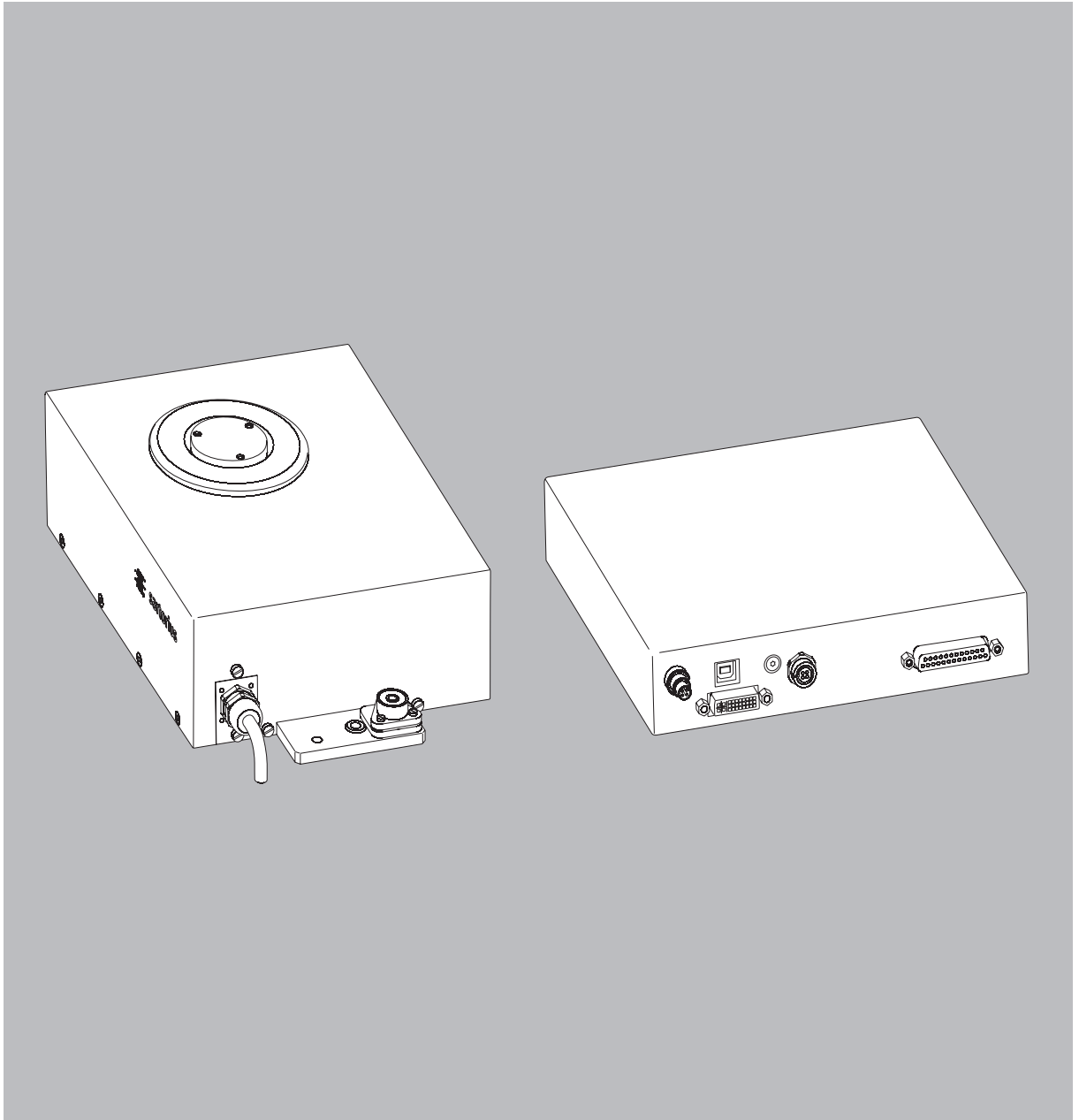


Installation Instructions

# Sartorius Weigh Cell

Model WZA26-HC



|  |    |
|--|----|
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## Intended Use

Weigh cells have been developed for







- Use in measuring devices and production machinery
- High-precision weighing within limited space
- Precise weight determination on active production lines.

## System Description

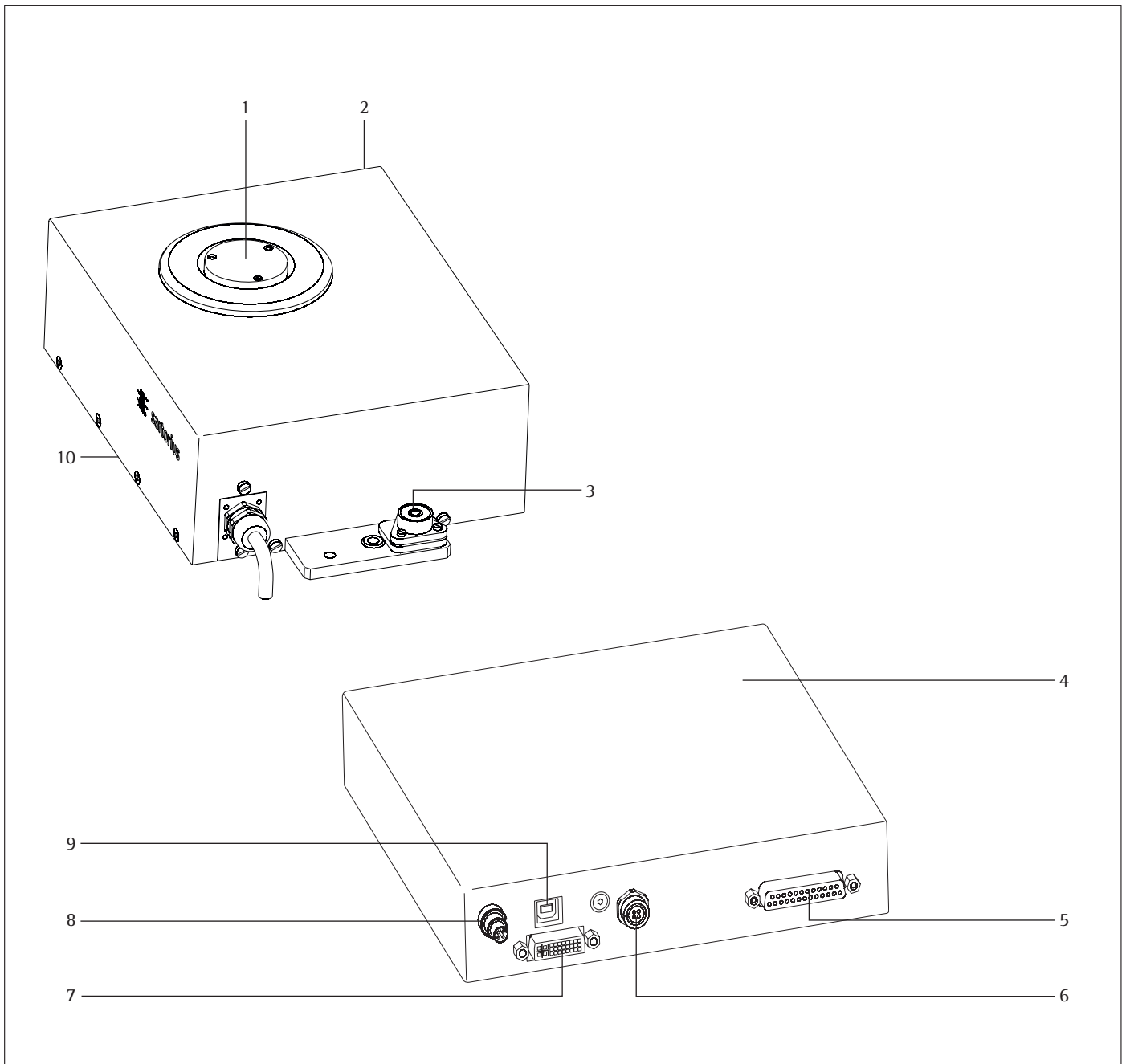
The products are comprised of two components:

- A compact weigh cell that must be secured at three points
- Electronics unit
- These compact weigh cells can be used to determine weights within restricted space.

## Safety


- The user of the weigh cell should take into account at least the following points with regard to the complete product with the installed weigh cell:
    - Compliance with directives and standards for electrical equipment
    - Electromagnetic compatibility of the complete device
    - Compliance with mandatory safety regulations.
  - Read these installation instructions thoroughly before using your weigh cell. That way you will prevent damage to the equipment.
  - These installation instructions only describe the technological specifications of the weigh cell and the conditions that must be observed during installation.
-  Never perform any work on the equipment while it is energized.
- Installation**
-  Do not use this equipment in hazardous areas, zones exposed to explosive gases or dusts, or areas exposed to potentially explosive materials. The equipment must not be exposed to silicone vapors.
-  Use of the weigh cell in areas where medical equipment is operated is not permitted.
-  Do not mix up weigh cell and electronics unit:  
Only connect devices that are made to be operated together. Make sure that the serial numbers match.
-  Any improper handling, modifications or installation work will result in forfeiture of all claims under the warranty.
-  The requirements pertaining to applicable installation regulations must be followed when using electrical equipment in systems and environmental conditions with increased safety requirements.
- Warning when using RS-232 cables purchased from other manufacturers: RS-232 cables purchased from other manufacturers often have incorrect pin assignments for use with Sartorius equipment. Be sure to check the pin assignments against the chart in this manual before connecting cables and disconnect any lines identified as different from those specified by Sartorius.
  - Note on installation:  
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.
  - If there is visible damage to the components: Disconnect from the supply voltage and replace the weigh cell and electronics unit.
  - Do not unnecessarily expose the device to aggressive chemical vapors (e.g. silicone), or to extreme temperatures, moisture, shocks, or vibration.
  - If you have any problems with your device: contact your local Sartorius office, dealer, or service center.

# General View of the Equipment



| No. | Description      |
|-----|------------------|
| 1   | Load receptor    |
| 2   | Weigh cell       |
| 3   | Level indicator  |
| 4   | Electronics unit |
| 5   | Data interface   |

| No. | Description                     |
|-----|---------------------------------|
| 6   | Optional display unit connector |
| 7   | Weigh cell connector            |
| 8   | DC jack                         |
| 9   | USB port for PC connection      |
| 10  | Hook for below-cell weighing    |

 Users should never change any other screws!

# Installation

## Storage and Shipping Conditions

- Once the equipment has been removed from the packaging, it may lose accuracy if subjected to strong vibration.
- Do not expose the equipment to unnecessarily extreme temperatures, moisture, shocks, blows, or vibration.
- It is a good idea to save the box and all parts of the packaging. Only the original packaging provides the best protection for shipment.
- Before packing your equipment for shipping, unplug all connected cables to prevent unnecessary damage.
- Do not exceed gravitational acceleration of  $\approx 300 \text{ m/s}^2$  (without additional superstructure on the load receptor).

## Incoming Inspection

The customer shall inspect the product and packaging immediately upon delivery for proper functioning, completeness, and absence of defects. This is to be performed in an incoming inspection within 10 days of delivery of the product or service. The incoming inspection must take place before the equipment is installed. Any obvious defects, errors, or incorrect delivery must be reported in writing. Defects detected at a later date must be reported in writing immediately upon detection.

Be sure to perform the following as part of the incoming inspection:

- We recommend performing a repeatability test using an auxiliary draft shield to make sure there was no damage during transport. Sartorius PC configuration software can be used as a tool for this.
- ## Equipment supplied
- Weigh cell
  - Electronics unit
  - Installation instructions (this manual)
  - AC adapter
  - Any special accessories as listed on the bill of delivery or in accordance with any customer-specific agreement
- An extension cord (weigh cell – electronics) is not included in the equipment supplied. If required, order separately or follow the notes on creating an extension cord connection.

