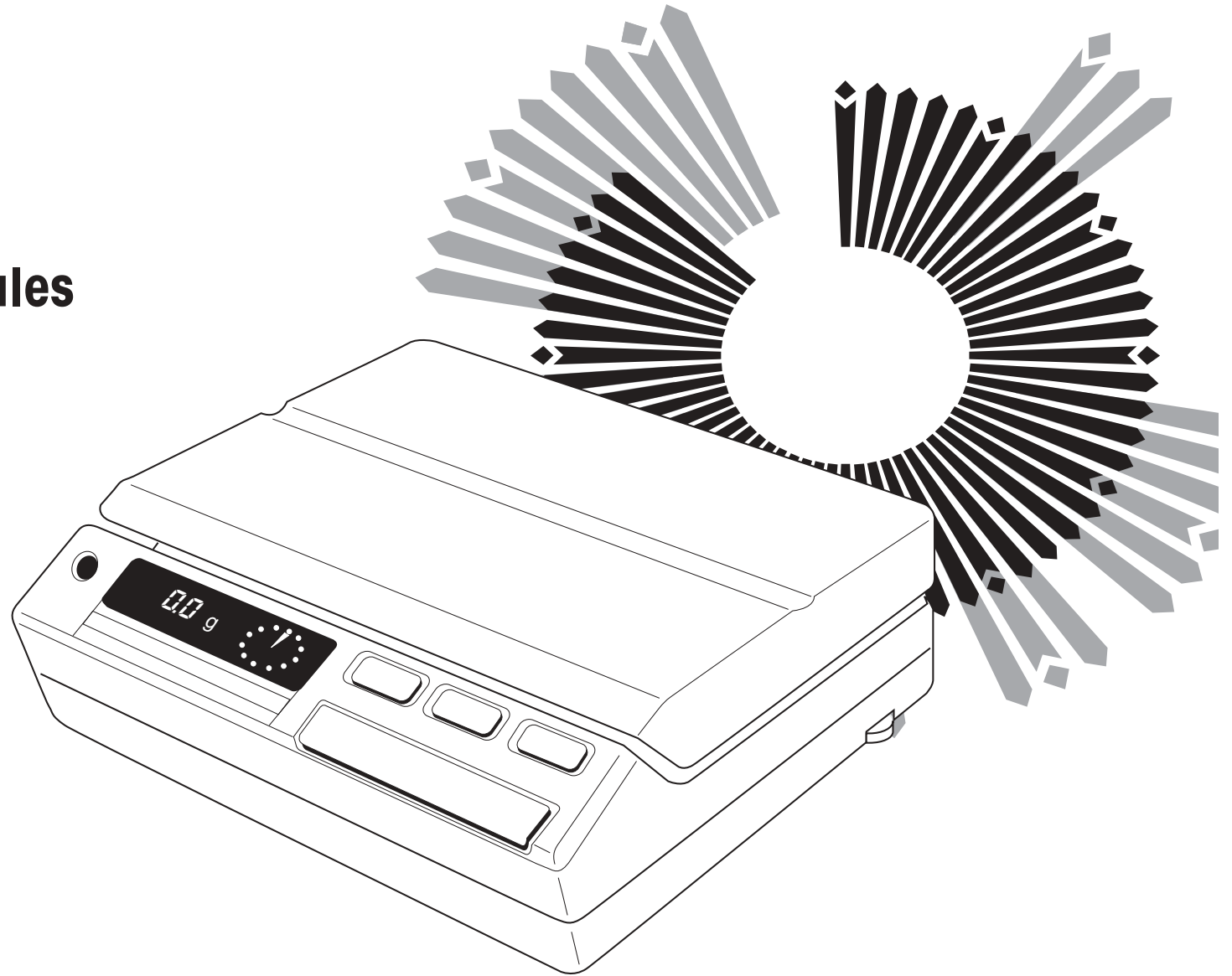


Operating Instruction

METTLER TOLEDO High-Capacity PM-Scales



METTLER TOLEDO

Thank you very much for the confidence you have shown in our products by choosing a METTLER TOLEDO precision scale. To obtain complete satisfaction from your scale, it is essential that you read through these operating instructions carefully.

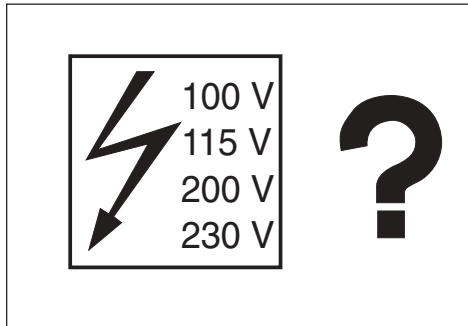
These operating instructions apply to scales of the PM series with a weighing range between 11 and 32 kg. Although the operating procedures for these scales are identical, differences exist regarding the weighing range and the readability accuracy.

Preparation	Set line voltage / Choosing the location	page 4
	Mounting the weighing platform / Levelling the scale	page 5
Operation	Controls / Connections / Display	page 6
	METTLER DeltaTrac / METTLER DeltaRange	page 7
	Switching display on/off	page 8
	Simple weighing and taring	page 9
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	Calibrating	page 12
	Adapting the scale to the type of weighing (weighing process adapter)	page 14
	Adapting the scale to the ambient conditions (vibration adapter)	page 15

Configuring	Overview	page 16
	Configuration example	page 18
	Standard setting and printout	page 20
	Scale operating settings	page 22
	Unit selection, applications, status displays	page 24
	Adaptation to external equipment for data exchange	page 26
	Securing configuration	page 28
Applications	Overview	page 30
	Weight unit selection	page 31
	Piece counting	page 32
	Plus/minus and percent weighing	page 34
	Animal weighing / Weighing in extremely unsteady or vibrating surroundings	page 36
	Print/transfer command	page 37
What if ...	Troubleshooting	page 38
Miscellaneous	Change line voltage/fuse	page 40
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	Technical data for individual models	page 45
	General technical data	page 48
	Standard equipment	page 49
	Weighing ranges in secondary units	page 50
	decimal places in secondary units	page 51

Preparation

Set line voltage

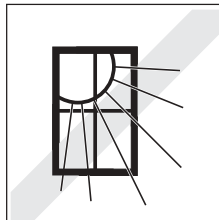
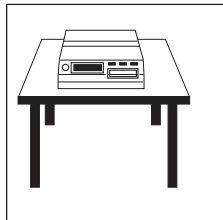


Before switching on the scale, ensure that the line voltage setting matches the local power supply.

The balance/scale has already been set in the factory to the correct line voltage for your country. The balance/scale may be operated only when connected to a supply network with a PE conductor.

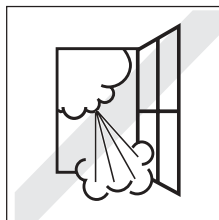
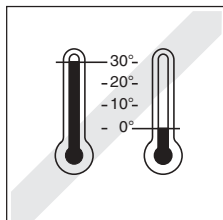
Select the proper location

For best results choose a suitable location for your scale.



A firm, vibration-free location as horizontal as possible

Avoid exposure to direct sunlight

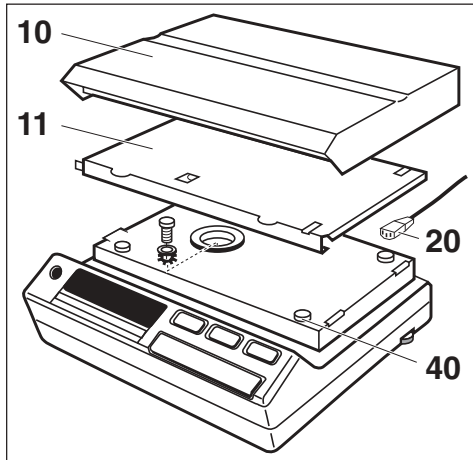


No extreme temperature changes

No draft

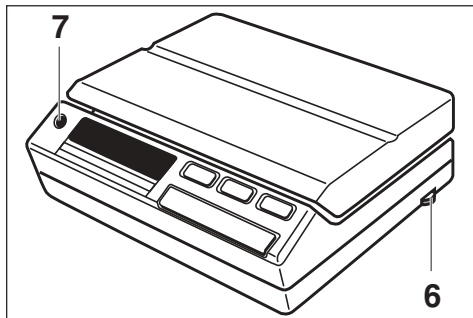
**Despite a possibly unfavorable location, your scale can still produce accurate weighing results:
In this case you should adjust the vibration adapter accordingly. For procedure, refer to section “Menu”.**

Mount the weighing platform ...



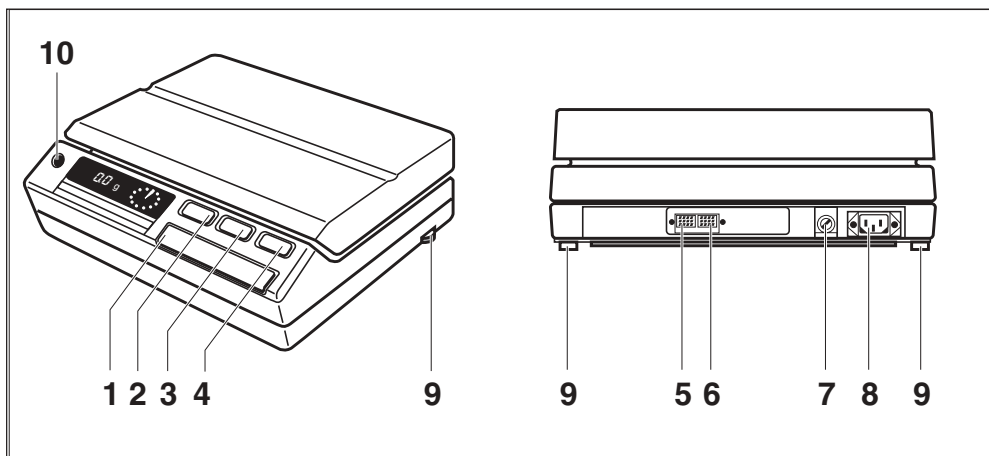
Install platform support **11** with all four pins sitting on rubber grommets **40**; then place weighing platform **10** on platform support **11**; connect power cable **20**.

... and now level the scale



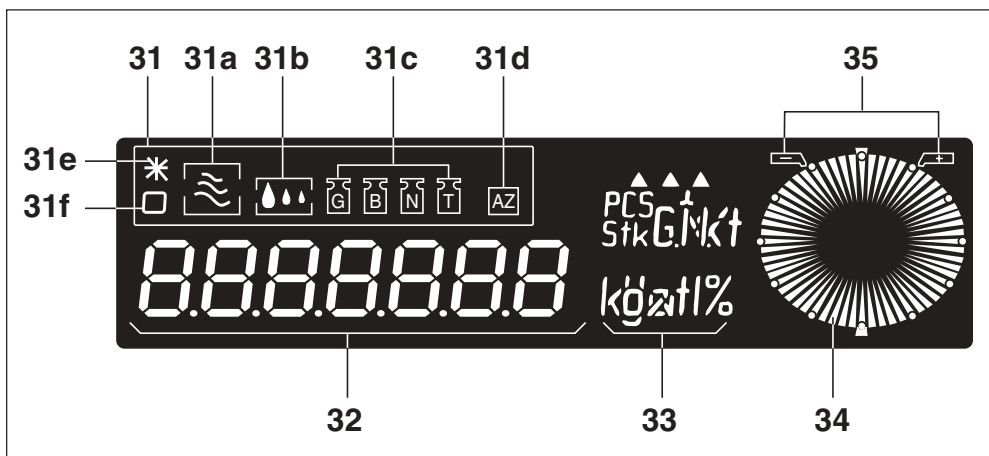
After each relocation of the scale, repeat levelling procedures. For this purpose adjust bubble in level indicator **6** with the two levelling screws **7**.

