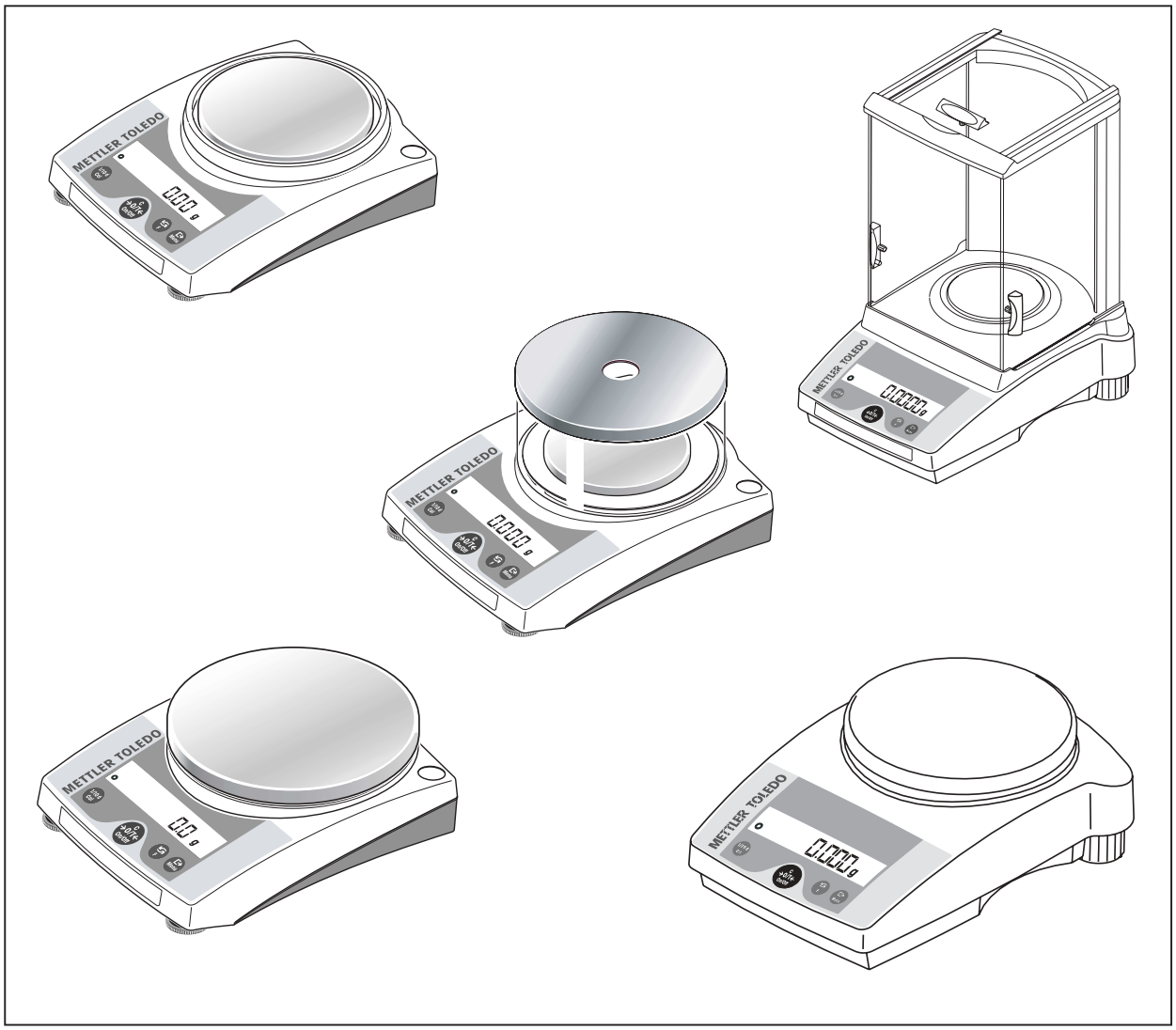
Operating instructions

METTLER TOLEDO

METTLER TOLEDO
Line of balances

- **AL**
- **PL/PL-S**

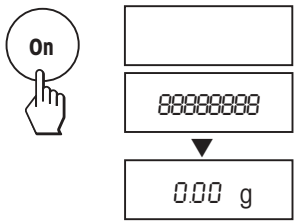


Operating instructions in a nutshell

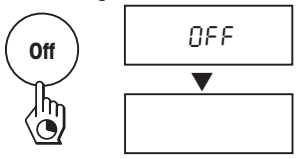
Press key **briefly** — Press and **hold key down** until the desired display appears — ▼ automatic sequence

*** These functions must be activated in the menu (section 4.3.2)**

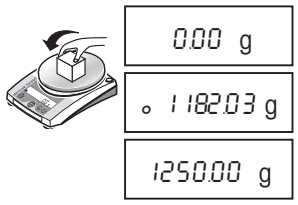
Switching on



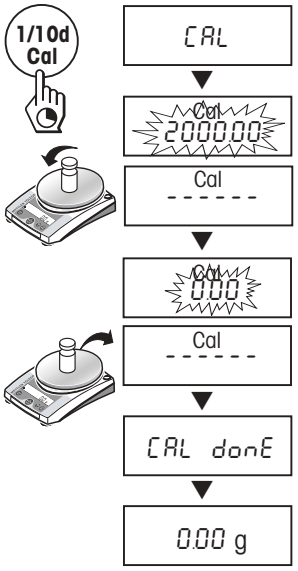
Switching off



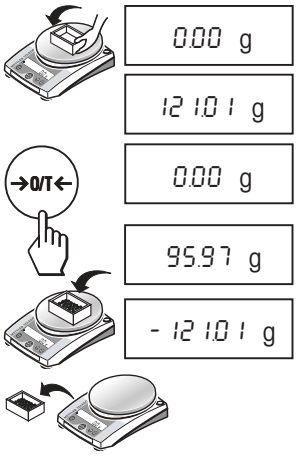
Simple weighing



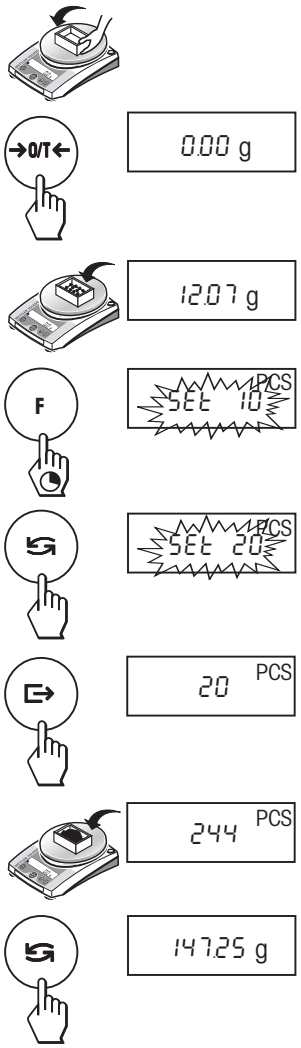
Adjusting (calibration) external



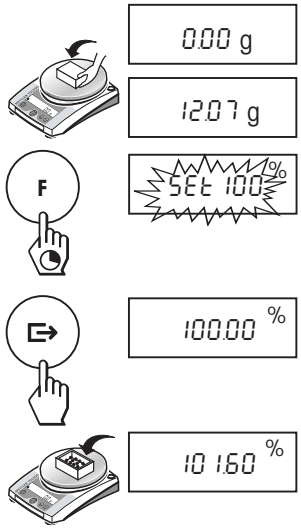
Taring



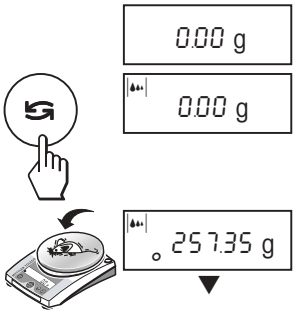
Piece counting*



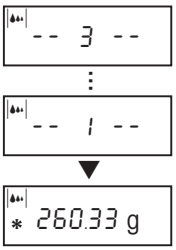
Percent weighing*



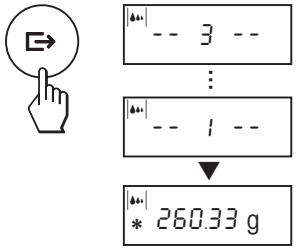
Dynamic weighing*



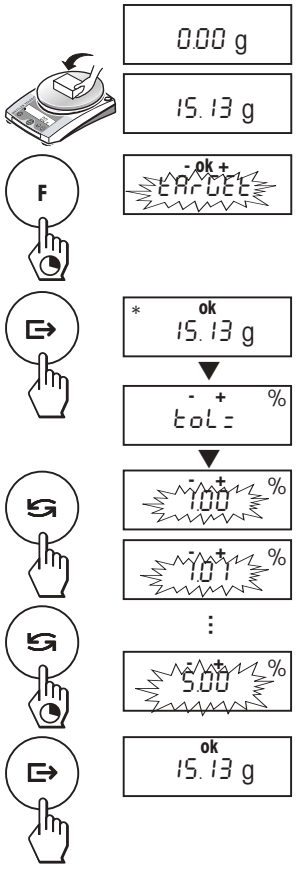
with automatic start (Dyn A)



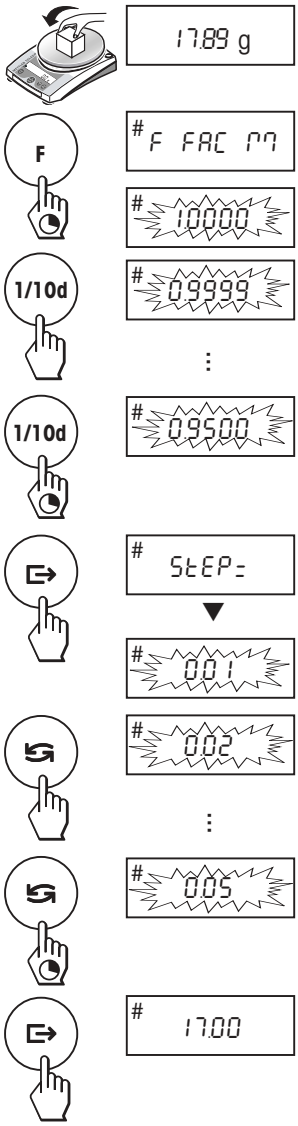
with manual start (Dyn M)



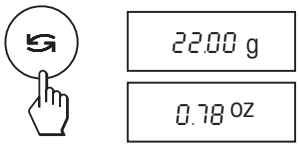
Plus-minus weighing*



Free factor / selectable display increment*



Unit switching*



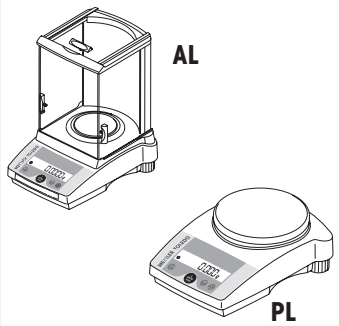
Contents

English

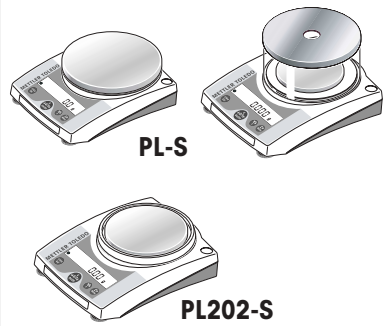
1 Getting to know L/L-S balances line

1.1 General (Types of construction, Balance features)

Standard construction



Compact construction



Several types of construction – uniform operation

- The L/L-S balance line ranges from high-resolution analytical balances (AL) with a readability of 0.1 mg through to precision balances (PL/PL-S) with a readability of 0.001 g to 1 g. The weighing ranges extend from 51 g to 6.1 kg.
- The operation of all theses balances is identical.

