



# 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

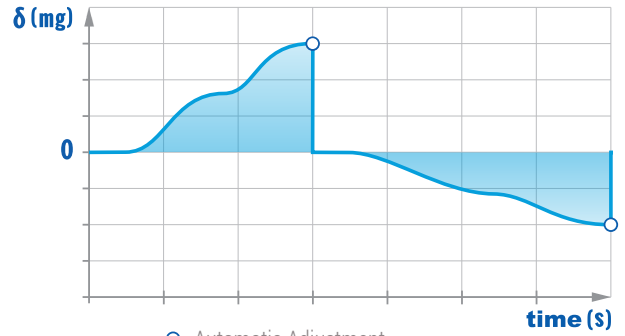
# Optimisation of Operation in a Laboratory

## 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

```

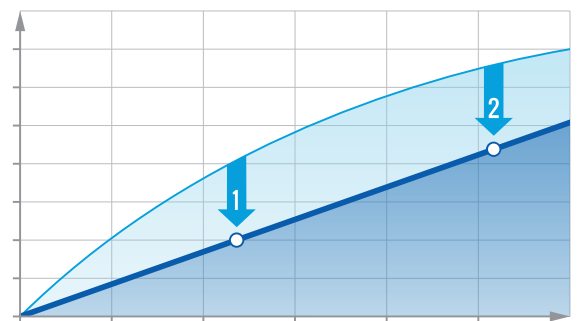
----- Adjustment: Internal -----
Date           2019.01.19
Time           09:12:38
Balance type   MYA 4Y
Balance ID     392543
User           Smith
Level status   Yes
Difference     0.000000
Temperature    25 °C
-----
Signature
    
```



## 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.



- 1 — Prior adjustment performance (linearity errors)
- 2 — Past 2-point adjustment performance

## 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!

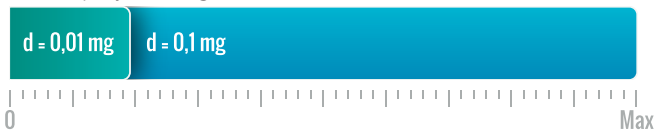
**XA 4Y**  $d=0.1\text{ mg}$  **2.2 s**

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

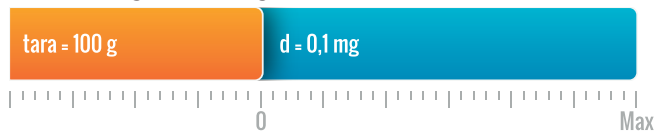
**MYA 4Y**  $d=0.001\text{ mg}$  **4.5 s**

Time taken to reach stable weighing result

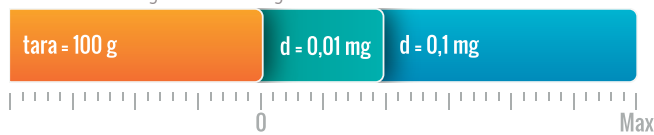
An exemplary dual range balance



Balance lacking Movable Range function



Balance featuring Movable Range function



## Movable Weighing Range

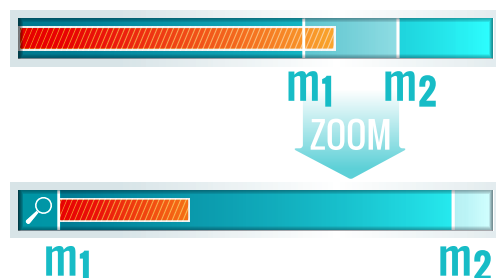
Dual range balances of 4Y series offer Movable Range function. With this, maximum accuracy for weighing of even small samples is guaranteed regardless of applied tare container.

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.

