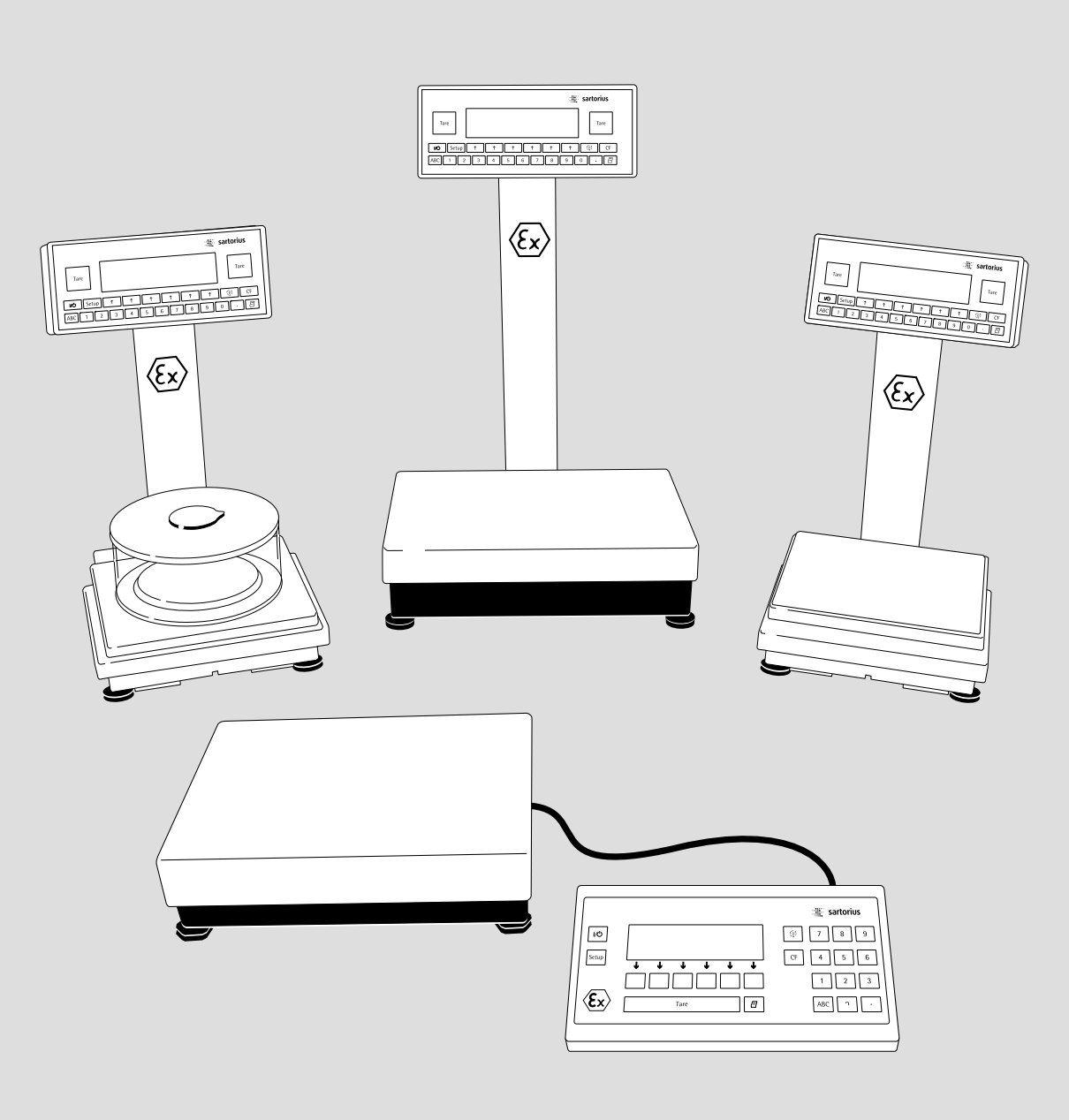
sartorius

Operating Instructions

Sartorius Factory Series

FC and FCA Models
Electronic Precision Scales for Hazardous Areas/Locations



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Appendix
Entering the General Password

Symbols
The following symbols are used in these instructions:

● indicates steps you must perform

○ indicates steps required only under certain conditions

> describes what happens after you have performed a certain step

– indicates an item in a list

⚠ indicates a hazard

Important Note to Users
Make sure to carefully read and follow sections marked with this symbol – they contain important safety instructions.

Hotline
For advice on the use of these applications, just call or fax
Telephone: +49.551.308.4440
Telefax: +49.551.308.4449

Operating Design

The scales in the Factory Series consist of a weighing cell and a display and control unit. Besides an AC adapter, your scale also has an interface port for connecting a printer, computer, universal remote control switch, etc.

The display and control unit and the weighing cell can be set up separately.

Where not expressly indicated otherwise, the uses described in this manual apply to verified and verifiable scale versions* (indicated by the suffix "...CE" in the model number), as well as the standard version.

Combining Applications
You can combine the use of various application programs to meet your more complicated requirements.

Press the [Toggle] key to select the desired application programs.

Keys
You can operate the scale either using the keys on the terminal or from a connected PC. This manual describes operation using the keys on the terminal.

Labeled Keys
These keys always have the function indicated by their label, but are not available at all times. Availability of their functions depends on the current operating status of the scale and the menu settings.

Meaning

[ABC] Alphabetic keys
Please see section on "Text Input"

[I/On/Off] On/off/standby key
Turns the scale on and off or switches it to the standby mode

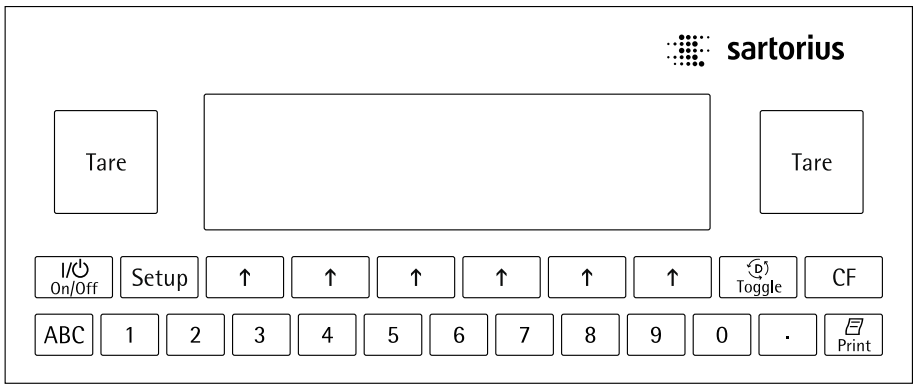
[Setup] Menu settings
Accesses and exits the Setup

[Toggle] Toggles to the next application program

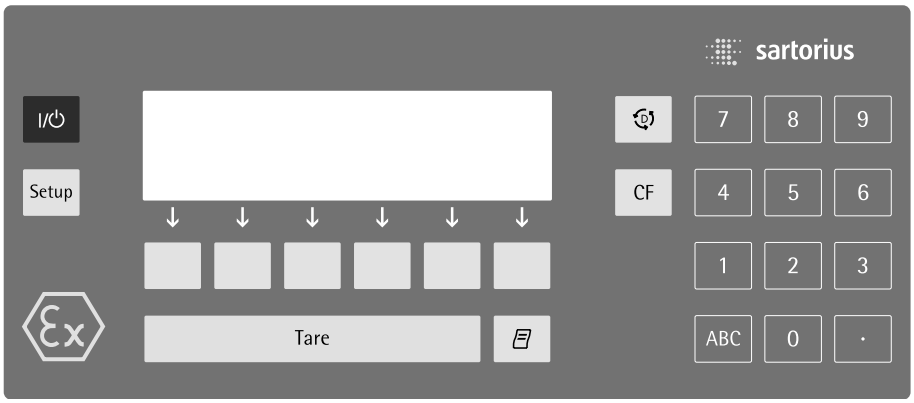
[CF] Clear Function
Deletes keypad input
Interrupts a calibration and adjustment routine in progress
Quits application programs

* For the use in legal metrology in the EU and European Economic Area

FC Models:



FCA Models:



[Print] Print key
Outputs displayed values or data logs to the interface port

[·] Enters a decimal point

[1] ... [9] [0] keys
See the section on "Numeric Input"

[Tare] Tares the scale

Numeric Input
To enter numbers:
press [1] ... [9] [0] [·]

To store numbers entered:
press the corresponding function key directly below the soft key label

To delete an entire numeric input digit by digit: press the [CF] key

Text Input

- To enter numbers:
  see the section on "Numeric Input"

- To enter letters or characters:
  press the [ABC] key
  > Letters are displayed in the bottom line for selection

- To select a different letter:
  press the corresponding soft key to change the letter shown

- To select the letter/character shown:
  press the corresponding function key below the soft key label
  > The selected letter is shown on the display

○ Enter the next letter/character, if desired, as described above

○ To exit the letter input mode e.g., if the last character entered is a letter):
  press the [ABC] key

- To store a word: press the corresponding function key (soft key), such as **ID**

- To delete an input character by character: press the [CF] key

- To delete user data:
  enter [·] or a space "■" and save

Operating Design

Keys
Your Factory scale is operated either through the keys on the display and control unit or via a connected PC. Operation through the scale keys is described in the following.

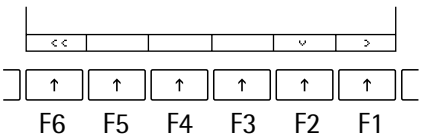
Function Keys (Soft Keys)

The current function of a soft key is indicated in the bottom line of the display.

The bottom line shows symbols and/or abbreviations to indicate soft key functions. The abbreviations are usually self-explanatory.

Example
isoTST: start calibration/adjustment
S ID: save ID

The function keys are numbered F1 through F6, from right to left.



The arrows shown in the footer indicate the following functions:

<< Return to Setup menu (in the Setup menu: save settings and exit the Setup program)

< Go back to the higher selection level

> Show sub-items under the active item

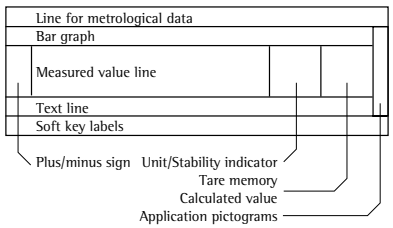
^ Move upward in the input/output window

v Move downward in the input/output window

↵ Set the selected menu parameter

Display
There are two fundamentally different types of display:
- display of measured and calculated values
- display for menu parameter settings (setup)

Display of Measured and Calculated Values
This display is divided into nine sections.



Line for Metrological Data:
If the scale is verified for use in legal metrology, the following metrological specifications are shown here:

Max Maximum capacity of the scale

Min Minimum capacity of the scale; i.e., the minimum weight allowed when the scale is used in legal metrology

e Verification scale interval of the scale

d Readability: indicates the scale interval of the scale

R1 through R4 Displayed when e = d
e = d

On standard scales, only Max and d are shown.

Bar Graph:
The bar graph indicates how much of the scale's capacity is "used up" by the current load; during checkweighing, t indicates the control limits.

The following symbols may be displayed here:

0% Lower load limit

100% Upper load limit

Bar graph showing 10% intervals

− Minimum for checkweighing

= Target for checkweighing

+ Maximum for checkweighing

Plus/Minus Sign, Stability Symbol:
A plus or minus sign (+ or −) is shown here for a weight value (e.g., a calculated value when weighing in percent) or the O symbol, indicating that the verified or verifiable scale has been zeroed or tared.

Measured Value Line:
This section shows the weighed or calculated value or alphanumeric input.
Note Concerning Verified Scales Approved for Use as Legal Measuring Instruments in the EU*:

For verified scales that have a verification scale interval e not equal to the scale interval d, the last digit on the display is bordered

Unit and Stability:
When the scale reaches stability, the weight unit or calculation unit is displayed here.

The ⚠ symbol may be displayed for readouts on a scale verified for legal metrology. However, these readouts can be used only for standard applications (not in legal metrology/not legal for trade).

* including the Signatories of the Agreement on the European Economic Area

Tare Memory, Calculated Values:
The symbols displayed here indicate when there is a value in one of the tare memory modules or when the value shown is a result of calculation rather than direct measurement.

These symbols are as follows:

⚠ Calculated value

NET 1 Tare memory used by an

NET 2 Application program (e.g., formulation, second tare)

Application Pictograms:
The pictograms displayed here indicate the application(s) selected. The pictogram is displayed inversely when the corresponding application is active.

For example, the following symbols may be displayed simultaneously:

The counting application is active

Checkweighing is also active

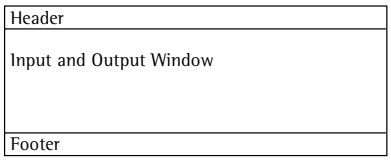
Print

Data record

Text Line:
Additional information is displayed here (e.g., operator guidance prompts, name of the active program, etc.).

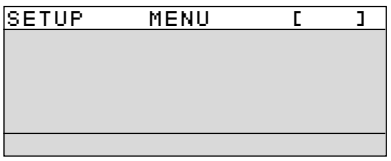
Soft Key Labels:
The current functions of the soft keys are indicated here; during calibration/ adjustment, this line shows up- and down-arrows (^ and v) for selecting calibration and adjustment functions.

Display for Menu Parameter Settings (Setup)
This display is divided into three sections.



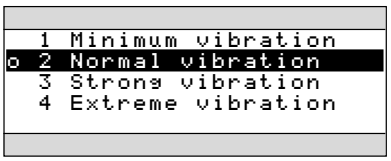
Header
The header indicates the function of the current screen page. In the Setup program, the current menu path is shown here.

Example in the path “Setup/Menu”:



Input and Output Window
This window contains either detailed information (e.g., on the active application) or a pick list. A selected item is displayed inversely. You can also enter information in an active field in this window using the alphanumeric keys.

Example in the path “Setup/Menu”:



The o symbol in this window indicates the current menu setting.

Soft Key lD Labels:
see “Function Keys (Soft Keys)” on the previous page.

To select a parameter:
- Press ^ or v repeatedly until the desired setting is selected (displayed inversely)
- Confirm your selection by pressing the ↵ soft key

To change the alphanumeric value of a parameter:
- Press ^ or v repeatedly until the desired setting is selected (displayed inversely)
- Enter the desired character using the [0] [1] ... [9] [·] keys or press the [ABC] key and enter letters or characters
- Confirm your selection by pressing the ↵ soft key

To return to the Setup/Menu level:
- Press the << soft key

Input

Numeric Input
To enter numbers:
Press the [1] [2] ... [0] [·] keys

To store numbers entered:
Press the corresponding soft key (i.e., the arrow key under the appropriate abbreviation in the bottom line of the display)

To interrupt/cancel numeric input:
Press [CF]

Alphabetic Input
(see also the example given on page 33)

● To enter letters or characters: first press the [ABC] key
> Letters are displayed in the bottom line

● To select a different letter: press the corresponding soft key to change the letter shown (i.e., the arrow key under the letter displayed)

● To select the letter/character shown: press the corresponding soft key
> The selected letter is shown in the display

○ Enter the next letter/character, if desired, as above.

● To store a word: press the corresponding soft key (e.g., S ID)

● To delete a word: press [CF]

Parameter Settings
The parameters for configuration are in the application menu and the scale operating menu. These menus have several levels.

● To set parameters: press [Setup] and then the appropriate soft key (e.g., App for the application menu)

● To move within a menu level: use the ^ and v soft keys

To select a parameter:
● Press ^ or v repeatedly until the desired setting is selected (displayed inversely)

● Confirm your selection by pressing the ↵ soft key

To change the numeric value of a parameter:
● Press ^ or v repeatedly until the desired setting is selected (displayed inversely)

● Enter the desired number using the [1] [2] ... [0] [·] keys

● Confirm your selection by pressing the ↵ soft key

To return to the Setup/Select level:
● Press the << soft key

See the chapter entitled "Configuration" for a complete description of all parameters.

To save the parameter settings and exit the Setup menu: press [Setup] or the << soft key

To cancel the parameter setting operation: press [I/⏻]

Data Output

Your Factory scale is equipped with an interface port for connecting your choice of the following:
- Printer*
- Peripheral device (e.g., computer)*
- Universal remote control switch

Printer
You can configure the print functions to meet your individual requirements by selecting the corresponding menu code.

You can have printouts generated automatically, or by pressing [⎙]; dependent on or independent of the stability or time parameters; with or without IDs; and as standard or ISO/GMP-compliant printouts.

ISO: International Organization for Standardization

GMP: Good Manufacturing Practice

See the section on "Data Output Functions" in the chapter entitled "Operation" for a detailed description of data output options.

Interface Port
Instead of a printer, you may choose to connect a different peripheral device, e.g. a computer (PC)*. With an on-line PC you can control both the weighing cell and the display unit of the Factory scale.

Request messages are sent via the interface to initiate functions in the weighing cell and in the display unit. Some of the functions generate response messages.

See the chapter entitled "Operation" under the section on "Data Output" for a detailed description of the interface port.

Error Codes

If you press a key that has no function, or which is blocked at a certain point in an application program, this error is indicated as follows:

- a double-beep is sounded as an acoustic signal if the key has no function

- a double-beep is sounded and a message is displayed for 2 seconds in the text line if the key function is not available at that time

The response to an operator error is identical in all models of the Factory series. See the chapter entitled "Error Codes" for a detailed description.

Storing Settings

Storing Parameter Settings
The settings configured are stored in the scale's non-volatile memory. Additionally, the factory settings can be reloaded.

Saving Parameter Settings
You can assign passwords in order to block access to:

- printing function Config
- the application menu App
- the scale operating menu Menu and
- user data input functions Input

* using a Zener barrier (see also page 131)

Configuration

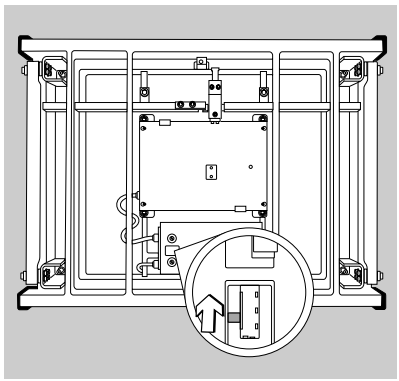
Purpose
You can configure the scale terminal to meet individual requirements by entering user data and setting parameters in the Setup program.

The Setup menu contains the following submenus:
- Balance/scale functions
- Device parameters
- Application parameters
- Printout
- Device information
- Language
- Factory settings

Setting the Language
You can choose from 5 languages for the information display:
- German
- English (factory setting)
- English with U.S. date/time format
- French
- Italian
- Spanish

Configuring the Scale for Use in Legal Metrology
Set the menu access switch as described below to configure the following functions for use of the scale in legal metrology:
- Display: Verification scale interval **e**; lower limit of the weighing capacity **Min**
- External calibration blocked

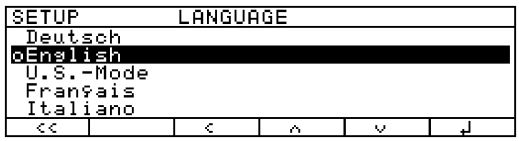
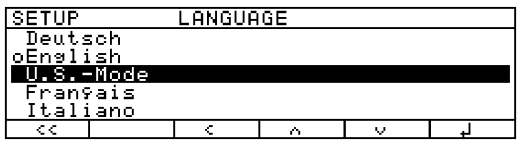
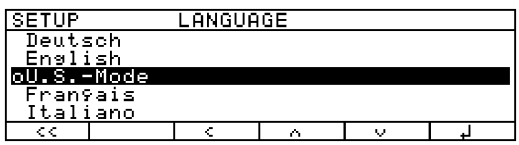
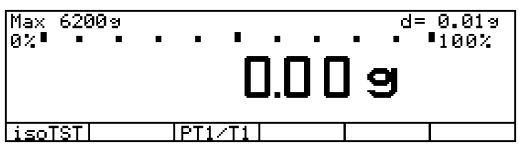
Preparation FCA...lGG:
- Remove the load plate from the weighing platform
- Remove the cap from the back of the scale housing
- Move the switch upwards



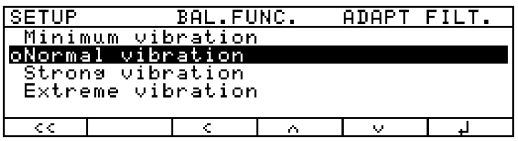
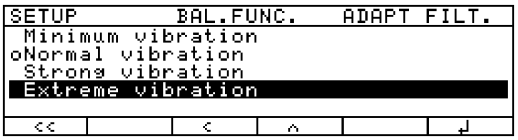
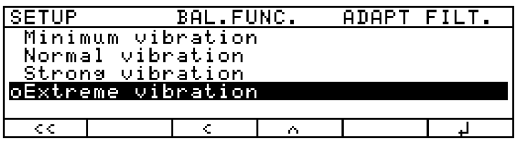
> When the switch is in the upper position, the Setup menu is locked and the scale can be used in legal metrology
> When the switch is in the lower position, the menu is accessible

Preparation FC..., FCA...EDE:
- Switch located see sections entitled “Overview” and “Plates and Markings”

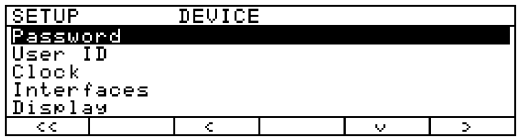
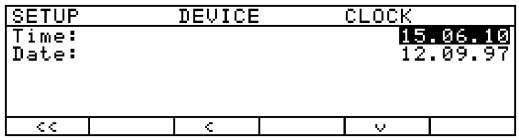
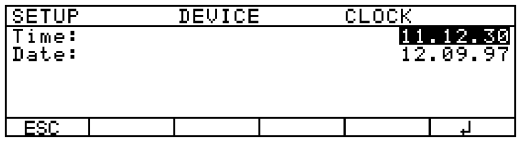
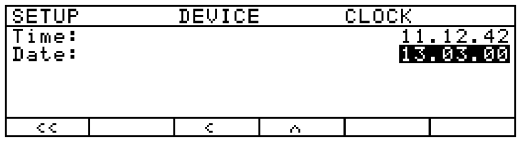
Example:
Settting the Language to “U.S. Mode”

Step	Press key (or follow instructions)	Display/Output
1. Select “Setup” menu	Setup	
2. Select “Language” and confirm	repeatedly press ˅ soft key, then > soft key	
3. Select “U.S. mode”	˄ soft key	
4. Save language	↵ soft key	
5. Exit the Setup menu	<< soft key	

Navigating in the Setup Menu (Examples):
Example: Adapting the scale to “Extreme vibration”

Step	Press key(s) (or follow instructions)	Display/Output
1. Select Setup menu	Setup	
2. Confirm “Scale functions”	> soft key	
3. Select menu item “Adapt filter” and confirm	v, then > soft key	
4. Select menu item “Extreme vibration”	v soft key	
5. Confirm menu item “Extreme vibration”	↵ soft key	
6. If required, select further menu items	< v ^ > soft keys	
7. Save setting and exit Setup Menu	<< soft key	

Example: Entering the time and date

Step	Press key(s) (or follow instructions)	Display/Output
1. Select Setup menu; select “Device parameters“	Setup, then ˅ soft key and ˃ soft key	
2. Set clock	press ˅ repeatedly, then press ˃	
3. Enter the time	1 1 · 1 2 · 3 0	
4. Set the time according to your local clock	↲ soft key	
5. Enter the date	1 3 · 0 3 · 0 0	
6. Store the date	↲ soft key	
7. Enter other data, if desired	˂ ˅ ˄ ˃ soft keys	
8. Exit Setup menu	˂˂ soft key	

Setting the Scale Functions (BAL.FUNC.)

Purpose
This menu item enables you to configure the scale functions, i.e., to meet individual requirements by selecting predefined parameters in the Setup menu. You can block access to the menu by assigning a password.

Features
The scale functions are combined in the following groups (1st menu level):

- Calibration/adjustment
- Adapt filter
- Application filter
- Stability range
- Taring
- Auto zero
- Weight unit 1
- Zero range
- Zero range at power on
- Tare/zero at power on
- Factory settings: only wgh. param. (only the scale functions)

Factory Settings
Parameters: The factory settings are identified by the symbol “o” in the list starting on the next page.

Preparation
Show available balance/scale functions:

● Select Setup menu: press the Setup key
> SETUP is displayed

● Select ”Scale functions”: press the > soft key

If you already assigned a password:
> The password prompt is displayed

○ If access is blocked by a password: enter the password using the numeric/ alphabetic keys.

○ If the last character of the password is a letter: conclude input by pressing ABC

● Confirm your password and have the scale functions displayed: Press the ↵ soft key
> Scale functions are displayed:

○ To select the next group: press the v soft key (down arrow)

○ To select the previous item of a group: press the ^ soft key (up arrow)

○ To select the next sub-item within a group: press the > soft key (right arrow)

○ To select the previous group: press the < soft key (left arrow)

○ To confirm: press the ↵ soft key

Extra Functions

● Exit the Setup menu: press the << soft key
> Restart your application

● Print parameter settings:
– When the balance/scale functions are displayed, press F
> Printout (example)
Texts with more than 20 characters are cut off

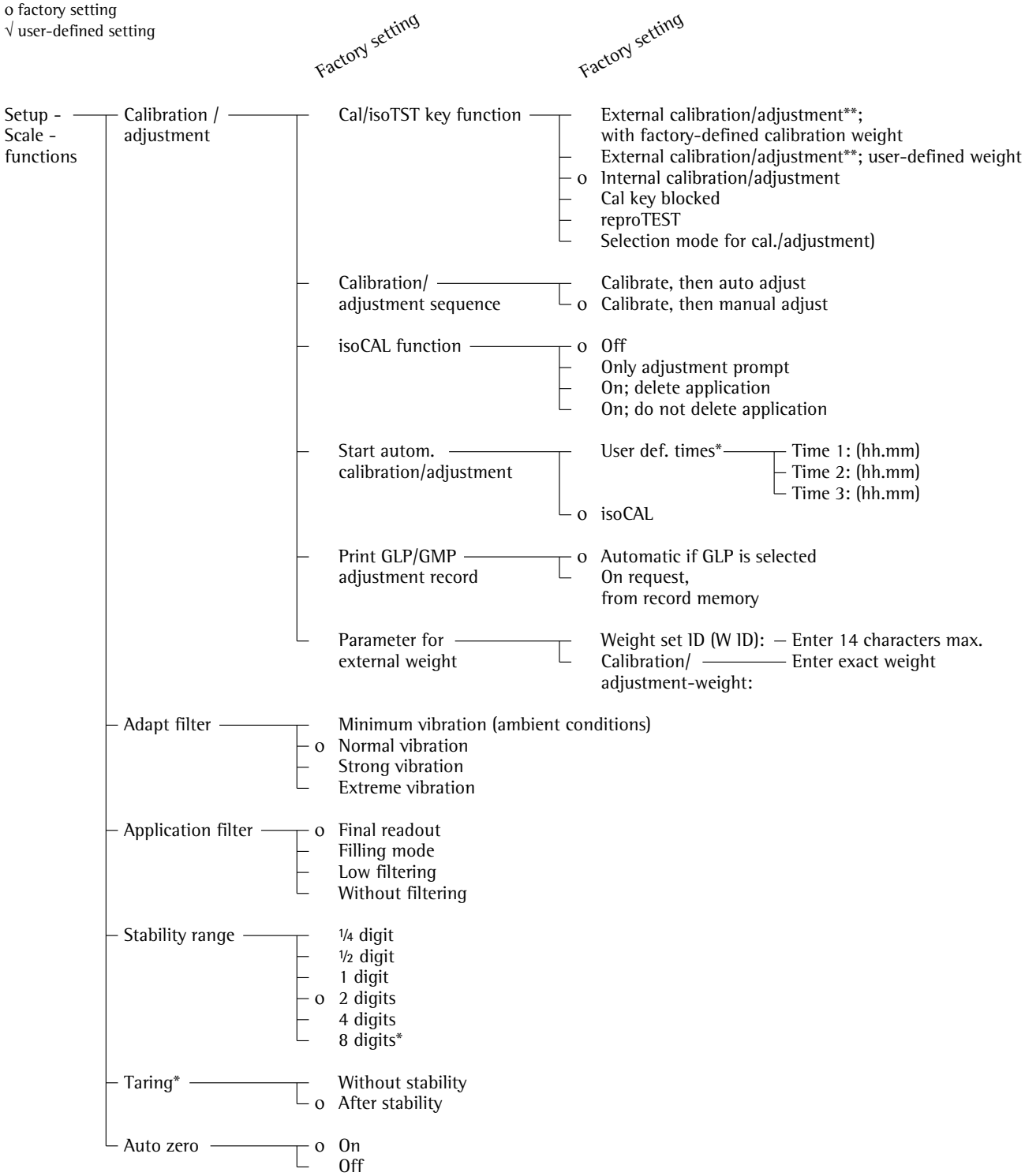
```
SETUP
     BAL.FUNC.
----------------------
Calibration/adjustm
  CAL/iso TST key fun
  Internal cal./adju
  Cal/adjustm seq
Cal. with adjustm au
.
  isoCAL-function
                  Off
  Start autom. adjus
              isoCAL
  Print GLP/GMP adju
Automatic if GLP is
selected
  Parameter for exte
   Wt. ID (W ID):

   Cal./adjust.-wt:
         5000.00 g
 Adapt filter
     Normal vibration
 Application filter
          Filling mode
 Stability range
   2 digits
 Taring
     After stability
Auto zero
                  Off
 Weight unit 1
            Grams /g
```

etc.

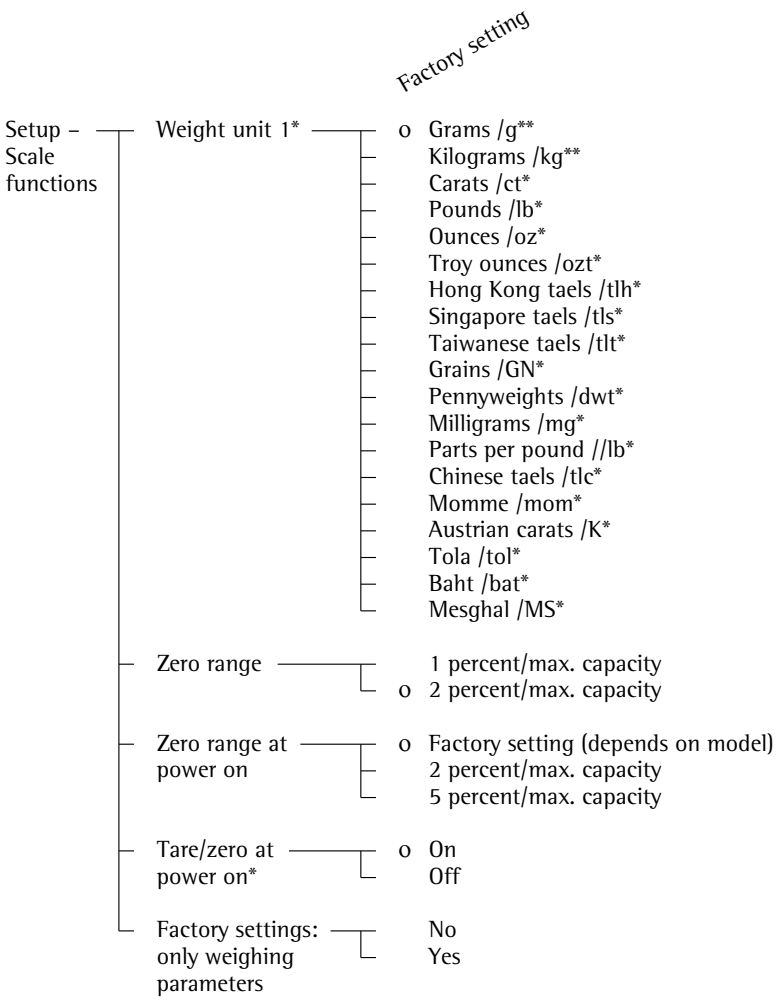
Setting the Scale Functions (Overview)

o factory setting
√ user-defined setting



* = not applicable to verified scales used in legal metrology in the European Economic Area
** = verified scales can only be externally calibrated, not adjusted (you can only check the external weight)

Setting the Scale Functions (Bal Func.)



* = not applicable to verified scales used in legal metrology in the European Economic Area
** = factory setting depends on weighing range: – ≤ 33 kg: grams
– ≥ 34 kg: kilograms

Setting the Device Parameters (DEVICE)

Purpose
This menu item enables you to configure the scale to meet individual requirements by selecting predefined menu parameters in the Setup menu. You can block access to the menu by assigning a password.

Features
The device parameters are combined in the following groups (1st menu level):

- Password
- User ID
- Clock
- Interfaces
- Display
- Keys
- Extra functions
- Factory settings: only device parameters

Factory Settings
Parameters: The factory settings are identified by the symbol “o” in the list starting on the page after next.

Preparation
Display available device parameters

● Select the Setup menu: press Setup

> SETUP is displayed:

● Select “Device parameters”:
use the v and > soft keys

If no password has been assigned, anyone can access the Setup menu device parameters.

If a password has already been assigned:

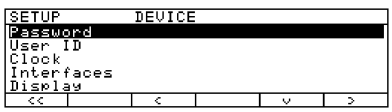
> The password prompt is displayed

○ If access is blocked by a password: enter the password using the numeric and/or alphabetic keys

○ If the last character of the password is a letter: conclude input by pressing the ABC key

● Press ↵ to confirm the password

> Device parameters are now displayed:



○ To select the next group:
press the v soft key (down arrow)

○ To select the previous menu item of a group: press ^ soft key (up arrow)

○ To select the next sub-item within a group: press the > soft key (right arrow)

○ To select the previous group:
press the < soft key (left arrow)

○ Press ↵ soft key to confirm the selected menu item

Entering or Changing a Password

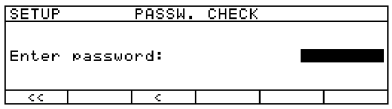
– Let’s assume that a password with 8 characters max. has already been assigned to access the Setup device parameters

● Select the Setup menu: press Setup

> SETUP is displayed

● Select parameters:
Use the v and > soft keys

> The password prompt is displayed:



○ Enter the password

○ Press the ↵ soft key to confirm your password and view the device parameters

● Write down your password here for easy reference:
Password =.....

If you assign a password and then forget what the word is:

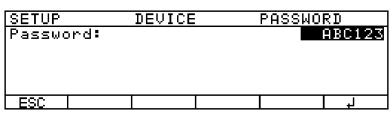
○ Enter the General Password (see Appendix)

○ Press the ↵ soft key to confirm and display the password

> The parameters are displayed

● Select the device parameter “Password”:
If necessary, repeatedly press v or ^ , until you see

> Password: and any existing password



Setting the Device Parameters (DEVICE)

- New password: Enter the numbers and/or letters for the new password (8 characters max.)
  If “none” is displayed, this means no password has been assigned to delete the user password: Press [·] and confirm

- To confirm: press the ↵ soft key

- Exit the Setup menu:
  press the << soft key
> Restart the application

Extra Functions

- Exit the Setup menu:
  press the << soft key
> Restart the application

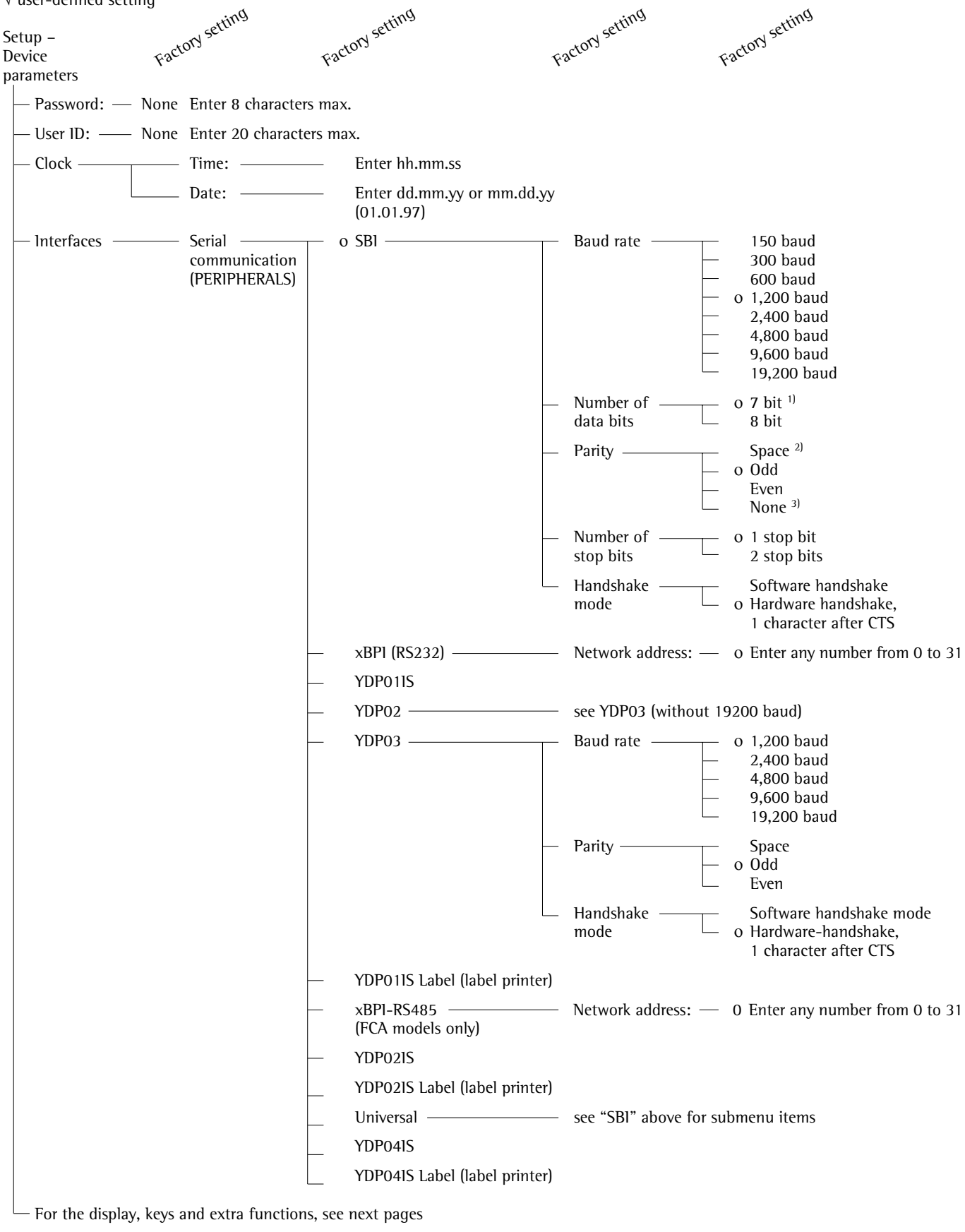
- Print the parameter settings:
– If the device parameters are displayed:
  press [F1]
> Printout (example)

```
SETUP
       DEVICE
--------------------
 User ID
  User ID:

 Interfaces
  Serial communicati
   SBI
    Baud rate
           1200 baud
    Number of data b
          7 data bits
    Parity
                 Odd
    Number of stop b
           1 stop bit
    Handshake-mode
  Hardware handshake
  after 1 char
   Function external
         Print key
  Function control
             Output
 Display
  Contrast
                   2
  Background
               White
  Digit size
10mm + bar graph
+text display
  Application symbo
                 On
 Keys
  CF function in ap
Clear all applicati
  CF function for i
Delete last charact
  Block key functio
  All keys unblocke
```

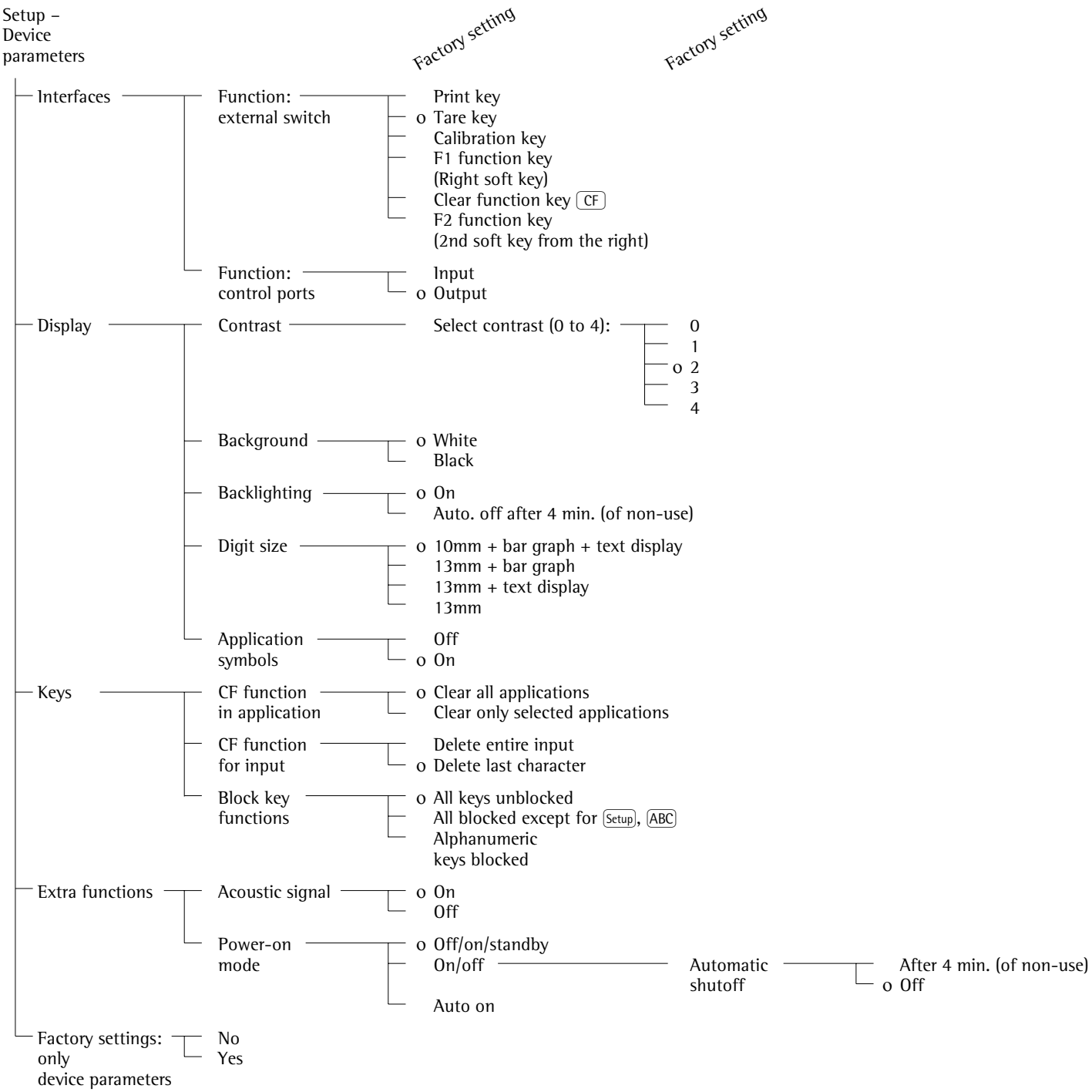
etc.

Device Parameters (Overview)
o factory setting
√ user-defined setting



1) not if “None” parity is selected
2) only if 7 data bits selected
3) only if 8 data bits selected

Setting the Device Parameters (DEVICE)



Setting the Application Parameters (Application)

Purpose
This menu item enables you to configure the scale, i.e., adapt the scale to your individual requirements by selecting from a list of parameter options in a menu. You can block access to this menu by assigning a password.

Features
The simple weighing function is available at all times. You can select one from each of the following application groups. This means a number of combinations are possible.

Application 1 (basic settings)
- Toggle weight units
- Counting
- Weighing in percent
- Animal weighing (averaging)
- Recalculation
- Calculation
- Density determination
- Differential weighing

Application 2 (control functions)
- Checkweighing
- Time-controlled functions

Application 3 (data records)
- Totalizing
- Formulation
- Statistics

In addition, you can assign 2 extra functions to each of the soft keys, in some cases (depending on the Setup configuration):
- Second tare memory
- Identification codes
- Manual storage M+ key
- Product data memory

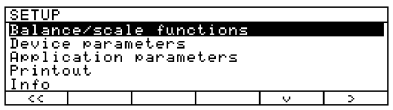
Auto-start application the scale is switched on

Factory settings:
only application parameters

Factory Settings
The factory settings are identified by the symbol "o" in the list starting on the next page.

Preparation
Display available application parameters:

● Select the Setup menu:
press the Setup key
> SETUP is displayed



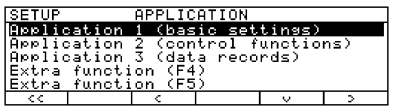
● Select parameters: repeatedly press the v and > soft keys

If you have already assigned a password:
> The password prompt is displayed:

○ If access is blocked by a password: enter the password using the numeric/ alphabetic keys

○ If the last character of the password is a letter: conclude input by pressing ABC

● Confirm your password and have the application parameters displayed:
press the ↵ soft key
> The application menu is displayed:



○ To select the next group:
press the v soft key (down arrow)

○ To select the previous item of a group:
press the ^ soft key (up arrow)

○ To select the next sub-item within a group: press the > soft key (right arrow)

○ To select the previous group:
press the < soft key (left arrow)

○ To confirm: press the ↵ soft key

Extra Functions
● Exit the Setup menu:
press the << soft key
> Restart your application

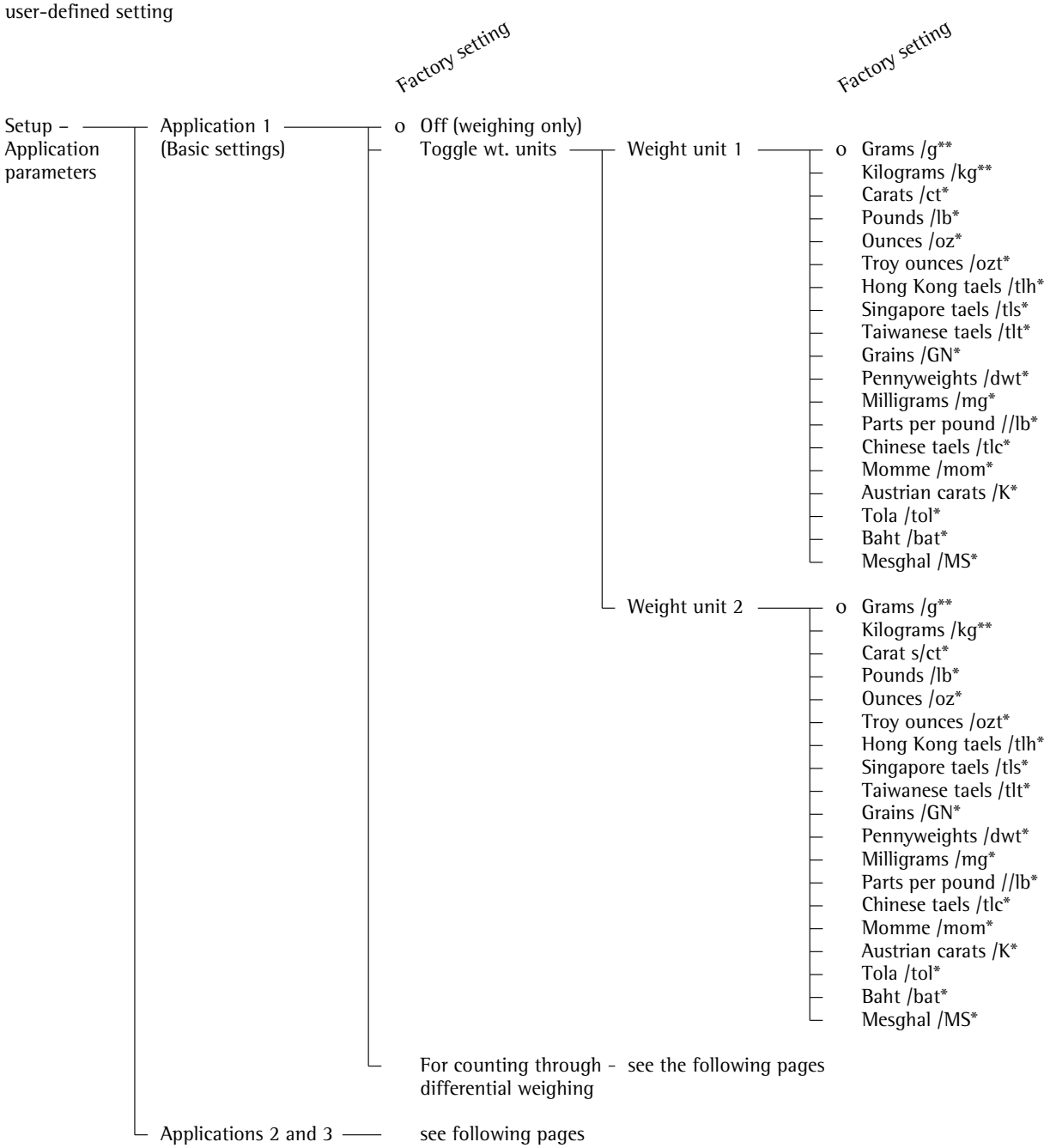
● Print parameter settings:
– When the scale functions are displayed, press F
> Printout (example)
Texts with more than 20 characters are truncated

```
SETUP
    APPLICATION
--------------------
 Application 1 (basi
                  Off
 Application 2 (cont
                  Off
 Application 3 (data
                  Off
 Extra function (F4)
  2nd tare memory
   Container tare we
                   No
   Automatic printou
                  Off
 Extra function (F5)
                  Off
 Auto-start app. whe
                  Off
--------------------
```

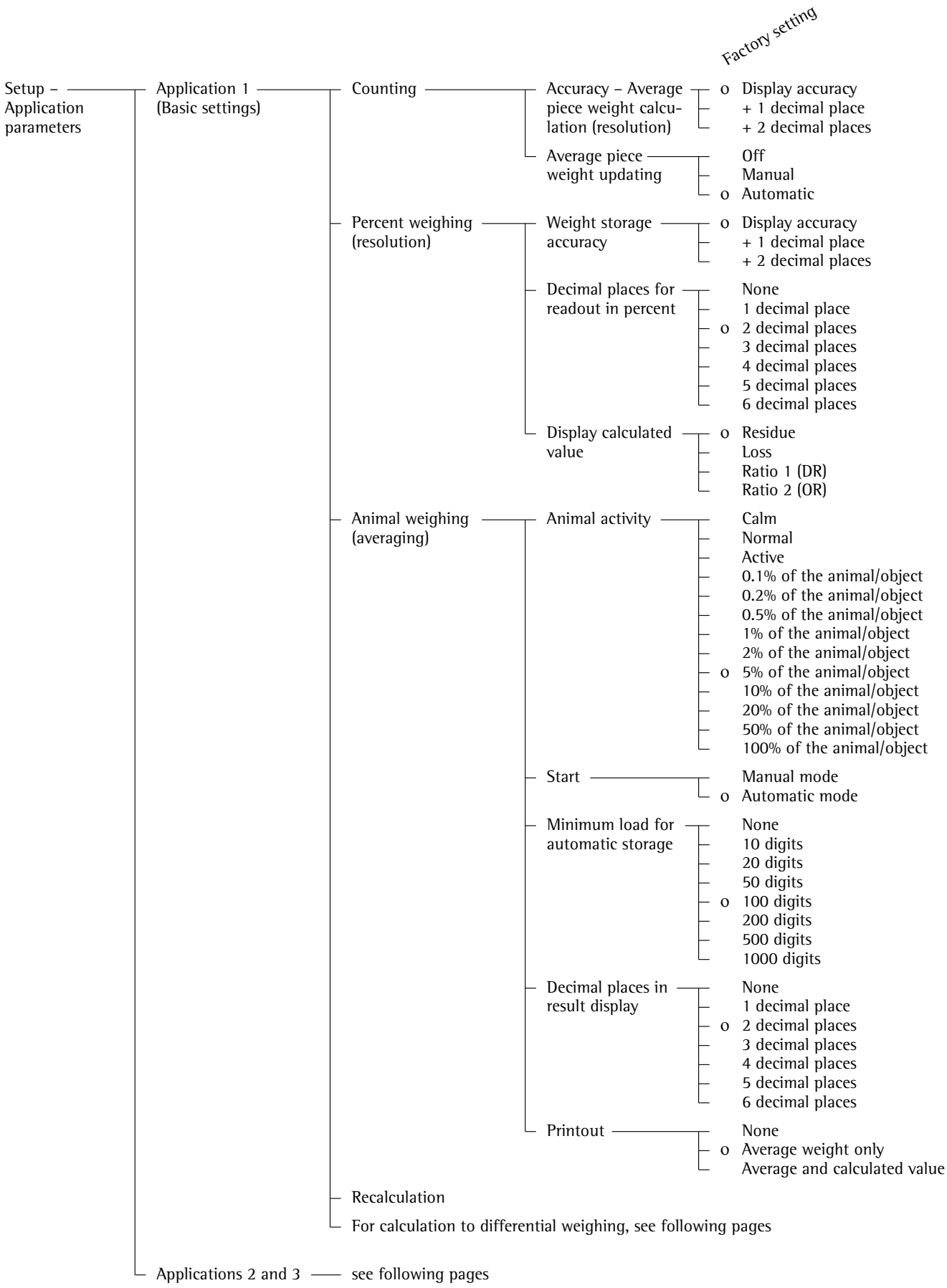
Setting the Application Parameters (Application)

