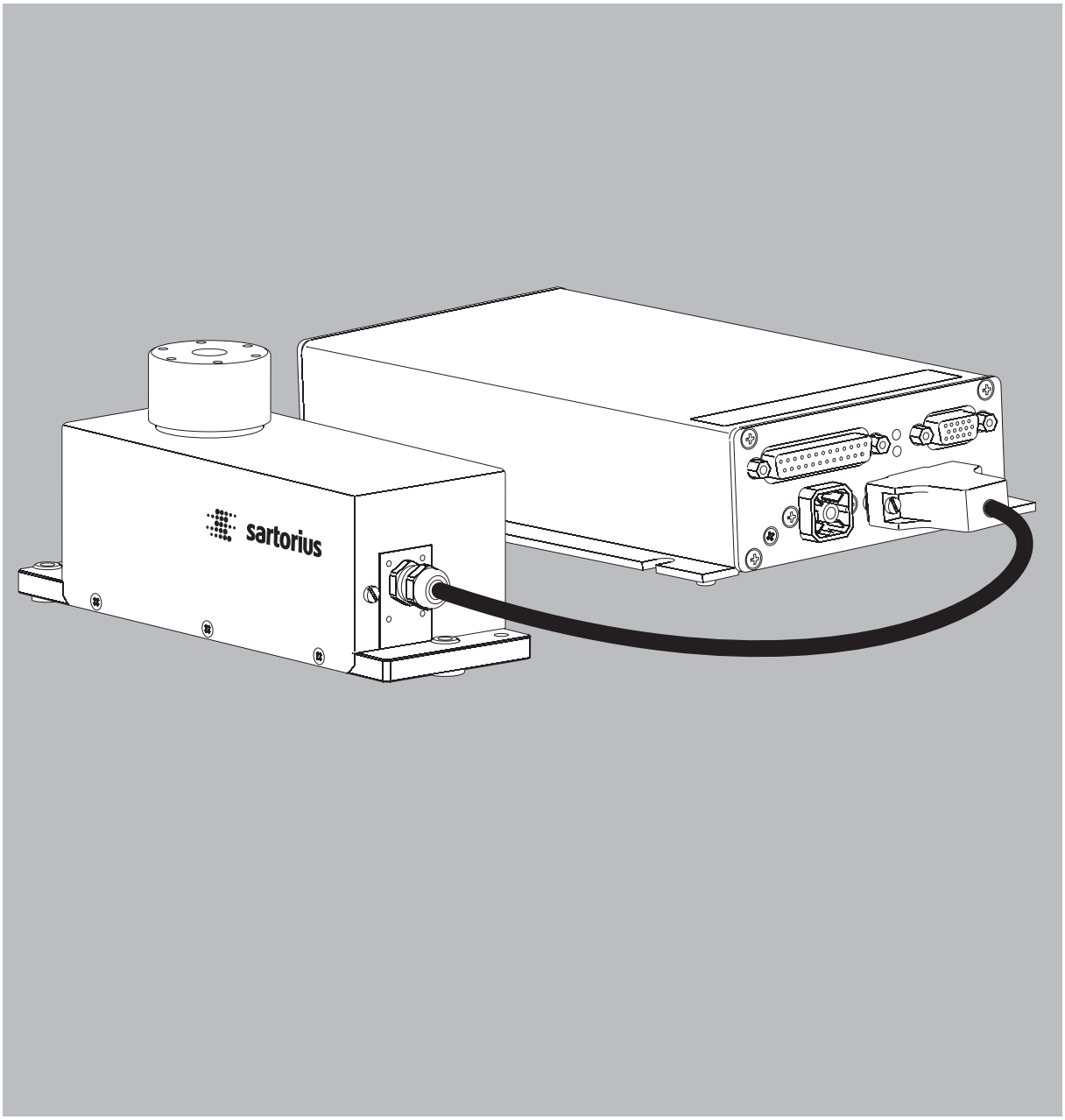
sartorius

Installation Instructions

Sartorius Weigh Cells

Models WZA...-N, WZA...-NC, WZA224-ND



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Warning and Safety Instructions

Safety

● Once the weigh cell has been installed, the entire product must be checked for the following:
- Compliance with directives and standards for electrical apparatus
- Electromagnetic compatibility of the complete weighing instrument
- 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 describe only the technological specifications of the weigh cell and the conditions that must be observed during installation.

⚠ Always make sure that the equipment is disconnected from power before performing any work on it!

⚠ The equipment may be opened only by trained service technicians who follow Sartorius' standard operating procedures.

Installation

⚠ Do not use this equipment in hazardous areas, zones exposed to explosive gases or dusts, nor areas exposed to potentially explosive materials.

⚠ Use of the weigh cell in areas where medical equipment is operated is not permitted.

⚠ Replacement of the weigh cell and electronics module:
Only connect devices that are made to be operated together. Pay attention that the serial numbers match.

⚠ Any improper handling, modifications or installation work will result in forfeiture of all claims under the warranty.

⚠ 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.

- Warning: RS-232 cables purchased from other manufacturers often have incorrect pin assignments for use with Sartorius equipment. Therefore, be sure to check the pin assignments before connecting the cable, and disconnect any lines assigned differently.

- Note on Installation:
The operator shall be responsible for any modifications to Sartorius equipment or connections of cables not supplied by Sartorius and must check and, if necessary, correct these modifications.
Information on operational quality is available on request from Sartorius (in line with norms pertaining to immunity).

○ If there is visible damage to the components:
Disconnect from the supply voltage and replace the weigh cell and electronics module:

Do not expose the power supply to aggressive chemical vapors or to unnecessarily extreme temperatures, moisture, shocks, or vibration.

○ If a service problem with the device should occur: Contact Sartorius Service.

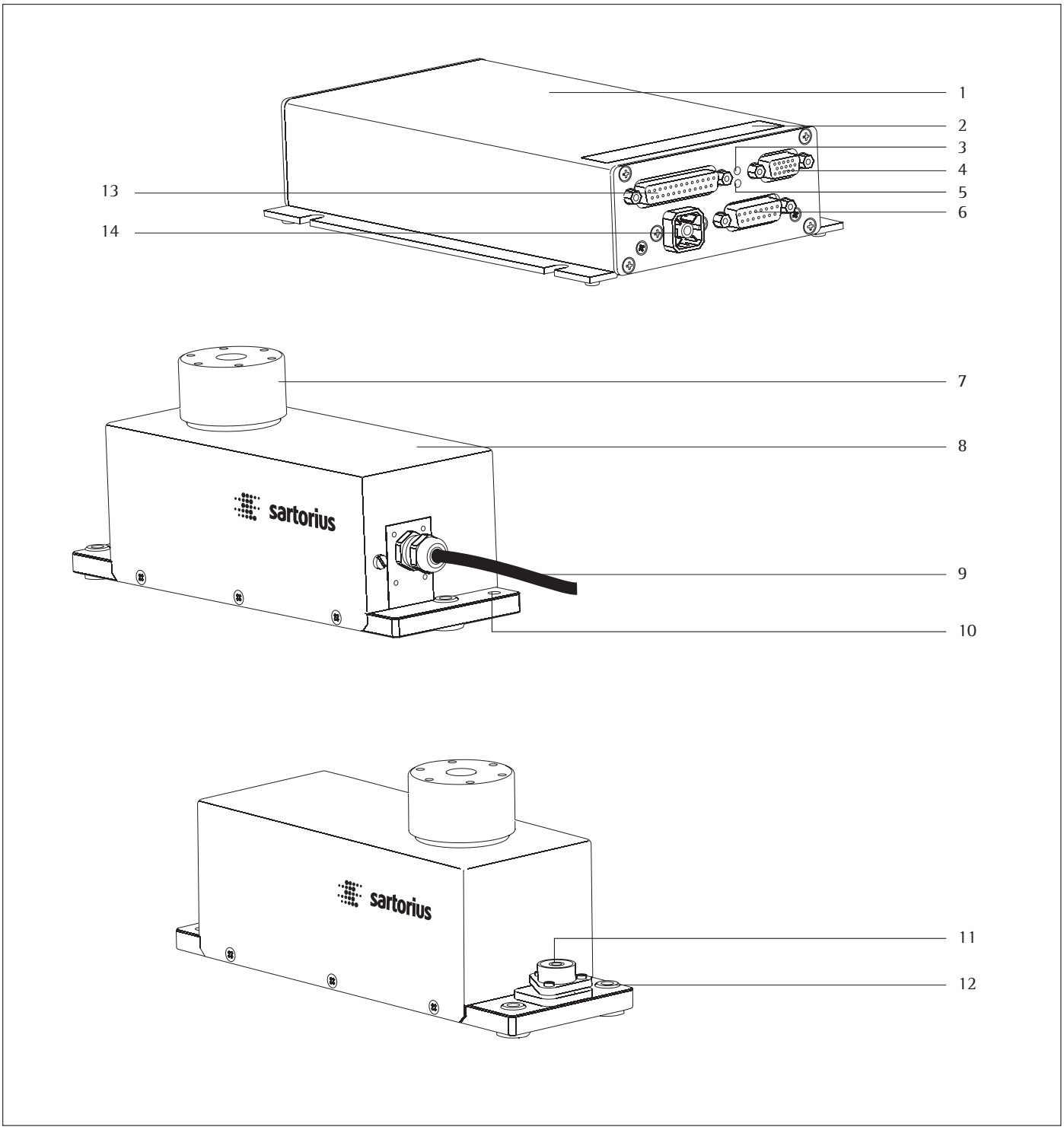
Intended Use

- The 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:
- Compact weigh cell that can be affixed to a smooth, even surface.
- Electronics module
- Model WZ...-NC weigh cells have a built-in calibration weight and can be calibrated and adjusted any time by transmitting a control command or at the press of a key using the optional YAC01ED display and control unit or the CAS-Suite software.
- These compact weigh cells can be used to determine weights within restricted space.

General View of the Equipment

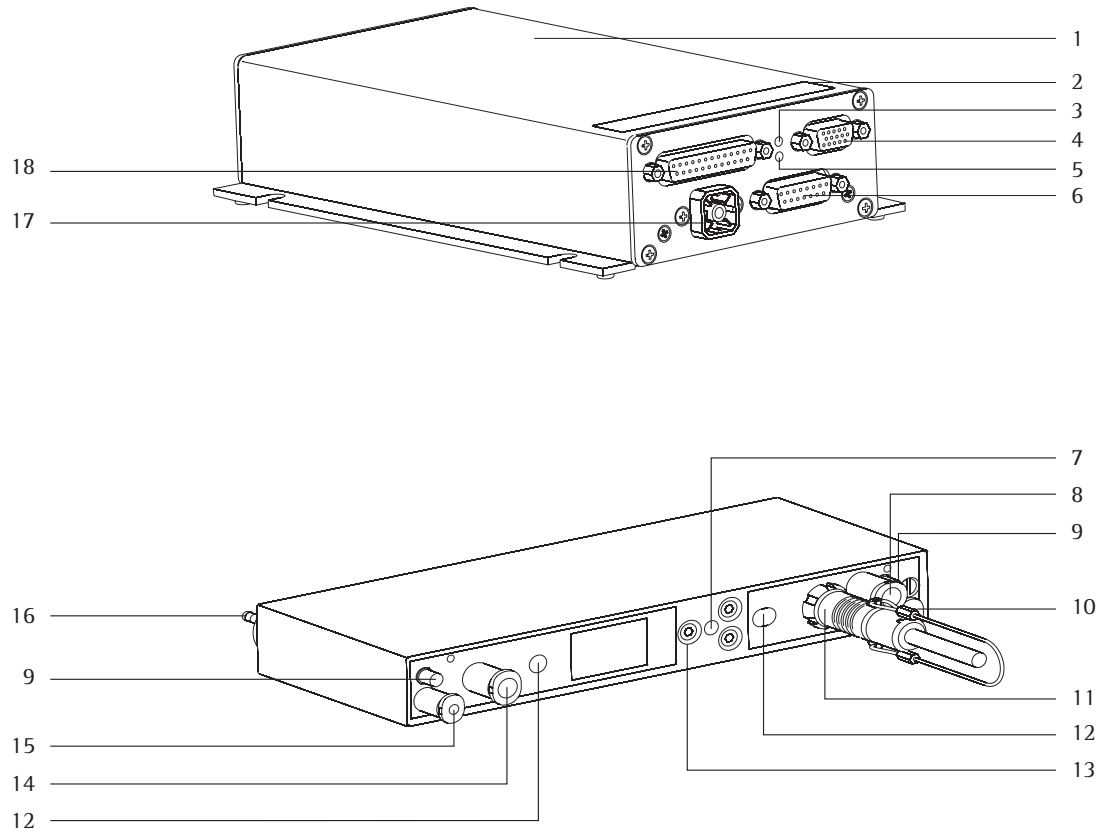


Pos.	Designation
1	Electronics module
2	Plate: Interface description
3	LED: RxD/Supply voltage (yellow)
4	Female connector for the optional display unit
5	LED: TxD (red)
6	Female connector for weigh cell
7	Load receptor

Pos.	Designation
8	Weigh cell
9	Connector (male) for electronics module
10	Threaded hole for equipotential bonding terminal
11	Level indicator
12	Threaded hole (M6) for mounting the weigh cell
13	Data Interface
14	DC jack

General View of the Equipment

WZA25-NC



Pos.	Designation
1	Electronics module
2	Plate: Interface description
3	LED: RxD/Supply voltage (yellow)
4	Female connector for the optional display unit
5	LED: TxD (red)
6	Female connector for weigh cell
7	Threaded hole for mounting
8	Overpressure outlet 50 mbar, ∅ 6 mm
9	Pressure outlet for 10 and 15
10	Pressure inlet closing mechanism 6 bar, ∅ 3 mm

Pos.	Designation
11	Electrical connection
12	Positioning holes
13	Mounting surface
14	Overpressure inlet 50 mbar, ∅ 6 mm
15	Pressure inlet Cal.-weight circuit mechanism 6 bar, ∅ 3 mm
16	Load pin
17	DC jack
18	Data interface

⚠ Users should never change any other screws!

