074	0.25	0.5	2	2	21
20 g	0.013	0.025	0.037	0.074	0.1	0.35	0.7	3	3	33
30 g	0.014	0.026	0.037	0.074	0.15	0.45	0.9	4	5	44
50 g	0.015	0.03	0.06	0.12	0.25	0.6	1.2	5.6	7	62
100 g	0.025	0.05	0.13	0.25	0.5	1	2	9	10	100
200 g	0.05	0.1	0.25	0.50	1	2	4	15	20	160
300 g	0.075	0.15	0.38	0.75	1.5	3	6	20	30	210
500 g	0.13	0.25	0.6	1.2	2.5	5	10	30	50	300
1 kg	0.25	0.50	1.3	2.5	5	10	20	50	100	470
2 kg	0.5	1	2.5	5	10	20	40	100	200	750
3 kg	0.75	1.5	3.8	7.5	15	30	60	150	300	1 000
5 kg	1.3	2.5	6	12	25	50	100	250	500	1 400
10 kg	2.5	5	13	25	50	100	200	500	1 000	2 200
20 kg	5	10	25	50	100	200	400	1 000	2 000	3 800
25 kg	6.25	12.5	31	62	125	250	500	1 200	2 500	4 500
30 kg	7.5	15	38	75	150	300	600	1 500	3 000	4 500
50 kg	13	25	63	125	250	500	1 000	2 500	5 000	7 500
100 kg					500	1 000	2 000	5 000	10 000	15 000
200 kg					1000	2 000	4 000	10 000	20 000	30 000
300 kg					1500	3 000	6 000	15 000	30 000	45 000
500 kg					2 500	5 000	10 000	25 000	50 000	75 000
1 000 kg					5 000	10 000	20 000	50 000	100 000	150 000
2 000 kg					10 000	20 000	40 000	100 000	200 000	300 000
3 000 kg					15 000	30 000	60 000	150 000	300 000	450 000
5 000 kg					25 000	50 000	100 000	250 000	500 000	750 000

Calibration range for weights according to OIML R111



Calibration range for weights according to ASTM E617





Calibration range	E1
	E2
	F1
	F2
	M1
	M2
Max capacity [Max]	
Readability [d]	
Repeatability at low load [S]*	
Repeatability at nominal load [S]*	
Electric compensation range	
Internal supplementary weights	
Stabilization time	
Adjustment	
Power supply	
Weighing pan size	
Weights magazine	
Weighing unit size (L×W×H)	
Control unit size (L×W×H)	
Draft shield size (L×W×H)	
Net/gross weight	
Comparator packaging size (L×W×H)	
Draft shield packaging size (L×W×H)	
Operating temperature	
Operating temperature change rate	
Relative humidity	
Relative humidity change	

Automatic Mass Comparators – PROFESSIONAL LINE

UMA 5	UMA 100	UMA 1000	AK-4/100	AK-4/1000	AK-4/1001
1 mg – 5 g	1 g – 100 g	100 g – 1000 g	10 g – 100 g	100 g – 1 kg	100 g – 1 kg
1 mg – 5 g	1 g – 100 g	10 g – 1000 g	10 g – 100 g	100 g – 1 kg	100 g – 1 kg
1 mg – 5 g	1 g – 100 g	10 g – 1000 g	10 g – 100 g	100 g – 1 kg	100 g – 1 kg
1 mg – 5 g	1 g – 100 g	10 g – 1000 g	10 g – 100 g	100 g – 1 kg	100 g – 1 kg
1 mg – 5 g	1 g – 100 g	10 g – 1000 g	–	–	–
1 mg – 5 g	1 g – 100 g	10 g – 1000 g	–	–	–
5.1 g	110 g	1100 g	110 g	1.02 kg	1.02 kg
0.0001 mg	0.001 mg	0.005 mg	0.001 mg	0.005 mg	0.001 mg
0.2 µg (0 - 1 g) 0.3 µg (1 g - 2 g)	0.002 mg (1 g)	0.012 mg (10 g)	0.002 mg (10 g)	0.012 mg (100 g)	0.002 mg (100 g)
0.4 µg (2 g - 5 g)	0.002 mg (100 g)	0.012 mg (1000 g)	0.002 mg (100 g)	0.012 mg (1 kg)	0.002 mg (1 kg)
0 – +5.1 g	-1 g – +10 g	-10 g – +110 g	-1 g – +10 g	-10 g – +20 g	-1 g – +10 g
–	automatic	automatic	half-automatic	half-automatic	half-automatic
30 s	30 s	30 s	30 s	30 s	30 s
internal	external	external	external	external	external
110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz
ø 20 mm	ø 20 mm	ø 50 mm	ø 30 mm	ø 50 mm	ø 50 mm
36 positions	36 positions	18 positions	4 positions	4 positions	4 positions
950 × 590 × 540 mm	700 × 585 × 720 mm	700 × 585 × 820 mm	385 × 215 × 600 mm	385 × 215 × 600 mm	385 × 215 × 600 mm
460 × 250 × 195 mm	460 × 250 × 195 mm	460 × 250 × 195 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm
–	–	–	560 × 340 × 665 mm	560 × 340 × 665 mm	560 × 340 × 665 mm
55 kg / 75 kg	60 kg / 80 kg	70 kg / 90 kg	25 kg / 41 kg	25 kg / 41 kg	25 kg / 41 kg
1200 × 800 × 950 mm	1200 × 1000 × 1200 mm	1200 × 1000 × 1300 mm	860 × 800 × 560 mm	860 × 800 × 560 mm	860 × 800 × 560 mm
–	–	–	950 × 420 × 630 mm	950 × 420 × 630 mm	950 × 420 × 630 mm
+15 – +30 °C	+15 – +30 °C	+15 – +30 °C	+15 – +30 °C	+15 – +30 °C	+15 – +30 °C
±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h
40 % – 60 %	40 % – 60 %	40 % – 60 %	40 % – 60 %	40 % – 60 %	40 % – 60 %
±2 % / 4 h	±2 % / 4 h	±2 % / 4 h	±2 % / 4 h	±2 % / 4 h	±2 % / 4 h

Calibration range	E1
	E2
	F1
	F2
	M1
	M2
Max capacity [Max]	
Readability [d]	
Repeatability at low load [S]*	
Repeatability at nominal load [S]*	
Electric compensation range	
Eccentricity error	
Internal supplementary weights	
External supplementary weights	
Stabilization time	
Adjustment	
Power supply	
Weighing pan size	
Weighing unit size (L×W×H)	
Control unit size (L×W×H)	
Draft shield size (L×W×H)	
Net/gross weight	
Comparator packaging size (L×W×H)	
Draft shield packaging size (L×W×H)	
Operating temperature	
Operating temperature change rate	
Relative humidity	
Relative humidity change	

Manual Mass Comparators – PROFESSIONAL LINE

UYA 5.4Y.KO	WAY 100.4Y.KO	WAY 500.4Y.KO	WAY 1.4Y.KO	WAY 2.4Y.KO	WAY 5.4Y.KO
1 mg – 5 g	5 g – 100 g	200 g – 500 g	500 g – 1 kg	1 kg – 2 kg	2 kg – 5 kg
1 mg – 5 g	100 mg – 100 g	10 g – 500 g	100 g – 1 kg	500 g – 2 kg	500 g – 5 kg
1 mg – 5 g	1 mg – 100 g	1 g – 500 g	10 g – 1 kg	100 g – 2 kg	100 g – 5 kg
1 mg – 5 g	1 mg – 100 g	1 g – 500 g	1 g – 1 kg	10 g – 2 kg	10 g – 5 kg
1 mg – 5 g	1 mg – 100 g	1 g – 500 g	1 g – 1 kg	1 g – 2 kg	1 g – 5 kg
1 mg – 5 g	1 mg – 100 g	1 g – 500 g	1 g – 1 kg	1 g – 2 kg	1 g – 5 kg
5.1 g	110 g	520 g	1.02 kg	2.3 kg	5.05 kg
0.0001 mg	0.001 mg	0.01 mg	0.01 mg	0.1 mg	0.1 mg
0.0003 mg (100 mg)	0.003 mg (100 mg)	0.02 mg (100 mg)	0.035 mg (1 g)	0.1 mg (1 g)	0.2 mg (1 g)
0.0003 mg (5 mg)	0.003 mg (100 g)	0.02 mg (500 g)	0.035 mg (1 kg)	0.1 mg (2 kg)	0.2 mg (5 kg)
0 – +5.1 g	-1 g – +10 g	-10 g – +20 g	-10 g – +20 g	-50 g – +300 g	-10 g – +50 g
1 division per 1 mm	1 division per 1 mm	1 division per 1 mm	1 division per 1 mm	1 division per 1 mm	1.5 division per 1 mm
–	half-automatic	half-automatic	half-automatic	half-automatic	half-automatic
–	10 g	30 g; 10 g (× 2)	50 g; 30 g; 10 g (× 2)	100 g (× 2)	500 g; 300 g; 100 g (× 2)
30 s	30 s	30 s	30 s	20 s	20 s
internal	external	external	external	external	external
110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz
ø 16 mm	ø 30 mm	ø 50 mm	ø 60 mm	ø 70 mm	ø 90 mm
370 × 160 × 175 mm	385 × 215 × 500 mm	385 × 215 × 420 mm	385 × 215 × 420 mm	385 × 215 × 420 mm	560 × 340 × 550 mm
206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm
560 × 350 × 255 mm	560 × 340 × 570 mm	560 × 300 × 665 mm	560 × 300 × 665 mm	660 × 470 × 700 mm	560 × 340 × 570 mm
10.2 / 14.7 kg	15 kg / 31 kg	15.5 kg / 32 kg	16 kg / 32.5 kg	17 kg / 33.5 kg	21 kg / 37 kg
600 × 600 × 400 mm	860 × 800 × 550 mm	860 × 800 × 550 mm	860 × 800 × 550 mm	860 × 800 × 550 mm	860 × 800 × 500 mm
820 × 840 × 630 mm	820 × 850 × 630 mm	820 × 850 × 630 mm	820 × 850 × 630 mm	820 × 850 × 630 mm	820 × 850 × 630 mm
+15 – +30 °C	+15 – +30 °C	+15 – +30 °C	+15 – +30 °C	+15 – +30 °C	+15 – +30 °C
±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h
40 % – 80 %	40 % – 60 %	40 % – 60 %	40 % – 60 %	40 % – 60 %	40 % – 60 %
±2 % / 4 h	±3 % / 4 h	±3 % / 4 h	±3 % / 4 h	±3 % / 4 h	±5 % / 4 h

AK-4/2000	AK-4/5000	AK-4/10000	AKM-2/10	AKM-2/20.1	AKM-2/20.5	AKM-2/50
200 g – 2 kg	1 kg – 5 kg	1 kg – 10 kg	2 kg – 10 kg	5 kg – 20 kg	5 kg – 20 kg	20 kg – 50 kg
200 g – 2 kg	1 kg – 5 kg	1 kg – 10 kg	500 g – 10 kg	1 kg – 20 kg	5 kg – 20 kg	5 kg – 50 kg
200 g – 2 kg	1 kg – 5 kg	1 kg – 10 kg	500 g – 10 kg	1 kg – 20 kg	5 kg – 20 kg	5 kg – 50 kg
200 g – 2 kg	1 kg – 5 kg	1 kg – 10 kg	500 g – 10 kg	1 kg – 20 kg	5 kg – 20 kg	5 kg – 50 kg
–	–	–	500 g – 10 kg	1 kg – 20 kg	5 kg – 20 kg	5 kg – 50 kg
–	–	–	500 g – 10 kg	1 kg – 20 kg	5 kg – 20 kg	5 kg – 50 kg
2.02 kg	5.05 kg	10.02 kg	10.2 kg	20.5 kg	20.5 kg	51 kg
0.01 mg	0.01 mg	0.01 mg	0.1 mg	0.1 mg	0.1 mg	1 mg
0.015 mg (200 g)	0.015 mg (1 kg)	0.02 mg (1 kg)	0.2 mg (500 g)	0.4 mg (1 kg)	0.4 mg (1 kg)	2 mg (5 kg) 5 mg (50 kg)
0.015 mg (2 kg)	0.015 mg (5 kg)	0.02 mg (10 kg)	0.2 mg (10 kg)	0.4 mg (20 kg)	0.4 mg (20 kg)	2 mg
-10 g – +20 g	-10 g – +50 g	-10 g – +50 g	-100 g – +200 g	-500 – +500 g	-500 – +500 g	0 g – 50.5 kg
half-automatic	half-automatic	half-automatic	half-automatic	half-automatic	half-automatic	–
30 s	30 s	30 s	30 s	30 s	30 s	30 s
external	external	external	external	external	external	external
110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz
ø 70 mm	ø 70 mm	ø 100 mm	ø 90 mm	ø 90 mm	ø 90 mm	ø 100 mm
4 positions	4 positions	4 positions	2 positions	2 positions	2 positions	2 positions
385 × 215 × 600 mm	350 × 405 × 650 mm	800 × 500 × 930 mm	950 × 650 × 1150 mm	950 × 650 × 1150 mm	950 × 650 × 1150 mm	1050 × 650 × 1150 mm
206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm
560 × 340 × 665 mm	660 × 470 × 700 mm	800 × 505 × 885 mm	–	–	–	–
25 kg / 41 kg	25 kg / 41 kg	90 kg / 140 kg	230 kg / 350 kg	235 kg / 352 kg	235 kg / 352 kg	260 kg / 380 kg
860 × 800 × 560 mm	1000 × 900 × 685 mm	1000 × 900 × 685 mm	1050 × 800 × 1320 mm	1050 × 800 × 1320 mm	1150 × 800 × 1320 mm	1150 × 800 × 1320 mm
950 × 420 × 630 mm	950 × 420 × 630 mm	850 × 750 × 1000 mm	–	–	–	–
+15 – +30 °C	+15 – +30 °C	+15 – +30 °C	+10 – +30 °C	+10 – +30 °C	+10 – +30 °C	+10 – +30 °C
±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h	±0.5 °C / 12 h
40 % – 60 %	40 % – 60 %	40 % – 60 %	40 % – 60 %	40 % – 60 %	40 % – 60 %	40 % – 60 %
±2 % / 4 h	±2 % / 4 h	±2 % / 4 h	±2 % / 12 h	±2 % / 12 h	±2 % / 12 h	±2 % / 12 h

APP 10.4Y.KO	APP 30.4Y.KO	APP 64.4Y.KO	HRP 200.4Y.KO	HRP 500.4Y.KO	HRP 1000.4Y.KO	HRP 2000.4Y.KO
5 kg – 10 kg	20 kg	–	–	–	–	–
1 kg – 10 kg	10 kg – 20 kg	50 kg	–	–	–	–
100 g – 10 kg	2 kg – 20 kg	20 kg – 50 kg	–	–	–	–
100 g – 10 kg	1 kg – 20 kg	5 kg – 50 kg	100 kg – 200 kg	200 kg – 500 kg	500 kg – 1000 kg	1000 kg – 2000 kg
100 g – 10 kg	1 kg – 20 kg	2 kg – 50 kg	50 kg – 200 kg	100 kg – 500 kg	200 kg – 1000 kg	500 kg – 2000 kg
100 g – 10 kg	1 kg – 20 kg	1 kg – 50 kg	50 kg – 200 kg	50 kg – 500 kg	100 kg – 1000 kg	200 kg – 2000 kg
10.2 kg	30.5 kg	64 kg	210 kg	510 kg	1050 kg	2100 kg
0.1 mg	1 mg	10 mg	0.2 g	0.5 g	1 g	2 g
0.5 mg (100 g)	2 mg (1 kg)	18 mg (1 kg)	0.5 g (50 kg)	0.5 g (50 kg)	1.5 g (100 kg)	2.5 g (200 kg)
0.5 mg (10 kg)	3 mg (30 kg)	18 mg (50 kg)	0.6 g (200 kg)	1.6 g (500 kg)	2.5 g (1000 kg)	5 g (2000 kg)
-100 g – +200 g	+100 g – +30.5 kg	0 – +64 kg	0 – +210 kg	0 – +510 kg	0 – +1050 kg	0 – +2100 kg
2 divisions per 1 mm	2 divisions per 1 mm	2 divisions per 1 mm	2 division per 1 mm	2 division per 1 mm	1 division per 1 mm	1 division per 1 mm
half-automatic	half-automatic	–	–	–	–	–
300 g; 200 g	–	–	–	–	–	–
30 s	20 s	20 s	10 s	10 s	10 s	10 s
external	external	external	external	external	external	external
110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz	110–230 V AC / 50–60 Hz
ø 190 mm (ø 300 mm)	ø 220 mm (ø 300 mm)	ø 300 mm (ø 400 mm)	800 × 600 mm 600 × 600 mm (self-centering pan)	800 × 600 mm 600 × 600 mm (self-centering pan)	1000 × 800 mm 600 × 600 mm (self-centering pan)	1250 × 1000 mm 920 × 920 mm (self-centering pan)
455 × 300 × 380 mm	455 × 290 × 205 mm	455 × 290 × 205 mm	810 × 600 × 260 mm	810 × 600 × 260 mm	1010 × 800 × 275 mm	1250 × 1000 × 430 mm
206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm	206 × 140 × 70 mm
660 × 440 × 680 mm	700 × 440 × 545 mm	–	–	–	–	–
30 kg / 59 kg	30 kg / 34 kg	14.5 kg / 17 kg	105 kg / 140 kg	105 kg / 140 kg	165 kg / 215 kg	530 kg / 665 kg
1160 × 650 × 700 mm	1170 × 650 × 700 mm	1160 × 650 × 700 mm	1000 × 800 × 355 mm	988 × 800 × 355 mm	1200 × 1000 × 485 mm	1500 × 1200 × 735 mm
960 × 920 × 735 mm	960 × 825 × 730 mm	–	–	–	–	–
+15 – +30 °C	+15 – +35 °C	+10 – +40 °C	+15 – +30 °C	+15 – +30 °C	+15 – +30 °C	+15 – +30 °C
±0.5 °C / 12 h	±0.5°C / 12 h	±0.5°C / 12 h	±1 °C / 12 h	±1 °C / 12 h	±1 °C / 12 h	±1 °C / 12 h
40 % – 60 %	30 % – 70 %	30 % – 70 %	40 % – 60 %	40 % – 60 %	40 % – 60 %	40 % – 60 %
±3 % / 4 h	±5 % / 4 h	±10 % / 4 h	±5 % / 4 h	±5 % / 4 h	±5 % / 4 h	±5 % / 4 h

*\* Standard deviation of 6 ABBA cycles (acc. to R111 OIML) for maximal mass being subjected to comparison when stable laboratory conditions are maintained*

**Excellent measurement accuracy**  
**100-position mass standards magazine**  
**Function of automatic mass standard dissemination**



[www.radwag.com](http://www.radwag.com)

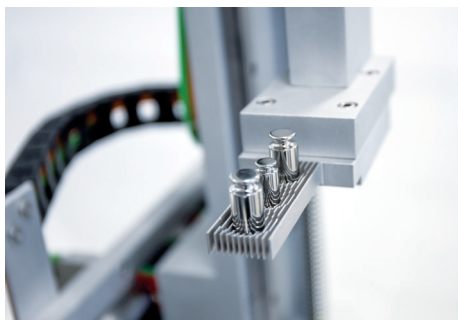
## **RMC – Robotic Mass Comparator**

AUTOMATIC COMPARISON PROCESS





The RMC mass comparator is equipped with 100-position magazine.



Feeder of custom design enables fast and precise comparison and dissemination.



Intermediate mass standard magazine significantly shortens calibration and facilitates dissemination.

# RMC

## Full automation of mass standards comparison

**The new line of RADWAG-manufactured RMC robotic mass comparator ensures repeatability of measurements ranging from 1 mg to 1 kg with readability of 0.1 µg.**

The device is equipped with two magazines, 100-position one and additional 2-position magazine enabling dissemination of the mass standard into maximum 3 mass standards (e.g. 50 g mass standard can be disseminated into 3 mass standards of 20 g, 20 g and 10 g). Locating additional magazine near mass comparator weighing pan significantly shortens the calibration process.

### The Best Measurement Repeatability over Short Period of Time

RMC robotic mass comparator, due to the elimination of the human factor, temperature changes and air drafts, guarantees excellent measurement repeatability.

Intermediate mass standard magazine enables storing mass standards near the weighing pan. With this the calibration time is reduced to minimum.

### Ambient Conditions Measurement Carried Out in Few Points of the Device

The mass comparator is equipped with top-class thermo-hygro-barometers allowing to test ambient conditions in real time and in different points (e.g. in weighing chamber, mass standard magazine, etc.). The characteristic feature of the device is high repeatability of pressure (0.001 hPa), humidity (0.01%), and temperature (0.001 °C).



Option of remote mass comparator control via computer or tablet.

### Universal Magazine Insert Shape

Insert design of the mass standard magazine allows measurement of weight of very small mass with high accuracy and prevents weight jamming. The device enables comparison of weight of various shapes using just one universal insert.

	RMC 5	RMC 100	RMC 100.1	RMC 1000
OIML calibration range <b>E1</b>	1 mg ÷ 5 g	1 g ÷ 100 g	1 g ÷ 100 g	10 g ÷ 1000 g
OIML calibration range <b>E2</b>	1 mg ÷ 5 g	1 g ÷ 100 g	1 g ÷ 100 g	10 g ÷ 1000 g
OIML calibration range <b>F1</b>	1 mg ÷ 5 g	1 g ÷ 100 g	1 g ÷ 100 g	10 g ÷ 1000 g
OIML calibration range <b>F2</b>	1 mg ÷ 5 g	1 g ÷ 100 g	1 g ÷ 100 g	10 g ÷ 1000 g
Maximum capacity [Max]	5.1 g	110 g	110 g	1060 g
Readability [d]	0.1 µg	1 µg	0.1 µg	1 µg
Repeatability *	0.2 µg (1 mg ÷ 1 g) 0.3 µg (1 g ÷ 2 g) 0.4 µg (2 g ÷ 5 g)	2 µg	1 µg	4 µg (10 g ÷ 100 g) 5 µg (100 g ÷ 500 g) 8 µg (500 g ÷ 1000 g)
Stabilization time	30 s	30 s	30 s	30 s
Adjustment	Internal	Automatic external	Automatic external	Automatic external
Electric compensation range	0 g ÷ +5.1 g	-1 g ÷ +10 g	-1 g ÷ +10 g	-1 g ÷ +60 g
Magazine positions	100 positions	100 positions	100 positions	36 positions
Communication interfaces	2×USB-A, Ethernet, 2×RS 232 4×IN, 4×OUT, Wi-Fi®	2×USB-A, Ethernet, 2×RS 232 4×IN, 4×OUT, Wi-Fi®	2×USB-A, Ethernet, 2×RS 232 4×IN, 4×OUT, Wi-Fi®	2×USB-A, Ethernet, 2×RS 232 4×IN, 4×OUT, Wi-Fi®
Weighing pan dimensions	24 × 50 mm	24 × 63 mm	24 × 63 mm	50 × 125 mm

\*Repeatability is expressed as a standard deviation determined for 6 ABBA cycles | Wi-Fi® is a registered trademark of Wi-Fi Alliance.



# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)

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



www.radwag.com

## **AVK-1000 – Automatic Vacuum Mass Comparator**

COMPARISON IN VACUUM WITH THE HIGHEST ACCURACY

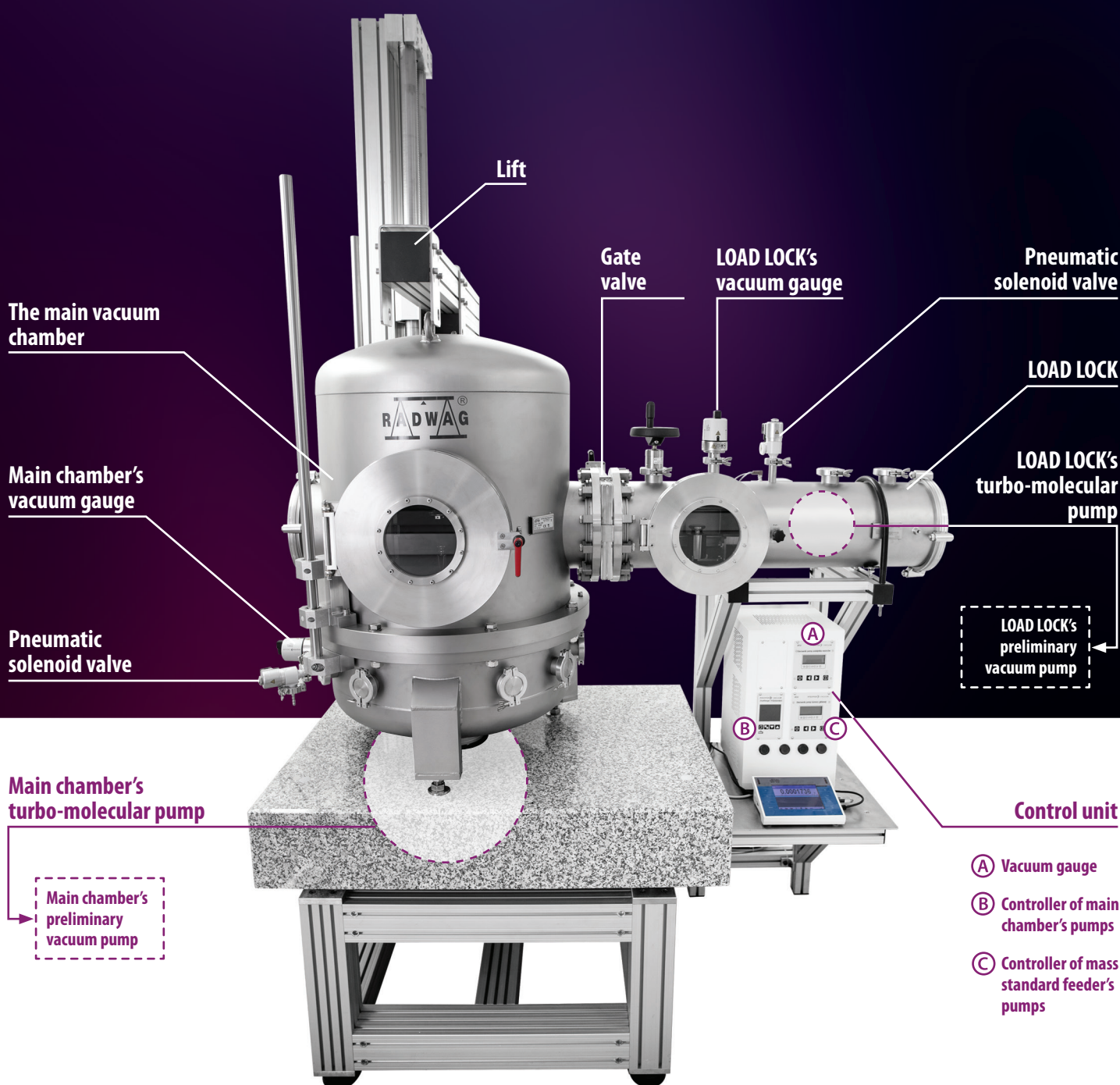


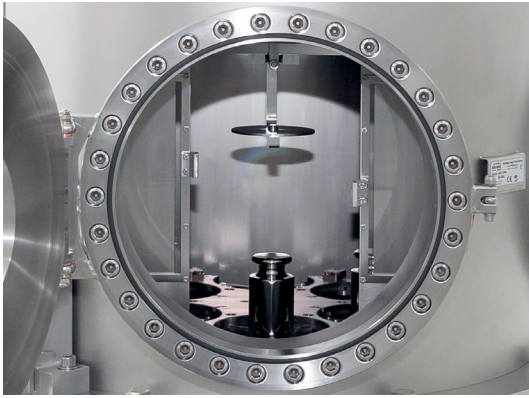
# AVK-1000

## 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  $\mu$ g. 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.

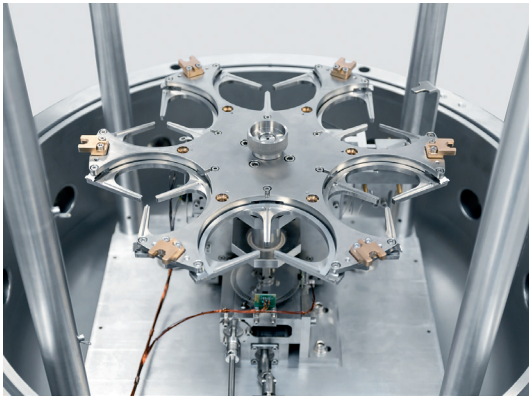




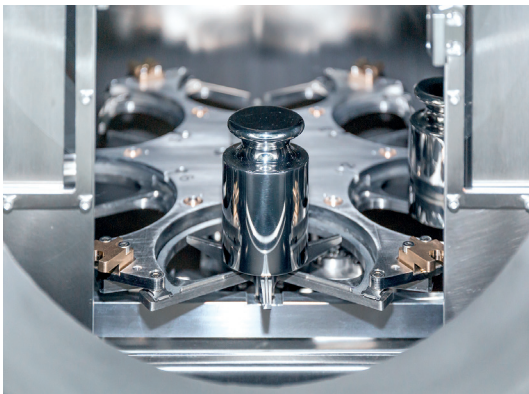
Used chamber enables comparison in vacuum of maximum  $10^{-6}$  mBar or in noble gases such as argon.



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  $\varnothing$  (22 - 95) x 110 mm or sphere objects of maximum diameter of  $\varnothing$  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 $\mu$ g

### 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  $\mu$ g and readability of 0.1  $\mu$ g. 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  $^{\circ}$ C for temperature).

### LOAD LOCK Mass Standard Transfer System

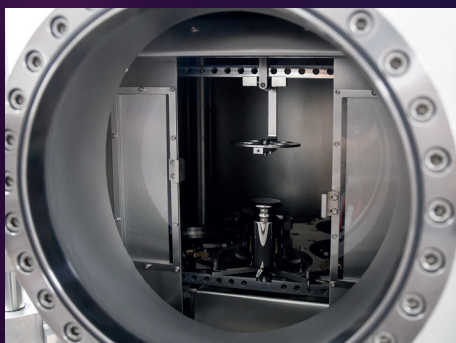
The system enables switching or adding artefacts without changing the atmosphere inside the main chamber. Use of mass standard transfer chamber reduces time required for obtaining the respective value of vacuum to ca. 4 hours. The LOAD LOCK is equipped with a high-efficiency pump system and a top-class 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

OIML calibration range <b>E1</b>	100 g ÷ 1 kg
OIML calibration range <b>E2</b>	100 g ÷ 1 kg
OIML calibration range <b>F1</b>	100 g ÷ 1 kg
OIML calibration range <b>F2</b>	100 g ÷ 1 kg
OIML calibration range <b>M1</b>	—
OIML calibration range <b>M2</b>	—
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 <sup>−6</sup> 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.