Application Parameters (Overview)

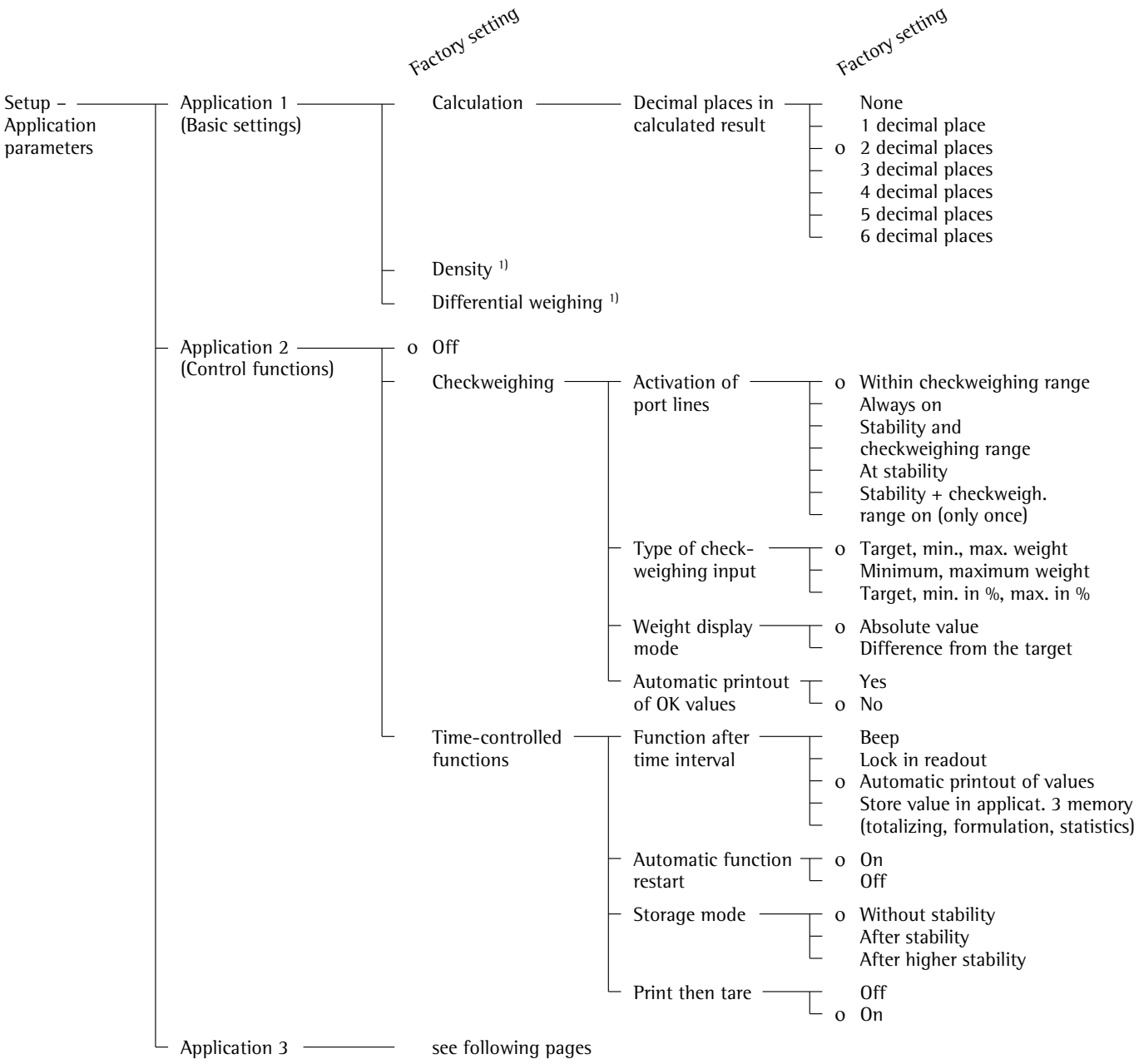
o factory settings
√ user-defined setting



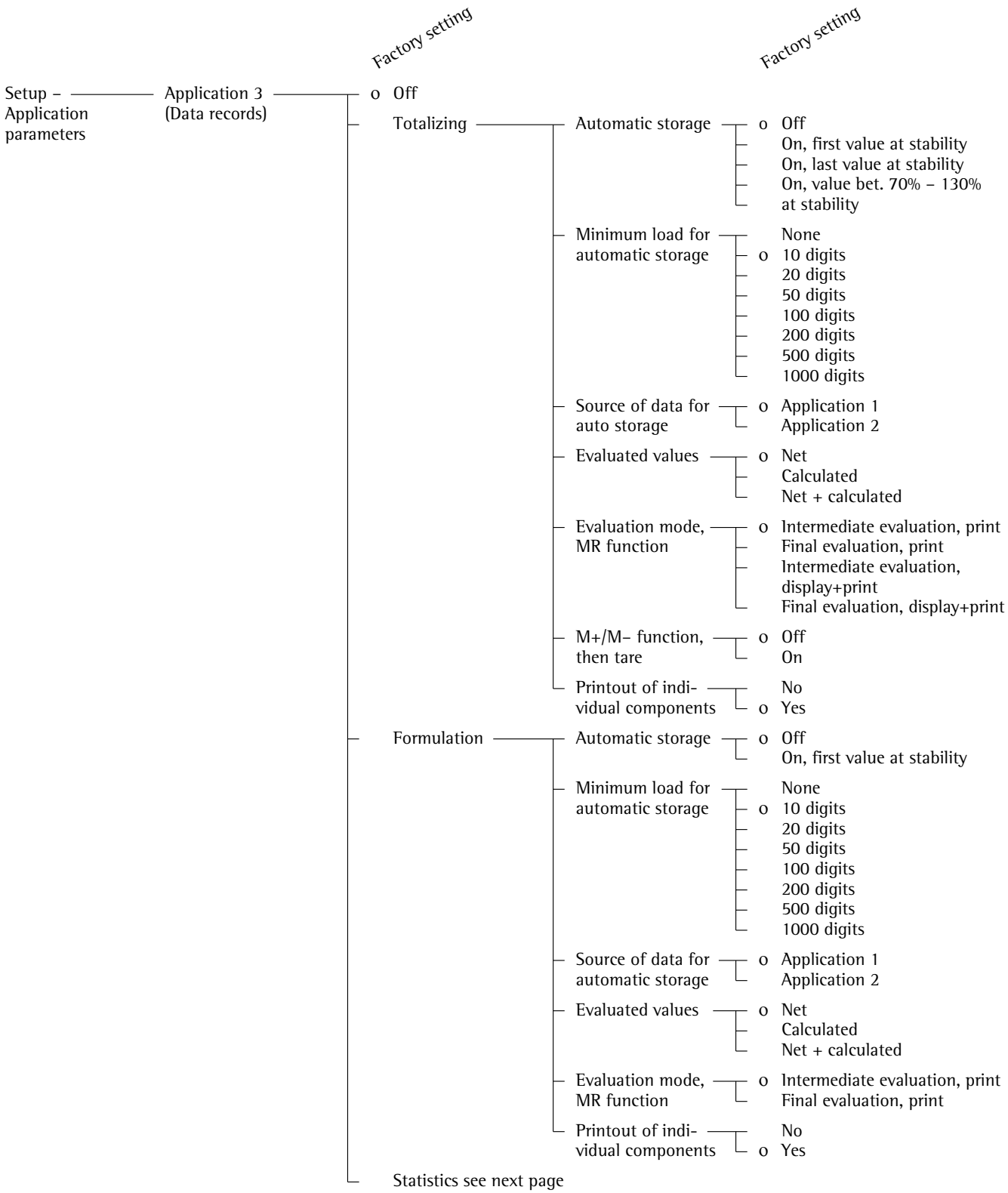
* = not applicable to verified scales used in the European Economic Area
** = factory setting depends on weighing range: – ≤ 33 kg: grams
– ≥ 34 kg: kilograms


Factory setting
Setup – Application parameters
Application 1 (Basic settings)
Counting
Accuracy – Average piece weight calculation (resolution)
o Display accuracy
+ 1 decimal place
+ 2 decimal places
Average piece weight updating
Off
Manual
o Automatic
Percent weighing (resolution)
Weight storage accuracy
o Display accuracy
+ 1 decimal place
+ 2 decimal places
Decimal places for readout in percent
None
1 decimal place
o 2 decimal places
3 decimal places
4 decimal places
5 decimal places
6 decimal places
Display calculated value
o Residue
Loss
Ratio 1 (DR)
Ratio 2 (OR)
Animal weighing (averaging)
Animal activity
Calm
Normal
Active
0.1% of the animal/object
0.2% of the animal/object
0.5% of the animal/object
1% of the animal/object
2% of the animal/object
o 5% of the animal/object
10% of the animal/object
20% of the animal/object
50% of the animal/object
100% of the animal/object
Start
Manual mode
o Automatic mode
Minimum load for automatic storage
None
10 digits
20 digits
50 digits
o 100 digits
200 digits
500 digits
1000 digits
Decimal places in result display
None
1 decimal place
o 2 decimal places
3 decimal places
4 decimal places
5 decimal places
6 decimal places
Printout
None
o Average weight only
Average and calculated value
Recalculation
For calculation to differential weighing, see following pages
Applications 2 and 3
see following pages

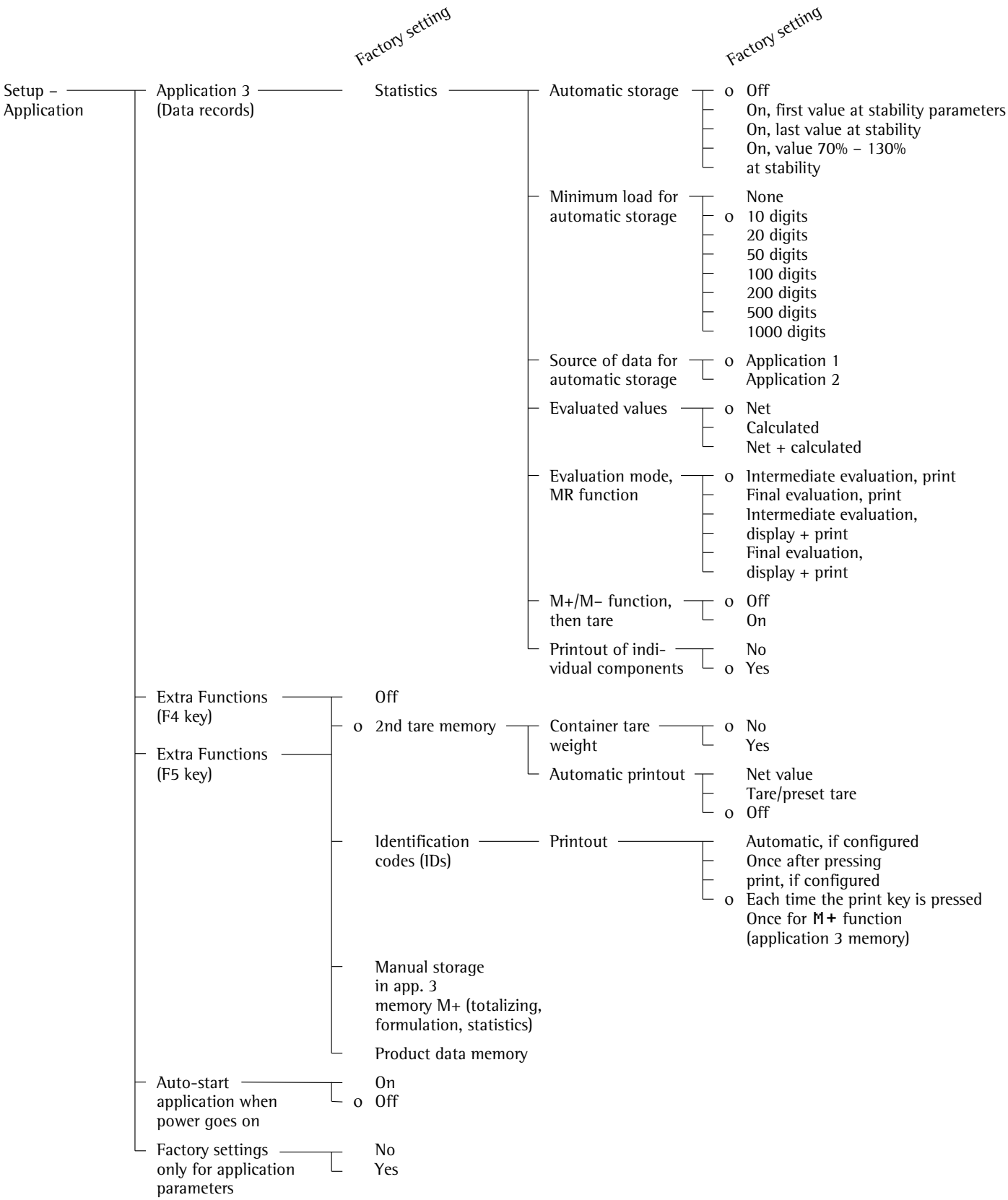
Setting the Application Parameters (Application)



[1])=For details on using the "Differential Weighing" application, please refer to the operating instructions for Master[pro] LA balances, available on request from Sartorius or by Internet download (www.sartorius.com → Laboratory Mechatronics → Downloads; file name: "LA.pdf").


Factory setting
Factory setting
Setup – Application parameters
Application 3 (Data records)
o Off
Totalizing
Automatic storage
o Off
On, first value at stability
On, last value at stability
On, value bet. 70% – 130% at stability
Minimum load for automatic storage
None
o 10 digits
20 digits
50 digits
100 digits
200 digits
500 digits
1000 digits
Source of data for auto storage
o Application 1
Application 2
Evaluated values
o Net
Calculated
Net + calculated
Evaluation mode, MR function
o Intermediate evaluation, print
Final evaluation, print
Intermediate evaluation, display+print
Final evaluation, display+print
M+/M– function, then tare
o Off
On
Printout of individual components
No
o Yes
Formulation
Automatic storage
o Off
On, first value at stability
Minimum load for automatic storage
None
o 10 digits
20 digits
50 digits
100 digits
200 digits
500 digits
1000 digits
Source of data for automatic storage
o Application 1
Application 2
Evaluated values
o Net
Calculated
Net + calculated
Evaluation mode, MR function
o Intermediate evaluation, print
Final evaluation, print
Printout of individual components
No
o Yes
Statistics see next page

Setting the Application Parameters (Application)



Selecting the Printout Function (PRINTOUT)

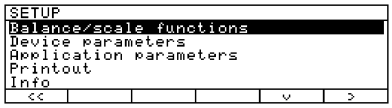
Purpose
This menu item enables you to configure the printout to meet your individual requirements by selecting predefined menu parameters in the Setup menu. Printouts of weights and other measured or calculated values and IDs enable you to document your data. You can select the particular data you wish to print. To prevent changes to your settings, you can block access to the menu by assigning a password.

Features
The device parameters are combined in the following groups (1st menu level):
- Application-defined output
  - Configured Printout
  - FlexPrint
- Automatic output of displayed values
- Output to interface port
- Line format
- ISO/GLP/GMP printout
- Identification (identifier)
- Factory settings – printout only

Factory Settings
Parameters: The factory settings are identified by the symbol “o” in the list on the next page.

Preparation
Display available printout parameters

● Select the Setup menu: press Setup
> SETUP is displayed:



● Select “Printout”: use the v and > soft keys

If no password has been assigned, anyone can access the printout parameters in the Setup menu

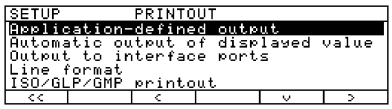
If a password has already been assigned:
> The password prompt is displayed

○ If access is blocked by a password: enter the password using the numeric and/or alphabetic keys

○ If the last character of the password is a letter: conclude input by pressing the ABC key

● Press ↵ to confirm the password

> Printout parameters are now displayed:



○ To select the next group: press the v soft key (down arrow)

○ To select the previous item of a group: press the ^ soft key (up arrow)

○ To select the next sub-item within a group: press the > soft key (right arrow)

○ To select the previous group: press the < soft key (left arrow)

○ To confirm: press the ↵ soft key

Extra Functions
● Exit the Setup menu: press the << soft key
> Restart your application

● Print parameter settings:
– When the printout parameters are displayed, press F

> Printout (Example)

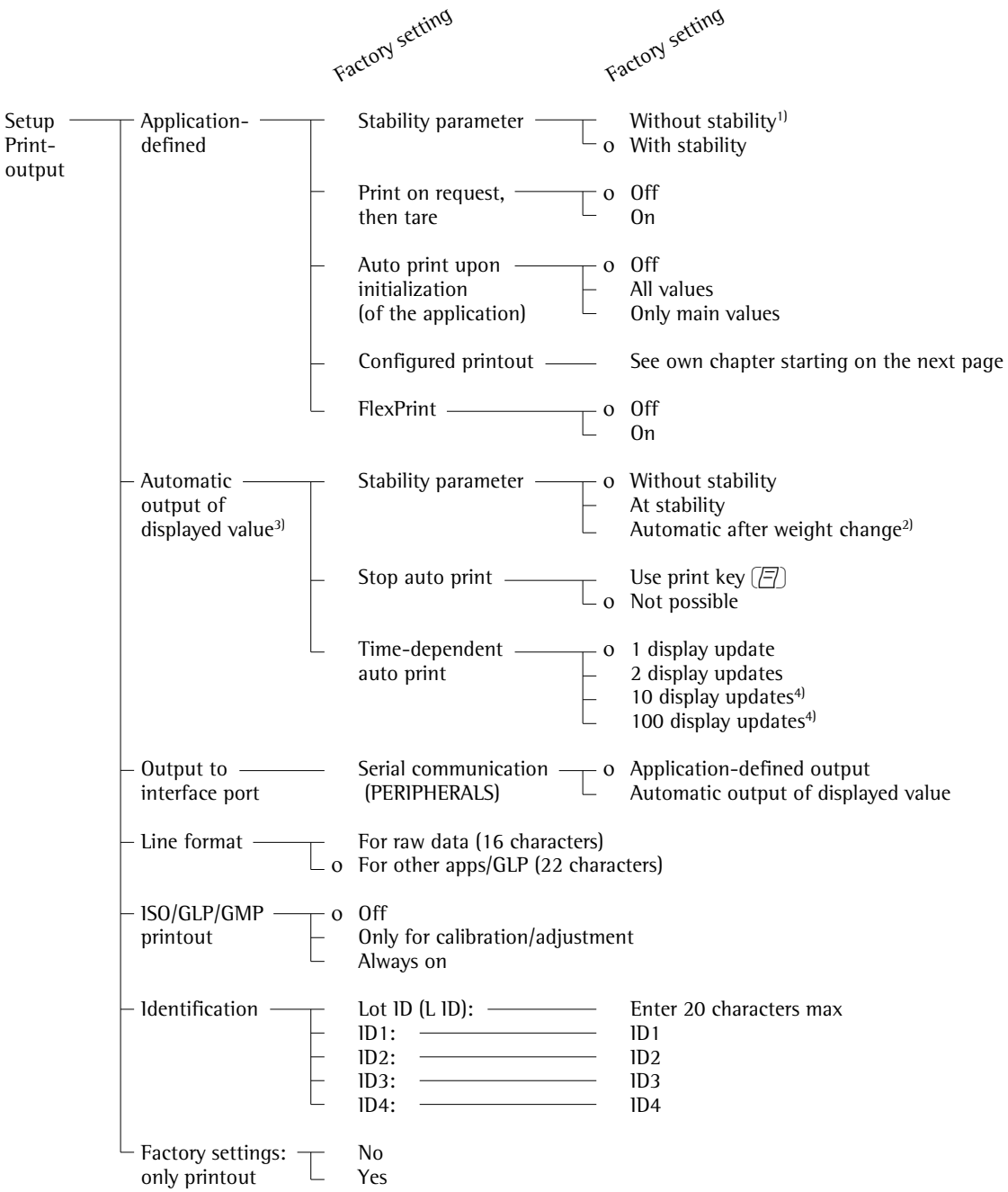
```
SETUP
      PRINTOUT
--------------------
 Application defined
  Stability paramete
     With Stability
  Print on request t
              Off
  Auto print upon in
          All values
  Configured printou
   Indiv.: Printout
   Comp.: Printout
   Total: Printout
  FlexPrint
                  Off
 Automatic Output of
  Stability paramet
     Without stabili
  Stop auto print
      Not possible
  Time-dependent aut
    1 display update
 Output to interface
  Serial communicat:
Application-defined
output
 Line format
For other apps/GLP
 (22 characters)
 ISO/GLP/GMP printou
                  Off
 Identification
  Lot (L ID):

  ID1:
                  ID1
```

etc

Selecting the Printout Function (PRINTOUT)

Printout Parameters (Overview)
o factory setting
√ user-defined setting



[1)] = When the scale is used in legal metrology, this setting may be configured for control purposes only; printout of values is not permitted
[2)] = Autoprint when load change is >10 d and stability is reached: no printout until residual difference in load value >5 d
[3)] = To enable automatic output of the displayed value, the corresponding option ("Automatic output of displayed value") must be activated under the next menu item at this level, "Output to interface port"
[4)] = These settings may not be changed on verified scales

Printout Configuration

Purpose
This menu item enables you to configure individual printout formats. With the formulation, totalizing and statistics applications, you can also define the values to be included on the total printout when the MR key is pressed.

Under “Setup: Printout: Application-defined output: Configured printout”, you can configure individual, component or total data records that contain the items available for printouts in each application. Configure these printouts after you have configured the applications, because some entries in the data record depend on the particular application.

Features
- Maximum items in a data record: 60

- Separate configuration of printout formats for individual weights, components, total, backweighing and statistics

- Individual printout generation: press the (⎙) key

  Automatic printout of application data: results from animal weighing or density application (Setup menu: Application 1: Density: Printout: All data) OK values from checkweighing application, time-controlled printouts, 2nd tare memory

- Component printout: For results from totalizing, formulation or statistics applications, press `M+` or `M−` (Setup: Application 3: ..., Printout of individual components: On)

- Total printout: For totalizing, formulation or statistics applications, press `MR`

- Backweighing printouts or records: automatically generated after backweighing or manually by pressing the (⎙) key when the result is displayed at the end of backweighing

- Statistics printout or output: To generate, press the (⎙) key when the statistics are displayed

  Printouts for Differential Weighing: These printouts can be generated as standard or configured (user-defined) reports.

  You can configure the following printouts:
- Individual printout
- Backweighing printout
- Statistics printouts

  Printouts are generated in one of two ways:
- at the request of the user by pressing the (⎙) key (print on request)
- automatically, if configured in the Setup menu [Application parameters: Application 1: Differential weighing: Generate printout: Auto]

  You can turn off automatic printout generation in the Setup menu [Application parameters: Application 1: Differential weighing: Generate printout: None]

  Data records are deleted after you have switched to a different application or activated or de-activated an extra function in the application parameters of the Setup menu

- A new pick list for a data record is created based on the currently active application programs and extra functions

- Printout items can be deleted individually

- No printout is generated when the following setting is configured:

  Setup: Printout: Line format: For raw data (16 characters)

- Print item “Form feed” for footer: Advance to beginning of next label in the ”YDP01IS-Label” and “YDP02IS-Label” interface mode

Extra Functions
● Exit printout configuration: press `<<` soft key
> Restart application

Printing “Select” and “List” Settings
- `LIST`: print the currently selected list `Select`: printout items that can still be selected

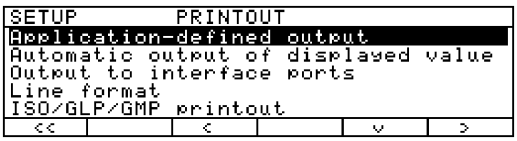
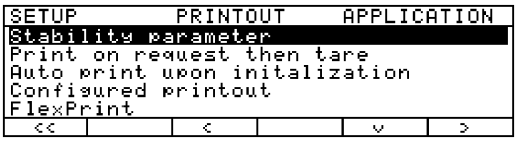
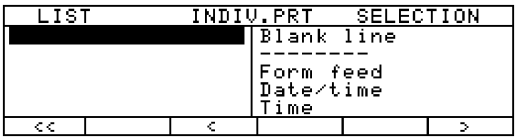
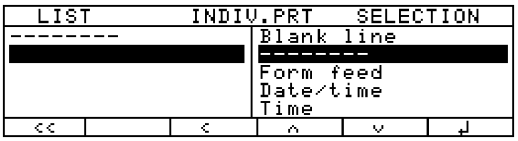
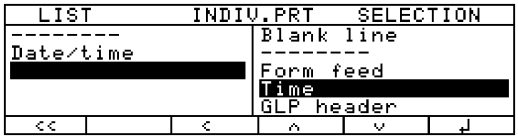
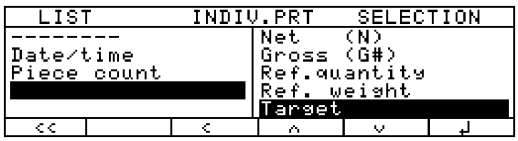
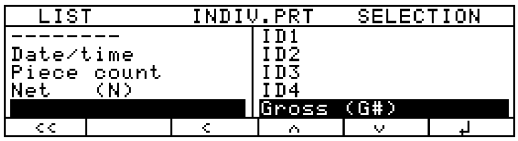
● When the select bar is on `LIST` or `Select`: press the (⎙) key
> Printout (Example)

```
BACKW. PRINT.LIST
====================
Sample date
Net initial wt.
Backweighed res
Loss in %
====================
```
etc.

Printout Configuration

Practical Example:
Configure an Individual Printout for Counting Application to Include Dotted Line, Date/Time, Piece Count and Net Weight

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Application 1: Counting
Exit the Setup menu: press the << soft key
Then call Setup again and select: Printout: Application-defined output: Configured printout

Step	Press key(s) (or follow instructions)	Display/Output
1. Select Setup menu, "Printout"	Setup, then ∨ repeatedly and > soft key	
2. Confirm "Application-defined output"	> soft key	
3. Select and confirm "Configured printout"	∨ soft key 3× > soft key	
4. Confirm "Indiv. printout"	> soft key	
5. Select "Dotted line"	>, ∨, ↵ soft keys	
6. Select "Date/time"	∨ soft key twice, then ↵ soft key	
7. Select "Piece count"	∨ repeatedly, then ↵ soft key	
8. Select "Net weight"	∧ soft key repeatedly, then ↵ soft key	
9. Exit "Printout configuration"	<< soft key	
10. Perform weighing operations, then print	E	---------- 14.01.2000 09:19 Qnt + 598 pcs N + 2003.13 g

Data Items for the Printout:

Parameter	Display text	Indiv.	Comp.	Total
Blank line**	Blank line	x	x	x
Dotted line**	--------	x	x	x
Form feed*	Form feed	x	x	x
Date/Time*	Date/Time	x	x	x
Time with seconds*	Time	x	x	x
GLP header*	GLP header	x	x	x
GLP footer*	GLP footer	x	x	x
Sample ID*	S ID	x	x	x
ID 1*	ID1	x	x	x
ID 2*	ID2	x	x	x
ID 3*	ID3	x	x	x
ID 4*	ID4	x	x	x
Net weight*	Net (N)	x		
Gross weight*	Gross (G#)	x	x	x
Preset tare/ Tare 1 weight*	Tare1 (T1/PT1)	x	x	x
With "Counting" application:				
Reference quantity	Ref. quantity	x	x	x
Reference weight	Ref. weight	x	x	x
Piece count	Piece Count	x		
With "Weighing in percent" application:				
Reference percentage	Ref. percent	x	x	x
Reference weight	Ref. weight	x	x	x
Percentage	Percent	x		
With "Animal Weighing" application:				
Number of weighing operations	No. of weights	x	x	x
Calculation factor	Factor	x	x	x
Average animal weight	Mean value	x		
Average Animal weight calculated	Mean factor	x		
With "Calculation" application:				
Equation	Equation	x	x	x
Calculated result	Calc. result		x	

* = Items are available independently of the applications selected
** = Items are available independently of the applications selected and can be selected more than once

Data Items for the Printout:

Parameter	Display text	Indiv.	Comp.	Total
With the "Check-weighing" application:				
Target value	Target	x	x	x
Minimum value	Minimum	x	x	x
Maximum value	Maximum	x	x	x
With "Time-controlled Functions" application:				
Time/interval	Time/interval	x		
With the "Totalizing" application:				
No. of weights	No. of wts.		x	x
Weight of transaction	Trans. wt.		x	
Weight total	Wt. total			x
Number of calculated values	No.of calc.val.		x	x
Calculated value transactions	Calc.val.trans.		x	
Total of calculated values	Total calc.			x
Nominal no. of weighing operations	Nom.no.wghs.		x	x
With "Formulation" application:				
Number of components	Number		x	x
Net component	Net component		x	
Components calculated	Net transact.		x	
Total net components	Net/comp.calc.			x
Total calc. components	Tot.comp.calc.			x
Preset tare/ Tare 2 weight	Tare2	x	x	x
Nominal no. of weighing operations	Nom.no.wghs.		x	x
With the "Statistics" application:				
No. of weights	No. of wts.		x	x
Weigth of trans.	Trans. wt.		x	
Mean weight	Average wt.			x
Standard deviation – weight	Std.dev.wt.			x
Variation coefficient –weight	Var.coeff.wt.			x
Weight total	Wt.total			x
Minimum weight	Min. wt.			x
Maximum weight	Max. wt.			x
Difference – weight	Diff. wt.			x
No. of calc. values	No. of calc. val.		x	x
Calc. value – transactions	Calc.val.trans.		x	
Mean calc. value	Mean calc. val			x
Standard derivation calculated values	Std.dev.calc.			x
Variation coefficient – calc. values	Var.coeff.calc.			x
Total – calc. values	Total calc.			x
Minimum – calc. values	Min. calc.			x
Maximum – calc. values	Max. calc.			x
Difference – calc. values	Diff. calc.			x
Nominal no. of weighing operations	Nom.no.wghs		x	x

Displaying Info

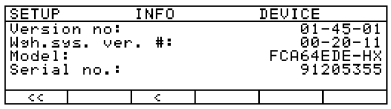
Purpose
This menu item enables you to have information displayed about the specific scale ("device"), as well as "FlexPrint" information.

Displaying Device Information

● Select the Setup menu:
press the Setup key
> "SETUP" is displayed:

● Select "Device information":
Repeatedly press the v soft key,
then press the > soft key

● Press > soft key to confirm "Device information"
> Device information is displayed:



● Print device information:
Press the key

> Printout (Example)

```
--------------------
23.02.2000      13:02
Model      FCA64EDE-HX
Ser. no.     91205355
Vers. no.    01-45-01
(Version of the operating program)
ID           BECKER123
(User-ID)
--------------------
SETUP
         INFO
                DEVICE
--------------------
 Version-no.:
             01-45-01
 (Version of the operating program)
 Wgh. sys. vers:
             00-20-11
 (Version no. of the weighing cell)
 Model:
          FCA64EDE-HX
 Serial no.:
             91205355
--------------------
```

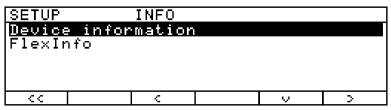
● Return to SETUP overview:
press the < soft key

● Exit Setup menu:
press the << soft key
> Original settings are restored

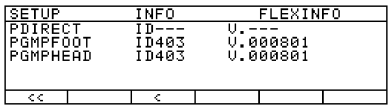
Display Flexprint Information

● Select the Setup menu:
press the Setup key
> "SETUP" is displayed:

● Select "Info": press the v soft key
repeatedly and then the > soft key



● Select "FlexInfo": press the v soft key
and then the > soft key
> The FlexPrint information is displayed, with print instruction file name, software ID and version number:



○ To select a particular print file name with software ID (for example, ID403), if desired: press key v or ^ as required

> If the display shows `ID---` :
The weight block for legal metrology is not printed by this print file.

> Display of version number:
`V.xx.xx.xx`
Created by Sartorius:
`V.S.xx.xx.xx`

● Return to SETUP overview:
press the < soft key

● Exit Setup menu:
press the << soft key
> The device returns to the previous mode

Date of Manufacture
The month and year of manufacture are encoded in the serial number as follows:

Y M M x x x x x

Y	Year
1	2000–2006
2	2007–2013
3	2014–2020
4	2021–2027
5	2028–2034
6	2035–2041
7	2042–2048
8	2049–2055
9	2056–2062

The first digit represents a 7-year period as indicated in the table above. The next 2 digits represent the month. The months are numbered consecutively, starting with 13, over the entire 7-year period. Thus the number representing the month also indicates the specific year of manufacture.

2000 13–24
2001 25–36
... etc.

Example:
113xxxxx –> January 2000

The individual devices are numbered consecutively in the last 5 digits, starting from 00000 again at the beginning of each month.

MP8 Interface Emulation

Purpose
With the MP8 interface emulation function, you can connect peripheral devices of the MP8 generation that have separate AC power supplies (such as the 73822... Data Control terminal, a YFC..., or a YDI 50 Z Data Input dedicated keyboard, for example) to your scale.

Features
- The scale can be used only to determine weights.
- The interface communicates exclusively in the MP8 binary protocol.
- Select the application program and the program index for MP8, as well as individual application parameters, in the Setup menu.
- See next page for menu setting options

Preparation
- Activate the MP8 emulation mode*:

● Press Setup

● Select the `factory settings` and confirm: press the `v` soft key repeatedly and then the `>` soft key

● Select `Reset to MP8`: press `v` soft key and `>` soft key

● Select `Yes` and press ↵ to confirm
> The terminal is restarted

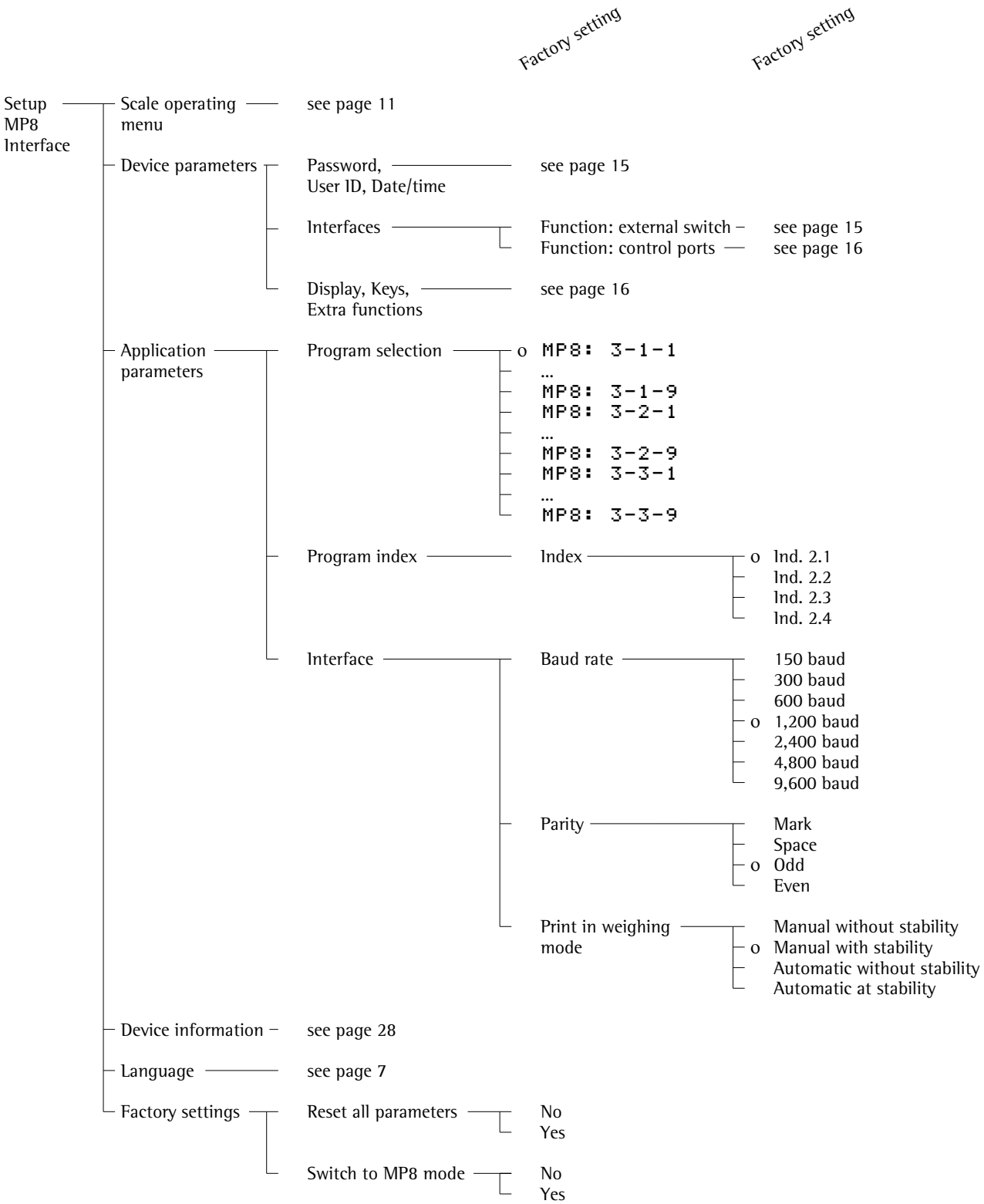
* follow the same procedure to return from MP8 emulation back to factory setting

Factory Settings

Each parameter category has a factory setting. To restore the factory settings, select this item in the Setup menu and select `YES` to confirm.

The following parameters are not restored to factory settings when you activate this function:
- Language
- Password
- Display contrast
- Time (clock)

MP8 Interface Emulation Parameters (Overview)
o factory setting
√ user-defined setting



Basic Weighing Function

Purpose
The basic weighing function is always accessible and can be used alone or in combination with an application program (Toggle between Weight Units, Counting, Weighing in Percent, etc.).

Features
- Taring the scale
- Assigning IDs to weights
- Printing weights
- Printing ID codes for weights

Factory Settings
Tare: `After stability`

Manual/auto print mode:
`Manual with stability`

Line format:
`For other apps/GLP (22 characters)`

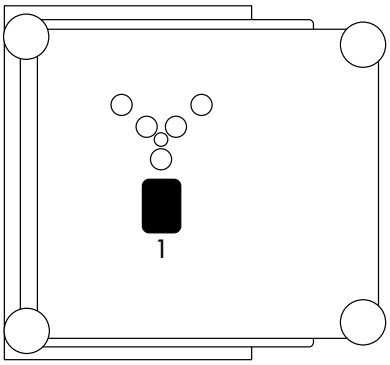
Soft Key Functions

`isoTST`	Initiate calibration/ adjustment routine
`isoCAL`	Press to start isoCAL routine
`S ID`	Store ID entered

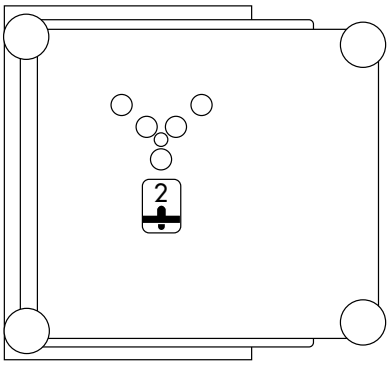
* including the Signatories of the Agreement on the European Economic Area

Under-Scale Weighing
A port for an under-scale weighing hanger is located on the bottom of the scale.

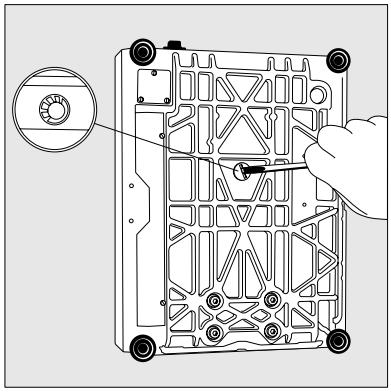
FC... BBE, FC... CCE:
● Open cover plate **(1)** on the bottom of the scale



● Attach the sample (e.g., using a suspension wire) to the hook **(2)**.



FCG... EDE:
● Use a suitable screwdriver to remove the cover plate from the bottom of the scale.



● Fasten the hook to the cross-bar (see "Accessories").

○ If necessary, install a shield for protection against drafts

⚠ Important Note Concerning Verified Scales Approved for Use as Legal Measuring Instruments in the EU*: The under-scale weighing port may not be opened or used when an approved scaleis being operated as a legal measuring instrument

Preparation
● Turn on the scale: press I/⏻
> The Sartorius logo is displayed

○ To tare the scale, if desired: press Tare

> The **O** symbol is displayed when a verified scale is tared or zeroed (± 0.25 digits).

⚠ Important Note Concerning Verified Scales Approved for Use as Legal Measuring Instruments in the EU*: The type-approval certificate for verification applies only to non-automatic weighing instruments; for automatic operation with or without auxiliary measuring devices, you must comply with the regulations of your country applicable to the place of installation of your scale.

● You must calibrate the scale at the place of installation before using it as a legal measuring instrument (see the section entitled "Calibration and Adjustment" in this chapter)

○ The temperature range indicated on the verification ID label must not be exceeded during operation

Additional Functions
In addition to the functions:

- alphanumeric input
- taring (not during alphanumeric input)
- printing

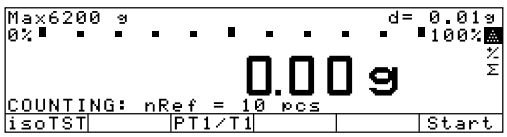
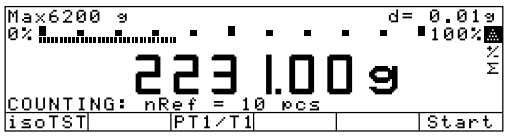
you can also access the following functions from the weighing application:

Calibration
● Press isoTST
> See the section on “Calibration/ Adjustment” for further instructions.

Setup
● Press Setup
> See the chapter entitled “Configuration” for further instructions.

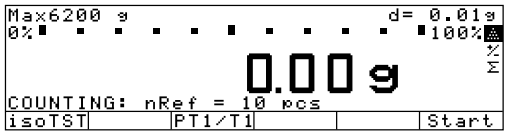
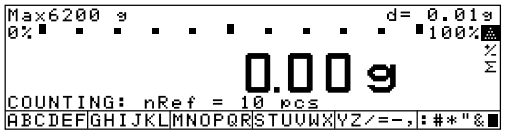
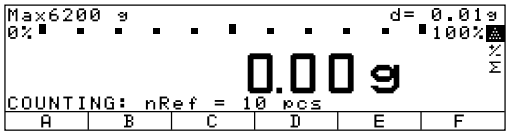
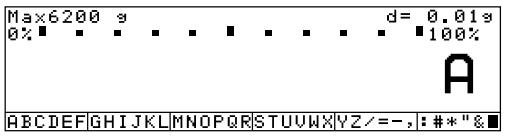
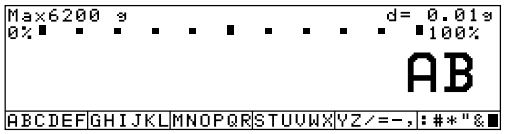
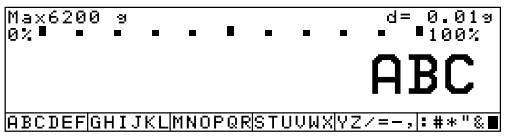
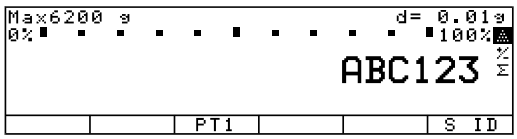
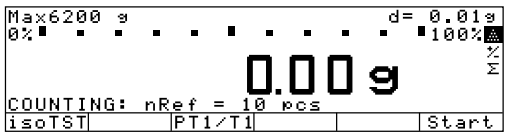
Turning Off the Scale
● Press I/⏻
> The scale shuts off
> The display goes blank

Practical Examples
Example W1: Simple weighing

Step	Key (or instruction)	Display/Output
1. If necessary, tare the scale	Tare	
2. Enter sample ID	see Example W2	
3. Determine sample weight (Example)	Place load on scale	
4. Print weight value	E	S-ID ABC123 N + 2231.56 g

Example W2
Enter “ABC123” as sample ID

⚠ Note:
– The sample ID generally applies to one weighing operation only
– The ID is deleted after data output

Step	Key (or instruction)	Display/Output
Initial status (scale unloaded) (ID can also be entered while scale is loaded)		
1. Select alphabetic input	ABC	
2. Select the required letter group	**ABCDEF** soft key	
3. Enter the letter “A” (To delete a letter:	**A** soft key CF)	
4. Select the letter group and enter “B”	**ABCDEF** soft key **B** soft key	
5. Select the letter group and enter “C” (If only letters are entered, conclude input:	**ABCDEF** soft key **C** soft key ABC)	
6. Enter the numbers 1, 2 and 3	1 2 3	
7. Store the ID (max. 20 characters) – The next printout will include the sample ID	**S ID** soft key	

Device Parameters

Password
You can enter a password to block access to the operating menu and to the functions for ID code input and exact calibration weight input.

For details, see “Setting the Device Parameters” in the chapter entitled “Configuration”.

User ID
You can enter your own personal password (20 characters max.)

Clock
ISO/GMP printouts in particular must be generated with the date and time stamp of the specific measurement. This date and time stamp is optional on other printouts.

For details, see “Setting the Device Parameters” in the chapter entitled “Configuration.”

Interface

Purpose
This item enables you to set the parameters for the following interfaces:

- Serial interface port
- External switch function

Serial communications port
You can set the serial communications port to use for the following modes:
- SBI
- XBPI
- YDP01IS
- YDP02
- YDP03
- YDP01IS-Label
- XBPI-RS485*
- YDP02IS
- YDP02IS-Label
- Universal
- YDP04IS
- YDP04IS-Label

Universal Remote Switch
You can connect an external universal remote switch (foot switch) to one of the two serial ports. Then you can assign one of the following functions to be performed when the switch is activated:
- Print key
- Tare key
- Cal key
- F1 function key
- CF key
- F2 function key

For further information on the pin assignment chart, see “Pin Assignment Charts” in the chapter entitled “Data Output Functions”.

Control Port Function
You can connect either a checkweighing display or an external universal switch to the serial communications port on the balance (factory setting).

To do so, you need to configure the interface for input or output in the operating menu under “Device parameters: Interfaces.”

Pin Assignment Chart of the Female Interface Connector

Pin	Function: Input
0	(=/) key; see “Universal switch”
F	Tare key
E	Soft key 6 (Cal)
G	Soft key (F1)
D	CF key
F	Tare key

Pin	Function: Output
0	“External switch” (see above)
F	Control port 1: lighter
F	Control port 2: equal
F	Control port 3: heavier
F	Control port 4: “set”

For further information on the pin assignment chart, see the section on “Pin Assignment Charts” in the chapter entitled “Overview”.

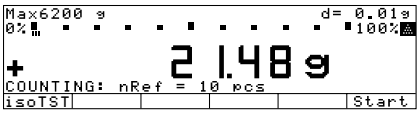
* FCA models only

Display
You can configure the display for your individual needs.

The contrast can be adjusted in 5 levels: `Contrast`

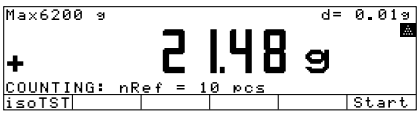
Characters can be displayed in black on white or vice versa: `Background`

You can blank out either the bar graph or the text line or both `Digit size`

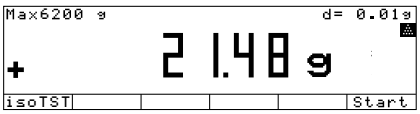


`10mm + bar graph + text display`

`13mm + bar graph`



`13mm + text display`



`13mm`

You can blank out the display of application symbols `Application symbols`

Keys
You can assign different functions to the CF key for deleting input and applications.

When you delete applications, you can delete either the data stored for all applications or just selected data. `CF function in application`

When you delete input, you can either delete all the data input in a field, or only the last character entered. `CF function for inputs`

You can block key functions; you can choose whether to block all keys (except I/⏻ and Setup) or just the alphanumeric keys. `Block key functions`

Extra Functions
Acoustic Signal

An acoustic signal is emitted when you press a key. When the key pressed is allowed, the signal is a single beep-tone; when it is not allowed, this is signaled by a double-beep (key does not initiate a function). In the Setup menu, you can configure whether

- the acoustic signal should sound (`On`)
- the acoustic signal should not sound (`Off`)

Power-On Mode
You can configure the scale so that when a power supply is connected,

- the scale is off (`Off/on/standby`), or
- the scale switches on automatically (`Auto on`)

You can also configure the scale to go into the standby mode (`Off/on/standby`) when it is turned off.

After you turn on the scale, a self-test of the functions is run (`TEST` is displayed in the text line and the bar graph is shown)

Calibration/Adjustment “isoTEST”*

Purpose
Calibration is the determination of the difference between the weight readout and the true weight (mass) of a sample. Calibration does not entail making any changes within the scale.

Adjustment is the correction of this difference between the measured value displayed and the true weight (mass) of the sample, or the reduction of the difference to an allowable level within maximum permissible error limits.

Using Verified Scales as Legal Measuring Instruments in the EU:**
Before using your scale as a legal measuring instrument, you must perform “internal calibration” at the place of installation after the warmup period.

Available Features
You can start the isoTEST function at the press of a key to check a scale used as measuring, inspection and test equipment at any time. The scale is calibrated and any deviation is displayed. Press the **Start** soft key to start adjustment. If you do not wish to have the scale adjusted, press the **End** soft key to cancel the isoTEST.

Your scale can be calibrated externally (Scale menu: CAL/isoTST key function; menu item **Ext. cal./adj.: factory-def. wt.** or **Ext. cal./adj.: user-defined wt.**) or internally (**Internal cal./adjustment**).

External calibration can be performed
- using a pre-set weight value **Ext. cal./adj.: factory-def. wt.**, or
- with a user-defined weight **Ext. cal./adj.: user-defined wt.**

The adjustment can be performed
- automatically following calibration: **Cal., then auto adjust.** or
- if desired, the adjustment operation can be started manually after calibration: **Cal., then manual adjust**

You can also configure whether the calibration mode
- will be activated according to the specific setting (external/internal) or
- can be selected by the user after pressing the **isoTST** soft key: **Selection mode**.

You can have the scale automatically display an adjustment prompt after a certain time interval has elapsed since the last calibration/adjustment or when the ambient temperature changes by a defined amount.

You can configure the scale to perform calibration and adjustment automatically (isoCAL) when the pre-set time(s) and/or temperature limit is reached: **On and reset application** and **On without resetting application**.

You can have the calibration/adjustment results documented on an ISO/GMP-compliant printout or on a block printout with up to 50 adjustment sequences; see page 100.