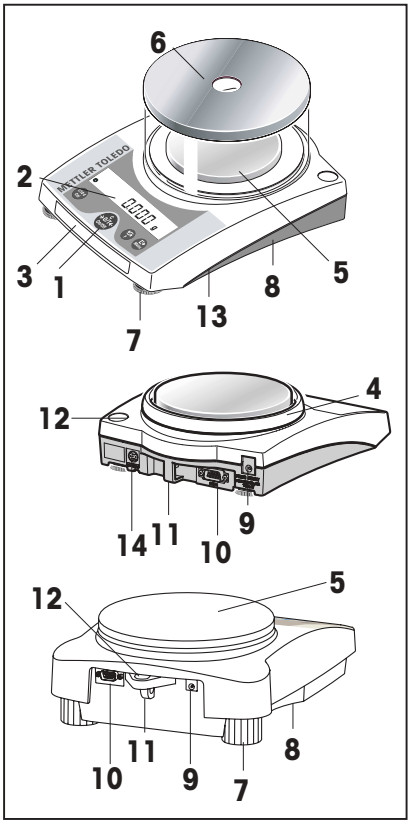
Balance features

- In addition to basic operations such as **weighing**, **taring** and **adjusting** (calibration) miscellaneous functions such as **"Piece counting"**, **"Percent weighing", "Dynamic weighing", "+/- Weighing"** or **"Free factor"** can be activated.
- Several L/L-S balances are fitted with a glass draft shield in the factory; with other models a draft shield is available as an optional extra.

Notes

- Models of Line AL and PL-S balances are available as certified versions. Please ask your METTLER TOLEDO dealer for details.
- If you wish to build on what you have learned about weighing in these operating instructions, you will find valuable tips in booklet Order No. 720906 "Weighing the right way".

1.2 Layout of balances



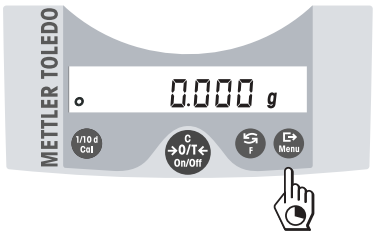
1 Keys
2 Display
3 Model plate with the following data:
"Max": maximum capacity
"d": readability
"Min": minimum capacity (recommended minimum load; **only relevant for certified balances**)
"e": verification scale interval (smallest display increment tested during certification; **only relevant for certified balances**)
4 Draft shield element (not on all models)
5 Weighing pan
6 Draft shield (supplied as standard with models with a readability of 0.1 mg and 1 mg)
7 Leveling feet (not on all models)
8 Hanger opening for weighing below the balance (underside of balance)
9 AC adapter socket
10 Optional RS232C interface
11 Lug for optional antitheft device
12 Leveling control (not on all models)
13 Compartment for batteries (only in compact models equipped with the AccuModule option) in underside of balance
14 Optional interface for special PL-S auxiliary display (only for compact construction)

Keys and display are identical for all L/L-S balances.

1.3 Overview of key functions

The balances have two operator control levels: the **weighing mode** and the **menu**. The function of each individual key depends on the operator control level and how long the key is pressed.

Weighing mode



Menu

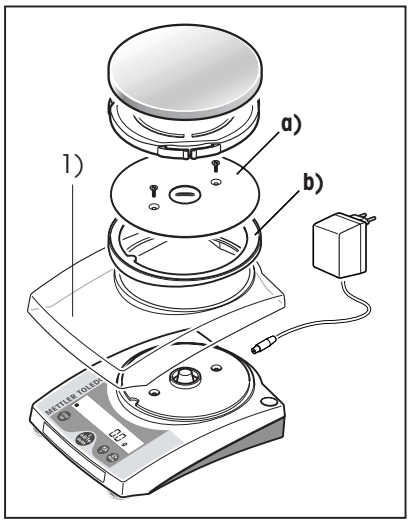
Key functions in weighing mode			
Press briefly		**Press and hold down**	
1/10d	• Reduce readability	**Cal**	• Adjust (calibrate)
On **→0/T←** **C**	• Switch on • Zero/tare • Cancel function	**Off**	• Switch off
	• Switch • Change settings	**F**	• Call function; A function must be activated in the menu, otherwise "F nonE" appears in the display
	• Transfer weighing data via interface with activated printer • Confirm settings	**Menu**	• Show menu (hold key down until MENU appears)

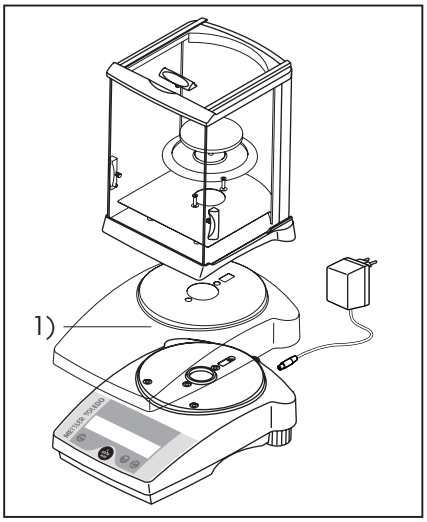
Key functions in menu mode			
Press briefly		**Press and hold down**	
1/10d	• Change settings • Reduce value by 1 step	**1/10d**	• Reduce value rapidly
C	• Close menu (without saving changes)		–
	• Change settings • Increase value by 1 step		• Increase value rapidly
	• Select next menu item	**Menu**	• Save changes and close menu

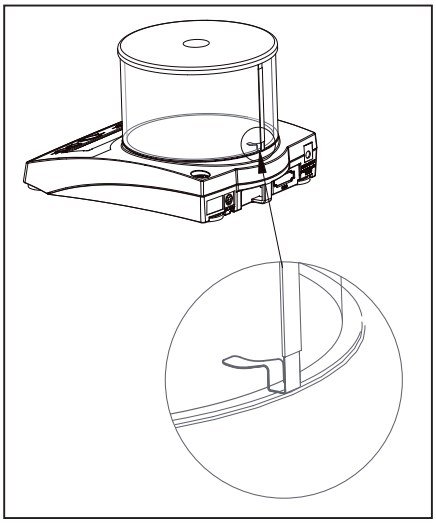
English

2 Startup

2.1 Unpacking / standard equipment





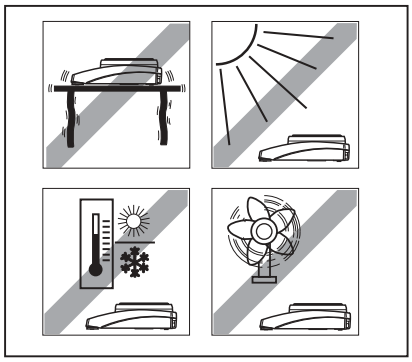


The standard equipment for every balance comprises:

- **AC adapter**, to national standard
- **Weighing pan, Weighing pan sup-port, draft shield element** (de-pending on model)
- **Draft shield** standard supply with models of 0.1 /1 mg readability (for other models available as an optional extra)
- **Operating instructions**
- **Protective cover for compact balances PL-S** (placed on the balance over the weighing cell cone) with instruction sheet. **This protective cover must not be mislaid. It will be needed again later to protect the cone when changing batteries (underside of balance).**

1) In-use covers are available as optional extras (Section 6.4). In the case of models having the large weighing pan (ø 160 mm), the antistatic plate **a)** (secured by two screws) and the adapter ring **b)** must also be removed in order to fit the in-use cover.

2.2 Setting up, leveling, preparations for weighing below the balance

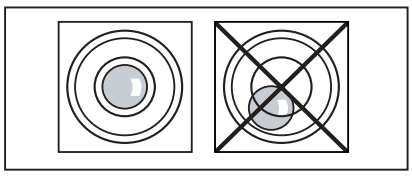


The optimum location

The correct location makes an important contribution to the accuracy of the weighing results of high-resolution analytical and precision balances.

- Stable, vibration-free position as horizontal as possible
- No direct sunlight
- No excessive temperature fluctuations
- No drafts

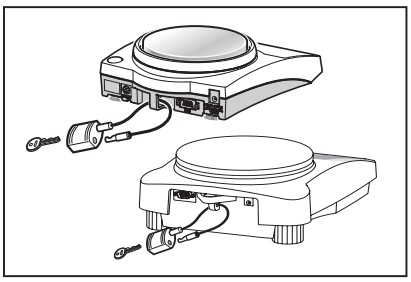
The best location is on a stable bench in a corner protected against drafts, as far away as possible from doors, windows, radiators or the louvers of air conditioners.



Leveling

Some models are equipped with a level glass and two or four leveling feet to compensate for minor irregularities in the surface on which the balance stands. The balance is exactly horizontal when the air bubble is in the middle of the level glass.

Note: The balance should be leveled each time it is moved to a new location.



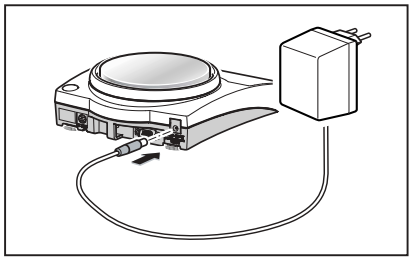
Antitheft device
Models in the L/L-S balance line are provided with a lug for attaching an antitheft device (see optional equipment in Section 6.4).

Preparations for weighing below the balance
To carry out weighing operations below the balance, the special cover on the underside of the balance must be slackened **(Note: never put the balance without the protective cover over its cone down on its head, only on its side!)**, turned through 180° and retightened. This exposes the opening for the hanger, making weighing below the balance possible.

2.3 Cautionary notes / Power supply

2.3.1 Power supply

- L/L-S balances must **not** be operated in **hazardous areas** with the standard-supply AC adapter.
- Before connecting the AC adapter, verify that the voltage printed on it corresponds to the local AC power supply voltage. If this is not the case, please contact your local METTLER TOLEDO dealer.
- Only use these balances in a dry environment.
- For use with CSA Certified (or equivalent approved) power source, which must have a limited circuit output.



Power supply
→ Plug the AC adapter into the AC adapter socket on the balance, and connect to the power supply.
→ The balance performs a self-test. This test is finished when "OFF" appears.
→ Press the «**On**» key briefly: the balance is in operational readiness. Before any work is performed with the balance, it must be adjusted (Section 2.4).

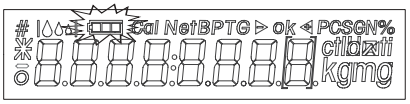
Notes
To achieve accurate results with analytical balances (AL), they must be left switched on for at least 60 minutes to reach operating temperature before carrying out the first weighing operation.

2.3.2 Battery operation (compact models only)

Models in the compact (PL-S) line of balances can also be operated independently of the AC power supply by using their batteries. To do this, **always fit the protective cover over the weighing cell cone first**, then open the cover of the battery compartment on the underside of the balance and insert the batteries.

Caution: ensure correct polarity (as specified inside the battery compartment).

Close battery compartment again.



When the balance is operating on its batteries, the border around the battery symbol in the display lights up. The number of segments that are lit is an indicator of battery condition (3 = fully charged, 0 = discharged). When the batteries are almost completely discharged, the last segment flashes.

Recommended battery type: AA (LR6) 1.5 V alkali-manganese.

NiMH (nickel-metal hydride) rechargeable batteries, which are recharged in an external battery charger, can be also be used. The intervals between recharging are not as long as the service life of a nonrechargeable battery.

English

Notes

- Batteries are not included in the standard supply.
- Battery operation is automatically overridden when the AC adapter is connected to the AC power supply.
- To prolong battery (disposable or rechargeable) life, it is advisable to activate «Auto shut» in the menu (see Section 4.3.7).
- All discarded batteries must be disposed of in an environmentally responsible manner. No attempt must be made to incinerate or disassemble them.
- Models with the standard construction (AL, PL) cannot be operated with batteries or with an internal battery charger.