**Testing 1 g - 1 kg mass standards of class E1**  
**Maximum accuracy and stability of the measurement**  
**Compliance with OIML R111**



www.radwag.com

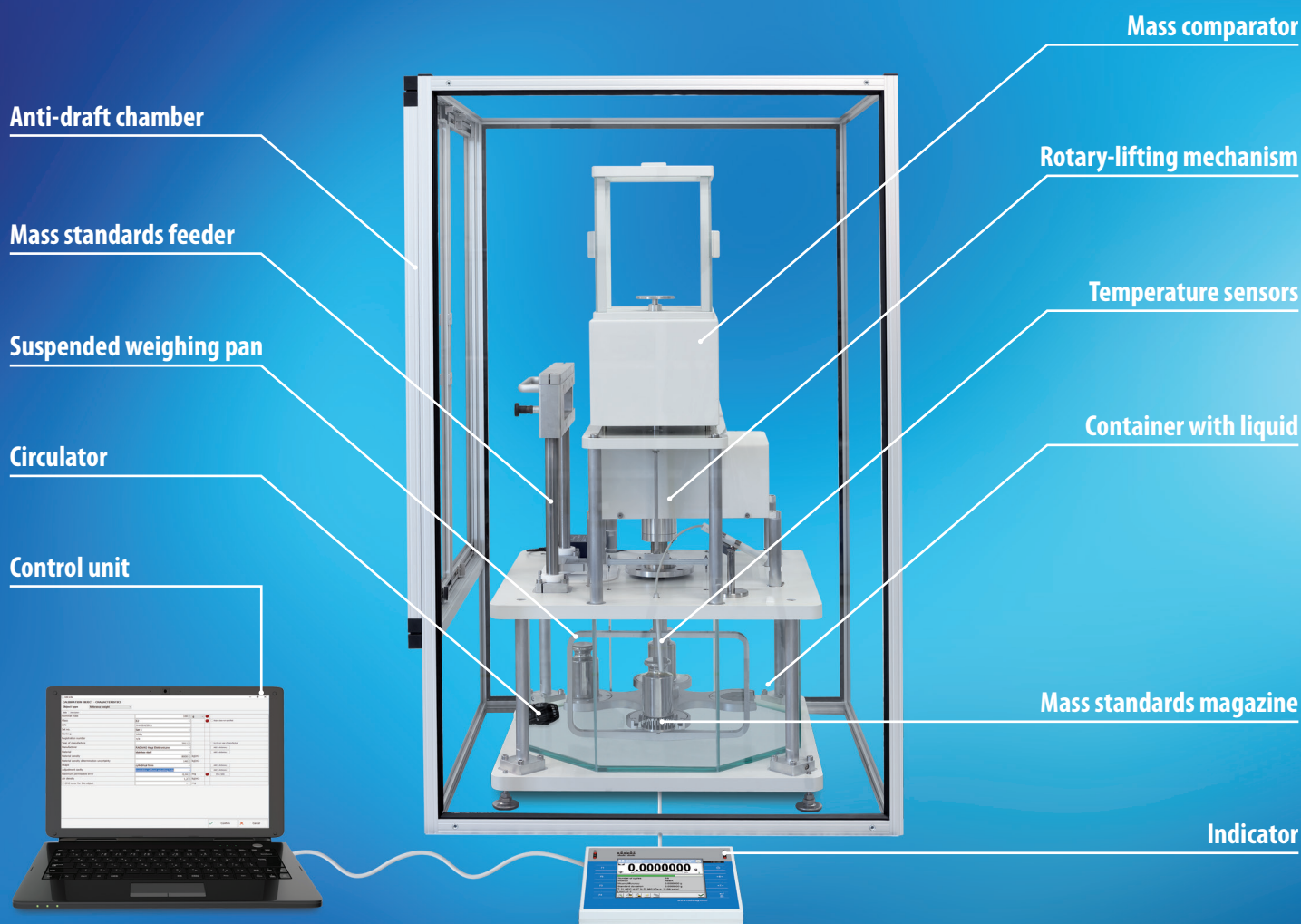
## **AGV-4/1000** **Automatic Comparator**

FOR DETERMINATION OF MASS STANDARD'S DENSITY AND VOLUME

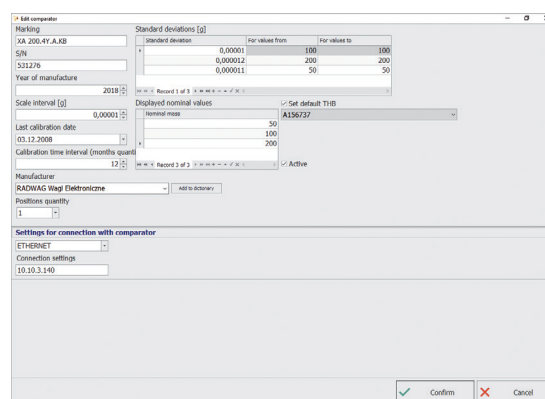
# AGV-4/1000

## Determination of mass standard's density and volume with the greatest accuracy

The AGV-4/1000 automatic comparator determines density and volume of mass standards of class E1 and lower in accordance with OIML R111. It is characterized by measurement stability ranging between 1 g and 1 kg and readability of  $d = 0.01$  mg. The AGV-4/1000 automatic comparator enables density determination to be carried out simultaneously for 3 mass standards using one reference weight.



Top-class comparator of 0.01 mg reading unit and 110 g electric compensation range ensures very precise measurements and eliminates uncertainty.



Dedicated software for determination of mass standard's density and volume.



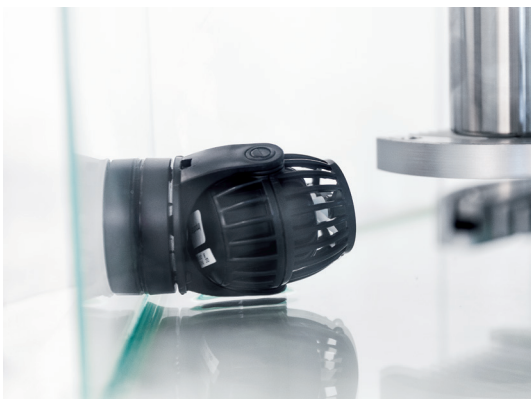
## Testing 1 g – 1 kg mass standards of class E1 and lower



Special design of the insert ensures very high measuring range of the comparator (1g-1kg). It is also intended for comparison of silicone spheres.



The comparator features specially designed feeder to load and unload the magazine with mass standards.



The device is equipped with an additional circulator eliminating air bubbles and facilitating mixing of the liquid in the container in order to even its temperature.



A weighing pan suspended on wires of 0.3 mm diameter significantly minimizes the eccentricity and eliminates the influence of liquid surface tension.

### Weighing in Air and in Liquid

RADWAG-designed AGV-4/1000 automatic comparator uses the most accurate method of determining density of mass standard. First, the mass standard is weighed in air and then in liquid of known density. Specially designed construction of the weighing pan minimizes the influence of surface tension of the liquid.

### 4-Position Magazine (Mass Standard + 3 Test Weights)

The AGV-4/1000 comparator for determination of density and volume enables to determine the density of three test weights while using only one reference weight. The density value is obtained with the highest accuracy simultaneously for all the test weights.

### Temperature Measurement Performed in 3 Points

The comparator is equipped with a top-class thermometer of 0.001°C resolution and three temperature sensors. Measurement carried out in three points of the container (at the bottom, in the middle and near the surface) allows to assess the difference in temperature. With this, it is possible to mix and even the liquid temperature in the container. Otherwise, the density measurement results may be incorrect.

### Dedicated Software for Density Determination

The comparator software enables to determine mass standards density and calculate uncertainty using A method according to OIML R111. It also allows to determine (verify) liquid density.

### Mass Standards Feeder

The AGV-4/1000 automatic comparator is equipped with a special feeder designed to load and unload the magazine with mass standards and silicone spheres. With this, the operation is significantly improved.

### Ergonomics and Comfort of Operation

5.7" colour touch screen ensures comfort of comparator operation. Easy access to numerous applications and functions is ensured by home screen customization. The indicator is equipped with two programmable proximity sensors.





High quality  
and precise  
ASL F200  
thermometer



Smooth  
regulation  
of circulator  
revolution



**AGV-4/1000**

OIML calibration range	<b>E1</b>	1 g ÷ 1 kg
OIML calibration range	<b>E2</b>	1 g ÷ 1 kg
OIML calibration range	<b>F1</b>	1 g ÷ 1 kg
OIML calibration range	<b>F2</b>	1 g ÷ 1 kg
OIML calibration range	<b>M1</b>	—
OIML calibration range	<b>M2</b>	—
Maximum capacity [Max]		1110 g
Readability [d]		0.01 mg
Repeatability for nominal load *		0.05 mg
Stabilization time		30 s
Adjustment		External
Electric compensation range		−10 g ÷ + 110 g
External supplementary weights		500 g; 800 g; 900 g
Comparison object dimensions		cylindrical $\varnothing$ (22-95) × 110 mm; spherical $\varnothing$ (40-100) mm
Magazine positions		4
Display		5.7" colour resistive touch screen
Communication interfaces		2×USB-A, Ethernet, 2×RS 232, 4×IN, 4×OUT, Wi-Fi®
Weight dimensions		5 mm ÷ 94 mm
Operating temperature		+15 ÷ +30 °C
Operating temperature change rate		± 0.5°C/12h (± 0.3°C/h)
Relative humidity change rate		5%/12% (2%/4h)
Relative humidity **		45 ÷ 60%
Transport and storage temperature		−20 ÷ +50 °C
Weighing pan dimensions		$\varnothing$ 60 mm
Indicator dimensions (L × W × H)		206 × 140 × 70 mm
Overall dimensions (L × W × H)		690 × 710 × 1060 mm

\*Repeatability is expressed as a standard deviation determined for 6 ABBA cycles | \*\*Non-condensing conditions | Wi-Fi® is a registered trademark of Wi-Fi Alliance.

**Excellent measurement repeatability**  
**Multi-position magazine for mass standard sets**  
**Compliance with OIML R111**



www.radwag.com

## UMA – Automatic Mass Comparator

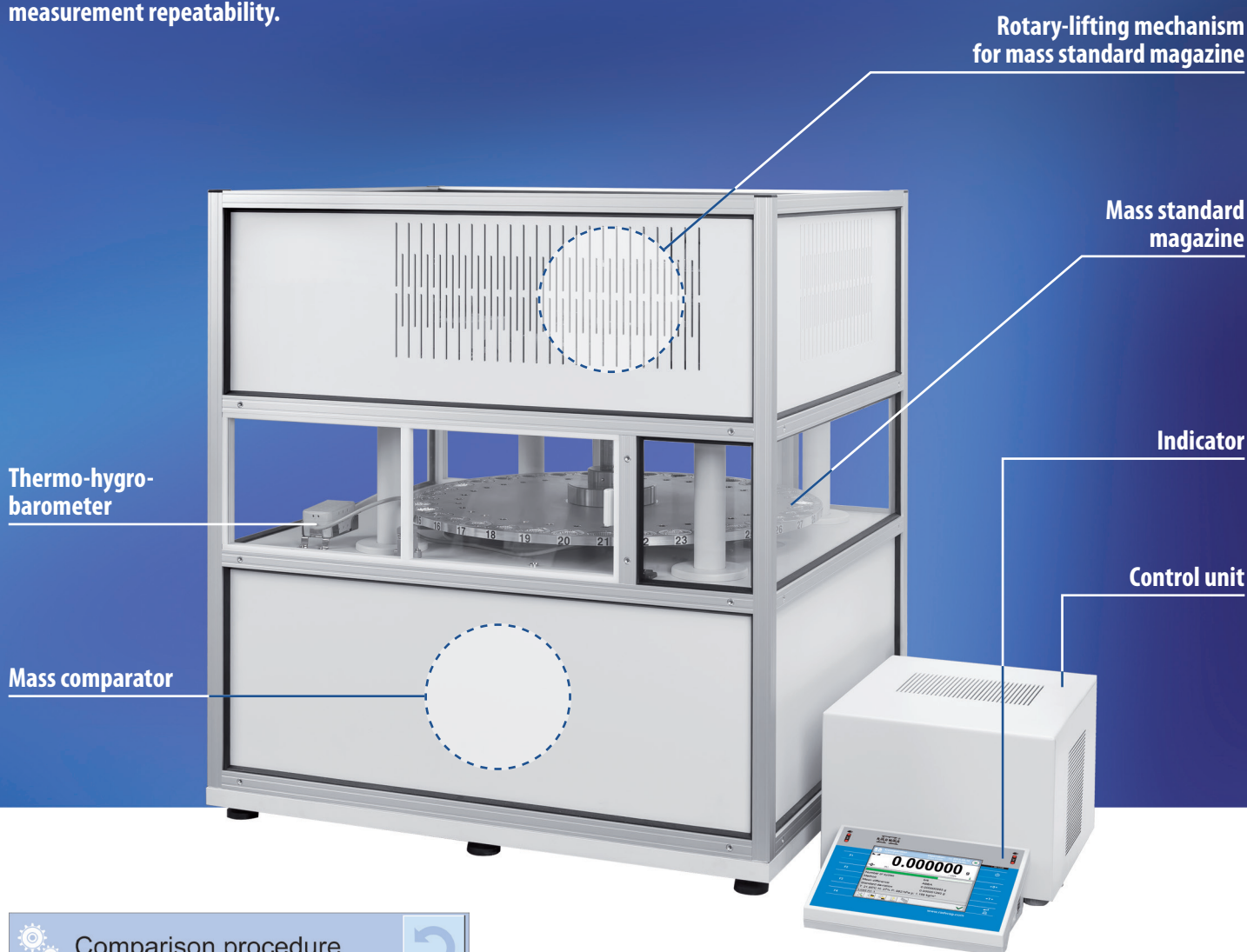
AUTOMATED COMPARISON OF MASS STANDARDS

# UMA

## Automatic concurrent comparison of up to 36 mass standards

The automatic UMA series stands for a class-leading mass comparator. This instrument enables comparison of 1 mg - 1000 g weights of class E1 and lower. The UMA mass comparator is equipped with either 18-position or 36-position magazine. This universal solution has been designed to let you compare whole weight sets during one process, but also just few mass standards of the same mass.

UMA automatic mass comparator, due to the elimination of the human factor, temperature changes and air drafts, guarantees excellent measurement repeatability.



Comparison procedure		
1	Reference weight	None
2	Test weight	None
3	Cycles quantity	6
4	Method	ABBA
5	Quantity of start-up A loadings	1
6	Start-up weighing cycles quantity	1

Intuitive in-built software allows to create calibration plan fast without the need to use the computer.

### Direct Measurement of Ambient Conditions in a Weighing Chamber

The UMA mass comparator is equipped with a high-class thermo-hygro-barometer allowing to test ambient conditions in real time. The characteristic feature of the device is high readability of pressure (0.001 hPa), humidity (0.01%), and temperature (0.001 °C).

### Real-Time Measurement of Vibrations

With vibration sensor placed inside the electronics, the UMA mass comparators analyse and identify vibration sources. The sensor helps to determine whether the recorded vibrations influence the measurement result or not.





Comparison of very small 1 mg plate mass standards without the threat of jamming.



Custom design insert allowing calibration of rod mass standards.



Universal insert for UMA-1000 guarantees precise measurement of 10 g - 1 kg mass standards regardless of shape and size.



Possibility to load 36 objects onto the comparator's magazine. This allows to calibrate the whole set of weights during one course.

## Comparison range from 1 mg to 1000 g Repeatability of 0.2 $\mu$ g

### Effective and Excellent Measurement

The automatic UMA series stands for a class-leading mass comparator. This instrument enables comparison of 1 mg - 1000 g weights of class E1 and lower.

### Comparison of Weight Sets

The UMA mass comparator is equipped with either 18-position or 36-position magazine. This universal solution has been designed to let you compare whole weight sets during one process, but also just few mass standards of the same mass.

### The Best Measurement Repeatability over Short Period of Time

UMA automatic mass comparator, due to the elimination of the human factor, temperature changes and air drafts, guarantees excellent measurement repeatability. Due to the consistent mechanical design, the mass standards are located in close vicinity one to another. With this the calibration time is reduced to minimum.

### Dedicated Software

Thanks to a user-friendly and functional software the user can prepare complete calibration plan within just a few minutes. The program stores calibration plans in memory. The plans can be used in future due to which preparation of calibration procedure takes less time.

### Universal Insert Shape

Insert design allows measurement of very small and light weight with high accuracy, and prevents mass standard jamming. The automatic UMA mass comparator enables comparison of weights of various shapes using just one universal insert.

### Compact Design

The UMA mass comparators due to their mechanical design can be easily adapted to any laboratory conditions. The device size facilitates its placing on the anti-vibration table of standard dimensions.

### In-Built Weight Positioning Assistant

Supplementary software monitors loading of the mass comparator magazine, this prevents using of the same position many times.

### Dedicated Databases

The mass comparator records all comparison reports and ambient conditions into databases. This makes them easily accessible and facilitates fast copying and printout.



Separation of an electronic control unit and the mass comparator ensures constant ambient conditions (temperature) in the weighing chamber during the measurement.



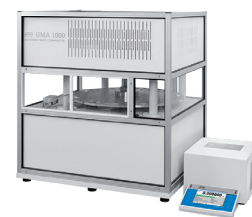
Special light system of the mass comparator chamber facilitates precise loading of mass standards and helps to find and remove potential impurities.



**UMA-5**



**UMA-100**



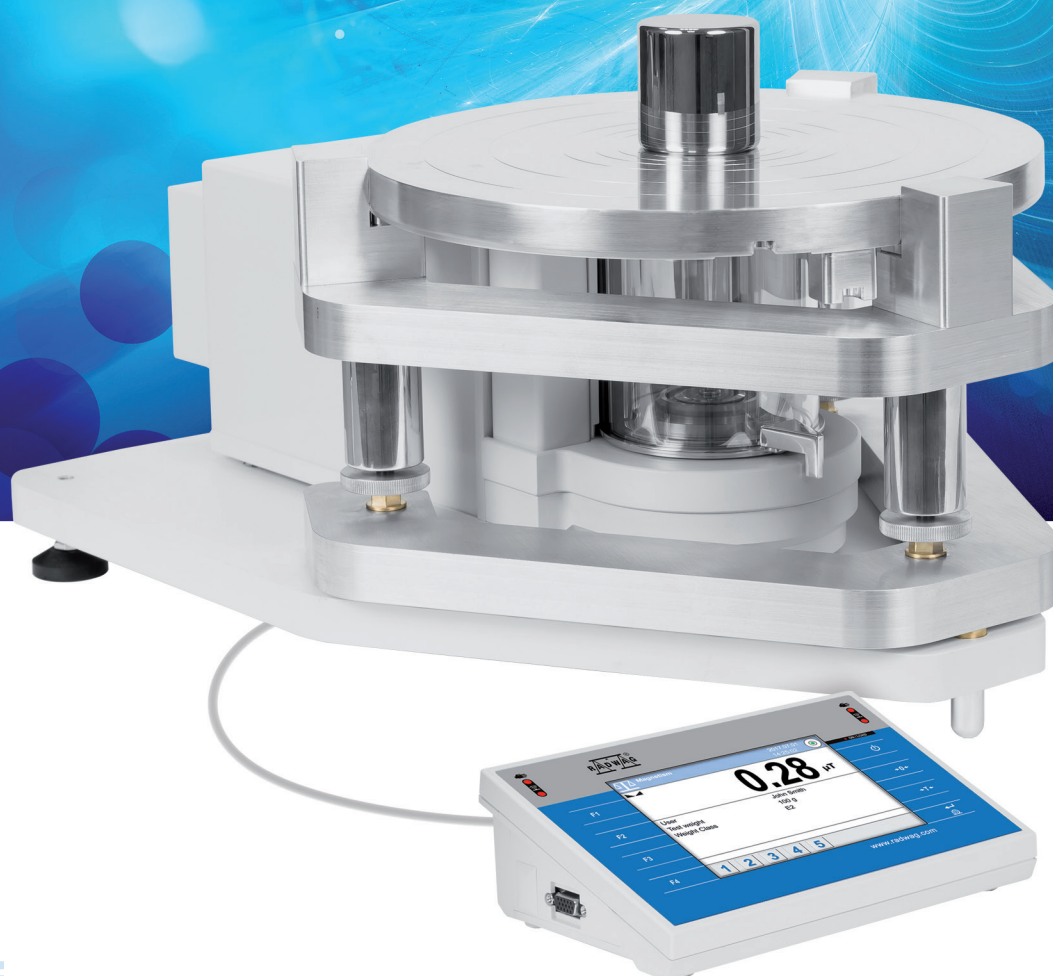
**UMA-1000**

OIML calibration range <b>E1</b>	1 mg ÷ 5 g	1 g ÷ 100 g	100 g ÷ 1000 g
OIML calibration range <b>E2</b>	1 mg ÷ 5 g	1 g ÷ 100 g	100 g ÷ 1000 g
OIML calibration range <b>F1</b>	1 mg ÷ 5 g	1 g ÷ 100 g	100 g ÷ 1000 g
OIML calibration range <b>F2</b>	1 mg ÷ 5 g	1 g ÷ 100 g	100 g ÷ 1000 g
OIML calibration range <b>M1</b>	1 mg ÷ 5 g	1 g ÷ 100 g	100 g ÷ 1000 g
OIML calibration range <b>M2</b>	1 mg ÷ 5 g	1 g ÷ 100 g	100 g ÷ 1000 g
Maximum capacity [Max]	5.1 g	110 g	1060 g
Readability [d]	0.1 µg	1 µg	5 µg
Repeatability for small load *	0.2 µg (1 mg ÷ 1 g); 0.3 µg (1 g ÷ 2 g)	2 µg (1 g)	12 µg (10 g)
Repeatability for nominal load *	0.4 µg (2 g ÷ 5 g)	2 µg (100 g)	12 µg (1000 g)
Stabilization time	30 s	30 s	30 s
Adjustment	Internal	External	External
Electric compensation range	0 g ÷ +5.1 g	-1 g ÷ +10 g	-1 g ÷ +60 g
Internal supplementary weights	—	Automatic	Automatic
Eccentricity (for test weight)	0 µg	0 mg	0 mg
Magazine positions	36	36	18
Display	5.7" colour resistive touch screen	5.7" colour resistive touch screen	5.7" colour resistive touch screen
Communication interfaces	2×USB-A, Ethernet, 2×RS 232, 4×IN, 4×OUT, Wi-Fi®	2×USB-A, Ethernet, 2×RS 232, 4×IN, 4×OUT, Wi-Fi®	2×USB-A, Ethernet, 2×RS 232, 4×IN, 4×OUT, Wi-Fi®
Operating temperature	+15 ÷ +30 °C	+15 ÷ +30 °C	+15 ÷ +30 °C
Operating temperature change rate	±0,5 °C / 12 h (± 0,3 °C / 4 h)	±0,5 °C / 12 h (± 0,3 °C / 4 h)	±0,5 °C / 12 h (± 0,3 °C / 4 h)
Relative humidity change rate	±2% / 4h	±2% / 4h	±2% / 4h
Relative humidity **	40 ÷ 60%	40 ÷ 60%	40 ÷ 60%
Transport and storage temperature	-20 ÷ +50 °C	-20 ÷ +50 °C	-20 ÷ +50 °C
Weighing pan dimensions	ø 20 mm	ø 21 mm	ø 48 mm
Control unit dimensions (L×W×H)	465 × 187 × 261 mm	465 × 187 × 261 mm	465 × 187 × 261 mm
Overall dimensions (L×W×H)	900 × 535 × 585 mm	700 × 775 × 585 mm	700 × 775 × 585 mm

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



**Determining magnetic characteristics of mass standards**  
**Minimum readability of  $d = 0.1 \mu\text{g}$**   
**Wide range of operation starting from 2 g up to 50 kg**



www.radwag.com

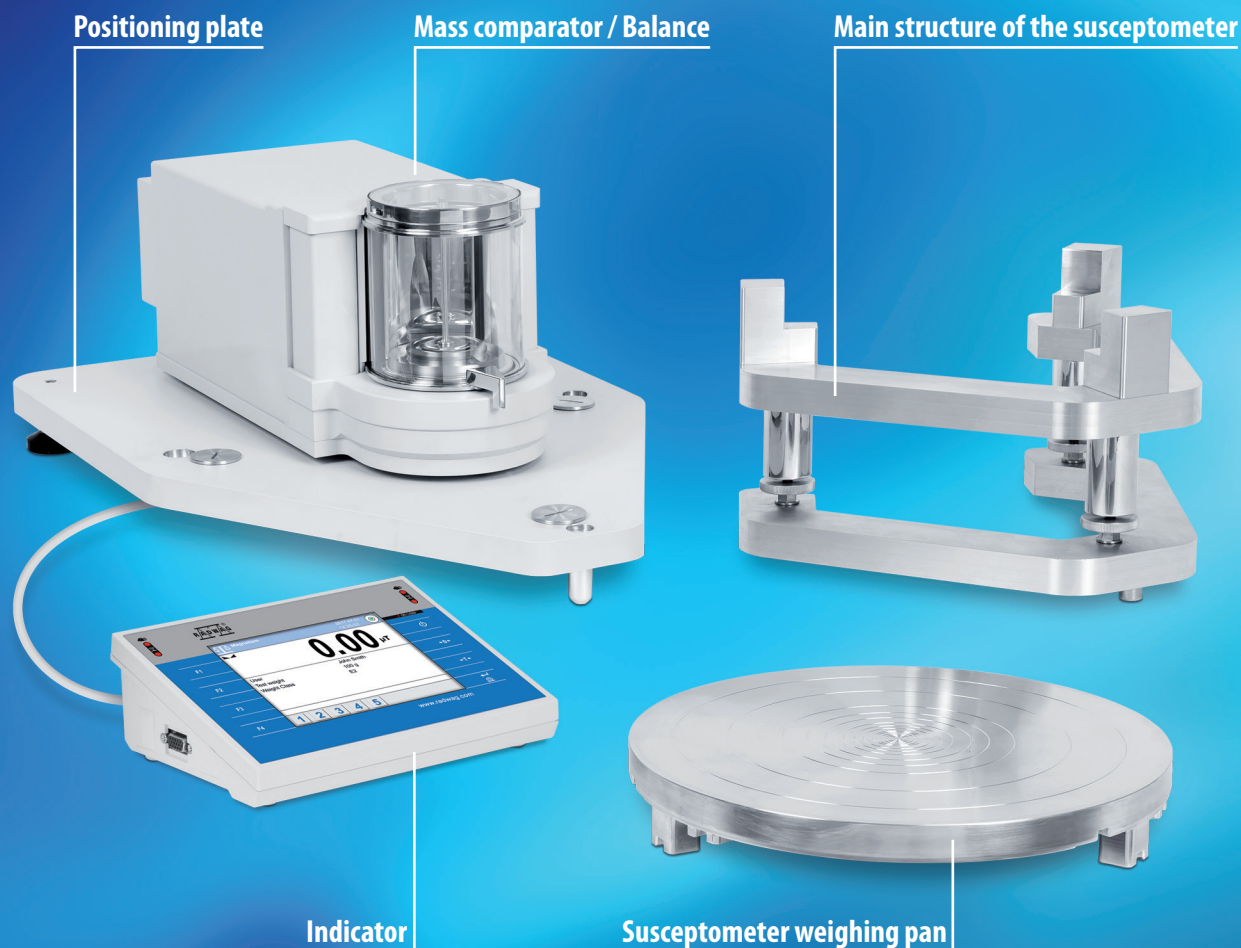
## SM Susceptometer

DETERMINATION OF MAGNETIC CHARACTERISTICS



# SM | Reliable solution for determination of susceptibility and polarisation

The OIML R111 determines susceptometer as a complete reference solution for specifying the magnetic characteristics of mass standards. The SM susceptometer measures magnetic susceptibility and magnetization of weights of E1 and lower classes with the highest accuracy. Modular design, upon disassembling respective module, enables using the susceptometer as a mass comparator or a balance.



Additional mass standard with magnetic susceptibility determined by NMI enables verification and calibration of the susceptometer.

Susceptibility		
1	Weight class	E1 (Z1 = 20 mm)
2	Weight height	0 mm
3	Weight diameter	0 mm
4	Weight mass	0 g
5	Test weights quantity	1
6	Start	1

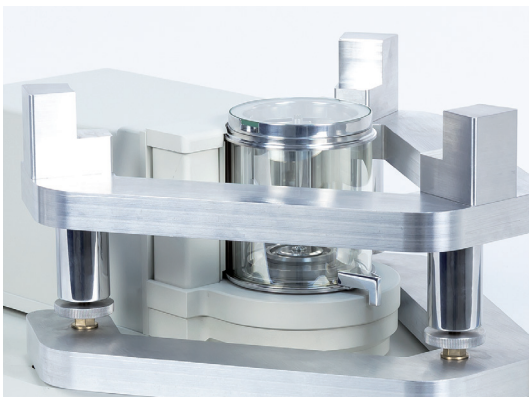
Intuitive software for determination of magnetic susceptibility and polarization (residual magnetism) is characterised by high functionality and uncomplicated operation.



A top-class magnet guarantees repeatability.



Positioners on the susceptometer weighing pan facilitate centring of the mass standard.



The modular design enables to use the susceptometer as a microbalance or a mass comparator.



Specially designed susceptometer weighing pan does not require any additional elements to change the measuring range of the device.

## Determining magnetism of mass standards according to OIML R111

### Compliance with OIML R111

Publication of the OIML R111 standard in 2004 made it necessary to determine magnetic characteristics of mass standards. There are different methods for determining mass standards magnetic characteristics. The susceptometer method is recommended for small mass standards, ranging from 2 g to 50 kg. Knowing the properties of permanent magnet located on the weighing pan, the geometry of the test mass standard and the constant known distance between the magnet and the standard, you can calculate mass standard's magnetic characteristics.

### Measurements of Magnetic Susceptibility and Residual Magnetism

RADWAG-designed SM susceptometer enables determination of magnetic characteristics of mass standards of the following classes: E1, E2, F1 and F2. The device features 3 different heights, from the mass standard base to the centre of the magnet. The recommended distance between the mass standard and the magnet depends on the mass standard's class. The measurement result is magnetic susceptibility and polarisation, i.e. residual magnetism.

### Modular Construction

Modular design, upon disassembling respective module and depending on the model, enables using the susceptometer as a mass comparator or a balance.

### High Measuring Range

Innovative design of the susceptometer enables verification of magnetic characteristics of 2g-50kg mass standards.

### Intuitive and Uncomplicated Operation

With use of modern indicator with very efficient processor, the susceptometer does not require additional external devices supporting calculations. Indicator software calculates magnetic susceptibility and polarisation, which facilitates and accelerates mass standards testing. The software automatically verifies measurements compliance with OIML R111. Mass standard status can be read on the test report.

### Top-Class Materials

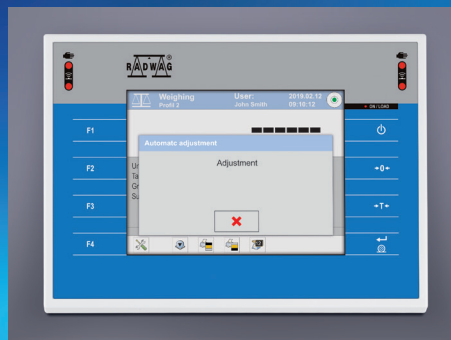
The materials used for designing the susceptometer undergo detailed control of magnetic parameters in order to eliminate the possibility of errors occurrence during mass standards testing.

### Ergonomics and Comfort of Operation

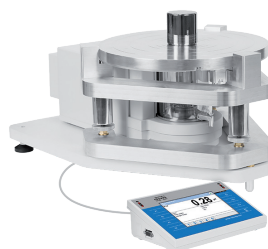
5.7" colour touch screen ensures comfort of comparator operation. Easy access to numerous applications and functions is ensured by home screen customization. The indicator is equipped with two programmable proximity sensors.



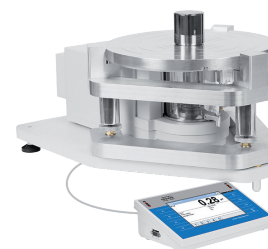
Weighing pans construction facilitates their easy replacement and quick switching between susceptometer, microbalance and mass comparator.



Measurement accuracy is guaranteed by an internal automatic adjustment carried out with regard to the dynamics of temperature changes and time.



**SM-UYA-3.4Y**  
**SM-UYA-5.4Y.KO**



**SM-MYA-5.4Y**  
**SM-MYA-11.4Y**

OIML calibration range	<b>E1</b>	2 g ÷ 50 kg	2 g ÷ 50 kg
OIML calibration range	<b>E2</b>	2 g ÷ 50 kg	2 g ÷ 50 kg
OIML calibration range	<b>F1</b>	2 g ÷ 50 kg	2 g ÷ 50 kg
OIML calibration range	<b>F2</b>	2 g ÷ 50 kg	2 g ÷ 50 kg
OIML calibration range	<b>M1</b>	—	—
OIML calibration range	<b>M2</b>	—	—
Maximum capacity [Max]		50 kg	50 kg
Readability [d]		0.1 µg	1 µg
Stabilization time		10 s	10 s
Adjustment		Internal	Internal
Dipole moment of magnets		≤ 0.1 Am <sup>2</sup>	≤ 0.1 Am <sup>2</sup>
Weighing platform-magnet centre distance		20 mm, 27 mm, 43 mm	20 mm, 27 mm, 43 mm
Magnetic field		2000 A/m, 800 A/m, 200 A/m	2000 A/m, 800 A/m, 200 A/m
Display		5.7" colour resistive touch screen	5.7" colour resistive touch screen
Communication interfaces		2×USB-A, Ethernet, 2×RS 232, 4×IN, 4×OUT, Wi-Fi®	2×USB-A, Ethernet, 2×RS 232, 4×IN, 4×OUT, Wi-Fi®
Operating temperature		+15 ÷ +30 °C	+15 ÷ +30 °C
Operating temperature change rate		±0,5 °C / 12 h (± 0.3 °C / 4 h)	±0,5 °C / 12 h (± 0.3 °C / 4 h)
Relative humidity change rate		±2% / 4h	±2% / 4h
Relative humidity *		40 ÷ 60%	40 ÷ 60%
Transport and storage temperature		-20 ÷ +50 °C	-20 ÷ +50 °C
Weighing pan dimensions		ø 300 mm	ø 300 mm
Indicator dimensions (L×W×H)		206 × 140 × 70 mm	206 × 140 × 70 mm
Overall dimensions (L×W×H)		525 × 246 × 350 mm	525 × 246 × 350 mm

\*Non-condensing conditions | Wi-Fi® is a registered trademark of Wi-Fi Alliance.



