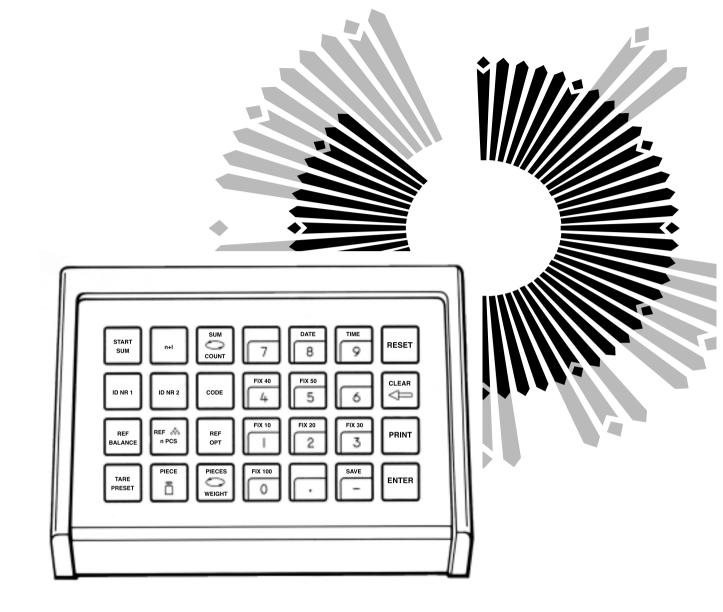
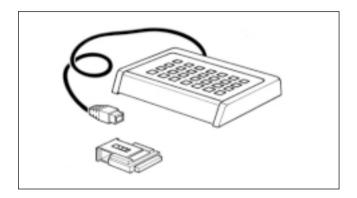
Operating instructions

METTLER TOLEDO CountPac-M





The METTLER TOLEDO CountPac-M



The METTLER TOLEDO piece counting system is designed for all types of weight-based counting operations. It comprises a METTLER TOLEDO balance, with a second balance if necessary, and the CountPac-M application package.

Main features of the piece counting system:

- 1. Piece numbers can be determined on a weight basis with the weight of a single piece being either calculated by the balance or keyed in via the keypad by the user.
- 2. For totalization and portion counting operations, the sum of the number of parts (items) and the sum of the individual weights (g) is cumulated automatically.

Other features:

- Possibility to input the tare preset via the keypad. Fragile items must not therefore be dumped out of the container.
- Use of a second balance for the piece weight determination. Counting is also possible with this balance.
- Determination of the piece weight with any number of items.
- Optimization of the reference piece weight.
- Determination of mean value and standard deviation of pieces to be counted.
- Connection possibility for a printer (e.g. METTLER TOLEDO GA44) for result record.
- Possibility to input two identification numbers, code, date and time for result printout.
- When METTLER TOLEDO balances of the SM type are used, work can be carried out with the SM terminal instead of the CountPac-M terminal. Further details are given in the Section "SM keypad" on pages 14 and 15.

To insert the program cassette

Insertion of the program cassette is described in the Operating Instructions of the balance used.

Notes:

- -Before changing the program cassette, disconnect power cord of the balance (with SM balances, press key [OFF]).
- Replace standard program cassette by CountPac-M cassette.
- -Please keep the standard cassette; it may be useful in subsequent use without the CountPac-M.

To connect the terminals and other units:

Two connection sockets at the rear of the balance are provided for the following units:

Socket "DATA I/0": Units with RS232C or CL interface, e.g. a second balance or a GA44 printer

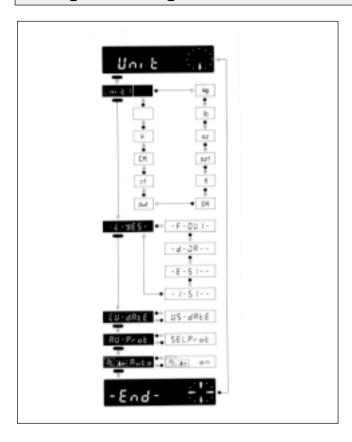
(for GA44 in the configuration register, section I-Face; select standard

setting: S.Stb, b 2400 and interval 1 s)

Socket "GM": CountPac-M terminal and GM units with adapter plug

The coding pins in the sockets prevent improper connection.

