Excellence Balances

Excellence Plus XP
High-performance
Micro and Analytical balances
from METTLER TOLEDO

Comprehensive Security
Has no Alternative

METTLER TOLEDO

We Understand Your Safety Concerns
And We Have the Solution

Three innovations provide comprehensive weighing security

- **SmartSens**
- **SmartGrid**
- **SmartScreen**

METTLER TOLEDO is changing the world of analytical balances. SmartSens, SmartGrid and SmartScreen – three innovations combined in a single balance – provide comprehensive weighing security. They provide maximum user protection, unparalleled measurement performance, full data security and seamless traceability.

The result is secure processes, higher speed and lower costs.

Excellence Plus XP: Improved performance with more security.

SmartSens

SmartGrid

SmartScreen

Hazardous Material, Valuable Substances?
Weigh Them Safely with no Loss.

SmartSens for hands-free draft shield operation

Open sesame! Thanks to the SmartSens infrared sensors, you can weigh without touching the balance. Tare, open the door, close the door, weigh, print: Everything is done automatically with a wave of your hand. You can focus completely on the sample, and weigh valuable or toxic substances safely and without spilling.

Excellence Plus XP with SmartSens:
Keeping you as safe as your samples.

Height-adjustable inner draft shield:
The smaller the weighing chamber, the less air turbulence and the faster you get stable results. Samples can also be acclimatised in a protected area on top of the inner draft-shield.

Minimum risk of contamination, maximum protection for your sample:
Each panel of the draft shield can be removed easily and is cleaned in a flash.

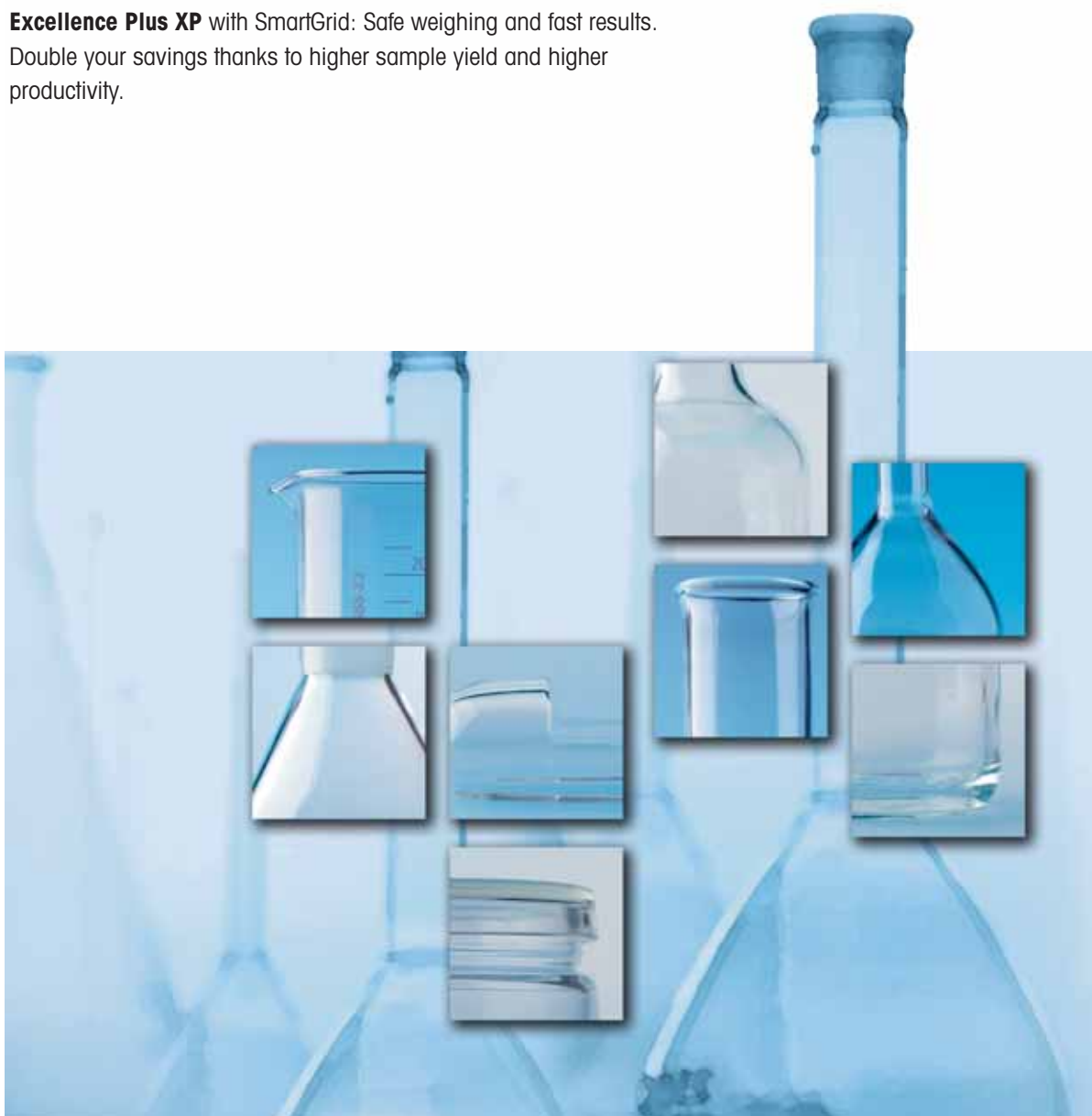METTLER TOLEDO

0.00000 g

23 Jan 2006 14:20

SmartSens
Allows weighing without touching the balance. With complete focus on the sample, valuable or toxic substances are weighed safely and without spilling.
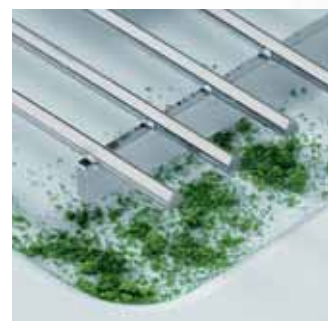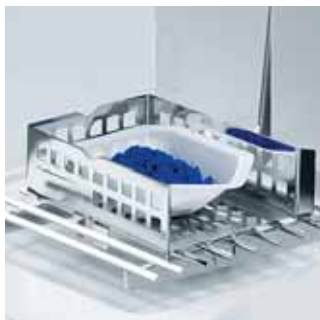
Assorted Tare Containers?
Weigh Directly and Fast.

SmartGrid is the key to high speed and secure sample handling
SmartGrid, the unique grid weighing pan, successfully minimizes the effects of air turbulence in the weighing chamber. Stabilization times are dramatically shorter so you receive measuring results faster. Overfilling is easily avoidable and minimum weights are even smaller, which pays off when it comes to valuable substances. The ErgoClips allow you to securely fasten any type of tare container so that none of your sample is wasted.

Excellence Plus XP with SmartGrid: Safe weighing and fast results. Double your savings thanks to higher sample yield and higher productivity.

ErgoClips allow secure placement of volumetric and round-bottom flasks, glass and plastic test tubes as well as disposable weighing pans.

Distortion of the weight value due to statically charged tare containers is practically prevented by the Faraday-shield effect of the grid basket.

But if anything ever does go wrong, SmartGrid ensures that spilled substances simply fall into the tray underneath. Spills will not falsify your weighing result and can simply be thrown away.

Secure Operation Guaranteed –
for Smooth Processes and Flawless Data

SmartScreen guarantees complete control
SmartScreen is the brain behind the Excellence Plus XP. Multilingual and color-coded. Easy-to-use and self-explanatory. With touchscreen and profiles configured individually for up to eight users or jobs, SmartScreen saves time and helps prevent mistakes.

Excellence Plus XP with SmartScreen: Extremely easy to operate. For the highest data security and full regulatory compliance.

More personalized in every way.
Up to eight users can save their individual settings in their own languages, including color profile, and protect them against unauthorized access.

Preconfigure up to eight jobs.
With defined fault tolerances for each job and password protection. We have eliminated the danger of unwanted modifications. You can also change quickly from job to job, to avoid unproductive time.

Clear documentation for perfect traceability. What is weighed, when, how and by who can be completely configured and documented, protecting users, data and processes.

```
------- Weighing -------
Jan 23 2006      3:23 PM
Quality Control
Laboratory B-633
Balance Type      XP205
Balance ID RD Balance 04
Balance is levelled
User Name   Joanne Smith

Project nr.     A123-005
Sample           001
     G    49.21183 g
     T    42.37937 g
-------------------------
     N     6.83246 g
-------------------------


Signature
```

XP Analytical Balance –
Synergies par Excellence

Measurement certainty, user safety and data security combined with high-speed and maximum operating convenience.

Communication is everything.
Menu guidance, input and output in seven languages:

German
English
French
Spanish
Italian
Russian
Japanese

▶ **www.mt.com/XP-analytical**

Flexible interfaces.
Equipped as standard with a sealed RS232 interface and a slot for a second, optional interface:
- Bluetooth
- Ethernet
- LocalCan
- RS232
- PS/2
- USB (with USB Convertor cable)

30% smaller sample sizes.
Repeatability is increased by 30% thanks to the integrated temperature control system (ITC).

QM
MinWeigh

Spills contained.
Spilled substances are caught by the tray underneath the weighing pan and are easy to dispose of.

Completely protected.
Thanks to the fastening of the grid weighing pan at the rear of the weighing chamber, the two adjustment weights are completely protected against contamination by a chrome steel cover.

Individual operation.
The top panel and each side panel of the glass draft shield is motorized and can be opened individually.

Status display.
The green illuminated symbol shows that SmartSens is activated and set to "Print".

XP Micro Balance –
for the Smallest Sample Quantities

- **World-leading measurement performance: 52 g x 1 µg**
- **Minimum sample weight according to USP as low as 2.1 mg**
- **Direct-dosing of small samples into large tare containers**
- **No sample transfer means no loss of valuable substances**

When it comes to weighing small samples, we leave nothing to chance. Our XP56 micro balance, offering a world-leading capacity of 52 g with 1 µg readability, allows minimum sample weights according to USP as low as 2.1 mg – for maximum yield of your substances and substantial cost savings.