**Remote preview and online mass comparator operation**  
**Comprehensive support of calibration laboratory**  
**Management of the calibration orders execution**



www.radwag.com

## **RMCS – RADWAG Mass Comparator System**

COMPREHENSIVE MANAGEMENT OF THE CALIBRATION PROCESS

## Software supporting CALIBRATION LABORATORY

RMCS – RADWAG Mass Comparator System enables comprehensive realisation of mass standards and weights calibration in laboratory. The RMCS software is intended for integration with mass comparators manufactured by RADWAG.

The system manages the whole calibration process, starting from the moment the order is placed, through procedure performance, to the moment of issuing the calibration certificate. It facilitates performance of calibration process using ABBA and ABA methods.

The RMCS system can support multiple and various mass comparators operating in different laboratory rooms and connected via Ethernet or Wi-Fi®.

The system enables integration of RADWAG-designed mass comparators with THB sensors recording ambient conditions (temperature, humidity, pressure) during the entire calibration process. Measurement results are continuously displayed on the mass comparator screen and sent to RMCS system for process control and data archiving.

*Wi-Fi® is a registered trademark of Wi-Fi Alliance.*

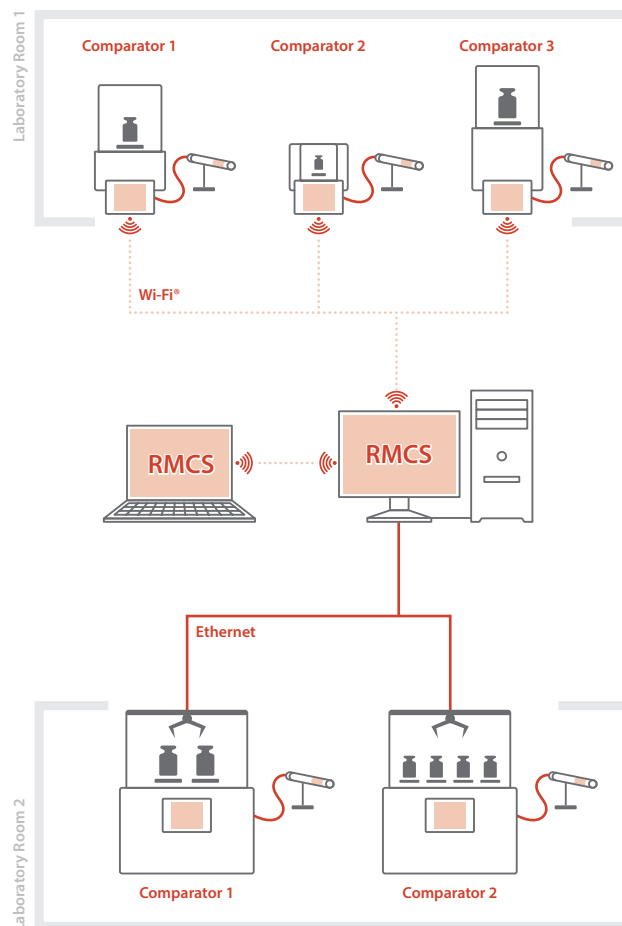


Diagram of RMCS system operation

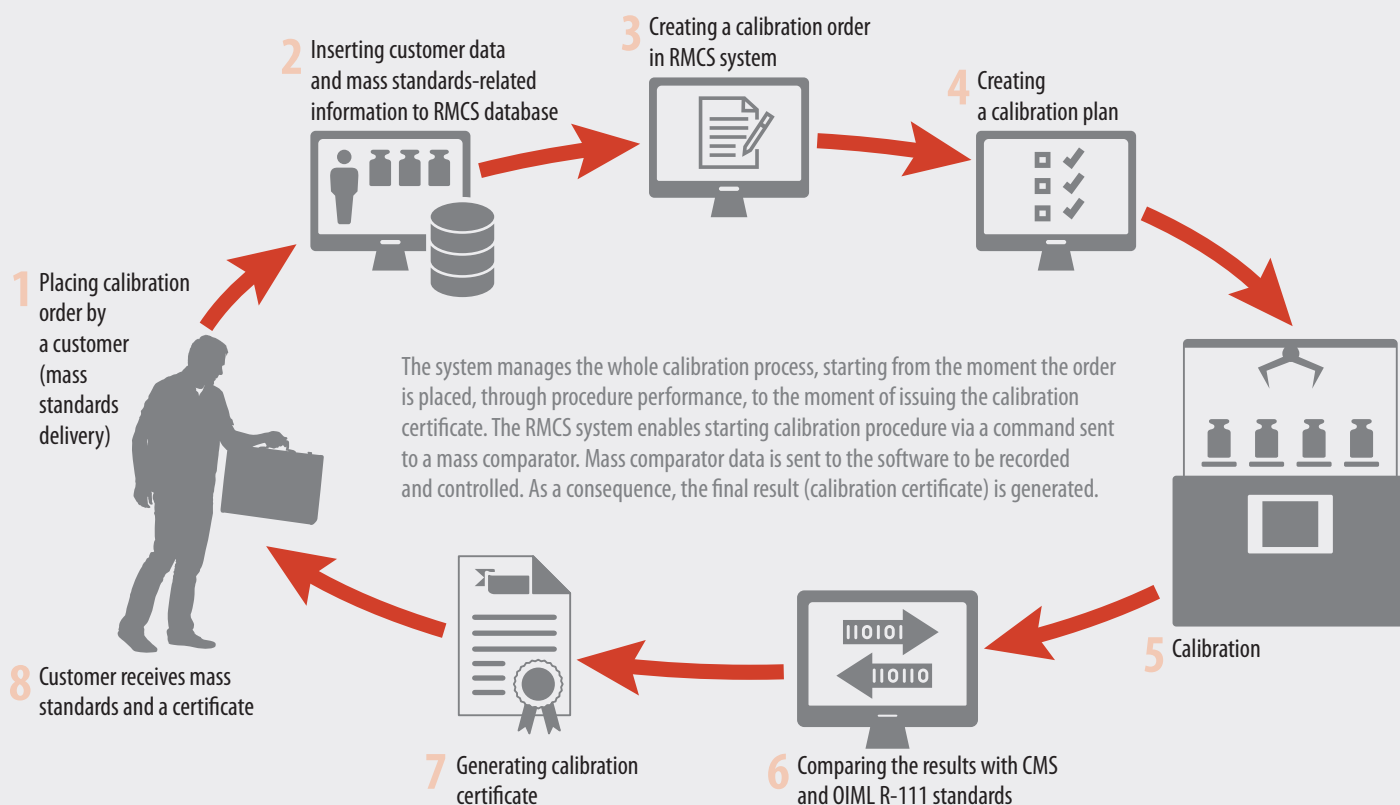


## Remote preview and ONLINE OPERATION

RMCS system enables preview of mass comparator status on the computer screen. It also allows for remote operation of the device and start of a calibration plan for automatic mass comparators via master computer.

Carrying out the calibration process with an aid of the computer software significantly improves productivity, guarantees reliable measurement results, offers complex documentation and reduces labour costs.

## Performance of CALIBRATION PROCESS



## Compliance with OIML R-111

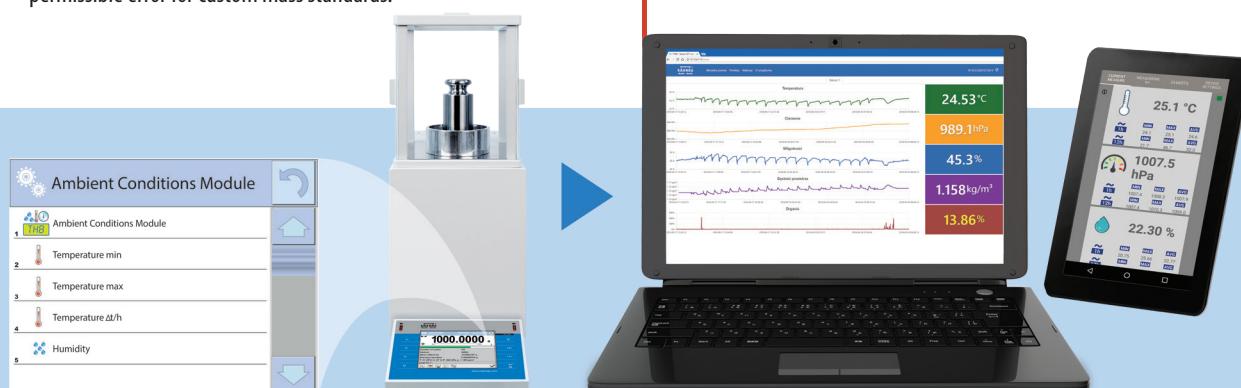
The system calculates the end result of calibration and estimates measurement uncertainty in accordance with OIML R-111-1.

The RMCS system contains database of maximum permissible errors for various masses and classes of mass standards in accordance with OIML R-111. It also allows to determine custom value of maximum permissible error for custom mass standards.

## Monitoring of AMBIENT CONDITIONS

Recorders and sensors of THBR 2.0 system enable constant record of temperature, humidity, atmospheric pressure and calculation of air density.

To each mass measurement carried out during calibration, current ambient conditions recorded in the vicinity of the mass comparator are assigned.





## File STORAGE

The function enables automatic copying of calibration data to another computer. The data that can be copied are calibration reports, orders forms, photographs attached as appendixes to orders, etc.



## Measurement capability of CMC

The system stores laboratory data concerning the measuring capability, and facilitates placing it on a calibration certificate. It enables determining CMC value, e.g. for custom mass standards.

## Templates of CALIBRATION CERTIFICATES

The software supports different templates of calibration certificates (e.g. various languages) and provides their intuitive editing.

## Supervision over MEASURING EQUIPMENT

The RMCS system collects and stores current metrological characteristics of measuring equipment such as reference weight data, standard deviation for mass comparators, corrections for thermo-hygro-barometers.

Information on the expiry date of measuring equipment calibration is presented to the operator via messages on the screen and an e-mail.

## Hardware RECOMMENDATIONS

### Client computer or server in a weighing system consisting of max 10 weighing instruments

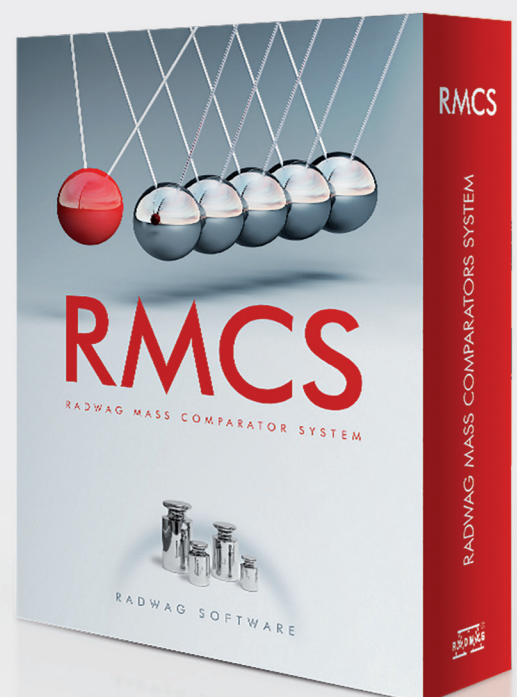
#### PC computer

- operating system: Microsoft Windows 10 / 8 / 8.1 / 7 (excluding Starter version)
- 2 GHz dual-core processor or faster
- minimum 2 GB operating memory
- minimum 10 GB of free space on a hard drive
- 1280x1024 computer monitor
- MS SQL Server 2008 R2 or later version;
- server systems: Microsoft Windows Server 2016 / 2008 SP2 / 2008 R2
- printer operating in Microsoft Windows environment

### Server in a weighing system consisting of max 10 weighing instruments

#### PC computer

- operating system: Microsoft Windows 10 / 8 / 8.1 / 7 (excluding Starter version)
- 3 GHz quad-core processor or faster
- minimum 8 GB of operating memory
- minimum 50 GB of free space on a hard drive
- 1280x1024 computer monitor
- MS SQL Server 2008 R2 or later version;
- server systems: Microsoft Windows Server 2016 / 2008 SP2 / 2008 R2
- printer operating in Microsoft Windows environment





# Terminals and Scales Operated in Industry

HIGH-TECH WEIGHING TECHNOLOGY

# WEIGHING TERMINALS

## Advanced Solutions for Industry

With use of advanced RADWAG terminals you can design multifunctional load cell scales. The terminals are intended for cooperation with high resolution platforms and weighing modules.

Some selected terminals serve as a base of multiplatform weighing systems.

When it comes to terminals range, RADWAG offers numerous designs meeting various use-related requirements. Particular models differ in LCD size, IP rating, housing type, software and most of all their functionality. The most hi-tech models combine features typical for balance and for advanced industrial computer.

Terminal's software provides numerous applications enabling processes such as weighing, dosing, labelling, formulations,

parts counting, weight control, etc. Equipped with numerous interfaces the terminal can be integrated into automatic systems of production line.

Some models can be compatible with user-owned weighing applications. Cooperation between applications of yours and platforms or weighing modules is possible due to a set of programming components.



### PUE C32 Terminal

OIML accuracy class: III
Max quantity of verification units: 6000 e
Display: 5" graphic colour
Housing: ABS plastic
Power supply: battery, mains power
Supported platforms quantity: 1
IP rating: IP 43
Communication interfaces: USB-A, USB-B, 2×RS 232, Ethernet, Wi-Fi*, 4×IN, 4×OUT

# 4 LOAD CELL SCALES

## Precise Measurement in Industry



### C315.C and WPT/4 C Platform Scales

Maximum capacity [Max.]: 150 kg – 6000 kg
Readability [d]: 0.05 kg – 2 kg
Platform dimensions: 800×800 mm – 2000×2000 mm
Platform design: powder-coated steel
Indicator: PUE C315, PUE C31H,
Display: backlit LCD
Keyboard: 5 function keys
Power supply: battery (up to 35 h) and mains power
Communication interfaces: RS232, Wi-Fi(C315.C)*
IP rating: IP 65 – platform, IP 43 – indicator



### WPT/4 H Platform Scale

Maximum capacity [Max.]: 300 kg – 6000 kg
Readability [d]: 0.1 kg – 2 kg
Platform dimensions: 800×800 mm – 1500×2000 mm
Platform design: stainless steel
Indicator: PUE C31H
Display: backlit LCD
Keyboard: 5 function keys
Power supply: battery (up to 45 h) and mains power
Communication interfaces: RS232
IP rating: IP 68 – platform, IP 68/69 – indicator

Mass measurement carried out using 4 load cell solution guarantees accuracy and precision regardless of load location on the weighing pan. RADWAG-manufactured 4 load cell scales stand for precise and fast mass measurement performed even under severe industrial conditions.

4 load cell range covers numerous design solutions. Particular models differ in used material (stainless steel or powder-coated steel) and offered design (floor version, pit version, opening weighing pan version, ramp scales, pallet scales).

\*Wi-Fi® is a registered trademark of Wi-Fi Alliance.





## PUE 7.1 Terminal

OIML accuracy class: III

Max quantity of verification units: 6000 e

Display: 5.7", touchscreen

Housing: ABS plastic

Operating system: Windows CE 7

Processor: Dual-Core 1GHz

Memory: 256 MB RAM + 16 GB micro SD

Supported platforms quantity: 2

IP rating: IP 43

Communication interfaces: 2×USB-A, 2×RS 232, Wi-Fi®\*, 4×IN, 4×OUT



## PUE HY10 Terminal

OIML accuracy class: II or III

Max quantity of verification units: 6000 e

Display: 10.1", touchscreen

Housing: stainless steel

Operating system: Windows 7 Embedded Compact

Processor: Dual-Core 1GHz

Memory: 256 MB RAM + 16 GB micro SD

Supported platforms quantity: 1 (6 - option)

IP rating: IP 68/69

Communication interfaces: USB-A, USB MR 4 Pin, 2×RS 232, RS 485, Ethernet, 4×IN, 4×OUT, Modbus RTU, optional: Profibus, Profinet, AN, 12×IN, 12×OUT, A/C DP4, Wi-Fi®\*



## PUE 5 Terminal

OIML accuracy class: III

Max quantity of verification units: 6000 e

Display: 15.6" or 19", touchscreen

Housing: stainless steel

Operating system: Windows 7 Embedded, opcja: Windows 7 Pro, Windows 10 IoT, Windows 10 Pro

Processor: Quad-Core 2.56 GHz

Memory: 4 GB RAM + 128 GB SSD (256, 512 - option)

Supported platforms quantity: 1 (4 - option)

IP rating: IP 68

Communication interfaces: 4×USB-A, 2×RS 232, RS 485, 2×Ethernet, optional: 3×RS 232, 4×IN, 4×OUT, Profibus or RS 485.

\*Wi-Fi® is a registered trademark of Wi-Fi Alliance.



## WPT/4N H Ramp Scale

Maximum capacity [Max.]: 150 kg – 1500 kg

Readability [d]: 0.05 kg – 0.5 kg

Platform dimensions: 840×860 mm – 1500×1500 mm

Platform design: stainless steel

Indicator: PUE C31H

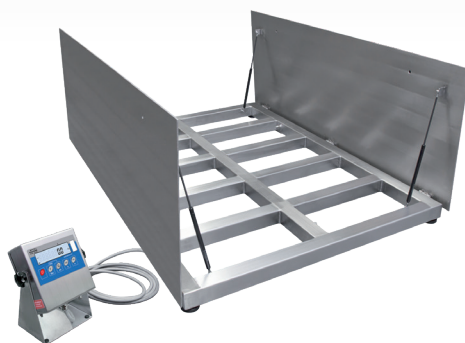
Display: backlit LCD

Keyboard: 5 function keys

Power supply: battery (up to 45 h) and mains power

Communication interfaces: RS232

IP rating: IP 68 – platform, IP 68/69 – indicator



## WPT/4 H/Z Platform Scale – Pit Version

Maximum capacity [Max.]: 300 kg – 6000 kg

Readability [d]: 0.1 kg – 2 kg

Platform dimensions: 800×800 mm – 1500×2000 mm

Platform design: stainless steel

Indicator: PUE C31H

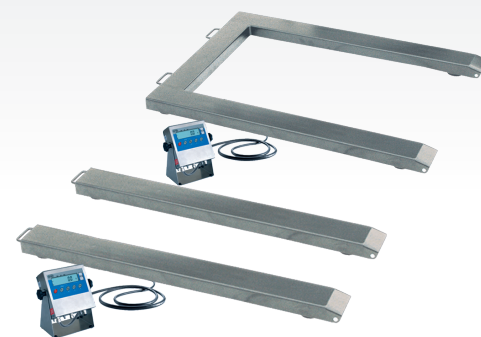
Display: backlit LCD

Keyboard: 5 function keys

Power supply: battery (up to 45 h) and mains power

Communication interfaces: RS232

IP rating: IP 68 – platform, IP 68/69 – indicator



## WPT/4P H Pallet Scale

Maximum capacity [Max.]: 600 kg – 3000 kg

Readability [d]: 0.2 kg – 1 kg

Platform dimensions: 860×1200 mm

## WPT/4P2 H Beam Scale

Maximum capacity [Max.]: 600 kg – 6000 kg

Readability [d]: 0.2 kg – 2 kg

Beams length: 1200 mm – 2500 mm

Platform/beams design: stainless steel

Indicator: PUE C31H

Display: backlit LCD

Keyboard: 5 function keys

Power supply: battery (up to 45 h) and mains power

Communication interfaces: RS232

IP rating: IP 68 – platform, IP 68/69 – indicator

💡 Ease of weighing platform loading!

💡 Opening weighing pan (ease of maintenance)!  
Option of embedding the platform in a ground!

💡 Weighing of pallets (pallet scale) and loads of various dimensions (beam scale)!

# WATERPROOF SCALES

## Reliability Under Severe Conditions


Operation in humid environment and in case of direct contact with water requires use of special weighing instruments. **Waterproof scales provide precise mass measurement and reliable, failure free operation under severe industrial conditions.**

Waterproof platform scales offer two various design solutions which differ in IP rating (IP 67 or IP 68), used material (AISI 304 or AISI 316 stainless steel) and applied load cell protection technology.



### WPT/H Waterproof Scale

Maximum capacity [Max.]:	3 kg – 300 kg
Readability [d]:	1 g – 100 g
Platform Design:	200×150 mm – 800×800 mm
Platform design:	AISI 304 stainless steel
Indicator:	PUE C31H
Display:	backlit LCD
Keyboard:	5 function keys
Power supply:	battery (up to 45 h) and mains power
Communication interfaces:	RS232
IP rating:	IP 67 – platform, IP 68/69 – indicator

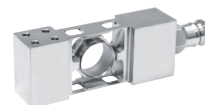
 Bellow design applied on WPT/H scales aims to protect load cell against ambient conditions influence.



### WPT/HR Waterproof Scale

Maximum capacity [Max.]:	3 kg – 150 kg
Readability [d]:	1 g – 50 g
Platform Design:	250×300 mm – 600×600 mm
Platform design:	AISI 316 stainless steel
Indicator:	PUE C31H
Display:	backlit LCD
Keyboard:	5 function keys
Power supply:	battery (up to 45 h) and mains power
Communication interfaces:	RS232
IP rating:	IP 68 – platform, IP 68/69 – indicator

 Applied in WPT/HR scales load cell with IP 68/69K guarantees precise measurement under challenging industrial conditions.





# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)



**Ease of operation and clear indication**  
**Wireless communication**  
**Versatility of use**



[www.radwag.com](http://www.radwag.com)

## C315 Platform Scales

MASS MEASUREMENTS IN INDUSTRY

# C315

## Fast and Precise Weighing for Numerous Industrial Applications



### Weighing Data Record

An in-built memory allows record of data of the ongoing weighing - up to 5 000 records. Additional ALIBI memory guarantees safety by cause of automatically saved measurement log. All log-stored data can be analysed (up to 100 000 records).

### Wireless communication

Use of the wireless communication Wi-Fi® enables export of recorded measurements and data stored by ALIBI memory, it also facilitates transfer of current mass indications either to a mobile application or a respective RADWAG software.

### Generating Reports

The C315 indicator offers a function using which you can generate and print a report on performed adjustments and weighings, all it in accordance with GLP rules. The reports can be completed with the real time of carried out measurements, this is thanks to an in-built RTC.

### Reliability and Safety

Platform of solid mechanical design, made of powder-coated steel AISI 304, ensures durability and endurance in everyday use in slightly challenging industrial conditions.

### Ease of Operation and Clear Indication Presentation

Due to a backlit LCD the measurement result is clearly visible. Easy operation enables fast and reliable measurements to be carried out even by an inexperienced operator.

### Numerous Configurations

Weighing pan of numerous dimensions and vast capacity range favour selection of an optimal solution suiting specific requirements and needs of various customers.

## C315 Platform Scales

Maximum capacity [Max]	1.5 kg ÷ 300 kg
Minimum capacity	10 g ÷ 2 kg
Readability [d]	0.5 g ÷ 100 g
Tare range	-1.5 kg ÷ -300 kg
OIML class	III
Platform material	St3S powder-coated steel
Weighing pan material	AISI304 stainless steel
Indicator fastening	On a post, next to platform, on a cable
Display	LCD (with backlight)
Ingress protection - design	IP 65
Ingress protection - indicator	IP 43
Communication interfaces	RSR 232*, Wi-Fi®
Operating temperature	-10 °C ÷ +40 °C
Wymiary szalki	300 × 300 mm, 400 × 500 mm, 700 × 500 mm

\*Possibility of optional scale model featuring two RS232 communication interfaces | Wi-Fi® is a registered trademark of Wi-Fi Alliance.



**5" colour graphic display**  
**Menu customization**  
**100 thousand measurements kept in terminal's memory**



[www.radwag.com](http://www.radwag.com)

## PUE C32 Terminal

ADVANCED LEVEL FOR INDUSTRIAL SCALES



# PUE C32

## Warranty of continuous data storing Optional battery power supply



### Work ergonomics

The terminal has been equipped with 5" colour display ensuring perfect readability, and 16-key membrane keypad featuring programmable function keys. The terminal offers customized menu, with this all your personal needs can be met which makes operation even more intuitive and simple. Two proximity sensors allow touch-free operation, you can assign them with any terminal function. The housing is made of durable ABS plastic.

### Battery as an Optional Power Source

Use of the optional battery enables the PUE C32 terminal to operate even when there is either no or unstable power supply.

### Communication Interfaces

Communication interfaces of PUE C32 terminal facilitate cooperation with numerous peripheral devices, e.g. printer or computer, and enable exchange of data by means of USB flash drives. Equipped with Wi-Fi® module, the PUE C32 can also communicate with wireless networks.

### Data Management

Information system of PUE C32 terminals has been based on ALIBI memory and the following databases: users, products, weighings, packagings, formulations, customers. Data exchange within the system is bidirectional and it is carried out via USB interface. The terminals enable import and export of databases which is done using USB flash drives.

### ALIBI Memory

ALIBI memory provides data safety and allows saving up to 100 thousand weighing records. This guarantees continuous storing of data over a long period of time.



### PUE C32

Display	5" colour graphic screen
Verification units [e]	6000
OIML class	III
Ingress protection	IP43
Housing	Plastic
Operated weighing platforms quantity	1
Programmable infrared sensors	2
Load cell connection	4 or 6 wires + shield
Operating temperature	-10 ÷ +40 °C
Communication interfaces	2×RS232, USB-A, USB-B, Ethernet, Wi-Fi®, 4×IN, 4×OUT

\*Wi-Fi® is a registered trademark of Wi-Fi Alliance.

**5.7" colour touchscreen**  
**Vast range of applications**  
**Intended for network operation**



[www.radwag.com](http://www.radwag.com)

## PUE 7.1 Terminal

ADVANCED LEVEL FOR INDUSTRIAL SCALES



# PUE 7.1

## Numerous working modes High efficiency



### Ergonomics and Comfort of Operation

The terminal has been equipped with 5.7" colour TFT touchscreen, ensuring perfect readability, and membrane keypad. The device features two proximity sensors placed at the front of the housing, which can be freely configured using menu. The proximity sensors enable touch free operation making your work even more comfortable, and help to keep the terminal clean.

### Ingress Protection Rating

The standard version of the terminal, PUE 7.1, features plastic housing for which the degree of protection is IP43. The panel version, i.e. PUE 7.1 P terminal, has been equipped with housing made of stainless steel, rated with IP66/67. The stainless steel model can be installed in a control panel or a switchboard.

### Vast Range of Applications

Terminal software offers numerous working modes designed to perform various weighing processes such as parts counting, dosing, formulations, transactions or determination of density of solids. The terminal can be an integral part of many scales and weighing systems operating in various branches of industry.

### Communication Interfaces

PUE 7.1 and PUE 7.1P terminals have been equipped with RS232, USB-A and Ethernet interfaces and with 4 digital inputs and outputs. This facilitates both cooperation of the terminal with peripheral devices and data exchange using USB drives. The PUE 7.1 comprises wireless communication module allowing the terminal to connect with wireless networks.

### High Efficiency

The terminal features dual-core processor with 1 GHz processing power, 256 MB RAM and Windows CE 7.0. With this high efficiency operation is guaranteed.



**PUE 7.1**



**PUE 7.1P**

	PUE 7.1	PUE 7.1P
Display	5.7" resistive colour touchscreen	5.7" resistive colour touchscreen
Verification units [e]	6000	6000
Ingress protection	IP43	IP66/67*
Housing	ABS Plastic	Stainless steel
Maximum quantity of operated weighing platforms	2	2
System	Windows CE 7	Windows CE 7
Memory	256 MB RAM + 16 GB microSD	256 MB RAM + 16 GB microSD
Processor	Dual-core 1 GHz	Dual-core 1 GHz
Communication interfaces	2×USB-A, 2×RS232, Ethernet, 4×IN/4×OUT (digital), Wi-Fi**, Modbus RTU	2×USB-A, 2×RS232, Ethernet, 4×IN/4×OUT (digital), Wi-Fi**, Modbus RTU

\* IP66/67 - panel version, IP32 - standard version | \*\*Wi-Fi® is a registered trademark of Wi-Fi Alliance.



**Terminal and computer in one**  
**Large modern touchscreen**  
**Wide range of industrial applications**



[www.radwag.com](http://www.radwag.com)

# PUE 5

## Professional Weighing Terminal

VERSATILE INDUSTRIAL APPLICATIONS

# PUE 5

## Reliability in Industrial Conditions Complete Support of Weighing Processes



### Comfort of Operation

PUE 5 terminal features a large, modern, high-resolution screen – 15.6 inches or 19 inches (depending on the chosen model). Easy to read menu and clear-cut information arrangement ensure comfort of operation.

### Industrial Computer Functionality

PUE 5 combines functionality of an advanced weighing terminal and typical features of a Windows based industrial computer. With Quad Core 2GHz processor, 4GB RAM and fast SSD the terminal processes your data quickly even when complex applications are operated.

### Reliability and Resistance to Adverse Working Conditions

PUE 5 terminal is equipped with a hermetic stainless steel housing of protection class IP 65. Such solution allows the user to operate the terminal in harsh industrial conditions: high humidity and dustiness. It also guarantees both resistance to mechanical damage and good readability. Absolute precision of touch detection enables the user to wear gloves while operating the terminal.

### Industrial Applications of PUE 5.

PUE 5 software allows using the terminal for labelling, parts counting, formulations, weighing records and transactions. All these applications work with E2R software thus providing a complete support of the weighing processes.

### Easy Process of Creating Your Own Applications

PUE 5 operates on the basis of Windows 7 what makes working with various applications prepared by the customer a lot easier. The device is equipped with a set of programming components enabling cooperation of created applications with weighing modules.

### Multiplatform Systems Management

PUE 5 terminal can support up to 4 load cell weighing platforms. To your benefit it features option of connecting laboratory balances and weighing modules.



**PUE 5.15R**  
**PUE 5.15IR**  
**PUE 5.15C**



**PUE 5.19R**  
**PUE 5.19IR**  
**PUE 5.19C**

Display dimensions	Colour 15.6" touchscreen	Colour 19" touchscreen
Display type	R - resistive, IR - Infrared, C - capacitive	R - resistive, IR - Infrared, C - capacitive
Verification units	6000	6000
IP rating	IP 68	IP 68
Housing	Stainless steel	Stainless steel
Weighing platforms quantity	1 (standard), up to 4 (option)	1 (standard), up to 4 (option)
System	Microsoft Windows Embedded 7	Microsoft Windows Embedded 7
Memory	4GB DDR3L 1333MHz - max 8GB	4GB DDR3L 1333MHz - max 8GB
Processor	Quad Core 2GHz	Quad Core 2GHz
Communication Interfaces	4×USB, 2×RS232, 1×RS485, 2×Ethernet, 4×IN, 4×OUT	4×USB, 2×RS232, 1×RS485, 2×Ethernet, 4×IN, 4×OUT



10.1" touchscreen  
Screen customization  
Remote control of terminal's settings



www.radwag.com

# PUE HY10 Terminal

ADVANCED WEIGHING SOLUTION FOR INDUSTRY



# PUE HY10

Quality and precision in challenging working conditions  
Customization to production process requirements



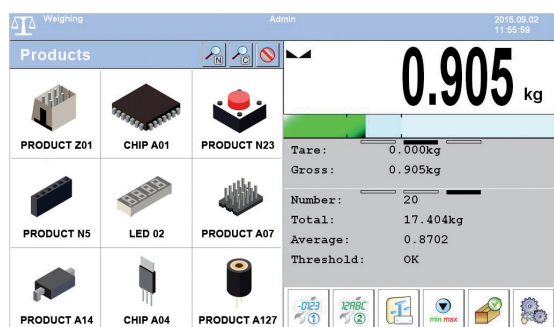
*Hermetic stainless steel housing guaranteeing faultless operation in humid and dusty environment.*



*10.1" colour capacitive display of 1024x600 pixels resolution providing good ergonomics*



*Complex customization option, i.e. self-designed screen layout and menu.*



*HY 10 terminal features pictograms database providing you with icons that can be assigned to weighed products.*

## Screen Customization

PUE HY10 screen is customizable to make it suit your individual preferences and specific requirements of any production process.

## Production Processes Editor

'Traceability Processes' function enables you to precisely program weighing process course. As an operator you are guided step by step therefore there is no need for you to worry that any operation might be omitted.

## Remote Setup

The remote setup is a cutting-edge solution. Now you can set PUE HY10 terminal from anywhere in the world. All you need to connect to the terminal is Internet and 'Parameters Editor' application.