Configuration register with CountPac-M



The CountPac-M can be adapted to units specific to the application. In the section -Unit- of the "configuration register" (see Operating Instructions of the balance, "Configuration"), the following can be selected whatever the standard software of the balance:

Language: - E -Yes- = English (standard setting)

F -Oui- = French
d -Ja- = German
E -Si- = Spanish
I -Si- = Italian

Date: EU-date = day, month, year (standard setting)

US-date = month, day, year

Printout: Au-Prot = printout automatic, depending on application (standard setting)

SEL.Prot = printout only with [PRINT] key

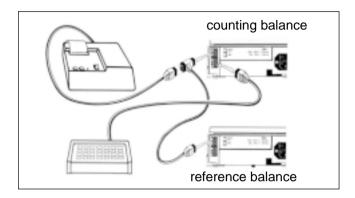
Notes: - If the configuration register cannot be selected, check whether the jumper of the

program cassette is in position "unsecured" (cf. Operating Instructions of the

balance "Configuration").

- Reset does not reset language and date.

Connection of a second balance (reference balance)



Any of the following can be used as a second balance for more accurate determination of the piece weight (please order cable for reference balance separately):

	Cable No.
Balances with M technology (e.g. AM, PM, CM, SM)	33868
Balances with J technology (e.g. AJ, PJ)	33868
- with data output Option 018	

PE balances

- with data output Option 016	33868
- with interface Option 017	
in the printer mode and CL249 Interface Converter	33956

AE balances

- with data output Option 011	33956
- with interface Option 012,	
configured to "out only"	33956

Data transfer is effected via the RS232C interface of the second balance. It must be set as follows:

Transmission mode : send continuous

Transmission rate : 2400 baud

Parity : even

Printing interval (for balances with M technology) : as short as possible

No special program cassette has to be inserted into the second balance with M technology; the standard cassette suffices.

Functions of general system keys

[DATE] Begin date entry (always 6 digits). The calendar runs until a power failure occurs. Cleared by overwriting with "0". **RESET** [TIME] Begin time entry (00...24 h; 6 digits, hours, minutes, seconds). The clock runs until a power failure occurs. Cleared by overwriting with "0". **FIX 50 FIX 40 CLEAR** [RESET] Clears all entries except for date, time and tare preset. [RESET] must always be pressed before a new weighing task. [CLEAR] Clears the entry of the last numeric key pressed (numeric keypad), then the next to **PRINT** last, etc. provided [ENTER] has not yet been pressed. [PRINT] Manual print command to print out entries or results which are not printed out automatically (by an application) (cf. Appendix). **FIX 100 ENTER** [ENTER] Concludes the numerical input on the numeric keypad. [SAVE] Secures piece weight and identification number ID NR 1 during lengthy counting

If a printer is connected, the date, time, identification number and code, if inputted, are printed out

tasks against loss on power failure. The key sequence [RESET][SAVE] clears this

at the top of the printout. On power failure, the printout inscription is cleared.

memory.

To enter values

If a dark function key is pressed, the counting system executes the appropriate command immediately, whereas if a light function key is pressed a numerical input is awaited.

Each type of numerical input with the numeric keypad ([0] ... [9], [_], [-]) requires three steps:

1. Press desired light function key. The light function keys determine the type of numerical input to follow: a code number, a piece weight, etc.

The keys [DATE] and [TIME] have two functions:

When pressed once they act as function keys. As this operation activates the numeric keypad, they then become numeric keys (numeric keypad).

2. Input the value on the numeric keypad.

3. Press [ENTER] key [ENTER] stores the displayed value and assigns it to the preselected function.

CorrectionsWrong entries which have already been closed with [ENTER] must be corrected by reinputting them. Entries not yet closed with [ENTER] can be cleared with [CLEAR].