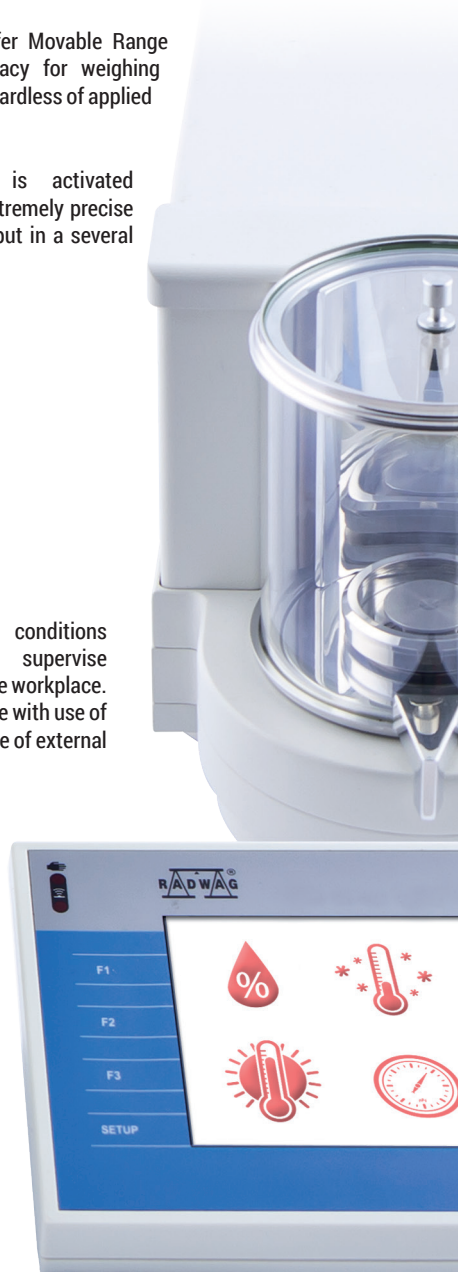
When sample weight increase results with preset threshold exceeding, Zoom function activates automatically. The function enlarges particular bargraph section, which in effect becomes as wide as the whole bargraph. This option lets you observe sample weight variation in a greater scale thus making it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



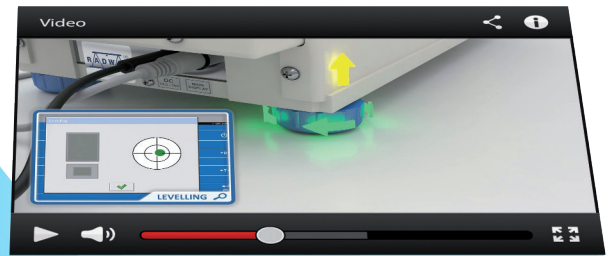
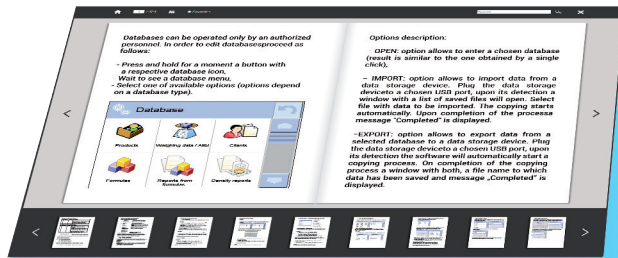
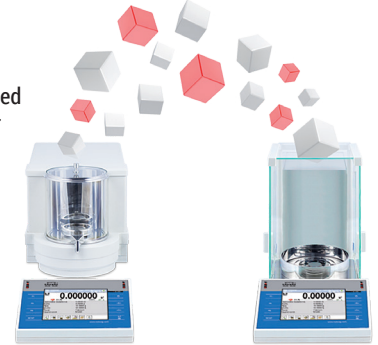


## Databases As Support for the Weighing Process

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.



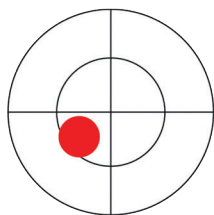
## Video-Guidance And an On-screen Manuals

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.

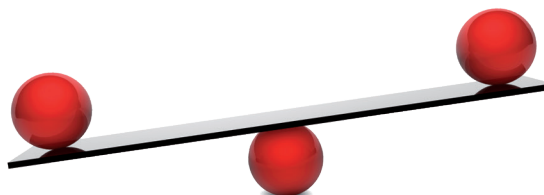
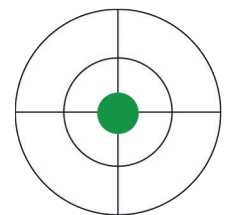
The help is offered in a form of an on-screen displayed user manual, text and drawing instruction and short video guides.