## Applications in Line with Industry Requirements

PUE HY10 software makes the terminal possible to be used for vast range of industrial applications, e.g. labelling, dosing, parts counting, formulations, prepackaged goods control (PGC), statistic quality control.

## Reliability and Hygiene in Challenging Conditions

Stainless steel mechanical design and IP68/69 in-use facilitate terminal operation under challenging industrial conditions. These two characteristics make the terminal meet high hygiene standards for food and pharmaceutical industries.

## Managing Multi-Platform Systems

PUE HY10 terminal can support operation of 6 weighing platforms (including 2 load cell ones). It offers connecting laboratory balances and weighing modules.

## Databases and Ease of Archiving

Large PUE HY10 terminal database facilitates archiving the results of your work and reports. The data can be exchanged between terminals. Data import and export options are at your disposal.



Display	10.1" capacitive colour touchscreen
Ingress protection	IP68 (1h max) / 69
Housing	AISI304 Stainless Steel
Weighing platforms quantity	1 (standard), up to 6 (option)
System	Microsoft Windows 7 Embedded Compact
Memory	256 MB DDR2, 16 GB - micro SD card
Processor	Dual Core 1 GHz
Communication Interfaces	2xUSB, 2xRS 232, RS 485, Ethernet, 4xIN, 4xOUT, Modbus RTU
Optional	Profibus Module, Profinet Module, AN module, 12IN module, Wi-Fi*, Module of an additional A/D DP4 converter

\*Wi-Fi® is a registered trademark of Wi-Fi Alliance.

**Multifunctional software**  
**Clear menu and intuitive operation**  
**Handy diode bar graph**



[www.radwag.com](http://www.radwag.com)

# PUE HX7 Terminal

ERGONOMICS IN INDUSTRY



# PUE HX7



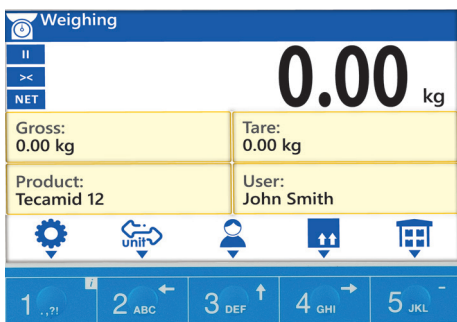
The bar graph, consisting of 9 red and green diode fields, is located at the top of the operation panel, it visualises a current net weight value.



The housing is made of AISI 304 stainless steel of high protection class: IP66/68.



The back side of the housing features hermetic connectors of communication interfaces.



Clear menu and intuitive information arrangement on the display guarantee uncomplicated and comfortable operation.

## Quality and precision in unfavourable working conditions Adaptation to the requirements of a production process

### Wide Area of Use

The PUE HX7 terminal is an industry device used as an integral component of multifunctional single and multiple load-cell scales. The terminal is based on the latest solutions and an advanced computing platform. Its housing is made of AISI 304 stainless steel of high protection class: IP66/68.

### Communication with Weighing Platforms

Basic version of the terminal supports 1 analog weighing platform. With an additional weighing module installed, the terminal can support two weighing platforms.

### Diode Bar Graph

9-diode bar graph, located at the housing top regardless of the interface, signals current net weight of a product in relation to the scale range. The terminal features 3 working modes: linear, weighing thresholds signalling and checkweighing. The bar graph significantly increases the comfort of terminal operation during piecework in food industry where fast and unambiguous presentation of product mass deviation related to the declared min and max values is crucial.

### Intuitive Interface and Multifunctional Software

When creating the software, a great emphasis was put on its functionality and ergonomics. Intuitive interface plus large 7" screen stand for maximum comfort of operation. The terminal's software allows carrying out processes such as weighing, parts counting, dosing, labelling and percent weighing. The information system of the terminal is based on the following databases: users, products, weighings, packaging, formulations and customers. Use of Alibi memory guarantees stored data safety.

### Battery as an Optional Power Source

Thanks to the optional battery, the PUE HX7 terminal can operate even when there is either no or unstable power supply. This improves the security of acquired data and improves comfort of operation.

### Hermetic Connectors of Communication Interfaces

PUE HX7 terminal is equipped with hermetic connectors of the following interfaces: RS 232, USB, Ethernet, digital inputs/outputs, etc.



## PUE HX7

Weighing platforms quantity	Max 2 (1 × standard + 1 × optional)
Housing material	AISI304 stainless steel
Ingress protection	IP66/68
Diode bar graph	9 diodes, 3 working modes
Display	7" graphic colour
Keypad	Membrane, 22 keys
Data safety	ALIBI Memory
Power supply	100 ÷ 240V AC 50÷60Hz, optionally 12-24 V DC
Optional power supply	Internal battery, 7h of continuous operation





# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)



# HX7 Multifunctional Industrial Scales

VERSATILE SOLUTION  
IN MASS MEASUREMENT PROCESS

# PUE HX7 Terminal

QUALITY AND PRECISION IN UNFAVOURABLE WORKING CONDITIONS  
ADAPTATION TO THE REQUIREMENTS OF A PRODUCTION PROCESS

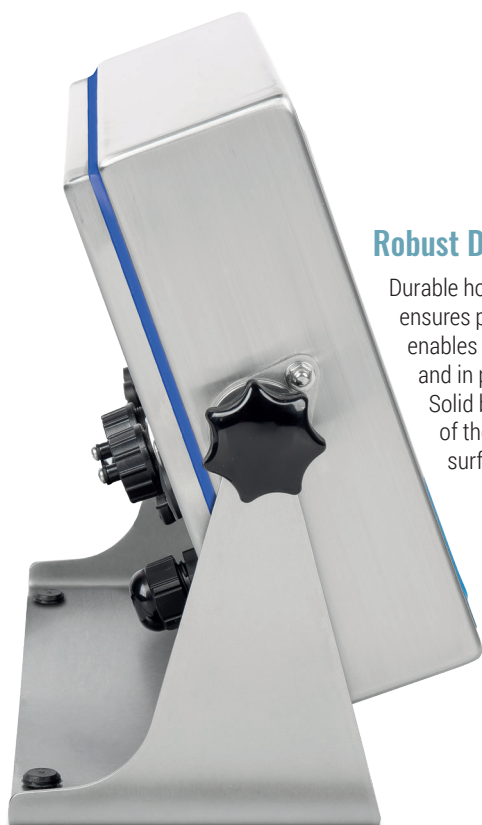
An advanced PUE HX7 weighing terminal is a device intended to make reliable industrial scales operating on the basis of one or multiple load cells. Complex communication protocol enables establishing communication with IT, adjustment and control systems.

The highest quality of used components ensures excellent precision and repeatability. The terminal's multifunctional software allows carrying out processes such as weighing, parts counting, dosing, labelling and percent weighing. The software is based on numerous databases and the built-in Alibi Memory guarantees safety of the obtained information.



## Robust Design

Durable housing, made of AISI304 stainless steel, ensures protection class of IP66/IP68 which enables operation in harsh industrial conditions and in places of high hygiene standards. Solid base guarantees stable mounting of the terminal either on any flat horizontal surface or on the wall.



## Communication Interfaces

The terminal is equipped with hermetic connectors of the following interfaces: Ethernet, USB, RS 232 and digital inputs/outputs.

In the optional version of the device the communication interfaces can be expanded.





## Display

7" colour graphic display of high resolution guarantees clear presentation of displayed information on current state of carried out process. Ease of operation, clear menu and intuitive information arrangement on the display guarantee comfort of operation.



## Diode Bar Graph

9-diode bar graph, consisting of colour fields, presents current net mass of a product in reference to the scale range. The bar graph can operate in one of three modes: „linear“, „weighing thresholds signalling“, „checkweighing“.



## Battery Power Supply

Use of the optional battery enables the terminal to be operated even when there is either no or unstable power supply. This improves the security of acquired data and comfort of operation.

# HX7 Scales

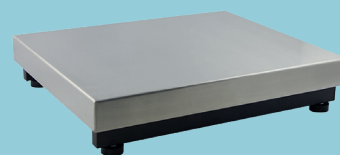
REMARKABLY FAST AND PRECISE MEASUREMENTS  
PRECISE WEIGHING USING 1 OR 4 LOAD CELLS

The PUE HX7 terminal can be integrated with any RADWAG-manufactured single or multi-load-cell weighing platform. Basic version of the terminal supports one analog weighing platform. The possibility to install an additional weighing module enables to support two weighing platforms.



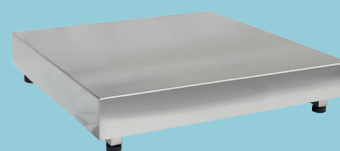
Weighing Terminal	PUE HX7
Housing	AISI 304 stainless steel
IP ingress protection by EN 60529	IP66 / IP68 (1.5 m)
Display	7" graphic display
Keypad	Membrane
OIML class	III
Verification units [e]	6000
Minimum voltage per verification scale interval	0.4 $\mu$ V
Maximum voltage per verification scale interval	3.25 $\mu$ V
Minimum load cell impedance	50 $\Omega$
Maximum load cell impedance	1200 $\Omega$
Connection of load cells	4 or 6 wires + Shield
Maximum quantity of connected platforms	1 (2 optional model)
Communication interfaces	RS 232
	USB
	Ethernet 10/100 Mbit
	IN $\times$ 4 / OUT $\times$ 4
Operating temperature	-10°C – 40°C
Power supply	100 – 240 V AC 50/60Hz
Battery power supply (option)	7h of continuous operation
Dimensions	340 $\times$ 231 $\times$ 120 mm

## 1-load-cell platforms



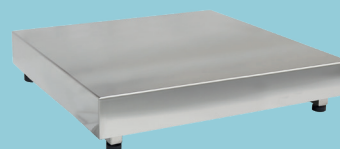
**F and C series**  
1-load-cell platforms

Robust platforms of construction made of St3S carbon steel and protected against corrosion via powder coating. Weighing pan made of AISI304 stainless steel. The F series features a weighing pan with rounded corners and the C series with sharp corners. The IP65 allows to use these platforms in dry environment.



**H Series**  
waterproof 1-load-cell platforms

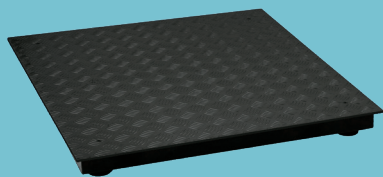
Solid and robust platforms made of AISI304 stainless steel. The IP68 allows to use these platforms in challenging industrial environment, at direct contact with water and in places of high hygiene standards.



**HR Series**  
waterproof and acid-resistant  
1-load-cell platforms

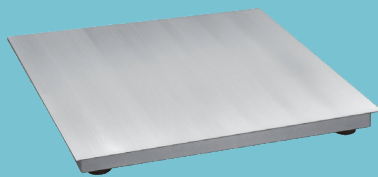
Solid and robust platforms made of acid-resistant AISI316 stainless steel. The platforms use stainless steel load cell of an increased ingress protection. The IP68 allows to use these platforms in challenging industrial environment, at direct contact with water and corrosive substances.

## 4-load-cell platforms



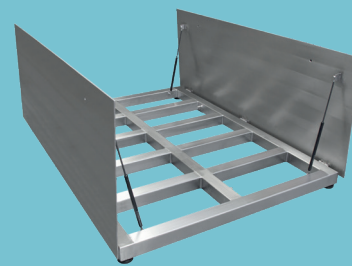
**4C Series**  
4-load-cell platforms

The platforms are made of St3S structural carbon steel and protected against corrosion via powder coating. Their tear plate surface prevents potential slip. The IP65 allows to use these platforms in dry environment.



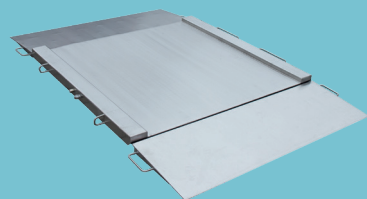
**4H Series**  
waterproof 4-load-cell platforms

Very solid and robust platforms made of AISI304 stainless steel. The IP68 allows to use these platforms in challenging industrial environment and at direct contact with water.



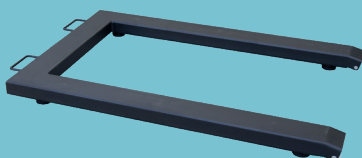
**4H/Z Series**  
embedded stainless steel platforms  
with opening option

Extremely solid and reliable platforms made of AISI304 stainless steel. The platforms feature frame that is to be embedded in the ground, and a weighing pan with opening option, which allows to maintain the device clean. The IP68 allows to use these platforms in challenging industrial environment and at direct contact with water.



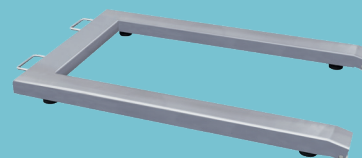
**4N Series**  
waterproof ramp platforms

Low-profile platforms made of AISI304 stainless steel, and equipped with two ramps. They are perfect solution for weighing loads transported using trolleys. The IP68 allows to use these platforms in challenging industrial environment and at direct contact with water.



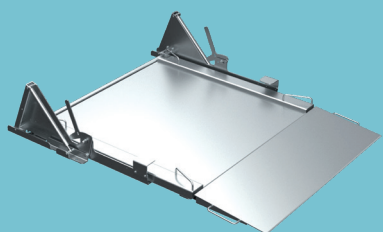
**4P.C Series**  
pallet platforms

The pallet platforms are made of St3S structural carbon steel and protected against corrosion via powder coating. The platforms are intended for weighing products on transport pallets and enable easy loading of the weighing pan using a forklift. The IP65 allows to use these platforms in dry environment.



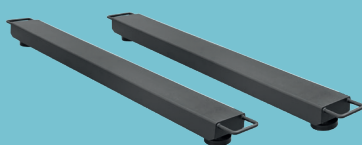
**4P.H Series**  
waterproof pallet platforms

The pallet platforms are made of AISI304 stainless steel. The platforms are intended for weighing products on transport pallets and enable easy loading of the weighing pan using a forklift. The IP68 allows to use these platforms in challenging industrial environment and at direct contact with water.



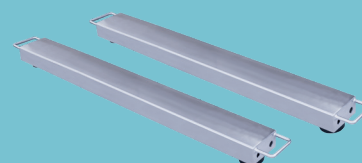
**4N.LD Series**  
waterproof ramp platforms with lifted  
weighing pan

Solid and robust platforms made of acid-resistant AISI316 stainless steel. The platforms use stainless steel load cell of an increased ingress protection. The IP68 allows to use these platforms in challenging industrial environment, at direct contact with water and corrosive substances.



**4P2.C Series**  
beam platforms

The beam platforms are made of St3S structural carbon steel and protected against corrosion via powder coating. They are designed for weighing objects of atypical and unfixed size. The set contains 2 beams and enables their spacing to up to 5 m. The IP65 allows to use these platforms in dry environment.











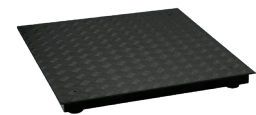

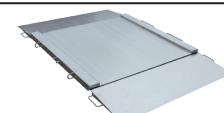

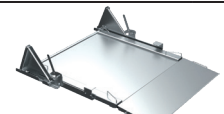

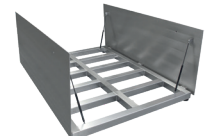

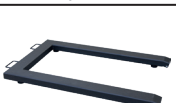
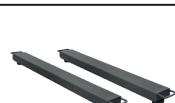


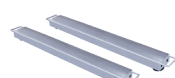
**4P2.H Series**  
waterproof beam platforms

The beam platforms are made of AISI304 stainless steel. They are designed for weighing objects of atypical and unfixed size. The set contains 2 beams and enables their spacing to up to 5 m. The IP68 allows to use these platforms in challenging industrial environment and at direct contact with water.



# HX7 Scales – Specification

Maximum capacity [Max]
Readability [d]
Minimum capacity [Min]*
Maximum possible readability for non-verified scales
1-load-cell
4-load-cell*

1-LOAD-CELL SCALES		Group	Model	Material	Platform
 +  / 	Platform scales		HX7.F1	St3S / AISI304	300 × 300 mm
			HX7.C2	St3S / AISI304	400 × 500 mm
			HX7.C3	St3S / AISI304	500 × 700 mm
 + 	Waterproof platform scales		HX7.H1	AISI304	150 × 200 mm
			HX7.H2	AISI304	250 × 300 mm
			HX7.H3	AISI304	410 × 410 mm
			HX7.H4	AISI304	500 × 500 mm
			HX7.H3/5	AISI304	400 × 600 mm
			HX7.H5	AISI304	600 × 600 mm
 + 	Waterproof and acid-resistant platform scales		HX7.H6	AISI304	800 × 800 mm
			HX7.HR2	AISI316	250 × 300 mm
			HX7.HR3	AISI316	410 × 410 mm
			HX7.HR4	AISI316	500 × 500 mm
			HX7.HR3/5	AISI316	400 × 600 mm
 + 	Platform scales		HX7.HR5	AISI316	600 × 600 mm
			HX7.4.C6	St3S	800 × 800 mm
			HX7.4.C7	St3S	1000 × 1000 mm
			HX7.4.C8	St3S	1200 × 1200 mm
			HX7.4.C8/9	St3S	1200 × 1500 mm
			HX7.4.C9	St3S	1500 × 1500 mm
	Waterproof platform scales		HX7.4.C10	St3S	1500 × 2000 mm
			HX7.4.C11	St3S	2000 × 2000 mm
			HX7.4.H6	AISI304	800 × 800 mm
			HX7.4.H7	AISI304	1000 × 1000 mm
			HX7.4.H8	AISI304	1200 × 1200 mm
 + 	Waterproof ramp scales		HX7.4.H8/9	AISI304	1200 × 1500 mm
			HX7.4.H9	AISI304	1500 × 1500 mm
			HX7.4.H10	AISI304	1500 × 2000 mm
			HX7.4N.H1	AISI304	840 × 860 mm
 + 	Waterproof ramp scales with lifted platform		HX7.4N.H2	AISI304	1100 × 1200 mm
			HX7.4N.H3	AISI304	1200 × 1500 mm
			HX7.4N.H4	AISI304	1500 × 1500 mm
			HX7.4N.H1.LD	AISI304	840 × 860 mm
 + 	Waterproof embedded scales with opened platform		HX7.4N.H2.LD	AISI304	1100 × 1200 mm
			HX7.4N.H3.LD	AISI304	1200 × 1500 mm
			HX7.4N.H4.LD	AISI304	1500 × 1500 mm
			HX7.4.H6/Z	AISI304	800 × 800 mm
			HX7.4.H7/Z	AISI304	1000 × 1000 mm
			HX7.4.H8/Z	AISI304	1200 × 1200 mm
 +  / 	Pallet and beam scales		HX7.4.H8/9/Z	AISI304	1200 × 1500 mm
			HX7.4.H9/Z	AISI304	1500 × 1500 mm
			HX7.4.H10/Z	AISI304	1500 × 2000 mm
			HX7.4P.C	AISI304	840 × 1200 mm
			HX7.4P2.C	AISI304	1200 mm length
 +  / 	Waterproof pallet and beam scales		HX7.4P2.C1	AISI304	2000 mm length
			HX7.4P2.C2	AISI304	2500 mm length
			HX7.4P.H	AISI304	840 × 1200 mm
			HX7.4P2.H	AISI304	1200 mm length
			HX7.4P2.H1	AISI304	2000 mm length
			HX7.4P2.H2	AISI304	2500 mm length

\* N/A in case of pallet and beam scales

**Compliance with ATEX directive**  
**Operation in hazardous area**  
**Stainless steel housing of high protection class**



[www.radwag.com](http://www.radwag.com)

# HX5 EX

INDICATOR FOR HAZARDOUS AREAS



## HX5.EX is an indicator intended for industry designed to be used in hazardous areas. HX5.EX is compliant with ATEX directive.

### Intended Use

HX5.EX indicator is a device used to make multifunctional weighing instruments based on load cells. It is the latest RADWAG solution intended for hazardous areas and compliant with ATEX directive. Due to its mechanical design, the HX5.EX can be used in environment filled with explosive gases and dust. It can be operated in zones: 1/21 and 2/22.

### Mechanical Design

The housing is made of AISI 304 stainless steel of IP 66/68 protection class. The indicator is equipped with a membrane keypad and 5" colour graphic display covered with polycarbonate that protects it against shocks. Hermetic, intrinsically safe interfaces connectors are located on the back side of the housing. Stable mount bracket enables mounting the indicator either on any flat horizontal surface or on the wall where its inclination angle can be easily adjusted. HX5.EX indicator is powered by intrinsically safe power supply that can be operated in both hazardous and safe areas.

### Communication Interfaces

The indicator is equipped with the following communication interfaces enabling cooperation with devices located in hazardous area:

- RS 232 × 2 (barcode scanner, data transmission),
- RS 485 (data transmission),
- IN / OUT × 4 (external keys, dosing devices control, checkweighing thresholds signalling).

The interfaces range can be expanded using communication module, connected to a terminal via intrinsically safe interface RS485, placed outside hazardous area.

### Communication Module

#### Standard design:

- Ethernet,
- RS232×2,
- USB,
- 4 IN/4 OUT - digital (external keys, dosing devices control, checkweighing thresholds signalling).

#### Optional design:

- Profibus Dp (transmission of data with PLC controllers: mass, tare),

- 4-20mA/0-10V analog output (mass value indication),
- up to 12 digital IN/OUT (external keys, dosing devices control, checkweighing thresholds signalling).

### Multifunctional Software

Indicator software allows carrying out processes such as weighing, parts counting, dosing and percent weighing. Information system is based on numerous databases: operators, products, weighings, packaging, customers. Alibi memory guarantees stored data safety. The interfaces enable cooperation between the indicator and the accessories intended for operation in hazardous and safe areas. Accessories: barcode scanners, printers, external displays, control buttons, light signalling towers and other controlling/signalling devices. The indicator can cooperate with systems for automatic process control and superior IT systems.



### Indicator

### HX5.EX

Housing	Stainless steel
IP rating by PN-EN 60529	IP66 / IP68 (1.5 m)
Certificate (hazardous area approval)	ATEX
Protection class for gases	II 2G Ex ib IIC T4 Gb
Protection class for dust	II 2D Ex ib IIIC T60°C Db
Zones	(gas) 1, 2 (dust) 21, 22
Display	5" colour, graphic 800 × 480 px
Keypad	Numeric + function keys
OIML	III
Verification units [e]	6000
Minimum voltage per verification unit	0.4 μV
Minimum impedance of load cell	80 Ω
Maximum impedance of load cell	1200 Ω
Connection of load cells	4 or 6 wires + shield
Communication interfaces	RS232x2, RS485, 4DI, 4DO
Operating temperature	-10°C ÷ 40°C
Power supply	Intrinsically safe power supply PM01.EX 100-240VAC 50/60Hz
Dimensions	340 × 231 × 120 mm



### Power supply

### PM01.EX-1

### PM01.EX-2

Housing	Stainless steel	Stainless steel
IP rating by PN-EN 60529	IP66 / IP68 (1.5 m)	IP66 / IP68 (1.5 m)
Certificate (hazardous area approval)	ATEX	ATEX
Protection class for gases	II 2G Ex eb mb [ib] IIC T4 Gb	II (2)G [Ex ib Gb] IIC
Protection class for dust	II 2D Ex tb [ib] IIIC T60°C Db	II (2)D [Ex ib Db] IIIC
Intended use	Hazardous area	Safe area
Operating temperature	-20°C ÷ 40°C	-20°C ÷ 40°C
Power supply	100-240VAC 50/60Hz	100-240VAC 50/60Hz
Dimensions	196 × 174 × 64 mm	196 × 174 × 64 mm



### Comm. module

### IM01.EX

Housing	Powder coated aluminium
IP rating by PN-EN 60529	IP66 / IP68 (1.5 m)
Certificate (hazardous area approval)	ATEX
Protection class for gases	II (2)G [Ex ib] IIC Gb
Protection class for dust	II (2)D [Ex ib] IIIC Db
Standard communication interfaces	Ethernet, RS232 × 2, USB, 4 DI, 4 DO
Additional communication interfaces	Profibus Dp, Analog module 4-20mA / 0-10V, Up to 12 DI and 12 DO
Operating temperature	-10°C ÷ 40°C
Power supply	100-240VAC 50/60Hz
Dimensions	222 × 146 × 81 mm





# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)



# Weighing Solutions for Hazardous Areas

FULL COMPLIANCE WITH ATEX DIRECTIVE



# PUE HX5.EX

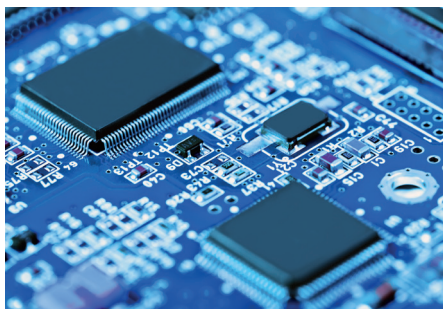
## explosion-proof hazardous area indicator



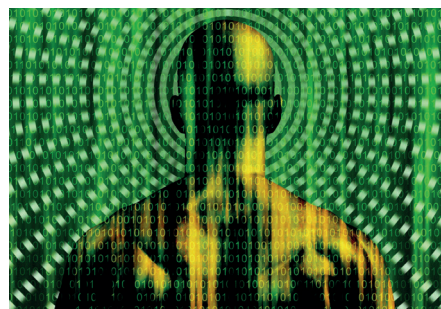
**ATEX APPROVAL**  
PUE HX5.EX is a cutting-edge weighing indicator, designed to make industrial load-cell scales that can be operated in production areas endangered with explosion, classified as zones 1, 2, 21, 22.



**VERSATILITY OF USE**  
The indicator is intended to be used under challenging environmental conditions, and in places of high hygiene standards, e.g. in chemical, pharmaceutical or food industries.



**ELECTRONICS**  
PUE HX5.EX is equipped with high-tech electronics due to which utmost precision and perfect measurement repeatability are ensured. The indicator can cooperate with system comprised of 4 load cells, where the impedance value is 350  $\Omega$ , or of 8 load cells, with 1000  $\Omega$  impedance.



**COMMUNICATION PROTOCOL**  
Complex communication protocol enables establishing communication with IT systems, and superior adjustment and control systems.



#### DISPLAY

5" colour graphic display of high resolution guarantees clear and fast presentation of displayed information on current state of carried out process. Graphic user interface features option of customization via widgets, this adds to comfort of operation.

#### KEYPAD

Large and functional 35-key keypad is equipped with programmable function keys which enable its customization.

#### SOFTWARE

Advanced software enables carrying out many operations connected with mass measurement, e.g. parts counting, checkweighing, statistics. Alibi memory guarantees stored data safety.



#### HOUSING

Robust, made of AISI304 stainless steel, guarantees IP66 / IP68 ingress protection (up to 1.5-meter deep immersion). Solid bracket enables mounting of the device either on a flat surface or wall.



#### COMMUNICATION INTERFACES

PUE HX5.EX is equipped with two intrinsically safe RS232 connectors and one intrinsically safe RS485 connector.

Possibility to install additional digital inputs/ outputs (4 IN/4 OUT) extends the range of instruments compatible with the indicator by automation components that are compliant with ATEX directive.



# Power Supply certified intrinsically safe technology

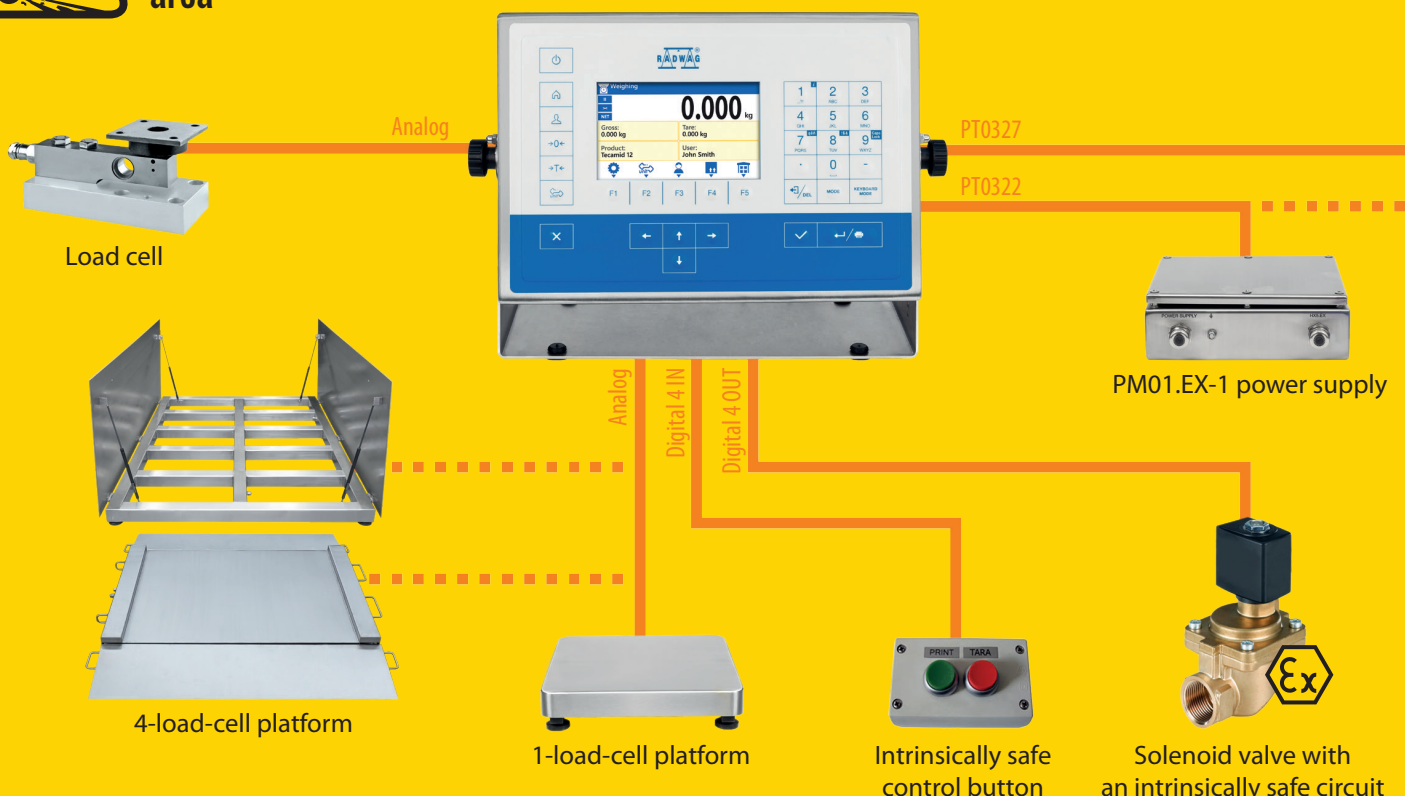
PUE HX5.EX indicator must be powered using exclusively a certified intrinsically safe Radwag PM01.EX power supply. Depending on the needs, the PM01.EX can be connected to the voltage source placed either in hazardous or safe area.

PM01.EX power supply comes in two designs:

- **PM01.EX-1:** power supply intended for operation in hazardous area:
  - Zone 1 and 2, where there is a risk of explosion due to mixture of air with vapour, mist or gas, classified as explosion group IIC, IIB and IIA and as temperature class T1, T2, T3, T4.
  - Zone 21 and 22, where there is a risk of explosion due to mixture of air with dust, flammable fibres and volatile fuels, classified as explosion group IIIC, IIIB and IIIA.
- **PM01.EX-2:** power supply intended for operation outside hazardous area, equipped with intrinsically safe circuits which may be placed in zones 1, 2, 21, 22.



**Hazardous  
area**





# Communication Module cooperation with external devices

With use of IM01.EX communication module it is possible to expand communication interfaces range of the HX5.EX indicator. The module is installed outside the hazardous area, and connected to the indicator using intrinsically safe interface.

The module facilitates cooperation with various accessories, e.g. barcode scanners, printers, displays, control buttons, light signalling towers, buzzers and other controlling/signalling devices. It enables establishing communication with systems of automatic adjustment and control of industrial processes, and with superior IT systems.

## Available designs:

- **IM01.EX-1 (standard):** 2 × RS232, USB, 4 IN/4 OUT, Ethernet
- **IM01.EX-2:** Analog output 4-20mA/0-10V
- **IM01.EX-3:** Digital 12IN/12OUT
- **IM01.EX-4:** Profibus DP
- **IM01.EX-5:** Profinet
- **IM01.EX-8:** RS485
- **IM01.EX-9:** EtherNet/IP



# 1-Load-Cell EX Scales

## remarkably fast and precise measurements

EX scales equipped with 1-load-cell platforms are designed to enable fast and precise measurement of loads, weight of which is not greater than 300 kg.

