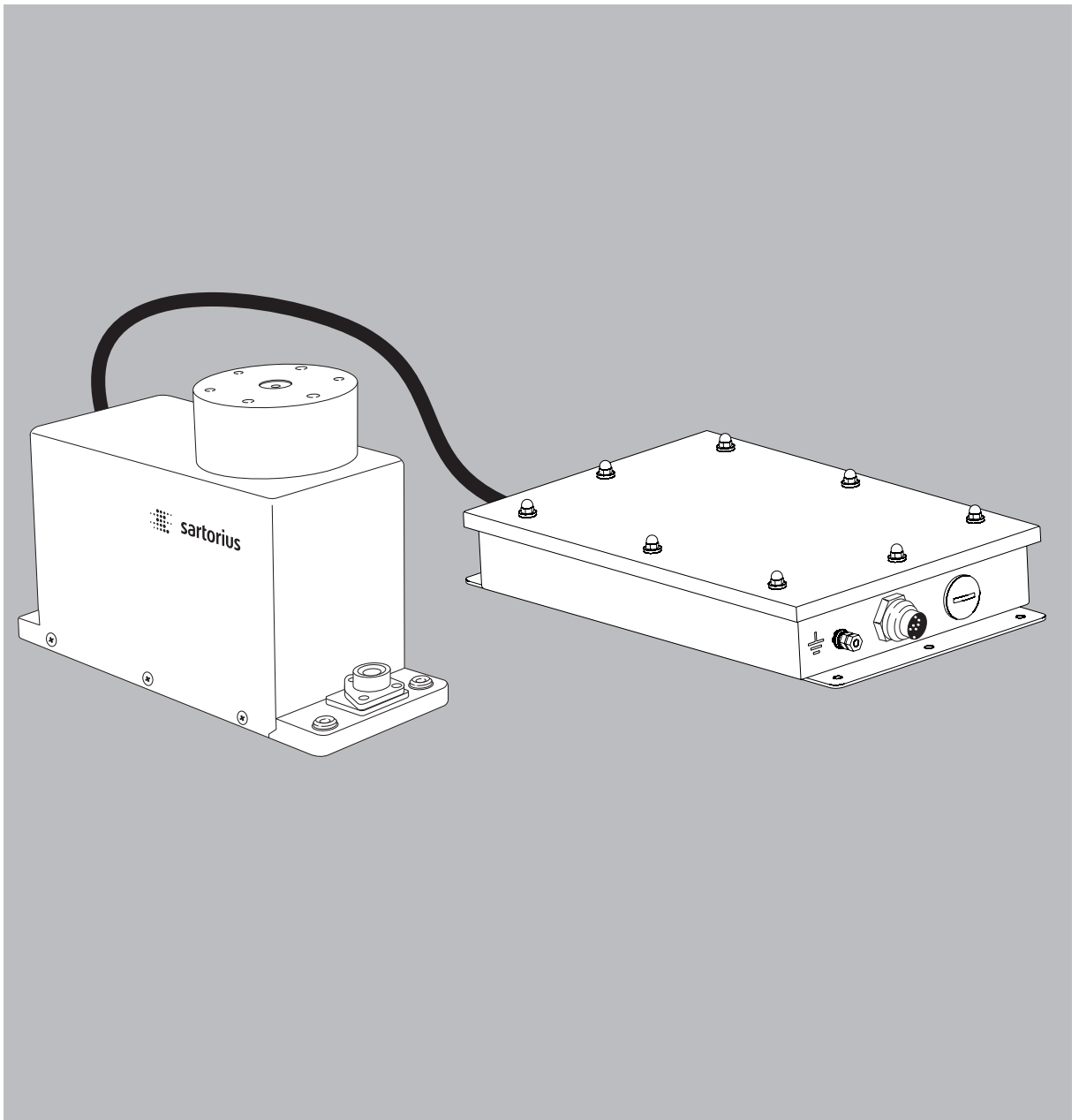


Installation Instructions

# Sartorius Explosion-protected Weigh Cells

Models WZA...-NX





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# User Information


## Warning / Danger Symbols

 These notes identify hazards which have a high probability of resulting in death or serious physical injury if not avoided.

 These notes identify hazards that can result in moderate or mild injuries if not avoided.

 These notes identify hazards associated with the risk of material damage.

## Explanation of Symbols

 This symbol identifies useful information and tips.

The following symbols are used in these instructions:

- ▶ indicates required steps.
- ▷ describes what happens after you have performed a particular step
- Texts that use this mark are lists

## Conventions for these Instructions:

The figures in these instructions are based on “standard” scales. On scales verified for use in legal metrology, some displays and reports may deviate slightly from the figures. Where this is significant for operation, the differences will be explained in the text.

## About These Instructions.

- ▶ Please read these instructions carefully and completely before putting the equipment into operation for the first time. Observe the safety instructions.
- ▶ These instructions are an important part of the product. Keep these instructions in a safe place. If you give the device to others to use, give them these instructions too.
- ▶ If these instructions are lost, please contact Sartorius for a replacement or download the latest manual from our website: [www.sartorius.com](http://www.sartorius.com)


# System Description


- The product is comprised of two components:
- Compact weigh cell that can be affixed to a smooth, even surface
- Electronics module
- These compact weigh cells can be used to determine weights within restricted space.
- The weigh cells have been developed for
- Installation in measuring devices and production machinery
- High-precision weighing within limited space
- Precise weight determination on active production lines

# Warnings and Safety Precautions

## Safety Precautions

- For Europe (EU):  
The weigh cell meets the requirements for Group II, Category 2 equipment in accordance with EC Directive 94/9/EC in accordance with FM EC type-examination certificate FM 15ATEX0013X and is certified in accordance with EC-type examination certificate FM 15ATEX0013X and the Certificate of Conformity IECEX FMG 16.0045X.
- For U.S. and Canada:  
The weigh cell meets the “Hazardous location electrical equipment per US and Canadian Requirements” in accordance with FM17US0299X, FM17CA0151X and the associated Control Drawing.
- The weigh cell may be used in Zone 1, 2, 21 or 22 hazardous areas or Class 1, Division 1 or 2 hazardous locations (gas and dust explosion hazards). Please make sure the currently valid regulations and guidelines for installing equipment in the hazardous areas/locations listed above are strictly observed. Whether the equipment can be used in a given area containing potentially explosive agents must be checked on a case-by-case basis.
- That way you will prevent damage to the device.
- These installation instructions describe only the technological specifications of the weigh cell and the conditions that must be observed during installation.
- Read these installation instructions thoroughly before using your weigh cell. The weigh cell can be operated indoors or outdoors.

 Any incoming inspection, alterations to the equipment or installation work that does not conform to the instructions in this manual will result in forfeiture of all claims under the manufacturer's 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.

- ▶ Have the equipment inspected at appropriate intervals for correct functioning and safety by a trained technician.



Always make sure the weigh cell is disconnected from AC power before performing any installation, cleaning, maintenance or repair work. If the equipment housing is opened by anyone other than persons authorized by Sartorius, all claims under the manufacturer's warranty are forfeited. Use only original Sartorius spare parts.



Disconnecting equipotential bonding conductors is not permitted.



If you see any indication that the weigh cell cannot be operated safely (for example, due to damage), turn off the unit and lock it in a secure place so that it cannot be used for the time being. Observe the relevant safety precautions and inform personnel as required.



The casing on all connecting cables, as well as the casing on wires inside the equipment housing, is made of PVC. Chemicals that corrode these materials must be kept away from these cables.



Make sure the weighing instrument is not exposed to substances that release chlorine ions at the place of use. If such exposure cannot be ruled out, the operator is responsible for establishing and observing appropriate safety precautions, to be checked at regular intervals for continued effectiveness.



The weigh cell may be used and operated by qualified personnel only. The permissible use of the equipment is defined by the equipment specifications and the relevant safety regulations. Operating the weigh cell beyond the specifications listed in the type-approval certificate is not permitted, and is considered use of the equipment for other than its intended purpose. All restrictions listed in the type-examination certificate must be strictly observed.

- ▶ Once the weigh cell has been installed, it must be checked to ensure:
  - Observance of the guidelines and standards for using electrical equipment
  - Electromagnetic compatibility of the entire device
  - Compliance with mandatory safety regulations.
  - Installation in a Zone 1, 2, 21 or 22 hazardous area or Class 1, Division 1 or 2 hazardous location must be performed by a trained technician who is familiar with the assembly and operation of the equipment, as well as with the procedure for putting the system into operation. Furthermore, the trained technician must have the required qualifications and must be familiar with the relevant guidelines and regulations. If you need assistance, contact the system installer, your Sartorius dealer or the Sartorius Service Center. Any installation work that does not conform to the instructions in this manual will result in forfeiture of all claims under the manufacturer's warranty. Be sure to observe all restrictions listed in the type-examination certificate. Operating the weigh cell beyond the limits imposed by these restrictions is not permitted and is considered use of the equipment for other than its intended purpose.



Always make sure the weigh cell is disconnected from AC power before performing any installation, cleaning, maintenance or repair work.



The electronics module and the optional YAC01NX display and control unit may not be opened. The weigh cell may be opened only by authorized service technicians who have been trained by Sartorius and who follow Sartorius' standard operating procedures for maintenance and repair work.



Avoid interchanging weigh cells and electronics modules. Connect the parts that fit together, ensuring that the serial numbers match.



Do not expose the weigh cell unnecessarily to extreme temperatures, aggressive chemical vapors, moisture, temperature fluctuations or vibrations. The permissible operating temperature range during operation is +5°C to +40°C.



Be sure to unplug the system from AC power before connecting or disconnecting any cables.



If you are using the optional YAC01NX display and control unit, it must be installed a way that limits the risk of mechanical damage.



Never open the display and control unit.



If there is visible damage to the components: disconnect the equipment from AC power and replace the weigh cell along with the electronics module.



If you use cables purchased from another manufacturer in the non-hazardous area/location, check the pin assignments. Before connecting the cable to Sartorius equipment, check the pin assignments in the cable against those specified by Sartorius and disconnect any wires that are assigned differently. The operator shall be solely responsible for any damage or injuries that occur when using cables not supplied by Sartorius. On request, Sartorius will provide information on the minimum operating specifications (in accordance with the Standards for defined immunity to interference).



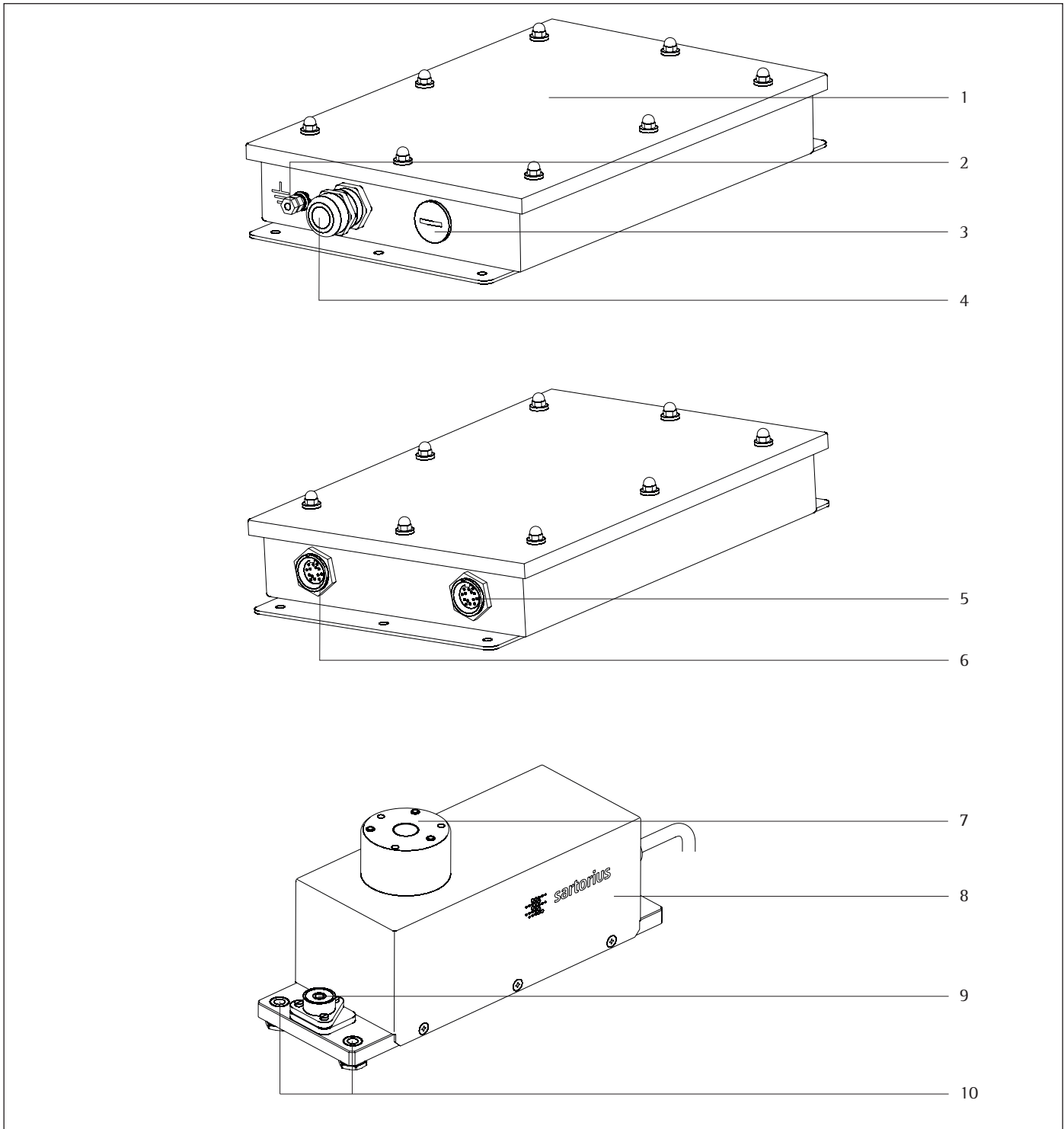
When using the weigh cell in hazardous areas/locations, make sure there is no current or voltage in the equipment before connecting or disconnecting current-carrying cables to or from the weigh cell. Disconnect the weigh cell from AC power before connecting or disconnecting cables. Avoid exposing the weigh cell to static electricity.



All components of the system must be grounded, including any draft shields used. Be sure to connect an equipotential bonding conductor.

- If any problems arise with the weigh cell that require service, please contact your local Sartorius dealer.

# General View of the Equipment



Pos.	Designation
1	Electronics module
2	Read these installation instructions thoroughly before using your weigh cell.
3	Socket for connecting an optional display and control unit
4	Connection for weigh cell
5	Connection for optional Zener barrier

Pos.	Designation
6	DC jack
7	Load receptor
8	Weigh cell
9	Level indicator
10	Threaded hole (M6) for mounting the weigh cell

# 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. Excessively strong vibration may compromise the safety of the equipment.
- Do not expose the equipment unnecessarily to extreme temperatures, moisture, shocks 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 damage.
- Do not expose the equipment to gravitational acceleration in excess of  $\approx 300 \text{ m/s}^2$  (unless additional equipment is installed on the load receptor that enables it to withstand this force).

## 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. 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 "Sartorius CAS-Suite" software or the optional YAC01NX display and control unit as an aid for this test.

## Equipment Supplied

- Weigh cell
- Electronics module
- Installation instructions (this document)
- Special accessories as listed on the bill of delivery, if ordered, or in accordance with specific arrangement.

## Ambient Conditions

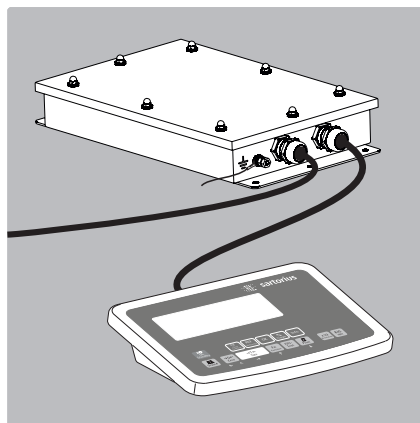
The equipment is designed to provide reliable results under normal ambient conditions. If you have any questions or difficulties when developing your weighing system, please contact the specialists at Sartorius. When designing and setting up your weighing system, please observe the following so that 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 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.
- Switch the system to the standby mode when not in use.