## Setup Instructions

The weigh cell is delivered in antistatic packaging along with its associated analog electronics.

The other electronic components are packaged separately on a base plate in an antistatic bag.

Before operating, always make sure that the serial numbers of the weigh cell and the electronics match.

The corresponding cable must be securely inserted into the electronics before initial startup.

The device is designed to deliver reliable weighing results when installed properly.

If you have any questions or difficulties when developing your weighing system, please contact the specialists at Sartorius. When designing and setting up your weighing system, please observe the following so that you will be able to work with added speed and accuracy:

- Avoid exposing the equipment to the effects of extremely high temperatures; for example, caused by other electronic components, heaters, or direct sunlight.
- Protect the equipment from direct drafts that come from open windows or doors.
- Avoid exposing the equipment to excessive vibrations during weighing; for example, caused by motors or valves.

- Protect the equipment from aggressive chemical vapors and silicone.
- Do not expose the analyzer to extreme moisture.
- Switch the system to Standby mode when not in use.
- Avoid the effects of magnetism.

⚠ Always calibrate/adjust the weigh cells after transport.

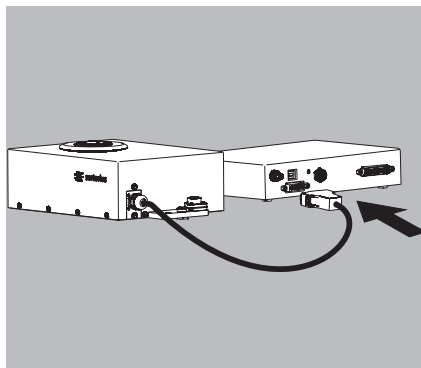
- Equipment installed on the load receptor can interfere with weigh cell functions. The user accepts all liability for production release and the specifications of the entire equipment. The specifications attained by your system may differ from those listed in the "Specifications" Chapter.

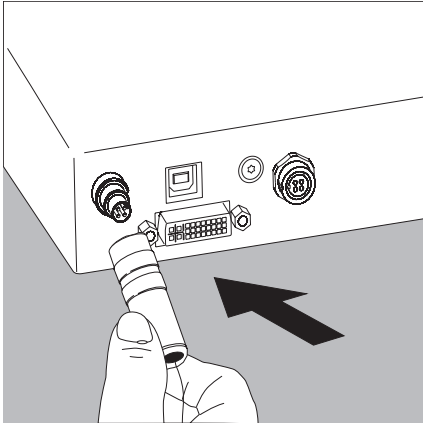
## Conditioning the equipment:

Moisture in the air can condense on the surface of a cold weighing instrument or other device whenever it is moved to a substantially warmer place. If you transfer the equipment to a warmer area, make sure to condition it for about two hours at room temperature, leaving it unplugged from AC power.

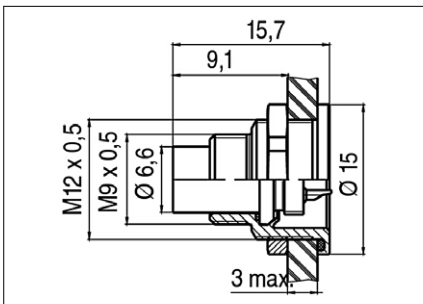
## Connecting the Weigh Cell to the Electronics Unit

- Plug the male connector of the connecting cable into the socket of the electronics unit.





Flange plug:



#### Connecting the Device to AC Power

- Check the voltage rating and the plug design.  
If they do not match your local rating or standard: Contact your supplier
- Use only
  - Genuine AC adapters
  - AC adapters approved by specialist technicians which meet the specifications below
- Insert the DC supply lead plug from the AC adapter into the electronics unit and screw it on.
- Connect the equipment to power:
  - Plug the AC adapter into the wall outlet (mains)
  - Power is supplied through the DC jack.  
If the stated supply voltage or the plug design of the power cord does not comply with your country's standard, please inform the nearest Sartorius representative or your dealer.
  - Using an AC adapter other than that supplied with the equipment:  
The weigh cell can be operated with a DC voltage of 15 V (+15% to -10%).  
The power must be connected in accordance with the regulations applicable in your country.



#### Operation of the evaluation electronics connected to a safety extra-low voltage (SELV) source

##### Safety requirements:

The external power supply must meet the requirements of EN 61010, Part 1, Section 6: Protection Against Shock Current. Please also refer to the specifications for classification of electrically operated equipment in EN 61010-1.

##### Safety precautions:

The power supply must be rated to safety extra low voltage (SELV) or grounded (earthed) safety extra low voltage (SELV-E).  
An adapter rated to Class 2 can be plugged into any wall outlet with no additional safety precautions required. A ground or earth terminal is connected to the housing. The electronics module must be grounded for operation. The data interface is also electrically connected (grounded) to the weigh cell housing.

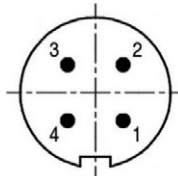
##### EMC requirements:

The connector is designed for DC connections between equipment/systems that are not connected to a DC power supply.  
The cable length must not exceed 3 m.

To use an external power supply, the power source must meet the requirements of EN 61326. The following standards apply:

|                       |               |
|-----------------------|---------------|
| Fast transients       | IEC 61000-4-4 |
| Surge voltages        | IEC 61000-4-5 |
| Conductive HF signals | IEC 61000-4-6 |

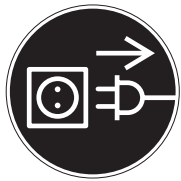
Sizes in mm



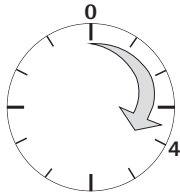
- Pin 1: +15 V
- Pin 2: GND
- Pin 3: internally assigned
- Pin 4: internally assigned

|  |  |
|--|--|
| Built-in connector on electronics unit | Type: Binder 4-pin flange plug 094118004 |
| Socket for the above connector         |  |
| Name:                                  | Female cable connector, 4-pin            |
| Range:                                 | M9                                       |
| Series:                                | 712                                      |
| Order number:                          | 9904100004                               |

<http://www.binder-connector.de/de/rundsteckverbinder/m9rundsteckverbinderip67/67>



- **Connecting Electronic Devices (Peripherals)**  
Make absolutely sure to unplug the weigh cell from AC power before you connect or disconnect a peripheral device (e.g., PC) to or from the data interface.



#### Warm-up Time

The amount of warm-up time required depends in part on the system used. The guideline for these weigh cells is approx. 4 hours. However, this guideline must be verified by the user for the respective system/application.

#### Leveling the Weigh Cell in a Portable Weighing System

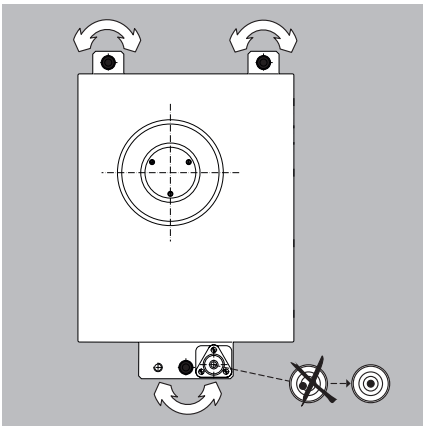
Purpose:

- To compensate for unevenness at the place of installation.
- To ensure that the weigh cell is placed in a perfectly horizontal position for consistently reproducible weighing results.
- Always level the weigh cell again any time after it has been moved to a different location.

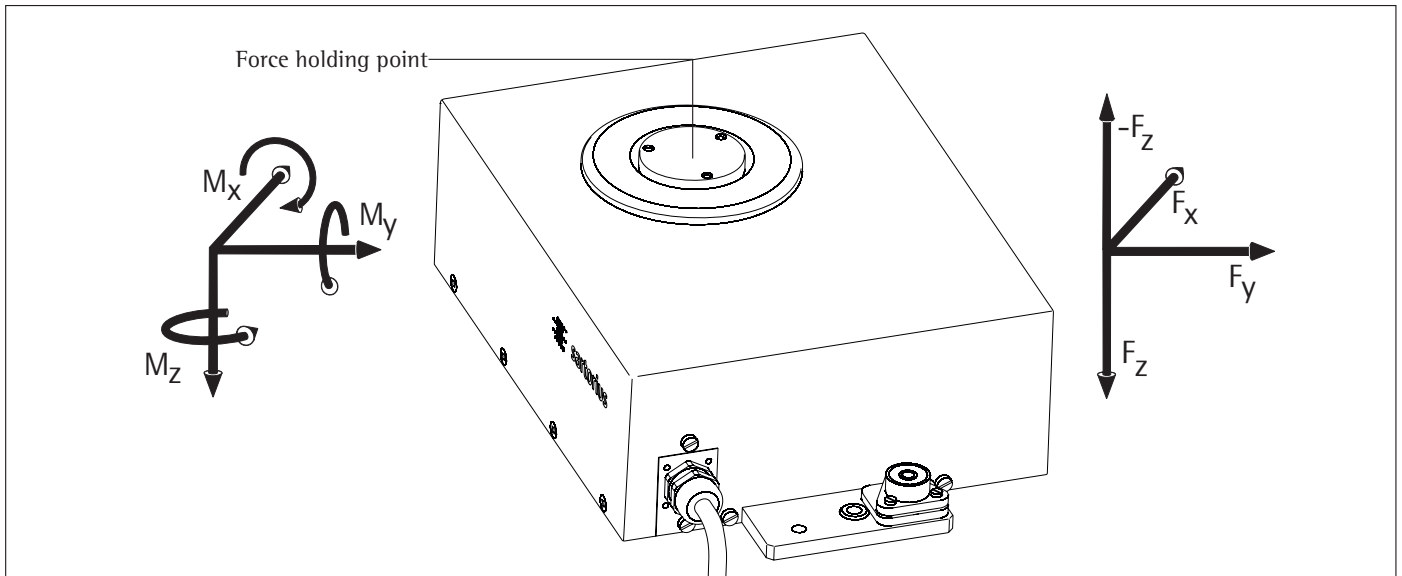
- Adjust the leveling feet until the air bubble is centered within the circle on the level indicator.

or

- The weigh cell should be secured to the system fastening frame via the three threaded holes.



**Maximum permissible load on load receptor:**



| Model    | Max. torque | Torque forces in the thread on the pan | + F <sub>z</sub> | Max. force for below-cell weighing (F <sub>z</sub> ) | Max. forces at force holding point F <sub>x</sub> , F <sub>y</sub> |
|----------|-------------|--|------------------|--|--|
| WZA26-HC | 0.25 Nm     | 0.5 Nm                                 | 10 N             | 1 N*   | 3 N  |

\* Pan not fitted

You can either have the maximum force or the maximum torque. If forces and torque occur simultaneously, then the sum of the percentage loads cannot exceed 100%. Higher loads may result in damage to the weigh cell.

$$1 = F_z / F_{zMax} + M_y / M_{Max}$$

The integrated overload protection only provides protection against forces in direction "z", and not against exceeding the permitted torque.

In general, load receptors should be constructed to be rigid to bending and twisting. We recommend testing to avoid unwanted feedback effects in the control loop. You should also take into account the effects of drafts and observe all instructions for analytical weighing.

# Operation

## Notes on Analytical Weighing with Weigh Cells

### Handling of Samples and Containers

Samples should be acclimatized to the temperature of the weigh cell. This is the only way to avoid measurement errors caused by air buoyancy and fluctuations resulting from convection currents across the surface of the sample.

These negative effects increase as the volume and/or surface area of the sample increases. For this reason, the size of the container should be appropriate for the sample.

