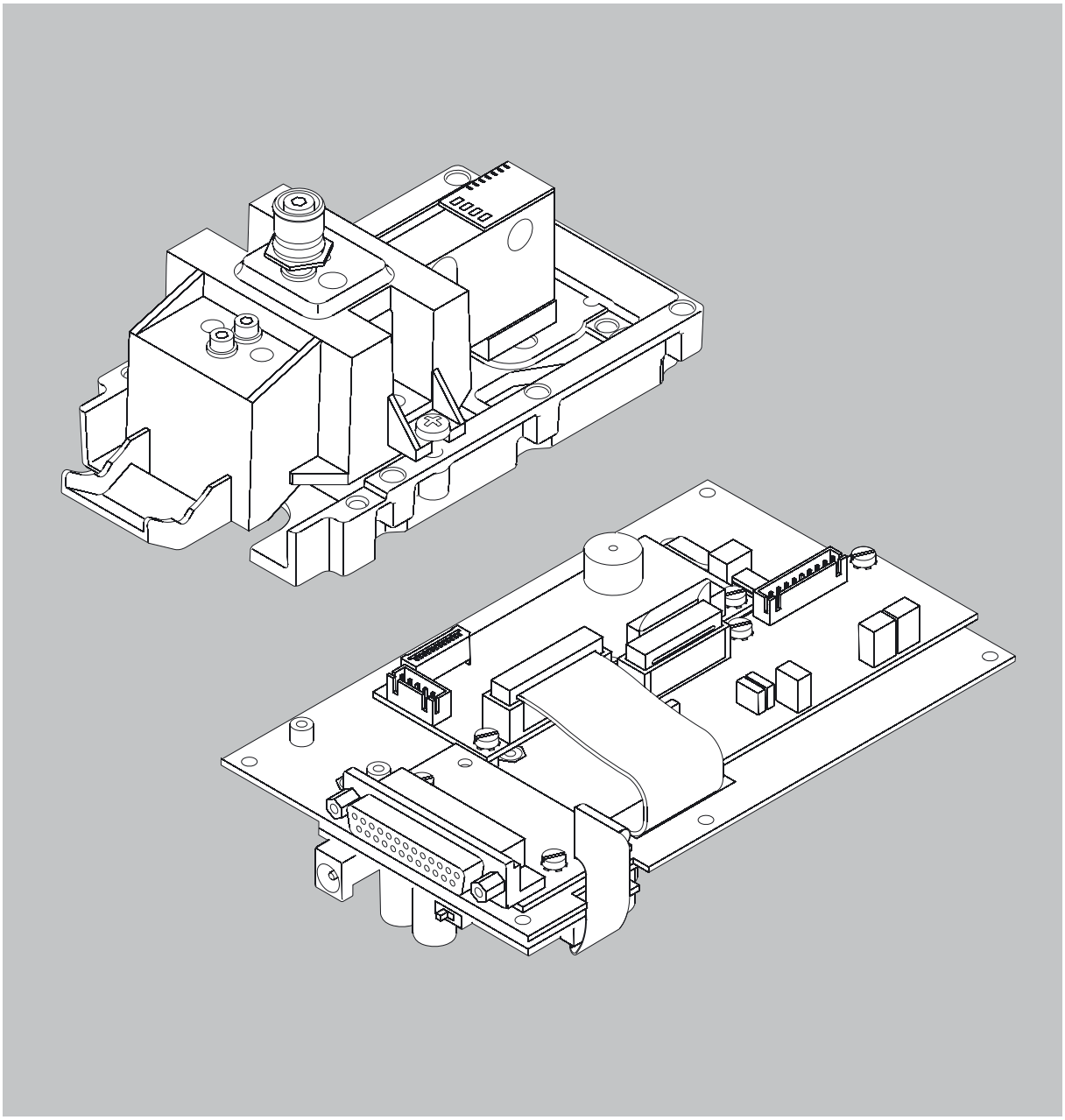
Installation Instructions

Sartorius Weigh Cells

Models WZA...-B



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Contents

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

⚠ These devices are modules for installation and cannot be implemented directly unless any additional measures are undertaken. Direct sale to the end customer is not permitted because the equipment does not bear a CE mark.

System Description

The products are comprised of two components:
- Compact weigh cell that must be affixed to three points.
- Electronics unit
- These compact weigh cells can be used to determine weights within restricted space.

Warning and Safety Instructions

Safety

● The user must at least take the following points into account when using the weigh cell installed in the entire product:
- 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 requirements that must be observed during installation into a system.

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

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.

⚠ Replacing the weigh cell and electronics unit: 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.

⚠ The requirements pertaining to applicable installation regulations must be followed when using electrical equipment in systems and under environmental conditions with increased safety requirements.

- Warning: RS-232 cables purchased from other manufacturers: 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 any such cables and disconnect any lines assigned differently.

- Note on Installation:
The operator shall be responsible for any modifications to the 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 expose the equipment to aggressive chemical vapors or to unnecessarily extreme temperatures, moisture, shocks, or vibration.

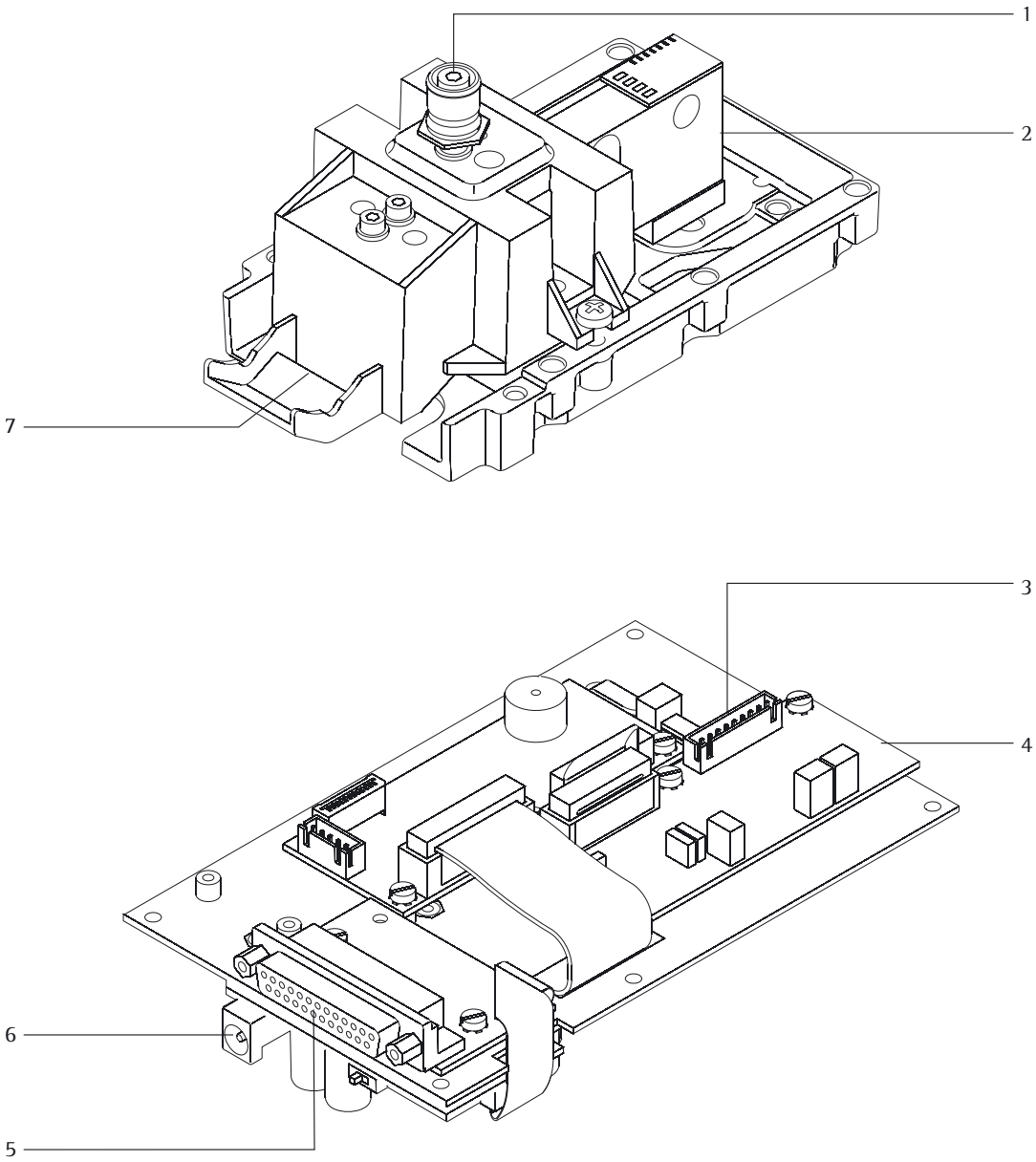
○ Should any problems arise with your device, please contact your Sartorius customer service center.

