Operating Instructions

Sartorius Combics 1 | Combics 1 plus | Combics 2
Models CW1P | CW1NP | CW2P | CW1S | CW1NS | CW2S
Combics Complete Scales
Combics 1, Combics 1 plus and Combics 2 are rugged display and control units for the complex quality control tasks you perform every day. They meet the highest requirements placed on the accuracy and reliability of weighing results:

- in the food industry
- in the pharmaceutical industry
- in the chemical industry
- in the electronics and metal-working industries

Combics complete scales are:

- Rugged and durable (stainless steel housing)
- Easy to clean and disinfect
- Easy to operate, thanks to the following features:
  - large, backlit display segments
  - large keys with positive click action
  - Independent of the weighing instrument location
  - Equipped with a range of interfaces for flexible use
  - Password-protected from unauthorized changes in parameters (optional)

Combics 1 plus speeds up your routine procedures with:

- Input functions for tare values through numeric keypad
- Option for 2 alphanumeric lines to identify samples
- Connectivity for bar code scanner to enter tare values or ID codes

Combics 2 indicators have the following features:

- Built-in application programs:
  - Counting
  - Neutral measurement
  - Weighing in percent
  - Averaging
  - Checkweighing
  - Classification
  - Net-total formulation
  - Totalizing
- Automatic initialization when you switch on the Combics
- Automatic taring when a load is placed on the weighing instrument
- Optional remote control using an external computer

Symbols
The following symbols are used in these instructions:

● indicates required steps
○ describes what happens after you have performed a certain step
⚠ indicates a hazard

Hotline:
For advice on the use of these applications, just call or fax your local Sartorius office. For the address, please visit our Internet website at:
www.sartorius.com
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Appendix:

General Password
**Safety Information:**

- Please read these operating instructions carefully before using your scale to prevent damage to the equipment.

- Do not use this equipment in hazardous areas.

- Use only standard cables that have protective grounding conductors. The protective conductor must not be disconnected for any reason.

- Disconnect the scale from power before connecting or disconnecting peripheral devices.

- The scale may be opened only by trained service technicians.

- If you operate the equipment under ambient conditions subject to higher safety standards, you must comply with the applicable installation regulations.

- If there is visible damage to the equipment or power cord, unplug the equipment and make sure it cannot be used for the time being.

- 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.

**Installation:**

- Proceed with extreme caution when using pre-wired RS-232 connecting cables from other manufacturers, as the pin assignments may not be compatible with Sartorius equipment. Check all pin assignments against the cabling diagrams and disconnect any lines that are not assigned.

- Always wear gloves, safety boots and protective clothing when lifting the load plate with a vacuum lifting pad. Danger of injury! This work may be carried out only by authorized and properly trained personnel.

- Weighing platforms with dimensions larger than 1 x 1 m are provided with suspension supports. Be careful not to stand under the load when the weighing platform/load plate is being transported or lifted with a crane. Always comply with the applicable accident prevention regulations. Make sure to avoid damaging the terminal box and housing or the load cell during transport.

- Connect only Sartorius accessories and options, as these are optimally designed for use with your Combics indicator. The operator shall be solely responsible for installation and testing of any modifications to Sartorius equipment, including connection of cables or equipment not supplied by Sartorius. Contact Sartorius for detailed operating specifications in accordance with the Standards for immunity to interference.

- Do not expose the indicator to aggressive chemical vapors or to extreme temperatures, moisture, shocks, or vibration.

- Clean your Combics only in accordance with the cleaning instructions (see “Care and Maintenance”).

- If you have any problems with your Combics indicator, contact your local Sartorius customer service center.

**IP Rating:**

- CISL models are rated to IP44 (with Option L1: IP65); CIS models are rated to IP67.

- The IP65/IP67 protection rating is ensured only if the rubber gasket is installed and all connections are fastened securely (including the caps on unused sockets). Weighing instruments must be installed and tested by a certified technician.

- If you install an interface port after setting up your indicator, keep the protective cap in a safe place for future use. The cap protects the interface connector from vapors, moisture and dust or dirt.

**Using the Equipment in Legal Metrology in the EU:**

- When the indicator is connected to a weighing instrument and the resulting weighing instrument is to be verified, make sure to observe the applicable regulations regarding verification. When connecting a Sartorius weighing instrument, please observe the “Guide to Verification” on the enclosed CD and the permitted weighing range as listed in the Declaration of Conformity.

- EU legislation requires that a control seal be affixed to the verified device. The control seal consists of a sticker with the “Sartorius” logo. This seal will be irreparably damaged if you attempt to remove it. If any of the verification seals are damaged, make sure to observe the national regulations and standards applicable in your country in such cases. In some countries, the verification will become null and void and the equipment must be re-verified.

* Including the Signatories of the Agreement on the European Economic Area
The complete scale is available in various versions. If you have ordered special options, the indicator will be supplied with these options premounted at the factory.

**Storage and Shipping Conditions**
- Allowable storage temperature: -10 ... +40°C (+14°F ... + 104°F)
- Unpackaged equipment may lose its accuracy when exposed to strong vibration. Excessive vibration may compromise the safety of the equipment.
- Do not expose the indicator unnecessarily to extreme temperatures, moisture, shocks, or vibration.

**Unpacking**
- After unpacking the equipment, please check it immediately for any visible damage.
- If you detect any damage, proceed as directed in the chapter entitled “Care and Maintenance” under “Safety Inspection.”
- If you will need to ship the equipment later, save all parts of the packaging because only the original packaging provides the best protection for shipment.
- Before shipping, be sure to disconnect all cables to prevent damage.

**Equipment Supplied**
- Indicator
- Weighing platform
- Operating instructions (this manual)
- Special accessories listed on the bill of delivery, if ordered

**Installation Instructions**
Choose a location that is not subject to the following unfavorable conditions:
- Excessive temperatures (operating temperature range: -10°C to +40°C; +14°F to +104°F)
- Aggressive chemical vapors
- Excessive moisture (depends on IP rating)

**Conditioning the Indicator**
Moisture in the air can condense on cold surfaces whenever the equipment is moved to a substantially warmer place. To avoid the effects of condensation, condition the indicator for about 2 hours at room temperature, leaving it unplugged from AC power.

**Checking the Geographical Data Entered for Use in Legal Metrology**

**Preparation**
(see also the “Device Information” menu items listed under “Operating Menu Overview” in the chapter entitled “Settings”.)
- Press \( \text{Q} \) to turn on the Combics
- While all segments are lit, press \( \text{+} \)
  > \( \text{APPL} \) is displayed
- Select “Info”: Press \( \text{Fn} \) repeatedly; press \( \text{r} \) to confirm
- Select “Device Specific Information”: for WP1 or WP2: Press \( \text{Fn} \) repeatedly; press \( \text{r} \) to confirm
  > Press \( \text{Fn} \) repeatedly to scroll through the geographical data (data shown depends on input before verification), for example:
  - Latitude (in degrees): 51°
  - Evaluation (in meters): 513 m
  or
  - Acceleration of gravity in \( \text{m/s}^{-2} \): 9.810

The scale can be used anywhere in Germany if the geographical data is as follows:
- Latitude: 51.00 degrees
- Elevation: 513 meters

This data corresponds to the following value:
- Acceleration of gravity: 9.810 \( \text{m/s}^{-2} \)

These values are calculated for Germany based on a mean value for the Earth’s acceleration. The greater the precision of the geographical data entered, the greater the precision achieved with the weighing instrument; the tolerance range, however, is also restricted accordingly.

The tolerance ranges, for example for a scale with 3000 e, are as follows:
- \( \pm \)100 km for the latitude and
- \( \pm \)200 m for the elevation above sea level.

⚠️ If used outside the specified zone, the scale must be re-verified for use in legal metrology. Please contact an authorized service technician.

**Seal on Indicators Verified for Use in Legal Metrology in the EU**: EU legislation requires that a control seal be affixed to the verified device. The control seal consists of a sticker with the “Sartorius” logo. This seal will be irreplaceably damaged if you attempt to remove it. If the seal is broken, the validity of the version becomes null and void, and you must have your scale re-verified.

* Including the Signatories of the Agreement on the European Economic Area
General View of the Equipment

Display and Keypad:
1. Load plate
2. Leveling feet
3. Level indicator
4. Keypad for numeric input
5. "Clear" key (deletes ID codes and tare input)
6. "Info" key (shows ID codes and tare input)
7. ID keys (for entering ID codes)
8. Data output
9. Gross/net; 2nd unit or 10 x higher resolution (depending on the settings)
10. Tare
11. Zero
12. On/off key
13. Display (for a detailed view, see chapter entitled "Operating Design"
14. Select reference weight (depending on the application)
15. "Clear" key
16. LEDs (for checkweighing and classification)
17. Start application
18. Toggle to the application program | application-specific information
19. Toggle to different weighing platform

* Combics 1 plus only

Rear View
20. Second „UNICOM“ interface port for bar code scanner or external rechargeable battery pack (Combics 2 only) (additional functions optional)
21. RS-232C “COM1” interface port (standard)
22. Power cord with country-specific plug
23. Menu access switch (standard operating mode or legal metrology mode)
24. Connector for weighing platform
25. Vent valve
Connecting the Equipment to AC Power

- Check the voltage rating and the plug design.

○ The scale is powered through the pre-installed power cord. The power supply is built into the scale, which can be operated with a supply voltage of 100V to 240V. Make sure that the voltage rating printed on the manufacturer's ID label is identical to that of your local line voltage. If the voltage specified on the label or the plug design of the AC adapter does not match the rating or standard you use, please contact your Sartorius office or dealer.

The power connection must be made in accordance with the regulations applicable in your country.

○ To power a protective class I device, plug the power cord into an electrical outlet (mains supply) that is properly installed with a protective grounding conductor (protective earth = PE).

Safety Precautions

If your local AC output does not have a protective grounding conductor (protective earth), have a certified electrician install equivalent protection according to your country's valid installation requirements. Make sure the protective grounding effect is not neutralized by use of an extension cord that lacks a protective grounding conductor.

Connecting Electronic Peripheral Devices

- Make absolutely sure to unplug the device from AC power before you connect or disconnect a peripheral device (printer or PC) to or from the interface port.

Warmup Time

To deliver exact results, the device must warm up for at least 30 minutes after initial connection to AC power or after a relatively long power outage. Only after this time will the device have reached the required operating temperature.

Using Equipment Verified as Legal Measuring Instruments in the EU*:

○ Make sure to allow the equipment to warm up for at least 24 hours after initial connection to AC power or after a relatively long power outage.

Connecting the External Rechargeable Battery Pack (Accessory: YRB10Z)

⚠ Disconnect the equipment from AC power (unplug the AC adapter)

- Installation
  
  For model CW1P | CW1NP | CW2P: Connect a 25-pin D-SUB male connector (connecting cable YCC02-RB01) to a second "UNICOM" interface port
  
  For model CW1S | CW1NS | CW2S: see the Section “Pin Assignment Chart” (via connecting cable YCC02-RB02 or as option L2)

- Operating
  
  Hours of operation: up to 40, depending on the weighing platform connected; without options. The Combics will automatically switch to battery operation whenever there is a power shortage or the power is cut off. Once the mains power supply is reinstated, the Combics will automatically switch back to normal operation.

Battery symbol

Battery fully charged: 

Battery empty: 

* including the Signatories of the Agreement on the European Economic Area
Connecting a Bar Code Scanner (Accessory: YBR02CISL)

DisConnect the equipment from AC power (unplug the AC adapter)

Installation
For model CW1NP | CW2P:
- Connect a 25-pin D-SUB male connector (connecting cable YCC02-BR01) to a second “UNICOM” interface port
- For bar code scanner and external rechargeable battery: please use T connector YTC01.

For model CW1NS | CW2S: see the section entitled “Pin Assignment Chart” (via connecting cable YCC02-RB02 or as option M8)

Installing the Verification Adapter for Use in Legal Metrology
(on verifiable models only)

- Remove the nut located on the back of the indicator
- Use the slotted screw to install the adapter plate
- Affix the verification seal over the adapter
Leveling the Weighing Platform

Purpose:
- To compensate for uneven areas at the place of installation
- Make sure that the equipment is placed in a perfectly horizontal position for consistently reproducible weighing results

Always re-level the weighing platform after changing the place of installation.

- Level the weighing platform using the four adjustable feet. Keep turning the feet until the air bubble is centered in the level indicator circle.

- Make sure that all four feet are touching the ground.
- The load must be equally distributed over all leveling feet!
- Loosen the lock nuts on the leveling feet with an open-end wrench.
- Setting the adjustable feet:
  - Raise the weighing platform by extending the leveling feet (turning to the right).
  - Lower the weighing platform by retracting the leveling feet (turning to the left).
- After aligning the weighing platform, tighten the lock nuts.
  - Small platforms (1 weighing cell): against the platform frame,
  - Large platforms (4 weighing cells): against the platform foot.

Operating Tolerances

Never exceed the maximum capacity of the weighing platforms.
The maximum loading capacities of the weighing platforms are listed in the table below and depend on the position of the weight loaded on the platform (center, sides, one-sided corner load):

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<th>Center</th>
<th>Side</th>
<th>Corner</th>
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<td>320 x 240</td>
<td>50</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>400 x 300</td>
<td>130</td>
<td>85</td>
<td>45</td>
</tr>
<tr>
<td>500 x 400</td>
<td>300</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>500 x 400 (P*)</td>
<td>600</td>
<td>400</td>
<td>200</td>
</tr>
<tr>
<td>650 x 500 (S**)</td>
<td>450</td>
<td>300</td>
<td>150</td>
</tr>
<tr>
<td>800 x 600 (P*)</td>
<td>1200</td>
<td>800</td>
<td>400</td>
</tr>
<tr>
<td>800 x 600 (S**)</td>
<td>900</td>
<td>600</td>
<td>300</td>
</tr>
<tr>
<td>1000 x 1000</td>
<td>4500</td>
<td>3000</td>
<td>1500</td>
</tr>
<tr>
<td>1250 x 1000</td>
<td>4500</td>
<td>3000</td>
<td>1500</td>
</tr>
<tr>
<td>1500 x 1250</td>
<td>4500</td>
<td>3000</td>
<td>1500</td>
</tr>
<tr>
<td>1500 x 1500</td>
<td>4500</td>
<td>3000</td>
<td>1500</td>
</tr>
<tr>
<td>2000 x 1500</td>
<td>4500</td>
<td>3000</td>
<td>1500</td>
</tr>
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* Steel
** Stainless steel
Operating Design

Keys
The operation of Combics 1, Combics 1 plus and Combics 2 involves just a few keys. These keys have one function during measurement and another during configuration. Some of the keys have one function when pressed briefly, and another when held for longer than 2 seconds.

If a key is inactive, this is indicated as follows when it is pressed:
- The error code “-------” is displayed for 2 seconds. The display then returns to the previous screen content.
- An acoustic signal (double-beep) is emitted.

Weighing/Measurement
Input Through the Keypad

Keys below the Display

- **CO** On/off key
  - Press briefly: Zero the instrument
  - Press and hold (> 2 sec): Show the adjustment/configuration counter

- **T** Tare the instrument
  - Save numeric input as tare weight (Combics 1 plus only)
  - Press and hold (> 2 sec): Start calibration/adjustment

- **fn** Toggle the display between (depends on configuration):
  - first and second weight unit, gross and net values, or normal and 10-fold increased display resolution

- **F** Press briefly: Print
  - Press and hold (> 2 sec): Print GMP footer

When two weighing instruments are connected, this key toggles the display between instruments (Combics 2 only).

Keys to the Right of the Display on Combics 1 plus

Keys for entering ID codes and tare values

- **1** Numeric keypad for entering values that are identified by the key subsequently pressed (e.g., **T** for tare input or “ID” key for ID codes)

- **C** Press to delete data (either ID code or tare input, depending on subsequent key; e.g., **T** for tare)

- **E** Press to delete data (either ID code or tare value, depending on subsequent key; e.g., **T** for tare)

- **ID1, ID2** Press to store or view ID codes (user-defined data to identify weight values)

Keys to the Right of the Display on Combics 2

These keys are used for operating applications. Please refer to the individual application descriptions for details.

- **CF** Deletes initialization values or totaling memory, depending on configuration.

- **DR** For modifying reference values.

- **OK** Store a value or start an application program.

- **S** Toggle between display modes within an application program

Input Through the Digital Input Port

The indicator is equipped with a control input (universal input port). You can connect a hand switch or foot switch to this port, if desired. Assign one of the following functions to this port in the operating menu:

- **F** key
- **F** (> 2 sec.)
- **T** key
- **T** key (> 2 sec.)
- **fn** key
- **E** key
- **OK** key
Operating Design

Display in Weighing Mode

The illustration above shows all of the main display elements and symbols shown during weighing.

1. Busy symbol; indicates that an internal process is in progress
2. ± sign for the value displayed
3. Identifies “zero” as a weight value (after the weighing instrument has been zeroed)
4. Weight value or calculated value (main display)
5. In legal metrology, on equipment with e = d, the digit shown with a border is not valid
6. Identification of calculated value in the main display (value not valid in legal metrology)
7. Weight unit of the value displayed
8. Net value in the main display (when data is stored in tare memory)
9. Gross value in main display (when data is stored in tare memory)
10. Printing in progress
11. Display of the range on multiple-range instruments
12. GMP-compliant printing in progress (Combics 1 plus and Combics 2 only)
13. Battery symbol showing status of rechargeable battery (empty outline indicates battery is drained)
14. Indicates active weighing instrument; flashes to prompt calibration/adjustment (Combics 2 only)
15. Bar graph (Combics 2 only)
   - Shows how much of the available weighing capacity is “used up” by the current load, or
   - Shows the measured value in relation to a target value (with the Checkweighing or Classification application)
16. Symbols for Checkweighing and classification (Combics 2 only)
17. Application symbols:
   - Totalizing, Checkweighing, Classification, Net-total Formulation, Weighing in Percent, Counting and Neutral Measurement.
   For details, please refer to the descriptions of the applications (Combics 2 only).
18. Symbols for reference updating (Combics 2 only)
   - Auto: Depending on the weight value, a reaction is triggered in the application
   - Opt: Automatic reference updating has been performed (Counting application)
19. Numeric display; e.g., shows reference value (Combics 2 only)

Saving Data in Weighing Mode

All of the application parameters saved (e.g., reference values) remain stored and are still available when
- you switch the Combics off and then back on again
- you return to the originally selected application from a second one (for example, when you switch from Averaging back to Counting, all parameters saved for Counting are available)
Configuration (Operating Menu)

Navigation and input in the operating menu are implemented using the keys below the display (on Combics 1 plus, numeric values can be entered using the numeric keypad).

Opening the Menu
Press the \( \text{[Enter]} \) key to switch the Combics off and then on again; while all segments are displayed, press the \( \text{[Enter]} \) key briefly.

Navigating the Menu

- \( \text{[Prev]} \) Close the active submenu and return to next higher menu level (“back”)
- \( \text{[Next]} \) – Press briefly (< 2 sec): Select and store a menu item
  - Press and hold (> 2 sec): Exit the menu
- \( \text{[Show Item]} \) Show the next item on the same menu level (the display scrolls through all items in series)
- \( \text{[Print]} \) Print the menu settings starting from the current position, or print Info data

Alphanumeric Input in the Menu

- \( \text{[fn]} \) – Press briefly: Activate character to the left of the current character (when first character is active: exit input mode without saving changes)
- \( \text{[fn]} \) – Press and hold (> 2 sec): Exit the input mode without saving changes
- \( \text{[fn]} \) – Press briefly (< 2 sec): Confirm currently active character and move 1 position to the right (after the last character: store input)
- \( \text{[fn]} \) – Press and hold (> 2 sec): Store current input and display the menu item

- \( \text{[Prev]} \) – Cursor in first position, no characters entered yet: Delete character(s) and enter 0
  - Change the displayed character; scroll forward (sequence: 0 to 9, decimal point, minus sign, Z to A, space)
- \( \text{[Next]} \) – Cursor in first position, no characters entered yet: Delete entire string and enter a space
  - Change the displayed character; scroll backwards (sequence: Space, A to Z, minus sign, decimal point, 9 to 0)

Numeric input in Combics 1 plus operating menu:
Enter values (date and time, etc.) using the 10-key numeric keypad

Display of Menu Settings
The illustration above shows all of the main display elements and symbols shown during menu configuration.

1  Selected menu item on text level (e.g., “Printer” for configuring the connected printer)
2  Indication that there are additional submenus
3  Indication that this is the currently active setting
4  Menu history (indicates the highest menu level)
5  Highest level in numeric menu
6  Second level in numeric menu
7  Third level in numeric menu

Saving Data in Configuration Mode
The parameters selected in the operating menu remain stored after you switch off the Combics.
You can prevent unauthorized changes in operating menu settings by requiring password input for menu access.

Display of menu settings: Text menu (example) Display of menu settings: Numeric menu (example)
Weighing

The basic weighing function is available at all times.

Features:
- Zero the weighing instrument by pressing \( \text{zero} \)
- Store the weight on the instrument as tare by pressing \( \text{tare} \)
- Tare container weight automatically
- Enter tare weight through bar code scanner (Combics 1 plus and Combics 2 only)
- Enter tare weight through numeric keypad (Combics 1 plus only)
- Delete tare values by pressing \( \text{cancel} \) and \( \text{zero} \) or \( \text{cancel} \) and \( \text{tare} \) (Combics 1 plus only)
- Press \( \text{fn} \) to toggle the display between:
  - Gross and net values,
  - 1st and 2nd weight unit, or
  - normal and 10-fold higher resolution
- Weighing with two weighing instruments (Combics 2 only)
- Individual data ID codes with numeric values for identifying weight values (Combics 1 plus only)
- Print weight value:
  - GMP-compliant printout
  - Automatic printing
  - Automatic data output (see "Data Interfaces")

Automatic Taring (Menu Item 3.7)
When menu item 3.7.2 is active, the first load placed on the weighing instrument that exceeds the specified minimum load is stored, at stability, in the tare memory. The weighing instrument returns to the initial state when the load is less than 50% of the minimum load.

Minimum Load for Automatic Taring and Automatic Printing (Menu Item 3.5)
You can choose from the following settings for the minimum load:

- 1 digit (no minimum load)
- 2 digits
- 5 digits
- 10 digits
- 20 digits
- 50 digits
- 100 digits
- 200 digits
- 500 digits
- 1000 digits

The "digits" here refer to the intervals in the connected weighing instrument. If the interval of the connected instrument is 1 g, for example, and 1000 digits are required, the minimum load is 1000 g (=1000 digits). If the interval of the connected instrument is 5 g and the same number of intervals is required as in the example above, the minimum load is 5000 g.

Once the load on the weighing instrument exceeds the specified minimum, the instrument is tared and/or a printout is generated, if the operating menu is configured for automatic taring (menu item 3.7.2) and/or automatic printing (menu item 7.13.2).

Automatic Printing (Menu Item 7.13)
When menu item 7.13.2 is active, the first weight value that exceeds the specified minimum load is printed. If the menu code for automatic taring is also active, the weighing instrument is only tared when the minimum load is exceeded; the value is not printed.

First Weighing Instrument Displayed (Combics 2 only)
You can define which weighing instrument shows the first weight value when you switch on the Combics, under \( \text{utilit} \) (menu item 8.9).

Entering Tare Weight using a Bar Code Scanner (Combics 1 plus and Combics 2 only)
You can enter the tare value of a container using a bar code scanner. To do this, the "Store value as tare" \( \text{tare} \) menu item must be selected under "Setup > Bar code" in the operating menu. In this case, the value is stored as the tare automatically, without pressing the \( \text{tare} \) key. The contents of the tare memory are displayed in Info mode (press and hold \( \text{fn} \)).

Entering ID Codes using a Bar Code Scanner (Combics 1 plus only)
You can use a bar code scanner to enter ID codes. To do this, the "Store value as ID1" \( \text{id1} \) menu item must be selected under "Setup > Bar code" in the operating menu. In this case, the value is stored as ID1 automatically, without pressing the \( \text{id1} \) key. To store the second ID code, the \( \text{id2} \) key must be pressed. To view the stored ID codes:

- Press \( \text{fn} \) and \( \text{id1} \)
- Press \( \text{fn} \) and \( \text{id2} \)
Calibration/Configuration Counter on Standard Weighing Instruments

Purpose
These two mutually independent counters keep track of changes made in calibration/adjustment parameters and in the operating menu. Counter values are stored in an EEPROM, and remain stored during the entire service life of this memory chip. To view the current values in the counter, press and hold the key (longer than 2 sec). The readout shows the “configuration counter” value for 3 seconds first (identified by “P”). Then the “calibration counter” value is shown for 3 seconds (identified by “C”). The information display closes automatically after 6 seconds.

