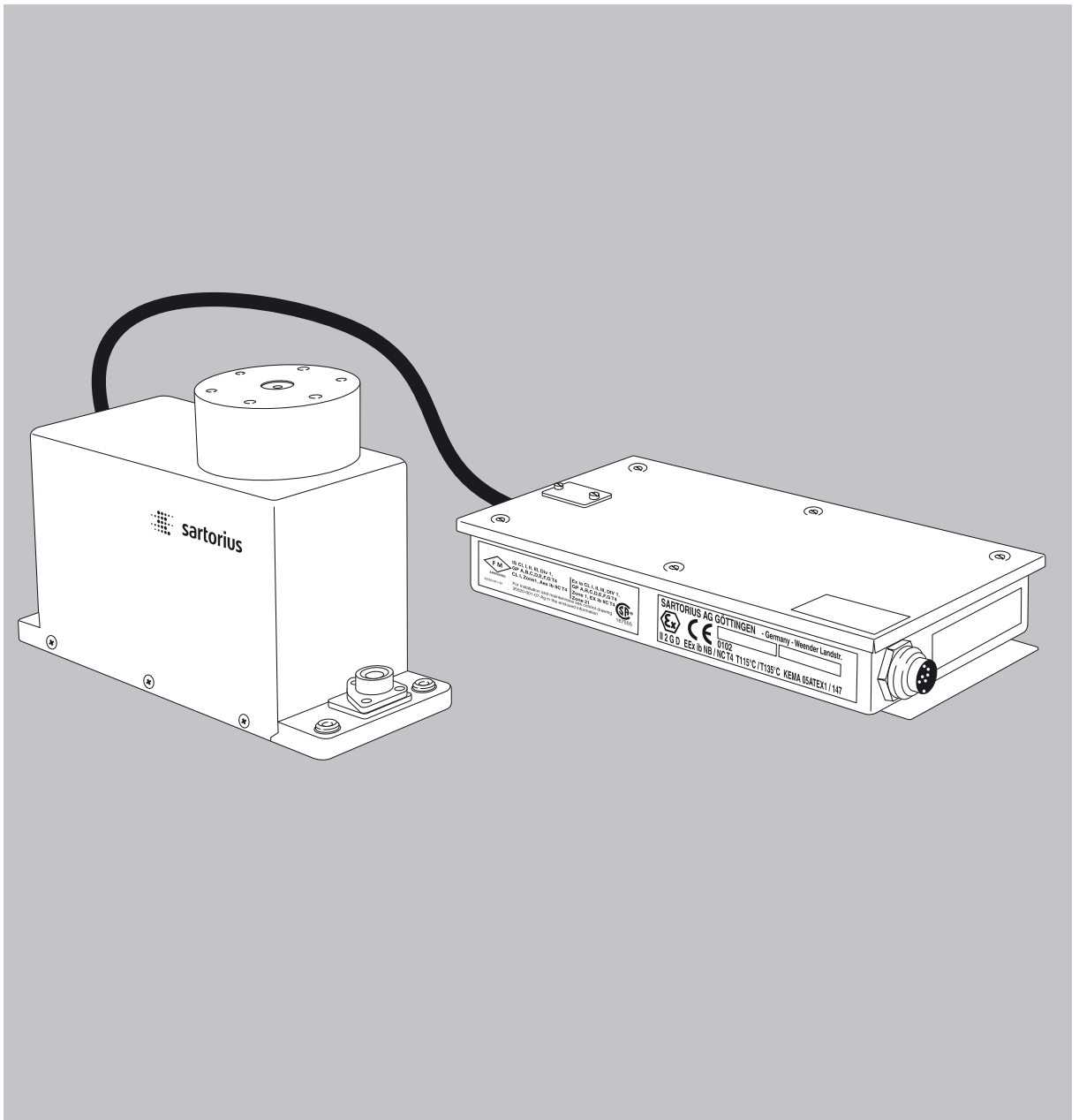


Installation Instructions

# Sartorius Explosion-protected Weigh Cells

Models WZA...-X



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## 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


## Safety Precautions


- The weigh cell meets the requirements for Group II, Category 2 equipment in accordance with EC Directive 94/9/EC and bears the designation  II 2 GD EEx ib IIB/IIC T4 T115°C or 135°C in accordance with KEMA EC type-examination certificate 05ATEX1147X. Furthermore, the weigh cell meets the EC Directives for electromagnetic compatibility (see the Declaration of Conformity). Improper use or handling, however, can result in damage and/or injury.
- To prevent damage to the equipment, read these installation instructions thoroughly before using your weigh cell.
- These installation instructions describe only the technological specifications of the weigh cell and the conditions that must be observed during installation.
- The weigh cell can be operated indoors or outdoors. This weigh cell must not be used in the medical industry (as a medicinal product).
- 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 (e.g., EN60079-14, EN50281-1-2) 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.


 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 Requirements

- 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 YAC02FC-X 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 YAC02FC-X 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.

### Hotline

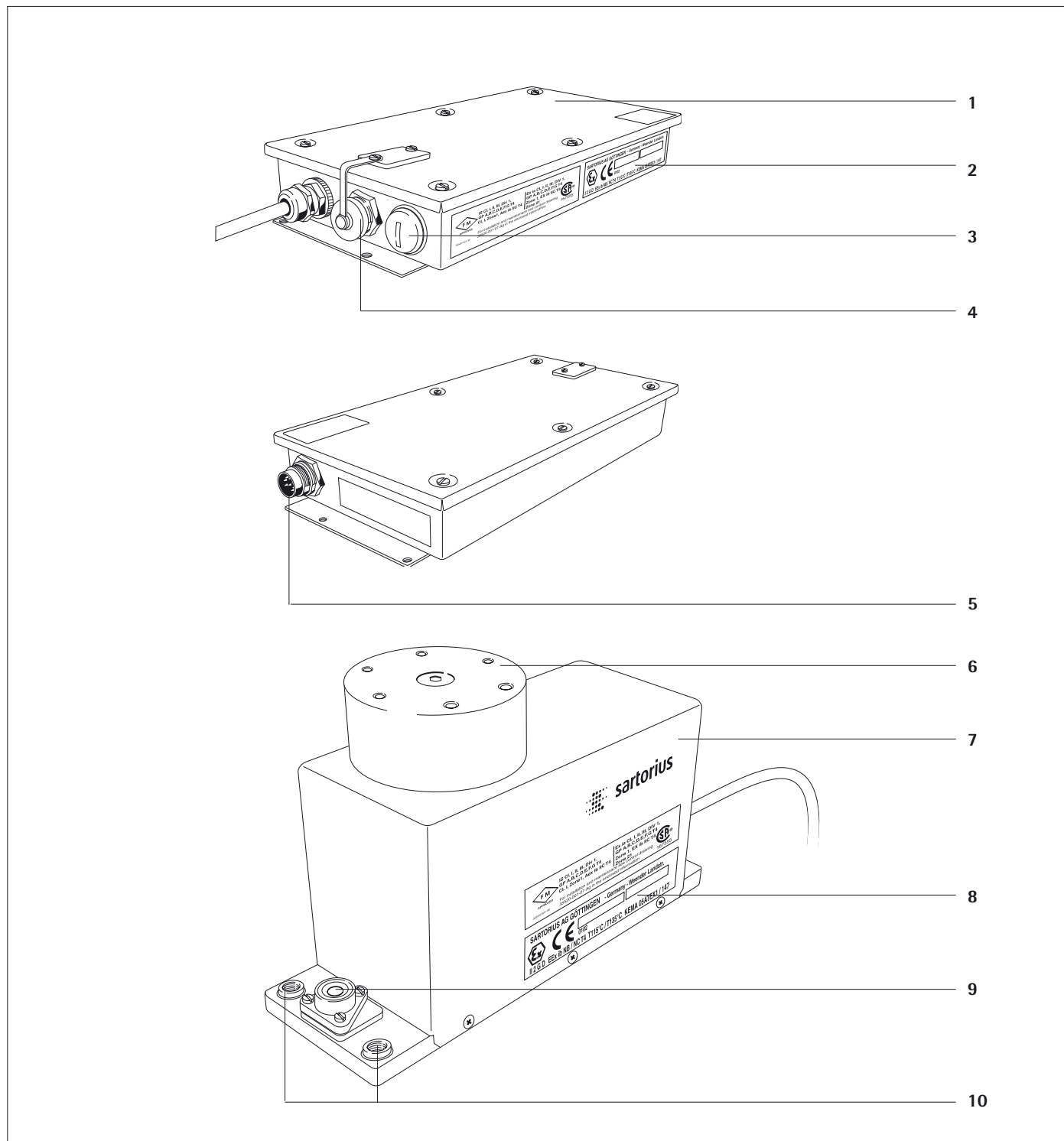
- If you have technical questions about the construction, specifications or installation of this weigh cell, just call or fax your local Sartorius office. For the address, please visit our Internet website at: [www.sartorius.com](http://www.sartorius.com)

### Explanation of Symbols

The following symbols are used in these instructions:

- indicates required steps
- indicates steps required only under certain conditions
- > describes what happens after you have performed a particular step
- indicates an item in a list
-  indicates a hazard  
Make sure you observe the warning and safety information in its entirety during installation and operation, as well as while performing maintenance and repair work on the equipment. It is important that all personnel using the equipment understand this information and have access to it at all times.

# General View of the Equipment



Pos.	Designation
1	Electronics module
2	Identification label on the electronics module
3	Socket for connecting an optional display and control unit
4	Interface port
5	DC jack

Pos.	Designation
6	Load receptor
7	Weigh cell
8	Identification label on the 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 YAD011S software or the optional YAC02FC-X 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

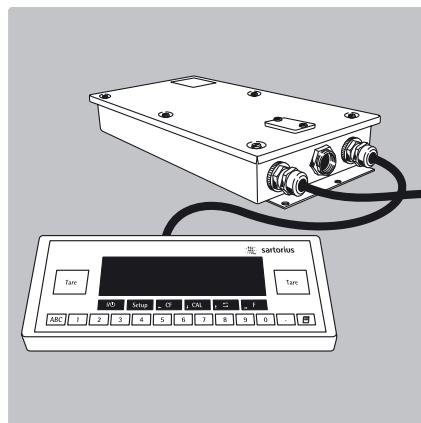
The equipment is designed to provide reliable results under normal ambient conditions. If you have any questions or difficulties when developing your weighing system, please contact the specialists at Sartorius. When designing and setting up your weighing system, please observe the following so that 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.

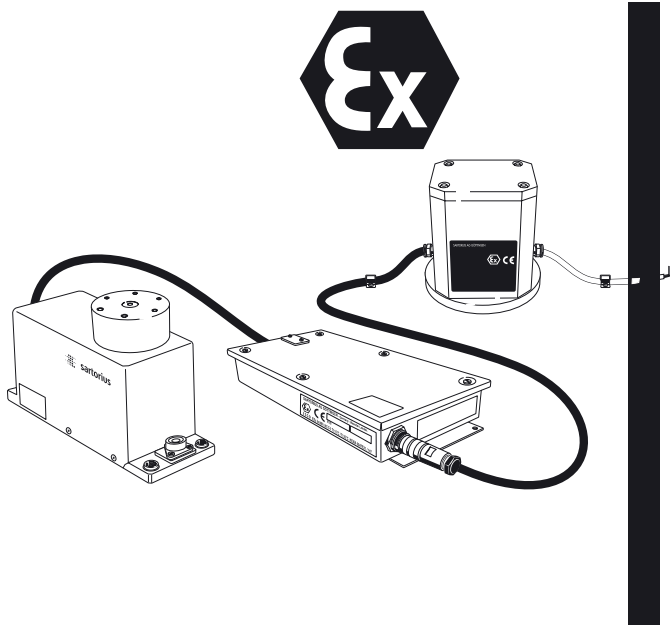
## Components Attached to the Load Receptor

- 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 YAC02FC-X 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 YAC02FC-X 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.