Hotline

● Please direct technical questions on design, specifications and installation to your operating partner or directly to Sartorius, at the hotline:
Phone: +49.551.308.4440
Fax: +49.551.308.4449

General View of the Equipment

Models WZA822-B, WZA8201-B



Pos.	Description
1	Load receptor (WZA8201-B: 2 threaded holes for the pan retainer)
2	Weigh cell
3	Female connector for weigh cell
4	Electronics unit

Pos.	Description
5	Interface port
6	DC jack
7	Threaded borehole for a hook for below-balance 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 until you have successfully installed your equipment. 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 expose the equipment to gravitational acceleration in excess of 0 300 m/s² (unless additional equipment is installed on the load receptor).

⚠ The packaging always allows for sending exactly 8 weigh cells with electronics units. Deviations from these specifications can result in damage to the weigh cells during transport.

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 YAD011S-H8S software as an aid for this test.

Equipment Supplied

- Weigh cell
- Electronics unit
- Installation instructions (this document)
- Special accessories as listed on the bill of delivery or in accordance with any customer-specific agreement

○ An AC adapter is not included with the equipment supplied. If required, please order separately or follow the notes on connecting optional current generators (safety extra-low voltage (SELV) source).

○ An extension cord (weigh cell electronics) is not included with the equipment supplied. If required, order separately or follow the notes on producing an extension cord connection.

Installation Instructions

The weigh cell is supplied in an anti-static packaging with the corresponding analog electronics.

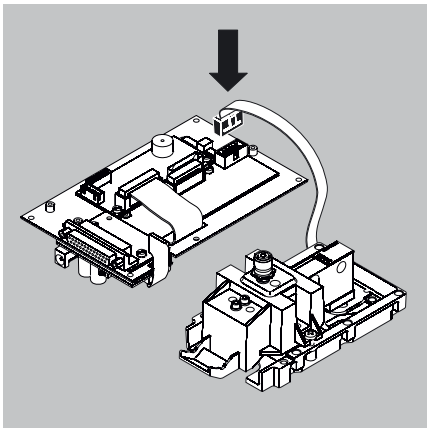
The other electronic components are packaged separately on a base plate in an anti-static bag.

When using them, make sure the serial numbers of weigh cell and electronic components match!

The analog electronics supplied with the weigh cell can be attached on the base plate.

Before startup, plug the corresponding cable securely into the analog electronics.

The device is constructed so that it provides 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.
- 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...-B: External calibration

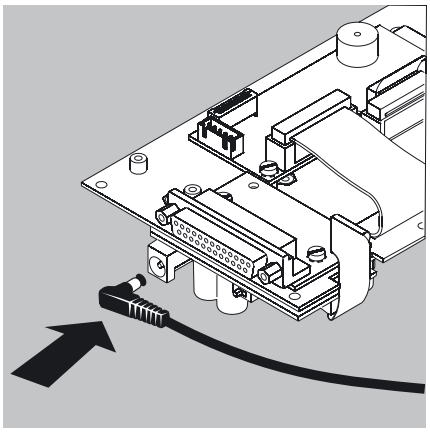
- Equipment installed on the load receptor can interfere with weigh cell functions. The user accepts all liability for production release and the specifications of the entire equipment. The specifications attained by your system may differ from those listed in the “Specifications” Chapter.

Conditioning the equipment:

Moisture in the air can condense on the surfaces of cold equipment whenever it is brought to a much warmer environment. 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 unit and on the weigh cell.



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
- Original Sartorius AC adapters and power supplies
- AC adapters approved by specialist technicians

● Connect the mains unit jack plug to the electronics unit.

● Connect the equipment to power:
Plug the AC adapter into the wall outlet (mains)

○ Power is supplied through the DC power supply (jack plug).

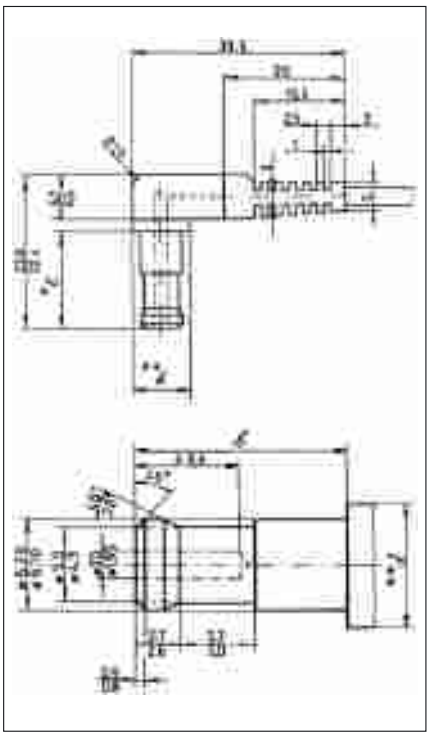
○ The device can be operated with a supply voltage of 12 V to max. 26 V.

⚠ 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
Safety requirements:
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).

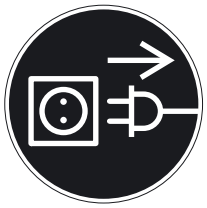
When using the mains power supply unit 6971412:
The Class 2-rated AC adapter can be plugged into any wall outlet without any additional precautions.
When using the universal power supply 6971966:
An AC adapter rated to Class 1 can be plugged into any wall outlet which has a protective grounding conductor (PE).
A ground or earth terminal is connected to ground or earth of the device . The equipment can be additionally grounded, if required for certain functions. The data interface is likewise galvanically connected (grounded) to the ground or earth terminal of the weigh cell.



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.

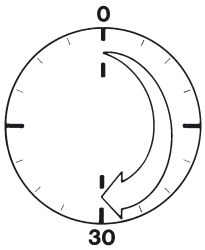
To use an external power supply, the power source must meet the requirements of EN 61326.

Power supply connection:
Via a barrel connector (straight or angled) according to DIN 45323, outside positive and inside negative.