Factory Settings
Calibration/adjustment mode: **Selection mode**

Calibration/adjustment sequence: **Calibrate, then auto adjust**

Automatic calibration/adjustment function: **On without resetting app.**

Start automatic adjustment: **isoCAL**

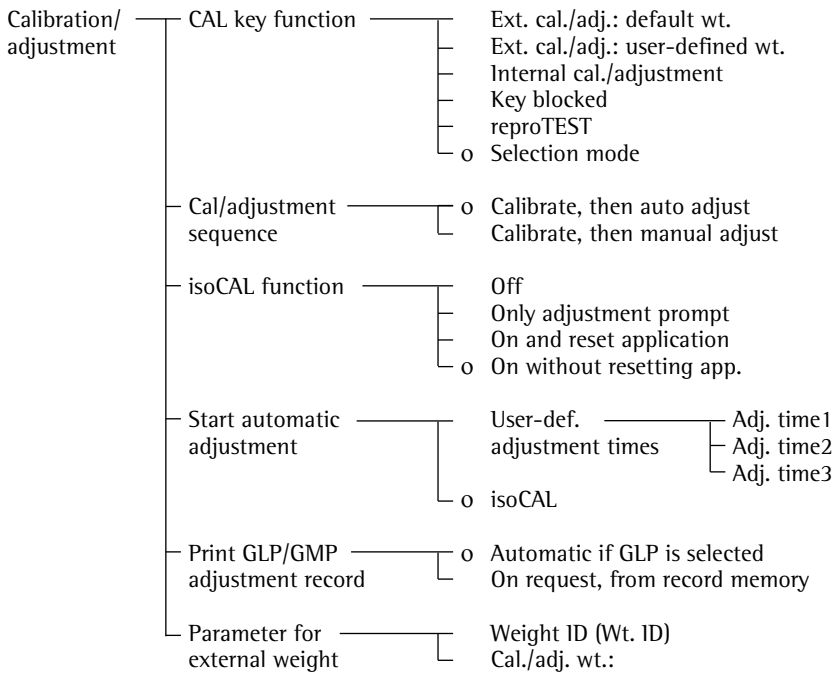
Generate GLP/GMP-compliant record: **Automatic if GLP is selected**

External Calibration in Verified Scales of Accuracy Class Ⓘ
- External calibration is blocked when the scale is used in legal metrology
> External calibration can only be released after removing the verification control seal, in which case the validity of the verification becomes void and the scale must be re-verified
- External calibration can now be performed

* isoTEST = TEST in the U.S. and Canada
** including the Signatories of the Agreement on the European Economic Area

Preparation

- Select the balance function for “calibration/adjustment”: press Setup
- To select the `Balance/scale functions`: press the `>` soft key
- Select `Calibration/adjustment`: press the `>` soft key

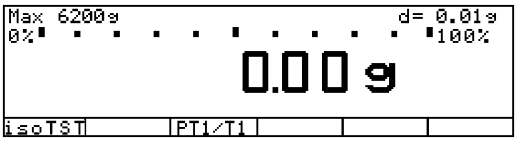
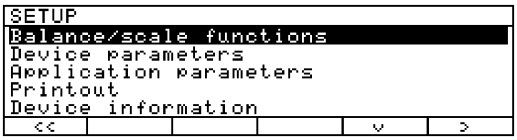
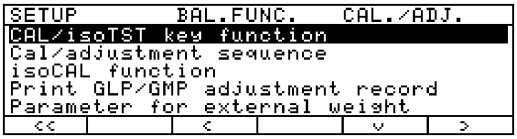
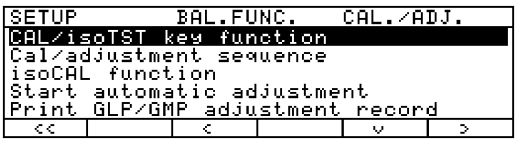
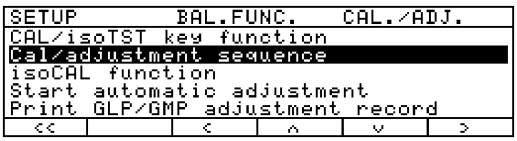


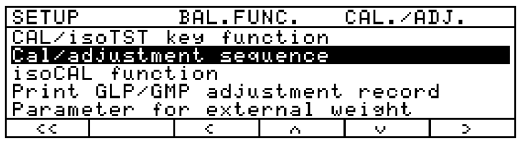
o = factory setting

- Save settings and exit Setup menu: press the `<<` soft key

Calibration/Adjustment

Preparation
Set the parameters for calibration and adjustment; e.g., with manual calibration/adjustment, isoCAL off

Step	Press key(s) (or follow instructions)	Display/Output
1. Switch on the scale, if not already on	I/⏻	Sartorius logo and self-test 
2. Select the Setup menu	Setup	
3. Select “Balance/scale functions”	> soft key	
4. Select “Calibration/adjustment”	> soft key	
5. Select CAL/isoTST key function	> soft key	 o = last setting selected
6. Select desired function and confirm (e.g., “Ext. cal./adj.; factory-def. wt.”)	^ soft key, repeatedly, if necessary ↵ soft key	
7. Exit CAL/isoTST key function	< soft key	
8. Select “Cal./adjustment sequence”	v soft key	

Step	Press key(s) (or follow instructions)	Display/Output
9. Confirm calibration and adjustment sequence	> soft key	 o = last setting selected
10. Select other settings, if desired and confirm (e.g., Calibration with manual adjustment)	v and ↵ soft keys	
11. Exit Cal./adjustment sequence	< soft key	
12. Save settings and exit the Setup menu	<< soft key	

Calibration/Adjustment

Internal Calibration/Adjustment
First set either `Internal cal./adjustment` or `Selection mode` (factory setting) in the Setup: Scale menu.

Inside the scale housing is a built-in motorized calibration weight.

The internal calibration/adjustment sequence is as follows:

● Select the calibration function: Press the `isoTST` soft key twice

> The internal calibration weight is applied automatically

> The scale is calibrated

> If the setting `Calibrate, then auto adjust` is selected in the Scale menu, the scale is now automatically adjusted

> If the setting `Calibrate, then manual adjust` is selected in the Scale menu, the internal calibration routine is now ended without adjusting the scale (see "Calibration and Adjustment Sequence", next column)

> The internal calibration weight is removed

> (ISO/GMP printout: see page 100)

Calibration and Adjustment Sequence
In the Setup menu, you can configure the scale so that:

– calibration is always followed automatically by adjustment `Calibrate, then auto adjust` (factory setting) or

– you have the choice of ending the sequence or starting adjustment after calibration `Calibrate, then manual adjust`

If no deviation is determined in calibration, or the deviation is within the tolerance limits dictated by the degree of accuracy you require, it is not necessary to adjust the scale. In this case, you can end the calibration/adjustment sequence after calibration.

There are 2 soft keys active at this point:

– `Start` to start adjustment
– `End` to end the sequence

Selecting the Calibration/Adjustment Parameter
The setting `Selection mode` must be selected in the Setup menu (factory setting).

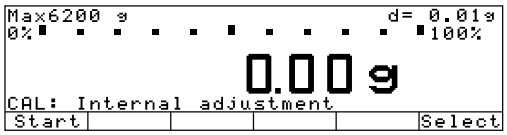
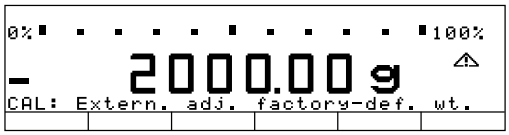
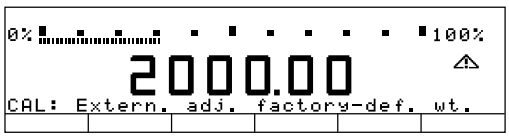
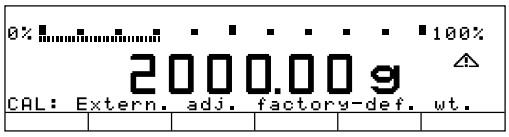
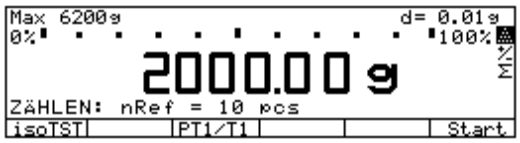
After pressing the `isoTST` soft key, you can choose from among the following settings by pressing the `Select` soft key:

- External calibration/adjustment with the preset calibration weight: `Ext. cal./adj.: factory-def. wt.`
- External calibration/adjustment with a calibration weight determined by the user: `Ext. cal./adj.: user-defined wt.`
- Internal calibration/adjustment `Internal cal./ adjustment`
- Reproducibility test `reproTEST`

● Start the desired routine:
Press the `isoTST` soft key again

In the selection mode: Perform external calibration followed by automatic adjustment with the factory-set weight

Configuration:
factory settings

Step	Key(s) (or instruction)	Display/Output
1. Select Calibration	`isoTST` soft key	
2. Select external calibration/adjustment with factory-defined weight (for scales of accuracy class (II), only “external adjustment” is possible)	`Select` soft key repeatedly	
3. Start external calibration/ adjustment	`Start` soft key	
4. Place the weight on the scale (e.g., 2,000.00 g) Minus sign –: Weight too low Plus sign +: Weight too high no plus/minus sign: Weight o.k.	Place weight on scale	
This is displayed after calibration, for approx.10 seconds: (on verified scales, the difference between the displayed weight and the true weight (mass) is displayed)		
5. Unload the scale (ISO/GMP printout: see page 100)		

Calibration/Adjustment

External Calibration/Adjustment* with a User-Defined Calibration Weight
First set either `Ext. cal./adj.:user-defined wt.` or `Selection mode` (factory setting) in the Setup: Scale menu.

You can define a weight for calibration/adjustment. External calibration/adjustment must be performed with weights that are traceable to a national standard and that have error limits which are at least 1/3 of the required tolerance of the display accuracy. The defined weight must equal at least 10% of the maximum scale capacity.

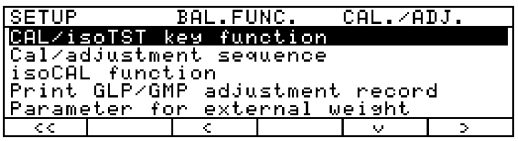
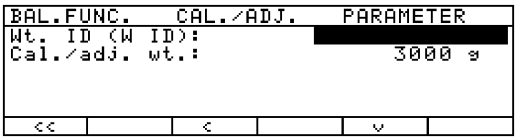
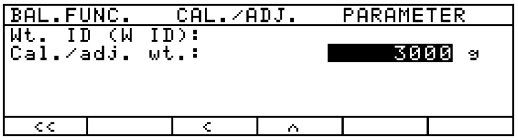
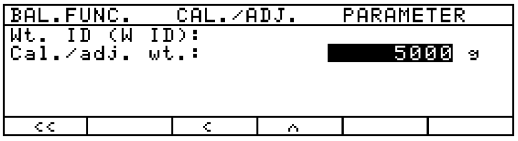
See page 41 for the external calibration/adjustment sequence. For this example, select external calibration/adjustment with a user-defined weight.

The scale has a factory-set weight value (see “Specifications”).

To reset a user-defined calibration weight to the original factory setting:

○ Enter the factory-defined value manually (see “Specifications”)

Define the Calibration Weight

Step	Press key(s) (or follow instructions)	Display/Output
1. Select Setup menu	Setup	
2. Select “Balance/scale functions”	> soft key	
3. Select “Calibration/adjustment”	> soft key	
4. Select parameter for external weight	v soft key 5 x > soft key	
5. Select “Cal./adj. wt.”	v soft key	 3000 = last setting selected
6. Enter calibration weight (e.g., 5000 g) and save	5 0 0 0	
7. Save the calibration weight	↵ soft key	
8. Exit the Setup menu	<< soft key	

isoCAL:
Automatic Calibration and Adjustment after a Change in Temperature
First set either `On and reset the application` or `On without resetting the app.` (factory setting) in the Setup: Scale menu.

The "isoCAL" display automatically begins flashing if the ambient temperature changes in relation to the temperature at the time of the last calibration/adjustment, or after a defined time interval has elapsed. The scale is telling you that it wants to adjust itself.

This automatic calibration prompt is triggered when:

- The change in temperature is greater than 10 Kelvin
- The scale status does not correspond to Setup configurations
- No number or letter input is active
- The load has not been changed within the last 2 minutes
- The scale has not been operated within the last 2 minutes
- The load on the scale does not exceed 2% of the maximum capacity

When these requirements are met, `C` is displayed in the measured value line.

If the scale is not operated and the load is not changed, internal calibration and adjustment starts after 15 seconds have elapsed.

Automatic Calibration and Adjustment at Specific Time Settings
Select either `On and reset application` or `On without resetting app.` (factory setting) in the Setup menu.

In the Setup: Input menu, you can now enter up to three different times of day for automatic calibration/adjustment. The scale will display the flashing calibration prompt ("isoCAL"). Calibration/adjustment is not performed if the scale is off or in the Setup mode at the time set for calibration.

If the scale is being operated at the time set for automatic calibration/adjustment, the calibration/adjustment sequence is prompted afterward.

If time settings are selected for automatic calibration/adjustment, the time and temperature criteria for the isoCAL function are switched off.

Automatic calibration/adjustment is prompted at fixed times when:

- The user-defined time is reached
- The scale status does not correspond to Setup configurations
- No alphanumeric input is active (e.g., equation for calculation)
- The load has not been changed within the last 2 minutes
- The scale has not been operated within the last 2 minutes
- The load on the scale does not exceed 2% of the maximum capacity

When these requirements are met, `C` is displayed in the measured value line.

If the scale is not operated and the load is not changed, internal calibration and adjustment starts after 15 seconds have elapsed.

In the Setup menu, you can configure the scale so that after calibration and adjustment

- the application program is restarted `On and reset the application`
- the application program remains at its previous status `On without resetting the app.`

Also in Setup, you can configure the scale so that it displays a calibration prompt, but does not perform the calibration/adjustment functions automatically `Only adjustment prompt`

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Calibration/Adjustment

Printout of Calibration/Adjustment Data

You can have the results of a calibration/ adjustment procedure printed out. You can configure whether the printout is generated as soon as the procedure is completed, or whether a number of calibration/ adjustment procedures (up to 50) are collected for a block printout.

Block Printout of Calibration/ Adjustment Results

With the following menu configuration under Setup: Balance/scale functions: Calibration/adjustment, you can store the data from up to 50 calibration/ adjustment procedures and have them printed on request:

- isoCAL printout

  `On request, from record memory`

When the memory contains 50 data records:

- additional records are output automatically

If at least one block printout data record has been configured, the following soft keys are available after you press the `Cal` soft key:

`Info`	The number of records is displayed in the text line
`PrtPro`	Print accumulated records
`DelPro`	Delete accumulated records; records can only be deleted after a printout has been generated. If a password has been assigned in the Setup: Input menu, you must enter either the configured password or the General Password before you can delete the records.

For internal calibration/adjustment, the initialization mode of the procedure is displayed in the `Start` line.

```
--------------------
13.05.1997     09:17
       SARTORIUS
Mod.        FC6CCE-HX
Ser. no.     60419914
Ver. no.     01-35-18
ID
--------------------

24.04.1997     12:03
Start:         manual
Diff. +      0.01 g
External calibration
       completed

25.04.1997     12:10
Start:    isoCAL/temp
Diff. +      0.01 g
Internal adjustment
       completed
Diff. +      0.00 g

25.04.1997     18:30
Start:      Adj.time
Diff. +      0.01 g
Internal adjustment
       completed
Diff. +      0.00 g

26.04.1997      9:37
Start:         manual
Diff. +      0.01 g
Internal adjustment
       completed
Diff. +      0.00 g

27.04.1997     11:53
Start:       Ext.cal.
W ID
Nom.  +  2000.00 g
Diff. +      0.01 g
External calibration
       completed
Diff. +      0.00 g

--------------------
13.05.1997     09:17
Name:

--------------------
```

GLP header

List of Calibration/Adjustment Procedures:

Example 1:
External calibration

Example 2:
isoCAL triggered by difference in temperature

Example 3:
isoCAL at defined time

Example 4:
Internal calibration/adjustment triggered manually

Example 5:
External calibration/adjustment

GLP footer

Determination of the Repeatability (reproTEST)

Definition
Repeatability is the ability of the scale to display identical readouts when it is loaded several times with the same weight under constant ambient conditions (also called "reproducibility").

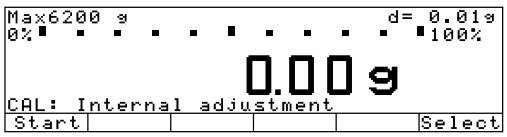
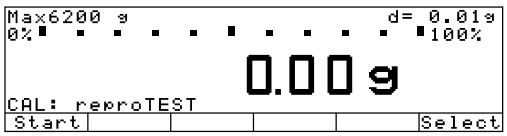
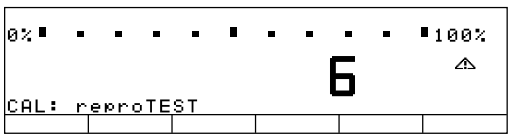
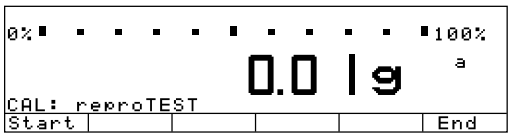
The standard deviation for a given number of measurements is used to quantify the repeatability.

Purpose
The "reproTEST" function automatically determines the repeatability of results (based on 6 individual measurements). In this way, the scale determines one of the most important quantities in relation to the place of installation. The results are displayed with the scale's accuracy.

Preparation
- Turn on the scale: press I/⏻
> The Sartorius logo is displayed
> The scale performs a self-test

- Select reproTEST in the Setup menu: Press Setup
- Select Calibration/adjustment: CAL-key function: press the > v keys
- Select either reproTEST or Selection mode (factory setting): see "Configuration"
- Exit the Setup menu: Press the << soft key

Check the Reproducibility of the Scale

Step	Key(s) (or instruction)	Display/Output
1. If reproTEST is set: and proceed with step 4.	isoTST soft key	
If Selection mode is set:	isoTST soft key	
2. Select reproTEST	Select soft key	
3. Start reproTEST	Start soft key	
4. Number of measurements is displayed; 6 measurements will now be performed		
The standard deviation is displayed		
5. End reproTEST or restart reproTEST	End soft key Start soft key	

Soft Key Functions
`Start` Start application program

`Weigh.` Toggle to basic weighing functions

Auto-Start Application When the Power Goes On
In the Setup menu, you can select whether the application that is active before you turn off the power will automatically start when the power is turned on again (Setup: Application parameters: Auto-start app. when power goes on: On).

Using Verified Scales as Legal Measuring Instruments in the EU*:
All application programs can be selected on scales verified for use in legal metrology. Non-metric values can be indicated as follows:
- Percent = %
- Piece counting (Counting) = pcs
- Computed value = o, ⚠

Toggle between Two Weight Units

Purpose
With this application program you can switch the display of a weight value back and forth between two weight units by pressing a soft key.

You can use this application program in combination with a program chosen from Application 2 (checkweighing, time-controlled functions) and one from Application 3 (totalizing, formulation, statistics).

Available Features
- Toggling the displayed weight
- Other features as for the basic weighing function

Factory Settings
Weight unit 1: `Grams /g`
Weight unit 2: `Kilograms /Kg`

Preparation
Scales used as legal measuring instruments: grams and kilograms are the only weight units available.

Standard scales: The following weight units are available in both ranges:

Unit	Conversion factor	Display/ Printout	Line for metrological data
Grams	1.00000000000	g	g
Kilograms	0.00100000000	kg	kg
Carats	5.00000000000	ct	ct
Pounds	0.00220462260	lb	lb
Ounces	0.03527396200	oz	oz
Troy ounces	0.03215074700	ozt	ozt
Hong Kong taels	0.02671725000	tlh	tlh
Singapore taels	0.02645544638	tls	tls
Taiwanese taels	0.02666666000	tlt	tlt
Grains	15.43235835000	GN	GN
Pennyweights	0.64301493100	dwt	dwt
Milligrams	1000.00000000000	mg	mg
Parts per pound	1.12876677120	/lb	lb
Chinese taels	0.02645547175	tlc	tlc
Mommes	0.26670000000	mom	M
Austrian carats	5.00000000000	K	K
Tola	0.08573333810	tol	tol
Baht	0.06578947437	bat	bat
Mesghal	0.21700000000	MS	MS

- Turn on the scale: Press I/⏻
> Sartorius logo is displayed

- Select the “Toggle weight units” program in the Setup menu: press Setup
- Select `Application parameters`: press the `v` soft key 2×, then the `>` soft key once
- `Application 1 (basic settings)`: press the `>` soft key
- Select `Toggle wt. units`: `^` or `v` soft key (repeatedly)
- Confirm `Toggle wt. units`: `>` soft key
- Select and confirm:
  - `Weight unit 1`: see above
  - `Weight unit 2`: see above
  see also the “Application Menu (Overview)” in the chapter entitled “Configuration”
- Save settings and exit the Setup menu: Press the `<<` soft key

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Additional Functions

In addition to the functions for:
- alphanumeric input,
- taring (not during alphanumeric input),
- printing (NUM print; S ID),

you can also access the following functions from this application:

Calibration/Adjustment
- ● Press the **isoTST** soft key
- > See "Calibration/Adjustment" for further instructions

Toggling to the Next Application
- ● Press [DT]
- > See the section on the corresponding application program for further instructions

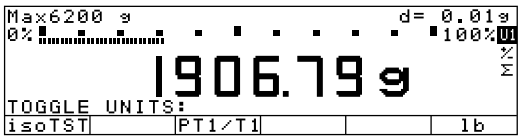
Setup (setting parameters)
- ● Press [Setup]
- > See "Configuration" for further instructions

Turning Off the Scale
- ● Press [I/⏻]
- > The scale shuts off

Practical Example

Toggle the Display From Grams [g] (1st Unit) to Pounds [lb] (2nd Unit)

Settings (changes in the factory settings required for this example):
Setup: App: Application 1: Toggle wt. units: Weight unit 2: Pounds/lb

Step	Key (or instruction)	Display/Output
1. Delete previous setting if necessary (**U1**: Weight unit 1)	[CF]	
2. Change weight unit to Pounds [lb] (**U2**: Weight unit 2)	**lb** soft key	
3. Change weight unit to Grams [g]	**g** soft key	

Counting

Purpose
With the Counting application, you can determine the number of pieces of approximately equal weight.

You can use this application program in combination with a program chosen from Application 2 (checkweighing, time-controlled functions) and one from Application 3 (totalizing, formulation, statistics).

Features
- Optional scale configuration in Setup for automatically initializing this application and loading the most recent reference sample quantity “nRef” and average piece weight “wRef” when you switch on the scale (this is the automatic setting when the scale is initialized; Setup menu: Application parameters: Auto-start app. when power goes on: On).
- Reference sample quantity “nRef” entered manually
- Average piece weight “wRef” entered manually
- Storage of the current weight value for the preset reference sample quantity “nRef”, to be loaded when the Counting program is initialized
- Setting the accuracy when the reference sample weight “wRef” is stored for calculating a piece count
- Automatic output of the quantity and sample weight via the data interface port after initialization or reference sample updating while running the Counting program (Printout: Application-defined printout: Auto print upon initialization: All values)
- Toggling between piece count and weight value by pressing the `Count.` or `Weigh.` soft key
- Toggling between counting and other applications using the key (for example, checkweighing)

Factory Settings
Accuracy when calculating piece weight:
`Display accuracy`

Reference sample updating:
`Automatic`

Soft Key Functions

`nRef`	Store value input as reference sample quantity
`wRef`	Store input value as reference sample weight
`Update`	Reference updating criteria met; reference updating can be performed to optimize the accuracy
`Count.`	Toggle to the Counting application
`Weigh.`	Toggle to the Weighing mode
`Start`	Storage of the current weight value for the preset reference sample quantity

Preparation

To calculate a piece count, the average weight of one piece must be known. This average piece weight can be entered into the Counting program in one of three ways:

- Enter the average piece weight using the numeric keys and store it;
- The last reference sample quantity entered is loaded and displayed when you turn on the scale. Place the same number of parts on the scale and initialize the Counting program;
- When the automatic initialization parameter (see previous page) is on (Setup: Printout: Application-defined output: Auto print upon initialization: All values), the scale goes into the "Counting" mode when you turn it on and loads the last average piece weight and corresponding reference sample quantity that were entered or calculated.

Reference Sample Updating

You can have the average piece weight updated during counting (with the piece count displayed) if "AWP update" is set to "manual" or "automatic" in the Setup menu. Manual updating can only be performed when the **Update** soft key is displayed. Reference sample updating must be completed before using an application program from Application 3.

The **Update** soft key is displayed when:

- the scale has reached stability (stability symbol displayed)
- the current piece count is less than double the original piece count
- the current piece count is less than 100
- the internally calculated piece count (e.g., 17.24) differs from the nearest whole number (here: 17) by less than 0.3

Reference updating can be repeated several times with an approximately doubled piece count.

● To perform reference updating: Press the **Update** soft key

● Turn on the scale: Press I/⏻
> Sartorius logo is displayed, self-test is performed

● Select the "Counting" program in the Setup menu: Press Setup

● Select **Application parameters**: press the **v** soft key 2×, then the **>** soft key once

● Select **Application 1 (basic settings)**: press the **>** soft key

● Select **Counting**: **^** or **v** soft key, repeatedly

● Confirm **Counting**: **>** soft key

- Counting
  - Average – average piece weight calculation
    - o Display accuracy
    - +1 decimal place
    - +2 decimal places
  - Average piece weight updating
    - Off
    - Manual
    - o Automatic

o = factory setting

see also the "Application Menu (Overview)" in the chapter entitled "Configuration"

● Save settings and exit the Setup menu: Press the **<<** soft key

Additional Functions

In addition to the functions for:
- alphanumeric input,
- taring (not during alphanumeric input),
- printing,

you can also access the following functions from this application:

Calibration/Adjustment
● Press the **isoTST** soft key
> See "Calibration/Adjustment" for further instructions

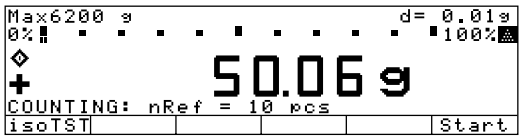
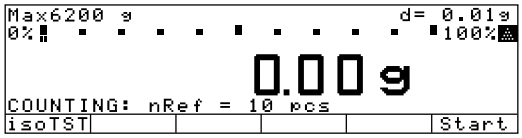
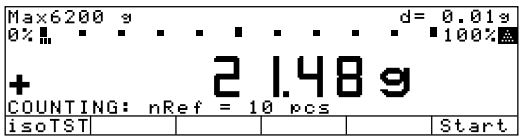
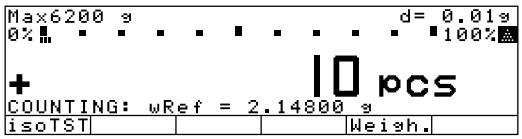
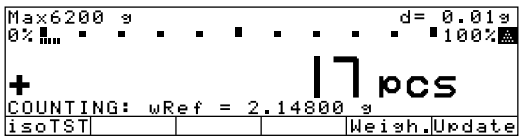
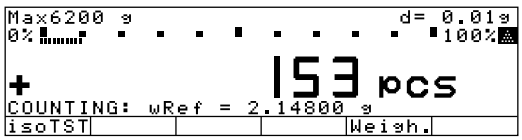
Toggling to the Next Application
● Press ⏻
> See the section on the corresponding application program for further instructions

Setup (setting parameters)
● Press Setup
> See "Configuration" for further instructions

Turning Off the Scale
● Press I/⏻
> The scale shuts off

Practical Example
Determining an Unknown Piece Count; Weighing in the Preset Reference Sample Quantity

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Application 1: Counting: Average piece weight updating: Manual
Setup: Printout: Application-defined output: Autoprint upon initialization: All values

Step	Key (or instruction)	Display/Output
1. Delete previous setting if necessary	CF	
2. Prepare a container for the parts to be counted	Place the empty container on the scale	
3. Tare the scale	Tare	
4. Place the reference sample quantity on the scale (example: 10 pcs)	Place the displayed number of parts in the container	
5. Determine the average piece weight (number of decimal places displayed depends on the scale model)	**Start** soft key	 nRef + 10 pcs wRef + 2.14800 g
6. If necessary, increase the number of parts and perform reference sample updating (example: 7 additional pieces)	Place additional parts in the container **Update** soft key	 nRef + 17 pcs wRef + 2.14800 g
7. Weigh uncounted parts	Place parts to be counted in the container	
8. If desired, print total piece count (here: 153 pcs)	F	Qnt + 153 pcs

Weighing in Percent %

Purpose
This application program allows you to obtain weight readouts in percent which are in proportion to a reference weight. Alternatively, you can have the value displayed as a difference in percent between the weight on the scale and the reference weight, or as a special ratio 1 or ratio 2.

You can use this application program in combination with a program chosen from Application 2 (checkweighing, time-controlled functions) and one from Application 3 (totalizing, formulation, statistics).

Available Features
- Reference percentage "pRef" loaded from long-term memory when you turn on the scale
- Optional scale configuration in Setup for automatically initializing this application and loading the most recent reference percentage "pRef" entered with reference weight "Wxx%" when you turn on the scale
- Value displayed as:
  – Residual quantity (portion)
  – Difference (deviation)
  – Ratio1
  – Ratio2
  depending on the Setup menu code selected.
- Reference percentage "nRef" entered manually
- Store the current weight as the reference percentage weight "Wxx%" for initializing the weighing-in-percent application program
- Reference weight "Wxx%" entered manually
- Storage parameter (rounding-off factor) for storing the reference weight "W100%" in percentage calculation can be configured
- Configuration of decimal places displayed with a percentage
- Optional configuration for having the reference weight "Wxx%" and reference percentage automatically output via the data interface port after initialization of the weighing-in-percent program (print application parameters)
- Toggle the display between percentage and weight readout by pressing the **Weigh.** soft key
- Toggle between the weighing-in-percent program and other applications (e.g., checkweighing) by pressing

Factory Settings
Storage parameter:
Display accuracy

Digits displayed with percentage:
2 digits

Display calculated value:
Residue

Soft Key Functions

pRef	Store value input as reference percentage
Wxx%	Store input value as reference sample weight
Perc.	Toggle to the Weighing-in-percent application
New	Store next value
Weigh.	Toggle to the Weighing mode
Start	Store the current weight value for the preset reference sample quantity

Preparation

To calculate a value in percent, the reference percentage must be known.
This value can be entered into the weighing-in-percent program in one of three ways:

– The last reference percentage entered is loaded and displayed when you turn on the scale. Place the corresponding weight on the scale and initialize the weighing-in-percent program;

– With automatic initialization switched on (see previous page), the scale goes into the "weighing in percent" mode when you turn on the power and loads the last reference percentage entered as well as the corresponding reference weight (Setup: Printout: Application-defined output: Auto print upon initialization: All values);

– Enter the reference weight using the numeric keys and store it (`Wxx%` soft key).

● Turn on the scale: press I/⏻
> Sartorius logo is displayed, self-test is performed

● Select the "Weighing in percent" application in the Setup menu: press Setup

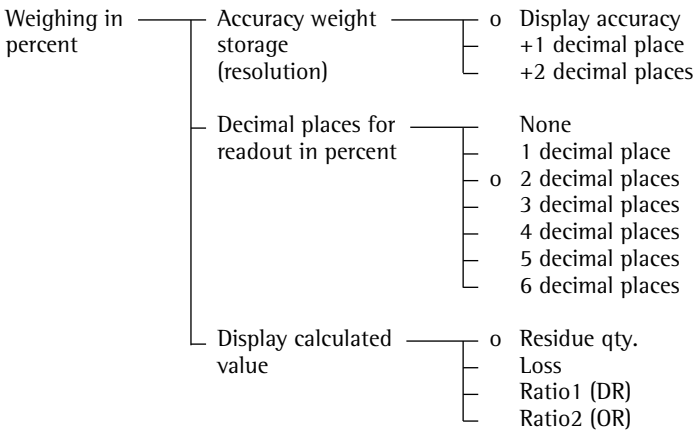
● Select `Application parameters`: press the `v` soft key 2×, then the `>` soft key once

● Select `Application 1 (basic settings)`: press the `>` soft key

● Select `Percent weigh.`: `^` or `v` soft key repeatedly

● Confirm `Percent weigh.`: `>` soft key

● Select and confirm:



o = factory setting

see also the "Application Menu (Overview)" in the chapter entitled "Configuration"

● Save settings and exit the Setup menu: Press soft key `<<`

Equations

The following equations are used for the corresponding calculations:
Residue = Current weight ÷ 100% weight x 100%
Loss = (Current weight – 100% weight) ÷ 100% weight x 100%
Ratio1 = (100% weight – current weight) ÷ current weight x 100%
Ratio2 = 100% weight ÷ current weight x 100%

Additional Functions

In addition to the functions for:

– alphanumeric input,
– taring (not during alphanumeric input),
– printing,

you can also access the following functions from this application:

Calibration/Adjustment
● Press the `isoTST` soft key
> See "Calibration/Adjustment" for further instructions

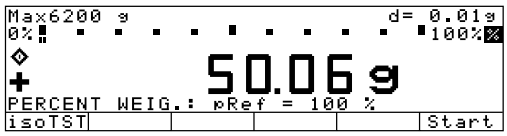
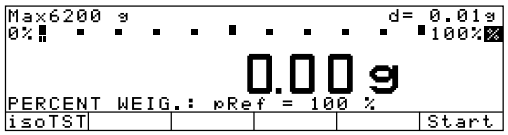
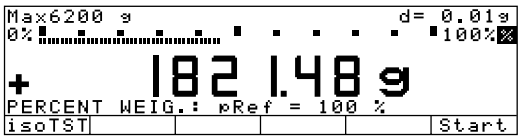
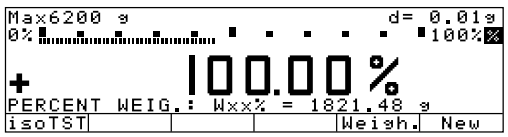
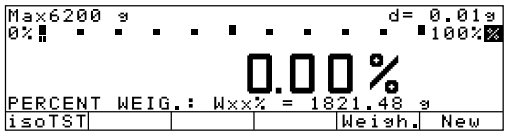
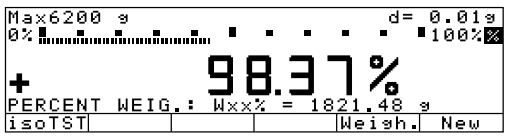
Toggling to the Next Application
● Press ⏻
> See the section on the corresponding application program for further instructions

Setup (setting parameters)
● Press Setup
> See "Configuration" for further instructions

Turning Off the Scale
● Press I/⏻
> The scale shuts off

Examples
Practical Example: Weighing in Percent with Reference Weight Taken from Weight on Scale

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Application 1: Weighing in percent
Setup: Printout: Application-defined output: Autoprint upon initialization: All values

Step	Key (or instruction)	Display/Output
1. Delete previous setting if necessary	CF	
2. Prepare a container for the parts	Place the empty container on the scale	
3. Tare the scale	Tare	
4. Place the reference weight on the scale (here: 1821.48 g = 100%)	Place weight equal to reference weight in the container	
5. Initialize the scale	Start soft key	 pRef + 100 % Wxx% + 1821.48 g
6. Unload the scale	Remove reference sample from the container	
7. Determine the percentage of an unknown weight	Place sample to be measured in the container	
8. If desired, print percentage (here: 98.37%)		Prc + 98.37 %

Animal Weighing

Purpose
Use this program to determine the weights of unstable samples (e.g., live animals) or to determine weights under unstable ambient conditions. In this program, the scale calculates the weight as the average of a defined number of individual weighing operations. These weighing operations are also known as "subweighing operations."

You can use this application program in combination with a program chosen from Application 2 (checkweighing, time-controlled functions) and one from Application 3 (totalizing, formulation, statistics).

Available Features

- Animal weighing started manually or automatically
- Automatic start:
  - when a defined threshold has been exceeded (Minimum load threshold: None; 10; 20; ...; 500; 1,000 display increments)
  - when three successive subweights lie within a user-defined tolerance range (calm; normal; active; 0.1%; 0.2%; ...; 50%; 100% of the animal/object)
- Manual start:
  - also possible when the load is under the minimum load threshold
  - when three successive subweights lie within a user-defined tolerance range (calm; normal; active; 0.1.%; 0.2%; ...; 50%; 100% of the animal/object)
  - Optional scale configuration in the Setup menu for automatically initializing this application when you turn on the scale (Setup: Printout: Auto-start application when power goes on: On)
- Number of weighing operations for calculation of an average (`mDef`) can be set before the beginning of each animal weighing operation
- The factor for calculation of the result can be set before the beginning of each animal weighing operation
- The number of subweighs remaining to be performed is indicated in the text display during weighing
- Arithmetic average displayed as a result in the pre-set weight unit (identified by the ⚠ symbol).
- Optional multiplication of the arithmetic average by a user-defined factor `Mul`.
  A circle "o" is displayed as weight unit and `Mul = xxx` is shown in the text line
- Toggling between the weight and the calculated value by pressing the `xNet` soft key and the `xRes` soft key
- Automatic output of results via the interface port:
  - Number of weighing operations `mDef`
  - Multiplication factor `Mul`
- Automatic output of results (printout) via the interface port:
  - Weighing result `xNet`
  - Calculated result `xRes`

  The following options have to be set: Printout: Application-defined output: Auto print upon initialization: All values
- The unload threshold is equal to one-half the minimum scale capacity
- Return to weighing mode by unloading the scale; i.e., when the load is below the unload threshold

Factory Settings
Animal activity:
`5% of the animal/object`

Start: `Automatic`

Minimum load for automatic storage:
`100 display increments`

Decimal places in result display:
`2 decimal places`

Printout:
`Average weight only`

Soft Key Functions

`New` Automatic start:
- Unload scale and weigh next animal, if desired
- Press key to start next subweigh

Manual start:
Start next subweigh

`mDef` Store user-defined number of subweighs for averaging

`Mul` Store user-defined factor as multiplication factor for calculated the arithmetic mean

`xNet` Toggle to the animal weighing application

`xRes` Toggle to the calculated animal weighing result

`Start` Activate Animal weighing

Printout for Animal Weighing
Upon completion of the averaging process, you can have the results printed out automatically. You can also have both the weight and the calculated result printed.

```
mDef          10
Mul      0.00347
xNet  +   153.00 g
xRes  +     5.30 o
```

mDef: Number of subweighing operations for averaging

Mul: Multiplication factor

xNet: Result of averaging

xRes: Calculated result

Preparation

- Turn on the scale: press I/⏻
> Sartorius logo is displayed

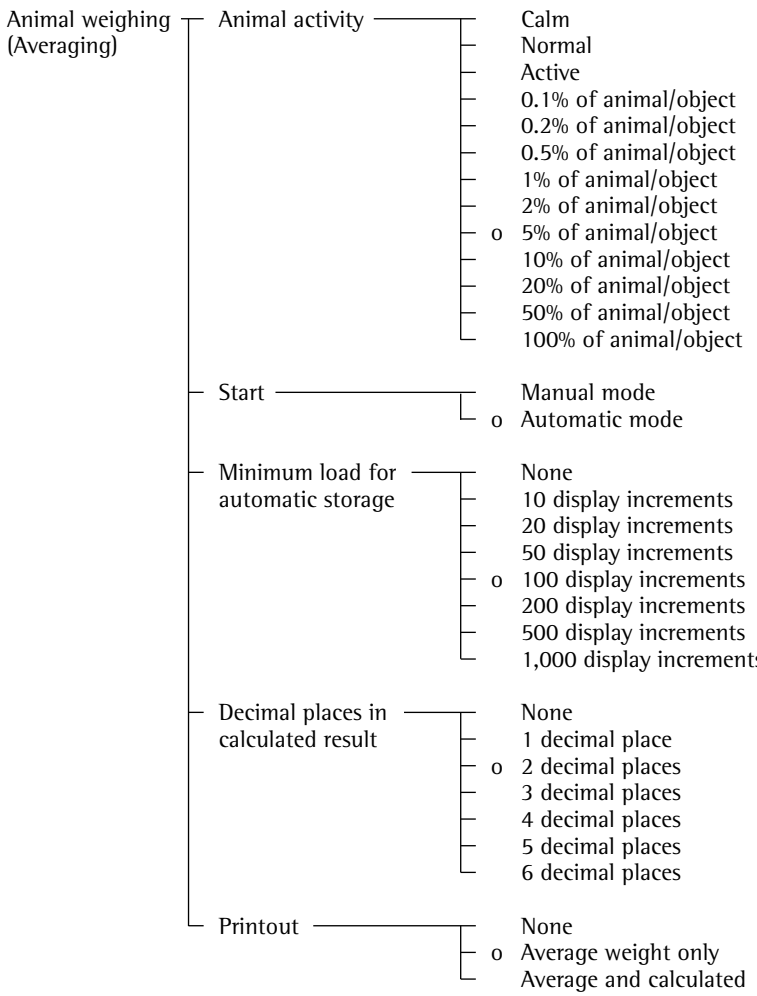
- Select the “Animal weighing” application in the Setup menu: press Setup

- Select `Application parameters`: press the `v` soft key 2×, then the `>` soft key once

- Select `Application 1 (basic settings)`: press the `>` soft key

- Select `Animal weigh.`: `^` or `v` soft key repeatedly

- Confirm `Animal weigh.`: `>` soft key



o = factory setting

see also the “Application Menu (Overview)” in the chapter entitled “Configuration”

- Save settings and exit the Setup menu: press the `<<` soft key

Additional Functions

In addition to the functions for:

– alphanumeric input,

– taring (not during alphanumeric input),

– printing,

you can also access the following functions from this application:

Calibration/Adjustment

- Press the `isoTST` soft key
> See “Calibration/Adjustment” for further instructions

Toggling to the Next Application

- Press ⏻
> See the section on the corresponding application program for further instructions

Setup (setting parameters)

- Press Setup
> See “Configuration” for further instructions

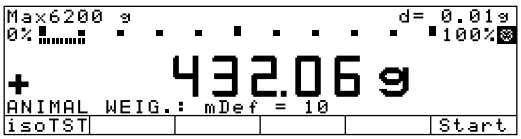
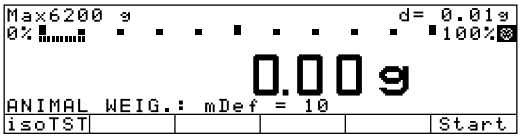
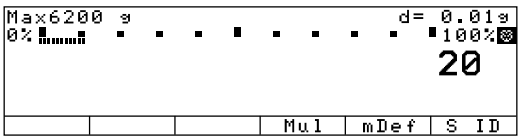
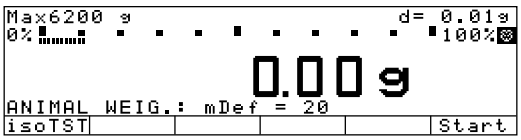
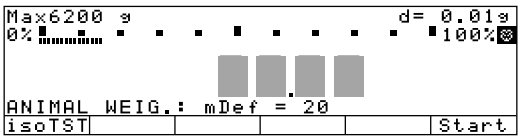
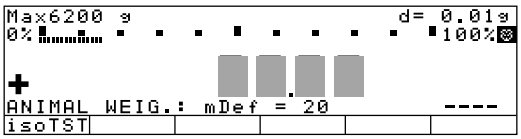
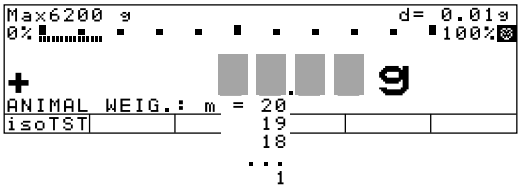
Turning Off the Scale

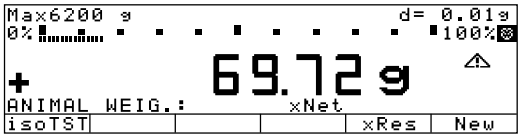
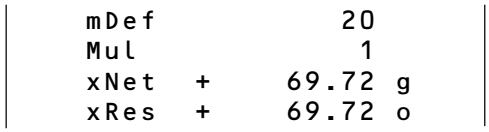
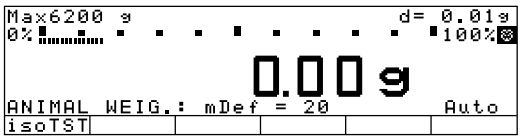
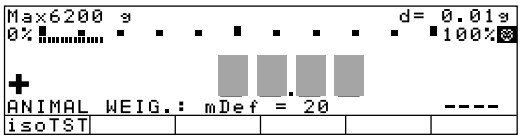
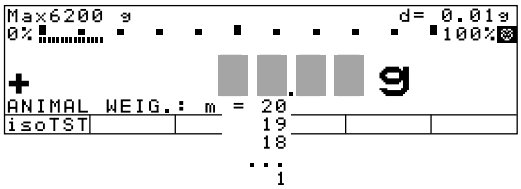
- Press I/⏻
> The scale shuts off

Animal Weighing

Practical Example
Determining Animal Weight With Automatic Start of 20 Subweighing Operations for Averaging; Automatic Printout of the Number of Subweighing Operations and of the Animal Weight

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Application 1: Animal weighing: Animal activity: Active
Setup: Application parameters: Application 1: Animal weighing: Decimal places in calculated result display: 2 decimal places
Setup: Application parameters: Application 1: Animal weighing: Printout: Average and calculated values
Setup: Printout: Application-defined output: Auto print upon initialization: All values

Step	Key (or instruction)	Display/Output
1. Delete previous setting if necessary	CF	
2. Prepare a container (cage)	Place empty cage on the scale	
3. Tare the scale	Tare	
4. Enter number of subweighing operations for averaging	2 0	
5. Save number	**mDef** soft key	
6. Weigh the first animal	Place 1st animal in cage	weight value fluctuates due to animal activity 
7. Start automatic animal weighing	**Start** soft key	
The scale delays starting the subweighing operation until three successive subweights lie within the range defined for an “active” animal	When this criterion is met, the subweighing series begins	

Step	Key (or instruction)	Display/Output
After 20 subweighing operations the arithmetic average (xNet) is displayed		
(**mDef**: no. of subweighs **Mul**: calculation factor **xNet**: arithm. average, net value)		
8. Unload the scale	Remove animal from cage	
9. If desired, weigh next animal	Place animal in cage	
Next weighing series begins automatically		

Recalculation

Purpose
With this application program you can compensate for over-poured components in formulation.

If a component is over-poured when weighing in the individual formulation components, the mixture already poured cannot be used in its current composition. To avoid having to discard the materials weighed, you can adjust the proportions of the formulation to compensate for the over-pour.

When you use this application, the recalculation procedure is mainly performed by the scale.

You can use this application program in combination with a program chosen from Application 2 (checkweighing, time-controlled functions) and one from Application 3 (totalizing, formulation, statistics).

Available Features

- Individual components (up to 99) weighed in with a readout showing from "0" to the desired component weight
- Transaction counter shows the next component expected
- Weighed components are stored, followed by automatic printout and taring
- Additive weighing of components with printout
- Toggle the display between component weight and total formulation weight (additive mode) after first component is stored
- Stored component weight displayed as true net weight for 2 seconds
- Enter a divisor before or during component weighing. For example, if the formulation has a total weight of 100 g, enter the divisor 10 to weigh in a total formulation of 1,000 g
- If a component is over-poured, you can use the recalculation function to change the amount of this component indicated in the formulation by using plus or minus keys or numeric input. A factor is then calculated by which all components amounts will then adjusted
- Recalculation factor displayed in the text line, with a warning symbol if the factor is not equal to 1
- All components displayed with number and the amount (by weight) to be added in follow-on filling. Components displayed in sequence by the scale
- Display of actual net weight during follow-on filling
- After the amounts of the components already weighed have been corrected, weighing continues according to the adjusted formulation amount. The readout is recalculated (updated) according to the divisor
- You can repeat the over-pour correction procedure as often as necessary, in case other components are over-poured
- After follow-on (corrective) filling, the total amount differs from that given for the formulation, but the proportion of components in relation to each other is the same
- You can have the weight printed after each measurement
- Choose whether the current component weight or tare value is printed after each measurement
- Individual component weights are printed as "Compxx."
- Press CF to exit the application program. The component memory is cleared and the sum of components printed as "S-Comp."
- Toggle between the recalculation program and other applications (e.g., checkweighing) by pressing ↕.

Factory Settings of the Parameters
Print application parameters (automatic output of application parameters):
`All values`

Line format:
`for other apps/GLP`
(22 characters)

Soft Key Functions

`Comp.xx`	Store component
`Add.xx`	Store component in additive weighing mode
`Div.`	Store divisor before or during component weighing
`Recalc`	Start correction procedure for recalculation
`→Add./ →Comp.`	Toggle display between component weight and total weight (additive mode)
`Comp.`	Store numeric input for recalculation
`Minus`	Set value given for the formulation
`Plus`	Set value given for the formulation

Preparation
- Turn on the scale: press I/⏻
> The Sartorius logo is displayed

- Select the “Recalculation” application in the Setup menu: press Setup
- Select `Application parameters`: press the `v` soft key 2×, then the `>` soft key once
- Select `Application 1 (basic settings)`: press the `>` soft key
- Select `Recalculation`: `^` or `v` soft key repeatedly
- Confirm `Recalculation`: `<` soft key
- Save settings and exit the Setup menu: press the `<<` soft key

Additional Functions
In addition to the functions for:

– alphanumeric input,

– taring (not during alphanumeric input), and

– printing,

you can also access the following functions from this application:

Calibration/Adjustment
- Press the `isoTST` soft key
> See “Calibration/Adjustment” for further instructions

Taggling to the Next Application
- Press ⏲
> See the section on the corresponding apllication program for further instructions

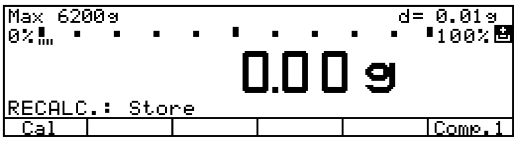
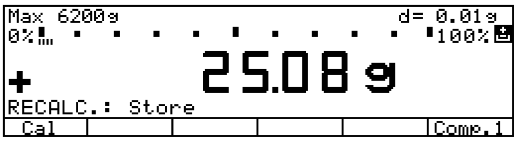
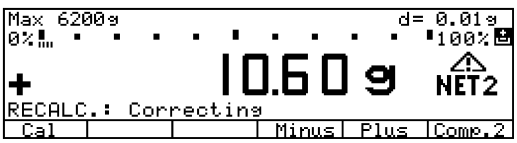
Setup (setting parameters)
- Press Setup
> See “Configuration” for further instructions

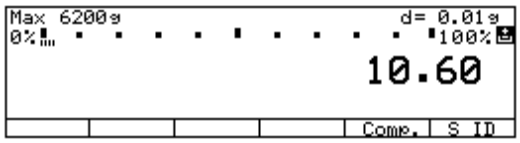
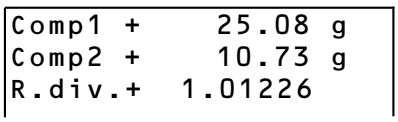
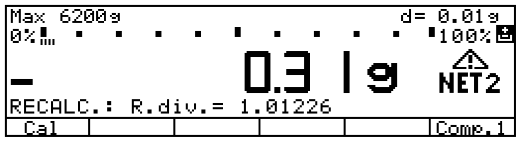
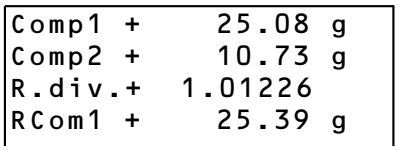
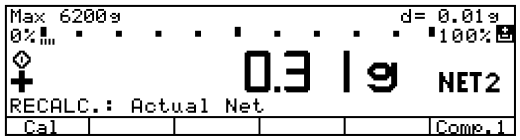
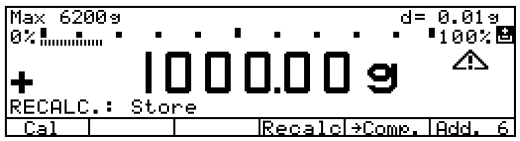
Turning Off the Scale
- Press I/⏻
> The scale shuts off

Recalculation

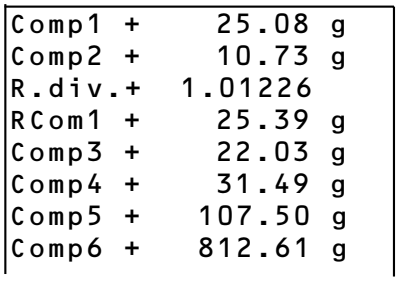
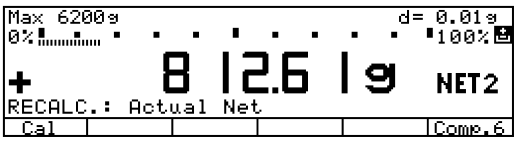
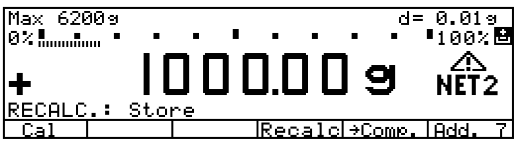
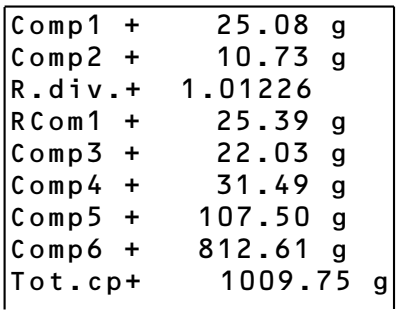
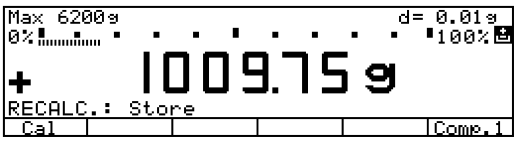
Practical Example
When weighing in formulation components, the second component is over-poured.