Control elements and connections



- 1 Control bar (On / Menu / Re-Zero)
- 2 Off key
- 3 Function and switch key
- 4 Print key
- 5 Connector for data interface
- 6 Connector for METTLER TOLEDO GM instruments
- 7 Fuse holder (with spare fuse)
- 8 Power socket
- 9 Screw feet (level adjustment)
- 10 Level indicator

Display



- 31 Status indicators
- 31 a Vibration adapter
- 31 b Weighing process adapter
- 31 c Weight status
- 31 d Automatic zero correction (Autozero)
- 31 e Special status of digital display*
- 31 f Stability control
- 32 Digital display
- 33 Units
- 34 DeltaTrac (dynamic graphic indicator and dispensing aid with 60 radial segments)
- 35 Tolerance limits

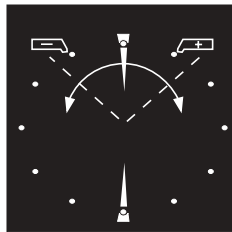
* indicates calculated quantities such as mean values or values multiplied by constants, as well as data entered via the interface

The METTLER DeltaTrac

This **dynamic graphic indicator** with 60 radial segments is incorporated in all scale models. METTLER DeltaTrac shows you a graphic representation of the numerical values shown in the digital display.



With absolute weighing, subtractive weighing, weighing-in and formula weighing, the dynamic display **indicates the weighing range used up and that still remaining.**



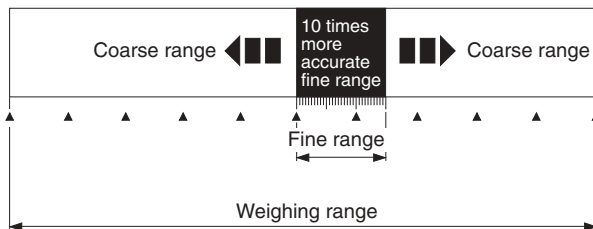
With the aid of METTLER DeltaTrac you can check fill quantities and determine deviations from a definable target weight in percent.

You can always see **the tolerance limits** with correct signs, as well as positive or negative deviations (see “Applications”).

When used together with METTLER TOLEDO Pacs, the METTLER DeltaTrac can also perform additional functions (see booklet “Applications – Technical data – Accessories”).

METTLER DeltaRange® balances ...

... include a fine range with **10 times the normal accuracy**. Briefly pressing the control bar (taring) will activate DeltaRange anywhere throughout the entire weighing range.



Note: The 10 times more accurate fine range also remains effective for backweighing.

Switch on display (▼ display changes automatically)



Display switched off (standby)



Briefly press control bar; all display segments light up briefly (automatic system and display check)



Software No. (e.g. 10.40.00, for information only)



Display subsequently indicates zero (weighing mode). The number of decimal places depends on the readability of your scale model as well as the selected weight unit.

Note: Should a power outage occur, the display will indicate -OFF- immediately the power is restored. You should then briefly press the control bar (also consult "What if ...").

Switch off display



Weighing mode

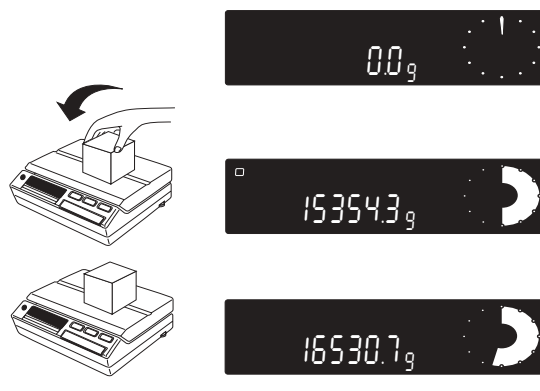
OFF



Press the **OFF** key; the display fades. The electronics remain live as long as the power cable is connected (standby). Thus, the scale is always ready for operation; no warm-up time required.

Simple weighing

Caution: Before the scale is used for the first time, it must be calibrated (see “Calibrating” in section “Menu”).



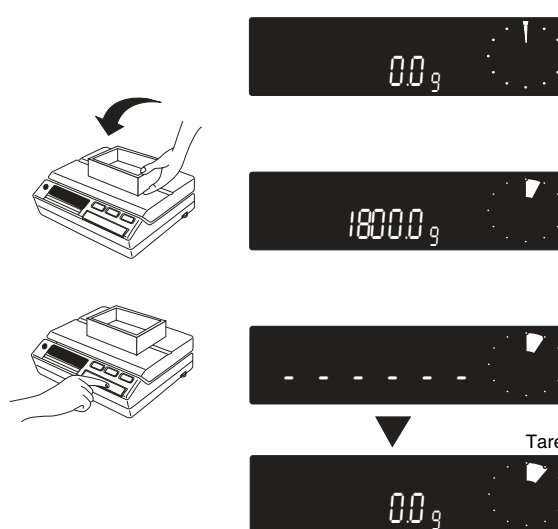
The diagram illustrates the simple weighing process in three stages. Stage 1: A scale is shown with a sample being placed on the pan. The display shows 0.0 g. Stage 2: The sample is on the pan, and the display shows 15354.3 g. Stage 3: The sample is on the pan, and the display shows 16530.7 g. A stability indicator (a semi-circle) is shown next to the display in the second and third stages, indicating when the reading is stable.

Weighing mode

Load weighing sample

Wait for stability and read result
(stability is attained when the stability detector fades)

Taring (▼ display changes automatically)



The diagram illustrates the taring process in four stages. Stage 1: A scale is shown with an empty container on the pan. The display shows 0.0 g. Stage 2: The container is on the pan, and the display shows 1800.0 g. Stage 3: A hand is shown pressing the control bar on the scale. The display shows a dashed line. Stage 4: The display shows 0.0 g. A downward arrow points from the dashed line to the final display. A 'Tare' label is positioned above the final display.

Weighing mode

Load an empty container or package

Brief pressing of control bar initiates taring cycle

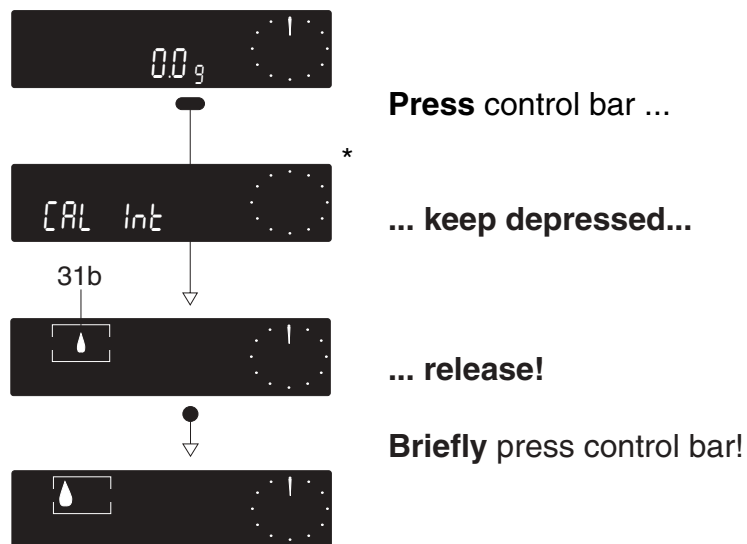
The container or packing has now been tared
The weighing range minus tare weight is now available for weighing-in

Note: The stability detector can be switched off during taring by pressing the control bar twice. It is then possible that the display does not show exactly 0.0 g. The foot or hand switch from the accessories offers the possibility of external taring.

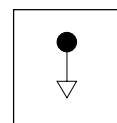
Operation

Introducing the symbols

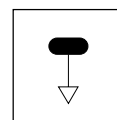
Use the following example to familiarize yourself with the key symbols. Switch on the display and remove weight from weighing pan. Now try to select and change the weighing process adapter **31b**.



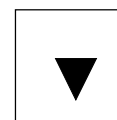
Symbols



Press control bar **briefly**



Press and hold control bar until required display appears



Display changes automatically

Note: If the display automatically returns to zero (weighing mode) **3 seconds** after the control bar was last pressed, simply begin the procedure again.

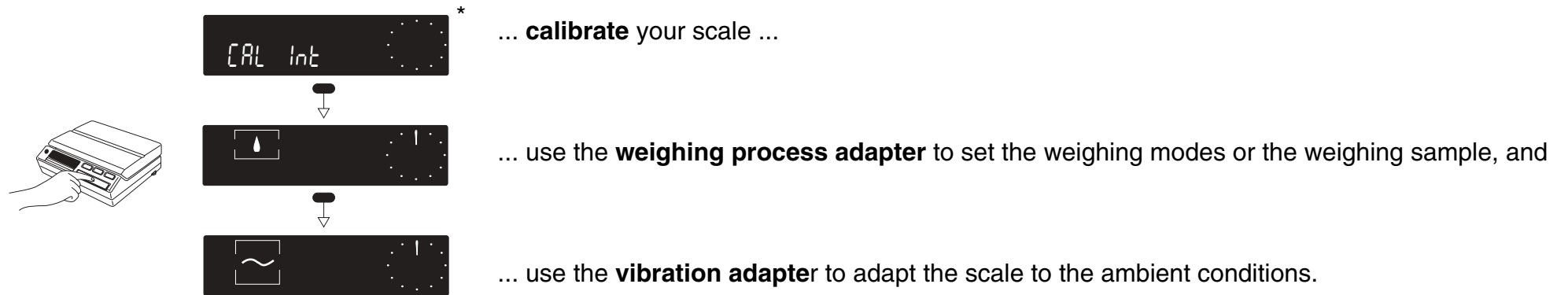
Have you adjusted the status display so that the “drop symbol” is shown on the left of the display? If your first attempt was unsuccessful, try again. You will find further information regarding the weighing process adapter and much more in the following sections.

* With scales without a built-in calibration weight (PM ... -N), “-CAL-” appears.

Menu

We distinguish between two levels of software. The first, simpler level, we call the **Menu**. It can be activated by pressing and holding the control bar. The second software level is called the **Configuration** file and is described in detail in the section “Configuring”.

When the Menu is activated, you can ...



You can select the menu from the weighing mode. Switch on display and remove load from weighing platform. Then press control bar (and keep depressed): The Menu sequence starts. After the third menu step the scale returns to the weighing mode. Now release the control bar.

Note: If you have selected the menu step “Weighing process adapter” or “Vibration adapter” and do **not** press the control bar for **3 seconds**, your scale will return automatically to the weighing mode. However, the actual settings are stored (the same applies if you return to the weighing mode by pressing and holding the control bar).

* With scales without a built-in calibration weight (PM ... -N), “-CAL-” appears.

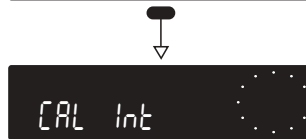
Automatic calibration with PM ... -K

Before the scale is used for the first time, it must be calibrated (to take the acceleration due to gravity into account).

Caution: To obtain accurate results it is advisable to connect the scale to the power supply 30 minutes before calibrating.



Start calibration with display switched on by pressing and holding the control bar (weighing mode, display zero with empty weighing platform).