Samples and containers should not be touched by the operator's hands. This is because the hygroscopic effect of fingerprints and the effect of the hand's temperature can influence the measurement results.

Samples must be carefully placed on the pan, either manually (using forceps) or automatically (by a robot or filling system).

When designing a draft shield device, steps must be taken to keep the increase in temperature within the weighing chamber to a minimum (e.g., using a bypass).

### Weighing Electrostatically Charged Samples and Containers

Significant measuring errors can occur when electrostatically charged objects are weighed. This problem particularly involves samples that have extremely poor conductivity (glass, plastic, filters) since they can discharge electrostatic – i.e., friction-induced – charges through the weighing pan over a relatively long period of time.

The result is a force acting between the charge on the sample and the permanently installed parts of the weigh cell. This causes the readout to fluctuate constantly.

Ionization can be applied to make the air around the sample conductive. This allows the charge to be compensated through the air, or discharged through the ground (grounded).

Aside from purely mechanical solutions (e.g., using a special weighing pan to shield the sample), bombarding the sample with ions of opposing polarity to neutralize the surface charge is one of the most effective methods for eliminating static electricity. Sartorius can provide ionization devices for installation in weighing systems.

The area around the weigh cell, like plastic parts, can also contain charges that negatively affect the accuracy of weighing results. Appropriate steps (grounding) taken in the design of a draft shield device can counteract such effects.

The weigh cell base plate and the electronics base plate should be grounded via the screw connections.

### Weighing Magnetic or Magnetizable Samples

It is technically impossible to avoid using magnetizable materials for the production of weigh cells. This is primarily because the operating principle of high-resolution weigh cells is based on compensation of the load through magnetic forces.

When weighing magnetic or magnetizable samples or containers, interaction between the sample or container and the above-mentioned parts inside the weigh cell may have a distorting effect on the weighing results.

To keep such effects to a minimum, we recommend increasing the distance between the sample/container and the weighing system using a non-magnetic material. The force is reduced quadratically with the increase in distance.

Magnetizable or magnetized samples and the weigh cell itself interact with magnetic fields and magnetizable or magnetized parts in the area surrounding the weighing system. The system can be shielded from external magnetic fields to some extent using (soft magnetic) plates.

### Effects of Drafts

Depending on the size of the load receptor and the sample, the effects of drafts may occur.

To minimize this effect, install a draft shield for protection.

Protect the weigh cell from drafts.

## Calibration/Adjustment

Calibration/adjustment can be performed as follows:

- Via control commands with Sartorius configuration software CAS-Suite installed on a computer: See page 29 for example

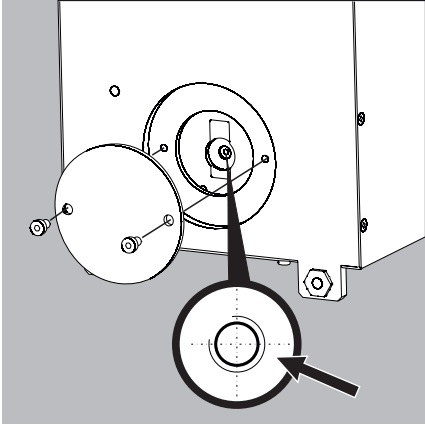
or

- With the optional YAC01CU display and control unit



## Below-Cell Weighing

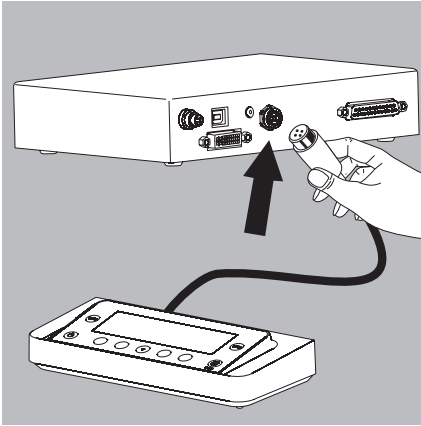
An opening for a below-cell weighing hook is located on the bottom of the weigh cell.



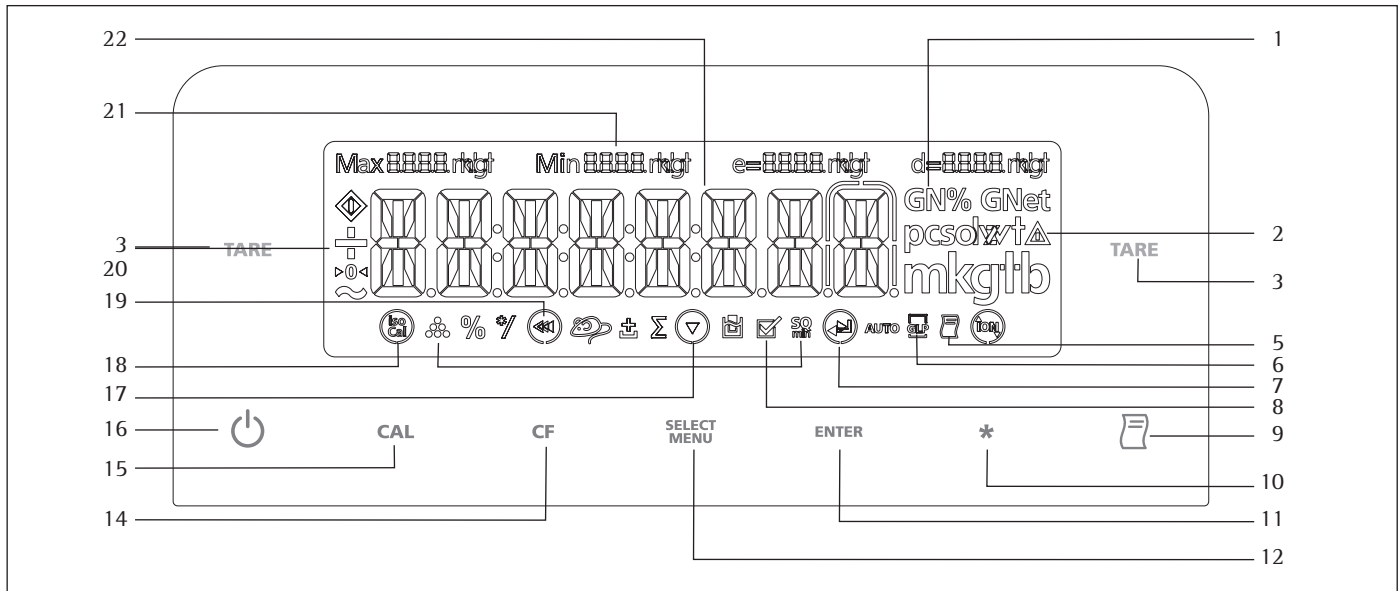
- Carefully install the customer-specific load receptor.  
Threaded fastener for hook: M3  
Maximum torque: max. 0.5 Nm
- ⚠ Screw-in depth: do not exceed 5 mm!
- ⚠ No overload and underweight protection available.
- Install a draft shield if necessary.

# Operation with the Optional YAC01CU Display and Control Unit

## Connecting the Display and Control Unit



Connect display and control unit to the weigh cell electronic unit using cable supplied.



### Overview of Display and Control Panel

| Item | Description   |
|------|---|
| 1    | Weight units  |
| 2    | Calculated-value indicator: not a weight value  |
| 3    | Tare/zero   |
| 5    | Symbol for "Printing mode active"   |
| 8    | Symbol for "Application program active"   |
| 9    | Data output: Press this key to send readout values to the built-in data interfaces.   |
| 10   | Key with no function  |
| 11   | Select next item in a menu level or confirm a menu item.  |
| 12   | Call up menu  |
| 14   | Delete (Clear Function)<br>This key is generally used to cancel functions:<br>- Cancel calibration / adjustment routine / Exit menu |

| Item | Description                                      |
|------|--|
| 15   | Start calibration / adjustment routine           |
| 16   | On / Off   |
| 18   | Symbol: isoCAL Calibration / adjustment function |
| 20   | Symbols for zero range (verified models only)    |
| 21   | Metrological data                                |
| 22   | Weight value displayed in selected weight unit   |

Symbol:


|    |    |  |
|----|----|--|
| 19 | ◀◀ | Exit menu                              |
| 19 | ◀  | Go back to previous menu level         |
| 17 | ▼  | Select menu item                       |
| 7  | ▶  | Select next item in current menu level |
| 7  | ⏵  | Confirm menu item                      |

# Basic Weighing Function


## Characteristics

- Tare the balance
- Printing weights


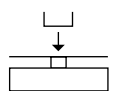
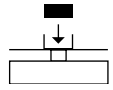

## Preparation

- Switch on the balance: Press the (  ) key
  - Level the balance if necessary
  - Tare the balance if necessary: Press the ( TARE ) key
- Change configuration settings if necessary: See “Configuration Settings” chapter
  - Change factory settings if necessary: see “Configuration Settings” chapter

## Additional Functions:

- Turn balance off: Press the (  ) key

## Quick Guide: First Weighing

| Step   | Press key   | Display/Printout |
|--|---|------------------|
| 1. Switch on the balance<br>Self-test is performed,<br>followed by automatic initial tare function.  | (  )   | 0.0 g            |
| 2. Place container on weighing pan (in this example 11.5 g).<br>Close the draft shield (if available).   |       | + 11.5 g         |
| 3. Tare the balance<br>The balance is tared, the displayed value is zero.  | ( TARE )  | 0.0 g            |
| 4. If required, open the draft shield and carefully place the sample<br>in the container on the weighing pan – in this example: 132 g.<br>Close the draft shield (if available).<br>You can read the measured value as soon as the weight value<br>stops changing and the unit is displayed. |      | + 132.0 g        |
| 5. Press weight value  | (  ) | N + 132.0 g      |

# Configuration (Operating Menu)

## Purpose

The weigh cell is configured at the factory. In Setup, you can configure the weigh cell, i.e. adapt it to individual requirements.

## Characteristics

The weighing parameters are combined into the following groups (1st menu level):

1. Setup: Balance parameters
2. Device Parameters
3. Data Output
4. Application program<sup>1)</sup>
5. Input
6. Information
7. Language Setting

## Factory Settings for the Parameters

Factory-set configurations are marked with "o". **Customer-specific settings can be configured on request.**

## Preparation

- The following operating menu functions can be carried out using the Sartorius configuration software CAS-Suite installed on a PC:
  - Read
  - Change
  - Print
  - Save
- or
- With the optional YAC01CU display and control unit


You can configure the balance; i.e., adapt it to individual requirements.

## Functions of the Keys In the Menu:

| Symbol     | Key                     | Function   |
|------------|-------------------------|--|
| ▼          | (SELECT MENU)           | Set menu item  |
| ▶          | (ENTER)                 | One menu level lower (with cursor right up to 4 menu levels) |
| ↵          | (ENTER)                 | Confirm menu item  |
|            | ( CF ) (Press and hold) | Save settings and exit menu from any position                |
| ◀◀         | ( CF )                  | Save settings and exit menu                                  |
| ◀          | ( CF )                  | One menu level higher (left cursor)                          |
| 2. 3. 1. 1 |                         | Indicates menu level   |

## Menu Navigation

Example: Setting the Language

| Step  | Press key                       | Display / Printout  |
|---|---------------------------------|---|
| 1. <b>Open the menu:</b><br>Display the 1st menu item in the weighing mode                                      | (SELECT MENU) hold              | APPLIC.   |
| 2. Scroll upward within the menu level;<br>After the last menu item, the first item is displayed again (scroll) | multiple times<br>(SELECT MENU) | INPUT<br>...  |
| 3. Select the next menu levels<br>(scrolls to the right)  | Press repeatedly<br>(ENTER)     | ENGLISH °   |
| 5. <b>Change setting:</b><br>Scroll up to the menu item   | (SELECT MENU)                   | GERMAN  |
| 6. <b>Confirm the setting;</b><br>"o" indicates the active menu item  | (ENTER)                         | GERMAN °  |
| 7. Go back to the previous menu level<br>(from menu level 4)  | ( CF )                          | LANGUAGE  |
| ○ Change more menu items if required  | S, (ENTER)                      |   |
| 8. <b>Save setting</b><br>and exit menu   | repeatedly<br>( CF )            |  |
| > Restart the application   |                                 | 0.0 g   |

<sup>1)</sup> The application programs are not available in the weigh cell.