Moreover, XP Microbalances enable you to dose your samples directly into the tare container which helps avoid sample transfer errors. The result: maximum measurement certainty and reduced contamination risk.

SmartSens
Infrared sensor for the automatic and hands free operation of the inner and outer draft shield. The outer draft shield opens horizontally, the inner one vertically.

Easy cleaning
The inner draft shield is quick and easy to dismantle.

▶ **www.mt.com/micro**

ErgoClip Basket micro and ErgoClip Flask micro
For secure positioning of various reagent test tubes and measuring flasks. The ErgoClips can be turned to any angle on either side making it easier to dose directly into narrow container openings.

Regulatory Compliance
Through Built-in Warning Functions

- **Eliminate risk factors with Balance Check**
- **User Management**
- **proFACT automatic internal adjustment**
- **MinWeigh**
- **LevelControl**

Precise weighing is the backbone of many laboratory processes. Non-compliance with defined maximum limits can have disastrous consequences in regulated areas. Measurement series must be repeated, and valuable substances are wasted. Inaccurate values can even cause production to stop. Unnecessary costs are incurred.

Thanks to the built-in warning functions MinWeigh and LevelControl, the User Management function and proFACT automatic internal adjustment, risk factors are eliminated, keeping you within regulatory limits.

Excellence Plus XP: Ensuring your security.
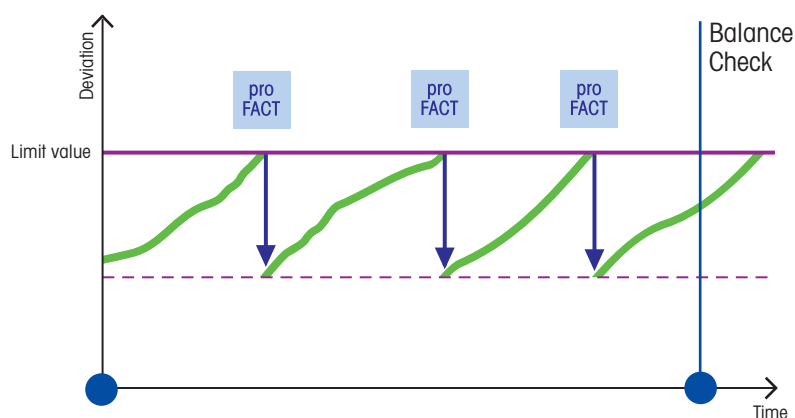
Balance risk factor?
BalanceCheck and proFACT automatic adjustment.
Receive automatic prompts to validate the measuring accuracy with an external weight – whenever the SOP calls for it. Between test intervals, proFACT automatic adjustment ensures that you never exceed your maximum limits. It also stores the last 50 adjustments in the History File.

OIML weights
For the systematic control of inspection, measuring, and test equipment we offer a comprehensive assortment of METTLER TOLEDO OIML weights.
(ASTM weights available in the USA.)

▶ **www.mt.com/weights**

Human risk factor?
MinWeigh warning function. Does your weighing result fall below the defined fault tolerance? MinWeigh uses the unmistakable red-colored display to warn you that the result is invalid.

User Management
Individual access rights can be provided for each application and up to eight users. Applications and users that are not being used can be disabled. Faulty operation is ruled out.
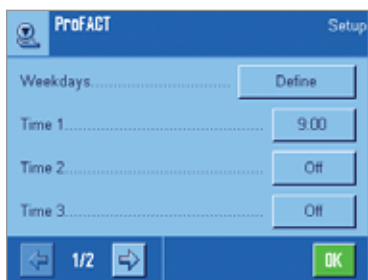
proFACT
Freely configurable time and/or temperature-controlled internal adjustment and linearisation with two built-in weights.

SOP device balances

Test, Maintain, Monitor

A. At least 60 min. before calibration
   Switch on balance

B. Clean weighing platform. Observe acclimatisation time

C. Allow certified control masses to acclimatise

D. Check and if necessary correct levelling

E. Close draft shield

F. Set display to "Zero"

G. Certified control mass

Environment as a risk factor?
LevelControl warning function. Was the balance jarred when it was cleaned? Is it inaccurate because it's no longer level? LevelControl gives off an acoustic warning signal and shows you, in the display, exactly what you need to do to level the balance.

LabX Software –
the Weighing Assistant

- **Easy data collection**
- **Full user guidance**
- **Calibration management**
- **Full traceability**
- **Export to Excel, LIMS…**

LabX pro supports 21 CFR Part 11 and network integration

LabX pro balance is a powerful, PC-based solution for managing and controlling balances. The software allows all balances to be fully networked and enables seamless integration into laboratory information systems (LIMS). LabX pro collects all relevant data and allows access to the settings and status of all balances from any PC in the network. Thanks to rapid access, users can login to the system directly from the balance and carry out weighing jobs without touching a PC. Of course LabX also fully supports compliance with 21 CFR part 11.

LabX light – Weighing data management made easy

LabX light balance is a user-friendly solution for connecting a single balance to a PC. In addition to the many data collection options, LabX light balance also offers convenient functions to set and control balance settings. If the collected data needs to be processed further in another application such as Excel, of course LabX offers the appropriate interfaces.

Eliminates electrostatic charges

Integrable anti-static kit
The same weighing sample but different weight values in the display? The phenomenon is well-known and the explanation is usually a simple one: electrostatically-charged samples lead to inaccurate results. The integrable ioniser immediately neutralises the electrostatically-charged object. The forces that give false weighing results are eliminated.

Fully integrable, no swirling, extremely fast
The fully integrable ioniser generates positively and negatively-charged ions. These immediately eliminate the electrostatic charge that causes the interference. The system does not swirl any of the weighing material as may be the case with other products available in the market. Toxic substances no longer pose a threat to the user. Cross-contamination of samples is prevented. The anti-static kit guarantees precise weighing under the most severe conditions.

▶ **www.mt.com/labx**
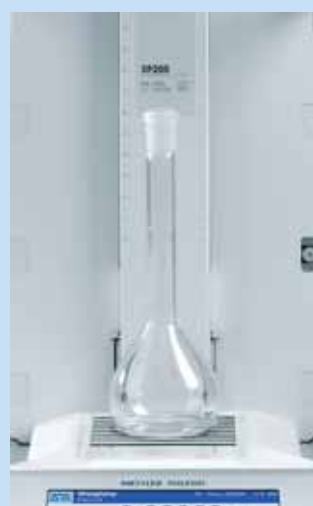
Standard equipment

- SmartSens, Sensor for hands free operation
- SmartGrid, grid weighing pan for fast and stable results
- SmartScreen, color display for safe and user-friendly operation
- ErgoClip Basket small, or ErgoClip Basket micro (with models XP56/XP26). Holder for tare containers for ergonomic weighing
- MinWeigh warns if the minimum weight is not reached (Minimum weight determined on site by service technician)
- User Management for granting access rights
- LevelControl warns when the balance is not levelled
- BalanceCheck, prompts automatically for validation with external weights
- ProFACT, fully-automatic temperature and/or time-controlled internal adjustment and linearisation

- Seven different applications with user guidance (incl. density determination, statistical analysis, formulation and differential weighing)
- Individual reports can be defined with up to 4 IDs
- Built-in RS232 interface and two auxiliary outlets
- Slot for second interface (7 options)
- Height-adjustable inner draft shield
- Motor-driven draft shield doors
- Completely dismountable draft shield for easy cleaning
- Terminal can be positioned separately from the balance
- Protective cover for the terminal
- Production certificate

ErgoClips for XP Analytical balances

ErgoClip Round Bottom Flask 11106746

ErgoClip Basket Small 11106747

ErgoClip Weighing Boat 11106748

ErgoClip Flask 11106764

ErgoClip Tube 11106784

ErgoClip Titration Basket 11106883

XP Analytical balances

Technical data (Limit Values)	XP105DR	XP205	XP205DR	XP204	XP504
Maximum capacity	120 g	220 g	220 g	220 g	520 g
Maximum capacity, fine range	31 g	—	81 g	—	—
Readability	0.1 mg	0.01 mg	0.1 mg	0.1 mg	0.1 mg
Readability, fine range	0.01 mg	—	0.01 mg	—	—
Repeatability – (at nominal load)	0.06 mg (100 g)	0.03 mg (200 g)	0.06 mg (200 g)	0.07 mg (200 g)	0.12 mg (500 g)
– (at low load)	0.05 mg (10 g)	0.015 mg (10 g)	0.05 mg (10 g)	0.05 mg (10 g)	0.1 mg (10 g)
– (at low load), fine range	0.015 mg (10 g)	—	0.015 mg (10 g)	—	—
Linearity	0.15 mg	0.1 mg	0.15 mg	0.2 mg	0.4 mg
Excentric load deviation (test load) [1]	0.2 mg (50 g)	0.2 mg (100 g)	0.25 mg (100 g)	0.25 mg (100 g)	0.4 mg (200 g)
Sensitivity offset	$4 \times 10^{-6} \cdot Rnt$	$2 \times 10^{-6} \cdot Rnt$	$2.5 \times 10^{-6} \cdot Rnt$	$3 \times 10^{-6} \cdot Rnt$	$3 \times 10^{-6} \cdot Rnt$
Sensitivity temperature drift[2]	$1 \times 10^{-6} /°C \cdot Rnt$	$1 \times 10^{-6} /°C \cdot Rnt$	$1 \times 10^{-6} /°C \cdot Rnt$	$1 \times 10^{-6} /°C \cdot Rnt$	$1 \times 10^{-6} /°C \cdot Rnt$
Sensitivity stability [3]	$1 \times 10^{-6} /a \cdot Rnt$	$1 \times 10^{-6} /a \cdot Rnt$	$1 \times 10^{-6} /a \cdot Rnt$	$1 \times 10^{-6} /a \cdot Rnt$	$1 \times 10^{-6} /a \cdot Rnt$
Interface update rate	23/s	23/s	23/s	23/s	23/s