Release control bar when "CAL Int" is displayed.



The calibration runs automatically.



Note: You can also trigger the calibration via the serial interface with the command "CA" (see operating instructions "Bidirectional data interface of the PM balances").



After the calibration, the scale automatically returns to the weighing mode.

Calibrate with an external calibration weight with PM ... -N

Before using the scale for the first time, it must be calibrated (taking gravity into consideration).

Caution: For exact results it is advisable to connect the scale to the power supply 30 minutes before calibrating.



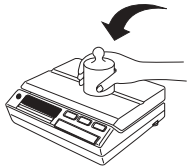
Start calibration with display switched on by pressing and holding the control bar (weighing mode, display zero with empty weighing pan).



Release control bar as soon as “-CAL-” appears in display.



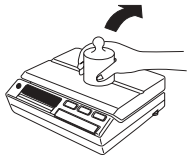
Required calibration weight, e.g. 4000.0 g flashes.



Place required calibration weight on scale.



Prompt to remove weight.



Remove weight from scale.



Now the scale is calibrated.

Adapt your scale to the type of weighing (weighing process adapter)

Access



Weighing mode



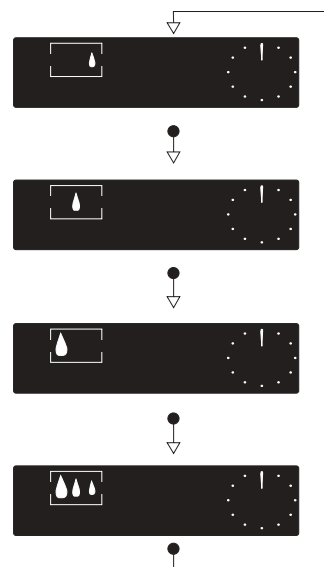
Weighing process adapter

With this adapter you will optimize the display speed of the digits as a function of weighing mode: For instance, for fine dispensing of powders even the last place of the digital display must be continuously recognizable. This is not the case for absolute weighing; the adapter thus suppresses the display during the weighing process. The result with all decimal places will appear only when it is stable.

Adjustments

Weighing process

Remarks



Fine dispensing (weighing-in) of fine powder or small quantities of liquids

For slow addition of the sample, **all decimal places** of the display are available. The weight increase can thus be followed easier.

Universal

Standard setting. With DeltaDisplay -on-, the last decimal place is suppressed in coarse dispensing, see page 23.

Absolute weighing

In this setting, you can **rapidly check a weight**. Only the final result appears in the display. “- - - -” is displayed during the unstable phase.

Animal weighing or weighing in extremely

Your scale is operating in the **animal weighing mode**, e.g. movements of a live animal do not influence the display. The measurement values are averaged during a certain time period and subsequently indicated on the display.
Starting of measuring cycle and setting of measuring time are explained the section “Applications, animal weighing”.

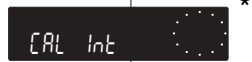
* With scales without a built-in calibration weight (PM ... -N), “-CAL-” appears.

... as well as to the ambient conditions (vibration adapter)

Access



Weighing mode



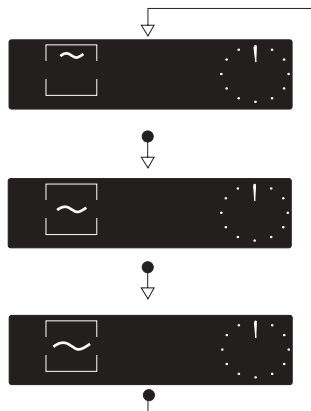
Vibration adapter

Under vibration-free conditions adjust the adapter to obtain results within the shortest possible time. However, if you are operating in an environment with severe vibrations or drafts, adjust the adapter to obtain reliable results, even under adverse conditions.

Adjustments

Weighing environment

Remarks



Very quiet and stable

With this setting your scale operates **very fast** (short weighing cycle), but the scale is relatively sensitive to ambient disturbances.

Normal

Standard setting

Unstable, e.g. draft or strong building vibrations

Your scale is **not sensitive** to external disturbances, however, its operation is slowed down.

* With scales without a built-in calibration weight (PM ... -N), “-CAL-” appears.

Configuring

Special requirements need special settings within the configuration file

Your scale has been factory-set to a standard configuration, i.e. the settings in the configuration file correspond to the most common user requirements. If you wish to change these settings to meet special requirements you must access the configuration file and change the settings according to your needs. The configuration file is divided into four sectors, in which you can change the following settings:



Standard setting and record printout



Resetting to standard configuration



Printout of balance specification values and actual configuration (printer connected)



Setting scale operating parameters



Changing stability detector (four settings)



Reducing readability



Switching off METTLER DeltaDisplay



Switching off automatic zero correction



Unit selection, applications etc.



Selection of basic unit



Selection of second unit and applications



Switch on status displays



Adapting to peripherals for data interchange



Transmission mode



Baud rate



Parity



Pause between data transfers and handshake

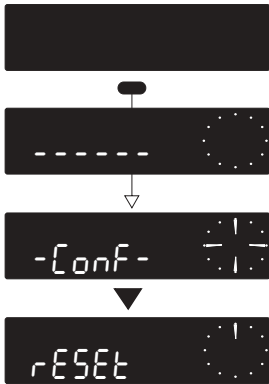


Suppression of certification symbols in data transmission

Please see the following pages for more information on the individual setting possibilities.

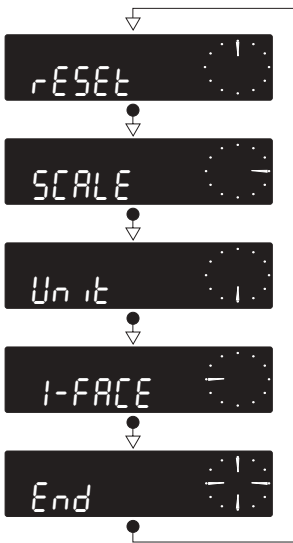
Note: Short-form operating instructions are enclosed with this operating manual and show the configuration file with all possible settings. These short-form instructions are intended for use as an overview aid in your day-to-day work.

Configuring - a quick introduction



Access

Start from standby, i.e. display switched off.
 Now press control bar and **release only**
 when display shows –Conf–.
 Display now automatically changes over to –
 Reset–.

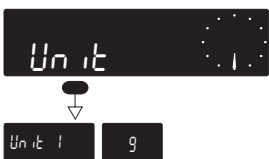


Selecting sectors

The 4 sectors can be selected by **briefly**
 pressing the control bar.

Note:

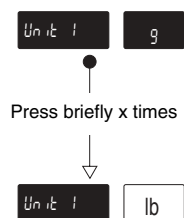
The –End– display between the sectors
 –I-Face– and –Reset– indicates the end
 of the four sectors.



Selecting adjustment

For instance in sector –Unit–:
 Keep control bar **depressed** until the desired
 selection is displayed (e.g. –Unit 1–).

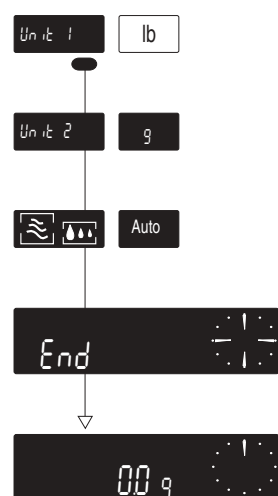
Have you found the setting –Unit 1–? If not, switch off the display by pressing the OFF key. Then restart by accessing the configuration file. This time it's sure to work.



Change setting

e.g. from –g– (gram) to –lb– (pound):

Briefly press control bar **several times** until pound (lb) appears in display.



Return to weighing mode

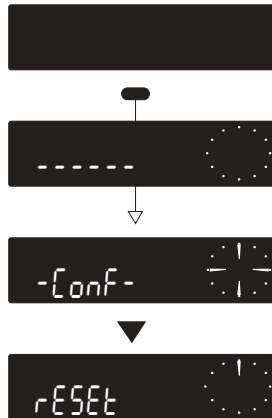
After completing your configuration keep control bar **depressed** until zero indication appears (weighing mode). The effective settings are now stored, and you can proceed with your weighings.

Note: If you **release** the control bar **at –End–** (each sector is terminated with –End–) and then press **briefly**, you will return to the start of the corresponding sector (e.g. –Unit–).

If, after making these changes, you would like to return to the **standard configuration**, please turn to the next page. The following pages also tell you everything you wish to know regarding the individual setting options. A general overview of the configuration file is available from the enclosed **short-form operating instructions**.

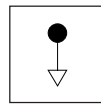
Standard setting and record printout

Access

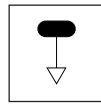


Standby

Symbols



Control bar
press
briefly



Press and hold
control bar
until required display appears

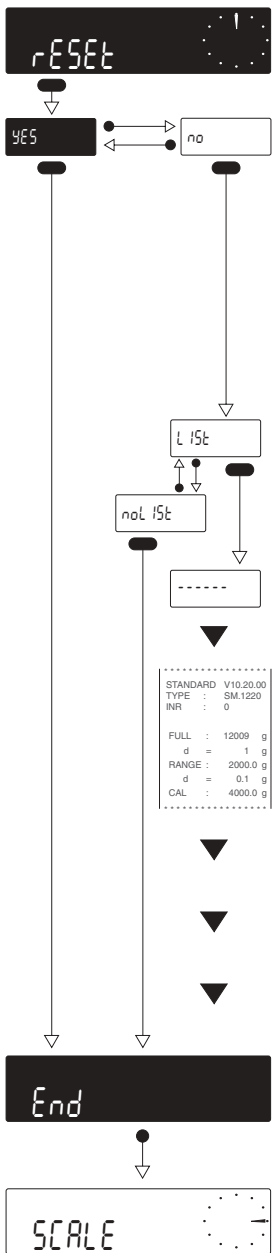


Display changes automatically

Important

Return to weighing mode always by pressing and holding the control bar until zero is displayed.

If you do not press the control bar for **40 sec**, the scale will **automatically** return to the weighing mode.



Configuring

Settings

Standard settings Yes/No?

For resetting your scale to standard configuration, select sector –Reset–. Now press control bar until –yes– is displayed. **By pressing and holding the control bar again until –End– or zero appears, you acknowledge** the resetting (weighing mode appears after –End– indication). Your scale is now reset to the original factory setting.

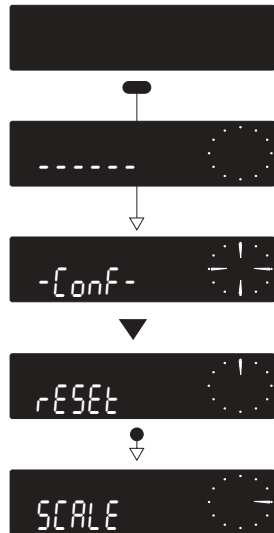
Printout of scale specifications and the actual configuration Yes/No?