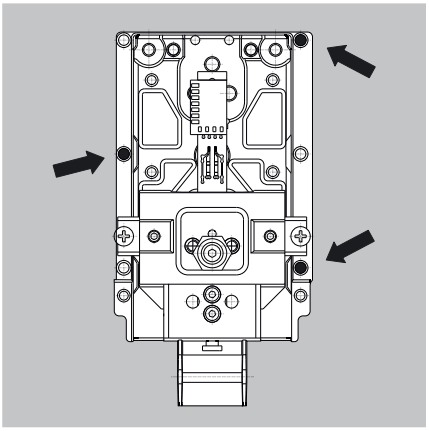
Connecting Electronic Peripheral Devices

- 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.
The guide value for these weigh cells is approx. 45 minutes. This guide value, however, must be verified by the user in the respective system or application.

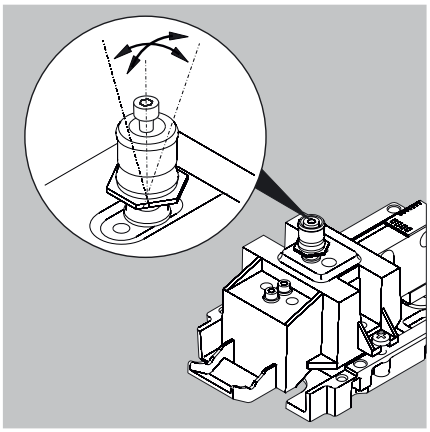


Mounting the Weigh Cell

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

- Using the 3 drill holes, securely mount the weigh cell with the fastening frame of the system.

WZA822-B:

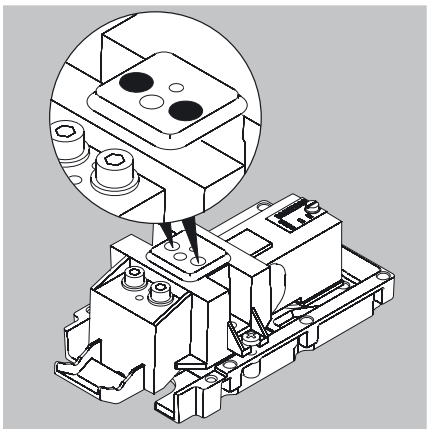


WZA822-B: Leveling the load receptor for user-specific loading

- Remove the screw.
- Radially position and level the load receptor.
- Reattach the load receptor with the screw: torque 1 Nm.
- Maximum permissible load on load receptor: See table on next page.
- ○ The load receptor can be disassembled completely when operated with a user specific transducer.

⚠ Make sure the user-specific transducer is rigid.

WZA8201-B:

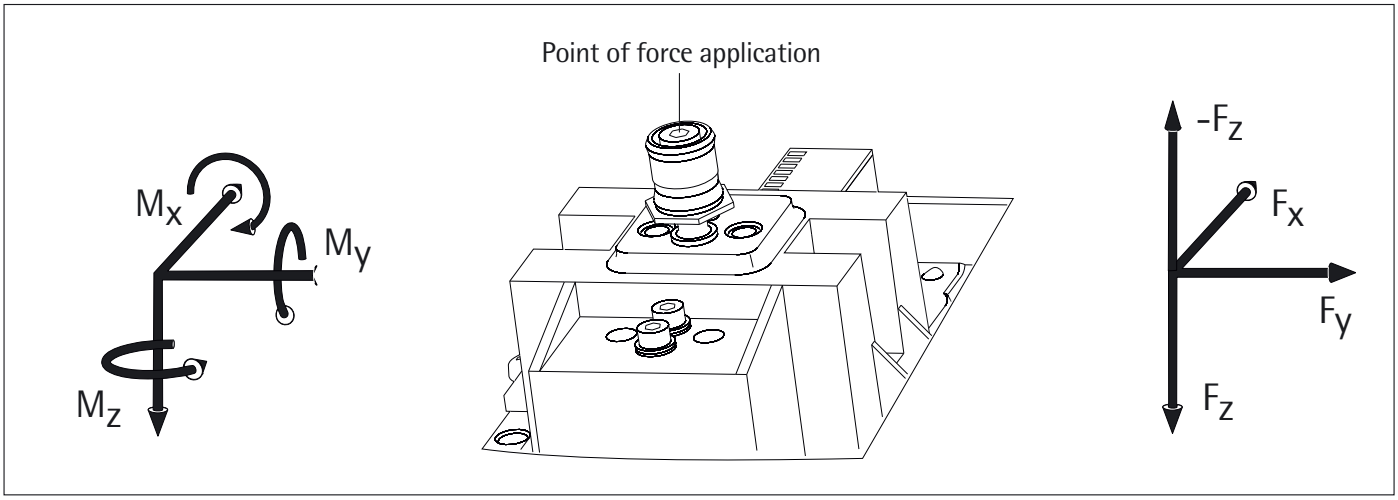


WZA8201-B: Attaching the User-specific Transducer

- Screw the user-specific transducer on to the two threaded fasteners of 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 firmly attached to the load receptor.

Maximum permissible load on load receptor:



Model	Max. torque	Screwing torque	+ F_z	Max. force against the direction of load (-F_z)	Max. force at point of force application F_x, F_y
WZA822-B	0.8 Nm	1 Nm	40 N	40 N	30 N
WZA8201-B	8 Nm	3 Nm	200 N	200 N	100 N

Apply either the maximum forces or the torque. If force and torque are applied simultaneously, the total percentage of used weighing capacity must not exceed 100%.
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 overload weight being exerted W_{Over} and the torque created by the intrinsic weight W_{Hook} holding the weight.
Force F_z is the sum of the force of the weight F_{Load}, the force of the weight of the hook arm F_{Hook} and the overload force F_{Over}.

How heavy may the maximum off-center overload force F_{Over} be for a WZA224-B 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?

The total percentage of used weighing capacity applied by force and torque must not exceed 100%.

$1 = F_z/F_{zmax} + M_y/M_{max}$

$F_z = F_{Load} + F_{Hook}/F_{Over}$
$F_z = 1.57N + F_{Over}$

$M_y = M_{Load} + M_{Hook} + M_{Over}$
$M_y = 1.27\ Nm + F_{Over} + 0.1\ m$

$1 = (1.57\ N + F_{Over}/20\ N + (0.127\ Nm + F_{Over} + 0.1\ m/0.8\ Nm$
$F_{Over} = 4.36\ N$

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.

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.
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. This problem particularly involves samples that have extremely poor conductivity (glass, plastic, filters) since they can only 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 and electronics base plates must both be grounded through 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 and weighing pan using a nonmagnetic 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.

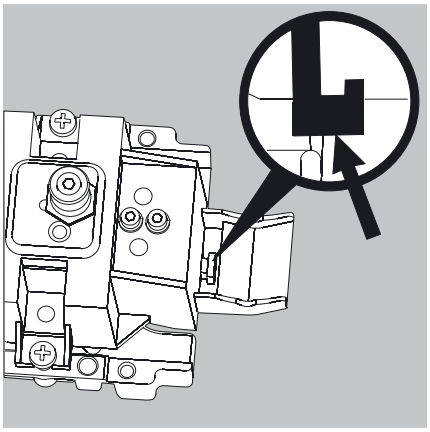
Effects of Drafts
Depending on the size of the load receptor and the sample, the effects of drafts may occur.
To minimize this effect, install a draft shield for protection. Protect the weigh cell against wind influences.