## Menu Structure (Overview)

| Level 1                            | Level 2  | Level 3   | Menu level info             |          |
|------------------------------------|--|---|-----------------------------|----------|
| 1) <b>SETUP</b>                    | <b>BAL.SCALE</b><br>Balance / scale parameters                                       | <b>AMBIENT</b> conditions                             | 1. 1. 1.                    |          |
|                                    |  | <b>APP.FILT.</b> Application filter                   | 1. 1. 2.                    |          |
|                                    |  | <b>STAB.RNG.</b> Stability range                      | 1. 1. 3.                    |          |
|                                    |  | <b>STAB.dly</b> <b>STABILITY</b> delay                | 1. 1. 4.                    |          |
|                                    |  | <b>TARING</b>   | 1. 1. 5.                    |          |
|                                    |  | <b>AUTOZER.</b> Auto zero                             | 1. 1. 6.                    |          |
|                                    |  | <b>WT.UNIT</b> Basic weight unit                      | 1. 1. 7.                    |          |
|                                    |  | <b>DISP.LAY</b> Display accuracy                      | 1. 1. 8.                    |          |
|                                    |  | <b>CAL./ADJ.</b> Function of the ( <b>cal</b> ) key   | 1. 1. 9.                    |          |
|                                    |  | <b>CAL.ROUTINE</b> Calibration/adjustment routine     | 1. 1. 10.                   |          |
|                                    |  | <b>ZERORNG.</b> Zero range                            | 1. 1. 11.                   |          |
|                                    |  | <b>ZERODON</b> Zero at power on                       | 1. 1. 12.                   |          |
|                                    |  | <b>ON.TARE</b> Tare/zero at power on                  | 1. 1. 13.                   |          |
|                                    |  | <b>CYC.RATE</b> Output rate                           | 1. 1. 14.                   |          |
|                                    |  | <b>ISO.CAL</b> Auto calibration/adjustment            | 1. 1. 15.                   |          |
|                                    |  | <b>CAL.EKT.</b> External adjustment                   | 1. 1. 16.                   |          |
|                                    | <b>CAL.UNIT.</b> weight unit for calibration   | 1. 1. 17.   |                             |          |
|                                    | <b>GEN.SERV.</b> General service   | <b>MEN.RESET</b> Factory settings                     | 1. 9. 1.                    |          |
| 2) <b>DEVICE</b>                   | <b>EXTRAS</b><br>(Additional functions)  | <b>MENU</b> Menu read only/can be edited              | 2. 1. 1.                    |          |
|                                    |  | <b>SIGNAL</b> Acoustic signal (beep)                  | 2. 1. 2.                    |          |
|                                    |  | <b>KEYS</b> (Keypad)                                  | 2. 1. 3.                    |          |
|                                    |  | <b>EXT.KEY</b> External switch function               | 2. 1. 4.                    |          |
|                                    |  |   | <b>ONMODE</b> Power-on mode | 2. 1. 6. |
|                                    | <b>PERIPHER.</b><br>(25-pin "Peripherals" interface)                                 | <b>BAT.REC.</b> Communication mode                    | 2. 2. 1./2. 3. 1.           |          |
|                                    |  | <b>BAUD</b> Baud rate                                 | 2. 2. 2./2. 3. 2.           |          |
|                                    | <b>PC-USB</b> (USB port "PC")  | <b>PARITY</b> Parity                                  | 2. 2. 3./2. 3. 3.           |          |
|                                    |  | <b>STOPBIT</b> Number of stop bits                    | 2. 2. 4./2. 3. 4.           |          |
|                                    |  | <b>HANDSHK.</b> Handshake mode                        | 2. 2. 5./2. 3. 5.           |          |
| <b>DATABIT</b> Number of data bits |  | 2. 2. 6./2. 3. 6.                                     |                             |          |
| 3) <b>DATADUT</b><br>(Data output) | <b>COM.SBI</b><br>(PC communication)   | <b>COM.out</b> Communications <b>OUT</b> put          | 3. 1. 1.                    |          |
|                                    |  | <b>STOP</b> Stop automatic output                     | 3. 1. 2.                    |          |
|                                    |  | <b>AUT.CYCL.</b> Time-dependent automatic data output | 3. 1. 3.                    |          |
|                                    |  | <b>FORMAT</b> (Line format)                           | 3. 1. 4.                    |          |
|                                    |  | <b>AUTO.TARE</b> Auto taring after data output        | 3. 1. 5.                    |          |
|                                    | <b>PRINT.PARA</b> Parameters for printing  | <b>RES.</b> Print resolution (manual/automatic)       | 3. 2. 1.                    |          |
|                                    |  | <b>FORMAT</b> Line format for printout                | 3. 2. 2.                    |          |
|                                    |  | <b>PRT.INIT.</b> Printout of appl. parameters         | 3. 2. 3.                    |          |
|                                    |  | <b>GLP ISO/GLP</b> -compliant printout                | 3. 2. 4.                    |          |
|                                    |  | <b>TAR./PRT.</b> Tare bal./balance after ind. print   | 3. 2. 5.                    |          |
|                                    |  | <b>TIME: 12 h/24 h</b>                                | 3. 2. 6.                    |          |
|                                    |  | <b>DATE</b> Date format                               | 3. 2. 7.                    |          |
| 4) <b>APPLICATION</b> programs     | with no function   |   |                             |          |
| 5) <b>INPUT</b>                    | <b>ID.</b> ID input; max. 7 characters   |   | 5. 1.                       |          |
|                                    | <b>DATE</b> Set date   |   | 5. 2.                       |          |
|                                    | <b>TIME</b> Set time   |   | 5. 3.                       |          |
|                                    | <b>PASSWORD</b> Password entry (for service)   |   | 5. 4.                       |          |
|                                    | <b>CAL.WT.</b> Enter weight value  |   | 5. 5.                       |          |
| 6) <b>INFORMATION</b>              | <b>VERSIONNO., SER.NO., MODEL.,</b><br><b>LOADS, KDC VERS, DR.Shield, if OPT.MOD</b> | Display of software version, serial no., model        | 6. 1. to 6. 6.              |          |
| 7) <b>LANGUAGE</b>                 | <b>ENGLISH</b> (factory setting)   |   | 7. 1.                       |          |
|                                    | <b>DEUTSCH</b> German  |   | 7. 2.                       |          |
|                                    | <b>FRANC.</b> (French)   |   | 7. 3.                       |          |
|                                    | <b>ITAL.</b> (Italian)   |   | 7. 4.                       |          |
|                                    | <b>ESPAÑOL</b> (Spanish)   |   | 7. 5.                       |          |
|                                    | <b>РУССКИЙ</b> (Russian)   |   | 7. 6.                       |          |
|                                    | <b>POLSKI</b> (Polish)   |   | 7. 7.                       |          |

## Parameter Settings: Overview

o = Factory setting; ✓ = User defined setting

| Level 1  | Level 2                        | Level 3   | Level 4  | Menu level info |
|----------|--------------------------------|---|--|-----------------|
| 1) SETUP | BAL.SCAL<br>Balance parameters | AMBIENT. Ambient conditions (filter adjustment) | VERY stable  | 1.1.1.1         |
|          |                                |   | o STABLE   | 1.1.1.2         |
|          |                                |   | UNSTABLE   | 1.1.1.3         |
|          |                                |   | VERY unstable  | 1.1.1.4         |
|          |                                | APP.FILT. Application filter                    | o FINAL.RD   | 1.1.2.1         |
|          |                                |   | FILLING  | 1.1.2.2         |
|          |                                |   | REDUCE   | 1.1.2.3         |
|          |                                |   | OFF  | 1.1.2.4         |
|          |                                | STAB.RNG Stability range                        | MAX.ACC. Maximum accuracy (1/4 digit)                            | 1.1.3.1         |
|          |                                |   | VERY ACCURATE (1/2 digit)  | 1.1.3.2         |
|          |                                |   | ACCURATE (1 digit)   | 1.1.3.3         |
|          |                                |   | o FAST (2 digits)  | 1.1.3.4         |
|          |                                |   | VERY FAST (4 digits)   | 1.1.3.5         |
|          |                                |   | MAX.FAST (8 digits)  | 1.1.3.6         |
|          |                                | ST.del. STABILITY delay                         | NO No delay  | 1.1.4.1         |
|          |                                |   | o SHORT  | 1.1.4.2         |
|          |                                |   | AVERAGE  | 1.1.4.3         |
|          |                                |   | LONG   | 1.1.4.4         |
|          |                                | TARE  | WIGST.B. (W/o stability)   | 1.1.5.1         |
|          |                                |   | o WIST.B. (W/o stability)  | 1.1.5.2         |
|          |                                |   | ATSTAB. At stability   | 1.1.5.3         |
|          |                                | AUT.ZERO<br>Autozero                            | o ON Automatic zeroing on  | 1.1.6.1         |
|          |                                |   | OFF Automatic zeroing off  | 1.1.6.2         |
|          |                                | UNIT<br>Basic weight unit                       | Grams  | 1.1.7.1         |
|          |                                |   | o Grams g  | 1.1.7.2         |
|          |                                |   | Kilograms kg   | 1.1.7.3         |
|          |                                |   | Carat ct   | 1.1.7.4         |
|          |                                |   | Pound lb   | 1.1.7.5         |
|          |                                |   | Ounce oz   | 1.1.7.6         |
|          |                                |   | Troy ounces ozt  | 1.1.7.7         |
|          |                                |   | Hong Kong taels tlh  | 1.1.7.8         |
|          |                                |   | Singapore taels tls  | 1.1.7.9         |
|          |                                |   | Taiwanese taels tlt  | 1.1.7.10        |
|          |                                |   | Grains GN  | 1.1.7.11        |
|          |                                |   | Pennyweights dwt   | 1.1.7.12        |
|          |                                |   | Milligrams mg  | 1.1.7.13        |
|          |                                |   | Parts per pound /lb  | 1.1.7.14        |
|          |                                |   | Chinese taels tlc  | 1.1.7.15        |
|          |                                |   | Mommes mom   | 1.1.7.16        |
|          |                                |   | Austrian carats Kt   | 1.1.7.17        |
|          |                                |   | Tola tol   | 1.1.7.18        |
|          |                                |   | Baht bat   | 1.1.7.19        |
|          |                                |   | Mesghal MS   | 1.1.7.20        |
|          |                                |   | Tons t   | 1.1.7.21        |
|          |                                |   | Pound:ounce l/o  | 1.1.7.22        |
|          |                                |   | Newtons N  | 1.1.7.23        |
|          |                                | Micrograms µg                                   | 1.1.7.24   |                 |
|          |                                | DISP.DIG.<br>Display accuracy                   | o ALL  | 1.1.8.1         |
|          |                                |   | LP.ON.OFF (Last digit after load change)                         | 1.1.8.2         |
|          |                                |   | Increment of the measured values one level higher                | 1.1.8.3         |
|          |                                |   | Increment of the measured values two levels higher               | 1.1.8.4         |
|          |                                |   | Increment of the measured values three levels higher             | 1.1.8.5         |
|          |                                |   | DIV. 1 interval  | 1.1.8.6         |
|          |                                |   | MINUS 1 (reduced by 1 digit)                                     | 1.1.8.7         |
|          |                                |   | Resolution by a factor of 10                                     | 1.1.8.14        |
|          |                                |   | Increment of the measured values one level lower                 | 1.1.8.15        |
|          |                                |   | Increment of the measured values two levels lower                | 1.1.8.16        |
|          |                                | CAL.ADJ.<br>Function of (CAL) key               | CAL.EXT. External calibr./adjustment with factory-set weight     | 1.1.9.1         |
|          |                                |   | CAL.EUSR. External calibr./adjustment with user-defined weight   | 1.1.9.3         |
|          |                                |   | o CAL.INT. Internal calibr./adjustment                           | 1.1.9.4         |
|          |                                |   | INT.LIN. Internal linearization (on analytical balances only)    | 1.1.9.5         |
|          |                                |   | LINEXT. External linearization with factory set weights          | 1.1.9.6         |
|          |                                |   | LINUSR. External linearization with user-defined weights         | 1.1.9.7         |
|          |                                |   | SET.PREL. Set the preload  | 1.1.9.8         |
|          |                                |   | DEL.PREL. Delete the preload                                     | 1.1.9.9         |
|          |                                |   | LOCKED (CAL) locked  | 1.1.9.10        |
|          |                                |   | SELECT   | 1.1.9.1.2       |
|          |                                |   | SET.EXT.W. Determine the external adjustment weight for CAL.EUSR | 1.1.9.17        |
|          |                                |   | Determine the internal weight                                    | 1.1.9.1.8       |