Typical values for calculating the measurement uncertainty

	XP105DR	XP205	XP205DR	XP204	XP504
Repeatability* (sd)	$0.04\ mg + 1 \times 10^{-7} \cdot Rgr$	$0.008\ mg + 6 \times 10^{-8} \cdot Rgr$	$0.04\ mg + 5 \times 10^{-8} \cdot Rgr$	$0.04\ mg + 5 \times 10^{-8} \cdot Rgr$	$0.04\ mg + 6 \times 10^{-8} \cdot Rgr$
Repeatability*, fine range (sd)	$0.008\ mg + 1.5 \times 10^{-7} \cdot Rgr$	–	$0.008\ mg + 1.2 \times 10^{-7} \cdot Rgr$	–	–
Differential linearity deviation (sd)	$\sqrt{2.5 \times 10^{-11} g \cdot Rnt}$	$\sqrt{5 \times 10^{-12} g \cdot Rnt}$	$\sqrt{1.2 \times 10^{-11} g \cdot Rnt}$	$\sqrt{2 \times 10^{-11} g \cdot Rnt}$	$\sqrt{5 \times 10^{-11} g \cdot Rnt}$
Differential eccentric load deviation (sd)	$1 \times 10^{-6} \cdot Rnt$	$5 \times 10^{-7} \cdot Rnt$	$5 \times 10^{-7} \cdot Rnt$	$6 \times 10^{-7} \cdot Rnt$	$5 \times 10^{-7} \cdot Rnt$
Sensitivity offset (sd)[2]	$1 \times 10^{-6} \cdot Rnt$	$5 \times 10^{-7} \cdot Rnt$	$8 \times 10^{-7} \cdot Rnt$	$1 \times 10^{-6} \cdot Rnt$	$6 \times 10^{-7} \cdot Rnt$
Minimum weight (according to USP)	$24\ mg + 4.5 \times 10^{-4} \cdot Rgr$	$24\ mg + 1.8 \times 10^{-4} \cdot Rgr$	$24\ mg + 3.6 \times 10^{-4} \cdot Rgr$	$120\ mg + 1.5 \times 10^{-4} \cdot Rgr$	$120\ mg + 1.8 \times 10^{-4} \cdot Rgr$
Minimum weight * (U=1%, 2 sd)	$1.6\ mg + 3.0 \times 10^{-5} \cdot Rgr$	$1.6\ mg + 1.2 \times 10^{-5} \cdot Rgr$	$1.6\ mg + 2.4 \times 10^{-5} \cdot Rgr$	$8\ mg + 1 \times 10^{-5} \cdot Rgr$	$8\ mg + 1.2 \times 10^{-5} \cdot Rgr$
Settling time	1.5s	2.5s	1.5s	1.5s	1.5s
Settling time, fine range	4s	6s	4s	4s	4s

[1] According to OIML R76
[2] In temperature range 10 – 30 °C
[3] Stability of sensitivity as from first installation with proFACT

sd: Standard deviation
Rgr: Gross weight
Rnt: Net weight (of sample)
a: Year (annum)

For more information visit

▶ **www.mt.com/XP-analytical**
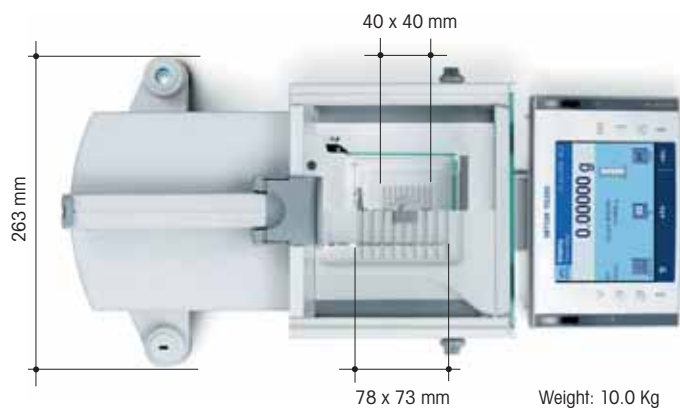
▶ **www.mt.com/micro**

Connection guaranteed
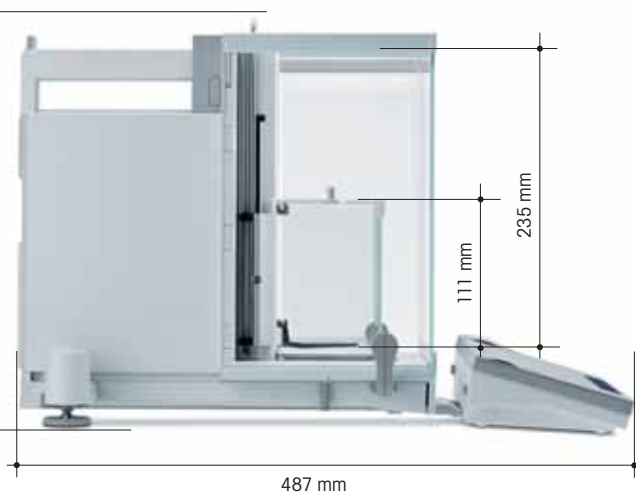Whether Bluetooth, Ethernet or simply RS232: The XP guarantees connectivity.

Wireless connection
to balance with the Bluetooth Printer BT-P42.

40 x 40 mm
263 mm
78 x 73 mm   Weight: 10.0 Kg

322 mm   235 mm   111 mm   487 mm

MinWeigh Door
for exterior draft shield
11106749

ErgoClips for XP Micro balances

ErgoClip Basket micro
11107889

ErgoClip Flask micro, including extension
11107879

MinWeigh Door micro
for inner draft shield
11107869

XP Micro balances

XP504DR
520 g
101 g
1 mg
0.1 mg
0.6 mg (500 g)
0.5 mg (10 g)
0.1 mg (10 g)
0.5 mg
0.5 mg (200 g)
$4\times10^{-6}\cdot$Rnt
$1\times10^{-6}/°C\cdot$Rnt
$1\times10^{-6}/a\cdot$Rnt
23/s

Technical data (Limit Values)	**XP26**	**XP26DR**	**XP56**	**XP56DR**
Maximum capacity	22 g	22 g	52 g	52 g
Maximum capacity, fine range	–	5.1 g	–	11 g
Readability	0.001 mg	0.01 mg	0.001 mg	0.01 mg
Readability, fine range	–	0.002 mg	–	0.002 mg
Repeatability - (at nominal load)	0.0025 mg (20 g)	0.008 mg (20 g)	0.006 mg (50 g)	0.014 mg (50 g)
- (at low load)	0.0015 mg (1 g)	0.005 mg (1 g)	0.0015 mg (1 g)	0.006 mg (1 g)
- (at low load), fine range	–	0.002 mg (1 g)	–	0.002 mg (1 g)
Linearity	0.006 mg	0.01 mg	0.02 mg	0.03 mg
Excentric load deviation (test load) [1]	0.02 mg (10 g)	0.025 mg (10 g)	0.03 mg (20 g)	0.035 mg (20 g)
Sensitivity offset	$4\times10^{-6}\cdot$Rnt	$5\times10^{-6}\cdot$Rnt	$2.5\times10^{-6}\cdot$Rnt	$3\times10^{-6}\cdot$Rnt
Sensitivity temperature drift [2]	$1\times10^{-6}/°C\cdot$Rnt	$1\times10^{-6}/°C\cdot$Rnt	$1\times10^{-6}/°C\cdot$Rnt	$1\times10^{-6}/°C\cdot$Rnt
Sensitivity stability [3]	$1\times10^{-6}/a\cdot$Rnt	$1\times10^{-6}/a\cdot$Rnt	$1\times10^{-6}/a\cdot$Rnt	$1\times10^{-6}/a\cdot$Rnt
Interface update rate	23/s	23/s	23/s	23/s

XP504DR
0.4 mg+$2\times10^{-7}\cdot$Rgr
0.04 mg+$2.0\times10^{-7}\cdot$Rgr
$\sqrt{8\times10^{-11}g}\cdot$Rnt
$5\times10^{-7}\cdot$Rnt
$8\times10^{-7}\cdot$Rnt
120 mg+$6\times10^{-4}\cdot$Rgr
8 mg+$4\times10^{-5}\cdot$Rgr
1.5s
3.5s

Typical values for calculating the measurement uncertainty

	XP26	**XP26DR**	**XP56**	**XP56DR**
Repeatability* (sd)	0.0007 mg+$4\times10^{-8}\cdot$Rgr	0.004 mg+$5\times10^{-8}\cdot$Rgr	0.0007 mg+$6\times10^{-8}\cdot$Rgr	0.004 mg+$6\times10^{-8}\cdot$Rgr
Repeatability*, fine range (sd)	–	0.0012 mg+$1\times10^{-7}\cdot$Rgr	–	0.0012 mg+$1\times10^{-7}\cdot$Rgr
Differential linearity deviation (sd)	$\sqrt{1.2\times10^{-13}g}\cdot$Rnt	$\sqrt{3\times10^{-13}g}\cdot$Rnt	$\sqrt{5\times10^{-13}g}\cdot$Rnt	$\sqrt{1.2\times10^{-12}g}\cdot$Rnt
Differential eccentric load deviation (sd)	$3\times10^{-7}\cdot$Rnt	$4\times10^{-7}\cdot$Rnt	$3\times10^{-7}\cdot$Rnt	$4\times10^{-7}\cdot$Rnt
Sensitivity offset (sd) [2]	$1\times10^{-6}\cdot$Rnt	$1.2\times10^{-6}\cdot$Rnt	$6\times10^{-7}\cdot$Rnt	$8\times10^{-7}\cdot$Rnt
Minimum weight (according to USP)	2.1 mg+$1.2\times10^{-4}\cdot$Rgr	3.6 mg+$3\times10^{-4}\cdot$Rgr	2.1 mg+$1.8\times10^{-4}\cdot$Rgr	3.6 mg+$3\times10^{-4}\cdot$Rgr
Minimum weight * (U=1%, 2 sd)	0.14 mg+$8\times10^{-6}\cdot$Rgr	0.24 mg+$2\times10^{-5}\cdot$Rgr	0.14 mg+$1.2\times10^{-5}\cdot$Rgr	0.24 mg+$2\times10^{-5}\cdot$Rgr
Settling time	3.5s	2.5s	3.5s	2.5s
Settling time, fine range	–	3.5s	–	3.5s