Installation

The weigh cells are available in various versions. If you have ordered special options, the weigh cells are equipped with the specified features at the factory.

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 until you have successfully installed your equipment. Only the original packaging provides the best protection for shipment.

○ Before packing your equipment, unplug all connected cables to prevent unnecessary damage.

○ Gravitational acceleration ≙ 300 m/s^2
Do not expose the equipment to gravitational acceleration in excess of ≙ 300 m/s^2 (unless additional equipment is installed 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 the weigh cells were not damaged in transport. You can use the YAC01ED display and control unit or the CAS-Suite software as an aid for this test.

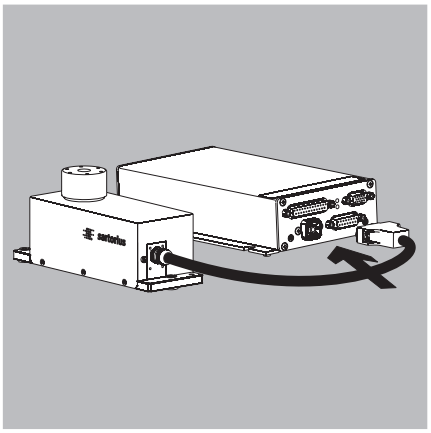
Equipment Supplied

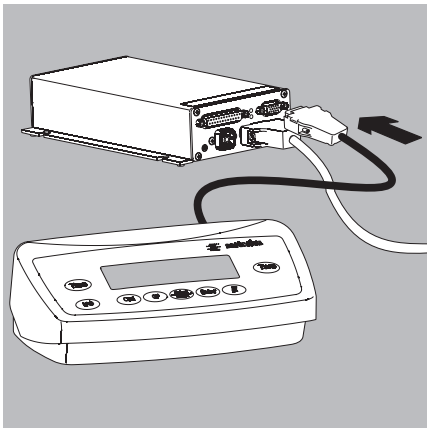
- Weigh cell
- Electronics module
- Installation instructions (this document)
- AC adapter with country-specific power plug adapter
- Special accessories as listed on the bill of delivery or in accordance with any customer-specific agreement

Installation Instructions

The equipment is designed to provide reliable results under normal ambient conditions. 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.
- Avoid extreme moisture.
  Switch the system to the standby mode when not in use.
- Avoid the effects of magnetism.

⚠ Always calibrate/adjust the weigh cells after transport:

- WZA...-N, WZA224ND:
  External calibration
- WZA...-NC: Internal calibration

- 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 2 hours at room temperature, leaving it unplugged from AC power.

Connecting the Weigh Cell to the Electronics Module

- Plug the connecting cable into the socket on the electronics module and the male connector on the weigh cell

Connecting an Optional Display and Control Unit

- The YAC01ED display and control unit can be installed while operations are running (hot plug-in).

● Plug the cable into the socket on the electronics module.

AC Power Supply

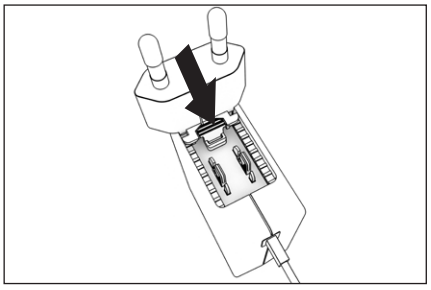
AC Adapter Assembly

Fatal electric shocks can be caused by use of the incorrect power plug adapter or improper use of the power plug adapter.

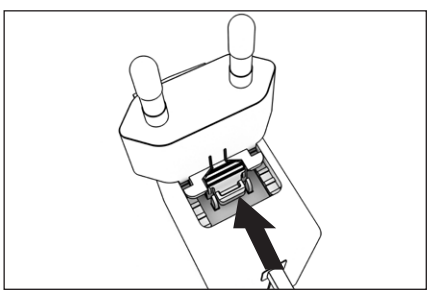
– Attach the country-specific power plug adapter to the AC adapter. The power plug adapter must be suitable for the wall outlet at the installation location.
– Do not insert the power plug adapter into the socket without an AC adapter.

Item number on packaging	Power supply/country-specific power plug adapter (packed in PE bag with printed country code, e.g. EU)	Illustration (from left to right)
YEPS01-15VOH	Power supply with connection cable	
YEPS01-PS1	USA and Japan (US+JP) Europe (EU) United Kingdom (UK)	
YEPS01-PS2	India (IN) South Africa (ZA) Argentina (AR) Brazil (BR)	
YEPS01-PS3	Australia (AU) Korea (KR) China (CN)	
YEPS01-PS6	Australia (AU) South Africa (ZA) Argentina (AR) Brazil (BR)	
YEPS01-PS7	India (IN) Korea (KR) China (CN)	

- Select the country-specific power plug adapter. The power plug adapter must be suitable for the wall outlet at the installation location.



- Push the power plug adapter into the AC adapter's holder. The ribbed button must be facing forward.
- Push the power plug adapter all the way in until it audibly engages.
- Check that the power plug adapter is firmly locked in place. To do this, gently pull on the power plug adapter.
- ○ If the power plug adapter cannot be moved then it is locked in place.

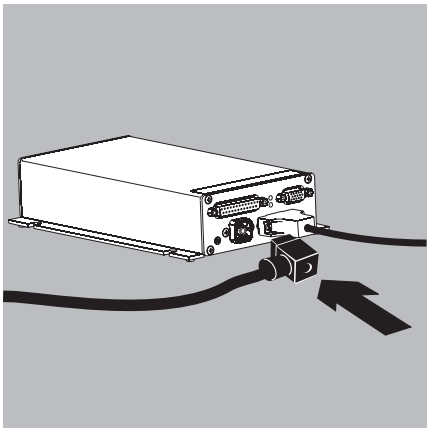


Removing the Power Plug Adapter

- Press on the ribbed button from above and slide the power plug adapter backward.
- Push the power plug adapter out of the AC adapter and remove it.

Connecting the AC Adapter

- Check the voltage rating on the AC adapter's type plate. Make sure that the voltage rating printed on this unit matches the local supply voltage at the place of installation.
- If the stated supply voltage does not comply with the local supply voltage or there is no suitable AC adapter available: Do not use the AC adapter.
  Contact Sartorius Service.
- Only use original Sartorius AC adapters.



- Insert the right-angle plug from the AC adapter into the jack on the electronics module and tighten the fastening screw
- Connect the equipment to power:
  plug the AC adapter into the wall outlet (mains) at the installation location.

> After connecting the power supply: the LED "RxD/Power" lights up yellow

○ Power is supplied through the DC jack (Hirschmann plug).
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 device can be operated with a supply voltage of 12 V to max. 26 V.

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

Safety requirements for operation of the evaluation electronics connected to a safety extra-low voltage (SELV) source:
The external power supply must meet the requirements of EN 61010-1, 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 AC 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.

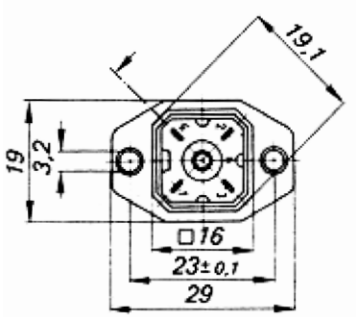
EMC Requirements:
The connector is designed for DC connections between equipment/systems that are not connected to a DC power supply. The cable length must not exceed 3 m.

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

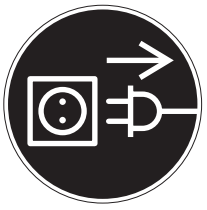
Fast transients	IEC61000-4-4
Surge voltage	IEC 61000-4-5
Conductive HF signals	IEC61000-4-6

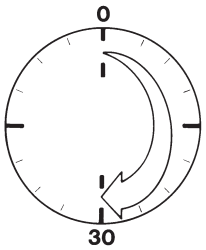
Socket, electronics unit	Type: G 4 A 5 M
Socket for the above connector	Type: G 4 W 1 F, Hirschmann order no. 932157-100

Hirschmann Electronics GmbH & Co.
Stuttgarter Strasse 45-51
72654 Neckartenzlingen
Germany



Dimensions in mm





Connecting Electronic Peripheral Devices

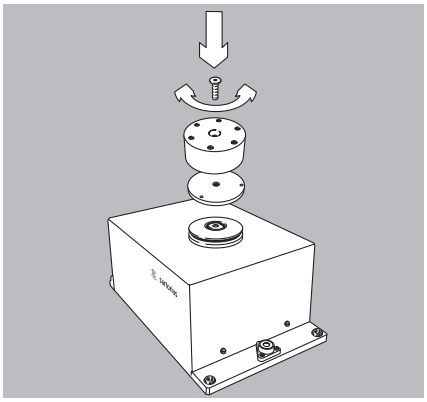
- Make absolutely sure to unplug the weigh cell from AC power before you connect or disconnect a peripheral device (e.g., PC) to or from the interface port:

Warm-up Time

The amount of warm-up time required depends in part on the system used. To return precise results, the weigh cell must warm up for at least the length of time indicated below after it is connected to power for the first time:

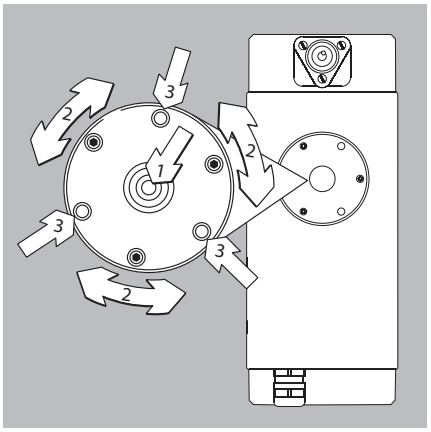
- WZA224-N/WZA224-ND: 45 minutes
- Other WZA...-N/-NC-models: 30 minutes

Only after this time will the device have reached the required operating temperature.



WZA8202-N/-NC: Installing Parts

- Position spacer and load receptor
- Tighten the (S1) screw supplied to fasten the load receptor:
  For torque values, see table on the next page

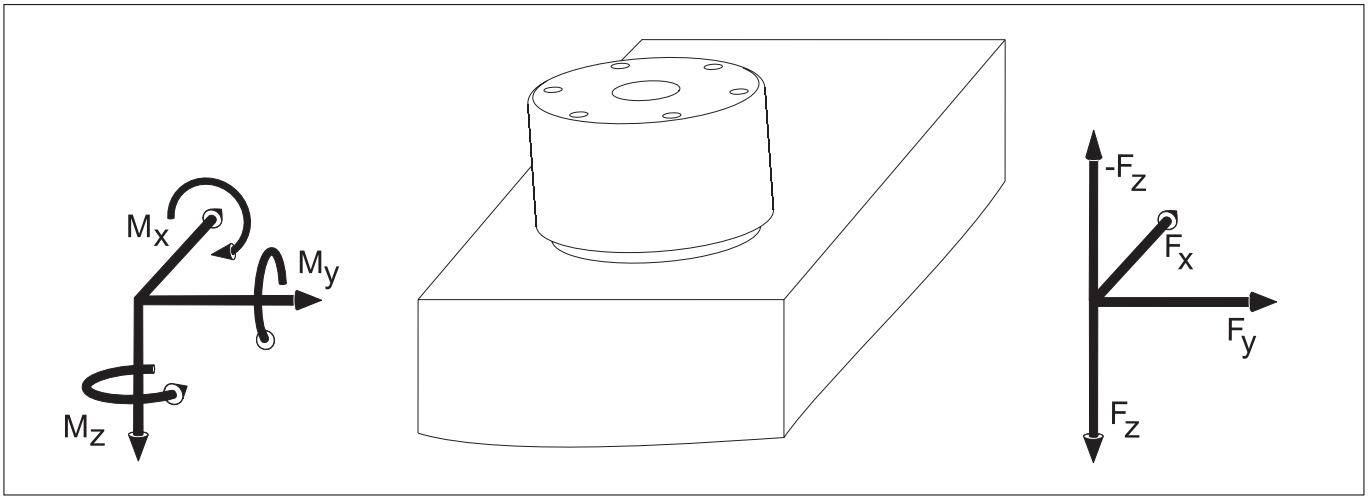


Leveling the Load Receptor and Attaching the User-specific Transducer

- Remove **(1)** screw
- Use the **(2)** screws to radially position and level the load receptor
  (minor height adjustment also possible)
- Attach the **(1)** screw to affix the load receptor:
  For torque values, see table on the next page
- Attach any user-specific transducer to the threaded fastener **(3)** on the load receptor.
  For torque values, see table on the next page:
  Maximum permissible load on load receptor

⚠ Make sure the user-specific transducer is rigid, and is firmly attached to the load receptor.