## 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.

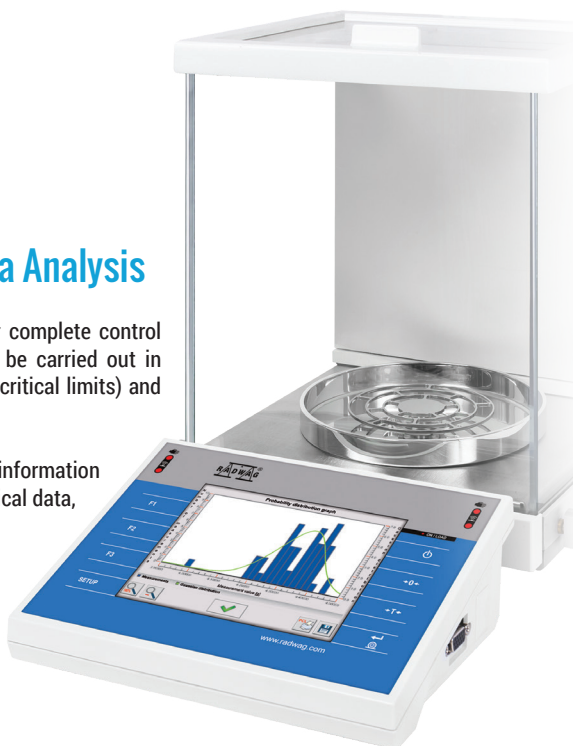


----- SQC -----	
User	Lab
Product	Pill
Start date	2019.01.02 10:10:18
End date	2019.01.02 10:14:41
Batch number	1\A
Batch quantity	10
Nominal mass	0.361 g
Limit T2-	0.0361 g 10 %
Limit T1-	0.01 05 g 5 %
Limit T1+	0.01805 g 5 %
Limit T2+	0.0361 g 10 %
----- Measurement 1 -----	
Net	0.366185 g
----- Measurement 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 a 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

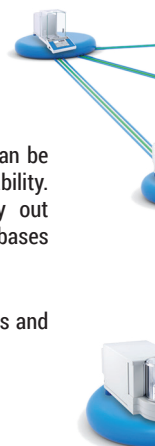
Alibi Memory is a special partition for measurement data storing. The memory content can be viewed by means of free computer software, Alibi Reader.



## 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.

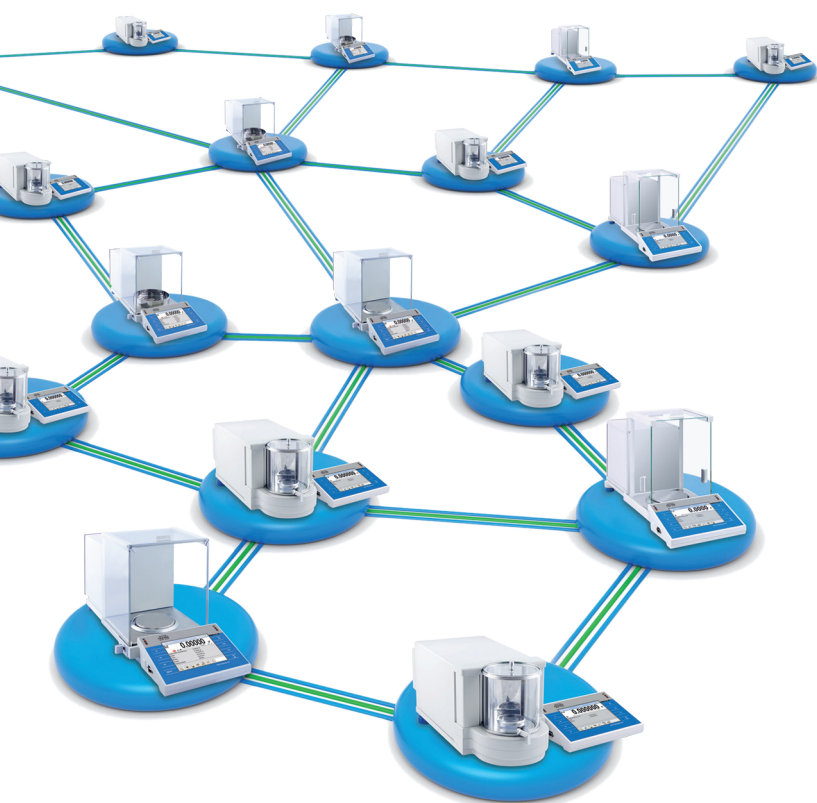




## Settings Customization as Working Environment Optimisation Tool

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.

	----- Weighing -----		
Header	Date	2019.01.02	
	Time	14:07:43	
	Balance ID	419036	
	User	Admin	
	Level status	Yes	
	Product	Calcium	
	Packaging	Blister	
	Measurement Data	Temperature during measurements	26.79 °C
		Humidity during measurements	24 %
		Pressure during measurements	994 hPa
Footer	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		



4Y balances are compatible with a vast range of label printers and barcode scanners.