| Level 1   | Level 2                                    | Level 3                                 | Level 4   | Menu level info   |
|-----------|--|---|---|---|
|           |  | CAL./ADJ. CALIBRATION/adjustment        | o SEQUENCE Sequence adjustment<br>CAL./ADJ. Adjustment as needed  | 1. 1.10. 1<br>1. 1.10. 2  |
|           |  | ZERORNG. Zero range                     | o 1PERC. 1 percent of max. load<br>o 2PERC. 2 percent of max. load<br>o 5PERC. 5 percent of max. load<br>o 10PERCENT<br>o DEFAULT (factory-set)   | 1. 1.11. 1<br>1. 1.11. 2<br>1. 1.11. 3<br>1. 1.11. 4<br>1. 1.11. 5  |
|           |  | INIT.ZERO Zero at power on              | o DEFAULT (factory-set)<br>o 2PERCENT<br>o 5PERCENT<br>o 10PERCENT<br>o 20PERCENT<br>o 50PERCENT<br>o 100PERCENT  | 1. 1.12. 1<br>1. 1.12. 2<br>1. 1.12. 3<br>1. 1.12. 4<br>1. 1.12. 5<br>1. 1.12. 6<br>1. 1.12. 7  |
|           |  | ONTARE (Tare/zero at power on)          | o ON<br>o OFF   | 1. 1.13. 1<br>1. 1.13. 2  |
|           |  | CYC.RATE Output rate                    | o NORMAL<br>o HIGHVAR. High var. output<br>o SLOW<br>o AVERAGE<br>o FAST<br>o VERY FAST<br>o MAXIMUM  | 1. 1.14. 1<br>1. 1.14. 2<br>1. 1.14. 3<br>1. 1.14. 4<br>1. 1.14. 5<br>1. 1.14. 6<br>1. 1.14. 7  |
|           |  | ISOCAL Autom. calibration/adjustment    | o OFF<br>o NOTE<br>o ON   | 1. 1.15. 1<br>1. 1.15. 2<br>1. 1.15. 3  |
|           |  | CAL.EXT. External calibration           | o FREE Unlocked<br>o LOCKED (blocked)   | 1. 1.16. 1<br>1. 1.16. 2  |
|           |  | CAL.UNIT.unit for calibration weight    | o GRAMS<br>o KILOGR. Kilograms<br>o USER-DEFINE unit (factory setting: pounds)  | 1. 1.17. 1<br>1. 1.17. 2<br>1. 1.17. 4  |
|           | GEN.SERV. General service                  | MEN.RESET Menu reset (factory settings) | o YES Restore factory settings<br>o NO Do not restore factory settings<br>o STANDARD<br>o VERIFIABLE  | 1. 9. 1. 1<br>1. 9. 1. 2<br>1. 9. 1. 3<br>1. 9. 1. 4  |
| 2) DEVICE | EXTRAS (Additional functions)              | MENUS                                   | o CANedit<br>o Rd.only Read only parameters   | 2. 1. 1. 1<br>2. 1. 1. 2  |
|           |  | SIGNAL Acoustic signal                  | o OFF<br>o ON   | 2. 1. 2. 1<br>2. 1. 2. 2  |
|           |  | KEYS (Keypad)                           | o FREE<br>o LOCKED  | 2. 1. 3. 1<br>2. 1. 3. 2  |
|           |  | EXT.KEY External switch function        | o PRINT ( [P] ) key (print)<br>o Z/TARE (TARE) key (tare)<br>o CAL./ADJ. (CAL) key (calibrate)<br>o CF ( CF ) key (go back/exit) ( CF )<br>o ENTER (ENTER) key<br>o DR.SHIELD<br>o IONIZ. ionizer<br>o APPL. key<br>o ASTERISK key( * ) | 2. 1. 4. 1<br>2. 1. 4. 2<br>2. 1. 4. 3<br>2. 1. 4. 5<br>2. 1. 4. 6<br>2. 1. 4. 9<br>2. 1. 4. 10<br>2. 1. 4. 1.1<br>2. 1. 4. 12  |
|           |  | ONMODE Power-on mode                    | o OFF/ON/STB Off/On/Standby<br>o OFF/ON/SO Off/On/Auto Shut-off<br>o ON/STB On/Stand-by<br>o AUTO-ON Automatic on mode  | 2. 1. 6. 1<br>2. 1. 6. 2<br>2. 1. 6. 3<br>2. 1. 6. 4  |
|           | PERIPHER. (25-pin "Peripherals" interface) | DAT.REC. Operating mode                 | o SBI (ASCII) for 25-pin interface 1)<br>o # XBI<br>o OFF   | Periphery/PC USB:<br>2. 2. 1. 1 / 2. 3. 1. 1<br>2. 2. 1. 2 / 2. 3. 1. 2<br>2. 2. 1.10 / 2. 3. 1.10  |
|           | PC-USB ("PC" USB port)                     | BAUD Baud rate                          | o 600<br>o 1200<br>o 2400<br>o 4800<br>o # 9600<br>o 19200 <sup>2)</sup><br>o 38400 <sup>2)</sup><br>o 57600 <sup>2)</sup><br>o 115200 <sup>2)</sup>  | 2. 2. 2. 3 / 2. 3. 2. 3<br>2. 2. 2. 4 / 2. 3. 2. 4<br>2. 2. 2. 5 / 2. 3. 2. 5<br>2. 2. 2. 6 / 2. 3. 2. 6<br>2. 2. 2. 7 / 2. 3. 2. 7<br>2. 2. 2. 8 / 2. 3. 2. 8<br>2. 2. 2. 9 / 2. 3. 2. 9<br>2. 2. 2.10 / 2. 3. 2.10<br>2. 2. 2.11 / 2. 3. 2.11 |

1) Blocked for PC-USB port.  
2) Only one of the two ports can be used.  
# = Factory setting for "PC-USB" port

| Level 1                     | Level 2                        | Level 3  | Level 4  | Menu level info  |
|-----------------------------|--------------------------------|--|--|--|
| 2) DEVICE                   | PERIPHER.<br>PC USB            | PARITY   | o 0DD<br>EVEN<br>NONE  | Periphery/PC USB:<br>2. 2. 3. 3 / 2. 3. 3. 3<br>2. 2. 3. 4 / 2. 3. 3. 4<br>2. 2. 3. 5 / 2. 3. 3. 5 |
|                             |                                | STOPBIT<br>No. of stop bits                              | o 1STOP BIT<br>2STOP BITS  | 2. 2. 4. 1 / 2. 3. 4. 1<br>2. 2. 4. 2 / 2. 3. 4. 2   |
|                             |                                | HANDSHAKE.<br>Handshake mode                             | SOFTWARE<br>o HARDW. hardware<br># NONE  | 2. 2. 5. 1 / 2. 3. 5. 1<br>2. 2. 5. 2 / 2. 3. 5. 2<br>2. 2. 5. 3 / 2. 3. 5. 3                      |
|                             |                                | DATABIT<br>No. of data bits                              | o 7BITS<br># 8BITS   | 2. 2. 6. 1 / 2. 3. 6. 1<br>2. 2. 6. 2 / 2. 3. 6. 2   |
| 3) DATAOUT<br>(Data output) | COMM.SBI<br>(PC communication) | COM.OUTPUT.<br>(Manual/automatic)                        | IN.WID Without stability<br>o IN.AFTER After stability<br>IN.AT At stability<br>AUTO.WID Auto without stability<br>AUT.WITH. Autom. w/ stability | 3. 1. 1. 1<br>3. 1. 1. 2<br>3. 1. 1. 3<br>3. 1. 1. 4<br>3. 1. 1. 5                                 |
|                             |                                | STOPAUT. Stop automatic output                           | o OFF<br>ON  | 3. 1. 2. 1<br>3. 1. 2. 2   |
|                             |                                | AUT.CYCL.<br>Time-dependent automatic data output        | o EVERY<br>2ND VALUE   | 3. 1. 3. 1<br>3. 1. 3. 2   |
|                             |                                | FORMAT (Line format)                                     | o 16CHARS (digit not identified)<br>22CHARS (digit identified)<br>EXTR.LINE (date, time, and weight value)                                       | 3. 1. 4. 1<br>3. 1. 4. 2<br>3. 1. 4. 4   |
|                             |                                | AUTO.TARE<br>Auto taring after data output               | o OFF<br>AUTO TARE ON  | 3. 1. 5. 1<br>3. 1. 5. 2   |
|                             | PRINT.PARA<br>for printing     | RES.olution<br>(manual/auto)                             | MANUAL WITHOUT stability<br>o MAN.AFTER. Autom. w/ stability<br>MAN.AT stability<br>AUTO.LE (autom. at load change)                              | 3. 2. 1. 1<br>3. 2. 1. 2<br>3. 2. 1. 3<br>3. 2. 1. 6   |
|                             |                                | FORMAT Line format for printout                          | 16CHARS (digit not identified)<br>o 22CHARS. (digit identified)<br>EXTR.LINE (date, time, and weight value)                                      | 3. 2. 2. 1<br>3. 2. 2. 2<br>3. 2. 2. 4   |
|                             |                                | PRT.INIT. Printout of application parameters             | OFF<br>o ALL parameters<br>MAINPAR. Main parameters  | 3. 2. 3. 1<br>3. 2. 3. 2<br>3. 2. 3. 3   |
|                             |                                | GLP Printout as ISO/GLP-compliant printout               | o OFF<br>CAL.ADJ.T. For calibration/adjustment only<br>ALWAYS on   | 3. 2. 4. 1<br>3. 2. 4. 2<br>3. 2. 4. 3   |
|                             |                                | TARE./PRT.<br>Tare the balance after individual printout | o OFF<br>ON  | 3. 2. 5. 1<br>3. 2. 5. 2   |
|                             |                                | TIME   | o 24H display<br>12H display "AM/PM"   | 3. 2. 6. 1<br>3. 2. 6. 2   |
|                             |                                | DATE   | o DD.MM.YY -Date Format<br>MMM.DD.YY -Date Format  | 3. 2. 7. 1<br>3. 2. 7. 2   |

# = Factory setting for "PC-USB" port



# Data Interfaces

## Purpose

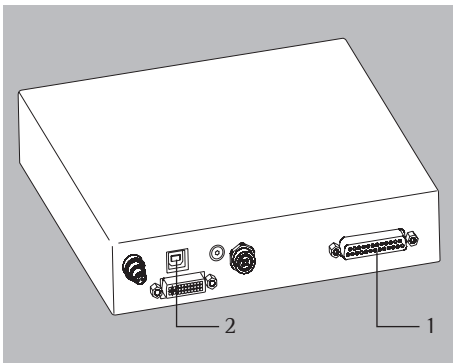
Interfaces are used to exchange data with connected peripheral devices: Measured values and calculated values can be output to a printer or PC; conversely, control commands and data inputs can be sent to connected devices (PC, keyboard, foot switch, barcode scanner).