Examples

The keys mentioned should be pressed in the specified sequence

To enter date (for EU-date)	e.g.	24.7.87	[DATE] [2] [4] [0] [7] [8] [7] [ENTER]
To enter time	e.g.	9.45.38	[TIME] [0] [9] [4] [5] [3] [8] [ENTER]
To enter a piece weight	e.g.	83.5 g	[PIECE WEIGHT] [8] [3] [·] [5] [ENTER]
To enter a tare preset	e.g.	27.8 g	[TARE PRESET] [2] [7] [·] [8] [ENTER]

Counting

Each new counting operation should be started by pressing [RESET]. This resets the system to the starting position. Time and date are retained as is the tare preset (it is cancelled using the control bar of the balance).

Determination of piece weight

	Significance	Procedure	Display
FIX 10	Fixed reference piece number The simplest way to determine the piece weight	Place container on pan, tarePlace e.g. 10 items in containerPress [FIX10]	0.00 g 10 PCS
REF n PCS	Freely selectable reference piece number	Add pieces to be counted, readPut container on pan, tarePlace e.g. 5 items in containerPress [REF n PCS] [5] [ENTER]	124 PCS 0.00 g 5 PCS
PIECE	Known piece weight	Add pieces to be counted, readPress [PIECE WEIGHT]Input e.g. [1] [5] [·] [7] [ENTER]Put container on pan, tare	28 PCS 0.00 g
REF OPT	Reference optimization Improvement of piece weight with larger reference piece number	 Add pieces to be counted, read Piece weight determined with relative small number of items (above method) Add more items 	•
REF BALANCE	Optimized pc.wt. = displ. weight displ. count Second balance as ref. balance Improvement of resolution during counting and hence of counting accuracy	 Press [REF OPT] Press [REF WAAGE] Determine piece weight on reference balance (above methods) Place items to be counted on counting 	ng balance

Piece weight and ID NR 1 can be protected against loss on power failure with [SAVE].

To switch the dis	play			
	Significance	Procedure		Display
PIECES WEIGHT	Switching between pieces/ weight As soon as the piece weight has been determined, switching back and forth between piece number and weighing display is possible at any time.	Piece weight determinedPress [PIECE/ WEIGHT]Press [PIECE/ WEIGHT]	6: 4: 6:	75.0 g
REF BALANCE	Second balance as counting balance. Improvement of counting accuracy with very small parts. It is possible to switch between first and second balances at any time. Displays of the second balance are marked with *.	 Piece weight determined Press [REF BALANCE] Press [PIECE/ WEIGHT] Place items to be counted on second balance 	e.g. * 10 e.g. * 10 e.g. * 50	

The two keys [PIECES / WEIGHT] and [REF BALANCE] can be combined at will. The piece numbers are always displayed on the first balance.

To preset the tare				
	Significance	Procedure		Display
TARE	Tare preset If the weight of the container	Piece weight determined e.gPress [TARE PRESET]	. 68	PCS
PRESET	is known, it can be keyed in by hand	- e.g. key in [8] [9] [·] [5]	. 50	PCS

The inputted tare preset is cleared when the balance control bar is pressed or the value overwritten with 0 (zero). Limits and conditions relating to tare preset as well as error messages can be found in the Appendix.

Counting examples on the following pages

Example: Counting into a container (ordinary counting)

(Balance type PM4600 Delta Range)

Procedure	Press keys	Display	Printout
Place on container, tare	Balance control bar	0.00 g	
Place e.g. 20 items in container	[FIX20]	20 PCS	*RefW 10.5422 g out of 20 PCS
Add items to achieve desired count	([PRINT])	144 PCS	Count 144 PCS

Example: Counting out of a container

Procedure	Press keys	Display	Printout
Place on container with items, tare	Balance control bar	0.00 g	
Pamaya itama a a 4	IDEE n DOSI (4) (ENTED)	-4 PCS	*RefW 10.2200 g out of 4 PCS
Remove items, e.g. 4	[REF n PCS] [4] [ENTER]	-4 PC3	Count -100 PCS
Remove desired number of items	([PRINT])	-100 PCS	