**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.

## Components Attached to the Load Receptor

- Components that are attached to the load receptor can adversely affect the way the weigh cell functions. The user is responsible for how the series is used and the specifications achieved for the entire system. Your specifications may differ from those listed in the section entitled "Specifications."



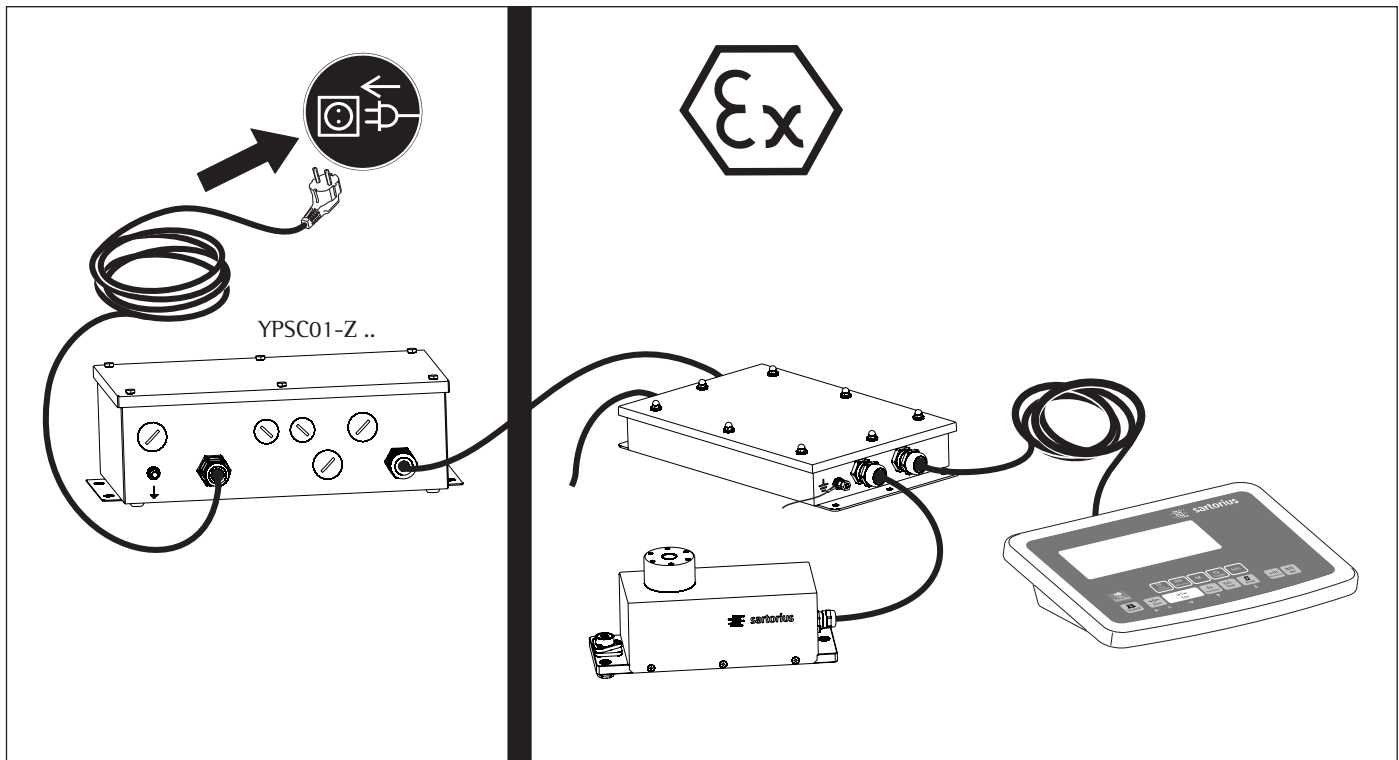
## Connecting an Optional YAC01NX Display and Control Unit



The display and control unit can only be connected if specified directly at the time the order is placed.



Protect the YAC01NX display and control unit from mechanical damage. If you discover that the equipment has been damaged, disconnect it from AC power and remove it from service.



### Conditions for Installation

Before putting the equipment into operation, it is important to make sure that the power cord on the associated power supply is correctly connected to the power outlet (mains supply). All equipment must be connected to the equipotential bonding conductor by connecting the grounding cable (not included in delivery) to the grounding terminals provided for this purpose on each device. The dimensions of the grounding cable are specified in national regulations for electrical installations. Installation must be performed by a trained technician in accordance with national regulations and acknowledged technological standards.

Use only cabling and extensions approved by Sartorius, as these are made in accordance with the restrictions on permissible cable lengths imposed by both the capacitance and inductivity values and the requirements for electromagnetic compatibility (see the EC Type-Examination Certificate).

Before putting the weighing system into operation for the first time, make sure there is no hazard of explosion present at the place of installation. If there is any indication that the equipment does not function properly (e.g., display remains blank or is not backlit) due to damage during transport:

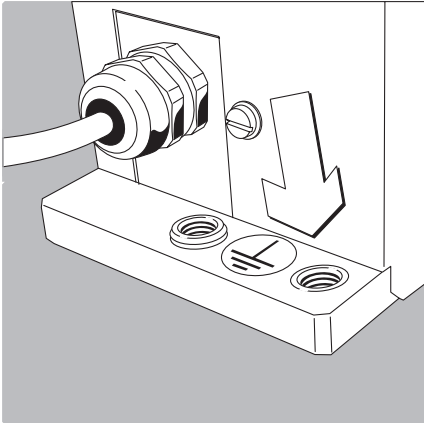
- disconnect the equipment from power and
- notify your nearest Sartorius Service Center.

The weigh cell specifications for Ui, Li, Pi, Ta, temperature class, Ci, and Li are listed in the EC type-examination certificate. This certificate also specifies the display and control unit models that can be used with these weigh cells.

The explosion-protected weighing system must be installed in accordance with acknowledged rules of engineering. These include national and international laws and regulations (such as VbF, EX-RL, DIN EN 60079-14, DIN VDE 0166, DIN VDE 0100, DIN VDE 0101, and DIN VDE 0800).

In particular, the conditions described under Item 17 of the KEMA EC type-examination certificate, "Special Conditions for Safe Use," must be observed. Furthermore, national regulations for accident prevention and environmental protection must be observed at all times.

Before you operate your weigh cell in a hazardous area/location, it must be inspected either by a certified electrician or under the guidance and supervision of a certified electrician to make sure that the weigh cell complies with the applicable regulations. Determine whether your weigh cell must be reported to the technical inspection authorities (such as the trade board) in your country. The system must also be inspected during operation. The system should be inspected at intervals which allow for early detection of the faults that occur as a result of normal wear and tear, so that they can be corrected before damage is caused. In any case, inspection must be performed at least every 3 years. Other conditions and standards that regulate the installation and operation of the equipment and are applicable in your country must be met as well. When performing inspections, generally acknowledged rules of engineering relevant to these conditions must also be applied. If the unit housing is opened by anyone other than persons authorized by Sartorius, or if the equipment is installed or operated incorrectly, this will result in forfeiture of the approval for use in the stated hazardous area(s)/location(s) and of all claims under the manufacturer's warranty.



► Connecting an Equipotential Bonding Conductor (Grounding)

- If the weigh cell is in a hazardous area/location, it must be grounded (i.e., an equipotential bonding conductor must be connected). This connection should be made by a trained technician. The weigh cell is equipped with a connector for the grounding conductor. The position is marked by the symbol shown here, indicating the grounding connection.

Use a stainless steel screw (M6 thread) to connect the grounding conductor.

We recommend using a tooth lock washer to prevent the screw from coming loose.

The wire used for the grounding conductor should have a cross-sectional diameter of at least 4 mm<sup>2</sup>, with a suitable ring lug attached.

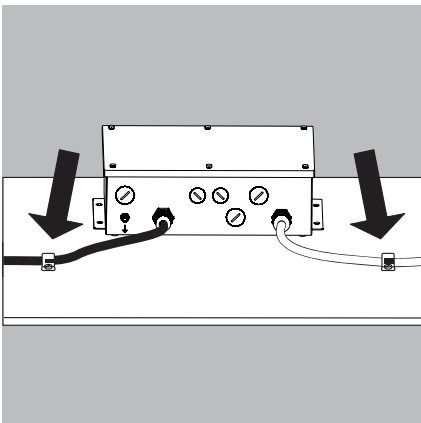
The grounding cable must be installed in such a way that it is not under mechanical stress and so the screw will not become loose. Connect all equipment, including peripheral devices, to the equipotential bonding conductor.

**Connecting the Weigh Cell to AC Power**

- Before putting the weigh cell into operation, make sure that the power cable is correctly connected to the electrical outlet; it is especially important to make sure the grounding cable is attached to the housing of the power supply. All devices used must be connected to the equipotential bonding conductor via the retainers provided on each device. Installation must be carried out by a certified electrician according to the valid standards of technology.



Before putting the equipment into operation for the first time, make sure that the area of installation is not hazardous. If the equipment shows any signs of malfunction as a result of damage during shipment (display remains blank, display not backlit even with a weight readout, weight value not repeatable, readout does not stabilize, etc.), disconnect the equipment from AC power and contact a Sartorius service technician.



► YPSC01-X: flameproof power supply:

- Lay both cables in a manner that is secure and protected.
- Flexible installation of cables with threaded fasteners can be carried out on request.

► Check the voltage rating and the plug design.

- If they do not match the rating or standard you use, contact your Sartorius office or dealer.

– Use only original Sartorius power supplies:

- YPC01-Z... (for use outside hazardous areas/locations)
- YPC01-X (for use within hazardous areas/locations)



To operate the weigh cell in a hazardous area or location, please comply with the following:

- Currently valid standards and regulations for installation of explosion-protected equipment in such areas
- Installations in Zone 1 must be carried out and checked by a certified electrician.

- Plug the female connector of the blue intrinsically safe power supply cable into the socket on the weigh cell. Secure this connection by tightening the knurled collar.



Be sure to connect the power supply to the electronics module before plugging the equipment in to AC power.



Install the power cable so that it is protected from damage.

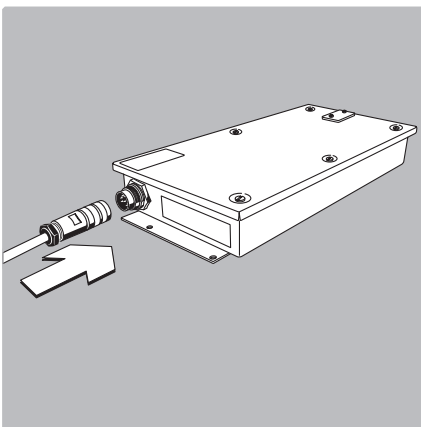


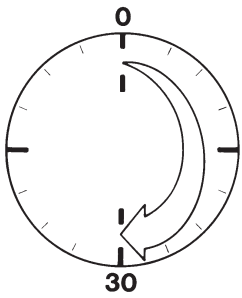
The intrinsically safe connector for the power cable (primary side) is not part of the standard equipment supplied (open cable ends).



**Connecting Electronic Peripheral Devices**

Make absolutely sure to unplug the weigh cell from AC power before you connect or disconnect a peripheral device (display and control unit or PC) to or from the interface port.

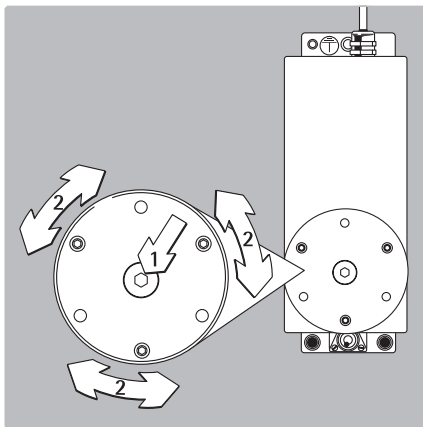




### Warmup Time



The amount of warmup time required depends in part on the system in which the weigh cell is installed. To deliver exact results, the weigh cell must warm up for at least 30 minutes after it is connected to power for the first time. Only after this time will the device have reached the required operating temperature.



### Leveling the Load Receptor and User-Specific Transducer

- ▶ Remove the (S1) screw.
- ▶ Use the (S2) screws to radially position and level the load receptor (minor height adjustment also possible).
- ▶ Attach the (S1) screw to affix the load receptor and tighten it as indicated in the table below listing the torque values.
- ▶ Attach any user-specific transducer to the threaded fastener (S3) on the load receptor and tighten it as indicated in the table below: Maximum load on load receptor.
- ▶ The user-specific transducer must be rigid and securely connected to the load receptor.

### Maximum load on load receptor:

Model	M <sub>eck</sub>	S1	S2	S3
WZA623-NX	2.5 Nm	1 Nm	1 Nm	2 Nm
WZA6202-NX	6 Nm	4 Nm	2 Nm	4 Nm

If the load is not centered on the load receptor, the corner load moment M<sub>eck</sub> may not be exceeded, since this could lead to a defect in the weigh cell.

The force "G" is comprised of the weight of the sample and the non-centric load on the weigh cell.

The load receptors should be constructed so that they are stiff and cannot be bent or twisted.

### Example: What is the maximum permissible length of the cantilever (on WZA623-NX in this instance)?

It is assumed that the load is connected to a cantilever that has a uniform width. The cantilever utilizes the necessary preload of 600 grams on the WZA623-NX.

$$M_{eck \text{ Arm}} \sim 1/2 R \times G_{Arm}$$

$$G_{Arm} = 9.81 \text{ m/s}^2 \times 0.6 \text{ kg} = 5.9 \text{ N}$$

$$M_{eck \text{ Last}} = R \times G_{Last}$$

$$G_{Last} = 9.81 \text{ m/s}^2 \times 0.62 \text{ kg} = 6.1 \text{ N}$$

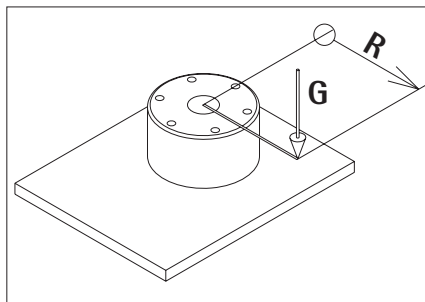
$$M_{eck} = M_{eck \text{ Arm}} + M_{eck \text{ Last}} = R (1/2 \times G_{Arm} + G_{Last})$$

$$R = \frac{M_{eck}}{(1/2 G_{Arm} + G_{Last})}$$

$$R = 2.5 \text{ Nm} / 12 \text{ N} = 0.2 \text{ m}$$

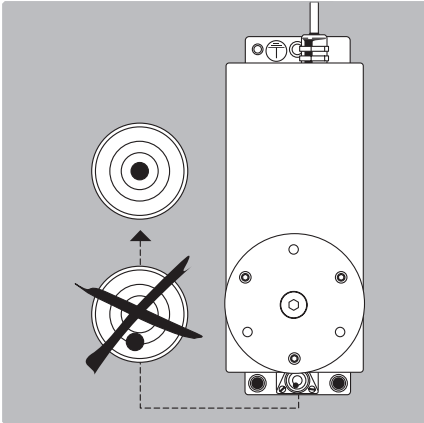
$$R = 0.2 \text{ m}$$

The maximum length that the cantilever can be without destroying the system is 200mm. As a result of handling, other moments can occur, which must be taken into consideration. In general, we recommended testing first because there can be undesired repercussions. Drafts can influence results as well.



G = Load  
R = Distance from the center of the pan  
M<sub>eck</sub> = G · R





### 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.

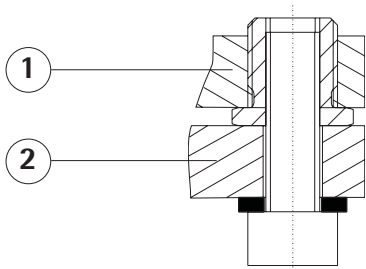
- Adjust the leveling feet until the air bubble is centered within the circle on the level indicator.

### Permanently Installed Weigh Cells

- Adjust the weigh cell after it has been installed in the system in its permanent location (see next page).