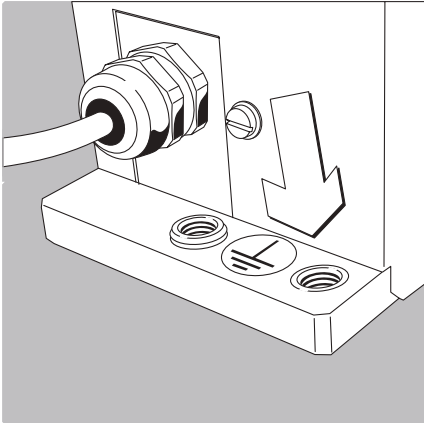
The weigh cell specifications for Ui, Li, Pi, Ta, temperature class, Ci, and Li are listed in the EC type-examination certificate.

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 EN 5281-1-2, 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.

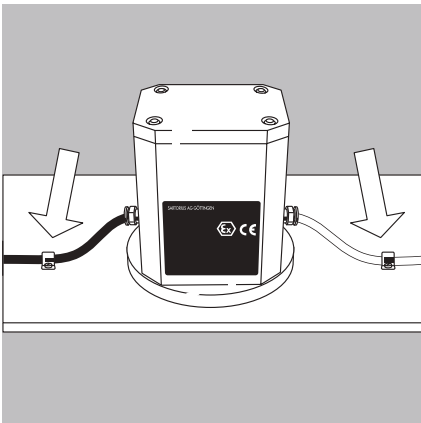
Use a stainless steel screw (M6 thread) to connect the grounding conductor. We recommend using a tooth lock washer to prevent the screw from coming loose. The wire used for the grounding conductor should have a cross-sectional diameter of at least 4 mm<sup>2</sup>, with a suitable ring lug attached.

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.

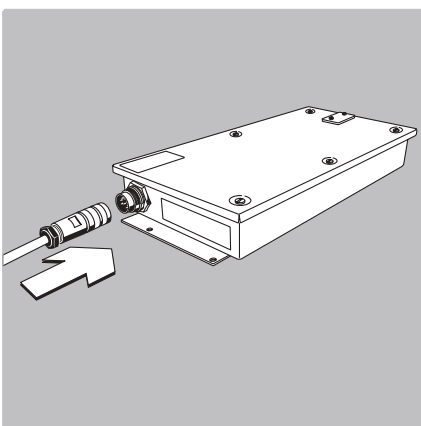


- YPS02-X..: flameproof power supply:
  - Install both cables so that they are stationary and mechanically protected
  - Flexible installation of cables with threaded fasteners can be carried out on request.

- 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:

- YPS02-Z.. (for use outside hazardous areas/locations)
- YPS02-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.

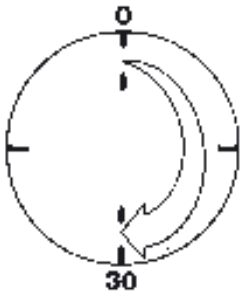
⚠ Be sure to connect the power supply to the electronics module before plugging the equipment in to AC power.

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

- The intrinsically safe connector for the power cable (primary side) of YPS02-X.. power supplies 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
WZA64-X	2 Nm	1 Nm	2 Nm	
WZA623-X	2.5 Nm	1 Nm	1 Nm	2 Nm
WZA6202-X	6 Nm	4 Nm	2 Nm	4 Nm
WZA12001-X	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-X 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-X.

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

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

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

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

$$M_{eck} = M_{eck\ Arm} + M_{eck\ Last}$$

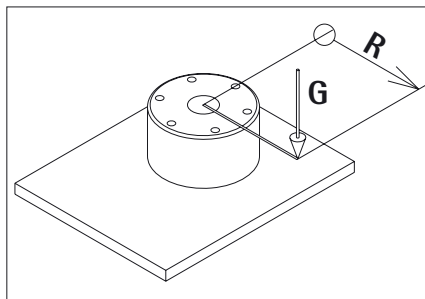
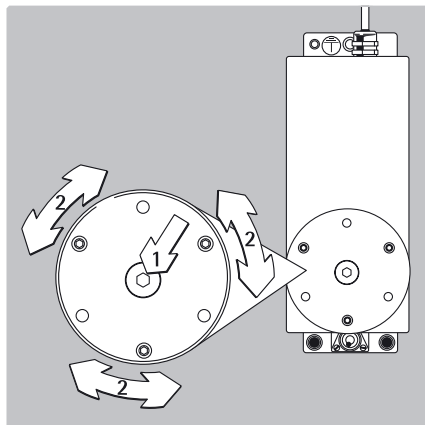
$$= R (1/2 \times G_{Arm} + G_{Last})$$

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

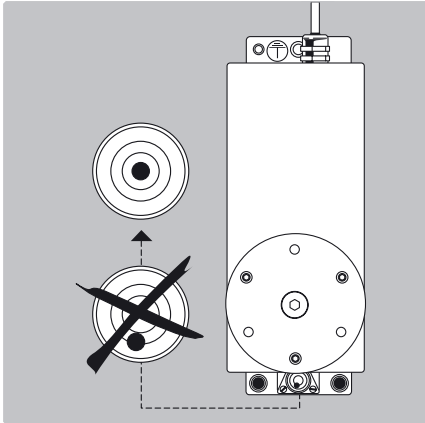
$$R = 2.5 \text{ Nm} / 12 \text{ N} = 0.2 \text{ m}$$

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

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 recommend 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.

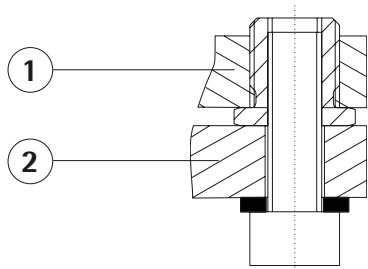
- Adjust the leveling feet until the air bubble is centered within the circle on the level indicator.

### Permanently Installed Weigh Cells

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

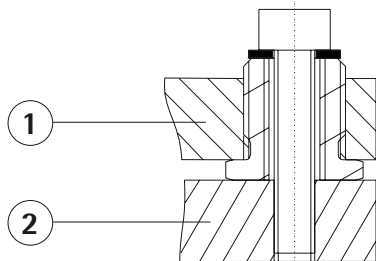
The weigh cell must be leveled again any time the location or position of the weighing system is changed.

- 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

1	2000–2006	6	2035–2041
2	2007–2013	7	2042–2048
3	2014–2020	8	2049–2055
4	2021–2027	9	2056–2062
5	2028–2034		

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 (M M) advance chronologically from 13 upwards.

2000 13–24

2001 25–36

...

Example:

113xxxxx (January 2000)

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.

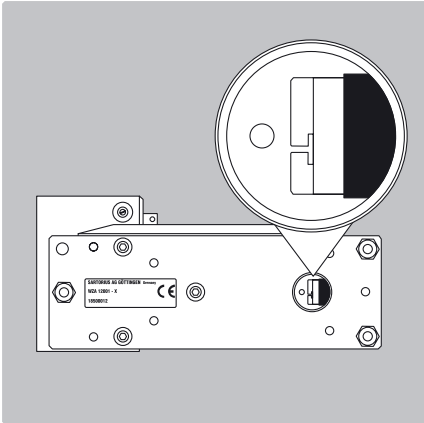
To keep such effects to a minimum, we recommend increasing the distance between the sample/container and the weighing system using a non-magnetic material. The force is reduced quadratically with the increase in distance.

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 YAD011S configuration software from Sartorius, installed on a computer (see page 16 for the commands)  
or
- Using the optional YAC02FC-X 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 following models: WZA64-X and WZA623-X
- △ Models WZA6202-X and WZA12001-X:  
No overload protection provided
- Carefully install the special hook: maximum torque: 0.75 Nm
- If necessary, install a shield for protection against drafts.
- △ Protection rating: only protection rating IP22 is provided when the cover plate for the below-cell weighing port has been removed.

# 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

The parameters are combined in the following groups (highest menu level):

- 1 Weigh cell functions ("Weighing")
- 5 Interface
- 6+7 Print in weighing mode
- 8 Extra functions
- 9 Restore factory settings

## Factory Settings for Menu Parameters

The factory-set configurations are identified by an "o" in the list below. Customer-specific settings can be configured upon request.

## Preparation

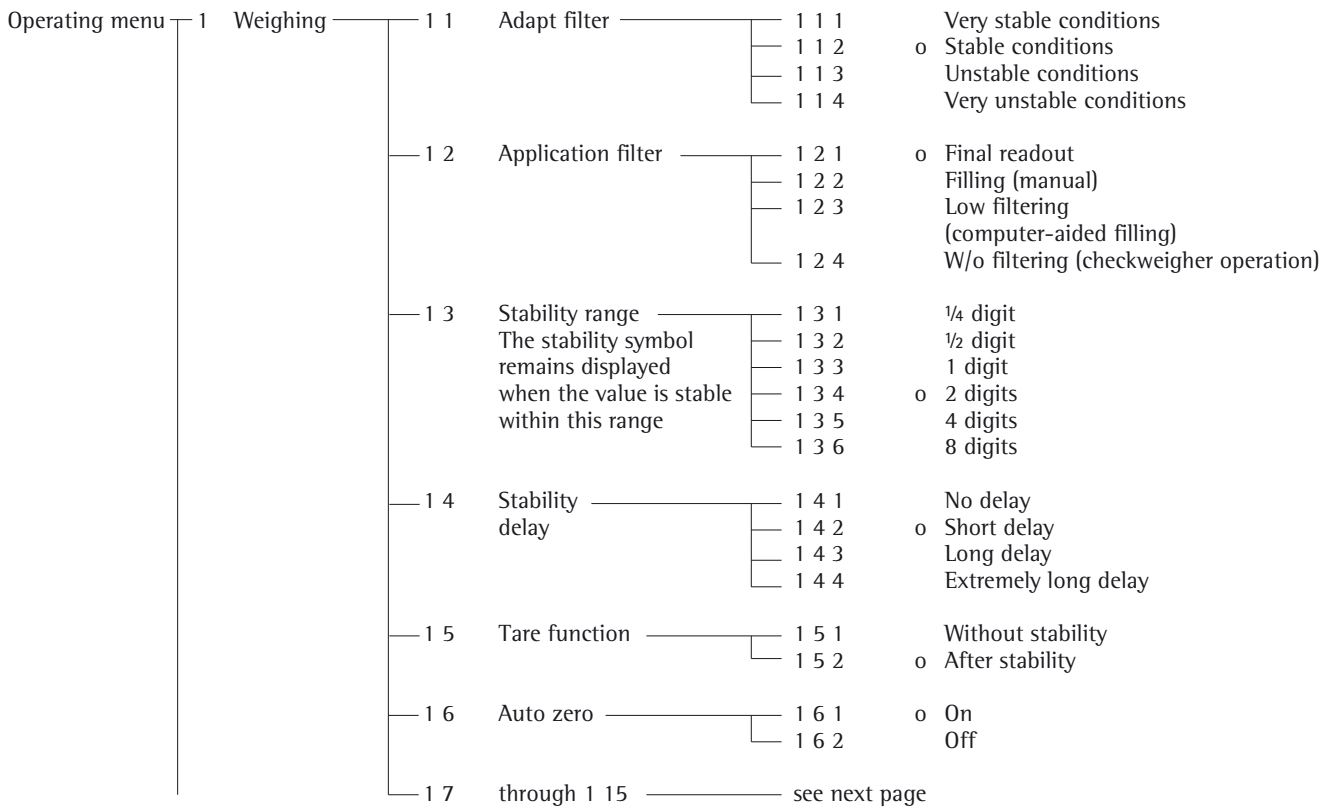
- Using the YAD011S configuration software from Sartorius, you can process the operating menu parameters as follows:
  - read
  - edit
  - print
  - save

- Operation with the optional YAC02FC-X display and control unit:
  - The menu is extended by the addition of application programs.
  - The display and control unit has a separate processor for configuring the settings.
  - The settings are effective only as long as the display and control unit is connected.