Adjustment

Calibration/adjustment can be performed as follows:
- Using control commands sent by the YAD01IS-H8S configuration software from Sartorius, installed on a computer
(see page 19 for the commands)

Below-Balance Weighing

WZA822-B, 8201-B:



A port for a below-balance weighing hanger is located on the bottom of the weigh cell.

Models WZA822-B and 8201-B:

● Hang the customer-specific hook for below-balance weighing on the retainer.
Models WZA822-B, and 8101-B: overload and underload protection provided.

○ Install a draft shield if necessary.

Basic Weighing Function

Features

– Taring the weigh cell
– Weighing parameter prompt

Preparation

● Connect the weigh cell to the power supply: If necessary, apply a minimum preload.

● Tare the balance/scale, if necessary: Send Esc T

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

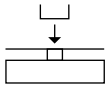
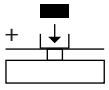
○ If desired, load the factory settings: See the chapter entitled “Configuration”

Additional functions:

○ Disconnect the weigh cell from the power supply

Example

Determine a weight value

Step	Command	Data Output
1. If necessary, apply minimum preload (see Specifications)		
2. Switch on the weigh cell Self-test runs. Followed by automatic initial tare function.		0.0 g
3. Place container on weighing pan (in this example 11.5 g).		+ 11.5 g
4. Tare the weigh cell	Esc T	0.0 g
5. Place sample in container (in this example 132 g).		132.0 g
6. Weighing parameter prompt	Esc P	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 device parameters are combined in the following groups:
(1st menu level):
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.

Preparation
○ Using the YAD011S-H8S configuration software from Sartorius installed on a PC, you can process the operating menu parameters as follows:
– Read
– Edit
– Print
– Save

Menu Structure (Overview)

	Level 1	Level 2	Codes
Setup menu	Balance/scale (Weigh cell functions)	Place of use/ambient conditions (filter adaptation)	1. 1.
		Application filter	1. 2.
		Stability range	1. 3.
		Stability delay	1. 4.
		Taring	1. 5.
		Auto zero	1. 6.
		Basic weight unit	1. 7.
		Accuracy of weighing aids (display positions)	1. 8.
		Calibration/adjustment function	1. 9.
		Adjustment sequence	1.10.
		Calibration weight unit for calibration weight	1.11.
		Zero range	1.12.
		Zero at power on	1.13.
		Zero at power/zeroing	1.14.
	Interface	Baud rate	5. 1.
		(Parity)	5. 2.
		Number of stop bits	5. 3.
		Handshake mode	5. 4.
		Number of data bits	5. 5.
		Communication mode SBI (ASCII) or printer	5. 6.
	Print/communication	Data output	6. 1.
		Stop automatic output	6. 2.
		Time-dependent autom. output	6. 3.
		Auto taring after manual output	6. 4.
		Printout of appl. parameters	6. 5.
		Output format	6. 6.
		ISO/GLP-compliant printout	6. 7.
		Output time (12h/24h)	6. 8.*
		Output date format	6. 9.*
	Additional functions	Menu read only/can change	8. 1.
		Acoustic signal	8. 2.
		Keypad	8. 3.
		External switch function	8. 4.
		Switch-on behaviour	8. 5.
		Display backlighting	8. 6.
	General settings (reset)	Menu (factory setting)	9. 1.

* Only in conjunction with Sartorius laboratory data printer YDP20-OCE

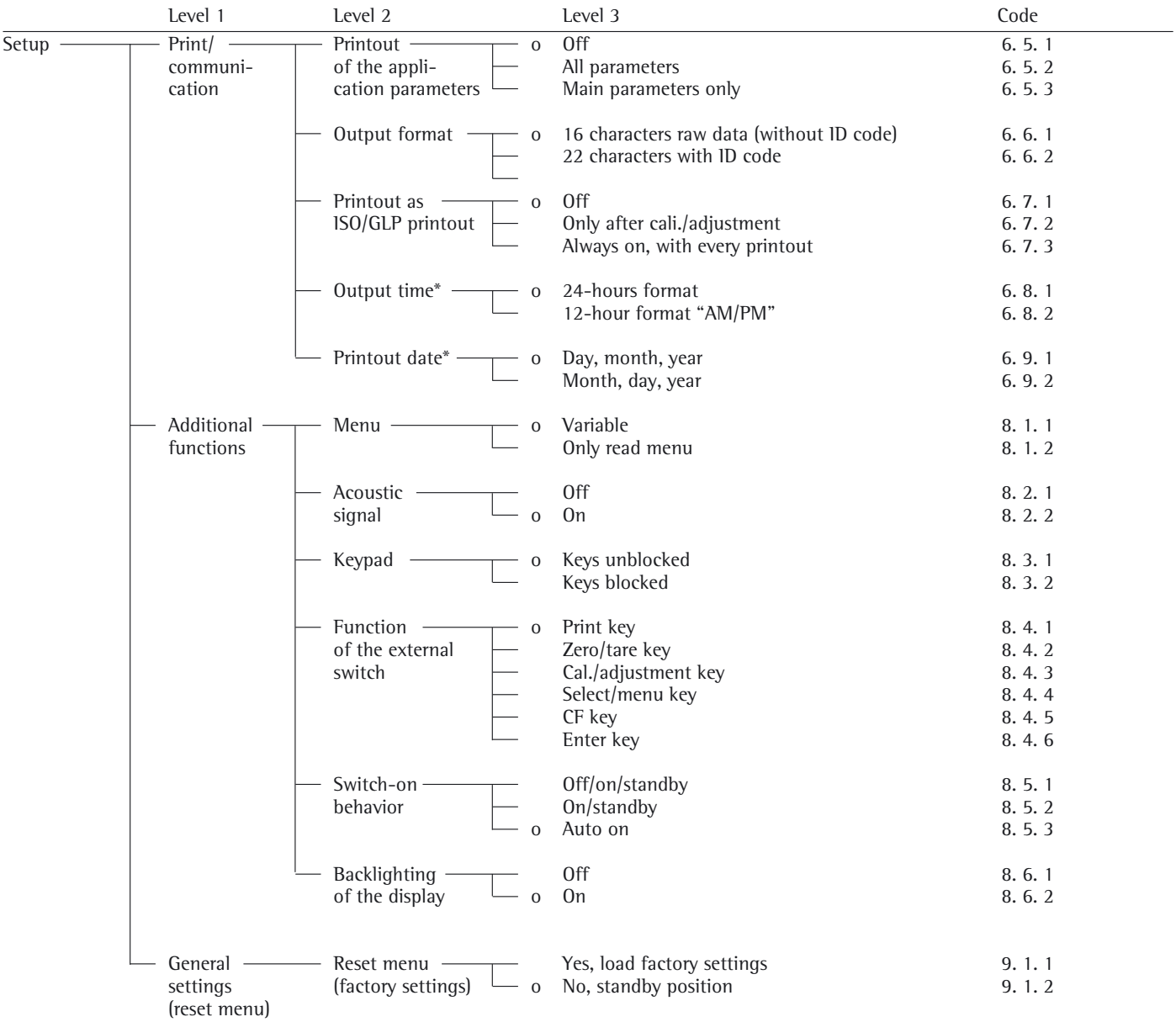
Parameter Settings (Overview)