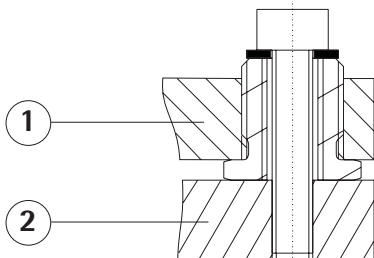
The weigh cell must be leveled again any time the location or position of the weighing system is changed.

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

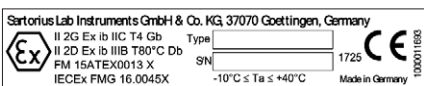


- 1) Bottom plate of the weighing cell
- 2) Fastening frame of the system

- 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).



### Device-Specific Information: Coding of the Serial Number

The year that the device was manufactured is coded in the serial number.

The format is as follows:

YMM x x x x x

Y Year

3	2014–2020	6	2035–2041
4	2021–2027	7	2042–2048
5	2028–2034	8	2049–2055
		9	2056–2062

Each number in the Y column represents a group of seven years during which the device was manufactured. Within each group of years, the months of the year (MM) advance chronologically from 13 upwards.

Year: 2015 2016 2017 ...

MM: 25-36 37-48 49-60 ...

Example:

328xxxx (April 2015)

xxxxx is a consecutive number that is counted upward after being reset each month.

# Operation

## Notes on Analytical Weighing with Weigh Cells

### Handling of Samples and Containers

Samples should be acclimatized to the temperature of the weigh cell 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 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 or Containers

If a sample or container is electrostatically charged, significant errors may result during weighing. Materials with 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).

The area around the weigh cell can also contain charges that negatively affect the accuracy of weighing results. Appropriate steps taken in the design of a draft shield device can counteract such effects. In the process, be sure to install devices that are suitable for use in the particular hazardous zones.

### Weighing Magnetic or Magnetizable Samples

For technical reasons, the use of magnetizable materials in the manufacture of weigh cells is unavoidable, 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 certain parts inside the weigh cell may have a distorting effect on the weighing results.

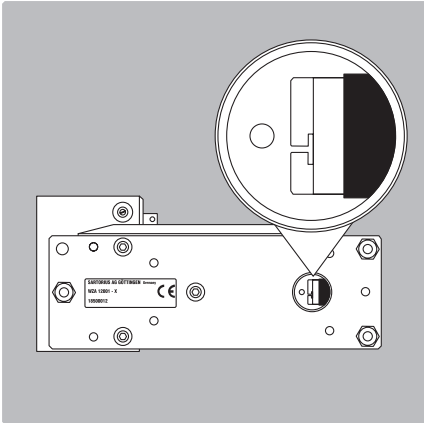
To keep such effects to a minimum, we recommend increasing the distance between the sample/container and the weighing system using a non-magnetic material. The force is reduced quadratically with the increase in distance.

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.

## 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 18 for the commands) or
- Using the optional YAC01NX display and control unit



## Below-Cell Weighing

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

- ▶ Remove the cover plate.
  - Threaded fastener for hook: M3

### Overload protection

- Standard feature on the WZA623-NX model

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<b>IMPORTANT</b>	Models WZA6202-NX: No overload protection provided
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- ▶ Carefully install the special hook: maximum torque: 0.75 Nm
  - If necessary, install a shield for protection against drafts.

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<b>IMPORTANT</b>	Protection rating: only IP22 is provided when the cover plate for the below-cell weighing port has been removed.
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## Factory Settings (Setup)

### Purpose

- The weigh cell is configured at the factory. The factory settings can be adapted to individual requirements by editing the “Setup” menu.

### Features

Parameters are combined into the following groups

(1st menu level):

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

### Factory Settings for the Parameters

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

### Preparation

The following operating menu functions can be carried out using the Sartorius CAS-Suite configuration software installed on a PC:

- Read
- Change
- Print
- Save

or

With one of the optional YAC01NX control units

<sup>1)</sup> Detailed instructions on the available application programs can be found in the operating instructions for the Cubis Series, MSE Models, which can be downloaded online:

Go to [www.sartorius.com](http://www.sartorius.com) – Service Center → Downloads.

## Menu Structure (Overview)







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

<sup>1)</sup> Detailed instructions on the available application programs can be found in the operating instructions for the „Signum series,“ which can be downloaded online: Go to [www.sartorius.com](http://www.sartorius.com) – Service Center → Downloads.

## Parameter Settings: Overview

o = factory setting; √ = user-defined setting

Level 1	Level 2	Level 3	Level 4	Info about menu level	
1) SETUP	BAL.SCAL. Balance parameters	AMBIENT Ambient conditions (filter adjustment)	o V.STABLE Very stable	1. 1. 1. 1	
			STABLE Stable	1. 1. 1. 2	
			UNSTABLE Unstable	1. 1. 1. 3	
			V.UNSTBL. Very unstable	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	
			REDUC. Reduced	1. 1. 2. 3	
			OFF Off	1. 1. 2. 4	
		STAB.RNG. Stability range	MAX.ACC. Maximum accuracy (1/4 digit)	1. 1. 3. 1	
			V.ACC. Very accurate (1/2 digit)	1. 1. 3. 2	
			ACC. Accurate (1 digit)	1. 1. 3. 3	
			o FAST Fast (2 digits)	1. 1. 3. 4	
			V.FAST Very fast (4 digits)	1. 1. 3. 5	
			MAX.FAST Maximum speed (8 digits)	1. 1. 3. 6	
		ST.DEL. Stability delay	NO No delay	1. 1. 4. 1	
			o SHORT Short delay	1. 1. 4. 2	
			AVERG. Average delay	1. 1. 4. 3	
			LONG Long delay	1. 1. 4. 4	
		TARE Tare	WIDSTB. Without stability	1. 1. 5. 1	
			WISTB. After stability	1. 1. 5. 2	
			o ATSTAB. At stability	1. 1. 5. 3	
		AUT.ZERO Auto zero	o ON Automatic zeroing on	1. 1. 6. 1	
			OFF Automatic zeroing off	1. 1. 6. 2	
		WT.UNIT Basic weight unit	For list of units, see "Toggling between weight units"		1. 1. 7. 1 to 1. 1. 7.24
			DISP.DIG. Display accuracy	o ALL Display all digits	1. 1. 8. 1
		LP.ON.OFF Last digit after load change		1. 1. 8. 2	
		Increment of measured values one level lower		1. 1. 8. 3	
Increment of measured values two levels lower	1. 1. 8. 4				
Increment of measured values three levels lower	1. 1. 8. 5				
INCRM. ↑ Last digit single increment	1. 1. 8. 6				
MINUS ↓ Reduced by one digit	1. 1. 8. 7				
Resolution by a factor of 10	1. 1. 8.14				
CAL./ADJ. Function of (CAL) key	EXT.CAL. External calibr./adjustment with factory-set weight	1. 1. 9. 1			
	CAL.EUSR. External calibr./adjustment with user-defined weight	1. 1. 9. 3			
	o CAL.INT. Internal calibr./adjustment	1. 1. 9. 4			
	LINE.INT. Internal linearization (on analytical balances only)	1. 1. 9. 5			
	LINE.EXT. External linearization with factory-set weights	1. 1. 9. 6			
	LINE.EUSR. External linearization with user-defined weights	1. 1. 9. 7			
	SET.PREL. Set the preload	1. 1. 9. 8			
	CLR.PREL. Delete the preload	1. 1. 9. 9			
	LOCKED (CAL) locked	1. 1. 9.10			
	SELECT Select	1. 1. 9.12			
	SET.EXT.W. Determine ext. calibration weight for CAL.EUSR	1. 1. 9.17			
	Determine internal weight	1. 1. 9.18			
CAL./ADJ. Calibration/adjustment	o SEQUENCE Sequence adjustment	1. 1.10. 1			
	CAL./ADJ. Adjustment as needed	1. 1.10. 2			
ZERORNG. Zero range	o 1PERC. 1 percent of max. load	1. 1.11. 1			
	2PERC. 2 percent of max. load	1. 1.11. 2			
	5PERC. 5 percent of max. load	1. 1.11. 3			
	10PERC. 10 percent	1. 1.11. 4			
	DEFAULT (factory-set)	1. 1.11. 5			
INIT.ZERO Zero at power on	o DEFAULT (factory-set)	1. 1.12. 1			
	2PERC. Initial zero 2 percent	1. 1.12. 2			
ON.TARE Tare/zero at power on	o ON Init. tare/zero on	1. 1.13. 1			
	OFF Init. tare/zero off	1. 1.13. 2			
	5PERC. 5 percent	1. 1.13. 3			
	10PERC. 10 percent	1. 1.13. 4			
	20PERC. 20 percent	1. 1.13. 5			
	50PERC. 50 percent	1. 1.13. 6			
	100PERC. 100 percent	1. 1.13. 7			
CYC.RATE Output rate	o NORMAL Normal output	1. 1.14. 1			
	HIGHVAR. High var. output	1. 1.14. 2			
	SLOW Slow output	1. 1.14. 3			
	MEDIUM Medium output	1. 1.14. 4			
	FAST Fast output	1. 1.14. 5			
	VERYFAST Very fast output	1. 1.14. 6			
	MAXIMUM Max. output	1. 1.14. 7			
ISOCAL Auto calibration/adjustment	o OFF Auto cal./adj. off	1. 1.15. 1			
	NOTE Info	1. 1.15. 2			
	ON Auto cal./adj. on	1. 1.15. 3			
EXT.CAL. External calibration	o FREE Unlocked	1. 1.16. 1			
	LOCKED Locked	1. 1.16. 2			
CAL UNIT Unit for calibration weight	o GRAM Grams	1. 1.17. 1			
	KILGR. Kilograms	1. 1.17. 2			
	USERDEF. User-defined unit (factory setting: pounds)	1. 1.17. 4			
GEN.SERV. General service	MEN.RESET Menu reset (factory settings)	o YES Restore factory settings	1. 9. 1. 1		
		NO Do not restore factory settings	1. 9. 1. 2		
		STANDARD Standard settings	1. 9. 1. 3		
		VERIFIABLE Verifiable settings	1. 9. 1. 4		

Level 1	Level 2	Level 3	Level 4	Menu level info
2) DEVICE	EXTRAS (Additional functions)	MENU	<ul style="list-style-type: none"> <li>o CANEDIT Can edit</li> <li>RDONLY Read only</li> </ul>	2. 1. 1. 1 2. 1. 1. 2
		SIGNAL Acoustic signal	<ul style="list-style-type: none"> <li>OFF Acoustic signal off</li> <li>o ON Acoustic signal on</li> </ul>	2. 1. 2. 1 2. 1. 2. 2
KEYS Keypad		<ul style="list-style-type: none"> <li>o FREE Unlocked</li> <li>LOCKED Locked</li> </ul>	2. 1. 3. 1 2. 1. 3. 2	
EXT.KEY External switch function		o PRINT (  ) key (print)	2. 1. 4. 1	
		Z/TARE (  ) key (tare)	2. 1. 4. 2	
		CAL. (  ) key (calibrate)	2. 1. 4. 3	
		CF (  ) key (go back/exit)	2. 1. 4. 5	
		ENTER (  ) key (enter)	2. 1. 4. 6	
		DRAFTSHIELD  Draft shield	2. 1. 4. 9	
		IONIZER Ionizer	2. 1. 4. 10	
	APPL. Application key	2. 1. 4. 11		
o ASTERISK ( * ) key	2. 1. 4. 12			
ONMODE Power-on mode	OFF/ON/STBY Off/On/Standby	2. 1. 6. 1		
	OFF/ON/SO Off/On/Auto shut-off	2. 1. 6. 2		
	ON/STBY On/Standby	2. 1. 6. 3		
	o AUTOON Auto on	2. 1. 6. 4		
PERIPHER. (25-pin "Peripherals" interface)	DAT.REC. Operating mode	o SBI (ASCII)	2. 2. 1. 1/2. 3. 1. 1	
		XBPI	2. 2. 1. 2/2. 3. 1. 2	
REM.DISPL. Remote display		2. 2. 1. 4/2. 3. 1. 4		
UNI.PRINT Universal printer		2. 2. 1. 7/2. 3. 1. 7		
LAB.PRINT (Parameters for YDP10 printer)		2. 2. 1. 8/2. 3. 1. 8		
PCUSB (USB port for PC)	BAUD Baud rate	OFF Interface off	2. 2. 1.10/2. 3. 1.10	
		600	2. 2. 2. 3/2. 3. 2. 3	
o 1200		2. 2. 2. 4/2. 3. 2. 4		
2400		2. 2. 2. 5/2. 3. 2. 5		
4800		2. 2. 2. 6/2. 3. 2. 6		
9600		2. 2. 2. 7/2. 3. 2. 7		
19200 <sup>1)</sup>		2. 2. 2. 8/2. 3. 2. 8		
38400 <sup>1)</sup>		2. 2. 2. 9/2. 3. 2. 9		
57600 <sup>1)</sup>		2. 2. 2.10/2. 3. 2.10		
115200 <sup>1)</sup>		2. 2. 2.11/2. 3. 2.11		

<sup>1)</sup> Only one of the two interfaces can be used.

Level 1	Level 2	Level 3	Level 4	Menu level info
2) DEVICE	PERIPHER. PC USB	PARITY	o <i>000</i> Odd parity <i>EVEN</i> Even parity <i>NONE</i> No parity	Periphery:/PC USB: 2. 2. 3. 3/2. 3. 3. 3 2. 2. 3. 4/2. 3. 3. 4 2. 2. 3. 5/2. 3. 3. 5
		STOPBIT Number of stop bits	o <i>1STOP</i> 1 stop bit <i>2STOP</i> 2 stop bits	2. 2. 4. 1/2. 3. 4. 1 2. 2. 4. 2/2. 3. 4. 2
		HANDSHK. Handshake mode	o <i>SOFTW.</i> Software o <i>HARDW.</i> Hardware # <i>NONE</i> No handshake	2. 2. 5. 1/2. 3. 5. 1 2. 2. 5. 2/2. 3. 5. 2 2. 2. 5. 3/2. 3. 5. 3
		DATABIT Number of data bits	o <i>7BITS</i> 7 data bits o <i>8BITS</i> 8 data bits	2. 2. 6. 1/2. 3. 6. 1 2. 2. 6. 2/2. 3. 6. 2
3) DATAOUT Data output	COMM.SDI PC communication	COM.OUTPUT Manual/automatic	o <i>IN.WID</i> Without stability o <i>IN.AFTER</i> After stability o <i>IN.AT</i> At stability o <i>AUTO.WID</i> Auto without stability o <i>AUT.WITH</i> Auto with stability	3. 1. 1. 1 3. 1. 1. 2 3. 1. 1. 3 3. 1. 1. 4 3. 1. 1. 5
		STOP Auto output	o <i>OFF</i> Auto output off o <i>ON</i> Auto output on	3. 1. 2. 1 3. 1. 2. 2
		AUT.CYCL. Time-dependent automatic data output	o <i>EVERY</i> o <i>2NDVALUE</i>	3. 1. 3. 1 3. 1. 3. 2
		FORMAT Line format	o <i>16CHARS</i> (digit not identified) o <i>22CHARS</i> (digit identified) o <i>EXTR.LINE</i> (date, time, and weight value)	3. 1. 4. 1 3. 1. 4. 2 3. 1. 4. 4
		AUTO.TARE Auto taring after data output	o <i>OFF</i> Auto tare off o <i>ON</i> Auto tare on	3. 1. 5. 1 3. 1. 5. 2
		PRINT.PARA Parameters for printing	RES.olution (manual/auto)	o <i>MANUAL.WITHOUT</i> Manual without stability o <i>MAN.AFTER</i> Manual after stability o <i>MAN.AT</i> Manual at stability o <i>AUTO.LC</i> Auto at load change
	FORMAT Line format for printout		o <i>16CHARS</i> (digit not identified) o <i>22CHARS</i> (digit identified) o <i>EXTR.LINE</i> (date, time, and weight value)	3. 2. 2. 1 3. 2. 2. 2 3. 2. 2. 4
	PRT.INIT. Printout of application parameters		o <i>OFF</i> Printout off o <i>ALL</i> Print all parameters o <i>MAINPAR.</i> Print main parameters	3. 2. 3. 1 3. 2. 3. 2 3. 2. 3. 3
	GLP ISO/GLP- compliant printout		o <i>OFF</i> Printout off o <i>CAL.ADJ.</i> For calibration/adjustment only o <i>ALWAYS</i> Printout always on	3. 2. 4. 1 3. 2. 4. 2 3. 2. 4. 3
	TARE./PRT. Tare bal./scale after individual print		o <i>OFF</i> Taring off o <i>ON</i> Taring on	3. 2. 5. 1 3. 2. 5. 2
	TIME		o <i>24H</i> 24 h display o <i>12H</i> 12 h display (AM/PM)	3. 2. 6. 1 3. 2. 6. 2
	DATE		o <i>DD.MMM.YY</i> Date format o <i>MMM.DD.YY</i> Date format	3. 2. 7. 1 3. 2. 7. 2

# = Factory setting for "PC-USB" interface



# RS-232 Interface Port

## Purpose

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

## Computer

You can connect a computer to alter, start or monitor weigh cell functions.