Features of the Calibration Counter:
- Limited to a count of 9999
- Counter set to “C 0000” when the hardware is first put into operation
- Counter cannot be reset
- The counter value is updated (“1” is added) automatically following:
  - Successful calibration/adjustment or linearization
  - Changes in the user-defined calibration/adjustment or linearization weight (menu item 1.18)
  - Changes in any of the following parameters:
    Function of the key (menu item 1.9)
    Zero-setting range (menu item 1.11)
    Initial zero-setting range (menu item 1.12)
  - Resetting of the above parameters to factory settings (menu item 9.1.1)

Features of the Configuration Counter:
- Limited to a count of 9999
- Counter set to “P 0000” when the hardware is first put into operation
- Counter cannot be reset
- The counter value is updated (“1” is added) automatically following:
  - Changes in the following parameters:
    Place of installation (menu item 1.1)
    Application filter (menu item 1.2)
    Stability range (menu item 1.3)
    Taring (menu item 1.5)
    Auto zero (menu item 1.6)
    Weight unit 1 (menu item 1.7)
    Weight unit 2 (menu item 3.1)
    Weight unit 3 (menu item 3.3)
  - Resetting of the above parameters to factory settings (menu item 9.1.1)
  - Function of the key changed to or from 10-fold higher resolution display
  - Activation or deactivation of application-dependent automatic taring (menu item 3.7)
  - Resetting of the application parameters to factory settings (menu code 9.1.1)

Device parameters

Password
You can prevent unauthorized changes in the device settings (“Setup > Code”) and application settings (“Setup > Utilities,” Combics 2 only) by assigning a password under “Setup > Code” (“Set Code,” see also the chapter entitled “Configuration”).

Acoustic Signal
An acoustic signal is emitted when you press a key (active key: single beep; inactive key: double-beep). You can switch the acoustic signal off or on under “Setup > Utilities” (“Setup > Utilities,” Combics 2 only) (menu item 8.2).

Keys
In the Setup menu under “Setup > Utilities,” you can block or release the keypad for input (menu item 8.3).

Automatic Power-off
In the Setup menu under “Setup > Utilities,” you can configure the Combics to shut down automatically following a specified interval of no user activity (menu item 8.7).

Display Backlighting
In the Setup menu under “Setup > Utilities,” you can choose from the following settings for the display backlighting:
- On (8.8.1)
- Off (8.8.2)
- Shut off after the specified time period has elapsed (8.8.3)

Timer Mode
In the Setup menu under “Setup > Utilities,” you can set the timer interval to 2, 4 or 10 minutes (menu item 8.9).
Operating

Example
Switch on the Combics, zero the weighing instrument, tare the container weight, place sample in container, toggle display to gross weight, 2nd weight unit or 10-fold increased resolution

Switch on the Combics
All display segments are shown for approx. 1 second (self-test)

Display with no load on weighing instrument

Zero the weighing instrument
Display with no load on weighing instrument

Place container on weighing instrument

Container weight is displayed

Tare the weighing instrument
Display with tared container on weighing instrument

Place sample in container (in this example, 120.2 g)
Display with tared weighing instrument and sample in container

Toggle display; readout depends on your settings:

- gross weight
  (in this example, 50 g for container + 120.2 g substrate) or

- display in 2nd weight unit (in this example, kg) or

- display with 10-fold increased resolution

Return to previous readout
(if 10-fold increased resolution is shown, display returns to previous readout automatically after 10 seconds)

Print results
Operating the Combics 1 plus

Example:
Combics 1 plus: Weighing with tare value entered using the numeric keypad; generate printout of results

Switch on the Combics 1 plus
The automatic self-test runs. Once a readout is shown, Combics 1 plus is automatically zeroed and ready to operate. With no load on the weighing instrument, you can zero the instrument at any time by pressing 0.

Enter the tare weight in the current weight unit using the keypad (in this example, 0.25 kg).

Tare the weighing instrument

Place container with sample on the weighing instrument

Read the result

Toggle the display from net to gross weight values. The display shows the gross weight (in this example, 0.250 kg for the container plus 2.000 kg for the sample)
Toggle to display of net value

Print the results

Start of GMP header (only if GMP-compliant printout is configured)

End of GMP header

Header lines

ID code 1

ID code 2

GMP footer (only if GMP-compliant printout is configured)

End of GMP footer

Delete tare weight entered through the keypad

or
Operating the Combics 1 plus

Example:
Combics 1 plus: Weighing with varying tare values; generate printout of results, delete tare values

Switch on the Combics 1 plus
The automatic self-test runs. Once a readout is shown, the Combics is automatically zeroed and ready to operate. With no load on the weighing instrument, you can zero the instrument at any time by pressing \( \text{zero} \).

Place empty container on the weighing instrument

Tare the weighing instrument
Note: With the automatic tare function enabled, you do not need to press \( \text{tare} \) to tare the weighing instrument; the tare weight is stored automatically when you place the container on the weighing instrument.

Wait until a zero value is displayed together with the NET symbol.

Place packaged sample in the container

Enter the tare weight of the packaging in the current weight unit using the keypad (in this example, 0.25 kg).

Save the package weight. The package tare is added to the container tare.

Read off net weight
Print the results

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>G#</td>
<td>+</td>
<td>6.433 kg</td>
</tr>
<tr>
<td>T</td>
<td>+</td>
<td>4.183 kg</td>
</tr>
<tr>
<td>PT2</td>
<td>+</td>
<td>0.250 kg</td>
</tr>
<tr>
<td>N</td>
<td>+</td>
<td>2.000 kg</td>
</tr>
</tbody>
</table>

-------------------
0

Enter a zero ("0") using the keypad

→T←

Save the value entered. This deletes tare values; the display shows the gross value

6.433 kg

Print the results

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>G#</td>
<td>+</td>
<td>6.433 kg</td>
</tr>
<tr>
<td>T</td>
<td>+</td>
<td>0.000 kg</td>
</tr>
<tr>
<td>N</td>
<td>+</td>
<td>6.433 kg</td>
</tr>
</tbody>
</table>

-------------------
Operating the Combics 1 plus

Individual ID Codes (Identifiers)

You can assign ID codes (such as product name, batch number, etc.) while weighing, for identification of measured values.

Features

- Assign up to two ID codes.
- Assign both a name and a value for each ID code.
- The name is left-justified and the value is right-justified on the printout. If the entire code is too long for one line, additional lines are printed.
- Enter ID code names in Setup under: Setup: PrtProt (printouts):
  7.4.3 (ID1)
  and
  7.4.4 (ID2)
- Enter up to 20 characters for the ID code name. No more than 11 characters are displayed during input; all 20 characters are printed.
- Maximum length for values: 21 characters.
- Enter numeric values for ID codes using the numeric keypad and press ID1 or ID2 to save.
- To delete the last character entered in the ID code value: Press C
  To delete the entire ID code: Press C and then ID1 or ID2
- If both the name and value fields are empty, no ID code is printed.
- Print ID codes: Refer to the Setup menu for menu item numbers. Data is output to COM1 menu item 7.7.x) or UniCOM (menu item 7.8.x).
- Show ID codes:
  Press Info and then ID1 or ID2
- To store values entered using a bar code scanner: Scan the value for ID1

Function Keys

ID1 Store the input as or value for first or
ID2 second ID code.

C Delete the selected ID code value

Info Display ID codes

Application Parameters: ID Codes

Setup

PrtProt PrtProt Printouts

7.4. Input

7.4.3 ID1

7.4.4 ID2

7.7 COM1: Configure

7.7.6 ID1 and ID2

7.8 UniCOM:

7.8.6 ID1 and ID2
**Example:**

Entering ID code values.
Enter “123.456” and “678.9” as values for ID codes 1 and 2.
See “Entering the Password” in the chapter entitled “Configuration” for details on how to enter ID code names.

1. Enter value for ID code 1 (in this example, 123.456)
   - 1 2 3 .
   - 4 5 6
   - 123456
   - **ID1**

2. Confirm value for the first ID code

3. Enter value for ID code 2 (in this example, 678.9)
   - 6 7 8
   - 9
   - 6789
   - **ID2**

4. Confirm the value for the second ID code

Place container with sample on the weighing instrument

Print weight value (perform further weighing operations as desired, and print)

<table>
<thead>
<tr>
<th>ID code</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID1</td>
<td>123.456</td>
</tr>
<tr>
<td>ID2</td>
<td>6.789</td>
</tr>
</tbody>
</table>

24.02.2003 10:09

---

**Ser.no.** 12345678
**G#** + 6.433 kg
**T** + 0.000 kg
**N** + 6.433 kg

Delete ID code:
You can delete each ID code individually when the weighing series has been completed.
**Operation**

**Calibration and Adjustment**

**Purpose**
The accuracy of weighing results must be carefully controlled. This is achieved through calibration and adjustment.

Perform calibration to determine the difference between the value displayed and the actual weight on the weighing instrument. Calibration does not entail making any changes within the weighing instrument.

The adjustment procedure actually eliminates the difference between the readout and the actual weight, or reduces it to a level within the permissible tolerance limits.

**Features**
Which of the following features are available depends on the weighing instrument:

- External calibration/adjustment with the default weight value or standard weight (1.9.1) (not available on verified instruments)
- External calibration/adjustment with a user-defined weight (1.9.3) (not available on verified instruments)
- Internal calibration/adjustment for IS platform (1.9.4), WP2 only
- Block the key to prevent use of the two functions described above (1.9.10)
- Calibrate first; then adjust automatically (1.10.1) (not available on verified instruments)
- Calibrate, then prompt for manual input of adjustment command (1.10.2)
- Calibration prompt: flashing symbol (1.15.2). If more than one weighing instrument is connected, the instrument number is also displayed.
- Block external calibration/adjustment (1.16.2)

- Display altitude and geographical latitude or acceleration of gravity after CAL is shown at the beginning of the calibration procedure (menu item 8.12.2). These values are shown only if they have been entered in the service menu and activated. For each of these parameters, the term is displayed first (Altitude, Latitude or Gravity) for 1 second, and then the corresponding value is displayed continuously until you press .

**Note**
On verified weighing instruments, the external calibration/adjustment function is available only when the menu access switch is in the “open” position, which entails breaking the verification seal (refer to the chapter entitled “Service”). The equipment must be re-verified after the seal has been broken.

**Example**
External calibration and manual adjustment with default weights

Setup menu settings:
1.9.1; 1.10.2

Unload and zero the weighing instrument

Start calibration (e.g., when calibration prompt is flashing: )

The following is displayed for 2 seconds

You are prompted to place the required weight on the weighing instrument (e.g., 10 kg)
Position the calibration weight on the weighing instrument

The difference between the weight value and the true mass is displayed, with ± sign.

Calibration record is printed, if adjustment was not performed and the process was stopped by pressing [key to cancel]

Activate calibration/adjustment manually (press the [key to cancel]

The calibration weight is displayed at the conclusion of calibration

A GMP-compliant printout is generated

Unload the weighing instrument
Operating the Combics 2

Counting

With the Counting application, you can determine the number of parts that each have approximately equal weight.

Features:
- Store the weight on the weighing instrument as reference weight
- Enter reference weight using a bar code scanner
- Enter tare weight using a bar code scanner
- Automatic reference sample updating (user-definable)
- Counting with two weighing instruments
- Toggle the display between piece count and weight by pressing \( \text{OK} \)
- Info mode for display of average piece weight and reference sample quantity by pressing \( \text{SF} \) (> 2 sec)

Before the quantity on the weighing instrument can be calculated, the average piece weight must be entered in the application. There are 2 ways to do this with the Combics:

- By placing the number of parts defined as the reference sample quantity on the weighing instrument and pressing \( \text{OK} \) to store the average piece weight.

The reference sample quantity is shown in the numeric display, and can be changed by pressing \( \text{R} \).

How the reference weight is calculated depends on the menu setting for resolution (3.9). Either the value is rounded off in accordance with the display resolution, or the display resolution is increased 10-fold (+1 decimal place) or 100-fold (+ 2 decimal places), or maximum internal resolution is applied.

- By entering the reference piece weight (i.e., the weight of one piece) using a bar code scanner (menu setting: “Setup> Bar code > Store value as reference (“REF”). In this case, the value is stored as a reference automatically, without pressing the \( \text{OK} \) key.

This value remains active in the reference memory until you delete it by pressing \( \text{CF} \), overwrite it or until you select a different application. It also remains in memory when you switch to a different application program, or switch off the Combics.

Application Parameters: Counting

- 3. 5. Minimum Load for Automatic Taring and Automatic Printing
  - 3. 5. 1 * 1 digit
  - 3. 5. 2 2 digits
  - 3. 5. 3 5 digits
  - 3. 5. 4 10 digits
  - 3. 5. 5 20 digits
  - 3. 5. 6 50 digits
  - 3. 5. 7 100 digits
  - 3. 5. 8 200 digits
  - 3. 5. 9 500 digits
  - 3. 5. 10 1000 digits

- 3. 6. Minimum Load for Initialization
  - 3. 6. 1 * 1 digit
  - 3. 6. 2 2 digits
  - 3. 6. 3 5 digits
  - 3. 6. 4 10 digits
  - 3. 6. 5 20 digits
  - 3. 6. 6 50 digits
  - 3. 6. 7 100 digits
  - 3. 6. 8 200 digits
  - 3. 6. 9 500 digits
  - 3. 6.10 1000 digits

- 3. 7. Automatic Taring: 1st Weight Tared
  - 3. 7. 1 * Off
  - 3. 7. 2 On

- 3. 8. Start Application with Most Recent Application Data when Combics is Switched On
  - 3. 8. 1 Automatic (on)
  - 3. 8. 2 * Manual (off)

- 3. 9. Resolution for Calculation of Reference Value
  - 3. 9. 1 * Display resolution
  - 3. 9. 2 Display resolution + 1 decimal place
  - 3. 9. 3 Display resolution + 2 decimal places
  - 3. 9. 4 Internal resolution

- 3. 10 Storage Parameter
  - 3. 11. 1 * At stability
  - 3. 11. 2 At increased stability

- 3. 12 Reference Sample Updating
  - 3. 12. 1 Off
  - 3. 12. 2 * Automatic

- 3. 13 Reference Weighing Instrument
  - 3. 13. 1 * No reference instrument selected
  - 3. 13. 2 WP1
  - 3. 13. 3 WP2
Storage Parameter
The reference weight is saved when
the weighing instrument has stabilized.
“Stability” is defined as the point at
which fluctuation of a measured value
lies within a defined tolerance range.
The narrower the tolerance range, the
more stable the weighing instrument
is at “stability.” This setting is also
applied when you zero the weighing
instrument.
Under menu item 3.11 you can
determine whether the value is saved
“At stability” (normal tolerance range)
or “At increased stability” (narrower
tolerance range).
If you select “At increased stability,”
the average piece weight stored will
be more accurate and the results more
reproducible, but the response time
of the weighing instrument might be
longer.

Minimum Load for Initialization
The minimum load for initialization
is configured under menu item 3.6.
If the load exceeds this limit, the
weighing instrument can be initialized.
If the load is too light, the following
will occur when you try to save a value:
– The error code inf 29 is displayed
– A warning signal is emitted
(double-beep)
– The weighing instrument is not
initialised
– The preset reference sample quantity
is stored

Reference Sample Updating
In the Application settings under 3.12,
you can define whether the reference
sample is updated automatically.
Reference sample updating is performed
automatically only when the following
6 criteria are met:
1. Menu item 3.12.3 is active
2. The current piece exceeds the original
piece count by at least two
3. The current piece count is less
than twice the original piece count
(does not apply for the first update
if the piece count is entered using
a bar code scanner).

4. The current piece count is less
than 100.
5. The internally calculated piece count
(such as 17.24 pcs) differs by less
than ± 0.3 pcs from the whole number
(17 pcs in this example).
6. The weighing instrument is stable
in accordance with the defined stability
parameter.

When automatic reference sample
updating is active, the AUTO symbol is
displayed in addition to the Counting
symbol (Z). When the reference
sample has been updated, OPT is dis-
played below AUTO. During an up-
dating operation, OPt and the updated
piece count are displayed briefly in
the main display.

At the conclusion of reference sample
updating, a beep is sounded and
the new reference weight and reference
sample quantity are stored. Activate
the “Info” mode to view the reference
values (press and hold [g] > 2 sec).

Counting with
Two Weighing Instruments
You can use two weighing instruments
simultaneously with the Counting appli-
cation. When using two instruments,
you can choose from the following
operating modes:

– Counting with two equivalent weighing
instruments
– Counting with one reference weighing
instrument and one counting platform

Counting with Two Equivalent
Weighing Instruments
Use this mode when samples of widely
varying weight are counted at one
workstation. Count the lighter-weight
pieces on one weighing instrument
and the heavier pieces on another.
When you press (9) to toggle from one
weighing instrument to the other, the
application is re-initialized.
You can define which of the two
weighing instruments is active in the
display when the Combics is switched
on (menu item 8.11). This is the first
weighing instrument active when you
switch on the Combics, regardless of
the setting for automatic initialization
of the Counting application.

Counting with One Reference Weighing
Instrument and One Counting Platform
In this mode, a high-resolution weighing
instrument with a relatively low maxi-
mum capacity is used as a reference
weighing instrument. The weighing
platform is used for weighing heavier
samples, and has a high capacity with
a relatively low resolution.
This way, you can both determine the
reference sample quantity very precisely
and count large amounts of parts,
without requiring an expensive high-
resolution, high-capacity weighing
platform.
Specify which weighing instrument
is the reference instrument under
menu item 3.13. The system toggles
to the reference weighing instrument
for initialization (=EF
is displayed). Following initialization,
the system toggles to the counting
platform.

The system does not toggle auto-
matically for automatic reference
sample updating; the update is based
on whichever instrument is active.
Operating the Combics 2

Example:

1. Place empty container on the weighing instrument
2. Tare the weighing instrument
3. Set the desired reference sample quantity (in this example, 20)
4. Place the corresponding number of pieces (20) in the container
5. Confirm reference sample weight
Add more parts to the container (in this example, 18 pcs)

\[ + \quad \text{38 pcs} \]

\( \Delta \) is displayed if automatic reference sample updating is enabled

\( \Delta \) Toggle the display from piece count to weight

\( \Delta \) Piece count is displayed

\( \Delta \) Toggle to Info mode

\( \Delta \) Reference sample quantity is displayed

\( \Delta \) Return to weighing mode

\( \Delta \) Print results

\[ \begin{array}{ll}
\text{G#} & + \quad 610.0 \text{ g} \\
\text{T} & + \quad 200.0 \text{ g} \\
\text{N} & + \quad 410.0 \text{ g} \\
\text{Qnt} & \quad 38 \text{ pcs} \\
\end{array} \]
Neutral Measurement

When the Neutral Measurement application is selected, you can use your weighing instrument to measure the length, surface and volume of parts that have roughly the same specific weight. The symbol is displayed as the weight unit.

Features:
- Store the weight on the weighing instrument as reference weight
- Enter reference weight using a bar code scanner
- Enter tare weight using a bar code scanner
- Toggle the display between weight and calculated value by pressing \( \text{w} \)
- Info mode for display of reference weight by pressing \( \text{w} \) (> 2 sec)

To calculate the result correctly, the average weight of a reference quantity must be known (in the example below, the reference is 1 meter of electrical cable). There are 2 ways to do this with the Combics:

- By placing the number of parts defined for the reference value on the weighing instrument and pressing \( \text{OK} \) to store the average piece weight.

The reference value is shown in the numeric display, and can be changed by pressing \( \text{REF} \).

How the reference weight is calculated depends on the menu setting for resolution (3.9). Either the value is rounded off in accordance with the display resolution, or the display resolution is increased 10-fold (+1 decimal place) or 100-fold (+ 2 decimal places), or maximum internal resolution is applied.

- By entering the reference weight (i.e., the weight of one piece) using a bar code scanner (menu setting: "Setup> Bar code > Store value as reference (+EF)"). In this case, the value is stored as a reference automatically, without pressing the \( \text{OK} \) key.

This value remains active in the reference memory until you delete it by pressing \( \text{CF} \), overwrite it or until you select a different application. It also remains stored after you switch off the Combics.

Application Parameters: Neutral Measurement

<table>
<thead>
<tr>
<th>3. 5. Minimum Load for Automatic Taring and Automatic Printing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 5. 1 * 1 digit</td>
</tr>
<tr>
<td>3. 5. 2 2 digits</td>
</tr>
<tr>
<td>3. 5. 3 5 digits</td>
</tr>
<tr>
<td>3. 5. 4 10 digits</td>
</tr>
<tr>
<td>3. 5. 5 20 digits</td>
</tr>
<tr>
<td>3. 5. 6 50 digits</td>
</tr>
<tr>
<td>3. 5. 7 100 digits</td>
</tr>
<tr>
<td>3. 5. 8 200 digits</td>
</tr>
<tr>
<td>3. 5. 9 500 digits</td>
</tr>
<tr>
<td>3. 5.10 1000 digits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 6. Minimum Load for Initialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 6. 1 * 1 digit</td>
</tr>
<tr>
<td>3. 6. 2 2 digits</td>
</tr>
<tr>
<td>3. 6. 3 5 digits</td>
</tr>
<tr>
<td>3. 6. 4 10 digits</td>
</tr>
<tr>
<td>3. 6. 5 20 digits</td>
</tr>
<tr>
<td>3. 6. 6 50 digits</td>
</tr>
<tr>
<td>3. 6. 7 100 digits</td>
</tr>
<tr>
<td>3. 6. 8 200 digits</td>
</tr>
<tr>
<td>3. 6. 9 500 digits</td>
</tr>
<tr>
<td>3. 6.10 1000 digits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 7. Automatic Taring:1st Weight Tared</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 7. 1 * Off</td>
</tr>
<tr>
<td>3. 7. 2 On</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 8. Start Application with Most Recent Application Data when Combics is Switched On</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 8. 1 Automatic (on)</td>
</tr>
<tr>
<td>3. 8. 2 * Manual (off)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 9. Resolution for Calculation of Reference Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 9. 1 * Display resolution</td>
</tr>
<tr>
<td>3. 9. 2 Display resolution + 1 decimal place</td>
</tr>
<tr>
<td>3. 9. 3 Display resolution + 2 decimal places</td>
</tr>
<tr>
<td>3. 9. 4 Internal resolution</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 10. Decimal Places for Display of Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 10. 1 * None</td>
</tr>
<tr>
<td>3. 10. 2 1 decimal place</td>
</tr>
<tr>
<td>3. 10. 3 2 decimal places</td>
</tr>
<tr>
<td>3. 10. 4 3 decimal places</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 11. Storage Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 11. 1* At stability</td>
</tr>
<tr>
<td>3. 11. 2 At increased stability</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 13. Reference Weighing Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 13. 1* Off</td>
</tr>
<tr>
<td>3. 13. 2 WP1</td>
</tr>
<tr>
<td>3. 13. 3 WP2</td>
</tr>
</tbody>
</table>
Storage Parameter
The reference weight is saved when the weighing instrument has stabilized. “Stability” is defined as the point at which fluctuation of a measured value lies within a defined tolerance range. The narrower the tolerance range, the more stable the weighing instrument is at “stability.” This setting is also applied when you zero the weighing instrument.
Under menu item 3.11 you can determine whether the value is saved “At stability” (normal tolerance range) or “At increased stability” (narrower tolerance range). If you select “At increased stability,” the average piece weight stored will be more accurate and the results more reproducible, but the response time of the weighing instrument might be longer.

Decimal Places for Display of Results
In neutral measurement, not only whole numbers but also decimal numbers (for example, 1.25 o electrical cabling) can be displayed. The number of decimal places displayed in neutral measurement is configured under menu item 3.10. The measured result can be displayed with 0, 1, 2 or 3 decimal places.

Minimum Load for Initialization
The minimum load for initialization is configured under menu item 3.6. If the load exceeds this limit, the weighing instrument can be initialized. If the load is too light, the following will occur when you try to save a value:
- The error code inf 29 is displayed
- A warning signal is emitted (double-beep)
- The weighing instrument is not initialized
- The preset reference value is stored

Neutral Measurement with Two Weighing Instruments
You can use two weighing instruments simultaneously with the Neutral Measurement application. When using two instruments, you can choose from the following operating modes:
- Neutral measurement with two equivalent weighing instruments
- Neutral measurement with one reference weighing instrument and one measurement platform

Neutral Measurement with Two Equivalent Weighing Instruments
Use this mode when samples of widely varying weight are measured at one workstation. Measure the lighter-weight pieces on one weighing instrument and the heavier pieces on another. When you press [ ) to toggle from one weighing instrument to the other, the application is re-initialized.
You can define which of the two weighing instruments is active in the display when the Combics is switched on (menu item 8.11). This is the first weighing instrument active when you switch on the Combics, regardless of the setting for automatic initialization of the Neutral Measurement application.

Neutral Measurement with One Reference Weighing Instrument and One Measuring Platform
In this mode, a high-resolution weighing instrument with a relatively low maximum capacity is used as a reference weighing instrument. The measuring platform has a high capacity, but a relatively low resolution.
This allows you to both determine the reference value with high resolution; i.e., very precisely, and to measure large samples, without requiring an expensive high-resolution, high-capacity weighing platform.
Specify which weighing instrument is the reference instrument under menu item 3.13. The system toggles automatically to the reference instrument for initialization (rEF is shown in the main display). Following initialization, the system toggles to the measuring platform.
Example:
Determine the length of an amount of electrical cable after weighing in the defined reference unit value

Place empty container on the weighing instrument

Tare the weighing instrument

Set the desired reference value (in this example, 2)

Place a sample corresponding to the reference quantity in the container (in this example, 2 meters of electrical cable)

Confirm reference sample weight
Remove the reference material and place the sample to be measured on the weighing instrument (in this example, 8 meters of electrical cable).