Settings (changes in the factory settings required for this example):
Setup: App(lication parameters): Application 1: Recalculation

Step	Key (or instruction)	Display/Output
1. Delete previously stored values, if necessary	CF	
2. Place container for filling components on the scale	Place empty container on the scale	
3. Tare	Tare	
4. Add the first component	Weigh the first component into the container	
5. Store component	Press the Comp.1	Comp1 + 25.08 g
6. Add the second component	Weigh the second component into the container	
7. Start recalculation, because 10.73 g were poured rather than 10.60 g	Recalc soft key	
8. Either press the minus key to correct the value ...	Minus soft key repeatedly	

Step	Key (or instruction)	Display/Output
... or enter the desired value	1 0 · 6 0	
9. Confirm the new value	Comp. soft key	
Follow-on filling amount for first component is displayed		
10. Follow-on filling of 1st component	Weigh the first component up to 0	
and store	Comp.1 soft key	
The true net value is displayed for 2 seconds		
11. Weigh in further components, if called for in the formulation	Repeat steps 4 and 5 as needed	
12. Toggle to the additive mode, if required	→Add. soft key	
13. Add further components, as required ... (here, e.g., up to the total weight of the formulation:1,000 g)	Add components to container	

Recalculation

Step	Key (or instruction)	Display/Output
14. ... and store (here, e.g., the 6th component)	**Add.6** soft key	
The true net value (of the 6th component) is displayed for 2 seconds		
Then the total weight is displayed		
15. End the weighing procedure Total weight is printed	CF	
Total weight is displayed Component memory is cleared		

Calculation

Purpose
With this application program you can calculate a weight value using an algebraic equation. This can be used, for example, to determine the gsm weight (grams per square meter) of paper.

You can use this application program in combination with a program chosen from Application 2 (checkweighing, time-controlled functions) and one from Application 3 (totalizing, formulation, statistics).

Available Features
- You can store an equation and configure the Setup menu to initialize this program automatically with the stored equation (Setup: ... Auto-start application when power goes on: On)
- The o symbol is displayed to indicate a calculated value. The equation used is displayed in the text line
- If no equation was entered, the weight value is displayed
- Toggle between the weight readout, equation input and display of the calculated result by pressing the `Start` or `Weigh` soft key (or press CF to toggle between weight and calculated value)
- There are four operators (+, –, *, /) and one factor (weight value) available when you enter an equation
- Max. equation length: 28 characters
- Pressing CF will delete either the equation or the last character entered, depending on the configuration in the Setup menu (Setup: ... Keyboard: CF function for input: Delete last character; see also "Configuration")
- The calculated result is displayed with the number of decimal places configured in the Setup menu. Not all decimal places are displayed if the result is longer than the display allows. If there are more digits before the decimal point than the display can show, an error message is displayed.
- The equation is stored in non-volatile memory

Factory Settings
Decimal places in calculated result:
`2 decimal places`

Soft Key Functions

`Equat.`	Toggle to equation
`+`	Enter an addition operator in the equation
`–`	Enter a subtraction operator in the equation
`*`	Enter a multiplication operator in the equation
`/`	Enter a division operator in the equation
`Start`	Start calculation
`Weigh.`	Toggle to the weighing mode
`Weight`	Enter a weight operand in the equation

Printout for Calculation
The calculation result is printed.

```
Res    +    693.88 o
```

Res: Result of calculation with equation

Additional Functions
In addition to the functions for:
- alphanumeric input,
- taring (not during alphanumeric input),
- printing,

you can also access the following functions from this application:

Calibration/Adjustment
● Press the `isoTST` soft key
> See "Calibration/Adjustment" for further instructions

Toggling to the Next Application
● Press ⏻
> See the section on the corresponding application program for further instructions

Setup (setting parameters)
● Press Setup
> See "Configuring the Scale" for further instructions

Turning Off the Scale
● Press I/⏻
> The scale shuts off

Preparation
● Turn on the scale: press I/⏻
> Sartorius logo is displayed

● Select the "Calculation" application program in the Setup menu: press Setup

● Select `Application parameters`: press the `v` soft key 2×, then the `>` soft key once

● Select `Application 1 (basic settings)`: press the `>` soft key

● Select `Calculation`: `^` or `v` soft key repeatedly

● Confirm `Calculation`: `>` soft key

Calculation → Decimal places in calculated result:
- None
- 1 decimal place
- o 2 decimal places
- 3 decimal places
- 4 decimal places
- 5 decimal places
- 6 decimal places

o = factory setting

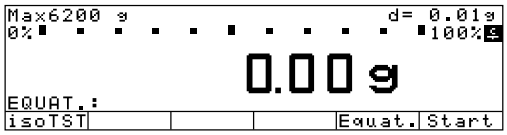
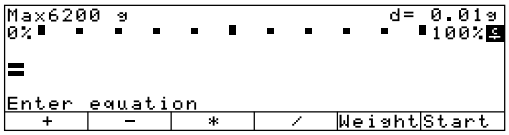
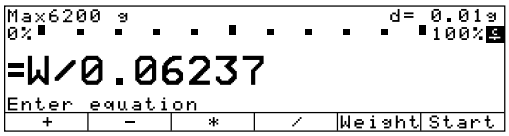
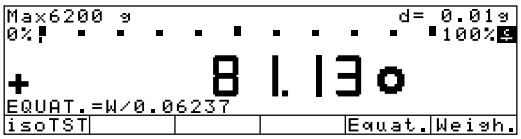
see also the "Application Menu (Overview)" in the chapter entitled "Configuration"

● Save settings and exit the Setup menu: press `<<` soft key

Calculation

Practical Example
Calculate the gsm weight of paper: determine the gsm of a sheet of A4 paper with the dimensions 0.210 m × 0.297 m = 0.06237 m^2. The gsm weight is a product of the division of the weight by the surface area.

Settings (changes in the factory settings required for this example):
Setup: App: Application 1: Calculation

Step	Key (or instruction)	Display/Output
1. Turn on the scale and configure the settings as indicated above	I/⏻	
2. Delete previous setting if necessary	CF	
3. Tare the scale	Tare	
4. Select equation input	**Equat.** soft key	
5. Enter weight value Enter division sign Enter the surface area of a sheet of A4 paper	**Weight** soft key / soft key · 0 6 2 3 7	
6. Turn on the calculated result display	**Start** soft key	
7. Determine the gsm weight	Place A4 sheet on the scale	

Checkweighing %

Purpose
This program is used to check whether a sample corresponds to a pre-set target value or is within a specific tolerance range. In addition to the display in the measured value line, the results are shown on the bar graph and can be routed through the interface port via control lines for further electronic processing.

You can use this application in combination with any program chosen from Application 1 (such as counting, weighing in percent) and one from Application 3 (totalizing, formulation, statistics).

Available Features
- Optional configuration in the Setup menu for long-term storage of target value and tolerance limits
- Optional scale configuration in the Setup menu for automatically initializing this application and loading the values stored in long-term memory for the target value and the upper and lower tolerance limits when you turn on the scale
- You can perform checkweighing
  - without entering a target value, but only upper and lower tolerance limits;
  - as differential checkweighing;
  - with symmetric or asymmetric limits which can be entered as percentages
- Enter the target value and limits by placing a load on the scale or using the numeric keys
- Control parameter in entering target and tolerance values, so that the upper limit ≥ the target ≥ the lower limit ≥1 display increment
- Accuracy of a weight readout or keyboard input as target/tolerance values corresponds to the display accuracy
- Optional scale configuration in the Setup menu for automatic output to the interface port (print application parameters) of the target value and tolerance limits when initialization is completed (... Auto print upon initialization: All values).
- Control range for the scale's data output port lines is 30% to 170% of the target value
- Optional configuration in the Setup menu for activation of control lines dependent on weight value (weight value within checkweighing range, stability reached)
- Toggling the display between weight readout and checkweighing display by pressing the corresponding soft key. If the weight value exceeds tolerances, the line for measured values shows the weight while the checkweighing display shows »LL« for »too low« or »HH« for »too high.«
- Press the `Show` soft key to display target value and tolerance limits in the text line after initializing the application.
- Weight value in bar graph displayed in relation to upper and lower limits and target value
- »OK« transaction counter displayed in the text line (e.g., `n = 4`), if selected (Checkweighing: Automatic printout of OK values: Yes). This counter shows the number of measured values that lie within the tolerance range.
- Optional automatic printout of the weight value when it is within the control range at stability

  After an automatic printout, the printing of OK values is blocked. Before you can generate the next printout, you must unblock the scale by unloading it (weight must be under 30% of the target) or by placing a load on the scale (bringing the weight up to at least 170% of the target).
- Initialization parameters are overwritten after the `Param.` soft key has been pressed
- Press CF to delete the initialization parameters and end the Checkweighing program

Factory Settings
Activation of port lines:
`Within checkweighing range`

Type of checkweighing input:
`Target, minimum, maximum weight`

Weight display mode:
`Absolute value`

Automatic printout of OK values: `No`

Soft Key Functions

`Param.`	Begin input of target and tolerance values
`Show`	Display target and tolerance values in succession during checkweighing
`LLHH`	Toggle to checkweighing display (»LL« for too light and »HH« for too heavy)
`Diff.`	Display difference between current value and target
`Net`	Display net weight
`Start`	Start checkweighing

Auto Print Checkweighing
With the over/under checkweighing application, you can have the result printed automatically as soon as the weight lies within a defined range.

```
N     +     153.00 g
Setp  +     180.03 g
Min   +     160.05 g
Max   +     200.06 g
N     +     165.14 g
```

N: Net weight
Setp: Target weight
Min: Lower limit
Max: Upper limit
N: Printout of "OK" values

Checkweighing

Preparation
The checkweighing program often requires a target value for comparison with the current value. This target has a tolerance range, which is defined by absolute weight values. The tolerance range is defined as either an absolute value or a percentage with upper and lower limits. The values defining the limits can be symmetric or asymmetric to the target value. These values can be entered either by storing weights on the scale or by key input.

There are four control lines, called data output port lines, which are activated as follows: (see also the diagram at the right):

- lighter
- equal
- heavier
- set

The control range spans 30% to 170% of the target value. You can configure this parameter in the Setup menu (... Application 2: Checkweighing: Activation of port lines:) to select whether the control lines are:

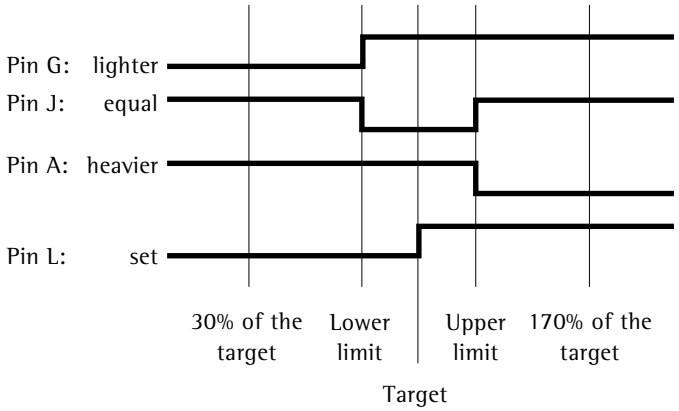
- activated within the checkweighing range
- always on
- activated at stability within the checkweighing range
- activated at stability
- activated at stability within the checkweighing range
  –> once

This makes it possible, for example, to connect a simple indicator for the weighing results (e.g., three different colors, one each for the weighing results: too light, O.K., too heavy).

Response of Control Lines During Checkweighing

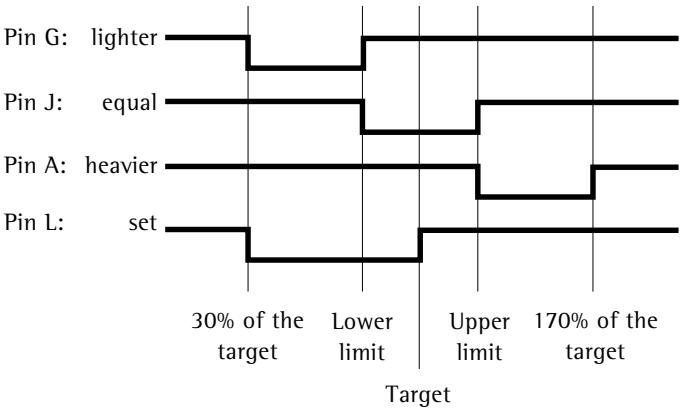
Configurations:
- always on
- activated at stability

12-pin via Zener barrier



Configurations:
- activated within checkweighing range
- activated at stability within checkweighing range
- activated at stability within checkweighing range

12-pin via Zener barrier



For further information about the pin assignment, see “Pin Assignment Charts.”

Output port specifications
- When not in use, the voltage level is high: >2.4 V/+2mA.
- When activated, the voltage level is low: <0.4 V/-2mA.

⚠The output ports are not protected against short circuits!

Preparation

- Turn on the scale: press I/⏻
> The Sartorius logo is displayed; a self-test is performed

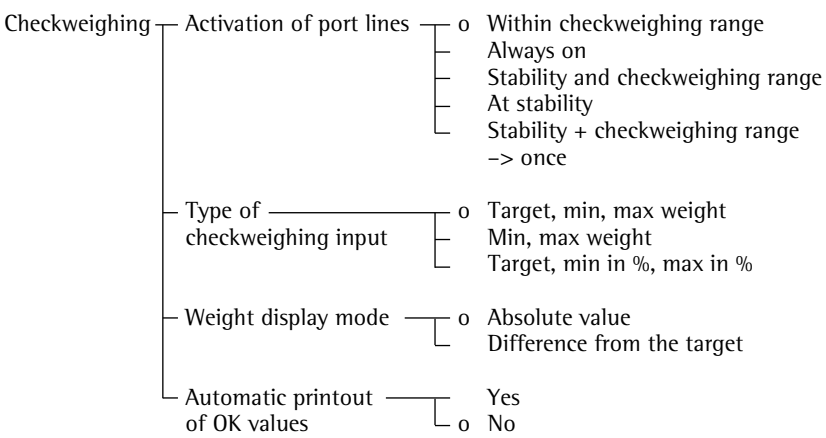
- Select the “Checkweighing” application in the Setup menu: press Setup

- Select the **Application parameters**: press the v soft key 2×, then the > soft key

- Select **Application 2 (control functions)**: Press the v soft key, then the > soft key

- Select **Checkweighing**: press the ^ or v soft key, repeatedly, if necessary

- Confirm **Checkweighing**: press the > soft key



o = factory setting

see also the “Application Parameters (Overview)” in the chapter entitled “Configuration”

- Save settings and exit the Setup menu: press the << soft key

Additional Functions

In addition to the functions for:

– alphanumeric input, (not during initialization),

– taring (not during alphanumeric input)

– printing,

you can also access the following functions from this application:

Calibration/Adjustment

- Press the **isoTST** soft key
> See “Calibration/Adjustment” for further instructions

Toggling to Another Application

- Press ⏻
> See the section on the corresponding application program for further instructions

Setup (Setting Parameters)

- Press Setup
> See “Configuration” for further instructions

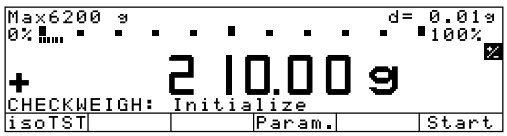
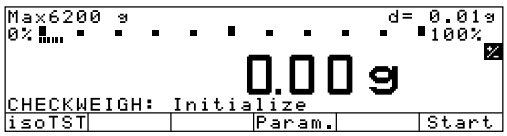
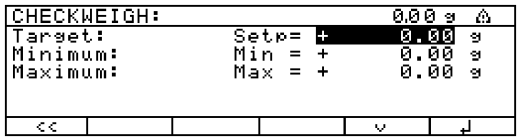
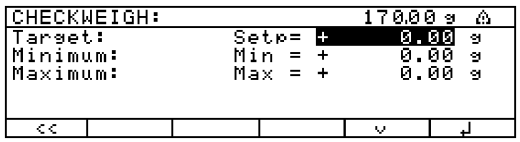
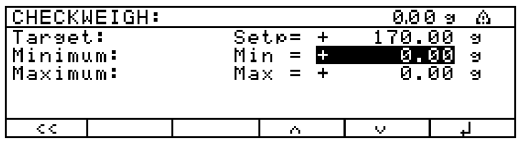
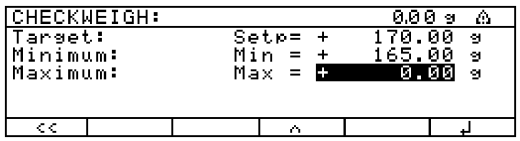
Turning Off the Scale

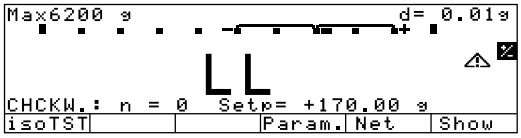
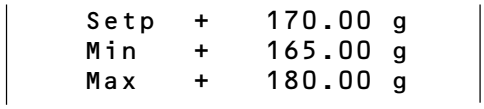
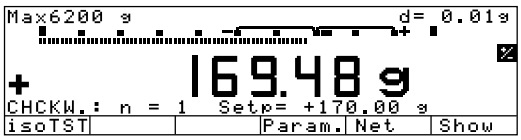
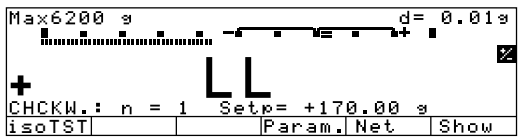
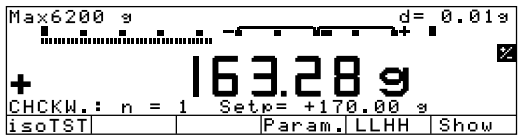
- Press I/⏻
> The scale shuts off

Checkweighing

Practical Example
Checkweighing samples of 170 g, with an allowable tolerance of –5 g and +10 g. Printout of upper and lower tolerance limits.
Weighed values are printed out automatically when stability is reached and the weight value is within the checkweighing range.

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Application 2: Checkweighing: Automatic printout of OK values: On

Step	Press key(s) (or follow instructions)	Display/Output
1. Turn on the scale and configure the settings as indicated above	I/⏻	
2. Delete previous values, if necessary	CF	
3. Prepare a container for the samples	Place empty container on the scale	
4. Tare the scale	Tare	
5. Enter initialization values	Param. soft key	
6. Accept target value (in this example: 170 g)	Place ideal sample in container	
7. Save target and unload the scale	↵ soft key Remove ideal sample from the scale	
8. Enter value for lower limit (170 g – 5 g) and save	1 6 5 ↵ soft key	

Step	Press key(s) (or follow instructions)	Display/Output
9. Enter value for upper limit (170 g + 10 g) and save	1 8 0	 
10. Weigh sample (in this case: 169.48 g)	Place sample in container	
If the weight value is too low:		
11. In this case, switch to net value (for ex., a weight of 163.28 g)	**Net** soft key	
12. Weigh next sample (if any)	Place sample in container	

Time-Controlled Functions

Purpose
With this application program, you can configure the scale to perform certain functions (such as automatic printout of values, store value in totalization memory) at a given time or after a set interval.

You can use this application in combination with any program chosen from Application 1 (such as counting, weighing in percent) and one from Application 3 (such as totalizing, formulation).

Features
- Time-controlled activation of scale functions:
  - one time only, at a given time (`Setting=` is displayed in the text line)
  - repeatedly, at given intervals (`Interval=` is displayed in the text line before the function is started, and `Repeat =` is displayed after the function has been started)
- Functions that can be time-controlled include:
  - Acoustic signal (beep)
  - Lock in readout
  - Automatic printout of values
  - Store values for totalizing, formulation or statistics
- Print time in addition to weight value
- Store value depending on the stability parameter
- Tare the scale after printout of weight values
- Press the corresponding soft key to cancel time-controlled functions

Factory Settings
Function after time interval:
`Automatic printout of values`

Automatic function restart: `On`

Storage mode:
`Without stability`

Print then tare: `On`

Soft Key Functions

`Stop`	Stop the application
`Quit`	Confirm performed function (e.g., »Lock in readout« or »Beep«)
`Interv`	Store input interval for time-controlled functions
`Set.`	Store input time for one-time performance of function
`Start`	Start timer function

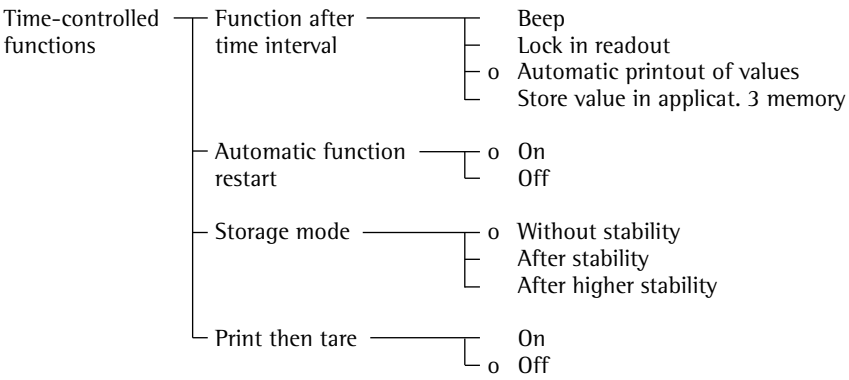
Printout for Time-Controlled Functions
If the "Automatic printout of values" parameter is set, the time and weight (or other value) are printed out.

```
Time:          10:15:00
N       +    150.00 g
```

Time: Time that the values were stored
N: Net weight

Preparation
- Turn on the scale: press I/⏻
> The Sartorius logo is displayed

- Select the "Time-controlled functions" application in the Setup menu: press Setup
- Select the `Application parameters`: press the `v` key 2×, then the `>` soft key
- Select `Application 2 (control functions)`: press the `v` soft key, then the `>` soft key
- Select `Time-controlled functions`: press the `^` or `v` soft key
- Confirm `Time-controlled functions`: press the `>` soft key



o = factory setting

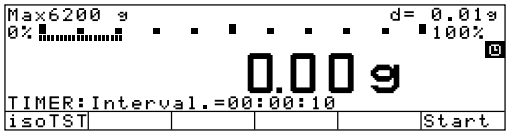
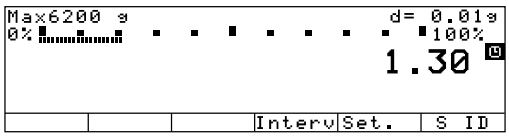
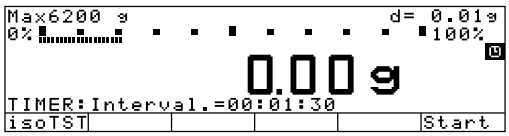
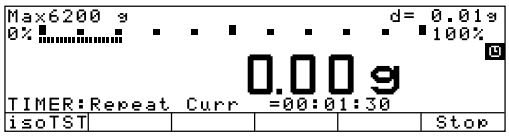
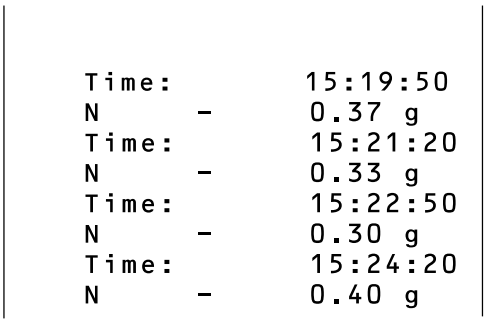
see also the "Application Parameters (Overview)" in the chapter entitled "Configuration"

- Save settings and exit the Setup menu: press the `<<` soft key

Print Net Values without Printout of Time
Select the Setup menu:
Setup: Printout: Application-defined output: Auto print upon initialization: Off

Practical Example
Document the evaporated amount of a sample with defined surface, temperature and air pressure at preset intervals of 1 minute, 30 seconds.

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Application 2: Time-controlled functions
Setup: Balance/scale functions: Taring: Without stability
Setup: Printout: Application-defined output: Stability parameter: Without stability

Step	Press key(s) (or follow instructions)	Display/Output
1. Turn on the scale and configure the settings as indicated above	I/⏻	
2. Delete stored values, if necessary	CF	
3. Place container with sample on the scale and tare	Tare	
4. Enter time interval: 1 minute, 30 seconds	1 · 3 0	
5. Store time interval	**Interv** soft key	
6. Begin documentation (Time remaining until the next printout is displayed in the text line)	**Start** soft key	
Printout of evaporated amount every ½ minutes		
7. Stop the documentation procedure	**Stop** soft key	

Totalizing Σ

Purpose
This application program runs as a cumulative memory function.

You can use this application in combination with any program chosen from Application 1 (such as counting, weighing in percent) and one from Application 2 (checkweighing, time-controlled functions).

Features
- Totalization of weight values and calculated values
- Optional configuration in the Setup menu for simultaneous storage of net and calculated values
- Optional configuration in the Setup menu for loading weight values and calculated values either from Application 1 (e.g., counting, weighing in percent) or from Application 2 (checkweighing, time-controlled functions)
- Totalization memory for up to 65,535 values
- Simultaneous display in the text line of transaction counter and, e.g., the current total
- Optional configuration in the Setup menu for having the scale tare automatically after a value is stored in the totalization memory, if no preset tare has been entered
- Manual input of the number of individual weighing operations and confirmation using the **nDef** soft key (target no. of operation nDef). Result printed and memory cleared after printout of nDef.
- Optional configuration in the Setup menu to add the current weight, with display accuracy, to the current total by pressing the **M+** soft key and generate a printout of the result
- Optional configuration in the Setup menu for stability-dependent storage of the measured value: **Balance/ scale functions, Stability range**
- Optional automatic storage of measured values
  Storage of measured value is indicated by →←; ↓↓ indicates that you can place a load on the scale.
- Minimum load threshold for automatic storage
- Press the **M–** soft key to delete the last value added to the totalizing memory. The transaction counter value is reduced by one and a printout is generated.
- Press the **MR** soft key for information about number of transactions and the current total. In the Setup menu, you can define whether the information is displayed and printed, or only printed, and whether the information comprises an intermediate or final evaluation
- In the Info window you can choose which value is displayed in the text line during weighing
- Printout of the end result independent of which program is configured for Application 1 or Application 2. Configure the Setup menu to define which values are included on the printout (printout of individual components)
- Press the key identified by **MR** (soft key label) for a printout of an intermediate evaluation after each addition or a final evaluation
- If you end the totalization process by pressing CF without having first pressed the **MR** soft key for a printout, a final evaluation is printed when you press CF
- Optional configuration in the Setup menu to clear the totalizing memory and reset the transaction counter by pressing CF or after an evaluation is printed out
- Totalization data and transaction counter data are stored in non-volatile memory
- Continue totalization after turning the scale off and back on

Factory Settings of Parameters
Automatic storage: **Off**

Minimum load for automatic storage: **10 digits**

Source of data for auto storage: **Application 1**

Evaluated values: **Net**

Evaluation mode, MR key function: **Intermediate evaluation, print**

M+/M– function, then tare: **Off**

Printout of individual components: **Yes**

Stability range: **2 digits**

Application-defined output:
Print then tare: **Off**

Soft Key Functions

M+	Add weight values or application values to the total in the totalization memory. The component or transaction counter value increases by one each time you press this key.
M–	Delete the last value added to memory. The transaction counter value decreases by 1. You cannot delete previous values by repeatedly pressing this key.
MR	Print or display an intermediate or final evaluation
nDef	Store the input number of components

Printout for Totalizing
The transaction or component counter is printed in front of each measured value (weight). When an intermediate or final evaluation is printed out, all results up to this point are included.

```
n                5
Total      +151.67 g
```

Preparation

- Turn on the scale: press I/⏻
> The Sartorius logo is displayed; a self-test is performed

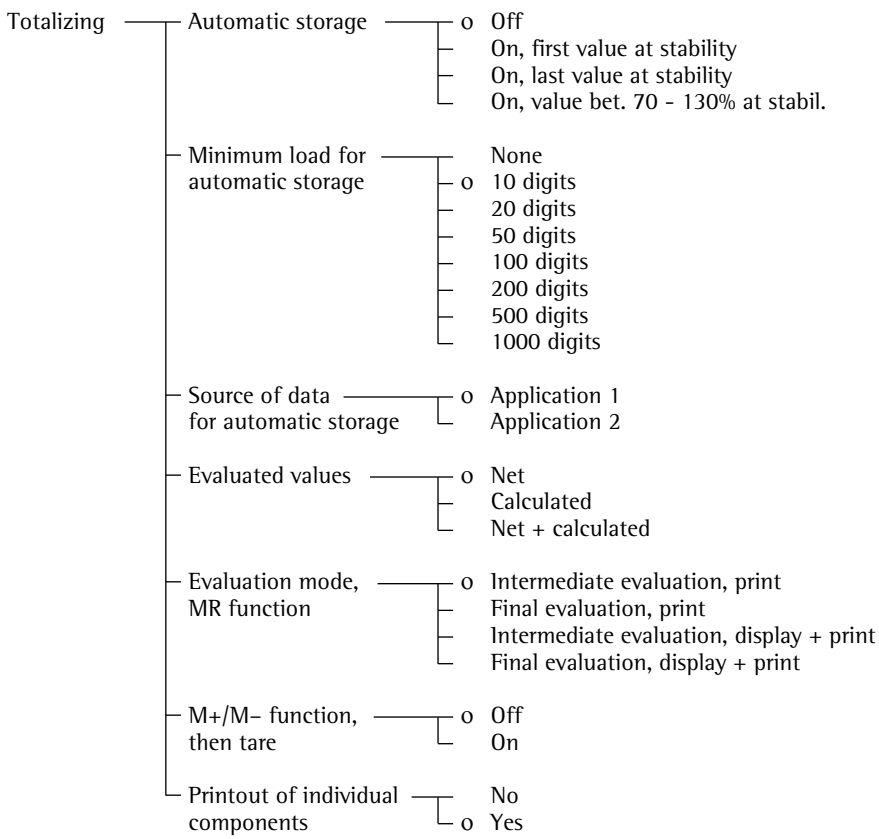
- Select the “Totalizing” application program in the Setup menu: press Setup

- Select the **Application parameters**: press the v soft key 2×, then the > soft key

- Select **Application 3 (data records)**: press the v soft key 2×, then the > soft key once

- Select **Totalizing**: press the ^ or v soft key

- Confirm **Totalizing**: press the > soft key



o = factory setting

see also the “Application Parameters (Overview)” in the chapter entitled “Configuration”

- Save settings and exit the Setup menu: press the << soft key

Additional Functions

In addition to the functions for:

– alphanumeric input,

– taring (not during alphanumeric input),

– printing,

you can also access the following functions from this application:

Calibration/Adjustment

- Press the **isoTST** soft key
> See “Calibration/Adjustment” for further instructions

Toggling to Another Application

- Press ⟲
> See the section on the corresponding application program for further instructions

Setup (Setting Parameters)

- Press Setup
> See “Configuration” for further instructions

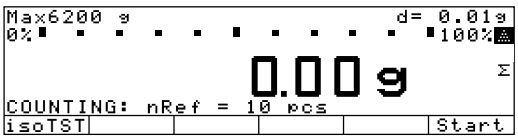
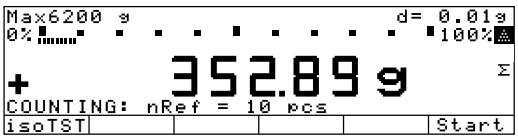
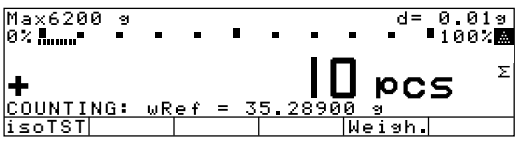
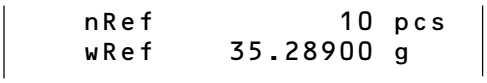
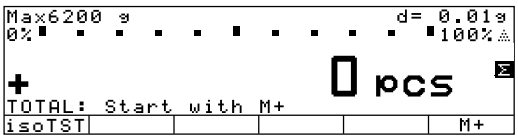
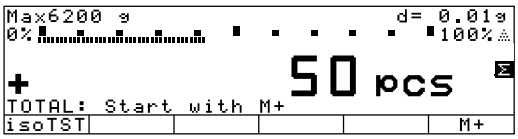
Turning Off the Scale

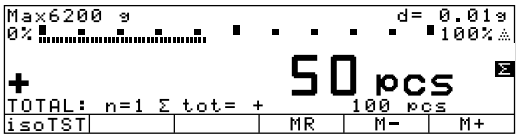
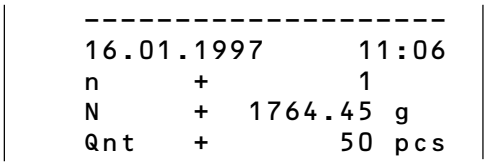
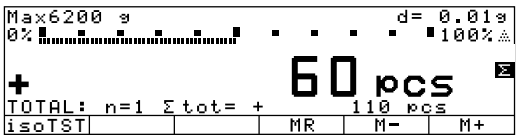
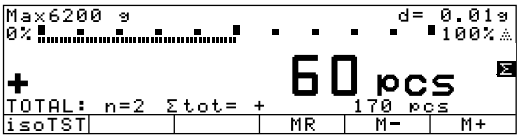
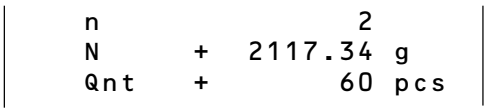
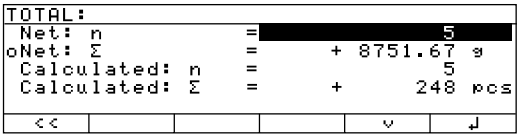
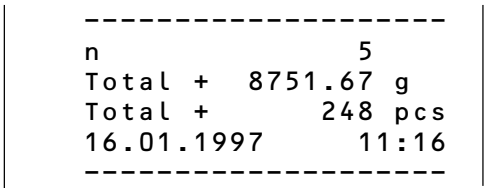
- Press I/⏻
> The scale shuts off

Totalizing Σ

Practical Example
Totalize counted pieces

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Application 1: Counting
Setup: Application parameters: Application 2: Off
Setup: Application parameters: Application 3: Totalizing: Evaluated values: Net + calculated
Setup: Application parameters: Application 3: Totalizing: Evaluation mode, MR function: Final evaluation, display + print

Step	Press key(s) (or follow instructions)	Display/Output
1. Turn on the scale and configure the settings as indicated above	I/⏻	
2. Delete old totalization data, if necessary	CF	
3. Tare the scale	Tare	
4. Toggle to Application 1: Counting	⟲D⟳	
5. Place the displayed number of parts on the scale (here: 10 pcs)	Place parts to be counted on the scale	
6. Initialize the Counting application	**Start** soft key	 
7. Remove the reference sample quantity and toggle to Totalizing	Unload the scale ⟲D⟳	
8. Place a number of parts on the scale (here: 50 pcs)	Place parts on the scale	

Step	Press key(s) (or follow instructions)	Display/Output
9. Store piece count	**M+** soft key	 
10. Unload the scale	Remove parts from the scale	
11. Place another load of parts on the scale (e.g., 60 pcs)	Place parts on the scale	
12. Add piece count to stored total	**M+** soft key	 
13. Repeat steps 10 and 11 as required		
14. Display final evaluation ("Info" window) (here: 5 weighing operations; total weight: 8751.67 g; total quantity: 248) The ○ indicates which value is displayed in the text line; you can change this selection	**MR** soft key	 
15. Print final evaluation	⎙	

Formulation

Purpose
With this application program you can add weight values and calculated values as components of a formula to a totalizing memory.

You can use this application in combination with any program chosen from Application 1* (such as counting, weighing in percent) and one from Application 2 (checkweighing, time-controlled functions) as well as with the extra functions.

*= not with recalculation or 2nd tare memory; cannot be activated during formulation

Available Features
- Totalization of weight values and calculated values
- Weigh in different components toward zero to a total amount defined by pressing the **Nom** soft key and entering the value through the numeric keys
- Simultaneous storage of net and calculated values, if available
- Optional configuration in the Setup menu for loading weight values and calculated values either from Application 1 (e.g., counting, weighing in percent) or from Application 2 (checkweighing, time-controlled functions)
- Totalizing memory for up to 65,535 values
- Transaction counter and current total displayed in the text line
- Scale tared after a value has been stored
- Manual input of the number of individual weighing operations and confirmation using the **nDef** soft key (target no. of operations nDef). Result printed and memory cleared after printout of nDef.
- Optional configuration in the Setup menu to add the current weight, with display accuracy, to the current total by pressing the **M+** soft key and generating a printout of the result
- Optional configuration in the Setup menu for stability-dependent storage of the measured value: Balance/scale functions, Stability range
- Optional automatic storage of measured values
  Storage of measured value is indicated by →←; ↓↓ indicates that you can place a load on the scale.
- Minimum load threshold for automatic storage
- Press the **M–** soft key to delete the last value added to the totalizing memory. The transaction counter value is reduced by one and a printout is generated.
- Printout of an evaluation of results, depending on the Application 1 or Application 2 parameters. Configure the Setup menu to define the information included on this printout.
- Press the key identified by **MR** (soft key) for a printout of an intermediate evaluation after each addition or a final evaluation
- A final evaluation is printed when the formulation routine is ended by pressing CF, if no final evaluation was generated by pressing **MR**
- Optional configuration in the Setup menu to clear the totalizing memory and reset the transaction counter by pressing CF or after an evaluation is printed out
- Totalization data and transaction counter data are stored in the non-volatile memory
- Continue formulation after turning the scale off and back on

Factory Settings of the Paramters
Automatic storage: **Off**

Minimum load for automatic storage:
10 digits

Source of data for auto storage:
Application 1

Evaluated values: **Net**

Evaluation mode, **MR** key function:
Intermediate evaluation, print

Printout of individual components: **Yes**

Stability range: **2 digits**
Printout: Application-defined output:
Print on request then tare: **Off**

Soft Key Functions

M+	Add weight values or application values to the total in the totalizing memory. The component or transaction counter value increases by one each time you press this key.
M–	Delete the last value added to memory. The transaction counter value decreases by 1. You cannot delete previous values by repeatedly pressing this key.
MR	Print or display an intermediate or final evaluation
nDef	Store the input number of components
Nom	Press to enter target component weight using the numeric keys

Printout of Formulation Report
When an intermediate or final evaluation is printed out, all results up to this point are included.

```
Comp2 + 42.38 g
Tot.cp+184.89 g
```

Comp2: Weight of the 2nd component
Tot.cp: Total of all components

Preparation

- Turn on the scale: press I/⏻
> The Sartorius logo is displayed; a self-test is performed

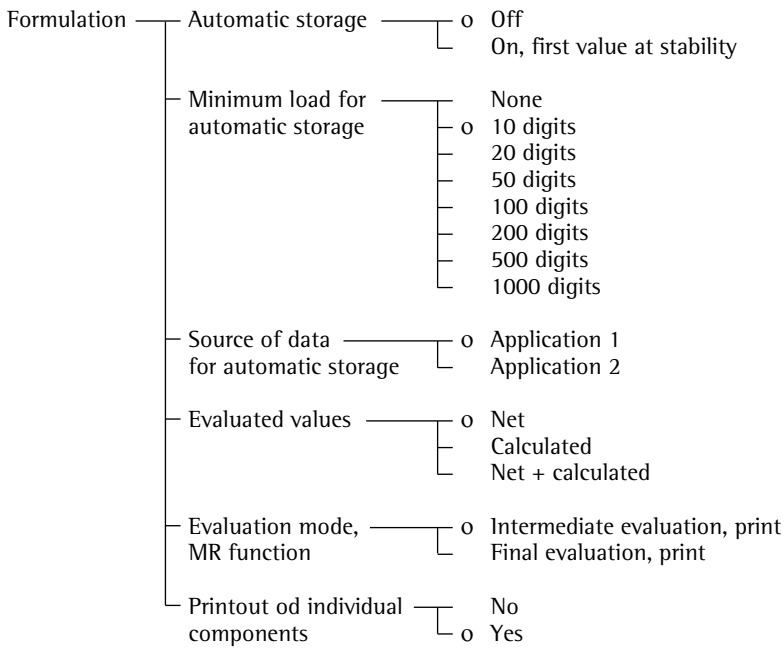
- Select the "Formulation" application in the Setup menu: press Setup

- Select `Application parameters`: press the `v` soft key 2×, then the `>` soft key once

- Select `Application 3 (data records)`: press the `v` soft key 2×, then the `>` soft key once

- Select `Formulation`: press the `^` or `v` soft key

- Confirm `Formulation`: press the `>` soft key



o = factory setting

see also the "Application Parameters (Overview)" in the chapter entitled "Configuration"

- Save settings and exit the Setup menu: press the `<<` soft key

Additional Functions

In addition to the functions for:

– alphanumeric input,

– taring (not during alphanumeric input),

– printing,

you can also access the following functions from this application:

Calibration/Adjustment

- Press the `isoTST` soft key
> See "Calibration/Adjustment" for further instructions

Toggling to Another Application

- Press ⏻
> See the section on the corresponding application program for further instructions

Setup (Setting Parameters)

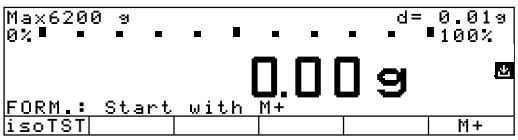
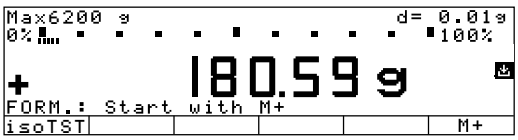
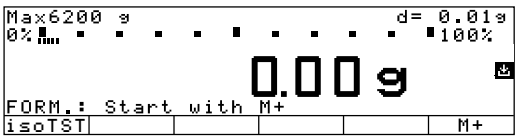
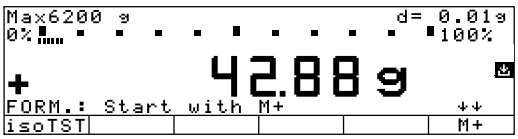
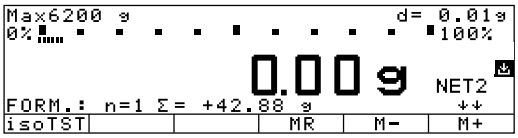
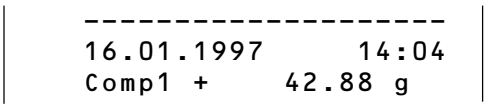
- Press Setup
> See "Configuration" for further instructions

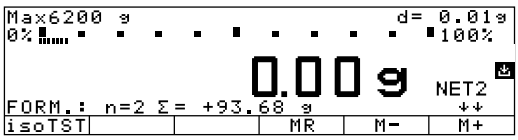
Turning Off the Scale

- Press I/⏻
> The scale shuts off

Practical Example
Weighing in Components

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Application 3: Formulation: Automatic storage: On, first value at stability
Setup: Application parameters: Application 3: Formulation: Minimum load for automatic storage: 100 digits
Setup: Application parameters: Application 3: Formulation: Evaluation mode, MR function: Final evaluation, print

Step	Press key(s) (or follow instructions)	Display/Output
1. Turn on the scale and configure the settings as indicated above	I/⏻	
2. Delete old formulation data	CF	
3. Tare the scale	Tare	
4. Place the empty container on the scale (here: 180.59 g)	Place load on the scale	
5. Tare the scale	Tare	
6. Weigh in the first component (here: 42.88 g)	Place components in container	
7. Store components in the formulation memory Scale is tared automatically	**M+** soft key	
Component are printed out automatically		

Step	Press key(s) (or follow instructions)	Display/Output
8. Weigh in next component (here: 50.80 g)	Place components in container	
Components are stored in the Totalization memory at stability and printed out		Comp2 + 50.80 g
Scale is tared automatically		
9. Repeat step 7 as required		
10. Print final evaluation (here: with total weight of all components: 212.43 g)	MR soft key	---------- n 2 Tot.cp+ 212.43 g 16.01.1997 14:10 ----------
11. Delete old formulation data, if necessary	CF	

Statistics x̄

Purpose
With this application program, you can have weight values and calculated values totalized and statistically evaluated.

The values determined for the evaluation are:

- average (mean value)
- standard deviation
- variation coefficient
- sum of all values
- lowest value (minimum)
- highest value (maximum)
- difference between the minimum and the maximum

You can use the statistics application in combination with any program chosen from Application 1 (such as counting, weighing in percent) and one from Application 2 (checkweighing, time-controlled functions) as well as with the extra functions.

Features
- Storage of weight values and calculated values
- Simultaneous storage of net and calculated values
- Optional configuration in the Setup menu for loading weight values and calculated values either from Application 1 (such as counting, weighing in percent) or from Application 2 (checkweighing, time-controlled functions)
- Totalizing memory for up to 65,535 values
- Simultaneous display in the text line of the transaction counter and, e.g., the current total
- Optional configuration in the Setup menu for having the scale tare automatically after a value has been stored in the totalizing memory
- Manual input of the number of individual weighing operations and confirmation using the `nDef` soft key (target no. of operations nDef). Result printed and memory cleared after printout of nDef.
- Optional configuration in the Setup menu to add the current weight, with display accuracy, to the current total by pressing the `M+` soft key and generate a printout of the result
- Optional configuration in the Setup menu for stability-dependent storage of the measured value: Balance/scale functions, Stability range
- Optional automatic storage of measured values
  Storage of measured value is indicated by →←; ↓↓ indicates that you can place a load on the scale.
- Minimum load threshold for automatic storage
- Press the `M–` soft key to delete the last value added to the totalizing memory. The transaction counter value is reduced by one and a printout is generated.
- Press the `MR`: soft key for information about number of transactions and the current total. By configuring the Setup menu, you can define whether the information is displayed and printed, or only printed, and whether the information comprises an intermediate or final evaluation
- In the Info window you can use the ˅, ↲ (○) soft keys to choose which value will be displayed in the text line during weighing
- Printout of the final result depending on the Application 1 or Application 2 parameters. Configure the Setup menu to define which values are included on the printout (printout of individual components)
- Press `MR` for a printout of an intermediate evaluation after each addition or a final evaluation
- A final evaluation is printed when the statistics routine is ended by pressing CF, if no final evaluation was generated by pressing `MR`
- Optional configuration in the Setup menu to clear the totalizing memory and reset the transaction counter by pressing CF or after an evaluation is printed out
- Totalization data and transaction counter data is stored in the non-volatile memory
- Continue totalization after turning the scale off and back on

Factory Settings
Automatic storage: `Off`

Minimum load for automatic storage:
`10 digits`

Source of data for auto storage:
`Application 1`

Evaluated values: `Net`

Evaluation mode, MR key function:
`Intermediate evaluation, print`

M+/M– function, then tare: `Off`

Printout of individual components: `Yes`

Stability range: `2 digits`

Application-defined output:
Print on request then tare: `Off`

Soft Key Functions

`M+`	Add weight values or application values to the total in the totalizing memory. The component or transaction counter value increases by one each time you press this key.
`M–`	Delete the last value added to memory. The transaction counter value decreases by 1. You cannot delete previous values by repeatedly pressing this key.
`MR`	Print or display an intermediate or final evaluation
`nDef`	Store the input number of components

Printout of Statistics
The transaction or component counter is printed in front of each measured value (weight). When an intermediate or final evaluation is printed out, all results up to this point are included.

```
n              5
Total  + 151.67 g
Avg.   +   33.0 pcs
s      +    3.2 pcs
srel   +   9.70 %
Total  +    165 pcs
Min    +     29 pcs
Max    +     37 pcs
Diff   +      8 pcs
```

n:	Transaction counter
Total:	Sum of all values
Mean:	Average
s:	Standard deviation
srel:	Variation coefficient
Total:	Sum of all values
Min:	Minimum
Max:	Maximum
Diff:	Difference between minimum and maximum

Preparation

- ● Turn on the scale: press I/⏻
- > The Sartorius logo is displayed

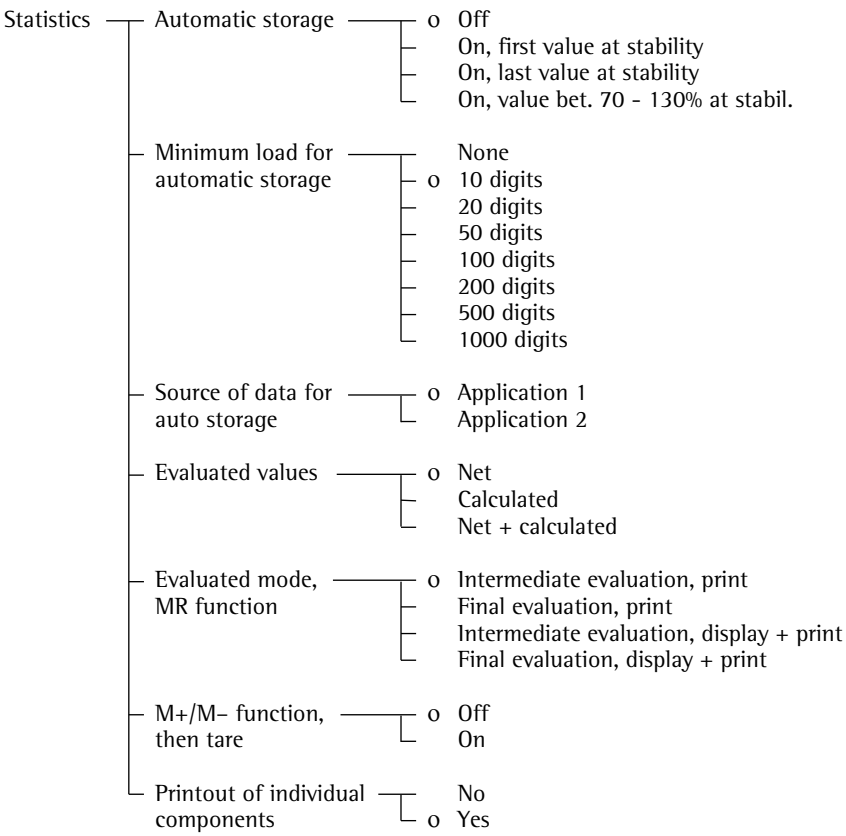
- ● Select the “Statistics” application in the Setup menu: press Setup

- ● Select `Application parameters`: press the `v` soft key 2×, then the `>` soft key once

- ● Select `Application 3 (data records)`: press the `v` soft key 2×, then the `>` soft key once

- ● Select `Statistics`: press the `^` or the `v` soft key

- ● Select `Statistics`: press the `>` soft key



o = factory setting

see also the “Application Parameters (Overview)” in the chapter entitled “Configuration”

- ● Save settings and exit the Setup menu: press the `<<` soft key

Additinal Functions

In addition to the functions for:

- – alphanumeric input,
- – taring (not during alphanumeric input),
- – printing,

you can also access the following functions from this application:

Calibration/Adjustment

- ● Press the `isoTST` soft key
- > See “Calibration/Adjustment” for further instructions

Toggling to Another Application

- ● Press ⏻
- > See the section on the corresponding application program for further instructions

Setup (Setting Parameters)

- ● Press Setup
- > See “Configuration” for further instructions

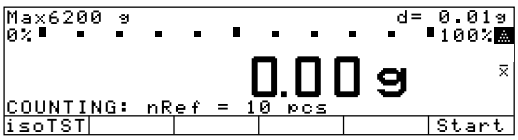
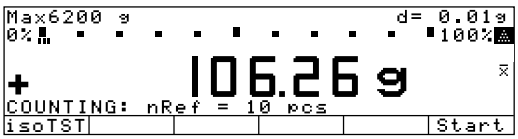
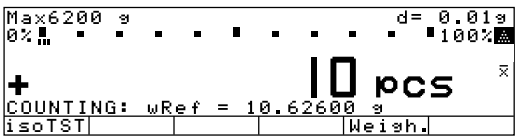
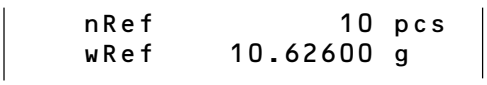
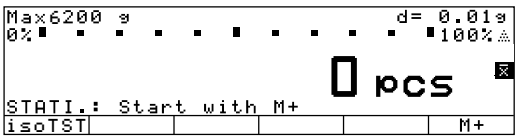
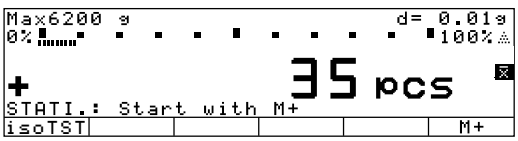
Turning Off the Scale

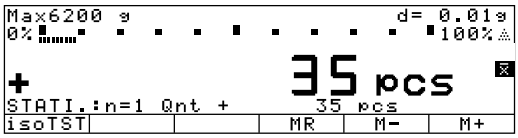
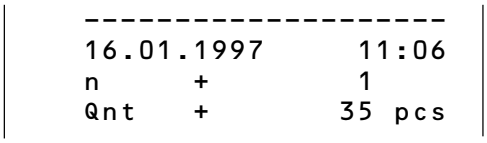
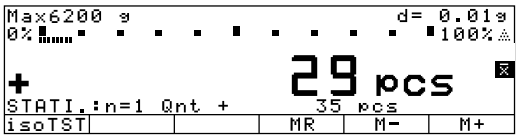
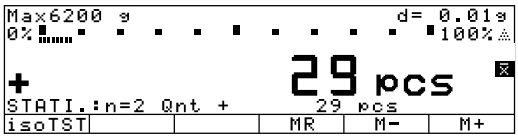
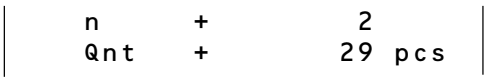
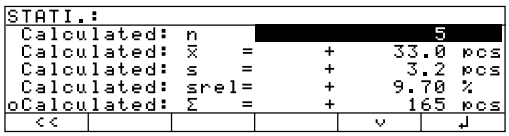
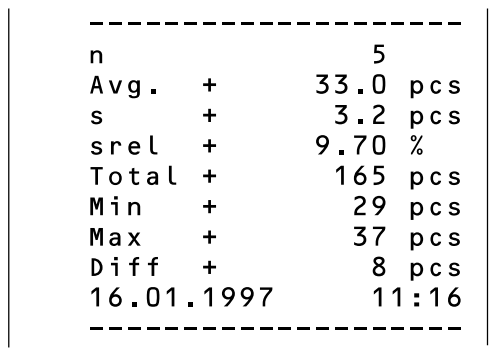
- ● Press I/⏻
- > The scale shuts off

Statistics x̄

Practical Example
Totalize counted pieces and print out statistics

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Application 1: Counting: Average piece weight updating: Manual
Setup: Application parameters: Application 3: Statistics: Evaluated values:Calculated
Setup: Application parameters: Application 3: Statistics: Evaluation mode, MR function: Final evaluation, display + print

Step	Press key(s) (or follow instructions)	Display/Output
1. Turn on the scale and configure the settings as indicated above	I/⏻	
2. Delete old statistics data, if necessary	CF	
3. Tare the scale	Tare	
4. Toggle to Application 1: Counting	⟲D⟳	
5. Place the displayed number of parts on the scale (here: 10 pcs)	Place parts to be counted on the scale	
6. Initialize the Counting application	**Start** soft key	 
7. Remove the reference sample quantity and toggle to Statistics	Unload the scale ⟲D⟳	
8. Place a number of parts on the scale (here: 35 pcs)	Place parts on the scale	

Step	Press key(s) (or follow instructions)	Display/Output
9. Store piece count	**M+** soft key	 
10. Unload the scale	Remove parts from the scale	
11. Place another load of parts on the scale (e.g., 29 pcs)	Place parts on the scale	
12. Add piece count to stored total	**M+** soft key	 
13. Repeat steps 11 and 12 as required		
14. Display final evaluation (»Info« window) (here: 5 weighing operations; total quantity: 165) The ○ indicates which value is displayed in the text line; you can change this selection	**MR** soft key	
15. Print final evaluation	⎙	

Extra Functions (in the Application Menu)

Second Tare Memory (Preset Tare)

Purpose
With this function, you can store the weight currently on the scale as a tare weight, or use the numeric keys to enter a number for a preset tare weight.