## Features

Type of interface:	Serial interface
Operating mode:	Full duplex
Standard:	RS-232
Transmission rates:	600 to 115,200 baud
Parity:	Space, odd, even
Character format:	Start bit, 7-bit ASCII, parity 1 or 2 stop bits
Handshake mode:	For 2-wire interface: software (XON/XOFF) For 4-wire interface: hardware (CTS/DTR)
Operating mode:	SBI (ASCII), XBPI*

### \* XBPI operating mode:

Always with 9600 baud, 8-bit, parity odd, 1 stop bit.

There are numerous additional commands for communicating with the weigh cell. Please contact Sartorius for more information about their operation.

## Protocols

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

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

## Synchronization

During data communication between balance and PC, messages consisting of ASCII or binary characters are transmitted via the interface. For error-free data exchange, parameters for baud rate, parity, handshake mode, and character format must be identical for both units. You can configure the respective settings in System Settings (menu).


In addition to these settings, data output for the balance can also be made dependent on several conditions that are defined in the individual tasks. These conditions are described under each of the tasks.

## Data Output

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

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

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

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

## Data Output Formats

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

**Example: Output without Identification** + 253 pcs 16 characters are printed

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

### 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	*	*	*	*	*	*	*	*	*	*						

∗:	Space	CR:	Carriage return
A:	Displayed characters	LF:	Line feed
E:	Unit characters	. :	Decimal point

### Special Outputs

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

∗:	Space	High:	Overload
Cal. Ext.:	Adjustment, external	Low:	Underweight

### Error Message

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

∗: Space # # #: Error code  
<sup>1)</sup> For cause and solution, please refer to the "Troubleshooting Guide"

Example: Output of the weight value + 123.56 g

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

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

**Data Output Format with 22 Characters**

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
- \*: Space
- A: Displayed characters
- E: Unit characters
- CR: Carriage return
- LF: Line feed

Example:

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

SBI Setting:

In the “SBI” setting (menu code 1. 5. 6. 1), the non-verified display digit is not automatically identified. Please take the corresponding measures or adjust the settings on the peripheral device.

**Special Outputs**

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

- \*: Space
- Cal. Ext.: 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	I	S	.	E	R	R 1)	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	P	R	T	.	E	R	R 1)	*	*	*	*	CR	LF

- \*: Space
- ###: Error code

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

**Data Output Rates – Values per Second**

Ambient Conditions (filter adjustment)	XBPI / SBI “Autoprint”	
Very stable (1.1.1.1)	20	20
Stable (1.1.1.2)	10	10
Unstable (1.1.1.3)	5	5
Very unstable (1.1.1.4)	2.5	2.5

---

## Data Input (Compatibility with Current Weigh Cells)

### SBI Commands (Data Input Format)

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

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

#### Formats for Control Commands (Syntax)

Format 1: Esc ! CR LF

---

Format 2: Esc ! # \_ CR LF

---

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

#### Examples:

Format 1: Esc P

Format 2: Esc x1\_

## Overview of SBI Commands

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

---

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

### Purpose

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

### Features

The adjustment routine 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 balance parameter settings:  
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

In the menu, the item *CAL./ADJ.>CAL.INT.* must be set.

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

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

## Internal Calibration/Adjustment

Configuration:  
`SETUP > BAL.SCAL. > CAL./ADJ. > CAL.INT.`

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

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

### Performing Calibration and Adjustment Routines

The following settings can be configured:

- Always perform calibration and adjustment in one routine (factory setting)
- After calibration, the user has the option to quit the routine without correction or to adjust the balance.

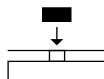
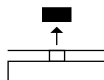
If no deviations are found during calibration, the calibration/adjustment routine can be exited after the calibration is completed. Two keys are now active:

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

Step	Execute interface command	Display/Output
1. Tare balance	ESC T	0.0000 g
2. Start adjustment routine	ESC Z	CAL.INT.
		The internal calibration weight is loaded automatically.
		CAL.RUN.
3. Adjustment carried out		CAL.END
4. Internal weight is removed from balance		0.0000 g

## External Calibration

Configuration:  
`SETUP > BAL.SCAL. > CAL./ADJ. > EXT.CAL.`  
 The balance has a factory-set calibration weight value (see “Specifications”).

Step	Execute interface command	Display/Output
1. Tare balance	ESC T	0.0000 g
2. Start adjustment routine	ESC W	EXT.CAL.
		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. Adjusted carried out; adjustment weight is displayed		CAL.END
		+ 50.0000 g
5. Remove the adjustment weight		50.0000 g
		

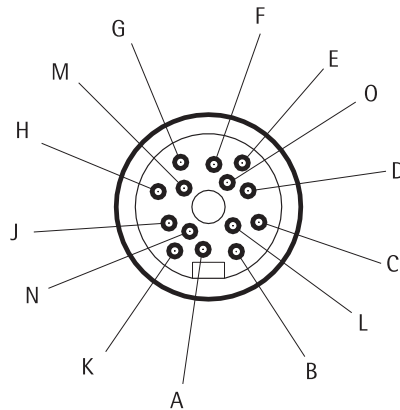
# Pin Assignment Chart

## Female Interface Connector:

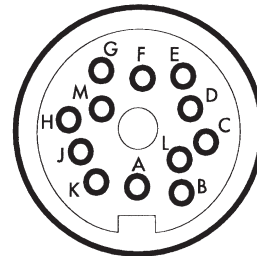
14-contact round connector with screw lock hardware

## Pin Assignment

14-contact:  
Electronics module of the weigh cell



12-contact:  
YDI05-Z... Zener barrier



14-contact round connector	12-contact round connector	RS-232 signal (SBI and xBPI)	RS-485 signal <sup>1)</sup> (xBPI)
G	A <sup>3)</sup>	Control output "heavier"	Control output "heavier"
K	B	Data output (TxD)	RxD - TxD - N
J	C	Data input (RxD)	RxD - TxD - P
N	D	Data terminal ready (DTR)	-
M	E	Signal ground	Signal ground
F	G <sup>3)</sup>	Control output "lighter"	Control output "lighter"
A	H	Clear to Send (CTS)	-
E	J <sup>3)</sup>	Control output "equal"	Control output "equal"
O	-	Universal switch function <sup>2)</sup>	Universal switch function <sup>2)</sup>
D	L <sup>3)</sup>	Control output "set"	Control output "set"

Provide a low-resistance connection between shield and connector casing.

<sup>1)</sup> RS-485 interface available on request

<sup>2)</sup> For details, see "External Remote Switch" under "Additional Functions"

<sup>3)</sup> Control output available only for YDI03-Z

**IMPORTANT** Only electrical equipment with a maximum voltage rating  $U_m$  of 250 V is permitted to be connected to the Zener barrier. The voltage rating  $U_z$  of this Zener barrier is 12 V.

## Cabling Diagram (Connecting Cable for PC)

YCC01-09ISM5 adapter cable, round, DB9-PC

Diagram for interfacing a computer via a Zener barrier to the weigh cell using the RS-232C/V24 standard and cables up to 15 m long.

## Warning When Using Prewired Connecting Cables:

**IMPORTANT** Cables purchased from other manufacturers often have incorrect pin assignments for use with Sartorius weighing instruments. Be sure to check the pin assignment against the chart below before connecting the cable, and disconnect any lines marked "Internally Connected." Failure to do so may damage or even completely destroy your weigh cell and/or peripheral device.



# Troubleshooting Guide

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

Display	Cause	Solution
HIGH or ERR 55	Weighing capacity exceeded	Unload the weighing pan
LOW or ERR 54	Contact between load plate and environment; 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 weight
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 – Load on weighing pan	Correct the setup conditions Calibrate only when zero is displayed Unload the balance/scale
ERR 10	“Tare” function is locked for active application program “Net total” application program; only one 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 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 08 <> Zero range*	Error during zeroing (value outside 2%)	Change process
ERR 09 < 0 not allowed*	Error during taring (tare value ≤ 0)	Change process
ERR 19 Preload is too high	The preload to be applied is too high	Change the preload value
ERR 30	Balance/scale is in BPI mode	Use service tool and built-in “Close” 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 body between weighing pan and housing	Change setup location Adjust Setup configuration Remove foreign body
The weight readout is obviously wrong	Balance/scale not calibrated/adjusted Balance/scale not tared before weighing	Adjust Tare
Weight data not output via the serial interface (ERR 294).	Initial connection of an optional YAC01...display and control unit	1) Move the lock switch back and forth (position see page 3 ff.). 2) Switch power off and then on again.

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

If any other errors occur, contact your local Sartorius Service Center.  
Web address: <http://www.sartorius.com>

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# Shipping / Disposal

## Shipping

### Returning the Device and Parts

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

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

## Disposal

### Information on Decontamination

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

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

### Disassembly

- Remove the weigh cell from the system.

### Disposing of the Device and Parts

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

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

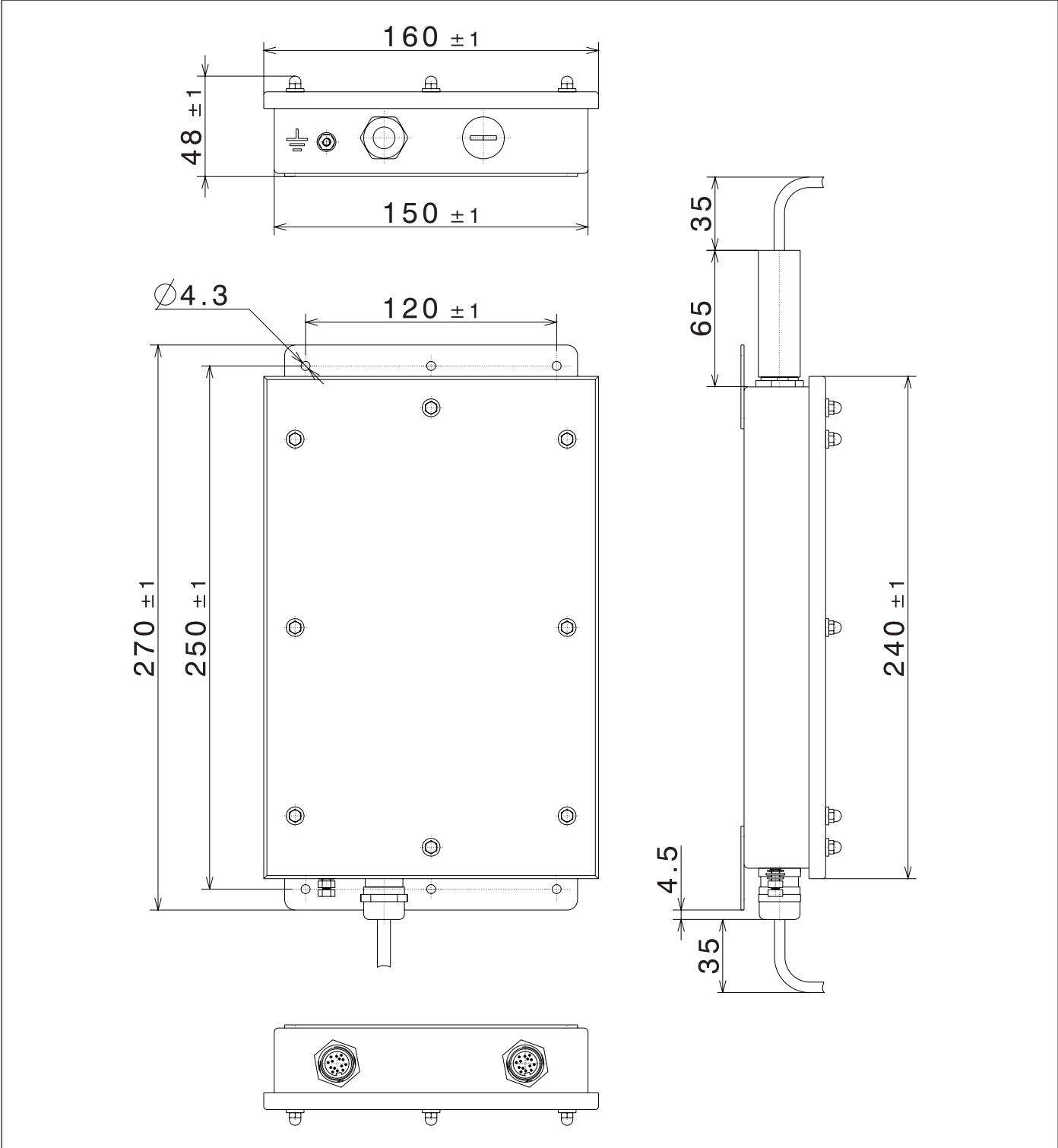
# Technical Data

Model	Standard specifications		User-specific modifications
		WZA623-NX	WZA6202-NX
Weighing capacity	g	620	6,200
Readability	g	0.001	0.01
Necessary preload onpan support	g	600	0
Tare range (subtractive)	g	100% of the maximum capacity	
Repeatability (standard deviation) <sup>1)</sup>	<±g	0.001	0.01
Linearity	<±g	0.002	0.02
Response time <sup>1)</sup>	s	< 1.5	< 2
Adaptation to ambient conditions		By selection of 1 of 4 optimized filter levels	
Display update (factory setting, depends on filter level selected)	s	0.1 – 0.4	
Fast display update (with menu code setting 1 14 2)	s	0.02 – 0.1	
Operating temperature range	°C	+10...+30 °C	
Allowable ambient operating temperature	°C	+5...+40 °C	
Sensitivity drift within +10... +30°C	<±/K	2 · 10 <sup>-6</sup>	2 · 10 <sup>-6</sup>
External calibration weight (of at least accuracy class)	g	200 (E2)	2000 (E2)
Material:			
– Weigh cell:		Stainless steel (load receptor: chemically nickel-plated aluminum)	
– Electronics module:		Stainless steel aluminum/Stainless steel	
Net weight, approx.	kg	2.0	2.8
AC power source, power supply		AC adapter 90 Vac (min.) to 264 Vac (max.)	
Frequency		48 – 60 Hz	
Power consumption		25 VA	
Built-in interface		RS-232C-S/V24-V28; 7-bit; parity: even, mark, odd, or space; transmission rates 150 to 19,200 baud, 1 or 2 stop bits, software/hardware handshake	
IP protection rating of the weigh cell		IP44	