Maximum Permissible Load on Load Receptor:



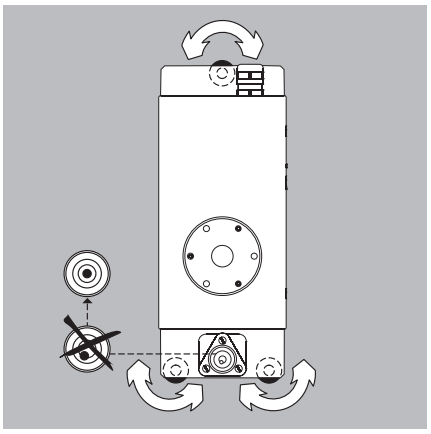
Model	Max. torque M_x, M_y, M_z	Screwing torque	Max. force opposite to direction of load ($-F_z$)	Max. forces F_x, F_y, F_z
WZA224-N WZA224-ND WZA224-NC	2 Nm	1 Nm	3 N	20 N
WZA523-N WZA523-NC	2.5 Nm	1 Nm	6 N	25 N
WZA1203-N WZA1203-NC	4 Nm	2 Nm	15 N	40 N
WZA8202-N WZA8202-NC	8 Nm	4 Nm	100 N	80 N F_z 200 N
WZA25-NC	0.1 Nm	0.5 Nm	2 N	2 N

Higher loads may result in damage to the weigh cell.

Example:
Weigh cell with hook projecting out to the front.
Torque M_y is the sum of the torque from the force of the weight W_{Load}, the torque of any excess weight being exerted W_{Ex} and the torque created by the intrinsic weight W_{Hook} holding the weight.

Example:
How heavy may the maximum off-center overload force $_{over}$ for a WZA224-N at a load of M_{Load} = 100 g and a hook arm length L of 100 mm and an intrinsic weight M_{Hook} = 60 g be?
M_{Load} = $M_{Load} \times 9.81\ m/s^2 \times L$
M_{Load} = 0.098 Nm
M_{Hook} = $M_{Hook} \times 9.81\ m/s^2 \times L / 2$
M_{Load} = 0.029 Nm
M_{Ex} = $F_{Ex} \times L$
$M_y = M_{Load} + M_{Hook} + M_{Ex}$
W_{Ex} = $(M_{corner} - M_{Load} - M_{Hook}) / L$
W_{Ex} = 18.7 N

However, even very small forces can trigger the overload protection mechanism.
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.

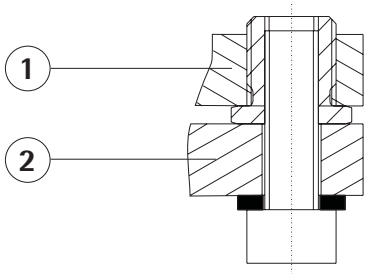


Leveling the Weigh Cell in a Portable Weighing System (Leveling Feet Optional)

Purpose:
- To compensate for uneven areas 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.

Permanently Installed Weigh Cells
- Adjust the weigh cell after it has been installed in the system in its permanent location – see next page.
  The weigh cell must be calibrated/adjusted again any time its location or position is changed.

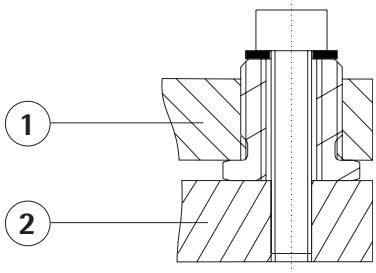


- For optimum operation, install the weigh cell in a horizontal position.

1) Bottom plate of the weigh cell

2) Fastening frame of the system

● Fastening with M6 screws:
Connection to the threaded fasteners on the weigh cell **(1)**: torque 2.5 Nm



● Fastening with M4 screws:
Connection to the threaded fasteners of a user-specific frame **(2)**.

⚠ Do not unscrew the sleeve.

Notes on Analytical Weighing with Weigh Cells

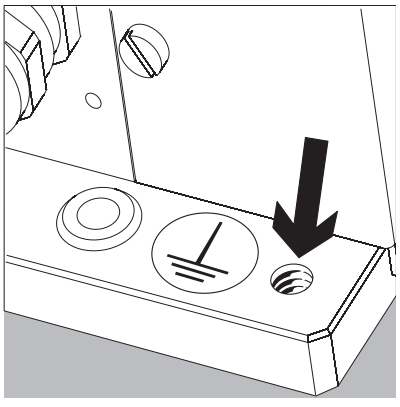
Handling of Samples and Containers
Samples should be acclimatized to the temperature of the weigh cell.
This is the only way to avoid negative effects on results, such as measurement errors and fluctuations caused by air buoyancy resulting from convection currents across the surface of the sample.

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, as the hygroscopic effect of fingerprints and the effect of the hand's temperature can influence the measurement results.

Samples must be applied very carefully, whether manually (using a 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. Materials with extremely low conductivity, such as glass, plastic or filters, are particularly susceptible to static electricity (resulting e.g. from friction) because the weighing pan can discharge the static electricity only very slowly.

The result is a force action 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.

A threaded hole (M6) in the equipotential bonding terminal is provided on the rear of the weighing cell mounting plate for grounding equipment (e.g., a scoop). It must be ensured that the frame is grounded.

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.

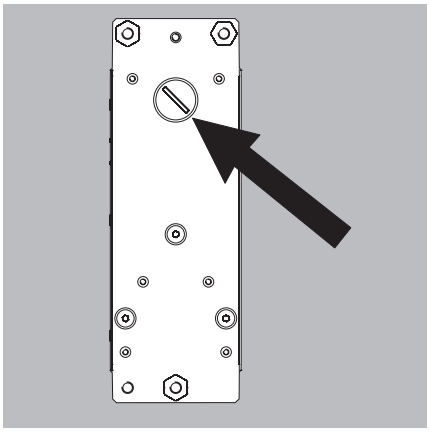
Calibration/Adjustment

Calibration/adjustment can be performed as follows:

– Using control commands sent by the CAS-Suite configuration software from Sartorius, installed on a computer (see page 23 for the commands)

or

○ Using the optional YAC01ED control unit



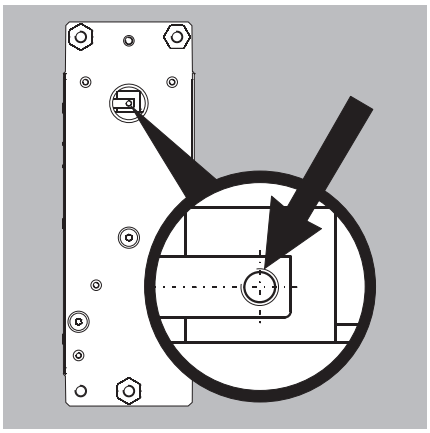
Below-Cell Weighing

A port for a below-cell weighing hanger is located on the bottom of the weigh cell (not on model WZA25-NC).

● Remove the closing screw.

○ **Overload protection**
– Standard feature on the following models: WZA224-N/-NC, WZA1203-N/-NC, WZA523-N/-NC

⚠ No overload protection provided on the following models: WZA8202-N/-NC, WZA25-NC

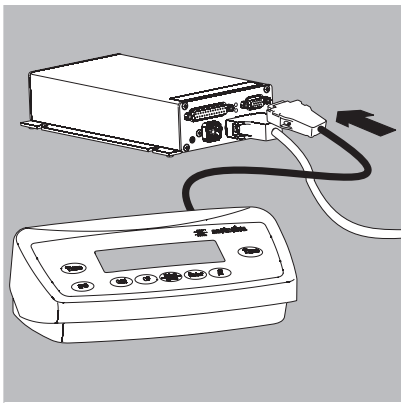


● Carefully install the customer-specific hook.
Threaded fastener for hook: M3
Maximum torque: 0.8 Nm.

⚠ Maximum screw installation depth: do not exceed 5 mm!

○ Install a draft shield if necessary

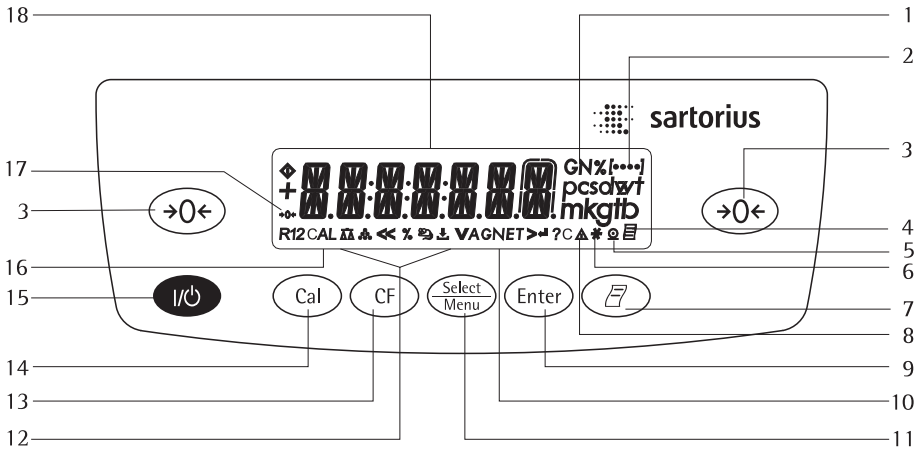
Operation with the Optional YAC01ED Display and Control Unit



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

Connecting cable: Approx. 1 meter long with 15-pin D-Sub plug and socket.
Pin 15 is not assigned.

Overview of Display and Operating Elements



Position	Designation
1	Weight units
2	Menu level indicator
3	Tare | Zero
4	Symbol “GLP printing mode active”
5	Symbol: “Printing mode active”
6	Application program active
7	Data output: Press this key to send readout values to the built-in data interface.
8	Calculated-value indicator: not a weight value
9	Start an application program
10	Display: Gross or net value
11	Select an application program | Open the operating menu
12	Symbols for active application (⚖, ⁂, %, 🐑, ⬇, A, C)

Position	Designation
13	Clear Function This key is generally used to cancel functions: – Quit application program – Cancel calibration/adjustment routine | Exit menu
14	Start the calibration process
15	On/off switch
16	Display: Calibration/adjustment function
17	Symbols for zero range (verified models only)
18	Weight value displayed in selected weight unit
Symbol:	
<<	Exit menu
<	One menu level higher
V	Scroll through menu items
>	To select the next sub-item within a group
↲	To confirm the menu item selected

Basic Weighing Function

Features

– Taring the weigh cell
– Print weight value

Preparation

● Switch on the weigh cell:
Press the (I/⏻) key

● Tare the balance/scale, if necessary:
Press (Tare)

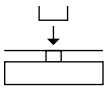
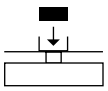
○ If necessary, change the configuration settings:
see the chapter entitled “Configuration”

○ If desired, load the factory settings:
see the chapter entitled “Configuration”

Additional Functions:

○ Switching off the weigh cell:
Press (I/⏻)

Example:
Determine a weight value

Step	Press key	Display/Printout
1. Switch on the weigh cell: Self-test runs followed by automatic initial tare function.	(I/⏻)	0.0 g
2. Place container on weighing pan (in this example 11.5 g).		+ 11.5 g
3. Tare the weigh cell	(Tare)	0.0 g
4. Place sample in container (in this example 4.66 oz).		+ 132.0 g
5. Print weight value	(🖹)	N + 132.0 g

Configuration (Operating Menu)

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

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

1. Weigh cell functions
   - Interface
   - Record (print)
   - Extra functions
2. Application programs
3. Input
4. Information
5. Language setting

Factory Settings for the Parameters
The factory-set configurations are identified by an "o" in the list below. **Customer-specific settings can be configured on request.**

Preparation

○ Using the CAS-Suite configuration software from Sartorius installed on a PC, you can process the operating menu parameters as follows:

- Read
- Edit
- Print
- Save

or

Using the optional YAC01ED control unit

Configuring of the weigh cell, i.e., adapting it to individual requirements.

Functions of the Keys in the Menu:

Symbol displayed	Key	Function
V	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)
[••••]		Indicates menu level

Menu Navigation

Example: Setting the language

Step	Press key	Display
1. **Open the menu**: In weighing mode: first menu item is shown	Select Menu hold	APPLIC.
2. Scroll upward within the menu level; After the last menu code, the first code is displayed again (scroll)	Repeatedly press Select Menu	INPUT ... LANGUAG.
3. Select next menu level (scrolls to the right)	Repeatedly press Enter	ENGLISH o
5. **Change setting:** Select the menu item by scrolling up	Select Menu	GERMAN
6. **Confirm setting:**; "o" indicates the active Menu item	Enter	GERMAN o
7. Go back to the previous menu level (from menu level 4)	CF	LANGUAGE
○ If required, select further menu items	Select Menu, Enter	
8. **Save settings** and exit menu:	Repeatedly press CF	
or		
○ Exit menu without saving changes	I/⏻	
> Restart your application		0.0 g