Characteristic feature of 1-load-cell platforms is use of one load cell sensor for mass measurements. The platforms are equipped with stainless steel weighing pan, their frame, depending on the model, can be made of stainless, acid-proof or powder coated steel.

### F1, C2 and C3 series

Platforms of F1, C2 and C3 series, designed with durability and reliability in mind, are relatively inexpensive devices when speaking in terms of quality they offer. These are solutions of up to 30 000 d resolution (non-verified scales). IP65 ingress protection allows to use these platforms in dry environment.

The series is intended for operation in zone 1 and 2.

### H1-H6 series

Platforms of H1-H6 series are intended to be operated either under high humidity conditions or at direct contact with water. Solid and reliable mechanical design makes them a perfect solution in food and cosmetic industries, and wherever meeting high hygiene standards is required.

The series is intended for operation in zone 1 and 2.

### HR2-HR6 Series

Platforms of HR2-HR6 series are intended to be operated under the most challenging environmental conditions, and at direct contact with both water and chemical substances. They are made of acid-proof steel providing resistance to corrosive substances used in chemical and pharmaceutical industries on a regular basis.

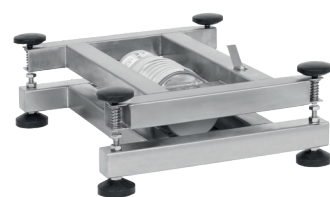
The series is intended for operation in zone 1, 2, 21 and 22.

### The main features

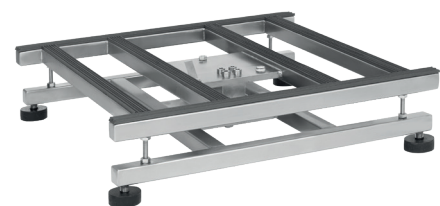
resolution	3000 d	verified scales
	up to 30000 d	non-verified scales
ingress protection	F1, C2-C3	IP65
	H1-H6	IP68
	HR2-HR5	IP68/69
material	F1, C2-C3	mechanical design St3S, platform AISI304
	H1-H6	AISI304
	HR2-HR5	AISI316
load cell	F1, C2-C3	aluminium IP65
	H1-H6	aluminium IP65, protected by silicone bellow
	HR2-HR5	stainless steel IP68/69



Platform F1



Platform H2



Platform HR3

# 4-Load-Cell EX Scales

## precise measurements of large loads

**EX scales equipped with platforms featuring multiple load cells are intended to carry out fast and precise mass measurements of large loads.**

When it comes to design of multiple-load-cell platforms, its characteristic feature is use of numerous load cells, usually four. They are made of either stainless steel or powder coated carbon steel, their design is often customized so that particular user needs are met (pallet scales, ramp scales, etc.).

### 4.C6–4.C11 series

Platforms of IP65 ingress protection, made of St3S carbon steel, and protected against corrosion via powder coating. Their tear plate surface prevents potential slip. The platforms are offered in wide range of different dimensions and maximum capacities. They can be equipped with numerous dedicated accessories (ramps, ramps for pit-version scales, etc.). These scales are intended to be operated in dry environment.

The series can be used in zone 1 and 2 (ATEX).

### 4.H6–4.H10 and 4.H6/Z–4.H10/Z series

Extremely solid and reliable platforms made of AISI304 stainless steel. Due to IP68 ingress protection they can be operated under severe industrial conditions and at a frequent contact with water. Z series features frame that is to be embedded in the ground, and opened weighing pan, which allows to maintain the device clean.

H6–H10 series is intended for operation in zone 1/21 and 2/22, and H6/Z–H10/Z in zone 1 and 2.

### 4N.H1–4N.H4 series

Low-profile platforms made of AISI304 stainless steel, and equipped with two ramps. They are perfect solution for weighing loads transported using trolleys. The IP68 ingress protection allows to use these platforms in corrosive conditions (frequent cleaning and contact with water).

The series is intended for operation in zone 1/21 and 2/22.

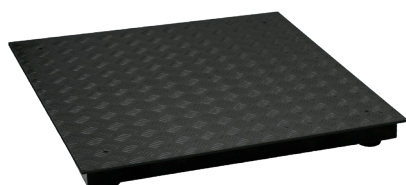
### 4P and 4P2 series

Pallet and beam scales made of carbon steel, St3S, or stainless steel, AISI304. They are designed to enable weighing of loads placed on pallets, and objects of atypical and unfixed size. These scales can be operated in challenging industrial environment.

The series is intended for operation in zones 1, 2 (St3S), and in zones 1/21, 2/22 (AISI304).

### The main features

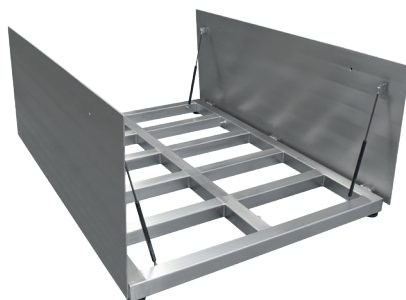
resolution	3000 d	verified scales
	up to 30000 d	non-verified scales
ingress protection	4.C6–4.C11	IP65
	4P.C, 4P2.C– 4P2.C2	
	4.H6–4.H10, 4.H6/Z–4.H10/Z	IP68
	4N.H1–4N.H4	
material	4P.H, 4P2.H–4P2.H2	
	4.C6–4.C11	St3S
	4P.C, 4P2.C– 4P2.C2	
	4.H6–4.H10, 4.H6/Z–4.H10/Z	AISI304
load cell	4N/H1–4N/H4	
	4P/H, 4P2/H–4P2/H2	
	4.C6–4.C11, 4P.C	powder coated steel IP67
	4P2.C– 4P2.C2	stainless steel IP67
	4.H6–4.H10, 4.H6/Z–4.H10/Z	stainless steel IP68
	4N.H1–4N.H4	
	4P.H, 4P2.H–4P2.H2	



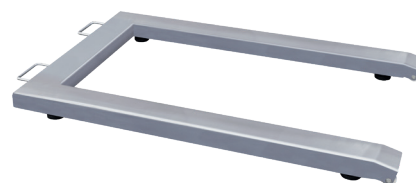
Platform C6



Platform 4N.H



Platform 4.H/Z



Platform 4P.H



# EX Zones

## classification, description, characteristics

Zone endangered with explosion risk is a hazardous area where gases, vapours and mists or dusts are mixed with air causing potentially explosive atmosphere. In accordance with 1999/92/EC directive, these zones are classified with regard to frequency of explosive atmosphere occurrence and its duration:

Explosive atmosphere caused by mixture of air and:	Hazardous area	Characteristics
gas, liquid and vapours (zone G)	Zone 0	constant explosion risk lasting for a long period of time
	Zone 1	occasional explosion risk
	Zone 2	no explosion risk during regular work, shall any occur it lasts for a short period of time
flammable dust (zone D)	Zone 20	constant explosion risk lasting for a long period of time
	Zone 21	occasional explosion risk
	Zone 22	no explosion risk during regular work, shall any occur it lasts for a short period of time

Wherever there is a risk of fire or explosion, it is necessary to use safe, respective for a particular zone, devices. The devices must allow operation in potentially hazardous environment. They must eliminate risk of fire or explosion due to electric arch, spark or high temperature.

HX5.EX series scales intended for operation in hazardous areas meet the highest safety standards. Their mechanical design prevents initiation of explosive mixtures ignition.

**General classification of devices designed to be used within hazardous area where the devices have been classified with regard to the intended use and required safety level:**

Group I	protective systems and devices intended to be used in mines, where there is methane hazard or risk of coal dust explosion
Group II	protective systems and devices intended to be used in other than mines places where there is risk of explosive atmospheres occurrence

**Devices of each group are divided into categories. When speaking of group II, the categories are:**

Category 1	devices guaranteeing very high safety level, even in case of sporadic device breakdowns, with the following safety measures taken: a) if one of the safety measures fails, the required safety level is ensured by a second independent safety solution b) required safety level is ensured in case two independent breakdowns occur
Category 2	devices guaranteeing high safety level with such safety measures taken that protection is ensured even in case of frequent breakdowns
Category 3	devices ensuring standard safety level with such safety measures taken that guarantee protection in the course of typical operation



# EX Zones classification and marking

The device intended to be operated within an area where there is risk of explosion, features CE mark and symbols classifying the device for a particular area, group and category. For explanation of EX marking symbols see the table below.

Hazardous areas classification and marking				
Flammable material	Explosion probability	Hazardous areas classification	Products classification	
			Group	Category
Gases, vapours, mists	Continuously or frequently	Zone 0	II	1G
	Occasionally	Zone 1	II	2G
	Rarely or for a short period only	Zone 2	II	3G
Dusts	Continuously or frequently	Zone 20	II	1D
	Occasionally	Zone 21	II	2D
	Rarely or for a short period only	Zone 22	II	3D

Area classification with regard to gases, vapours and mists										
Explosion group			Examples (depending on explosion group and temperature class)							
IIA	IIB	IIC	Hydrogen	Acetylene					Carbon disulfide	
			Acrylate Nitrile Town gas	Ethylene Ethylene oxide	Ethylene glycol Hydrogen sulfide	Diethyl ether				
			Ammonia Propane Ethane	Butane Ethanol	Petrol Diesel oil Hexsane	Acetalde- hyde				
			Temperature class							
			T1<450 °C							
			T2<300 °C							
			T3<200 °C							
			T4<135 °C							
			T5<100 °C							
			T6< 85 °C							
			Protection level (gases)							
			Ga	Zone 0, 1, 2						
			Gb	Zone 1, 2						
			Gc	Zone 2						



II 2G Ex ib IIC T4 Gb  
II 2D Ex ib IIC T60°C Db

Flame-proof enclosures preventing the explosion from spreading outside the enclosure	1, 2	EN 60079-1	Ex db
Increased safety preventing high temperature and ignition sparks	1, 2	EN 60079-7	Ex eb
Intrinsic safety low voltage /current	0, 1, 2, 20, 21, 22	EN 60079-11	Ex ia
Intrinsic safety low voltage /current	1, 2, 21, 22	EN 60079-11	Ex ib
Encapsulation sealing	1, 2, 21, 22	EN 60079-18	Ex mb
Hermetic housing preventing dust explosion	21, 22	EN 60079-31	Ex tb
Exemplary protection types	Zone	Standard	Code


































































Classification and marking of protection type

		Da		Zone 20, 21, 22	Protection level (dusts)
		Db		Zone 21, 22	
		Dc		Zone 22	
		Maximum surface temperature in area endangered with dust explosion			Surface temperature
IIIA	IIIB	IIIC	Volatile fuels		
			Non-conductive dust		
			Conductive dust		
Explosion group			Examples (depending on explosion group)		
Hazardous areas classification due to dusts					

Hazardous areas classification due to dusts

# Technical specifications

Maximum capacity [Max]		1,5 kg	3 kg	6 kg	15 kg	30 kg	60 kg	150 kg
Readability [d]		0,5 g	1 g	2 g	5 g	10 g	20 g	50 g
Minimum capacity for verified scales [Min]*		10 g	20 g	40 g	100 g	200 g	400 g	1 kg
Maximum resolution for non-verified scales	1-load-cell device	0,2 g	0,2 g	0,2 g	0,5 g	1 g	2 g	5 g
	4-load-cell device*						20 g	20 g

	Group	Model	Material	GASES	DUSTS	Platform							
1-load-cell scales	Platform scales F1, C2 – C3	<a href="#">HX5.EX-1.F1</a>	St3S			300 × 300 mm	•	•	•	•	•		
		<a href="#">HX5.EX-1.C2</a>	St3S			400 × 500 mm				•	•	•	•
		<a href="#">HX5.EX-1.C3</a>	St3S			500 × 700 mm				•	•	•	•
	Waterproof platform scales H1 – H6	<a href="#">HX5.EX-1.H1</a>	AISI304			150 × 200 mm	•	•	•	•			
		<a href="#">HX5.EX-1.H2</a>	AISI304			250 × 300 mm		•	•	•	•		
		<a href="#">HX5.EX-1.H3</a>	AISI304			410 × 410 mm			•	•	•	•	•
		<a href="#">HX5.EX-1.H4</a>	AISI304			500 × 500 mm			•	•	•	•	•
		<a href="#">HX5.EX-1.H3/5</a>	AISI304			400 × 600 mm			•	•	•	•	•
		<a href="#">HX5.EX-1.H5</a>	AISI304			600 × 600 mm			•	•	•	•	•
		<a href="#">HX5.EX-1.H6</a>	AISI304			800 × 800 mm					•	•	•
		<a href="#">HX5.EX-1.HR2</a>	AISI316			250 × 300 mm		•	•	•	•		
		<a href="#">HX5.EX-1.HR3</a>	AISI316			410 × 410 mm			•	•	•	•	•
		<a href="#">HX5.EX-1.HR4</a>	AISI316			500 × 500 mm			•	•	•	•	•
		<a href="#">HX5.EX-1.HR3/5</a>	AISI316			400 × 600 mm			•	•	•	•	•
		<a href="#">HX5.EX-1.HR5</a>	AISI316			600 × 600 mm			•	•	•	•	•
4-load-cell scales	Platform scales 4.C6 – 4.C11	<a href="#">HX5.EX-1.4.C6</a>	St3S			800 × 800 mm						•	•
		<a href="#">HX5.EX-1.4.C7</a>	St3S			1000 × 1000 mm						•	•
		<a href="#">HX5.EX-1.4.C8</a>	St3S			1200 × 1200 mm							
		<a href="#">HX5.EX-1.4.C8/9</a>	St3S			1200 × 1500 mm							
		<a href="#">HX5.EX-1.4.C9</a>	St3S			1500 × 1500 mm							
		<a href="#">HX5.EX-1.4.C10</a>	St3S			1500 × 2000 mm							
		<a href="#">HX5.EX-1.4.C11</a>	St3S			2000 × 2000 mm							
	Waterproof platform scales 4.H6 – 4.H10	<a href="#">HX5.EX-1.4.H6</a>	AISI304			800 × 800 mm						•	•
		<a href="#">HX5.EX-1.4.H7</a>	AISI304			1000 × 1000 mm						•	•
		<a href="#">HX5.EX-1.4.H8</a>	AISI304			1200 × 1200 mm							
		<a href="#">HX5.EX-1.4.H8/9</a>	AISI304			1200 × 1500 mm							
		<a href="#">HX5.EX-1.4.H9</a>	AISI304			1500 × 1500 mm							
		<a href="#">HX5.EX-1.4.H10</a>	AISI304			1500 × 2000 mm							
	Waterproof ramp scales 4.H6 – 4.H10	<a href="#">HX5.EX-1.4N.H1</a>	AISI304			840 × 860 mm						•	•
		<a href="#">HX5.EX-1.4N.H2</a>	AISI304			1100 × 1200 mm							•
		<a href="#">HX5.EX-1.4N.H3</a>	AISI304			1200 × 1500 mm							
		<a href="#">HX5.EX-1.4N.H4</a>	AISI304			1500 × 1500 mm							
	Waterproof pit-version scales 4.H6/Z – 4.H10/Z	<a href="#">HX5.EX-1.4.H6/Z</a>	AISI304			800 × 800 mm						•	•
		<a href="#">HX5.EX-1.4.H7/Z</a>	AISI304			1000 × 1000 mm							•
		<a href="#">HX5.EX-1.4.H8/Z</a>	AISI304			1200 × 1200 mm							
		<a href="#">HX5.EX-1.4.H8/9/Z</a>	AISI304			1200 × 1500 mm							
		<a href="#">HX5.EX-1.4.H9/Z</a>	AISI304			1500 × 1500 mm							
		<a href="#">HX5.EX-1.4.H10/Z</a>	AISI304			1500 × 2000 mm							
	Pallet and beam scales 4.P2.C – 4.P2.C2	<a href="#">HX5.EX-1.4P.C</a>	AISI304			840 × 1200 mm							
		<a href="#">HX5.EX-1.4P2.C</a>	AISI304			df. 1200 mm							
		<a href="#">HX5.EX-1.4P2.C1</a>	AISI304			df. 2000 mm							
		<a href="#">HX5.EX-1.4P2.C2</a>	AISI304			df. 2500 mm							
	Waterproof pallet and beam scales 4.P2.C – 4.P2.C2	<a href="#">HX5.EX-1.4P.H</a>	AISI304			840 × 1200 mm							
		<a href="#">HX5.EX-1.4P2.H</a>	AISI304			df. 1200 mm							
		<a href="#">HX5.EX-1.4P2.H1</a>	AISI304			df. 2000 mm							
		<a href="#">HX5.EX-1.4P2.H2</a>	AISI304			df. 2500 mm							



[illegible]

\* n/a for pallet and beam scales

Indicator	PUE HX5.EX
Housing	Stainless steel
Ingress protection by PN-EN 60529	IP66 / IP68 (1,5 m)
Certificate (hazardous area approval)	ATEX
Protection class for gases	II 2G Ex ib IIC T4 Gb
Protection class for dust	II 2D Ex ib IIIC T60°C Db
Zones	(gas) 1, 2 (dust) 21, 22
Display	5" colour widescreen display 800×480 px
Keypad	Numeric + function keys
OIML	III
Verification unit [e]	6000
Minimum voltage per verification unit	0.4 µV
Minimum impedance of load cell	80 Ω
Maximum impedance of load cell	1200 Ω
Connection of load cells	4 or 6 wires plus shield
Communication interfaces	RS232x2, RS485, 4DI, 4DO
Operating temperature	-10°C ÷ 40°C
Power supply	From intrinsically safe power supply PM01.EX 100-240VAC 50/60Hz
Dimensions	330 x 231 x 123 mm

Intrinsically safe power supply	PM01.EX-1	PM01.EX-2
Housing	Stainless steel	Stainless steel
Ingress protection by PN-EN 60529	IP66 / IP68 (1,5 m)	IP66 / IP68 (1,5 m)
Certificate (hazardous area approval)	ATEX	ATEX
Protection class for gases	II 2G Ex eb mb [ib] IIC T4 Gb	II (2)G [Ex ib Gb] IIC
Protection class for dust	II 2D Ex tb [ib] IIIC T60°C Db	II (2)D [Ex ib Db] IIIC
Area of use	Hazardous area	Safe area
Operating temperature	-20°C ÷ 40°C	-20°C ÷ 40°C
Power supply	100-240VAC 50/60Hz	100-240VAC 50/60Hz
Dimensions	196 x 174 x 64 mm	196 x 174 x 64 mm

Communication module	IM01.EX
Housing	Powder coated aluminium
Ingress protection by PN-EN 60529	IP66 / IP68 (1,5 m)
Certificate (hazardous area approval)	ATEX
Protection class for gases	II (2)G [Ex ib Gb] IIC
Protection class for dust	II (2)D [Ex ib Db] IIIC
Standard communication interfaces	Ethernet, RS232 x2, USB, 4 digital IN, 4 digital OUT
Additional communication interfaces	Analog OUT 4-20mA/0-10V, 12 digital IN/OUT, Profibus DP, Profinet, RS485, EtherNet/IP
Operating temperature	-10°C ÷ 40°C
Power supply	100-240VAC 50/60Hz
Dimensions	222 x 146 x 82 mm



# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)



# High Resolution Platforms and Weighing Modules

PRECISE MEASUREMENT IN INDUSTRY



# MODULES AND HRP PLATFORMS

## Mass Measurement with Maximum Possible Accuracy

### What is the electromagnetic module?

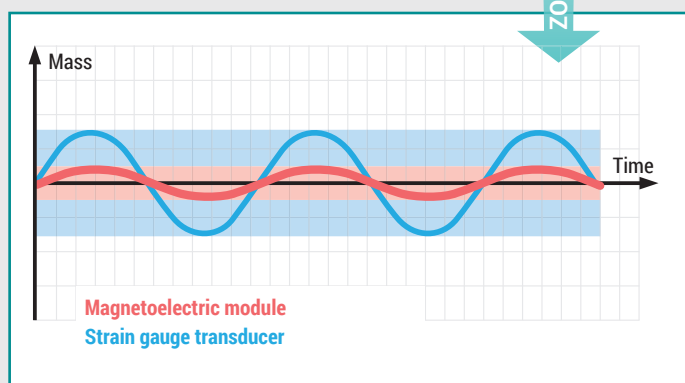
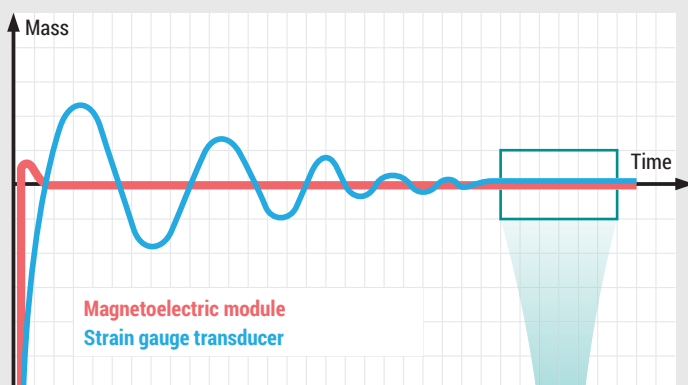
Mechanical design of magnetoelectric laboratory balances has been developed and housed in a dust and water proof casing provided for use in industry under severe conditions.

The above solution has resulted with designing of a whole product group, i.e. industrial high resolution electromagnetic weighing modules.

Special platform design plus use of electromagnetic modules for mass measurement enabled developing HRP scales.



### Magnetoelectric Module

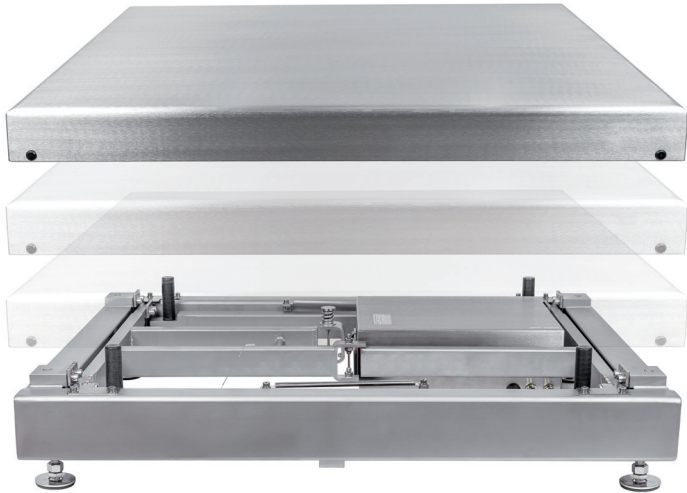


### Measurement Speed

Magnetoelectric measuring system has been equipped with hi-tech adjustment solutions which facilitate fast stabilisation. In case of strain gauge transducer use, stabilisation YES takes much more time.

### Measurement Accuracy

Magnetoelectric modules generate practically no measuring noise, this favours high resolution measurement.



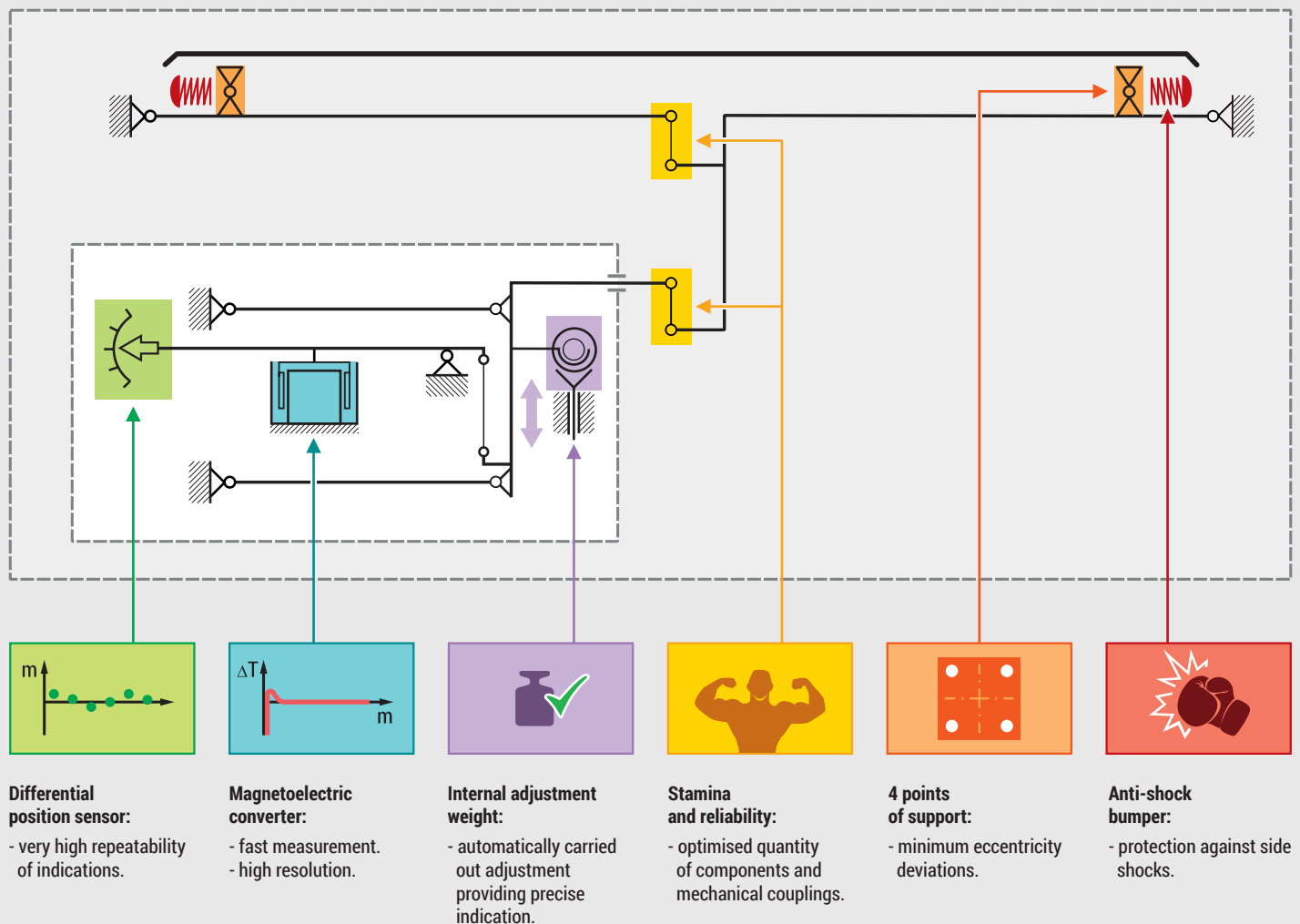
The HRP platforms enable adaptation of technology so far used exclusively in laboratory to industrial processes.

Dedicated design solutions, dust and water proof housing, vast capacity range, numerous communication interfaces and automatic adjustment mechanism redefine quality of mass measurement carried out in industry!

RADWAG-manufactured HRP platforms are intended for those who cannot rely on classic load cell platform, i.e. those who require high resolution measurement to be obtained within short time interval.

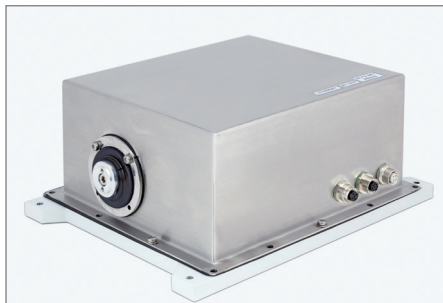
The HRP platforms facilitate performance of measurement with few hundred better accuracy than load cell platforms can offer.

## HRP Platform

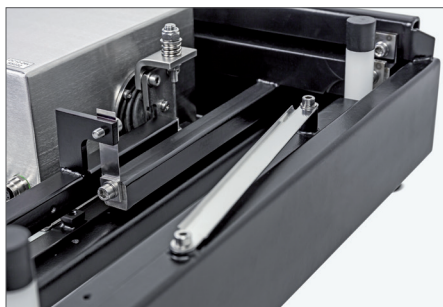
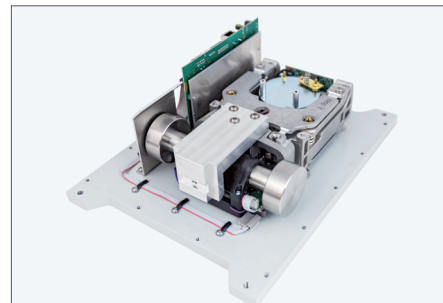


# HRP

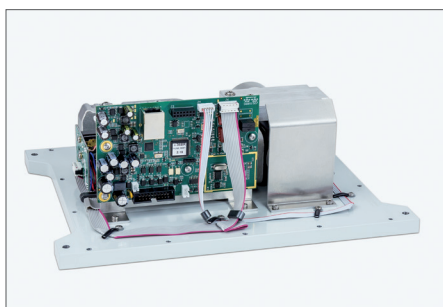
## High Resolution Weighing Platforms



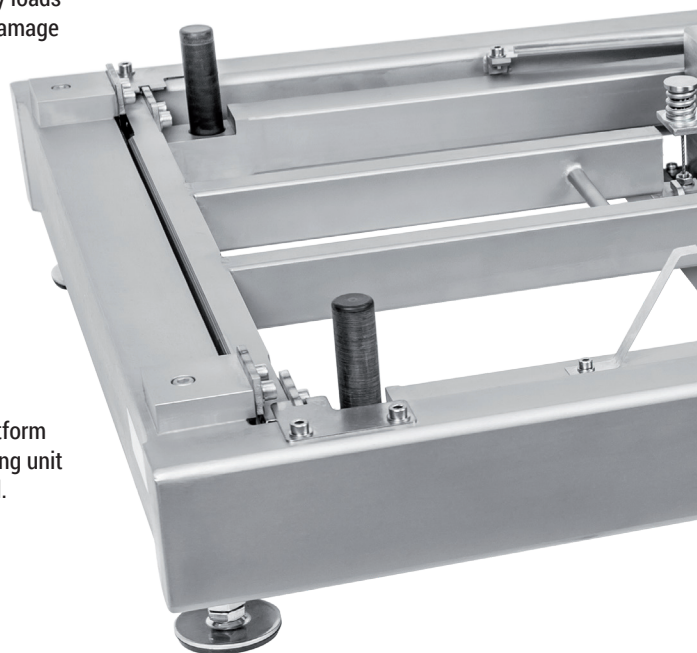
The HRP platform features electromagnetic force compensation module of high resolution. The module is housed in dust and water proof casing (IP67).



Mechanical levers system coupled to the weighing module enables precise measurement of heavy loads and facilitates resistance to damage of mechanical nature.



Integrated HRP platform's electronics store metrological parameters. With this, the platform can be an autonomous weighing unit not requiring use of a terminal.



The HRP platform has been equipped with numerous communication interfaces facilitating cooperation with computer systems, terminals, indicators, large-size displays and PLC controllers.

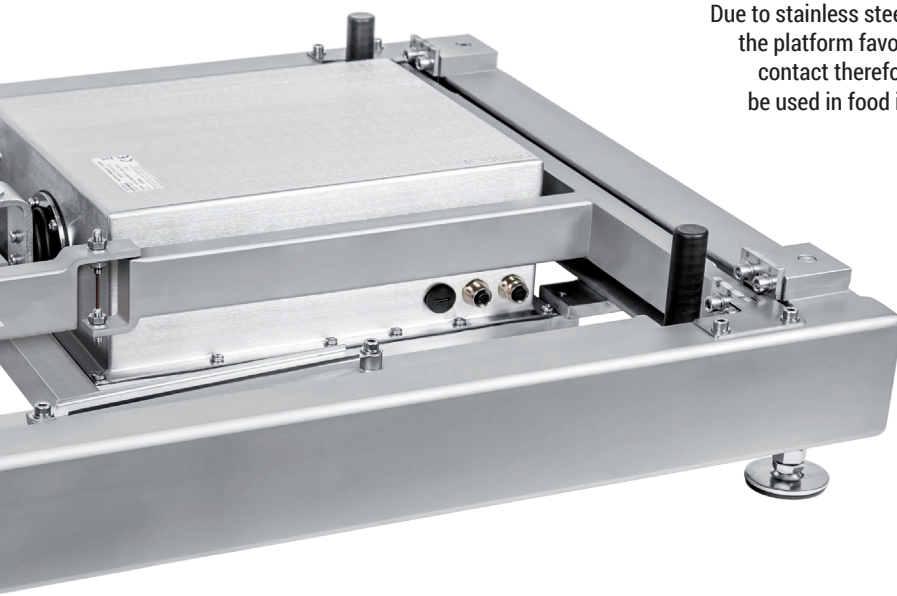
MWMH Manager PC software has been designed to support operation of HRP platforms. The software enables easy and intuitive setup.