2.3.3 Rechargeable battery operation "AccuModule" with internal charger (option for compact models only)

Models in this line with the compact (PL-S) models can also be operated with a battery charger integrated in the instrument. This option is **not** part of the standard supply. It must either be ordered when the balance is purchased or be retrofitted later by a METTLER TOLEDO dealer.

Caution ⚠

If the balance is equipped with an "AccuModule" internal battery charger, on no account must normal (i.e. disposable, nonrechargeable) batteries be used! **This would constitute a fire and explosion hazard. Only rechargeable NiMH (nickel-metal hydride) batteries may be used.** Balances equipped with the internal charger have the following warning notice on the cover of the battery compartment and on an adhesive label on the underside of the balance: **"CAUTION! Risk of Battery Explosion if batteries are replaced with incorrect type. Replace only with type NiMH RECHARGEABLE batteries".**

⚠ **If weighing with power supply connection > 48 h, the batteries must be removed (overheating hazard).**

Always fit the protective cover over the weighing cell cone before removing the cover of the battery compartment on the underside of the balance and inserting the NiMH rechargeable batteries.

Note: ensure correct polarity (as specified inside the battery compartment)!

Close battery cover again.

Charging NiMH batteries

Always charge NiMH rechargeable batteries fully before putting them into service. To do this, it is sufficient for the balance to be connected to the power supply by the AC adapter. It is not necessary for the balance to be switched on.

If the balance is switched on during charging, the display flashes in waves. Once the batteries are fully charged, all three segments of the symbol are permanently lit.

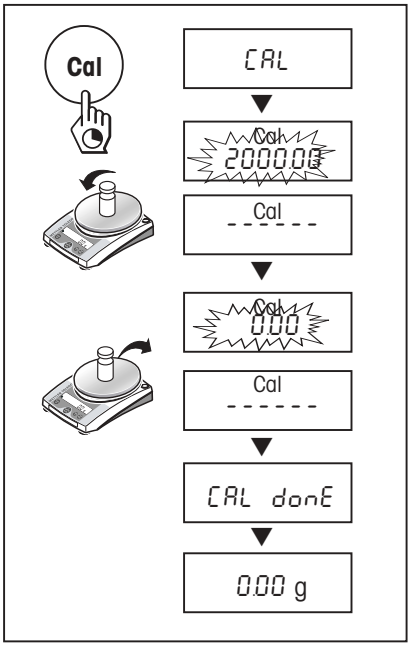
The condition of the rechargeable batteries is displayed at all times when the instrument is in use (just as with normal batteries).

2.4 Adjusting (calibration)

To obtain accurate weighing results, the balance must be adjusted to match the gravitational acceleration at its location.

Adjusting is necessary

- before the balance is used for the first time
- at regular intervals during weighing service
- after a change of location



To obtain accurate results, the balance must be left switched on for 60 minutes to reach operating temperature before starting the adjustment procedure.

→ Have required adjusting weight ready.

→ Unload weighing pan.

→ Press and hold the «**Cal**» key down until "CAL" appears in the display. Release key.

The required adjustment weight value flashes in the display.

→ Place adjustment weight in centre of pan. The balance adjusts itself automatically.

→ When "0.00 g" flashes, remove adjustment weight.

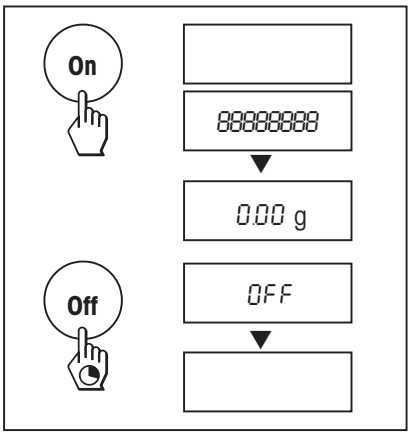
The adjusting is finished when the message "CAL done" appears briefly in the display, followed by "0.00 g". The balance is again in weighing mode and ready for operation.

Notes

- **Certified PL-S models cannot** be adjusted by the user, because of weights and measures legislation.
- This adjustment procedure can be terminated at any time with the «**C**» ("Cancel") key. The balance reverts to weighing mode.

3 Weighing

3.1 On/Off switching



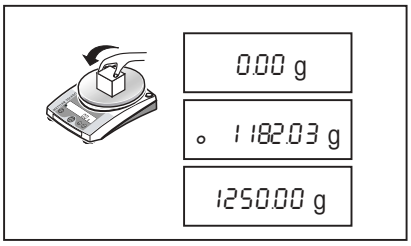
Switching on

→ Remove any load from weighing pan and press «**On**» key briefly.
The balance performs a display test (all segments in the display light up briefly).
When zero is displayed, the balance is ready for operation.

Switching off

→ Press and hold the «**Off**» key down until "OFF" appears in the display. Release the key.

3.2 Simple weighing



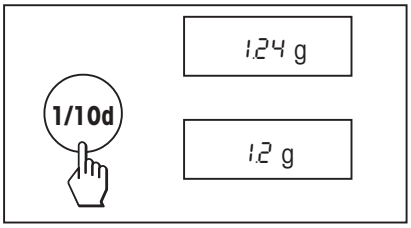
→ Place weighing sample on the weighing pan.

→ Wait until the stability detector "o" disappears.

→ Read the result.

3.3 Faster weighing with reduced readability

The balance has the facility for speeding up the weighing operation by reducing its readablity (number of decimal places):

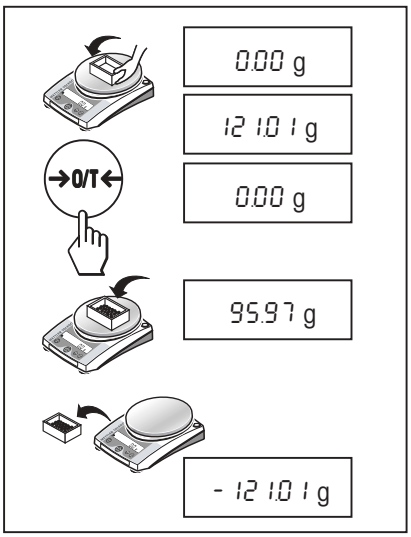


→ The balance is operating with its **normal readability and speed**.

→ Press the «**1/10d**» key and …

→ … the balance operates with **reduced readability** (one decimal place less), but displays the weighing result quicker. Pressing the «**1/10d**» key briefly again toggles the balance back to its full readability.

3.4 Taring



→ Place empty container on the balance.

→ The weight is displayed.

→ Press the «**→0/T←**» key briefly.

→ Add weighing sample to container. The net weight is now displayed.

If the container is removed from the balance, the tare weight will be shown as a negative value.

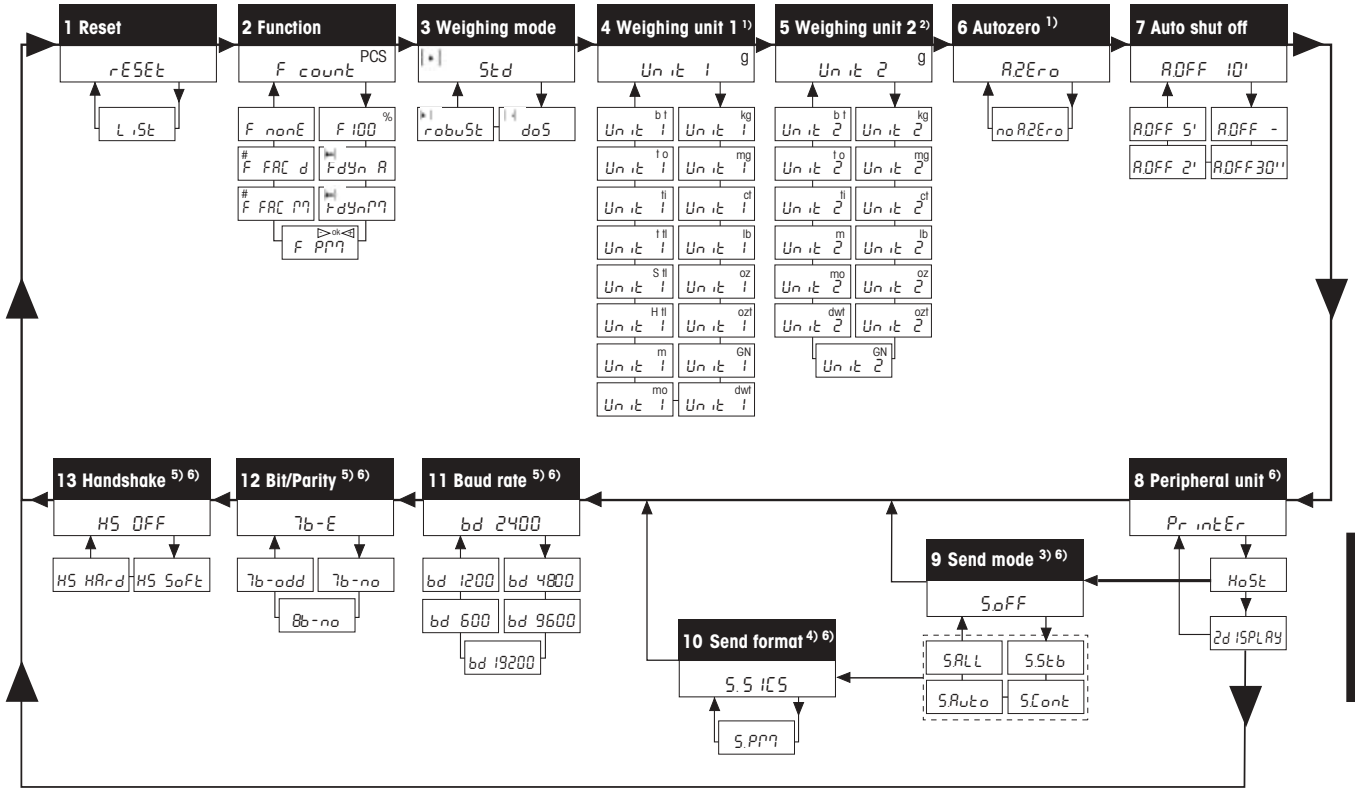
The tare weight remains stored until the «**→0/T←**» key is pressed again or the balance is switched off.

4 Menu

4.1 Overview

In the menu you can change the weighing unit (for certified balances, only if national weights and measures legislation allows), select additional functions and carry out various settings. A description of the individual menu options is given in Section 4.3.

Overview of menu



Menu option
Factory setting

Notes

1) With certified balances, this menu option has a fixed setting and cannot be changed.

2) With certified balances, only those weighing units allowed by the appropriate national weights and measures legislation may be selected.

3) This menu option is only shown if "Host" has been selected in menu option 8 (Peripheral unit).

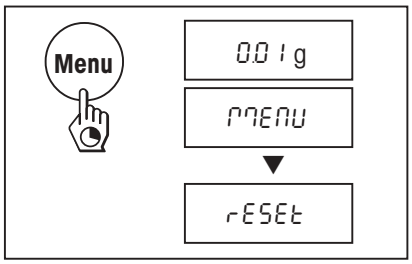
4) This menu option is only shown if "S.oFF" has not been selected in menu option 9 (Send mode).

5) These menu options are only shown if "Host" or "Printer" has been selected in menu option 8 (Peripheral unit).

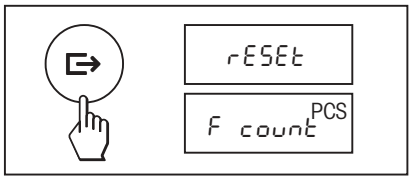
6) Only displayed if the optional interface has been installed.