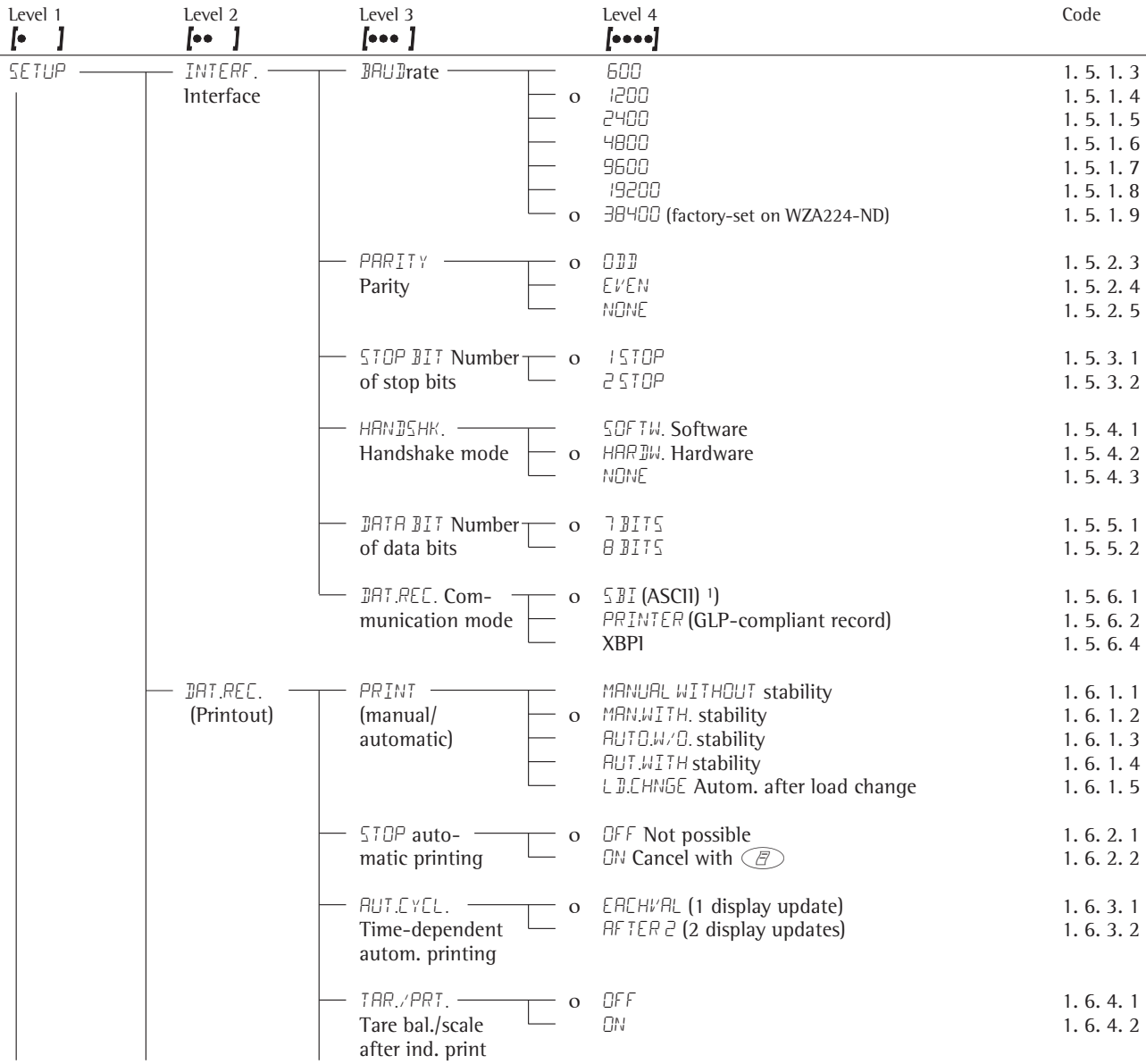
Menu Structure (Overview)

Level 1 [•]	Level 2 [••]	Level 3 [•••]	Codes
SETUP	BAL.SCAL. (Weigh cell functions)	AMBIENT Ambient conditions (Adapt filter)	1. 1. 1.
		APP.FILT. Application filter	1. 1. 2.
		STAB.RNG. Stability range	1. 1. 3.
		ST.DEL. Stability delay	1. 1. 4.
		TARING Taring	1. 1. 5
		AUTOZER. Auto zero	1. 1. 6
		WT.UNIT Basic weight unit	1. 1. 7.
		DISPLAY Display accuracy	1. 1. 8.
		CAL./ADJ. Function of the (Cal) key	1. 1. 9.
		CAL.ROUTINE	1. 1.10.
		CAL.UNIT Weight unit for calibration	1. 1.11.
		ZERO RNG. Zero range	1. 1.12.
		ZERO.ON Zero at Power On	1. 1.13.
		ON.TARE Tare/zero at power:	1. 1.14.
	INTERF. Interface	BAUD Baudrate	1. 5. 1.
		PARITY Parity	1. 5. 2.
		STOP BIT Number of stop bits	1. 5. 3.
		HANDSHK. Handshake mode	1. 5. 4.
		DATA BIT Number of data bits	1. 5. 5.
		DAT.PROT. SBI (ASCII) or printout	1. 5. 6.
	DAT.REC. (Print)	PRINT (manual/automatic)	1. 6. 1.
		STOP automatic printing	1. 6. 2.
		AUT.CYCL. Time-dependent autom. printing	1. 6. 3.
		TAR./PRT. Tare bal./scale after ind. print	1. 6. 4.
		PRT.INIT. Printout of appl. parameters	1. 6. 5.
		FORMAT Line format for printout	1. 6. 6.
		GLP ISO/GLP-compliant printout	1. 6. 7.
		TIME 12h/24h	1. 6. 8.
		DATE format	1. 6. 9.
	EXTRAS (Additional functions)	MENU Can Edit / Can change settings	1. 8. 1.
		HORN Acoustic Signal	1. 8. 2.
		KEYS (Keypad)	1. 8. 3.
		EXT.KEY External switch function	1. 8. 4.
		ON MODE Power-on mode	1. 8. 5.
		BACKLIT Display backlighting	1. 8. 6.
	RESET	MENU Factory settings	1. 9. 1.
APPLIC. Application programs	WEIGH		2. 1.
	UNIT Toggle	DISPLAY Display accuracy	2. 2. 2.
	COUNTING	RESOLUT.	2. 3. 1.
		REF.UPDT. Auto reference updating	2. 3. 2.
	PERCENT weighing	DEC.PLCS Decimal places	2. 4. 1.
	NET.TOT. Net total	COMP.PRT. Printout of components	2. 5. 1.
	TOTAL Totalizing	COMP.PRT. Printout of components	2. 6. 1.
	ANIMALW. Animal weighing	ACTIVTY. Animal activity	2. 7. 1.
		START	2. 7. 2.
	CALC. Calculation	METHOD (Operator)	2. 8. 1.
		DEC.PLCS Decimal places	2. 8. 2.
	DENSITY determination	DEC.PLCS Decimal places	2. 9. 1.
INPUT Input	ID NO.	ID input; max. 7 characters	3. 1.
INFO Information	VERSION, SER.NO., MODEL	Displays software vers., serial no., model	4. 1./.2./.3.
LANGUAGE (LANGUAG.)	ENGLISH (factory setting)		5. 1.
	DEUTSCH (German)		5. 2.
	FRANC. (French)		5. 3.
	ITAL. (Italian)		5. 4.
	ESPANOL (Spanish)		5. 5.
	PYCCK (Russian)		5. 6.
	POLSKI (Polish)		5. 7.
	CODES Menu shows codes (not texts)		5. 8.

Parameter Settings: Overview

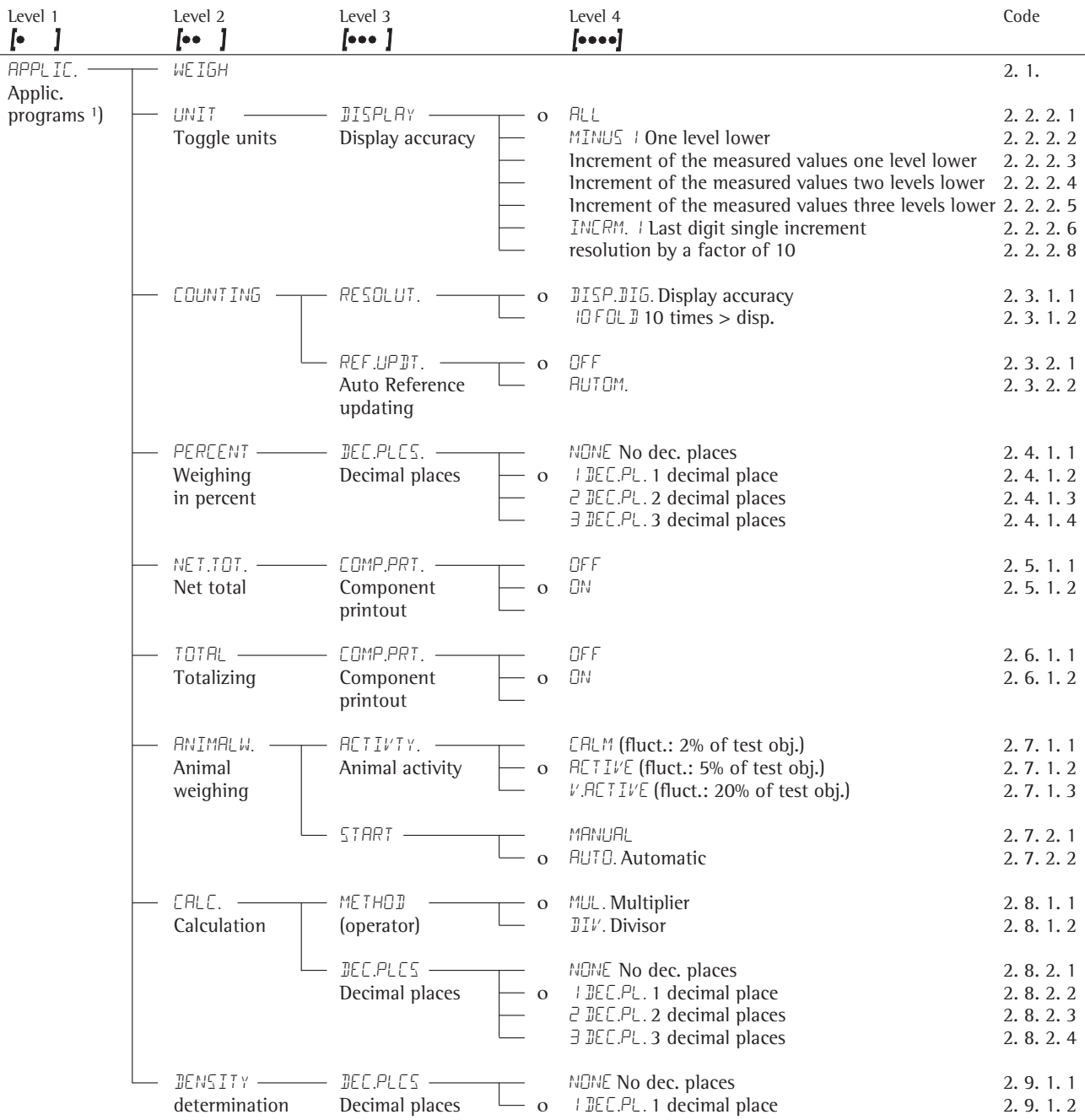
o = Factory setting; √ = User-defined setting

Level 1 [•]	Level 2 [••]	Level 3 [•••]		Level 4 [••••]	Code
1.) SETUP	BAL.SCAL Weigh cell functions	AMBIENT conditions (Filter adaptation)		V.STABLE Very stable conditions	1. 1. 1. 1
			o	STABLE Stable conditions	1. 1. 1. 2
				UNSTABL Stable conditions	1. 1. 1. 3
				V.UNSTBL. Very unstable conditions	1. 1. 1. 4
		APP.FILT. Application filter	o	FINAL.RD. Final readout mode	1. 1. 2. 1
				FILLING Filling mode	1. 1. 2. 2
		STAB.RNG. Stability range		1/4 DIG. (digit)	1. 1. 3. 1
				1/2 DIG. (digit)	1. 1. 3. 2
				1 DIG. (digit)	1. 1. 3. 3
			o	2-DIG. (digit)	1. 1. 3. 4
				4 DIG. (digit)	1. 1. 3. 5
				8 DIG. (digit)	1. 1. 3. 6
		STAB. delay		No delay	1. 1. 4. 1
			o	Short delay	1. 1. 4. 2
				Medium delay	1. 1. 4. 3
				Long delay	1. 1. 4. 4
		TARING Taring		W/O STB W/o stability	1. 1. 5. 1
			o	W/ STAB After stability	1. 1. 5. 2
		AUT.ZERO Auto zero		OFF	1. 1. 6. 1
			o	ON	1. 1. 6. 2
		WT.UNIT Basic Weight unit		For list of units, Gram to Newton	1. 1. 7. 1 to 1. 1. 7.23
		DISPLAY Basic accuracy	o	ALL	1. 1. 8. 1
				MINUS 1 One level lower	1. 1. 8. 2
				Increment of the measured values one level lower	1. 1. 8. 3
				Increment of the measured values two levels lower	1. 1. 8. 4
				Increment of the measured values three levels lower	1. 1. 8. 5
				INCRM. 1 Last digit single increment	1. 1. 8. 6
				resolution by a factor of 10	1. 1. 8. 8
		CAL./ADJ. Function of the (Cal) key	o	CAL.EXT. Adjustment/calibration with factory-set weight	1. 1. 9. 1
			o	E.CAL.USR. External calibration/adjustment with user-defined weights (factory-set on WZA25-NC)	1. 1. 9. 3
				CAL.INT. Internal calibration/adjustment only on models WZA...-NC	1. 1. 9. 4
				LIN.EXT. Linearization with factory-set weights	1. 1. 9. 6
				LIN.E.USR. Linearization with user-def. weights	1. 1. 9. 7
				STR.PREL. Set preload	1. 1. 9. 8
				CLR.PRELOAD Clear preload	1. 1. 9. 9
				BLOCKED (Cal) Blocked	1. 1. 9. 11
		CAL.ROUTINE	o	ADJ. one sequence	1. 1. 10. 1
				CAL./ADJ. as required	1. 1. 10. 2
		CAL.UNIT Weight unit for calibration	o	GRAMS	1. 1. 11. 1
				KILOGR. Kilograms	1. 1. 11. 2
				POUNDS	1. 1. 11. 3
		ZERO RNG. Zero range		DEFAULT. (factory-set)	1. 1. 12. 1
			o	2 PERC.ent	1. 1. 12. 2
				5 PERC.ent	1. 1. 12. 3
				10 PERC.ent	1. 1. 12. 4
		INT.ZERO Power On		Zero at power-on default (factory-set)	1. 1. 13. 1
				Initial zero 2%/max. cap	1. 1. 13. 2
			o	Initial zero 5%/max. cap	1. 1. 13. 3
				Initial zero 10%/max. cap	1. 1. 13. 4
				Initial zero 20%/max. cap	1. 1. 13. 5
				Initial zero 50%/max. cap	1. 1. 13. 6
				Initial zero 100%/max. cap	1. 1. 13. 7
		ON.TARE (Tare/Zero at Power/Zero-setting range)	o	ON	1. 1. 14. 1
				OFF	1. 1. 14. 2
		Output rate	o	Normal	1. 1. 15. 1
				Fast (five times faster)	1. 1. 15. 2



1) Note concerning verified balances/scales as legal measuring instruments in the EU*:
In the setting “SBI”, the non-verified display digit is not automatically identified.
Please take the corresponding measures or adjust the settings on the peripheral device.