You can use this function in combination with a program from Application 1 (such as counting, weighing in percent), one from Application 2 (checkweighing, time-controlled functions) and one from Application 3 (totalizing, formulation, statistics) as well as with the extra functions.

Features
- Store a weight on the scale in the second tare memory (without numeric input)
- Store a numeric value in the second tare memory (input using the numeric keys)
- Identify a net value as **NET** when there is a value stored in the second tare memory
- You can assign this function to the fourth or fifth soft key (from the right); i.e., F4 or F5.
  The soft key designation for this function is: PT1/T1
- Optional configuration in the Setup menu for storing the current weight readout as the container tare weight. Any load subsequently placed on the scale that is more than 70% of the tare weight is automatically recognized as a container and the scale is tared automatically.
- Automatic printout when a value is stored or input (see "Configuration")
- Press CF to delete the (preset) tare value

Factory Settings
Container tare weight: No

Automatic printout: Off

Soft Key Functions
PT1/T1 Store weight as tare value

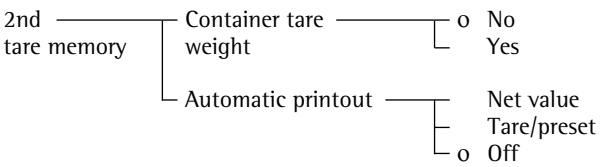
PT1 Store input value

Printout of the Data in the 2nd Tare Memory
The printout shows either:
- Net value N1,
- Tare weight T1, or
- Manually entered tare value PT1

```
N1      63.48 g
T1     138.73 g
PT1    150.00 g
```

N1: Net weight (value) when a weight is stored in the tare memory
T1: Tare weight
PT1: Preset tare value entered using the numeric keys

Preparation
- Turn on the scale: press I/⏻
> The Sartorius logo is displayed; a self-test is performed
- Select Extra function (F4) or Extra function (F5) in the Setup menu: press Setup
- Select Application parameters: press the v soft key 2×, then the > soft key once
- Select Extra function (F4) or Extra function (F5): press the v soft key 3× (or 4×), then press the > soft key once
- Select 2nd tare memory
- Confirm 2nd tare memory



o = factory setting

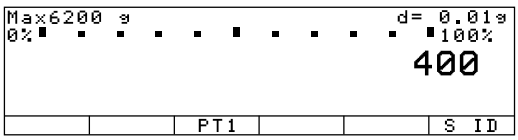
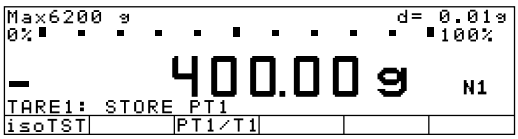
see also the "Application Parameters (Overview)" in the chapter entitled "Configuration"

- Save settings and exit the Setup menu: press the << soft key

Second Tare Memory in Legal Metrology
- Press the (i)PT1 soft key to enter information about the tare value using the number keys.
- The PT1 tare value is printed out with the net value.

Practical Example
Determine the Contents of Bottles: Bottle weight = 400 g.

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Extra function (F4): 2nd tare memory: Automatic printout: Tare/preset tare

Step	Press key(s) (or follow instructions)	Display/Output
1. If necessary: turn on the scale and enter the settings given above	I/⏻	
2. Enter bottle weight (example 400 g)	4 0 0	
3. Store tare value	**PT1** soft key	
4. Determine net weight of bottles (in this case: net contents = 650 g)	Place filled bottles on the scale	

Individual Identification Codes (ID)

Purpose
With this function, you can assign IDs to values for documentation and printouts.

You can use this function in combination with any program from Application 1 (such as counting, weighing in percent), one from Application 2 (checkweighing, time-controlled functions) and one from Application 3 (totalizing, formulation, statistics) as well as with the other extra functions.

Features
- Store up to 4 IDs; these can be stored, changed or deleted individually.
- Each ID consists of a name and a value; both can be defined by the user.
- ID designations are configured as follows: Setup: Printout: Identification codes
- Each ID code can have up to 20 characters; when you enter the value later, however, no more than 15 characters of this ID are displayed.
- The ID values are entered while the application program is active; press the **ID** soft key to toggle to the ID input mode.
- Each ID value can have up to 20 characters.
- Access 1 of the 4 IDs directly using the numeric keys. The other three can only be accessed by pressing the **ID** soft key to toggle to the ID input mode.
- You can assign this function to the fourth or fifth soft key (from the right); i.e., F4 or F5.
- You can configure when the ID will be included on the printout (see "Preparation" on the next page).
- You can configure the position of IDs on the individual or total printout.
- The ID code is printed flush left; the value flush right. If the name and value together are too long for one line, the data is printed on two lines.
- Optional configuration in the Setup menu to delete a single character when entering an identification code by pressing CF. Setup: Device parameters: Keys: CF function for input: Delete last character
- Press the **Delete** soft key to delete an ID

Factory Settings of the ID Names
ID1: **ID1**
ID2: **ID2**
ID3: **ID3**
ID4: **ID4**

Factory Settings for ID Codes
No values set

Factory Settings
Printout:
`Each time the print key is pressed`

Soft Key Functions

ID	Toggle to "Identification codes" menu
Delete	Delete input of selected ID

Printout of ID Codes
Up to 4 (stored) identification codes are printed out.

```
ID1      Lot no. 1234
ID2 Daimler/Chrysler
ID3       Screws M4x6
ID4         Jack Smith
```

ID1: Identification 1 (ID 1)
ID2: Identification 2 (ID 2)
ID3: Identification 3 (ID 3)
ID4: Identification 4 (ID 4)

Preparation

- ● Turn on the scale: press I/⏻
- > The Sartorius logo is displayed

- ● Select Extra function (F4) or Extra function (F5) in the Setup menu: press Setup
- ● Select `Application parameters`: press the v soft key 2×, then the > soft key once
- ● Select `Extra function(F4)` or `Extra function(F5)`: press the v soft key 3× (or 4×), then the > soft key once
- ● Select `Identification codes`
- ● Confirm `Identification codes`

Identification — Printout
- Automatic, if configured
- Once after pressing print, if configured
- o Each time the print key is pressed
- Once for M+ function (app. 3 memory)

o = factory setting

see also the “Application Parameters (Overview)” in the chapter entitled “Configuration”

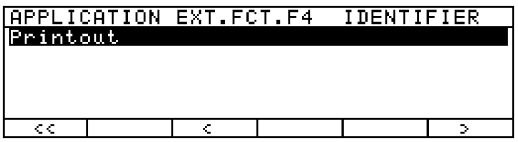
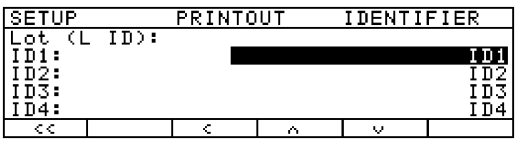
- ● Save settings for the printout: press the < soft key 4×
- ● Enter ID name: Select “Printout”: press the v soft key, then the > soft key
- ● Select “Identification #”: press the v soft key 5×, then the > soft key once
- ● Select `ID1`
- ● Enter name for `ID1` and confirm: use the numeric keys for numbers and/or the soft keys to enter letters
- ○ Enter names for `ID2`, `ID3` and `ID4`, if desired
- ● Save settings and exit the Setup menu: press the << soft key

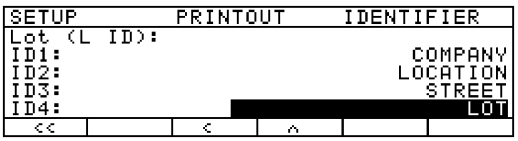
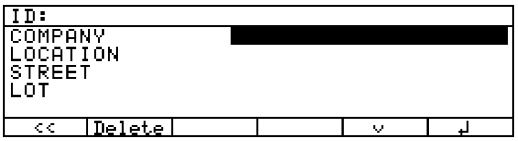
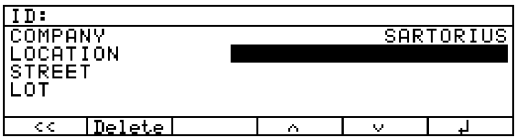
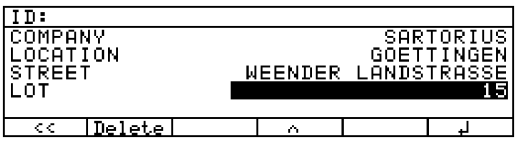
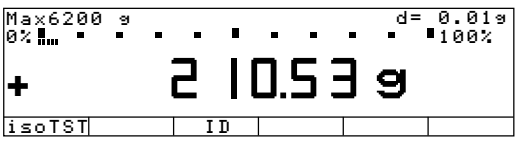
Example

See next page

Practical Example
Include company address and sample lot number on the printout. Each ID line begins with the name.
Print this ID for each net value.

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Extra function (F4): Identification codes
Setup: Input: ID1: Company
Setup: Input: ID2: Location
Setup: Input: ID3: Street
Setup: Input: ID4: Lot

Step	Press key(s) (or follow instructions)	Display/Output
1. If necessary, turn on the scale	I/⏻	
2. Select “Extra Function (F4)” in the Setup menu	Setup ˅ soft key 2×, then > soft key once ˅ soft key 3×, then > soft key once	
3. Select “Identification codes”	˅ or ˄ soft key; repeatedly, if necessary	
4. Confirm “Identification codes” and exit this menu item	> soft key; then < soft key 3 times	
5. Select ID1 (Printout: Identifier)	˅ or > soft key ˅ soft key 5×, then > soft key, then ˅ soft key	
6. Enter name for ID 1 (in this case: COMPANY) and confirm	ABC ... see also page 33 ABC, ↵ soft key	

Step	Press key(s) (or follow instructions)	Display/Output
7. Repeat steps 6 and 7 for: ID2: LOCATION ID3: STREET ID4: LOT		
8. Save settings, exit the Setup menu and select input mode for IDs	**<<** soft key **ID** soft key	
9. Enter name of company (such as Sartorius)	ABC ... see also page 33	
10. Confirm input	↵ soft key	
11. Repeat steps 10 and 11 for LOCATION: GOETTINGEN STREET: WEENDER LANDSTRASSE LOT: 15		
12. Place the first sample on the scale (ex.: weight of 110.53214 g)	Place load on scale	
13. Print weight (if desired, perform further weighing operations and print results)	⎙	
14. When the weighing is completed delete each ID individually	**ID** soft key **Delete** soft key 4 times	

Manual Storage (M+)

Purpose
With this function you can load weight values and calculation results directly from Application 1 (e.g., counting, weighing in percent) or Application 2 (checkweighing, time-controlled functions) into Application 3 (totalizing, formulation, statistics).

Available Features
- You can assign this function to the fourth or fifth soft key (from the right), i.e. F4 or F5. The soft key designation for this function is: **M+**
- An Application 3 program (totalizing, formulation or statistics) must be running so you can display and print the result

Factory Settings
There are no optional parameters

Preparation
- Turn on the scale: press I/⏻
> Sartorius logo is displayed
- Select Extra function (F4) or Extra function (F5) in the Setup menu: press Setup
- Select `Application parameters`: press the `v` soft key 2×, then the `>` soft key
- Select `Extra func. (F4)` or `Extra func. (F5)`: press the `v` soft key 3× (or 4×), then the `>` soft key once
- Select `Man. store in app.3 memory (M+)`
- Confirm `Man. store in app.3 memory (M+)` see also the "Application Menu (Overview)" in the chapter entitled "Configuration"
- Save settings and exit the Setup menu: press the `<<` soft key

Product Data Memory

Purpose
With this function you can enter, store and load data records for initialization of applications, including user-defined data.

You can use this function in combination with a program from Application 1 (e.g., counting, weighing in percent), one from Application 2 (checkweighing, time-controlled functions) and extra functions F4 and F5 (identifiers, second tare memory).

Available Features
- Store up to 300 data records.
- Data records can be created, stored or deleted individually.
- Press the `ProDat` soft key to display data records.
- Define a name for each data record of up to 15 alphanumeric characters; the desired location is displayed in the product data memory.
- Optional configuration in the Setup menu to delete a single character when entering a data record name by pressing CF. Setup: ... Keypad: CF function for input: Delete last character.
- Data records are displayed in alphabetical order.
- Initialization data set for an application (e.g., wRef, nRef) is saved when you select the Store option. This data is loaded from the product data memory when you access this memory from the corresponding application.
- Use alphanumeric input to search for and display individual data records.
- You can assign this function to the fourth or fifth soft key (from the right), i.e. F4 or F5.
- Error messages are displayed in the text line in plain English.
- Press the `Delete` soft key to delete a data record.

Loading Stored Data:
Data for the block printout is stored in battery-backed memory. The first time you put the scale into operation, it must remain connected to power for a full day. This data remains in memory for approx. 3 months after the equipment is disconnected from AC power.

Factory Settings
No user-definable parameters.

Soft Key Functions

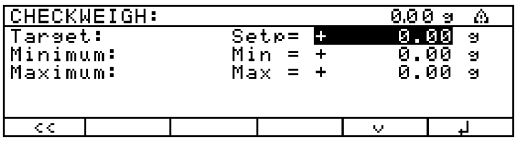
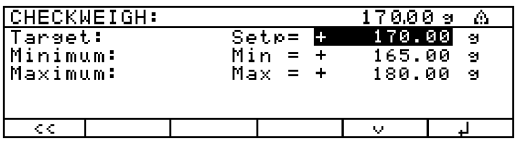
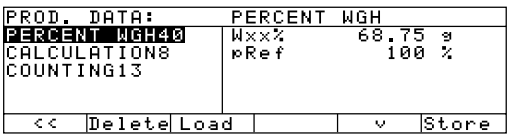
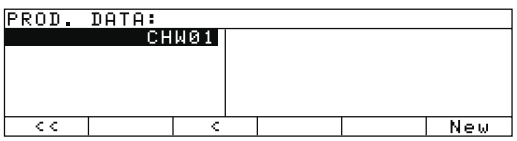
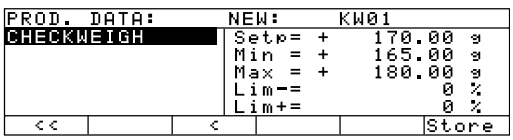
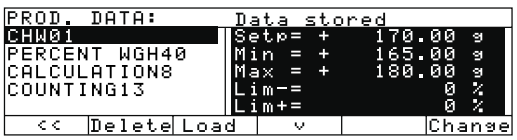
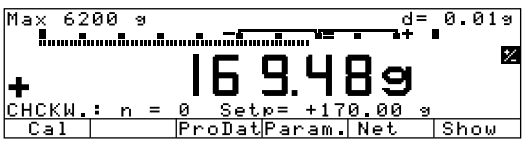
`ProDat`	Toggle to data record display
`Delete`	Delete selected data record
`Load`	Overwrite the initialization data with the selected data record
`Change`	Change the data in the stored data record
`New`	Create a new data record (after entering a data record name).
`Store`	Store the current application data under the selected data record name. If data already exist for this data record, a prompt asks whether this data should be overwritten.
`No`	Answer no to cancel a “delete” or “overwrite” operation
`Yes`	Answer yes to perform the “delete” or “overwrite” operation

Preparation
- Turn on the scale: press I/⏻
> Sartorius logo is displayed
- Select Extra function (F4) or Extra function (F5) in the Setup menu: press Setup
- Select `Application parameters`: press the `v` soft key 2×, then the `>` soft key once
- Select `Extra function (F4)` or `Extra function (F5)`: press the `v` soft key 3× (or 4×), then the `>` soft key once
- Select `Product data memory`
- Confirm `Product data memory` see also the “Application Menu (Overview)” in the chapter entitled “Configuration”
- Save settings and exit the Setup menu: press the `<<` soft key

Product Data Memory

Practical Example
Create a New Data Record for Initializing the Checkweighing Program, Including: Target Value, Minimum, Maximum

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Extra function (F4): Product data memory
Setup: Application parameters: Application 2: Checkweighing

Step	Key (or instruction)	Display/Output
1. If necessary: turn on the scale and enter the settings given above	I/⏻	
2. In the Checkweighing application, toggle to the input mode for target, minimum and maximum values	**Param.** soft key	
3. Enter target: 170 g; minimum: 165 g; maximum: 180 g	see the Practical Example for Checkweighing, steps 5 through 9	
4. Toggle to display of product data (existing data records are displayed; in this example, 3 data records have been stored)	**ProDat** soft key	
5. Enter a name for the new data record (here: CHW01)	ABC **ABCDEF** soft key, **C** soft key **GHIJKL** soft key, **H** soft key **STUVWX** soft key, **W** soft key 0 1	
6. Store current Checkweighing parameters as a data record	**New** soft key	
7. Confirm	**Store** soft key	
8. Exit data record display	**<<** soft key	

"FlexPrint" Printout Function

Purpose
The YAD02IS "Nice Label Express" software from Sartorius lets you load user-defined label printing formats and the corresponding print instruction files in your scale. This software lets you connect any of a number of printers, equipped with a variety of printer fonts, to the RS-232 interface on your scale.

Features
With the "FlexPrint" option activated:

- Print command generates configured printout (if print instruction file exists; see table, next page). Print command generates default printout (if print instruction file does not exist).

- The function that generates an automatic printout upon initialization of an application cannot be used. Initialization data can be output only to a print instruction file.

  The following items are output only as standard printouts:
- Calibration/adjustment
- SETUP printouts
- (F) key in "Identifier:" display page
- (F) key on "Product data memory:" display page
- (F) on "Parameter" display page for "Checkweighing" application: print function carried out
- MR function carried out when (F) is pressed during evaluation (info window) in Totalizing and Statistics applications.
- To recall the file names, software ID and version numbers, for FlexPrint, see the section on "Basic Settings," Info Display."

- Printout for legal metrology: Weight blocks (special weight value formats that are acceptable in legal metrology) are designated by the following line, which is printed in both header and footer and cannot be edited:
  "------ CE [M] ------"

  Examples of Weight Block Printouts

  Without tare:

```
------ CE [M] -------
N   +       348.65 kg
------ CE [M] -------
```

  With tare:

```
------ CE [M] -------
G   +       459.70 kg
N   +       348.65 kg
T1  +       111.05 kg
------ CE [M] -------
```

  Scale tare (2nd tare memory):

```
------ CE [M] ------
G   +       124.45 kg
N   +       100.00 kg
T1  +        24.00 kg
T2  +         0.45 kg
------ CE [M] ------
```

Preparation
- Turn on the scale: press the (I/⏻) key
- Configure FlexPrint in Setup: press the Setup key
- Select Printout: press v soft key 3 times, and then > soft key
- Confirm Application-defined output: press > soft key
- Select FlexPrint: press v soft key 3 times and then > soft key
- Select On: press v soft key and then > soft key
- Save settings and exit Setup: press << soft key

Print events
Printouts generated using the "Nice Label Express" software are divided into the following groups:

Event	Explanation	File name for event group:
1. (F) key with individual values	Print key	PPRINT
2. (F) key with text input	Input and (F) key	PDIRECT
3. GLP /GMP header	GLP header	PGMPHEAD
4. GLP /GMP footer	GLP footer	PGMPFOOT
5. Results, Application 1	Animal weighing, MR-CF	PA1RES
6. Results, Application 2	OK values, time-controlled print	PA2RES
7. Results, Application 3	MR, MR-CF	PA3RES
8. Components, Application 1	M+ printout	PA1COMP
9. Components, Application 3	M+/M– printout	PA3COMP

Combining Applications

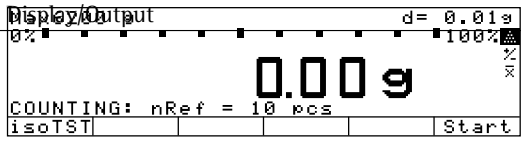
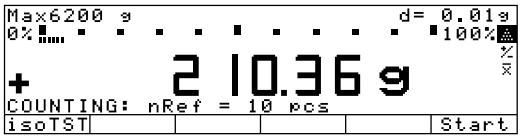
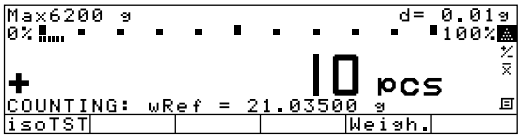
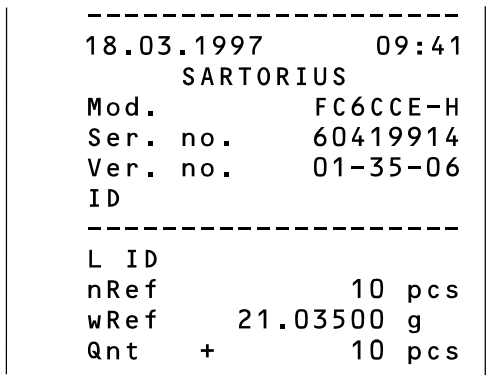
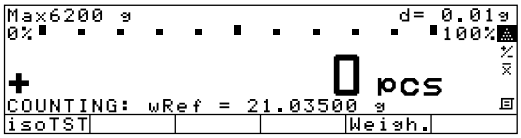
The following table summarizes the possibilities for combination of the application programs described here.
Each line stands for one combination. The weighing function is generally available, and does not have to be combined with a calculating function.

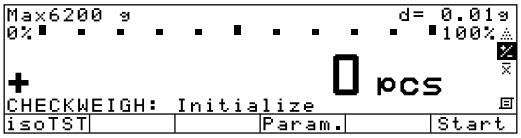
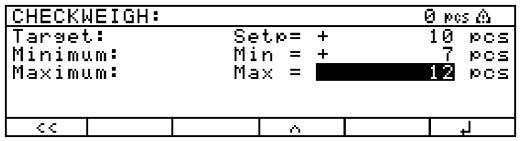
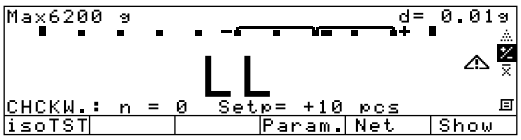
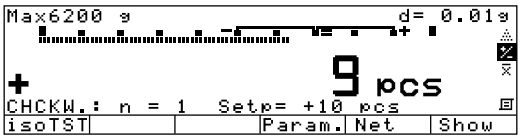
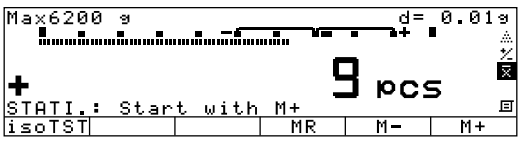
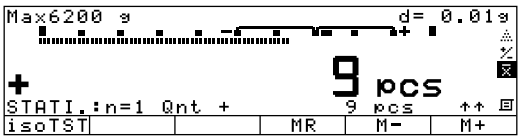
Application 1 (basic function)	Application 2 (control function)	Application 3 (documenting function)
Counting	–	Totalizing
Counting	–	Formulation
Counting	–	Statistics
Weighing in percent	–	Totalizing
Weighing in percent	–	Formulation
Weighing in percent	–	Statistics
Animal weighing	–	Totalizing
Animal weighing	–	Statistics
Recalculation	–	Totalizing
Recalculation	–	Statistics
Calculating	–	Totalizing
Calculating	–	Formulation
Calculating	–	Statistics
Density determination	–	Statistics
Density determination	Time-controlled functions	Statistics
Differential Weighing	–	–
–	Checkweighing	Totalizing
–	Checkweighing	Formulation
–	Checkweighing	Statistics
Counting	Checkweighing	Totalizing
Counting	Checkweighing	Formulation
Counting	Checkweighing	Statistics
Weighing in percent	Checkweighing	Totalizing
Weighing in percent	Checkweighing	Formulation
Weighing in percent	Checkweighing	Statistics
Recalculation	Checkweighing	Totalizing
Recalculation	Checkweighing	Statistics
Calculating	Checkweighing	Totalizing
Calculating	Checkweighing	Formulation
Calculating	Checkweighing	Statistics
–	Time-controlled functions	Totalizing
–	Time-controlled functions	Formulation
–	Time-controlled functions	Statistics
Counting	Time-controlled functions	Totalizing
Counting	Time-controlled functions	Formulation
Counting	Time-controlled functions	Statistics
Weighing in percent	Time-controlled functions	Totalizing
Weighing in percent	Time-controlled functions	Formulation
Weighing in percent	Time-controlled functions	Statistics
Animal weighing	Time-controlled functions	Totalizing
Animal weighing	Time-controlled functions	Statistics
Recalculation	Checkweighing	Totalizing
Recalculation	Checkweighing	Statistics
Calculating	Time-controlled functions	Totalizing
Calculating	Time-controlled functions	Formulation
Calculating	Time-controlled functions	Statistics

Examples of Application Combinations

Example: Counting and checkweighing with statistical evaluation
You want to check a piece count, and have the results that lie within the tolerance range statistically evaluated and printed as a ISO/GMP-compliant record.

Settings (changes in the factory settings required for this example):
Setup: Application parameters: Application 1: Counting
Setup: Application parameters: Application 2: Checkweighing
Setup: Application parameters: Application 3: Statistics: Automatic storage: On, first value at stability
Setup: Application parameters: Application 3: Statistics: Source of data for auto storage: Application 2
Setup: Application parameters: Application 3: Statistics: Evaluated value: Calculated
Setup: Application parameters: Application 3: Statistics: Evaluation mode, MR function: Intermediate evaluation, display+print
Setup: Application parameters: Basic application: Printout configuration: ISO/GLP/GMP printout: Always

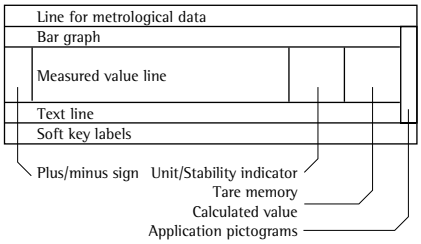
Step	Key (or instruction)	Display/Printout
1. If necessary: turn on the scale and enter the settings given above	I/⏻	
2. Place reference sample quantity	Place parts on the scale on the scale	
3. Initialize the scale	`Start` soft key	
		
4. Remove reference sample quantity	Unload the scale	

Step	Key (or instruction)	Display/Output
5. Initialize Checkweighing Toggle to Checkweighing	(D)	
6. Enter target, minimum and maximum values (here: target: 10 pcs; minimum: 7 pcs; maximum: 12 pcs)	Param. soft key 1 0, ↵ soft key 7, ↵ soft key 1 2	
7. Store input	↵ soft key	 Setp + 10 pcs Min + 7 pcs Max + 12 pcs
8. Determine first unknown quantity	Place uncounted parts on the scale	
9. Toggle to Statistics	(D)	
10. Initialize automatic storage	M+ soft key	 n 1 Qnt + 9 pcs
11. Determine further unknown quantities Printout is generated automatically	Place parts to be counted on the scale	... n 4 Qnt + 9 pcs --- n 4 Avg. + 10.0 pcs s + 0.8 pcs srel + 8.00 % Total 40 pcs Min + 9 pcs Max + 11 pcs Diff + 2 pcs --- 18.03.1997 10:26 Name: ---
12. End weighing series Statistics are evaluated Final GMP printout is generated	CF	
13. Delete initialization of the last application	CF	

Data Output Functions

There are 3 options for data output:

- Output to the display and control unit
- Output to a printer (generate a printout)
- Output to a peripheral device (e.g., computer) via the interface port



Output to the Display and Control Unit
The display is divided into 9 sections. Information about the scale, the application being used and the sample weighed is output in the following sections:

- Line for metrological data
- Bar graph
- Plus/minus sign
- Measured value line
- Weight unit display, stability symbol display
- Data in tare memory; calculated value
- Application symbol display
- Text line
- Soft key labels

Line for Metrological Data (on scales verified for legal metrology)
This line shows:

Max6200 g – Maximum scale capacity (e.g., 6,200 g)

Min 0.5 g – Minimum scale capacity; the weight must not go below this limit when the scale is used in legal metrology

e= 0.1 g – Verification interval of the scale; irrelevant if the scale is not used in legal metrology (e.g., 0.1 g)

d=0.01 g – Readability: Indicates the actual scale interval (display increment of the scale) (e.g., 0.01 g)

Bar Graph (overview display)
In the bar graph, weighing results are displayed either

0% 100% – as a percentage of the maximum scale capacity, or

0% 100% – in relation to a target value, with tolerance limits indicated.

You can turn off (blank) the bar graph display
(Setup: App: Basic settings: Display: Digit size)

Plus/Minus Sign
This section shows:

– "Busy" symbol

\+ − – Plus or minus sign

0 – Zero symbol (indicating the scale has been zeroed)

Measured Value Line
This line shows:

125.03 – The current weight value (bordered values are invalid in legal metrology)

35 – Calculated values (e.g., piece count)

=W* 18.3*0.9 – User input (e.g., lot number, equation)

Weight Unit Display, Stability Symbol
This section shows:

kg – The current weight unit (e.g., kg)

pcs – Designation of other values (e.g., “pcs”)

Tare Memory, Calculated Value
This section shows:

⚠ – Indication that value is calculated (not valid in legal metrology)

NET1 NET2 PT – Indication that the tare memory contains application data

Application Symbols
This column shows:

U1 – Symbol for Application 1 (toggling between weight units, counting, weighing in percent, animal weighing, calculation)

– Symbol for Application 2 (checkweighing, time-controlled functions)

Σ – Symbol for Application 3 (totalizing, formulation, statistics)

– Symbol for current print job

– Symbol for ISO/GMP printout

Text Line
This line contains:

COUNTING: nRef = 10 pcs – Explanatory text about the application program (e.g., about “Counting”)

Ref.wt. too light – Explanation of error codes

Soft Key Labels
This line shows:

isoTST PT1/T1 S-ID M+ – Texts (abbreviations) to indicate the function assigned to each key

<< < ∧ ∨ > ↵ – Symbol for selecting and confirming parameter settings (see also “Operating Design”)

Scale Information
In the Setup menu, you can select Setup: ... Info for a display of scale information. The display includes:

SETUP	INFO
Version no.:	01-45-01
Bal. ver. no.:	00-20-13
Model:	FC6CCE-HX
Serial no.:	70604025
<<	

– Software version number

– Scale version number

– Scale model

– Scale serial number

Printouts

Purpose
This function enables you to print out weights, other measured values and IDs. You can format the printout to meet different requirements.

Features

Line format: You can configure a data ID code with up to 6 characters at the beginning of each of the values to be printed

Weight ID: You can configure an extra line for identification of each weighed or calculated value using the code `S ID`

Print application parameters: You can generate a printout of the values configured for initialization of an application before printing the measured results

ISO/GMP-compliant printout: You can print out parameters relating to the weighing conditions

Print animal weights: Application-defined, automatic printout of animal weights or of animal weights plus calculated weights after averaging

Configuring Printout Formats
For a number of application programs, you need to set initialization values. All values upon initialization or only the main values can be automatically printed as soon as you have configured this in the Setup menu: `Auto print upon initialization`

Weights and calculated values can be printed as numeric values either with a preceding data ID code (numeric value with 22 characters) or without one (numeric value only 16 characters). See also the section on `Line format` in the chapter entitled “Data Output Functions.”

You can generate an ISO/GMP print-out always or only for calibration/adjustment or turn off this option.
See also page 100.

Generating an ISO/GLP/GMP Printout
In the Setup menu, you have a choice of three settings:

- No ISO/GLP/GMP printout generated (`Off`)
- ISO/GLP/GMP printout generated only for calibration/adjustment (`Only for calibration/adjustment`)
- Every printout is an ISO/GLP/GMP-compliant report (`Always on`)

Auto print checkweighing results: automatic printout of a weight when it lies within the preset limits at stability

Auto print with time-controlled functions: automatic printout of weights after a preset time has elapsed or at a defined time
Printout of intermediate or final evaluation from the application 3 memory (totalizing, formulation and statistics); generate by pressing the `MR` soft key

Generating Printouts Acceptable for Legal Metrology:
You can configure the Setup menu of the scale to generate data records that are acceptable for legal metrology on a Sartorius printer:

- YDP02
- YDP03
- YDP01IS
- YDP01IS Label
- YDP02IS
- YDP02IS Label
- YDP04IS
- YDP04IS Label

ISO/GMP-compliant Printout/Record

You can have the parameters pertaining to weighing conditions printed before (GMP header) and after (GMP footer) the values from the weighing series. These parameters include:

- Date
- Time at the beginning of a weighing series
- Scale manufacturer
- Scale model
- Model serial number
- Software version
- Lot number (weighing series no.)
- Time at the conclusion of the weighing series
- Field for operator signature

Operating the Scale with an ISO/GMP-capable Documentation Device (Printer)

ISO/GMP-compliant documentation requires a computer with special software. Contact Sartorius for a detailed description for creating this software.

Setting:
Setup: Printout: ISO/GMP printout: Always on

The record is output to a Sartorius YDP03-0CE Data Printer or a computer.

End GMP printout:

● Press CF
End GMP printout while application is active:
This requires the following settings:
Setup: Device: Keys: CF function in application: Clear only selected applications

● Press CF

> Text line: CF selected: clear application

● Press the GLP soft key

```
--------------------
17.01.1997      16:12
      SARTORIUS
Mod.          FC6CCE-HX
Ser. no.      60419914
Ver. no.      01-35-18
ID     12345678901234
--------------------
L ID   12345678901234
nRef             10 pcs
wRef       1.35274 g
Qnt    +        235 pcs
Qnt    +       4721 pcs
S ID   12345678901234
Qnt    +        567 pcs
--------------------
17.01.1997      16:13
Name:

--------------------
```

Dotted line
Date/time
Scale manufacturer
Scale model
Scale serial number
Software vers. (display and control unit)
Scale ID no.
Dotted line
Weighing series no.
Application initialization value
Application initialization value
Counting result
Counting result
ID for counting result
Counting result
Dotted line
Date/time
Field for operator signature
Blank line
Dotted line

Record of Internal Calibration/Adjustment:

```
--------------------
17.01.1997      16:24
        SARTORIUS
Mod.          FC6CCE-HX
Ser. no.      60419914
Ver. no.      01-35-18
ID
--------------------
L ID   12345678901234
Internal calibration
Start:     manual
Diff. +       0.006 g
Internal calibration
        completed
Diff. +       0.000 g

--------------------
17.01.1997      16:25
Name:

--------------------
```

Dotted line
Date/time
Scale manufacturer
Scale model
Scale serial number
Software vers. (display and control unit)
Scale ID no.
Dotted line
Weighing series no.
Calibration adjustment mode
Beginning mode for calibration/adjustment
Difference after calibration/adjustment
Confirmation of completed calibration/adjustment routine
Difference between current and target values after calibration
Dotted line
Date/time
Field for operator signature
Blank line
Dotted line

Interface Description

Purpose
Your Factory scale comes equipped with an interface port for connection to a computer or other peripheral device.

You can use an on-line computer to change, start and/or monitor the functions of the scale and the application programs. The interface port also has four data output port lines for the over/under checkweighing program.

⚠ **Warning When Using Prewired RS-232 Connecting Cables!**
RS-232 cables purchased from other manufacturers often have incorrect pin assignments for use with Sartorius scales. Be sure to check the pin assignment against the chart on page 106 before connecting the cable, and disconnect any lines marked “Internally Connected”. Failure to do so may damage or even completely ruin your scale and/or peripheral device.

Available Features

Type of interface:	Serial interface
Operating mode:	Full duplex
Standard:	RS-232
Transmission rates: 4,800; 9,600; 19,200 baud	150; 300; 600; 1,200; 2,400;
Parity:	Space, odd, even
Character format:	1 start bit, 7-bit ASCII, parity, 1 or 2 stop bits
Handshake:	2-wire interface: via software (XON/XOFF); 4-wire interface: via hardware handshake lines (CTS/DTR)
Operating mode:	SBI, xBPI*
Network address**:	0, 1, 2, ..., 30, 31
Data output format of the scale:	16 or 22 characters

* xBPI operating mode: 9,600 baud, 8 bits, odd parity, 1 stop bit
** Network address is only valid in the XBPI mode

Factory Settings:

Transmission rate:	1,200 baud
Parity:	Odd
Stop bits:	1 stop bit
Handshake:	Hardware 1 character after CTS
Operating mode:	SBI
Network address:	0
Print manually/automatically:	Manual after stability
Stop automatic printing:	Not possible
Automatic printout, time-dependent:	After 1 display update
Tare after ind. printout:	Off
Application initialization values:	Off
Line format:	For other applications/GLP (22 characters)

Preparation
- See page 106 for the pin assignment chart

Line Format (Data Output Format)
You can output the values displayed in the measured value line and the weight unit with or without adata ID code

Example: Without data ID code
```
+      253 pcs
```

Example: With data ID code
```
Qnt    +      253 pcs
```

Configure this parameter in the Setup menu (Setup: Basic settings: Printout configuration: Line format).

The output with data ID code has 16 characters; without data ID code, 22 characters.

Output Format With 16 Characters

Display segments that are not activated are output as spaces. Characters without a decimal point are output without a decimal point.

The following characters can be output, depending on the characters displayed on the scale:

Normal Operation

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	+	*	D	D	D	D	D	D	D	D	*	U	U	U	CR	LF
or	–		.	.	.	.	.	.	.	.		*	*	*		
or	*		*	*	*	*	*	*	*	*						

*: Space
D: Digit or letter
U: Unit symbol
CR: Carriage return
LF: Line feed

Special Codes

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	*	*	*	*	*	*	–	–	*	*	*	*	*	*	CR	LF
or							H	H								
or							L	L								
or							C									

*: Space
– –: Weight
H: Overload
H H: Overload in checkweighing
L: Underload
L L: Underload in checkweighing
C: Calibration/adjustment

Error Codes

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	*	*	*	E	r	r	*	*/#	#	#	*	*	*	*	CR	LF

*: Space
#: Error code number

Data output example: + 1255.7 g

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	+	*	*	*	1	2	5	5	.	7	*	g	*	*	CR	LF

Position 1: Plus or minus sign or space
Position 2: Space
Position 3–10: Weight with a decimal point; leading zeros = space
Position 11: Space
Position 12–14: Unit symbol or space
Position 15: Carriage return
Position 16: Line feed

Data Output With ID Code

When data with an ID code is output, the ID code consisting of 6 characters precedes the data with the 16-character format. These 6 characters identify the subsequent value.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
KI	I	I	I	I	I	+	*	D	D	D	D	D	D	D	D	*	U	U	U	CR	LF
	*	*	*	*	*	–		.	.	.	.	.	.	.	.		*	*	*		
						*		*	*	*	*	*	*	*	*						

I: ID code character[1)]
*: Space
D: Digit or letter
U: Unit symbol[1)] see “Toggle between Weight Units”
CR: Carriage return
LF: Line feed

[1)] depends on scale type; e.g., not all units and characters are available on scales verified for use in legal metrology

Special Codes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S	t	a	t	*	*	*	*	*	*	*	*	–	–	*	*	*	*	*	*	CR	LF
												H	H								
												L	L								
												C									

*: Space
– –: Weight
H: Overload
H H: Overload in checkweighing
L: Underload
L L: Underload in checkweighing
C: Calibration/adjustment

Error Codes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S	t	a	t	*	*	*	*	*	E	r	r	*	#	#	#	*	*	*	*	CR	LF

*: Space
#: Error code number

ID code characters I [1)]

Stat	Status
ID	Identifier
L ID	Weighing series no.
W ID	Weight set number
Nom.	Exact calibration weight
S ID	Sample ID
NUM	Numeric input
T1	Application tare memory 1
N	Net weight (T1 = 0)
N1	Net weight (T1# 0)
Qnt	Quantity
Prc	Percentage
nRef	Reference sample quantity
pRef	Reference percentage
wRef	Average piece weight
Wxx%	Reference percentage weight
mDef	Target value for animal weighing
Mul	Multiplication factor for animal weighing
x–Net	Result in animal weighing
x–Res	Calculated result in animal weighing
Res	Result using equation (Calculation)
Setp	Target value for checkweighing
Min	Lower limit for checkweighing
Max	Upper limit for checkweighing
Time	Time that a value was stored
Compxx	No. of components in formulation
Tot.cp	Total weight in formulation
n	Transaction counter
Total	Sum of all values
Avg	Average in statistics
s	Standard deviation
srel	Variation coefficient
Diff	Difference between maximum and minimum

Data Input Format
You can connect a computer to your scale to send commands via the scale interface port to control scale functions and applications. The commands sent are control commands and may have different formats; e.g., control commands can have up to 26 characters. Each character must be transmitted according to the settings configured in the Setup menu for data transmission.

Format for Control Commands

Format 1:	Esc	!	CR	LF						
Format 2:	Esc	!	#	_	CR	LF				
Format 3:	Esc	!	#	&t		(max. 20 &t)	&t	_	CR	LF
Format 4:	Esc	!	#	&t		(max. 8 &t)	&t	_	CR	LF

Esc:	Escape	_:	Underline (ASCII: 95)
!:	Command character	CR:	Carriage RETURN (optional)
#:	Number	LF:	Line FEED (optional)
&t:	Number or letter	max:	depends on command character: i.e. parameter: once the max. length is reached, input received is cut off, rather than discarded as with keyboard input

Format 1

!	Meaning
l	Weighing mode 1
L	Weighing mode 2
M	Weighing mode 3
N	Weighing mode 4
O	Block keys
P	Print
R	Unblock keys
S	Restart
T	Tare and zero
Z	Internal calibration/adjustment
Q	Acoustic signal

Format 2

!#	Meaning	
f3	Zero	
f4	Tare (without zeroing)	
kF1 ... kF6	Soft key 1* Soft key 6*	Function depends on setting in application program
kF7	Function key Setup	
kF8	Function key	
s3	Function key CF	
x0	Perform internal calibration**	
x1	Print scale model	
x2	Print weighing platform serial number	
x3	Print weighing platform software version	
x4	Print display and control unit software version	
x5	Print (GMP) scale ID number	
x6	Print weight set (“inventory”) number	
x7	Print weighing series number	

Format 3 (not allowed in the Setup menu)

!#	Meaning
z5	Input (GMP) scale ID number
z6	Input weight set (“inventory”) number
z7	Input weighing series number

Format 4

!	Meaning
t	Text input in display

* numbered from right to left
** built-in calibration weight required

Synchronization
During data communication between the scale and an on-line device (computer), messages consisting of ASCII characters are transmitted via the interface. For error-free data communication, the parameters for baud rate, parity, handshake mode and character format must be the same for both units.

You can set these parameters in the Setup menu so that they match those of the on-line device. You can also define parameters in the scale to make data output dependent on various conditions. The conditions that can be configured are described under each of the application program descriptions.

If you do not plug a peripheral device into the scale interface port, no error message will be generated.

Handshake
The scale interface (Sartorius Scale Interface = SBI) has transmit and receive buffers. You can define the handshake parameter in the Setup menu:

- Hardware handshake (CTS/DTR)
- Software handshake (XON, XOFF)

Hardware Handshake
With a 4-wire interface, 1 more character can be transmitted after CTS (Clear to Send).

Software Handshake
The software handshake is controlled via XON and XOFF. When a device is switched on, XON must be transmitted to enable any connected device to communicate.

When the software handshake is configured in the Setup menu, the hardware handshake becomes active after the software handshake.

The data transmission sequence is as follows:

Scale	--- byte --->	Computer
(transmitting	--- byte --->	(receiving
device)	--- byte --->	device)
	--- byte --->	
	<--- XOFF ---	
	--- byte --->	
	--- byte --->	
	...	
	(Pause)	
	...	
	<--- XON ---	
	--- byte --->	
	--- byte --->	
	--- byte --->	
	--- byte --->	

Transmitting Device:
Once XOFF has been received, it prevents further transmission of characters.
When XON is received, it re-enables the transmitting device to send data.

Receiving Device:
To prevent too many control commands from being received at one time, XON is not transmitted until the buffer is almost empty.

Activating Data Output
You can define the data output parameter so that output is activated either when a print command is received or automatically and synchronous with the scale display or at defined intervals (see application program descriptions and auto-print setting).

Data Output by Print Command
The print command can be transmitted by pressing (PRINT) or by a software command (Esc P).

Automatic Data Output
In the “auto print” operating mode, data are output to the interface port without a print command. You can choose to have data output automatically at defined print intervals with or without the stability parameter. Whichever parameter you select, the data will be output as the readouts appear on the scale display. The display update frequency depends on both the model of the scale and the current operating status.

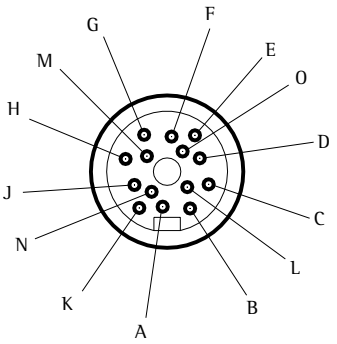
If you select the auto print setting, data will be transmitted immediately the moment you turn on the scale. In the Setup menu you can configure whether this automatic output can be stopped and started by pressing (PRINT).

Pin Assignment Chart

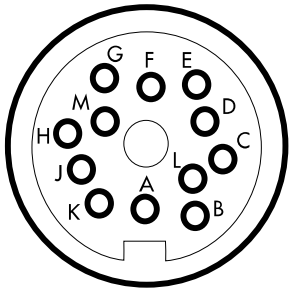
Female Interface Connector:
14-contact round connector, with screw-lock hardware for cable gland

Pin Assignment Chart

14-contact:
Scale/YAC01FC-X display and control unit



12-contact:
Zener Barrier
IDI01-Z, YDI02-Z, YDI03-Z



14-contact Round connector	12-contact Round connector	RS-232 signal (SBI and xBPI)	RS-485 signal[1]) (xBPI)
G	A[3])	Control output “heavier”	Control output “heavier”
K	B	Data output (TxD)	RxD – TxD – N
J	C	Data input (RxD)	RxD – TxD – P
N	D	Data Terminal Ready (DTR)	–
M	E	Signal GND	Signal GND
F	G[3])	Control output “lighter”	Control output “lighter”
A	H	Clear to Send (CTS)	–
E	J[3])	Control output “equal”	Control output “equal”
O	–	Universal switch[2])	Universal switch[2])
D	L[3])	Control output “set”	Control output “set”

Connect low-ohmic shield to the connector case

[1]) RS-485 interface available on request
[2]) See “Universal Remote Switch” in the section “Device Parameters” for more information on the switch functions
[3]) Control output available only for YDI03-Z

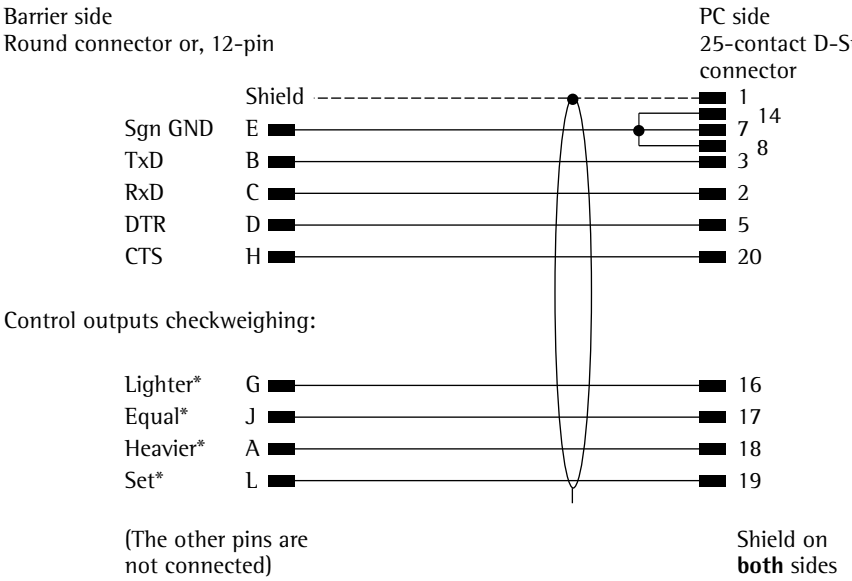
⚠ **Important Note:**
Only electrical equipment with a maximum voltage rating V_m of 250 V is permitted to be connected to the Zener barrier. The voltage rating V_Z of this Zener barrier is 12 V.