* Repeatability and minimum weight capacity can be improved by the following measures:
Select suitable weighing parameters, choose a better location, use smaller weighing containers
[1] According to OIML R76   [2] In temperature range 10 – 30 °C   [3] Stability of sensitivity as from first installation with proFACT
sd: Standard deviation Rgr: Gross weight Rnt: Net weight (of sample) a: Year (annum)

Accessories:

Printer RS-P42 with RS232 connection	229265	PS/2 keyboard connection (interface)	11132520
Printer BT-P42 with wireless Bluetooth connection	11132540	LocalCAN (interface)	11132505
Footswitch: switch for balance functions	11106741	Cable RS9-RS9 (m/f), 1m	11101051
ErgoSens: hands free sensor for balance functions	11132601	Cable LC-RS9 for LocalCAN	229065
Terminal extension cable 4.5 m	11600517	Weighing Kit – ErgoClip Set	11106707
Density determination add-on	11106706	PC-Volume Option 1	21900791
Integrable anti-static kit, complete	11107761	Evaporation trap, PC-Volume Option 2 XS/XP	21901263
RS232-C (interface)	11132500	PC-Volume Option 3 XS/XP	21901264
Bluetooth BTS Single point (interface)	11132535	Printer stand	11106730
Bluetooth BT Multi point (interface)	11132530	SE-Kit XP-A separate electronics	11106743
Ethernet (interface)	11132515	USB Convertor cable	11600610

Conformity and Operational Reliability
With Service XXL

Qualify your balances and work efficiently and safely from day one. METTLER TOLEDO offers customized solutions for working in a regulated environment.

EQ-Pac – Conformity and efficiency all inclusive
The complete Equipment Qualification solution. All relevant IQ/OQ/PQ/MQ processes, the associated services and the necessary documentation are combined in a complete package. In order to perform the preliminary Design Qualification (DQ) competently and quickly, we recommend the use of the METTLER TOLEDO DQ protocol in addition to the EQ Pac.

IPac – to ensure qualified installation
Ready for use straight away. With IPac, you ensure a professional installation and initial qualification. IPacs are ideal for integrating the weighing unit into an existing quality management system.

XXL Service – more than just service
METTLER TOLEDO offers custom services for day-to-day operational reliability, to maintain the value and ensure fault-free operation of your weighing unit. Our global service network comprises over 1200 highly-trained and local engineers offering cost-effective service solutions. Contact your local METTLER TOLEDO partner.

ServiceXXL
Tailored Services

www.mt.com/micro
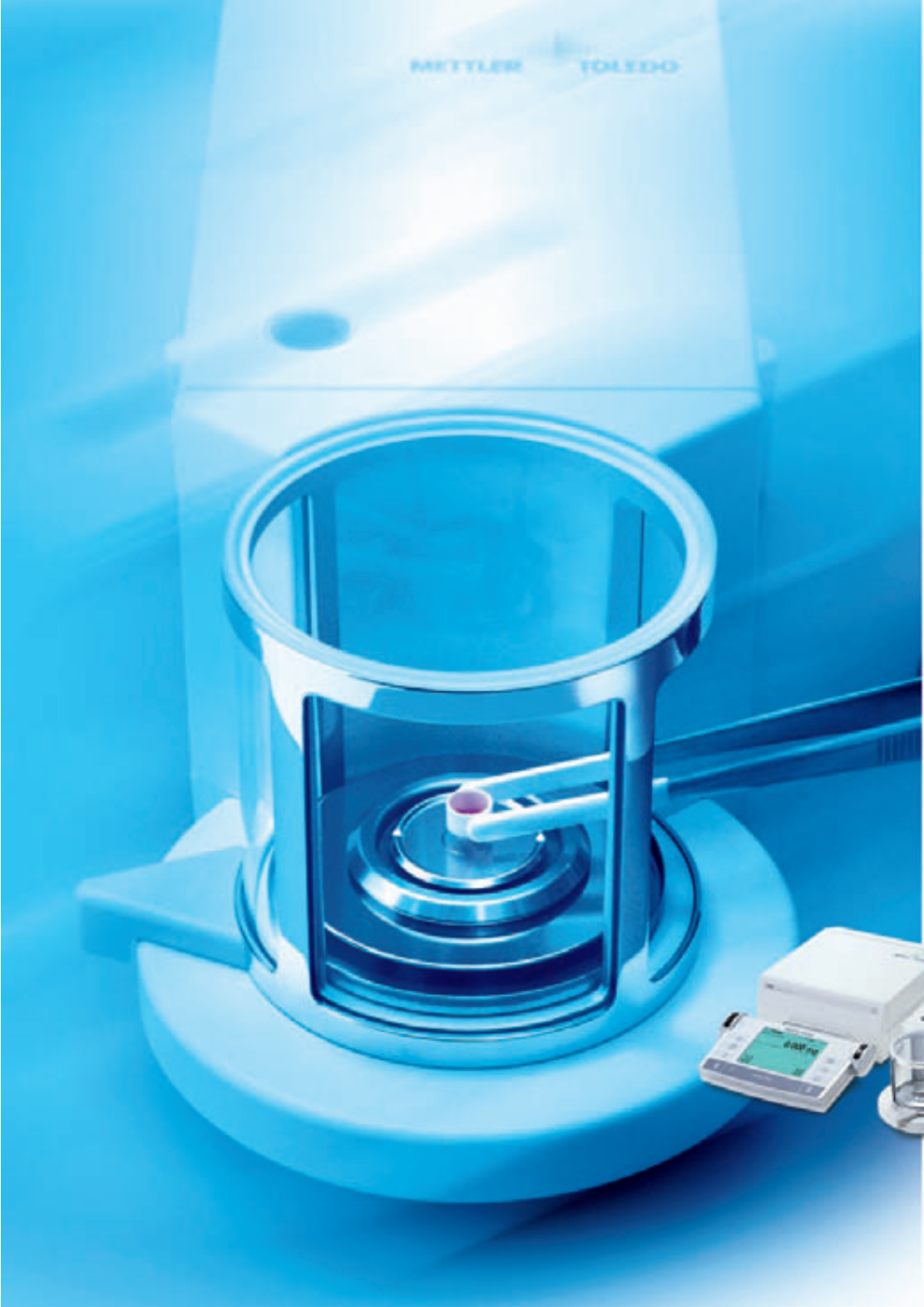**www.mt.com/XP-Analytical**

For more information

Quality certificate
development, production
and testing under ISO 9001

Environmental management system
under ISO 14001

CE **"Communauté Européenne"**
This mark guarantees that our products comply with the latest directives.

AX analytical balances and
MX/UMX microbalances from
METTLER TOLEDO.

Utmost measurement
performance for maximum
certainty.
That's the weigh!

Setting the standard:
analytical and microbalances.

METTLER TOLEDO

A question of adjustment.
Configure your own specific methods.

- ☐ Eight mutually independent user settings can be configured at will
- ☐ Easy operation with TouchScreen
- ☐ Alphanumeric keypad for clear identification of samples
- ☐ Information window gives clear overview of application progress

"Now I can configure the balance individually. Just the way I like it. I save the selected settings and activate them under my name. So I always work with a completely personalized balance."

Gisela Bender, lab technician

Direct access.
Individuality at the workplace is motivating. And results in fast and reliable work. Which is why the balance can be configured according to the task. Up to eight password-protected methods or user settings can be defined. The desired settings can be called up at a keystroke.

Easy operation.
Thanks to touchscreen technology configuring the balance is especially easy. The screen guides you. You select and confirm with the touch of a fingertip. The selected settings are then saved automatically.

Everything visible.
A glance at the large, clear screen tells you not only the weight value but also information about your application. The information to be displayed about the application and functions can be individually defined by each user.
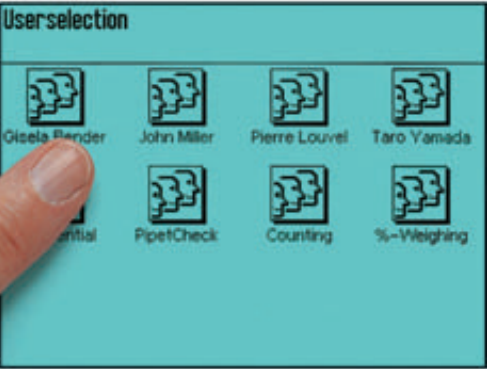
Multilingual dialogue.
The operator dialogue is in the language of your choice: English, German, French, Spanish, Italian, Japanese or Russian.
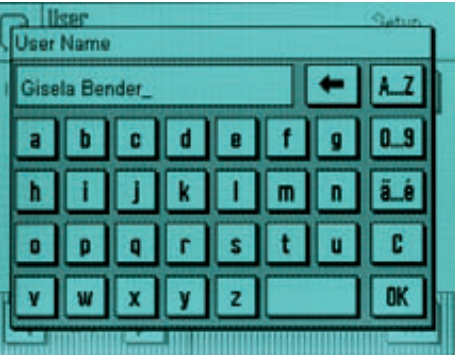
Practical.
The alphanumeric keypad can be called up for easy input of user, application, and sample information.

A soft touch on the name.
One of the eight individual balance configurations is immediately activated.

During the process: Easy to operate, clear overview, reliable functioning.

Informs:
The display can show additional individual information about the progress of each application.

Perfect documentation also. Assured traceability complies with all quality assurance regulations.

2

3

Door opener.
SmartSens automatically opens the weighing chamber for you.

- ☐ SmartSens for hands-free operation
- ☐ Operator terminal can be positioned as convenient
- ☐ Display unit can be set at the best angle for good visibility

"Hands-free operation – a simple but brilliant idea. This leaves me both hands free for weighing – but on only with these balances."