English

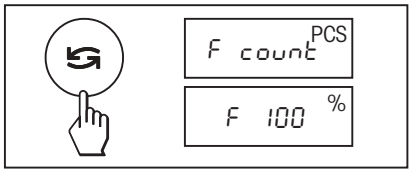
4.2 Menu operation



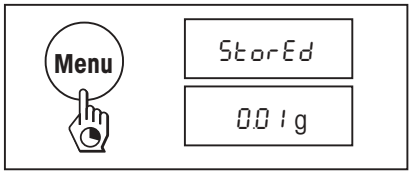
Opening the menu
In weighing mode, press and hold down the «**Menu**» key until "MENU" appears in the display. Release the key: the 1st menu option is displayed.



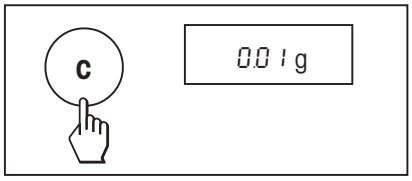
Select menu options
The «⇨» key is used to select individual menu options with their current settings one after the other.



Change settings
Pressing the «↻» key displays the next setting; pressing the «**1/10d**» key displays the previous one. Once the desired setting appears in the display, the next menu option can be selected («⇨») or you can close the menu (see following Section).



Saving settings and closing the menu
Hold the «**Menu**» key down until "StorEd" appears in the display. Release the key and the balance reverts to weighing mode. All changes are saved.

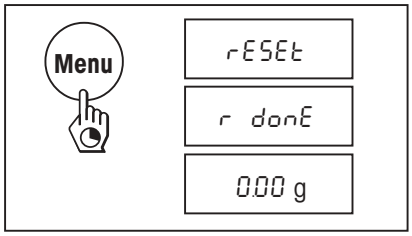


Abort
Press the «**C**» key briefly. The balance reverts to weighing mode. Changes are **not** saved.

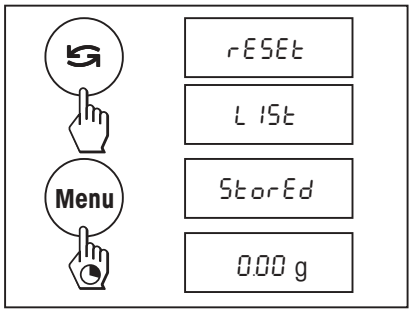
Note
If no entry is made within 45 seconds, the balance reverts to weighing mode. Changes are **not** saved.

4.3 Description of menu options

4.3.1 Reset or recording of balance settings (1st menu option "RESET")



Reset balance settings
→ Select "Reset", press and hold down the «**Menu**» key until the message "r donE" confirms that all menu settings have been reset. The balance then reverts to weighing mode and works with the factory settings (Section 4.1).

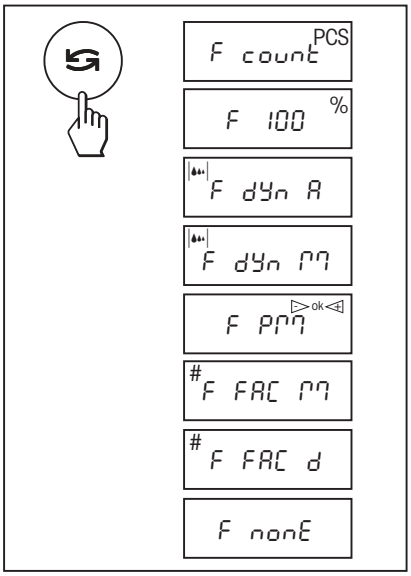


Recording balance settings
→ Select "List" and hold down the «**Menu**» key until the message "StorEd" is displayed.

The current balance settings are transmitted to the peripheral device connected to the optional RS232C interface. To do this the setting "Printer" must always be selected at the 8th menu option (Peripheral unit). The current balance settings are saved at the same time.

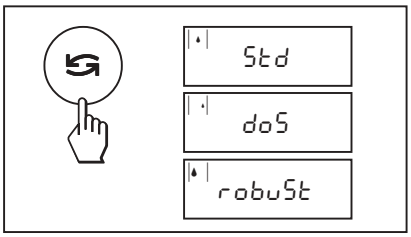
4.3.2 Functions (2nd menu option / see Section 5 for their use)

In addition to simple weighing, the following functions can be selected with the «⇆» key:



F count	Piece counting
F 100 %	Percent weighing
F dYn A	Dynamic weighing with automatic start
F dYn M	Dynamic weighing with manual start
F PM	Plus-minus weighing
F FAC M	Multiply free factor value by weight, change size of display increment
F FAC d	Divide free factor value by weight, change size of display increment
F nonE	No function, simple weighing

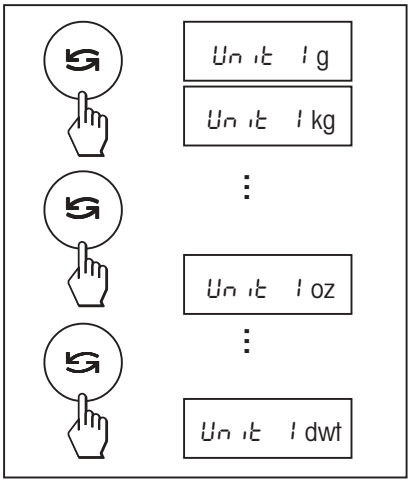
4.3.3 Weighing mode (3rd menu option)



This setting allows you to adapt the balance to the weighing mode. Select "Std" (standard) for all normal weighing processes. With "doS" (dosing) - for dispensing substances in liquid or powder form - the balance reacts very rapidly to the slightest changes of weight. With "robuSt" (absolute weighing) the balance only reacts to more significant changes in weight, so that the weighing result is very stable.

4.3.4 Weighing unit 1 (4th menu option "UNIT 1")

Depending on requirements, the balance can operate with the following units (possible with certified balances only if permitted by national weights and measures legislation):



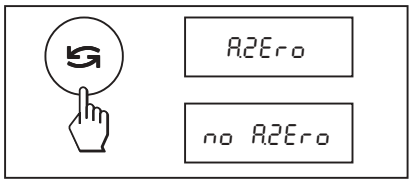
Unit		Conversion factor	Comments
g	gram		factory setting
kg	kilogram	1 kg = 1000 g	not with 0.1 mg and 1 mg balances
mg	milligram	1 mg = 0,001 g	with 0.1 mg and 1 mg balances
ct	carat	1 ct = 0,2 g	
lb	pound	1 lb ≈ 453,59237 g	not with 0.1 mg balances
oz	ounce	1 oz ≈ 28,349523125 g	
ozt	troy ounce	1 ozt ≈ 31,1034768 g	
GN	grain	1 GN ≈ 0,06479891 g	not with 1 g balances
dwt	pennyweight	1 dwt ≈ 1,555173843 g	
mo	momme	1 mo ≈ 3,749999953 g	
m	Mesghal	1 m ≈ 4,6083162 g	
H tl	Hong Kong tael	1 H tl ≈ 37,42900 g	
S tl	Singapore tael	1 S tl ≈ 37,799366256 g	The Malaysian tael has the same value
t tl	Taiwan tael	1 t tl ≈ 37,499995313 g	
cl	tical	1 cl ≈ 16,3293 g	
t o	tola	1 to ≈ 11,6638038 g	
b t	baht	1 bt ≈ 15,2 g	

4.3.5 Weighing unit 2 (5th menu option "UNIT 2")

If it is required to show the weighing result in weighing mode in an additional unit by pressing the «⇆» key, the desired second weighing unit can be selected in this menu option. The same weighing units are available as under "UNIT 1", with the exception of the tael units ("H tl", "S tl" and "t tl").

4.3.6 Autozero (6th menu option / see overview and notes in Section 4.1)

This menu option allows you to switch the automatic zero correction on or off.

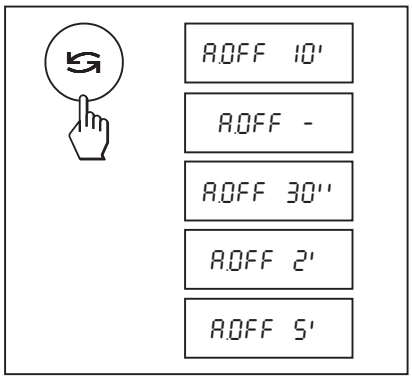


Autozero switched on
The zero point is automatically corrected (e.g. if drift occurs or the weighing pan becomes dirty). Certified balances, however, have a fixed zero point.

Autozero switched off
The zero point is **not** automatically corrected. This setting is advantageous for special applications (e.g. evaporation measurements).

4.3.7 Auto shut off

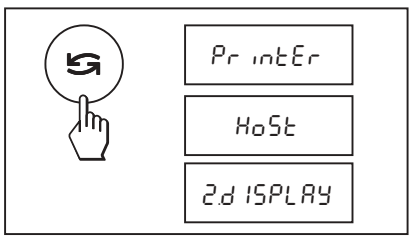
If the automatic shut off function is activated, the balance automatically switches itself off after a selected period of inactivity (i.e. with no key being pressed or changes of weight occurring):



A.OFF 10`	Automatic shutoff after 10 minutes inactivity
A.OFF -	Automatic shutoff **not** activated
A.OFF 30"	Automatic shutoff after 30 seconds inactivity
A.OFF 2`	Automatic shutoff after 2 minutes inactivity
A.OFF 5`	Automatic shutoff after 5 minutes inactivity

4.3.8 Peripheral unit (8th menu option / see overview and notes in Section 4.1)

Peripheral devices can only be connected if the balance has been equipped with the optional RS232C interface. The balance automatically saves the appropriate settings (Sections 4.3.9 – 4.3.13) for every peripheral device.

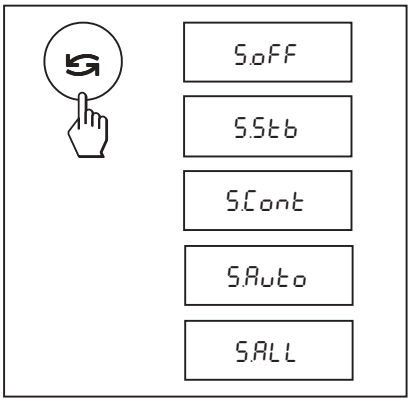


Printer	Connected to a printer.
Host	Connection to any desired peripheral device.
Aux. display	Connection of an optional auxiliary display unit (communications parameters cannot be selected).

4.3.9 Send mode (9th menu option / see overview and notes in Section 4.1)

Note: This menu option is only available if the "Host" setting was selected in the 8th menu option (Peripheral unit)!

It specifies how a value is transferred to a peripheral device.

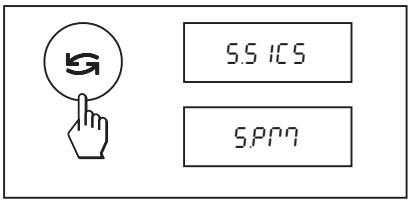


S.oFF	Send mode switched off.
S.Stb	The next possible stable value will be transferred after the «⇨» key has been pressed.
S.Cont	All values are transferred automatically.
S.Auto	Only stable values are transferred automatically.
S.All	The current value is transferred after the «⇨» key has been pressed.

4.3.10 Send format (10th menu option / see overview and notes in Section 4.1)

Note: This menu option is only available if the "S.oFF" setting was **not** selected in the 9th menu option ("Send mode")!

It sets the data transfer format.



"S. SICS": The MT-SICS data transfer formats are used. Please refer to the "Reference Manual MT-SICS B-S/L/L-S balances 11780447", available from your METTLER TOLEDO dealer or downloaded from the Internet (www.mt.com/pl or www.mt.com/al see "Support"). More Information please find in the Section 6.3.