Level 1 [•]	Level 2 [••]	Level 3 [•••]		Level 4 [••••]	Code
SETUP	DAT.REC. (Printout)	PRT.INIT. Printing application parameters	o	OFF	1. 6. 5. 1
				ALL All parameters	1. 6. 5. 2
				MAINPAR. Main parameters	1. 6. 5. 3
		FORMAT Line format for printout	o	16.CHAR. 16 characters (w/o ID)	1. 6. 6. 1
				22.CHAR. 22 characters (w/ ID)	1. 6. 6. 2
				2NDLINE with date/time	1. 6. 6. 3
		GLP ISO/GLP-compliant printout	o	OFF	1. 6. 7. 1
				CAL.-ADJ. Only for calib./adj.	1. 6. 7. 2
				ALWAYS on	1. 6. 7. 3
		TIME	o	24H 24-hour format	1. 6. 8. 1
				12H 12-hour format “AM/PM”	1. 6. 8. 2
		DATE	o	DD.MMM.YY Day/month/year	1. 6. 9. 1
				MMM.DD.YY Month/day/year	1. 6. 9. 2
	EXTRAS (Additional functions)	MENU	o	CANEDIT	1. 8. 1. 1
				RD.ONLY Read only	1. 8. 1. 2
		HORN Acoustic Signal		OFF	1. 8. 2. 1
			o	ON	1. 8. 2. 2
		KEYS (Keypad)	o	FREE	1. 8. 3. 1
				LOCKED	1. 8. 3. 2
		EXT.KEY. Function of the external switch	o	PRINT key (🖹)	1. 8. 4. 1
				Z/TARE (Tare)	1. 8. 4. 2
				CAL. (Cal)	1. 8. 4. 3
				SELECT (Select Menu)	1. 8. 4. 4
				CF (CF)	1. 8. 4. 5
				ENTER (Enter)	1. 8. 4. 6
				LOCKED Key locked	1. 8. 4. 9
		ONMODE Power-on mode		OFF/ON Off/on/standby	1. 8. 5. 1
				STANDBY On/standby	1. 8. 5. 2
			o	AUTO ON Auto on	1. 8. 5. 3
		BACKLIT Display backlighting		OFF	1. 8. 6. 1
			o	ON	1. 8. 6. 2
	RESET Reset menu	MENU Factory settings		YES Restore factory settings	1. 9. 1. 1
			o	NO Do not restore settings	1. 9. 1. 2



1) If you need more detailed information on application programs:
Please contact your local Sartorius dealer.

Configuration (Setup)

Purpose
The weigh cells are equipped with an interface port for connection to a computer or other peripheral device.

PC
You can connect a computer to change, start and/or monitor functions and application programs.

Features
Type of interface: Serial interface
Interface operating mode: Full duplex
Level: RS-232
Transmission rate:
600, 1200, 2400, 4800, 9600, 19,200 and 38,400 baud
Parity: Odd, even, none
Number of data bits: 7 or 8 bits
Character transmission:
Start bit, 7-bit ASCII, parity, 1 or 2 stop bits
Handshake:
For 2-wire interface:
Software (XON/XOFF) or none
For 4-wire interface:
Hardware (CTS/DTR) or none
Data output of balance:
16 or 22 characters

Factory Setting of the Parameters
Transmission rate:
1200 baud (Code 1. 5. 1. 4)
Parity: ODD Odd (1. 5. 2. 3)
Stop bits: 1STOPbit (1. 5. 3. 1)
Handshake:
HANDSK. Hardware handshake (1. 5. 4. 2)
Communication mode: SBI (1. 5. 6. 1)
Printing: MAN.WITH Manual after stability (1. 6. 1. 2)

Preparation
See “Pin Assignments” and “Pin Assignment Chart”

Operation

Output Format with 16 Characters (Compatibility with Current Weigh Cells)

Display segments 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	*		*	*	*	*	*	*	*	*						

*: Spaces
A: Displayed characters
E: Unit symbol
CR: Carriage return
LF: Line feed
. : Decimal point

Special Codes

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	.					

*: Spaces
Cal. Ext. Calibration, external
High: Overload
Low: Underload

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[1)]	*	*	*	*	CR	LF
				D	l	S	.	E	R	R[1)]	*	*	*	*	CR	LF
				P	R	T	.	E	R	R[1)]	*	*	*	*	CR	LF

*: Spaces
#: Error code number

[1)] 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
	+	*	*	1	2	3	.	5	[	6	]1)	g	*	*	CR	LF

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

Output Format with 22 Characters (Compatibility with Current Weigh Cells)

When data is output with an ID code, 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
*: Spaces
A: Displayed characters
E: Unit symbol
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
N						+			1	2	3	.	5	[	6	]1)	g	*	*	CR	LF

SBI Mode:
When the SBI mode is active (menu code 1. 5. 6. 1), non-verified digits are not marked. Please take the corresponding measures or adjust the settings on the peripheral device.

Special Codes

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

*: Spaces
Cal. Ext. Calibration, external
High: Overload
Low: Underload

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	R1)	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	D	I	S	.	E	R	R1)	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	P	R	T	.	E	R	R1)	*	*	*	*	CR	LF

*: Spaces
#: Error code number

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

Commands (Data Input Format Compatible with Current Weigh Cells)
The computer connected via the data port can send commands to the weigh cell for controlling functions. The commands sent are control commands and may have different formats. Control commands consist of up to 13 characters. Each character must be transmitted according to the settings configured in the operating menu for data transmission.

Formats for Control Commands

Format 1:	Esc	!	CR	LF		
Format 2:	Esc	!	#	_	CR	LF

Esc: Escape (optional)
!: Command character
_: Underline
CR: Carriage return
LF: Line feed (optional)

Command character !	Format 1: Meaning
K	Ambient conditions: Very stable
L	Ambient conditions: calm
M	Ambient conditions: unstable
N	Ambient conditions: Very unstable
O	Block keys
P	(print) key (print, auto print; activate or block)[1])
Q	Acoustic signal
R	Unblock keys
S	Restart/self-test
T	Tare: (Tare) key
U	Tare
V	Zero
W	Calibrate | Adjust depending on menu setting
Z	Perform internal calibration/adjustment[2])

Command character !#	Format 2: Meaning
f0_	Function key (Select Menu)
f1_	function key (Cal) Calibration/adjustment (depending on the menu setting)
f2_	Function key (Enter)
s1_	With »s8_« compatibility: Toggle selection in steps of 1 With »s9_« compatibility: Adjust according to menu setting
s2_	Activate parameter mode (selection)
s3_	(CF) key
s8_	Compatibility: Consistent with current weigh cells (from 2013)
s9_	Compatibility: Consistent with older weigh cells (previous models)
x0_	Perform internal adjustment
x1_	Print model
x2_	Print serial no.
x3_	Print software version

[1]) When initiating the print command, the data output rates may differ: see table on next page.
[2]) only on models with built-in motorized calibration weight

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 "ERR 02" 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

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

Voraussetzung:
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.

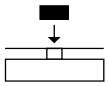
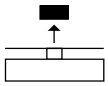
If no deviations are found during calibration, the calibration/ adjustment routine can be exited after the calibration is completed. Two keys are now active:

– 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.
The internal calibration weight is applied automatically.		CAL.RUN.
3. Calibration/adjustment executed		CAL.END
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	Execute interface command	Display/ Output
1. Tare balance	ESC T	0.0000 g
2. Start adjustment routine	ESC W	CAL.EXT.
Once you store the zero point, a prompt for the required calibration weight flashes on the display.		- 50.0000 g
3. Place displayed calibration weight on balance (in this example: 50 g). Weight too low: a minus sign “-” is shown 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		CAL.END + 50.0000 g
5. Remove the adjustment weight		50.0000 g

Data Interface Port:
Compatibility with Older Weigh Cells (Previous Models)

Once command »ESC s9_« has been sent, data input and data output behave as in the earlier Sartorius WZ-/ WZA weigh cells (previous models).

Data Output Format
In operating mode »SBI«, 16 characters are printed out.
Example:

```
+    253 pcs
```

Data Output Format with 16 Characters

Characters that are displayed blank are printed as spaces. Display values without a decimal point are output without a decimal point.

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

Normal Operation

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

*: Space
A: Digits of measurement value
E: Unit symbol
CR: Carriage return
LF: Line feed

Special Codes

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

*: Space
– –: Final readout
H: Overload
H H: Overload in checkweighing
(Function is only available during operation with following peripheral devices: Optional display unit or software YAD011S)
L: Underweight
L L: Underweight in checkweighing
C: Adjustment

Error Messages

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

*: Space
#: Error number

Example: Output of the weight value + 1255.7 g

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

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

Data Input Format
A computer connected via the data port can send commands to the device to control device functions.

The commands sent are control commands and may have different formats.
Control commands have up to 26 characters. Each of these characters must be sent based on the setup configuration for data transmission.

Formats for Control Commands

Format 1:	Esc	!	CR	LF		
Format 2:	Esc	!	#	_	CR	LF

Esc: Escape
!: Command character
#: Number
_: Underscore (ASCII: 95)
CR: Carriage return (optional)
LF: Line feed (optional)
max: Depending on the command character, i.e. parameter: The entry is truncated after the max. length, and not rejected as when entered via the keyboard

Format 1 (e.g., ESC K)

!	Meaning
K	Filter adjustment: Very stable conditions
L	Filter adjustment: Stable conditions
M	Filter adjustment: Unstable conditions
N	Filter adjustment: Very unstable conditions
O	Lock keys
Q	Acoustic signal (beep)
P	Print
R	Release keys
S	Restart
T	Tare and zero
Z	Internal adjustment

Format 2 (e.g., ESC f3_)

!#	Meaning
f1_	Calibrate or Adjust according to menu setting
f3_	Zero
f4_	Tare (without zeroing)
s1_	External adjustment
s3_	Function [CF]
x0_	Perform internal calibration
x1_	Print load cell type
x2_	Print load cell series no.
x3_	Load cell software version

Synchronization
During data communication between the weigh cell and a connected device (computer), messages consisting of ASCII 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 set these parameters in the Setup menu so that they match those of the connected device. You can also define parameters in the balance/scale to make data output dependent on various conditions These conditions are described under each of the application program descriptions.

No errors are generated just because no peripheral device is connected to an interface port (open data port).

Handshake
The weigh cell interface (Sartorius Balance Interface = SBI)
has transmit and receive buffers.
You can define the different handshake parameters in the Setup menu of your weigh cell:
- Hardware handshake (CTS/DTR)
- Software handshake (XON, XOFF)
- No 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 is switched on, XON must be transmitted to enable any connected device to communicate.

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

Automatic Data Output
Activate the “auto print” operating mode to have data output to the interface port without a print command. You can have synchronized data output automatically at defined display update intervals, with or without the stability parameter. The length of a print interval depends on the operating menu settings for AMBIENT (ambient conditions) (menu code 1. 1. 1. x) and AUT. CYCL. (time-dependent autom. printing; menu code 1. 6. 3. x).
If you activate the auto print setting, data will be transmitted immediately the moment you turn on the balance/scale.
In the operating menu, you can define whether automatic printing can be stopped by pressing the “Print” key or using the interface.

Data Output Rates – Values per Second

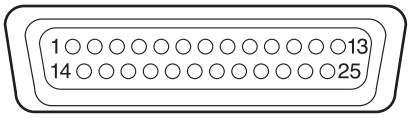
Ambient conditions	WZA...	N/-NC	WZA224-ND	
(Filter adaptation)	XBPI	SBI ”Auto print”	XBPI	SBI ”Auto print”
Very stable (1.1.1.1)	20	20	150	150
Stable (1.1.1.2)	10	10	150	150
Unstable (1.1.1.3)	5	5	150	150
Very unstable (1.1.1.4)	2.5	2.5	18.75	18.75

Pin Assignment Chart

Female Interface Connector:
25-contact D-Submini (DB25S) with screw lock hardware

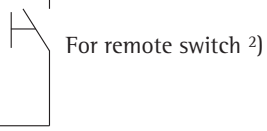
Required Male Connector (Recommendation):
25-contact D-Submini (DB25S) with integrated shielded cable clamp assembly
(Amp 826 985-1C) and fastening screws (Amp 164 868-1)

⚠ **Warning When Using Pre-wired RS-232 Connecting Cables:**
The pin assignments in RS-232 cables purchased from other manufacturers may be incompatible with Sartorius weighing instruments. Be sure to check the pin assignments against the chart below before connecting the cable, and disconnect any lines identified differently from those specified by Sartorius (e.g., pin 6).
Failure to do so may cause malfunction, damage or even completely ruin your balance/scale and/or peripheral device(s).