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

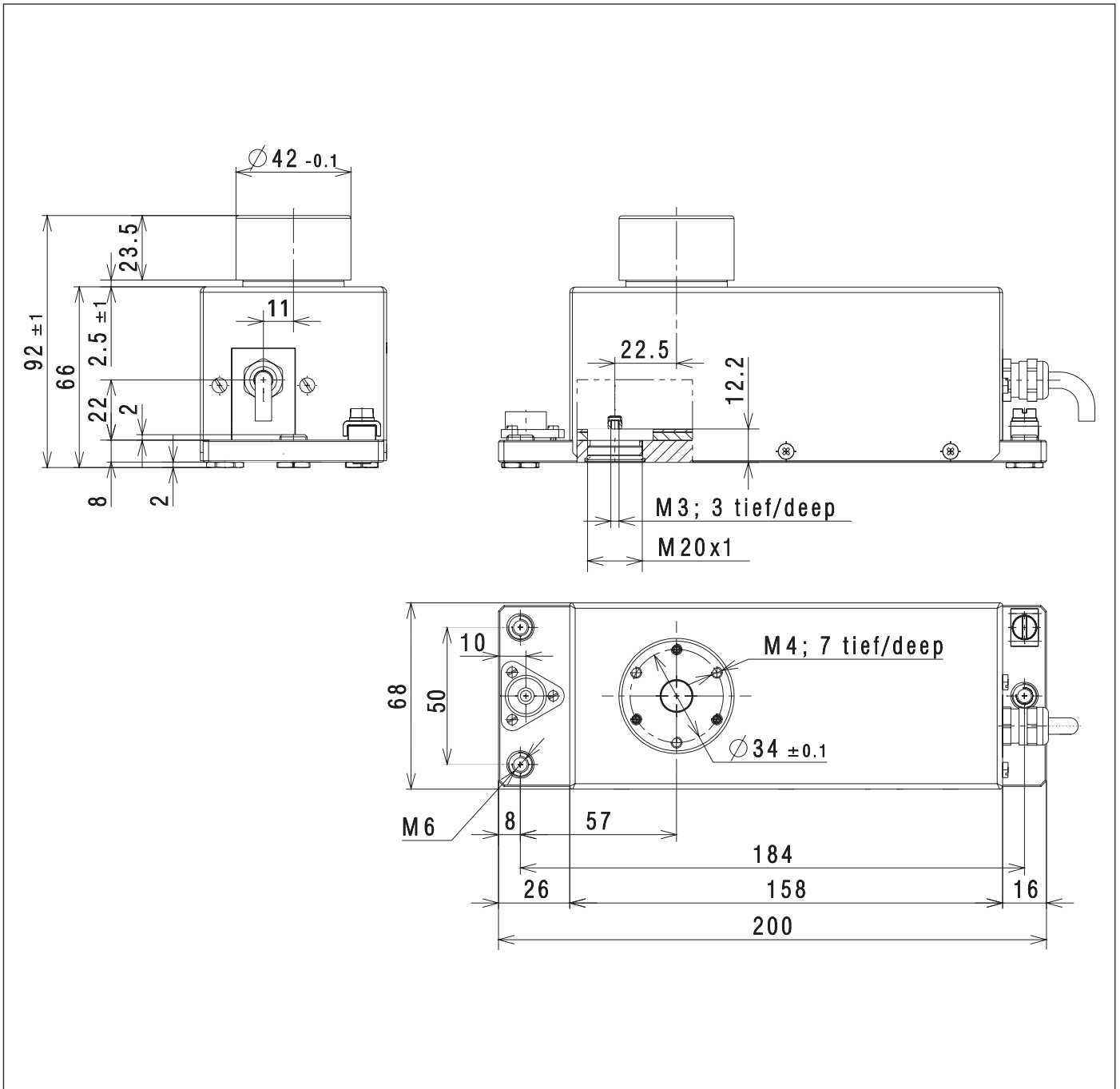
# Dimensions (Balance Drawings)

Electronics module:



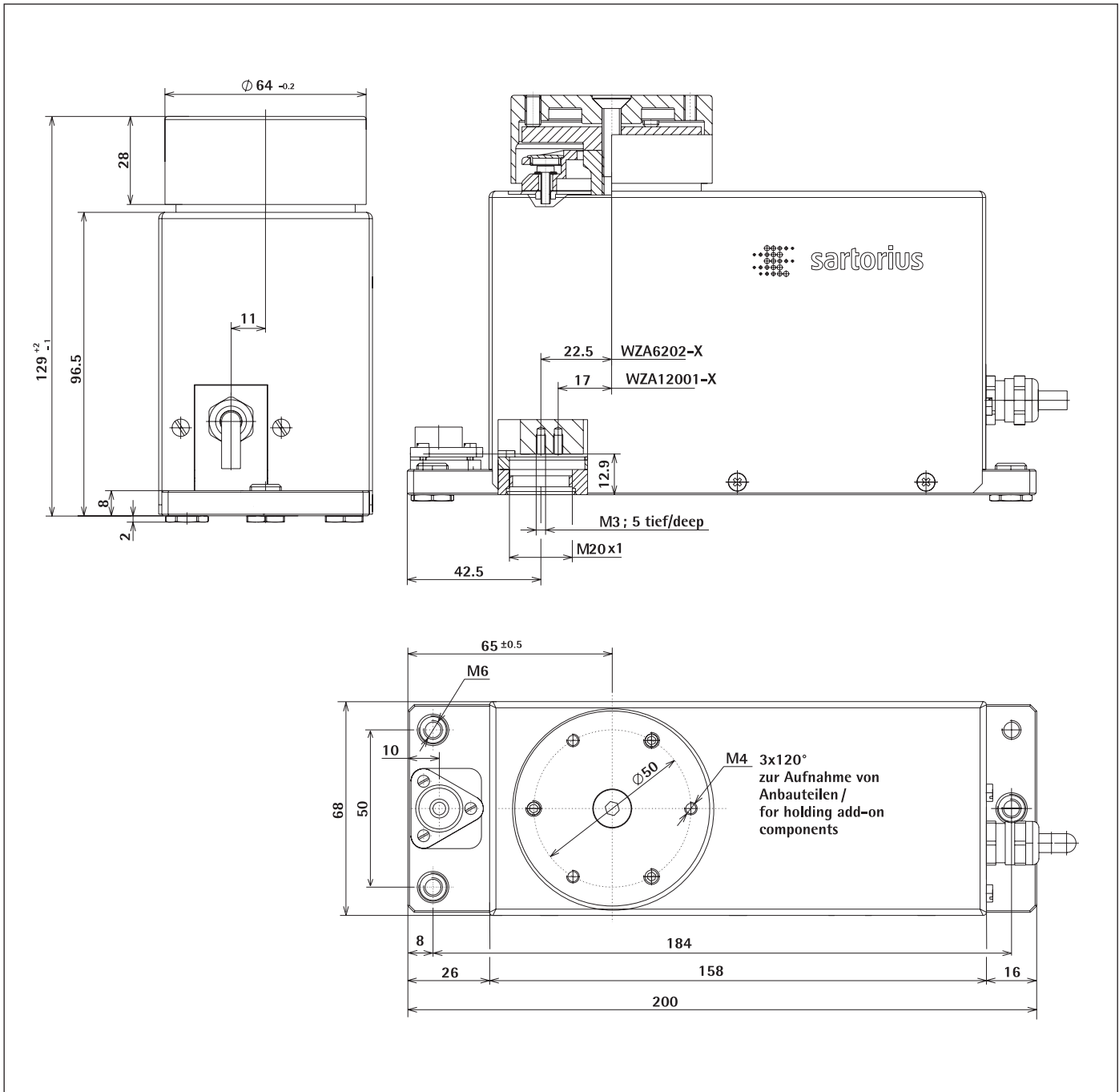
All dimensions shown in millimeters.

Weigh cell model: WZA623-NX



All dimensions shown in millimeters.

Weigh cell model: WZA12001-NX



All dimensions are given in millimeters.

# Accessories

Product	Order No.
Display and control unit with cable (2.5 m) for connection to enclosed electronics module (factory installed)	YAC01NX
Configuration software for settings, calibration/adjustment and setting the preload	Sartorius CAS-Suite
<b>AC adapters</b>	
<b>AC adapter for use outside of the hazardous area</b> (110...240 V, cable length: 20 m)	YPSC01-Z..
<p>⚠ Install the cable so that it is protected from damage. Connect the terminal of the housing to a terminal for equipotential bonding or a grounding conductor.</p>	
<b>AC adapter for use within the hazardous area</b> (110...240 V, cable length: 6 m)	YPSC01-X..
<p>⚠ Install the cable so that it is protected from damage. Connect the terminal of the housing to a terminal for equipotential bonding or a grounding conductor.</p>	
<b>Electrical accessories</b>	
RS-232 <b>Zener barrier for connecting accessories</b> in the non-hazardous area/location; e.g., printer/PC, RS-232 cable for PC/laptop with 9-contacts. Cable length: 5 m Cable length between electronics module and Zener barrier: 20 m	YDI05-Z with option + M52 + M56
<p>⚠ Install the cable so that it is protected from damage. Connect the terminal of the housing to a terminal for equipotential bonding or a grounding conductor.</p>	

Additional options and accessories available upon request



## CE EU-Konformitätserklärung EU Declaration of Conformity

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

erklärt in alleiniger Verantwortung, dass das Betriebsmittel  
*declares under sole responsibility that the equipment*

Geräteart  
Device type Digitale Wägezelle  
Digital weighing unit

Baureihe  
Type series WZA6202-NX, WZA623-NX

in der von uns in Verkehr gebrachten Ausführung allen einschlägigen Bestimmungen der folgenden Europäischen Richtlinien – einschließlich deren zum Zeitpunkt der Erklärung geltenden Änderungen – entspricht und die anwendbaren Anforderungen folgender harmonisierter Europäischer Normen erfüllt:  
*in the form as delivered fulfils all the relevant provisions of the following European Directives – including any amendments valid at the time this declaration was signed – and meets the applicable requirements of the harmonized European Standards listed below:*

2014/30/EU Elektromagnetische Verträglichkeit  
*Electromagnetic compatibility*  
EN 61326-1:2013

2011/65/EU Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS)  
*Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)*  
EN 50581:2012

2014/34/EU Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen  
*Equipment and protective systems intended for use in potentially explosive atmospheres*  
EN 60079-0:2012, EN 60079-11:2012

Kennzeichnung II 2 G Ex ib IIC T4 Gb  
*Marking* II 2 D Ex ib IIIB T80°C Db -10°C ≤ Ta ≤ +40°C

EG-Baumusterprüfbescheinigung Nummer FM15ATEX0013X  
*EC-Type Examination Certificate number*

Anerkennung der Qualitätssicherung (Produktion) FM13ATEXQ0092  
*Quality Assurance Notification (production)*

Jahreszahl der CE-Kennzeichenvergabe | *Year of the CE mark assignment:* 16

Sartorius Lab Instruments GmbH & Co. KG  
Goettingen, 2016-04-20

*i.v. P. Baumfalk*

Dr. Reinhard Baumfalk  
Vice President R&D

*i.v. D. Klausgrete*

Dr. Dieter Klausgrete  
Head of International Certification Management

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten EU-Richtlinien, ist jedoch keine Zusicherung von Eigenschaften. Bei einer mit uns nicht abgestimmten Änderung des Produktes verliert diese Erklärung ihre Gültigkeit. Die Sicherheitshinweise der zugehörigen Produktdokumentation sind zu beachten.

*This declaration certifies conformity with the above mentioned EU Directives, but does not guarantee product attributes. Unauthorised product modifications make this declaration invalid. The safety information in the associated product documentation must be observed.*



# EG-/EU-Konformitätserklärung EC / EU Declaration of Conformity

## Anhang 1 | Annex 1

### Liste der angewendeten harmonisierten Europäischen Normen *List of the applied harmonized European Standards*

2004/108/EG <i>2004/108/EC</i>	EN 61326-1:2013 Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV- Anforderungen - Teil 1: Allgemeine Anforderungen <i>Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements</i>
2011/65/EU <i>2011/65/EU</i>	EN 50581:2012 Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe <i>Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances</i>
94/9/EG <i>94/9/EC</i>	EN 60079-0:2012 Explosionsfähige Atmosphäre - Teil 0: Geräte - Allgemeine Anforderungen <i>Explosive atmospheres - Part 0: Equipment - General requirements</i> EN 60079-11:2012 Explosionsfähige Atmosphäre - Teil 11: Geräteschutz durch Eigensicherheit „i“ <i>Explosive atmospheres - Part 11: Equipment protection by intrinsic safety „i“</i>

## Anhang 2 | Annex 2

### Angaben zur Richtlinie 94/9/EG *Specifications regarding Directive 94/9/EC*

Kennzeichnung <i>Marking</i>	II 2 G Ex ib IIC T4 Gb II 2 D Ex ib IIIB T80°C Db -10°C ≤ Ta ≤ +40°C
Zertifizierung <i>Certification</i>	EG-Baumusterprüfbescheinigung Nummer: <b>FM15ATEX0013X</b> <i>EC-Type Examination Certificate number:</i>
QAN	Anerkennung der Qualitätssicherung (Produktion) <i>Quality Assurance Notification (production)</i>  durch FM Approvals Ltd, benannte Stelle Nr. 1725 für Anhang IV nach Artikel 9 der Richtlinie 94/9/EG: <i>by FM Approvals Ltd, notified body number 1725 in accordance with Article 9 of Directive 94/9/EC.</i> <b>FM13ATEXQ0092</b>

# 1 EU-TYPE EXAMINATION CERTIFICATE



2 **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 2014/34/EU**

3 **EU-Type Examination Certificate No:** FM15ATEX0013X

4 **Equipment or protective system:** WZAab-NXc Intrinsically Safe Digital Weighing Unit  
(Type Reference and Name)

5 **Name of Applicant:** Sartorius Lab Instruments GmbH & Co. KG

6 **Address of Applicant:** Weender Landstrasse 94 - 108  
Goettingen 37075  
Germany

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8 FM Approvals Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

3053244 dated 21<sup>st</sup> May 2015

9 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN 60079-0:2012+A11:2013, EN 60079-11:2012 and EN 60529:1992+A1:2000+A2:2013

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include:



II 2 G Ex ib IIC T4 Gb

II 2 D Ex ib IIIB T80 °C Db -10°C ≤ Ta ≤ +40°C

**Richard Zammitt**  
Certification Manager, FM Approvals Europe Ltd.

**Issue date: 12th April 2019**

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin. Ireland. D02 E440  
T: +353 (0) 1761 4200 E-mail: [atex@fmapprovals.com](mailto:atex@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

F ATEX 020 (Mar/2019)

Page 1 of 3

# SCHEDULE



to EU-Type Examination Certificate No. FM15ATEX0013X

**13 Description of Equipment or Protective System:**

The WZAab-NXc Intrinsically Safe Digital Weighing Unit is used for weighing small amounts of weights but with high accuracy. Additional data transfer can be made by an intrinsically safe RS232, RS485 or RS422 data output board with and without digital I/O signals. As an option all models can be equipped with a display unit.

The intrinsically safe digital weighing unit series WZAab-NXc consists of a weighing cell, an electronic box and optionally a display unit. The WZAab-NXc is suitable for use in hazardous areas Zone 1 with gas group IIC and temperature class T4 and for use in hazardous areas Zone 21 group IIIB. The maximum surface temperature for dusts is 80°C.

**WZAab -NXc Intrinsically Safe Digital Weighing Unit**

-10°C ≤ Ta ≤ +40°C

a = up to four numbers denoting the maximum load

b = one number for number of digits behind the decimal point

c = up to four letters and/or numbers or blank

Electrical Parameters:

**Connections to the DC Supply Connector**

Circuit	Ui	Ii	Pi	Ci	Li
V 1	12.6 V	133 mA	1.46 W	188 nF	0.0 mH
V 2	12.6 V	133 mA	1.46 W	3 nF	0.0 mH
V 3	8.6 V	187 mA	1.51 W	391 nF	0.0 mH
V 4	12.6 V	150 mA	1.68 W	223 nF	0.1 mH

The WZAab-NXc Digital weighing unit may be powered by the Sartorius Ex-Battery Pack YRB02-X (KEMA 03ATEX2137X) or by the Sartorius power supply type YPS02-X.. (KEMA 98ATEX0892 X), YPS02-Z.. (KEMA 98ATEX0611 X), YPSC01-X or YPSC01-Z (KEMA 08 ATEX 0044) or by any other suitable power supply with EU-TYPE EXAMINATION CERTIFICATE.