Print results:

<table>
<thead>
<tr>
<th>G#</th>
<th>+ 734.1 g</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>+ 200.0 g</td>
</tr>
<tr>
<td>N</td>
<td>+ 534.1 g</td>
</tr>
<tr>
<td>Qnt</td>
<td>8 o</td>
</tr>
</tbody>
</table>
Operating the Combs 2

Checkweighing

When the Checkweighing application is selected, you can check whether sample weights correspond to a specified target weight; i.e., whether the weight on the weighing instrument is within a given tolerance range. The tolerance range is defined by upper and lower limits. The result is displayed in the main indicator, in the bar graph and by color-coded LEDs.

Features:
- The target value can be taken over as a weighed value from a weighing instrument, and the tolerance limits are defined as a perceptual deviation from the target value. The following percentages can be selected as the deviation: 0.1%, 0.2%, 0.5%, 1%, 1.5%, 2%, 3%, 5% or 10%.
- The target value, lower tolerance limit (minimum) and upper tolerance limit (maximum) can be taken over as weighed values from the weighing instrument.
- Target and tolerance limits checked during input; values must conform to: Upper limit > Target > Lower limit ≥ 1 digit
- Checkweighing range: either 30% to 170% of the target, or from 10% to infinity
- Application started automatically with most recent application data when Combics switched on
- Automatic taring
- Automatic printing
- Toggle the display between weight and tolerances limits by pressing \(\text{OK}\).

Checkweighing entails comparing the current weight value to a defined target. The target value has a tolerance range which can be entered either as an absolute value or percentage (menu item 4.5).

- Entering the tolerance range as an absolute value (weighed value) (menu item 4.5.1):
  Start initialization by pressing \(\text{OK}\); the middle segments of the bar graph flash to prompt the placement of the weight on the weighing instrument. Place the weight on the instrument and press \(\text{OK}\) to store. The bar graph segment for the lower limit flashes to prompt the weight for lower limit. Place the weight on the weighing instrument and press \(\text{OK}\) to store. The bar graph segment for the upper limit flashes to prompt the weight for upper limit. Place the weight on the weighing instrument and press \(\text{OK}\) to store.

- Entering the tolerance range as a percentage (menu item 4.5.2):
  A value for the percentage is shown in the numeric display (lower right-hand corner) together with the “%” sign. Press \(\text{REF}\) to change the percentage value (0.1%, 0.2%, 0.5%, 1%, 1.5%, 2%, 3%, 5%, 10%). Start initialization by pressing \(\text{OK}\); the middle segments of the bar graph flash to prompt the placement of the weight on the weighing instrument. Place the weight on the instrument and press \(\text{OK}\) to store. To can change the percentage value for the tolerance limits again before the target value is stored, press \(\text{REF}\).

Before the new initialization, the previous initialization values must be deleted by pressing \(\text{CF}\).

Application Parameters: Checkweighing

<table>
<thead>
<tr>
<th>3. 5. Minimum Load for Automatic Taring and Automatic Printing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 5. 1 * 1 digit</td>
</tr>
<tr>
<td>3. 5. 2 2 digits</td>
</tr>
<tr>
<td>3. 5. 3 5 digits</td>
</tr>
<tr>
<td>3. 5. 4 10 digits</td>
</tr>
<tr>
<td>3. 5. 5 20 digits</td>
</tr>
<tr>
<td>3. 5. 6 50 digits</td>
</tr>
<tr>
<td>3. 5. 7 100 digits</td>
</tr>
<tr>
<td>3. 5. 8 200 digits</td>
</tr>
<tr>
<td>3. 5. 9 500 digits</td>
</tr>
<tr>
<td>3. 5.10 1000 digits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 7. Automatic Taring: 1st Weight Tared</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 7. 1 * Off</td>
</tr>
<tr>
<td>3. 7. 2 On</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 8. Start Application with Most Recent Application Data when Combics is Switched On</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 8. 1 Automatic (on)</td>
</tr>
<tr>
<td>3. 8. 2 * Manual (off)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. 2. Checkweighing Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. 2. 1 * 30% to 170%</td>
</tr>
<tr>
<td>4. 2. 2 10% to infinity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. 3. Activate Control Line for “Set” as:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. 3. 1 * “Set” output</td>
</tr>
<tr>
<td>4. 3. 2 Ready to operate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. 4. Activation of Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. 4. 1 Off</td>
</tr>
<tr>
<td>4. 4. 2 Always active</td>
</tr>
<tr>
<td>4. 4. 3 Active at stability</td>
</tr>
<tr>
<td>4. 4. 4 * Active within checkweighing range</td>
</tr>
<tr>
<td>4. 4. 5 Only at stability within the checkweighing range</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. 5. Parameter Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. 5. 1 * Min, max, target</td>
</tr>
<tr>
<td>4. 5. 2 Only target with percent limits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. 6. Automatic Printing</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. 6. 1 * Off</td>
</tr>
<tr>
<td>4. 6. 2 On</td>
</tr>
<tr>
<td>4. 6. 3 Only values within tolerance</td>
</tr>
<tr>
<td>4. 6. 4 Only values outside tolerance</td>
</tr>
</tbody>
</table>
Display
The result of a measurement is shown either as a weight value or in relation to the target. You can toggle between these two display modes by pressing \( \mathcal{G} \).

- Weight display mode:
The main display always shows the weight value, even if the value is outside the tolerance range.
The bar graph is displayed with symbols indicating lower limit, target and upper limit. It shows a logarithmic display of the current load if the weight is anywhere from 0 to the minimum load, and a linear display for weights beyond that range.
The LEDs indicate the following:
Yellow: weight value > upper tolerance limit
Green: weight value is within tolerance
Red: weight value < lower tolerance limit
If no LED lights up:
- the application is not completely initialized, or
- the weight value is outside the checkweighing range (see menu item 4.2)
- the weighing instrument has not stabilized

- Tolerance limit display mode:
As “Weight display mode” above, with the exception that:
- \( LL \) is shown on the main display if the weight value is lower than the target, and
- \( HH \) is shown on the main display if the weight value is higher than the target

Digital Input/Output Interface
The Checkweighing application supports the digital input/output interface.
There are 4 control lines, or outputs, which are activated as follows (also refer to the diagram):
- Lighter
- Equal
- Heavier
- Set

The “SET” output normally changes its voltage level when the load is near the target weight. Alternatively, you can assign the “Ready-for-use” function to this port (menu item 4.3.2).

Under menu item 4.4, you can define whether these control ports are
- inactive (4.4.1)
- always active (4.4.2)
- active at stability (4.4.3)
- active within the check range, or
- active at stability within the check range
For example, you can use this function to show the weighed or measured result on a simple external indicator, similar to the 3 LEDs on the Combics 2.

All data output ports have a high voltage level when:
- the application has not been initialized,
- the weighing instrument is not at stability and one of the “at stability…” parameters, (4.4.3 or 4.4.5) is selected, or
- the weight is not within the check range (4.4.4).

Digital I/O Interface
“SET” control line: set and control lines:
Always active/Active at stability

Output line specifications:
- In the inactive state, the levels are set to “high:” > 3.7 V/±4 mA
- In the active state, the levels are set to “low:” < 0.4 V/–4 mA
\( \Delta \) The output lines are not short-circuit proof!
Operating the Combics 2

Example:
Initialize the Checkweighing application by taking over the weighed value as target; select percentage to define tolerance range (menu item 4.5.2)

Delete any existing initialization data

Begin initialization

The middle segments of the bar graph flash to prompt the placement of the weight on the weighing instrument

Place the weight for the target on the weighing instrument (in this example, 100.0 g)

Select the desired percentage for tolerance limits (in this example, 5%)

Store target and calculate tolerance range based on the selected percentage

Optional: < 2 sec. Toggle to Info mode to view stored values
Target value is displayed

Optional: [5]

Toggle to the next display mode

Percentage for limits is displayed

Optional: [5]

Toggle to the next display mode

Weight value for the lower limit (minimum) is displayed

Optional: [5]

Toggle to next display mode (weight value for the upper limit is displayed)

Optional: [5] > 2 sec

Exit the Info mode

Unload weighing instrument

Optional: [5]
Operating the Combics 2

Example:
Check the weight of a sample; use Tolerance Limit display mode

Place a load of unknown weight on the weighing instrument

If the weight is under the lower tolerance limit, \( \text{LL} \) is shown in the tolerance limit display (load is too light) (the weight display shows the measured weight value)

If the weight is within the tolerance range (in this example, 103.2 g), the weight value is displayed

If the weight is over the upper tolerance limit, \( \text{HH} \) is shown in the tolerance limit display (load is too heavy) (the weight display shows the measured weight value)

Print results

Printout

---

ACE HARDWARE
GOETTINGEN
19.03.2002 15:43

<table>
<thead>
<tr>
<th>Setp</th>
<th>Min</th>
<th>Max</th>
<th>G#</th>
<th>T</th>
<th>N</th>
<th>Lim</th>
<th>W.Diff+</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.0</td>
<td>95.0</td>
<td>105.0</td>
<td>103.2</td>
<td>0.0</td>
<td>103.2</td>
<td>3.20%</td>
<td>3.2 g</td>
</tr>
</tbody>
</table>

Target value
Minimum
Maximum
Gross weight
Tare weight
Net weight
Percentage of deviation from target*
Absolute difference from target

* In Tolerance Limit display mode:
If the weight is lighter than the target, the display shows: \( \text{Stat LL} \)
If the weight is heavier than the target, the display shows: \( \text{Stat HH} \)
### Classification

With the Classification application, you can determine whether the weight of a given sample lies within the limits of a defined weight class.

**Features:**
- Configure 3 or 5 classes (menu item 4.8)
- Define contiguous classes
- Define classes that cover the entire weighing range of the weighing instrument
- Range below the specified minimum load is designated “Class 0”
- Define the upper limit of a given class by storing weight on weighing instrument or by entering a weight value and a percentage
- Show the current weight in the main display as a weight value or as belonging to a certain class
- Class of current weight also indicated by 1 LED (when using 3 classes) or 2 LEDs (when using 5 classes)
- Toggle the display between weight and class by pressing the appropriate button
- Digital input/output interface
- Info mode for display of class limits by pressing the appropriate button

To use the Classification application, you need to enter the delimiters that separate one class from another.

- Start the initialization by pressing the appropriate button.
  - The lower limit of Class 1 is defined by the preset minimum load. Weight values below minimum load are classified as belonging to Class 0, in part to prevent an unloaded weighing instrument from displaying a value that designates a class.
  - You can enter the other class delimiters as absolute values or percentages (menu item 4.9).

- Entering the class delimiters as absolute values (weighed values) (menu item 4.9.1):
  - For each upper limit (except that of the highest class), place a load on the weighing instrument and press the appropriate button to store it as the upper limit of a class.
  - The bar graph and the numeric display show the limit currently being configured.
  - Each time you store a value for an upper limit, a check is run to make sure the value is equal to or greater than the upper limit of the previous class. If the value is invalid, an acoustic signal is emitted; the limit must be entered again.

- Entering delimiters as percentages (menu item 4.9.2):
  - Define the upper limit of Class 1 by placing the corresponding weight on the weighing instrument and pressing the appropriate button. The value is equal to 100 %.
  - The upper limit of Class 2 is equal to 100 % plus the percentage you select by pressing the appropriate button (1, 2, 5, 10, 15, 30, 50, 70, 100, 150, 199 %).

Example: A load of 100 g is stored from the weighing instrument as the upper limit of Class 1. The value 15% is then entered, defining the upper limit of Class 2 as 115 g.

In this case, the weight ranges when working with 5 classes are:
- Class 0: up to the minimum load
- Class 1: Minimum load – 100 g
- Class 2: 100 g – 115 g
- Class 3: 115 g – 130 g
- Class 4: 130 g – 145 g
- Class 5: 145 g – maximum capacity

Before a new initialization, the previous initialization values must be deleted by pressing the appropriate button.

### Application Parameters: Classification

<table>
<thead>
<tr>
<th>Application</th>
<th>Parameters</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.</td>
<td>Minimum Load for Automatic Taring and Automatic Printing</td>
<td>1 digit, 2 digits, 5 digits, 10 digits, 20 digits, 50 digits, 100 digits, 200 digits, 500 digits, 1000 digits</td>
</tr>
<tr>
<td>3.6.</td>
<td>Minimum Load for Initialization and Defining the Class 1 Lower Limit</td>
<td>1 digit, 2 digits, 5 digits, 10 digits, 20 digits, 50 digits, 100 digits, 200 digits, 500 digits, 1000 digits</td>
</tr>
<tr>
<td>3.7.</td>
<td>Automatic Taring: 1st Weight Tared</td>
<td>Off, On</td>
</tr>
<tr>
<td>3.8.</td>
<td>Start Application with Most Recent Application Data when Combics is Switched On</td>
<td>Automatic (on), Manual (off)</td>
</tr>
<tr>
<td>4.3.</td>
<td>Activate Control Line for “Set” as:</td>
<td>“Set” output, Ready to operate (for process control systems)</td>
</tr>
<tr>
<td>4.7.</td>
<td>Activation of Outputs</td>
<td>Off, Always active, Active at stability</td>
</tr>
<tr>
<td>4.8.</td>
<td>Number of Classes</td>
<td>3 classes, 5 classes</td>
</tr>
<tr>
<td>4.9.</td>
<td>Parameter Input</td>
<td>Weight values, Percentage</td>
</tr>
<tr>
<td>4.10.</td>
<td>Automatic Printing</td>
<td>Off, On</td>
</tr>
</tbody>
</table>
Minimum Load for Initialization and Defining the Class 1 Lower Limit
The minimum load defines the lower limit for Class 1 (i.e., the delimiter between Classes 0 and 1). The application can only be initialized (to define the upper limit of Class 1) when the load on the weighing instrument exceeds the minimum load.

Display
The result of a given measurement is shown as either a weight value or the class number. You can toggle between these two display modes by pressing \( \text{w} \).

- Weight display; 3 classes:
The current weight is shown in the display; for example: 108.7 g
  - Class 1 Bar graph:
    - Numeric display: \( 1 \)
    - LED: red is lit
  - Class 2 Bar graph:
    - Numeric display: \( 2 \)
    - LED: green is lit
  - Class 3 Bar graph:
    - Numeric display: \( 3 \)
    - LED: yellow is lit

- Weight display; 5 classes:
The current weight is shown in the display; for example: 108.7 g
  - Class 1 Bar graph:
    - Numeric display: \( 1 \)
    - LED: red is lit
  - Class 2 Bar graph:
    - Numeric display: \( 2 \)
    - LED: red and green are lit
  - Class 3 Bar graph:
    - Numeric display: \( 3 \)
    - LED: green is lit
  - Class 4 Bar graph:
    - Numeric display: \( 4 \)
    - LED: green and yellow are lit
  - Class 5 Bar graph:
    - Numeric display: \( 5 \)
    - LED: yellow is lit

- Class display; 3 classes:
The current class is shown in the display; for example: CLASS 1 and the bar graph indicates the current weight. The LEDs are lit as for the weight display described above.

- Class display; 5 classes:
The current class is shown in the display; for example: CLASS 1, and the bar graph indicates the current weight. The LEDs are lit as for the weight display described above.

Digital Input/Output Interface
The Classification application supports the digital input/output interface. There are 4 control lines, or outputs, which are activated as follows (also refer to the diagram):
- Lighter
- Equal
- Heavier
- Set

The “Set” line usually indicates that the minimum load is exceeded. Alternatively, you can assign the “Ready-for-use” function to this port.

Under menu item 4.7, you can define whether these control ports are
- inactive (4.7.1),
- always active (4.7.2), or
- active at stability (4.7.3).
This makes it possible, for example, to connect a simple indicator for weighing or calculation results, similar to the 3-segment checkweighing display on the Combics, or control an automatic process.

Digital I/O Interface
Control lines when working with 3 classes

Digital I/O Interface
Control lines when working with 5 classes
Example:
Initialize the Classification application by taking over weighed values (menu item 4.9.1) to define 3 classes (menu item 4.81.)

CF
Delete any existing initialization data

OK
Begin initialization

The minus sign of the bar graph flashes to prompt the weight for the upper limit of the first class. A “1” is shown in the numeric display.

Place the weight for the upper limit of the first class on the weighing instrument (in this example, 10.0 g)

OK
Store the weight value as the upper limit for the first class

The middle segments of the bar graph flash to prompt the placement of the weight for the upper limit of the second class on the weighing instrument. A “2” is shown in the numeric display.

Place the weight for the upper limit of the second class on the weighing instrument (in this example, 20.0 g)
Operating the Combics 2

Store the weight value as the upper limit for the second class

When initialization is complete, the display shows the class to which the weight on the weighing instrument belongs.

Optional: w < 2 sec. Toggle to Info mode to view stored values

Upper limit of Class 1 is displayed

Toggle to the next display mode

Upper limit of Class 2 is displayed

Exit the Info mode

Unload weighing instrument
Example:
Determine the class of a given weight

Place a load of unknown weight on the weighing instrument

The display shows which class the weight falls into; in this example, Class 2 (10 g – 20 g)

Toggle display to weight readout

The weight of the load is shown (in this example, 17.3 g)

Print results

Printout

PET STORE
GOETTINGEN
05.03.2002 09:43

Lim1 + 10.0 g
Lim2 + 20.0 g

G# + 17.3 g
T + 0.0 g
N + 17.3 g

Class 2
Weighing in Percent %

With the Weighing in Percent application, you can use your weighing instrument to obtain weight readouts in percent which are in proportion to a reference weight. The % symbol is displayed as the weight unit.

**Features:**
- Store the weight on the weighing instrument as reference weight
- Enter reference weight using a bar code scanner
- Enter tare weight using a bar code scanner
- Toggle the display between percentage and weight by pressing \( w \)
- Show percentage as loss or residue
- Info mode for display of reference weight by pressing \( \text{REF} \) (> 2 sec)

To determine the weight of a sample relative to a reference weight, you must enter the reference weight in the weighing instrument. There are 2 ways to do this with the Combics:

- By placing the amount of reference material on the weighing instrument specified by the reference percentage and pressing \( \text{OK} \) to calculate the average and store the value.

The reference percentage is shown in the numeric display, and can be changed by pressing \( \text{REF} \).

How the reference weight is calculated depends on the menu setting for resolution (3.9). Either the value is rounded off in accordance with the display resolution, or the display resolution is increased 10-fold (+1 decimal place) or 100-fold (+2 decimal places), or maximum internal resolution is applied.

- By entering the reference weight (i.e., the weight of 100%) using a bar code scanner (menu setting: "Setup > Bar code > Store value as reference (=EF)"). In this case, the value is stored as a reference automatically, without pressing the \( \text{OK} \) key.

This value remains active in the reference memory until you delete it by pressing \( \text{CF} \), overwrite it or until you select a different application. It also remains stored after you switch off the Combics.

---

**Application Parameters: Weighing in Percent**

| 3. 5. Minimum Load for Automatic Taring and Automatic Printing |
| --- | --- |
| 3. 5. 1 * | 1 digit |
| 3. 5. 2 | 2 digits |
| 3. 5. 3 | 5 digits |
| 3. 5. 4 | 10 digits |
| 3. 5. 5 | 20 digits |
| 3. 5. 6 | 50 digits |
| 3. 5. 7 | 100 digits |
| 3. 5. 8 | 200 digits |
| 3. 5. 9 | 500 digits |
| 3. 5. 10 | 1000 digits |

| 3. 6. Minimum Load for Initialization |
| --- | --- |
| 3. 6. 1 * | 1 digit |
| 3. 6. 2 | 2 digits |
| 3. 6. 3 | 5 digits |
| 3. 6. 4 | 10 digits |
| 3. 6. 5 | 20 digits |
| 3. 6. 6 | 50 digits |
| 3. 6. 7 | 100 digits |
| 3. 6. 8 | 200 digits |
| 3. 6. 9 | 500 digits |
| 3. 6.10 | 1000 digits |

| 3. 7. Automatic Taring: 1st Weight Tared |
| --- | --- |
| 3. 7. 1 * | Off |
| 3. 7. 2 | On |

| 3. 8. Start Application with Most Recent Application Data when Combics is Switched On |
| --- | --- |
| 3. 8. 1 | Automatic (on) |
| 3. 8. 2 * | Manual (off) |

| 3. 9. Resolution for Calculation of Reference Value |
| --- | --- |
| 3. 9. 1 * | Display resolution |
| 3. 9. 2 | Display resolution +1 decimal place |
| 3. 9. 3 | Display resolution +2 decimal places |
| 3. 9. 4 | Internal resolution |

| 3. 10. Decimal Places for Display of Results |
| --- | --- |
| 3. 10. 1 * | None |
| 3. 10. 2 | 1 decimal place |
| 3. 10. 3 | 2 decimal places |
| 3. 10. 4 | 3 decimal places |

| 3. 11. Storage Parameter |
| --- | --- |
| 3. 11. 1 * | At stability |
| 3. 11. 2 | At increased stability |

| 3. 13. Reference Weighing Instrument |
| --- | --- |
| 3. 13. 1 * | No reference instrument selected |
| 3. 13. 2 | WP1 |
| 3. 13. 3 | WP2 |

| 3. 15. Display of calculated value |
| --- | --- |
| 3. 15. 1 * | Residue |
| 3. 15. 2 | Loss |
**Storage Parameter**
The reference weight is saved when the weighing instrument has stabilized. “Stability” is defined as the point at which fluctuation of a measured value lies within a defined tolerance range. The narrower the tolerance range, the more stable the weighing instrument is at stability. This setting is also applied when you zero the weighing instrument. Under menu item 3.11 you can determine whether the value is saved “At stability” (normal tolerance range) or “At increased stability” (narrower tolerance range). If you select “At increased stability,” the reference weight stored will be more accurate and the results more reproducible, but the response time of the weighing instrument might be longer.

**Minimum Load for Initialization**
The minimum load for initialization is configured under menu item 3.6. If the load exceeds this limit, the weighing instrument can be initialized. If the load is too light, the following will occur when you try to save a value:
- The error code *inf 29* is displayed
- A warning signal is emitted (double-beep)
- The weighing instrument is not initialized
- The preset reference percentage is stored

**Weighing in Percent with Two Weighing Instruments**
You can use two weighing instruments simultaneously with the Weighing in Percent application. When using two instruments, you can choose from the following operating modes:
- Weighing in Percent with two equivalent weighing instruments
- Weighing in Percent with one reference weighing instrument and one weighing platform

**Weighing in Percent with Two Equivalent Weighing Instruments**
Use this mode when samples of widely varying weight are measured at one workstation. Measure the lighter-weight pieces on one weighing instrument and the heavier pieces on another. When you press \( \text{F4} \) to toggle from one weighing instrument to the other, the application is re-initialized. You can define which of the two weighing instruments is active in the display when the Combics is switched on (menu item 8.11). This is the first weighing instrument active when you switch on the Combics, regardless of the setting for automatic initialization of the Weighing in Percent application.

**Weighing in Percent with One Reference Weighing Instrument and One Weighing Platform**
In this mode, a high resolution weighing instrument with a relatively low maximum capacity is used as a reference weighing instrument. The measuring platform has a high capacity, but a relatively low resolution. This allows you to both determine the reference value with high resolution; i.e., very precisely, and to measure large samples, without requiring an expensive high-resolution, high-capacity weighing platform. Specify which weighing instrument is the reference instrument under menu item 3.13. The system toggles automatically to the reference instrument for initialization (\( r\EF \) is shown in the main display). Following initialization, the system toggles to the measuring platform.

**Display**
With the Weighing in Percent application, the result can be displayed as a remainder or loss. This is configured in Setup under menu item 3.15.

Equations:
- **Residue** = \( \frac{\text{Current weight}}{100\% \text{ weight}} \times 100 \)
- **Loss** = \( \frac{(\text{Current weight} - 100\% \text{ weight})}{100\% \text{ weight}} \times 100 \)
Example:

Place empty container on the weighing instrument

Tare the weighing instrument

Set the desired percentage (in this example, 50%)

Place reference material corresponding to the reference percentage in the container

Confirm the reference weight
Remove the reference material and place the sample to be measured on the weighing instrument.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>G#</td>
<td>641.2 g</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>200.0 g</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>441.2 g</td>
<td></td>
</tr>
<tr>
<td>Prc</td>
<td>21.00%</td>
<td></td>
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</tbody>
</table>

Print results

Residue

<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
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<tr>
<td>T</td>
<td>200.0 g</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>441.2 g</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>-79.00%</td>
<td></td>
</tr>
</tbody>
</table>
Averaging (Animal Weighing)

With the Averaging application, you can use your weighing instrument for calculating weights as the average of a number of individual weighing operations. These individual operations are also known as “subweighing operations.” This function is used to determine weights under unstable ambient conditions or for weighing unstable samples (such as live animals).