For more detailed information on configuration of the weigh cell, please contact Sartorius.

## Parameter Settings (Overview)

- o Factory setting
- √ User-defined setting



Operating menu	1 Weighing	1 1 through 1 7	see previous page
	1 7	Weight unit 1	<ul style="list-style-type: none"> <li>1 7 1 Grams (display: o)</li> <li>1 7 2 o Grams (display: g)</li> <li>1 7 3 Kilograms</li> <li>1 7 4 Carats</li> <li>1 7 5 Pounds</li> <li>1 7 6 Ounces</li> <li>1 7 7 Troy ounces</li> <li>1 7 8 Hong Kong tael</li> <li>1 7 9 Singapore tael</li> <li>1 7 10 Taiwanese tael</li> <li>1 7 11 Grains</li> <li>1 7 12 Pennyweights</li> <li>1 7 13 Milligrams</li> <li>1 7 14 Parts per pound</li> <li>1 7 15 Chinese tael</li> <li>1 7 16 Mommies</li> <li>1 7 17 Austrian carats</li> <li>1 7 18 Tola</li> <li>1 7 19 Baht</li> <li>1 7 20 Mesghal</li> </ul>
	1 8	Display/output accuracy	<ul style="list-style-type: none"> <li>1 8 1 o All digits</li> <li>1 8 2 Reduced for load change</li> <li>1 8 3 Index +1</li> <li>1 8 4 Index +2</li> <li>1 8 5 Reduced by 1 digit</li> </ul>
	1 9	Calibration/adjustment, linearization and preload	<ul style="list-style-type: none"> <li>1 9 1 o External calibration/adjustment with factory-set weight value</li> <li>1 9 2 External calibration/adjustment with known weights</li> <li>1 9 3 External calibration/adjustment with user-defined weights</li> <li>1 9 6 External linearization with factory-set weight value</li> <li>1 9 7 External linearization with user-def. weights</li> <li>1 9 8 Store preload</li> <li>1 9 9 Clear preload</li> <li>1 9 10 Calibration/adjustment/linearization blocked</li> </ul>
	1 10	Calibration/adjustment sequence	<ul style="list-style-type: none"> <li>1 10 1 o Calibrate, then auto adjust</li> <li>1 10 2 Calibrate, then manual adjust</li> </ul>
	1 11	Zero-setting range	<ul style="list-style-type: none"> <li>1 11 1 1%/max. cap.</li> <li>1 11 2 o 2%/max. cap.</li> <li>Extended zero-setting range available on request</li> </ul>
	1 12	Initial zero setting range	<ul style="list-style-type: none"> <li>1 12 1 o 3 to 5 %/max. cap. (depending on model)</li> <li>1 12 2 2%/max. cap.</li> <li>1 12 3 5%/max. cap.</li> <li>1 12 4 10%/max. cap.</li> </ul>
	1 13	Tare/zero at power-on	<ul style="list-style-type: none"> <li>1 13 1 o On</li> <li>1 13 2 Off</li> <li>1 13 3 Only zero at power on</li> </ul>
	1 14	Display update	<ul style="list-style-type: none"> <li>1 14 1 o Normal output rate</li> <li>1 14 2 Accelerated output rate</li> </ul>

Operating menu	5	Interface	5 1	Baud rate	5 1 1	150 baud
					5 1 2	300 baud
					5 1 3	600 baud
					5 1 4	o 1,200 baud
					5 1 5	2,400 baud
	5 1 6	4,800 baud				
	5 1 7	9,600 baud				
	5 1 8	19,200 baud				
	5 2	Parity	5 2 1	Mark		
			5 2 2	Space		
			5 2 3	o Odd		
			5 2 4	Even		
	5 3	Number of stop bits	5 3 1	o 1 stop bit		
			5 3 2	2 stop bits		
	5 4	Handshake mode	5 4 1	Software		
			5 4 2	Hardware, 2 characters after CTS		
			5 4 3	o Hardware, 1 character after CTS		
	5 5	Communication mode	5 5 1	o SBI mode (ASCII)		
			5 5 2	XBPI mode (binary) <sup>1)</sup>		
	6	Print	6 1	Manual/auto print	6 1 1	Manual without stability
					6 1 2	o Manual after stability
					6 1 3	Manual at stability
					6 1 4	Automatic without stability
					6 1 5	Automatic at stability
6 2		Stop automatic printing function	6 2 1	Manual with function/print key		
			6 2 2	o Not stoppable		
6 3		Time-dependent printing	6 3 1	o 1 display update		
			6 3 2	2 display updates		
	6 3 3		5 display updates			
	6 3 4		10 display updates			
6 3 5	20 display updates					
6 3 6	50 display updates					
6 3 7	100 display updates					
7	Print	7 2	Line format of printout	7 2 1	o 16 characters	
				7 2 2	22 characters <sup>2)</sup>	
8	Extra functions	8 1	Menu	8 1 1	o Parameter settings alterable	
				8 1 2	Parameters "read only"	
		8 4	External switch function	8 4 1	o Print	
				8 4 2	Tare	
				8 4 3	Function key F1	
				8 4 4	"Toggle" function key	
		8 5	Turn on the display <sup>2)</sup>	8 5 1	o On	
				8 5 2	Off	
8 5 3	Automatic shut-off after 4 min. not in use					
8 6	Power-on mode for weighing platform	8 6 1	Off/on/standby <sup>2)</sup>			
		8 6 2	Off/on <sup>2)</sup>			
		8 6 4	o Auto on			
9	Reset menu	9 1	Factory settings	9 1 1	Restore	
				9 1 2	o Do not restore	

<sup>1)</sup> xBPI extended operating mode: additional commands for weigh cell < - > computer communication.  
For more information, please contact Sartorius.

<sup>2)</sup> Function available only when using YAC02FC-X display and control unit or YAD01IS software.

# 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:	150, 300, 600, 1200, 2400, 4800, 9600 and 19,200 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 9600 baud, 8 bits, odd parity, 1 stop bit.  
There are a number of commands for use in communication between weigh cell and computer.  
For more information, please contact Sartorius.

## Factory Settings for SBI Operating Mode:

Transmission rate:	1200 baud	(Menu code 5 - 1 - 4)
Parity:	Odd	(Menu code 5 - 2 - 3)
Stop bits:	1 stop bit	(Menu code 5 - 3 - 1)
Handshake:	Hardware, 1 character after CTS	(Menu code 5 - 4 - 3)
Operating mode:	SBI	(Menu code 5 - 5 - 1)
Print manually/automatically	Manually after stability	(Menu code 6 - 1 - 2)
Stop automatic printing:	Not possible	(Menu code 6 - 2 - 2)
Time-dependent autoprint:	After 1 display update	(Menu code 6 - 3 - 1)

## Preparation

- See page 18 for the pin assignment chart and cabling diagram.

## Data Output Format

Data are output with 16 characters per line.

Example:

+ 253 pcs

## Data Output Format with 16 Characters

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

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

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

- \*: Space
- A: Digit or letter
- E: Unit symbol
- CR: Carriage return
- LF: Line feed

Special codes for operation with optional YAC02FC-X display and control unit:

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

- \*: Space
- -: Final readout mode
- H: Overload
- H H: Overload in checkweighing  
(Function available only when operating the YAC02FC-X display and control unit)
- L: Underload
- L L: Underload in checkweighing
- C: Calibration/adjustment

**Error codes**

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

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

Example: Output of the weight value + 1255.7 g

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

- Position 1: Plus or minus sign or space
- Position 2: Space
- Position 3 - 10: Weight with a decimal point; leading zeros = space
- Position 11: Space
- Position 12 - 14: Unit symbol or space
- Position 15: Carriage return
- Position 16: Line feed

**Data Input Format**

The computer connected to the interface can be used to send commands controlling weigh cell functions.

The commands sent are control commands and may have different formats. Control commands consist of up to 26 characters. Each character must be transmitted according to the settings configured in the operating menu for data transmission.

**Formats for Control Commands**

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

- Esc: Escape
- #: Digit
- \_: Underline (ASCII: 95)
- CR: Carriage return (optional)
- LF: Line feed (optional)
- max: depends on command character, i.e., parameter input beyond the maximum length is truncated, not discarded as in the case of keypad input
- !: Command character

**Format 1 (example: ESC K)**

!	Meaning
K	Adapt filter (ambient conditions): very stable conditions
L	Adapt filter: stable conditions
M	Adapt filter: unstable conditions
N	Adapt filter: very unstable conditions
O	Block all keys
Q	Beep
P	Print
R	Release (unblock) keys
S	Restart
T	Tare and zero
Z	Internal calibration/adjustment (WZ...-CW models)

**Format 2 (example: ESC f3\_)**

!#	Meaning
f1_	Calibration or adjustment in accordance with menu setting Menu code 1 9 xx
f3_	Zero
f4_	Tare without zeroing
s1_	External calibration/adjustment
s3_	Clear function [CF]
x0_	Internal calibration WZ...-CW models
x1_	Print weigh cell type
x2_	Print serial no. of weigh cell
x3_	Software version in weigh cell

### Synchronization

During data communication between the weigh cell and a connected computer, messages consisting of ASCII characters are transmitted via the interface. For error-free data communication, the parameters for baud rate, parity, handshake mode and character format must be the same for both units. You can set these parameters in the operating menu so that they match those of the connected device. You can also define parameters in the weigh cell to make data output dependent on various conditions. The conditions that can be configured are listed in the operating menu overview. If you do not connect a peripheral device to the interface port, this will not generate an error message.

### Handshake

The weigh cell interface (SBI) has transmit and receive buffers. You can define the handshake parameter in the operating menu (menu code 5 4 x):

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

### Hardware Handshake

Hardware handshake with a 4-wire interface: 1 more character can be transmitted after CTS (clear-to-send).