Each interface has to be configured according to the peripheral device and desired function. No error messages are generated when no devices are connected to an interface (open data interface).

## Characteristics

The weigh cell has at least two interfaces:

- 1 Peripheral connection (25-pin interface)
- 2 USB port for PC connection



## Protocols

For data exchange, the interfaces are configured with the following protocols:

- **SBI** (Sartorius Balance Interface): Sartorius standard protocol for connection to a PC or control unit. This simple ASCII-based protocol allows you to use ESC commands from your PC to control the basic weighing functions (only via 25-pin interface).
- **xBPI** (eXtended Balance Processor Interface, also known as X-Bus): Binary protocol with extended scope of commands. This protocol lets you control numerous weighing functions. For further information on this, please contact Sartorius.  
To use the protocols, application software must be installed on the PC.

## Synchronization

During data communication between balance and PC, messages consisting of ASCII or binary characters are transmitted via the interface. For error-free data exchange, parameters for baud rate, parity, handshake mode, and character format must be identical for both units.

You can configure the respective settings in System Settings (menu). In addition to these settings, data output for the balance can also be made dependent on several conditions that are defined in the individual tasks. These conditions are described under each of the tasks.

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## USB Port (PC Connection)

**Purpose** The weigh cell can be connected to a PC equipped with a USB port. A virtual serial interface (virtual COM port, VCP) is set up as a device type at the PC's USB port. This virtual serial interface is identified and operated by the application program.

The protocol xBPI can be transmitted via the USB port.



The USB port is designed for the laboratory environment and is not suitable for use in rough industrial environments. Full IP protection is only guaranteed when the USB cover is closed.

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**System requirements**

- Computer (PC) with Windows 98SE®, Windows ME®, Windows 2000®, Windows XP® or more recent versions
- Available USB port on the PC
- USB cable

**Software Driver and Installation Guides** The VCP driver, used to set up the virtual interface on the computer, can be downloaded online:  
<http://www.ftdichip.com/FTDrivers.htm>

The installation guides for the drivers can be found at  
<http://www.ftdichip.com/Documents/InstallGuides.htm>

### Connecting the Balance via USB

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The current USB port for the computer is established when the software driver is installed. The driver must be re-installed every time you wish to change the port. Therefore, choose one USB port that can permanently or regularly be used to connect the balance.

---

- ▶ Switch off the balance.
- ▶ Unplug the balance from the mains.
- ▶ Connect the USB cable to the balance and to the USB port on the computer.
- ▶ Plug the balance into the mains again and switch it on.
- ▷ Windows detects the device connected to the USB port.  
If the device is being connected for the first time, the Windows Installation Wizard will run.

### Installing Software Drivers

- ▶ Run the Installation Wizard for the driver.
- ▶ Follow the instructions that appear.
- ▶ To complete the installation, click on **Finish**.
- ▷ The virtual interface is now ready for operation.

Windows® usually adds the virtual interface in the position following your highest-numbered COM port.

**Example:** For a PC with up to four COM ports, the new virtual interface would then be COM5 (see Device Manager).

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**Installation Instructions for Windows XP® and above**  
Changing Ports If the USB port is used with a program that limits the number of COM ports (e.g., COM1, COM2, COM3, and COM4 only), you may have to assign one of these port numbers to the new virtual interface.

- ▶ Open the settings for the **USB serial port** in the Windows® Control Panel:
  - START > My Computer > Control Panel
  - System > Hardware > Device Manager

- ▶ Open the **Connections** submenu.

- ▶ Double-click on **USB Serial Port**.

- ▶ Select **Port Settings > Advanced**.

Changing Latency ▶ Open the settings for the USB serial port, following the above instructions.

- ▶ For a faster rate of communication, change the setting for the **latency timer** to 1 msec.

Plug & Play Mode in Auto Print (SBI) ▶ Open the settings for the USB serial port, following the above instructions.

- ▶ Stop the **Plug & Play mode** from running.

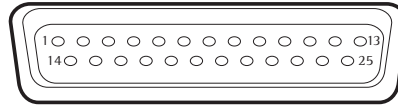
#### **Uninstalling the Driver**

The software driver for the USB connection can be uninstalled with the Windows® Uninstaller.

# Pin Assignment Chart

## "Peripherals" Interface and Optional RS-232 Interface (25-pin)

### Interface Socket:



### Pin Assignment Chart, 25-pin, RS-232:

|         |                           |  |
|---------|---------------------------|--|
| Pin 1:  | Shield                    |  |
| Pin 2:  | Data output (TxD)         |  |
| Pin 3:  | Data input (RxD)          |  |
| Pin 4:  | Internal ground (GND)     |  |
| Pin 5:  | Clear to send (CTS)       |  |
| Pin 6:  | Not assigned              |  |
| Pin 7:  | Internal ground (GND)     |  |
| Pin 8:  | Internal ground (GND)     |  |
| Pin 9:  | Not assigned              |  |
| Pin 10: | Not assigned              |  |
| Pin 11: | +12 V output              |  |
| Pin 12: | Reset_Out 1)              |  |
| Pin 13: | + 5 V output              |  |
| Pin 14: | Internal ground (GND)     |  |
| Pin 15: | Universal remote switch   |  |
| Pin 16: | Internally assigned       |  |
| Pin 17: | Internally assigned       |  |
| Pin 18: | Internally assigned       |  |
| Pin 19: | Internally assigned       |  |
| Pin 20: | Data Terminal Ready (DTR) |  |
| Pin 21: | No function               |  |
| Pin 22: | No function               |  |
| Pin 23: | No function               |  |
| Pin 24: | No function               |  |
| Pin 25: | + 5 V output              |  |

Connection  
for switch 2)

1) = Hardware restart

2) = External switch function can be programmed via device:

"Setup" menu item: *EXTRAS* : *EXT.key* (2.1.4.x)

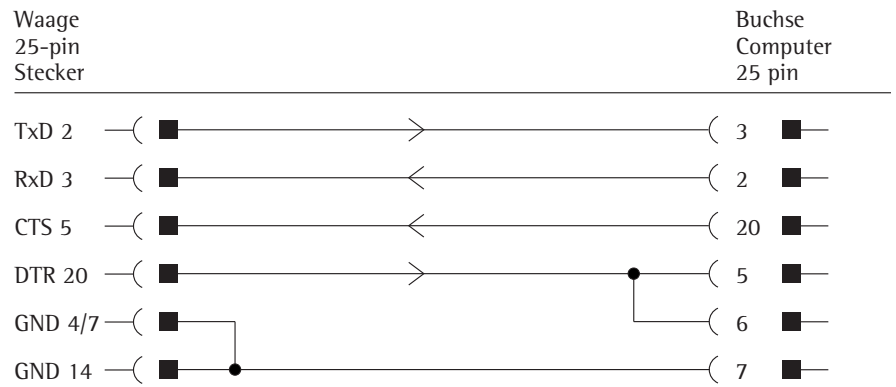
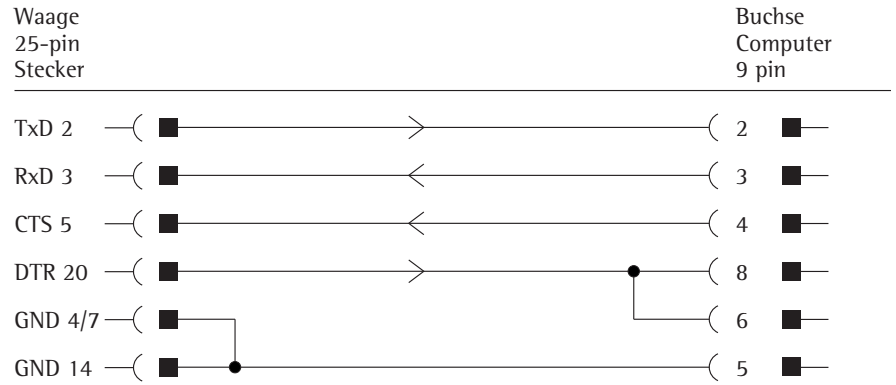
### Preparation

You can set these parameters for the connected device in the Setup menu:  
see "Configuration".

# Cabling Diagram

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


**Do not assign any other pins on this balance!**




Cable type: AWG 24 specification

## Data Output

You can define the data output parameter so that output is activated either when a print command is received or automatically synchronized with the display or at defined intervals (see application programs and autoprnt settings).

Data Output following Print Command The print command can be transmitted by pressing the (  ) key or by a software command (EscP).

Automatic Data Output In **Autoprnt** mode, data is output to the data interface port without an extra print command. You can have synchronized data output automatically at defined display update intervals, with or without the stability parameter. The interval time depends on the balance operating status and balance type.

If the automatic data output is activated in the Device Configuration, it starts immediately after the balance is turned on. You can also configure whether the automatic data output can be stopped and started with the (  ) key.

## Data Output Formats

You can output the values displayed in the line for measured values and weight units with or without an ID code. Configure this output parameter in the Device Parameters menu (Menu > Device parameters > Configure data output > Line format).

Example: Output without Identification + 253 pcs 16 characters are output

Example: Output with Identification Q n t + 253 pcs 22 characters are output

### Data Output Format with 16 Characters

Display characters that are not activated are output as spaces.

The type of character that can be output depends on the character's position:

| Position | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|----------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
|          | + |   |   | A | A | A | A | A | A | A  | *  | E  | E  | E  | CR | LF |
| or       | - |   | . | . | . | . | . | . | . | .  |    | *  | *  | *  |    |    |
| or       | * | * | * | * | * | * | * | * | * | *  |    |    |    |    |    |    |

\*: Space CR: Carriage return  
 A: Display characters LF: Line feed  
 E: Unit characters .: Decimal point

### Special Outputs

| Position | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|----------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
|          | * | * | * | * | * | * | * | * | * | *  | *  | *  | *  | *  | CR | LF |
| or       |   |   |   |   |   |   | H | i | g | h  |    |    |    |    |    |    |
| or       |   |   |   |   |   |   | L | o | w |    |    |    |    |    |    |    |
| or       |   |   |   | C | a | l | . | E | x | t  | .  |    |    |    |    |    |

\*: Space High: Overload  
 Cal. Ext.: External adjustment Low: Underweight

### Error message

| Position | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10              | 11 | 12 | 13 | 14 | 15 | 16 |
|----------|---|---|---|---|---|---|---|---|---|-----------------|----|----|----|----|----|----|
|          |   |   |   | E | r | r | * | # | # | #               | *  | *  | *  | *  | CR | LF |
|          |   |   |   | A | P | P | . | E | R | R <sup>1)</sup> | *  | *  | *  | *  | CR | LF |
|          |   |   |   | D | l | S | . | E | R | R <sup>1)</sup> | *  | *  | *  | *  | CR | LF |
|          |   |   |   | P | R | T | . | E | R | R <sup>1)</sup> | *  | *  | *  | *  | CR | LF |

\*: Space ###: Error number

<sup>1)</sup> For cause and solution, please refer to the "Troubleshooting Guide"

Example: Output of the weight value + 123.56 g

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

- Position 1: Plus or minus sign or space
- Position 2: Space
- Position 3-10: Weight value with decimal point; leading zeros are output as spaces
- Position 11: Space
- Position 12-14: Characters for unit of measure or space
- Position 15: Carriage return
- Position 16: Line feed

**Data Output Format with 22 Characters**

In this case, the 6-character code precedes the 16-character string described above. These six characters identify the subsequent value.