An internal automatic adjustment system guarantees measurement repeatability and precision even for unstable ambient conditions. Adjustment is carried out upon temperature change or passage of specified time interval. It can be also performed with reference to user-defined time-table.

System protecting against overloading and mechanical shocks is a warranty of reliable and safe operation.



Due to stainless steel design the platform favours food contact therefore it can be used in food industry.



Connecting a HRP platform to a terminal enhances platform's functionality. With this you can YES advantage of numerous applications intended for industry. Go for this solution and enjoy user-friendly interface.



# INDUSTRIAL WEIGHING MODULES

## Series of Professional Magnetolectric Modules



The module features mounting holes enabling its integration into production line. As for the weighing pan, it has been equipped with openings which make installation of company-owned conveyor possible.

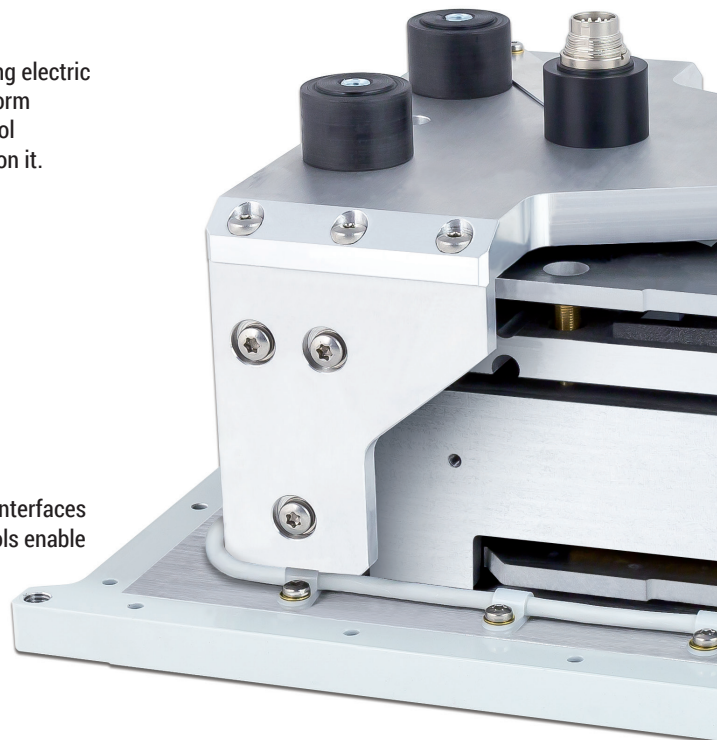
Due to innovative design solutions enabling proper measurement speed, the module can be applied in industry on automated production lines. The module provides throughput of 3200 samples per second.



With use of cable transferring electric signal to the weighing platform it is possible to install control components and actuators on it.



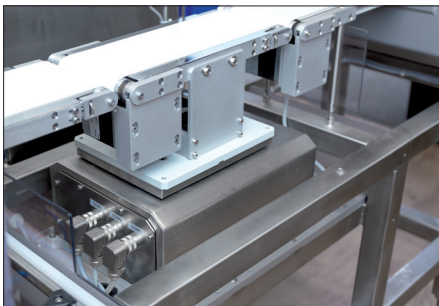
Numerous communication interfaces and communication protocols enable cooperation of weighing modules with PLC controllers, terminals, indicators, large-size displays and computers.



Weighing modules feature stainless steel housing. With IP65, IP67 or IP69K in-use, they can be operated under challenging industrial conditions. The mechanical design lacks sharp edges and recesses facilitating easy maintenance.

Fast operation of the module makes it a perfect tool for performance of dosing and checkweighing processes. Module's digital outputs enable control of devices such as valves and feeders.



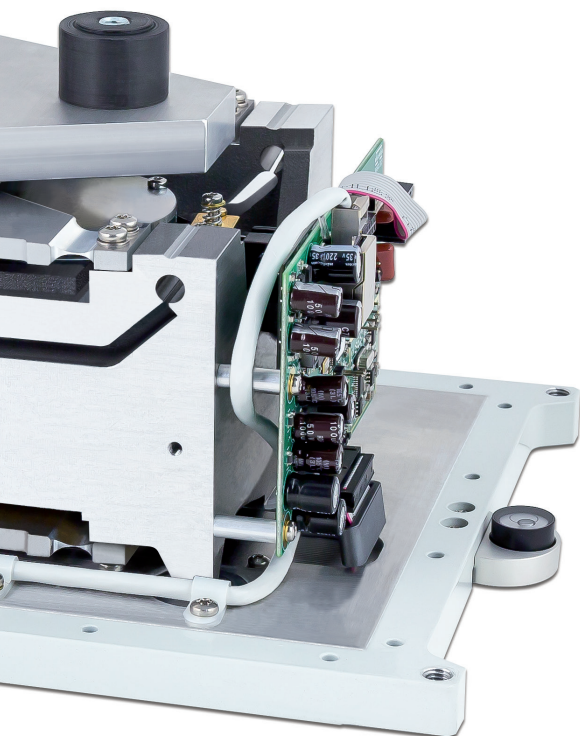


## MWSH

Max: 6 kg  
d: 0.01 g



MWSH module is the most compact device of the airtight weighing modules series. Using it you can weigh up to 6 kg heavy loads with  $d=0.01$  g. An in-built internal adjustment system is a guarantee of highly precise measurements even when the device operates in unstable ambient conditions.



## MWMH

Max: 1–10 kg  
d: 0.01–0.1 g



MWMH module allows weighing of up to 10 kg heavy loads. You can install even 15 kg conveyor on the module without worrying that the measuring range will be affected. MWMH has been equipped with cable transferring electric signal to the weighing platform. Due to this solution it is possible to control automatic systems installed directly onto the weighing pan without the need of using any external cables that might distract your attention in the course of the weighing process.



## MWLH

Max: 10–35 kg  
d: 0.01–0.1 g



MWLH module, when compared to other devices of this product group, offers the highest capacity. It is intended for precise mass measurement of products weighing up to 35 kg.



# HIGH RESOLUTION WEIGHING MODULES

## Module-Terminal Sets

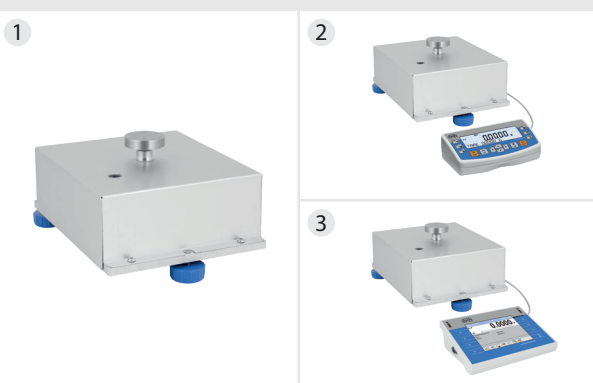
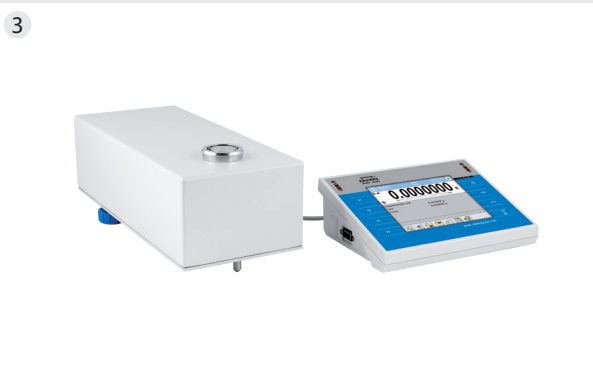
Advanced MUYA, MAS and MPS weighing modules are characteristic for high resolution measurement. They are intended to be a component of laboratory workstations and also to be integrated into production lines operating in dust-free industrial environment.

There are three different versions:

- 1 module as a stand-alone device (without the operation panel),
- 2 module with the R operation panel (weighing terminal with the LCD and the membrane keypad),
- 3 module with the Y operation panel (multifunctional weighing terminal with a 5.7" colour graphic touch screen).

Functions and features:

- ALIBI memory allowing to store weighing records,
- weighing applications: differential weighing, dosing, SQC, other,
- automatic internal adjustment providing repeatability and precise indication,
- databases: users, products, etc.,
- cooperation with printers and scanners,
- customized printouts and reports,
- quick data exchange via USB port,
- compatibility with Rad-Key, PW-WIN, E2R System and Rad Connect (3Y series exclusively).



# WEIGHING TERMINALS

## Cooperating with Platforms and Weighing Modules

Full-featured RADWAG terminals advance functionality of HRP platforms and weighing modules. 'Terminal - weighing module' or 'terminal - HRP platform' set gives you high resolution scale offering numerous applications intended for industry. The terminal communicates with the module or the platform via RS232 and Ethernet interfaces.

### PUE HY10 terminal

enables designing multifunctional scales operating in industry. It features 10.1" touchscreen housed in a stainless steel casing. With use of HY10 terminal it is possible to perform processes such as dosing, parts counting, labelling, formulations, weight control, etc. Vast range of industrial interfaces allows for integration of the terminal and production line automatics. HY10 can be a component of a multiplatform workstation comprising HRP platforms, weighing modules, laboratory balances and load cell platforms.

### PUE 5 terminal

combines characteristic features of a scale and an industrial computer. Depending on a model, it can be equipped with either 15" or 19" touchscreen and a dust and water proof stainless steel housing. PUE5 provides you with the following applications: parts counting, formulations, weighing records and transactions. These applications cooperate with E2R system, created to enable complex support of the weighing process. PUE5 operating on the basis of Windows 7 facilitates cooperation with customer-designed applications. The terminal has been equipped with set of programming components by means of which communication between customer's application and platforms or weighing modules can be established. You can use PUE5 terminal as a base for multiplatform weighing system.

### PUE HX7 terminal

is a key component of advanced industrial scales. It is equipped with 7" colour graphic display and a hermetic stainless steel housing. The terminal's multifunctional software allows carrying out processes such as weighing, parts counting, dosing, labelling and percent weighing. Complex communication protocol enables establishing communication with IT, adjustment and control systems. Option: an in-built battery facilitating flawless operation in case of no or unstable power supply.

### PUE 7.1 terminal

has been equipped with 5.7" display and a plastic housing. Both PUE 7.1 and HY10 terminals offer the same set of weighing applications. PUE 7.1 can be a component of scale operating in dust-free industrial environment.

### PUE HY10

Touch screen  
10.1"



### PUE 5

Touch screen  
15" or 19"



### PUE HX7

Screen 7"



### PUE 7.1

Touch screen  
5.7"



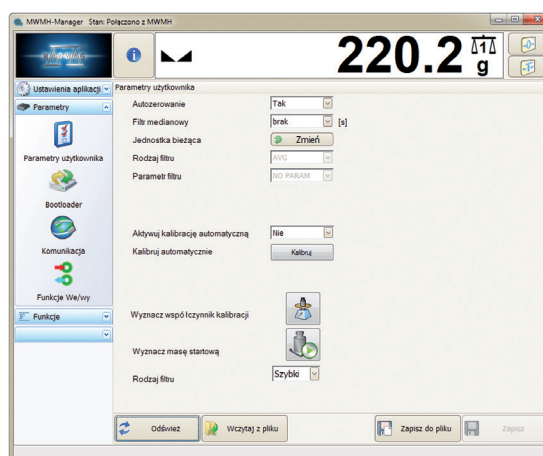
# SOFTWARE

## Dedicated for Platforms and Modules



MWMH Manager program is a tool facilitating setup of HRP platforms and weighing modules. Connection between MWMH Manager and the device is established via RS232 or Ethernet ports.

Using the program you can set communication parameters, filter rate, determine zero indication upon installation of a weighing pan and record measurements.



# ACCESSORIES

## For Platforms and Weighing Modules



Communications cable,  
power supplies



Adapter with roller  
conveyor



Ramps

RADWAG offer covers:

- positioning mat
- platform frame (pit version)
- cantilever arm
- platform frame



# TECHNICAL SPECIFICATIONS

## MAS and MPS Weighing Modules

	<b>MAS.1.21</b> <b>MAS.1.21.R</b> <b>MAS.1.21.Y</b>	<b>MAS.1.51</b> <b>MAS.1.51.R</b> <b>MAS.1.51.Y</b>	<b>MAS.1.82/220</b> <b>MAS.1.82/220.R</b> <b>MAS.1.82/220.Y</b>
Maximum capacity [Max]	21 g	51 g	82 / 220 g
Minimum capacity [Min]	1 mg	1 mg	1 mg
Verification unit	–	–	–
Readability [d]	0.01 mg	0.01 mg	0.01 mg / 0.1 mg
Tare range	- 21 g	- 51 g	- 220 g
Preload	–	–	–
Repeatability	0.02 mg	0.025 mg	0.1 mg
Linearity	± 0.06 mg	± 0.06 mg	± 0.06 mg / ± 0.2 mg
Measurement stabilization time	6 s	6 s	6 s / 2 s
Weighing pan dimensions	ø 33 mm	ø 33 mm	ø 42 mm
Internal adjustment	YES	YES	YES
Sensitivity drift	1 ppm / °C	1 ppm / °C	1 ppm / °C
Working temperature	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C
Atmospheric humidity	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%
IP rating	IP 54	IP 54	IP 54
Power supply	<b>MAS.1, MAS.1.R</b> – 12 ÷ 16 V DC   <b>MAS.1.Y</b> – 13.5 ÷ 16 V DC		
Verification	–	–	–
Display	<b>MAS.1</b> – none   <b>MAS.1.R</b> – LCD (backlit)   <b>MAS.1.Y</b> – 5.7" colour touch screen		
Interfaces	<b>MAS.1, MAS.1.R</b> – RS 232   <b>MAS.1.Y</b> – 2 × USB-A, 2 × RS 232, Ethernet, Wi-Fi®, 4 × IN / 4 × OUT		
Module material	aluminium	aluminium	aluminium
Weighing pan material	stainless steel	stainless steel	stainless steel
Module dimensions	289 × 143 × 125 mm	289 × 143 × 125 mm	289 × 143 × 125 mm

	<b>MAS 220</b> <b>MAS 220.R</b> <b>MAS 220.Y</b>	<b>MPS 2000</b> <b>MPS 2000.R</b> <b>MPS 2000.Y</b>	<b>MPS 6000</b> <b>MPS 6000.R</b> <b>MPS 6000.Y</b>
Maximum capacity [Max]	220 g	2000 g	6000 g
Minimum capacity [Min]	10 mg	20 mg	500 mg
Verification unit	–	–	–
Readability [d]	0.1 mg	1 mg	1 mg
Tare range	- 220 g	- 2000 g	- 6000 g
Preload	–	–	–
Repeatability	0.1 mg	15 mg	15 mg
Linearity	± 0.2 mg	± 4 mg	± 30 mg
Measurement stabilization time	3.5 s	3 s	1.5 s
Weighing pan dimensions	ø 42 mm	ø 115 mm	ø 115 mm
Internal adjustment	YES	YES	YES
Sensitivity drift	1 ppm / °C	2 ppm / °C	2 ppm / °C
Working temperature	+10 ÷ +40 °C	+10 ÷ +40 °C	+10 ÷ +40 °C
Atmospheric humidity	40% ÷ 80%	40% ÷ 80%	40% ÷ 80%
IP rating	IP 32	IP 32	IP 32
Power supply	<b>MAS, MPS</b> – 12 ÷ 16 V DC   <b>MAS.1.Y</b> – 13.5 ÷ 16 V DC		
Verification	–	–	–
Display	<b>MAS, MPS</b> – none   <b>MAS R, MPS R</b> – LCD (backlit)   <b>MAS Y, MPS Y</b> – 5.7" colour touch screen		
Interfaces	<b>MAS, MAS R, MPS, MPS R</b> – USB-B, RS 232   <b>MAS Y, MPS Y</b> – 2 × USB-A, 2 × RS 232, Ethernet, Wi-Fi®, 4 × IN / 4 × OUT		
Module material	aluminium	aluminium	aluminium
Weighing pan material	stainless steel	stainless steel	stainless steel
Module dimensions	248 × 180 × 117 mm	293 × 190 × 112 mm	293 × 190 × 112 mm

# TECHNICAL SPECIFICATIONS

## HRP Platforms and MW Weighing Modules

	PL.16.HRP PL.16.HRP.H	PL.32.HRP PL.32.HRP.H	PL.62.HRP PL.62.HRP.H	PL.120.HRP PL.120.HRP.H
Maximum capacity [Max]	16 kg	32 kg	62 kg	120 kg
Minimum capacity [Min]	5 g	5 g	25 g	50 g
Readability [d]	0.1 g	0.1 g	0.5 g	1 g
Tare range	- 16 kg	- 32 kg	- 62 kg	- 120 kg
Preload	4 kg	4 kg	30 kg	10 kg
Repeatability	0.1 g	0.1 g	0.3 g	0.6 g
Linearity	± 0.1g	± 0.3 g	± 1 g	± 2 g
Weighing pan dimensions	360 × 280 mm	360 × 280 mm	500 × 500 mm	500 × 500 mm
Internal adjustment	YES	YES	YES	YES
Sensitivity drift	2 ppm / °C	2 ppm / °C	2 ppm / °C	2 ppm / °C
Working temperature	+10° ÷ +40°C	+10° ÷ +40°C	+10° ÷ +40°C	+10° ÷ +40°C
Atmospheric humidity	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%
IP rating	IP 66 / 67	IP 66 / 67	IP 66 / 67	IP 66 / 67
Power supply	12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC
Interfaces	RS 485, RS 232, Ethernet / optional: Profibus, 2 × IN, 2 × OUT			
Communication protocols	Radwag protocol, ASCII, Modbus			
Platform material	powder coated aluminium, stainless steel [HRP], stainless steel [HRP.H]		powder coated steel [HRP], stainless steel [HRP.H]	
Weighing pan material	stainless steel [HRP], stainless steel [HRP.H]		stainless steel [HRP], stainless steel [HRP.H]	
Platform dimensions	360 × 313 × 170 mm	360 × 313 × 170 mm	513 × 500 × 150 mm	513 × 500 × 150 mm

	MWSH 6000	MWMH 100	MWMH 200	MWMH 500	MWMH 1000
Maximum capacity [Max]	6000 g	1000 g	2000 g	5000 g	10000 g
Minimum capacity [Min]	500 mg	2 g	4 g	10 g	20 g
Verification unit	–	0.1 g	0.2 g	0.5 g	1 g
Readability [d]	0.01 g	0.1 g	0.2 g	0.5 g	1 g
Tare range	- 6000 g	- 1000 g	- 2000 g	- 5000 g	- 10000 g
Preload	600 g	6 kg – 9 kg	4 kg – 7 kg	4 kg – 7 kg	4 kg – 7 kg
Repeatability	15 mg	0.03 g	0.05 g	0.3 g	0.5 g
Linearity	± 30 mg	0.05 g	0.1 g	0.2 g	0.5 g
Measurement stabilization time	1.5 s	1 s	1 s	1.5 s	1.5 s
Weighing pan dimensions	100 × 100 mm	212 × 174 mm	212 × 174 mm	212 × 174 mm	212 × 174 mm
Internal adjustment	YES	–	–	–	–
Sensitivity drift	2 ppm / °C	2 ppm / °C	2 ppm / °C	2 ppm / °C	2 ppm / °C
Working temperature	+10° ÷ +40°C	+5° ÷ +40°C	+5° ÷ +40°C	+5° ÷ +40°C	+5° ÷ +40°C
Atmospheric humidity	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%
IP rating	IP 65	IP65 / IP69K	IP65 / IP69K	IP65 / IP69K	IP65 / IP69K
Power supply	12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC
Verification	–	YES	YES	YES	YES
Display	–	–	–	–	–
Interfaces	RS 232, Ethernet, 3 × IN, 2 × OUT / optional: Profibus, RS 485, 2 × IN, 2 × OUT				
Communication protocols	Radwag protocol, ASCII, Modbus				
Module material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
Platform dimensions	336 × 175 × 96 mm	242.5 × 350 × 164 mm	242.5 × 350 × 164 mm	242.5 × 350 × 164 mm	242.5 × 350 × 164 mm

PL.150.HRP PL.150.HRP.H	PL.300.HRP PL.300.HRP.H	PL.300.1.HRP PL.300.1.HRP.H	PL.600.HRP PL.600.HRP.H	PL.1100.HRP PL.1100.HRP.H	PL.2000.HRP PL.2000.HRP.H
150 kg	300 kg	300 kg	600 kg	1100 kg	2000 kg
50 g	100 g	100 g	250 g	500 g	1000 g
1 g	2 g	2 g	5 g	10 g	20 g
- 120 kg	- 300 kg	- 300 kg	- 600 kg	- 1100 kg	- 2000 kg
30 kg	60 kg	60 kg	60 kg	100 kg	200 kg
1.5 g	3 g	3 g	7.5 g	15 g	30 g
± 3 g	± 6 g	± 6 g	± 15 g	± 30 g	± 60 g
800 × 600 mm	800 × 600 mm	1000 × 800 mm	1000 × 800 mm	1000 × 800 mm	1250 × 1000 mm
YES	YES	YES	YES	YES	YES
2 ppm / °C	2 ppm / °C	2 ppm / °C	2 ppm / °C	2 ppm / °C	2 ppm / °C
+10° ÷ +40°C	+10° ÷ +40°C	+10° ÷ +40°C	+10° ÷ +40°C	+10° ÷ +40°C	+10° ÷ +40°C
15% ÷ 80%	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%
IP 66 / 67	IP 66 / 67	IP 66 / 67	IP 66 / 67	IP 66 / 67	IP 66 / 67
12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC
RS 485, RS 232, Ethernet / optional: Profibus, 2 × IN, 2 × OUT					
Radweg protocol, ASCII, Modbus					

RS 485, RS 232, Ethernet / optional: Profibus, 2 x IN, 2 x OUT

Radwag protocol, ASCII, Modbus

powder coated steel [HRP], stainless steel [HRP.H]

stainless steel [HRP], stainless steel [HRP.H]

707 × 600 × 173 mm	707 × 600 × 173 mm	1011 × 800 × 175 mm	1011 × 800 × 175 mm	1011 × 800 × 175 mm	1250 × 1000 × 245 mm
--------------------	--------------------	---------------------	---------------------	---------------------	----------------------

MWLH 10	MWLH 25	MWLH 30	MWLH 35	MUYA 2.4Y	MUYA 5.4Y
10 kg	25 kg	30 kg	35 kg	2.1 g	5.1 g
0.5 g	5 g	5 g	5 g	–	–
–	–	–	–	–	–
0.01g	0.1g	0.1g	0.1g	0.1 µg	1 µg
- 10 kg	- 25 kg	- 30 kg	- 35 kg	- 2.1 g	- 5.1 g
1 kg	2.5 kg	3 kg	3.5 kg	–	–
0.01 g	0.1 g	0.1 g	0.1g	0.5 µg	1 µg
± 0.02 g	± 0.1 g	± 0.3 g	± 0.3 g	± 1.5 µg	± 5 µg
3 s	2 s	2 s	2 s	10 ÷20 s	~5 s
212 × 174 mm	212 × 174 mm	212 × 174 mm	212 × 174 mm	ø 16 mm	ø 26 mm
YES (option)	YES (option)	YES (option)	YES (option)	YES	YES
2 ppm / °C	2 ppm / °C	2 ppm / °C	2 ppm / °C	1 ppm / °C	1 ppm / °C
+10° ÷ +40°C	+10° ÷ +40°C	+10° ÷ +40°C	+10° ÷ +40°C	+10° ÷ +40°C	+10° ÷ +40°C
15% ÷ 80%	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%	15% ÷ 80%
IP65	IP65	IP65	IP65	IP32	IP32
12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC	12 ÷ 24 V DC	13.5 ÷ 16 V DC	13.5 ÷ 16 V DC
–	–	–	–	–	–
–	–	–	–	5.7" colour touch screen	

RS 232, Ethernet, 3 × IN, 2 × OUT / optional: Profibus, RS 485, 2 × IN, 2 × OUT

Wi-Fi®, 2 x RS 232, 2 x USB, 1 x Ethernet, 4 x IN, 4 x OUT

Radwag protocol, ASCII, Modbus

ASCII

stainless steel	stainless steel	stainless steel	stainless steel	aluminium	aluminium
341 × 236 × 164 mm	341 × 236 × 164 mm	341 × 236 × 164 mm	341 × 236 × 164 mm	248 × 180 × 117 mm	293 × 190 × 112 mm



**Redefined accuracy for heavy loads weighing**  
**Reliability under challenging working conditions**  
**Automatic adjustment system**



www.radwag.com

# HRP

## New Series of High Resolution Platforms

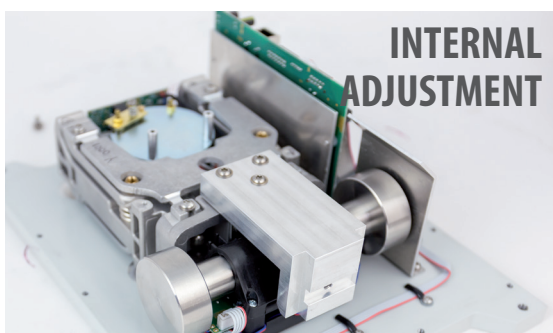
PRECISE MEASUREMENT IN INDUSTRY

### HRP PLATFORM DESIGN



HRP platforms have been designed on the basis of electromagnetic mechanisms. They provide accuracy typical for laboratory measurement.

### INTERNAL ADJUSTMENT



An internal automatic adjustment system guarantees measurement repeatability and precision even under changing ambient conditions.

### HIGH IP RATING



High IP rating, IP67, facilitates operation under the most challenging working conditions such as high humidity and heavy dustiness.

### TERMINALS



The HRP platforms can cooperate with PUE 5, PUE HY10 and PUE 7.1 terminals.

### Redefined Weighing Accuracy

The HRP is a brand new series of high resolution weighing platforms designed to operate in challenging industrial environment. The platforms enable performance of measurement with resolution so far available for laboratory balances exclusively.

### Up-to-date Technology of Electromagnetic Modules

The HRP platform features electromagnetic force compensation module facilitating highly precise measurement. Due to an in-built adjustment mechanism the module guarantees both accuracy and repeatability even for changing ambient conditions.

### Wide Capacity Range

The HRP platforms offer wide capacity range starting from a dozen or so kilograms. With this you can select a device that perfectly suits your needs.

### Intended for Industry

Powder coated or stainless steel mechanical design and IP67 in-use allow operation even under the most challenging working conditions. System protecting against overloading and mechanical shocks is a warranty of smooth and effective operation.

### Vast Range of Communication Ports

The HRP series platforms are independent workstations ensuring precise mass readout and flawless performance of manufacturing processes. Equipped with numerous communication interfaces they can communicate with computer systems, terminals, indicators, large-size displays and PLC controllers.

### PC Software

MWMH Manager is a PC software designed to support operation of HRP platforms. It comes standard with the platform and makes its setup easy and intuitive.



### HRP

Maximum capacity [Max]	16 kg - 2000 kg
Readability [d]	0.1 g - 20 g
Preload	4 kg - 200 kg
Platform	360×280 mm - 1250×1000 mm
Adjustment	internal (automatic)
IP Rating	IP67
Interfejsy	RS 232, RS 485, Ethernet
Optional communication interfaces	2×IN, 2×OUT, Profibus
Communication protocols	ASCII, Radwag, Modbus
Processes control	Dosing, Checkweighing
Construction	Powder-coated steel / stainless steel



Module designed for special tasks  
Simple integration into a production line  
Fast and precise measurement



www.radwag.com

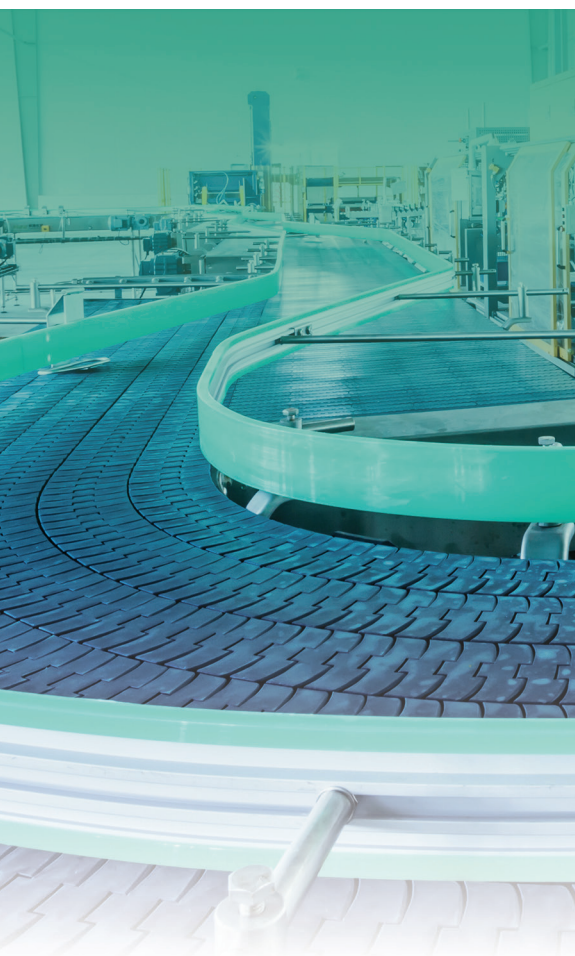
# Magnetoelectric Weighing Modules

PROFESSIONAL MODULES INTENDED FOR INDUSTRY



# MAGNETOELECTRIC WEIGHING MODULES

## Adaptation to industrial environment Cooperation with external devices



### Vast Max Capacity Range

Magnetoelectric weighing modules are intended for mass measurement ranging from 2g to 35kg. Minimum readability of 0.01g guarantees amazing accuracy for your measurement.

### Ease of Installation

Compact dimensions and ergonomic installation handles enable easy and fast integration of the module into a production line. Innovative internal design allows control of automation systems installed directly on a weighing pan. Applied solution, i.e. system transferring electric signal to the weighing platform, eliminates necessity to feed external cables disturbing the weighing process.

### Fast and Precise Measurement

High measurement accuracy with  $sd=1d^*$  guarantees both readout of real weighing results and repeatability of indications. Cutting-edge design solutions provide fast measurement which is an asset allowing to install the module on automated production lines. Intended for fast and dynamic measuring processes the weighing module's converter throughput is 3200 meas./s<sup>\*\*</sup>.

### Internal Auto-Adjustment

A built-in system of automatic internal adjustment guarantees correct weighing results even for the highest readability. Adjustment is carried out within specified time intervals or with reference to a schedule, it can also be triggered by temperature change. Option of adjustment time setup enables adapting adjustment processes to production line schedule.

### Protection Against Challenging Conditions

Hermetic versions of modules feature stainless steel housing with IP65. This allows operation even in the most challenging conditions. Mechanical design lacks sharp edges and gaps which ensures adherence to HACCP, GMP and FDA standards for safety and quality of operation.

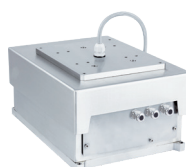
### Cooperation with terminals

Connecting the module to a multifunctional weighing terminal expands communication interfaces range and increases usage in industrial applications.

\* repeatability is expressed as standard deviation from 10 weighing cycles



**MWSH**



**MWMH**



**MWLH**

Maximum capacity [Max]	6 kg	1 kg - 10 kg	10 kg - 35 kg
Readability [d]	0.01 g	0.1 g - 1 g	0.01 g - 0.1 g
Verification unit [e]	—	0.1 g - 1 g	—
Preload	600 g	4 - 9 kg	1 kg - 3.5 kg
Weighing pan dimensions	100×100 mm	212 × 174 mm	212 × 174 mm
IP rating	IP65	IP65	IP65
Adjustment	Internal (automatic)	External	External
Communication interfaces	RS 232, RS 485, Ethernet, 2×IN, 2×OUT	RS 232, Ethernet, 2×IN, 2×OUT	RS 232, RS 485, Ethernet, 2×IN, 2×OUT
Optional communication interfaces	Profibus		
Communication protocols	Radwag, text ASCII, Modbus		

<sup>\*\*</sup>option

Compact design  
High measurement precision  
Easy integration with measuring devices and into a production line



# Magnetoelectric Weighing Modules

PROFESSIONAL HIGH RESOLUTION MODULES



# MAGNETOELECTRIC WEIGHING MODULES

## Possibility of installation at any place Cooperation with peripheral devices



### High Resolution

High resolution is the characteristic feature of the advanced line of MAS, MPS and MUYA weighing modules. Their operation is based on an EMFC converter. The modules are intended to be a component of laboratory workstations and to be integrated into production lines.

### Ease of Integration

MAS and MPS's designs enable fast and easy installation at any surface. A weighing terminal is connected to the modules with up to 5-metre long cable facilitating ergonomics of use. Both modules offer option of under-pan weighing.