John Miller, lab technician

Automatic and smart.
SmartSens comprises two sensors, one at each side of the weighing chamber. If a hand approaches, the chamber automatically opens at the left, at the right, or completely. When the hand is removed, the glass weighing chamber doors slide shut and the weighing process starts.

Safe weighing results.
Hands-free weighing with Smart-Sens lets you focus entirely on handling the sample. So you can avoid unnecessary waste of sample material.

Personal adjustment.
The way SmartSens functions can be configured differently to suit personal work styles. Each config-uration is then saved together with other settings for up to eight differ-ent balance operators.

No messing.
SmartSens makes new ways of operating the balance possible. The automatic system functions flawlessly, even under difficult or contaminated conditions, and is always dependable. No mainte-nance work or adjustments are necessary.

A new slant.
You can adjust the inclination of the operator terminal to make it easy to read even under unfavor-able lighting conditions.

Personal inclination.
You can adjust the angle of the display unit. This makes it easy to read from any direction, even when the lighting is less than perfect.

Keeping your distance. The op-erator terminal can be completely separated from the weighing unit and positioned up to five meters away.

Proceed with caution. Operation without con-tact, thanks to SmartSens. Ideal in contaminated environments.

Keep your hands to yourself. Thanks to SmartSens you can weigh without ever touching the balance: taring, printing, opening and closing the door, weighing – all automatic.

A shared resolution.
Highest accuracy with the smallest samples.

- Weighing range electronically accurate to 0.0001 mg
- Comprehensive product range with capacities up to 510 g
- High-resolution models for smallest samples
- proFACT for fully automatic calibration and linearity adjustment
- MinWeigh for utmost certainty when weighing very small quantities

A new benchmark.
METTLER TOLEDO has again set new standards for analytical weighing with its UMX and MX microbalances and its AX analytical balances.

Safety factor.
Sophisticated electronic circuitry, with high computing power, filters out environmental disturbances during weighing, such as shaking and air circulation, more effectively than ever. This produces results at accuracies and speeds never before achieved.
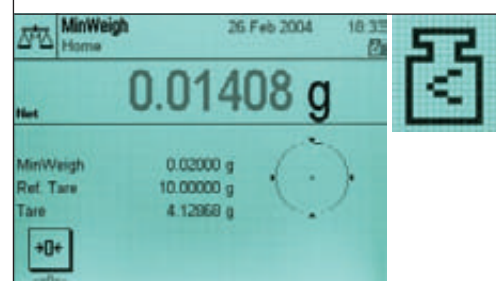
Automatic precision.
Even the slightest environmental influences such as temperature fluctuations affect the weighing results. The built-in proFACT automatic calibration system counteracts this. When the balance goes outside set tolerances, it uses built-in weights to recalibrate itself fully automatically. At the same time linearization is carried out over the entire weighing range. This means that proFACT reduces your costs, because you can forget those daily checks using external weights.

Precious little.
UMX, MX and AX balances offer high maximum loads at a most accurate readability down to 0.1 µg. This means that some models have up to 50 million divisions of resolution. So you can work with even smaller samples and easily comply with international regulations for a defined minimum allowable weight.

"Today, particularly in the field of molecular biology, we work with extremely expensive substances and compounds. There is therefore scope for reducing costs, and we take advantage of balances such as the new AX, MX and UMX from METTLER TOLEDO to do just this. It is fantastic how these balances achieve the specified standard deviations, even with the smallest of samples, and thus guarantee valid weight measurements."
Taro Yamada, Lab Manager

100% correct weighing results.
MinWeigh warns unmistakably with a weight symbol and gray display if the minimum weight allowed by international guidelines is fallen below. Which ensures that expensive substances are used optimally and not wasted.
You will find more information about MinWeigh on page 18.

Minimal. Smaller minimum samples are possible thanks to unprecedented accuracies with the additional inner draft shield on the AX balance.

Calibration. Fully automatic, thanks to proFACT. The AX lowers two built-in weights automatically onto the weighing pan, ensuring that you continue to weigh with optimum precision at all times over the entire weighing range.

Little difference. With Delta-Range models, a fine weighing range with ten times the accuracy of the regular range is recalled every time the balance is tared within a certain range. This is ideal when using heavy tare containers for very small samples.

On a fine scale.
UMX ultra-microbalances and MX microbalances.

- ☐ Separate electronics unit for minimum disturbance to weighing process
- ☐ Door opened 'hands-free' or from keypad
- ☐ Rugged construction
- ☐ Overload protection
- ☐ Easy to clean with removable draft shield
- ☐ Filter weighing kit for filter diameters up to 100 mm

"C'est magnifique, when the best gets even better. Like with the new MX and UMX balances from METTLER TOLEDO. Now we can be certain that we are obtaining valid results even with minimum-weight samples."

**Pierre Louvel
quality manager**

Details count.
Earlier models set new standards a few years ago, and are today regarded as the industry benchmark. Now the latest ultra-microbalances and microbalances represent a marked improvement with new electronics and fine honing of every detail. Here again our aim was to fulfill the wishes and needs of users, or better, to exceed their expectations.

Practical solutions.
Despite the sophisticated and clever technology which is used to perform a weighing operation with an unprecedented 50 million calibration divisions, the concept of this high-end balance is completely practical. Every detail bears witness to this. As you work from one sample to the next, you will see that the new METTLER TOLEDO UMX and MX microbalances are designed to boost efficiency, increase reliability and guarantee network compatibility.

Reference class.
The performance of UMX and MX balances is already making them valued instruments in metrological institutes for the certification of weights. And their operation is just as simple and convenient as with analytical balances.

Accessible from both sides. You can place objects in the weighing chamber from the left or the right: the motorized draft shield can be operated hands-free, from the keypad or by hand. In addition, the glass draft shield cover can be removed for applications that require it.

Minutest weighings. With the UMX balances, samples of up to 5 g can be weighed to an accuracy of 0.1 µg.

Highly accurate differential weighing. With a reproducibility never before achieved. The filter set is designed for weighing the finest traces of filter residue (filters up to 110 mm diameter).

Straightforward cleaning. Simply remove the round glass draft shield by hand, and the balance is easy to clean.

Freedom of movement.
With AX semi-microbalances and analytical balances.

□ Door opened on approach or by pressing a key

□ Automatic opening for left- or right-handed operation

□ Free access to weighing pan with no cross-struts

□ Rugged metal housing

□ Low-profile square weighing pan

Detailed print-outs. ISO- and GLP-compliant reports printed by the GA42 on plain paper. It documents the calibration procedures initiated automatically by the AX together with the date, sample and identification numbers, time of day, type of instrument and serial number, and marks a space for your signature.

"I can reach the weighing pan from the side that suits me best. Being left-handed, that makes my life a lot easier. And that's the great thing about the AX – handy to use, just like I wanted."
Gisela Bender, lab technician

Free access to the weighing pan. The three-part draft shield can be opened as a whole, leaving no cross-struts to obstruct access. However, it can also be opened only at the top, left side or right side to access the weighing chamber. So you only need to open the chamber just enough for the weighing task concerned.

Free access to weighing chamber. SmartSens opens the weighing chamber at the left, at the right or entirely, depending on the active configuration, when a hand approaches the balance. The front pane provides a protection against radiant heat from the person working with the balance.

Practical considerations.
These have led to the unequaled design of the draft shield on semi-microbalances and analytical balances. It can be opened completely. Or only on the side preferred by left- or right-handed users. Or at one side only, for left- or right-handed operators. With hands-free actuation or at the touch of a key, the doors slide open and shut automatically. This is what we mean by convenience. But above all, efficiency.

Convenient operation.
The display is easy to read, and the keys are arranged for maximum clarity. A generously dimensioned low-profile weighing pan allows you to rest your hand on the benchtop when weighing in formulations. The weighing chamber is easy to clean.

Long-term decisions.
The materials used to make these balances – glass, metal and performance polymers – are of the highest quality. They are resistant to acids. Cleaning is easy, since there are virtually no awkward grooves or recesses. METTLER TOLEDO balances withstand the rigors of intensive daily use undamaged.

Free access for robot arms. The generously dimensioned weighing chamber, with no cross-struts, offers unobstructed access from three sides when required.

Easy on the arm. When dosing into low containers you can rest your hand on the benchtop, since the weighing pan is at such an unusually low level.

METTLER TOLEDO

Weighing   21.MAR 2004   18.36
Gisela Bender

0.00000 g

→0/T←

A good all-rounder.
Network compatibility with built-in applications.

- ☐ Built-in user-guided software as standard
- ☐ For density determination, differential weighing, PipetCheck, plus-minus weighing, piece counting
- ☐ Optional second interface, LocalCAN or RS232

Plug and weigh.
The AX, MX and UMX interface concept guarantees maximum flexibility. One RS232 interface is fitted as standard. You can also equip the balances with an additional RS232 interface, a LocalCAN universal interface or a downward-compatible interface.

Programmable for the future.
LocalCAN is a particularly safe investment in future technology. The possibility of programming it externally means that this interface can also comply with future standards. In addition, it enables up to five peripheral devices to be connected at the same time.

Integration into existing systems.
If an AX, MX or UMX balance needs to be integrated into an existing system configuration, the 'Mini-Mettler' interface is ideal.

Task-specific adaptability.
Practical methods for various frequently used applications are incorporated as standard software.
Density determination. You can calculate the density of solid objects and liquids directly with the buoyancy method. The result is displayed immediately on the balance screen.
Differential weighing. Frequently a routine task: measuring the difference between initial and residual weights as a percentage and in grams. With this application you are free to specify your own working method and sequence.
Pipette checking. The gravimetric method is a particularly reliable and simple way of verifying the accuracy of a pipette. All the data, results, and tolerances of 20 pipettes can be saved in the database. The data, results, and tolerances of 20 pipettes can be stored.

Versatility. The flexible interface concept allows several devices to be connected at the same time. Whether you use an RS232 interface or, with the future in mind, a LocalCAN interface: just connect the peripherals – and you're in business.