To obtain a printout of scale specifications and the selected settings in the configuration file select –List–. **Acknowledge** the List command by pressing and holding the control bar until - - - - - appears. The record with the following values can be printed out with an attached printer (e.g. METTLER TOLEDO GA44):

Balance specification values	Actual configuration
<ul style="list-style-type: none"> STANDARD Software version, e.g. V.10.40.00 TYPE Stock designation, e.g. PM3281 (Type code for PM30000-K) INR Identification number, 7 digits FULL Weighing range, e.g.11000.0 g d Readability, e.g. 0.1g CAL INTERNAL with PM...-K Calibration weight value e.g. 4000.0 g with PM...-N 	<ul style="list-style-type: none"> Asd Stability control, e.g. step 2 d Readability, e.g. 0.1 g dd DeltaDisplay, e.g. on AZ Automatic zero correction, e.g. on Unit 1 Basic unit, e.g. lb Unit 2 Second unit,e.g. lb or Applications, e.g. PCS [] [] Status display, e.g. auto S Transmission mode,e.g. Stb b Baud rate, e.g. 2400 Baud P Parity, e.g. –E– Pause Pause duration between data transfers, e.g. 1 s AU Suppress special characters, e.g. –on–

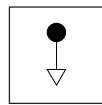
Setting scale operating parameters

Access

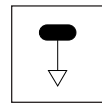


Standby

Symbols



Control bar
press
briefly



Press and hold
control bar
until required display appears



Display changes automatically



Standard setting

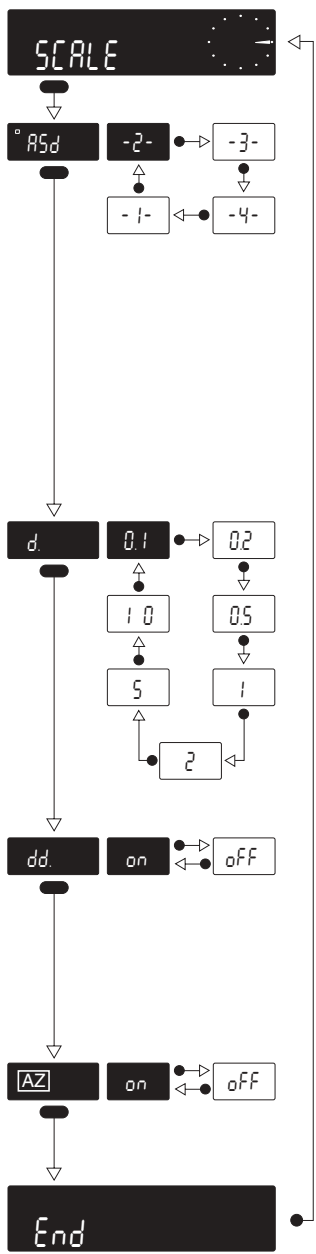


Selectable setting

Important

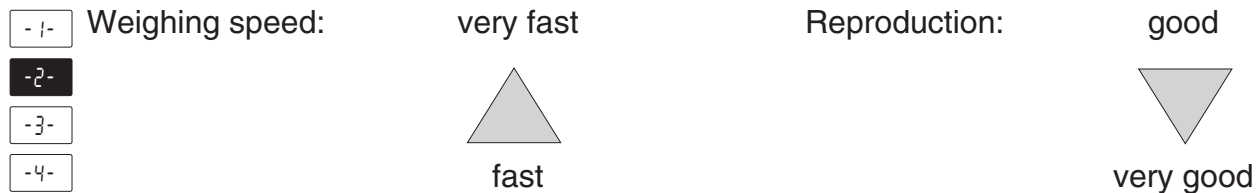
Return to weighing mode, **always** by pressing and holding the control bar until zero is displayed.

If you do not press the control bar for **40 sec**, the scale will **automatically** return to the weighing mode. Modified settings will be stored.



Automatic stability detection

The stability detector **31f** lights up when the scale is unstable. At the same time, the data interface is blocked until the weighing result is stable (except for data transfer mode “S” being set to –All– or –Cont–; see sector –I-Face–).



Selection of display sequences (Readability)

Example for 0.1 g scales:

Step	(d)	1	2	5	10	20	50	100
Display	(g)	<input checked="" type="checkbox"/> 0.1	<input type="checkbox"/> 0.2	<input type="checkbox"/> 0.5	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 5	<input type="checkbox"/> 10

Weighing-in aid (DeltaDisplay) switching on or off

DeltaDisplay is a weighing-in aid for fast, accurate weighing. The number of decimal places is reduced by one, depending on the rate of weighing-in. In the final phase of the weighing-in process the scale automatically switches back to normal weighing.



Automatic zero correction (Autozero) switching on or off

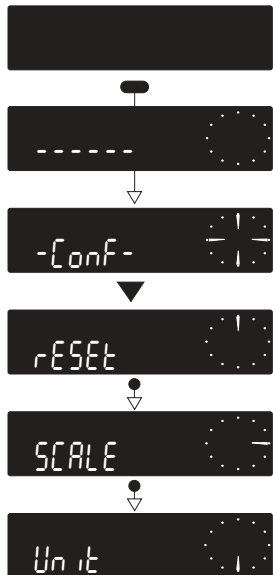
Autozero automatically compensates for zero drift or soiled platform.



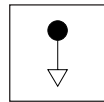
Note: The symbol –AZ–, in either position (on/off), appears only in the configuration file.

Unit selection, Applications, Status displays

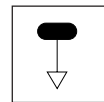
Access



Symbols



Control bar
press
briefly



Press and hold
control bar
until required display appears



Display changes automatically



Standard setting

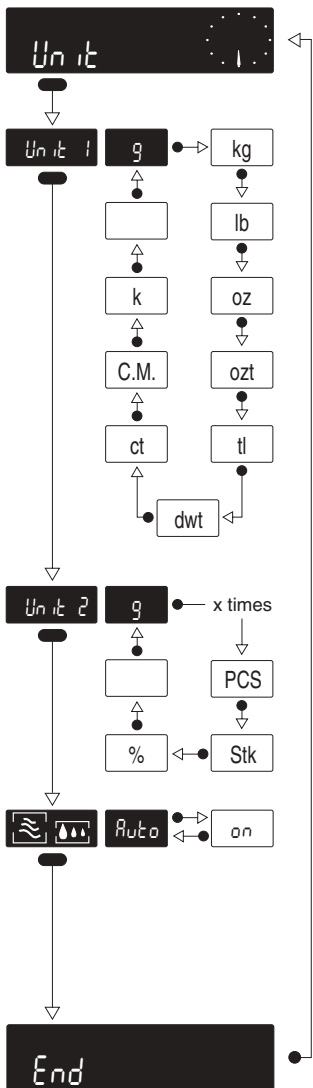


Selectable setting

Important

Return to weighing mode, **always** by pressing and holding the control bar until zero is displayed.

If you do not press the control bar for **40 sec**, the scale will **automatically** return to the weighing mode. Modified settings will be stored.



Setting options

Basic weighing unit

In addition to the weight unit g, the following weight units can be selected for weighing:

g gram
 kg kilogram
 lb pound
 oz ounces
 ozt troy ounces
 tl tael
 dwt pennyweight
 ct
 C.M.
 k carat
 ... no unit display (display value in g)

Note: The number of decimal places depends on the scale model and selected weight unit (see “Decimal places for secondary units” in the booklet “Applications – Technical data – Accessories” and “Conversion factors” in the section “Applications” under “Switching weight unit”).

Switchable second unit

–Unit 2– includes the same weight units as basic unit. In addition you may select:

PCS
 Stk Piece counting
 % Plus/ minus or percent weighing

For further information regarding these applications, see section “Applications”.

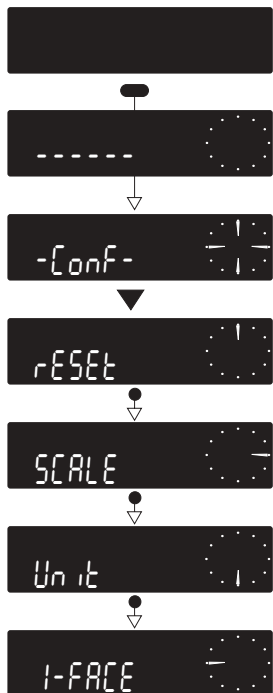
Switch status indicators , on or off

Auto 3 minutes after switching on scale, the two status indicators fade automatically.

on The two status indicators remain active, i.e. they are always visible on display.

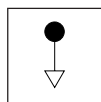
Adaptation to external equipment for data exchange

Access

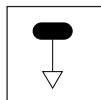


Standby

Symbols



Control bar
press
briefly



Press and hold
control bar
until required display appears



Display changes automatically



Standard setting



Selectable setting

Important

Return to weighing mode, **always** by pressing and holding the control bar until zero is displayed.

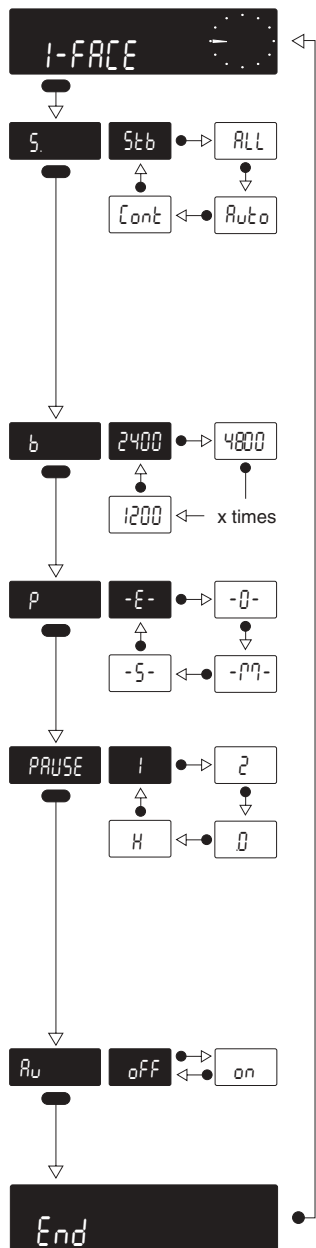
If you do not press the control bar for **40 sec**, the scale will **automatically** return to the weighing mode. Modified settings will be stored.

General information

Every METTLER TOLEDO PM scale is factory-equipped with a bidirectional interface (CL and RS232C). For detailed information see operating instructions "Bidirectional Interfaces of the PM scales".

Data format of scale interface:

1 start bit, 7 data bits, 1 parity bit, stop bit automatic (1 RX / 2 TX).



Data transfer mode

- Stb** The next possible stable value is transferred after initiation of print/transfer command (after release by stability detector).
- ALL** The momentary value (dynamic “SD” or stable “S”) is transferred after initiation of print/transfer command.
- Auto** Only stable values are transferred automatically after each change of weight (required change 1 g, with scales having readability 1 g: 5 g. For animal weighing, see section “Applications”).
- Cont** All values (dynamic “SD” and stable “S”) are transferred automatically.

Baud rate

The Baud rate is the transfer rate unit for serial data transmission in bits/sec:

110 150 300 600 1200 **2400** 4800 9600 Baud

Parity

Parity control permits recognition of simple bit errors in data transmissions:

-E- even parity **-0-** odd parity **-??-** mark parity **-5-** space

Pause between transfers and handshake (hardware related for RS 232C)

Settings –Pause 0–, 1 and 2 permit the adaptation of transfer rate to data receivers working at different rates (specifications in seconds). –Pause H– evaluates the hardware related handshake signal for RS 232C. The scale is ready for handshake mode operation.

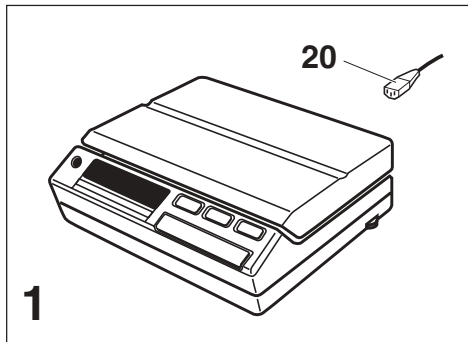
Caution: In handshake operation, no external key may be attached to the Data I/O output as a transfer key (see booklet “Applications – Technical data – Accessories”).