### Precise Measurement

Auto adjustment system ensures accuracy even under changing ambient conditions. The most precise measurement is guaranteed thanks to repeatability of  $sd \leq 1d^*$ .

### Customized Control Panels

Weighing modules are offered with R or Y control panels. The first one has been equipped with LCD and its functionality is equal to functionality of a standard laboratory balance. The second is a multifunctional weighing terminal providing you with applications such as formulations, checkweighing, SQC and differential weighing.

### Databases and Alibi Memory

Both panels, R and Y, feature internal databases of products and operators. The databases are secure thanks to implemented modules of ALIBI memory. The panels, being functional devices, provide you with option of easy data import and export.

### Communication Interfaces

Offered range of available interfaces enables connecting the printer, fast transfer of data using USB flash drive and cooperation with PC software.

\* repeatability is expressed as standard deviation from 10 weighing cycles



**MAS.1**  
**MAS.1.R**  
**MAS.1.Y**



**MAS**  
**MAS R**  
**MAS Y**



**MPS**  
**MPS R**  
**MPS Y**



**MUYA 4Y**

Maximum capacity [Max]	21 g - 220 g	220 g	6000 g	2.1 g – 5.1 g
Readability [d]	0.01 mg – 0.1 mg	0.1 mg	10 mg	0.1 µg – 1 µg
Display	<b>MAS.1, MAS, MPS:</b> none; <b>MAS.1.R, MAS R, MPS R:</b> LCD (backlit); <b>MAS.1.Y, MAS Y, MPS Y, MUYA 4Y:</b> 5.7" colour touch screen;			
Adjustment	Internal (automatic)			
Weighing pan dimensions	ø 33 mm – ø 42 mm	ø 42 mm	ø 115 mm	ø 16 mm – ø 26 mm
Interfaces	<b>MAS.1:</b> RS 232 <b>MAS, MPS:</b> USB-B, RS 232 <b>MAS.1.R, MAS R, MPS R:</b> RS 232 <b>MAS.1.Y, MAS Y, MPS Y, MUYA 4Y:</b> 2×RS 232, 2×USB-A, Ethernet, 4xIN, 4xOUT, Wi-Fi®			

Wi-Fi® is a registered trademark of Wi-Fi Alliance.



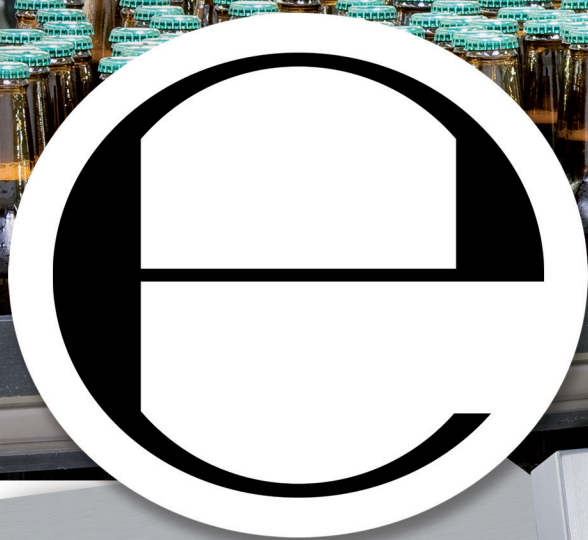


# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)

Adherence to law regulations  
Information safety  
Intuitive operation



www.radwag.com

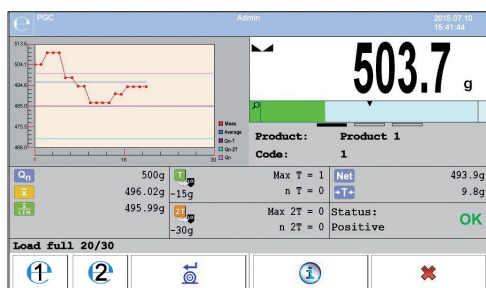
# PGC

Prepackaged  
Goods Control

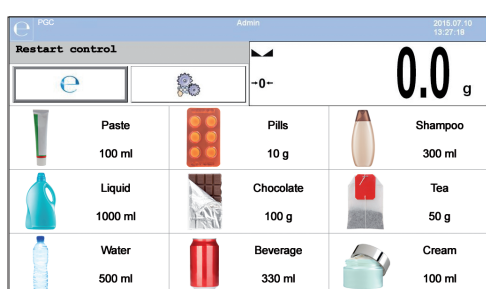
STATISTICAL CONTROL

## Law-accordant and internal control criteria

### Non-destructive and destructive control



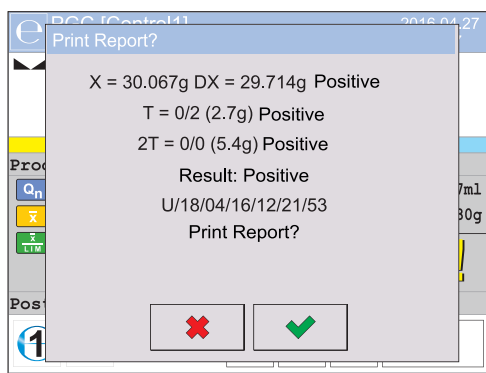
PGC control, HY10.PGC.H



HY10.PGC.H Scale's Home Screen

Timestamp	Weight	Status
1. 2015.07.10 15:36:35	499.4g	Positive
2. 2015.07.10 15:37:28	492.3g	Positive
3. 2015.07.10 15:37:32	492.3g	Positive
4. 2015.07.10 15:38:19	498.1g	Positive
5. 2015.07.10 15:38:20	498.0g	Positive
6. 2015.07.10 15:38:21	498.0g	Positive
7. 2015.07.10 15:38:21	498.0g	Positive
8. 2015.07.10 15:38:21	498.0g	Positive
9. 2015.07.10 15:38:21	498.0g	Positive
10. 2015.07.10 15:38:22	498.0g	Positive
11. 2015.07.10 15:38:22	498.0g	Positive
12. 2015.07.10 15:38:22	498.0g	Positive
13. 2015.07.10 15:38:22	498.0g	Positive
14. 2015.07.10 15:38:22	498.0g	Positive
15. 2015.07.10 15:38:23	498.0g	Positive
16. 2015.07.10 15:38:23	498.0g	Positive

PGC weighings carried out by means of HY10.PGC.H scale



Control completion screen on WLY/PGC and WPY/PGC scales

#### Versatile Use of PGC Control Scales

PGC control scales are used in food, chemical, pharmaceutical and cosmetic industry wherever statistical control is a must.

#### Adherence to International Law Regulations

Software accordant with Polish law on prepackaged goods control, PGC Law of 7th May 2009 (OJ No. 91, item 740), Directive 76/211/EEC and WELMEC 6.4 Guide titled "Guide for Packers and Importers of e-marked Prepacked Products".

#### Innovative Solutions for Control Scales

PGC control scales have been equipped with high-tech colour touchscreen providing perfect readability even in low light conditions. Clear menu arrangement improves performance and adds to maximum comfort of operation.

#### Independent Operation of PGC Scales

PGC scales operation is based on local database whereas computer database is a source of information on operators, products and time schedules for scales cooperating in a network.

#### Authorized Access Control

Access levels to particular functions, defined individually for particular users, prevent interference of unauthorized operators.

#### Databases Management

Option of adding, deleting, and editing local products, operators and time schedules database.

#### Safe Mechanisms for Data Record and Storage

Upon control completion final report featuring all necessary data is saved. Control and average tares reports can be printed or recorded to USB flash drive.

#### User-friendly Interface

At each control stage important control-related information is displayed, with this comfort of operation is guaranteed.

#### Optimization and Production Cost Reduction

Declaring tolerance high threshold allowing to maintain control over product giveaway.

#### Internal Criteria

PGC scales offer option of carrying out control in accordance with internal criteria, including tolerance thresholds. The said option enables adaptation of the whole control process to internal regulations and operations performed by the customer.

#### Various Methods of Batch Assessment

Using the scale it is possible to perform control by means of few methods (non-destructive average tare, non-destructive empty-full and destructive full-empty).

#### Performance Boost

The scale facilitates performance of two concurrent controls, restarted upon power supply loss.

#### Controls Schedule

Going according to a predefined control schedule or cyclic control of selected products within specified time interval.

#### Auto Reminders

By means of prompts displayed on a screen or on an external signaling device the scale reminds you about necessity to carry out a measurement in the course of control. You are also prompted when it is time to start the control.

#### Average Tare Estimation Module

An in-built tare estimation module enables performance of average tare control directly prior product control, it also facilitates cyclic supervision within predefined time interval.



## PC Software PGC Viewer

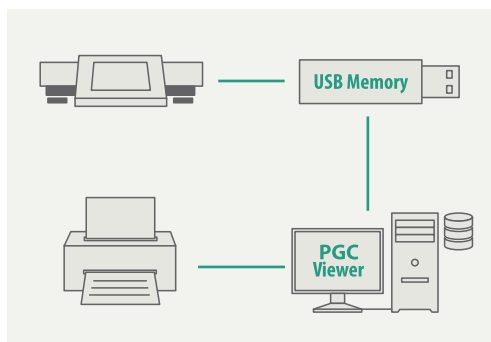


Diagram of data acquisition carried out by means of PGC Viewer

**PGC Viewer** is an application designed to support workstations for prepackaged goods control. Using the application you can preview and print reports on accomplished controls of prepackaged goods and reports on controls of tare.

<div>      3 z 3   Defined column </div>	
	Controls
	CONTROL REPORT NO. U/07/07/06/13/16
	CONTROL REPORT NO. U/07/07/06/13/16
▶	CONTROL REPORT NO. Z/07/07/06/15/55

PC Software PGC Viewer

## E2R PGC An integrated module

### Modular E2R Software

E2R PGC module of a modern, fully integrated weighing system, E2R, is a tool providing you with maximum security. The system, due to innovative modules characteristic for their extensive functionality, enables automation, full support and control of the manufacturing processes.

Advanced functions facilitate monitoring of current devices state, remote control start and preview of complex analysis, i.e. reports and charts, of archive controls.

Cutting-edge technology is a warranty of faultless system operation and stored data safety. Data recorded on a balance is sent to a computer database based on Microsoft SQL server. By means of E2R PGC application it is possible to control particular users access to the system.

When it comes to exchange of data, the system offers option of cooperation with external IT systems. All the above plus user-friendly environment add to your comfort.

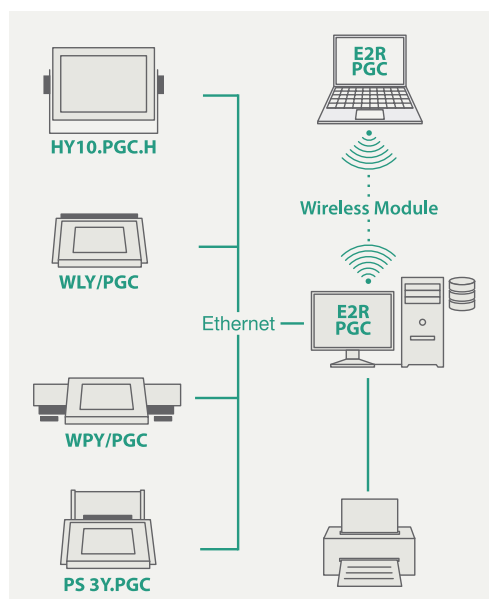
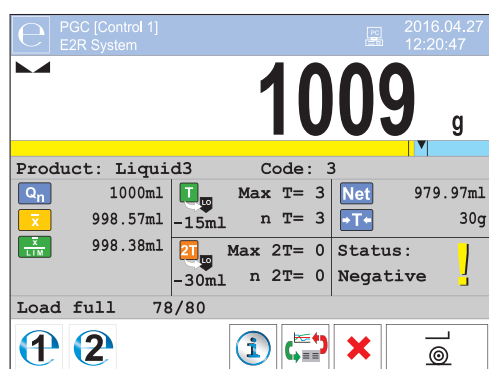
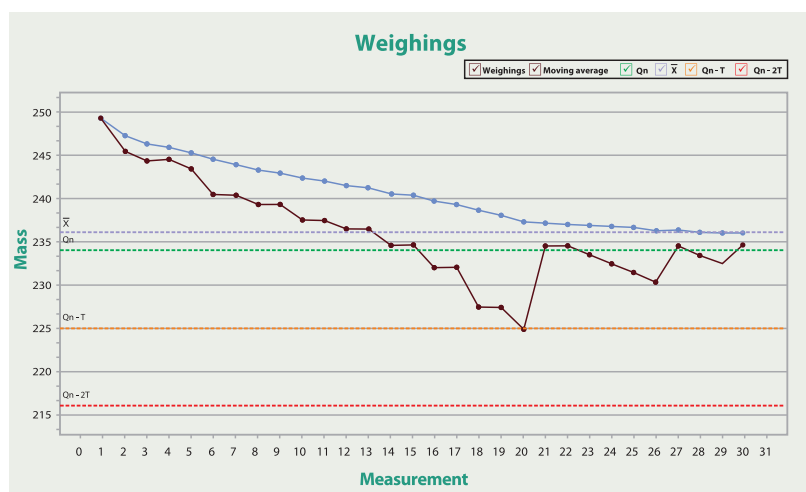


Diagram of E2R PGC system



PUE 7.1 Home Screen



Online preview of measurements



### Scales for Statistical Control - Wide Range of Maximum Capacities

Max capacity of scales for statistical control ranges from 0.6g to 120kg, accuracy starts from 10mg.

### Reliability and Hygiene in Challenging Working Conditions

Stainless steel mechanical design and IP68/69 in-use facilitate operation of HY10.PGC.H under challenging industrial conditions such as great dust and high humidity. These two characteristics make the scales meet high hygiene standards for food and pharmaceutical industries.

### Ergonomics and Comfort of Operation

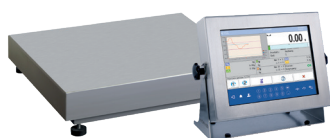
Due to compact and ergonomic design, access to the interfaces of WPY/PGC scales is convenient. The device can be operated using barcode reader, transponder card reader and IR sensors. This enables touch free operation of the workstation.

### Redefined Accuracy

WLY/PGC series is intended for fast and precise mass measurement under both laboratory and industrial conditions, wherein the readability is even 0.01g.

### Professional Weighing and the Highest Measurement Accuracy

With the highest possible weighing accuracy and measurement repeatability of  $sd < 1$ , the PS 3Y.PGC redefines quality of mass measurement. Control over the right scale's level is carried out by means of a semi-automatic levelling system. An in-built system for ambient conditions monitoring facilitates control of the workroom. As for the measurement accuracy it is provided with auto adjustment function.



**HY10.PGC.H**



**WPY/PGC**



**WLY/PGC**



**PS 3Y.PGC**

OIML accuracy class	III	III	II	II
Maximum capacity [Max]	1.5 kg - 60 kg	0.6 kg - 60 kg	0.6 kg - 120 kg	750 g - 2500 g
Verification unit [e]	0.5 g - 20 g	0.2 g - 20 g	0.1 g - 20 g	0.01 g - 0.1 g
Stabilization time	2 s - 3 s	2 s - 3 s	3 s	1.5 s - 2 s
Automatic adjustment	○	○	○	●
IP rating	IP 68/69	IP 43	IP 43	IP 43
Display	10.1" touchscreen	5.7" touchscreen	5.7" touchscreen	5.7" touchscreen
Weighing pan dimensions	150×200 mm, 250×300 mm, 410×410 mm	195×195 mm, 300×300 mm, 400×500 mm	195×195 mm, 360×290 mm, 400×500 mm	128×128 mm, 195×195 mm
Communication interfaces	2×RS 232, 2×USB, Ethernet, 4×IN, 4×OUT*	2×RS 232, 2×USB, Ethernet, 4×IN/OUT (digital), Wi-Fi®	2×RS 232, 2×USB, Ethernet, 4×IN/OUT (digital), Wi-Fi®	2×RS 232, 2×USB, Ethernet, 4×IN/OUT (digital), Wi-Fi®

\*HY10.PGC.H – optional interfaces: up to 12xINs, up to 12xOUTs, Profibus, Modbus, Wi-Fi®, RS 485, analog outputs: 4-20mA, 0-20mA, 0-10V

| Wi-Fi® is a registered trademark of Wi-Fi Alliance.



# Checkweighers

INNOVATIVE TECHNOLOGIES FOR INDUSTRY



# Functionality

## POSSIBILITIES AND ADVANTAGES OF RADWAG CHECKWEIGHERS

### ADVANCED FUNCTIONALITY AND POSSIBILITIES FOR ENSURING MAXIMUM BENEFITS

**Radwag checkweighers have been designed to meet the highest demands of users.**

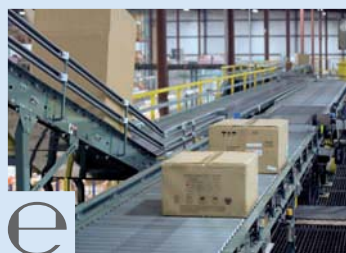
Not only do they ensure control and optimization of the production process but also minimise loss and provide significant cost reductions.



Magneto-  
electric  
weighing  
module



Belt  
conveyors



PGC:  
Packaged  
Goods  
Control

### The highest weighing precision and mass control

- 0.01 g accuracy.
- Electromagnetic module developed by Radwag.
- Dedicated solutions for pharmaceutical industry.

### Throughput and speed

- Shorter operating time - greater line productivity.
- Minimisation of production downtime.
- Economy - raw material loss reduction.
- Impressive operating speed achieved thanks to Radwag's innovative technology.

### High quality

- IP67 protection rate.
- Materials: AISI 304 or AISI 316 steel.
- Quick assembly and installation.
- The maintenance and cleaning process of the mechanical parts is simple and fast.
- Components protected against adverse external conditions.

## Vast range of functions

- Data control and protection.
- Customisation of the control type according to user demands.
- 100% control of products.
- Batching processes control via feedback.
- Alibi storage.
- Interfaces: Ethernet, Profibus, USB, Wi-Fi.
- Multilingual, intuitive menu of the device.
- Multi-product.

## Control process management: E2R system

- Option of creating multi-workstation networks.
- Keeping records of data stored in scales.
- Exporting data to external systems.

## Production safety

- HACCP - food industry attestation for direct contact with food products.
- Protection of out-of-tolerance products that have been rejected.
- Protection of the scale moving elements.
- Removal of metallic impurities with the use of metal detectors.

## Accordance with the quality standards

- MID - directive on measuring instruments.
- OIML R51 - in accordance with the test procedures.
- HACCP - system of hazard and critical control points analysis.
- PGC - accordance with the legal requirements of Packaged Goods Regulation.
- GMP - Good Manufacturing Practice.
- FDA - guidelines of US Food and Drug Administration (CFR21).

## Modular construction

- Easily expandable.
- Light and sound signaling.
- Individual selection of the discriminators and bins for out-of-tolerance products.
- Cooperation with metal detectors, label printers, bar code scanners, proximity card readers.

E2R system:  
PC software  
for process  
control  
management



Pressure  
control  
sensor



Line with belt  
conveyors and  
roller conveyors  
with a pneumatic  
rejecter



Open design,  
offering simplicity  
for maintenance  
and cleaning



Metal and  
metallic  
compounds  
detector



Vertical, flexible  
system of side  
guides used  
for transporting  
bottles



# Communication and maintenance

## SOFTWARE AND COMMUNICATION INTERFACE

WIDE RANGE OF CONFIGURATION OPTIONS  
AND USER OPTIONS TOGETHER WITH  
THE SIMPLICITY OF MAINTENANCE

**Large touch screen and intuitive, user friendly menu** ensure ease of operation and quick way of completing specific tasks.



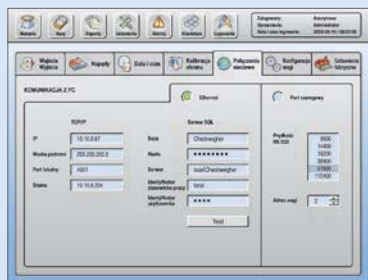
Interfaces: Ethernet  RS 232  USB 



Communication  
interfaces ports  
of DWM scales



Communication  
interfaces ports  
of DWT scales



Configuration  
window  
of network  
connections

### Ethernet

- Full data exchange.
- Sending weighing records, databases, scales settings; real-time monitoring of scales operation.
- Communication realized both: via the communication protocol and at SQL Server database level.

### USB

- Cooperation with mass storage devices, external drives etc.
- Exporting batch reports and weighing data.
- Software updates.

### RS 232

- Cooperation with peripheral devices:
  - Label and receipt printers.
  - Thermal and ink-jet printers.
  - Bar code readers.

### PLC Controller

- Exchange of both: binary data or analogue operating signals.



## The main window of the program

- Clear screen layout.
- Various views of the displayed data, user-configurable.
- Intuitive menu.
- Process progress indicators.
- Quick access to statistical data.
- Report export and data export directly from the scales.

## Operating modes

- Various operating modes and systems of reporting:
  - statistical mode,
  - dynamic mode,
  - CPG control (conformable to Packaged Goods Regulation),
  - CPG control in accordance with custom criteria,
  - measurements registration.

## Configuration

- Quick adaptation of scales to working conditions.
- Easy setup of belt speeds with the use of scrollbars.
- Configurable parameters of products rejection, signalization and cooperation with other production line devices (e.g. batchers).

## Diagnostics

- Automatic control of all the systems and scale elements.
- Continuous control from the start of the device.
- Recording all errors and breakdowns in the error log.
- Control of other production line devices, with alarming function in the case of production disturbance.

## Operators control

- Defining operators access rights.
- Multiple levels of access control for selected functions, defined by administrator.

## Database system

- Database based on SQL system.
- Easy configuration and data exchange with computer systems.
- Start-up configuration of the pre-defined data enables immediate device initiation.
- Quick access to configuration settings.
- Reliability and failure-free operation.

The main weighing window with signalisation of the thresholds and statistics



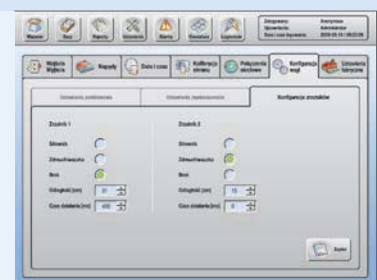
Settings window of signal inputs and outputs



Settings window of drives operation and conveyors speed



Configuration window of faulty products rejecters



Database window for assortment preview and selection

Nazwa produktu	Kod produktu	Masa nominalna	Ten.
Chlebki w paczce	127	40.2	5.28
Herbatki granulowane Mielone	128	100.0	5.35
Herbatki granulowane oryginalne	129	100.0	5.35
Herbatki granulowane powiazane	130	100.0	5.34
Kawa granulowana Extra Good	131	50.2	5.35
Kawa granulowana Double	132	50.2	5.35
Luszczyki ziemniaczane kruszone	133	400.0	5.40
Mleko w paczce	134	1000.0	5.10
Sladki proszek mleczny	135	80.0	5.35
Sladki proszek 70% Sposob	136	40.0	5.35

Database window for editing selected products



# Versatile possibilities

## CHECKWEIGHERS WITH ELECTROMAGNETIC WEIGHING MODULE

### Mechanical options

- Central control system.
- Conveyor systems adjusted to the user needs.
- Design adapted to existing production lines.
- Various lengths and width of the conveyors.
- Stainless steel or powder coated mild steel design.
- Optional equipment: metal detectors, barcode scanners, video cameras, extra display etc.
- Ingress Protection rating – IP 65/67.

### Products separation systems

- Air-blast rejecter.
- Pneumatic pusher.
- Diverting arm.
- Drop belt rejecter.
- Production line stop.

### Communication

- USB mass storage devices.
- Implemented communication protocol.
- Cooperation with the thermal and ink-jet printer.
- Support for printers compatible with the Windows OS.
- Interfaces: Ethernet, USB, RS 232, optionally RS 422 and RS 485.
- Profibus DP.
- Data exchange at the SQL level.
- Extended I/O module.

### Accessories

- Side guides.
- Transition plates between the conveyors.
- Slat band conveyors.
- Barcode readers support.
- Additional infeed conveyor systems
- Vertical speeding side guides.
- Table tops for rejected products.
- Storage bins.
- Roller conveyor tops.

12" COLOUR  
TOUCH SCREEN DISPLAY

COMMUNICATION INTERFACES  
IN HERMETIC PORTS

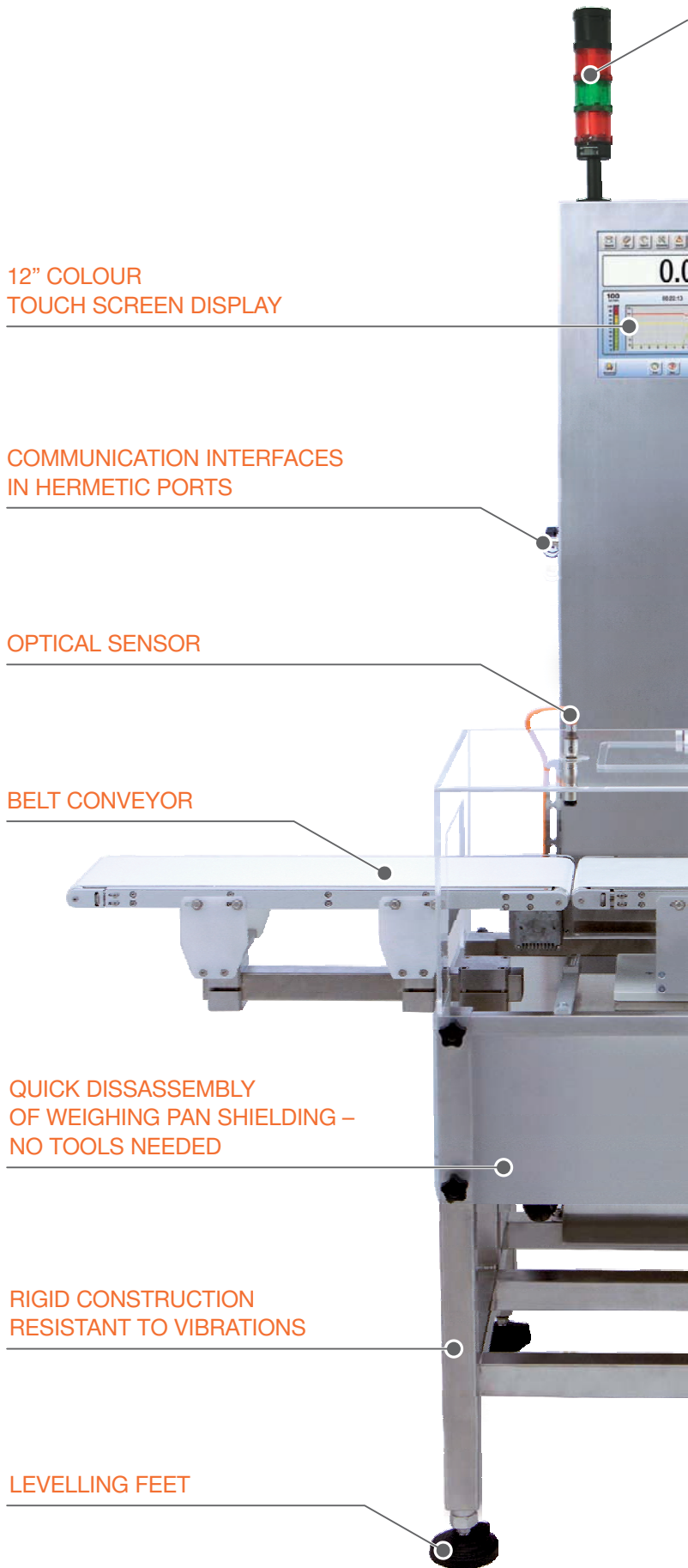
OPTICAL SENSOR

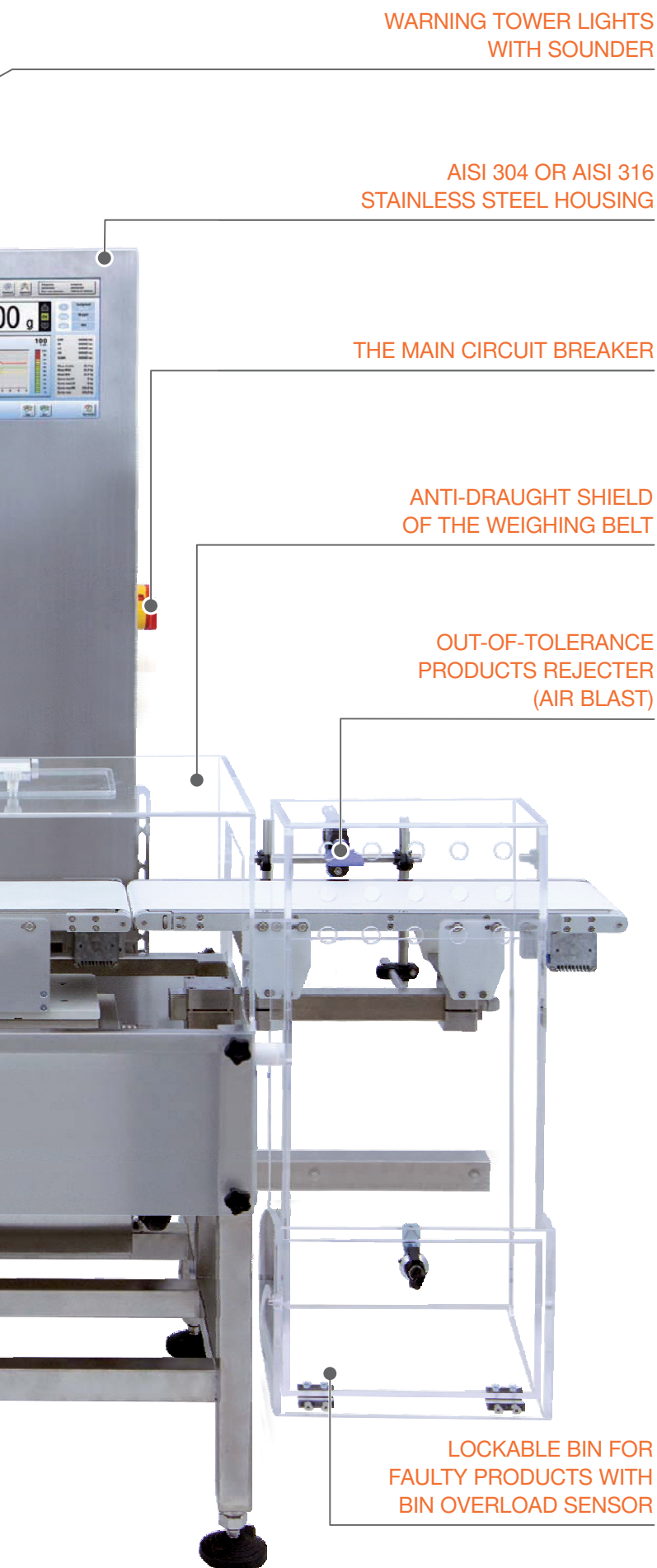
BELT CONVEYOR

QUICK DISSASSEMBLY  
OF WEIGHING PAN SHIELDING –  
NO TOOLS NEEDED

RIGID CONSTRUCTION  
RESISTANT TO VIBRATIONS

LEVELLING FEET





## Control and safety systems

- Errors logging.
- Product flow control.
- Line productivity meter.
- Emergency power off system.
- Product rejection control.
- Breakdown signalisation output.
- Emergency stop input.
- Bin overload sensor.
- Downstream conveyor product jam sensor.
- Product length sensor.
- Products gap sensor.
- Servo motor position control.

## Electrical options

- Faulty products stacklights.
- Mass range stacklights.
- Alarm and events audio signalling base.
- User conveyor control.
- Conveyors speed line regulation.
- Extra Inputs/Outputs.

## Cooperation with the production line devices

- Communication with palletiser.
- Cooperation with batchers (settings error correction mode).
- Emergency line stop upon detection of faulty products.

## Extra functions

- Extended statistical system.
- Reporting module.
- Extended PGC module.
- The product average mass control.
- Cooperation with E2R computer system.
- Complete auto diagnostics.
- Production line operation control.



# Custom made design

INTENDED FOR PHARMACEUTICAL INDUSTRY

## DWM

DYNAMIC SCALES WITH AN ELECTROMAGNETIC WEIGHING MODULE

**The highest standard of manufacturing.  
Unprecedented weighing speed and weighing accuracy!**

The scales are intended to control single loads of mass up to 7,5 kg. The scales are based on an industrial computer, and they are equipped with 12" colour touch screen.

Electromagnetic module provides extremely fast and accurate mass measurement.