o = Factory setting; √ = User-defined setting

	Level 2	Level 3		Level 4	Code
1.) Setup menu	Balance/scale weighing parameters	Installation location/ambient conditions (filter adaptation)		Very stable conditions	1. 1. 1
			o	Stable conditions	1. 1. 2
				Unstable conditions	1. 1. 3
				Very unstable conditions	1. 1. 4
		Application filters	o	Final readout	1. 2. 1
				Filling mode	1. 2. 2
		Stability range		1/4 digi.t Digits	1. 3. 1
				1/2 digi.t Digits	1. 3. 2
				1 digi.t Digit	1. 3. 3
			o	2 digi.t Digits	1. 3. 4
				4 digi.t Digits	1. 3. 5
				8 digi.t Digits	1. 3. 6
		Stability delay		No delay	1. 4. 1
			o	Short delay	1. 4. 2
				Medium delay	1. 4. 3
				Long delay	1. 4. 4
		Taring		Without stability	1. 5. 1
			o	At stability	1. 5. 2
		Auto zero		Off	1. 6. 1
			o	On	1. 6. 2
		Basic Unit of weight	o	Grams	1. 7. 1
				Kilograms	1. 7. 2
				Carats /ct	1. 7. 4
				Pounds /lb	1. 7. 5
				Ounces /oz	1. 7. 6
				Troy Ounces /ozt	1. 7. 7
				Hong Kong taels /tlh	1. 7. 8
				Singapore taels /tls	1. 7. 9
				Taiwanese taels /tlt	1. 7. 10
				Grains /GN	1. 7. 11
				Pennyweights /dwt	1. 7. 12
				Milligrams /mg	1. 7. 13
				Parts per pound /lb	1. 7. 14
				Chinese taels /tlc	1. 7. 15
				Mommes /mom	1. 7. 16
				Austrian Carats /ct	1. 7. 17
				Tola /tol	1. 7. 18
				Baht /bat	1. 7. 19
				Mesghal /MS	1. 7. 20
				Tons /t	1. 7. 21
				Pound:Ounce l/o	1. 7. 22
				Newton /N	1. 7. 23
		(Display digits) Weighing aids	o	Show all decimal places	1. 8. 1
				Last digit off (reduced by 1 digit)	1. 8. 2
				Increment of the measured values one level lower	1. 8. 3
				Increment of the measured values two levels lower	1. 8. 4
				Increment of the measured values three levels lower	1. 8. 5
				Last digit single increment	1. 8. 6
				10x resolution	1. 8. 8

Level 2	Level 3		Level 4	Code
	Function Cal./adjustment	o	Calibration/adjustment with factory-set weight	1. 9. 1
			Calibr./adjustment with user-defined weight	1. 9. 3
			Linearization with factory-set weights	1. 9. 6
			Linearization with user-defined weights	1. 9. 7
			Deactivated	1. 9. 11
	Adjustment sequence	o	Command immediate adjustment	1. 10. 1
			Calibration before adjustment	1. 10. 2
	Adjustment unit for adjustment weight:	o	Grams	1. 11. 1
			Kilograms	1. 11. 2
			Pounds	1. 11. 3
	Zero range		Factory settings	1. 12. 1
		o	2 Perc.ent	1. 12. 2
			5 Perc.ent	1. 12. 3
			10 Perc.ent	1. 12. 4
	Power on zero range		Factory settings	1. 13. 1
			2% max load	1. 13. 2
		o	5% max load	1. 13. 3
			10% max load	1. 13. 4
			20% max load	1. 13. 5
			50% max load	1. 13. 6
			100% max load	1. 13. 7
	Power on Tare/zero	o	On	1. 14. 1
			Off	1. 14. 2

Level 1	Level 2	Level 3		Level 4	Code
Setup	Interface	Baud rate		600	5. 1. 3
			o	1200	5. 1. 4
				2400	5. 1. 5
				4800	5. 1. 6
				9600	5. 1. 7
				19200	5. 1. 8
		Parity (Parity)	o	Odd	5. 2. 3
				Even	5. 2. 4
				No parity	5. 2. 5
		Stop bits Number of stop bits	o	1 Stop bit	5. 3. 1
				2 Stop bits	5. 3. 2
		Handshake Operational mode		Software handshake	5. 4. 1
			o	Hardware handshake	5. 4. 2
				No handshake	5. 4. 3
		Number of the data bits	o	7 Data bits	5. 5. 1
				8 Data bits	5. 5. 2
		Communi-cation mode	o	Standard SBI (ASCII) [1])	5. 6. 1
				Laboratory data printer	5. 6. 2
				Binary xBPI	5. 6. 4
	Print/ communi-cation	Data output		Individual value without stability	6. 1. 1
			o	Individual value at stability	6. 1. 2
				Automatic without stability	6. 1. 3
				Automatic at stability	6. 1. 4
				Individual value after load change	6. 1. 5
		Cancel Auto data output	o	Off, individual value not possible	6. 2. 1
				On, cancellation by print command	6. 2. 2
		Cycle Auto data output	o	Each value	6. 3. 1
				Every 2nd value	6. 3. 2
		Automatic disconnect from power after manual output	o	Off	6. 4. 1
				On	6. 4. 2



	Level 1	Level 2		Level 3	Code
Setup	Print/ communi- cation	Printout of the appli- cation parameters	o	Off	6. 5. 1
				All parameters	6. 5. 2
				Main parameters only	6. 5. 3
		Output format	o	16 characters raw data (without ID code)	6. 6. 1
				22 characters with ID code	6. 6. 2
		Printout as ISO/GLP printout	o	Off	6. 7. 1
				Only after cali./adjustment	6. 7. 2
				Always on, with every printout	6. 7. 3
		Output time*	o	24-hours format	6. 8. 1
				12-hour format “AM/PM”	6. 8. 2
		Printout date*	o	Day, month, year	6. 9. 1
				Month, day, year	6. 9. 2
	Additional functions	Menu	o	Variable	8. 1. 1
				Only read menu	8. 1. 2
		Acoustic signal		Off	8. 2. 1
			o	On	8. 2. 2
		Keypad	o	Keys unblocked	8. 3. 1
				Keys blocked	8. 3. 2
		Function of the external switch	o	Print key	8. 4. 1
				Zero/tare key	8. 4. 2
				Cal./adjustment key	8. 4. 3
				Select/menu key	8. 4. 4
				CF key	8. 4. 5
				Enter key	8. 4. 6
		Switch-on behavior		Off/on/standby	8. 5. 1
				On/standby	8. 5. 2
			o	Auto on	8. 5. 3
		Backlighting of the display		Off	8. 6. 1
			o	On	8. 6. 2
	General settings (reset menu)	Reset menu (factory settings)		Yes, load factory settings	9. 1. 1
			o	No, standby position	9. 1. 2

* Only in conjunction with Sartorius laboratory data printer YDP20-OCE

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 rates:
600, 1200, 2400, 4800, 9600 and 19,200 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 (1. 5. 2. 3)
Stop bits: 1 Stop bit (1. 5. 3. 1)
Handshake:
Handsk. Hardware handshake (1. 5. 4. 2)
Communication mode: SBI (1. 5. 6. 1)
Printing: man.with Manual at stability (1. 6. 1. 2)

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

Operation

Parameter Settings (Menu):
Please refer to the installation and operating instructions supplied with your balance/scale.