### Software Handshake

The software handshake is controlled via XON and XOFF. When a device is switched on, XON must be transmitted to enable any connected device to communicate.

When the software handshake is configured in the operating menu, the hardware handshake becomes active after the software handshake.

The data transmission sequence is as follows:

```
Weigh cell  --- byte --->  Computer
(trans-      --- byte --->  (receiving
mitting      --- byte --->  device)
device)      --- byte --->
              <--- XOFF ---
              --- byte --->
              --- byte --->
              ...
              (Pause)
              ...
              <--- XON ---
              --- byte --->
              --- byte --->
              --- byte --->
              --- byte --->
```

### Transmitting Device:

Once XOFF has been received, it prevents further transmission of characters. When XON is received, it re-enables the transmitting device to send data.

### Receiving Device:

To prevent too many control commands from being received at one time, XON is not transmitted until the buffer is almost empty.

### Activating Data Output

Data output can be activated by sending a print command or automatically, either synchronously with the display or at defined display update intervals (see the application program and autoprnt settings).

### Data Output by Print Command

The print command can be transmitted by sending a software command (Esc P).

### Automatic Data Output

In the "auto print" operating mode, data are output to the interface port without a print command. You can have data output automatically synchronously to the display at defined intervals, with or without the stability parameter. The length of a print interval depends on the weigh cell model and operating mode.

If you select the auto print setting during setup, data will be transmitted immediately the moment you turn on the weigh cell. In the operating menu, you can define whether automatic printing can be stopped and started by pressing the "Print" key.

### Faster Output Speeds

If you require measured value output at speeds faster than 10 Hz, please contact Sartorius for further information.

# Pin Assignment Chart

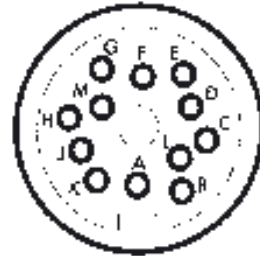
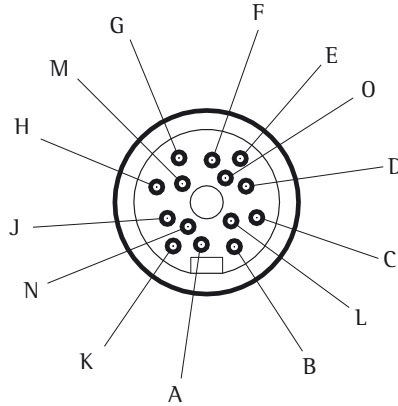
## Female Interface Connector:

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	RS232 signal (SBI and xBPI)	RS485 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 Note

⚠ 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:

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
No segments appear	No AC power is available Power supply not plugged in	Check the AC power supply Connect power supply to the wall outlet (mains)
<b>H</b>	The load exceeds the weigh cell capacity	Unload the weigh cell
<b>L or Err 54</b>	Necessary preload has not been reached	Place weighing pan or sample holder on weigh cell
<b>Err 01</b>	Data output not compatible with output format	Change the configuration in the operating menu
<b>Err 02</b>	Calibration/adjustment condition not met, e.g.: – not tared – load on load plate	Calibrate only when zero is displayed Tare the weigh cell Unload the weigh cell
<b>Err 03</b>	Calibration/adjustment could not be completed within the required time period	Allow the weigh cell to warm up again and repeat the adjustment
<b>Err 07</b>	Function not allowed	Contact the Sartorius Service Center
<b>Err 08*</b>	The load on the weigh cell is too heavy to zero the readout	Check whether the “initial” zero-setting range” is misconfigured
<b>Err 09*</b>	No tare possible when gross $\leq$ zero	Zero the weigh cell
<b>Err 10</b>	Tare key blocked when there is data in tare memory (Net-total). Only one tare function can be performed at one time	Delete the tare memory by pressing CF (Clear Function) to make the tare key accessible again
<b>Err 11</b>	Tare memory not allowed	Check the value entered
<b>Err 12</b>	Tare memory greater than weighing range or range limits	Check the sample or container
<b>Err 30</b>	Interface port for printer output	Contact the Sartorius Service Center
<b>Err 340</b>	Operating parameters (EEPROM) are defective	Contact the Sartorius Service Center
<b>No WP**</b>	Weigh cell defective Function blocked	Contact the Sartorius Service Center None
The weight readout changes constantly	Unstable ambient conditions (excessive vibration or draft) at the place of installation A foreign object is caught between the load plate and the housing	Set up the weigh cell in another area Add a draft shield Remove the foreign object
The weight readout is obviously wrong	The weigh cell was not calibrated/adjusted The weigh cell was not tared The weigh cell is not level	Calibrate/adjust the weigh cell Tare before weighing Level the weigh cell

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

\* = Occurs only when operated over the SBI interface (ESC f3\_/f4\_)

\*\* = Only with optional YAC02FC-X display and control unit

# Overview

## Specifications

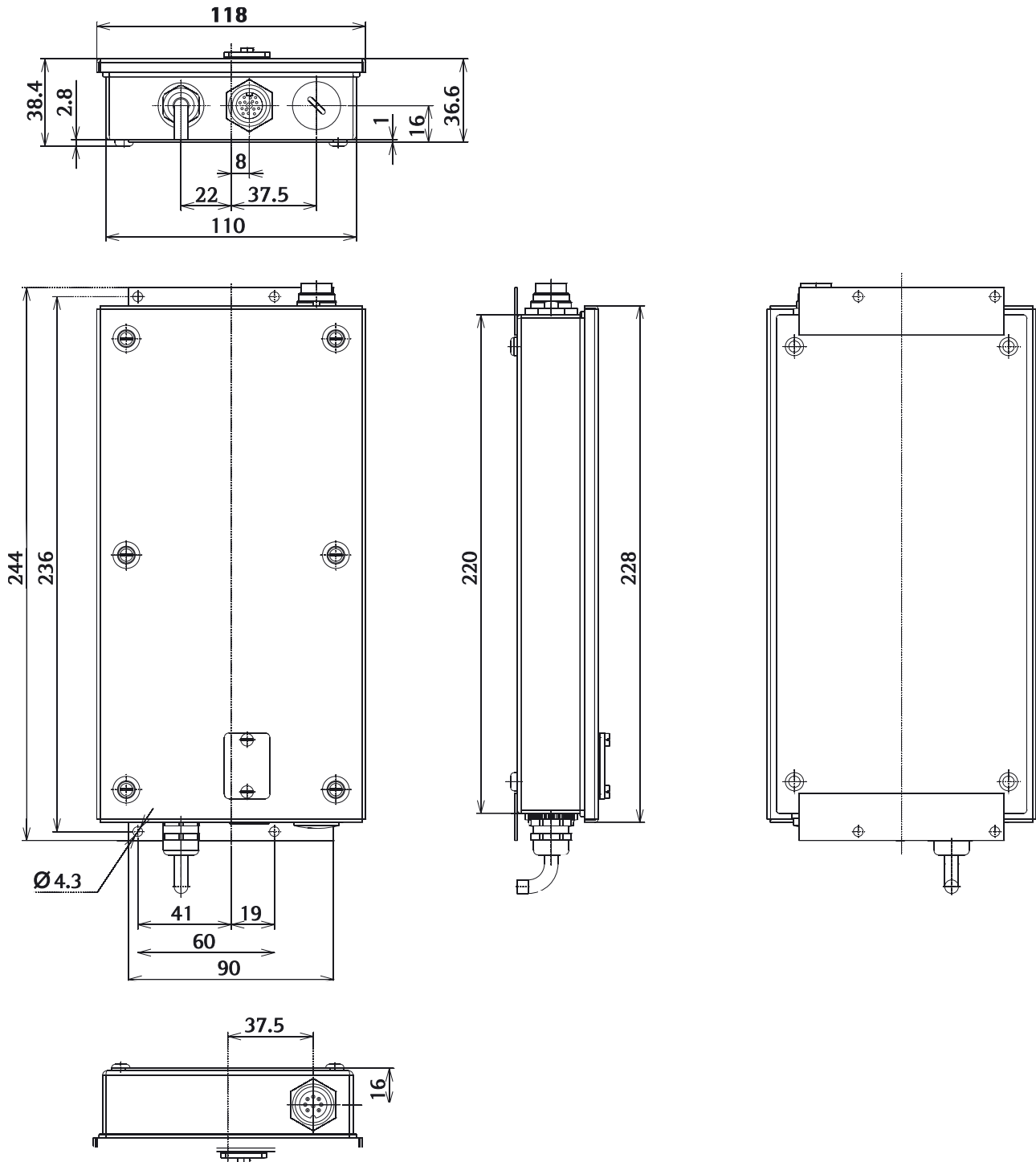
		Standard specifications				User-specific modifications
Model		WZA64-X	WZA623-X	WZA6202-X	WZA12001-X	
Weighing capacity	g	64	620	6,200	12,000	
Readability	g	0.0001	0.001	0.01	0.1	
Necessary preload on pan support	g	105	600	0	0	
Tare range (subtractive)	g	100% of the maximum capacity				
Repeatability (standard deviation) <sup>1)</sup>	<±g	0.0001	0.001	0.01	0.05	
Linearity	<±g	0.0002	0.002	0.02	0.2	
Response time <sup>1)</sup>	s	< 2	< 1.5	< 2	< 1	
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	1 · 10 <sup>-6</sup>	2 · 10 <sup>-6</sup>	2 · 10 <sup>-6</sup>	4 · 10 <sup>-6</sup>	
External calibration weight (of at least accuracy class)	g	20 (E2)	200 (E2)	2000 (E2)	5000 (F1)	
Material:		Stainless steel (load receptor: chemically nickel-plated aluminum)				
- Weigh cell:		Stainless steel aluminum/Stainless steel				
- Electronics module:		Stainless steel aluminum/Stainless steel				
Net weight, approx.	kg	2.0	2.0	2.8	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		RS232C-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