**Connections to the Data Adapter Board (COM1)**

Circuit	Ui	Ii	Pi	Ci	Li
RS232	12.6 V*/25.2 V**	328 mA***	any	2.2 nF*/0.5nF**	0 mH
RS422	8.6 V	210 mA	0.5 W	0.5 µF	0 mH
RS485	See Table 1	See Table 1	any	260nF	0 mH
Digital I/O	8.6 V	any	any	0 µF	0 mH

\*: versus ground; \*\*: between the lines; \*\*\*: resistively limited

**Table 1: For the RS485 communication**

Ui	±12.4 V	12 V	7.2 V
Ii	130 mA***	164 mA***	any
Rmin	95.4 Ω	73.2 Ω	any

RS485 (Rmin = Ui / Ii is the minimum output resistance of the combined circuits of the associated apparatus connected to the WZAab-NXc)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin, Ireland. D02 E440  
T: +353 (0) 1761 4200 E-mail: [atex@fmaprovals.com](mailto:atex@fmaprovals.com) [www.fmaprovals.com](http://www.fmaprovals.com)

# SCHEDULE



Member of the FM Global Group

to EU-Type Examination Certificate No. FM15ATEX0013X

**Output parameters (COM1)**

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS232	10.0 V*/20.0V**	101 mA***	253 mW	3 µF*/217nF**	3 mH	140µH/Ω
RS422	5.2 V	290 mA	496 mW	60 µF	300 µH	50µH/Ω
RS485	5.2 V	210 mA***	263 mW	60 µF	600 µH	125 µH/Ω
Digital I/O	6.0 V	45 mA***	67 mW	40 µF	20 mH	530 µH/Ω

\*: versus ground; \*\*: between the lines; \*\*\*: resistively limited

**14 Specific Conditions of Use:**

1. The front panel (of the optionally used display unit) of the intrinsically safe digital weighing unit WZAab-NXc is non-metallic and shall not be used where UV light or radiation may impinge on the enclosure.
2. The cables between the electronic box and weighing cell and between the electronic box and display unit must be permanently installed and protected against damages.
3. Electrostatic charges shall be avoided. Use only a damp cloth to wipe down the equipment.

**15 Essential Health and Safety Requirements:**

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

**16 Test and Assessment Procedure and Conditions:**

This EU-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Europe Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Europe Ltd's ATEX Certification Scheme.

**17 Schedule Drawings**

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

**18 Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
27 <sup>th</sup> May 2015	Original Issue.
12 <sup>th</sup> April 2019	Supplement 1: Report Reference: RR217978 dated 22 <sup>nd</sup> March 2019 Description of the Change: Minor documentation update. Standard EN 60079-0 updated from 2012. Certificate transferred from FM Approvals Ltd., notified body no. 1725, to FM Approvals Europe Ltd., notified body no. 2809.

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin. Ireland. D02 E440  
T: +353 (0) 1761 4200 E-mail: [atex@fmapprovals.com](mailto:atex@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: IECEx FMG 16.0045X Issue No: 0 Certificate history:  
Status: **Current** Page 1 of 3 Issue No. 0 (2017-02-20)

Date of Issue: **2017-02-20**

Applicant: **Sartorius Lab Instruments GmbH & Co. KG**  
Otto-Brenner-Str. 20  
Goettingen 37079  
Germany

Equipment: **WZAab-NXc Intrinsically Safe Digital Weighing Unit**  
*Optional accessory:*

Type of Protection: **Ex ib**

Marking:  
Ex ib IIC T4 Gb  
Ex ib IIIB T80°C Db -10°C ≤ Ta ≤ +40°C

Approved for issue on behalf of the IECEx  
Certification Body:

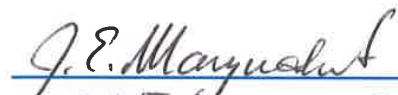
James E. Marquedant

Position:

Manager, Electrical Systems

Signature:  
(for printed version)

Date:

  
24 February 2017

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

**FM Approvals LLC**  
1151 Boston-Providence Turnpike  
Norwood, MA 02062  
United States of America





# IECEx Certificate of Conformity

Certificate No: IECEx FMG 16.0045X Issue No: 0  
Date of Issue: 2017-02-20 Page 2 of 3  
Manufacturer: **Sartorius Lab Instruments GmbH & Co. KG**  
Otto-Brenner-Str. 20  
Goettingen 37079  
Germany

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

#### STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

**IEC 60079-0 : 2011** Explosive atmospheres - Part 0: General requirements  
Edition:6.0  
**IEC 60079-11 : 2011** Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"  
Edition:6.0

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

#### TEST & ASSESSMENT REPORTS:

*A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in*

Test Report:

[US/FMG/ExTR16.0052/00](#)

Quality Assessment Report:

[GB/FME/QAR13.0020/00](#)



# IECEX Certificate of Conformity

Certificate No: IECEX FMG 16.0045X

Issue No: 0

Date of Issue: 2017-02-20

Page 3 of 3

## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The WZAab-NXc Intrinsically Safe Digital Weighing Unit is used for weighing **small amount** s of weight with high accuracy. As an option all models can be equipped with a display unit.

The intrinsically safe digital weighing unit series WZAab-NXc consists of a weighing cell, an electronic box and optionally a display unit. The WZAab-NXc is suitable for use in hazardous areas Zone 1 with gas group IIC and temperature class T4 and for use in hazardous areas Zone 21 group IIIB. The maximum surface temperature for dusts is 80°C.

### Operation Temperature Ranges:

The ambient operating temperature range of the WZAab-NXc Intrinsically Safe Digital Weighing Unit is -10C to 40C.

Note: Equipment section continued on attachment.

### CONDITIONS OF CERTIFICATION: YES as shown below:

1. The front panel (of the optionally used display unit) of the intrinsically safe digital weighing unit WZAab-NXc is non-metallic and shall not be used where UV light or radiation may impinge on the enclosure.
2. The cables between the electronic box and weighing cell and between the electronic box and display unit must be permanently installed and protected against damages.
3. Electrostatic charges shall be avoided. Use only a damp cloth to wipe down th equipment.

### Annex:

[FMG16.0045X\\_attachment.docx](#)

**WZAab -NXc Intrinsically Safe Digital Weighing Unit**

-10°C ≤ Ta ≤ +40°C

a = up to four numbers denoting the maximum load  
 b = one number for number of digits behind the decimal point  
 c = up to four letters and/or numbers or blank

Electrical Parameters:

**Connections to the DC Supply Connector**

Circuit	Ui	Ii	Pi	Ci	Li
V 1	12.6 V	133 mA	1.46 W	188 nF	0.0 mH
V 2	12.6 V	133 mA	1.46 W	3 nF	0.0 mH
V 3	8.6 V	187 mA	1.51 W	391 nF	0.0 mH
V 4	12.6 V	150 mA	1.68 W	223 nF	0.1 mH

The WZAab-NXc Digital weighing unit may be powered by any suitable power supply with an IECEx EXAMINATION CERTIFICATE.

**Connections to the Data Adapter Board (COM1)**

Circuit	Ui	Ii	Pi	Ci	Li
RS232	12.6 V*/25.2 V**	328 mA***	any	2.2 nF*/0.5nF**	0 mH
RS422	8.6 V	210 mA	0.5 W	0.5 μF	0 mH
RS485	See Table 1	See Table 1	any	260nF	0 mH
Digital I/O	8.6 V	any	any	0 μF	0 mH

\*: versus ground; \*\*: between the lines; \*\*\*: resistively limited

**Table 1: For the RS485 communication**

Ui	±12.4 V	12 V	7.2 V
Ii	130 mA***	164 mA***	any
Rmin	95.4 Ω	73.2 Ω	any

RS485 (Rmin = Ui / Ii) is the minimum output resistance of the combined circuits of the associated apparatus connected to the WZAab-NXc)

**Output parameters (COM1)**



Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS232	10.0 V*/20.0V**	101 mA***	253 mW	3 μF*/217nF**	3 mH	140μH/Ω
RS422	5.2 V	290 mA	496 mW	60 μF	300 μH	50μH/Ω
RS485	5.2 V	210 mA***	263 mW	60 μF	600 μH	125 μH/Ω
Digital I/O	6.0 V	45 mA***	67 mW	40 μF	20 mH	530 μH/Ω

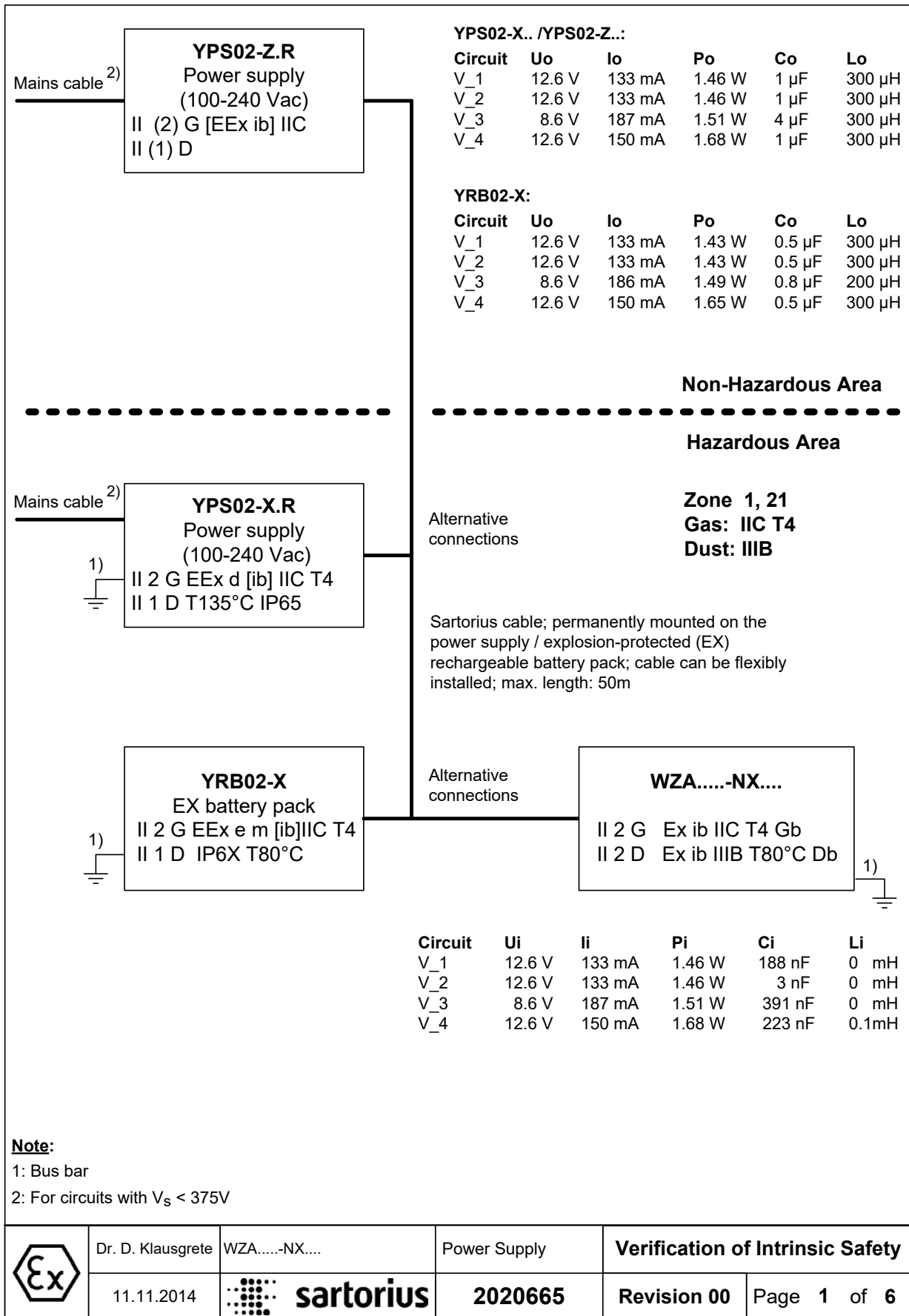
\*: versus ground; \*\*: between the lines; \*\*\*: resistively limited