Pin Assignments:

Pin 1: Signal Ground
Pin 2: Data Output (TxD)
Pin 3: Data Input (RxD)
Pin 4: Internal Ground (GND)
Pin 5: Clear to Send (CTS)
Pin 6: Not Connected
Pin 7: Internal Ground (GND)
Pin 8: Internal Ground (GND)
Pin 9: Not Connected
Pin 10: Not Connected
Pin 11: +12 V (Power supply for Sartorius printer)
Pin 12: Reset _ Out[1])
Pin 13: +5 V
Pin 14: Internal ground (GND)
Pin 15: Universal remote switch
Pin 16: Not Connected
Pin 17: Not Connected
Pin 18: Not Connected
Pin 19: Not Connected
Pin 20: Data Terminal Ready (DTR)
Pin 21: Not Connected
Pin 22: Not Connected
Pin 23: Not Connected
Pin 24: Not Connected
Pin 25: +5 V

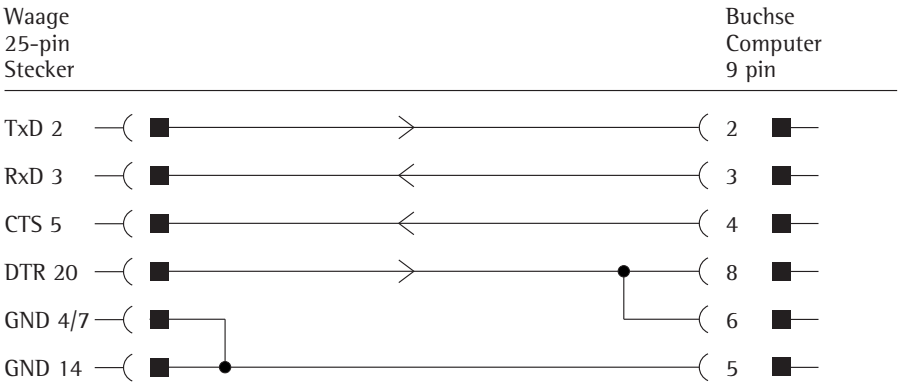


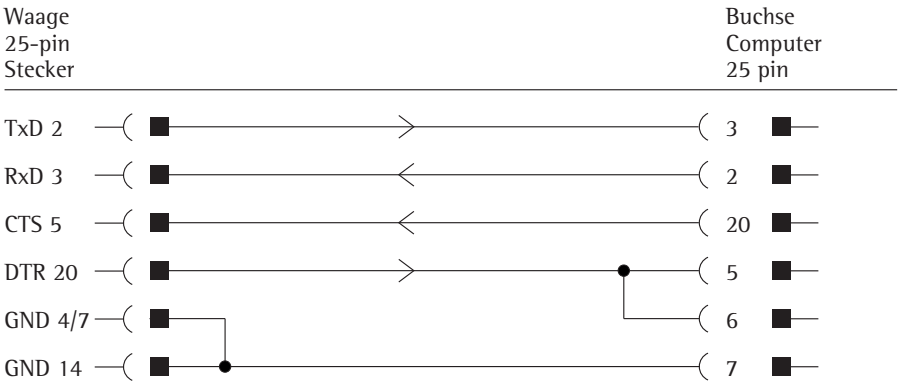
[1]) = Hardware restart
[2]) = External switch function can be programmed in the menu Setup: EXTRAS : EXT. key (1.8.4.x)

Cabling Diagram

For connecting a computer or other peripheral device to the balance/scale using the RS-232C/V24 protocol and cable lengths of up to 15 m (approx. 50 ft).

Do not connect any other pins to the cable connector of the balance/scale!





Cable type: AWG 24 specification

Troubleshooting Guide

Error codes are displayed for about 2 seconds. The program then returns automatically to the weighing mode.

Problem	Cause	Solution
HIGH or ERR 55	Weighing capacity exceeded	Unload the weighing pan
LOW or ERR 54	Contact between load plate and environment; load on weighing pan too light	Weighing pan must not be in contact with surrounding parts.
APP.ERR.	Cannot save data: 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 or contact Sartorius Service.
ERR 02	Calibration parameter not met, e.g.: – Unstable – Tare – Scale loaded	Correct the setup conditions. Do not carry out adjustment until after 0 display. Unload the scale.
ERR 03	Zero point error at the end of calibration	Check installation conditions; observe warm-up time. Repeat calibration
ERR 06	Int. calibration weight faulty or not available	Contact Sartorius Service.
ERR 07	External calibration is locked. The access switch is closed.	Open the access switch and perform calibration.
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 10	"Tare" function is locked for active application program "Net total"; Only 1 tare function can be used at a time	Clear the tare memory to unlock the "Tare" function.
ERR 11	Tare memory not allowed	Carry out "Tare" function.
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" 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 ambient conditions (excessive vibration or draft) Foreign object is caught between weighing pan and housing	Change setup location. Adjust Setup configuration. Remove foreign object.
The weight readout is obviously wrong	Balance | scale not calibrated | adjusted Balance was not tared before weighing	Adjust Tare

* = can only occur during operation via the SBI interface (ESC f3_/f4)

If any other errors occur, contact Sartorius Service.
For contact information: go to: 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).
- 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).
- Dispose of the packaging in accordance with local government regulations.

Technical Data

		Standard specifications						Customer-specific modifications
Model		**WZA25-NC**	**WZA224-N/-NC**	**WZA224-ND**	**WZA1203-N/-NC**	**WZA523-N/-NC**	**WZA8202-N/-NC**	
Weighing capacity	g	20	220	220	1200	520	8200	
Readability	g	0.00001	0.0001	0.0001	0.001	0.001	0.01	
Maximum preload on pan support w/o limiting the weighing range, typical [2])	g	0	70	70	0	50	1300	
Required preload	g	5	–	–	–	–	–	
Tare range (subtractive)	g	of the maximum capacity						
Repeatability (standard deviation) [1])	<±g	0.00002	0.0001	0.0001	0.001	0.001	0.01	
Linearity	<±g	0.00005	0.0002	0.0002	0.002	0.002	0.02	
Response time [3])	s	0.8 s/0.01 mg	0.6 s/0.1 mg	0.25 s/1 mg	0.6 s/1.0 mg	0.6 s/1.0 mg	0.6 s/1.0 mg	
Adaptation to ambient conditions		By selection of 1 of 4 optimized filter levels						
Operating temperature range	°C	+10 ... +30 °C						
Allowable ambient operating temperature	°C	+5...+40 °C						
Sensitivity drift within +10... +30 °C	<±/K	$1 \bullet 10^{-6}$	$1 \bullet 10^{-6}$	$1 \bullet 10^{-6}$	$2 \bullet 10^{-6}$	$2 \bullet 10^{-6}$	$2 \bullet 10^{-6}$	
External calibration weight (of at least accuracy class...)	g	10 (E2)	50 (E2)	50 (E2)	500 (E2)	200 (F1)	2000 (E2)	
Material: – Weigh cell: – Electronics module:		VA (14404, (AISI 316L) Pan stud: titanium	VA (load receptor: chemically nickel-plated aluminum) Transparently passivated aluminum					
Net weight, approximate	kg	2.0	2.0	2.0	2.0	2.0	2.8	
Alternatively: Supply voltage Ripple 50/60 Hz Power consumption switch-on current	VDc	min. 12 ... 26 max., optimal/15 V 0.5 Vpp (Voltage peak-to-peak) typically 3.4 W (weigh cell only) Average: 6 W (weigh cell only); with optional YAC01ED: display and control unit: 7.3 W (weigh cell + display and control unit)						
Built-in interface		RS-232C-S/V24-V28; 7-bit; even, mark, odd, space; transmission rates: 150...38400 baud, 1 or 2 stop bits; software/hardware handshake						

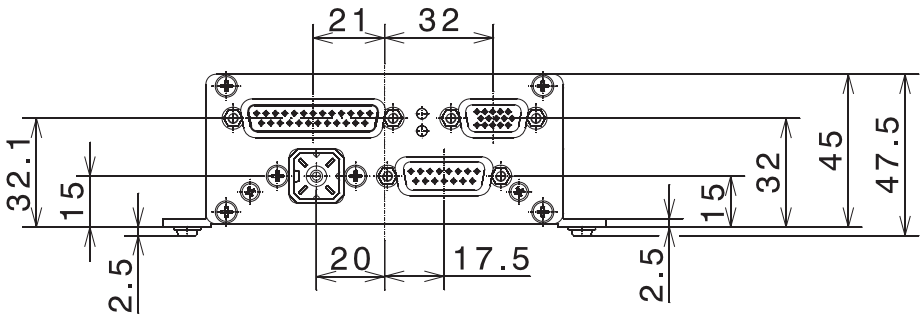
AC adapter

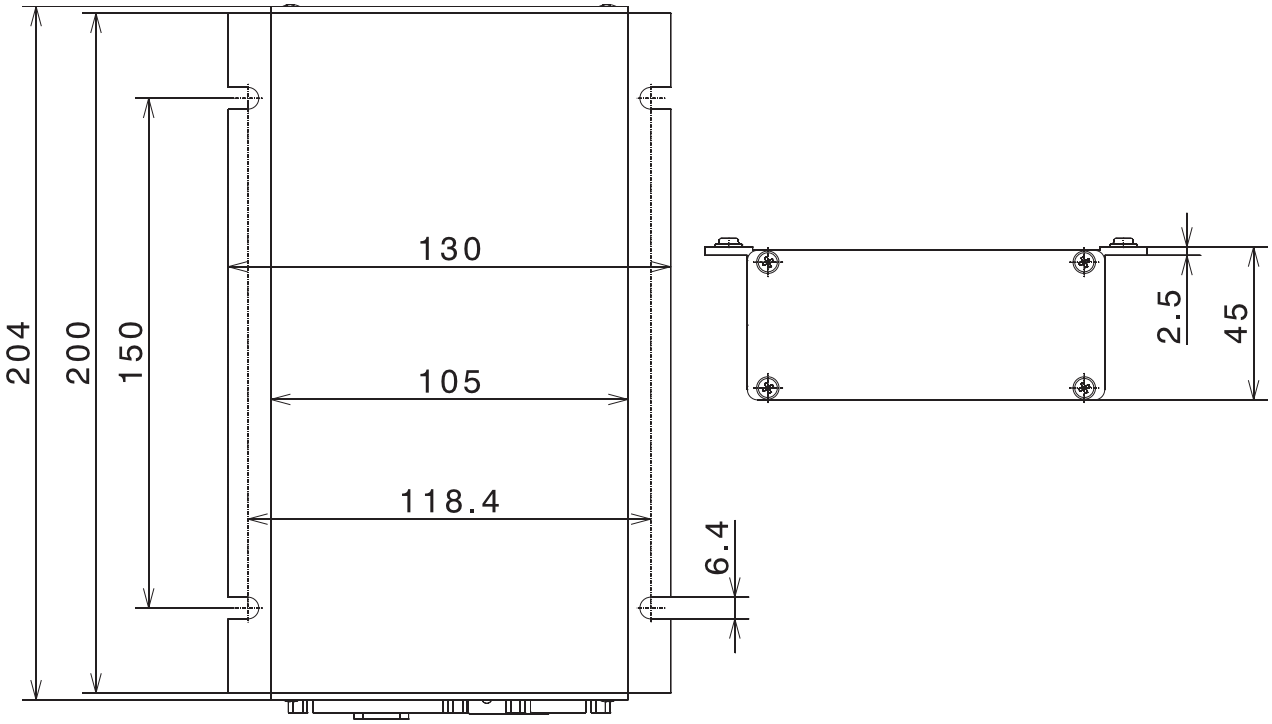
	Unit	**Value**
Power supply (primary)		
Voltage	V_{AC}	100 – 240 ± 10%
Current	A	0.2
Frequency	Hz	50 – 60 ± 5%
Power supply (secondary)		
At between 0°C and +40°C	V_{DC} / mA (max.) / W (max.)	15 ± 5% / 530 / 8
At between +40°C and +50°C	V_{DC} / mA (max.) / W (max.)	15 ± 5% / 330 / 5
Installation location, above sea level (NN)	m	3000
Protection class according to EN/IEC 60950-1		II
Protection class according to EN/IEC 60529		IP40

[1]) = depends on system design
[2]) = for operation with greater preload setting, please send e-mail to request YAD018S configuration software; e-mail address: fast.factory@sartorius.com
Greater preloads are possible, but reduce the weighing capacity.
[3]) = The weighing time is the time period in which the measured value oscillates within the stated range of the static end value.
Test weight approx. 25% of max.