# Overview

## Dimensions (Scale Drawings)

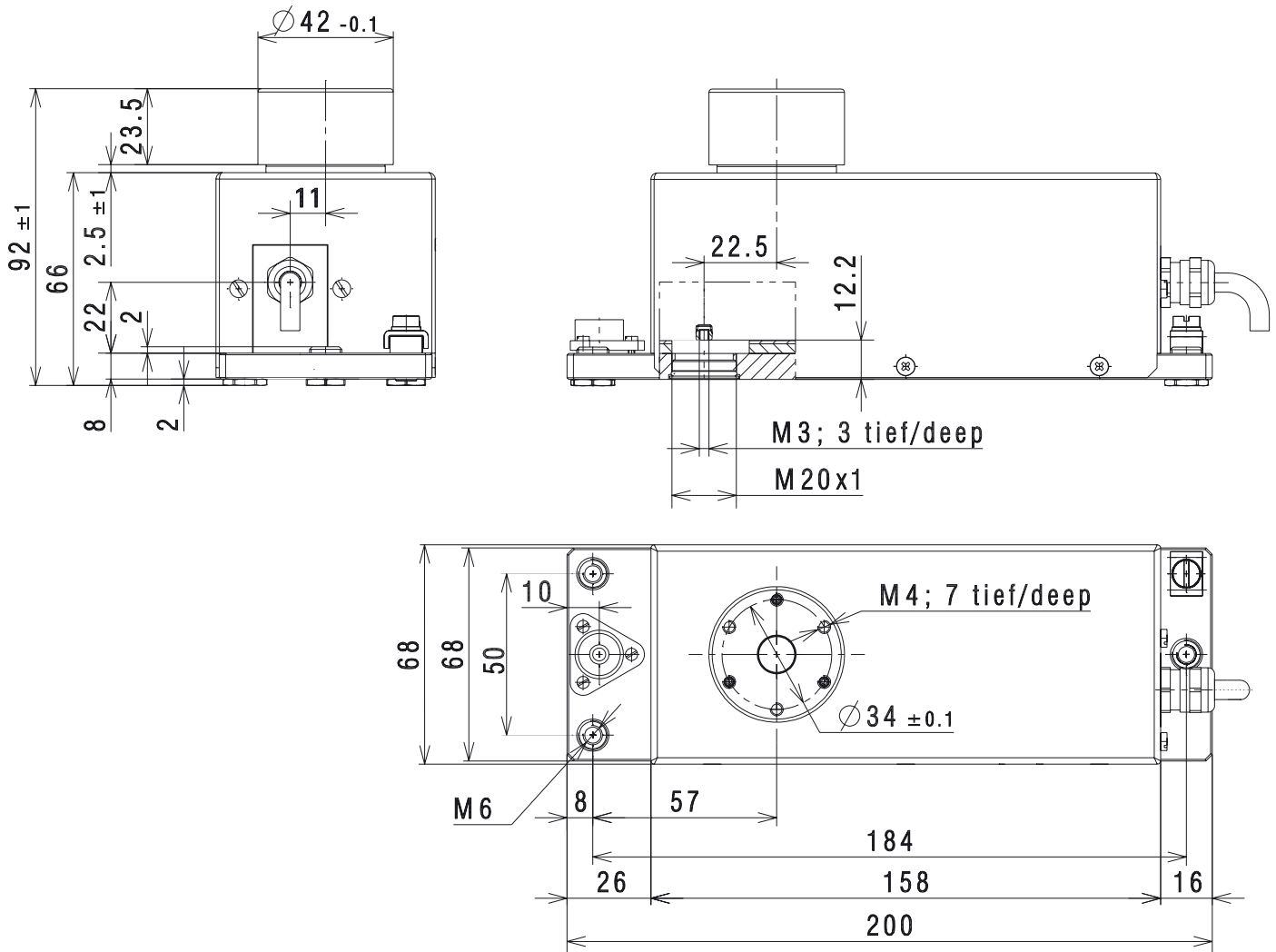
Electronics module:



All dimensions shown in millimeters.

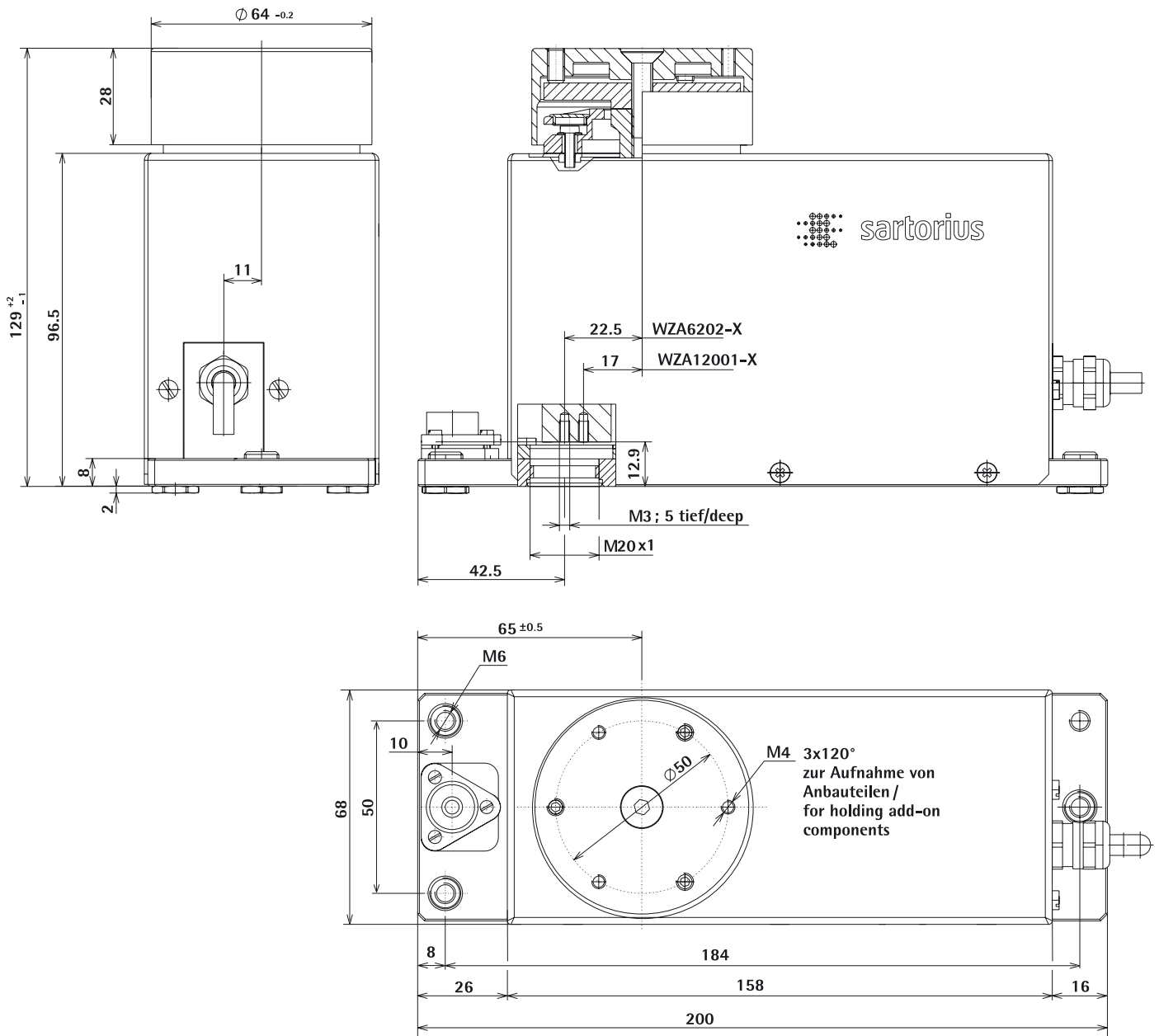
## Dimensions (Scale Drawings)

Weigh cell models: WZA64-X and WZA623-X



All dimensions shown in millimeters.

Weigh cell models: WZA6202-X and WZA12001-X



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)	YAC02FC-X
Configuration software for settings and calibration/adjustment	YAD011S
<b>AC adapters</b>	
<b>AC adapter for use outside of the hazardous area</b>	
(110...240 V, cable length: 20m)	
Europe except the UK	YPS02-ZDR
UK	YPS02-ZGR
U.S./Canada	YPS02-ZKR
<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: 6m)	
Europe except the UK	YPS02-XDR
UK	YPS02-XGR
U.S./Canada	YPS02-XKR
<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>	
<b>RS-232 Zener barrier for connecting accessories</b>	
in the non-hazardous area/location; e.g., printer/PC,	YDI05-Z
RS-232 cable for PC/laptop with 9-contacts. Cable length: 5 m	with option
Cable length between electronics module and Zener barrier: 20 m	+ 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>	
Other data interfaces (e.g., RS-485, etc.)	Available upon request
Additional options and accessories available upon request	



sartorius

# CE EG-Konformitätserklärung EC Declaration of Conformity

Sartorius Weighing Technology GmbH  
Weender Landstrasse 94 - 10B  
D-37075 Göttingen, Germany

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

Geräteart: **Wägezelle**  
*Device type: Weighing Cell*

Baureihe / Type series: **WZA12001-X, WZA6202-X, WZA623-X, WZA64-X**

in der vom uns in Verkehr getragenen Ausführung mit den grundlegenden Anforderungen der  
folgenden Europäischen Richtlinien übereinstimmt:  
*in the form as delivered complies with the basic requirements of the following European Directives*

Richtlinie 2004/108/EG **Elektromagnetische Verträglichkeit**  
*Directive 2004/108/EC Electromagnetic compatibility*

Richtlinie 94/9/EG **Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in  
explosionsgefährdeten Bereichen**  
*Directive 94/9/EC Equipment and protective systems intended for use in potentially explosive  
atmospheres*

Das Gerät erfüllt die anwendbaren Anforderungen der in Anhang 1 aufgeführten harmonisierten  
Europäischen Normen. Zu Angaben zur Richtlinie 94/9/EG siehe Anhang 2.

*The apparatus meets the applicable requirements of the harmonized European Standards listed in Annex 1.  
For specifications regarding Directive 94/9/EC see Annex 2.*

Jahr der Anbringung der CE-Kennzeichnung / Year of attachment of CE marking: **12**

Sartorius Weighing Technology GmbH  
Göttingen, 2012-02-08

Dr. Reinhard Baumfalk  
Vize Präsident RGD

Dr. Dieter Klausgrube  
Head of International Certification Management

Diese Erklärung beschränkt die Übereinstimmung mit den genannten EG-Richtlinien, ist jedoch keine Zusicherung  
von Eigenschaften. Im Falle einer mit uns nicht abgestimmten Änderung des Produktes verliert diese Erklärung ihre  
Gültigkeit. Die Sicherheitsanweisungen der zugehörigen Produktdokumentation sind zu beachten.

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



# EG-Konformitätserklärung EC Declaration of Conformity

## Anhang 1 / Annex 1

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

1. Richtlinie 2004/108/EG / Directive 2004/108/EC

EN 61326-1:2006 Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV-Anforderungen - Teil 1: Allgemeine Anforderungen (IEC 61326-1:2005)  
*Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements (IEC 61326-1:2005)*

2. Richtlinie 94/9/EG / Directive 94/9/EC

EN 60079-0:2006 Elektrische Betriebsmittel für gasexplosionsgefährdete Bereiche - Teil 0: Allgemeine Anforderungen  
*Electrical apparatus for explosive gas atmospheres - Part 0: General requirements*

EN 60079-11:2007 Explosionsfähige Atmosphäre - Teil 11: Geräteschutz durch Eigensicherheit „I“  
*Explosive atmospheres - Part 11: Equipment protection by intrinsic safety „I“*

EN 61241-11:2006 Elektrische Betriebsmittel zur Verwendung in Bereichen mit brennbarem Staub - Teil 11: Schutz durch Eigensicherheit „ID“  
*Electrical apparatus for use in the presence of combustible dust - Part 11: Protection by intrinsic safety „ID“*

.....

## Anhang 2 / Annex 2

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

1. Kennzeichnung / Marking

II 2GD - EEx Ib IIB/IIc T4 T115°C or T135°C

2. Zertifizierung / Certification

EG-Baumusterprüfbescheinigung Nummer: KEMA 05ATEX1147  
EC-Type Examination Certificate number

3. Anerkennung der Qualitätssicherung Produktion / Production Quality Assessment Notification

durch die Physikalisch-Technische Bundesanstalt (PTB), benannte Stelle Nr. 0102 für Anhang IV nach Artikel 9 der Richtlinie 94/9/EG: PTB 97 ATEX 0021

by the Physikalisch-Technische Bundesanstalt (PTB), notified body no. 0102, for Annex IV in accordance with Article 9 of the Council Directive 94/9/EC: PTB 97 ATEX 0021

.....