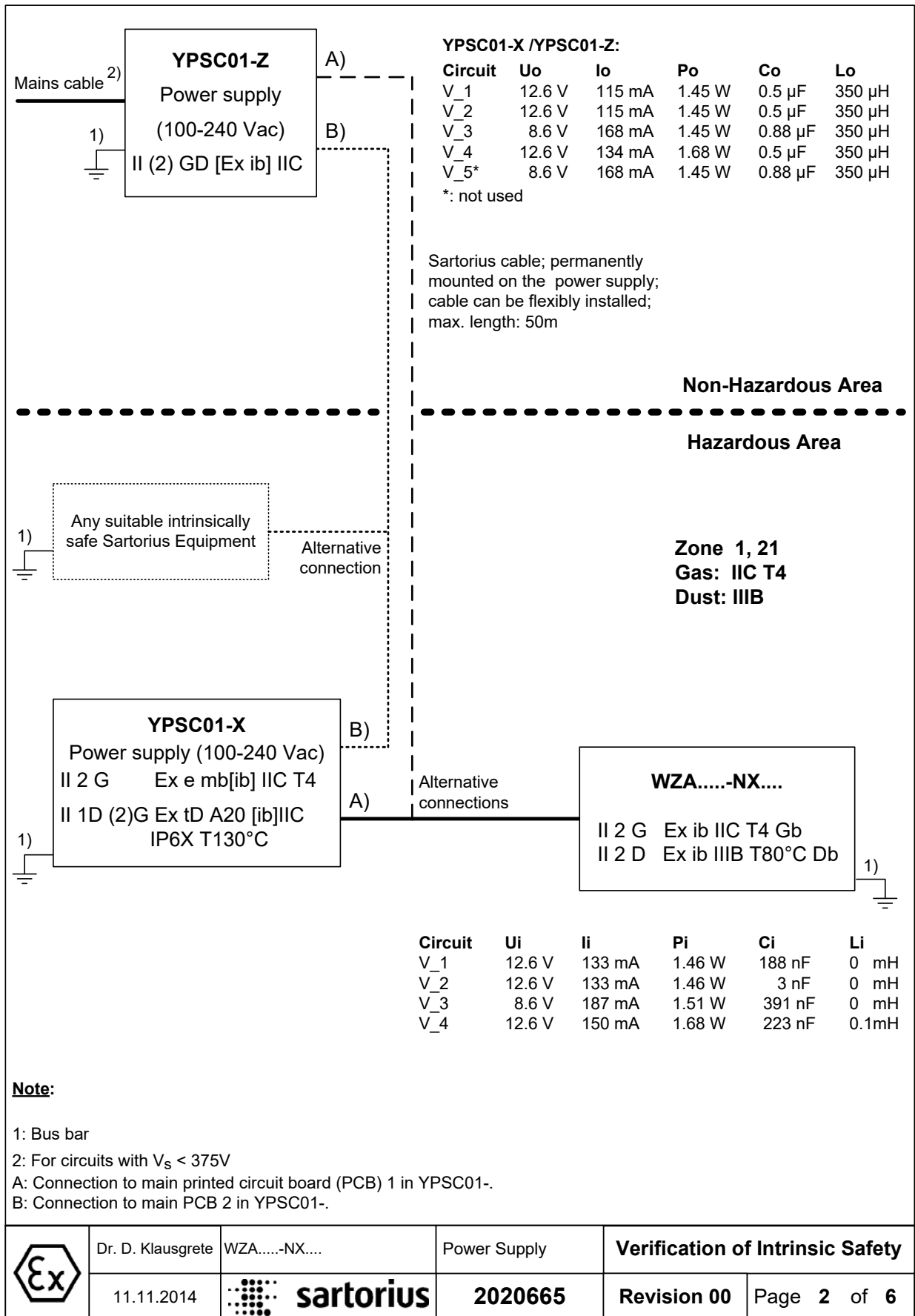


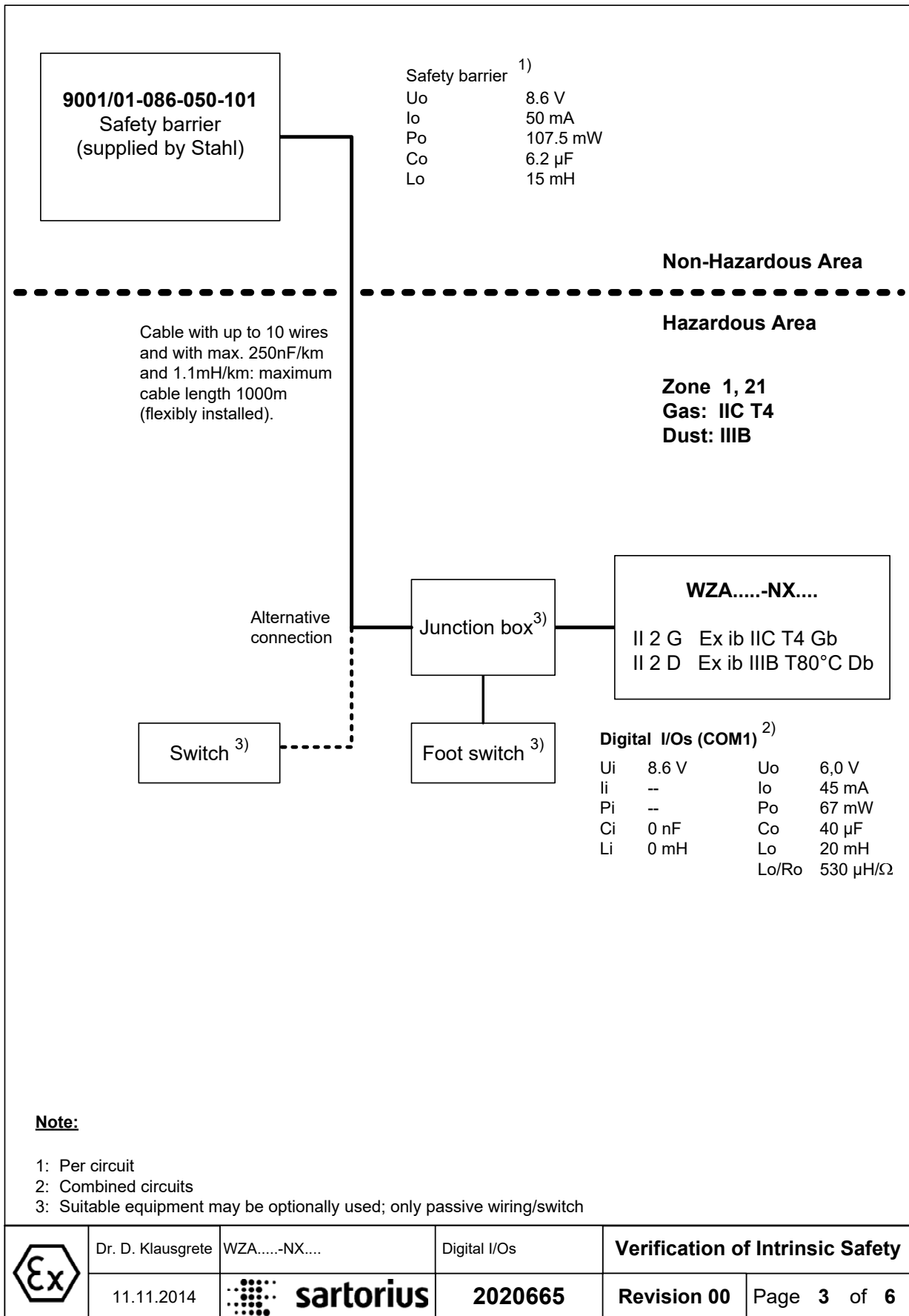
**These safety instructions apply to the installation, operation, maintenance and repair of the equipment**

- 1) Install the equipment in compliance with applicable laws, rules and regulations, ordinances and standards. In particular, be sure to conform to the European Standards EN 60079-14 (Explosive atmospheres – Part 14: Electrical installations design, selection and erection). For more information see „Verification of Intrinsic Safety“ 2020665.
- 2) Be sure to follow the installation, operating, maintenance and servicing instructions given in the manuals supplied.
- 3) The equipment shall be installed in such a way that it is protected against the entry of solid foreign objects or water capable of impairing the safety of the apparatus. Reduce the risk of mechanical damage to a minimum.
- 4) The equipment must be powered by a suitable certified/approved power supply / battery pack with intrinsically safe circuits as described in the certificate of this equipment.
- 5) Exposure to UV radiation is not allowed!
- 6) The connecting cables of the display unit and weighing cell must be permanently installed and prevented against damage and stress caused by strain.
- 7) Prior to opening the equipment, disconnect the power supply or make sure that there is no potentially explosive atmosphere or any other explosion hazard in the surrounding area!
- 8) The data cable connected to the equipment is considered as intrinsically safe circuit. The connection is secured against accidental disconnection and may only be plugged in or disconnected when the power is switched completely off. Output not used must be safeguarded by appropriate sealing cap so that the IP protection rating is maintained. Check the correct function of the data transfer before you use the equipment in a hazardous location.
- 9) If the equipment does not operate properly, unplug it immediately from line power (mains supply)!
- 10) All metal parts must be electrically connected to the terminal for the equipotential bonding conductor (PA). The equipment operator is obligated to connect a lead with a gauge of at least 4 mm<sup>2</sup> (cross section) to the PA terminal located on the side of the housing. The low resistance of this connection to the PA busbar must be checked when the system is installed at the intended place of use. The shielding of the connecting cables may only be used for grounding when no impermissible difference in voltage is generated and, if necessary, the shielding is able to conduct the equipotential current.
- 11) Avoid generating static electricity. Use only a damp cloth to wipe down the equipment. The equipment operator shall be responsible for preventing any risks caused by static electricity.
- 12) Keep chemicals and other agents, which can corrode the housing seals and cable sheaths, away from the equipment. These agents include oil, grease, benzene, acetone and ozone. If you are not sure about the safety of a certain substance, please contact the manufacturer.
- 13) Use equipment only in the temperature ranges indicated. Avoid exposing the equipment to heat.
- 14) The equipment operator is responsible for any non-Sartorius cables used.
- 15) Check the EX approval marking (particularly the group for gases/dusts and temperature class/code) on all equipment in the hazardous area before operation to ensure that this approved equipment is permitted to be operated in this area.
- 16) At reasonable intervals, have your equipment installation checked for proper functioning and safety by a trained and certified technician.
- 17) If your equipment needs to be repaired, use only original spare parts supplied by the manufacturer!
- 18) Any tampering with the equipment by anyone, other than repair work done by authorized Sartorius service technicians, will result in the loss of EX conformity and in the forfeiture of all claims under the manufacturer's warranty. Only authorized specialists may open the equipment.
- 19) Modifications, including those to be carried out by Sartorius employees, may be permitted only after the express written authorization has been obtained from Sartorius.
- 20) If an IP6x housing has been opened, close the housing with a tightening torque of 1 Nm.

	11.11.2014	 <b>sartorius</b>	Title <b>Safety Instructions</b>	Page <b>1</b> of <b>1</b>
	Dr. D. Klausgrete		Drawing number <b>2024873 U06</b>	<b>Revision 00</b>







**YDI05-Z.. interface converter**  
 II (2) GD [EEx ib] IIC or  
**Z966 Zener barrier** <sup>4)</sup>  
 in YDI02-Z...: II (2) G [EEx ib] IIC

**YDI05-Z..** <sup>2)</sup>  
 Uo 12.4 V\*      Ui 12.6 V\*  
          24.8 V\*\*      25.2 V\*\*  
 Io 260 mA\*\*\*    li any  
 Po 800 mW      Pi any  
 Co 1.24 µF\*    Ci 0  
          112 nF\*\*  
 Lo 400 µH\*      Li 0  
          400 µH\*\*  
 Lo/Ro 44 µH/Ω\* / 22 µH/Ω\*\*

**Z966** <sup>1)</sup> pins A/J/K/N and M  
 Uo 12 V\*  
          24 V\*\*  
 Io 82 mA / 164 mA <sup>8)</sup>  
 Po 0.24 W / 0.48 W <sup>8)</sup>  
 Co 1.41 µF\*  
          125 nF\*\*  
 Lo 5.52 mH  
          1.38 mH <sup>8)</sup>  
 Lo/Ro 147 µH/Ω  
          57 µH/Ω <sup>8)</sup>

**Non-Hazardous Area**

**Hazardous Area**

**Zone 1, 21**  
**Gas: IIC T4**  
**Dust: IIIB**



6-wire standard cable, up to 0.5mm<sup>2</sup> stranded wire, with max. 250nF/km, 750µH/km and minimum 34ohm/km has 22µH/ohm. However, the length of the cable (**flexibly installed**) is limited to **under 25m** by the RS-232 specifications. 6-wire cable, type PR6136 (Lmax = 1.1mH/km; Cmax = 220nF/km; Rmin = 26 ohms/km: 43µH/ohm): under 25m (see above).

**WZA.....-NX....**  
 II 2 G Ex ib IIC T4 Gb  
 II 2 D Ex ib IIIB T80°C Db

**RS232 data interface** <sup>2)</sup> **COM1**  
 Ui 12.6 V\* / 25,2V\*\*      Uo 10 V\* / 20V\*\*  
 li 328 mA\*\*\*              lo 101 mA\*\*\*  
 Pi any                      Po 253 mW  
 Ci 2.2 nF\* / 0.5nF\*\*      Co 3 µF\* / 217nF\*\*  
 Li 0 mH                      Lo 3 mH  
                                     Lo/Ro 140 µH/Ω

**Note:**

- 1: Per circuit
- 2: Combined circuits
- 3: Not all models can be used in zones 20,21,22
- 4: BAS01ATEX7005; II (1) GD [EEx ia] IIC
- 5: Both channels connected on Z966
- \*: Versus GND; \*\*: Between the lines; \*\*\*: Resistively limited

	Dr. D. Klausgrete	WZA.....-NX....	RS232 Data Interface	<b>Verification of Intrinsic Safety</b>	
	11.11.2014		<b>2020665</b>	<b>Revision 00</b>	Page <b>4</b> of <b>6</b>

**YDI05-Z.. interface converter**  
II (2) GD [EEx ib] IIC or

**Z966 Zener barrier** <sup>4)</sup>  
in YDI02-Z...: II (2) G [EEx ib] IIC

**Data cable:**  
Recommended: Sartorius cable  
**YCC485-X** with approx.  
10µH/ohm and 120pF/m (wire/wire)  
**up to 1000m flexibly installed.**

**YDI05-Z..** <sup>2) 7)</sup>

Uo	12.4 V*	Ui	12.6 V*
	24.8V**		25.2
V**			
Io	130 mA***	Ii	any
Po	400 mW	Pi	any
Co	1.24 µF*	Ci	0
	112nF**		
Lo	0.4 mH*	Li	0
	0.4 mH**		
Lo/Ro	44 µH/Ω* / 22 µH/Ω**		

**Z966** <sup>1)</sup> pins A/J/K/N and M

Uo	12 V*
	24V**
Io	82 mA /164mA <sup>6)</sup>
Po	0.24 W / 0.48W <sup>6)</sup>
Co	1.41 µF*
	125nF**
Lo	5.52 mH <sup>6)</sup>
	1.38mH <sup>6)</sup>
Lo/Ro	147 µH/Ω <sup>6)</sup>
	57 µH/Ω <sup>6)</sup>

**Non-Hazardous Area**

**Hazardous Area**

**Zone 1, 21**  
**Gas: IIC T4**  
**Dust: IIIB**

**WZA.....-NX.....**

II 2 G Ex ib IIC T4 Gb  
II 2 D Ex ib IIIB T80°C Db

Up to 7 additional  
**WZA.....-NX.....**

**RS485 data interface** <sup>5) 2)</sup> (UNICOM. LV2)

Uo	7.2 V	Ui	12.6 V
Io	127 mA*	Ii	1.5 A*
Po	0.273 W	Pi	2.5 W
Co	11.3 µF	Ci	0
Lo	2 mH	Li	2 µH
Lo/Ro	118 µH/ohm		

**RS485 data interface** <sup>5) 2)</sup> (LV4)

Uo	7.2 V <sup>3)</sup>	Ui	12.6 V
	8.2 V <sup>4)</sup>		
Io	168 mA*	Ii	1.5 A*
Po	0.25 W	Pi	2.5 W
Co	13 µF <sup>3)</sup>	Ci	300 nF <sup>3)</sup>
Co	7.6 µF <sup>4)</sup>	Ci	100 nF <sup>4)</sup>
Lo	0.8 mH	Li	0 mH
Lo/Ro	118 µH/ohm		



**RS485 data interface** <sup>2)</sup>

Ui	see below	Uo	5.2 V
Ii	see below	Io	210 mA***
Pi	any	Po	263 mW
Ci	260 nF	Co	60 µF
Li	0 mH	Lo	600 µH
		Lo/Ro	125 µH/Ω

Ui	±12.4V	12.0V	7.2V
Ii	130 mA***	164mA***	---

**Note:**

- 1: Per circuit
- 2: Combined circuits
- 4: BAS01ATEX7005; II (1) GD [EEx ia] IIC
- 5: Data for CIXS3
- 6: Both channels connected on Z966
- 7: Only 2 RS232 connections are used on the YDI05-Z
- \*: Versus GND; \*\*: Between the lines; \*\*\*: Resistively limited

	Dr. D. Klausgrete	WZA.....-NX.....	RS485 Data Interface	<b>Verification of Intrinsic Safety</b>	
	11.11.2014		<b>2020665</b>	<b>Revision 00</b>	Page <b>5</b> of <b>6</b>

**YDI05-Z  
(Option A25)**  
Interface converter  
II (2) GD [Ex ib] IIC

**RS422 data interface of YDI05-Z<sup>2)</sup>**

Uo	6.0 V <sup>*)</sup>	Ui	12.6 V <sup>*)</sup>
	6.8 V <sup>**)</sup>		25.2 V <sup>**)</sup>
Io	172 mA (linear)	Ii	0.2 A
Po	0.5 W	Pi	2.3 W
Co	12 µF <sup>*)</sup>	Ci	28 µF <sup>*)</sup>
Co	17.7 µF <sup>**)</sup>	Ci	200 nF <sup>**)</sup>
Lo	0.7 mH	Li	2 µH

**Non-Hazardous Area**

**Hazardous Area**

**Zone 1, 21**  
**Gas: IIC T4**  
**Dust: IIIB**

**Cable:**

For a standard cable (e.g., type LiYCY with max. 250nF/km (wire versus wire or wire versus shield), max. 750µH/km and at least 34 ohms/km (e.g. 0.5mm<sup>2</sup> stranded wire), this yields Lo/Ro = 22 µH/ohm. Permitted length of the flexibly installed cable: **330m**

**WZA.....-NX....**



II 2 G Ex ib IIC T4 Gb  
II 2 D Ex ib IIIB T80°C Db

**RS422 data interface<sup>2)</sup> (COM1)**

Uo	5,2 V	Ui	8.6 V
Io	290 mA	Ii	210 mA
Po	496 mW	Pi	0.5 W
Co	60 µF	Ci	0.5 µF
Lo	300 µH	Li	0 mH
Lo/Ro	50 µH/Ω		

**Note:**

- 1: Per circuit
- 2: Combined circuits
- \*: Versus GND; \*\*: Between the lines; \*\*\*: Resistively limited

	Dr. D. Klausgrete	WZA.....-NX....	RS422 Data Interface	<b>Verification of Intrinsic Safety</b>	
	11.11.2014		<b>2020665</b>	<b>Revision 00</b>	Page <b>6</b> of <b>6</b>

# CERTIFICATE OF CONFORMITY



1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** FM17US0299X
3. **Equipment:** WZA.....-NX.... Digital Weighing Unit  
(Type Reference and Name)
4. **Name of Listing Company:** Sartorius Lab Instruments GmbH & Co. KG
5. **Address of Listing Company:** Otto-Brenner-Straße 20  
Goettingen  
37079  
Germany
6. The examination and test results are recorded in confidential report number:  

3063578 dated 8<sup>th</sup> March 2018
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:  

FM Class 3600:2018, FM Class 3610:2018, FM Class 3810:2018,  
ANSI/ISA 60079-0:2013, ANSI/ISA 60079-11:2014, ANSI/IEC 60529:2004, ANSI/ISA 61010-1:2012
8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.
10. **Equipment Ratings:**  

Intrinsically safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F and G, T4, Ta = -10°C to 40°C;  
intrinsically safe for Class I, Zone 1, AEx ib IIC, T4, Ta = -10°C to 40°C; Zone 21 AEx ib IIIB, T80°C,  
Ta = -10°C to 40°C, hazardous (classified) locations; enclosure type IP6X (Electronic Box) / IP4X (Weighing Cell)

**Certificate issued by:**

  
\_\_\_\_\_  
J. E. Marquedant  
VP, Manager, Electrical Systems

8 March 2018  
\_\_\_\_\_  
Date

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA  
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmaprovals.com](mailto:information@fmaprovals.com) [www.fmaprovals.com](http://www.fmaprovals.com)



# SCHEDULE



Member of the FM Global Group

US Certificate Of Conformity No: FM17US0299X

**11. The marking of the equipment shall include:**

IS CL I,II,III, Div 1, GP ABCDEFG T4,  $-10^{\circ}\text{C} \leq \text{Ta} \leq 40^{\circ}\text{C}$ -2352292; Entity  
Class I Zone 1 AEx ib IIC T4,  $-10^{\circ}\text{C} \leq \text{Ta} \leq 40^{\circ}\text{C}$ /Gb-2352292; Entity  
Zone 21 AEx ib IIIB T80°C,  $-10^{\circ}\text{C} \leq \text{Ta} \leq 40^{\circ}\text{C}$ /Db-2352292; Entity  
Type IP6X (Electronic Box) / IP4X (Weighing cell)

**12. Description of Equipment:**

**General** - The WZA.....-NX.... is a series of high-accuracy / high resolution weighing units. Weighing data is transmitted via an RS232, RS485 or RS422 interface and, optionally, visually displayed.