Straight talking. You are guided through the differential weighing procedure step by step. Naturally in the language of your choice: English, German, French, Spanish, Italian, Japanese, or Russian.

```
---- METTLER TOLEDO -----
   DIFFERENTIAL WEIGHING

  1      T    36.22242 g
  1     NI     0.97006 g
  1     ND     0.97515 g
Diff.:        -0.2975 %
              =============
  2      T    36.22191 g
  2     NI     0.98890 g
  2     ND     0.98593 g
Diff.:        -0.3003 %
              =============
  3      T    36.22189 g
  3     NI     0.98115 g
  3     ND     0.98569 g
Diff.:         0.4627 %
              =============

Signature:

.............................
---------- END ------------
```

Sophistication. The density kit, accessed from the left or the right, with software already incorporated in the balance for automatically determining the density of solid objects and liquids.

Reliability. The pipette checking application is a very simple and reliable method for verifying the precision and accuracy of your pipettes. Giving you confidence at all times when pipetting.

Pipetting with METTLER TOLEDO. RAININ, a METTLER TOLEDO company, offers a complete system of hand-friendly pipettes, tips, and accessories. You will find more information at www.mt.com

Complete overview.
Everything under control.

Company network

Server

Production

Office

Lab
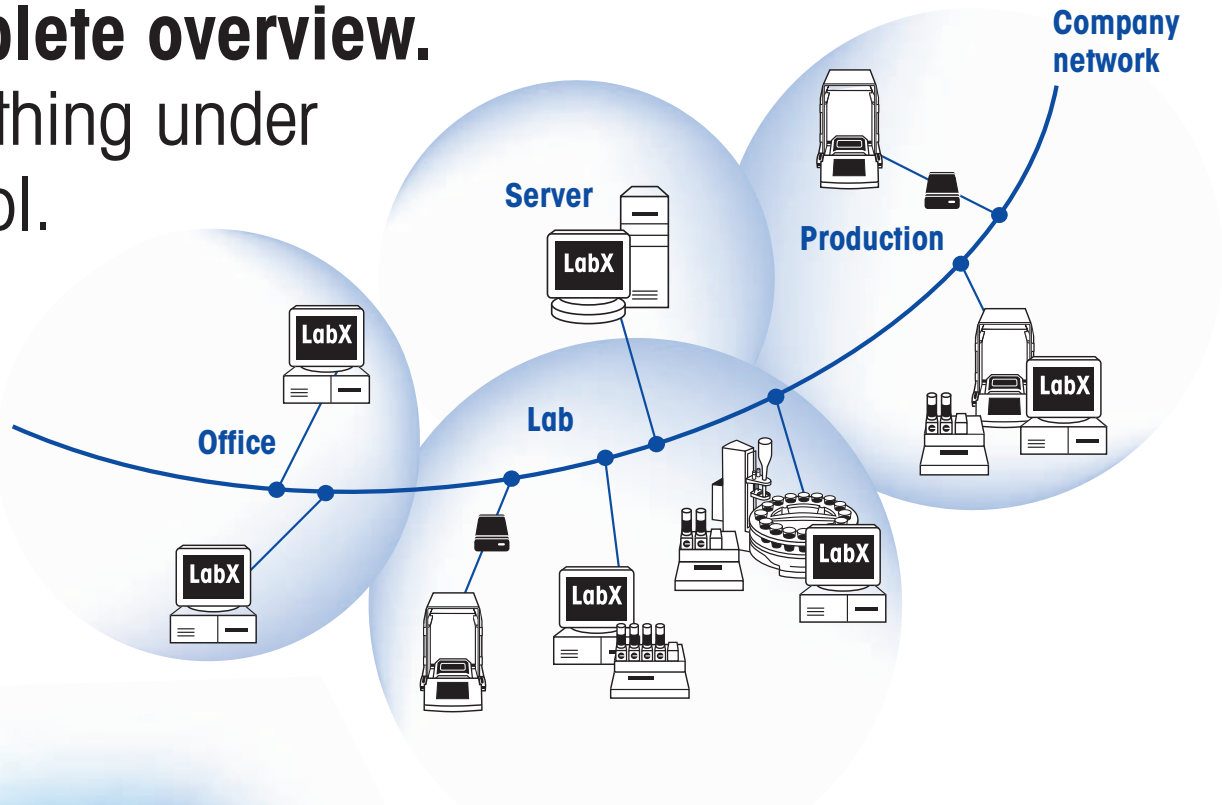
LabX

Monitor your measurements – with LabX, from wherever you like.

LabX allows measurements with AX/MX/UMX balances and titrators to be monitored from anywhere in the network. Just connect your instruments to a PC or directly to your company's Ethernet network and you can validate the data from your office or observe measurements in real time while you work at another workplace.

Direct access to LabX from a balance.

You can work with LabX without ever touching a computer. Balances like the AX, MX, and UMX allow you to login to LabX directly from the balance. To do so, the balance does not even have to be directly connected to a computer: just connect it to your company network via the METTLER TOLEDO e-Link box.

Simplify your routine work.

LabX helps you to simplify your daily work in many areas. For example, you can import your sample data directly from LIMS, create templates for daily routine analyses, prepare statistics and control diagrams, and much more besides. LabX provides you with an array of templates for simple and differential weighing so you can greatly simplify your application structure.

Completely efficient instrument management.

With LabX you can manage your instruments centrally. Operations such as validating calibration data, or updating methods, can be performed on the same PC. If desired, changes can be implemented globally for all connected instruments. So you save time and avoid errors.

LabX software for balances

	LabX pro balance	LabX light balance
METTLER TOLEDO instruments supported	Balances AX, MX, UMX, AG, XS, XP, PR, SR, PG, PG-S, SG, AT, MT, UMT	
Client/server architecture	•	
Control of multiple instruments	•	
Instrument management	•	•
21 CFR Part 11 support	•	
Direct access from balance (RapidAccess)	•	
Online view/control in real time	•	•
Task/methods editor	•	•
Automatic statistics/control diagrams	•	•
Report generator	•	•
LIMS connectability	•	

If you have questions please do not hesitate to contact us or visit our website at

www.mt.com/LabX

Complete support for 21 CFR Part 11.

LabX provides all the tools needed for FDA-compliant data management and storage according to 21 CFR Part 11. These include comprehensive user management, access protection, electronic signature capability, and audit trail functionality. For system validation METTLER TOLEDO offers comprehensive support as well as a two-volume validation manual so that your validation costs stay within limits.

Integrate your instruments into your network with e-Link

e-Link Ethernet Interface allows you to integrate balances, titrators, checkweighers, and terminals into your network without any adaptation of software or hardware, and with e-Link IP even in wet or hazardous areas. e-Link offers everything needed for networking – a processor, a rugged TCP/IP stack, a webserver, and a network connection to create an Ethernet bridge to your serial devices. You will find more information on our website at www.mt.com/elink

System solutions for maximum process optimization. e-Link can be integrated into existing software solutions such as LabX and FreeWeigh.Net.

AX/MX/UMX balances

Standard features
- Backlit graphic display with touch screen operation
- ProFACT, fully automatic temperature-driven calibration and linearization
- Built-in RS232 interface; plug-in module available for optional second interface of your choice
- Glass draft shield with automatic door opening and removable cover
- SmartSens for hands-free operation
- Replaceable protective cover
- Below-the-balance weighing facility
- AC/DC adapter for connection to AC power line
- Country-specific power cable
- Weighing adapter for optimum adaptation to ambient conditions

All models can:
- Download software from the Internet
- Display various units of weight
- Determine the density of solids and liquids
- Perform differential weighing
- Check the precision of pipettes
- Make statistical evaluations
- Calculate with factors
- Carry out piece counting and percent weighing operations
- Be tared over the entire weighing range
- MinWeigh (activated by local MT Service at your workplace)

AX-SE – for weighing in contaminated or underpressure environments

Thanks to a separate control unit for all AX modules the electronics can be placed separate from the weighing cell.5 m cable.

Part no. 11100030

5 m terminal cable with cover plate.

Part no. 11100081

RS-P42 printer
The RS-P42 printer documents the measurement values from the UMX, MX, and AX simply and securely according to guidelines of modern Q systems.

Funnel set
For simple weighing of small amounts of powdery substances.
For balance models: MX/UMX
MX/UMX funnel set

Part no. 211220

Filter weighing
Special filter sets for MX micro and AX semi-micro balances. Suitable for filters up to 110 mm diameter. The special construction largely prevents disturbing environmental influences.

For balance models:
AX26, AX26DR
AX105DR
AX205, AX205DR

AX filter set for filters up to ⌀ 105 mm

Part no. 210470

For balance models:
MX, UMX

Filter sets for filters up to ⌀50 mm	Filter sets for filters up to ⌀110 mm
Part no. 211214	211227

U ionizer
Usable with practically all balances and weighing objects, the ionization system comprises a U-shaped ionizer and a high-voltage power supply unit. The object or container being weighed is discharged by being passed through the U ionizer when loading the balance. The object being weighed is neutralized. The neutralization process takes only seconds. Although the ionizer uses a high voltage, it can be touched with absolute safety. You will find more information about anti-static solutions in our separate brochure.