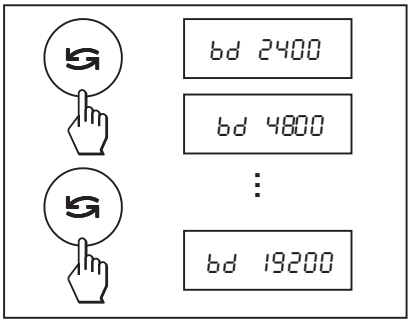
"S. PM"*: The following PM balance data transfer formats are used:

S.Stb: ␣␣␣␣␣1.67890␣g
S.Cont: S␣␣␣␣1.67890␣g SD␣␣␣1.39110␣g
S.Auto: S␣␣␣␣1.67890␣g
S.All: ␣␣␣␣␣1.67890␣g
␣D␣␣␣1.39110␣g

* unidirectional, no MT-SICS commands are accepted.

4.3.11 Baud rate (11th menu option / see overview and notes in Section 4.1)

Note: This menu option is only available if the "Printer" or "Host" setting was selected in the 8th menu option (Peripheral unit)!



The baud rate (data transfer rate) determines the speed of transmission via the serial interface. The unit is the baud (bd) = 1 bit/second.

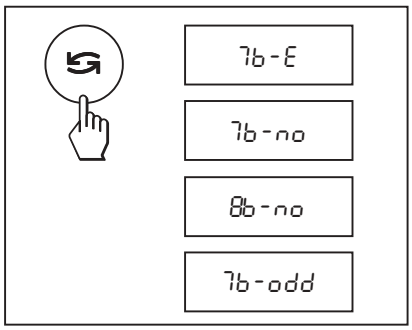
The following settings are available: 600 bd, 1200 bd, 2400 bd, 4800 bd, 9600 bd and 19200 bd.

For problem-free data transmission the sending and receiving devices must be set at the same value.

English

4.3.12 Bit/Parity (12th menu option / see overview and notes in Section 4.1)

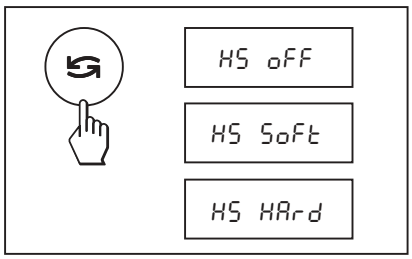
Note: This menu option is only available if the "Printer" or "Host" setting was selected in the 8th menu option (Peripheral unit)! It sets the character format for the peripheral device connected to the balance.



7b–E	7 data bits/even parity
7b–no	7 data bits/no parity
8b–no	8 data bits/no parity
7b–odd	7 data bits/odd parity

4.3.13 Handshake (13th menu option / see overview and notes in Section 4.1)

Note: This menu option is only available if the "Printer" or "Host" setting was selected in the 8th menu option (Peripheral unit)! This function is used to select the data transfer mode to suit different serial devices.

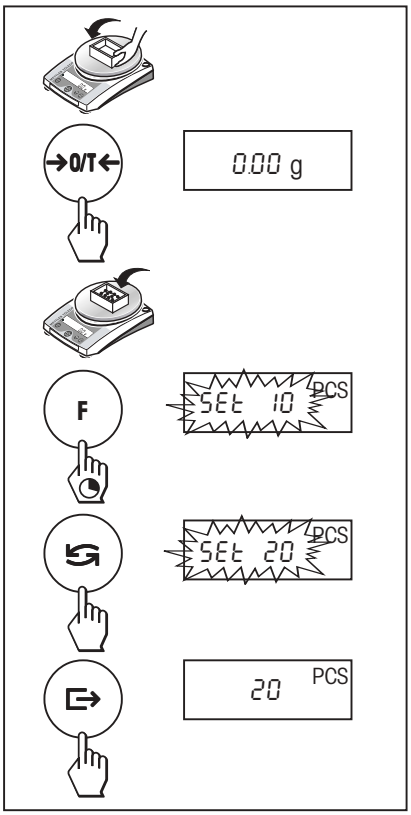


HS oFF	No handshake
HS SoFt	Software handshake (XON/XOFF)
HS HArd	Hardware handshake (DTR/CTS)

5 Functions

Settings and values saved under a given function are retained until they are replaced or another function is selected. The «**C**» key can be used to cancel the procedure currently in progress.

5.1 Piece counting



Requirement
The function "F count" must be activated in the menu (Section 4).

→ Place empty container on the balance and tare by briefly pressing the «**→0/T←**» key.

Setting the reference: a reference weight must first be entered for piece counting:

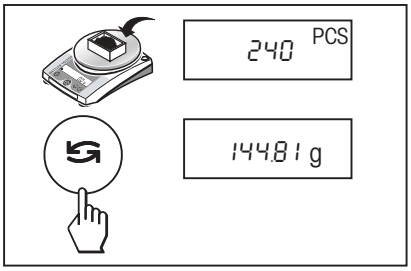
→ Add a number of reference pieces to container. Possible numbers are 5, 10, 20, 50, 100 and "no" (piece counting deactivates).

Note that the minimum weight = 10d (d: display increment), and the minimum unit weight = 1d!

→ Hold the «**F**» key down until "SEt ... PCS" is displayed.

→ Repeatedly press the «⟲» key until the display equals the number of reference pieces entered.

→ Confirm the number of reference pieces with the «⮕» key or automatic acceptance after 7 seconds. The current number of pieces (PCS = pieces) is displayed.



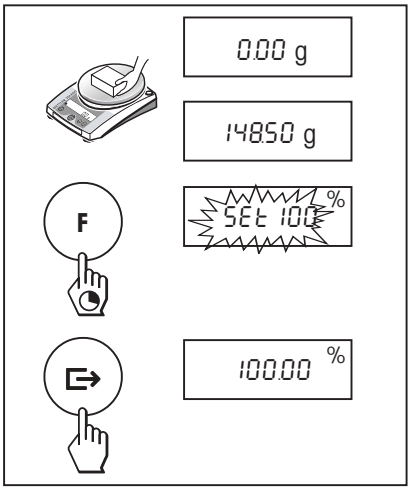
Switching between piece count and weight display

→ Place the items to be counted in the container. The number of pieces is displayed.

→ Press the «⟲» key. The weight is displayed (in unit 1, and if the key is pressed again, in unit 2, provided this function is activated).

→ Return to the piece count display by pressing the «⟲» key again.

5.2 Percent weighing



Requirement
The function "F 100 %" must be activated in the menu (Section 4).

Set target weight

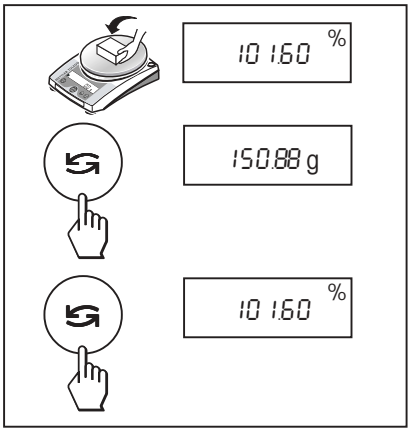
→ Target weight (Reference weight, which corresponds to 100 %) in centre of pan.
Note that the minimum weight = 10d (d: display increment).

→ Hold the «**F**» key down until "SEt 100 %" is displayed.

→ Press the «⟲» key to select "SEt 100 %" or "SEt no %" (Percent weighing deactivated).

→ The «⮕» key can be used briefly to confirm or automatic acceptance after 7 seconds.

English



Switching between percent weighing and weight display

→ Place weighing sample in centre of pan.
The weight of the sample is displayed as a percentage of the target weight.

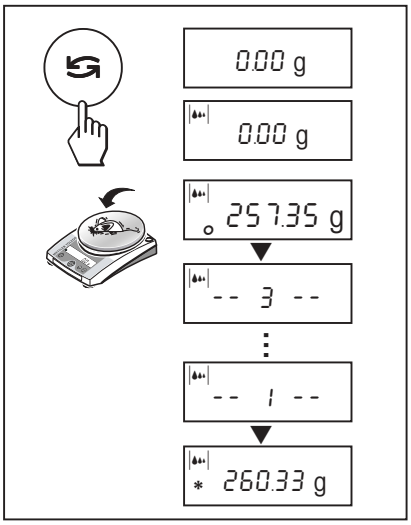
→ Press the «⇆» key. The weight is displayed (in unit 1, and if the key is pressed again, in unit 2, provided this function is activated).

→ Return to display in percent: pressing the «⇆» key again.

5.3 Dynamic weighing

Dynamic weighing is suitable for the weighing of unstable weighing samples. The mean value of the weighing results is determined over a specified time period (weighing time). The more unstable the weighing sample, the longer the selected weighing time.

Requirement
"F dYn A" for automatic start or "F dYn M" for manual start must be activated in the menu (Section 4). Factory setting is a weighing time of 3 seconds (t = 3").

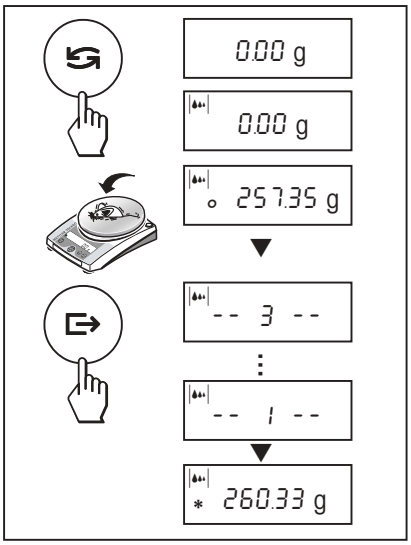


Dynamic weighing with automatic start (F dYn A)

→ The «⇆» key can be used select the dynamic weighing. The display shows the symbol |⇆|.

→ Load weighing sample. As soon as the balance is relatively stable, weighing starts automatically.
During the weighing time, a "count down" runs in the display.

→ Read off result.
The result of the dynamic weighing is displayed with ✶ (= calculated value) and remains in the display until the weighing sample is removed from the weighing pan or the container.



Dynamic weighing with manual start (F dYn M)

→ The «⟳» key can be used select the dynamic weighing. The display shows the symbol |⋯|.

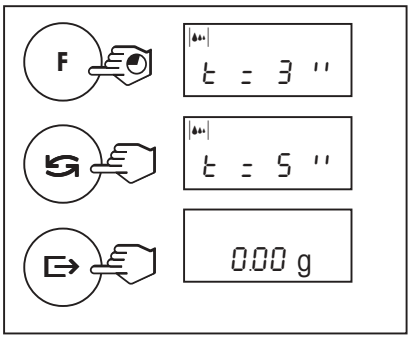
→ Load weighing sample.

→ Start weighing with the «⇨» key.
During the weighing time, a "count down" runs in the display.

→ Read off result.
The result of the dynamic weighing is displayed with ✶ (= calculated value) and remains in the display until the weighing sample is removed from the weighing pan or the container.

Notes

- The weighing cycle with the same weighing sample can be restarted with the «⇨» key.
- The «⟳» key can be used to switch between dynamic weighing and normal weighing.
- For weighing goods below 5 g the weighing must be started manually with the «⇨» key, even for dynamic weighing with automatic start.



Changing the weighing time

→ Press and hold the «**F**» key, until "t = 3"" appears in the display.

→ Repeatedly press the «⟳» key, until the desired weighing time appears.
Possible values are 3", 5", 10", 20", 1", 2".