Example: Inventory taking in a container with second (reference) balance attached

(Balance type PM 4600 Delta Range)

Procedure	Press keys	Display	Printout
Set display to zero	Control bar of ref. balance		
Remove e.g. 10 pieces from container, place on reference balance	[REF balance] [FIX10]	*110.86g 0 PCS	
Replace pieces in container			
Set display to zero	Control bar of balance	0 PCS	
Place container with all pieces on counting balance		68 PCS	
Read tare weight of container and key in	[TARE PRESET] [1] [8] [·] [2] [ENTER]	50 PCS	*RefW 11.0860 g
Read result	([PRINT])	50 PCS	out of 10 PCS *M-Tara 18.20 g Count 50 PCS
Weight display	[PIECES/ WEIGHT]	551,70 g	
To check the tare preset: Remove container from balance		-18.20 g	

Totalization/ Portion counting

This program can be used to totalize the number of pieces weighed. Relatively large numbers of pieces can be divided into portions. The total of the individual portions can be called up at any time. Furthermore, an item counter is displayed after each portion.

	Significance	Procedure	Display
START	Start of totalization Totalization/ Portioning can be started after the piece weight has been determined	 Determine piece weight Press [START SUM] Item counter appears then disappears as soon as balance pan is deflected 	0
n+I	Add next portion Press after every portion so that its count is added to the total	 Add pieces until desired count is reached Press [n + 1] Item counter incremented by 1 	e.g. 50 PCS
SUM	Call up total/ resume counting Switching function between current piece number and total Can also show subtotals	 Press [SUM/ COUNT] Total appears with * Press [SUM/ COUNT] Count of last portion appears 	e.g. * 450 PCS 150 PCS

Limits and conditions for totalization/portion counting as well as error messages are given in the Appendix.

If a printer (GA44) is connected, one or more record printouts will be generated, depending on the configuration. For details, please see Section "Record printout", page 19.

Example: Dividing a number of pieces into portions

(Balance type PM4600 Delta Range)

Procedure	Press keys	Display	Printout
Set display to zero	Balance control bar	0.00 g	When "Sel.Prot" selected in configuration register (cf. section
Place e.g. 10 pieces on balance	[FIX10]	10 PCS	"Preparation", page 4)
Remove pieces		0 PCS	15.12.87 08:22 ID 1 11.11-11
Start portion counting	[START SUM]	0	ID 2 22.22-22 Start
Put on container for 1st portion, tare	Balance control bar	0 PCS	15.12.87 08:23
Add pieces for 1st portion until desired count is reached, store	e.g.	50 PCS 1	ID 1 11.11-11 1D 2 22.22-22 *RefW 1.0875 g
Remove load from balance	e.g.	- 4 PCS	out of 10 PCS Count 50 PCS
Put on container for 2nd portion, tare	Balance control bar	0 PCS	
Add pieces for 2nd portion until desired count reached, store, etc.	e.g.	100 PCS	*Sum 1300 PCS *Total 1414.0 g
Call up total	[SUM/ COUNT] e.g.	*1300 PCS *1414,0 g	*Total 1414.0 g

Operation of METTLER TOLEDO SM balances with the SM terminal



With the terminal of METTLER TOLEDO balances of the SM type a number of commands can be executed in exactly the same manner as with the CountPac-M terminal.

Your advantage: If there is very little room for a counting balance, particularly in mobile use,

the CountPac-M terminal can be dispensed with. The benefits of the

CountPac-M can, however, still be utilized.

Notes: After the data have been saved, the CountPac-M terminal can be removed.

The values (date, time, identification numbers and reference quantity) are

kept until the balance is switched off or a power failure occurs.

Moreover, only the identification number ID1 remains stored. All other values $\,$

are cleared and the reference quantity set to 10.

The function key [F] can now, however, be used to change and store the

reference quantity at any time.

The switching key [5] always provides you with an overview of the weight

of the counted pieces..