Features:
- Averaging started manually or automatically
- Press the [REF] key to select the desired number of subweighing operations
- Toggle the display between last result and current weight by pressing [DS]

A number of subweighing operations are required to form the basis for calculation of an average weight. These are performed consecutively as soon as the weight of one sample differs from that of the previous sample by less than the preset deviation.

The value for this deviation is entered in the Application settings (3.19) as a percentage. This value and the minimum load must be reached to start the averaging routine.

Whether averaging starts automatically or manually is defined under menu item 3.18.

There are four modes for calculating average weights:
- Manual start with preset number of subweighing operations
- To use this mode, place the sample/animal on the weighing instrument and press [OK].
- Manual start with the number of subweighing operations entered manually
- To use this mode, place the sample/animal on the weighing instrument, press [REF] to enter the number of subweighing operations (10, 20, 30, 40) and then press [OK].

- Automatic start with preset number of subweighing operations
  The subweighing operations begin when the weight of the sample/animal on the weighing instrument exceeds the minimum load.

- Automatic start with the number of subweighing operations entered manually
  To use this mode, press [REF] and enter the number of subweighing operations before placing the sample or animal on the weighing instrument. The subweighing operations begin when the weight of the sample/animal on the weighing instrument exceeds the minimum load.

If the “automatic tare” function is configured, the weight of the first load is stored as the tare value, and averaging begins only when the second load is placed on the weighing instrument (provided this weight exceeds the preset minimum load).

Minimum Load for Automatic Start

The minimum load for automatic start is configured under menu item 3.6. If the load exceeds this limit, the averaging routine can begin.

Display

A calculated average value is shown continuously on the main display. The symbol $\bar{m}$ is displayed.

Press [DS] to toggle the display between this result and the current weight value.

If the menu setting “Display is static until unload threshold reached” (3.21.1) is active, the program returns to the weight display automatically when the weighing instrument is unloaded; i.e., when the load is less than half the minimum load. The result of the most recent averaging operation is not stored.

If the menu setting “Display is static until $[CF]$ is pressed” (3.21.2) is active, the average weight remains on the weighing instrument until [CF] key is pressed or until a new measurement series is started, whether manually or automatically.

Application Parameters: Averaging (Animal Weighing)

<table>
<thead>
<tr>
<th>3. 5. Minimum Load for Automatic Taring and Automatic Printing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 5. 1* 1 digit</td>
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<tr>
<td>3. 5. 2 2 digits</td>
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<tr>
<td>3. 5. 3 5 digits</td>
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<tr>
<td>3. 5. 4 10 digits</td>
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<td>3. 5. 5 20 digits</td>
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<td>3. 5. 6 50 digits</td>
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<tr>
<td>3. 5. 7 100 digits</td>
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<tr>
<td>3. 5. 8 200 digits</td>
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<tr>
<td>3. 5. 9 500 digits</td>
</tr>
<tr>
<td>3. 5.10 1000 digits</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 6. Minimum Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 6. 1* 1 digit</td>
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<tr>
<td>3. 6. 2 2 digits</td>
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<tr>
<td>3. 6. 3 5 digits</td>
</tr>
<tr>
<td>3. 6. 4 10 digits</td>
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<tr>
<td>3. 6. 5 20 digits</td>
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<tr>
<td>3. 6. 6 50 digits</td>
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<tr>
<td>3. 6. 7 100 digits</td>
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<tr>
<td>3. 6. 8 200 digits</td>
</tr>
<tr>
<td>3. 6. 9 500 digits</td>
</tr>
<tr>
<td>3. 6.10 1000 digits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 7. Automatic Taring: 1st Weight Tared</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 7. 1* Off</td>
</tr>
<tr>
<td>3. 7. 2 On</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 8. Start Application with Most Recent Application Data when Combics is Switched On</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. 8. 1 Automatic (on)</td>
</tr>
<tr>
<td>3. 8. 2* Manual (off)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 18. Start of Averaging Routine</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.18. 1* Manual</td>
</tr>
<tr>
<td>3.18. 2 Automatic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 19. Animal Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.19. 1 0.1 % of the animal/object</td>
</tr>
<tr>
<td>3.19. 2* 0.2 % of the animal/object</td>
</tr>
<tr>
<td>3.19. 3 0.5 % of the animal/object</td>
</tr>
<tr>
<td>3.19. 4 1% of the animal/object</td>
</tr>
<tr>
<td>3.19. 5 2% of the animal/object</td>
</tr>
<tr>
<td>3.19. 6 5% of the animal/object</td>
</tr>
<tr>
<td>3.19. 7 10% of the animal/object</td>
</tr>
<tr>
<td>3.19. 8 20% of the animal/object</td>
</tr>
<tr>
<td>3.19. 9 50% of the animal/object</td>
</tr>
<tr>
<td>3.19.10 100% of the animal/object</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 20. Automatic Printout of Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.20. 1* Off</td>
</tr>
<tr>
<td>3.20. 2 On</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. 21. Static Display After Load Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.21. 1* Display is static until unload threshold reached</td>
</tr>
<tr>
<td>3.21. 2 Display is static until [CF] is pressed</td>
</tr>
</tbody>
</table>
Example:

Place empty container on the weighing instrument

Tare the weighing instrument

Set the desired number of measurements (in this example, 20)

Place 1st animal in bowl

Start measurement

Measurement starts as soon as all criteria are met. The number of subweighing operations remaining is shown in the numeric display.

At the conclusion of the series, the calculated mean value is displayed with the △ symbol.
Operating the Combics 2

Print results

x-Net + 24.6 g

Unload weighing instrument

Once the weighing instrument is unloaded (i.e., the load = less than 1/2 the minimum load), the current weight value is displayed.
When the Net-Total Formulation application is selected, you can weigh in different components up to a defined total. Each component is saved in the net-total memory. You can print out both the total weight and the individual weights of the components.

Features:
- Weigh in up to 199 components in series
- Current component number shown in the numeric display (indicating the component to be added)
- Toggle the display between “component mode” and “additive mode” by pressing \( \text{w} \):
  - Component mode: Display the weight of the component currently on the instrument (for 1 second after it is saved; then the instrument is tared)
  - Additive mode: Display the weight of all components on the instrument (after it is saved, the net weight of the last component added is displayed briefly)
- Toggle to a second weighing instrument while weighing on the first
- Automatic printout of component or total weight when weight is saved
- Automatic taring of container weight
- Minimum load for automatic taring
- Minimum load for storing values
- Display the value in totalizing memory in the Info mode, accurately calculated in the active weight unit, by pressing and holding \( \text{S} \)

### Application Parameters: Net-Total Formulation

#### 3.5. Minimum Load for Automatic Taring and Automatic Printing
- 3.5.1 * 1 digit
- 3.5.2 2 digits
- 3.5.3 5 digits
- 3.5.4 10 digits
- 3.5.5 20 digits
- 3.5.6 50 digits
- 3.5.7 100 digits
- 3.5.8 200 digits
- 3.5.9 500 digits
- 3.5.10 1000 digits

#### 3.6. Minimum Load for Automatic Storage/Transfer of Values
- 3.6.1 * 1 digit
- 3.6.2 2 digits
- 3.6.3 5 digits
- 3.6.4 10 digits
- 3.6.5 20 digits
- 3.6.6 50 digits
- 3.6.7 100 digits
- 3.6.8 200 digits
- 3.6.9 500 digits
- 3.6.10 1000 digits

#### 3.7. Automatic Taring: 1st Weight Tared
- 3.7.1 * Off
- 3.7.2 On

#### 3.17. Automatic Individual or Component Printout when Value Stored
- 3.17.1 Off
- 3.17.2 Generate printout with complete standard configuration each time \( \text{OK} \) is pressed
- 3.17.3 Generate printout with complete standard configuration only once when \( \text{OK} \) is pressed

### Minimum Load for Automatic Storage/Transfer of Values

The minimum load for automatic storage or transfer of weight values is configured under menu item 3.6. If the load exceeds this limit, the weight currently displayed can be stored in net-total memory.

### Net-Total Formulation with Two Weighing Instruments

This mode is used for weighing large and small components at the same time. In this mode, you can toggle from the small-component instrument to the large-component instrument during measurement. Once you toggle to the large-component instrument, the \( \text{OK} \) and \( \text{AT} \) keys are available until a component is added.

For example, you can tare a partially-filled container taken from the small-component instrument on the large component instrument.

The value in component memory on the small-component instrument is transferred to the large-component instrument and the weight unit is converted, if necessary. The Component and Additive display modes are both available on the large-component instrument.

The value read by the active instrument is saved in component memory. The displayed result is accurately calculated in the active weight unit, for example:

\[
1243 \text{ g} (\text{from an instrument with 1 interval}) + 1.40 \text{ kg} (\text{from an instrument with 5 intervals}) = 2.643 \text{ kg (calculated result)}
\]

When you press \( \text{CF} \) to stop a measurement series, the tare memories for both weighing instruments are cleared, unless the large-component instrument is in SBI mode, in which case the instrument is only tared.
Operating the Combics 2

Example:
Weigh in 3 components, display total weight after 2nd component (Additive mode)

Place empty container on the weighing instrument

Container weight a prompt for first component are shown

Tare the weighing instrument

Add the first component (in this example, 68.3 g)

The weight of the first component is displayed

Store the weight of the first component

Total data record is printed, as configured under menu item 7.7. or 7.8.
The header is printed only once

Component weight

The weighing instrument is tared automatically and the component counter value is increased by one (prompting the next component)
Add the second component (in this example, 82.7 g)

![Image of weighing scale reading 82.7 g]

The weight of the second component is displayed

Store the weight of the second component

Component weight is printed

The weighing instrument is tared automatically and the component counter value is increased by one (prompting the next component)

Toggle to the Additive mode

The value displayed equals the weight of all components added up to now plus the current weight

Add the third component (bringing the total to the desired target)

Store the weight of the third component

Component weight is printed

End the weighing-in operation

Total data record is printed, as configured under 7.9. or 7.10.

<table>
<thead>
<tr>
<th>Ser.no</th>
<th>12345678</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>3</td>
</tr>
<tr>
<td>S-Comp+</td>
<td>200.1 g</td>
</tr>
<tr>
<td>Cont.T+</td>
<td>50.0 g</td>
</tr>
</tbody>
</table>

Serial number of the weighing instrument
Number of components
Content of component memory
Content of tare memory (container weight)
Dotted line
Totalizing Σ

With the Totalizing application, you can add weight values to the totalizing memory. The number of values added to the memory is also stored ("transaction counter").

Features:
- Weigh in up to 199 items
- Current transaction number displayed in the text line (indicating the items already added)
- Save weight values manually or automatically
- Accurate calculation of total of weight values from two weighing instruments
- Unfinished totalization stored in battery-backed memory
- Toggle the display between current weight and total value by pressing \[ \text{(T)} \]
- Totalizing mode: shows the value in totalizing memory plus the current weight; for filling to a defined total
- Automatically, when the weighing instrument has stabilized and the minimum load is exceeded (menu item 3.16.2).
  The weighing instrument is considered to be unloaded when the load is less than 50% of the minimum load (menu item 3.6).
  The numeric display shows the transaction counter.
  Press the \[ \text{(C)} \] key to clear the totalizing memory. A printout is generated automatically.
  With the weighing instruments connected, you can add values from both instruments to the totalizing memory. The displayed result is accurately calculated in the active weight unit.

Example: 1.243 kg (measured on a weighing instrument using 1 scale interval) added to 1.40 kg (measured on a weighing instrument using 5 scale intervals) is displayed as 2.643 kg.

The Combs has a totalizing memory for adding individual net and gross values. There are two ways to store weight values in the totalizing memory:

- Manually, by pressing the \[ \text{(OK)} \] key. The value is added to the value already stored, and the transaction counter value increases by one.
  When a value is added manually, the program does not check whether the weighing instrument has been unloaded since the last time the \[ \text{(OK)} \] key was pressed.

- Automatically, when the weighing instrument has stabilized and the minimum load is exceeded (menu item 3.16.2).
Minimum Load for Automatic Storage/Transfer of Values

The minimum load for automatic storage or transfer of weight values is configured under menu item 3.6. Once the load on the weighing instrument exceeds the specified minimum, the measured value is stored or transferred automatically, if the operating menu is configured for automatic storage (menu item 3.16.2).

Display

Press \text{[S]} to toggle the display between the weight currently on the weighing instrument and the current weight value plus the value in totalizing memory.

Press and hold \text{[S]} (> 2 sec) to toggle to the Info mode. In the “Info” mode, the total of gross weight values is shown first. Press \text{[S]} again to show the net value.

Press the \text{[S]} key again to show the transaction counter in the main display. Press \text{[S]} one more time to exit the Info mode.

To exit the “Info” mode earlier, press and hold \text{[S]} (> 2 sec).

Printout

Under menu item 3.17 you can configure whether a printout is generated manually, by pressing \text{[P]} (3.17.3), or automatically when a weight value is stored in the totalizing memory (3.17.2 or 3.17.3).

When you generate a printout manually by pressing \text{[P]}, the transaction counter value is not printed.

For automatic printouts, you can define whether a printout is generated after each individual transaction (3.17.2) or includes all totalized components (3.17.3).

Each printout starts with the header lines and the date and time, followed by a dotted line, before printing the gross, tare, net and transaction counter values.

The printout of components includes the header lines and date and time only on the first printout. Subsequent printouts include only the gross, tare, net and transaction counter values (and serial number, if configured).

The individual and component printouts are configured under menu items 7.7 and 7.8.

The total data record is printed when you clear the totalizing memory (by pressing the \text{[C]} key).

The total data record includes data from the gross totalizing memory (*G), the net totalizing memory (*N), the total transaction count (n) and a dotted line.

The fields selected under menu items 7.9. and 7.10. are printed every time the \text{[C]} key is pressed, regardless of whether individual or component printing is configured.
Operating the Combics 2

Example:
Totalizing weight values with printout of components

1. Place the sample on the weighing instrument

Weight value is displayed

Store weight value in totalizing memory

Main display: Current weight on the weighing instrument
Numeric display: Transaction counter (in this example: 1)

Unload the weighing instrument and then place the second sample on the instrument

Weight value is displayed

Optional: Toggle to Totalizing mode

Main display: Totalizing memory content plus current weight
Numeric display: Transaction counter (in this example: 1)

Store weight value in totalizing memory
Main display: Totalizing memory content plus current weight
Numeric display: Transaction counter (in this example: 2)

End totalizing

Total data record is printed, as configured under 7.9. or 7.10.

Number of components
Contents of component memory
Contents of tare memory (container weight)
Dotted line
### Configuration

#### Operating Menu Overview

You can configure the Combics to meet individual requirements by entering user data and setting selected parameters in the operating menu.

The operating menu is a combination of text levels and numeric codes.

- / / / / / = Setting/function available on Combics 1 plus only
- = Setting/function available on Combics 2 only
- = Setting/function available on Combics 1 plus and Combics 2 only

<table>
<thead>
<tr>
<th>First level display</th>
<th>2nd level display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Menu</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>APPL</strong></td>
<td>Δ Δ</td>
<td>Select and configure application programs</td>
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<tr>
<td></td>
<td>Δ</td>
<td>Basic Weighing Function</td>
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<td></td>
<td>Δ Ψ</td>
<td>Counting</td>
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<td>Ψ Ψ</td>
<td>Neutral Measurement</td>
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<td>Ψ Ψ Ψ</td>
<td>Averaging (Animal Weighing)</td>
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<td>Ψ Ψ Ψ Ψ</td>
<td>Checkweighing</td>
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<td>% %</td>
<td>Classification</td>
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<td></td>
<td>% % %</td>
<td>Weighing in Percent</td>
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<tr>
<td></td>
<td>Σ Σ</td>
<td>Net-Total Formulation</td>
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<td></td>
<td></td>
<td>Totalizing</td>
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<td><strong>Fn+KEY</strong></td>
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<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Define the function of (fn)</td>
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<td></td>
<td>dFF</td>
<td>No function</td>
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<td></td>
<td>Gro / net</td>
<td>Gross/net toggling</td>
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<td></td>
<td>2 un k</td>
<td>Show 2nd weight unit</td>
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<td></td>
<td>res 10</td>
<td>10-fold increased resolution</td>
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<tr>
<td><strong>SETup</strong></td>
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<td></td>
<td></td>
<td>Adapt Combics to user requirements</td>
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<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Settings for weighing instrument on WP1</td>
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<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Settings for the RS-232 interface</td>
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<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Settings for the optional second interface</td>
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<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Set the function of the universal input (control line)</td>
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<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Set the bar code scanner function</td>
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<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Settings for the printout</td>
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<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Settings for additional functions</td>
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<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Set the time</td>
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<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Set the date</td>
</tr>
<tr>
<td><strong>Info</strong></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Enter a password to protect menu settings</td>
</tr>
<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>View device-specific information (service date, serial number, etc.)</td>
</tr>
<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Select language for calibration, adjustment and GMP printouts</td>
</tr>
<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>German</td>
</tr>
<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>English</td>
</tr>
<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>English with U.S. date/time format</td>
</tr>
<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>French</td>
</tr>
<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Italian</td>
</tr>
<tr>
<td></td>
<td>Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ</td>
<td>Spanish</td>
</tr>
</tbody>
</table>
Example: Change language from “English” to “English with U.S. date/time format”

Switch on the Combics

While all segments are lit, press the key

First level of menu for selecting the application program APPL is shown

Select the Lang menu item (press \textit{\textbf{fn}} repeatedly until \textit{\textbf{Lang}} is displayed)

Select \textit{\textbf{Lang}} device parameter

The currently active language is shown

Select the \textit{\textbf{U.S. Mode}} menu item

Press \textit{\textbf{fn}} repeatedly until \textit{\textbf{U.S. Mode}} is displayed)

Confirm this menu item

Return to menu level 2 to configure other menu settings, or

return to menu level 1 to configure other menu settings, or

exit the operating menu
Example: Assign a password to protect the application program settings “APPL” and the device parameters “Setup” from unauthorized changes (in this example: AB2)

Switch on the Combics

While all segments are lit, press the key

First level of menu for selecting the application program APPL is shown

Select the Setup menu item

Open the Setup menu

Select the Code menu item

Open the password input menu item

Enter the first character using the and keys (in this example: A)

Store character
Enter the second character using the (A) and Fn keys (in this example: b)

Ab

Store character

Enter the third character using the (A) and Fn keys (in this example: 2)

Ab2

Store character
To enter other characters, use the (A) and Fn keys and press [→] to confirm

Ab2_  

Store the password

To delete a password:
Overwrite the old password with the new password, or enter a space as the password and press [→] to confirm.
Operating Menu Overview (Parameters)

- Setting/function available on Combics 1 plus only
- Setting/function available on Combics 2 only
- Setting/function available on Combics 1 plus and Combics 2 only

* Factory setting

Menu

### Application Programs

#### Basic Weighing Function

- Minimum Load for Automatic Taring and Automatic Printing
  - 1 digit
  - 2 digits
  - 5 digits
  - 10 digits
  - 20 digits
  - 50 digits
  - 100 digits
  - 200 digits
  - 500 digits
  - 1000 digits

- Automatic Taring: 1st Weight Tared
  - Off
  - On

- Factory Settings for All Application Programs
  - Yes
  - No

#### Counting

- Minimum Load for Automatic Taring and Automatic Printing

- Start Application with Most Recent Application Data when Combics is Switched On
  - Automatic (on)
  - Manual (off)

- Resolution for Calculation of Reference Value
  - Display resolution
  - Display resolution + 1 decimal place
  - Display resolution + 2 decimal places
  - Internal resolution

- Storage Parameter
  - At stability
  - At increased stability

- Reference Sample Updating
  - Off
  - Automatic

- Reference Weighing Instrument
  - No reference instrument selected
  - WP1
  - WP2

- Factory Settings for All Application Programs
  - Yes
  - No
Neutral Measurement

Minimum Load for Automatic Taring and Automatic Printing

Minimum Load for Automatic Start

Automatic Taring: 1st Weight Tared
Off
On

Start Application with Most Recent Application Data when Combics is Switched On
Automatic (on)
Manual (off)

Resolution for Calculation of Reference Value
- Display resolution
- Display resolution + 1 decimal place
- Display resolution + 2 decimal places
- Internal resolution

Decimal Places for Display of Results
- None
- 1 decimal place
- 2 decimal places
- 3 decimal places

Storage Parameter
- At stability
- At increased stability

Reference Weighing Instrument
- Off
- To weighing instrument WP1
- To weighing instrument WP2

Factory Settings for All Application Programs
- Yes
- No

Averaging (Animal Weighing)

Minimum Load for Automatic Taring and Automatic Printing

Minimum Load for Automatic Start

Automatic Taring: 1st Weight Tared
Off
On

Start Application with Most Recent Application Data when Combics is Switched On
Automatic (on)
Manual (off)

Start of Averaging Routine
- Manual
- Automatic

Animal Activity
- 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
- 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

Automatic Printout of Results
- Off
- On
3.21. 1 * Display is static until unload threshold reached
3.21. 2 Display is static until (F) is pressed

9. 1. Factory Settings for All Application Programs
9. 1. 1 Yes
9. 1. 2 * No

Checkweighing

Minimum Load for Automatic Taring and Automatic Printing

3.5. Numeric menu as for Weighing
3.7. 1 * Automatic Taring: 1st Weight Tared
3.7. 2 Off
3.8. 1 On

3.8. Start Application with Most Recent Application Data when Combics is Switched On
3.8. 1 Automatic (on)
3.8. 2 * Manual (off)

4.2. Check Range
4.2. 1 * 30% to 170%
4.2. 2 10% to infinity

4.3. Activate Control Line for “Set” as:
4.3. 1 * “Set” output
4.3. 2 Ready to operate (for process control systems)

4.4. Activation of Outputs
4.4. 1 Off
4.4. 2 Always active
4.4. 3 Active at stability
4.4. 4 * Active within check range
4.4. 5 Active at stability within the check range

4.5. Parameter Input
4.5. 1 * Min, max, target
4.5. 2 Only target with percent limits

4.6. Automatic Printing
4.6. 1 * Off
4.6. 2 On
4.6. 3 Only values within tolerance
4.6. 4 Only values outside tolerance

9. 1. Factory Settings for All Application Programs
9. 1. 1 Yes
9. 1. 2 * No

Classification

Minimum Load for Automatic Taring and Automatic Printing

3.5. Numeric menu as for Weighing
3.6. Numeric menu as for Counting
3.7. 1 * Automatic Taring: 1st Weight Tared
3.7. 2 Off
3.8. 1 On

3.8. Start Application with Most Recent Application Data when Combics is Switched On
3.8. 1 Automatic (on)
3.8. 2 * Manual (off)

4.3. Activate Control Line for “Set” as:
4.3. 1 * “Set” output
4.3. 2 Ready to operate

4.4. Activation of Outputs
4.4. 1 Off
4.4. 2 Always active
4.4. 3 Active at stability
4.8 Number of Classes
4.8.1 3 classes
4.8.2 5 classes

4.9 Parameter Input
4.9.1 Weight values
4.9.2 Percentage

4.10 Automatic Printing
4.10.1 Off
4.10.2 On

9.1 Factory Settings for All Application Programs
9.1.1 Yes
9.1.2 No

**Weighing in Percent**

- Minimum Load Automatic Taring and Automatic Printing
- Minimum Load for Automatic Initialization
- Automatic Taring: 1st Weight Tared
  - Off
  - On
- Start Application with Most Recent Application Data when Combics is Switched On
  - Automatic (on)
  - Manual (off)
- Resolution for Calculation of Reference Value
  - Display resolution
  - Display resolution + 1 decimal place
  - Display resolution + 2 decimal places
  - Internal resolution
- Decimal Places for Display of Results
  - None
  - 1 decimal place
  - 2 decimal places
  - 3 decimal places
- Storage Parameter
  - At stability
  - At increased stability
- Reference Weighing Instrument
  - Off
  - To weighing instrument WP1
  - To weighing instrument WP2
- Display of Calculated Value
  - Residue
  - Loss
- Factory Settings for All Application Programs
  - Yes
  - No

**Net-Total Formulation (2nd Tare Memory)**

- Minimum Load Automatic Taring and Automatic Printing
- Minimum Load for Automatic Storage/Transfer of Values
- Automatic Taring: 1st Weight Tared
  - Off
  - On
3.16. Automatic Storage
3.16. 1  * Off
3.16. 2 On

3.17. Printout when Value is Stored in Totalizing Memory
3.17. 1 Automatic printout of results: Off
3.17. 2 * Generate printout with complete standard configuration each time [OK] is pressed
3.17. 3 Generate printout with complete standard configuration only once when [OK] is pressed

9. 1. Factory Settings for All Application Programs
9. 1. 1 Yes
9. 1. 2 * No

Key Assignment: [Fn]

OFF *
Gross/Net toggling
2 Un it
RES 10

No [Fn] key function
Gross/Net toggling
Show 2nd unit
10-fold increased resolution. Display: max. 10 seconds
Setup