Data Output Format with 16 Characters

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
Ext. Cal.: Adjustment, external
High: Overload
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[1]	*	*	*	*	CR	LF
				D	I	S	.	E	R	R[1]	*	*	*	*	CR	LF
				P	R	D	.	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

Data Output Format with 22 Characters

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), display digits are not automatically 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
Ext. Cal.: Adjustment, external
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	D	.	E	R	R 1)	*	*	*	*	CR	LF

*: Spaces
#: Error code number

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

Commands (Data Input Format)
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: Stable
M	Ambient conditions: Unstable
N	Ambient conditions: Very unstable
O	Block keys
P	Data output/print function (print, auto print; activate or block) [1])
R	Unblock keys
S	Restart/self-test
D	Taring function

Command character !#	Format 2: Meaning
f0_	To activate setup menu function
f1_	Calibration/adjustment function (depending on the menu setting)
f2_	Enter function
s1_	External calibration/adjustment
s3_	CF function
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.

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 if 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
When hardware handshake is configured on a 4-wire interface, 1 more character can be transmitted after CTS.

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 (⎙) 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 an additional 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. "Timedependent autom. printing" (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 in Values/s

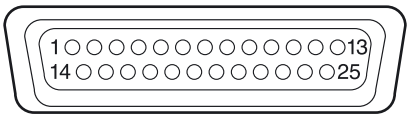
Place of installation/ambient conditions (filter adaptation)	XBPI/SBI
Very stable (1.1.1.1)	20
Stable (1.1.1.2)	10
Unstable (1.1.1.3)	5
Very unstable (1.1.1.4)	2.5

Pin Assignment Chart

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

Required Male Connector (Recommended):
25-pin D-Submini, DB25S, with integrated shielded cable clamp and shield plate assembly
(Amp type 826 985-1C) and fastening screws (Amp type 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. Therefore, be sure to check the pin assignments before connecting any such cables and disconnect any lines assigned differently. 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

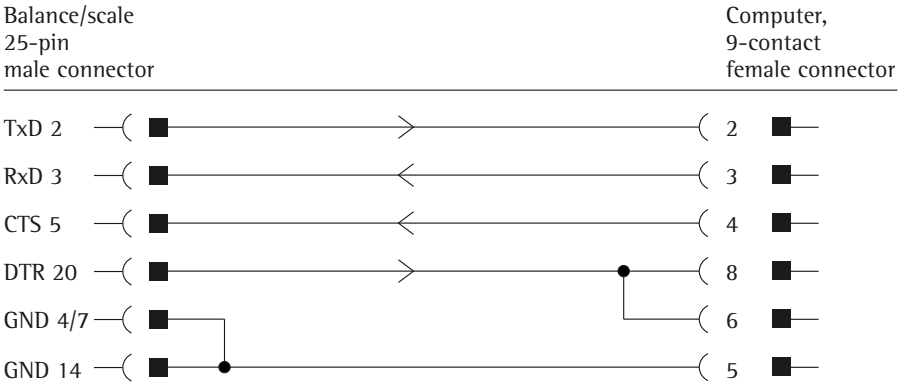
Switch port 2)

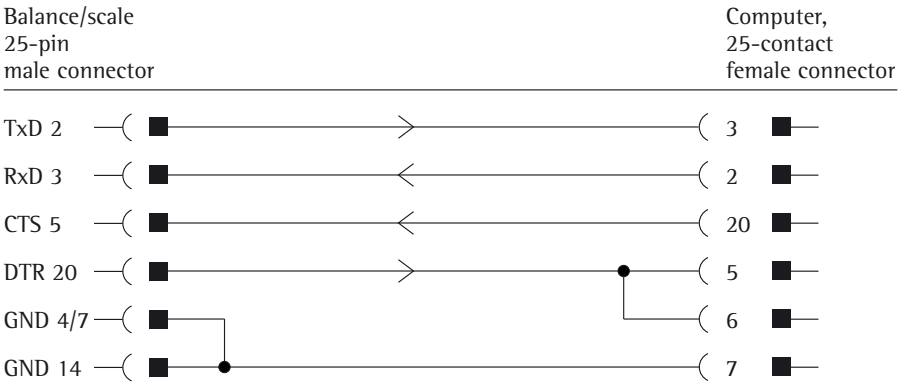
[1]) = Hardware restart
[2]) = External switch function can be programmed in the Setup > Extra functions > External switch (8.4.x) menu

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).

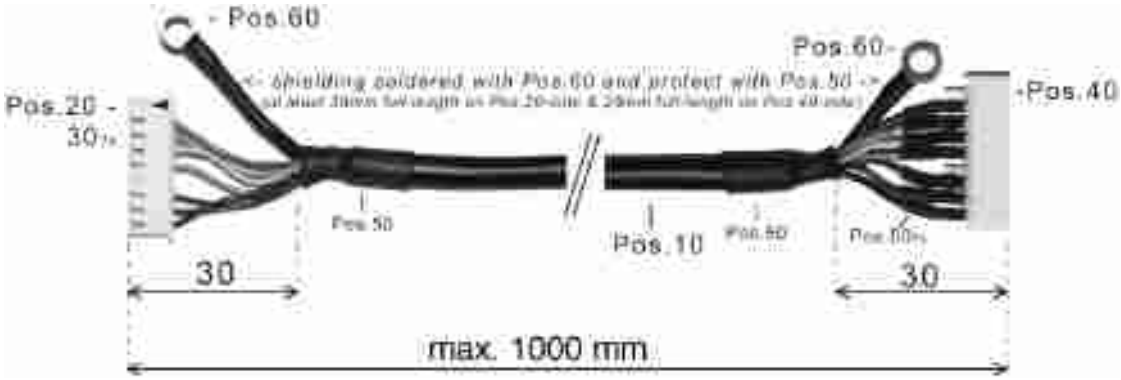
Do not connect any other pins to the cable connector of the balance/scale!





Cable type: AWG 24 specification

Extension cords between weigh cell and electronics PCB for models WZA822-B, WZA8201-B (DMS)



Pos.:	Description Name:	Manufacturer Manufacturer:	Manufacturer ID Manufacturer#.	Internal ID Internal article #:	Cutting length Blank:	Quantity Quantity:	Approvals & comments Approvals/Comments:
10	LiYCY 8xAWG26 PVC black LiYCY 8xAWG26 PVC black			57001-896-01	1000 mm	1+	AWM Style 2464
20	Socket housing, 9-pin Socket 9way	JST	XHP-9			1+	Ulrecognized E60389
30	Crimp contact Crimping contact	JST	SXH-001T-P0.6	57002-504-01		7+	Ulrecognized E60389
40	Plug connector 9-pin. Shrouded header 9way top entry	JST	B9B-XH-A			1+	Ulrecognized E60389
50	Heat shrinking tube Heat shrinking tube	DSG Canusa or Tyco	Deray I-3000 RNF 100		div	11+	Mil-DTL-23053/5 or RNF 100 ULFile#: E35586
60	Ring-terminal M4 brass blank Ring-terminal M4 brass	Stocko	RSB 7727 A4-1			2+	UL recognized E60389
70	Solder Flowtin TSC Tin solder	Stannol	KS 115				Lead-free pb-free