Accessories
- LocalCAN universal interface module
- RS232 interface module
- MiniMettler interface module
- Auxiliary display
- Interface cable
- BalanceLink PC software for data acquisition by a PC
- Foot switch
- Carrying case

Technical data (threshold values)	UMX2	UMX5	MX5	AX26	AX26DR	AX105DR	AX205	AX205DR	AX204	AX204DR	AX304	AX504	AX504DR
Maximum capacity	2,1 g	5,1 g	5,1 g	22 g	21 g	110 g	220 g	220 g	220 g	220 g	310 g	510 g	510 g
Maximum capacity of fine range	–	–	–	–	3 g	31 g	–	81 g	–	81 g	–	–	81 g
Readability	0,0001 mg	0,0001 mg	0,001 mg	0,001 mg	0,01 mg	0.1 mg	0.01 mg	0.1 mg	0.1 mg	1 mg	0.1 mg	0.1 mg	1 mg
Readability in fine range	–	–	–	–	0,002 mg	0.01 mg	–	0.01 mg	–	0.1 mg	–	–	0.1 mg
Repeatability (sd) at maximum capacity	0,00025 mg	0,0004 mg	0,0009 mg	0,002 mg	0,006 mg	0.05 mg	0.03 mg	0.06 mg	0.07 mg	0.6 mg	0.1 mg	0.1 mg	0.6 mg
Repeatability (sd) (at gross capacity)	0,00025 mg (0,2 g)	0,00025 mg (0,2 g)	0,0008 mg (0,2 g)	0,0015 mg (1 g)	0,002 mg (1 g)	0.015 mg (10 g)	0.015 mg (10 g)	0.015 mg (10 g)	0.05 mg (10 g)	0.05 mg (10 g)	0.07 mg (10 g)	0.07 mg (10 g)	0.1 mg (10 g)
Linearity	0,001 mg	0,004 mg	0,004 mg	0,006 mg	0,008 mg	0.15 mg	0.1 mg	0.15 mg	0.2 mg	0.3 mg	0.3 mg	0.4 mg	0.5 mg
Corner load at $^1/_2$ maximum capacity[1]	0,0025 mg	0,005 mg	0,005 mg	0,025 mg	0,025 mg	0.25 mg	0.25 mg	0.25 mg	0.25 mg	0.25 mg	0.5 mg	0.6 mg	0.6 mg
Sensitivity drift	$1,5 \times 10^{-5}$	$7,0 \times 10^{-6}$	$7,0 \times 10^{-6}$	$2,5 \times 10^{-6}$	$3,0 \times 10^{-6}$	4.0×10^{-6}	1.5×10^{-6}	2.0×10^{-6}	2.5×10^{-6}	3.0×10^{-6}	5.0×10^{-6}	5.0×10^{-6}	7.0×10^{-6}
Temperature drift of sensitivity[2]	0,0001%/°C	0,0001%/°C	0,0001%/°C	0,0001%/°C	0,0001%/°C	0.0001%/°C	0.0001%/°C	0.0001%/°C	0.0001%/°C	0.0001%/°C	0.0001%/°C	0.0001%/°C	0.0001%/°C
Stability of sensitivity[3]	0,0001%/a	0,0001%/a	0,0001%/a	0,0001%/a	0,0001%/a	0.0001%/a	0.0001%/a	0.0001%/a	0.0001%/a	0.0001%/a	0.0001%/a	0.0001%/a	0.0001%/a
Typical weighing time[4]	16 s	18 s	16 s	16 s	16 s	12 s	12 s	12 s	4 s	4 s	4 s	4 s	4 s
Update rate of the interface	7 /s	7 /s	7 /s	7 /s	7 /s	7 /s	7 /s	7 /s	7 /s	7 /s	7 /s	7 /s	7 /s
Weighing unit dimensions (w x d x h) [mm]	128 x 287 x 113	128 x 287 x 113	128 x 287 x 113	241 x 505 x 293	241 x 505 x 293	241 x 505 x 293	241 x 505 x 293	241 x 505 x 293	241 x 505 x 293	241 x 505 x 293	241 x 505 x 293	241 x 505 x 293	241 x 505 x 293
Control unit dimensions (w x d x h) [mm]	224 x 366 x 94	224 x 366 x 94	224 x 366 x 94	–	–	–	–	–	–	–	–	–	–
Effective height draft shield [mm]	55	55	55	240	240	240	240	240	240	240	240	240	240
Weighing pan dimensions (w x d) [mm]	16	16	27	28	32	80 x 80	80 x 80	80 x 80	80 x 80	80 x 80	80 x 80	80 x 80	80 x 80

[1] To OIML R76 [2] In the temperature range 10...30 °C [3] Stability of sensitivity when first put into operation with proFACT self-adjustment switched on [4] Includes sample handling and stabilization time

Typical data for calculating the measurement uncertainty

	UMX2	UMX5	MX5	AX26	AX26DR	AX105DR	AX205	AX205DR	AX204	AX204DR	AX304	AX504	AX504DR
Typical repeatability (sd)	$0.0002 \text{ mg} + 2.5 \times 10^{-8} \cdot R_{gr}$	$0.0002 \text{ mg} + 3 \times 10^{-6} \cdot R_{gr}$	$0.0005 \text{ mg} + 4 \times 10^{-8} \cdot R_{gr}$	$0.001 \text{ mg} + 2.5 \times 10^{-8} \cdot R_{gr}$	$0.004 \text{ mg} + 5 \times 10^{-8} \cdot R_{gr}$	$0.04 \text{ mg} + 1 \times 10^{-7} \cdot R_{gr}$	$0.01 \text{ mg} + 6 \times 10^{-8} \cdot R_{gr}$	$0.04 \text{ mg} + 5 \times 10^{-8} \cdot R_{gr}$	$0.04 \text{ mg} + 5 \times 10^{-8} \cdot R_{gr}$	$0.4 \text{ mg} + 5 \times 10^{-7} \cdot R_{gr}$	$0.04 \text{ mg} + 6 \times 10^{-8} \cdot R_{gr}$	$0.04 \text{ mg} + 6 \times 10^{-8} \cdot R_{gr}$	$0.5 \text{ mg} + 2 \times 10^{-7} \cdot R_{gr}$
Typical repeatability in fine range (sd)	–	–	–	–	$0.0015 \text{ mg} + 5 \times 10^{-7} \cdot R_{gr}$	$0.01 \text{ mg} + 6 \times 10^{-7} \cdot R_{gr}$	–	$0.01 \text{ mg} + 2.5 \times 10^{-7} \cdot R_{gr}$	–	$0.04 \text{ mg} + 1.2 \times 10^{-7} \cdot R_{gr}$	–	–	$0.04 \text{ mg} + 4 \times 10^{-7} \cdot R_{gr}$
Typical differential non-linearity (sd)	$\sqrt{1 \times 10^{-14} \text{g}} \cdot R_{nt}$	$\sqrt{8 \times 10^{-14} \text{g}} \cdot R_{nt}$	$\sqrt{8 \times 10^{-14} \text{g}} \cdot R_{nt}$	$\sqrt{5 \times 10^{-14} \text{g}} \cdot R_{nt}$	$\sqrt{8 \times 10^{-14} \text{g}} \cdot R_{nt}$	$\sqrt{6 \times 10^{-12} \text{g}} \cdot R_{nt}$	$\sqrt{1 \times 10^{-12} \text{g}} \cdot R_{nt}$	$\sqrt{3 \times 10^{-12} \text{g}} \cdot R_{nt}$	$\sqrt{5 \times 10^{-12} \text{g}} \cdot R_{nt}$	$\sqrt{1 \times 10^{-11} \text{g}} \cdot R_{nt}$	$\sqrt{8 \times 10^{-12} \text{g}} \cdot R_{nt}$	$\sqrt{8 \times 10^{-12} \text{g}} \cdot R_{nt}$	$\sqrt{1.5 \times 10 \text{-}11} \text{-} R_{nt}$
Typical differential corner-load deviation (sd)	$2.5 \times 10^{-7} \cdot R_{nt}$	$3 \times 10^{-7} \cdot R_{nt}$	$3 \times 10^{-7} \cdot R_{nt}$	$2.5 \times 10^{-7} \cdot R_{nt}$	$2.5 \times 10^{-7} \cdot R_{nt}$	$5 \times 10^{-7} \cdot R_{nt}$	$2.5 \times 10^{-7} \cdot R_{nt}$	$2.5 \times 10^{-7} \cdot R_{nt}$	$2.5 \times 10^{-7} \cdot R_{nt}$	$2.5 \times 10^{-7} \cdot R_{nt}$	$2.5 \times 10^{-7} \cdot R_{nt}$	$2 \times 10^{-7} \cdot R_{nt}$	$2 \times 10^{-7} \cdot R_{nt}$
Typical sensitivity drift (sd)	$3 \times 10^{-6} \cdot R_{nt}$	$1.5 \times 10^{-6} \cdot R_{nt}$	$1.5 \times 10^{-6} \cdot R_{nt}$	$8 \times 10^{-7} \cdot R_{nt}$	$8 \times 10^{-7} \cdot R_{nt}$	$8 \times 10^{-7} \cdot R_{nt}$	$6 \times 10^{-7} \cdot R_{nt}$	$6 \times 10^{-7} \cdot R_{nt}$	$6 \times 10^{-7} \cdot R_{nt}$	$6 \times 10^{-7} \cdot R_{nt}$	$6 \times 10^{-7} \cdot R_{nt}$	$8 \times 10^{-7} \cdot R_{nt}$	$8 \times 10^{-7} \cdot R_{nt}$
Typical minimum weight (per USP)[1]	$0.6 \text{ mg} + 7.5 \times 10^{-5} \cdot R_{gr}$	$0.6 \text{ mg} + 9 \times 10^{-5} \cdot R_{gr}$	$1.5 \text{ mg} + 1.2 \times 10^{-4} \cdot R_{gr}$	$3 \text{ mg} + 7.5 \times 10^{-5} \cdot R_{gr}$	$12 \text{ mg} + 1.5 \times 10^{-4} \cdot R_{gr}$	$120 \text{ mg} + 3 \times 10^{-4} \cdot R_{gr}$	$30 \text{ mg} + 1.8 \times 10^{-4} \cdot R_{gr}$	$120 \text{ mg} + 1.5 \times 10^{-4} \cdot R_{gr}$	$120 \text{ mg} + 1.5 \times 10^{-4} \cdot R_{gr}$	$1200 \text{ mg} + 1.5 \times 10^{-3} \cdot R_{gr}$	$120 \text{ mg} + 1.8 \times 10^{-4} \cdot R_{gr}$	$120 \text{ mg} + 1.8 \times 10^{-4} \cdot R_{gr}$	$1500 \text{ mg} + 6 \times 10^{-4} \cdot R_{gr}$
Typical minimum weight (per USP) in fine range[1]	–	–	–	–	$4.5 \text{ mg} + 1.5 \times 10^{-3} \cdot R_{gr}$	$30 \text{ mg} + 1.8 \times 10^{-3} \cdot R_{gr}$	–	$30 \text{ mg} + 7.5 \times 10^{-4} \cdot R_{gr}$	–	$120 \text{ mg} + 3.6 \times 10^{-4} \cdot R_{gr}$	–	–	$120 \text{ mg} + 1.2 \times 10^{-3} \cdot R_{gr}$

sd: Standard deviation R_{gr}: Gross weight R_{nt}: Net weight (sample weight) a: Year (annum)
[1] The minimum weight can be improved by the following measures: Choice of more suitable weighing parameters, selection of a better location, use of smaller tare containers, use of an inner draft shield

When very small weights are highly important.