# 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.

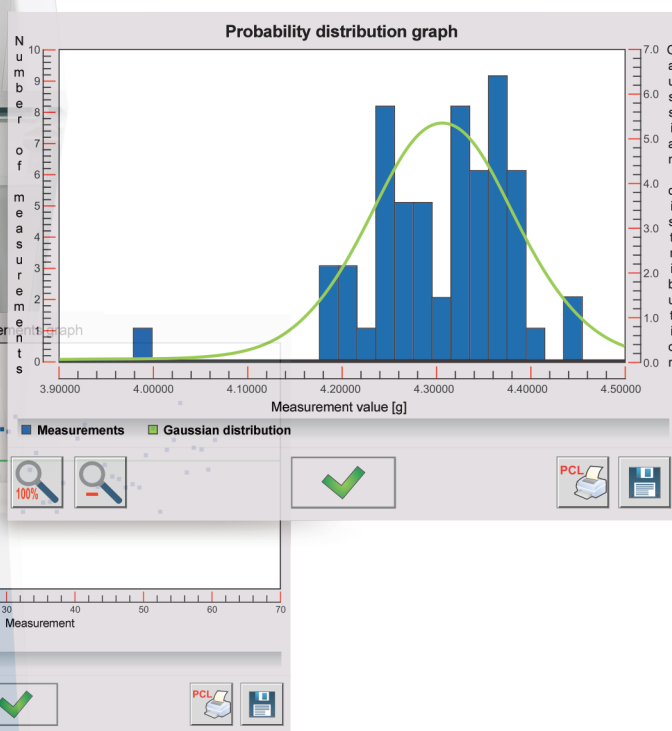
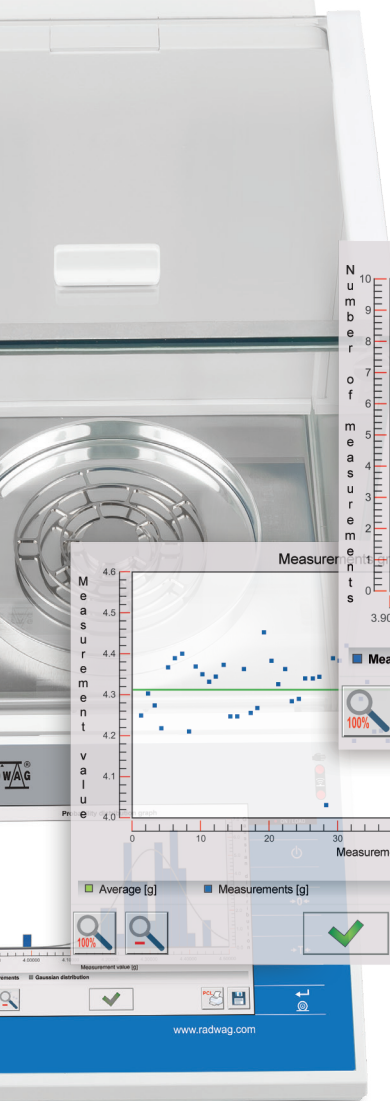
Software structure is protected against intrusion by means of system of passwords and permissions levels. Metrological settings as well as settings of operational nature can be restored (verified) when such need occurs.



## 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

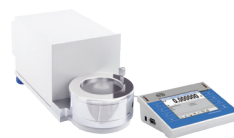
Selected working modes of the 4Y series (Statistics, SQC) feature chart function. The chart is generated for a particular weighing upon its completion.

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	0.04 mg - 0.4 mg	0.05 mg - 0.2 mg	0.24 mg
Minimum weight USP	0.4 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

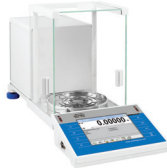




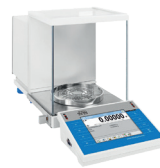
**XA 4Y.M**



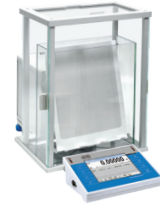
**XA 4Y.M.A**



**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
∅ 30 mm	∅ 30 mm	∅ 90 mm, ∅ 100 mm, ∅ 85 mm(option)	∅ 90 mm, ∅ 100 mm, ∅ 85 mm(option)	210 × 254 mm (for filters), ∅ 90 mm, ∅ 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

## 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.



**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

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