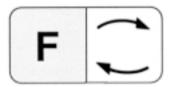
The [PRINT] key can be used to print out all values or transfer them to an

attached computer.

SM function keys with CountPac-M







Switching between current piece number and weight.

Corresponds to the key [PIECE/ WEIGHT] of the CountPac-M keypad.

Corresponds to the [PRINT] key of the CountPac-M keypad. In the enter mode, the [PRINT] key corresponds to the [ENTER] key of the CountPac-M keypad.

Start of a reference piece number entry. Sets the weight on the digital display equal to the displayed piece number.

The reference piece number can be incremented by 1 by pressing the function key [F] again. If this key is pressed and held, the reference piece number increases continuously.

The reference piece number can be decremented by 1 by pressing the switching key [5]. If this key [5] is pressed and held, the reference piece number is reduced continuously.

2.5 seconds after a key was last pressed, the displayed reference piece number is accepted automatically. It can also be stored with the [PRINT] key, however.

Error messages				
Err 0	Display/calculation range exceeded	 Weighed number of items is larger than ca. 8 000 000 Target weight or plus tolerance greater than balance capacity. 		
Err 1	Time for input or value transfer exceeded	Entry was not ended after ca. 30 seconds or a weight value needed for calculation has not been transferred.		
Err 2	Input value too high	Target weight or plus tolerance greater than balance capacity.		
Err 3	Piece weight too small	Piece weight smaller than 1/4 digit or reference weight smaller than 10 digits.		
Err 5	Date or time not complete	Format for both entries: XX.XX.XX (6 digit) or implausible EU date: DD.MM.YY US date: MM.DD.YY		
Err 6	Statistics from less than 2 or more than 255 weighings	In the determination of the mean value and standard deviation, no pieces or just 1 piece was loaded. Maximum 255 single weighings can be taken into account.		
Err 7	Change in the reference weight not possible	The reference weight cannot be changed during the totalization/portion counting		
Err 9	No or too exact/inexact reference balance	Reference balance missing or unsuitable for this piece counting system		

All these error messages are displayed for ca. 5 seconds. The balance then displays the weight again. The cause of the error display is ignored.

Other error messages do not originate with the CountPac-M and are explained in the Operating Instructions of the balance in question.

W	hat's wrong if?	
	is displayed?	An entry is not yet possible since the system is still occupied with a printing task or is waiting for a stable weight value. Wait, then press key again.
	Add is displayed?	In the determination of the piece weight, too few pieces were loaded and hence the accuracy of the counting results is too low (see Section "Limits and Conditions").
	the star in the top left of the display flashes?	The reference piece weight is between 1 and 1/4 digit.
	the counting system is in an	Press [RESET] key, if necessary switch balance off then on. Inputs and printout parameters are cleared by this.
	the display does not react to weight changes on the pan?	System is in enter mode. Close with [ENTER] is expected or clear with [CLEAR].
		Reference balance connected, the display refers to the reference balance (* appears in the display). Switching with [REF BALANCE] key.
	the GA44 Printer prints only テテテテテテ?	Wrong baud rate (transmission speed) setting (see Operating Instructions of the balance).
	the GA44 Printer does not print every line in the record?	The printing interval is set wrongly (correct setting is 1 second, see Operating Instructions of the balance) or the printing speed is too low. The time for 20 cm paper feed should be 2327 seconds (see GA44 Operating Instructions)
	the printer prints continuously or after every deflection of weighing pan?	Set configuration of the interface in accordance with the balance Operating Instructions to S.Stb (send stable values).
	no command can be entered via terminal of the SM balance?	Entries not saved with [SAVE] are cleared on switching off theSM balance or on power failure. The entries must be reinputted via the CountPac-M keypad and saved.

Record printout

If a printer is connected to the counting system, record printouts can be generated automatically or by pressing a key, depending on the configuration. Entry of the data and time has already been covered in the Section "Value entry".

Inputting record identification and code







Input possibility for two identification numbers with max. 7 digits and decimal points (e.g. user and workstation). Cleared by pressing [RESET] key. In addition, ID NR 1 can be protected against loss on power failure with the [SAVE] key.