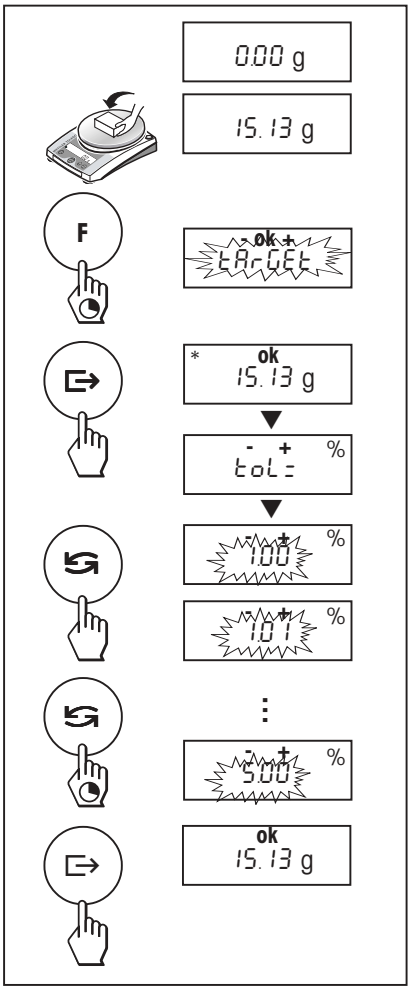
→ election with the «⇨» key briefly to confirm or by automatic acceptance after 3 seconds.

English

5.4 Plus-minus weighing

The plus-minus weighing function enables the parts or quantities dispensed on the weighing pan to be compared with a target weight and tolerances set by the user. Symbols in the display (▷ok◁) help the operator to assess the weighing result quickly.

Requirement
The function "F PM" must be activated in the menu (Section 4).



Setting target weight and tolerances (+/-)

→ Place the target weight on the weighing pan. Minimum weight = 10d (display increment)

→ Hold down the «**F**» key until "tArGEt" appears.

→ Press the «↻» key to select "tArGEt" and "notArGEt" (Plus-minus weighing deactivated).

→ Confirm this with the «⇨» key; the target weight is adopted automatically after 7 seconds if no action is taken.

The target weight is displayed again for a further two seconds, following which the display changes ("toL="), prompting you to enter the tolerances as a percentage of the target weight.

The displayed default value can be changed:

→ Pressing the «↻» key increases the tolerance.
Pressing the «**1/10d**» reduces the tolerance.

Pressing the key once changes the value by one increment. If the key is held down, the value changes increasingly rapidly.

→ Confirm the selected tolerance with the «⇨» key; it is adopted automatically after 7 seconds if no action is taken. The target weight and the tolerances have now been set.

Displayed weighing results

The display indicates the weighing status as follows:

"▷" lights up: The weight on the pan is less than the set lower tolerance.

"▷" and "ok" light up: The weight on the pan is within the set tolerances, but below target weight.

"ok" lights up: The weight on the pan is exactly equal to the target weight.

"ok" and "◁" light up: The weight on the pan is within the set tolerances but greater than the target weight.

"◁" lights up: The weight on the pan is greater than the set upper tolerance.

Toggling between plus-minus weighing with weight display and percent display

→ Place the sample on the weighing pan. Its weight is shown in unit 1.

→ Press the «↻» key. The weight is then displayed as a percentage (provided the balance is activated for unit 2 and the key is pressed again).

→ To return to the plus-minus weighing display: press the «↻» key again.

5.5 Weighing with free factor and/or selectable display increments

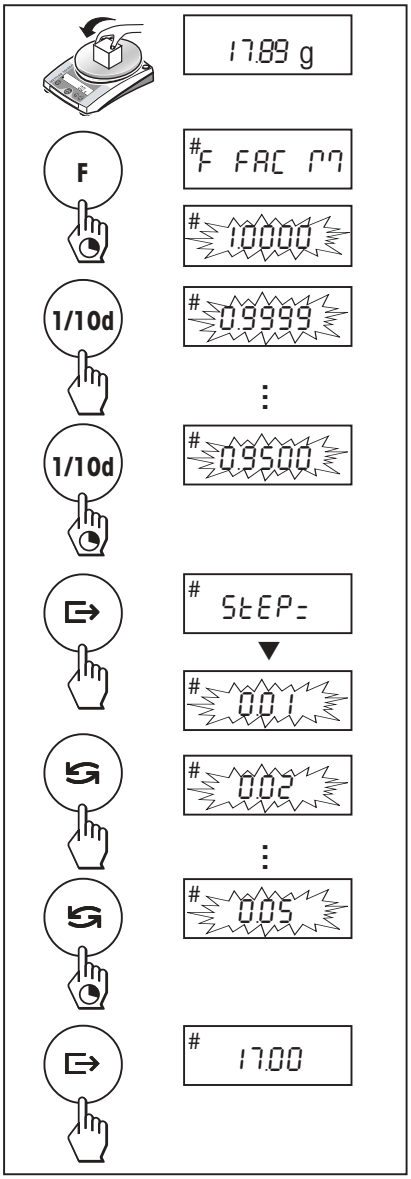
In this menu option a custom "free factor" can be defined at will.

This value is then either multiplied ("F FAC M") by the weighing result (in grams), i.e. reading = factor * weight, or it is divided ("F FAC d") by the weight, i.e. reading = factor / weight. The range over which this factor can be selected depends on the weighing range and the readability of the model concerned.

The "free factor" (FAC M) function can, for example, be used to calculate the price of the material weighed directly or to calculate the weight per defined unit of surface area. It can also be used to convert the weight into any desired alternative unit. This facility for dividing the factor by the weight (FAC d) is required for instance in the textile industry to determine yarn count.

The ability to select the display increments makes it possible to specify how the weighing result is to be presented, the choice of display increments being limited by the set factor and the resolution of the balance model itself.

Requirement
The function "F FAC M" or "F FAC d" must be activated in the menu (Section 4).



Entering the free factor and/or the display increments

→ Hold the «**F**» key down until "F FAC M" or "F FAC d" appears in the display.

→ Press the «↻» key to select "FAC M" / "FAC d" or "noFAC M" / "noFAC d" (Function deactivated).

→ Release the key. Either the factor 1 appears as default value or the factor that was saved most recently.

This value can now be changed:

→ Pressing the «↻» key increases the factor.
Pressing the «**1/10d**» key reduces the factor.

Pressing the key once changes the value by one increment. If the key is held down, the value changes increasingly rapidly.

Confirm the selected factor with the «⇨» key (it will not be saved automatically). "StEP=" appears in the display, and the program changes automatically to allow the display increments to be entered. The smallest possible display increment appears as default value, or the last value that was saved.

→ This value can be changed in the same way as for the free factor (see above).

Confirm the selected display increment with the «⇨» key (it will not be saved automatically).

The appropriate calculation is then made using the weight on the pan in grams and the selected factor, the result being displayed with the selected display increment. **No units are displayed**, the symbol "**#**" being displayed instead. The calculation is always based on the weight in grams.

Note

- If you only want to change the display increments, set the free factor at exactly 1.

Toggling between displaying the calculated value and the measured weight

Place the sample on the weighing pan. The appropriate calculation is then made using the weight of the sample and the selected factor, the result being displayed with the selected display increment.

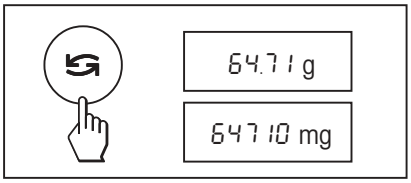
Press the «↻» key. The weight is displayed (in unit 1, and if the key is pressed again in unit 2, provided that this option is activated).

→ Press the «↻» key again to return to the calculated value.

English

5.6 Switching weight units

Requirement
Different weight units must be activated in the menu for unit 1 and unit 2 (Section 4).



→ The «↻» key can be used at any time to toggle between the two weighing units selected in the menu ("UNIT 1" and "UNIT 2").

Notes

- Switching between weight units may be blocked with **certified balances**, depending on national weights and measures legislation.
- This function is not available with dynamic weighing.

6 Technical data, options, optional equipment

6.1 Technical data

Standard equipment of L/L-S balances

- AC adapter to national standard as per list in Section 6.4.
  Balance power input 6-14,5VAC, 50/60Hz, 4VA or 7-20VDC, 4W
- Draft shield (on models with 0.1 / 1 mg resolution)
- All models can weigh below balance
- External adjustment weight with AL models

Materials

- Housing base:
  standard construction: die-cast aluminum, painted;
  compact construction: plastic (ABS/PC)
- Top housing: plastic (ABS/PC)
- Weighing pan: 18/10 chromium-nickel steel

Batteries, disposable and rechargeable (compact construction)

- Disposable: 4 x AA (LR6) 1.5 V alkali-manganese, typical 20 h (with 2.9 Ah capacity)
- Internal battery charger "AccuModule" (optional):
  4 NiMH, typical 11 h/charging time 5 h (with 1.5 Ah capacity)

Protection

- Protected against dust and water
- Pollution degree: 2
- Installation category: class II
- EMC: see declaration of conformity

Ambient conditions

The technical data are valid under the following ambient conditions:

- Ambient temperature 10 °C … 30 °C
- Relative humidity 80 % at 31 °C, linear decreasing to 50 % at 40 °C
  noncondensing

Operability is assured at ambient temperatures between 5 and 40 °C.

	AL54	AL104	AL204
Readability	0.0001 g	0.0001 g	0.0001 g
Max. capacity	51 g	110 g	210 g
Repeatability (s)	0.0001 g	0.0001 g	0.0001 g
Linearity –/+	0.0002 g	0.0002 g	0.0003 g
Sensitivity drift ppm/ °C	2.5	2.5	2.5
Typical stabilization time in s	4.0	4.0	4.0
Adjustment weight external	50 g	100 g	200 g
Construction	Standard		
External dimensions of balance (W/D/H) in mm	238x335x364		
External dimensions of packaging (W/D/H) in mm	520x385x555		
Weighing pan in mm	ø 90		
Max. height above weighing pan in mm	220		
Net weight (with packaging) kg	5.8 (8.2)		
Level indicator	yes	yes	yes
Number of leveling screws	2	2	2

	PL83-S	PL153-S	PL303	PL202-S	PL202-S2 *)
Readability	0.001 g	0.001 g	0.001 g	0.01 g	0.02 g
Max. capacity	81 g	151 g	310 g	210 g	210 g
Repeatability (s)	0.0008 g	0.002 g	0.001 g	0.008 g	0.008 g
Linearity –/+	0.002 g	0.003 g	0.002 g	0.02 g	0.02 g
Sensitivity drift ppm/ °C	10	10	6	10	10
Typical stabilization time in s	2.5	3.0	3.0	1.5	1.5
Adjustment weight external (optional equipment)	50 g	100 g	200 g	200 g	200 g
Construction	Compact	Compact	Standard	Compact	Compact
External dimensions of balance (W/D/H) in mm	194x225x137		238x335x287	194x225x67	
External dimensions of packaging (W/D/H) in mm	323x280x255		520x385x555	350x275x140	
Weighing pan in mm	ø 100		ø 100	ø 120	
Max. height above weighing pan in mm	74		140	–	
Net weight (with packaging) kg	1.3 (2.4)		5.2 (7.8)	1.0 (2.1)	
Level indicator	yes	yes	yes	–	yes
Number of leveling screws	2	2	2	–	2