Cabling Diagram

Cabling Diagram (Adapter Cable for PC)
(Adapter cable YCC01-03ISM5 – round – DB25-PC)

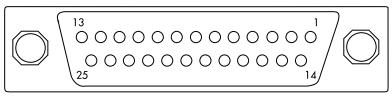
Diagram for interfacing a computer via a Zener barrier to the scale using the RS-232C/V24 standard and cables up to 15 m (50 ft) long

Cabling diagram:
Connection assignments for the cable from the Zener barrier to an RS-232 PC interface



* only with YDI03-Z Zener barrier

Female interface connector:
25-contact, D-Submini DB25S with screw lock hardware
Pin labeling of the 25-contact D-SUB connector

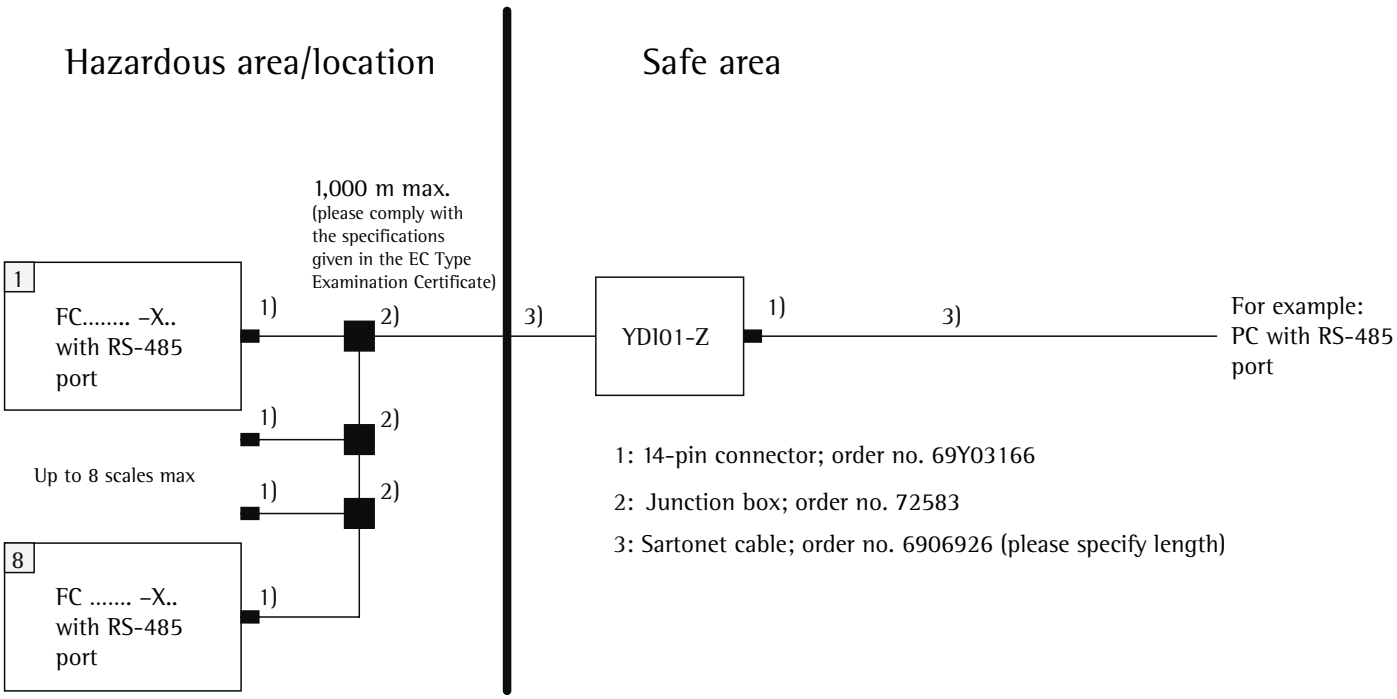


Connector – front view

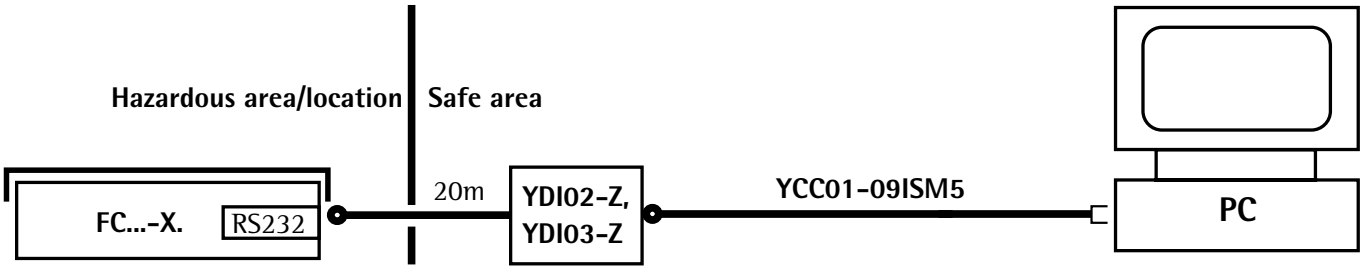
Male connector used:
(please use connectors with the same specifications):
25-pin D-Submini DB25S, with integrated shielded cable clamp assembly (Amp type 826 985-1C) and fastening screws (Amp type 164 868-1)

⚠ **Warning: When Using Pre-wired RS-232 Connecting Cables!**
RS-232 cables purchased from other manufacturers often have incorrect pin assignments for use with Sartorius scales. Be sure to check the pin assignment against the chart below before connecting the cable, and disconnect any lines marked “Internally Connected”. Failure to do so may damage or even completely ruin your scale and/or peripheral device.

Cabling Diagram: RS-485

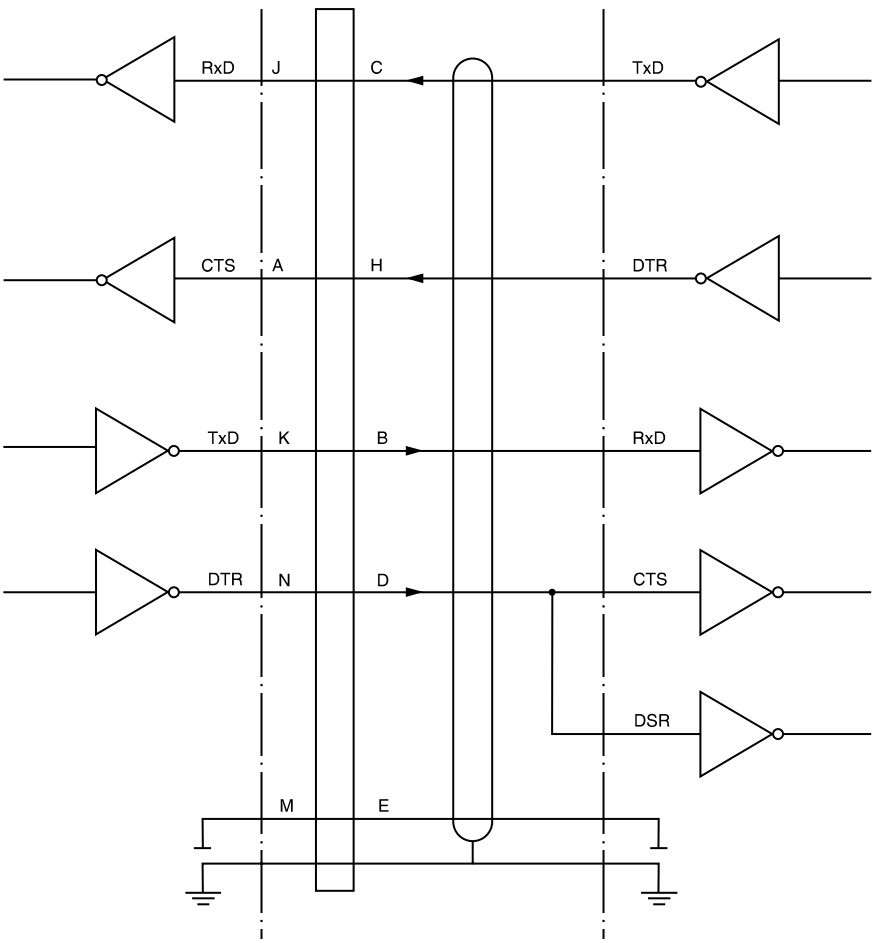


Cabling Diagram: RS232



Scale

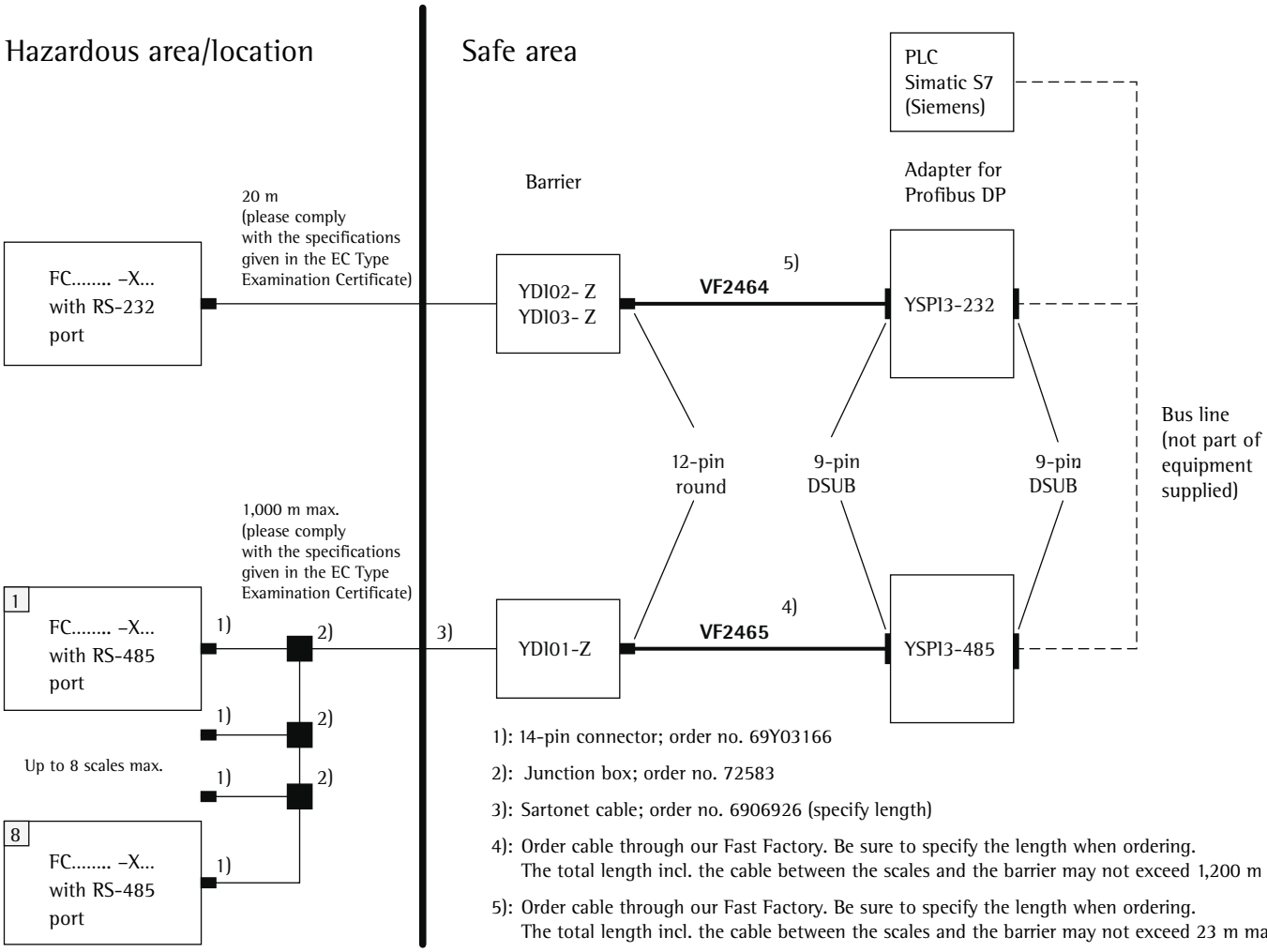
Zener barrier



	PC
25-pin	**9-pin**
2	3
20	4
3	2
5	8
6	6
7	5

⚠ **Important Note**
Only electrical equipment with a maximum voltage rating V_m of 250 V is permitted to be connected to the Zener barrier. The voltage rating V_Z of this Zener barrier is 12 V.

Cabling Diagram: Profibus



1): 14-pin connector; order no. 69Y03166

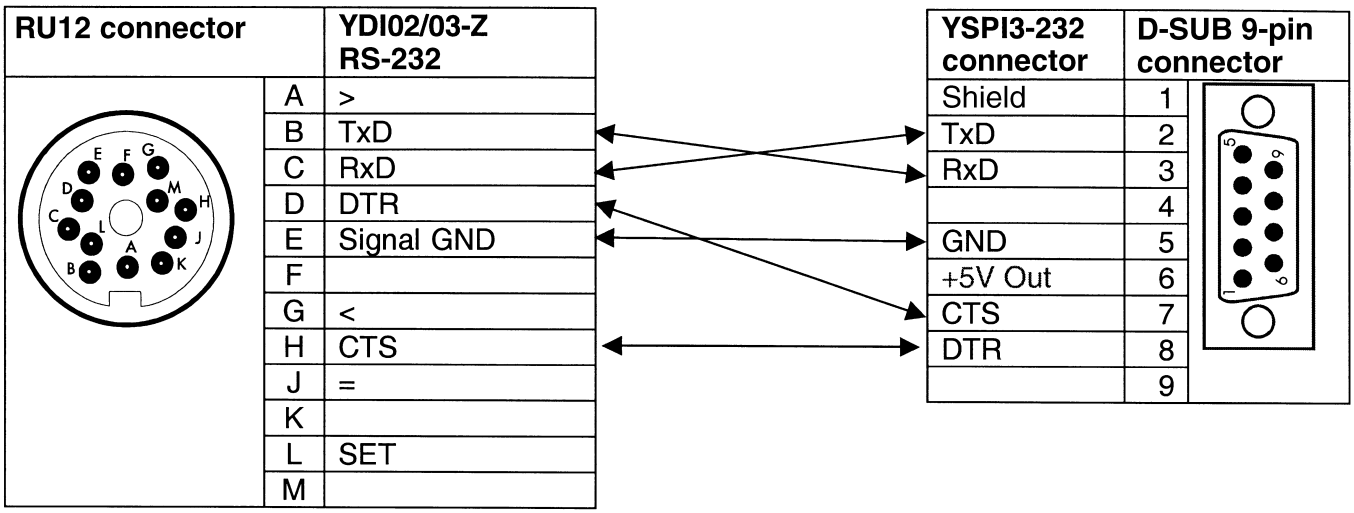
2): Junction box; order no. 72583

3): Sartonet cable; order no. 6906926 (specify length)

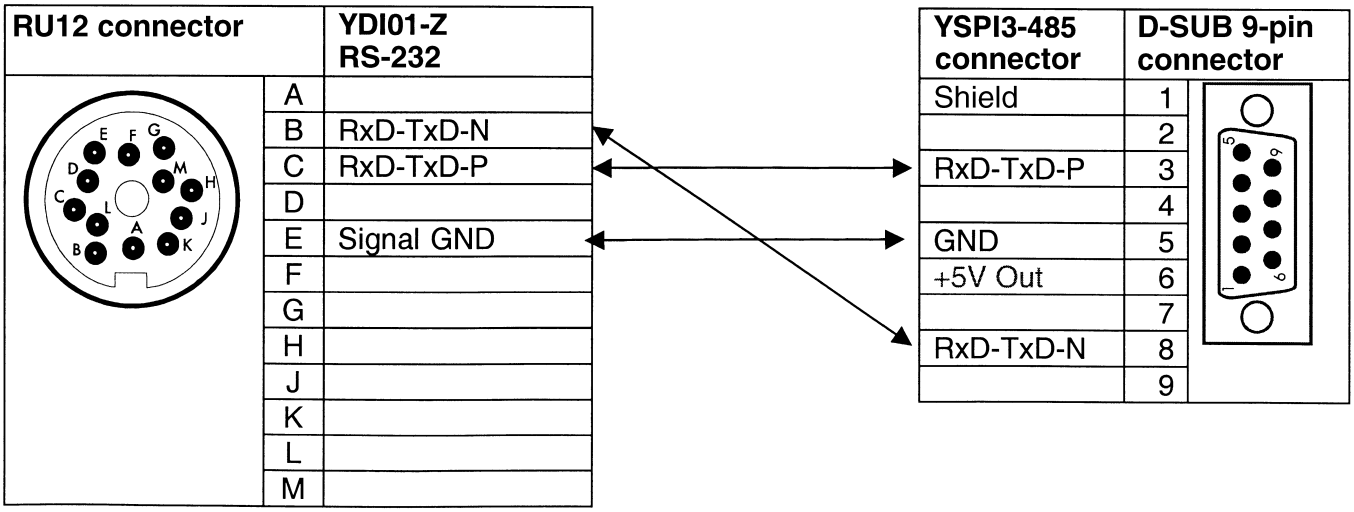
4): Order cable through our Fast Factory. Be sure to specify the length when ordering.
The total length incl. the cable between the scales and the barrier may not exceed 1,200 m max.

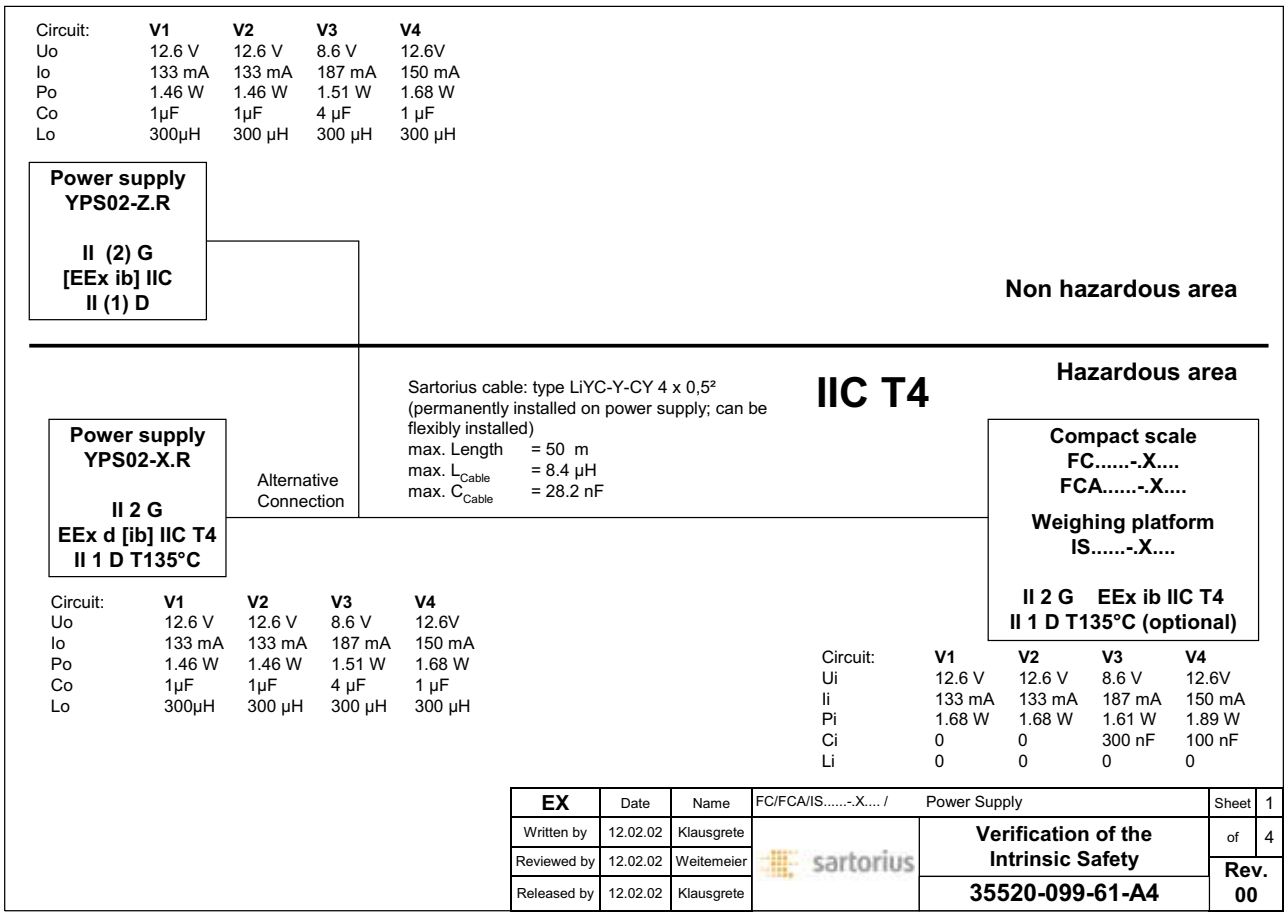
5): Order cable through our Fast Factory. Be sure to specify the length when ordering.
The total length incl. the cable between the scales and the barrier may not exceed 23 m max.

Connecting Cable (between YDI02/03-Z and YSPI3-232): **VF2464**

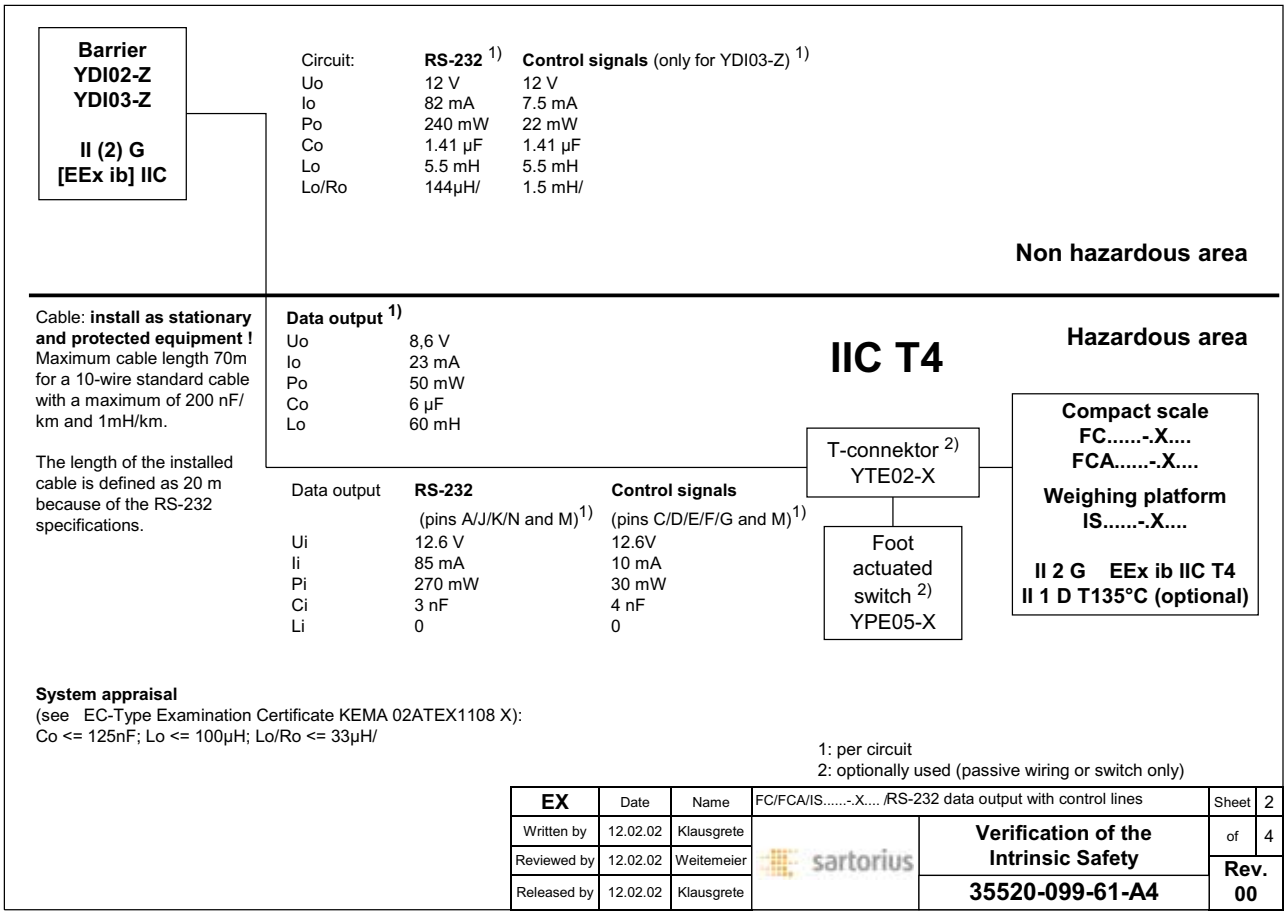


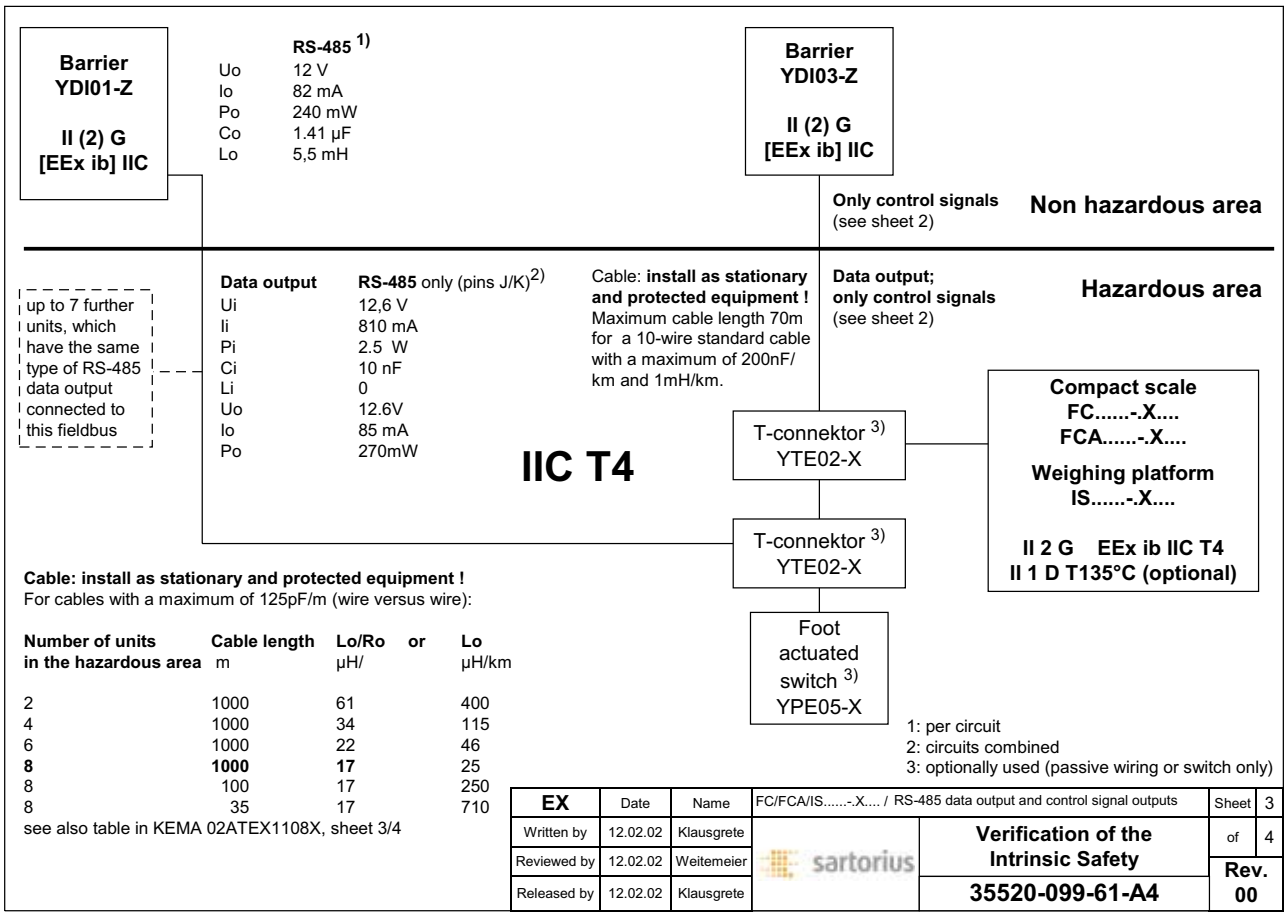
Connecting Cable (between YDI01-Z and YSPI3-485): **VF2465**



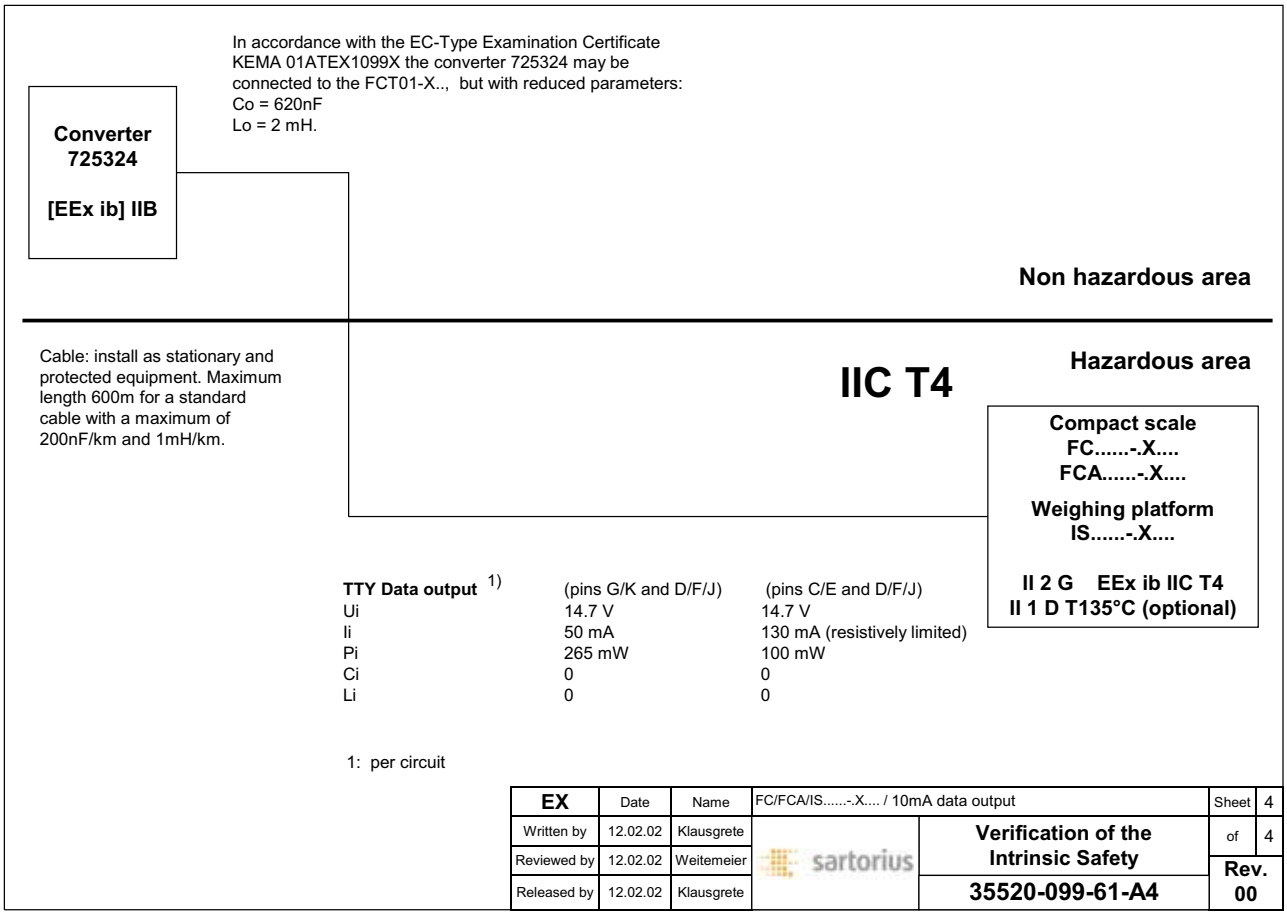

Circuit: V1 V2 V3 V4
Uo 12.6 V 12.6 V 8.6 V 12.6V
Io 133 mA 133 mA 187 mA 150 mA
Po 1.46 W 1.46 W 1.51 W 1.68 W
Co 1µF 1µF 4 µF 1 µF
Lo 300µH 300 µH 300 µH 300 µH
Power supply YPS02-Z.R
II (2) G [EEx ib] IIC
II (1) D
Non hazardous area
Hazardous area
IIC T4
Sartorius cable: type LiYC-Y-CY 4 x 0,5²
(permanently installed on power supply; can be flexibly installed)
max. Length = 50 m
max. L_{Cable} = 8.4 µH
max. C_{Cable} = 28.2 nF
Power supply YPS02-X.R
II 2 G
EEx d [ib] IIC T4
II 1 D T135°C
Alternative Connection
Compact scale
FC.....-.X....
FCA.....-.X....
Weighing platform
IS.....-.X....
II 2 G EEx ib IIC T4
II 1 D T135°C (optional)
Circuit: V1 V2 V3 V4
Uo 12.6 V 12.6 V 8.6 V 12.6V
Io 133 mA 133 mA 187 mA 150 mA
Po 1.46 W 1.46 W 1.51 W 1.68 W
Co 1µF 1µF 4 µF 1 µF
Lo 300µH 300 µH 300 µH 300 µH
Circuit: V1 V2 V3 V4
Ui 12.6 V 12.6 V 8.6 V 12.6V
Ii 133 mA 133 mA 187 mA 150 mA
Pi 1.68 W 1.68 W 1.61 W 1.89 W
Ci 0 0 300 nF 100 nF
Li 0 0 0 0
EX | Date | Name | FC/FCA/IS.....-.X.... / Power Supply | Sheet 1
Written by | 12.02.02 | Klausgrete
Reviewed by | 12.02.02 | Weitemeier
Released by | 12.02.02 | Klausgrete
sartorius
Verification of the Intrinsic Safety
of 4
35520-099-61-A4
Rev. 00

Cabling Diagram




Barrier
YDI01-Z
II (2) G
[EEx ib] IIC
RS-485 1)
Uo 12 V
Io 82 mA
Po 240 mW
Co 1.41 µF
Lo 5,5 mH
Barrier
YDI03-Z
II (2) G
[EEx ib] IIC
Only control signals
(see sheet 2)
Non hazardous area
Hazardous area
up to 7 further units, which have the same type of RS-485 data output connected to this fieldbus
Data output
Ui 12,6 V
Ii 810 mA
Pi 2.5 W
Ci 10 nF
Li 0
Uo 12.6V
Io 85 mA
Po 270mW
RS-485 only (pins J/K)2)
Cable: install as stationary and protected equipment ! Maximum cable length 70m for a 10-wire standard cable with a maximum of 200nF/ km and 1mH/km.
Data output;
only control signals
(see sheet 2)
IIC T4
T-connektor 3)
YTE02-X
T-connektor 3)
YTE02-X
Foot actuated switch 3)
YPE05-X
Compact scale
FC.....-.X....
FCA.....-.X....
Weighing platform
IS.....-.X....
II 2 G EEx ib IIC T4
II 1 D T135°C (optional)
Cable: install as stationary and protected equipment !
For cables with a maximum of 125pF/m (wire versus wire):
Number of units in the hazardous area | Cable length m | Lo/Ro or µH/ | Lo µH/km
2 | 1000 | 61 | 400
4 | 1000 | 34 | 115
6 | 1000 | 22 | 46
8 | 1000 | 17 | 25
8 | 100 | 17 | 250
8 | 35 | 17 | 710
see also table in KEMA 02ATEX1108X, sheet 3/4
1: per circuit
2: circuits combined
3: optionally used (passive wiring or switch only)
EX | Date | Name | FC/FCA/IS.....-.X.... / RS-485 data output and control signal outputs | Sheet 3
Written by | 12.02.02 | Klausgrete
Reviewed by | 12.02.02 | Weitemeier
Released by | 12.02.02 | Klausgrete
sartorius
Verification of the Intrinsic Safety
of 4
35520-099-61-A4
Rev. 00

Cabling Diagram



Error Codes

Error codes are displayed in the main display or text line for 2 seconds.
The program then returns automatically to the previous status.

Display	Cause	Solution
No segments appear on the display	No AC power is available The AC adapter is not plugged in Automatic shutoff configured in Setup (code 8 7 1)	Check the AC power supply Plug in the AC adapter Press I/⏻ to switch on the scale or select code 8 7 2 in Setup (“no automatic shutoff”)
H	The load exceeds the scale capacity	Unload the scale
L or Err 54	The weighing pan is not in place	Place the weighing pan on the scale; may have to be turned off and on again if “L” is displayed
Err 01 > Display range	Data output not compatible with output format	Change the configuration in the Setup menu
Err 02 Cal. n. possible	Calibration/adjustment condition not met, e.g., – The scale was not tared – The scale is loaded	Calibrate only when zero is displayed Press Tare to tare Unload the scale
Err 03 Cal./adj. interrupt	Calibration/adjustment could not be completed within a certain time	Allow the scale to warm up again and repeat the adjustment process
Err 05	Built-in calibration weight does not return to initial position	Contact your local Sartorius Service Center
Err 06 Int. wt. defective	Built-in calibration weight is defective	Contact your local Sartorius Service Center
Err 07 Function blocked	Function not allowed in scales verified for use in legal metrology	Contact your local Sartorius Service Center for information on having the settings changed
Err 08* <> zero range	The load on the scale is too heavy to zero the readout	Check whether the “power-on zero range” is set
Err 09* < 0 not allowed	Taring is not possible when the gross weight is ≤ zero	Zero the scale
Err 10 Tare fct. blocked	Tare key and 2nd tare memory are blocked when there is data in the tare memory for the formulation application	Press CF to clear the formulation application; the tare key and 2nd tare memory are then accessible
Err 11 Tare2 blocked	Tare memory not allowed	Check the tare value entered
Err 12 Tare2 > Max.	Tare memory greater than weighing range or range limits	Check sample/container
Err 17 Adj.-wt. > Max.	Internal adjustment is not possible because preload is too heavy	Reduce the preload or change the configuration
Err 30 Print fct. blocked	Interface port for printer output is blocked	Contact your local Sartorius Service Center

* = occurs only via the SBI interface (ESC f3_/f4_)

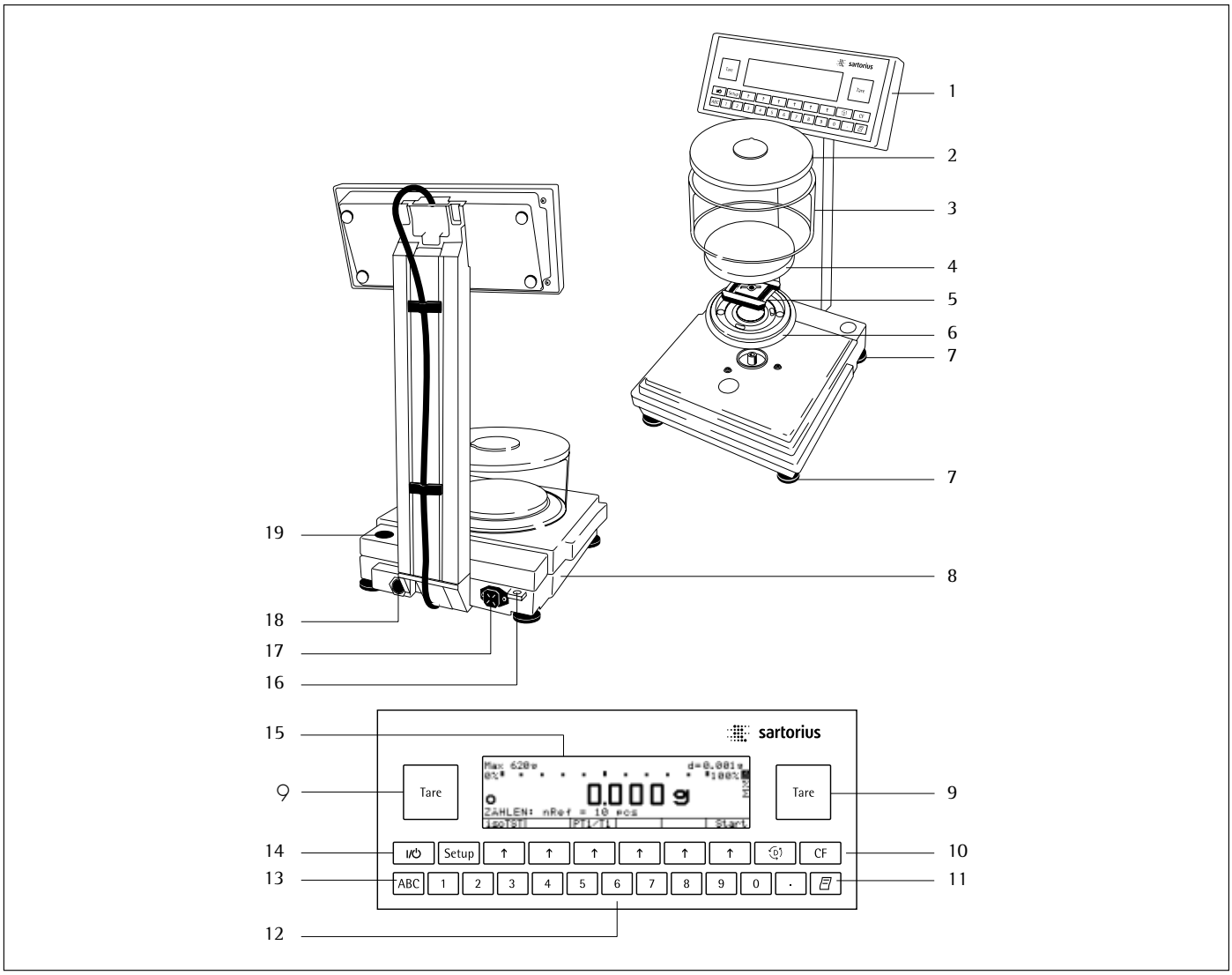
Display/Problem	Cause	Solution
Err 31 Print fct. blocked	Interface handshake interrupted (XOFF, CTS)	Transmit XON, then CTS
Ref.wt. too light	Error in storing reference weight (with the counting or weighing-in-percent application)	Weight too light or there is no sample on the scale
Cannot update	Reference updating not possible (with the counting application)	See “Counting” in “Operation” for reference updating criteria
Not a number xxxxx Too low xxxxx Too high	Input wrong (for any application program), e.g., alphabetic input not allowed	Follow the instructions for the application programs
Too many char.	Input text too long	Allowable text lengths, incl. decimal point: – S ID, NUM, L ID, ID: max. 20 characters – W ID: max. 14 characters
Equation too long	Equation exceeds 28 characters	Limit equation to 28 characters
Limits different than unit	The unit for the tolerance limits entered during checkweighing is different than that required for the current application	Change the tolerance limits to fit the application
Err 10x	Key is stuck Key pressed when switching on the scale:	Release key or Contact your local Sartorius Service Center
x = 1:	(F1, F2, F5, F6), CF	
x = 2:	, (F3), 0, 3, 4, 9	
x = 3:	2, 5, 6, ·, , Tare-right	
x = 4:	1, 7, 8, (F4), ABC, Tare-left	
“Checkerboard” pattern displayed continuously	Setup key was pressed when turning on the scale, or is stuck	
Err 340	Operating parameter (EEPROM) is wrong	Contact your local Sartorius Service Center
No WP	Weighing platform is defective	Contact your local Sartorius Service Center
blocked	Function blocked	none
The special code ◈ remains displayed	None of the keys has been pressed since the scale was turned on	Press a key
The weight readout changes constantly	Unstable ambient conditions Too much vibration, or the scale is exposed to a draft A foreign object is caught between the pan and the scale housing	Set up the scale in another area Change Setup configurations to adapt the scale to the ambient conditions Remove the foreign object
The weight readout is obviously wrong	The scale has not been calibrated/adjusted The scale was not tared before weighing The scale is not level The dust cover is caught under the weighing pan	Calibrate/adjust the scale Tare before weighing Level the scale See “Replacing the Dust Cover” in the chapter “Care and Maintenance”

If any other errors occur, contact your local Sartorius Service Center!

Overview

General Views of the Scales

FC06BBE-SX(CE)



Pos.	Designation	Spare Part Order No.
1	Display and control unit	
2	Draft shield cover	69 LP0002
3	Glass cylinder	69 14290
4	Weighing pan	69 LP0004
5	Pan support	69 LP0005
6	Shield disk	69 LP0003
7	Leveling foot	69 B20005
8	Menu access switch	
9	Metrological ID label (only on scales verified for legal metrology in the EU)	
10	Tare key	
11	Function keys	
12	Print key	

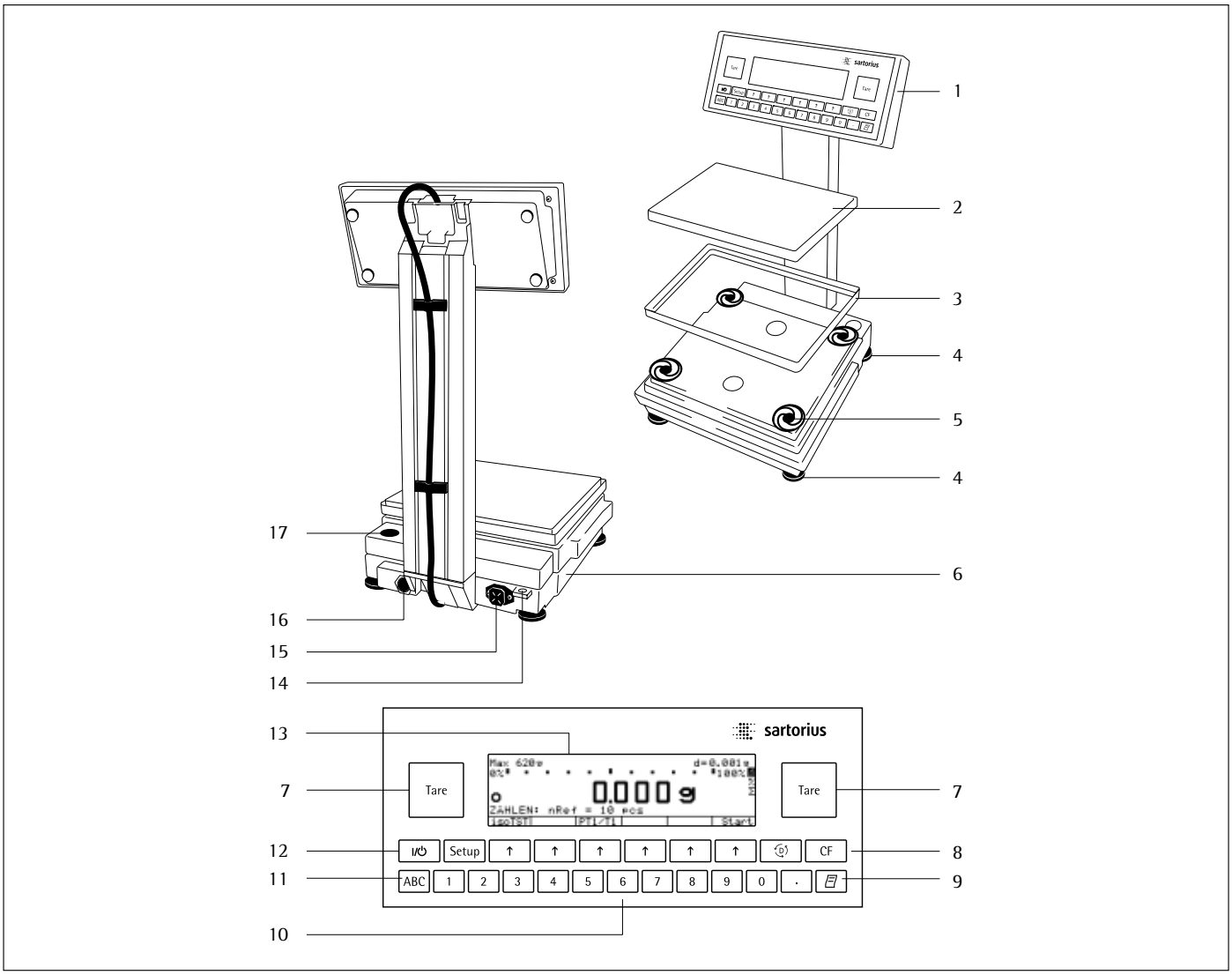
Pos.	Designation	Spare Part Order No.
13	Numeric keys	
14	Shift key for entering letters	
15	On/off key	
16	Display	
17	Lug for attaching an anti-theft locking device	
18	Main grounding terminal	
19	AC power socket	
20	Data interface port	
21	Level indicator	

Not shown:

Dust cover for weighing platform	69 60FB01
Dust cover for display & control unit	69 60LP03
Caps and plugs for covering ports (set)	69 B20009

Overview of the Scales

FC6CCE-HX(CE), FC2CCE-SX(CE), FC12CCE-SX(CE), FC12CCE-IXCE, FC6CCE-SX(CE)
"-CE" identifies the scale as verified for legal metrology in the EU*



Pos.	Designation	Spare Part Order No.
1	Display and control unit	
2	Weighing pan/load plate	69 LP0007
3	Pan shield (depends on type of model)	69 LP0008
4	Leveling foot	69 B20005
5	Menu access switch	
6	Shock absorber	69 LP0010
7	Metrological ID label (only on scales verified for legal metrology in the EU)	
8	Tare key	
9	Function keys	
10	Print key	
11	Numeric keys	

* including the Signatories of the Agreement on the European Economic Area

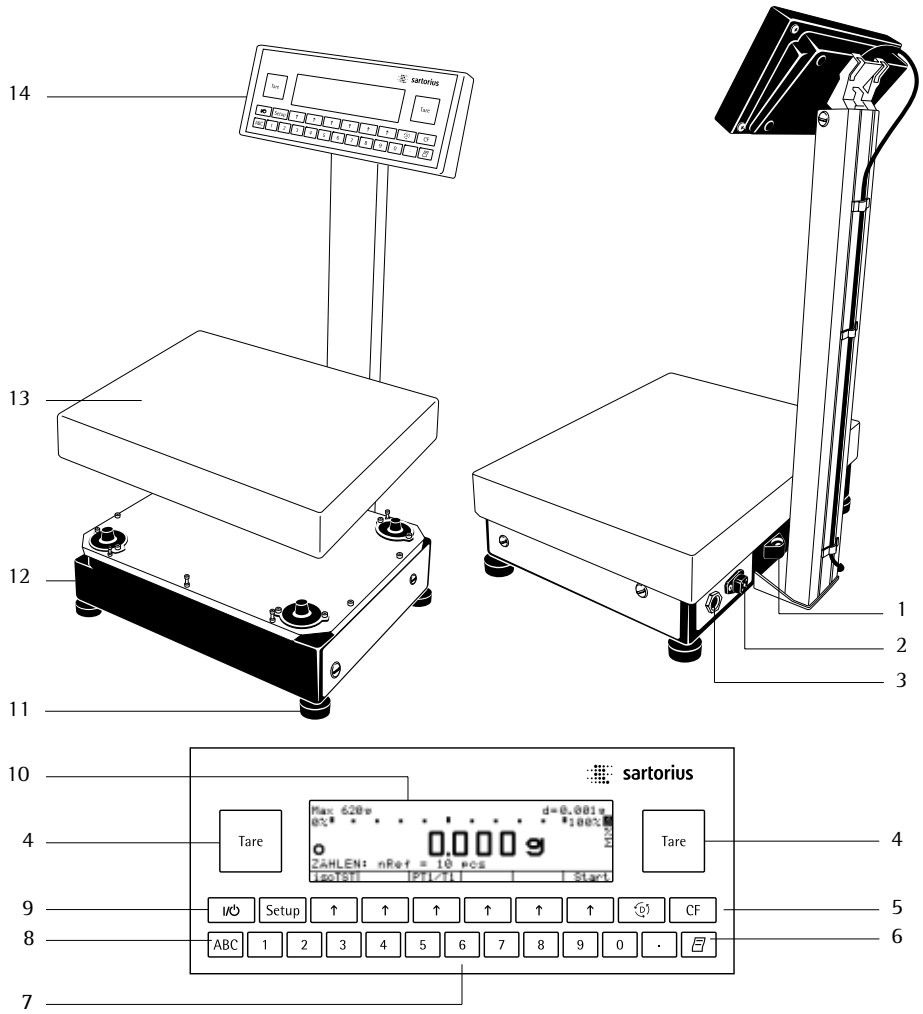
Pos.	Designation	Spare Part Order No.
12	Shift key for entering letters	
13	On/off key	
14	Display	
15	Lug for attaching an antitheft locking device	
16	Main grounding conductor	
17	AC power socket	
18	Data interface port	
19	Level indicator	

Not shown:

Dust cover for weighing platform	69 60FB02
Dust cover for display & control unit	69 60LP03
Caps and plugs for covering ports (set)	69 B20009

Overview of the Scales

FC34EDE-HX(CE), FC34EDE-PX(CE), FC16EDE-HX(CE), FC12EDE-PX(CE), FC64EDE-SX(CE), FC64EDE-HX
"·CE" identifies the scale as verified for legal metrology in the EU*