Device Parameters
Password prompt displayed, if a password is configured

Weighing Instrument 1
(Display designation of this menu level: 1)

| Off               |
|                  |
|                  |

1. 1

1. 1. 1 Adapting Weighing Instrument to Ambient Conditions (Adapt Filter)
Very stable conditions
Stable conditions
Unstable conditions
Very unstable conditions

1. 1. 2 *

1. 1. 3

1. 1. 4

1. 2

1. 2. 1 * Final readout
Final readout
Filling mode
Low filtering
Without filtering

1. 2. 2

1. 2. 3

1. 2. 4

1. 3

1. 3. 1 Stability Range
4 digit
5 digit
1 digit
2 digit
3 digit
4 digit
8 digit

1. 3. 2

1. 3. 3

1. 3. 4

1. 3. 5

1. 3. 6

1. 4

1. 4. 1 Stability delay
No delay
Short delay
Average delay
Long delay

1. 4. 2 *

1. 4. 3

1. 4. 4

1. 5

1. 5. 1 Taring *
Without stability
After stability

1. 5. 2 *

1. 6

1. 6. 1 *

1. 6. 2

1. 7

1. 7. 1 Weight Unit 1 *
Grams /g
Kilograms /kg
Carats (ct)
Pounds /lb
Ounces /oz
Troy ounces (ozt)
Hong Kong taels (t/hs)
Singapore taels (t/hs)
Taiwanese taels (t/hs)
Grains (GN)
Pennyweights (dwt)
Milligrams /mg
Parts per pound (lb)
Chinese taels (t/ls)
Mommes (mom)
Austrian carats (kt)
Tela (tol)
Baht (bat)
Mesghal (MS)
Tons /t

1. 7. 2

1. 7. 3

1. 7. 4

1. 7. 5

1. 7. 6

1. 7. 7

1. 7. 8

1. 7. 9

1. 7. 10

1. 7. 11

1. 7. 12

1. 7. 13

1. 7. 14

1. 7. 15

1. 7. 16

1. 7. 17

1. 7. 18

1. 7. 19

1. 7. 20

1. 7. 21

1. 8

1. 8. 1 *

1. 8. 2

1. 8. 3

1. 8. 4

1. 8. 5

Display Accuracy 1
All digits
Reduced by 1 decimal place
Reduced by 1 decimal place
Reduced by 2 decimal places
Reduced by 3 decimal places

1) = Not available on instruments verified for use in legal metrology
2) = Depends on weighing instrument model
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9.1</td>
<td>* Ext. calibration/adjustment; default weight</td>
</tr>
<tr>
<td>1.9.3</td>
<td>Ext. calibration/adjustment; weight can be selected under menu item 1.18.1</td>
</tr>
<tr>
<td>1.9.10</td>
<td>Press ( \text{[} ) ( \text{]} ) ( \rightarrow ) ( \text{2} ) sec: blocked</td>
</tr>
<tr>
<td>1.10.</td>
<td>Calibration/adjustment sequence</td>
</tr>
<tr>
<td>1.10.1</td>
<td>Calibration with automatic adjustment</td>
</tr>
<tr>
<td>1.10.2</td>
<td>Calibration with adjustment triggered manually</td>
</tr>
<tr>
<td>1.11.</td>
<td>Zero-setting Range</td>
</tr>
<tr>
<td>1.11.1</td>
<td>1 percent/max. cap.</td>
</tr>
<tr>
<td>1.11.2</td>
<td>* 2 percent/max. cap.</td>
</tr>
<tr>
<td>1.12.</td>
<td>Initial Zero-setting Range</td>
</tr>
<tr>
<td>1.12.2</td>
<td>2 percent/max. cap.</td>
</tr>
<tr>
<td>1.12.3</td>
<td>* 5 percent/max. cap.</td>
</tr>
<tr>
<td>1.13.</td>
<td>Tare/Zero at Power On</td>
</tr>
<tr>
<td>1.13.1</td>
<td>* On</td>
</tr>
<tr>
<td>1.13.2</td>
<td>Off, load previous tare value</td>
</tr>
<tr>
<td>1.13.3</td>
<td>Only zero at power on</td>
</tr>
<tr>
<td>1.15.</td>
<td>Calibration Prompt</td>
</tr>
<tr>
<td>1.15.1</td>
<td>* Off</td>
</tr>
<tr>
<td>1.15.2</td>
<td>Calibration prompt ( \text{W} ) ( \text{[]} ) flashes in the display</td>
</tr>
<tr>
<td>1.16.</td>
<td>External Calibration/Adjustment 1)</td>
</tr>
<tr>
<td>1.16.1</td>
<td>* Accessible</td>
</tr>
<tr>
<td>1.16.2</td>
<td>2) Blocked</td>
</tr>
<tr>
<td>1.18.</td>
<td>Enter Calibration Weight</td>
</tr>
<tr>
<td>3.1.</td>
<td>Weight Unit 2)</td>
</tr>
<tr>
<td>3.1.2</td>
<td>Grams /g</td>
</tr>
<tr>
<td>3.1.3</td>
<td>Kilograms /kg</td>
</tr>
<tr>
<td>3.1.4</td>
<td>Carats (ct 1)</td>
</tr>
<tr>
<td>3.1.5</td>
<td>Pounds /lb 1)</td>
</tr>
<tr>
<td>3.1.6</td>
<td>Ounces /oz 1)</td>
</tr>
<tr>
<td>3.1.7</td>
<td>Troy ounces /ozt 1)</td>
</tr>
<tr>
<td>3.1.8</td>
<td>Hong Kong taels /tlh 1)</td>
</tr>
<tr>
<td>3.1.9</td>
<td>Singapore taels /tls 1)</td>
</tr>
<tr>
<td>3.1.10</td>
<td>Taiwanese taels /tl 1)</td>
</tr>
<tr>
<td>3.1.11</td>
<td>Grains (GN 1)</td>
</tr>
<tr>
<td>3.1.12</td>
<td>Pennyweights /dwt 1)</td>
</tr>
<tr>
<td>3.1.13</td>
<td>Milligrams (mg 1)</td>
</tr>
<tr>
<td>3.1.14</td>
<td>Parts per pound /lbp 1)</td>
</tr>
<tr>
<td>3.1.15</td>
<td>Chinese taels /tlc 1)</td>
</tr>
<tr>
<td>3.1.16</td>
<td>Mommes (mom 1)</td>
</tr>
<tr>
<td>3.1.17</td>
<td>Austrian carats /kr 1)</td>
</tr>
<tr>
<td>3.1.18</td>
<td>Tola /tola 1)</td>
</tr>
<tr>
<td>3.1.19</td>
<td>Bhat /bat 1)</td>
</tr>
<tr>
<td>3.1.20</td>
<td>Mesghal /MS 1)</td>
</tr>
<tr>
<td>3.1.21</td>
<td>Tons /t</td>
</tr>
<tr>
<td>3.2.</td>
<td>Display Accuracy 2)</td>
</tr>
<tr>
<td>3.2.1</td>
<td>* All digits</td>
</tr>
<tr>
<td>3.2.2</td>
<td>Reduced by 1 decimal place for load change</td>
</tr>
<tr>
<td>3.2.3</td>
<td>Reduced by 1 decimal place 1)</td>
</tr>
<tr>
<td>3.2.4</td>
<td>Reduced by 2 decimal places 1)</td>
</tr>
<tr>
<td>3.2.5</td>
<td>Reduced by 3 decimal places 2)</td>
</tr>
</tbody>
</table>

1) = Not available on instruments verified for use in legal metrology
2) = Factory setting on instrument verified for use in legal metrology
3) = Menu depends on weighing instrument model
## Configuration

### Interface 1

(Display designation of this menu level: C1)

- **Off**

### Weighing Instrument 2

- **RS-232**
- **SBI Standard Version**
- **SBI trade version (for legal metrology)**
- **XBPI-232**

### Data Protocol

- **SBI Standard Version**

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.1</td>
<td>Baud rate</td>
</tr>
<tr>
<td>5.1.2</td>
<td>150 baud</td>
</tr>
<tr>
<td>5.1.3</td>
<td>300 baud</td>
</tr>
<tr>
<td>5.1.4</td>
<td>600 baud</td>
</tr>
<tr>
<td>5.1.5</td>
<td>1200 baud</td>
</tr>
<tr>
<td>5.1.6</td>
<td>2400 baud</td>
</tr>
<tr>
<td>5.1.7</td>
<td>4800 baud</td>
</tr>
<tr>
<td>5.1.8</td>
<td>9600 baud</td>
</tr>
<tr>
<td>5.1.9</td>
<td>19,200 baud</td>
</tr>
</tbody>
</table>

- **Parity**

- **Space**

- **Odd**

- **None**

- **Number of Stop Bits**

- **1 stop bit**

- **2 stop bits**

- **Handshake Mode**

- **Software handshake**

- **Hardware handshake, 1 character after CTS**

- **Number of Data Bits**

- **7 data bits**

- **8 data bits**

- **Data Output:**

- **Manual/Automatic**

- **Manual without stability**

- **Automatic without stability**

- **Protocol for computer**

---

1) = Menu depends on weighing instrument model
2) = not with setting 5.6.2 (8 bits)
3) = Not with setting 5.6.1 (7 bits)
**6.3. Time-dependent automatic data output**
- **6.3.1.** 1 display update
- **6.3.2.** 2 display updates
- **6.3.4.** 10 display updates
- **6.3.7.** 100 display updates

**Data Output: Line Format**
- For raw data: 16 characters
- For other applications: 22 characters

**Restore Factory Settings for Numeric Menu COM1: SBI**
- Yes
- No

**MP8 Interface Emulation**

**Program selection**
- **MP8: 3-1-1**
- **MP8: 3-1-9**
- **MP8: 3-2-1**
- **MP8: 3-2-9**
- **MP8: 3-3-1**
- **MP8: 3-3-9**

**Index 2**
- **Ind. 2.1**
- **Ind. 2.2**
- **Ind. 2.3**
- **Ind. 2.4**

**Baud Rate**
- **5.1.1.** 150 baud
- **5.1.2.** 300 baud
- **5.1.3.** 600 baud
- **5.1.4.** 1200 baud
- **5.1.5.** 2400 baud
- **5.1.6.** 4800 baud
- **5.1.7.** 9600 baud

**Parity**
- **5.2.1.** Mark
- **5.2.2.** Space
- **5.2.3.** Odd
- **5.2.4.** Even

**Manual/Auto Print Mode**
- **6.1.1.** Manual without stability
- **6.1.2.** Manual after stability
- **6.1.4.** Automatic without stability
- **6.1.5.** Automatic at stability
Configuration

Setup
dAtProt
SMA

5.1. Baud Rate
5.1.1 150 baud
5.1.2 300 baud
5.1.3 600 baud
5.1.4 1200 baud
5.1.5 2400 baud
5.1.6 4800 baud
5.1.7 * 9600 baud
5.1.8 19,200 baud

5.2 through 5.6.
Numeric menu as for SBI

Printer
Printer Configuration

YDP01S
Strip printer
Label printer
Label printer with manual feed

YDP02 Variants

Baud Rate
1200 baud
2400 baud
4800 baud
9600 baud

Parity
Odd
Even

Number of Stop Bits
1 stop bit
2 stop bits

Handshake Mode
Software handshake
Hardware handshake, 1 character after CTS

YDP03-0CE

Baud Rate
1200 baud
2400 baud
4800 baud
9600 baud
19,200 baud

5.2 through 5.4.
Numeric menu as for YDP02

YDP02IS
Strip printer
Label printer
### Setting Printer Interface

#### 5. Universal Interface

**Baud Rate**
- 150 baud
- 300 baud
- 600 baud
- 1200 baud
- 2400 baud
- 4800 baud
- 9600 baud
- 19,200 baud

**Parity**
- Space \(^1\)
- Odd
- Even
- None \(^2\)

**Number of Stop Bits**
- 1 stop bit
- 2 stop bits

**Handshake Mode**
- Software handshake
- Hardware handshake, 1 character after CTS

**Number of Data Bits**
- 7 data bits
- 8 data bits

\(^1\) = Not with setting 5.6.2 (8 bits)
\(^2\) = Not with setting 5.6.1 (7 bits)
**Setup** (Display designation of this menu level: 3)

**1. Off**

**2. Interface 2 (Optional)**

**Weighing Instrument 2**

- RS-232
- SBI Standard Version
- SBI Trade Version (for Legal Metrology)
- XBPI-232

**1. Calibration, Adjustment**

- Ext. calibration/adjustment; default weight
- Internal calibration/adjustment

**2. Press**

- > 2 sec: blocked

**Data Protocol**

- XBPI-232
- XBPI-485

**1) = Menu depends on connected weighing instrument**

---

1) = Menu depends on connected weighing instrument
**Printer Configuration**

- **YDP01IS**
  - Strip printer
  - Label printer
  - Label printer with manual feed

- **YDP02 models**

- **YDP03-0CE**

- **YDP02IS**
  - Strip printer
  - Label printer
  - Universal Interface

- **YDP04IS**
  - Strip printer
  - Label printer
  - Label printer with manual feed

**Memory**

- **YAM01IS**
  - as electronic memory for print data

**Analog Data Output Port for PLC Operation**

- **Analog Out: Value**
  - Net value
  - Gross value

- **Analog Out: Error Indicator**
  - High level (20 mA)
  - Low level: 0/4 mA on this interface during calibration and configuration.

- **Analog Out: Data Output Mode**
  - Zero to maximum capacity
  - Minimum/maximum values

- **Analog Out: Data Output Min./Max.**
  - Min. (0/4 mA) input in kg
  - Max. (20 mA) input in kg

**Verifiable Data Memory**

- **YAM01IS**
  - external data memory

---

1) = When setting 8.14.1 is active, the analog data output only works for XBPI weighing instruments

2) = Not with setting 8.14.1
Configuration

**External Switch**
(Display designation of this menu level: 4)

Function of Remote Switch (Universal)

- **p** key function
- **> 2 sec** function
- **< 1** key function
- **> 2 sec** function
- **n** key function
- **P** key function
- **OK** key function

**Bar Code**
(Display designation of this menu level: 5)

- **Int** * Store value as reference
- **Int** * Store value as tare
- **id 1** Store value as ID code 1
- **id 2** Enter value in display (triggered when a key is pressed)
- **HERed** Store value as tare or ID code, depending on bar code header

**Printouts**
(Display designation of this menu level: 6)

- **EF** * Store value as reference
- **EF** * Store value as tare
- **id 1** Store value as ID code 1
- **id 2** Enter value in display (triggered when a key is pressed)
- **HERed** Store value as tare or ID code, depending on bar code header

---

1) = More than one can be selected
### Setup

#### 7.10. Optional "UniCOM" Interface

- 7.10.1: Header lines 1, 2
- 7.10.2: Date and time
- 7.10.4: Weighing instrument designation
- 7.10.5: Result from the application program
- 7.10.7: 2 additional blank lines
- 7.10.8: 3 additional blank lines

#### 7.11. ISO/GMP-compliant Printout

- 7.11.1: Off
- 7.11.2: Always for one measurement result
- 7.11.3: Always for multiple measurement results

#### 7.12. Date/time printout line: Time not printed

- 7.12.1: Off
- 7.12.2: On

#### 7.13. One-time automatic printout at stability

- 7.13.1: Off
- 7.13.2: On

#### 7.14. FlexPrint

- 7.14.1: Off
- 7.14.2: On

#### 9.1. Restore Factory Settings of the Numeric Menu for Data Protocol

- 9.1.1: Yes
- 9.1.2: No

### Operation

(Designation of this menu level: 7)

#### 8.2. Acoustic Signal

- 8.2.1: On
- 8.2.2: Off

#### 8.3. Keys

- 8.3.1: Accessible
- 8.3.2: Blocked

#### 8.7. Automatic Shutoff, Indicator

- 8.7.1: Automatic shutoff acc. to menu item 8.9.
- 8.7.2: No automatic shutoff

#### 8.8. Display Lighting

- 8.8.1: On
- 8.8.2: Off
- 8.8.3: Automatic shutoff acc. to menu item 8.9.

#### 8.9. Timer

- 8.9.1: After 1 + 1 minute not in use
- 8.9.2: After 2 + 2 minutes not in use
- 8.9.3: After 5 + 5 minutes not in use

#### 8.11. First Instrument Displayed

- 8.11.1: Weighing instrument WP1
- 8.11.2: Weighing instrument WP2

#### 8.12. Show the Geographical Data before Calibration

- 8.12.1: No
- 8.12.2: Yes

#### 9.1. Restore Factory Settings of the Numeric Operating Menu

- 9.1.1: Yes
- 9.1.2: No

---

1) More than one can be selected
2) Warning: "E" and 12 flash simultaneously
**Setup**

- **Time**
  - Input example: 10:07:41 (hours.minutes.seconds)

- **Date**
  - Input example: 01.05.02 (day.month.year)
  - U.S. Mode: (month.day.year)

- **Password**
  - Set, change and delete [max. 8 characters];
  - example: 12345678

**Device Information**

**Service Information**

**Indicator**

- Model
- Serial number
- Version number of the indicator
- Software version

**Weighing Instrument 1**

- Software version: 1st weighing instrument
- Latitude (in degrees) \(^1\)
- Altitude (in meters) \(^2\)
- Acceleration of gravity m/s\(^2\) \(^1\)

**Weighing Instrument 2 (e.g., IS Weighing Platform)**

- Model: 2nd weighing instrument
- Software version: 2nd weighing instrument
- Serial number
- Latitude (in degrees) \(^1\)
- Altitude (in meters) \(^2\)
- Acceleration of gravity m/s\(^2\) \(^1\)

**FlexPrint**

- File name \(^2\)
- ID \(^2\)
- Version \(^2\)

**Language for Calibration/Adjustment and GMP Printouts**

- German
- English
- English with U.S. date/time format
- French
- Italian
- Spanish

---

\(^1\) Output: either latitude and altitude or acceleration of gravity (depends on the input before verification)

\(^2\) These three parameters are shown for each file loaded
The indicator is equipped with the following data interfaces:
- COM1: Standard interface (RS-232)
- UniCOM: Universal data interface (optional)

Both of these interfaces can be configured in the Setup menu for various input/output functions (e.g., Printer, second weighing instrument, PC, checkweighing/classification display). The optional UniCOM interface can be used for RS-232, RS-485 or RS-422 communication, or as voltage-/current (analog) interface. A bar code scanner (Combics 2 only) or an external rechargeable battery pack can be connected to the female UniCOM port (on CW1S, CW1NS and CW2S models, use the corresponding terminal screws).

Features
- Indicator models CW1P, CW1NP and CW2P (IP44 protection):
  Connect via a 25-contact D-Sub female connector.
  Use a T-connector (see “Accessories”) to connect a second device to the same interface.
- Indicator models CW1S, CW1NS and CW2S (IP67 protection):
  Route connecting cable from the peripheral device to the indicator via a cable gland. Then connect the free ends of the cable using the terminal screws.
  If you wish to connect a second peripheral device to the same interface port, use a separate cable gland to route the connecting cable of this device into the indicator.

⚠️ Warning When Using RS-232 Connecting Cables Not Supplied by Sartorius:
The pin assignments in the cable might not be compatible with Sartorius equipment. Check all pin assignments against the cabling diagrams and disconnect any lines that are not assigned. Failure to do so may damage or even completely ruin your indicator and/or peripheral device.

### Specifications

#### Serial interface:

<table>
<thead>
<tr>
<th>Operating mode</th>
<th>Full duplex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard:</td>
<td>COM1: RS-232, UniCOM (optional)</td>
</tr>
<tr>
<td>Interface connector:</td>
<td>CW1P, CW1NP and CW2P (IP44 protection): 25-contact D-Sub female connector CW1S, CW1NS and CW2S (IP67 protection): The cable is connected to terminal screws inside the housing and routed into the housing via a cable gland.</td>
</tr>
<tr>
<td>Transmission rates:</td>
<td>150, 300, 600, 1200, 2400, 4800, 9600 and 19,200 baud (depending on the operating mode)</td>
</tr>
<tr>
<td>Number of data bits:</td>
<td>7 or 8 bits</td>
</tr>
<tr>
<td>Parity:</td>
<td>Space, odd, even, none (depending on the operating mode)</td>
</tr>
<tr>
<td>Number of stop bits:</td>
<td>1 or 2 stop bits</td>
</tr>
<tr>
<td>Handshake mode:</td>
<td>Software (XON/XOFF) or hardware (1 character after CTS)</td>
</tr>
<tr>
<td>Communication mode:</td>
<td>SBI, XBPI-2322, XBPI-4851, MP8 binary3, SMA</td>
</tr>
</tbody>
</table>

Available printers:
- YDP011S
- YDP02IS-Label
- YDP011S-Label
- Universal
- YDP02
- YDP04IS
- YPD03
- YDP041S-Label
- YDP02IS
- YAM01IS Alibi memory

Network address 4):
- 0, 1, 2, (…), 31

SBI: Manual data output: Without stability, after stability, configurable printout
SBI: Automatic data output: Without stability, at stability, at user-defined intervals
SBI: Output format: 16 or 22 characters
Printout of application data: Output of a configurable printout

#### Analog UniCOM interface (optional)

| Standard: | 4 to 20 mA, 0 to 20 mA, 0 to 5V |
| Power supply: | Internal or external |
| Factory setting: | 4 to 20 mA, internal power supply |
| Interface connector: | CW1P, CW1NP and CW2P indicators (IP44 protection): 25-contact D-Sub female connector CW1S, CW1NS and CW2S indicators (IP67 protection): The free ends of the cable are connected to terminal screws inside the housing; the cable is routed into the housing via a cable gland. |

---

1) Optional UniCOM universal data interface
2) XBPI operating mode: 9600 baud, 8 data bits, parity: odd, 1 stop bit
3) Only with the standard COM1 interface
4) Network address is valid only in the XBPI mode
Options for Connecting Peripherals
You can connect the following printers to the COM1 and UniCOM interfaces:
- YDP02 (user-definable interface parameters)
- YDP03 (user-definable interface parameters)
- YDP01IS (strip or label printer)
- YDP02IS (strip or label printer)
- YDP04IS (strip or label printer)
- Universal printer (user-definable transmission parameters)
- YAM01IS Alibi memory

The following devices can also be connected to the COM1 interface:
- Foot switch / hand switch
- PC (RS-232 interface)
- Second weighing instrument (Combics 2 only, RS-232 interface)
- External checkweighing display (red/yellow/green) over the digital I/O (Sartorius standard)

The connector of the UniCOM universal port enables the following devices to be connected:
- External rechargeable battery pack
- Bar code scanner (Combics 1 plus and Combics 2 only)

The following devices can also be connected to the UniCOM universal interface:
- PC (RS-232 interface)
- Second weighing instrument (Combics 2 only; can be switched from RS-232 to RS-485 operating mode)
- Second printer (external power source required)
- Remote display
- Current interface (0/4 - 20 mA)

When necessary, use an external power source to power peripheral devices.

Connecting a second weighing instrument:
Combics 2 enables connection of a second weighing instrument to either the COM1 or the UniCOM port.

COM1 operates in RS232 mode.
A second weighing instrument on this port can use the following operating modes:
- SBI
- XBPI-232 (factory setting)
- ADC-232

UniCOM can operate in either the RS-232 mode or in RS-485 mode.
A second weighing instrument on this port can use the following operating modes:
- SBI (RS-232 mode)
- XBPI-232 (RS-232 mode)
- ADC-232 (RS-232 mode)
- IS-485 (RS-485 mode, XBPI mode; factory setting)
- ADC-485 (RS-485 mode)

Connecting a Printer
The standard COM1 port or the optional UniCOM interface (or both) can be used as a printer interface.

Operation as a COM Port
For operation as a COM port, you can adapt the data protocol to the following operating modes:
- SBI (factory setting)
- XBPI-232
- XBPI-485 (only UniCOM)
- MP8-binary (only COM1)
- SMA

You can operate the COM1 port and the UniCOM port independently of one another (i.e., for transferring data and controlling equipment via a PC while simultaneously outputting data to the COM1 printer port).