Troubleshooting Guide

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

Display	Cause	Solution
High	Weighing capacity exceeded	Unload the weigh cell
Low or Err 54	Something is touching the weighing pan and environment Load on weighing pan too light	Move the object that is touching the weighing pan Cannot store data: Increase load
App.err.	Load on weighing pan too light or no sample on pan while application is activedis.err. Change the configuration with output format in the operating menu	Data output not compatible with output format
prt.err.	Interface port for printer output is blocked	Reset the menu factory settings or contact your local Sartorius Service Center
Err 02	Adjustment condition was not met, e.g.: – Unstable – Tare – Load on weighing pan	Improve setup conditions Do not carry out adjustment until after 0 display Unload the balance/scale
Err 10	Taring function blocked when application program “net-total” is active; Only 1 tare function can be used at a time	The tare memory must be deleted Perform taring function again
Err 11	Tare memory not allowed	Perform taring function
The weight readout changes constantly	Unstable ambient conditions (excessive vibration or draft) Foreign object is caught between weighing pan and housing	Set up balance/scare in another area Change setup configurations Remove the foreign object
	The weight readout is obviously wrong Balance/scale was not tared before weighing	The balance/scale was not calibrated/adjusted Adjustment Tare

If any other errors occur, contact your local Sartorius Service Center.
Contact information: Please point your Internet browser to: http://www.sartorius.com

Overview

Specifications

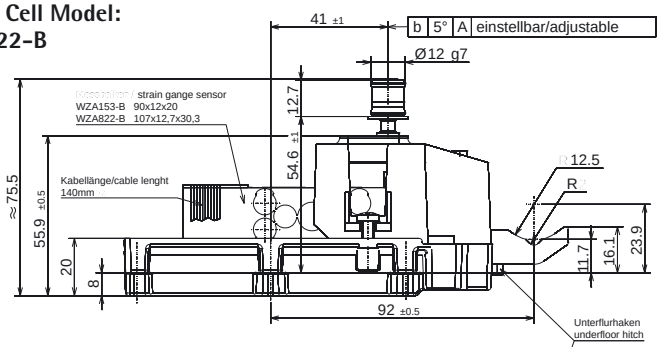
		Standard specifications		Customer-specific modifications
Model		**WZA822-B**	**WZA8201-B**	
Technology		DMS	DMS	
Weighing Capacity	g	820	8200	
Readability	g	0.01	0.1	
Required preload on pan support	g	170±40	730±400	
Maximum preload on pan support w/o limiting the weighing range, typical [2])	g	940	8400	
Tare range (subtractive)	g	of the maximum capacity		
Repeatability (standard deviation) [1])	<±g	0.01	0.1	
Linearity	<±g	0.03	0.3	
Measurement time [3])	s	0.5 s	0.3 s	
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	$5 \cdot 10^{-6}$	$5 \cdot 10^{-6}$	
External calibration weight (of at least accuracy class...)	g	200 (F1)	2000 (F1)	
Net weight, approximate	kg	0.65	0.75	
Weight of total packaging for 8 units	kg	12.6	12.6	
Supply voltage Ripple 50/60 Hz Power consumption Switch-on current	VDc VDc	min. 12 ... 26 max., optimal 15 V (+15% to –10%) 0.5 Vpp (voltage peak-to-peak) Typically 3.4 W Typically 6 W (weigh cell only)		
Built-in interface		RS-232C-S/V24-V28; 7-bit; even, mark, odd, space; Transmission rates: 150...19200 baud, 1 or 2 stop bits; software/hardware handshake		

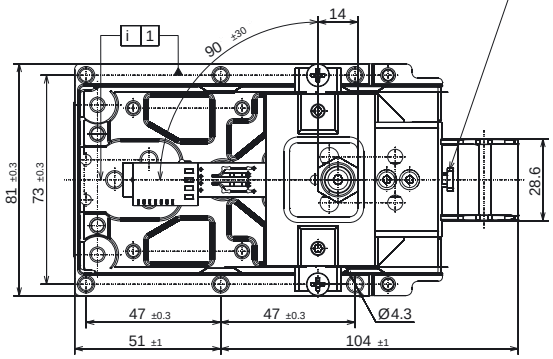
[1]) = Depends on system design
[2]) = For operation with greater preload setting, Please send e-mail to request for YAD01IS-H8S configuration software; e-mail address: fast.factory@sartorius.com
Greater preloads are possible, but reduce the weighing capacity.
[3]) = The weighing time is the time period in which the measured value oscillates within the stated range ±3x standard deviation from the static end value. Test weight approx. 25% of max.

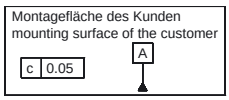
Overview

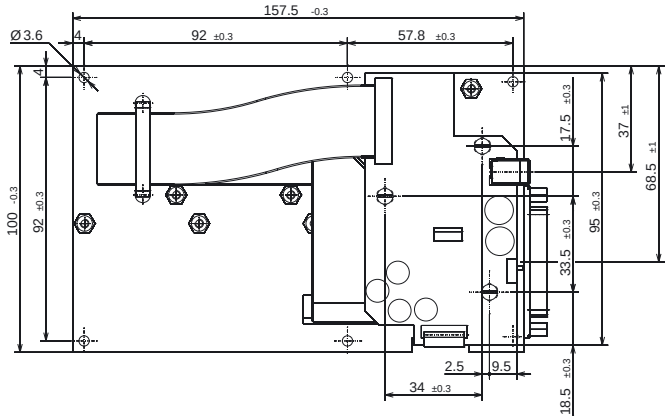
Dimensions (Scale Drawings)