The identification numbers appear in the record header.

Input possibility for one code number at any desired position on the printout.

Max. 7 digits and decimal points, e.g. for marking each counting operation of a series.

The code number is printed immediately after entry and then erased automatically.

Automatic generation of printout

Switching on

CountPac-M V14.42.00

*Ref.-W 10.5869 g

*Opt.RW 10.598 g out of 100 PCS

......

If the printer is connected and switched on when the system is switched on, the first line shown at the left is always printed automatically.

Piece weight

A newly determined piece weight is recorded automatically with the printout at the left after pressing the [PRINT] key.

Reference optimization

The newly determined piece weight is recorded automatically with the printout at the left (for AU-Prot, see Section "Preparation", page 4).

Printout at the press of a key

15.12.87	(08:27
ID 1	11.11-	11
ID 2	22.22-2	22
*RefW	3.267	5 g
out of	10	PCS
*M-Tara	18.20	g
Count	50	PCS

·····	~~~~~	***************************************
	222.85	g
<u></u>	***************************************	***************************************
*M-Tara	18.20	g
	62.67	g
L		

١			************	~~
ı				
ı	15.12.87		08:31	
ı	ID 1	11.11-	11	
ı	ID 2	22.22-	22	
ı	Start			
ı				
ı	1	50	PCS	
ı	2	150	PCS	
ı	3	200	PCS	
	*Sum	400	PCS	
	*Total	799.8	g	

Piece number

If a "weighed" piece count is shown in the display and all additional information is present, the record shown at the left will be printed out when the [PRINT] key is pressed. If a given piece of information has not been defined, its line will be omitted in the printout. The length of the record can thus vary between one and seven lines.

Weight

If a "weighed" weight is shown on the display, the printout at the left is obtained by pressing the [PRINT] key.

If a tare has been preset, the balance shows the net weight. It and the associated tare weight are printed out when the [PRINT] key is pressed.

Totalization

When the [START SUM] key is pressed, totalization is started and the header of the printout shown at the left is printed out (for Au-Prot, see Section "Preparation", page 4). If a given piece of information has not been defined, its line will be omitted in the printout. Every time the [n + 1] key is pressed, a line is printed with number and piece count. The total is printed whenever the [SUM] key is pressed.

Portion counting

Procedure same as for totalization, but Sel.Prot (see Section "Preparation", page 4) is inputted during configuration. When [n + 1] is pressed in this case, the entire record header and piece count are printed out every time. The record strips can thus be torn off to accompany the individual portions.

Limits and conditions

The program sets certain limits and conditions to permit rational counting on a weight basis:

-Piece weight greater than or equal to 1/4 digit (display step of balance in the unit g), e.g.

_		•	O 1	, ,		O / ·
for	1	mg balances:	at least	0,25	mg	(e.g. PM200)
	10	mg balances:	at least	2,50	mg	(e.g. PM2000)
	0,1	g balances:	at least	25	mg	(e.g. SM6000)
	1	g balances:	at least	250	mg	(e.g. PM30)

If the piece weight is between 1 and 1/4 digit, the special symbol * flashes at the top left of the display. The printout is marked with a star.

- If a reference (second) balance is used, the piece weight can be transferred from it to the counting balance up to 2 places (100x) more accurately
- If the piece weight is keyed in ([PIECE WEIGHT]), it can be entered with up to 6 digits.

The counting balance counts as follows:

Piece weight:	6	10	times smaller than 1 digit: in increments of	5
	11	20	times smaller than 1 digit: in increments of	20
	21	50	times smaller than 1 digit: in increments of	50
	51	100	times smaller than 1 digit: in increments of	100
	etc.			

-Weight of reference pieces

at least 10 digits (display step of balance in the unit g).

If this is not the case, the display shows "Add", i.e. more pieces have to be added for the piece weight determination.

-Tare preset

over the entire weighing range, only as accurate as balance permits. The tare preset can be cancelled with the balance control bar or overwritten with 0 (zero).