In the SBI communication mode, you can control a display unit and a connected weighing instrument by sending ESC commands from a PC to the communications port (COM1 or UniCOM) (see page 96).
Pin Assignment Charts

Models CW1P, CW1NP, CW2P (IP44-protected):

Female Connectors COM1 and UniCOM:

25-contact D-Submini DB25S with screw lock hardware

Front view

Male interface connector used (please use connectors with the same specifications):

25-pin D-Submini DB25, with integrated shielded cable clamp assembly (Amp type 826 985–1C) and fastening screws (Amp type 164868–1)

Pin 1: Shield
Pin 2: Data output (TxD)
Pin 3: Data input (RxD)
Pin 4: Not connected
Pin 5: Clear to send (CTS)
Pin 6: Internally connected
Pin 7: Internal ground (GND)
Pin 8: Internal ground (GND)
Pin 9: Not connected
Pin 10: Not connected
Pin 11: +12 V for printer
Pin 12: RES_OUT
Pin 13: +5 V
Pin 14: Internal ground (GND)
Pin 15: Universal remote switch
Pin 16: Control output “lighter”
Pin 17: Control output “equal”
Pin 18: Control output “heavier”
Pin 19: Control output “set”
Pin 20: Data terminal ready (DTR)
Pin 21: Supply ground (GND)
Pin 22: Not connected
Pin 23: Not connected
Pin 24: Power supply +15...25 V
Pin 25: +5 V

Pin Assignment Chart: 2nd Interface:

Connection of external rechargeable battery and bar code scanner (optional UniCOM interface not installed)

Pin 1: Shield
Pin 2: Not connected / *
Pin 3: Not connected / *
Pin 4: Internal ground (GND)
Pin 5: Not connected / *
Pin 6: Not connected / *
Pin 7: Not connected / *
Pin 8: Not connected / *
Pin 9: Not connected / *
Pin 10: Not connected / *
Pin 11: +12 V for printer
Pin 12: RES_OUT
Pin 13: +5 V switch
Pin 14: Internal ground (GND)
Pin 15: Keyboard data
Pin 16: Not connected / *
Pin 17: Not connected / *
Pin 18: Not connected / *
Pin 19: Keyboard clock
Pin 20: Not connected / *
Pin 21: LINE_1 _GND
Pin 22: LOW_BATT 2)
Pin 23: BATT_ON_OFF 3)
Pin 24: LINE_1_B
Pin 25: +5 V

* Pin assignments depending on the UniCOM used
1) Combics 2 only
2) Signal from battery pack: battery drained
3) Switch off battery pack when weighing instrument switched off
Models CIS1, CISN1 and CIS2 (IP67-protected):
Connection of open cable ends to terminal screws inside the indicator

COM1 interface connections:

Top view

Terminal assignments

No. 1: Universal switch
No. 2: Control output “set”
No. 3: Control output “heavier”
No. 4: Control output “equal”
No. 5: Control output “lighter”
No. 6: Clear to send (CTS)
No. 7: Data output (TxD)
No. 8: Data input (RxD)
No. 9: Data terminal ready (DTR)
No. 10: Internal ground (GND)
No. 11: LINE_A
No. 12: LINE_A
No. 13: GND_LINE_A
No. 14: GND_LINE_A
No. 15: +12 V for printer
No. 16: Reset output
No. 17: +5 V
No. 18: +5 V
No. 19: Ground (GND)
No. 20: Ground (GND)

Second connection: For connecting an external battery pack and a bar code scanner ¹)
(optional UNICOM interface not installed)

Terminal assignments in the 10-terminal strip

No. 1: Not connected* ¹
No. 2: GND
No. 3: GND
No. 4: +5V Switch
No. 5: Not connected * ¹
No. 6: Keyboard clock
No. 7: Keyboard data
No. 8: Not connected * ¹
No. 9: Not connected * ¹
No. 10: Not connected * ¹

Second connection: For connecting an external battery pack and a bar code scanner ¹)
(optional UNICOM interface not installed)

Terminal assignments in the 4-terminal strip

No. 1: Supply, ground (GND_LINE_B)
No. 2: Supply, battery pack
No. 3: LOW_BATT ²) ³)
No. 4: BATT_ON_OFF ³)

* Pin assignments depending on the UniCOM used
¹) Combics 2 only
²) Signal from battery pack: battery drained
³) Switch off battery pack when weighing instrument switched off
Installing the Interface Cable

Peripheral devices should be connected to the interfaces only by a trained and authorized Sartorius technician. Any installation work that does not conform to the instructions in this manual will result in forfeiture of all claims under the manufacturer’s warranty.

Disconnect the equipment from power (unplug from the wall socket) before beginning any installation work.

- Open the Combics indicator:
  - remove the four cap nuts from the front panel and remove the panel.

- Prepare the cable:
  - Expose approx. 10 cm (4 in) of the cable end for installation
  - Remove all but approx. 1 cm ($\frac{1}{2}$ in) of the shielding and fold it back over the casing
  - Strip the casing from approximately 1 cm ($\frac{1}{2}$ in) of the wires and attach ferrules to the wire ends.

- Attach the cable gland:
  - Please use extreme caution when performing any work on the equipment that affects this cable gland. Use a torque wrench and tighten the cable gland to 5 Nm.
  - Remove the protective cap from the bore hole on the indicator.
  - Guide the enclosed cable gland through the bore hole and secure it inside the housing with the nut (1).

  - Slide the cable gland over the cable until the clamps (3) are in contact with the shield (2). Tighten the nut (4) until the sealing clamp (5) forms a slight ridge between nut and cable.
  - Make sure the shield is in contact with the clamps.

- Connect the wires securely in accordance with the terminal assignments.

- After you close the housing again, use a pressure gauge to check the integrity of the IP67-protection. For details, contact the Sartorius Service Center.
Cabling Diagram (Adapter Cable for PC)

(Model CW1P | CW1NP | CW2P: adapter cable 7357312; model CW1S | CW1NS | CW2S: connecting cable YCCO2-D9F6).

Diagram for connecting a computer or other peripheral device to the indicator using the RS-232-C/V24 standard and cables up to 15 m (50 ft.) long:

![Diagram of connections](image)

Connection assignments for the cable from the indicator to an RS-232 PC interface:

<table>
<thead>
<tr>
<th>25-contact D-Sub male connector</th>
<th>D-Sub female connector:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Model CW1P/CW1NP/CW2P)</td>
<td>9-contact or 25-contact</td>
</tr>
<tr>
<td>1 Sgn GND</td>
<td>5 GND</td>
</tr>
<tr>
<td>Indicator side</td>
<td>2 RxD</td>
</tr>
<tr>
<td>TxD</td>
<td>3 TxD</td>
</tr>
<tr>
<td>RxD</td>
<td>8 CTS</td>
</tr>
<tr>
<td>DTR</td>
<td>4 DTR</td>
</tr>
<tr>
<td>CTS</td>
<td>20 DTR</td>
</tr>
</tbody>
</table>

Open cable end

(Model CW1S/CW1NS/CW2S)

<table>
<thead>
<tr>
<th>D-Sub female connector:</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-contact or 25-contact</td>
</tr>
<tr>
<td>Sgn GND 10</td>
</tr>
<tr>
<td>Indicator side</td>
</tr>
<tr>
<td>TxD 7</td>
</tr>
<tr>
<td>RxD 8</td>
</tr>
<tr>
<td>DTR 9</td>
</tr>
<tr>
<td>CTS 6</td>
</tr>
</tbody>
</table>

PC side
Synchronization

Data communication between the indicator and a computer takes the form of messages ("telegrams") made up of ASCII code. For error-free data communication, the settings for baud rate, parity, handshake mode and character format must be the same at both ends.

You can configure the interface settings in the Setup menu so that they match those of the computer. You can also define parameters in the indicator to make data output dependent on various conditions. The conditions that can be configured are listed in the descriptions of the application programs.

If you do not connect a peripheral device to the indicator’s interface port, this will not generate an error message.

Handshake

The weighing instrument interface (Sartorius Balance Interface = SBI) has transmit and receive buffers. You can define the handshake parameter in the indicator’s Setup menu:

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

Hardware Handshake

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 switched on, XON must be transmitted to enable a 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 ---> device) --- byte --->

<--- XOFF ---

--- byte --->

--- byte --->

--- byte --->

--- byte --->

(Pause)

--- 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.
Configuring the Data Interface as a COM Port

Configure the interface as a COM port in the Setup menu as a COM1 or UniCOM port under the “Data Protocol” menu item.

SBI Communication
This is a simple ASCII interface. Data output is configured under menu items 6.1 and 6.3:
- Manual output of displayed value with or without stability (menu items 6.1.1 and 6.1.2)
- Automatic output of displayed value with or without stability (menu items 6.1.4 and 6.1.5) at intervals defined in display updates. The number of display updates comprising an output interval is configured under menu item 6.3.
- Output of a printout as configured in the Setup program (menu item 6.1.7). Output is linked to the “Data Protocol” menu item (see page 100, “Configuring Printouts”).

If you do not activate and configure a user-definable data record, the printout simply contains the current value displayed on the indicator (weight with unit, calculated value, alphanumeric display).

SMA Communication
Standardized communications protocol of the Scale Manufacturers Association

MP8 Binary
Purpose
With the MP8 interface you can connect MP8-generation peripheral devices with separate power supplies to the Combics indicator.
Features
- The weighing instrument is used only for determining weight values.
- The data interface transmits only in MP8 binary protocol
- The application program for MP8 can be selected under menu item 3
- The program index 2 for MP8 can be selected under menu item 4.
- “MP8 interface emulation” is not permitted in legal metrology.

Data Input Format
You can connect a computer to your indicator to send commands controlling weighing instrument functions and applications via the interface port. All commands use the same format (data input format) starting with the ESC character (ASCII 27) and ending with a carriage return (CR; ASCII 13) and a line feed (LF; ASCII 10). The total length of a command is anywhere from 4 characters (1 command character between the start and end described above) to 7 characters (4 command characters).

The table below shows the available command characters; each command must be flanked by the start and end characters as described above. Example: The command character for output is “P” (“output to Port”). The string “ESC P CR LF” triggers this command.

<table>
<thead>
<tr>
<th>Command</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>Weighing mode 1</td>
</tr>
<tr>
<td>L</td>
<td>Weighing mode 2</td>
</tr>
<tr>
<td>M</td>
<td>Weighing mode 3</td>
</tr>
<tr>
<td>N</td>
<td>Weighing mode 4</td>
</tr>
<tr>
<td>O</td>
<td>Block all keys</td>
</tr>
<tr>
<td>P</td>
<td>Output readout to data interface</td>
</tr>
<tr>
<td>Q</td>
<td>Output acoustic signal</td>
</tr>
<tr>
<td>R</td>
<td>Release (unblock) keys</td>
</tr>
<tr>
<td>T</td>
<td>Tare and zero (combination tare function)</td>
</tr>
<tr>
<td>f3_</td>
<td>Zero (see also the “kZE_” command)</td>
</tr>
<tr>
<td>f4_</td>
<td>Tare without zeroing (see also the “kT_” command)</td>
</tr>
<tr>
<td>l_</td>
<td>Information about the indicator</td>
</tr>
<tr>
<td>x1_</td>
<td>Output model designation of active weighing instrument. Example: “LP6200S-0C”</td>
</tr>
<tr>
<td>x2_</td>
<td>Output serial number of active weighing instrument; example: “0012345678”</td>
</tr>
<tr>
<td>x3_</td>
<td>Output software version of active weighing instrument; example: “00-20-04”</td>
</tr>
<tr>
<td>x4_</td>
<td>Output software version of indicator; example: “01-25-02”</td>
</tr>
<tr>
<td>x9_</td>
<td>Output serial number of indicator; example: “0012345678”</td>
</tr>
<tr>
<td>x10_</td>
<td>Output model of indicator; example: “CW2P4-1500RR-LCE”</td>
</tr>
<tr>
<td>z1_</td>
<td>Activate input for printout header 1</td>
</tr>
<tr>
<td>z2_</td>
<td>Activate input for printout header 2</td>
</tr>
<tr>
<td>txx…x_</td>
<td>xx…x: Input text Length acc. to input (Combics 1 plus only)</td>
</tr>
</tbody>
</table>

The ASCII code for the “underline” character is 95.

Format for entering printout header lines: ESC z x a … a _ CR LF where x=(header line) 1 or 2; a … a= up to 20 characters of text, followed by the “underline” character, carriage return and line feed.
Data Output Format

You can output the values displayed in the line for measured values and the weight unit with or without a data ID code. The first 6 characters, called the data header, show the data ID code identifying the subsequent value. Select menu item 7.2 to define whether the data ID code is included in output or not.

Examples:

+ 235 pcs  Without data ID code
Qnt + 235 pcs  With data ID code

Display segments that are not activated are output as spaces. Values with no decimal point are output without a decimal point.

Data Output Format with 16 Characters (without Data Header)

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 - -  D D D D D D D D * * U U U CR LF
or * * * * * * * * * * * * CR LF

+-: Plus or minus sign
*: Space
D: Digit or letter (max. 7 characters plus decimal point)
U: Unit symbol (1 - 3 letters, followed by 0 - 2 spaces)
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
+++  H H H H H H H * * CR LF
or * * * * * * * * * * CR LF
or * * * * * * * L * * * * CR LF
or * * * * * * L L * * * * CR LF
or * * * * * * C * * * * CR LF

#: Space
– –: Final readout mode
H: Overload
HH: Overload in Checkweighing
L: Underload
LL: 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
or * * * * E r r * # # * * * * CR LF
#
#: Error code number (2 or 3 digits)

Example (output of value: +1255.7 g):

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

Data Output Format with 22 Characters

Normal Operation

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

II: ID code character, right-justified with spaces
+-: Plus or minus sign
*: Space
D: Digit or letter (max. 7 characters plus decimal point)
U: Unit symbol (1 - 3 letters, followed by 0 - 2 spaces)
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 17 18 19 20 21 22
S t a t * * * * * * * * * * * * * * * * CR LF
or S t a t * * * * * * * * H * * * * * * * * CR LF
or S t a t * * * * * * * * H * * * * * * * * CR LF
or S t a t * * * * * * * * L * * * * * * * * CR LF
or S t a t * * * * * * * * L L * * * * * * * * CR LF
or S t a t * * * * * * * * C * * * * * * * * CR LF

**: Space
– –: Final readout mode
H: Overload
HH: Overload in Checkweighing
L: Underload
LL: Underload in Checkweighing
C: Calibration/adjustment
Data Interfaces

Error Codes

<table>
<thead>
<tr>
<th>Position 1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stat</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>Err</td>
<td>*</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>CRLF</td>
<td>or Stat</td>
<td>*</td>
<td>*</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>CRLF</td>
</tr>
</tbody>
</table>

*: Space
#: Error code number (2 or 3 digits)

ID Code Characters

<table>
<thead>
<tr>
<th>ID character</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>G#</td>
<td>Gross value</td>
</tr>
<tr>
<td>N</td>
<td>Net value</td>
</tr>
<tr>
<td>T</td>
<td>Application tare memory 1</td>
</tr>
<tr>
<td>T2</td>
<td>Application tare memory 2</td>
</tr>
<tr>
<td>Diff</td>
<td>Difference from calibration value</td>
</tr>
<tr>
<td>Nom.</td>
<td>Exact calibration weight</td>
</tr>
<tr>
<td>Nom.</td>
<td>Exact calibration weight using SBI output</td>
</tr>
<tr>
<td>nRef</td>
<td>Reference sample quantity</td>
</tr>
<tr>
<td>pRef</td>
<td>Reference percentage</td>
</tr>
<tr>
<td>wRef</td>
<td>Reference sample weight</td>
</tr>
<tr>
<td>Qnt</td>
<td>Result from Counting application Result from Counting (piece count) and Neutral Measurement applications</td>
</tr>
<tr>
<td>mDef</td>
<td>Target value for Animal weighing</td>
</tr>
<tr>
<td>x-Net</td>
<td>Result from Animal Weighing</td>
</tr>
<tr>
<td>Setp</td>
<td>Target value for Checkweighing</td>
</tr>
<tr>
<td>W.Diff</td>
<td>Absolute difference (e.g., in kg) in Checkweighing</td>
</tr>
<tr>
<td>Lim</td>
<td>Deviation in % in Checkweighing</td>
</tr>
<tr>
<td>Max</td>
<td>Upper limit for Checkweighing</td>
</tr>
<tr>
<td>Min</td>
<td>Lower limit for Checkweighing</td>
</tr>
<tr>
<td>Stat</td>
<td>Status</td>
</tr>
<tr>
<td>Classx</td>
<td>Classification</td>
</tr>
<tr>
<td>Limx</td>
<td>Class limit</td>
</tr>
<tr>
<td>D</td>
<td>Percentage (as loss)</td>
</tr>
<tr>
<td>Prc</td>
<td>Percentage (as residue)</td>
</tr>
<tr>
<td>Wxx%</td>
<td>Reference percentage weight</td>
</tr>
<tr>
<td>Compxxx</td>
<td>Component xxx</td>
</tr>
<tr>
<td>Cont.T</td>
<td>Contents of the tare memory in Net-total Formulation</td>
</tr>
<tr>
<td>Tot. cp</td>
<td>Total weight in Net-Total Formulation</td>
</tr>
<tr>
<td>PT2</td>
<td>Preset tare</td>
</tr>
<tr>
<td>n</td>
<td>Transaction counter</td>
</tr>
<tr>
<td>*G</td>
<td>Sum of gross weights in Totalizing</td>
</tr>
<tr>
<td>*N</td>
<td>Sum of net weights in Totalizing</td>
</tr>
<tr>
<td>Ser. no</td>
<td>Serial number of the weighing instrument or indicator</td>
</tr>
</tbody>
</table>

Example (output of value: +1255.7 g):

<table>
<thead>
<tr>
<th>Position 1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td>G#</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>+</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>.</td>
<td>7</td>
<td>*</td>
<td>*</td>
<td>CRLF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Positions 1-6: ID code character, right-justified with spaces
Position 7: Plus or minus sign or space
Position 8: Space
Positions 9-16: Weight value with decimal point; leading zeros are output as spaces.
Position 17: Space
Positions 18-20: Unit symbol or space
Position 21: Carriage return
Position 22: Line feed

⚠️ If the weight value is output with 10-fold increased resolution, this value is not permitted to be printed or saved in a weighing instrument operated in legal metrology in the SBI mode. In this case, the unit symbol is not included with output.
Configuring the Data Interface as a Printer Port

You can connect one or two strip printers or one or two label printers to the Combics. Configure the COM1 and UniCOM interfaces as printer ports under the “Printe” menu item.

There are several actions that generate the command for outputting data to the printer port:
- Pressing the key. If the operating menu is active, all menu settings under the active menu level are printed.
- On receipt of the SBI command “Esc k P _”. For details, see “Data Input Format” in this chapter.
- In some applications, pressing a given key (e.g., to save a value or start a routine) also generates a print command. In this case, a configurable printout is generated with application-specific data.

The symbols are displayed when data is being output to the printer port.

Configuring Printouts

Configure printouts in the Setup menu is under the “Printouts” menu item (Prprt). The printout should be formatted only after the desired application has been configured, as some of the positions are application-dependent.

You can configure a different printout for each interface. Each printout contains your choice of the information blocks described in the following: to enable or disable a block in the printout, select it or deselect it in the Setup menu.

Combics 2 only: For the “Totalizing” and “Net-Total” applications, you can also configure summarized printouts results) independent of individual component value printouts.

Block 1: Headers

You can define 2 headers, each with 20 characters per line (e.g., for printing your company’s name).

Enter the header lines under menu items 7.4.1 and 7.4.2. Blank header lines are not printed.

Example: format of Block 1:

ACE HARDWARE
GOETTINGEN

In this example, the company name is centered on the printout. This was achieved by entering blank spaces at the beginning of each line.

Block 2: Date/Time

(not on Combics 1)

Example: format of Block 2:

21.01.2001   16:02

To obtain a standardized time stamp (e.g., for documentation within a completely automated system), you can suppress the printout of the time stamp in the “Date / time” information block. This function is controlled under menu code 7 -12, “Time not printed”. The factory setting is “Off” (i.e., the time is included on the printout). If you select “On” for this menu item, the time stamp can be inserted by a higher-level controller or central computer to maintain consistent time stamping. This setting is especially important for communication with a PC.

Separating Block:

Dotted line, blank line (for the Weighing application).

This block is automatically inserted before further information blocks are printed.

-------------------

Block 3: Initialization Data

Which data is included in this block depends on the active application. It can include, for example, reference sample quantity, reference piece weight, target weight, etc. The block is terminated with a blank line.

This block can only be activated for the standard printout. It cannot be selected for the printout of results.

Example: format of Block 3 (Counting application)

nRef 10 pcs
wRef + 0.035 kg

Block 4: Serial Number

Example: format of Block 4:

Ser.no.  1234567890

Block 5: Results

Which data is included in this block depends on the active application. Normally it includes gross, net and tare weights, followed by a blank line.

The result is printed after this data; for example, the piece count. The block is terminated with a blank line.

Example: format of Block 3 (Counting application)

G# + 1.402 kg
T + 0.200 kg
N + 1.202 kg

Qnt 34 pcs

--------------------
GMP-compliant Printouts

When the corresponding menu item is active, the measured result is bracketed on the printout by a GMP header and a GMP footer (GMP = “Good Manufacturing Practice”).

The GMP header precedes the first measured result. The GMP footer is printed either after each measured result (“ISO/GLP/GMP: For 1 application result,” menu item 7.11.2), or after the last result in a series of measurements (“ISO/GMP/GLP: For several application results,” menu item 7.11.3). To end a series of measured results, press and hold the [□] key (> 2 sec). In this case, the ☛ symbol is displayed after the GMP header is printed and remains in the display until the GMP footer is printed.

If you toggle to a different weighing instrument (Combics 2 only) while a GMP printout of several measured results is being generated, the GMP footer for the weighing instrument used up to that point is generated when you press [□]. The GMP header for the other weighing instrument is included on the next printout generated.

A GMP-compliant printout is generated automatically at the conclusion of calibration/adjustment routines, as well as when you set or clear a preload.

If you use a label printer for GMP-compliant printouts and menu item 7.11.3 is active, the header and footer are printed on two different labels. To generate GMP-compliant printouts on labels, select menu item 7.11.2.

Three examples of GMP headers and one example of a footer are shown in the following. On Combics 1 models, the “date and time” line is not included.

Weighing platform WP1:

<table>
<thead>
<tr>
<th>Date/time</th>
<th>14.01.2002 09:43</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>CW2P1-30ED-LCE</td>
</tr>
<tr>
<td>Ser.no.</td>
<td>12345678</td>
</tr>
<tr>
<td>Vers.</td>
<td>1.1007.12.1</td>
</tr>
<tr>
<td>BVers.</td>
<td>01-25-01</td>
</tr>
</tbody>
</table>

Weighing platform WP2 (xBPI protocol):

<table>
<thead>
<tr>
<th>Date/time</th>
<th>14.01.2002 09:45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>CW2P1-30ED-LCE</td>
</tr>
<tr>
<td>Ser.no.</td>
<td>12345678</td>
</tr>
<tr>
<td>Vers.</td>
<td>1.1007.12.1</td>
</tr>
<tr>
<td>BVers.</td>
<td>01-25-01</td>
</tr>
<tr>
<td>Type</td>
<td>IS12000S</td>
</tr>
</tbody>
</table>

Weighing platform WP2 (SBI protocol):

<table>
<thead>
<tr>
<th>Date/time</th>
<th>14.01.2002 09:45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>CW2P1-30ED-LCE</td>
</tr>
<tr>
<td>Ser.no.</td>
<td>12345678</td>
</tr>
<tr>
<td>Vers.</td>
<td>1.1007.12.1</td>
</tr>
<tr>
<td>BVers.</td>
<td>01-25-01</td>
</tr>
<tr>
<td>Type</td>
<td>SBI</td>
</tr>
</tbody>
</table>

GMP footer:

<table>
<thead>
<tr>
<th>Date/time</th>
<th>14.01.2002 09:45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
</tr>
</tbody>
</table>

1) Not applicable for Combics 1 indicators
2) Combics 2 indicators only
Sample Printouts

For details on the individual information blocks, see “Configuring Printouts” above. For details on configuring the header lines, refer to the chapter describing the particular application.

Weighing Application

There is no data for the “initialization data” block. If this block is enabled for the printout, a blank line is output.

---

**HEADER LINE 1**

**HEADER LINE 2**

---

14.01.2002 09:43

---

G# + 1.402 kg
T + 0.200 kg
N + 1.202 kg

---

With weighing instrument serial number:

Ser no. 80705337

---

Counting Application

The “Initialization data” block contains the reference sample quantity and reference piece weight. The “Results” block contains gross, net and tare weights, as well as the calculated piece count.

---

Neutral Measurement Application

The “Initialization data” block contains the reference sample quantity and reference weight. The “Results” block contains gross, net and tare weights, as well as the calculated piece count.

---

Weighing in Percent Application

The “Initialization data” block contains the reference percentage and reference weight. The “Results” block shows gross, net and tare weights, as well as the percentage, which is shown as either the loss or the residual amount.

---

Checkweighing Application

The “Initialization data” block contains the nominal, minimum and maximum weights. The “Results” block always contains the gross, net and tare weights. The other results can be displayed in one of two ways:

- **Result = Weight:**
  The deviation from the nominal weight is given both as a percentage and as an absolute (weight) value, whether the result lies within the tolerance limits or not.

- **Result = Threshold status:**
  If the result lies within the tolerance limits, the printout shows the deviation from the nominal weight both as a percentage and as an absolute (weight) value, just as in the “Weight” printout mode described above.
  If the result is outside the tolerance limits, the last line of the printout indicates the status as follows:

---

Result in “OK” range; “Weight” or “Threshold” printout:

---

---

Result outside (over) the “OK” range; “Threshold” printout:

---

---
Data Interfaces

Classification Application
The “Initialization data” block contains the upper limits of Classes 1 through 4.
The “Results” block contains gross, net and tare weights, as well as the class that the sample belongs to (1 through 5, where Class 5 means that the upper limit of Class 4 was exceeded).