Certification symbols in data transmission

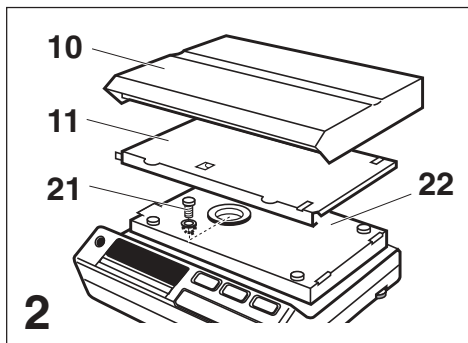
If scales are connected to peripheral units that can not process the certification symbols (<...>, *) (e.g. LP16-M Infrared Dryer and SQC systems) or if a printout of these symbols is not required, the function –Au– must be set to –on–.

How to protect the new settings in the configuration file

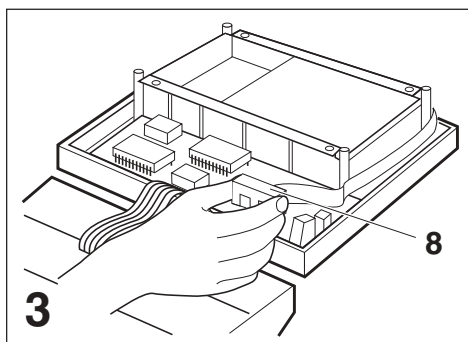
After having completed your configuration, you can protect your settings against inadvertent changes. Proceed as follows:



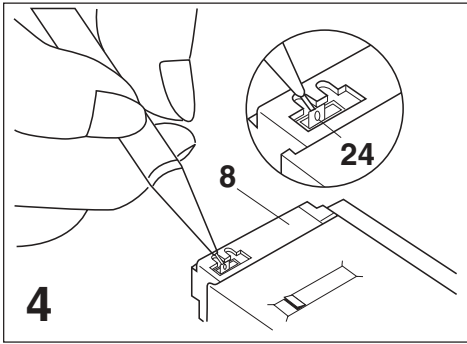
To protect the program cassette from possible interference, it is absolutely essential to first disconnect the line cable **20**.



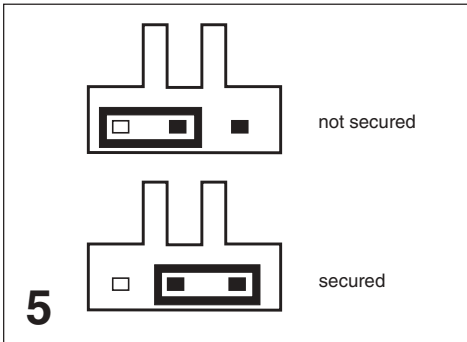
Lift off weighing platform **10** and platform support **11**. Undo screw **21**. Carefully lift off top housing **22** and place to one side with the display pointing downward.



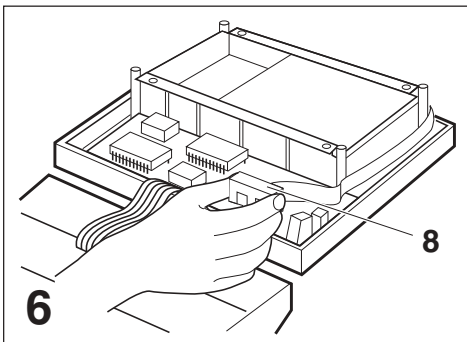
Grasp bracket of program cassette **8**, and carefully pull out cassette.



In the aperture of the program cassette **8**, the shorting jumper **24** is now visible. It can be lifted off from the contact pins (e.g. with a small pencil).



To protect your settings in the configuration file from involuntary changes, position the jumper across **both** contact pins (position **secured**).



Reinsert the program cassette **8**, make sure it is pressed in firmly and fully. Close the scale housing. Connect power cable **20**.

Your settings are now secured, i.e. accessing the configuration file is no longer possible. If you wish to remove the security provision, follow sequences shown in Figures 1 to 4. In Figure 5 select the position “**not secured**”.

Applications

Standard applications at a keystroke

Counting in or out of a container, percent formula weighing of powders or liquids, plus/minus checks of fill quantities, weighing in grams or in a second, selectable unit, or even animal weighing: all this and more can be performed with the applications built in as standard. You can choose between the following applications:



Changing weight units

You can switch between two selected weight units, e.g. between gram and carat.



Animal weighing

Animal weighings can also be performed simply and rapidly.



Piece counting

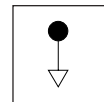
The scale can be used for piece counting; 10 is the fixed reference value.



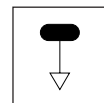
Plus/minus and percent weighing

The scale can also be used for plus/minus checks. If your scale is used for checks in %, the METTLER DeltaTrac indicates the deviation from the preset target weight, the tolerance limits of +/- 2.5 % and their violations. You can of course perform the usual percent weighings simply and rapidly.

Symbols



Press control bar
briefly



Press and hold
control bar
until required display appears



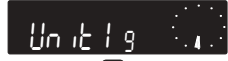
Display changes automatically

Switching weight unit

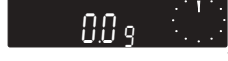
Configuration



Standby



Press briefly x times



In the configuration file, select the setting –Unit 1– in the –Unit– sector: The standard setting has the basic unit gram (g). If you wish to change this, press the control bar repeatedly until the desired unit appears.

Now press and hold the control bar until –Unit 2– is displayed: Select desired second unit (e.g. –ct–) by briefly pressing control bar.

Return to weighing mode

Applications

Working with two units



Basic unit, e.g.
–g– (gram)



Switch unit:
Press key



Second unit, e.g.
–ct– (carat)



Return to basic unit:
Press key



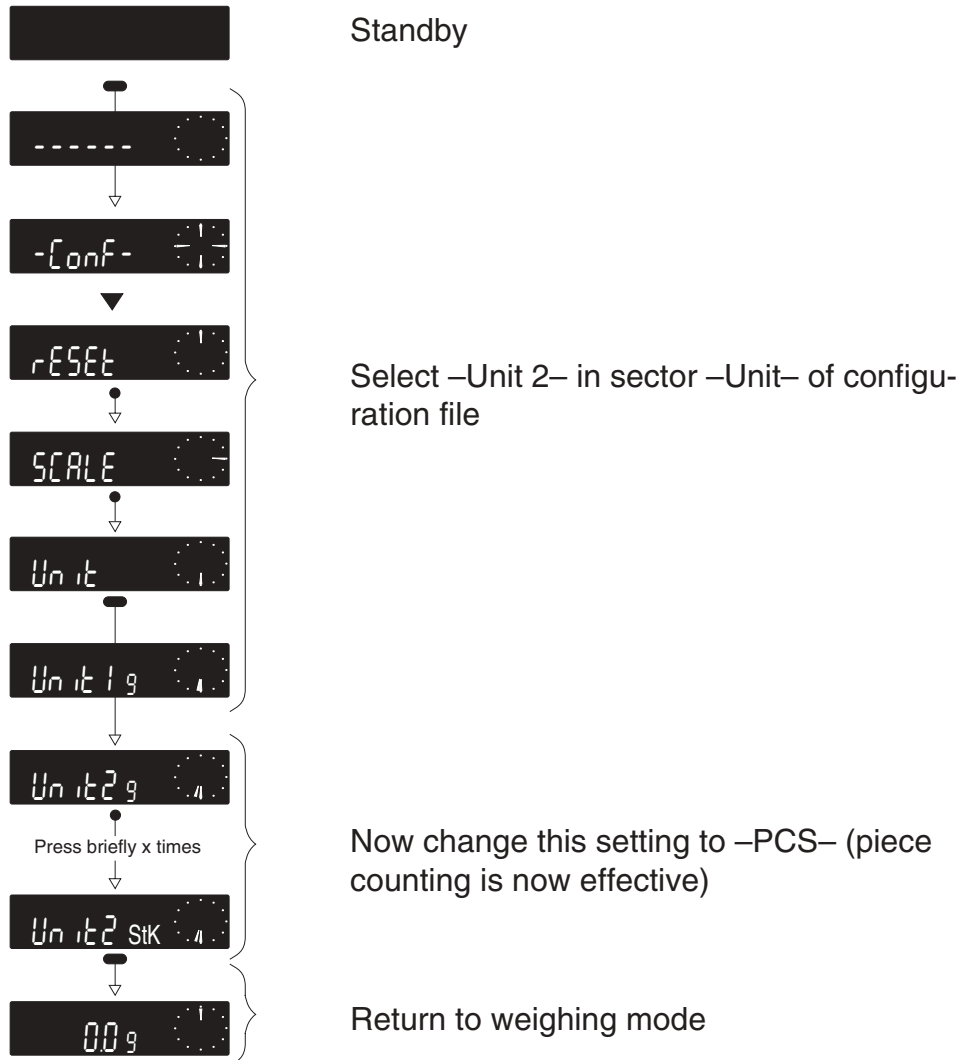
Basic unit

Conversion factors

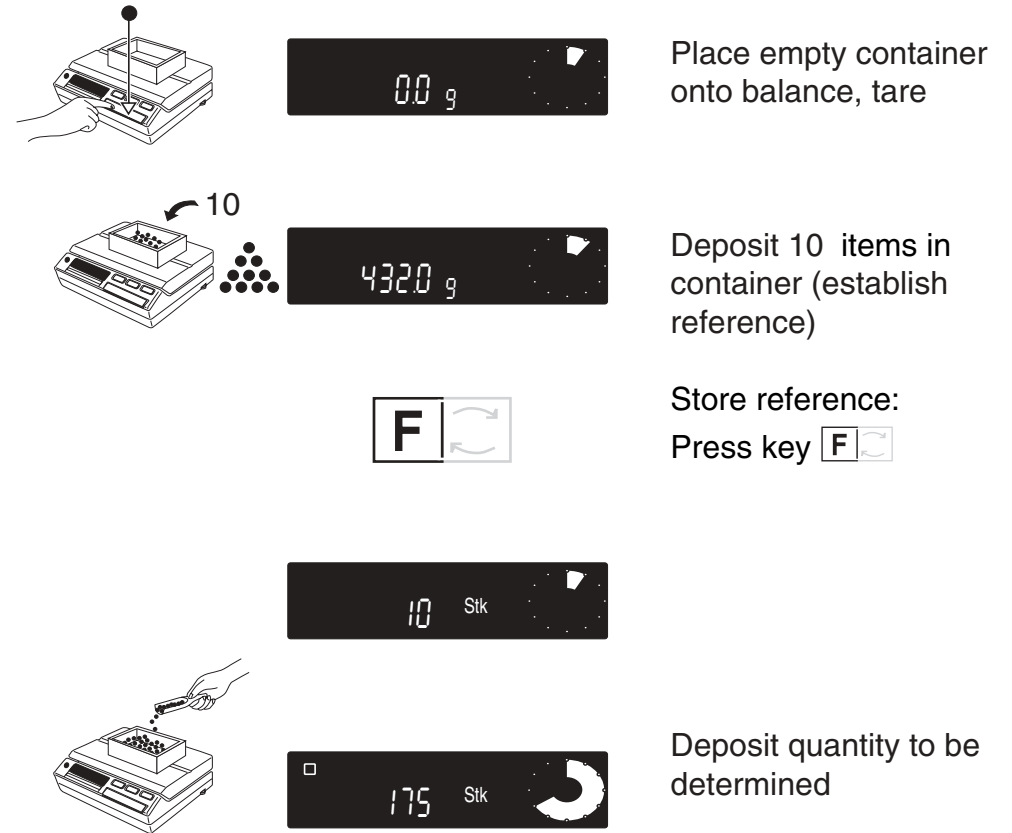
ounce	1 oz ≈ 28.349523125 g	1 g ≈ 0.035273962 oz
pound	1 lb ≈ 453.59237 g	1 g ≈ 0.002204623 lb
pennyweight	1 dwt ≈ 1.55517384 g	1 g ≈ 0.643014931 dwt
troy ounce	1 ozt ≈ 31.1034768 g	1 g ≈ 0.032150747 ozt
carat	1 ct = 0.2 g	1 g = 5 ct
tael	1 tl ≈ 37.4290 g	1 g ≈ 0.026717213 tl

Piece counting (fixed reference number = 10 pieces, 1 piece at least 1/4 digit)

Configuration



Counting into a container



Note: If the F-key is pressed again, the weight currently loaded will be stored as a new reference weight for the reference 10 items.