The WZA.....-NX.... is a system comprised of a weighing cell, electronics enclosure and an optional display unit. The weighing cell communicates with the electronics box via RS232, RS485 or RS422 interface. The electronics box is powered by an intrinsically safe power supply which operates from DC supply voltages of 8.6 V to 12.6V. Enclosures are constructed of stainless steel.

The equipment is rated for use over an ambient temperature range of  $-10^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ . Refer to control drawing 2352292-R00 for input/output parameters.

**13. Specific Conditions of Use:**

- 1) The front panel (of the optionally used display unit) of the intrinsically safe digital weighing unit WZA.....-NX.... is non-metallic and shall not be used where UV light or radiation may impinge on the enclosure.
- 2) The cables between the electric box and weighing cell and between the electronic box and display unit must be permanently installed and protected against damages
- 3) Electrostatic charges shall be avoided. Use only a damp cloth to wipe down the equipment.

**14. Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

**15. Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

**16. Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
8 <sup>th</sup> March 2018	Original Issue.

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA  
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmapprovals.com](mailto:information@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

# CERTIFICATE OF CONFORMITY



1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS**

2. **Certificate No:** FM17CA0151X  
3. **Equipment:** WZA.....-NX.... Digital Weighing Unit  
(Type Reference and Name)

4. **Name of Listing Company:** Sartorius Lab Instruments GmbH & Co. KG

5. **Address of Listing Company:** Otto-Brenner-Straße 20  
Goettingen  
37079  
Germany

6. The examination and test results are recorded in confidential report number:  
3063578 dated 8<sup>th</sup> March 2018

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

CAN/CSA C22.2 No. 60079-0:2015, CAN/CSA C22.2 No. 60079-11:2014, CAN/CSA C22.2 No. 61010-1:2012 (R2017), CAN/CSA C22.2 No. 60529:2016

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

10. **Equipment Ratings:**

Intrinsically safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F and G, T4, Ta = -10°C to 40°C; intrinsically safe, Ex ib IIC, T4, Ta = -10°C to 40°C; Ex ib IIIB, T80°C, Ta = -10°C to 40°C, hazardous locations; enclosure type IP6X (Electronic Box) / IP4X (Weighing Cell)

**Certificate issued by:**

  
\_\_\_\_\_  
J. E. Marquedant  
VP, Manager, Electrical Systems

8 March 2018  
\_\_\_\_\_  
Date

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA  
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmapprovals.com](mailto:information@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

# SCHEDULE



Canadian Certificate Of Conformity No: FM17CA0151X

**11. The marking of the equipment shall include:**

IS CL I,II,III, Div 1, GP ABCDEFG / T4, -10°C≤Ta≤40°C-2352292; Entity  
Ex ib IIC T4, -10°C≤Ta≤40°C/Gb-2352292; Entity  
Ex ib IIIB T80°C, -10°C≤Ta≤40°C/Db-2352292; Entity  
Type IP6X (Electronic Box) / IP4X (Weighing Cell)

**12. Description of Equipment:**

**General** - The WZA.....-NX.... is a series of high-accuracy / high resolution weighing units. Weighing data is transmitted via an RS232, RS485 or RS422 interface and, optionally, visually displayed.

The WZA.....-NX.... is a system comprised of a weighing cell,electronics enclosure and an optional display unit. The weighing cell communicates with the electronics box via RS232, RS485 or RS422 interface. The electronics box is powered by an intrinsically safe power supply which operates from DC supply voltages of 8.6 V to 12.6V. Enclosures are constructed of stainless steel.

The unit is rated for use over an temperature range of -10°C to +40°C. Refer to control drawing 2352292-R00 for input/output parameters.

**13. Specific Conditions of Use:**

- 1) The front panel (of the optionally used display unit) of the intrinsically safe digital weighing unit WZA.....-NX.... is non-metallic and shall not be used where UV light or radiation may impinge on the enclosure.
- 2) The cables between the electric box and weighing cell and between the electronic box and display unit must be permanently installed and protected against damage.
- 3) Electrostatic charges shall be avoided. Use only a damp cloth to wipe down the equipment.

**14. Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals Canadian Certification Scheme.

**15. Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

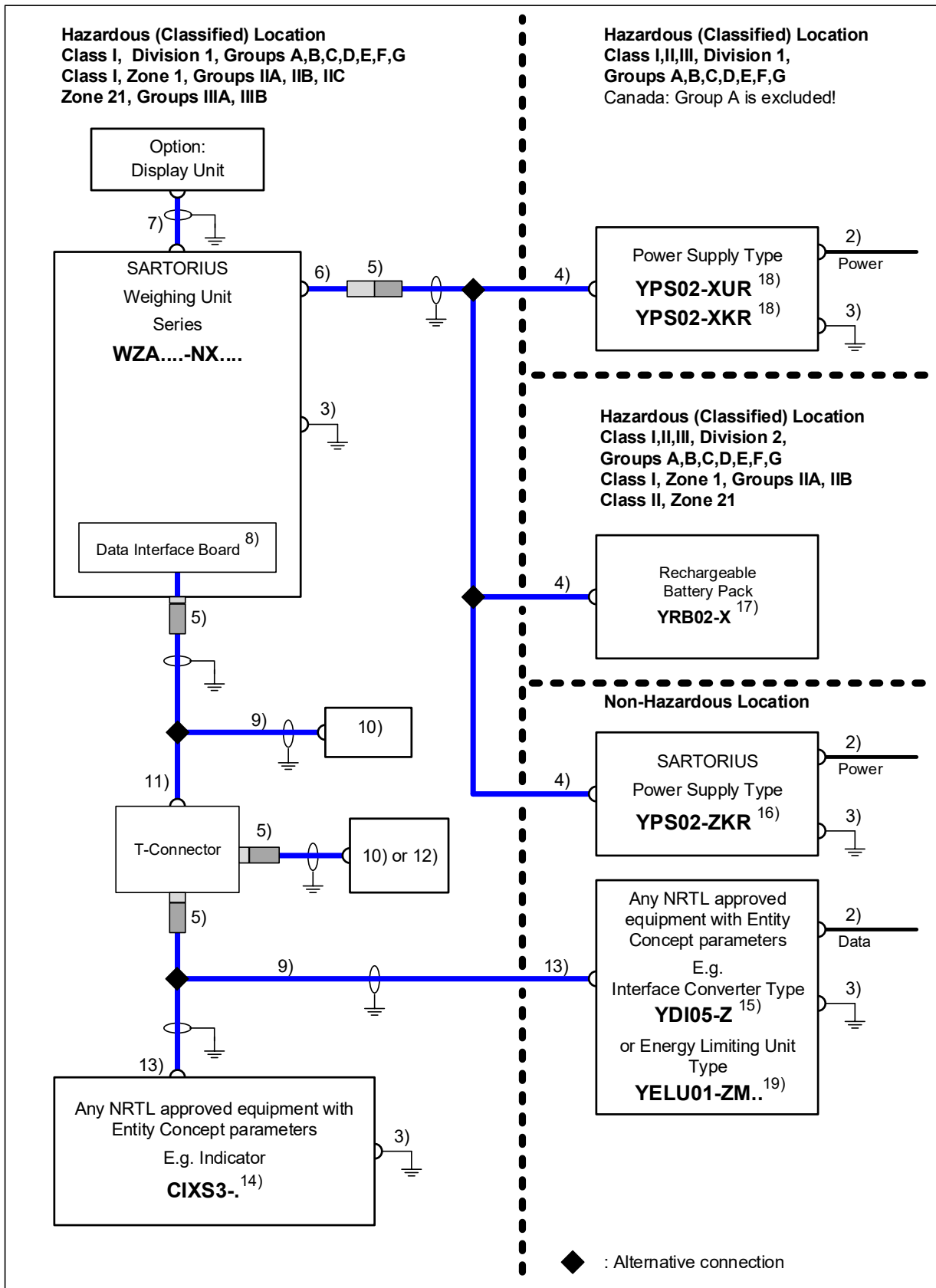
**16. Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
8 <sup>th</sup> March 2018	Original Issue.

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA  
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: [information@fmapprovals.com](mailto:information@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

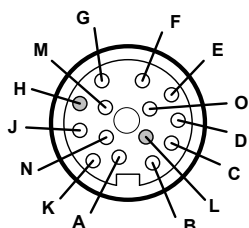


	2017-10-10		Title <b>Control Drawing</b> WZA....-NX..	
	Dr. D. Klausgrete		Drawing number <b>2352292</b>	Revision <b>00</b>

### Data Interface of the WZ....-NX....

<b>RS232 + Digital I/Os</b>	<b>RS422</b>	<b>RS485 + Digital I/Os</b>	<b>Pin</b> 14pin female connector
---------------------------------	--------------	---------------------------------	--------------------------------------

CTS	GND	GND	A
RxD	GND	TxD-RxD_P	J
TxD	TxD_N	TxD_RxD_N	K
DTR	TxD_P	---	N
GND	DRT_P	GND	C
GND	RxD_N	GND	M
GND	DTR_N	GND	B
UNI_IN	---	UNI_IN	O
SET	---	SET	D
PAR	CTS_N	PAR	E
MIN	CTS_P	MIN	F
MAJ	RxD_P	MAJ	G



#### Input parameters (combined circuits):

	U <sub>i</sub>	I <sub>i</sub>	P <sub>i</sub>	C <sub>i</sub>	L <sub>i</sub>
RS232	12.6 V* 25.2 V**	328 mA***	any	2.2 nF*/0.5nF**	0 mH
RS422	8.6 V	210 mA	0.5 W	0.5 µF	0 mH
RS485	see below	see below	any	260 nF	0 mH
Digital I/Os	8.6 V	any	any	0 µF	0 mH

\*: versus ground; \*\*: between the lines; \*\*\*: resistively limited

RS485 (R<sub>min</sub> = U<sub>i</sub> / I<sub>i</sub> is the minimum output resistance of the combined circuits of the equipment connected to the PMA35001-X..):

U <sub>i</sub>	±12.4V	12.0V	7.2V
I <sub>i</sub>	130 mA***	164mA***	any
R <sub>min</sub>	95Ω	73Ω	any

#### Output parameters (combined circuits):

	U <sub>o</sub>	I <sub>o</sub>	P <sub>o</sub>	C <sub>o</sub>	L <sub>o</sub>	Lo/Ro
RS232	10.0 V* 20.0 V**	101 mA***	253 mW	3 µF* 217 nF**	3 mH	140µH/Ω
RS422	5.2 V	290 mA	496 mW	60 µF	300 µH	50µH/Ω
RS485	5.2 V	210 mA***	263 mW	60 µF	600 µH	125 µH/Ω
Digital I/Os	6.0 V	45 mA***	67 mW	40 µF	20 mH	530 µH/Ω

\*: versus ground; \*\*: between the lines; \*\*\*: resistively limited



2017-10-10

Dr. D. Klausgrete



**sartorius**

Title

**Control Drawing**

**WZA....-NX..**

Drawing number

**2352292**



**Revision 00**

Sheet **2** of **3**

## Notes

- 1) In the **USA**: The installation must be in accordance with the National Electrical Code<sup>®</sup>, NFPA 70, Article 504 or 505 and ANSI / ISA-RP 12.6.  
 In **Canada**: The installation must be in accordance with the Canadian Electrical Code<sup>®</sup>, Part1, Section 18.
- 2) The apparatus must not be connected to any device that uses or generates in excess of 250Vrms or DC.  
 $U_m = 250V$ .
- 3) In the **USA**: The Apparatus must be connected to a suitable ground electrode per National Electrical Code<sup>®</sup>, NFPA 70, Article 504 or 505. The resistance of the ground pad must be less than 1 ohm.  
 In **Canada**: The Apparatus must be connected to a suitable ground electrode per Canadian Electrical Code<sup>®</sup>, Part 1. The resistance of the ground pad must be less than 1 ohm.
- 4) Connection by non interchangeable cable type LiYC-Y-CY 4 x 0.5; max length: 50m (164 ft).
- 5) Connection by means of polarized connector outside of the indicator.
- 6) Connection by non interchangeable cable type LiYC-Y-CY 4 x 0.5; max length: 0.5m (1.6 ft).
- 7) The cable must be protected against damage.
- 8) The circuits of the data output interface shall be assumed to be connected to earth.
- 9) The cable needs not be protected against damage.
- 10) Equipment with metallic housing (IP4x in minimum) and passive wiring, only. For use in Class II,III, Division 1 and in Zone 21 the housing must be IP6x.
- 11) The cable to the T-Connector must be protected against damage.
- 12) Any NRTL approved equipment with Entity Concept parameters (see note 12)
- 13) The Entity Concept allows interconnection of intrinsically safe apparatus with associated apparatus not specifically examined in combination as a system when the approved values of Voc, Isc and Pmax resp. Uo, Io, Po of the associated apparatus are less than or equal to Vmax, Imax and Pmax resp. Ui, li, Pi of the intrinsically safe apparatus and the approved values of Ca and La resp. Co and Lo of the associated apparatus are greater than Ci and Li of the intrinsically safe apparatus plus all cable parameters.  
 For the input and output parameters of the data interface of the WZA....-NX.... see page 2.
- 14) The Indicator Series CIXS3-<sup>\*)</sup> is approved/certified by FM for use in the USA and in Canada. See Certificate of Compliance and Control Drawing number 65607-000-07-A4.
- 15) The Interface Converter YDI05-Z..<sup>\*)</sup> is approved/certified by FM for use in the USA and in Canada. See Certificate of Compliance and Control Drawing number 65710-800-07-A4.
- 16) The Power Supply Model YPS02-ZKR<sup>\*)</sup> is approved/certified by FM for use in the USA and in Canada. See Certificate of Compliance and Control Drawing number 65501-000-17.
- 17) The rechargeable battery pack YRB02-X<sup>\*)</sup> is approved/certified by FM for use in the USA and in Canada. See Certificate of Compliance and Control Drawing number 65656-000-07-A4.
- 18) The Power Supply Model YPS02-XUR<sup>\*)</sup> is approved by FM for use in the USA. The Power Supply Model YPS02-XKR is certified by CSA for use in Canada. See Certificate of Compliance and Control Drawing number 65516-000-17.
- 19) The Sartorius Energy Limiting Unit Type YELU01-ZM.. is approved/certified by FM for use in the USA and in Canada. See Certificate of Compliance and Control Drawing number 98864-000-07.
- 20) Ambient temperature range: -10°C .... +40°C (14°F .... +104°F) The temperature class for gases of the WZA....-NX... is T4. The maximum surface temperature for dusts of the WZA....-NX.... is 80°C (176°F).
- 21) **WARNING:** SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.  
**AVERTISSEMENT:** LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE.

\*: Product of Minebea Intec Bovenden GmbH & Co. KG (former Sartorius Industrial Scales GmbH & Co. KG), Leinetal 2, D-37120 Bovenden, Germany.

	2017-10-10		<b>sartorius</b>	Title	<b>Control Drawing</b>		<b>WZA....-NX..</b>	
	Dr. D. Klausgrete			Drawing number	<b>2352292</b>	<b>Revision 00</b>	Sheet <b>3</b> of <b>3</b>	

# FCC Supplier's Declaration of Conformity



**Device type** Digital weighing unit

**Model** WZA6202-NX, WZA623-NX

## **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.

Sartorius Lab Instruments GmbH & Co. KG  
Otto-Brenner-Strasse 20  
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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08 | 2019