---------------------
Lim1 + 10.000 kg
Lim2 + 11.000 kg
Lim3 + 12.000 kg
Lim4 + 13.000 kg
G# + 9.700 kg
T + 0.000 kg
N + 9.700 kg
Class 1

Animal Weighing Application
The “Initialization data” block contains the number of measured values that averaging is based on. The “Results” block contains the tare weight and the mean value.

---------------------
mDef 8
T + 0.000 kg
x-Net + 4.202 kg

Net-Total Formulation Application
The “Initialization data” block is empty. If this block is enabled for the printout, a blank line is output.
Which data is contained in the “Results” block value depends on the program operating status at the time of printing.
The following options are available:
- Total/results printout
  After [c] is pressed
  (tare memory is cleared)
- Individual/components printout
  After [o] is pressed
  (component is stored in tare memory)
- Standard printout
  After [p] is pressed
  (component is stored in tare memory)

Example with 2 components

---------------------
HEADER LINE 1
HEADER LINE 2
14.01.2002 09:43
Cmp001+ 1.200 kg
Cmp002+ 2.000 kg

Component printout (menu item 3.17.3)
The entire standard printout is generated for each component.
Example for the second component:

---------------------
HEADER LINE 1
HEADER LINE 2
14.01.2002 09:46
Cmp002+ 2.000 kg

Standard printout
Example before the 2nd component is stored:

G# + 4.400 kg
T + 0.200 kg
N + 1.200 kg
n 1

Standard printout
Example after the 2nd component is stored:

G# + 4.400 kg
T + 0.200 kg
N + 1.200 kg
n 1

Totalizing Application
The “Initialization data” block is empty. If this block is enabled for the printout, a blank line is output.
Which data is contained in the “Results” block value depends on the program operating status at the time of printing.
The following options are available:
- Printout of results
  After [c] is pressed
  (totalizing memory is cleared)
- Individual/component printout
  of one transaction
  After [o] is pressed
  (component is stored in tare memory)
- Standard printout
  After [p] is pressed
  (component is not stored in tare memory)

“Total” printout:

--------
G $ 9.200 kg
N + 8.600 kg
n 3

Component printout (menu item 3.17.3)
The header is printed only once, all transaction are printed one after the other. For printing on a label printer, see also “Component printout, Net-Total.”
Example with 2 transactions:

---------------------
HEADER LINE 1
HEADER LINE 2
14.01.2002 09:43
Cmp002+ 2.000 kg

Standard printout
Example before the 2nd component is stored:

G# + 1.400 kg
T + 0.200 kg
N + 1.200 kg
n 1

Standard printout
Example after the 2nd component is stored:

G# + 3.400 kg
T + 0.200 kg
N + 3.200 kg
n 2
Component printout
(menu item 3.17.2)
The entire standard printout is generated for each component.
Example: 2. Print second transaction:

HEADER LINE 1
HEADER LINE 2
14.01.2002  09:43
G#  +  2.400 kg
T   +  0.200 kg
N   +  2.200 kg
n   2

Standard printout
The transaction counter value is not printed.
Example: 2. Print second transaction:

G#  +  2.400 kg
T   +  0.200 kg
N   +  2.200 kg

Print menu parameters:
All active menu item settings below the active menu level are printed.

----------
MENU
SETUP.

WP1
----------
1
  1.1
    1.1.2
    1.2.1
    1.3.2
...
  1.18
  1.18.1
  CAL 10.000 kg
etc.

GMP-compliant Printouts
Linearization record:
----------
14.01.2002   13:00
Model CW2P1-30ED-LCE
Ser.no.     12345678
Vers.       1.1007.12.1
BVers.      01-25-01
----------

Linearization
Wt.1 +  7.00 kg
Wt.2 + 15.00 kg
Wt.3 + 22.00 kg
Wt.4 + 30.00 kg
completed
----------
14.01.2002   13:02
Name:       
----------

Calibration/adjustment record:
----------
14.01.2002   13:50
Model CW2P1-30ED-LCE
Ser.no.     12345678
Vers.       1.1007.12.1
BVers.      01-25-01
----------

External calibration
Nom. + 30.000 kg
Diff. - 0.003 kg
External adjustment
Diff. + 0.000 kg
----------
14.01.2002   13:52
Name:       
----------

“Clear preload” record:
----------
14.01.2002   13:50
Model CW2P1-30ED-LCE
Ser.no.     12345678
Vers.       1.1007.12.1
BVers.      01-25-01
----------

Clear preload
completed
----------
14.01.2002   13:52
Name:       
----------

Weighing printout with multiple results; example with 2 results:
----------
14.01.2002   09:43
Model CW2P1-30ED-LCE
Ser.no.     12345678
Vers.       1.1007.12.1
BVers.      01-25-01
----------

HEADER LINE 1
HEADER LINE 2
----------
G#  +  2.40 kg
T   +  0.20 kg
N   +  2.20 kg
----------
HEADER LINE 1
HEADER LINE 2
----------
G#  +  3.40 kg
T   +  0.30 kg
N   +  3.10 kg
----------
14.01.2002   13:52
Name:       
----------

“Set preload” record:
----------
14.01.2002   13:50
Model CW2P1-30ED-LCE
Ser.no.     12345678
Vers.       1.1007.12.1
BVers.      01-25-01
----------

Set preload
completed
----------
14.01.2002   13:52
Name:       
----------

“Clear preload” record:
----------
14.01.2002   13:50
Model CW2P1-30ED-LCE
Ser.no.     12345678
Vers.       1.1007.12.1
BVers.      01-25-01
----------

Clear preload
completed
----------
14.01.2002   13:52
Name:       
----------

Error codes are shown on the main display. There are three types of error:
- Dynamic errors are indicated until the error is corrected, by an error code (e.g. \textit{inf 01}).
- Temporary errors are indicated for 2 seconds (e.g., \textit{inf 07}.)
- "Fatal" errors are displayed continuously (e.g., \textit{Err 101}) until the indicator is switched off and back on again.

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No display segments shown</td>
<td>No power connection</td>
<td>Check power supply</td>
</tr>
<tr>
<td>L or Err 54</td>
<td>Load plate/weighing pan is not on the weighing instrument</td>
<td>Place the load plate/weighing pan on the weighing instrument</td>
</tr>
<tr>
<td>Err 101 - 104</td>
<td>Key is stuck, Key pressed when switching on the Combics</td>
<td>Release key or Contact your local Sartorius Service Center</td>
</tr>
<tr>
<td>Err 320</td>
<td>Operating program memory (EEPROM) defective</td>
<td>Contact your local Sartorius Service Center</td>
</tr>
<tr>
<td>Err 335</td>
<td>Verified platform not compatible with terminal</td>
<td>Connect a compatible weighing platform</td>
</tr>
<tr>
<td>Err 340</td>
<td>Operating parameter (EEPROM) error</td>
<td>Turn the weighing instrument off, then back on again. If this error code remains displayed, please contact your local Sartorius Service Center</td>
</tr>
<tr>
<td>Err 341</td>
<td>Data lost from RAM, battery needs to be recharged</td>
<td>Leave the weighing instrument power on for at least 10 hrs.</td>
</tr>
<tr>
<td>Err 343</td>
<td>Loss of data in the memory area for transaction numbers in external Alibi memory modules</td>
<td>Contact your local Sartorius Service Center</td>
</tr>
<tr>
<td>Inf 01</td>
<td>Data output not compatible with output format</td>
<td>Change the configuration in the Setup menu</td>
</tr>
<tr>
<td>Inf 02</td>
<td>Calibration/adjustment condition not met, e.g., – the weighing instrument was not tared – the weighing instrument is loaded</td>
<td>Calibrate only when zero is displayed Press \textit{\textasciitilde} to tare</td>
</tr>
<tr>
<td>Inf 03</td>
<td>Calibration/adjustment could not be completed within a certain time</td>
<td>Allow the weighing instrument to warm up again and repeat the adjustment process</td>
</tr>
<tr>
<td>Inf 06</td>
<td>Internal calibration weight defective</td>
<td>Contact your local Sartorius Service Center</td>
</tr>
<tr>
<td>Inf 07</td>
<td>Function not allowed in weighing instruments verified for use in legal metrology</td>
<td>Contact your local Sartorius Service Center for information on having the settings changed</td>
</tr>
<tr>
<td>Inf 08</td>
<td>The load on the weighing instrument is too heavy to zero the readout</td>
<td>Check whether “tare/zero with power on” is set (1.12)</td>
</tr>
<tr>
<td>Inf 09</td>
<td>Taring is not possible when the gross weight is &lt; zero</td>
<td>Zero the weighing instrument</td>
</tr>
<tr>
<td>Inf 010</td>
<td>Tare key is blocked when there is data in the tare memory</td>
<td>The data stored for the application program (Combics 2 only) must be deleted (clear the memory) before taring.</td>
</tr>
<tr>
<td>Inf 018</td>
<td>Preload is too light</td>
<td></td>
</tr>
<tr>
<td>Inf 019</td>
<td>Preload is too heavy</td>
<td></td>
</tr>
<tr>
<td>Inf 029</td>
<td>Minimum load not reached</td>
<td>Define a lower value for the minimum load (in the Application settings, under 3.6)</td>
</tr>
<tr>
<td>Inf 030</td>
<td>BPI ID (BPI byte) in active weighing instrument not deleted (cannot deactivate XBPI mode in COM1)</td>
<td>Restore factory settings for device parameters in the active weighing instrument</td>
</tr>
<tr>
<td>Inf 031</td>
<td>Interface handshake not completed</td>
<td>Send XON, CTS</td>
</tr>
<tr>
<td>Inf 034</td>
<td>Cannot store the current weight value (e.g., if control limits are too low or too high)</td>
<td>None</td>
</tr>
<tr>
<td>Inf 072</td>
<td>Cannot store the current weight value (e.g., the transaction counter has reached its limit)</td>
<td>None</td>
</tr>
<tr>
<td>Inf NP</td>
<td>Data not found or unreadable</td>
<td>Contact your local Sartorius Service Center</td>
</tr>
<tr>
<td>Inf 01P</td>
<td>Function is blocked (e.g., menu is locked)</td>
<td>None</td>
</tr>
<tr>
<td>NWP</td>
<td>No weighing platform connected</td>
<td>Contact your local Sartorius Service Center</td>
</tr>
</tbody>
</table>
Care and Maintenance

Service
Regular servicing by a Sartorius technician will extend the service life of your Combics indicator and ensure its continued weighing accuracy. Sartorius can offer you service contracts, with your choice of regular maintenance intervals ranging from 1 month to 2 years.

The optimum maintenance interval depends on the operating conditions at the place of installation and on the individual tolerance requirements.

Repairs
⚠ Disconnect defective equipment from power immediately (unplug the equipment from the wall outlet [mains supply]). Repairs may be performed only by authorized Sartorius service technicians using original Sartorius parts. Repairs performed by untrained persons may result in considerable hazards for the user.

Important Note: If the equipment is still under warranty, send the entire indicator to the factory for repairs.

⚠ If a cable or cable gland is damaged or defective, replace the cable as a complete unit with all its connectors.

⚠ Do not open the indicator while it is carrying current. Allow at least 10 seconds to elapse after disconnecting the equipment from power before opening the equipment housing.

Proper fitting of all surfaces is essential for the IP rating of the housing; for this reason the device must be opened and closed by a certified technician.

Cleaning
⚠ Disconnect the indicator from power (unplug the from the wall outlet [mains supply]) and disconnect any data cables.

⚠ Make sure that no liquid enters the indicator housing.

⚠ Do not use any aggressive cleaning agents (solvents or similar agents).

⚠ Do not wash down the equipment with water or dry it with compressed air; this is not permitted.

- Clean the indicator using a piece of cloth which has been wet with a mild detergent (soap).
- If used in the food industry, use a cleaning agent suitable for the particular working environment.
- After cleaning, wipe down the indicator with a soft, dry cloth.
- If the weighing platform is installed in a pit, make sure that no dirt accumulates between the edge of the pit and the weighing platform. This will prevent measuring errors.
- Observe your company’s internal regulations and standard industry guidelines with regard to cleaning intervals and cleaning agents.
- Regularly remove all dirt from the floor of the pit.

Cleaning Stainless Steel Surfaces
Clean all stainless steel parts regularly. Use a damp cloth or sponge to clean stainless steel parts on the weighing instrument. You can use any household cleaning agent that is suitable for use on stainless steel. Clean stainless steel surfaces by wiping them down. Then rinse the equipment thoroughly, making sure to remove all residues. Afterwards, allow the equipment to dry. If desired, you can apply oil to the cleaned surfaces as additional protection.

Solvents are permitted for use only on stainless steel parts.

Cleaning the Interior of the Weighing Platform
- If dirt enters the interior of the weighing platform, the load plate has to be removed.
- Particular caution is advised when working with models larger than 1000 x 1000 mm.
- Blow out the interior with pressurized air or rinse with a weak water jet (max. 60°C).
- Make sure no dirt enters the gap in the overload safety mechanism (the gap between the load cell and the screwed-on plate).

Corrosive Environment
> Remove all traces of corrosive substances from the weighing platform on a regular basis.

Replacing the Dust Cover
> Replace damaged dust covers.

Safety Inspection
Safe operation of the device is no longer ensured when:
- there is visible damage to the device or power cord
- the built-in power supply no longer functions properly
- the device has been stored for a relatively long period under unfavorable conditions (e.g., extreme moisture)

If there is any indication that safe operation of the device is no longer warranted:
- Disconnect the equipment from power (unplug the equipment from the wall outlet [mains supply]) and lock it in a safe place to ensure that it cannot be used.
- Notify your nearest Sartorius Service Center or the International Technical Support Unit based in Goettingen, Germany.

Maintenance and repair work may be performed only by authorized Sartorius service technicians who:
- have access to the required service and maintenance manuals, and
- have attended the relevant service training courses.

⚠ The seals affixed to this equipment indicate that the equipment may be opened only by authorized service technicians, to ensure safe and trouble-free operation of the equipment and to maintain the conditions for warranty coverage.

Recycling
Sartorius products are packaged to ensure safe shipment using environmentally friendly materials. After successful installation of the indicator, you should return this packaging for recycling because it is a valuable source of secondary raw material.

For information on recycling options, including recycling of old weighing equipment, contact your municipal waste disposal center or local recycling depot.

If the equipment contains batteries, make sure to remove them before disposal. Batteries are hazardous waste and must be disposed of separately. Contact your municipal waste disposal center or local recycling depot for details on the proper disposal of batteries.
Common Specifications

- **Maximum readability**: 31,250 scale intervals (not in legal metrology)
- **Accuracy class**: L (on models with CE)
- **Verification scale intervals**: ≤93000e, (single-range scale) or 2 x 3000e (multiple range scale acc. to EN45501)
- **Digital protective interface**: acc. to EN45501
- **Data interface**: Bi-directional RS-232C interface with control outputs (standard equipment)
- **Additional data interface**: optional
- **Display**: 20 mm LCD, 7-segment plus status symbols, backlit

**Housing:**

- **Material**: AISI 304 stainless steel
- **Dust and water protection acc. to EN60529**: CW1P, CW1NP, CW2P: IP44 (optional IP65), CW1S, CW1NS, CW2S: IP67

- **Operating temperature range**: -10°C to +40°C
- **Power supply**: 100–240 VAC (-15/+10%), 50–60 Hz, max. 17 W/23 VA
- **AC Supply**: optional 15.5–24 VDC (±10%), max. 12 W
- **Battery operations**: External rechargeable battery pack YBR10Z
- **Emissions Acc. to EN61326+A1 Class B (IEC 61326+A1)
- **Immunity to interference**: Acc. to EN61326+A1, industrial environment (IEC 61326+A1)
- **Electrical safety**: EN61010-1 (IEC 1010-1), EN60950 (IEC 950)

**Model-specific Specifications (Platform Specifications)**

<table>
<thead>
<tr>
<th>Model code:</th>
<th>CW...-L</th>
<th>CW...-I</th>
<th>CW...-LCE</th>
<th>CW...-NCE (2 x 3000e)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weighing capacity</strong></td>
<td><strong>15000d</strong></td>
<td><strong>30000d</strong></td>
<td><strong>1x3000e</strong></td>
<td><strong>Weighing range 1</strong></td>
</tr>
<tr>
<td>3 kg</td>
<td>0.2 kg</td>
<td>0.1 g</td>
<td>1 g</td>
<td>1.5 kg</td>
</tr>
<tr>
<td>6 kg</td>
<td>0.5 kg</td>
<td>0.2 g</td>
<td>2 g</td>
<td>3 kg</td>
</tr>
<tr>
<td>15 kg</td>
<td>1 kg</td>
<td>0.5 g</td>
<td>5 g</td>
<td>6 kg</td>
</tr>
<tr>
<td>30 kg</td>
<td>2 kg</td>
<td>1 g</td>
<td>10 g</td>
<td>15 kg</td>
</tr>
<tr>
<td>60 kg</td>
<td>5 kg</td>
<td>2 g</td>
<td>20 g</td>
<td>30 kg</td>
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<tr>
<td>150 kg</td>
<td>10 kg</td>
<td>5 g</td>
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<td>60 kg</td>
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<tr>
<td>300 kg</td>
<td>20 kg</td>
<td>10 g</td>
<td>100 g</td>
<td>150 kg</td>
</tr>
<tr>
<td>600 kg</td>
<td>50 kg</td>
<td>20 g</td>
<td>200 g</td>
<td>300 kg</td>
</tr>
<tr>
<td>1500 kg</td>
<td>100 kg</td>
<td>50 g</td>
<td>500 g</td>
<td>600 kg</td>
</tr>
<tr>
<td>3000 kg</td>
<td>200 kg</td>
<td>100 g</td>
<td>1000 g</td>
<td>1500 kg</td>
</tr>
</tbody>
</table>

**Overview**
Here, we’ll show you an example of how to put together order numbers. CW1P1-60 FE-LCE means the following:

- Complete Combics scale with indicator 1
- With one load cell
- A maximum, single-range weighing capacity of 60 kg
- A platform size of 500 x 400 mm
- A resolution of 3,000 e for accuracy class LCE

**CW1P**

Indicator with 20 mm LCD, backlit; RS-232C interface port as a standard feature; port for optional battery operation. Indicator material: stainless steel
Type of protection: IP44

**CW1NP**

With selectable application programs. Indicator with 20 mm LCD, backlit; integrated LEDs (red-green-yellow) for checkweighing or classification; RS-232C interface port as a standard feature; port for bar code scanner or optional battery pack.

Applications: weighing; counting; checkweighing; classification into 3 or 5 classes; totalizing; net-total formulation; filling; weighing in percent; neutral measurement; animal weighing.
Indicator material: stainless steel.
Type of protection: IP44.

**CW2P**

With selectable application programs. Dot-matrix display, backlit. Integrated LEDs (red-green-yellow) for checkweighing or classification; RS-232C interface port as a standard feature; port for bar code scanner or optional battery pack.

Applications: weighing; counting; checkweighing; classification into 3 or 5 classes; totalizing; net-total formulation; filling; weighing in percent; neutral measurement; animal weighing.
Indicator material: stainless steel.
Type of protection: IP44.

### Applications

<table>
<thead>
<tr>
<th>CW1</th>
<th>Material Design</th>
<th>Number of load cells</th>
<th>Capacity (kg)</th>
<th>Platform size mm</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P</td>
<td>1</td>
<td>60</td>
<td>FE</td>
<td>LCE</td>
</tr>
<tr>
<td>1</td>
<td>3 kg</td>
<td>300 x 240</td>
<td>(DC)</td>
<td></td>
<td>LCE</td>
</tr>
<tr>
<td>1</td>
<td>6 kg</td>
<td>300 x 240</td>
<td>(DC)</td>
<td></td>
<td>LCE</td>
</tr>
<tr>
<td>1</td>
<td>15 kg</td>
<td>400 x 300</td>
<td>(ED)</td>
<td></td>
<td>LCE</td>
</tr>
<tr>
<td>1</td>
<td>30 kg</td>
<td>500 x 400</td>
<td>(FE)</td>
<td></td>
<td>LCE</td>
</tr>
<tr>
<td>1</td>
<td>60 kg</td>
<td>500 x 400</td>
<td>(FE)</td>
<td></td>
<td>LCE</td>
</tr>
<tr>
<td>1</td>
<td>150 kg</td>
<td>650 x 500</td>
<td>(GF)</td>
<td></td>
<td>LCE</td>
</tr>
<tr>
<td>1</td>
<td>300 kg</td>
<td>800 x 600</td>
<td>(IG)</td>
<td></td>
<td>LCE</td>
</tr>
<tr>
<td>1</td>
<td>600 kg</td>
<td>1,000 x 1,000</td>
<td>(LL)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td>1,500 kg</td>
<td>1,250 x 1,000</td>
<td>(NL)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td>3,000 kg</td>
<td>1,500 x 1,250</td>
<td>(RN)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1,500 x 1,500</td>
<td>(RR)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>2,000 x 1,500</td>
<td>(WR)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1,000 x 1,000</td>
<td>(LL)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>2,000 x 1,500</td>
<td>(WR)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1,500 x 1,250</td>
<td>(RN)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1,500 x 1,500</td>
<td>(RR)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>2,000 x 1,500</td>
<td>(WR)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1,250 x 1,000</td>
<td>(NL)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1,500 x 1,250</td>
<td>(RN)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1,500 x 1,500</td>
<td>(RR)</td>
<td></td>
<td>NCE</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>2,000 x 1,500</td>
<td>(WR)</td>
<td></td>
<td>NCE</td>
</tr>
</tbody>
</table>

Notes:
- **L**: 15,000 d
- **I**: 30,000 d
- **LCE**: 3,000 e (verification scale intervals)
- **NCE**: 2 x 3,000 e (verification scale intervals)
Complete Combics stainless steel scale

**CW2S-1500RR-L**, our example of a complete, stainless steel scale, means the following:

Complete Combics stainless steel scale with indicator 2 (CW2S...);
With four load cells
A maximum, single-range weighing capacity of 1,500 kg (...4...);
A platform size of 1,500 x 1,500 mm (...RR...); and
A resolution of 15,000 digits (...L)

Complete Combics stainless steel scale

**CW1S**

Indicator with 20 mm LCD, backlit;
RS-232C interface port as a standard feature;
port for optional battery operation.
Indicator material: completely made of stainless steel. Type of protection: IP67.

**CW1NS**

With selectable application programs.
Indicator with 20 mm LCD, backlit; integrated LEDs (red-green-yellow) for checkweighing or classification; RS-232C interface port as a standard feature; port for bar code scanner or optional battery pack.
Applications: weighing; counting; checkweighing; classification into 3 or 5 classes; totalizing; net-total formulation; filling; weighing in percent; neutral measurement; animal weighing.
Indicator material: completely made of stainless steel. Type of protection: IP67.

**CW2S**

With selectable application programs.
Dot-matrix display, backlit. Integrated LEDs (red-green-yellow) for checkweighing or classification; RS-232C interface port as a standard feature; port for bar code scanner or optional battery pack.
Applications: weighing; counting; checkweighing; classification into 3 or 5 classes; totalizing; net-total formulation; filling; weighing in percent; neutral measurement; animal weighing.
Indicator material: completely made of stainless steel. Type of protection: IP67.