MinWeigh, another innovation from METTLER TOLEDO.
MinWeigh is the new "Quality Application" for AX, MX, and UMX balances.
MinWeigh revolutionizes weighing where very small weights become highly important because quality management demands absolute compliance with specified tolerances. Because MinWeigh answers the minimum weight question with unprecedented precision.

Central challenge: Standards.
MinWeigh provides an outstanding service where guidelines of a quality assurance system such as GLP or GMP apply.

Central question: quality. In a quality management system, measurement uncertainty cannot be left to chance. It must lie within defined limits. How large must the minimum weight be to come inside the tolerances of the quality management system?
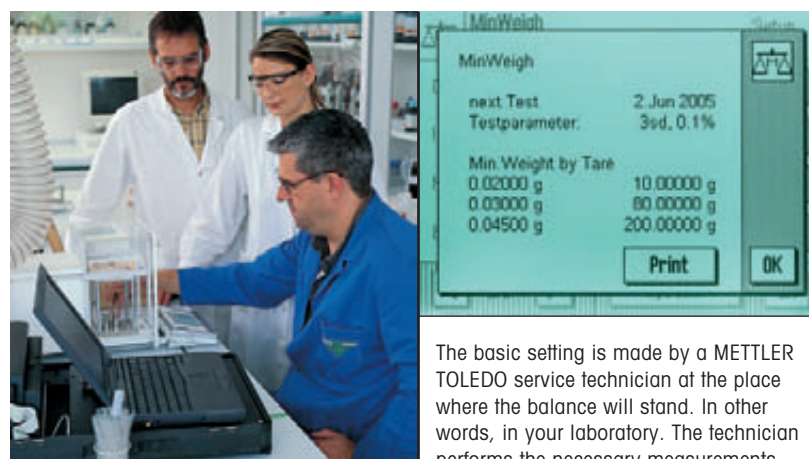
The basic setting is made by a METTLER TOLEDO service technician at the place where the balance will stand. In other words, in your laboratory. The technician performs the necessary measurements. According to the specifications of your quality assurance system he determines the minimum weight with the best possible settings and the typically used tare weight.

When the minimum weight is reached, the display changes from gray to black. The weight symbol disappears.

Central function: MinWeigh.
METTER TOLEDO offers a solution for the minimum weight with the MinWeigh application which is built into the AX/MX/UMX balances. MinWeigh knows the required minimum weight. If the minimum weight is not reached, MinWeigh detects the error and warns you via the balance terminal. Further use of non-compliant weighing results is prevented.

If the minimum weight is not reached, the net weight is marked with an asterisk on the report.

Tailored service from METTLER TOLEDO. We offer the corresponding all-round service for balances which form part of a quality management system or are used in regulated areas.

Systematic control of inspection, test, and measuring equipment is more important than ever before. Not only as a crucial component of seamless quality assurance but also as an additional instrument for permanently reducing costs. It also avoids complaints by inspectors and auditors. The Q-circle (qualification/validation) illustrates simply how the regulations are applied in practice to a balance and how we can support you with our services in all areas.

Suitable for:
• Companies which comply with GMP, GLP, ISO
• FDA regulated areas
• Pharmaceutical industry
• Chemical industry (suppliers to the pharma industry)
• Biotechnology
• Food industry
• Electrical, metal, and automobile industries

Design Qualification (DQ)
Define the requirements for a product according to the specification, regulations, and compliances.

Installation Qualification (IQ)
Correct and documented installation at the right location.

Operational Qualification (OQ)
Check and confirm the required performance data.

Performance Qualification (PQ)
Check that in normal operation the instrument constantly performs according to specification.

Maintenance Qualification (MQ)
Periodic mainten

Make sure that your balance is optimally configured to your needs right from the start. Qualification of your balance ensures precision, reliability, and a long service life. Benefit from the worldwide know-how and years-long experience of METTLER TOLEDO. Combine our different service offerings into an optimal solution for your service needs.
Packaged service. Tailored to your needs.

Service Packages
Simply select the appropriate service package according to the demands placed on the balance. You can add further services to ensure the package matches your changing requirements.

Service specialists
With sales and service companies in more than 100 countries, METTLER TOLEDO ensures you are cared for by highly trained specialists.

Service know-how
Knowledge and practical experience is exchanged within our global service network – for your benefit, too.

www.mt.com/service

Mettler-Toledo GmbH
Laboratory & Weighing Technologies
CH-8606 Greifensee, Switzerland
Phone +41-1-944 22 11, Fax +41-1-944 30 60
Internet: http://www.mt.com

AT **Mettler-Toledo GmbH.,** A-1100 Wien
Tel. (01) 604 19 80, Fax (01) 604 28 80
AU **Mettler-Toledo Ltd.,** Port Melbourne, Victoria 3207
Tel. (03) 9644 57 00, Fax (03) 9645 39 35
BE **N.V. Mettler-Toledo s.a.,** B-1932 Zaventem
Tel. (02) 334 02 11, Fax (02) 334 03 34
CA **Mettler-Toledo Inc.,** Ontario, Canada
Tel (800) 638-8537, Fax (905) 681-8036
CH **Mettler-Toledo (Schweiz) AG,** CH-8606 Greifensee
Tel. (01) 944 45 45, Fax (01) 944 45 10
CN **Mettler-Toledo (Shanghai) Ltd.,** Shanghai 200233
Tel. (21) 6485 04 35, Fax (21) 6485 33 51
CZ **Mettler-Toledo, spol. s.r.o.,** CZ-100 00 Praha 10
Tel. (0) 272 123 150, Fax (0) 272 123 170
DE **Mettler-Toledo GmbH,** D-35353 Giessen
Tel. (0641) 50 70, Fax (0641) 507 128
DK **Mettler-Toledo A/S,** DK-2600 Glostrup
Tel. (43) 270 800, Fax (43) 270 828
ES **Mettler-Toledo S.A.E.,** E-08908 Barcelona
Tel. (93) 223 76 00, Fax (93) 223 76 01
FR **Mettler-Toledo s.a.,** F-78222 Viroflay
Tel. (0) 130 97 17 17, Fax (0) 1 30 97 16 16
HK **Mettler-Toledo (HK) Ltd.,** Kowloon
Tel. (02) 744 12 21, Fax (02) 744 68 78
HR **Mettler-Toledo, d.o.o.,** HR-10000 Zagreb
Tel. (01) 230 41 47, Fax (01) 41 233 63 17
HU **Mettler-Toledo, KFT,** H-1139 Budapest
Tel. (01) 288 40 40, Fax (01) 288 40 50
IN **Mettler-Toledo India Pvt Ltd,** Mumbai 400 072
Tel. (22) 2857 08 08, Fax (22) 2857 50 71
IT **Mettler-Toledo S.p.A.,** I-20026 Novate Milanese
Tel. (02) 333 321, Fax (02) 356 29 73
JP **Mettler-Toledo K.K.,** Tokyo 143-006
Tel. (3) 5762 0606, Fax (3) 5762 0756
KR **Mettler-Toledo (Korea) Ltd.,** Seoul 137-891
Tel. (02) 3498-3500, Fax (02) 3498-3555
KZ **Mettler-Toledo CA,** 480009 Almaty
Tel. (07) 3272 980 834, Fax (07) 3272 980 835
MY **Mettler-Toledo (M) Sdn. Bhd.,** 40150 Selangor
Tel. (03) 784 55 773, Fax (03) 784 58 773
MY **Mettler-Toledo (S.E.A.),** 40150 Selangor
Tel. (03) 7845 5373, Fax (03) 7845 3478
MX **Mettler-Toledo S.A. de C.V.,** México C.P. 06430
Tel. (05) 547 57 00, Fax (05) 541 65 13
NL **Mettler-Toledo B.V.,** NL-4004 JK Tiel
Tel. (0344) 638 363, Fax (0344) 638 390
PL **Mettler-Toledo, Sp. z o.o.,** PL-02-929 Warszawa
Tel. (22) 651 92 32, Fax (22) 651 71 72
RU **Mettler-Toledo C.I.S. AG,** 10 1000 Moskau
Tel. (95) 921 92 11, Fax (95) 921 63 53
SE **Mettler-Toledo AB,** S-12008 Stockholm
Tel. (08) 702 50 00, Fax (08) 642 45 62
SG **Mettler-Toledo (S) Pte. Ltd.,** Singapore 139959
Tel. 65-6890 0011, Fax 65-6890 0012/13
SK **Mettler-Toledo,** SK-82104 Bratislava
Tel. (02) 434 27 496, Fax (02) 433 37 190
SI **Mettler-Toledo, d.o.o.,** SI-1236 Trzin
Tel. (01) 562 1801, Fax (01) 562 1789
TH **Mettler-Toledo (Thailand) Ltd.,** Bangkok 10320
Tel. (02) 723 0300, Fax (02) 719 6479
TW **Mettler-Toledo Pac Rim AG,** Taipei 114
Tel. (02) 2657 8898, Fax (02) 2657 0776
UK **Mettler-Toledo Ltd.,** Leicester, LE4 1AW
Tel. (0116) 235 70 70, Fax (0116) 236 63 99
US **Mettler-Toledo, Inc.,** Columbus, OH 43240
Tel. (614) 438 4511, Fax (614) 438 4900

For all other countries:
Mettler-Toledo GmbH
PO Box VI-400, CH-8606 Greifensee
Tel. +41-1-944 22 11, Fax +41-1-944 31 70

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