*) Certified balance

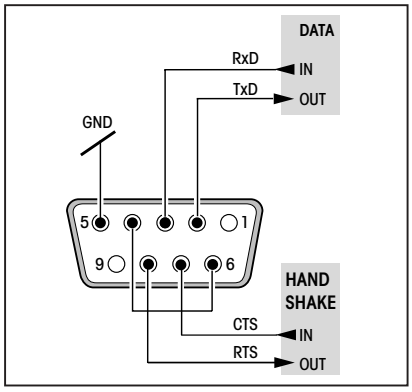
English

	PL602-S	PL1502-S	PL3002	PL601-S	PL1501-S
Readability	0.01 g	0.01 g	0.01 g	0.1 g	0.1 g
Max. capacity	610 g	1510 g	3100 g	610 g	1510 g
Repeatability (s)	0.008 g	0.02 g	0.01 g	0.08 g	0.08 g
Linearity –/+	0.02 g	0.03 g	0.03 g	0.2 g	0.2 g
Sensitivity drift ppm/ °C	10	10	6	10	10
Typical stabilization time in s	2.5	3.0	3.0	1	1.5
Adjustment weight external (optional equipment)	500 g	1000 g	2000 g	500 g	1000 g
Construction	Compact	Compact	Standard	Compact	Compact
External dimensions of balance (W/D/H) in mm	194x225x67		238x335x111	194x225x67	
External dimensions of packaging (W/D/H) in mm	350x275x140		520x385x360	350x275x140	
Weighing pan in mm	ø 160		ø 180	ø 160	
Max. height above weighing pan in mm	–	–	–	–	–
Net weight (with packaging) kg	1.2 (2.2)	1.3 (2.3)	4.1 (6.2)	1.2 (2.2)	1.3 (2.3)
Level indicator	yes	yes	yes	–	–
Number of leveling screws	4	4	4	–	–

	PL1501-S2 *)	PL3001-S	PL3001-S2 *)	PL6001-S	PL6000-S
Readability	0.2 g	0.1 g	0.2 g	0.1 g	1 g
Max. capacity	1510 g	3100 g	3100 g	6100 g	6100 g
Repeatability (s)	0.08 g	0.08 g	0.08 g	0.08 g	0.8 g
Linearity –/+	0.2 g	0.2 g	0.2 g	0.2 g	2 g
Sensitivity drift ppm/ °C	10	10	10	10	10
Typical stabilization time in s	1.5	2	2	2	1
Adjustment weight external (optional equipment)	1000 g	2000 g	2000 g	5000 g	5000 g
Construction	Compact	Compact	Compact	Compact	Compact
External dimensions of balance (W/D/H) in mm	194x225x67				
External dimensions of packaging (W/D/H) in mm	350x275x140				
Weighing pan in mm	ø 160				
Max. height above weighing pan in mm	–				
Net weight (with packaging) kg	1.3 (2.3)				
Level indicator	yes	yes	yes	yes	–
Number of leveling screws	4	4	4	4	–

*) Certified balance

6.2 Options



All optional equipment must be specified when ordering the balance. Retrofitting is only possible if carried out by a METTLER TOLEDO service facility.

RS232C interface and interface accessories

Every balance can be equipped with an optional RS232C interface for connection to a peripheral device (e.g. printer, auxiliary display or PC with a 9-pin male connector, see Section 6.4). The balance must then configured to suit the peripheral device in a menu dialog (Sections 4.3.8 – 4.3.11).

A detailed description of the available interface commands is given in the "Reference Manual MT-SICS B-S/L/L-S balances 11780447". This can be downloaded from the Internet (www.mt.com/pl or www.mt.com/al see "Support") and is only available in English.

The wide range of features of the L/L-S balances regarding documentation of the results can be utilized by connecting to a printer, e.g. the GA42 or LC-P45 from METTLER TOLEDO. Printed results then make a decisive contribution to simplifying GLP/GMP-compliant work.

RS232C special interface – only for auxiliary display PL-S

This interface can only be used with the special auxiliary display for PL-S balances (see Section 6.4), which will be available in 2004. Please ask your METTLER TOLEDO dealer for details.

When this auxiliary display is connected, no special settings need to be made in the menu.

Internal battery charger "AccuModule"

The models in the compact construction can be supplied with an internal battery charger "AccuModule" as an optional extra. They can then run on rechargeable batteries instead of disposable ones. See Sections 2.3.3/6.4.

6.3 MT-SICS Interface commands and functions

Many of the balances used have to be capable of integration in a complex computer or data acquisition system.
To enable you to integrate balances in your system in a simple manner and utilize their capabilities to the full, most balance functions are also available as appropriate commands via the data interface.
All new METTLER TOLEDO balances launched on the market support the standardized command set "METTLER TOLEDO Standard Interface Command Set" (MT-SICS). The commands available depend on the functionality of the balance.

Basic information on data interchange with the balance
The balance receives commands from the system and acknowledges the command with an appropriate response.

Command formats
Commands sent to the balance comprise one or more characters of the ASCII character set. Here, the following must be noted:

- Enter commands only in uppercase.
- The possible parameters of the command must be separated from one another and from the command name by a space (ASCII 32 dec., in this description represented as ␣).
- The possible input for "text" is a sequence of characters of the 8-bit ASCII character set from 32 dec to 255 dec.
- Each command must be closed by CRLF (ASCII 13 dec., 10 dec.).

The characters C_RL_F, which can be inputted using the Enter or Return key of most entry keypads, are not listed in this description, but it is essential they be included for communication with the balance.

Example
S – Send stable weight value

Command	**S**	Send the current stable net weight value.
Response	**S␣S␣WeightValue␣Unit**	
		Current stable weight value in unit actually set under unit 1.
	S␣I	Command not executable (balance is currently executing another command, e.g. taring, or timeout as stability was not reached).
	S␣+	Balance in overload range.
	S␣-	Balance in underload range.

Example

Command	**S**	Send a stable weight value.
Response	**S␣S␣␣␣␣␣␣100.00␣g**	
		The current, stable weight value is 100.00 g.

English

The MT-SICS commands listed below is a selected list of available commands. For additional commands and further information please refer to the Reference Manual "MT-SICS for B-S/L/L-S balances 11780447" downloadable from the Internet under **www.mt.com/pl** or **www.mt.com/al**.

S – Send stable weight value

Command	**S**	Send the current stable net weight value.

SI – Send value immediately

Command	**SI**	Send the current net weight value, irrespective of balance stability.

SIR – Send weight value immediately and repeat

Command	**SIR**	Send the net weight values repeatedly, irrespective of balance stability.

Z – Zero

Command	**Z**	Zero the balance.

@ – Reset

Command	@	Resets the balance to the condition found after switching on, but without a zero setting being performed.

SR – Send weight value on weight change (Send and Repeat)

Command	**SR**	Send the current stable weight value and then send continuously the stable weight value after every weight change. The weight change must be at least 12.5 % of the last stable weight value, minimum = 30d.

ST – Send stable weight after pressing ⊏→ (transfer) key

Command	**ST**	Inquiry of actual status of the ST function.

SU – Send stable weight value with currently displayed unit

Command	**SU**	As the "**S**" command, but with the currently displayed unit.

6.4 Optional equipment

AC adapters

Output:	12V ~ 500mA	
• Euro	230V/50Hz/80mA	11103740
• Euro/(grd)	230V/50Hz/80mA	11103744
• UK	240V/50Hz/80mA	11103742
• USA	120V/60Hz/10W	11103741
• Japan	100V/50Hz/10W	11103743
Output:	12V ~ 1.0A	
• Universal (bench version) 220-240V/50Hz/100mA		11103745*
Output:	12V ⎓ 2.08A	
• Universal (bench version) 100-240V / 50/60Hz/0.7A		11100750*

*(appropriate cable for country also required)

AccuPac B-S

• Rechargeable external power source for 15 hours weighing operation independent of AC power supply	21254691

Adjustment weights

Available as OIML weights (E1, E2, F2, with certificate); for further details see METTLER TOLEDO Weights brochure or as adjustment weights (not OIML)	11795245

Antitheft device

• Cable with lock (for all models)	590101

Auxiliary display

• Auxiliary display including RS cable for connection to optional RS232C interface and separate AC adapter	224200
• Auxiliary display PL-S (Available in 2004. Please ask your METTLER TOLEDO dealer for details)	12102508

Draft shields

• Glass cylinder for compact models (PL-S) (see also "Weighing pan")	12102988
• For standard models (xx3 Models) (AL/PL)	12105346
• Round draft shield with sliding opening	12102505

Interface

- RS232C
- RS232C special (for auxiliary display PL-S)

The interface must be fitted in the factory. Retrofitting is only possible if carried out by a METTLER TOLEDO service facility.

Interface cable

• RS9–RS25: (m/f), length 1 m	11101052
• RS9–RS9: (m/f), length 1 m	11101051
• RS9–RS9: (m/m), length 1 m	21250066

Internal battery charger "AccuModule" (compact balances only)

- This module for the fully automatic charging of rechargeable batteries must be fitted in the factory. Retrofitting is only possible if carried out by a METTLER TOLEDO service facility.

In-use cover

• Standard models	12102970
• Compact balances	12102980

Printer, Application printer (LC-P45)

• Plain-paper printer, 24 characters, with additional functions (time, date, statistic, multiplier etc.)	229119

Printer, Report printer (GA42)

• Plain-paper printer, 24 characters, without time/date	51229170

Rechargeable batteries

• (pack of 4)	12102935

Transport case

• For all compact PL-S models (without draft shield); accommodates balance, AC adapter, batteries and weights	12102982

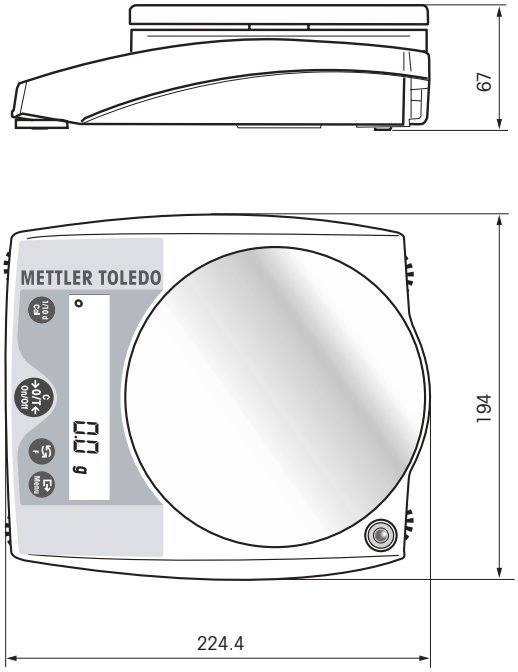
Weighing pan

• Only for PL-S models with (standard) ø 160 mm weighing pan: ø 120 mm weighing pan (+ pan holder + draft shield element for operation without a draft shield): necessary for use together with draft shield (12102988)	12102987

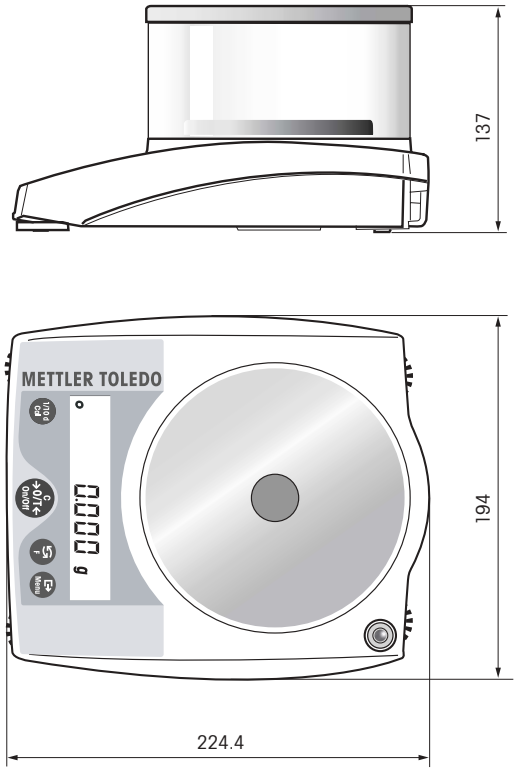
English

6.5 Dimensional drawings (in mm)

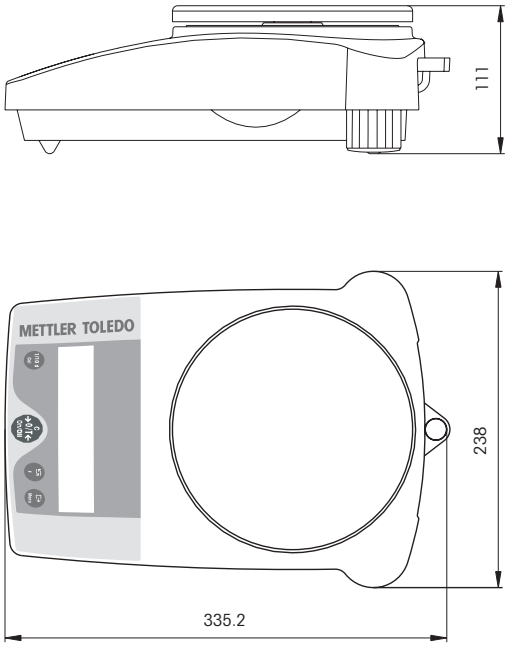
PL-S (compact construction) without draft shield