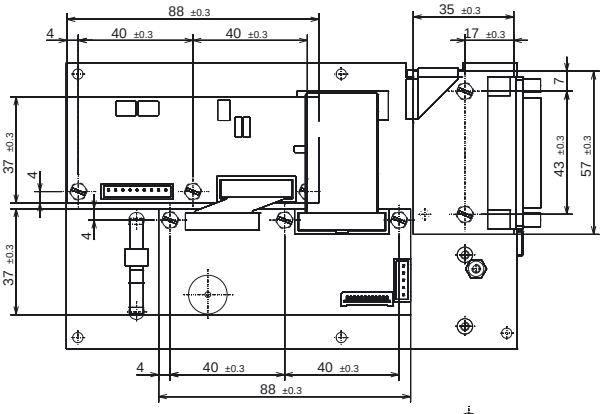
Weigh Cell Model:
WZA822-B

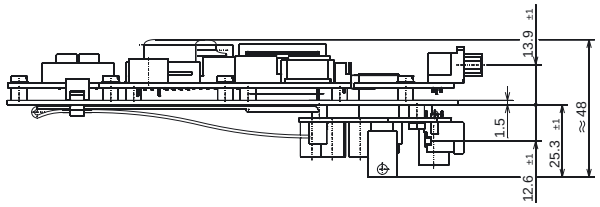


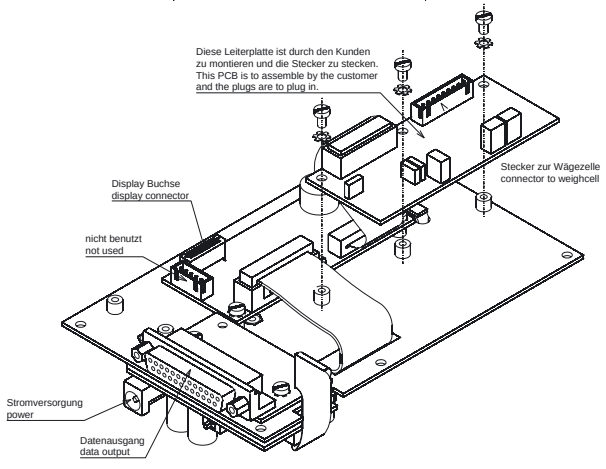








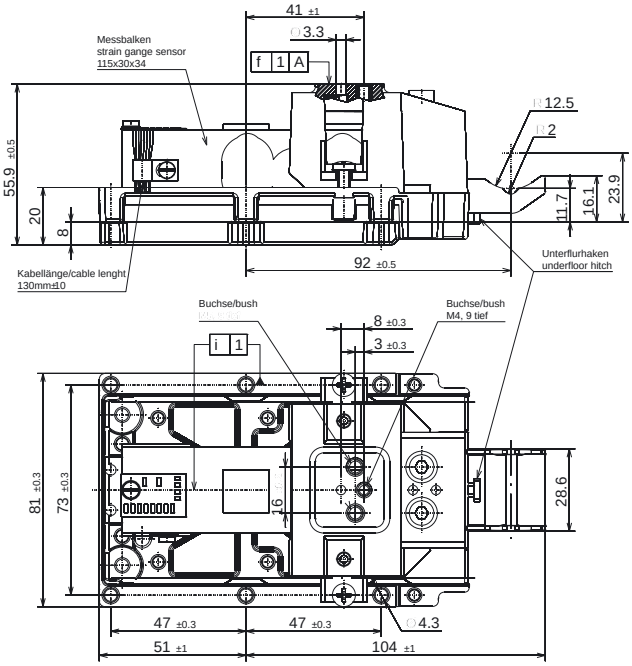


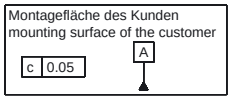


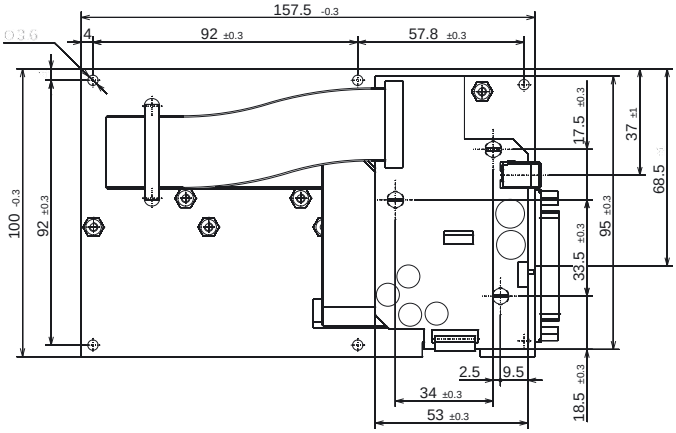
All dimensions are given in millimeters

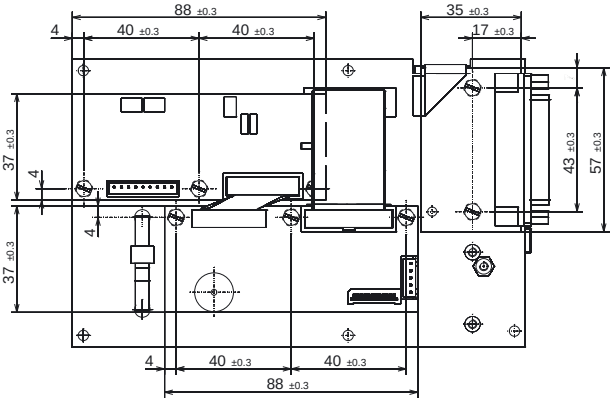
Dimensions (Scale Drawings)

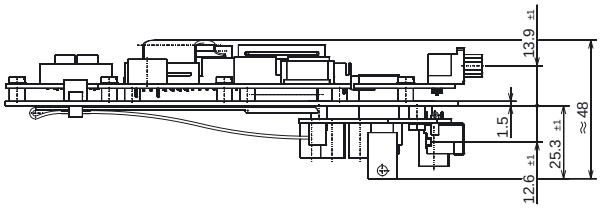
Weigh Cell Model:
WZA8201-B

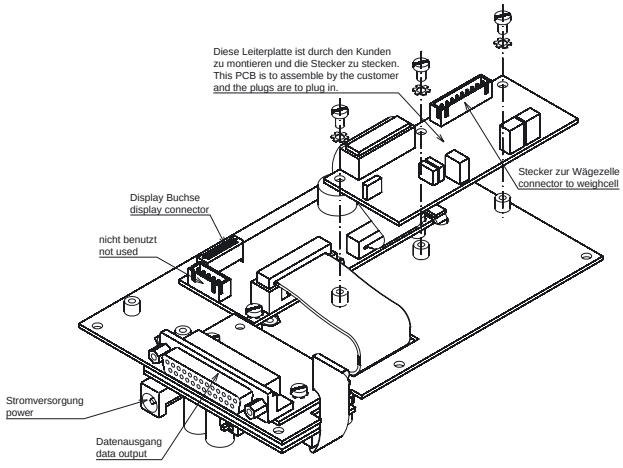












All dimensions are given in millimeters

Accessories

Product	Order No.
Configuration software for settings, adjustment and setting the preload	YAD011S-H8S
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)	YSC011
Data cables RS-232	
– for PC connection, 25-pin	7357312
– for PC connection, 9-pin	7357314
Sartorius power supply STNG6 IP40 protection in accordance with VDE 0470/529*	
– Europe	6971412
– US	6971413
– Sartorius universal power supply with broad mains input voltage range 100...240 V~, Order no. 6971966 and replaceable mains supply line:	
6900900 (Euro)	6900905 (OFF)
6900901 (US/CDN)	6900902 (ZA)
6971945 (UK)	6971776 (Italy)
6971980 (Denmark)	6971975 (Israel)

Additional options and accessories available on request.

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

Reparaturanforderung|Extern *)
Return for repair|external *)

sartorius

Einsender

Kunden-Nr.|Customer ID

Name|Name**)

Ansprechpartner|Contact person**)

Straße|Street**)

Tel.-Nr.|Phone**)

PLZ|Zip code**)

Fax-Nr.|Fax**)

Ort|City**)

Auftragsnummer|Order no.

Land|Country**)

Rechnungsnummer|Invoice no.

Gerät|Equipment

Type|Model**)

Fabr.-Nr.|Serial no. **)

☐ Reparatur|Repair
☐ Garantie|Warranty

☐ Kostenvoranschlag|Estimate
☐ Reklamation|Complaint

Bitte eine detaillierte Fehlerbeschreibung angeben, bzw. welche Arbeiten schon ausgeführt wurden. Garantieansprüche und Reklamationen sind zu begründen. Sollte kein Garantieanspruch bestehen, wird automatisch ein Kostenvoranschlag erstellt.
Please describe the failure or defect in detail and|or any repairs that have already been carried out. In case of warranty claims or complaints, please specify the reasons for your request. If your warranty has already expired, we will automatically send you an estimate.

Fehlerbeschreibung|Begründung
Description of failure or defect|Reasons and|or explanation

Nach erfolgter Reparatur soll das Gerät an|After repair, the device should be sent to:

☐ Einsender|Sender

☐ Kunden|Customer: *Please enter the complete address, contact person and phone no.*

Einsendedatum|Shipping date

Unterschrift|Signature

*) Bitte dem Gerät beilegen|Please attach to the equipment
** Pflichtfeld|Required field

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The status of the information,
specifications and illustrations
in this manual is indicated by the
date given below.
Sartorius reserves the right to make
changes to the technology, features,
specifications and design of
the equipment without notice.

Status:
November 2011,
Sartorius Weighing Technology GmbH,
Goettingen, Germany

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