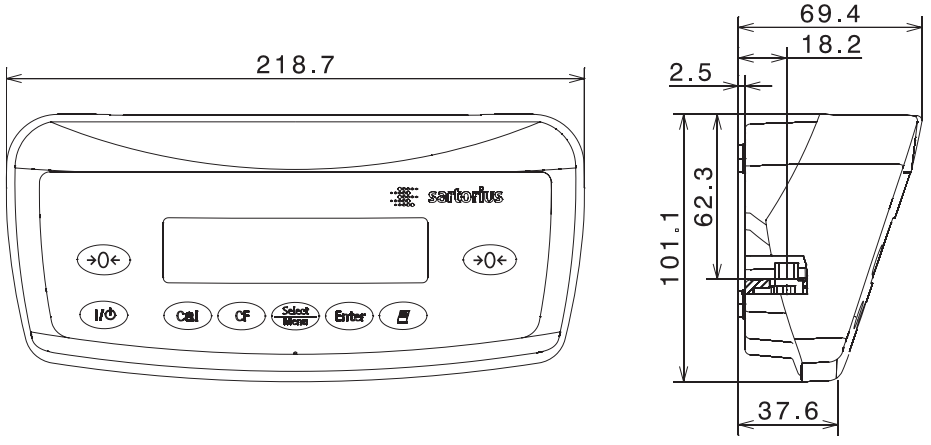
Dimensions (Scale Drawings)

Electronics module:



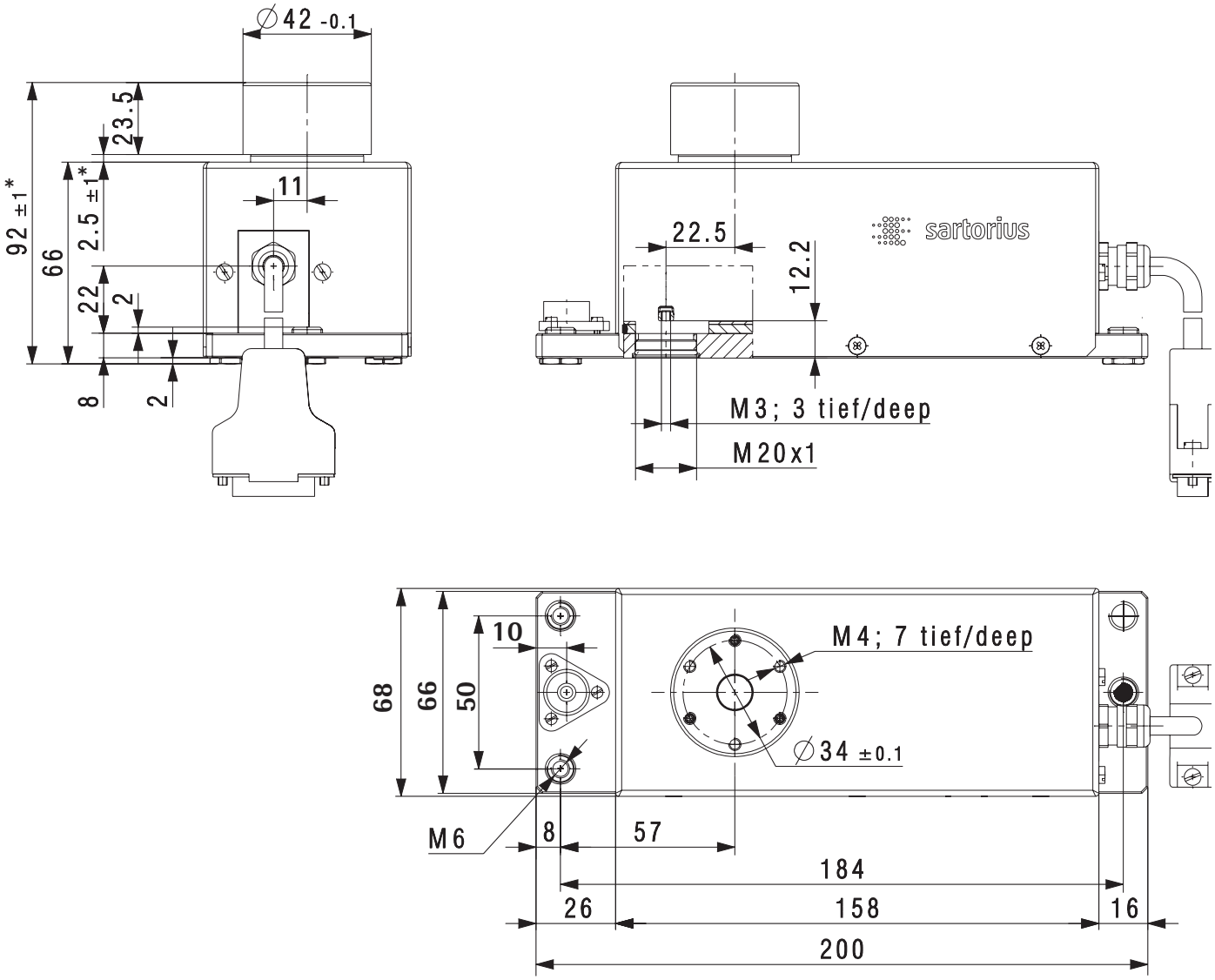


Optional YAC01ED Display and Control Unit:



All dimensions are given in millimeters

Weigh cell models:
WZA224-N, WZA224-ND, WZA1203-N and WZA523-N



Kabellänge: 3 m
15-pol. D-Sub-Stecker
zur Sartorius-Elektronikbox
Cable length: 3 m
15-pin D-Sub male connector
for Sartorius electronic PCB box

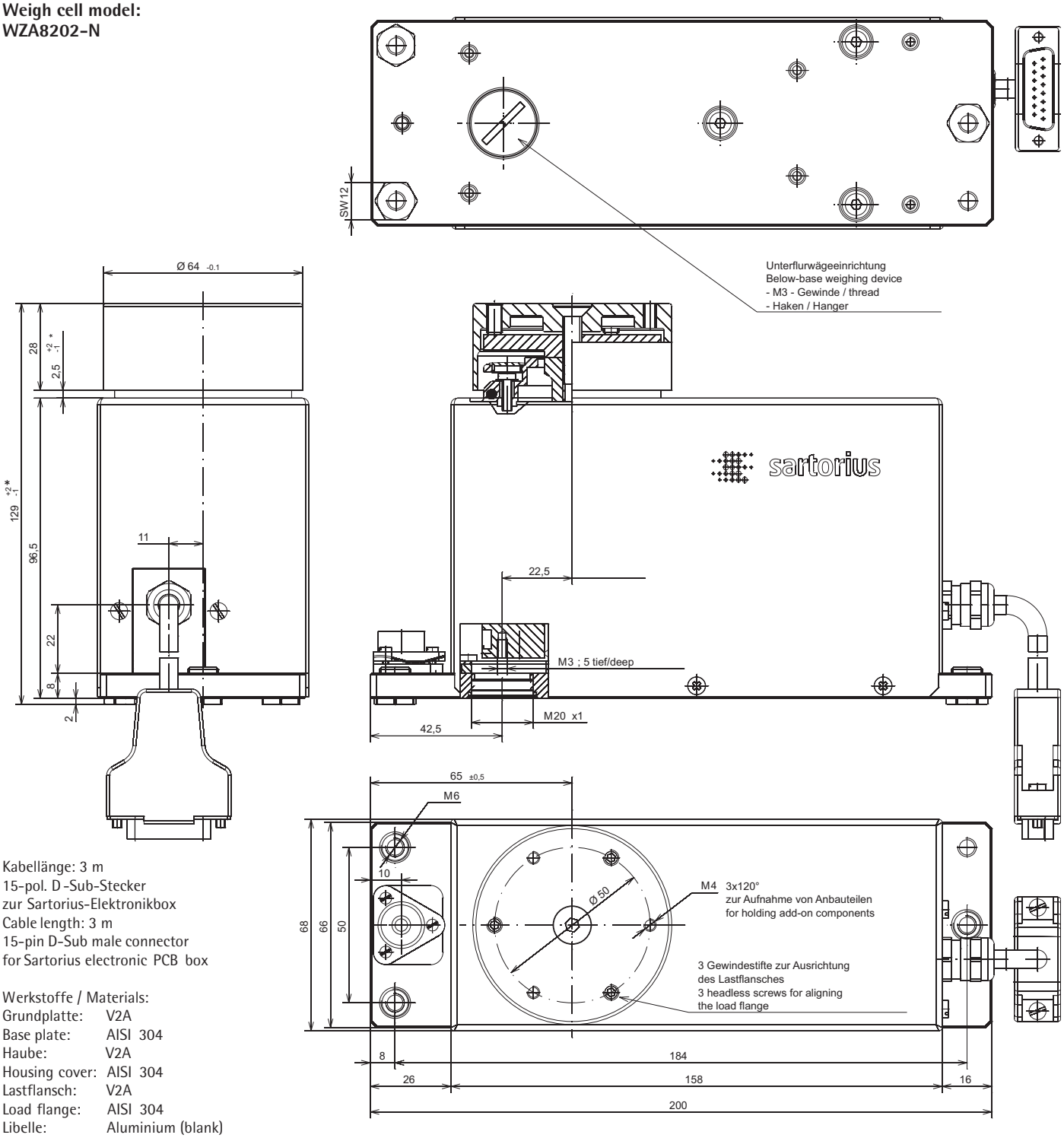
Werkstoffe / Materials:
Grundplatte: V2A
Base plate: AISI 304
Haube: V2A
Housing cover: AISI 304
Lastflansch: V2A
Load flange: AISI 304
Libelle: Aluminium (blank)
Level indicator: Aluminium (without finish)

Schutzklasse der Zelle: IP44
Type of protection of weigh cell: IP44

* Einstellbereich

All dimensions are given in millimeters

Weigh cell model:
WZA8202-N



Kabellänge: 3 m
15-pol. D-Sub-Stecker
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15-pin D-Sub male connector
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Base plate: AISI 304
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Housing cover: AISI 304
Lastflansch: V2A
Load flange: AISI 304
Libelle: Aluminium (blank)
Level indicator: Aluminium (without finish)

Schutzklasse der Zelle: IP44
Type of protection of weigh cell: IP44

* Einstellbereich

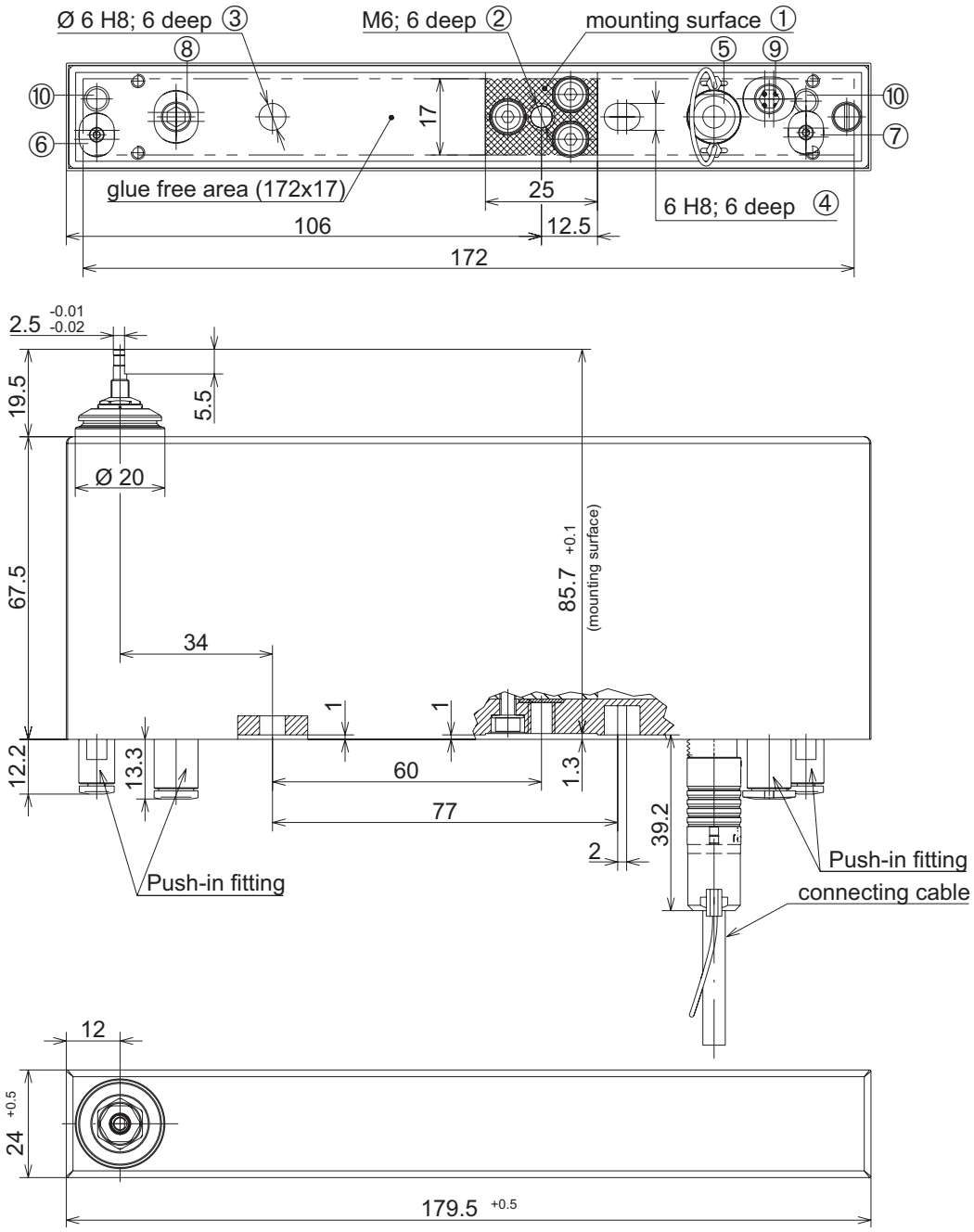
All dimensions are given in millimeters

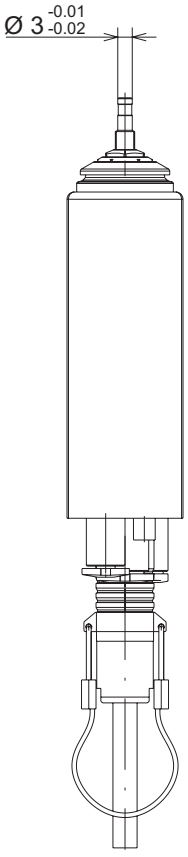
Weigh cell model:
WZA25-NC

Kabellänge: 3 m
15-pol. D-Sub-Stecker
zur Sartorius-Elektronikbox
Cable length: 3 m
15-pin D-Sub male connector
for Sartorius electronic PCB box