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| K | K | K | K | K | K | + | * | A | A  | A  | A  | A  | A  | A  | A  | *  | E  | E  | E  | CR | LF |
|   | * | * | * | * | * | - | . | . | .  | .  | .  | .  | .  | .  | .  | *  | *  | *  |    |    |    |
|   |   |   |   |   |   | * | * | * | *  | *  | *  | *  | *  | *  | *  |    |    |    |    |    |    |

- K: ID code character
- \*: Space
- A: Display characters
- E: Unit character
- CR: Carriage return
- LF: Line feed

Example:

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| N |   |   |   |   |   | + |   | 1 | 2  | 3  | .  | 5  | 6  | *  | g  | *  | *  |    |    | CR | LF |

SBI Setting:

In the "SBI" setting (code 1. 5. 6. 1), the non-verified display digit is not automatically identified. Corresponding measures or settings must be carried out on the peripheral device.

**Special Outputs**

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |    |
| S | t | a | t | * | * | * | * | * | *  | *  | *  | *  | *  | *  | *  | *  | *  | *  | *  | *  | CR | LF |
|   |   |   |   |   |   |   |   |   |    |    | H  | i  | g  | h  |    |    |    |    |    |    |    |    |
|   |   |   |   |   |   |   |   |   |    |    | L  | o  | w  |    |    |    |    |    |    |    |    |    |
|   |   |   |   |   |   |   |   |   |    |    | C  | a  | l  | .  | E  | x  | t  | .  |    |    |    |    |

- \*: Space
- Cal. Ext.: External adjustment
- High: Overload
- Low: Underweight

Error message

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|------|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16   | 17 | 18 | 19 | 20 | 21 | 22 |
| S | t | a | t | * | * | * | * | * | E  | R  | R  | *  | #  | #  | #    | *  | *  | *  | *  | CR | LF |
| S | t | a | t | * | * | * | * | * | A  | P  | P  | .  | E  | R  | R 1) | *  | *  | *  | *  | CR | LF |
| S | t | a | t | * | * | * | * | * | D  | l  | S  | .  | E  | R  | R 1) | *  | *  | *  | *  | CR | LF |
| S | t | a | t | * | * | * | * | * | P  | R  | T  | .  | E  | R  | R 1) | *  | *  | *  | *  | CR | LF |

- \*: Space
- # # #: Error number

1) For cause and solution, please refer to the "Troubleshooting Guide"

**Data Output Rates – Values per Second**

|  |                       |     |
|--|-----------------------|-----|
| Ambient conditions (filter adjustment) | XBPI/ SBI "Autoprint" |     |
| Very stable (1.1.1.1)                  | 10                    | 10  |
| Stable (1.1.1.2)                       | 5                     | 5   |
| Unstable (1.1.1.3)                     | 2.5                   | 2.5 |
| Very unstable (1.1.1.4)                | 2.5                   | 2.5 |

---

## Data Input (Compatibility with Current Weigh Cells)

### SBI Commands (Data Input Format)

The computer connected via the data interface can send control commands to the balance to control balance and application program functions.

These control commands may have different formats and contain up to 20 characters. Each of these characters must be sent based on the setup configuration for data transmission.

#### Formats for Control Commands (Syntax)

Format 1: Esc ! CR LF

---

Format 2: Esc ! # \_ CR LF

---

Esc: Escape  
!: Command character  
#: Number  
&: Parameter (number or letter)  
\_: Underscore (ASCII: 95)  
CR: Carriage return (optional)  
LF: Line feed (optional)

#### Examples:

Format 1: Esc P

Format 2: Esc x1\_



## Overview of SBI Commands

| Format | Comment | Action/Function   | Note   |
|--------|---------|---|--|
| 1      | ESC P   | Print at the interface sending the print request<br>According to menu settings;<br>with/without stability |  |
| 1      | ESC T   | “TARE” key; taring and zeroing  |  |
| 1      | ESC K   | Filter “Very stable conditions”   |  |
| 1      | ESC L   | Filter “Stable conditions”  |  |
| 1      | ESC M   | Filter “Unstable conditions”  |  |
| 1      | ESC N   | Filter “Very unstable conditions”   |  |
| 1      | ESC O   | Lock keypad   |  |
| 1      | ESC Q   | Acoustic signal   |  |
| 1      | ESC R   | Unlock keypad   |  |
| 1      | ESC S   | Restart   |  |
| 1      | ESC U   | Taring  |  |
| 1      | ESC V   | Zeroing   |  |
| 1      | ESC W   | Ext. Adjustment with standard weight  | According to menu settings;<br>1/2 step increments |
| 1      | ESC Z   | Internal adjustment   | According to menu settings;<br>1/2 step increments |
| 2      | ESC f0_ | ( <small>SELECT</small><br><small>MENU</small> ) key  |  |
| 2      | ESC f1_ | Start adjustment  |  |
| 2      | ESC f2_ | ( <small>ENTER</small> ) key  |  |
| 2      | ESC kP_ | Print as with “PRINT” key<br>(e.g., at multiple interfaces)   |  |
| 2      | ESC s3_ | ( <small>CF</small> ) key: Go back, exit, cancel  |  |
| 2      | ESC x1_ | Print model type  |  |
| 2      | ESC x2_ | Print serial no.  |  |
| 2      | ESC x3_ | Print software version  |  |

---

## Example: "Calibration/Adjustment" Function via RS-232 Interface

### Purpose

Calibration is the determination of any difference between the measured value displayed and the true weight (mass) of a sample. Adjustment is the correction of this difference, or its reduction to a suitable level within maximum permissible error limits.

### Characteristics

The adjustment procedure should only be started when

- The weigh cell is not loaded
- The weigh cell is tared
- The weighing signal is stable
  
- The sensitivity of the balance can be corrected by max. 2%.

If these criteria are not met, error message "ERR02" appears.

### Error message "ERR02":

- Note ambient conditions
- Weigh cell needs stability
- If necessary, change the pre-configured balance parameters:  
Select Ambient conditions menu item 1.1.1.4 (very unstable) or execute interface command ESC N

Adjustment can be made using different weight units:

`CAL.UNIT > GRAM, KILOGR.`

### Internal Calibration/Adjustment

In the menu, the item `CAL/ADJ.-CAL.INT.` must be set.

The weigh cell housing has a built-in motorized calibration weight.

- Select calibration/adjustment: Command ESC Z
- > The internal calibration weight is applied automatically
- > The balance is adjusted/calibrated
- > The internal calibration weight is removed

## Internal Calibration/Adjustment

Default setting:  
 SETUP - BAL.SCAL. - CAL.JUST. - CAL.INT.

The weigh cell housing has a built-in motorized calibration/adjustment weight.

- Select calibration: Command ESC Z
- > The internal calibration weight is automatically loaded
- > The balance is calibrated
- > When the setup is configured to “Calibration and adjustment in one,” the balance will be adjusted automatically
- > The internal calibration weight is removed

### Performing Calibration and Adjustment Routines

- The following settings can be configured:
- Always perform calibration and adjustment in one routine (factory setting)
  - After calibration, the user has the option to quit the routine without correction or to adjust the balance.

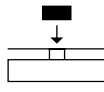
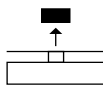
If no deviations are found during calibration, the calibration/adjustment routine can be exited after the calibration is completed. Two keys are now active:

- Start the adjustment: Command ESC f1\_
- Exit the routine: Command ESC f3\_

| Step                                       | Execute interface command | Display/Output                          |
|--|---------------------------|---|
| 1. Tare balance                            | ESC T                     | 0.0000 g                                |
| 2. Start adjustment routine                | ESC Z                     | CAL.INT.<br><br>CAL.RUN.<br><br>CAL.END |
| 3. Calibration/adjustment executed         |                           |   |
| 4. Internal weight is removed from balance |                           | 0.0000 g                                |

## External Calibration

Default setting:  
 SETUP - BAL.SCAL. - CAL.JUST. - CAL.EXT.  
 The required calibration weight is configured at the factory (see “Specifications”).

| Step Display/Output   | Execute interface command |   |
|---|---------------------------|---|
| 1. Tare balance   | ESC T                     | 0.0000 g  |
| 2. Start adjustment routine   | ESC W                     | CAL.EXT.<br><br>- 50.0000 g   |
| 3. Place displayed calibration weight on balance (in this example: 50 g).<br>Weight too low: a minus sign “-” is shown<br>Weight too high: a plus sign “+” is shown |                           | 50.0000 g   |
|   |                           |    |
|   |                           | The display stops flashing as soon as the weight value is within the defined limit.   |
| 4. Adjustment carried out; adjustment weight is displayed   |                           | + 50.0000 g   |
| 5. Remove the adjustment weight   |                           | 50.0000 g   |
|   |                           |  |

# Error Messages

Error codes are shown on the main display for approx. 2 seconds. The program then returns automatically to the previous mode.

| Display  | Cause   | Solution  |
|--|---|---|
| HIGH or ERR 55   | Weighing capacity exceeded  | Unload the weighing pan   |
| LOW or ERR 54  | Contact between load plate and environment;<br>load on weighing pan too light   | Weighing pan must not be in contact with surrounding parts  |
| APP.ERR.   | Cannot store data:<br>Load on weighing pan too light or no sample on pan while application is active                      | Increase load   |
| DIS.ERR.   | Data output not compatible with output format   | Set the correct output format in the menu   |
| PRT.ERR.   | Data interface for printout locked  | Reset menu factory settings<br>or<br>contact Sartorius Service.   |
| ERR 02   | Calibration parameter not met,<br>e.g.:<br>– Unstable<br>– Tare<br>– Load on weighing pan                                 | Correct the setup conditions<br>Calibrate only when zero is displayed<br>Unload the balance/scale               |
| ERR 10   | “Tare” function is locked with active<br>“Net Total” application program;<br>Only one tare function can be used at a time | Can only be run again after clearing the tare memory via the “Tare” function                                    |
| ERR 11   | Tare memory not allowed   | Carry out “Tare” function   |
| ERR 03   | Zero point error at the end of calibration  | Check installation conditions, observe warm-up time<br>repeat calibration                                       |
| ERR 06   | Int. calibration weight faulty or not available   | Contact Sartorius Service   |
| ERR 08 <> Zero range*  | Error during zeroing (value outside 2%)   | Change process  |
| ERR 09 < 0 not allowed*  | Error during taring (tare value ≤ 0)  | Change process  |
| ERR 19 Preload is too high                                     | The preload to be applied is too high   | Change the preload value  |
| ERR 30   | Balance/scale is in BPI mode  | Use service-tool and built-in “Close”<br>function   |
| ERR 50 or 53   | TC converter failure  | Contact Sartorius Service   |
| ERR 241  | Checksum error  | Contact Sartorius Service   |
| ERR 243  | Checksum error  | Carry out menu reset  |
| ERR 245 or 247   | Checksum error  | Calibrate/adjust balance/scale  |
| ERR 249  | Checksum error  | Contact Sartorius Service   |
| Weight readout changes constantly                              | Unstable setup location<br>(excessive vibration or draft)<br>Foreign body between weighing pan<br>and housing             | Change setup location<br>Adjust Setup configuration<br>Remove foreign body                                      |
| The weight readout is obviously wrong                          | The balance was not calibrated/adjusted<br>Balance not tared before weighing  | Calibrate/adjust the balance<br>Tare or zero the balance before weighing  |
| No weighing data is output via the serial interface (ERR 294). | First connection of an optional YACO1 display and control unit...   | 1) Move the lock switch back and forth (position see page 3 et seqq.)<br>2) Switch power off and then on again. |

\* = can only occur during operation via the SBI interface (ESC f3\_/f4)

**If any other errors occur, contact your local Sartorius Service Center.**

**Web address:** <http://www.sartorius.com>

## Shipping

### Returning the Device and Parts

**Defective devices or parts can be sent back to Sartorius. Returned devices must be clean, decontaminated, and properly packed. Transport damage as well as measures for subsequent cleaning and disinfection of the device or parts by Sartorius shall be charged to sender.**

- Decommission the device.
- Contact Sartorius Service for instructions on how to return devices or parts (please refer to [www.sartorius.com](http://www.sartorius.com)).
- Pack the device and its parts properly for return.