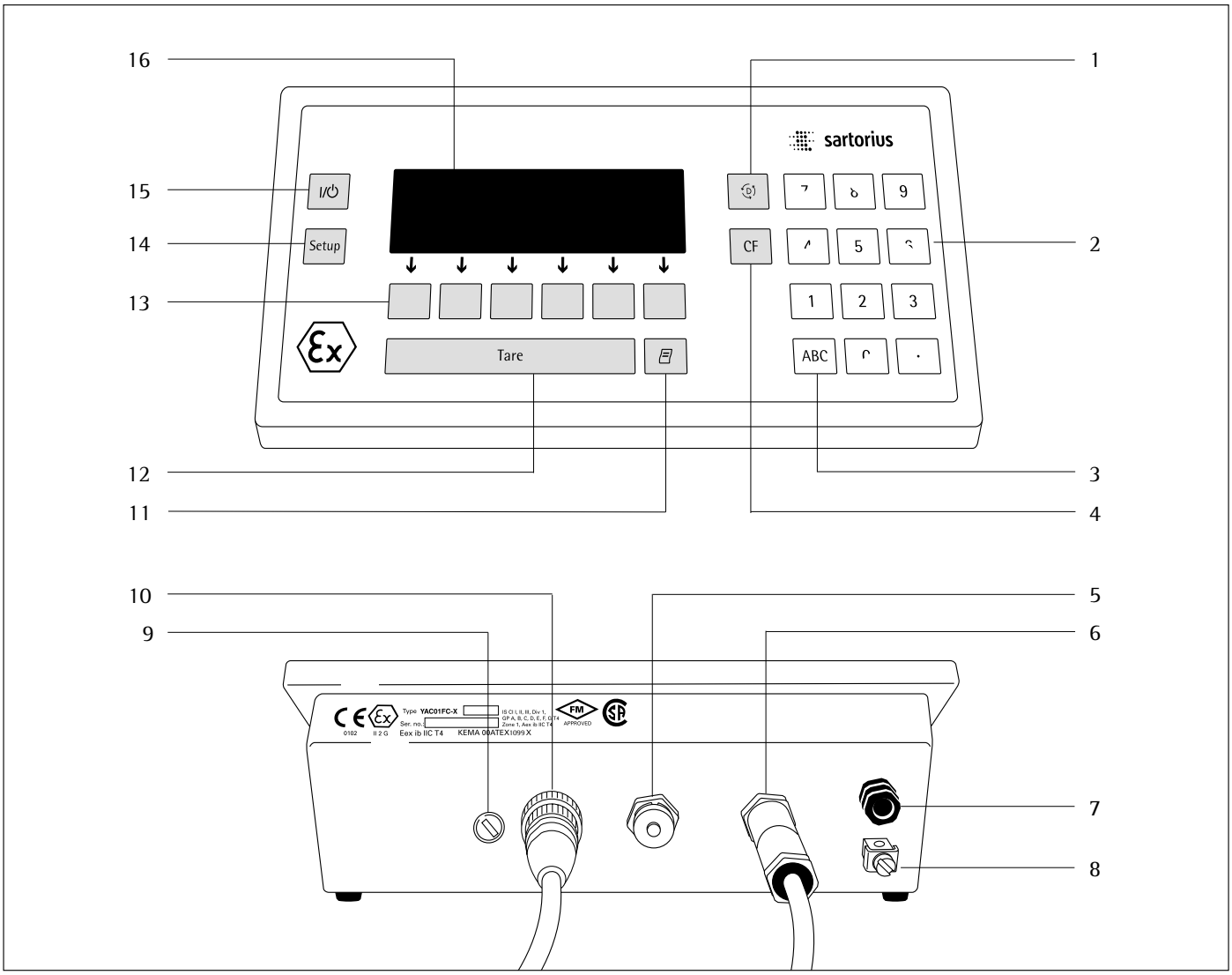
Pos.	Designation	Spare Part Order No.
1	Main grounding treminal	
2	Level indicator	
3	AC power socket	69 14290
4	Data interface port	69 LP0004
5	Manu access switch	
6	Tare key	
7	Function keys	
8	Print key	
9	Numeric keys	
10	Shift key	

Pos.	Designation	Spare Part Order No.
11	On/off key	
12	Display	
13	Leveling foot	69 LC0093
14	metrological ID label (only on scales verified for legal metrology in the EU)	
15	Load plate	
16	Display and control unit	
	Not shown:	
	Dust cover for display&control unit	69 60LP03

* including the Signatories of the Agreement on the European Economic Area

General View of the Terminal

FCA Models (this example: YAC01FC-X terminal)



Pos.	Designation
1	Toggle key for changing application programs
2	Numeric keys
3	Shift key for entering letters
4	CF key (clear function)
5	Serial communications port (14-pin)
6	Power jack
7	Vent valve
8	Terminal for an equipotential bonding conductor
9	Plug covering access switch

Pos.	Designation
10	Cable gland for connecting a weighing platform
11	Print key
12	Tare key
13	Function keys
14	Setup key
15	On/standby key
16	Display

Specifications

Standard Models

General Specifications:

AC power source/power requirements	AC adapter, 90 V AC (min.) to 264 V AC (max.)
Frequency	48 – 60 Hz
Allowable ambient operating temperature	0 ... +40 °C (273 ... 313 K, 32 °F ... 104 °F)
Adaptation to ambient conditions	By selection of 1 of 4 optimized filter levels
Display update (depends on the filter level selected)	0.1 – 0.4
Power consumption	25 VA
Hours of operation with fully charged YRB 06 Z external battery pack, approx.	14 h
Selectable weight units	Grams, kilograms, carats, pounds, ounces, Troy ounces, Hong Kong taels, Singapore taels, Taiwanese taels, grains, pennyweights, milligrams, parts per pound, Chinese taels, mommes, Austrian carats, tola, baht and mesghal
Selectable application programs	Mass unit conversion, counting, weighing in percent, animal weighing, calculation, density determination, over/under checkweighing, time-controlled functions, totalizing, statistics, 2nd tare memory, identifiers, product data memories
Built-in interface	RS-232C
Format: Parity: Transmission rates: Handshake:	7-bit ASCII, 1 start bit, 1 or 2 stop bits odd, even or space 150 to 19,200 baud Software or hardware

Specifications of the Individual Models:

Model		**FC06BBE-SX**	**FC6CCE-HX**	**FC2CCE-SX**	**FC12CCE-SX**	**FC6CCE-SX**
Readability	g	0.001	0.01	0.01	0.1	0.1
Weighing capacity	g	620	6,200	2,200	12,000	6,200
Max. capacity	kg	3	25	10	50	50
Tare range (subtractive)	g	–620	–6,200	–2,200	–12,000	–6,200
Electronically compensated preload (without restricting weighing range)	g	93	–	110	1,200	1,240
Max. preload when starting calibration/adjustment (scale must be zeroed)	g	110	5,200	1,300	10,000	6,400
Repeatability (standard deviation)	≤±g	0.001	0.01	0.01	0.05	0.05
Linearity	≤±g	0.002	0.02	0.02	0.2	0.1
Sensitivity drift within +10 ... +30 °C	≤±/K	$2 \cdot 10^{-6}$	$2 \cdot 10^{-6}$	$2 \cdot 10^{-6}$	$4 \cdot 10^{-6}$	$4 \cdot 10^{-6}$
Response time (average)	s	1.5	1.5	1.5	1	1
External calibration weight (of at least accuracy class...)	g	500 (E2)	5,000 (E2)	2,000 (F1)	5,000 (F1)	5,000 (F2)
Load plate	mm	∅ 130	218×200	218×200	218×200	218×200
Dimensions (W×D×H)	mm	240×294×86	240×294×86	240×294×86	240×294×86	240×294×86
Net weight, approx.	kg	7	8.4	7.3	7.3	7.3
Dust and water protection rating according to EN 60529		IP54				

Specifications

Model		FC64EDE-H, FCA64EDE-HX	FC34EDE-H, FCA34EDE-HX	FC16EDE-H, FCA16EDE-HX
Readability	g	0.1	0.1	0.1
Weighing capacity	kg	64	34	16
Max. overload capacity	kg	130	130	130
Tare range (subtractive)	kg	–64	–34	–16
Electronically compensated preload (without restricting weighing range)	kg	13	4	4
Max. preload when starting calibration/adjustment (scale display does not have to be zeroed)	kg	approx. 45	approx. 21	approx. 19
Repeatability	≤±g	0.1	0.1	0.05
Linearity	≤±g	0.5	0.2	0.2
Sensitivity drift within +10 ... +30°C	≤±/K	$3 \cdot 10^{-6}$	$2 \cdot 10^{-6}$	$2 \cdot 10^{-6}$
Response time (average)	s	1.5	1.5	1.5
External standard calibration weight (of at least accuracy class...)	kg	10 (F1)	10 (F1)	10 (F1)
Platform dimensions	mm	300×400		
Net weight, approx.	kg	16.0		
Dust and water protection rating according to EN 60529		IP44	IP65	IP65

Model		FC34EDE-PX, FCA34EDE-PX	FC12EDE-PX, FCA12EDE-HX	FC64EDE-SX, FCA64EDE-SX
Readability	g	0.1/0.2/0.5	0.1/0.2	1
Weighing capacity	kg	8/16/34	6/12	64
Max. overload capacity	kg	130	130	130
Tare range (subtractive)	kg	–34	–12	–64
Electronically compensated preload (without restricting weighing range)	kg	4	4	13
Max. preload when starting calibration/adjustment (scale display does not have to be zeroed)	kg	approx. 21	approx. 10	approx. 45
Repeatability	≤±g	0.05/0.05/0.1	0.05/0.05	0.3
Linearity	≤±g	0.2	0.2	1
Sensitivity drift within +10 ... +30°C	≤±/K	$2 \cdot 10^{-6}$	$2 \cdot 10^{-6}$	$3 \cdot 10^{-6}$
Response time (average)	s	1.5	1.5	1.5
External standard calibration weight (of at least accuracy class...)	kg	10 (F2)	10 (F1)	10 (F2)
Platform dimensions	mm	300×400		
Net weight, approx.	kg	16.0		
Dust and water protection rating according to EN 60529		IP65		

Model		FCA150IGG-HX	FCA300IGG-HX
Readability	g	1	2
Weighing capacity	kg	150	300
Max. overload capacity	kg	600	600
Tare range (subtractive)	kg	150	300
Electronically compensated preload (without restricting weighing range)	kg	30	60
Max. preload when starting calibration/adjustment (scale display does not have to be zeroed)	kg	approx. 120	approx. 300
Repeatability	≤±g	1	2
Linearity	≤±g	4	8
Sensitivity drift within +10 ... +30°C	≤±/K	$2.5 \cdot 10^{-6}$	$2.5 \cdot 10^{-6}$
Response time (average)	s	1.5	1.5
External standard calibration weight (of at least accuracy class...)	kg	50 (F2)	50 (F1)
Platform dimensions	mm	800×600	
Net weight, approx.	kg	70	
Dust and water protection rating according to EN 60529		IP67	

Specifications

Models Verified by the Manufacturer, with EC Type Approval

General Specifications		
AC power source/power requirements	AC adapter, 90 V AC (min.) to 264 V AC (max.)	
Frequency	48 – 60 Hz	
Allowable ambient temperature range	0...+40°C (273...313 K, 32°F...104°F)	
Adaptation to ambient conditions	By selection of 1 of 4 optimized filter levels	
Display update (depends on the filter level selected)	0.1–0.4	
Power consumption	25 VA	
Selectable weight units	Grams, kilograms	
Selectable application programs	Mass unit conversion, counting, weighing in percent, animal weighing, calculation, density determination, over/under checkweighing, time-controlled functions, totalizing, statistics, 2nd tare memory, identifiers	
Built-in interface	RS-232C	
	Format:	7-bit ASCII, 1 start bit, 1 or 2 stop bits
	Parity:	Space, odd, even
	Transmission rates:	150 to 19,200 baud
	Handshake:	Software or hardware

Specifications of the Individual Models:

Model		**FC06BBE-SXCE**	**FC6CCE-HXCE**	**FC2CCE-S0CE**
Type		isoTEST in conjunction with BD BF		
Accuracy class *		(II)	(II)	(II)
Scale interval d*	g	0.001	0.01	0.01
Max. weighing capacity*	g	620	6,200	2,200
Verification scale interval e*	g	0.01	0.1	0.1
Min. capacity*	g	0.05	0.5	0.5
Max. overload capacity	kg	3	25	10
Tare range (subtractive)		≤100% of the max. weighing capacity		
Electronically compensated preload (without restricting weighing range)	g	93	–	110
Max. preload when starting calibration/adjustment (scale must be zeroed)	g	110	5,200	1,300
Application range according to CD*	g	0.02–620	0.5–6,200	0.5–2,200
Response time (average)	s	1.5	1.5	1.5
Allowable ambient operating temperature		+10° to +30°C (50° to 86°F)		
Pan/load plate size	mm	∅130	218×200	218×200
Dimensions (W×D×H)	mm	240×294×86	240×294×86	240×294×86
Net weight. approx.	kg	7	8.4	7.3
Dust and water protection rating according to EN 60529		IP 54 (protected against harmful dust deposits and splashes of water)		

* CD = Council Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area

Model-Specific Specifications:

Model		**FC12CCE-SXCE**	**FC6CCE-SXCE**	**FC12CCE-IXCE**
Type		isoTEST in conjunction with BD BF		
Accuracy class *		Ⅱ	Ⅱ	Ⅱ
Scale interval d*	g	0.1	0.1	0.5
Max. weighing capacity*	g	12,000	6,200	12,000
Verification scale interval e*	g	1	1	0.5
Min. capacity*	g	5	5	25
Max. capacity	kg	50	50	50
Tare range (subtractive)		≤100% of the max. weighing capacity		
Electronically compensated preload (without restricting weighing range)	g	1,200	1,240	1,200
Max. preload when starting calibration/adjustment (scale must be zeroed)	g	8,200	2,440	8,200
Application range according to CD*	g	5–12,000	5–6,200	25–12,000
Response time (average)	s	1	1	1
Allowable ambient operating temperature		+10° to +30°C (50° to 86°F)		
Pan size	mm	218×200	218×200	218×200
Net weight, approx.	kg	7.3	7.3	7.3
Dust and water protection rating according to EN 60529		IP54		

Model		**FC34EDE-HXCE, FCA34EDE-HXCE**	**FC16EDE-HXCE, FCA16EDE-HXCE**	**FC34EDE-PXCE, FCA34EDE-PXCE**	**FC12EDE-PXCE, FCA12EDE-PXCE**	**FC64EDE-SXCE, FCA64EDE-SXCE**
Type		isoTEST in conjunction with BF BF				
Accuracy class *		Ⅱ	Ⅱ	Ⅱ	Ⅱ	Ⅱ
Scale interval d*	g	0.1	0.1	0.1/0.2/0.5	0.1/0.2	1
Max. weighing capacity*	kg	34	16	8/16/34	6/12	64
Verification scale interval e*	g	1	1	1	1	10
Min. capacity*	g	5	5	5	5	50
Tare range (subtractive)		≤100% of the max. weighing capacity				
Max. capacity	kg	130				
Electronically compensated preload (without restricting weighing range)	kg	4	4	4	4	13
Max. preload when starting calibration/adjustment (scale does not have to be zeroed)	kg	ca. 21	ca. 19	ca. 21	ca. 10	ca. 45
Application range according to CD*	g	5–34,000	5–16,000	5–34,000	5–12,000	50–64,000
Response time (average)	s	1.5				
Allowable ambient operating temperature		+10° to +30°C (50° to 86°F)				
Pan size	mm	300×400				
Net weight, approx.	kg	16.0				
Dust and water protection rating according to EN 60529		IP65				

* CD = Council Directive 90/384/EEC for non-automatic weighing instruments used within the European Economic Area

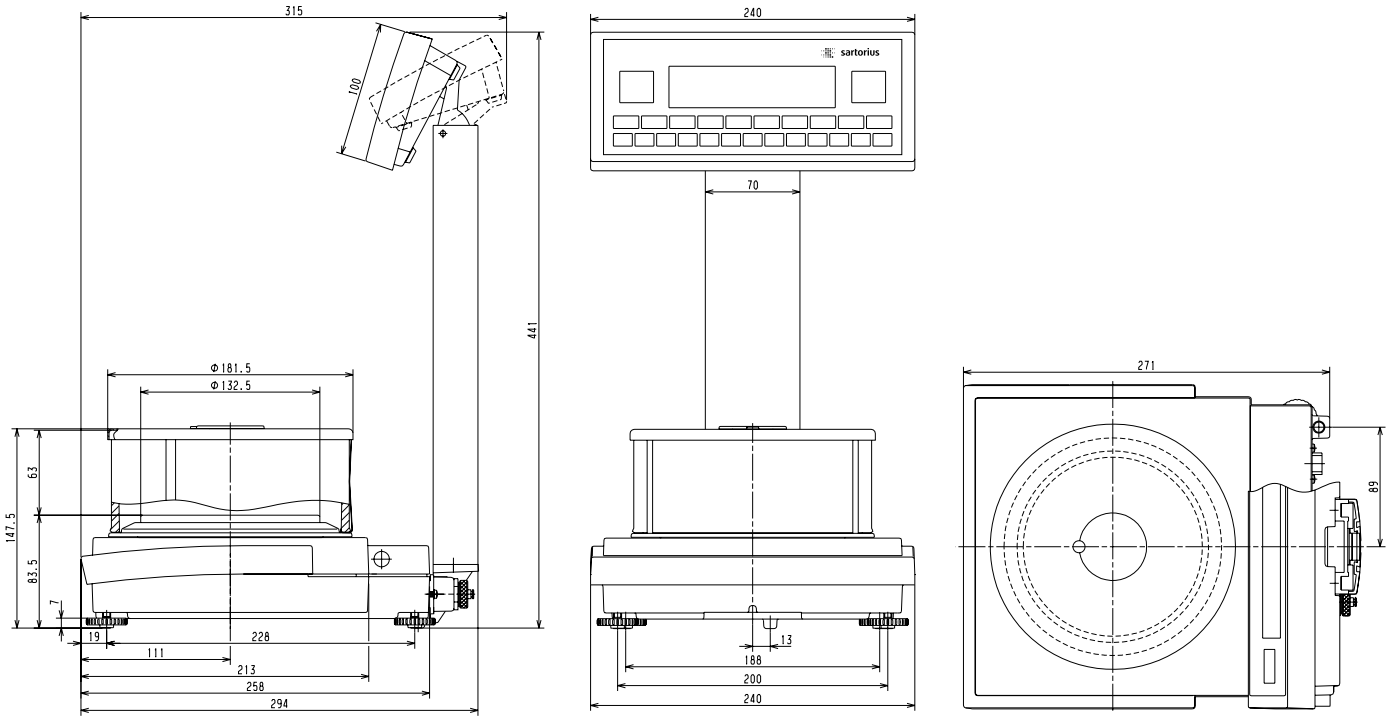
Specifications

Model		FCA150IGG-HXCE	FCA300IGG-HXCE
Type		isoTEST in conjunction with HC BF	
Accuracy class *		Ⅱ	Ⅱ
Scale interval d*	g	1	20
Max. weighing capacity*	kg	150	300
Verification scale interval e*	g	10	20
Min. capacity*	g	50	1000
Tare range (subtractive)		≤100% of the max. weighing capacity	
Max. overload capacity	kg	600	600
Tare range (subtractive)	kg	150	300
Electronically compensated preload (without restricting weighing range)	kg	30	60
Max. preload when starting calibration/adjustment (scale display does not have to be zeroed)	kg	approx. 120	approx. 300
Application range according to CD*	kg	0.05-150	1-300
Response time (average)	s	1.5	1.5
Allowable ambient operating temperature		0 to +40°C (273 to 313°K; +32° to 104°F)	
External standard calibration weight (of at least accuracy class...)	kg	50 (F2)	50 (F1)
Platform dimensions	mm	800×600	
Net weight, approx.	kg	70	
Dust and water protection rating according to EN 60529		IP67	

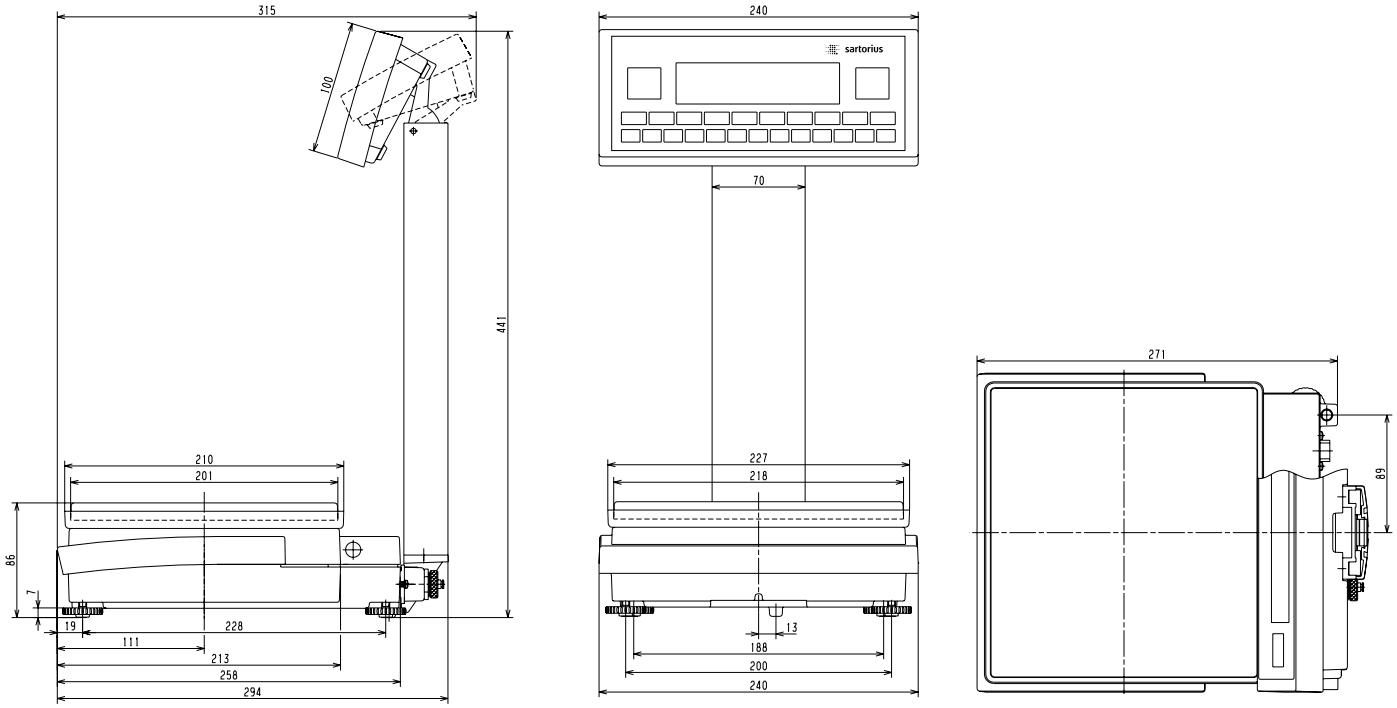
* CD = Council Directive 90/384/EEC for non-automatic weighing instruments used within the European Economic Area

Dimensions (Scale Drawings)

FC06BBE-SX (CE)



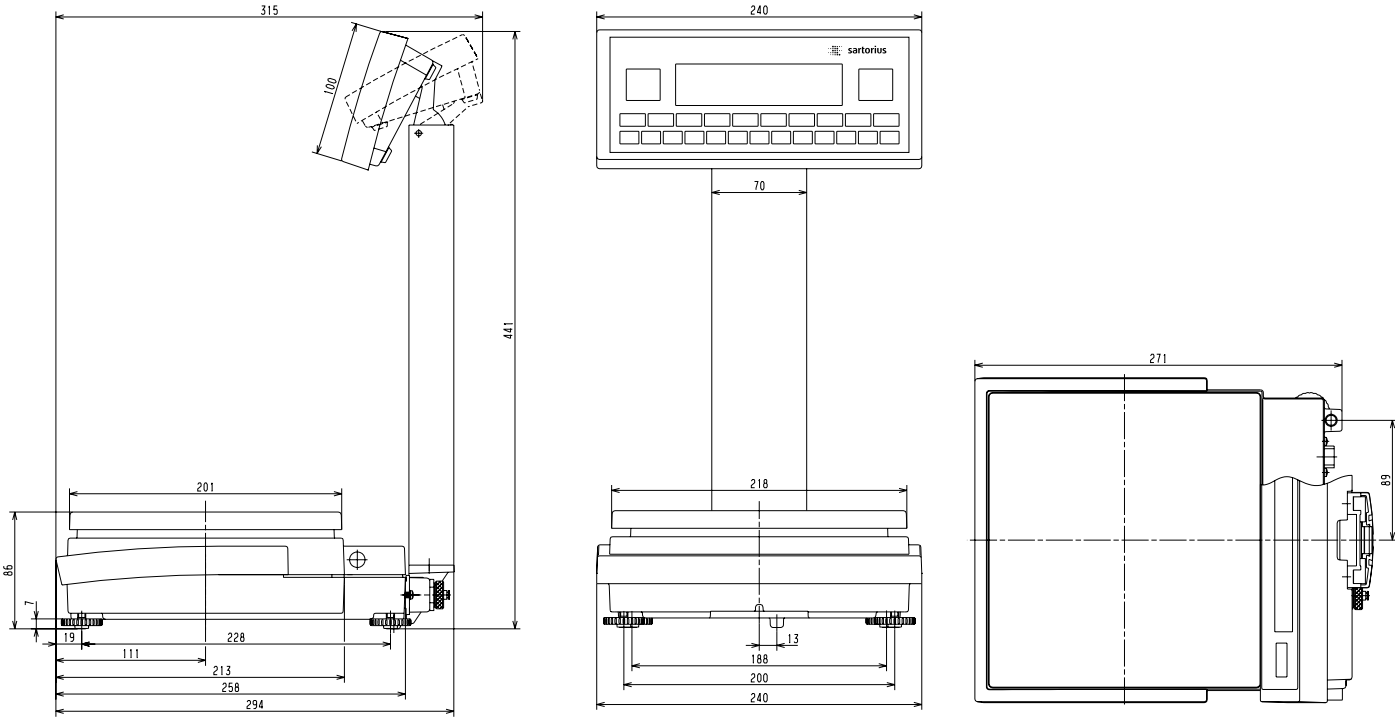
FC6CCE-HX (CE), FC2CCE-SX (CE)



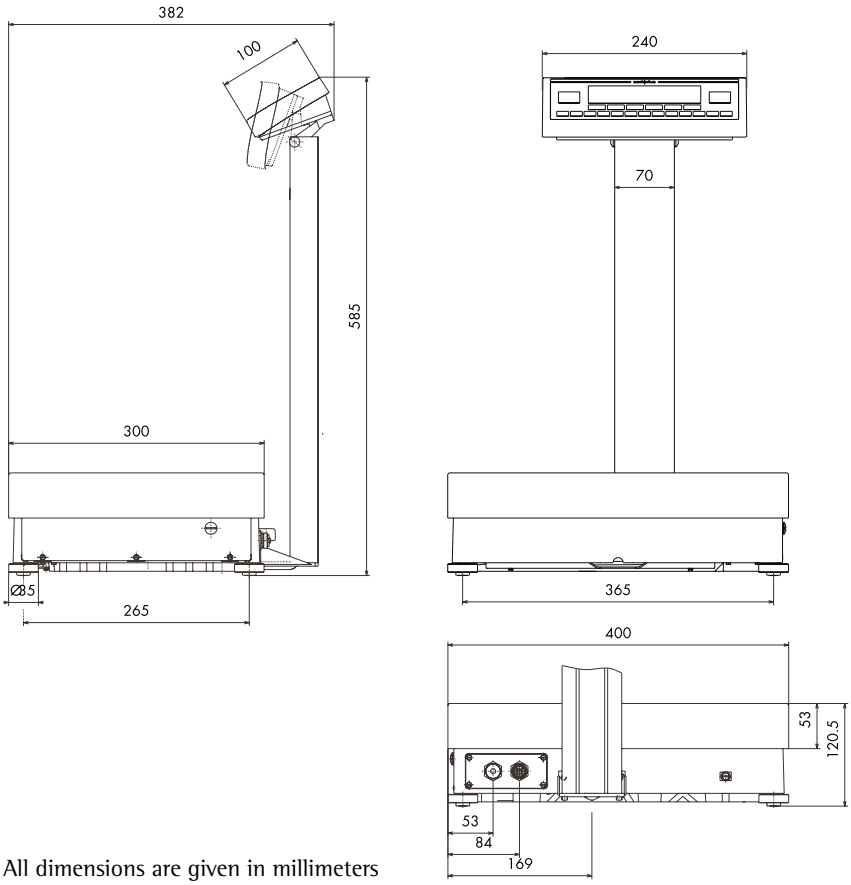
All dimensions are given in millimeters

Dimensions (Scale Drawings)

FC12CCE-SX (CE), FC12CCE-IXCE, FC6CCE-SX (CE)

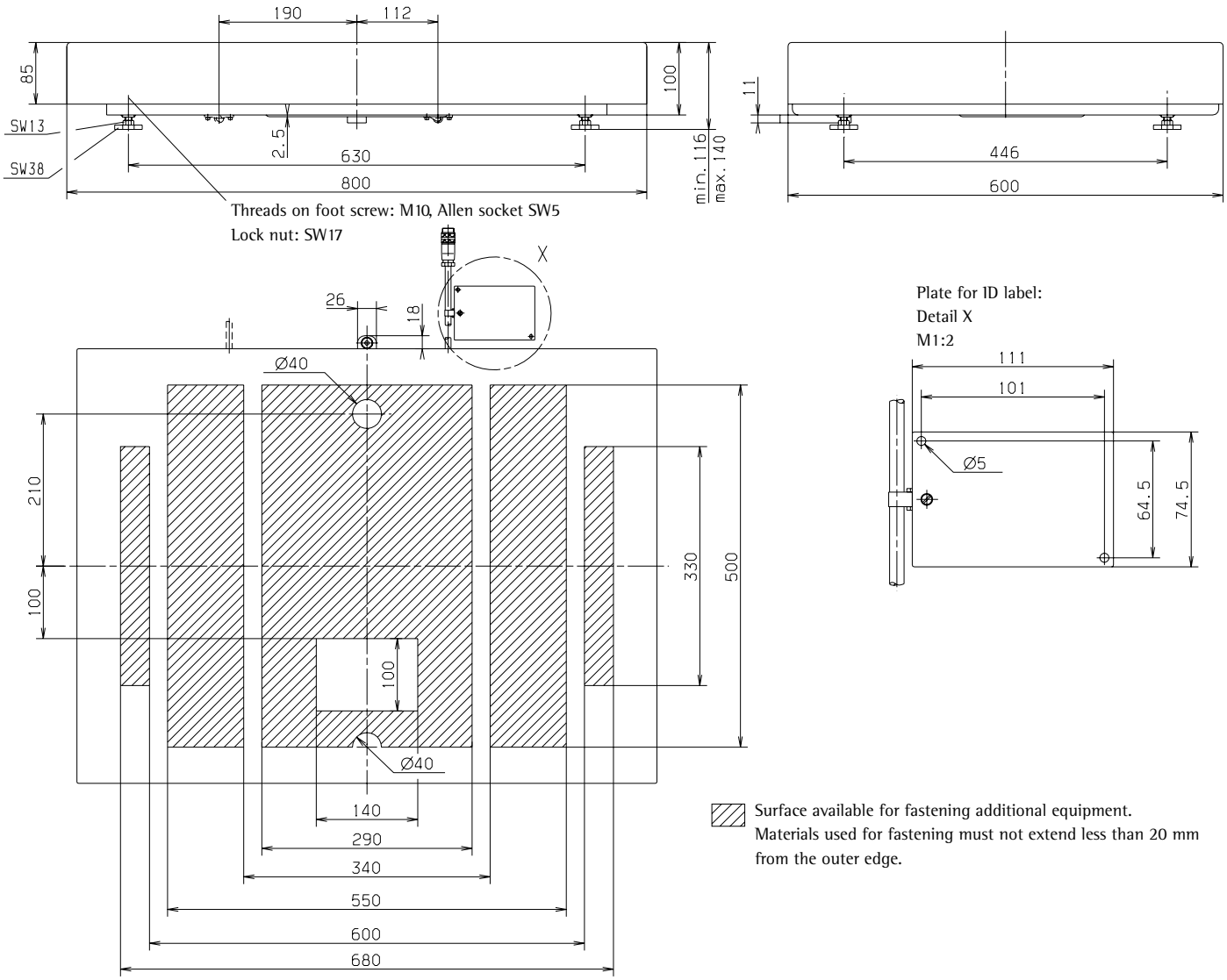


FC64EDE-HX(CE), FC34EDE-HX(CE), FC16EDE-HX(CE), FC34EDE-PX(CE), FC12EDE-PX(CE),FC64EDE-SX(CE)

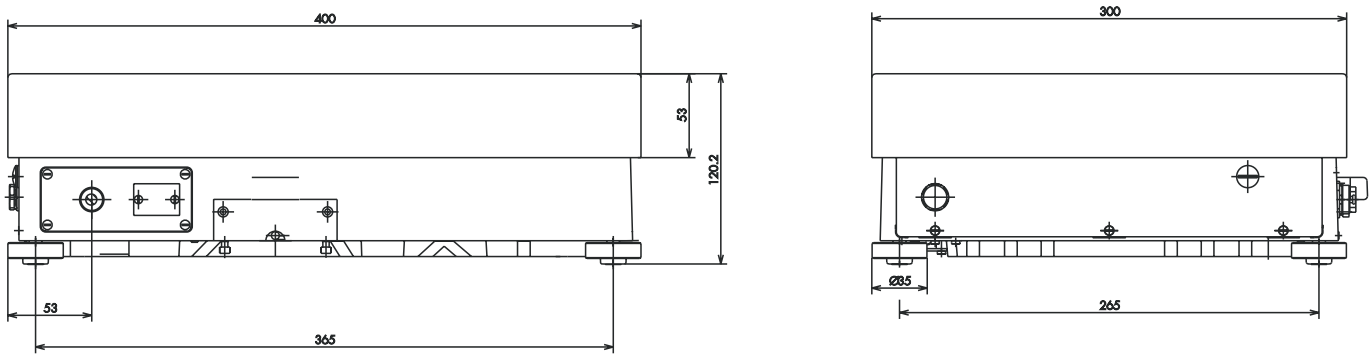


All dimensions are given in millimeters

Platform on FCA...IGG Models



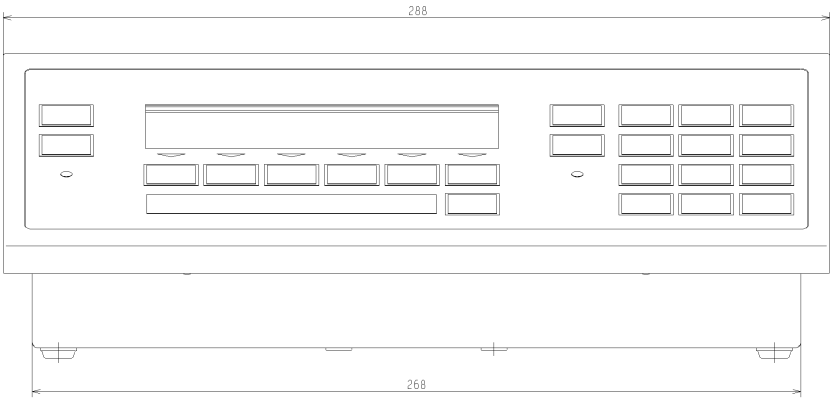
Platform on FCA...EDE Models

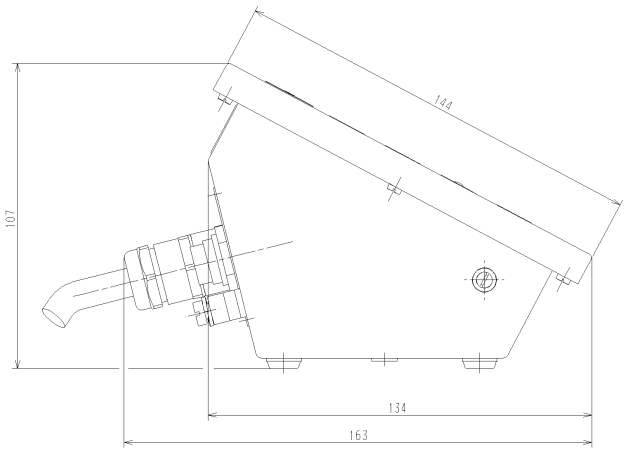


All dimensions are given in millimeters

Dimensions (Scale Drawings)

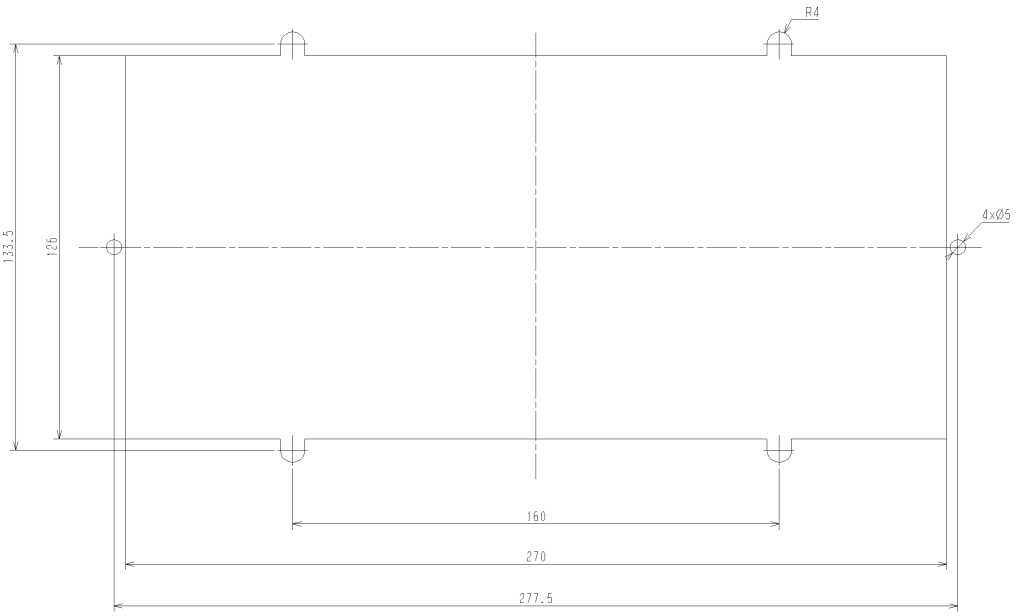
FCA Display and Control Unit





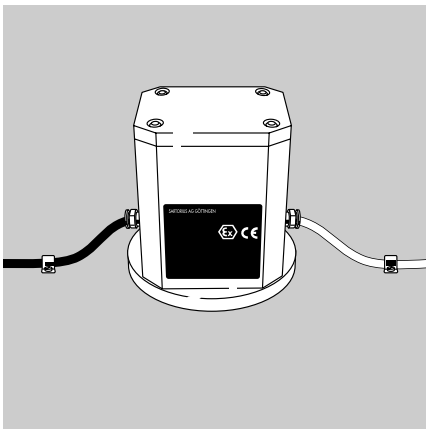
Control Box Installation:
Make sure you use screws of the required length. Install additional panels or other materials as necessary to ensure that the housing is impenetrable in accordance with the IP protection rating.

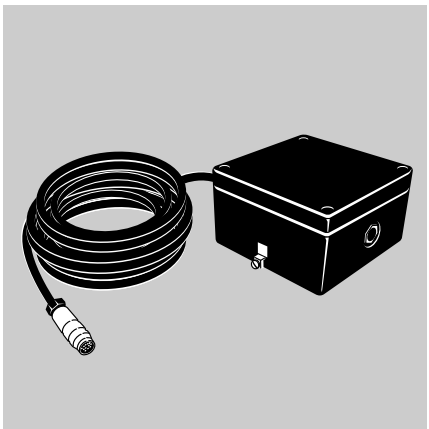
Installation dimensions:



All dimensions are given in millimeters

Accessories (Options)





Product	Order No.
Power supplies	
AC adapters for use in safe area (110 to 240 V)	
EU excluding UK	**YPS02-ZDR**
UK	**YPS02-ZGR**
USA	**YPS02-ZKR**
⚠ Install the cable so that it is protected from damage. Connect the terminal of the housing to a terminal for equipotential bonding (PE = protective earthing or grounding conductor)	
Power supplies for use in hazardous area (110 to 240 V)	
EU except UK	**YPS02-XDR**
UK	**YPS02-XGR**
USA	**YPS02-XKR**
⚠ Install the cable so that it is protected from damage. Connect the terminal of the housing to a terminal for equipotential bonding (PE = protective earthing or grounding conductor)	
External rechargeable battery pack, for use in Zone 1, 21 or 20 hazardous areas	**YRB02-X**
Battery charger for YRB02-X battery pack (for use in safe area)	**YRB02LD**
24V industrial power supply module for use in safe or hazardous area, switching cabinet installation: 14″	**YPS02-XV24**
Electrical accessories	
Zener barrier (2 data lines) for connecting up to 8 weighing instruments (model YDO02F-X output port (RS 485) required); cabeling supplied in accordance with customer requirements	**YDI01-Z**
Zener barrier (4 data lines) for connecting accessories installed in the safe area (e.g., printer, PC); cable for connceting Zener barrier to weighing instrument: 20 m	**YDI02-Z**
Zener barrier (4 data lines, 4 control lines) for connecting accessories installed in the safe area (e.g., PLC); cable length: 20 m	**YDI03-Z**
⚠ Install the cable so that it is protected from damage. Connect the terminal of the housing to a suitable ground electrode (PE = protective earthing or grounding conductor).	

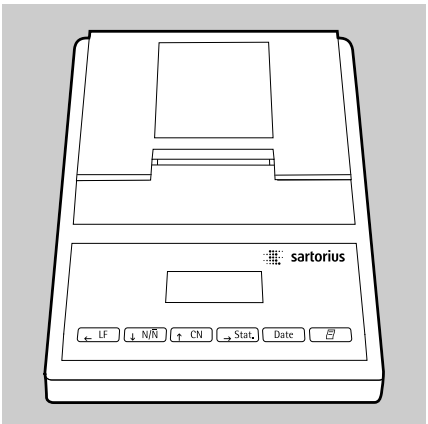
Accessories (Options)

Product	Order No.
T-connector (1 input, 2 outputs), 14-pin round male connector; cable length: 1 m	**YTE02-X**

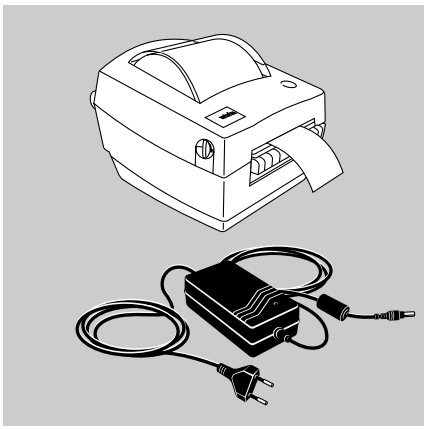
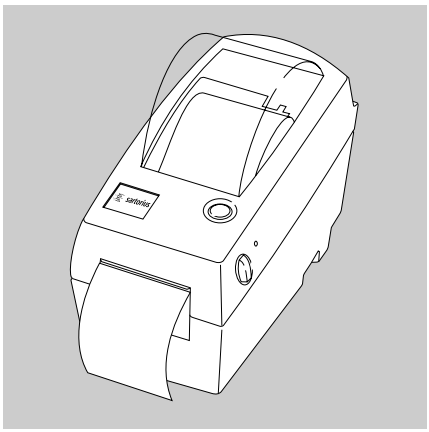
⚠Install the cable so that it is protected from damage.

Foot switch for hazardous areas/locations (Choice of functions to emulate keys on the display and control unit: [⊟], [Tare], [D], [isoTEST], [CF]	**YPE05-X**

Printer



(Data printer (not for use in hazardous areas/locations) for hard copies with the date, time, statistical evaluation, transaction counter; with an LCD (can be connected using: adapter cable YCC01-0016M3 or directly, without the printer cable included, using the interface cable YCC01-0019M3) Can be used in legal metrology. Please note: For verfied scales with e ≠ d, the last digit on the printout must be specially identified as shown on the scale display. Please set this parameter in the printer menu (see instructions manual for the printer)	**YDP03-0CE**

Product	Order No.
 **Verifiable strip and label printer** (for FC models only) with “thermo-direct” print head; paper width: up to 108 mm; with 100–240 V external power supply and power cord (EU and USA); only for use with flexible printout configuration software; adapter cable 69Y03142 required	**YDP12IS-0CEUV**
Verifiable strip and label printer (for FC models only) with “thermo-transfer” print head; paper width: up to 108 mm; with 100–240 V external power supply and power cord (EU and USA); only for use with flexible printout configuration software; adapter cable 69Y03142 required	**YDP12IS-0CEUVTH**
 **Verifiable strip and label printer** with “thermo” print head; paper width: up to 60 mm; with 100–240 V external power supply; adapter cable 69Y03142 required	**YDP04IS-0CEUV**

Accessories (Options)

Product	Order No.
Data interface (must be installed at the Sartorius Fast Factory or by a Sartorius service technician)	
for FC...BBE/CCE models: TTY/10 mA	**YDO01F-X**
for FC...BBE/CCE models: RS-485	**YDO02F-X**
for FC...EDE models RS-485	**YDO03FC-X**
for FC...EDE models TTY/10 mA	**YDO04FC-X**
for FCA models: TTY/10 mA	**YDO01FT-X**
for FCA models: RS-485	**YDO02FT-X**
Sartorius serial Profibus interface for RS-232 for the installation in safe areas behind Zener barier	**YSPI-232**
Sartorius serial Profibus interface for RS-485 for the installation in safe areas behind Zener barrier	**YSPI3-485**
Cable for connecting weighing platform to separate display and control unit (length: 2.70 m ~ 9 ft.)	**Ask for information**
– for FC...EDE models	**YCC01-19M3**
– for models with a weighing capacity ≤12 kg	
Tiltable retainer	
– for installing the FC...EDE or FCA display and control unit on the front of the scale or on the wall	**YDH01F**
Wrap-around load plate	**YLP01**
– for models FC6CCE-SX, FC12CCE-SX, FC12CCE-I X	
Hook for under-scale weighing for FC-EDE models	**69EA0040**
Calibration weights for all FC/FCA scales, extensive assortment, optionally available with officially recognized DKD certificate	**Ask for information**
Extension cable 12-pin round male connector/12-pin round female connector (6 m; ~ 20 ft.)	**YCC01-01ISM6**
Interface cable for connecting a PC to the YDI03-Z, YDI01-Z Zener barrier	**YCC01-03ISM5**
Interface cable for directly interfacing the scale to the YDP03-0CE data printer (via Zener barrier)	**YCC01-0019M3**
Adapter cable From round male connector to RS232-D-Submini female interface connector; for directly connecting Sartorius accessories to the scale (via Zener barrier)	**YCC01-0016M3**
Adapter cable, from 25-pin D-Submini male connector to 9-contact D-Submini female connector; length 0.25 m (~ .8 ft.)	**6965619**
Adapter plate for fastening the FCA display and control unit to the floor stand	**YAS01FCT-X**
Floor stand (stainless steel), height: 1.1 m (approx. 3.5 ft)	**YDH03IS**
– for FCA display and control units (adapter plate YAS01FCT-X required)	
Retainer for mounting the YRB02-X external rechargeable battery pack on a YDH03IS/YDH02CIS column or on the wall	**YBPH01**

Product	Order No.
SartoConnect data transfer software for connecting your Sartorius scale to a PC running the Windows 95, 98 or NT operating system. For loading measurement data from the scale into any PC for further processing (e.g., with Excel or Access) Includes 9/12-pin cable for connecting the scale to the PC.	**YSC01I**
Sartorius Win Scale Scale driver software for use under Windows 95/98/2000/NT. Display scale readout on the PC monitor and provides secure memory for storing data that is subject to legal control.	**YSW03**
Configuration software (PC, DOS) For storing and loading scale settings	**YAD01IS**
Sartorius "NICE Label Express" For creating customer-specific printouts	**YAD02IS**

Declarations of Conformity

The CE Mark on Sartorius Equipment
In 1985, the Council of the European Community approved a resolution concerning a new approach to the technical harmonization and standardization of national regulations. The organization for monitoring compliance with the directives and standards concerning the CE marking is governed in the individual EU Member States through the implementation of the EC Directives adopted by the respective national laws. As of December 1993, the scope of validity for all EC Directives has been extended to the Member States of the European Union and the Signatories of the Agreement on the European Economic Area.

Sartorius complies with the EC Directives and European Standards in order to supply its customers with weighing instruments that feature the latest advanced technology and provide many years of trouble-free service.

The CE mark may be affixed only to weighing instruments and associated equipment that comply with the applicable Directive(s):

Council Directive 89/336/EEC
"Electromagnetic compatibility (EMC)"

1. Electromagnetic compatibility:

1.1 Reference to 89/336/EEC:
Official Journal of the European Communities, Nr. 2001/C105/03

EN 61326-1
Electrical equipment for measurement control and laboratory use EMC requirements

Parts 1: General requirements
Defined immunity to interference:
Industrial areas, continuous, un-monitored operation Limitation of emmissions:
Residential areas Class B

Important Note:
The operator shall be responsible for any modifications to Sartorius equipment and for any connections of cables or equipment not supplied by Sartorius and must check and, if necessary, correct these modifications and connections. On request, Sartorius will provide information on the minimum operating specifications (in accordance with the Standards listed above for defined immunity to interference).

Council Directive 73/23/EEC
"Electrical Equipment Designed for Use within Certain Voltage Limits"
Applicable European Standards:

EN 60950
Safety of information technology equipment including electrical business equipment

EN 61010
Safety requirements for electrical equipment for measurement, control and laboratory use
Part 1: General requirements

If you use electrical equipment in installations and under ambient conditions requiring higher safety standards, you must comply with the provisions as specified in the applicable regulations for installation in your country.

Weighing Instruments for Use in Legal Metrology: Directive 90/384/EEC
"Non-automatic weighing instruments"
This Directive regulates the determination of mass in legal metrology.

For the respective Declaration of Conformity for weighing instruments that have been verified by Sartorius for use as legal measuring instruments and that have an EC Type-Approval Certificate, see the page after next.

This Directive also regulates the performance of the EC verification by the manufacturer, provided that an EC Type-Approval Certificate has been issued and the manufacturer has been accredited by an officer or a Notified Body registered at the Commission of the European Community for performing such verification.

The legal basis allowing Sartorius to perform EC verification is constituted by the EC Council Directive No. 90/384/EEC on non-automatic weighing instruments that has been in effect since January 1, 1993, in the Internal Market as well as by the Certificate of Accreditation of the Sartorius AG Quality Management System issued by the Metrology Department of the Regional Administration Office of Lower Saxony, Germany ("Niedersächsisches Landesverwaltungsamt -Eichwesen") on February 15, 1993.

For information on the CE mark on Sartorius equipment and legal regulations currently applicable in your country, and to obtain the names of the persons to contact, please ask your local Sartorius office, dealer or service center.

"New Installation" Service
Initial verification is covered in our "New Installation" service package. In addition to initial verification, this package provides you with a series of important services which will guarantee that you achieve optimal results with your weighing instrument:

- Installation
- Startup
- Inspection
- Training
- Initial verification

If you would like Sartorius to perform initial verification of your weighing instrument, contact an authorized service representative.

"EC Verification" –
A Service Offered by Sartorius
Our service technicians are authorized to perform verification* of your weighing instruments that are acceptable for legal metrological verification and can inspect and verify the metrological specifications at the place of installation within the Member States of the European Union and the Signatories of the Agreement on the European Economic Area.

Subsequent Verifications within the European Countries
The expiration date of the verification depends on the national regulations of the country in which the weighing instrument is used. For information on verification and legal regulations currently applicable in your country, and to obtain the names of the persons to contact, please contact your local Sartorius office, dealer or service center.

* in accordance with the accreditation certificate issued to Sartorius AG

CE Declaration of Type Conformity to Directive No. 90/384/EEC

This declaration is valid for non-automatic electromechanical weighing instruments for use in legal metrology. These weighing instruments accepted for legal metrological verification have an EC Type-Approval Certificate. The model(s) concerned is(are) listed below along with the respective type, accuracy class, and number of the EC Type-Approval Certificate:

Model	Type	Accuracy Class	EC Type Approval No.	In Conjunction with Test Certificate	
				Type	Certificate No.
FB/FC.....-.0CE	iso-TEST	(II)	D97-09-018	BD BF	D09-96.30
FB/FC.....-.0CE	iso-TEST	(II)	D97-09-018	BB BD	D09-95.08
FBG/FCG.....-.0CE	iso-TEST	(II)	D97-09-018	BF BF	D09-96.30
FC.....-X.CE	iso-TEST	(II)	D97-09-018	MA BF	D09-96.30
FC.....-.XCE	iso-TEST	(II)	D97-09-018	BA BF	D09-96.30
FC.....-.XCE	iso-TEST	(II)	D97-09-018	BF BF	D09-96.30
FB/FC.....-.XCE	iso-TEST	(II)	D97-09-018	BD BF	D09-96.30
FCA/FCB.....-.XCE	iso-TEST	(II)	D97-09-018	BF BF	D09-96.30
FCA...-HXCE	iso-TEST	(II)	D97-09-018	HC BF	D09-96.30

SARTORIUS AG declares that its weighing instrument types comply with the requirements of the Council Directive on non-automatic weighing instruments, no. 90/384/EEC of 20 June 1990; the associated European Standard "Metrological aspects of non-automatic weighing instruments," No. EN 45501; the amended, currently valid versions of the national laws and decrees concerning legal metrology and verification in the Member States of the European Union, the EU, and the Signatories of the Agreement on the European Economic Area, which have adopted this Council Directive into their national laws; and with the requirements stipulated on the Type-Approval Certificate for verification. This Declaration of Type Conformity is valid only if the ID label on the weighing instrument has the CE mark of conformity and the green metrology sticker with the stamped letter "M" (the two-digit number in large print stands for the year in which the mark has been affixed):

If these marks are not on the ID label, this Declaration of Type Conformity is not valid. Validity can be obtained, for example, by submitting the weighing instrument for final action to be taken by an authorized representative of SARTORIUS AG. The period of validity of this Declaration of Type Conformity shall expire upon any tampering with, repair or modification of this weighing instrument or, in some Member States, on the date of expiration.
The operator of this weighing instrument shall be responsible for obtaining an authorized renewal of the verification, such as subsequent or periodic verification, of the weighing instrument for use as a legal measuring instrument.