Switch piece count/weight readout



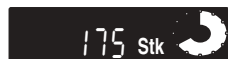
Switch to weight display:

Press key

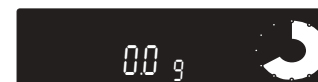
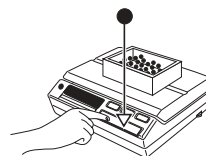


Return to display in PCS:

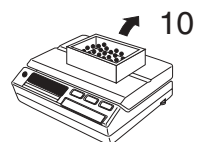
Press key



Counting out of a container



Place filled container on balance, tare

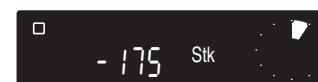
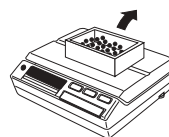


Remove 10 items (reference)



Store reference:

Press key

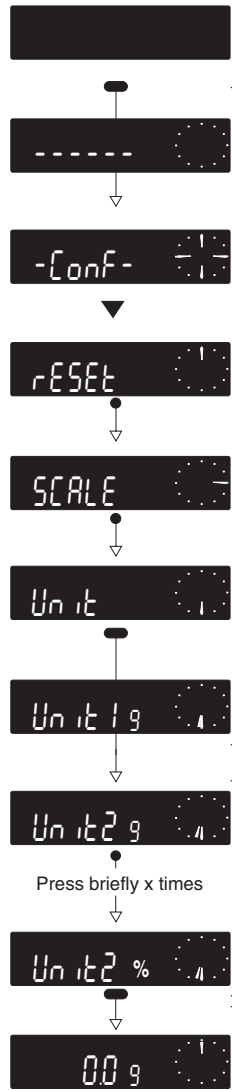


Take out quantity to be determined

Note: If the F-key is pressed again, the weight currently loaded will be stored as a new reference weight for the reference 10 items.

Plus/minus and percent weighing (tolerance limit $\pm 2.5\%$, 100% = target weight, minimum weight = 100 digit)

Configuration



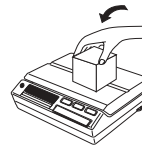
Standby

Select -Unit 2- in sector -Unit- of configuration file

Now change this setting to -%- by briefly pressing control bar (plus/minus, or percent weighing is now effective)

Return to weighing mode

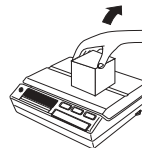
Set target weight



Place target weight on pan



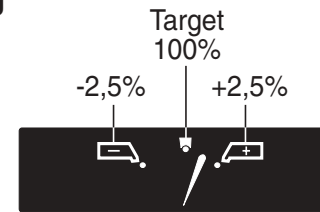
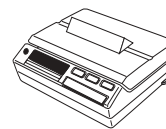
Store target weight:
Press key **F**



Remove target weight

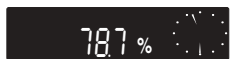
Note: If the F-key is pressed again, the weight currently loaded will be stored as a new target weight (100%).

Checkweighing



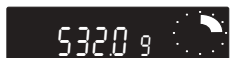
Place sample on platform and check if weight is within tolerance limits.

Switch percent weighing/weighing mode



Switch to weight display:

Press key

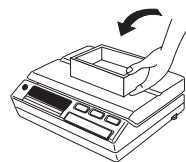


Return to display in % of target weight:

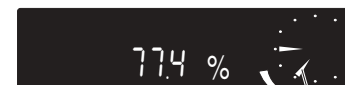
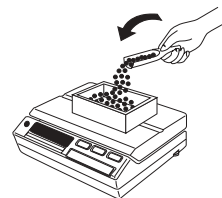
Press key



Coarse weighing-in

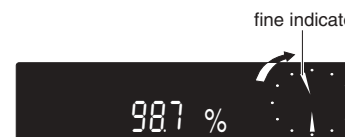
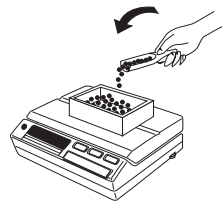


Place empty container on scale, tare.



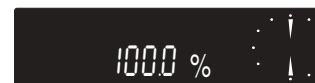
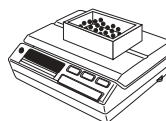
Add weighing sample rapidly; the coarse indicator moves downward (coarse indicator position six o'clock = target weight).

Fine weighing-in



Add weighing sample gradually; the fine indicator moves upward (fine indicator position 12 o'clock = target weight).

Target weight



When fine and coarse indicators form a vertical line, the target weight has been reached ($\pm 0.25\%$).

Animal weighing / Weighing in extremely unsteady or vibrating surroundings

Configuration



Set weighing process adapter **31 b** to “Animal weighing”



Use vibration adapter **31a** to select the desired time cycle (integration- + reading time):



4 sec.



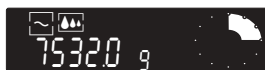
6 sec.



8 sec.

See also section “Menu”.

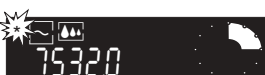
The various displays have the following meanings:



Scale ready
for animal weighing



Weighing cycle in process
(integration time)



Read result (Available reading time:
Display remains stable for 3...5 sec.)

Note: For certification reasons, an asterisk (*) must precede the animal weighing result.

Manual

- With PRINT key of your scale
- With print key of the GA44 Thermal Printer (see booklet “Applications – Technical data – Accessories”)
- With the external transfer keys (see booklet “Applications – Technical data – Accessories”)

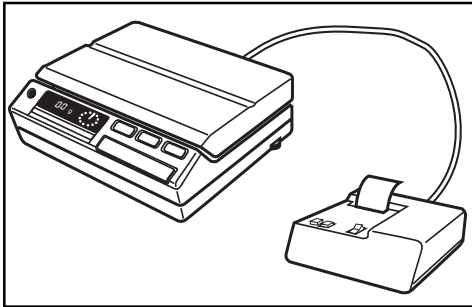
Note: If printer is connected, the stable weight value is printed out automatically.

Automatic

- Set data transfer mode “S” to –Auto– (see also “Configuring, Sector –I-Face–”). Placing a live animal on the weighing platform automatically initiates a weighing cycle. To initiate a new weighing sequence, the load on the scale between weighings must be below the following values: 10 g for 100 mg balances, 50 g for g balances.

Note: For DeltaRange scales select smallest unit as a reference.

Print/ transfer command






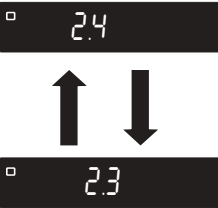


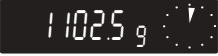
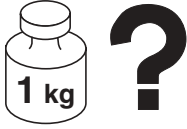
Pressing the **PRINT** key triggers transfer of a value from the scale to the attached peripheral (printer, e.g. METTLER TOLEDO GA44 or computer).

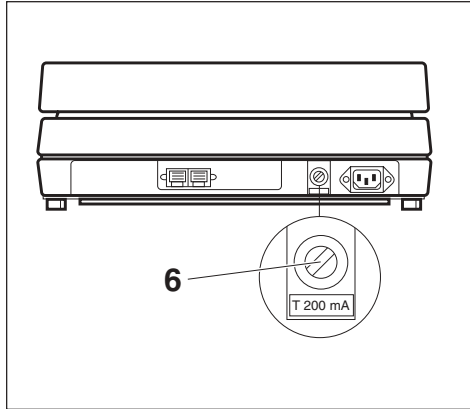
Note: In the animal weighing mode , pressing the **PRINT** key triggers the start of a new measurement cycle. See section “Applications” for further details.

What if...

A breakdown should occur anyhow

Display	Definition	Cause	Correction
	Display blank	<ul style="list-style-type: none"> - No power - Scale switched off - Power cable disconnected - Temporary disturbance - Incorrect operating voltage - Line fuse defective - In case of repetition 	<ul style="list-style-type: none"> - Check power system - Switch on scale - Connect power cable - Switch scale off/ on, or pull out/ plug in power cable - Inform METTLER TOLEDO Service - Replace fuse, see "Miscellaneous") - Inform METTLER TOLEDO Service
	Zero not defined	<ul style="list-style-type: none"> - Platform support and/or platform not in place 	<ul style="list-style-type: none"> - Place platform support and/or platform on scale
	Underload	<ul style="list-style-type: none"> - Platform support and/or platform not in place - Protective cover touching pan support - Weight below weighing range 	<ul style="list-style-type: none"> - Place platform support and/or platform on scale - Mount protective cover properly, see "Miscellaneous" - Tare
	Overload	<ul style="list-style-type: none"> - Load beyond weighing range 	<ul style="list-style-type: none"> - Reduce load
	Power loss	<ul style="list-style-type: none"> - Pull out then plug in power cable - Temporary power failure 	<ul style="list-style-type: none"> - Switch on scale with control bar - Check power connector for proper fitting, then tare
	Weighing result unstable	<ul style="list-style-type: none"> - Unstable weighing location - Unsteady object on balance (e.g. animal) - Incorrect operating voltage 	<ul style="list-style-type: none"> - Adjust vibration adapter, see "Menu" - Place scale on stable support - Set weighing process adapter to animal weighing mode, see "Menu" - Inform METTLER TOLEDO Service

Display	Definition	Cause	Correction
 	Incorrect result	<ul style="list-style-type: none"> - Operational error - Wrong unit - Protective cover touching pan support - Weighing sample touching housing 	<ul style="list-style-type: none"> - Take off weight, tare and repeat weighing - Check levelling, see "Preparation" - Check calibration, see "Menu" - Select correct unit, see "Configuring" - Mount protective cover properly, see "Miscellaneous" - Rearrange weighing sample to avoid contact with housing
Err 1	Unstable when taring, calibrating or setting reference	<ul style="list-style-type: none"> - Excessive vibration - Wrong calibration weight - Stability detector setting too sensitive 	<ul style="list-style-type: none"> - Adjust vibration adapter, see "Menu" - Adjust stability detector, see "Configuring"
Err 2	Taring in overload or underload condition	<ul style="list-style-type: none"> - See overload/ underload 	
Err 3	Reference insufficient	<ul style="list-style-type: none"> - Reference is too small or missing (piece counting, plus/ minus or % weighing) 	<ul style="list-style-type: none"> - Increase weight/ reference weight
Error 0 to Error 9	Error message from internal electronics monitor during automatic self check	<ul style="list-style-type: none"> - Program cassette improperly inserted - Admissible temperature range exceeded 	<ul style="list-style-type: none"> - Insert program cassette correctly - Pull out/ plug in power cable - If error message persists, contact METTLER TOLEDO Service

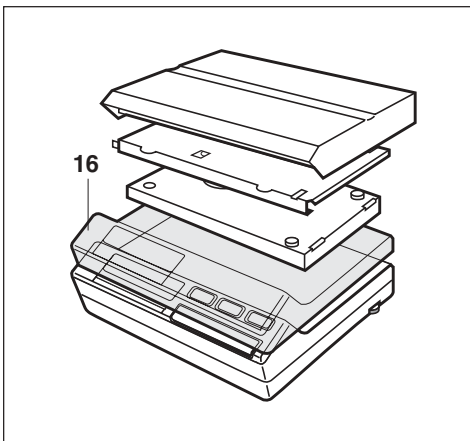
Changing the microfuse, quite simply

- Pull out power cable.
- Turn fuseholder **6** counterclockwise and pull out.
- Replace blown fuse with new 200 mA slow-blow fuse.
- Insert fuseholder **6**, press in slightly and turn clockwise.
- Plug in power cable, switch on scale.