-Totalization/ portion counting

highest total 8 000 000 pieces

The piece weight must be determined beforehand and cannot be changed during totalization. Exception: reference optimization.

Mean value and standard deviation of pieces to be counted

The weight of apparently identical pieces is always subject to a narrower or broader scatter. Counting accuracy depends largely on the scatter. Standard deviation is a measure of such scatter.

The piece counting system makes it possible to determine the mean weight and standard deviation of the pieces. The first step involves switching the system to a different "user level". This is achieved by pressing the [RESET] key for about 5 seconds. Afterwards, only the following five keys are operative:

-[0] key becomes [Start n, \bar{x} , s]

It sets the necessary memories back to zero and

the series of weighings can start.

-[] key becomes [Display \bar{x}]

If at least two pieces have been weighed, this key can be used to request the mean weight. This remains on the display as long as the key is

pressed.

-[-] key becomes [Display s]

Same as above, but this key displays the

standard deviation (scatter).

-[PRINT] key the mean value and standard deviation are

calculated and printed out. But these can also be interim figures. A restart is not made until the [Start

n, \bar{x} , s] key is pressed.

-[RESET] key remains [RESET]

Procedure:

-[RESET] key press for about 5 seconds until display reappears.

-[Start n, \bar{x}, s] key press ([0])

-balance shows "-0-A" (A-additive weighing)

-put on 1st piece

- balance shows weight until pan is stable

- balance shows "—1—A"

-put on 2nd piece (additive weighing)

- balance shows weight until pan is stable

- balance shows "-2-A", etc.

-[PRINT] ke press

- The values n, \bar{x} , and s are printed out. If no printer is connected, the vallues can be called up on the display with the keys [Disp \bar{x}] ([·]) and [Disp s] ([-]) and noted.

Printout:

If a printer is connected, use of the [PRINT] key will produce the following printout:

*n 6

*Mean x 2.610 g

*Std. s 0.070 g

The number of places of the weight results depends on the balance type and model and the weight unit selected.

Return to normal function

Use [RESET] key (press briefly) to return to the normal procedure for piece counting.

Explanation of specialized terms used

Reference piece weight: An average piece weight determined from a specified number (➡ reference piece number) of pieces.

Second balance: A balance (with greater resolution, i.e. smaller display steps than the counting balance) that can be attached

to the counting system and with which the reference piece weight can be determined with up to 100x greater

accuracy.

Reference piece number: Number of pieces whose average piece weight constitutes the reference piece weight.

Totalization: Total sum of several subcounts of identical pieces. (During the totalization, reference formulation is impossible.

This prevents addition of different types of pieces.)

Portion counting: Division of a total quantity into several subquantities (portions).

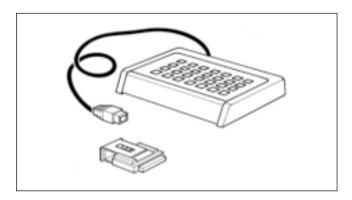
Weight of reference pieces: The total weight of the pieces needed for formulation of the reference.

Reference formulation: Calculation of the average piece weight

(⇒ reference piece weight) from a defined number

(⇒ reference piece number) pieces.

Overview METTLER TOLEDO Pac's



CalcPac-M

Allows further processing of weight values by calculation operations

CountPac-M

For demanding piece counting (with fixed and variable reference, tare preset, portion counting, totalization, etc.)

DataPac-M

Keypad which allows different inputs to the computer via a bidirectional data interface

GoldPac-M

Applications for jewelry (three units that can be called up, automatic reconciliation of weight values with inputted prices)

LabPac-M

Applications for the lab (differential weighing, % formula, net total)

PharmaPac-M

Applications for pharmaceutical products (piece counting, statistics, net total)

ProPac-M

Applications for the production (piece counting, statistics, ±control)

StatPac-M

For the statistical filling process control according to different tolerance systems and pharmacopeia

XPac-M

Allows realization of customer-specific applications

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



P702170

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

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702170 Printed in Switzerland 9912/2.12