## (1) EC-TYPE EXAMINATION CERTIFICATE

- (2) Equipment or protective system intended for use in potentially explosive atmospheres - Directive 94/9/EC
- (3) EC-Type Examination Certificate Number: KEMA 05ATEX1147
- (4) Equipment or protective system: Digital Weighing Cells Series Type WZ.....X.....
- (5) Manufacturer: Sartorius AG
- (6) Address: Weender Landstraße 94-108, 37075 Göttingen, Germany
- (7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to
- (8) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the directive.
- The examination and test results are recorded in confidential report no. Z580321.
- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
- EN 50014 : 1997 + A1, A2      EN 50020 : 2002**
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule in this certificate.
- (11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment or protective system according to the Directive 94/9/EC. 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 the following:

 II 2 GD EEx Ib IIB/NC T4 T115 °C or T135 °C

Amstelveen, 8 September 2005  
KEMA Quality B.V.

C.G. van Es  
Certification Manager

<sup>1</sup> This Certificate may only be reproduced or its content used without the change

## SCHEDULE

(13)

(14) **to EC-Type Examination Certificate KEMA 05ATEX1147**

(15) **Description**

The Digital Weighing Cells Series Type WZ.....-X... convert a weight into a digital signal for further processing. The Digital Weighing Cell Series consist of three parts (a weighing unit, electronics unit and a terminal box) which are connected with each other by permanently connected cables. For connection to other circuits the terminal box is provided with a male socket for the supply circuits and a female socket for the other circuits.

Ambient temperature range -20 °C . . +40 °C

The specified maximum surface temperature T115 °C applies to the weighing unit and T135 °C to the electronics unit and the terminal box. Both values are based on an ambient temperature of 40 °C.

The weighing unit has a degree of protection of IP4x, the other parts have a degree of protection of IP6x.

### Electrical data

Supply circuits ..... in type of protection intrinsic safety EEx ib IIC, only for connection to a certified intrinsically safe circuit, with following maximum values (for each circuit).

Circuit	$U_i$	$I_i$	$P_i$	$C_i$	$L_i$
V-1 (pin 6)	12,6 V	133 mA	1,68 W	2 nF	15 µH
V-2 (pin 4)	12,6 V	133 mA	1,68 W	2 nF	15 µH
V-3 (pin 5)	8,6 V	187 mA	1,61 W	300 nF	15 µH
V-4 (pin 7)	12,6 V	150 mA	1,80 W	100 nF	15 µH

RS232 circuits ..... in type of protection intrinsic safety EEx ib IIC, only for connection to a certified intrinsically safe circuit, with following maximum values (circuits combined):

$$\begin{aligned}
 U_i &= 12,6 \text{ V} && \text{(between line and earth/screen)} \\
 U_l &= 25,2 \text{ V} && \text{(between lines)} \\
 I_i &= 340 \text{ mA} && \text{(linear)} \\
 P_i &= 1,08 \text{ W} \\
 C_i &= 2 \text{ nF} \\
 L_i &= 15 \text{ µH}
 \end{aligned}$$

and  
in type of protection intrinsic safety EEx ib IIC or EEx ib IIB, with the following maximum values (circuits combined):

$$\begin{aligned}
 U_o &= 12,6 \text{ V} && \text{(between line and earth/screen)} \\
 U_o &= 25,2 \text{ V} && \text{(between lines)} \\
 I_o &= 131 \text{ mA} \\
 P_o &= 4,1 \text{ mW}
 \end{aligned}$$

	IIC		IIB	
	Between line and earth/screen	Between lines	Between line and earth/screen	Between lines
$C_o$	1,15 µF	105 nF	7,1 µF	0,62 µF
$L_o$	2 mH	2 mH	6 mH	8 mH
$L_o/R_o$	86 µH/Ohm	43 µH/Ohm	344 µH/Ohm	172 µH/Ohm

(13)  
(14)

### SCHEDULE

#### to EC-Type Examination Certificate KEMA 05ATEX1147

RS422 circuits ..... in type of protection intrinsic safety EEx ib IIC, only for connection to a certified intrinsically safe circuit, with following maximum values (circuits combined).

$$\begin{aligned}
 U_i &= 7,5 \text{ V} \\
 I_i &= 0,5 \text{ A} \quad (\text{linear}) \\
 P_i &= 0,9 \text{ W} \\
 C_i &= 5,5 \text{ } \mu\text{F} \\
 L_i &= 17 \text{ } \mu\text{H}
 \end{aligned}$$

and  
in type of protection intrinsic safety EEx ib IC or EEx ib IB, with the following maximum values (circuits combined):

$$\begin{aligned}
 U_o &= 12,6 \text{ V} \\
 I_o &= 160 \text{ mA} \\
 P_o &= 0,57 \text{ W}
 \end{aligned}$$

	IIC	IIB
$C_o$	1,15 $\mu\text{F}$	7,4 $\mu\text{F}$
$L_o$	0,7 mH	4 mH
$L_o/R_o$	62 $\mu\text{H}/\Omega\text{m}$	250 $\mu\text{H}/\Omega\text{m}$

RS485 circuits ..... in type of protection intrinsic safety EEx ib IIC, only for connection to a certified intrinsically safe circuit, with following maximum values (circuits combined):

$$\begin{aligned}
 U_i &= 12,6 \text{ V} \\
 I_i &= 810 \text{ mA} \quad (\text{linear}) \\
 P_i &= 2,5 \text{ W} \\
 C_i &= 12 \text{ nF} \\
 L_i &= 15 \text{ } \mu\text{H}
 \end{aligned}$$

and  
in type of protection intrinsic safety EEx ib IC or EEx ib IB, with the following maximum values (circuits combined):

$$\begin{aligned}
 U_o &= 12,0 \text{ V} \\
 I_o &= 65 \text{ mA} \\
 P_o &= 270 \text{ mW}
 \end{aligned}$$

	IIC	IIB
$C_o$	1,15 $\mu\text{F}$	7,4 $\mu\text{F}$
$L_o$	5 mH	20 mH
$L_o/R_o$	130 $\mu\text{H}/\Omega\text{m}$	530 $\mu\text{H}/\Omega\text{m}$

## SCHEDULE

(13)  
(14)

### to EC-Type Examination Certificate KEMA 05ATEX1147

TTY circuits ..... in type of protection intrinsic safety EEx ib IIC,  
(pins C, E, G, K and D, F, J for earth) only for connection to a certified intrinsically safe circuit, with following maximum values (for each circuit).

$U_i$	=	14,7	V	
$I_i$	=	50	mA	(linear, pins G, K and D, F, J)
$P$	=	265	mW	(pins G, K and D, F, J)
$I_i$	=	130	mA	(linear, pins C, E and D, F, J)
$P$	=	100	mW	(pins C, E and D, F, J)
$C_i$	=	2	nF	
$L_i$	=	15	$\mu$ H	

Except for the TTY circuits, all the above mentioned circuits are galvanically connected with each other.

**Installation instructions.**

- The RS422, RS485 and TTY circuits are optional, only one is installed (and the RS232 circuit is not used)
- Maximum allowed cable length between electronics unit and terminal box is 15 m
- Maximum allowed cable length between electronics unit and weighing unit is 10 m
- Alternatively all the above mentioned circuits may also be connected directly to the electronics unit, so without the use of the terminal box.

(10) **Report**

KEMA No. 2085321

(17) **Special conditions for safe use**

None.

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at (9)

For the assessment of equipment which may be installed in hazardous areas in which equipment of category 2 D is required, EN 61241-0:2004 + prAA and draft IEC 61241-11:2005 have been used as a guide.

(19) **Test documentation**

As listed in Test Report No. 2085321.

## AMENDMENT 1

To EC-Type Examination Certificate KEMA 05ATEX1147 X

Manufacturer: Sartorius AG

Address: Waeber Landstraße 94-108, 37075 Göttingen, Germany

### Description

In future, in accordance with the test documentation mentioned below, the Digital Weighing Cells Series Type WZ...-X... may also be used with a Display/Keyboard unit

The maximum surface temperature of the Display/Keyboard unit: T<sub>135</sub> °C is based on the maximum ambient temperature of 40 °C

The Display/Keyboard unit has a degree of protection of IP6x.

The sign "X" is placed after the certificate number to indicate that the Display/Keyboard unit is subject to special conditions for safe use as specified below.

### Electrical data

Unchanged

### Installation instructions

Additionally the following applies: The maximum allowed cable length between the Display/Keyboard unit and the electronics unit is 15 m

### Report

KEMA No. 2091116.

### Special conditions for safe use

The Display/Keyboard unit shall be installed in such a way that the risk for mechanical danger is low

### Essential Health and Safety Requirements

Additionally IEC 61241-11 : 2005 (incl. corrigendum 1) has been used as a guide

### Test documentation

As listed in test report no. 2091116

Arnhem, 25 April 2005  
KEMA Quality B.V.

  
Gert-Jan Es  
Certification Manager



1) **EC-TYPE EXAMINATION CERTIFICATE**

- 12) Equipment or protective system intended for use in potentially explosive atmospheres - Directive 94/9/EC
- 13) EC-Type Examination Certificate Number: **KEMA 98ATEX0892 X**
- 14) Equipment or protective system: **Power Supply Type YP602-X..**
- 15) Manufacturer: **Sartorius AG**
- 16) Address: **Waelder Landstraße 94-108, 37075 Göttingen, Germany**

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

18) KEMA, notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 80892.

19) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

**EN 50014: 1992 + prA1 EN 50016: 1994 EN 50020: 1994**

110) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

111) This EC-Type Examination Certificate relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

112) The marking of the equipment or protective system shall include the following.

II 2 (2) G      EEx d (ib) MC T4

Arnhem, 15 June 1998  
by order of the Board of Directors of N.V. KEMA

C.M. Boschloo  
Certification Manager

\* This Certificate may only be reproduced in its entirety and without any change



## SCHEDULE

(13)

(14)

to EC-Type Examination Certificate KEMA 98ATEX0892 X

(15) **Description**

The Power Supply Type YPS02-X... provides four independent intrinsically safe output channels for intrinsic safe scales. The power supply is mounted in an enclosure in type of protection flameproof enclosure "d". The maximum length of the interconnection cable type LiYC Y CY 4x0.5 between the Power Supply and the scales is 50 m.

Ambient temperature range: 0 °C ... 140 °C.