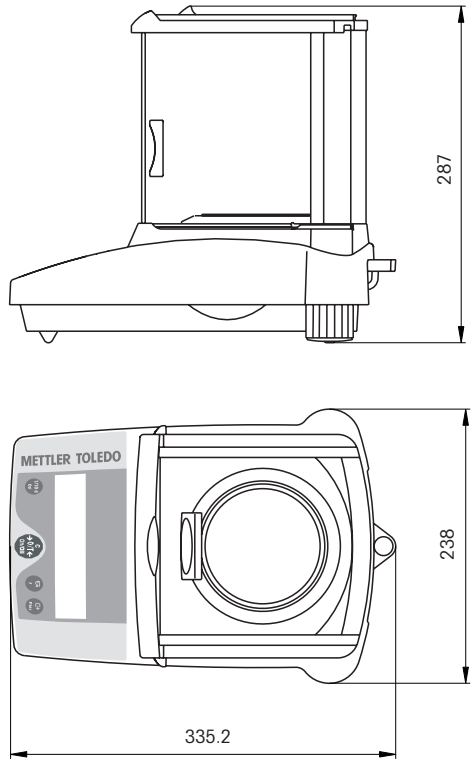
PL-S (compact construction) with draft shield



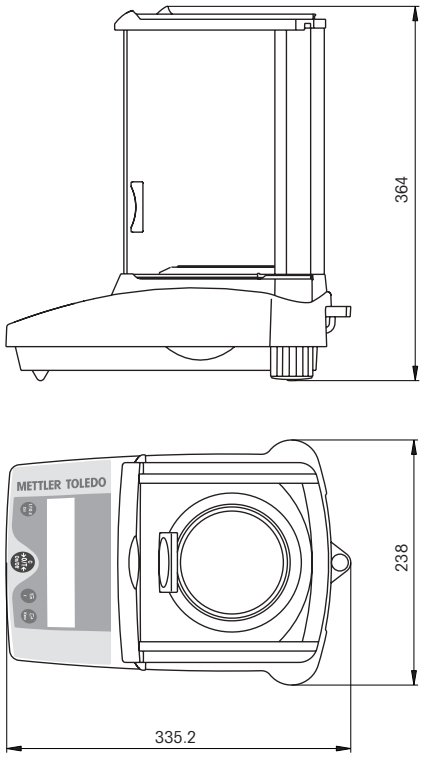
PL (standard construction) without draft shield



PL (standard construction) with "mg" draft shield (low)



AL (standard construction) with "0,1" mg draft shield (high)



7 Appendix

7.1 Typical printouts from METTLER TOLEDO GA42 and LC-P45 printers

Function: **Adjusting**

```
-BALANCE  CALIBRATION-
Date:  ................
Time:  ................

METTLER TOLEDO
Type:              PL1502
SNR:           1120053108
SW:                  1.0

Weight ID: ............
Weight:   1000.00 g

External Cal. done

Signature:


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

Function: **Piece counting**
Printout with reference weight

```
---- PIECE COUNTING ----
APW:          0.99 g
Out of:         10 PCS

             27.00 g
                27 PCS
```

Function: **Percent weighing**

```
----- % - WEIGHING -----
Ref.         10.008 g
             100.00 %

              60.01 g
             599.59 %
```

Function: **Dynamic weighing**

```
--- DYNAMIC WEIGHING ---
Weigh Time:      2 s

          DW 49.999 g
```

Function: **Plus-minus weighing**

```
----- +/- WEIGHING -----
Nominal:      9.68 g
+/-Tol:       1.04 %

             16.21 g
above range
```

Function: **Free factor**

```
- FREE FACTOR WEIGHING -
Formula: factor * weight
Factor:      12.73
Step:         0.01

             49.94 #
```

Function: **List**
Printout of the current balance settings

```
--- LIST OF SETTINGS ---
Date:  ................
Time:  ................

METTLER TOLEDO
Type:             PL601-S
SNR:           1120053108
SW:                  1.0
TDNR:     7.17.1.286.108
------------------------
Application:
 Count
------------------------
Weighing Parameters:
 Weighing Mode Standard
 Unit 1                g
 Unit 2               mg
 A.Zero               On
------------------------
System Parameters:
 Auto off          10 min
------------------------
Peripheral Devices:
P.Device          Printer
 Baud                2400
 Bit/Parity       7b-even
 Handshake            Off

P.Device             Host
 Sendmode             Off
 Baud                9600
 Bit/Parity         8b-no
 Handshake           Soft
--------- END ----------
```

Function: **Verification of the calibration (adjustment) with external weight.**
Only possible with LC-P45. Function is triggered via the printer.

```
----- BALANCE TEST -----
04.07.2002       09:52:12

METTLER TOLEDO
Type:              PL1502
SNR:           1120053108
SW:                  1.0

Weight ID: ............

Target : ..............
Actual : .......199.98 g
Diff   : ..............

External test done

Signature:


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

Function: **Statistics**
Only possible with LC-P45. Function is triggered via the printer.

```
04.07.2002       10:44:07
ID                    666
SNR:           1118015657
1           1100.15 g
2           1600.10 g
3           1699.95 g
n                  3
x          1466.733 g
s           321.372 g
srel          21.91 %
min.        1100.15 g
max.        1699.95 g
dif.         599.80 g
--------- END ----------
```

Function: **Multiplier**
Only possible with LC-P45. Function is triggered via the printer.

```
04.07.2002       08:23:22
ID                    242
SNR:           1118015657

Factor         1.65
             588.43 g
*          970.9095
```

Notes
With the GA42 the date and time must be entered by hand at the top of the report (see specimen printout for the "Adjusting" function).

With the LC-P45 the date and time are recorded automatically (see specimen printout for the "Statistics" function).

The operating instructions for the LC-P45 include a description of the functions that are triggered via that printer.

The **GA42** prints all reports in **English**. This applies also to the **LC-P45** reports that originate in the balance. In the case of reports triggered by the **LC-P45**, the following languages may be selected: **German, English, French, Spanish** or **Italian**.

7.2 What if ...?

Error/Error message	Cause	Rectification
r-----7	Overload	→ Remove sample from weighing pan, zero again (tare).
L_____J	Underload	→ Check whether weighing pan is positioned properly.
Error 1	No stability • in taring or adjusting (calibration) • when reference weight for piece counting is placed on pan	→ Wait for stability before pressing key. → Ensure more stable ambient conditions. → Remove weighing pan and clean if necessary
Error 2	Wrong adjustment weight on pan or none at all	→ Place required adjustment weight in centre of pan.
Error 3	Reference weight (Piece counting, Percent weighing, Plus-minus weighing) too small	→ Increase reference weight.
Error 4	Internal fault	→ Contact METTLER TOLEDO customer service.
0.000 g	Wrong weighing pan or pan missing or not empty	→ Place correct pan or empty pan on balance.
Abort	Adjustment aborted with the «**C**» key	
	No display • AC adapter not plugged in • Batteries discharged (only with compact models)	→ Check AC power supply. Plug AC adapter into power supply. → Replace batteries; if using rechargeables connect instrument to AC power supply.

English

7.3 Connecting L/L-S balances to other METTLER TOLEDO devices

Device	Connecting cable	settings/ Remarks
Titrators: DL31, 36, 38 DL50, 53, 55, 58	RS9–RS9 (m/f) 11101051	send continous
MTCom-Bus 310	RS9–RSopen (m/-) 21900640	
SQC 14 (statistical quality control)	RS9–RS9 (m/f) 11101051	
Spider (industrial scale) Viper BC (industrial scale)	RS9–RS9 (m/m) 21252588	
LC-PVolume (pipette calibration)	RS9–RS9 (m/f) 11101051	AX balances recommended
LC-PCalc	RS9–RS9 (m/f) 11101051	
LC-P45 (application printer)	RS9–RS9 (m/f) 11101051	
GA42 (report printer)	RS9–RS9 (m/f) 11101051	

7.4 Maintenance and cleaning

Service
Regular servicing of your balance by a service technician prolongs its working life. Ask your METTLER TOLEDO dealer for details of servicing options.

Cleaning
Wipe housing and weighing pan with a soft, lint-free cloth, and – if necessary – with a mild cleaning agent, e.g. soap solution. Protect balance and weighing pan from soiling. Soiled In-use covers can be replaced on all balance types (see Section 6.3).

Note
After working with chemicals, it is advisable to wash or clean the weighing pan and the bottom plate (if draft shield fitted). Although all materials are of high quality, corrosion may occur if corrosive substances are deposited on chrome steel for an extended period of time (and if air is excluded, for example by a coating of grease).

Important
If you have to dispose of the instrument, contact your METTLER TOLEDO agency.

7.5 Declaration of conformity

The undersigned declare on behalf of

Mettler-Toledo GmbH
Im Langacher
CH-8606 Greifensee

that the balances **METTLER TOLEDO AL... / PL... / PL...-S** to which this declaration relates (serial number specified on the product) are in compliance with the below mentioned EEC Directives (including all amendments)

73/23/EEC Low Voltage Directive

89/336/EEC Electromagnetic compatibility

Balances in certified version additionally comply with **90/384/EEC** Non-automatic weighing instruments

and that following standards have been applied **IEC/EN61010-1:2001, IEC/EN61326-1:1997+ A1:98** (class B)

for Canada, USA and Australia **CAN/CSA-C22.2 No.1010.1-92, UL Std. No.3101-1, FCC, Part 15, class A**

Greifensee, 31.10.2003

Mettler-Toledo GmbH
Laboratory & Weighing Technologies

Beat Lüthi
General Manager

Markus Gross
Manager Marketing

To protect your METTLER TOLEDO product's future:
METTLER TOLEDO Service assures the quality, measuring accuracy and preservation of value of all METTLER TOLEDO products for years to come.
Please send for full details about our attractive terms of service.
Thank you.

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Verlangen Sie bitte genaue Unterlagen über unser attraktives Service-Angebot.
Vielen Dank.

Pour assurer l'avenir de vos produits METTLER TOLEDO:
Le service après-vente METTLER TOLEDO vous garantit pendant des années leur qualité, leur précision de mesure et le maintien de leur valeur.
Demandez-nous notre documentation sur les excellentes prestations proposées par le service après-vente METTLER TOLEDO.
Merci.

Para un mejor futuro de sus productos METTLER TOLEDO:
El servicio postventa de METTLER TOLEDO garantiza durante años su calidad, su precisión metrológica y la conservación de su valor.
Pida nuestra documentación sobre las excelentes prestaciones que le ofrece el servicio postventa de METTLER TOLEDO.
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Per un buon futuro dei Vostri prodotti METTLER TOLEDO:
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Richiedeteci subito la documentazione illustrativa del servizio altamente professionale che Vi offriamo.
Grazie.

P11780472

Subject to technical changes and to the availability of the accessories supplied with the instruments.
Technische Änderungen und Änderungen im Lieferumfang des Zubehörs vorbehalten.

 11780472C Printed in China 0311/2.45

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