Remember to get a new spare fuse.

If the new fuse again blows after a short time, there is a fault in the power supply of the balance/scale. Please disconnect the balance/scale from the power supply and inform your authorized METTLER TOLEDO service facility.

How to change the protective cover



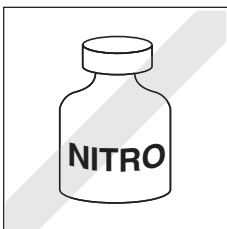
If weighing platform and platform support are already in place, take them off. Then detach protective cover **16** at the adhesive spots and carefully pull off upwards.

Replace in the reverse order.

Important: Protective cover must stick firmly (remove backing paper).

Note: Replacement protective covers are supplied in sets of 2.

Easy to clean



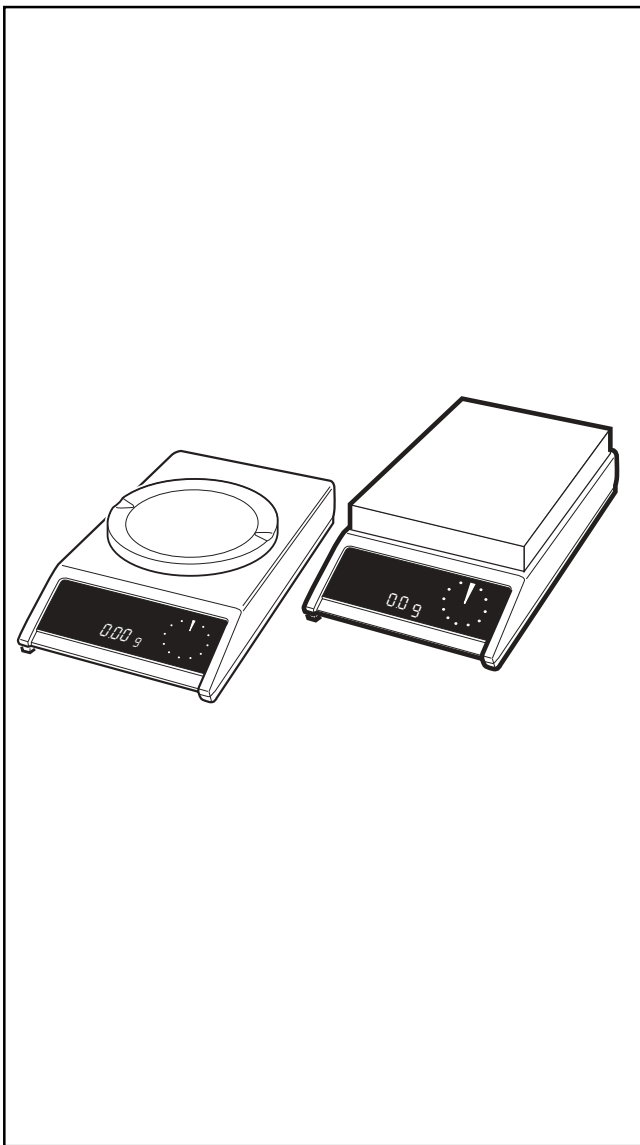
For cleaning the stainless steel platform, a cloth with soap and water is adequate. Never use powerful solvents.

Caution: Never position scale upside down (damage to measuring cell)!

You can't know all the words

Calibrating	Adapting the scale to a reference weight		
Configuration cycle	A run through the configuration file		
Configuration file	A second level, lockable with the jumper with variable parameters and selectable applications as additions to the menu, see "Configuring"	LCD	see "Configuring"
		Menu	Liquid crystal display
Configuring	The setting of parameters, see "Configuring"		The first level, consisting of calibration, adaptation of weighing process and vibration, can be extended with applications, see "Operation" and "Applications"
Control bar	A single operating device for weighing, working through the menu and configuring your balance	Reproducibility	The similarity of values obtained from repeated weighings on the same scale under the same conditions of measurement
DeltaDisplay	An aid to fast, accurate weighing-in, see "Configuring"	Sector	Part of the configuration file (Reset, Scale, Unit and I-Face)
DeltaRange	Selectable fine range, see "Operation"	Segment	A radial bar, 1/60th of the DeltaTrac
DeltaTrac	A dynamic graphic indicator with 60 radial segments, see "Operation"	Standard setting	The settings for normal user requirements
Digit (d)	The smallest displayed value (e.g. METTLER TOLEDO PM11-N: 0.1g)	Standby	The scale is ready for use (power cable plugged in) but not switched on, i.e. display is blank
Dispensing	Precise weighing-in of powder or small amounts of liquid	Tare weight	The weight of weighing vessels or packaging
Display	The entire display unit, see "Operation"	Taring	Allowing for the tare weight(s), i.e. the digital readout shows zero
FD	Fluorescent display	Vibration adapter	A means of adapting the scale to its location, see "Menu"
Indicators	These indicate the status of the scale, see "Operation"	Weighing process adapter	A means of adapting the scale to the materials weighed, see "Menu"
Jumper	A small connector for locking the configuration,		

Overview of the PM balance and scale families



Precision balances with readability 1 mg (10 mg)

PM100	Weighing capacity:	110 g	
PM200	Weighing capacity:	210 g	
PM400	Weighing capacity:	410 g	
PM1200	Weighing capacity:	1200 g	
PM480 DeltaRange	Fine range:	80 g	(Coarse range: 410 g)
PM2500 DeltaRange	Fine range:	500 g	(Coarse range: 2100 g)

Precision balances or scales with readability 10 mg (0.1 g)

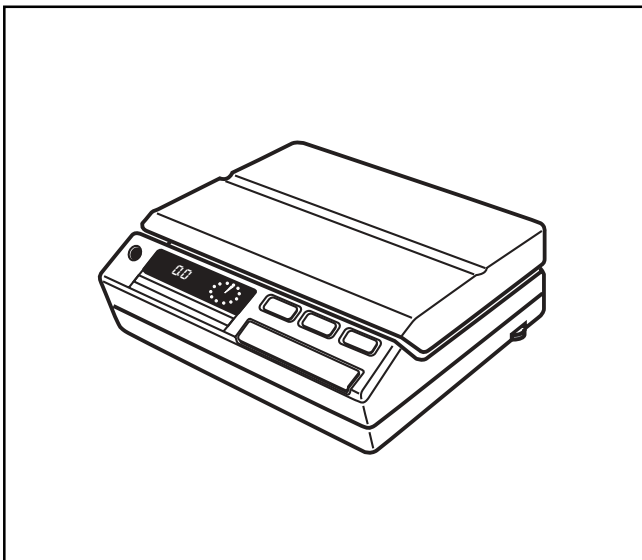
PM300	Weighing capacity:	310 g	
PM600	Weighing capacity:	610 g	
PM2000	Weighing capacity:	2100 g	
PM4000	Weighing capacity:	4100 g	
PM6100	Weighing capacity:	6100 g	
PM4800 DeltaRange	Fine range:	800 g	(Coarse range: 4100 g)

Precision scales with readability 0.1 g (1 g)

PM3000	Weighing capacity:	3.1 kg
PM6000	Weighing capacity:	6.1 kg

Precision scales with readability 1 g

PM6	Weighing capacity:	6.1 kg
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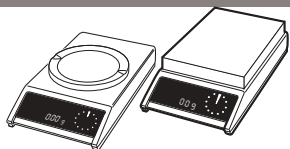
Precision scales with readability 0.1 g (1 g)

PM11-K, PM11-N	Weighing capacity:	11.0 kg	
PM16-K, PM16-N	Weighing capacity:	16.0 kg	
PM30000-K	Weighing capacity:	32.0 kg	
PM34-K DeltaRange	Fine range:	4.0 kg	(Coarse range: 32.0 kg)
PM34-N DeltaRange	Fine range:	4.0 kg	(Coarse range: 32.0 kg)

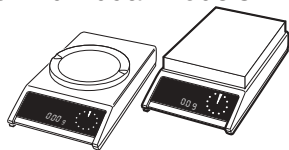
Precision scales with readability 1 g

PM15-K, PM15-N	Weighing capacity:	16.0 kg
PM30-K, PM30-N	Weighing capacity:	32.0 kg

Technical data for individual models



	PM100	PM200	PM400	PM1200	PM480 DeltaRange	PM2500 DeltaRange
Readability	0.001 g	0.001 g	0.001 g	0.001 g	0.01 g	0.01 g
- Fine range (recallable)	-	-	-	-	0.001 g	0.001 g
Weighing capacity	110 g	210 g	410 g	1200 g	410 g	2100 g
- Fine range (recallable)	-	-	-	-	80 g	500 g
Taring range (by subtraction)	110 g	210 g	410 g	1200 g	410 g	2100 g
Reproducibility (s)	0.5 mg	0.5 mg	0.001 g	0.001 g	0.003 g	0.003 g
- Fine range	-	-	-	-	0.001 g	0.001 g
Linearity	± 0.002 g	± 0.002 g	± 0.002 g	± 0.002 g	± 0.005 g	± 0.005 g
- Fine range	-	-	-	-	± 0.002 g	± 0.002 g
Sensitivity drift / °C (10 ... 30 °C)	4 x 10 ⁻⁶	4 x 10 ⁻⁶	3 x 10 ⁻⁶	1.5 x 10 ⁻⁶	4 x 10 ⁻⁶	1.5 x 10 ⁻⁶
Stabilization time ¹⁾	1.5/2/3 s	1.5/2/3 s	1.5/2/3 s	2.5/4/6 s	1.5/2/3 s	2.5/4/6 s
Update speed	0.13 s	0.13 s	0.13 s	0.13 s	0.13 s	0.13 s
Display ²⁾	FD	FD	FD	LCD	FD	LCD
Result deviation in inclined position (1:1000)	0.005 g	0.005 g	0.005 g	0.005 g	0.005 g	0.005 g
Weighing pan	Ø 130 mm	Ø 130 mm	Ø 130 mm	Ø 130 mm	Ø 130 mm	Ø 130 mm
Calibration weight ³⁾	100 g/F1	100 g/F1	200 g/F1	1000 g/E2	100 g/F1	1000 g/F1
Net weight	3.8 kg	3.8 kg	3.8kg	3.8 kg	3.8 kg	3.8 kg
Balance housing (W x D x H) in mm	194 x 316 x 68					
Power consumption	6 VA					
Fusing	63 mA/220 V					
	125 mA/110 V					