## Disposal

### Information on Decontamination

The device does not contain any hazardous materials that would necessitate special disposal measures. Contaminated samples used during the process that could cause biological or chemical hazards are potentially hazardous materials.

If the device has come into contact with hazardous substances: Steps must be taken to ensure proper decontamination and declaration. The operator is responsible for adhering to local government regulations on the proper declaration for transport and disposal and the proper disposal of the device.

### Disassembly

- Remove the weigh cell from the system.

### Disposing of the Device and Parts

**The device and the device accessories must be disposed of properly by disposal facilities. The packaging is made of environmentally friendly materials that can be used as secondary raw materials.**

- Dispose of the device. Follow the disposal instructions on our website ([www.sartorius.com](http://www.sartorius.com)).
- Dispose of the packaging in accordance with local government regulations.

# Technical Data

| Model   | WZA26-HC                  |   |
|---|---------------------------|---|
| Technology  | EMC                       |   |
| Weighing capacity                                   | g                         | 20  |
| Readability   | µg                        | 1   |
| Required preload on the load receptor <sup>2)</sup> | g                         | 12.5  |
| Tare range (subtractive)                            | g                         | Over entire weighing range                  |
| Reproducibility (standard deviation) <sup>1)</sup>  | <±µg                      | 2   |
| Linearity deviation                                 | <±µg                      | 20  |
| Measurement time <sup>3)</sup>                      | s                         | 1.8 at<br>≤±1 µg                            |
| Adaptation to operating and installation conditions | 4 optimized filter levels |   |
| Operating temperature range                         | °C                        | +10 to +30°C                                |
| Permissible ambient operating temperature           | °C                        | +5 to +40°C                                 |
| Sensitivity drift within +10... +30°C               | <±/K                      | 1 · 10 <sup>-6</sup>                        |
| External adjustment weight (min. accuracy class)    | g                         | 5 (E2)                                      |
| Net weight approx.                                  | kg                        | 2.25  |
| Power supply  | VDC                       | 15 V (+15% to -10%) via AC adapter 69 71987 |
| Ripple 50/60 Hz                                     | VDC                       | 0,1 Vpp (peak-peak)                         |
| Power consumption                                   |                           | Typically 3.75 W<br>max. 7 W                |

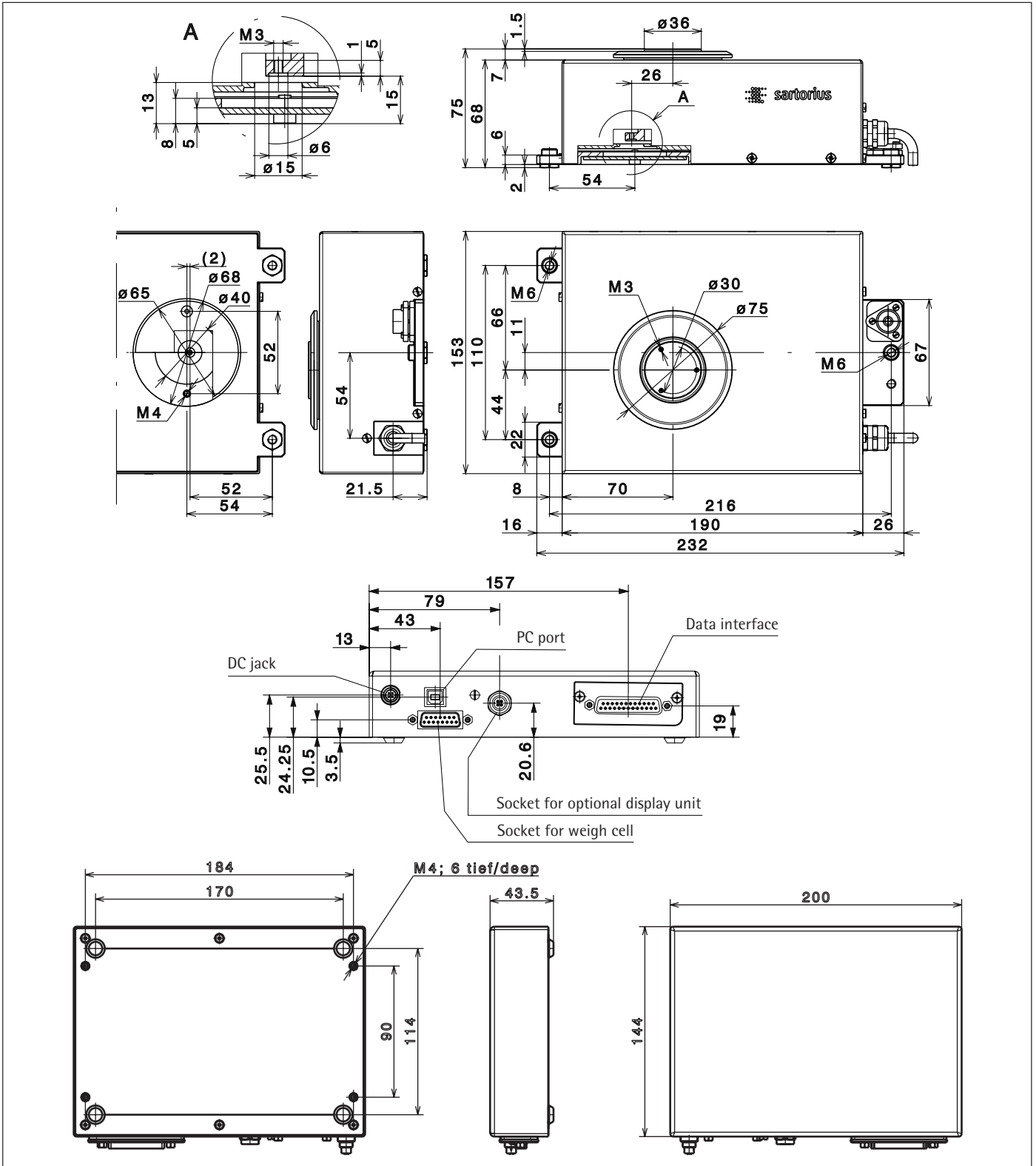
<sup>1)</sup> = Depends on system design

<sup>2)</sup> = The preload can be set using the Sartorius CAS Suite software. Greater preloads are possible, but reduce the weighing capacity.

<sup>3)</sup> = The measurement time is the time period in which the measured value oscillates within a range of ±3x the standard range of the static end value.  
Test weight approx. 25% of max.

## Dimensions (Scale Drawings)

Weigh Cell Model:  
WZA26-HC



All dimensions are given in millimeters

## Accessories

| Item   | Order No.              |
|--|------------------------|
| Display and control unit with cable (0.9 m) for connection to electronics unit   | YAC01CU                |
| Configuration software for settings, calibration/adjustment, and setting the preload   | Sartorius CAS-Suite    |
| SartoConnect data transfer software (for loading weight values onto a PC running Windows® 95/98/NT and directly processing them with application programs such as Excel, Access, etc.) incl. adapter cable (1.5 m) for connecting weigh cell to PC (12-pin/9-pin). | YSC011                 |
| Connection cable for connecting the weigh cell via the 25-pin D-sub socket to a PC with USB port   | YCC01-USBM2            |
| Data cables RS-232:  |                        |
| - for PC connection, 25-pin  | 7357312                |
| - for PC connection, 9-pin   | 7357314                |
| AC adapter   |                        |
| IP40 protection in accordance with DIN VDE 0470/529* plus respective mains supply:   | 6971987                |
|  | 6900900 (Europe)       |
|  | 6900901 (US/Canada)    |
|  | 6971945 (UK)           |
|  | 6971980 (Denmark)      |
|  | 6900905 (Australia)    |
|  | 6900902 (South Africa) |
|  | 6971776 (Italy)        |
|  | 6971975 (Israel)       |

Additional options and accessories available on request.

\* VDE = Verband der Elektrotechnik, Elektronik, Informationstechnik  
(German Association for Electrical, Electronic & Information Technologies)





Original

## EU Declaration of Conformity



**sartorius**

Manufacturer **Sartorius Lab Instruments GmbH & Co. KG**  
37070 Goettingen, Germany

declares under sole responsibility that the partly completed machinery

Device type **Weighing cell + display unit**

Type series **WZAa-b + YAC01c; WZV1.5SE**  
a= 25, 26, 224, 245, 523, 614, 1203, 8202; b = N, NC, ND, HC; c = CU, ED

in the form as delivered fulfils all the relevant provisions of the following European Directives  
2014/30/EU  
2011/65/EU

based on harmonized European Standards (including any amendments valid at the time this declaration was signed):

EN 61326-1:2013  
EN 50581:2012

## Declaration of Incorporation

(Machinery Directive 2006/42/EC)

In addition to the above information, the manufacturer declares:

Person authorised to compile the technical file:

Sartorius Lab Instruments GmbH & Co. KG  
Electronics & Product Compliance  
37070 Goettingen, Germany

The following essential health and safety requirements set out in Annex I to the above Directive have been applied and complied with:

- *General principles, No. 1*
- *No. 1.1.2*

The specific technical documentation according to part B of Annex VII has been prepared.

If necessary, we will provide the competent authority with the abovementioned specific technical documentation electronically in pdf format.

The partly completed machine may only be put into service if it has been determined that the machine in which the incomplete machine is to be installed complies with the provisions of this Directive.

Sartorius Lab Instruments GmbH & Co. KG  
Goettingen, 2019-10-10

Dr. Reinhard Baumfalk  
Head of Product Development  
Lab Products and Services Division

Dr. Dieter Klausgrete  
Senior Scientist Certification Management

# FCC Supplier's Declaration of Conformity



**Device type** Weighing cell + display unit

**Model** WZAa-b + YAC01c; WZV1.5SE  
*a = 25, 26, 224, 245, 523, 614, 1203, 8202; b = N, NC, ND, HC; c = CU, ED*

## Party issuing Supplier's Declaration of Conformity / Responsible Party – U.S. Contact Information

Sartorius Corporation  
5 Orville Dr Suite 200  
11716 Bohemia, NY  
USA  
Telephone: +1.631.254.4249

### FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### Information to the user

Note: This equipment has been tested and found to comply with the limits for a **class B** digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Connections between the device and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits.

Any modifications made to this device that are not approved by Sartorius may void the authority granted to the user by the FCC to operate this equipment.

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The information and figures contained in these instructions correspond to the version date specified below.

Sartorius reserves the right to make changes to the technology, features, specifications and design of the equipment without notice.

Masculine or feminine forms are used to facilitate legibility in these instructions and always simultaneously denote the other gender as well.

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