### Electrical data

Main supply .....	non intrinsically safe circuit, suitable for connection to electrical equipment with working voltages up to 264 V.									
Supply and input circuit ..... terminal (V_1, white)	in type of explosion protection intrinsic safety EEx ib IIC with following maximum values: <table style="margin-left: 40px; border: none;"> <tr> <td><math>U_o</math></td> <td>=</td> <td>12,6 V</td> </tr> <tr> <td><math>I_o</math></td> <td>=</td> <td>133 mA</td> </tr> <tr> <td><math>P_o</math></td> <td>=</td> <td>1,68 W</td> </tr> </table> <p>Maximum allowed external capacitance <math>C_o = 1 \mu F</math> Maximum allowed external inductance <math>L_o = 300 \mu H</math></p>	$U_o$	=	12,6 V	$I_o$	=	133 mA	$P_o$	=	1,68 W
$U_o$	=	12,6 V								
$I_o$	=	133 mA								
$P_o$	=	1,68 W								
Supply and input circuit ..... terminal (V_2, brown)	in type of explosion protection intrinsic safety EEx ib IIC with following maximum values: <table style="margin-left: 40px; border: none;"> <tr> <td><math>U_o</math></td> <td>=</td> <td>12,6 V</td> </tr> <tr> <td><math>I_o</math></td> <td>=</td> <td>133 mA</td> </tr> <tr> <td><math>P_o</math></td> <td>=</td> <td>1,68 W</td> </tr> </table> <p>Maximum allowed external capacitance <math>C_o = 1 \mu F</math> Maximum allowed external inductance <math>L_o = 300 \mu H</math></p>	$U_o$	=	12,6 V	$I_o$	=	133 mA	$P_o$	=	1,68 W
$U_o$	=	12,6 V								
$I_o$	=	133 mA								
$P_o$	=	1,68 W								
Supply and input circuit ..... terminal (V_3, green)	in type of explosion protection intrinsic safety EEx ib IIC with following maximum values: <table style="margin-left: 40px; border: none;"> <tr> <td><math>U_o</math></td> <td>=</td> <td>8,8 V</td> </tr> <tr> <td><math>I_o</math></td> <td>=</td> <td>187 mA</td> </tr> <tr> <td><math>P_o</math></td> <td>=</td> <td>1,61 W</td> </tr> </table> <p>Maximum allowed external capacitance <math>C_o = 4 \mu F</math> Maximum allowed external inductance <math>L_o = 300 \mu H</math></p>	$U_o$	=	8,8 V	$I_o$	=	187 mA	$P_o$	=	1,61 W
$U_o$	=	8,8 V								
$I_o$	=	187 mA								
$P_o$	=	1,61 W								
Supply and input circuit ..... terminal (V_4, yellow)	in type of explosion protection intrinsic safety EEx ib IIC with following maximum values: <table style="margin-left: 40px; border: none;"> <tr> <td><math>U_o</math></td> <td>=</td> <td>12,6 V</td> </tr> <tr> <td><math>I_o</math></td> <td>=</td> <td>150 mA</td> </tr> <tr> <td><math>P_o</math></td> <td>=</td> <td>1,89 W</td> </tr> </table> <p>Maximum allowed external capacitance <math>C_o = 1 \mu F</math> Maximum allowed external inductance <math>L_o = 300 \mu H</math></p>	$U_o$	=	12,6 V	$I_o$	=	150 mA	$P_o$	=	1,89 W
$U_o$	=	12,6 V								
$I_o$	=	150 mA								
$P_o$	=	1,89 W								

## SCHEDULE

(13)

(14)

to EC-Type Examination Certificate KEMA 88ATEX0892 X

(15) **Electrical data (continued)**

Cable type LiYC-Y-CY 4x0.5 .... .. Maximum cable capacitance  $C_{cable} = 28,2 \text{ nF}$   
 Maximum cable inductance  $L_{cable} = 8,4 \text{ } \mu\text{H}$   
 Maximum allowed cable length = 50 m

The intrinsically safe circuits are infallible galvanically isolated from the non-intrinsically safe circuits up to a sum of peak voltages of 375 V.

**Installation instruction**

The Power Supply provided with certified cables entries Type AOE can only be used for fixed installation. Certified cable entries Type AGRO can be used for flexible- and for fixed installation.

**Routine tests**

The transformer shall, before mounting into the apparatus, withstand per Clause 8.1.5 of EN 50 020 - 1994 without breakdown the application of 2500 V between the primary and secondary winding

Routine tests according to Clause 16 of EN 50018 are not required since the type test has been made at a static pressure of four times the reference pressure.

(16) **Report**

KEMA No. 80892

(17) **Special conditions for safe use**

None

(18) **Essential Health and Safety Requirements**

Essential Health and Safety Requirements not covered by standards listed at (9)	
Clause	Subject
1.0.6	Instructions

These Essential Health and Safety Requirements are examined and positively judged. The results are laid down in the report listed at (16).

## SCHEDULE

113)

114)

to EC-Type Examination Certificate KEMA 98ATEX0892 X

### 119) Test documentation

1. EC-Type Examination Certificate PTB 98ATEX1023 U  
Certificate of Conformity KEMA 98ATEX0611 X  
ISSEP 92.C.103.997  
LCIE 92.C8126 X

signed

2. Description 65473-000-06-A4,  
Rev. 00 (11 pages) 05.05.1998
3. Drawing No. 65473-700-06-A4 )  
65473-000-33-A3 ) 05.05.1998  
65473-700-05-A3 )
- 65473-000-06-A2 02.02.1998
- 66473-120-9D A3 )  
66473-120 95-A3 ) 08.01.1998  
66473 120-01 )

### 4. Samples

**AMENDMENT 1**

to EC-Type Examination Certificate KEMA 98ATEX0892 X

Manufacturer: **Sartorius AG**  
Address: **Waander Landstraße 94-106, 37075 Göttingen, Germany**

**Description**

In future the Power Supply Type YPS02-X, is alternatively also constructed in accordance with EN 50281-1-1:1998 and the documentation listed below

The marking for this version becomes

 II 2 G EEx d(Ib) IIC T4 and  1 D T 135 °C

The maximum surface temperature T 135 °C of the enclosure is based on an ambient temperature of 40 °C.

**Electrical Data**

The value of the maximum power of each supply and input circuit changes as follows:

Terminal V\_1, white : P<sub>n</sub> = 1.46 W  
Terminal V\_2, brown : P<sub>n</sub> = 1.46 W  
Terminal V\_3, green : P<sub>n</sub> = 1.51 W  
Terminal V\_4, yellow : P<sub>n</sub> = 1.68 W

All other data remain unchanged

**Installation instructions**

1. For use in potentially explosive atmospheres caused by the presence of flammable gases, fluids or vapours. The cable entry devices shall be of a certified flameproof type, suitable for the conditions of use and correctly installed.
2. For use in potentially explosive atmospheres caused by the presence of combustible dust. The cable entry devices shall be of a certified flameproof type, suitable for the conditions of use and correctly installed. The minimum ingress protection requirement of IP6X according to EN 60529 must be satisfied.
3. With the use of conduit entries a sealing device shall be provided either in the flameproof enclosure or immediately on the entrance thereto. The sealing device shall be of a certified flameproof type, suitable for the conditions of use and correctly installed.

**Special conditions for safe use**

1. For applications in explosive atmospheres caused by air/dust mixtures, the dust layer shall not exceed a thickness of 5 mm.
2. For ambient temperature range and electrical data see (15) and above

**Test documentation**

1. Drawing No. B5473-000-35-A4 dated 10 / 0.2000

Arnhem, 11 April 2002  
KEMA Quality B.V.



T. Pijpers  
Certification Manager

[20 / 8412]



(1) **EC-TYPE EXAMINATION CERTIFICATE**

(2) Equipment or protective system intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number: KEMA 91ATEX0611 X

(4) Equipment or protective system: Power Supply Type YPS02-Z

(5) Manufacturer: Sarataz AG

(6) Address: Weidur Landstraße 94-100, 33075 Göttingen, Germany

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

(8) KEMA, notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 80611.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014: 1992 - gVA

EN 50020: 1994

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

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



Amstelveen, 18 May 1998

By order of the Board of Directors of N.V. KEMA

C.M. Boonho  
Certification Manager

\* This Certificate may only be reproduced in its entirety and without any change.



## SCHEDULE

(13)

(14)

to EC-Type Examination Certificate KEMA 98ATEX0892 X

(15) **Description**

The Power Supply Type YPS02-X... provides four independent intrinsically safe output channels for intrinsic safe scales. The power supply is mounted in an enclosure in type of protection flameproof enclosure "d". The maximum length of the interconnection cable type LYC-Y-CY 4x0.5 between the Power Supply and the scales is 50 m.

Ambient temperature range: 0 °C ... +40 °C.

### Electrical data

Main supply ..... non intrinsically safe circuit, suitable for connection to electrical equipment with working voltages up to 264 V.

Supply and input circuit ..... in type of explosion protection intrinsic safety  
terminal (V\_1, white) EEx ib IIC with following maximum values:

$$\begin{aligned} U_s &= 12,6 \text{ V} \\ I_s &= 133 \text{ mA} \\ P_s &= 1,68 \text{ W} \end{aligned}$$

Maximum allowed external capacitance  $C_e = 1 \mu\text{F}$   
Maximum allowed external inductance  $L_e = 300 \mu\text{H}$

Supply and input circuit ..... in type of explosion protection intrinsic safety  
terminal (V\_2, brown) EEx ib IIC with following maximum values:

$$\begin{aligned} U_s &= 12,6 \text{ V} \\ I_s &= 133 \text{ mA} \\ P_s &= 1,68 \text{ W} \end{aligned}$$

Maximum allowed external capacitance  $C_e = 1 \mu\text{F}$   
Maximum allowed external inductance  $L_e = 300 \mu\text{H}$

Supply and input circuit ..... in type of explosion protection intrinsic safety  
terminal (V\_3, green) EEx ib IIC with following maximum values:

$$\begin{aligned} U_s &= 8,6 \text{ V} \\ I_s &= 187 \text{ mA} \\ P_s &= 1,61 \text{ W} \end{aligned}$$

Maximum allowed external capacitance  $C_e = 4 \mu\text{F}$   
Maximum allowed external inductance  $L_e = 300 \mu\text{H}$

Supply and input circuit ..... in type of explosion protection intrinsic safety  
terminal (V\_4, yellow) EEx ib IIC with following maximum values:

$$\begin{aligned} U_s &= 12,6 \text{ V} \\ I_s &= 150 \text{ mA} \\ P_s &= 1,89 \text{ W} \end{aligned}$$

Maximum allowed external capacitance  $C_e = 1 \mu\text{F}$   
Maximum allowed external inductance  $L_e = 300 \mu\text{H}$

## SCHEDULE

(13)

(14)

to EC-Type Examination Certificate KEMA 98ATEX0092 X

(15) **Electrical data (continued)**

Cable type LYC-Y-CY 4x0.5 .....	Maximum cable capacitance $C_{max} = 28,2 \text{ nF}$ Maximum cable inductance $L_{max} = 8,4 \text{ } \mu\text{H}$ Maximum allowed cable length = 50 m
---------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------

The intrinsically safe circuits are infallibly galvanically isolated from the non-intrinsically safe circuits up to a sum of peak voltages of 375 V.

**Installation instruction**

The Power Supply provided with certified cables entries Type ADE can only be used for fixed installation. Certified cable entries Type AGRO can be used for flexible- and for fixed installation.

**Routine tests**

The transformer shall, before mounting into the apparatus, withstand per Clause 8.1.5 of EN 50 020 - 1994 without breakdown the application of 2500 V between the primary and secondary winding.

Routine tests according to Clause 18 of EN 50018 are not required since the type test has been made at a static pressure of four times the reference pressure.

(16) **Report**

KEMA No. 80892

(17) **Special conditions for safe use**

None

(18) **Essential Health and Safety Requirements**

Essential Health and Safety Requirements not covered by standards listed at (9)	
Clause	Subject
1.0.6	Instructions

These Essential Health and Safety Requirements are examined and positively judged. The results are laid down in the report listed at (16).