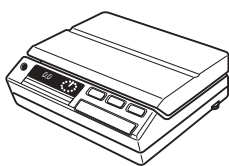


	PM300	PM600	PM2000	PM4000	PM6100	PM4800 DeltaRange	PM3000	PM6000	PM6
Readability	0.01 g	0.01 g	0.01 g	0.01 g	0.01 g	0.1 g	0.1 g	0.1 g	1 g
- Fine range (recallable)	-	-	-	-	-	0.01 g	-	-	-
Weighing capacity	310 g	610 g	2100 g	4100 g	6100 g	4100 g	3100 g	6100 g	6100 g
- Fine range (recallable)	-	-	-	-	-	800 g	-	-	-
Taring range (by subtraction)	310 g	610 g	2100 g	4100 g	6100 g	4100 g	3100 g	6100 g	6100 g
Reproducibility (s)	0.003 g	0.005 g	0.005 g	0.01 g	0.01 g	0.03 g	0.03 g	0.05 g	0.3 g
- Fine range	-	-	-	-	-	0.01 g	-	-	-
Linearity	± 0.01 g	± 0.01 g	± 0.02 g	± 0.02 g	± 0.02 g	± 0.05 g	± 0.1 g	± 0.1 g	± 1 g
- Fine range	-	-	-	-	-	± 0.02 g	-	-	-
Sensitivity drift / °C (10 ... 30 °C)	4 x 10 ⁻⁶	6 x 10 ⁻⁶	4 x 10 ⁻⁶	3 x 10 ⁻⁶	3 x 10 ⁻⁶	4 x 10 ⁻⁶	4 x 10 ⁻⁶	6 x 10 ⁻⁶	6 x 10 ⁻⁶
Stabilization time ¹⁾	1/1.5/2.5 s	1.5/2/3 s	1.5/2/3 s	1.5/2/3 s	2.5/4/6 s	1.5/2/3 s	1/1.5/2.5 s	1/1.5/2.5 s	1/1.5/2.5 s
Update speed	0.13 s	0.13 s	0.13 s	0.13 s	0.13 s	0.13 s	0.13 s	0.13 s	0.13 s
Display ²⁾	FD	FD	FD	FD	FD	FD	FD	FD	FD
Result deviation in inclined position (1:1000)	0.01 g	0.05 g	0.05 g	0.05 g	0.05 g	0.05 g	0.5 g	0.5 g	1 g
Weighing pan	Ø 130 mm	Ø 150 mm	Ø 150 mm	Ø 170 mm	Ø 150 mm	Ø 170 mm	182 x 228	182 x 228	182 x 228
Calibration weight Class F1 ³⁾	100 g	500 g	1000 g	2000 g	2 x 2000 g	1000 g	1000 g	2000 g	2000 g
Net weight	3.8 kg	3.8 kg	3.8 kg	3.8 kg	3.8 kg	3.8 kg	4.2 kg	4.2 kg	4.2 kg
Balance housing (W x D x H) in mm	194 x 316 x 68								
Power consumption	6 VA								
Fusing	63 mA/220 V								
	125 mA/110 V								

¹⁾ dependent on the setting of the vibration adapter

²⁾ FD Fluorescent display, self-luminous
LCD Liquid crystal display, passive

³⁾ for noncertified version



	PM11-K PM11-N	PM16-K PM16-N	PM30000-K	PM34-K DeltaRange PM34-N DeltaRange	PM15-K PM15-N	PM30-K PM30-N
Readability - Fine range (recallable)	0.1 g -	0.1 g -	0.1 g	1 g 0.1 g	1 g -	1 g -
Weighing capacity - Fine range (recallable)	11000 g -	16000 g -	32000 g -	32000 g 4000 g	16000 g -	32000 g -
Taring range (by subtraction)	11000 g	16000 g	32000 g	32000 g	16000 g	32000 g
Reproducibility (s) - Fine range	0.05 g -	0.05 g -	0.1 g -	0.3 g 0.1 g	0.3 g -	0.3 g -
Linearity - Fine range	± 0.2 g -	± 0.2 g -	± 0.2 g -	± 0.5 g ± 0.2 g	± 0.5 g -	± 0.5 g -
Sensitivity drift / °C (10 ... 30 °C)	6 x 10 ⁻⁶	4 x 10 ⁻⁶	4 x 10 ⁻⁶	4 x 10 ⁻⁶	4 x 10 ⁻⁶	4 x 10 ⁻⁶
Stabilization time ¹⁾	1.5/2/3 s	1.5/2/3 s	1.5/2/3 s	1.5/2/3 s	1/1.5/2.5 s	1/1.5/2.5 s
Update speed	0.13 s	0.13 s	0.13 s	0.13 s	0.13 s	0.13 s
Display ²⁾	FD	FD	FD	FD	FD	FD
Result deviation in inclined position (1:1000)	0.3 g	0.3 g	0.3 g	0.3 g	0.3 g	0.3 g
Weighing platform (W x L) in mm	245 x 350	245 x 350	245 x 350	245 x 350	245 x 350	245 x 350
Calibration weight with PM...-K	incorporated	incorporated	incorporated	incorporated	incorporated	incorporated
Calibration weight Class F1 ³⁾ for PM...-N	2 x 2000 g	2 x 2000 g	-	2 x 2000 g	2 x 2000 g	2 x 2000 g
Net weight	12.5 kg	12.5 kg	12.5 kg	12.5 kg	12.5 kg	12.5 kg
Scale housing (W x D x H) in mm	360 x 330 x 130					
Power consumption	8 VA					
Fusing	200 mA/220 V 125 mA/110 V					

General technical data

Basic unit of balance/scale, selectable ¹⁾	g, kg, lb, oz, ozt, tl, GN, dwt, ct, C.M., k
Switchable 2 nd unit ¹⁾	g, kg, lb, oz, ozt, tl, GN, dwt, ct, C.M., k
Applications, selectable	piece counting, +/- or % weighing, animal weighing
Digital display	7 digits
DeltaTrac ²⁾	60 segments
Power supply PM balances up to 6.1kg	voltage selectable: 115/230 V, +15/-20 %, 50/60 Hz
Power supply high-capacity PM scales	100/115/200/230 V, +15/-20 %, 50/60 Hz
Vibration adapter	choice of 3 settings, optical display
Weighing process adapter ;	choice of 4 settings, optical display
Stability detector	choice of 4 settings, optical display
Data interface	bidirectional RS232C/CL passive 20 mA
• Baudrate	110...9600 baud
• Parity	even, odd, mark, space
• Transmission	asynchronous 7-bit ASCII
• Plug-in connection	15-pin MiniMETTLER TOLEDO socket
• METTLER TOLEDO GM interface	15-pin MiniMETTLER TOLEDO for connection of peripherals
Admissible ambient conditions	
• Temperature	0 °C...40 °C
• Relative humidity	15 %...85 %
• Height below/above sea level	-300 m...+600 m
• Vibration	0.3 m/s ²

¹⁾ see decimal places for secondary units

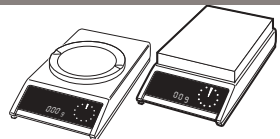
²⁾ dynamic graphic indicator and dispensing aid

Standard equipment

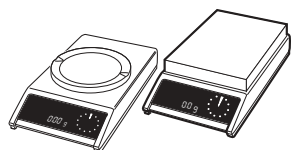
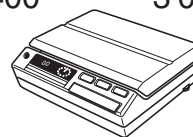
	PM100 PM200 PM400 PM480 PM1200 ¹⁾ PM2500 ¹⁾	PM300 PM600 PM2000 PM4000 PM4800 PM6100 ¹⁾	PM3000 PM6000 PM6	PM11-N PM15-N PM16-N PM30-K PM34-K PM30000-K
Molded in-use cover	✓	✓	✓	✓
Retainer ring for molded in-use cover	-	✓	-	-
Molded in-use cover for weighing platform	-	-	-	-
In-use cover for terminal	-	-	-	-
All-purpose draft shield	✓	-	-	-
Glass draft shield ²⁾	-	-	-	-
Power cable (to national codes)	✓	✓	✓	✓
Spare power fuse	✓	✓	✓	✓
Screwdriver	✓	✓	✓	✓
Hanger	✓	✓	✓	41622
Leveling screws and level	✓	✓	✓	✓
Data interface RS232C and CL	✓	✓	✓	✓
METTLER TOLEDO GM interface	✓	✓	✓	✓
Calibration weight (OIML E2)	-	-	-	-

¹⁾ no hanger possible

Weighing ranges in secondary units



		PM100	PM200	PM300	PM400 PM480	PM480 (fine)	PM600	PM1200	PM2000 PM2500	PM2500 (fine)	PM3000
Range in	g	110	210	310	410	80	610	1200	2100	500	3100
	lb	0.243	0.463	0.683	0.904	0.177	1.345	2.645	4.630	1.103	6.834
	oz	3.88	7.41	10.93	14.49	2.827	21.51	42.33	74.07	17.63	109.35
	ozt	3.536	6.752	9.97	13.18	2.573	19.61	38.58	67.51	16.07	99.67
	tl	2.938	5.609	8.28	10.95	2.137	16.29	32.05	56.09	13.35	82.80
	GN	1'697	3'240	4'784	6'327	1233	9'413	18'518	32'407	7'713	47'840
	dwt	70.73	135.0	199.3	263.6	51.44	392.2	771.6	1'350	321.5	1'993
	ct / k / C.M.	550	1'050	1'550	2'050	400	3'050	6'000	10'500	2'500	15'500



		PM4000 PM4800	PM4800 (fine)	PM6000 PM6100 PM6	PM11-N	PM15-N PM16-N	PM30-K PM34-K (fine) PM30000-K	PM34-K (fine)
Range in	g	4100	800	6100	11000	16000	32000	4000
	lb	9.039	1.764	13.45	24.25	35.27	70.54	8.818
	oz	144.6	28.27	215.1	388.0	564.4	1129	141.1
	ozt	131.8	25.73	196.1	353.6	514.4	1029	128.6
	tl	109.5	21.37	162.9	293.8	427.3	855	106.8
	GN	63'27	12'342	94'137	-	-	-	-
	dwt	2'636	514.4	3'922	7'073	10'288	20'576	2'572
	ct / k / C.M.	20'500	4'000	30'500	55'000	80'000	160'000	20'000

Decimal places in secondary units

	PM100 PM200 PM400 PM480 ¹⁾ PM1200 PM2500 ¹⁾	PM300 PM600 PM2000 PM4000 PM4800 ¹⁾ PM6100	PM3000 PM6000 PM11-N PM16-N PM34-K ¹⁾ PM30000-K	PM6 PM15-N PM30-K
g / dwt	0.000	0.00	0.0	0.
kg	not settable	0.00000	0.0000	0.000
lb	0.00000	0.0000	0.000	0.00
oz / ozt / tl	0.0000	0.000	0.00	0.0
GN	0.0	0.	not settable	not settable
ct / k / C.M.	0.00	0.0	0.	not settable

¹⁾ one decimal place less in coarse

**To give your METTLER TOLEDO product an assured future:
METTLER TOLEDO Service preserves the quality, measurement accuracy and value of METTLER TOLEDO
products for years to come.
Please send for full details of our attractive service conditions.
Thanks in advance**



P704684

Subject to technical changes and to the availability
of the accessories supplied with the instruments.

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