## Specification

Throughput:	up to 500 items/minute
Weighing accuracy [d]:	0.01 g
Verification scale interval [e]:	0.1 g
Weighing range:	2 – 7500 g
Weighing module:	electromagnetic
Screen:	12" colour touch-screen
Operating system:	Windows XP Embedded
Database system::	SQL Server



Electromagnetic weighing module



Air blast rejecter



Ports (Ethernet, USB, RS 232)

## Areas of use

- Packaged goods control.
- Complete 100% production process control.
- Production waste minimisation .
- Batchers control.
- Weighing of medical products, blisters, syrups etc.
- Inspection of production packaging.

## Characteristics

- **Type approval conformable to MID directive.**
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design.
- Food industry attestation for direct contact with food products.
- Possibility of seamless integration of the checkweigher into existing production lines.
- Open construction, easy maintenance and cleaning.
- Wiring system designed inside conveyor frames.
- Quick disassembly of weighing pan shielding.
- Anti-draught shielding of the weighing belt (in accordance with industrial safety regulations).
- Lockable storage bin (conformable to HACCP).
- Extra conveyor systems for optimal product distribution.
- Static side guides system and mechanically driven guides system.
- Pressure control, line jam sensor and bin over-load sensor Complete system of auto diagnostics.
- Continuous control of all scales systems.
- Online monitoring of the technological process.



## DWT/HL

### DYNAMIC SCALES WITH STRAIN GAUGE TRANSDUCER

The scales are intended for controlling single loads of mass up to 7,5 kg.

The scales are based on the industrial computer, and they are equipped with 12" colour touch screen.

Load cell is a lower cost alternative of an electromagnetic system.



## Specification

<b>Throughput:</b>	up to 180 items/minute
<b>Weighing accuracy [d]:</b>	0.2 g
<b>Verification scale interval [e]:</b>	0.2 g
<b>Weighing range:</b>	max. 7500 g
<b>Weighing module:</b>	strain gauge
<b>Screen:</b>	12" colour touch-screen
<b>Operating system:</b>	Windows XP Embedded
<b>Database system::</b>	SQL Server



Strain gauge transducer



Compressed Air Service Units



Lockable bin for the rejected products

## Areas of use

- Packaged goods control.
- Complete 100% production process control.
- Production waste minimisation.
- Batchers control.
- Weighing of medical products, blisters, syrups etc.
- Inspection of production packaging.

## Characteristics

- **Type approval conformable to MID directive.**
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design.
- Food industry attestation for direct contact with food products.
- Possibility of complete integration of the checkweigher into existing production lines.
- Open construction, easy maintenance and cleaning.
- Quick disassembly of weighing pan shielding.
- DWT/HL scales are lower cost alternative to DWM scales based on electromagnetic module, offering complete functionality for production lines where lower accuracy and weighing capacity is required.
- Weighing system is designed with the use of load cells and dedicated module for signal processing.

# Universal solutions

FOR WEIGHING PACKAGED PRODUCTS

## DWT/RC

DYNAMIC SCALES INTENDED  
FOR LARGE-SIZED PRODUCTS

The scales are intended for controlling loads of mass up to 60 kg. The scales are based on the industrial computer, and they are equipped with 12" colour touch screen.

Checkweighers DWT/RC series are autonomous stations controlling mass of packages moving down the conveyor lines.



### Specification

Throughput:	up to 100 items/minute
Weighing accuracy [d]:	5 g
Weighing range:	max. 60 kg
Weighing module:	strain gauge
Screen:	12" colour touch-screen
Operating system:	Windows XP Embedded
Database system::	SQL Server



Strain gauge  
transducer



Pneumatic  
rejecter



Quick coupling allowing  
easy detachment of conveyors

### Areas of use

- Weighing of packaged products: sacks, boxes, multi-packs etc.
- The scales are intended for any kind of packaging lines and for the fishing industry fishing industry as well as the meat processing industry.
- Marking packages with the use of the ink-jet printers and labelling machines. Packaged Goods Control.
- Complete production process control.
- Batchers control.

### Characteristics

- **Type approval conformable to MID directive.**
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design or powder coated mild steel design.
- Food industry attestation for direct contact with food products.
- Automatic sequencing of products gaps.
- Automatic identification of products with the use of bar code scanners.
- Cooperation with metal detectors.
- Light and sound signaling.
- Batchers operation control.
- Roller belt conveyors, modular belts.
- Open construction, easy maintenance and cleaning.
- Motor drive options: electric drum motors or motoreducers.





## DWT/RC

DYNAMIC SCALES INTENDED  
FOR LARGE-SIZED PRODUCTS

The scales are intended for controlling loads of mass up to 60 kg, mostly packaged products.

Checkweighers DWT/RC series are single conveyor scales, intended for recording the weight of transported loads through cooperation with peripheral devices.



### Specification

<b>Throughput:</b>	up to 100 items/minute
<b>Weighing accuracy [d]:</b>	5 g
<b>Weighing range:</b>	max. 60 kg
<b>Weighing module:</b>	strain gauge
<b>Screen:</b>	12" or 5.7" colour touch-screen
<b>Operating system:</b>	Windows CE or XP Embedded
<b>Database system::</b>	SQL Server



Warning tower lights with a sounder



Belt conveyor



The main circuit breaker

### Areas of use

- Cheese production lines.
- Meat processing lines.
- Integrated identification systems of mass and volume measurement in sorting lines of courier packages.
- Packaged Goods Control.
- Complete 100% production process control.
- Inspection of production packaging.

### Characteristics

- **Type approval conformable to MID directive.**
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design or powder coated mild steel design.
- Automatic identification of products with the use of bar code scanners.
- Cooperation with the palletisers.
- Light and sound signaling.
- Batchers operation control.
- Roller belt conveyors, modular belts.
- Motor drive options: electric drum motors or motoreducers.
- Possibility of connection to the external safety systems.

# Custom made solutions

FOR WEIGHING SPECIFIC PRODUCTS IN VARIOUS BRANCHES OF INDUSTRY

## DWR

ROTATIONAL SCALES  
FOR CYLINDRICAL  
PRODUCTS

The scales are intended for controlling single loads of cylindrical items (jars, tubes, sprays, aerosols, bottles).

The checkweigher construction makes it a perfect solution for all the products with a small diameter of the base and a high centre of gravity.



## DWT/HL C

AUTOMATIC SCALES FOR THE  
CONFECTIONERY INDUSTRY

The scales are mostly intended for weighing wafers.

Special construction, where the weighing module is mounted over the conveyor line, keeps it clean (wafer, toppings and cream leftovers fall into the container placed under the conveyor).

## Metal detection

Installation of the tunnel metal detector allows detection of any impurities in the weighed products.

Metal and metal compounds detection is carried out, in motion, therefore, there is no need for stopping the conveyor belt. The report on the detector operation and the weighing report on the product series are combined.



Rotational feeder  
of cylindrical products



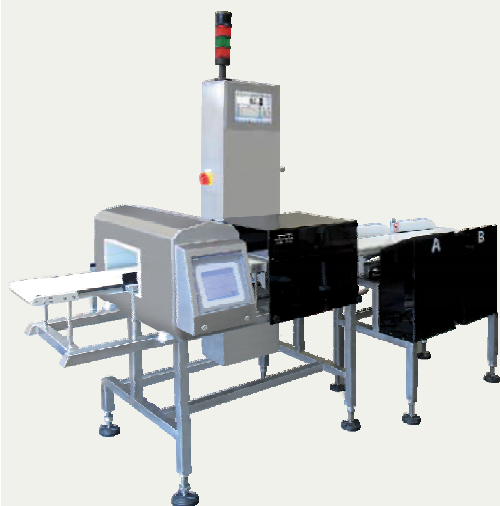
Side guides system for  
transporting bottles

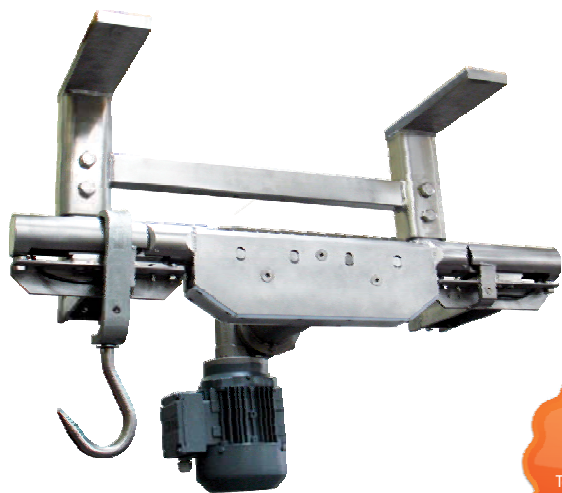


Tunnel metal detector

## Characteristics

- Type approval conformable to MID directive.
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design.
- Food industry attestation for direct contact with food products.
- Possibility of complete integration of the checkweigher into existing production lines.
- Custom-designed for a given product specification.
- Various systems of rejection.
- Quick disassembly of weighing pan shielding.
- Extra conveyor systems for optimal product distribution.
- Static side guides system and mechanically driven guides system.
- Pressure control, line jam sensor and bin overload sensor.
- Complete system of auto diagnostics.
- Continuous control of all scales systems.
- On-line monitoring of the technological process.



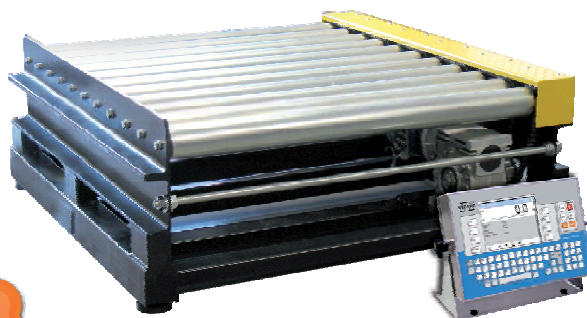


## DWT/RC K

### AUTOMATIC OVERHEAD TRACK SCALES

Scales intended for the meat processing industry, they are used for processed animal products transport and weighing (carcass, half carcass, poultry etc.).

Special construction was designed to fit in the tracks of transport rails. The scales allows for unattended weighing in motion, without the need to stop the conveyor.



## DWT/RC R

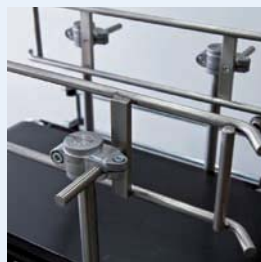
### AUTOMATIC CONVEYOR SCALES

The scales are intended to control any type of large loads, mostly palletized products.

Wide range range of applications allows for the scales operation in numerous branches of industry.

## Double-track scales

- The scales are intended for cooperation with a double-track batching and packing devices.
- Combination of two measuring systems in one construction allows for a close distance between the scales tracks, which not only makes the product distribution from the batching systems simple but also requires little space for the device.



Conveyor side guides



Stainless steel rejected products bin



Open construction, simplicity of maintenance and cleaning

## Characteristics

- Type approval conformable to MID directive.
- Tests in accordance with OIML R51.
- AISI 304 or AISI 316 stainless steel design.
- Food industry attestation for direct contact with food products.
- Possibility of complete integration of the checkweigher into existing production.
- Extra conveyor systems for optimal product distribution.
- Complete system of auto-diagnostics.
- Continuous control of the scales systems.
- On-line monitoring of the technological process.



# Software

## EXTENDED FUNCTIONALITY OF CHECKWEIGHERS

### E2R Checkweighers

ADVANCED SOFTWARE MODULE  
OF E2R PRODUCTION MANAGEMENT SYSTEM

**E2R system not only lowers the real cost of production and maintenance but also provides production process optimization.**

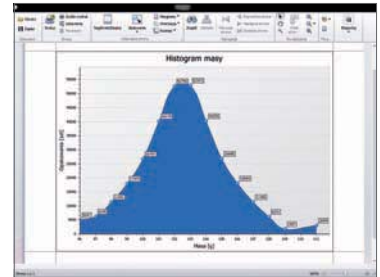
Numerous functions such as database synchronization, scales online status preview, storing measurements and advanced static reports of production process are available within one application only.

### Specification

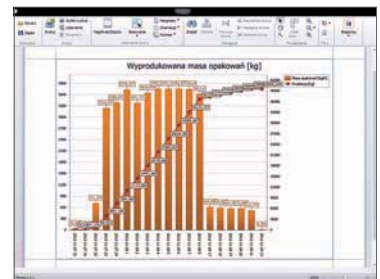
E2R Checkweighers is one of the modules within multifunctional E2R database computer system, which operates with any RADWAG scales. The module is intended for cooperation with RADWAG checkweighers. It communicates over Ethernet and is based on the SQL database.

### Functions

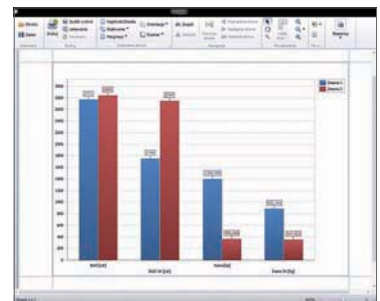
- **Real-time monitoring of multiple checkweighers in operation:**
  - weight diagrams: linear, histogram, bargraph,
  - diagrams on quantity of items,
  - efficiency diagrams,
  - current measurement readout and checkweigher settings.
- **Adding, deleting and editing records:**
  - for products,
  - for operators.
- **Assigning the products to checkweighers.**
- **Defining access levels for multiple users.**
- **Storing weighments.**
- **Operation on a vast amount of data in a real time.**
- **Recorded weighments filtration according to:**
  - operator name,
  - product batch,
  - product name,
  - weighing date,
  - net mass,
  - tare,
  - status.
- **The sum of filtered weighments in the form of:**
  - processed weighments sum,
  - processed weighments quantity,
  - average of processed weighments,
  - minimal measured mass,
  - maximal measured mass.
- **Access to reports sent from the scales:**
  - PGC report in accordance with legal regulations,
  - PGC report in accordance with custom criteria,
  - statistics report,
  - changeable products weighing report.
- **Generating the recorded reports of:**
  - average mass weighments with the overflow,
  - shift weighments,
  - hourly production weighments,
  - device effectiveness indicator (availability, efficiency, quality),
  - total production,
  - operating time, brakes and the scales status,
  - products metal impurity.
- **Reports export to files:**
  - PDF, HTML, MHT, RTF, XLS, CSV, TXT.



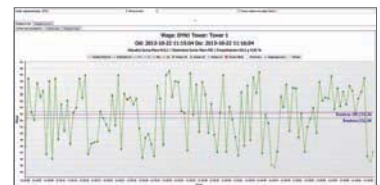
Mass histogram



Production report provided in weight units



Shift reporting of the production process

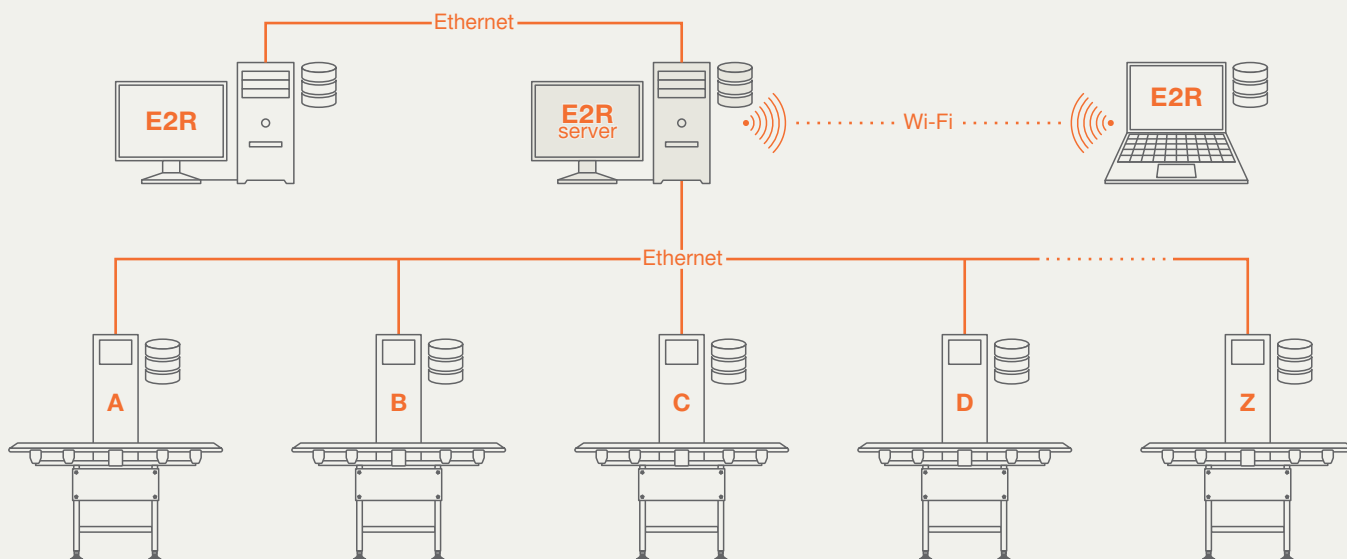


Linear weight diagram processed in real-time



Production efficiency coefficient preview

## Functional scheme of the system



### E2R system consists of :

- database server, where the management software is located,
- checkweighers operating in the production lines,
- ethernet network connecting the weighing

workstations with the database server, clients workstations enabling both; a current preview of system operation and database edition.

### E2R Checkweighers module ensures:

- continuous control of checkweighers via computer network,
- option of wireless communication with the scales and their databases.

## Characteristics

- **Extended reporting module** generated in accordance with legal regulations or the custom criteria.
- **Production process administration** through acquiring information on operational time, intended or unintended downtimes, production quality indicators, temporary line productivity etc..
- **On-line control of the production process** through the current access to:
  - weighing workstation on-line preview,
  - currently processed weight diagram,
  - production bargraph,
  - normal (Gaussian) distribution,
  - throughput diagrams and analytical samples correctness diagrams.

- **Simple edition of databases** at the server level or at the level of any operating scales connected to the system.
- **Data compatibility** of all the system elements, provided by an option of automatic database updates.
- **Production process optimization** through the OEE efficiency indicator analysis and through the information about the line efficiency and production quality.

### Data security ensured thanks to:

- authorized access to the server system and the checkweighers,
- databases backup option.

### Reliability of operation:

- reliable data storage system, allowing autonomous scales operation even during network or database server breakdowns,
- scales real-time status preview, allowing for instant system failure detection.

### Flexibility:

- Possibility of quick modification of both; the program interface and the reports layouts.

### Scalability:

- simple modification of the system and expanding it with new weighing workstations without any necessity for stopping measurement recording,
- possibility of numerous computer workstation connection within the system.

## OEE efficiency indicator analysis

TOTAL PRODUCTION TIME - EVERY 8 HOUR SHIFT			
OPERATION TIME			INTENDED DOWNTIME
ACCESSIBILITY		BREAKDOWNS	
EFFICIENCY		EFFICIENCY LOSS	
QUALITY	FAULTY PRODUCTS	LOSS	

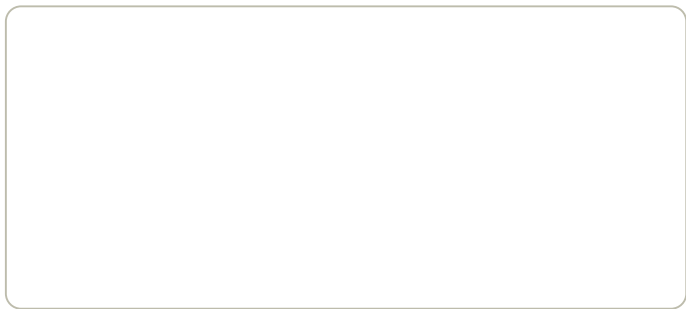
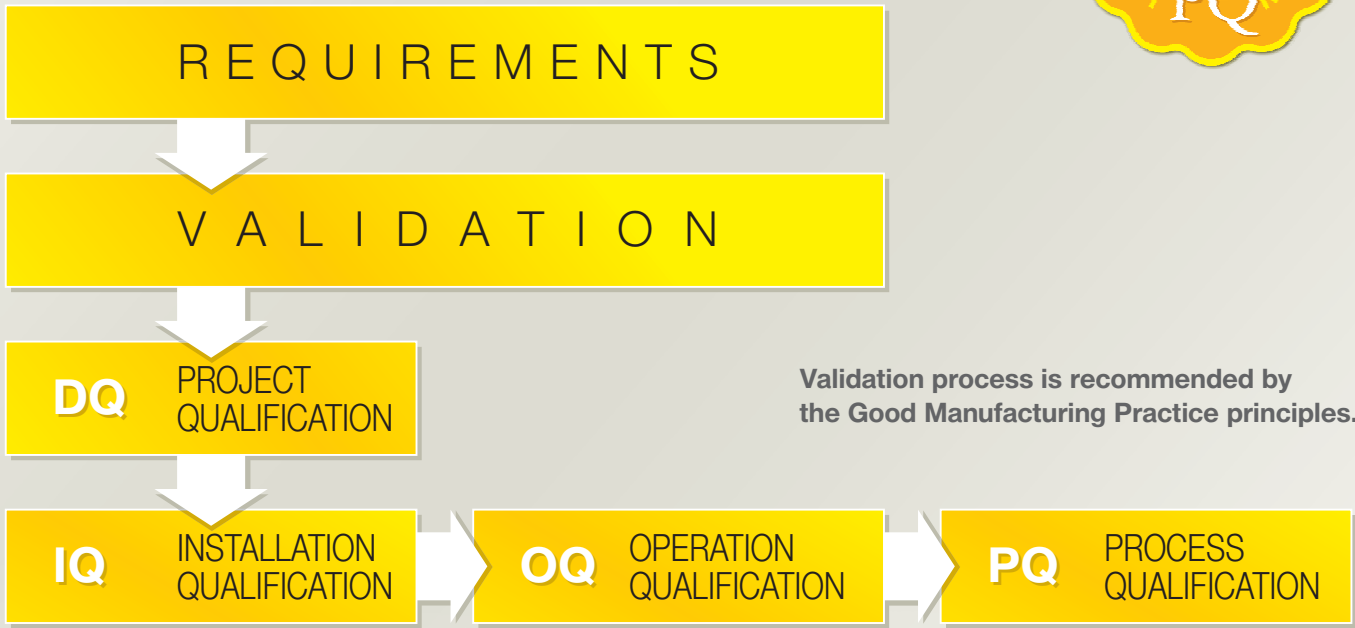
OEE efficiency indicator analysis is an integral function of the E2R system.

# Validation

RADWAG OFFERS SUPPORT IN VALIDATION  
OF CHECKWEIGHERS AND WEIGHING SYSTEMS

The validation guarantees that the measurements  
errors will be within the defined criteria and that the  
scales will meet the expectations.

One of the validation processes is complete qualification:







# **RADWAG BALANCES AND SCALES**

ADVANCED WEIGHING TECHNOLOGIES

[www.radwag.com](http://www.radwag.com)

High throughput  
Precise separating system  
Sorting by weight - up to 12 different sorting groups



www.radwag.com

## DWM HPS Sorting Checkweigher

AUTOMATIC SYSTEM FOR PRODUCT SORTING

# DWM HPS

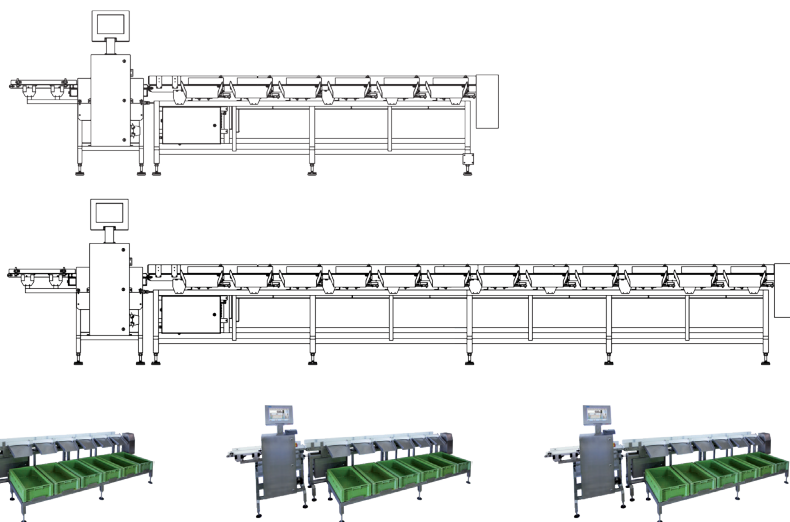
## Up to 12-chute sorting system The highest measuring accuracy



The sorting checkweigher is a high technology weighing instrument. It features specialized automatics system providing precise and fast product separation. With electromagnetic weighing module, the DWM checkweigher guarantees high speed and precision for your weighing process.

The automatic sorting checkweigher has been designed to provide self-acting product sorting process, wherein the products are separated into several groups varying by weight. Generally, the DWM HPS checkweigher is intended to be used in plants processing fish and meat, it aims to support product sorting process. Owing to the system functionality, the products can be separated into 12 different weight groups. Additionally, rejection of defective or faulty products is carried out automatically. Depending on the used algorithm, the products can be grouped within specified weight or quantity range (the containers can be filled up to determined weigh value or product quantity).

The device has been equipped with colour 12" touchscreen easy to read for any working environment. Modern industrial computer provides high throughput, complete data archiving and simultaneously performed communication with a master computer system. An in-built self-diagnostic system monitors the DWM HPS operation and reports any detected problems in real time.



**DWM 1500 HPS**

**DWM 3000 HPS**

**DWM 6000 HPS**

Maximum capacity [Max]	1500 g	3000 g	6000 g
Readability [d]	+/- 0.5 g	+/- 1 g	+/- 2 g
Minimum load [Min]	10 g	20 g	40 g
Conveyor velocity	1.6 m/s	1.6 m/s	1 m/s
Max. dimensions of sorted product [length × width]	350 mm × 180 mm	400 mm × 230 mm	500 mm × 280 mm
Throughput	150 items/minute	140 items/minute	90 items/minute
Weighing module	Magnetoelectric weighing module		
Number of separators	6 or 12		
Mechanical design	Stainless steel		
Conveyor type	Belt		
IP rating	IP 65		
Display	12" colour touchscreen		
Pneumatic connector	Quick coupling intended for 12 mm cable		



**Custom-made solutions**  
**Labelling of up to 70 pcs/min**  
**Operation in harsh conditions**



[www.radwag.com](http://www.radwag.com)

# **DWM HPE** **Labelling Checkweighers**

ADVANCED-CLASS WEIGHING SYSTEM WITH LABEL APPLICATION

# DWM HPE

## Weighing speed and precision ensured by electromagnetic module



### Complex Solution

Integration of the labeller and label applicator with the checkweigher due to the use of proprietary RADWAG software for label creation. With this, operational reliability of the whole machine is obtained and the time otherwise needed for integration of one device with another is saved.

### Advanced Label Application System

Depending on the requirements of the production process, blow or tamp applicators mounted on the actuator or on the rotary arm can be used. With this solution it is possible to label the product on each side.

### Intended Use

DWM labelling checkweighers are intended for the food industry where there is a need to mark packaged products of variable masses. The checkweighers are equipped with a module for price calculation.

### Clear Information Layout

The 12" display with a touch panel enables easy access to main functions and clear presentation of the most important information during operation, e.g. current mass value, current statistics, production line throughput and function keys.

### Measurement Speed and Precision

Mass measurement using the DWM checkweigher is carried out on electromagnetic module accurate to 0.01g.

### Databases

The DWM checkweigher features an SQL database. The database stores lists of products, operators, labels and reports of measurements. The checkweigher can be managed centrally.

### Connectivity with Central Database Systems

E2R software enables synchronization of local databases with a central database. With this, it is possible to preview and manage data from the weighing system administrator's computer. This enables automatic data update on scales operating in lines.

### Compliance with Global Standards

DWM checkweighers have type approval certification compliant with the MID directive, and have passed tests carried out in accordance with OIML R51. The checkweigher software enables creation of different permission levels for operators and registers operations carried out on the scale and possible operator errors. Due to the use of AISI 304 or 316 stainless steel, the checkweigher can gain food safety approval and be used in food production.



**DWM HPE**

Maximum capacity [Max]	750 – 7500 g
Readability [d]	0.1 – 5 g
Conveyor speed	1.6 m/s
Design	Stainless steel, powder-coated steel
OIML class	XIII(1), Y(a)
Ingress protection class	IP 44/69
Weighing system	Electromagnetic module
Display	12" colour touch panel
Communication interfaces	Ethernet, USB, RS232, IN/OUT



Reliable operation in extremely challenging conditions  
Designed to comply with strict hygiene standards  
Customization to user requirements



www.radwag.com

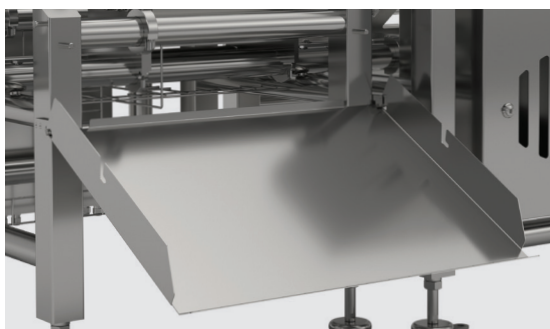
## DWM HPX Checkweigher

OPERATION IN ANY CONDITIONS

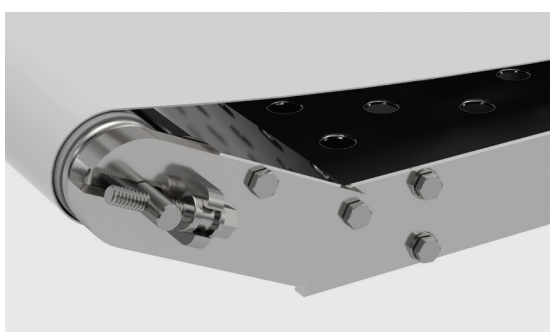


# DWM HPX

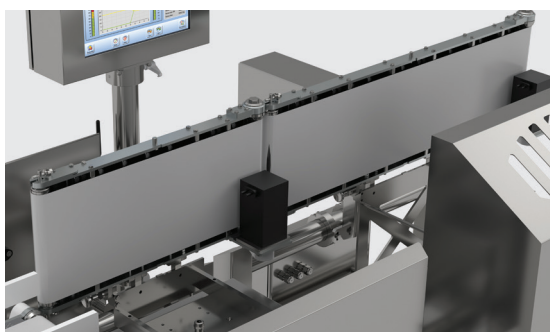
## Weighing speed and precision ensured by electromagnetic module



Easy-to-remove covers.



Conveyors disassembly requiring no tools.



Open construction facilitating maintenance.



Indicator installed on an elevated rotary post.

### Mechanical Design Compliant with HACCP

DWM HPX checkweigher is designed in accordance with 'hygienic design' requirements. Adopted solutions minimize potential spots where contamination can accumulate, and facilitate maintenance. Among these solutions there are: round-profile construction, no places accumulating contamination, fast disassembly of conveyors and belts requiring no tools, less flat horizontal surfaces on which contamination may accumulate, stainless steel mechanical design (AISI 304 or 316). Specially-designed gaskets, seal wires and shields guarantee IP69K ingress protection.

### Intended Use

This series of checkweighers is intended for food industry, it is especially useful on fish and meat processing production halls. The applied solutions and materials are compliant with strict hygiene standards required for food production. Reinforced, hermetic construction allows to clean the device with pressure washer.

### Measurement Speed and Precision

Mass measurement using DWM HPX checkweigher is carried out with up to 0.5g readability, on an electromagnetic weighing module housed in a hermetic housing of IP69K ingress protection.

### Clear Information Layout

The 12" display with a touch panel enables easy access to the main functions and clear presentation of the most important information during operation, e.g. current mass value, current statistics, production line throughput and function buttons.

### Databases

The DWM checkweigher features an SQL database. The database stores lists of products, operators and measurement reports.

### Connectivity with Central Database System

E2R software enables synchronization of local databases of particular weighing instruments with a central database. With this, it is possible to preview and manage data from the weighing system administrator's computer.

### Compliance with Global Standards

DWM HPX checkweighers have type approval certification compliant with the MID directive, and have passed tests carried out in accordance with OIML R51. The checkweigher software enables creation of different permission levels for operators, and registers operations carried out on the scale along with possible operator errors.



### DWM HPX

Maximum capacity [Max]	1500 – 7500 g
Readability [d]	0.5 – 5 g
Conveyor speed	1.6 m/s
Design	Stainless steel AISI304 or AISI316
OIML class	XIII(1), Y(a)
Ingress protection	IP69K
Communication interfaces	USB, Ethernet, RS 232, IN, OUT









Toruńska 5, 26-600 Radom, Poland

Tel. +48 48 3866 000

E-mail: [export@radwag.com](mailto:export@radwag.com)



[www.radwag.com](http://www.radwag.com)