### Applications

<table>
<thead>
<tr>
<th>Applications</th>
<th>Material Design</th>
<th>Number of load cells</th>
<th>Capacity (kg)</th>
<th>Platform size (mm)</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>CW2</td>
<td>S</td>
<td>4</td>
<td>1500</td>
<td>RR</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 3 kg</td>
<td></td>
<td>300×240</td>
<td>(DC)</td>
<td>L</td>
<td>15,000 d</td>
</tr>
<tr>
<td>1 6 kg</td>
<td></td>
<td>300×240</td>
<td>(DC)</td>
<td>L</td>
<td>15,000 d</td>
</tr>
<tr>
<td>1 15 kg</td>
<td></td>
<td>300×240</td>
<td>(DC)</td>
<td>L</td>
<td>15,000 d</td>
</tr>
<tr>
<td>1 30 kg</td>
<td></td>
<td>400×300</td>
<td>(ED)</td>
<td>L</td>
<td>30,000 d</td>
</tr>
<tr>
<td>1 60 kg</td>
<td></td>
<td>500×400</td>
<td>(FE)</td>
<td>L</td>
<td>30,000 d</td>
</tr>
<tr>
<td>1 150 kg</td>
<td></td>
<td>500×400</td>
<td>(FE)</td>
<td>L</td>
<td>3,000 e (verification scale intervals)</td>
</tr>
<tr>
<td>4 300 kg</td>
<td></td>
<td>650×500</td>
<td>(GF)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
<tr>
<td>4 800 kg</td>
<td></td>
<td>800×600</td>
<td>(IG)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
<tr>
<td>4 1,000 kg</td>
<td></td>
<td>1,250×1,000</td>
<td>(NL)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
<tr>
<td>4 1,500 kg</td>
<td></td>
<td>1,500×1,250</td>
<td>(RN)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
<tr>
<td>4 2,000 kg</td>
<td></td>
<td>1,500×1,500</td>
<td>(RR)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
<tr>
<td>4 3,000 kg</td>
<td></td>
<td>1,000×1,000</td>
<td>(LL)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
<tr>
<td>4 1,250×1,000</td>
<td></td>
<td>1,250×1,000</td>
<td>(NL)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
<tr>
<td>4 1,500×1,250</td>
<td></td>
<td>1,500×1,250</td>
<td>(RN)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
<tr>
<td>4 1,500×1,500</td>
<td></td>
<td>1,500×1,500</td>
<td>(RR)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
<tr>
<td>4 1,500×1,500</td>
<td></td>
<td>1,500×1,500</td>
<td>(RR)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
<tr>
<td>4 2,000×1,500</td>
<td></td>
<td>2,000×1,500</td>
<td>(WR)</td>
<td>L</td>
<td>2,000×1,500 (WR)</td>
</tr>
</tbody>
</table>
**Overview**

**Dimensions (Scale Drawings)**

Combics:

![Combics Diagram](image)

in millimeters

**Weighing Platforms:**

![Weighing Platforms Diagram](image)

**Standard and Stainless Steel Versions**

<table>
<thead>
<tr>
<th>Length</th>
<th>Width Standard Version</th>
<th>Height Stainless Steel Version</th>
<th>Height leveling feet</th>
<th>Distance between</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>a (mm)</td>
<td>b (mm)</td>
<td>c (mm)</td>
<td>d (mm)</td>
<td>e (mm)</td>
<td>[m] ca.</td>
</tr>
<tr>
<td>320</td>
<td>240</td>
<td>72</td>
<td>82</td>
<td>264</td>
<td>184</td>
</tr>
<tr>
<td>400</td>
<td>300</td>
<td>94</td>
<td>101</td>
<td>344</td>
<td>244</td>
</tr>
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<td>96</td>
<td>104</td>
<td>443</td>
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<tr>
<td>650</td>
<td>500</td>
<td>145</td>
<td>90</td>
<td>530</td>
<td>434</td>
</tr>
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<td>800</td>
<td>600</td>
<td>145</td>
<td>90</td>
<td>680</td>
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<td>1304</td>
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<td>1500</td>
<td>100</td>
<td>100</td>
<td>1804</td>
<td>1304</td>
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</table>
**Accessories**

**Combics full-range scales:**

<table>
<thead>
<tr>
<th>Optional Interface</th>
<th>Product Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface module (RS-232C) for UniCOM data interface</td>
<td>YD001C-232</td>
</tr>
<tr>
<td>Interface module (RS-485/422) for UniCOM data interface</td>
<td>YD001C-485</td>
</tr>
<tr>
<td>Profinet-DP module for UniCOM interface</td>
<td>YD001C-DP</td>
</tr>
<tr>
<td>Bluetooth® wireless interface module with antenna outside the housing</td>
<td>YD001C-BT</td>
</tr>
<tr>
<td>Analog current output, 0-20 mA, 4-20 mA, 0-10 V, 16-bit</td>
<td>YDA01C-20MA</td>
</tr>
</tbody>
</table>

**Printers and Printer Accessories**

- Verifiable printer with functions for date, time and statistical evaluations: YDP03-OCE
- Printer paper (5 rolls; length per roll: 50 m) for data printer: 6906937
- Replacement ink ribbon cartridge for printer: 6906918
- Verifiable strip and label printer with thermal print head, paper width 101 mm, with adapter cable (12-pin round male connector) and external power supply: YDP12IS-0CE-UV
  - Adapter cable YCC01-01CISLM3 required for CW.P models.
  - Adapter cable YCC02-R12F6 required for CW.S models.
  - Printer paper (1 roll) for YDP02IS-OCE printer, 101 mm x 75 m, thermo paper: 69Y03196
  - Labels for YDP02IS-OCE printer, extra large, 101 x 127 m, 305 labels: 69Y03195
- Verifiable strip and label printer with thermal print head, paper width 60 mm, with adapter cable (12-contact round male connector) and external power supply: YDP04IS-0CE-UV
  - Adapter cable YCC01-01CISLM3 required for CW.P models.
  - Adapter cable YCC02-R12F6 required for CW.S models.
  - Printer paper (3 rolls) for YDP02/04IS-OCE, 60 mm + 75 m, thermo paper: 69Y03090
  - Labels for YDP02/04IS-OCE small, 58 + 30 mm, 1000 labels: 69Y03092
  - Labels for YDP02/04IS-OCE medium, 58 + 76 mm, 500 labels: 69Y03093
  - Labels for YDP02/04IS-OCE large, 58 + 100 mm, 350 labels: 69Y03094
  - Cable for direct connection of YDP02/04IS-OCE to Combics CW.P models CISL indicator: YCC01-01CISLM3

* not for use in legal metrology
<table>
<thead>
<tr>
<th>Product</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical Accessories</strong></td>
<td></td>
</tr>
<tr>
<td>External red/green/red display for CW.P models</td>
<td>YRD11Z</td>
</tr>
<tr>
<td>Second display* for CW.P models</td>
<td>YRD02Z</td>
</tr>
<tr>
<td>Remote display*, 7-segment, e. g. up to 45 mm characters</td>
<td>On request</td>
</tr>
<tr>
<td>Bar code scanner, 120 mm scanning width, with cable for connection to Combics CW.P indicators</td>
<td>YBR02CISL</td>
</tr>
<tr>
<td>Bar code scanner for CW.S models, adapter cable YCC02-R12P6</td>
<td>YBR02FC</td>
</tr>
<tr>
<td>Foot switch, incl. D-SUB 25-pin T-connector</td>
<td>YFS01</td>
</tr>
<tr>
<td>Hand switch, incl. D-SUB 25-pin T-connector</td>
<td>YHS02</td>
</tr>
<tr>
<td>External Alibi memory for electronic storage of weighing data</td>
<td>YAM01IS</td>
</tr>
<tr>
<td>Scanner for loading weighing data from PC, from YAM13IS</td>
<td>YAM02IS</td>
</tr>
<tr>
<td>Power supply for YAM01IS or YAM02IS</td>
<td>YAM11IS</td>
</tr>
<tr>
<td>Memory card for YAM01IS Alibi memory</td>
<td>YAM13IS</td>
</tr>
<tr>
<td>Cable for connecting Combics indicator to YAM01IS Alibi memory</td>
<td>YCC01-10CIM3</td>
</tr>
<tr>
<td>Cable for connecting (D-SUB 9-pin) YAM01IS Alibi memory to a PC (2 m)</td>
<td>69EM0012</td>
</tr>
<tr>
<td>Flow control for pumps with analog or digital pulse interface</td>
<td>YFC02Z-V2</td>
</tr>
<tr>
<td><strong>Additional Accessories</strong></td>
<td></td>
</tr>
<tr>
<td>Dust covers (2 pcs)</td>
<td>YDC01C1</td>
</tr>
<tr>
<td>IP65 Kit for IP44 Combics</td>
<td>YAS01CISL</td>
</tr>
<tr>
<td>Anti-theft device</td>
<td>YTP01C1</td>
</tr>
<tr>
<td>Cable gland for Combics CW1S/CW4S models, IP67 protected</td>
<td>YAS04CIS</td>
</tr>
<tr>
<td><strong>Mechanical Accessories</strong></td>
<td></td>
</tr>
<tr>
<td>Retainer plate for mounting indicator on platform (front-mounted indicator), made of AISI 304 stainless steel, for platform dimensions 240 x 300 mm</td>
<td>YDH11CWS</td>
</tr>
<tr>
<td>Installation kit for installing the Combics in a pit (with connecting hardware that lets you disconnect the indicator as desired)</td>
<td>YAS99I</td>
</tr>
<tr>
<td>Retainer for wall mounting, stainless steel</td>
<td>YDH02CIS</td>
</tr>
<tr>
<td>Floor-mounted column</td>
<td>YDH03CIP</td>
</tr>
<tr>
<td>Floor-mounted column, stainless steel</td>
<td>YDH03CIS</td>
</tr>
<tr>
<td>Base for installing floor-mounted column</td>
<td>YBP03CIP</td>
</tr>
<tr>
<td>Base for installing floor-mounted column, stainless steel</td>
<td>YBP03CIS</td>
</tr>
<tr>
<td>Retainer for bar code scanner, for attachment to floor-mounted column, bench stand or complete scale retainer</td>
<td>YBH01CWS</td>
</tr>
<tr>
<td>Plates for attaching printer to floor-mounted column or bench stand</td>
<td>YPP01CWS</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td></td>
</tr>
<tr>
<td>Flexible formatting options for printouts (e.g., for bar codes with variable font size, graphics, etc.) – Ask your sales representative</td>
<td>Information available on request!</td>
</tr>
<tr>
<td>Sartorius WinScale scale driver software for Windows 95/98/2000/NT. Displays the scale readout on your PC monitor and provides secure memory for storing data that is subject to legal control</td>
<td>YSC011</td>
</tr>
<tr>
<td>YCC01-09ISM5 RS-232 connecting cable required</td>
<td>YSW03</td>
</tr>
<tr>
<td>SartoConnect data transfer software for connecting your Sartorius scale to a computer running Windows 95/98/NT. This software lets you load the data recorded by your scale in a PC application program such as MS Excel or Access. Includes a cable for connecting the scale to a PC</td>
<td></td>
</tr>
</tbody>
</table>

* not for use in legal metrology
### Power Supply

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>24V industrial power supply module*</td>
<td>YAS02C1</td>
</tr>
<tr>
<td>External rechargeable battery pack, up to 40 h operation, incl. charger</td>
<td>YRB10Z</td>
</tr>
<tr>
<td>Connecting cable (25-pin D-SUB) for YRB10Z battery pack (2 m)</td>
<td>YCC02-RB01</td>
</tr>
<tr>
<td>Connecting cable with cable gland for YRB10Z battery pack (2 m)</td>
<td>YCC02-RB02</td>
</tr>
<tr>
<td>Connecting cable with cable gland for car battery (2 m)</td>
<td>YCC02-CB02</td>
</tr>
</tbody>
</table>

### Connecting Cables

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecting cable with cable gland for YBR02FC bar code scanner¹)</td>
<td>YCC02-BR02</td>
</tr>
<tr>
<td>Connecting cable with cable gland 9-pin D-SUB male connector, 6 m¹)</td>
<td>YCC02-D09M6</td>
</tr>
<tr>
<td>Connecting cable with cable gland, 9-pin D-SUB female connector, 6 m¹)</td>
<td>YCC02-D09F6</td>
</tr>
<tr>
<td>Connecting cable with cable gland, 25-pin D-SUB female connector, 1.5 m¹)</td>
<td>YCC02-D25F6</td>
</tr>
<tr>
<td>Connecting cable with cable gland, 12-pin round male connector, 6 m¹)</td>
<td>YCC02-R12M6</td>
</tr>
<tr>
<td>Connecting cable with cable gland, 12-pin round female connector, 1.5 m¹)</td>
<td>YCC02-R12F6</td>
</tr>
<tr>
<td>Cable for YDA01C-20MA power interface, with open cable ends e.g., 5 x 5 m²</td>
<td>6906926</td>
</tr>
<tr>
<td>Cable for connecting a PC; 25-contact D-Sub, approx. 1.5 m</td>
<td>7358312</td>
</tr>
<tr>
<td>Cable for connecting a PC; 9-contact D-Sub, approx. 1.5 m</td>
<td>7358314</td>
</tr>
<tr>
<td>Cable for connecting an isi terminal or QA/QC or FB/PC scale; 25-pin D-Sub to 12-pin round connector</td>
<td>YCC01-02ISM3</td>
</tr>
<tr>
<td>Cable for connecting a scale with 25-contact D-Sub female connector (25-pin D-Sub male connectors on both ends)</td>
<td>YCCD1-01M3</td>
</tr>
<tr>
<td>Cable for connecting an IS weighing platform; 25-pin D-Sub male connector to 25-contact D-Sub female connector, 3 m</td>
<td>YCC01.03CISLM3</td>
</tr>
</tbody>
</table>

* not for use in legal metrology

¹) for stainless steel Combics models only (CW1S, CW1NS, CW2S)
### Platform Accessories:

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>800 × 600 mm</th>
<th>1000 × 1000 mm</th>
<th>1250 × 1000 mm</th>
<th>1500 × 1250 mm</th>
<th>1500 × 1500 mm</th>
<th>2000 × 1500 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drive-on ramp, painted</strong></td>
<td>YAR01CWP</td>
<td>YAR02CWP</td>
<td>YAR02CWP</td>
<td>YAR03CWP</td>
<td>YAR04CWP</td>
<td>YAR05CWP</td>
</tr>
<tr>
<td>Order No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drive-on ramp, painted (tread plate)</strong></td>
<td>YAR01CWPT</td>
<td>YAR02CWPT</td>
<td>YAR02CWPT</td>
<td>YAR03CWPT</td>
<td>YAR04CWPT</td>
<td>YAR05CWPT</td>
</tr>
<tr>
<td>Order No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drive-on ramp, AISI 304 stainless steel</strong></td>
<td>YAR01CWS</td>
<td>YAR02CWS</td>
<td>YAR02CWS</td>
<td>YAR03CWS</td>
<td>YAR04CWS</td>
<td>YAR05CWS</td>
</tr>
<tr>
<td>Order No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drive-on ramp, AISI 304 stainless steel (tread plate)</strong></td>
<td>YAR01CWST</td>
<td>YAR02CWST</td>
<td>YAR02CWST</td>
<td>YAR03CWST</td>
<td>YAR04CWST</td>
<td>YAR05CWST</td>
</tr>
<tr>
<td>Order No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drive-on ramp, AISI 316 Ti stainless steel</strong></td>
<td>YAR01CWST4</td>
<td>YAR02CWST4</td>
<td>YAR02CWST4</td>
<td>YAR03CWST4</td>
<td>YAR04CWST4</td>
<td>YAR05CWST4</td>
</tr>
<tr>
<td>Order No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drive-on ramp, AISI 316 Ti stainless steel (tread plate)</strong></td>
<td>YAR01CWST4</td>
<td>YAR02CWST4</td>
<td>YAR02CWST4</td>
<td>YAR03CWST4</td>
<td>YAR04CWST4</td>
<td>YAR05CWST4</td>
</tr>
<tr>
<td>Order No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frame for pit installation, painted</strong></td>
<td>YEG01CWP</td>
<td>YEG02CWP</td>
<td>YEG03CWP</td>
<td>YEG04CWP</td>
<td>YEG05CWP</td>
<td>YEG06CWP</td>
</tr>
<tr>
<td>Order No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frame for pit installation, stainless steel</strong></td>
<td>YEG01CWS</td>
<td>YEG02CWS</td>
<td>YEG03CWS</td>
<td>YEG04CWS</td>
<td>YEG05CWS</td>
<td>YEG06CWS</td>
</tr>
<tr>
<td>Order No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Length × Width</strong></td>
<td>320 × 240 mm</td>
<td>400 × 300 mm</td>
<td>500 × 400 mm</td>
<td>650 × 500 mm</td>
<td>800 × 600 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Roller conveyor, painted</strong>:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order No.</td>
<td>YRC01DCA</td>
<td>YRC01EDA</td>
<td>YRC01FEA</td>
<td>YRC01GFP</td>
<td>YRC01IGP</td>
<td></td>
</tr>
<tr>
<td><strong>Roller conveyor, AISI 304 stainless steel, for platform sizes</strong>:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order No.</td>
<td>YRC01DCS</td>
<td>YRC01EDS</td>
<td>YRC01FES</td>
<td>YRC01GFS</td>
<td>YRC01GSS</td>
<td></td>
</tr>
<tr>
<td><strong>Roller-ball load plate</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Order No.</td>
<td>YLP01CWS</td>
<td>YLP02CWS</td>
<td>YLP03CWS</td>
<td>YLP04CWS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Column, painted, for attaching indicator to platform</strong></td>
<td>YDH01CWP</td>
<td>YDH02CWP</td>
<td>YDH02CWP</td>
<td>YDH03CWP</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Order No.</td>
<td>(Height 330 mm)</td>
<td>(Height 500 mm)</td>
<td>(Height 500 mm)</td>
<td>(Height 750 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Column, AISI 304 stainless steel, for attaching indicator to platform</strong></td>
<td>YDH01CWS</td>
<td>YDH02CWS</td>
<td>YDH02CWS</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Order No.</td>
<td>(Height 330 mm)</td>
<td>(Height 500 mm)</td>
<td>(Height 500 mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bench, painted</strong></td>
<td>–</td>
<td>YWT01CWP</td>
<td>YWT02CWP</td>
<td>YWT03CWP</td>
<td>YWT04CWP</td>
<td></td>
</tr>
<tr>
<td>Order No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bench, AISI 304 stainless steel</strong></td>
<td>–</td>
<td>YWT01CWS</td>
<td>YWT02CWS</td>
<td>YWT03CWS</td>
<td>YWT04CWS</td>
<td></td>
</tr>
<tr>
<td>Order No.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### Connecting an IS Weighing Platform to a Combics 2 Indicator

You can connect an IS weighing platform as WP2.

**Characteristics:**

- IS weighing platforms process weighing data independently of the indicator.
- IS platforms can be internally adjusted.
- ...-0CE models have a separate approval number, on a tag affixed to the cable.
- Please observe the conditions described in the instruction manual for the platform connected.
Declaration of Conformity

CE Marking 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 and related equipment that feature the latest technology and provide many years of trouble-free service. The CE marking may be affixed only to weighing instruments and associated equipment that comply with the following Directives:

"Electromagnetic compatibility (EMC)"
Applicable European Standards:

1. Electromagnetic compatibility

1.1 Reference to 89/336/EEC:
Official Journal of the European Communities, No. 2001/C 105/03

EN 61326-1 Electrical equipment for measurement, control and laboratory use EMC requirements
Part 1: General requirements
Defined immunity to interference:
Industrial areas, continuous, un-monitored operation
Limitation of emissions:
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).

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:
"Non-automatic weighing instruments"
This Directive regulates the determination of mass in legal metrology. For the respective Declaration of Type Conformity for Sartorius weighing instruments verified for use as legal measuring instruments that have an EC Type-approval Certificate, see the instruction manual(s) for each weighing instrument connected or refer to the enclosed “Guide to Verification.” 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 of a Notified Body registered at the Commission of the European Community for performing such verification. Sartorius complies with EC Directive No. 90/384/EEC for non-automatic weighing instruments, which has been in effect since January 1, 1993, within the Single European Market, as well as the accreditation of the Quality Management System of Sartorius AG by Lower Saxony’s Regional Administrative Department of Legal Metrology (Niedersächsische Landesverwaltungsamt – Eichwesen) from February 15, 1993.

"EC Verification" – A Service Offered by Sartorius
Our service technicians authorized to perform the verification of your weighing instruments that are acceptable for legal metrological verification 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 validity of the verification will become void in accordance with 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.

For more information on the verification of weighing instruments for use in legal metrology, contact the Sartorius Service Center.

For additional information on the CE mark on Sartorius equipment, see Sartorius Publication No. W–0052-e93081.
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:

<table>
<thead>
<tr>
<th>Model</th>
<th>Type weighing instrument</th>
<th>Type indicator</th>
<th>Accuracy class</th>
<th>EC type-approval certificate no.</th>
<th>Indicator test certificate no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CW-CE</td>
<td>SARTICS</td>
<td>TN</td>
<td>III</td>
<td>D04-09-015</td>
<td>D09-03.13</td>
</tr>
</tbody>
</table>

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 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 Goettingen, 01.11.2004

[Signatures]

Dr. G. Maaz
(President of the Mechatronics Division)

J. Rehlbalz
(Head of the Production Department Mechatronics / Weighing Technology Division)
Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

EG-Bauartzulassung
EC type-approval certificate

Zulassungsinhaber: Sartorius AG
Issued to: Weender Landstr. 94-108
37075 Göttingen

Rechtsbezug: § 13 des Gesetzes über das Mess- und Eichwesen (verification act)
vom/dated 23. März 1992 (BGBl. I S. 711), zuletzt geändert am (last
amended on) 25.11.2003 (BGBl. I S. 2304), in Verbindung mit Richtlinie
(in connection with council directive) 90/384/EWG, geändert durch (amended
by) 93/68/EWG

Bauart: Nichtselbsttätige elektromechanische Waage mit oder ohne Hebelwerk
In respect of: Nonautomatic electromechanical weighing instrument with or without
lever system

Typ / Type: Max 0,5 kg ... 300 t

Option: Mehrbereichs- und Mehrteilungswaage
multi-interval and multiple range instrument

Zulassungsnummer: D04-09-015  1. Revision
Approval number:

Gültig bis: 07.04.2014
Valid until:

Anzahl der Seiten: 12
Number of pages:

Geschäftszeichen: PTB-1.12-4014622
Reference No.:

Benannte Stelle: 0102
Notified Body:

Im Auftrag
By order

Braunschweig, 18.10.2004

Siegel

Marcus Link

Die Hauptmerkmale, Zulassungsbedingungen und Auflagen sind in der Anlage enthalten, die Bestandteil der Revision 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 this Revision 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

Prüfschein
Test certificate

Ausgestellt für: Sartorius AG
Issued to: Weender Landstr. 94-108
37075 Göttingen

Prüfgrundlage: EN 45501 (1992), Nr. 8.1, WELMEC-Dokument 2.1 (1997) EWG
In accordance with: Richtlinie 90/384/EWG, OIML R 76-1

Gegenstand: Auswertegerät und Terminal
Indicator and Terminal
Typ: Typ: TN und / and TN-X

Kennnummer: D09-03.13 1. Revision
Serial number: D09-03.13 Revision 1

Datum der Prüfung: 9
Date of Test:

Anzahl der Seiten: 9
Number of pages:

Geschäftszahlen: PTB-1.12-4009190
Reference No.:

Benannte Stelle: 0102
Notified Body:

Im Auftrag
By order

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Siegel
Seal

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

Alternative: Disconnectable connection between indicator and load receptors with strain-gauge load cells:

If there is a junction box between load receptor and electronic evaluation unit the junction box has to be secured against inadmissible manipulation.

Alternative place for the Descriptive Plate of the weighing instrument:
Handling in this case:
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 representative must then seal the ID tag plate to the fastener.

Mark for EC verification (green metrology sticker)
Descriptive plate with CE-conformity
Metrological data: Max, Min and e
Protective mark
Protective mark, only for detachable labels that remain intact

Type weighing instrument: SARTICS  Type indicator: TN
EC type-approval certificate D04-09-015 + Test certificate D09-03.13
Example of descriptive plate of the already verified weighing instrument

SARTORIUS AG GÜTTINGEN Germany
SARTICS
D04-09-015
CE04 011 M
III 11114444

Example of plate with model designation of the terminal

SARTORIUS AG GÜTTINGEN Germany
CW1S1-60FE-NCE (TN)
11114444 D09-03.13

Example of plate with model designation of the platform

SARTORIUS AG GÜTTINGEN Germany
CW1S1-60FE-NCE (CAPS1-60FE-NCE)
11114444 D09-03.13

Example of label with metrological data

$\Delta \Delta 1 \text{ R1 Max 30 kg Min 200 g e}=10 \text{ g}$ $\text{ R2 Max 60 kg Min 400 g e}=10 \text{ g}$

In case of using as an indicating and operator terminal for weighing modules

- The same locations for protective marks are valid at the terminal
- A disconnectable connection between indicating and operator terminal and weighing module needs not to be secured with a protective mark
- For verification the regulations (Protective marks at the weighing module, fixing of the descriptive plate, etc.) of the weighing module have to be disregarded. To connect a weighing module the menu access switch of the Terminal must be set to the "unlocked" position. The serial number of the weighing module is stored in the Terminal and the Terminal is only working with this weighing module. After connecting the weighing module the menu access switch of the Terminal must be set to the "locked" position for verification. The weighing module has its own descriptive plate. The requirements of the approval no. D97-09-018 are valid.
- As well the metrological data of the weighing module have to be attached under the display and have to be secured against manipulation.

Example of label with metrological data for a connected weighing module

$\Delta \Delta 2 \text{ R1 Max 34 kg Min 5 g e}=1 \text{ g d}=0.1 \text{ g}$

Type weighing instrument: SARTICS  Type indicator: TN
EC type-approval certificate D04-09-015 + Test certificate D09-03.13
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When you select “Setup”, the password prompt is displayed for 2 seconds.

The first character of the password flashes.

Entering the password:
- Press (Fn) repeatedly and press (T) to select numbers and press (O) to confirm.
- Press either (Fn) (to scroll through numbers from 0 up to 9) or (P) (to scroll from 9 down to 0) repeatedly until the desired number is displayed.

The password is shown on the display.

Confirm the password entered.

Press and hold (T) (> 2 sec.) Store input and exit the Setup menu.

General password: 40414243

Service password: 202122