Sartorius AG
37070 Goettingen, Germany
Signed in Göttingen, 19.11.2002

Dr. G. Maaz
(Head of Technical Operations)

..V. J. Rehwald

J. Rehwald
(Head of Quality Management & Services)

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KEMA

(1) EC-TYPE EXAMINATION CERTIFICATE

(2) Equipment or protective system intended for use in potentially explosive atmospheres – Directive 94/9/EC

(3) EC-Type Examination Certificate Number: **KEMA 01ATEX1099 X**

(4) Equipment or protective system:

Weighing Module series, Type IS.....-.X.... and
Weighing System series, Type FC.....-.X.... and
Weighing System series, Type FCA.....-.X.... and
Weighing System series, Type FCB.....-.X....

(5) Manufacturer: **Sartorius A.G.**

(6) Address: **Weender Landstraße 94-108, 37075 Göttingen, Germany**

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 2010745.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1997 EN 50020 : 1994

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

(12) The marking of the equipment or protective system shall include the following:

Ex II 2 G EEx ib IIC T4

Arnhem, 18 October 2001
KEMA Quality B.V.

T. Pijpker
Certification Manager

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KEMA Quality B.V.
Utrechtseweg 310, 6812 AR Arnhem, The Netherlands
P.O. Box 5185, 6802 ED Arnhem, The Netherlands
Telephone +31 26 3 56 20 08, Telefax +31 26 3 52 58 00

ACCREDITED BY THE DUTCH COUNCIL FOR ACCREDITATION

KEMA

(13) # SCHEDULE

(14) **to EC-Type Examination Certificate KEMA 01ATEX1099 X**

(15) **Description**

The Weighing Modules series, Type IS....BBE-.X...., IS....CCE-.X...., IS....EDE-.X.... and IS....IGG-.X.... serve to measure weights and have connections for supply and a remote terminal for data handling.
Depending of the type the connections to the remote terminal and supply are via plugs or an integral cable, in the latter case e.g. via a junction box Type YAS06IS-X.
The Weighing Modules differ in size and construction, depending of the weight they can measure.

The Weighing Systems series, Type FC.....-.X...., FCA.....-.X.... and FCB.....-.X.... serve to measure weights, handle the data and provide communication with other units (e.g. a PC). The Weighing Systems consist of a Weighing Module of one of the above mentioned types and a terminal with a display and a keyboard.
Type FC.....-.X.... has an integral terminal, for Type FCA.....-.X.... and FCB.....-.X.... the terminal is remote mounted.

All types are supplied by four independent intrinsically safe supplies.
All types have the same supply and data communication circuits.
All types have external connections for passive equipment (e.g. a foot switch).
Type FCB.....-.X.... has additional I/O circuits for connection of the outputs to associated circuits via barriers and input circuits to passive circuits (e.g. switches).

Ambient temperature range -20 °C ... +40 °C.

Electrical data

All types

Unless otherwise specified, the connection-identifications are shown below per type.

Supply circuits ..... in type of explosion protection intrinsic safety EEx ib IIC, only for connection to a certified intrinsically safe circuit, with following maximum values (for each circuit):

Circuit	U_i	I_i	P_i	C_i	L_i
V-1	12,6 V	133 mA	1,68 W	0 nF	0 mH
V-2	12,6 V	133 mA	1,68 W	0 nF	0 mH
V-3	8,6 V	187 mA	1,61 W	300 nF	0 mH
V-4	12,6 V	150 mA	1,89 W	100 nF	0 mH

Data communication circuit ..... in type of explosion protection intrinsic safety EEx ib IIC, with the following maximum values (per circuit unless otherwise specified):

U_o = 8,6 V
I_o = 23 mA
P_o = 50 mW

The maximum allowed external capacitance C_o = 6 µF, the maximum allowed external inductance L_o = 60 mH.

KEMA

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 01ATEX1099 X**

Electrical data (continued)

Circuits only for connection to a certified intrinsically safe circuit, with following maximum values (for each circuit per applicable connection combination):

Circuit	U_i [V]	I_i [mA]	P_i [mW]	C_i [nF]	L_i [mH]	Connections	Note
RS232	12,6	85	270	3	0	A/J/K/N/M (BU9) or 9/10/11/12/8 (BU6)	1)
RS232	12,6	10	30	4	0	C/D/E/F/G/M (BU9) or 2/3/4/5/6/8 (BU6)	1)
RS485	12,6	85	270	110	0	J/K/L/M (BU9) or 3/4 (BU30) + 9/10 (BU6)	1)
RS485	12,6	10	30	4	0	C/D/E/F/G/M (BU9) or 6/11/8 (BU6)	1)
TTY	14,7	50	265	0	0	G/K/D/F/J (BU9) or 3/7/2/4/6 (BU30)	1)
TTY	14,7	130	100	0	0	C/E/D/F/J (BU9) or 1/5/2/4/6 (BU30)	1) 2)
I/O-out	30	120	900	0	0	1/2, 3/4, 5/6, 7/8 (ST20)	1) 3)

Notes:
1) The current I_i must be resistively limited
2) May alternatively be connected to converter Type 725324, certified per Certificate of Conformity PTB No. Ex-85.B.2089.
   For this combination the following data applies:
   Maximum allowed external capacitance C_o = 620 nF and maximum allowed external inductance L_o = 2 mH.
3) For Type FCB.....-.X..... only.

Maximum values of the output data (for each circuit per applicable connection combination):

Circuit	U_i [V]	I_i [mA]	P_i [mW]	C_i [µF]	L_i [mH]	Connections	Note
RS232	12,6	28	88	1,15	50	B/O/M (BU9) or 1/7/8 (BU6)	1)
RS485	12,6	28	85	1,15	50	B/O/M (BU9) or 7/8 (BU6)	1)
TTY	12,6	28	85	1,15	50	7/8 (BU6) or 7/8 (BU6)	1) 2)
I/O-in	12,6	30	95	1,15	50	9/10, 9/11, 9/12 (ST20)	3)

Notes:
1) Only for use in combination with passive intrinsically safe circuits
2) Same connector used with or without junction box.
3) For Type FCB.....-.X..... only.

KEMA

(13) # SCHEDULE

(14) **to EC-Type Examination Certificate KEMA 01ATEX1099 X**

Electrical data (continued)

Connections per type

Weighing Modules series,
Type IS....BBE-.X...., IS..CCE-.X...., IS..EDE-.X.... and IS..IGG-.X....

Connections:
- Supply circuits: ST8 pins 6/1 (V-1), 4/2 (V-2), 5/3 (V-3), 7/8 (V-4), in combination with termination box: BU2 pins 6/1 (V-1), 4/2 (V-2), 5/3 (V-3), 7/8 (V-4)
- Data communication circuits: BU9 (pins as specified above), in combination with termination box: BU6 + BU30 (pins as specified above)
- When termination box used: Maximum cable length between Weighing Module and termination box Type YAS06IS-X is 15 m.

Weighing System series Type FC.....-.X....

Connections:
- Supply circuits: BU2 pins 6/1 (V-1), 4/2 (V-2), 5/3 (V-3), 7/8 (V-4)
- Data communication circuits: BU9 (pins as specified above)

Weighing System series Type FCA.....-.X....

Connections:
- Supply circuits: ST8 pins 6/1 (V-1), 4/2 (V-2), 5/3 (V-3), 7/8 (V-4)
- Data and communication circuits: BU9 (pins as specified above)
- Maximum cable length between Weighing Module and Terminal is 15 m

Weighing System series Type FCB.....-.X....

Connections:
- Supply circuits: ST8 6/1 (V-1), 4/2 (V-2), 5/3 (V-3), 7/8 (V-4)
- Data and communication circuits: BU9
- Maximum cable length between Weighing Module and Terminal is 15 m

(16) **Report**

KEMA No. 2010745

(17) **Special conditions for safe use**

1. The output circuits of the I/O of Type FCB.....-.X.... may only be connected to shunt diode zener barriers with one side grounded. This ground and the external ground connection of the enclosure of the terminal of Type FCB.....-.X.... must be connected to the potential equalising system within the hazardous area.

2. For ambient temperature range and electrical data, see (15).

KEMA

(13) # SCHEDULE

(14) **to EC-Type Examination Certificate KEMA 01ATEX1099 X**

(18) **Essential Health and Safety Requirements**

Essential Health and Safety Requirements not covered by the standards listed at (9)	
Clause	Subject
1.0.5	Marking
1.0.6 b) and d)	Instructions

These Essential Health and Safety Requirements are examined and positively judged.
The results are laid down in the report listed at (16)

(19) **Test documentation**

1. EC-Type Examination Certificate KEMA 98ATEX0612 X
   EC-Type Examination Certificate KEMA 00ATEX1012 X

		dated
2.	Description (34 pages)	02.02.2001
3.	Drawing No. 35520-000-60-A4 (3 sheets)	20.02.2001
4.	Samples	

KEMA

AMENDMENT 1

to EC-Type Examination Certificate KEMA 01ATEX1099 X

Manufacturer: **Sartorius A.G.**

Address: **Weender Landstraße 94-108, 37075 Göttingen, Germany**

Description

In future the Weighing Modules series, Types IS....EDE-.X...., IS....IGG-.X...., the Weighing Systems series, Types FCA.....-.X...., FCB.....-.X.... and the junction box Type YAS06IS-X are alternatively also constructed in accordance with EN 50281-1-1:1998 and the documentation as listed below.

The marking for these versions becomes

⟨Ex⟩ II 2 G EEx ib IIC T4 and ⟨Ex⟩ II 1 D T 135 °C

The maximum surface temperature T 135 °C of the enclosure is based on an ambient temperature of 40 °C.

The electrical data of the Weighing Modules series, Types IS....BBE-.X...., IS....CCE-.X...., IS....EDE-.X...., IS....IGG-.X.... and the Weighing Systems series Types FC.....-.X...., FCA.....-.X...., FCB.....-.X...., is amended as specified below.

Electrical data

Data output circuit
for units with RS485 circuit ..... (BU9)

in type of explosion protection intrinsic safety EEx ib IIC, with the following maximum values:

U_o = 12,6 V
I_o = 85 mA
P_o = 270 mW

The maximum allowed external capacitance C_o = 1,15 µF, the maximum allowed external inductance L_o = 5 mH.

Only for connection to a certified intrinsically safe circuit, with following maximum values.

Connections J/K:

U_i = 12,6 V (each line to earth)
I_i = 810 mA (resistive limited)
P_i = 2,5 W

The effective internal capacitance C_i = 10 nF, the effective internal inductance L_i is negligibly small.

Connections D/E/F/G & M (values for each circuit):

U_i = 12,6 V
I_i = 10 mA (resistive limited)
P_i = 30 mW

The effective internal capacitance C_i = 4nF, the effective internal inductance is negligibly small.

Connections B/C/O/L are only for use in combination with passive intrinsically safe circuits, the effective internal capacitance C_i = 4 nF, the effective internal inductance L_i is negligibly small.

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KEMA

AMENDMENT 1

to EC-Type Examination Certificate KEMA 01ATEX1099 X

Electrical data (continued)

All other data remain unchanged.

Special conditions for safe use

For applications of the Weighing Modules series, Types IS....EDE-.X...., IS....IGG-.X...., the Weighing Systems series, Types FCA.....-.X...., FCB.....-.X.... and the junction box Type YAS06IS-X in explosive atmospheres caused by air/dust mixtures, the dust layer may not exceed a thickness of 5 mm.

All other data remain unchanged

Test documentation

			dated
1.	Description		16.11.2001
2.	Drawing No.	65638-000-39-A4	10.10.2000
		65651-000-55-A3	25.09.2001
		65638-000-55-A3 (2 sheets)	11.09.2001
		65638-000-55-A3	11.09.2001
		98100-036-30 Rev.00	04.10.2000
		98100-036-31 Rev.00	04.10.2000
		65638-700-90-A4 Rev.00	06.10.2000
		65552-000-05-A4	02.02.2001
		35520-700-30-A3	14.02.2001
		35632-210-02-A4	28.05.2001
		98100-031-25-A4 Rev.01	19.09.1995

Arnhem, 8 May 2002
KEMA Quality N.V.

T. Pijpker
Certification Manager

[2018412/2]

KEMA
REGISTERED QUALITY

(1) EC-TYPE EXAMINATION CERTIFICATE

(2) Equipment or protective system intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number: **KEMA 98ATEX0892 X**

(4) Equipment or protective system: **Power Supply Type YPS02-X..**

(5) Manufacturer: **Sartorius AG**

(6) Address: **Weender Landstraße 94-108, 37075 Göttingen, Germany**

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) KEMA, notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 80892.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1992 + prA1 EN 50018 : 1994 EN 50020 : 1994

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

(12) The marking of the equipment or protective system shall include the following:

Ex II 2 (2) G EEx d [ib] IIC T4

Arnhem, 15 June 1998
by order of the Board of Directors of N.V. KEMA

C.M. Boschloo
Certification Manager

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THE DUTCH COUNCIL
FOR ACCREDITATION

KEMA

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 98ATEX0892 X**

(15) **Description**

The Power Supply Type YPS02-X.. provides four independent intrinsically safe output channels for intrinsic safe scales. The power supply is mounted in an enclosure in type of protection flameproof enclosure "d". The maximum length of the interconnection cable type LiYC-Y-CY 4x0.5 between the Power Supply and the scales is 50 m.

Ambient temperature range 0 °C ... +40 °C.

Electrical data

Main supply ..... non intrinsically safe circuit, suitable for connection to electrical equipment with working voltages up to 264 V.

Supply and input circuit ..... terminal (V_1, white)
in type of explosion protection intrinsic safety EEx ib IIC with following maximum values:

U_o = 12,6 V
I_o = 133 mA
P_o = 1,68 W

Maximum allowed external capacitance C_o = 1 μF
Maximum allowed external inductance L_o = 300 μH

Supply and input circuit ..... terminal (V_2, brown)
in type of explosion protection intrinsic safety EEx ib IIC with following maximum values:

U_o = 12,6 V
I_o = 133 mA
P_o = 1,68 W

Maximum allowed external capacitance C_o = 1 μF
Maximum allowed external inductance L_o = 300 μH

Supply and input circuit ..... terminal (V_3, green)
in type of explosion protection intrinsic safety EEx ib IIC with following maximum values:

U_o = 8,6 V
I_o = 187 mA
P_o = 1,61 W

Maximum allowed external capacitance C_o = 4 μF
Maximum allowed external inductance L_o = 300 μH

Supply and input circuit ..... terminal (V_4, yellow)
in type of explosion protection intrinsic safety EEx ib IIC with following maximum values:

U_o = 12,6 V
I_o = 150 mA
P_o = 1,89 W

Maximum allowed external capacitance C_o = 1 μF
Maximum allowed external inductance L_o = 300 μH

KEMA

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 98ATEX0892 X**

(15) **Electrical data** (continued)

Cable type LiYC-Y-CY 4x0.5 ..... Maximum cable capacitance C_{cable} = 28,2 nF
Maximum cable inductance L_{cable} = 8,4 μH
Maximum allowed cable length = 50 m

The intrinsically safe circuits are infallible galvanically isolated from the non-intrinsically safe circuits up to a sum of peak voltages of 375 V.

Installation instruction

The Power Supply provided with certified cables entries Type ADE can only be used for fixed installation. Certified cable entries Type AGRO can be used for flexible- and for fixed installation.

Routine tests

The transformer shall, before mounting into the apparatus, withstand per Clause 8.1.5 of EN 50 020 - 1994 without breakdown the application of 2500 V between the primary and secondary winding.

Routine tests according to Clause 16 of EN 50018 are not required since the type test has been made at a static pressure of four times the reference pressure.

(16) **Report**

KEMA No. 80892

(17) **Special conditions for safe use**

None

(18) **Essential Health and Safety Requirements**

Essential Health and Safety Requirements not covered by standards listed at (9)	
Clause	Subject
1.0.6	Instructions

These Essential Health and Safety Requirements are examined and positively judged. The results are laid down in the report listed at (16).

KEMA

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 98ATEX0892 X**

(19) **Test documentation**

1. EC-Type Examination Certificate PTB 98ATEX1023 U
   KEMA 98ATEX0611 X
   Certificate of Conformity ISSeP 92.C.103.997
   LCIE 92.C6125 X

		signed
2. Description 65473-000-06-A4, Rev. 00 (11 pages)		05.05.1998
3. Drawing No. 65473-700-06-A4	)	
65473-000-33-A3	)	05.05.1998
65473-700-05-A3	)	
65473-000-05-A2		02.02.1998
65473-120-90-A3	)	
65473-120-95-A3	)	09.01.1998
65473-120-01	)	

4. Samples

KEMA

AMENDMENT 1

to EC-Type Examination Certificate KEMA 98ATEX0892 X

Manufacturer: **Sartorius AG**
Address: **Weender Landstraße 94-108, 37075 Göttingen, Germany**

Description

In future the Power Supply Type YPS02-X.. is alternatively also constructed in accordance with EN 50281-1-1:1998 and the documentation listed below.

The marking for this version becomes

Ex II 2 G EEx d[ib] IIC T4 and Ex 1 D T 135 °C

The maximum surface temperature T 135 °C of the enclosure is based on an ambient temperature of 40 °C.

Electrical Data

The value of the maximum power of each supply and input circuit changes as follows:

Terminal V_1, white	:	P_o = 1,46 W
Terminal V_2, brown	:	P_o = 1,46 W
Terminal V_3, green	:	P_o = 1,51 W
Terminal V_4, yellow	:	P_o = 1,68 W

All other data remain unchanged

Installation instructions

1. For use in potentially explosive atmospheres caused by the presence of flammable gases, fluids or vapours: The cable entry devices shall be of a certified flameproof type, suitable for the conditions of use and correctly installed.
2. For use in potentially explosive atmospheres caused by the presence of combustible dust: The cable entry devices shall be of a certified flameproof type, suitable for the conditions of use and correctly installed. The minimum ingress protection requirement of IP6X according to EN 60529 must be satisfied.
3. With the use of conduit entries a sealing device shall be provided either in the flameproof enclosure or immediately on the entrance thereto. The sealing device shall be of a certified flameproof type, suitable for the conditions of use and correctly installed.

Special conditions for safe use

1. For applications in explosive atmospheres caused by air/dust mixtures, the dust layer shall not exceed a thickness of 5 mm.
2. For ambient temperature range and electrical data see (15) and above.

Test documentation		dated
1. Drawing No.	65473-000-36-A4	10.10.2000

Arnhem, 11 April 2002
KEMA Quality B.V.

T. Pijpker
Certification Manager

[2018412]

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KEMA
REGISTERED QUALITY

(1) EC-TYPE EXAMINATION CERTIFICATE

(2) Equipment or protective system intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number: **KEMA 98ATEX0611 X**

(4) Equipment or protective system: **Power Supply Type YPS02-Z..**

(5) Manufacturer: **Sartorius AG**

(6) Address: **Weender Landstraße 94-108, 37075 Göttingen, Germany**

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) KEMA, notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 80611.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1992 + prA1 **EN 50020 : 1994**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

(12) The marking of the equipment or protective system shall include the following:

Ex **II (2) G** **[EEx ib] IIC**

Arnhem, 18 May 1998
by order of the Board of Directors of N.V. KEMA

C.M. Boschloo
Certification Manager

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FOR ACCREDITATION

KEMA

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 98ATEX0611 X**

(15) **Description**

The Power Supply Type YPS02-Z.. provides four independent intrinsically safe output channels for intrinsically safe scales. The Power Supply Type YPS02-Z.. is mounted in an enclosure providing a degree of ingress protection of IP 54. The maximum length of the interconnection cable
type LiYC-Y-CY 4 * 0.5 between the Power Supply and the scales is 50 m.

Ambient temperature range 0 °C ... +40 °C.

Electrical data

Main supply ..... non intrinsically safe circuit, suitable for connection to electrical equipment with working voltages up to 264 V.

Supply and input circuit ..... terminal (V_1, white)
in type of explosion protection intrinsic safety EEx ib IIC with following maximum values:

U_o = 12,6 V
I_o = 133 mA
P_o = 1,68 W

Maximum allowed external capacitance C_o = 1 μF
Maximum allowed external inductance L_o = 300 μH

Supply and input circuit ..... terminal (V_2, brown)
in type of explosion protection intrinsic safety EEx ib IIC with following maximum values:

U_o = 12,6 V
I_o = 133 mA
P_o = 1,68 W

Maximum allowed external capacitance C_o = 1 μF
Maximum allowed external inductance L_o = 300 μH

Supply and input circuit ..... terminal (V_3, green)
in type of explosion protection intrinsic safety EEx ib IIC with following maximum values:

U_o = 8,6 V
I_o = 187 mA
P_o = 1,61 W

Maximum allowed external capacitance C_o = 4 μF
Maximum allowed external inductance L_o = 300 μH

Supply and input circuit ..... terminal (V_4, yellow)
in type of explosion protection intrinsic safety EEx ib IIC with following maximum values:

U_o = 12,6 V
I_o = 150 mA
P_o = 1,89 W

Maximum allowed external capacitance C_o = 1 μF
Maximum allowed external inductance L_o = 300 μH

KEMA

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 98ATEX0611 X**

(15) **Electrical data** (continued)

cable type LiYC-Y-CY 4 * 0.5 ..... Maximum cable capacitance C_{cable} = 28,2 nF
Maximum cable inductance L_{cable} = 8,4 μH
Maximum allowed cable length = 50 m

The intrinsically safe circuits are infallible galvanically isolated from the non-intrinsically safe circuits up to a sum of peak voltages of 375 V.

Installation instructions

The Power Supply Type YPS02-Z.. must be installed outside the hazardous area.

After installation of the Power Supply, all applicable separations shall meet the requirements per Clause 6.4 of EN 50 020 - 1994.

Inside the hazardous area, the power supply must be mounted in an enclosure which is suitable for this purpose. This combination shall be seperately investigated and certified.

Routine test

The transformer shall, before mounting into the apparatus, withstand per Clause 8.1.5 of EN 50 020 - 1994 without breakdown the application of 2500 V between the primary and secondary winding.

(16) **Report**

KEMA No. 80611

(17) **Special conditions for safe use**

None

(18) **Essential Health and Safety Requirements**

Essential Health and Safety Requirements not covered by standards listed at (9)	
Clause	Subject
1.0.6 b	Instructions

These Essential Health and Safety Requirements are examined and positively judged. The results are laid down in the report listed at (16).

KEMA

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 98ATEX0611 X**

(19) **Test documentation**

1. Certificate of Conformity KEMA No. Ex-97.D.1279 X

	signed
2. Product Compliance Report ANNEX II, 65463-700-70-A4, Rev. 00	24.03.1998
3. Drawing No. 65463-000-34-A3	03.03.1998
4. Samples	

KEMA

AMENDMENT 1

to EC-Type Examination Certificate KEMA 98ATEX0611 X

Manufacturer: **Sartorius AG**

Address: **Weender Landstraße 94-108, 37075 Göttingen, Germany**

Description

In future the Power Supply Type YPS02-Z.. may also be constructed in accordance with the documentation listed below.

The marking becomes ⟨Ex⟩ II (2) G (1) D [EEx ib] IIC

Item (18) is amended with

Essential Health and Safety Requirements not covered by the standards listed at (9)	
Clause	Subject
2.2.2.2. and 2.2.2.4	Explosive atmospheres caused by air/dust mixtures

These Essential Health and Safety Requirements are examined and positively judged.

Electrical Data

The value of the maximum power of each supply and input circuit changes as follows:

Terminal V_1, white : P_o = 1,46 W
Terminal V_2, brown : P_o = 1,46 W
Terminal V_3, green : P_o = 1,51 W
Terminal V_4, yellow : P_o = 1,68 W

All other data remain unchanged

Test documentation

		dated
1. Drawing No.	65463-000-38-A4	10.10.2000

Arnhem, 11 April 2002
KEMA Quality B.V.

T. Pijpker
Certification Manager

[2018412]

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KEMA

(1) **EC-TYPE EXAMINATION CERTIFICATE**

(2) Equipment or protective system intended for use in potentially explosive atmospheres – Directive 94/9/EC

(3) EC-Type Examination Certificate Number: **KEMA 03ATEX2164 X**

(4) Equipment or protective system: **Power Supply type YPS02-XV24**

(5) Manufacturer: **Sartorius AG**

(6) Address: **Weender Landstraße 94-108, 37075 Göttingen, Germany**

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 2029029.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1997 EN 50020 : 2002 EN 50028 : 1987 EN 50281-1-1 : 1998

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

(12) The marking of the equipment or protective system shall include the following:

Ex II 2G 1D EEx m[ib] IIC T4 T 80 °C

Arnhem, 2 December 2003
KEMA Quality B.V.

C.G. van Es
Certification Manager

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KEMA

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 03ATEX2164 X**

(15) **Description**

The Power Supply type YPS02-XV24 contains four separate intrinsically safe supply circuits. The main supply and the instrinsically safe circuits are provided with a permanently connected cable. The length of the cable for the intrinsically safe circuits is maximum 100 m.

Ambient temperature range -20 °C ... +40 °C.

The maximum surface temperature T 80 °C of the enclosure is based on an ambient temperature of 40 °C.
For the exclusion of dust, the unit has a degree of ingress protection of at least IP6x in accordance with EN 60529.

Electrical data

Main supply circuit ..... 24 Vdc nominal, 30 V maximum, 6,5 W typical
Breaking capacity of fuse is 1500 A
U_m = 253 Vac

Supply circuit V1 ..... in type of explosion protection intrinsic safety EEx ib IIC,
(connections 1 and 6) with the following maximum values:

U_o	=	12,6	V
I_o	=	133	mA
P_o	=	1,43	W
C_o	=	0,5	µF
L_o	=	0,3	mH

Supply circuit V2 ..... in type of explosion protection intrinsic safety EEx ib IIC,
(connections 2 and 4) with the following maximum values:

U_o	=	12,6	V
I_o	=	133	mA
P_o	=	1,43	W
C_o	=	0,5	µF
L_o	=	0,3	mH

Supply circuit V3 ..... in type of explosion protection intrinsic safety EEx ib IIC,
(connections 3 and 5) with the following maximum values:

U_o	=	8,6	V
I_o	=	186	mA
P_o	=	1,49	W
C_o	=	0,8	µF
L_o	=	0,2	mH

Supply circuit V4 ..... in type of explosion protection intrinsic safety EEx ib IIC,
(connections 7 and 8) with the following maximum values:

U_o	=	12,6	V
I_o	=	150	mA
P_o	=	1,65	W
C_o	=	0,5	µF
L_o	=	0,3	mH

KEMA

(13) # SCHEDULE

(14) **to EC-Type Examination Certificate KEMA 03ATEX2164 X**

Electrical data (continued)

The intrinsically safe supply circuits of Power Supply type YPS02-XV24 are also suitable for connection to the applicable supply circuits (V1 ... V4) of the following certified equipment:

CIXS3	approved per KEMA 03ATEX1157 X
CW.XS3-.....-.....	approved per KEMA 03ATEX1157 X
FC.....-.X....	approved per KEMA 01ATEX1099 X
FCA.....-.X....	approved per KEMA 01ATEX1099 X
FCB.....-.X....	approved per KEMA 01ATEX1099 X
FCT01-X	approved per KEMA 00ATEX1012 X
FCT01-XV1	approved per amendment 1 to KEMA 00ATEX1012 X
IS.....-.X....	approved per KEMA 01ATEX1099 X
EB... ...-IX....	approved per KEMA 98ATEX1722 X

Routine test

The encapsulated parts of the unit shall be subjected to the routine tests in accordance with EN 50028, Clause 7.1 and 7.3.

(16) **Report**

KEMA No. 2029029.

(17) **Special conditions for safe use**

1. When the cable of the main supply is connected within the hazardous area a certified junction box suitable for the application and environment shall be used. For instance an enclosure and terminals in type of protection increased safety "e".
   For applications in explosive atmospheres caused by air/dust mixtures the termination box shall have an ingress protection of at least IP6x per EN 60529.
2. The enclosure shall be connected to the potential equalizing system, either direct or via the screen of the permanently connected cable. When the connection is made via the screen, it shall be assured that equalization currents stay within the current rating of the screen.
3. The connection cable without or with one outer screen shall be installed in such a way that mechanical damage is excluded.
4. For applications in explosive atmospheres caused by air/dust mixtures and where category 1D apparatus is required, the dust layer may not exceed a thickness of 5 mm.
5. For ambient temperature range and electrical data, see (15).

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at (9).

(19) **Test documentation** dated

Documentation list 65684-000-45-A4 09.09.2003

KEMA

(1) EC-TYPE EXAMINATION CERTIFICATE

(2) Equipment or protective system intended for use in potentially explosive atmospheres – Directive 94/9/EC

(3) EC-Type Examination Certificate Number: **KEMA 03ATEX2137 X**

(4) Equipment or protective system: **Ex rechargeable battery pack type YRB02-X**

(5) Manufacturer: **Sartorius AG**

(6) Address: **Weender Landstraße 94-108, 37075 Göttingen, Germany**

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 2021992.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1997 EN 50019 : 2000 EN 50020 : 2002
EN 50028 : 1987 EN 50281-1-1 : 1998

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

(12) The marking of the equipment or protective system shall include the following:

Ex **II 2G 1D EEx em[ib] IIC T4 T 80 °C**

Arnhem, 15 August 2003
KEMA Quality B.V.

C.G. van Es
Certification Manager

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KEMA

(13) # SCHEDULE

(14) **to EC-Type Examination Certificate KEMA 03ATEX2137 X**

(15) **Description**

The Ex rechargeable battery pack type YRB02-X contains four separate intrinsically safe supply circuits, powered by two integral rechargeable batteries (each 6,5 Ah or 10 Ah). The Ex rechargeable battery pack is provided with a permanently connected cable of maximum 50 m length.

Ambient temperature range -20 °C ... +40 °C.

The maximum surface temperature T 80 °C of the enclosure is based on an ambient temperature of 40 °C.
For the exclusion of dust, the applicable constructions of the Ex rechargeable battery pack have a degree of ingress protection of at least IP6x in accordance with EN 60529.

Electrical data

Supply circuit V1 ..... in type of explosion protection intrinsic safety EEx ib IIC,
(connections 1 and 6) with the following maximum values:

U_o	=	12,6	V
I_o	=	133	mA
P_o	=	1,43	W
C_o	=	0,5	µF
L_o	=	0,3	mH

Supply circuit V2 ..... in type of explosion protection intrinsic safety EEx ib IIC,
(connections 2 and 4) with the following maximum values:

U_o	=	12,6	V
I_o	=	133	mA
P_o	=	1,43	W
C_o	=	0,5	µF
L_o	=	0,3	mH

Supply circuit V3 ..... in type of explosion protection intrinsic safety EEx ib IIC,
(connections 3 and 5) with the following maximum values:

U_o	=	8,6	V
I_o	=	186	mA
P_o	=	1,49	W
C_o	=	0,8	µF
L_o	=	0,2	mH

Supply circuit V4 ..... in type of explosion protection intrinsic safety EEx ib IIC,
(connections 7 and 8) with the following maximum values:

U_o	=	12,6	V
I_o	=	150	mA
P_o	=	1,65	W
C_o	=	0,5	µF
L_o	=	0,3	mH

KEMA

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 03ATEX2137 X**

Electrical data (continued)

The intrinsically safe supply circuits of the Ex rechargeable battery pack may be connected to the applicable supply circuits (V1 ... V4) of the following certified equipment:

CIXS3	approved per KEMA 03ATEX1157 X
CW.XS3-.....-.....	approved per KEMA 03ATEX1157 X
FC.....-.X....	approved per KEMA 01ATEX1099 X
FCA.....-.X....	approved per KEMA 01ATEX1099 X
FCB.....-.X....	approved per KEMA 01ATEX1099 X
FCT01-X	approved per KEMA 00ATEX1012 X
FCT01-XV1	approved per amendment 1 to KEMA 00ATEX1012 X
IS.....-.X....	approved per KEMA 01ATEX1099 X
EB... ...-IX....	approved per KEMA 98ATEX1722 X

Routine test

The routine tests in accordance with EN 50028, Clause 7.1 and 7.3 shall be performed on the encapsulated parts of the unit.

(16) **Report**

KEMA No. 2021992.

(17) **Special conditions for safe use**

1. The batteries shall only be charged outside the potentially explosive area. The precautions as described in the instruction manual shall be taken into account as well.
2. The Ex rechargeable battery pack may only be used as moveable or stationary equipment.
3. The enclosure shall be connected to the potential equalizing system, either direct or via the screen of the permanently connected cable.
4. For applications in explosive atmospheres caused by air/dust mixtures and where category 1D apparatus is required, the dust layer may not exceed a thickness of 5 mm.
5. For the ambient temperature range and electrical data, see (15).

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at (9).

(19) **Test documentation**

	dated
Documentation list 65656-000-45-A4	06.05.2003

Declaration of Conformity

to Council Directives 89/336/EEC , 73/23/EEC and 94/9/EEC

The Ex rechargeable battery pack type YRB02-X

meets the requirements of the test standards listed below, in conjunction with the associated auxiliary peripheral devices and installation equipment listed in Annex A2 (see Annex A1 for a technical description).

1. Electromagnetic Compatibility

1.1 Source for 89/336/EEC: EC Official Journal, No. 2001/C105/03

EN 61326-1	Electrical equipment for measurement, control and laboratory use EMC requirements Part 1: General requirements Limitation of emissions: Residential areas, Class B Defined immunity to interference: Industrial areas, continuous unmonitored operation

2. Safety of Electrical Equipment

2.1 Source for 73/23/EEC: EC Official Journal, No. 2001/C106/03

EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements
EN 60950	Safety of information technology equipment

3. Equipment or protective systems or components intended for use in potentially explosive atmospheres and for use in presence of combustible dust

3.1 Source for 94/9/ EEC: EC Official Journal, No. 2001/C51/03

EN50014	General requirements
EN50019	Increased safety "e"
EN50020	Intrinsic safety "i"
EN50028	Encapsulation "m"
EN50281-1-1	Electrical apparatus protected by enclosures – Construction and testing

3.2 Type Examination: KEMA/Arnheim (NL) (Notified Body, Reg. No. 0344):

KEMA 03ATEX2137 X

3.3 Production Quality Assessment Notification:
Certified by PTB/Braunschweig (Notified Body, Reg. No. 0102)

Notification No.: PTB 97ATEX Q021-1

Sartorius AG
37070 Goettingen, Germany
2003

i.V.

W. Obermann
(Senior Vice President, R&D
Electronics Engineering
Mechatronics Division)

i.V.

Dr. K. Klein
(Senior Vice President, R&D
Mechanical Engineering
Mechatronics Division)

CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1153350 (LR 56628-34) **Master Contract:** 167555

Project: 1268586 (Edition 5) **Date Issued:** December 14, 2001

Issued to: **Sartorius AG**
Weender Landstraße 94-108
37075 Göttingen
Germany

The products listed below are eligible to bear the CSA Mark shown

Issued by: Andrew Redeker, C.E.T.
Certification Specialist

Authorized by: John Verwey, P.Eng.
Operations Manager

CLASS

2258 03 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive- For Hazardous Locations

PRODUCTS

Part A:

Class I, Div 1, Groups A,B,C, and D; Class II, Div 1, Groups E, F and G; Class III; Ex ib IIC T4

Precision Weighing System, Model FCabc-dXef and Precision Weighing Module, Model ISbc-dXef; Rated Input 15.5 V dc; 800 mA; Temperature Code T4; Intrinsically Safe when connected as per Control Drawing 33956-000-07-A4.
Notes:

(1) Suffix "a" in Model FC may be "blank", "A" or "B".

(2) Suffix "c" in the above Models may be
"BBE", "CCE" certified for Class I, Div 1, Groups A,B,C and D; Ex ib IIC T4 only
"EDE", "IGG" certified for Class I, Div 1, Groups A,B,C, and D; Class II, Div 1, Groups E, F and G; Class III; Ex ib IIC T4

(3) Options include RS485 communications, 10mA data communication, or any of the following simple apparatus; Junction Box (YAS06IS-X), T-conector (TYE02-X), foot switch (YPE05-X)

(4) The suitability of the final installation is to be determined by the local authorities having jurisdiction.

CSA INTERNATIONAL

Certificate: 1153350 **Master Contract:** 167555

Project: 1268586 **Date Issued:** December 14, 2001

Part B:

Power Supplies, Model YPS02-ZKR, rated at input 100-240 vac, 50/60 Hz, 25VA, output 15.5 V dc; 800 mA. for use in Ordinary (Non-Hazardous) Locations only and Model YPS02-XKR, rated at input 100-240 vac, 50/60 Hz, 25VA, output 15.5 V dc; 800 mA for use in Class I, Groups B, C and D; Class II, Groups E, F and G; Class III Hazardous Locations; provides intrinsically safe outputs for connection to Precision Weighing System, Model FC and Precision Weighing Module, Model IS when connected as per Control Drawing 33956-000-07-A4.

Notes:

(1) The above model numbers include suffixes designating indicator type, output signal, electrical connection, and options.

(2) The suitability of the final installation is to be determined by the local authorities having jurisdiction.

APPLICABLE REQUIREMENTS

CSA Standard C22.2 No 0-M1991	-	General Requirements - Canadian Electrical Code Part II.
0.4-M1982	-	Bonding and Grounding of Electrical Equipment (Protective Grounding).
0.5-M1982	-	Threaded Conduit Entries
25-M1966	-	Enclosures for Use in Class II Groups E, F and G Hazardous Locations.
30-M1986	-	Explosion-proof Enclosures for Use in Class I Hazardous Locations.
142-M1987	-	Process Control Equipment.
157-M1992	-	Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations.

Factory Mutual Research

1151 Boston-Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
T: **781 762 4300** F: 781 762 9375 www.fmglobal.com

CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

Isab-cxde Weighing Module series with standard RS232 Data Communication

IS/I,II,III/1/A,B,C,D,E,F,G – 33956-000-07-A4/ T4
I/1/ AEx ib IIC/T4–33956-000-07-A4
Maximum Entity Parameters: See control drawing 33956-000-07-A4

a = Figure for maximum mechanical load (03 thru 300)
b = Weighing unit type EDE or IGG (DIP); BBE or CCE (not DIP)
c = Mechanical sensitivity (H, I, P, S)
d = Calibration/Custody (CE)

Options:
e = Specials, color, applied software (V1, V2), RS485 Data Communication (instead of RS232), TTY Data Communication with 10 mA output (instead of RS232), YAS06IS-X Junction Box Type YAS06IS-X

Fcabc-dXef Weighing System series with standard RS232 Data Communication

IS/I,II,III/1/A,B,C,D,E,F,G – 33956-000-07-A4/ T4
I/1/ AEx ib IIC/T4 –33956-000-07-A4
Maximum Entity Parameters: See control drawing 33956-000-07-A4

a = Terminal type: FC is with terminal YAC01LA-X00FC
FCA is with terminal YAC01FC-X
FCB is with terminal YAC02FC-X
b = Figure for maximum mechanical load (03 thru 300)
c = Weighing unit type EDE or IGG (DIP); BBE or CCE (not DIP)
d = Mechanical sensitivity (H, I, P, S)
e = Calibration/Custody (CE)

An FM Global Affiliate

Options:
f = Specials, color, applied software (V1, V2), RS485 Data Communication (instead of RS232), TTY Data Communication with 10 mA output (instead of RS232), YAS06IS-X Junction Box Type YAS06IS-X

Equipment Ratings:

Intrinsically safe for Class I, Division 1, Groups A, B, C and D; suitable for Class II and III, Groups E, F and G; IS, Class I, Zone 1, AEx ib IIC, T4, hazardous locations, for indoor only use

Approved for:

SARTORIUS AG
WEENDER LANDSTRASSE 94-108
D-37070 GÖTTINGEN
GERMANY

Factory Mutual Research

This certifies that the equipment described has been found to comply with the following Factory Mutual Research Approval Standards and other documents:

Class 3600	1998
Class 3610	1999

Original Approval Job Identification: 3012724 Approval Granted: April 23, 2002

Subsequent Revision Reports / Date Approval Amended

Factory Mutual Research Corporation

Nicholas Ludlam
Technical Team Manager
Approvals Division

May 9th, 2002
Date

An FM Global Affiliate

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(1) **Production Quality Assessment Notification**

(Translation)

(2) Equipment or protective systems or components intended for use in potentially explosive atmospheres - **Directive 94/9/EC**

(3) Notification Number: **PTB 97 ATEX Q021-1**

(4) Product group(s): Balances, load cells and power supply units in the determining types of protection "Intrinsic Safety" and "Flameproof Enclosure"

A list of the EC-Type Examination Certificates covered by this notification is held by the notified body.

(5) Applicant: Sartorius AG
Weender Landstraße 94-108, D-37075 Göttingen

(6) Actual manufacturer: Sartorius AG
Weender Landstraße 94-108, D-37075 Göttingen

(7) The Physikalisch-Technische Bundesanstalt (PTB), notified body No. 0102 for Annex IV in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994 notifies to the applicant that the acutal manufacturer has a production quality system which complies to the Annex IV of the Directive.

(8) This notification is based on the confidential audit report No. 01QS003, issued the 2001-01-29. This notification is valid until 2003-12-18 and can be withdrawn if the actual manufacturer no longer satisfies to the requirements of Annex IV.

Results of periodical reassessment of the quality system are a part of this notification.

(9) According to Article 10 (1) of the Directive 94/9/EC the CE-Marking shall be followed by the identification number 0102 of PTB as the notified body which is involved in the production control stage.

Zertifizierungsstelle Explosionsschutz
By order

Braunschweig, January 29, 2001

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Sheet 1/1

Notifications without signature and official stamp shall not be valid. The notification may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

PTB

EG-Bauartzulassung

EC type-approval certificate

Zulassungsinhaber: *Issued to:*	Sartorius AG Weender Landstraße 94-108 37075 Göttingen Bundesrepublik Deutschland
Rechtsbezug: *In accordance with:*	§ 13 des Gesetzes über das Meß- und Eichwesen *(verification act)* vom/*dated* 23. März 1992 (BGBl. I S. 711) in Verbindung mit Richtlinie *(in connection with council directive)* 90/384/EWG, geändert durch *(amended by)* 93/68/EWG
Bauart: *In respect of:*	Nichtselbsttätige elektromechanische Waage *Nonautomatic electromechanical weighing instrument* Typ/*type*: iso-TEST Genauigkeitsklasse/*class* (I), (II), (III), (IIII) Max 0,05 kg ... 300 t Option: Mehrteilungswaage, Mehrbereichswaage *Multi-interval instrument, multiple range instrument*
Zulassungsnummer: *Approval number:*	**D97-09-018 4. Revision**
Gültig bis: *Valid until:*	2007-06-26
Anzahl der Seiten: *Number of pages:*	13
Geschäftszeichen: *Reference No.:*	1.14 – 02000518
Benannte Stelle: *Notified Body:*	0102

Im Auftrag
By order

Link

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 40

Braunschweig, 2002-03-26

Siegel
Seal

394 06 b-rb

Die Hauptmerkmale, Zulassungsbedingungen und Auflagen sind in der Anlage enthalten, die Bestandteil der EG-Bauartzulassung ist. Hinweise und eine Rechtsbehelfsbelehrung befinden sich auf der ersten Seite der Anlage

The principal characteristics, approval conditions and special conditions, if any, are set out in the Annex which forms an integral part of the EC type-approval certificate. For notes and information on legal remedies, see first page of the Annex.

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

PTB

Prüfschein

Test certificate

Ausgestellt für: *Issued to:*	Sartorius AG Weender Landstraße 94 – 108 37075 Göttingen Bundesrepublik Deutschland
Prüfgrundlage: *In accordance with:*	EN 45501 (1992), Nr.8.1, OIML R 76-1 (1992)
Gegenstand: *Object:*	Lastaufnehmer mit Wägezelle und Auswerteelektronik mit digitalem Ausgang als Modul einer elektromechanischen Waage zum Anschluß an geeignete Anzeige- und Bedienterminals *Load receptor with load cell and electronic device with digital output as module of an electromechanical weighing instrument for connection to suitable display- and operator-terminals* Typ / *type* **BA BF, BC BF, BD BF, BF BF, HC BF, MA BF und MD BF**
Kennummer: *Serial number:*	---
Prüfscheinnummer: *Test certificate number:*	D09-96.30 7. Revision / *Revision 7*
Datum der Prüfung: *Date of Test:*	
Anzahl der Seiten: *Number of pages:*	12
Geschäftszeichen: *Reference No.:*	1.14 – 02001430
Benannte Stelle: *Notified Body:*	0102

Im Auftrag
By order

Link

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 40

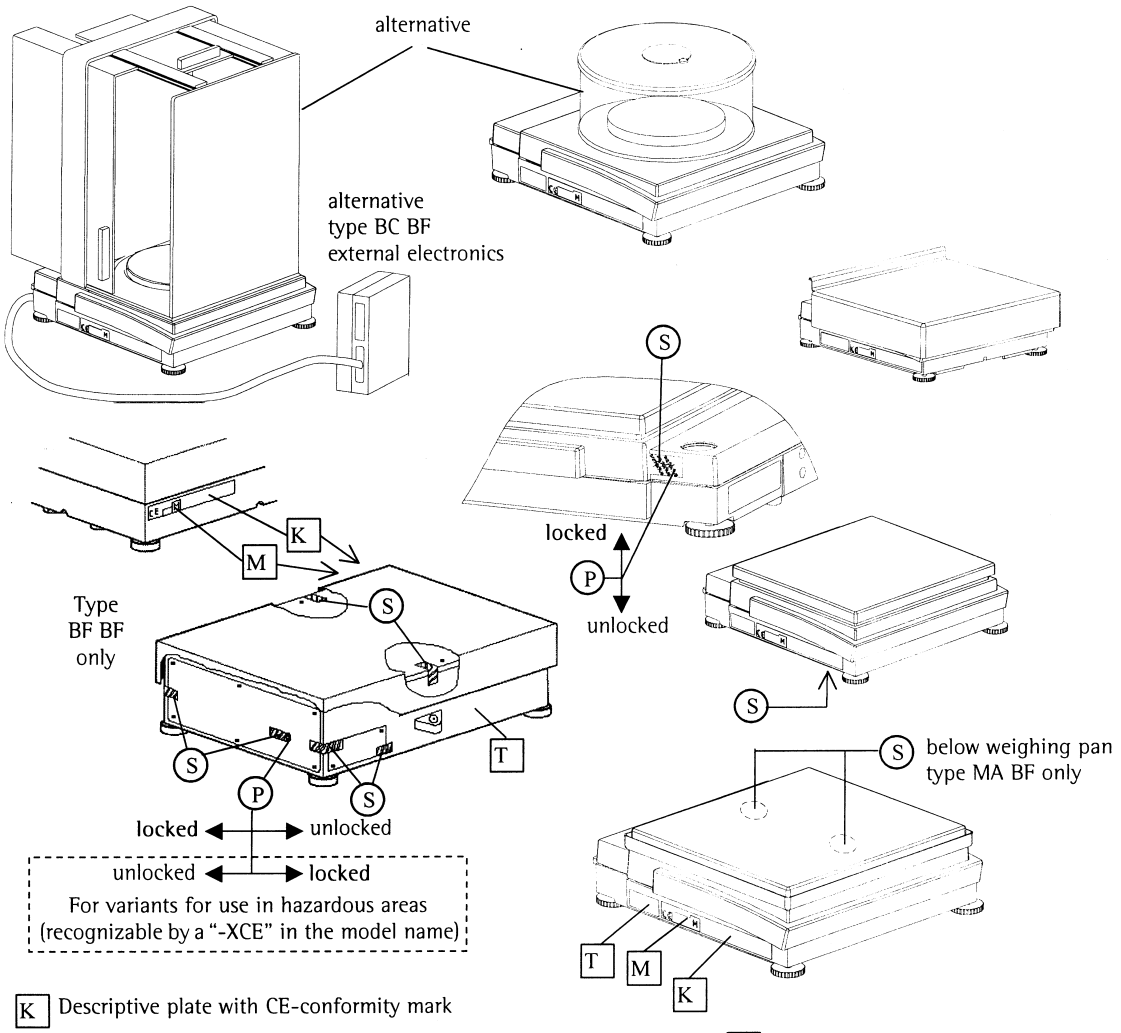
Braunschweig, 2002-11-13

Siegel
Seal

392 00 e-rb

Hinweise siehe erste Seite der Anlage, die Bestandteil des Prüfscheines ist.
For notes, see first page of the Annex which forms an integral part of the test certificate.

Plates and Markings



K Descriptive plate with CE-conformity mark

M Mark for EC verification (green metrology sticker)

S Protective seal, not for accuracy class (I)

T Plate with model designation

P Menu access switch

Indicating and operator terminals isi..., YAC01LA..., YAC01LP..., YAC01FC..., YAC02FC...,TN
front-mounted, raised (post-mounted) or positioned separately.
Alternative to terminal: PC with Sartorius Win Scale YSW03 software

Example of descriptive plate of the already verified weighing instrument K

SARTORIUS AG GÖTTINGEN Germany iso-TEST 12345678 D97-09-018
CE 0111 M (II) +10°C / +30°C
Max 8200 g d= 0,01 g
Min 0,5 g e= 0,1 g

Example of plate with model designation T

Weighing module

BD BF
FC6CCE-H0CE D09-96.30
12345678

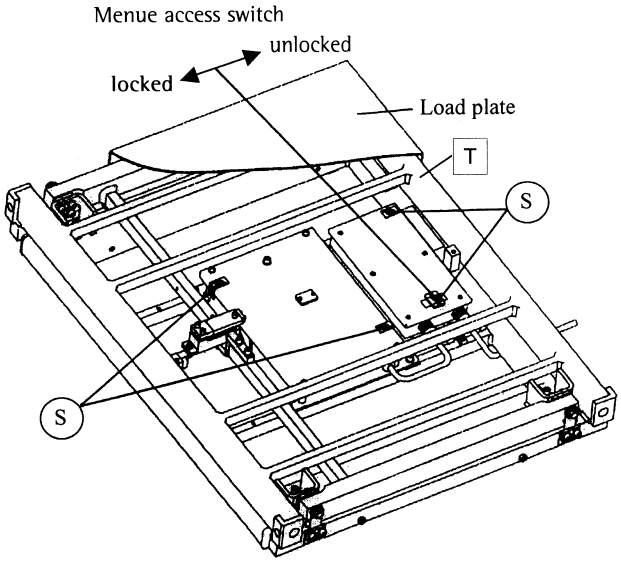
Indicating and operator terminal

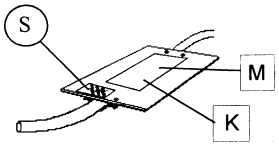
SARTORIUS AG GÖTTINGEN Germany
YAC01LA -000FC
12345678

PPBF180402e

Types: BA BF, BC BF, BD BF, BF BF, MA BF, MD BF
EC Type-approval D97-09-018 + EC Test certificate D09-96.30

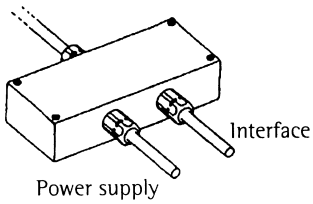
Plates and Markings





Affix the ID label of the weighing instrument to the delivered tag plate. Affix the ID tag plate to the data cable of the weighing module near the indicator. The verification officer or an authorized Sartorius representive must then seal the ID tag plate to the fastener.

Alternative: Junction box



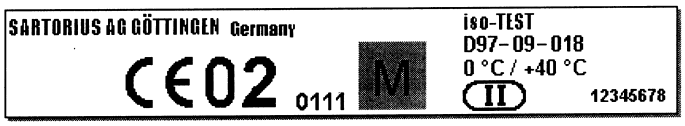
M Mark for EC verification (green metrology sticker)

K Descriptive plate with CE-conformity

S Protective mark

T Plate with model designation

Example of descriptive plate of the verified weighing instrument (weighing module+terminal) K



Example of plate with model designation T

PPHX251102e [HC BF Ex]

Type: iso-TEST EC type-approval certificate D97-09-018
+ Type: HC BF EC test certificate D09-96.30

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Entering the General Password

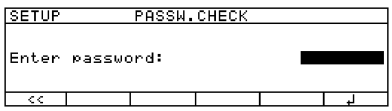
Enter/Change Password

● Select the Setup menu: Press Setup

> SETUP SELECTION is displayed

● Select the user input function:
Press the Input soft key

> The password prompt is displayed:



○ Enter the General Password (see below)

○ Confirm password: Press the ↵ soft key

> User data is displayed

§ Select the password setting function:
Press the v soft key repeatedly until

> Enter password:
is displayed, together with the current password setting

● Define a new password:
Enter letters/numbers for the new password (8 characters max.)
To delete the current password:
press · and confirm

● To confirm the new password:
press the ↵ soft key

● Exit the Setup menu:
Press the << soft key

> Restart your application

Detach the General Password card at the perforations and store it in a secure location

General Password:
40414243

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37075 Goettingen, Germany

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Sartorius AG reserves the
right to make changes to
the technology, features,
specifications and design of
the equipment without notice.

Status:
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Goettingen, Germany

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