Werkstoffe / Materials:

Grundplatte / Haube:	1.4404
Base plate / Housing cover:	AISI 316 L
Aufnahmezapfen:	Titan
Pan pin:	Titanium





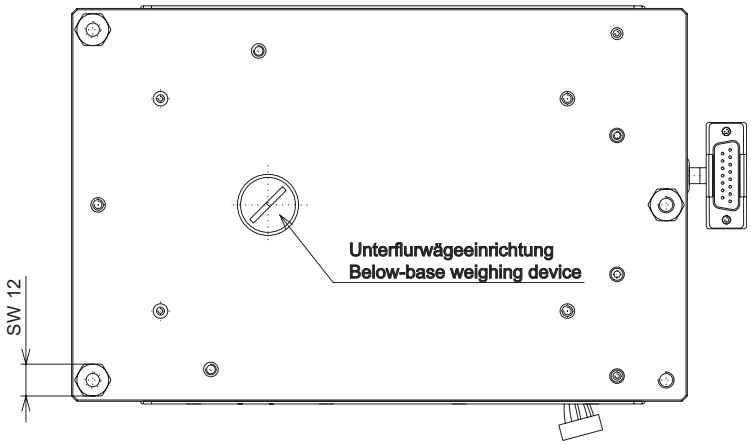
Pos.	Designation
1	Mounting surface
2	Threaded hole for mounting
3, 4	Positioning holes
5	Electrical connection
6	Pressure inlet Cal.-weight circuit mechanism 6 bar, ∅ 3 mm

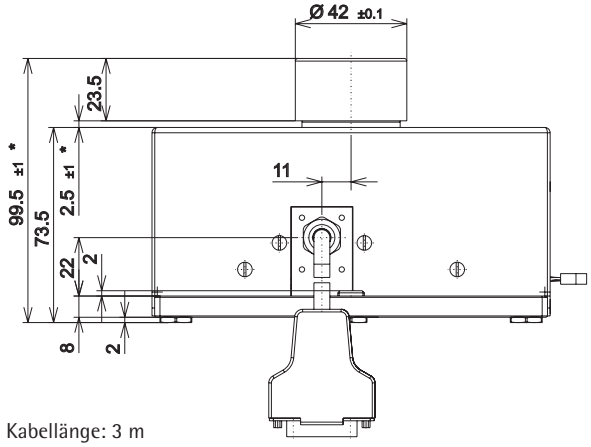
Pos.	Designation
7	Pressure inlet closing mechanism 6 bar, ∅ 3 mm
8	Air inlet for rinsing cycle ≤ 50 mbar, ∅ 6 mm
9	Air outlet for rinsing cycle ≤50 mbar, ∅ 6 mm
10	Pressure outlet for 6 and 7

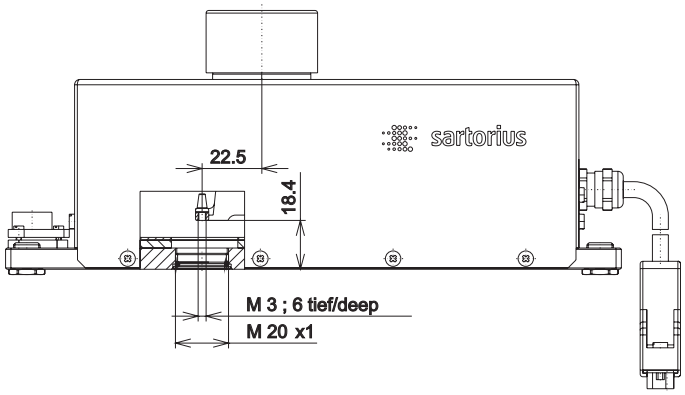
⚠ Users should never change any other screws!

All dimensions are given in millimeters

Weigh cell models:
WZA224-NC, WZA523-NC, WZA1203-NC







Kabellänge: 3 m
15-pol. D-Sub-Stecker
zur Sartorius-Elektronikbox
Cable length: 3 m
15-pin D-Sub male connector
for Sartorius electronic PCB box

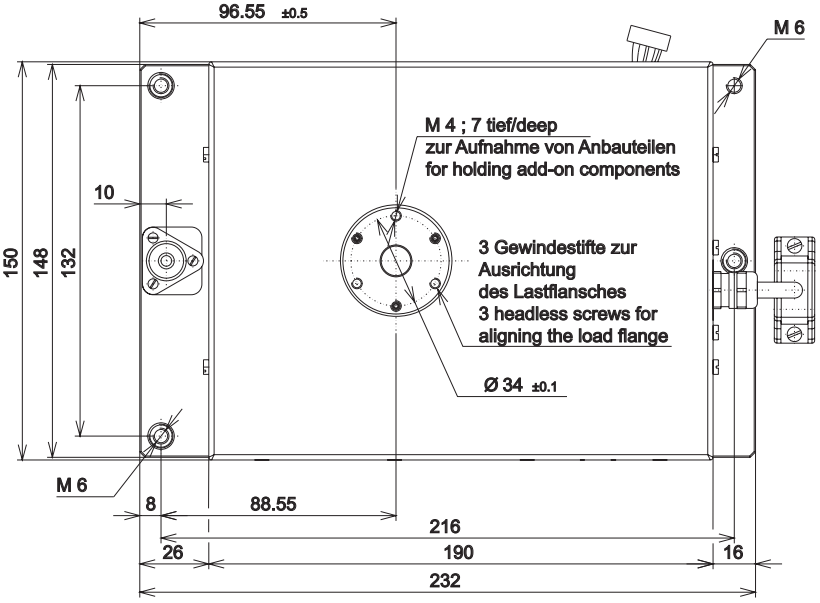
Werkstoffe / Materials:

Grundplatte:	1.4404
Base plate:	AISI 316L
Haube:	1.4404
Housing cover:	AISI 316L
Lastflansch:	Aluminium (chemisch Nickel)
Load flange:	Aluminium (chemical nickel)
Libelle:	Aluminium (blank)
Level indicator:	Aluminium (without finish)

Schutzklasse der Zelle: IP44
Type of protection of weigh cell: IP44

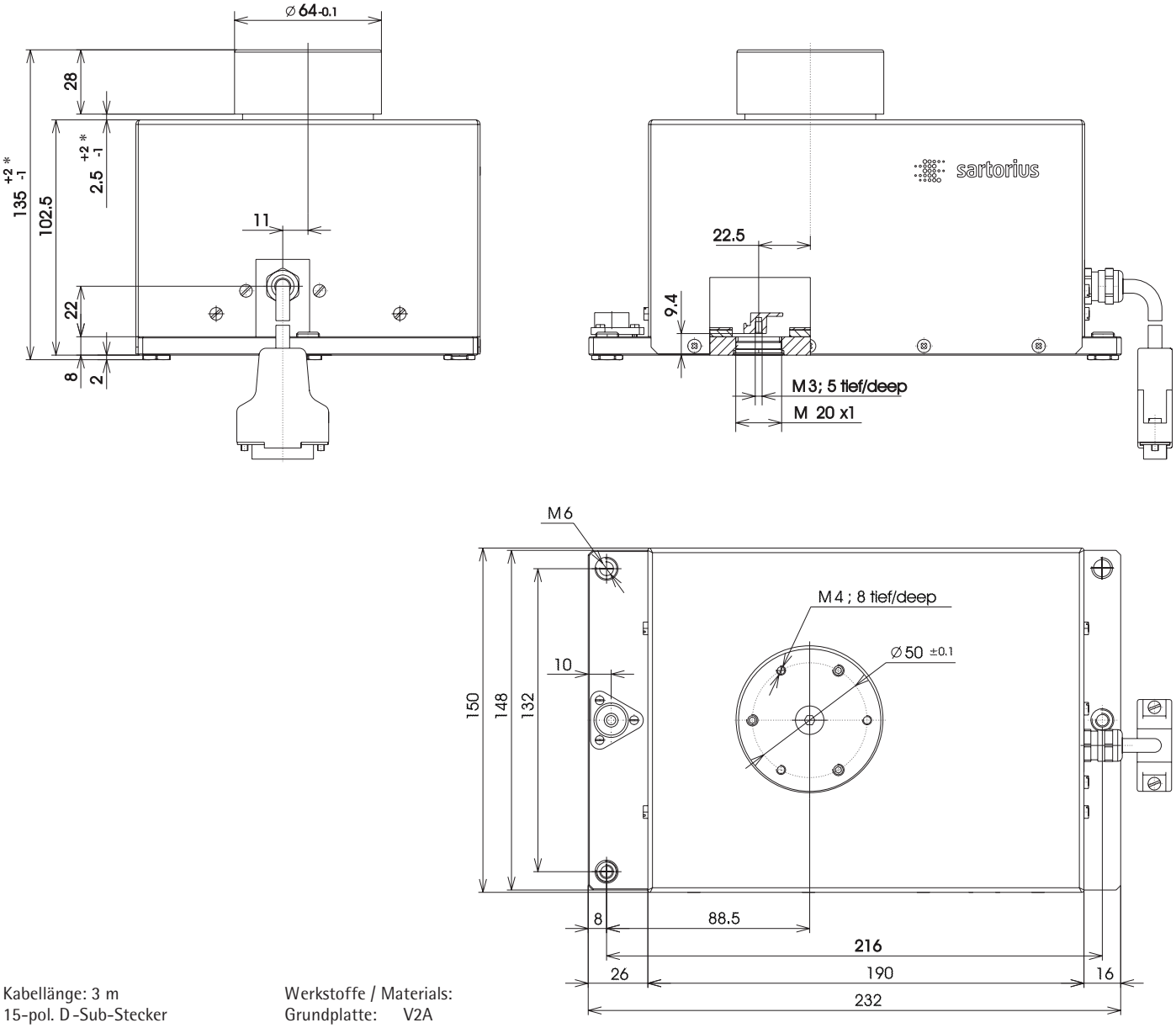
* Einstellbereich
* Range of adjustment

hierzu Massblatt Elektronikbox
add to dimension sheet electronic PCB box
Zeichnungs-Nr./drawing no.: 65905-600-65



All dimensions are given in millimeters

Weigh cell WZA8202-NC



Kabellänge: 3 m
15-pol. D-Sub-Stecker
zur Sartorius-Elektronikbox
Cable length: 3 m
15-pin D-Sub male connector
for Sartorius electronic PCB box

Werkstoffe / Materials:
Grundplatte: V2A
Base plate: AISI 304
Haube: V2A
Housing cover: AISI 304
Lastflansch: V2A
Load flange: AISI 304
Libelle: Aluminium (blank)
Level indicator: Aluminium (without finish)

Schutzklasse der Zelle: IP44
Type of protection of weigh cell: IP44

* Einstellbereich

All dimensions are given in millimeters

Accessories

Product	Order No.
Display and control unit with cable (0.9 m) for connection to enclosed electronics module	YAC01ED
Second display for connection to data interface	YRD03Z
Configuration software for settings, calibration/adjustment and setting the preload	Sartorius CAS-Suite
SartoConnect data transfer software (for loading weight values in a PC running Windows® 95/98/NT and direct processing with application programs such as Excel, Access, etc.) incl. adapter cable (1.5 m) from weigh cell to PC (12-pin to 9-pin)	YSC01I
Data cables RS-232	
– for PC connection, 25-pin (m) / USB type A, length approx. 1.8 m	YCC01-USBM2
– for PC connection, 25-pin (m) / 9-pin (f), length approx. 2.0 m	7357314
AC adapter IP40 protection in accordance with VDE* 0470/529	YEPS01-15VOH
Additional options and accessories available on request	

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

Original

EU Declaration of Conformity

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

i.V.

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

i.V.

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.

CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1928438 **Master Contract:** 167555

Project: 1928438 **Date Issued:** 2008/01/09

Issued to: **Sartorius AG**

Weender Landstrasse 94-108
Postfach 3243
Goettingen, 37075
Germany
Attention: Dr. Dieter Klausgrete

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'

C US

Issued by: J. Beacham

Authorized by: Gianluca Arcari, P.Eng., MBA,
Product Group Manager

Gianluca Arcari

PRODUCTS

CLASS 8721 85 - ELECTRICAL EQUIPMENT FOR LABORATORY USE - Certified to US Standards

CLASS 8721 05 - LABORATORY EQUIPMENT - Electrical

Laboratory Scale

Part A: Model WZ or GPC series.

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.

DQD 507 Rev. 2004-06-30

CSA INTERNATIONAL

Certificate:	1928438	**Master Contract:**	167555
Project:	1928438	**Date Issued:**	2008/01/09

Part B: Model WZG series.

Part C: Model WZV series.

Note 1: Models WZ, GPC and WZG are Equipment Class 1, Pollution Degree 2, and Installation Category II.

Note 2: Model WZV is evaluated as a component where the suitability of the enclosure and power supply is to be evaluated.

CONDITIONS OF ACCEPTABILITY

The equipment is supplied with an approved power supply cord set that is acceptable to the authorities in the country where the equipment is to be used.

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No. 61010-1-04 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements

UL Std. No. 61010-1 (2nd Edition) - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

Sartorius Lab Instruments GmbH & Co. KG
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37079 Goettingen, Germany

Phone: +49.551.308.0
www.sartorius.com

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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