## SCHEDULE

(13)

(14)

to EC-Type Examination Certificate KEMA 98ATEX0511 X

(19) **Test documentation**

1. Certificate of Conformity KEMA No. Ex-97.D.1279 X

signed

2. Product Compliance Report ANNEX II,  
65463-700-70-A4, Rev. 00

24.03.1998

3. Drawing No. 65463-000-34-A3

03.03.1998

4. Samples

**AMENDMENT 1**

to EC-Type Examination Certificate KEMA 98ATEX0611 X

Manufacturer: Sartorius AG

Address: Weender Landstraße 94-106, 37075 Göttingen, Germany

**Description**

In future the Power Supply Type YPS02-Z may also be constructed in accordance with the documentation listed below.

The marking becomes  II (2) G (1) D [EEx ib] IIC

Item (18) is amended with

Essential Health and Safety Requirements not covered by the standards listed at (9)	
Clause	Subject
2.2.2.2. and 2.2.2.4	Explosive atmospheres caused by air/dust mixtures

These Essential Health and Safety Requirements are examined and positively judged.

**Electrical Data**

The value of the maximum power of each supply and input circuit changes as follows:

Terminal V\_1, white :  $P_c = 1,46 \text{ W}$   
Terminal V\_2, brown :  $P_c = 1,46 \text{ W}$   
Terminal V\_3, green :  $P_c = 1,51 \text{ W}$   
Terminal V\_4, yellow :  $P_c = 1,68 \text{ W}$

All other data remain unchanged

**Test documentation****dated**

1. Drawing No. 65463-000-38-A4 10.10.2000

Arnhem, 11 April 2002  
KEMA Quality B.V.T. Pijker  
Certification Manager

[2018412]



FM Approvals  
1151 Boston-Providence Turnpike  
PO Box 9112 Norwood, MA 02062 USA  
T: 781 762 4300 F: 781 762 9175 www.fmaprovals.com

# CERTIFICATE OF COMPLIANCE

## HAZARDOUS LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

***Isab-cxde Weighing Module series with standard RS485 Data Communication***

IS/I,II,III/I/A,B,C,D,E,F,G – 33956-000-07-A4/ T4

I/I/ AEx ib IIC/ T4 –33956-000-07-A4

Maximum Entity Parameters. See control drawing 33956-000-07-A4

- a = Figure for maximum mechanical load (03 thru 300)
- b = Weighing unit type EDE or IGG (DIP); BBE or CCE (not DIP)
- c = Mechanical sensitivity (H, I, P, S)
- d = Calibration/Custody (CE)
- e = Specials, color, applied software (V1, V2)

**Options:**

RS232 Data Communication (instead of RS485), TTY Data Communication with 10 mA output (instead of R485), RS422 Data Communication (instead of RS485), Junction Box Type YAS06IS-X

***Fcabc-dXef Weighing System series with standard RS232 Data Communication***

IS/I,II,III/I/A,B,C,D,E,F,G – 33956-000-07-A4/ T4

I/I/ AEx ib IIC/ T4 –33956-000-07-A4

Maximum Entity Parameters. See control drawing 33956-000-07-A4

- a = Terminal type: FC is with terminal YAC01LA-X00FC  
FCA is with terminal YAC01FC-X  
FCB is with terminal YAC02FC-X
- b = Figure for maximum mechanical load (03 thru 300)
- c = Weighing unit type EDE or IGG (DIP); BBE or CCE (not DIP)
- d = Mechanical sensitivity (H, I, P, S)
- e = Calibration/Custody (CE)
- f = Specials, color, applied software (V1, V2)

**Options:**

RS485 Data Communication (instead of RS232), TTY Data Communication with 10 mA



output (instead of RS232). RS422 Data Communication (instead of RS232)

**WZabcdef-Xghik Digital Weighing Cells series with standard RS232 Data Communication**

IS, I, II, III/1/A, B, C, D, E, F, G – 35520-001-07-A4/ T4

I/1/ AEx ib IIC/ T4–35520-001-07-A4

Maximum Entry Parameters. See control drawing 35520-001-07-A4

**a** = letter (e. g. A)

**bcde** = up to 4 numbers (maximum load) (e. g. 64 = 640g; 1200 = 12,000 g)

**f** = number for the readability (e.g. 1 = 0.1g; 2 = 0.01g, 3 = 0.001g)

**ghik** = letters and/or numbers (Specials, color, applied software) (e.g. CEV1)

Options:

RS485 Data Communication (instead of RS232), TTY Data Communication with 10 mA output (instead of RS232) RS422 Data Communication (instead of RS232). Junction Box Type YASD6IS-X, terminal YAC01LA-X00FC, FCA, terminal YAC01FC-X, terminal YAC02FC-X

**Equipment Ratings:**

Intrinsically safe for Class I, Division 1 Groups A, B, C and D; suitable for Class II and III, Groups E, F and G; IS, Class I, Zone 1, AEx ib IIC, T4, hazardous locations, for indoor only use

**FM Approved for:**

SARTORIUS AG  
WEENDER LANDSTRASSE 94-108  
D-37070 GÖTTINGEN  
GERMANY



This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3600	1998
Class 3810	2005
Class 3810	1999

Original Project ID: 3028004

Approval Granted: *October 15, 2006*

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
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FM Approvals LLC

  
 Robert L. Martell, Jr.  
 Assistant Vice President

*October 15, 2006*  
 Date



# Certificate of Compliance

**Certificate:** 1153350 (J.R. 56628)      **Master Contract:** 167555  
**Project:** 1817562      **Date Issued:** 2006/08/18  
**Issued to:** Sartorius AG  
Weender Landstrasse 94-108  
Postfach 3243  
Goettingen, 37075  
Germany  
Attention: Dr. Dieter Klausgrete

*The products listed below are eligible to bear the CSA Mark shown*



**Issued by:** Wesley Van Hill

**Authorized by:** Patricia Pasernko, Operations Manager

## **PRODUCTS**

**CLASS 2258 03** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non - Incendive Systems - For Hazardous Locations

## **PART A:**

**Class I, Div I, Groups A,B,C, and D; Class II, Div I, Groups E, F and G; Class III; Zone I, Zone 21; Ex ib IIC T4**

Precision Weighing System, Model FCabc-dXef, Precision Weighing Module, Model ISho-dXef and Digital Weighing Cell Series Model WZubodet-Xghik; Temperature Code T4; Intrinsically Safe when connected as per Control Drawing 33956-001-07-A4 (Model FC and IS) or Control Drawing 35520-001-07-A4 (Model WZ).



Certificate: 1153350 (LR 56628)

Master Contract: 167555

Project: 1817562

Date Issued: 2006/08/18

The input parameters of the JS scales are:

Circuit	U <sub>i</sub>	I <sub>i</sub>	P <sub>i</sub>	C <sub>i</sub>	L <sub>i</sub>
V_1	12.6 V	133 mA	1.68 W	2 nF	15 µH
V_2	12.6 V	133 mA	1.68 W	2 nF	15 µH
V_3	8.6 V	187 mA	1.61 W	300 nF	15 µH
V_4	12.6 V	150 mA	1.89 W	100 nF	15 µH

Notes:

- (1) Suffix "a" in Model FC may be "blank", "A" or "B".
- (2) Suffixes "a-k" in Minifei WZ are variations which have no effect on the intrinsic safety of the device (eg. weighing range, calibration, software)
- (3) Suffix "c" in the above Models (except Model WZ) may be:
  - "BRC": "CCC" certified for Class I, Div 1, Groups A,B,C and D; Zone 1 Ex ib IIC T4 only
  - "BDF": "IGG" certified for Class I, Div 1, Groups A,B,C, and D; Class II, Div 1, Groups E, F and G; Class III, Ex ib IIC T4
- (4) Options include RS485 communications, IbmA data communication, RS422 communication or any of the following simple apparatus; Junction Box (YAS06IS-X), T-connector (TYE02-X), foot switch (YPE05-X)
- (5) The suitability of the final installation is to be determined by the local authorities having jurisdiction.

**PART B:**

Power Supplies, Model YPS02-ZKR, rated at input 100-240 VAC, 50/60 Hz, 25VA, output 15.5 V dc; 800 mA, for use in Ordinary (Non-Hazardous) Locations only and Model YPS02-XKR, rated at input 100-240 V ac, 50/60 Hz, 25VA, for use in Class I, Groups B, C and D; Class II, Groups E, F and G; Class III (Hazardous Locations); provides intrinsically safe outputs for connection to Precision Weighing System, Model FC, Precision Weighing Module, Model IS and Digital Weighing Cell Series Model WZ when connected as per Control Drawing 33956-000-07-A4 (Model FC and IS) or Control Drawing 35520-001-07-A4 (Model WZ)

Power supply output parameters:

Circuit	U <sub>o</sub>	I <sub>o</sub>	P <sub>o</sub>	C <sub>o</sub>	L <sub>o</sub>
V_1	12.6 V	133 mA	1.46 W	1 µF	300 µH



Certificate: 1153350 (I R 56628)

Master Contract: 167555

Project: 1817562

Date Issued: 2016/06/18

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V_2	12.6 V	133 mA	1.46 W	1 $\mu$ F	300 $\mu$ H
V_3	8.6 V	187 mA	1.53 W	4 $\mu$ F	300 $\mu$ H
V_4	12.6 V	150 mA	1.68 W	1 $\mu$ F	300 $\mu$ H

**Notes:**

(1) The above model numbers include suffixes designating indicator type, output signal, electrical connection, and options.

(2) The suitability of the final installation is to be determined by the local authorities having jurisdiction.

**APPLICABLE REQUIREMENTS**

CSA Standard C22.2 No. 0-M1991 - General Requirements - Canadian Electrical Code Part II

CSA Standard C22.2 No.0.4-M2004 - Bonding and Grounding of Electrical Equipment (Protective Grounding)

CSA Standard C22.2 No. 0.5-M1982 - Threaded Conduit Entries

CSA Standard C22.2 No. 25-M1966 - Enclosures for Use in Class II Groups E, F and G Hazardous Locations

CSA Standard C22.2 No. 30-M1986 - Explosion-Proof Enclosures for Use in Class I Hazardous Locations

CSA Standard C22.2 No. 142-M1987 - Process Control Equipment

CSA Standard C22.2 No. 157-M1992 - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations

CAN/CSA F60079-01:02 - Electrical apparatus for explosive gas atmospheres - Part 0: General requirements

CAN/CSA C60079-11:02 - Electrical apparatus for explosive gas atmospheres - Part 11: Intrinsic safety "i"



### Supplement to Certificate of Compliance

Certificate: 1153350

Master Contract: 167555

*The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.*

#### Product Certification History

Project	Date	Description
1817562	2006/08/18	Update to Report 1153350 to include revised main board, addition of RS422 option, addition of Class II, III display, addition of type WZ Digital Weighing cells and zone certification (all based on KEMA reports)

#### History

LR 56628-34 - December 9, 1998 - Original Certification for Precision Weighing System, Model FCab-cXd, Precision Weighing Module, Model JSab-cXd, Power Supply, Model YPS02-ZKR

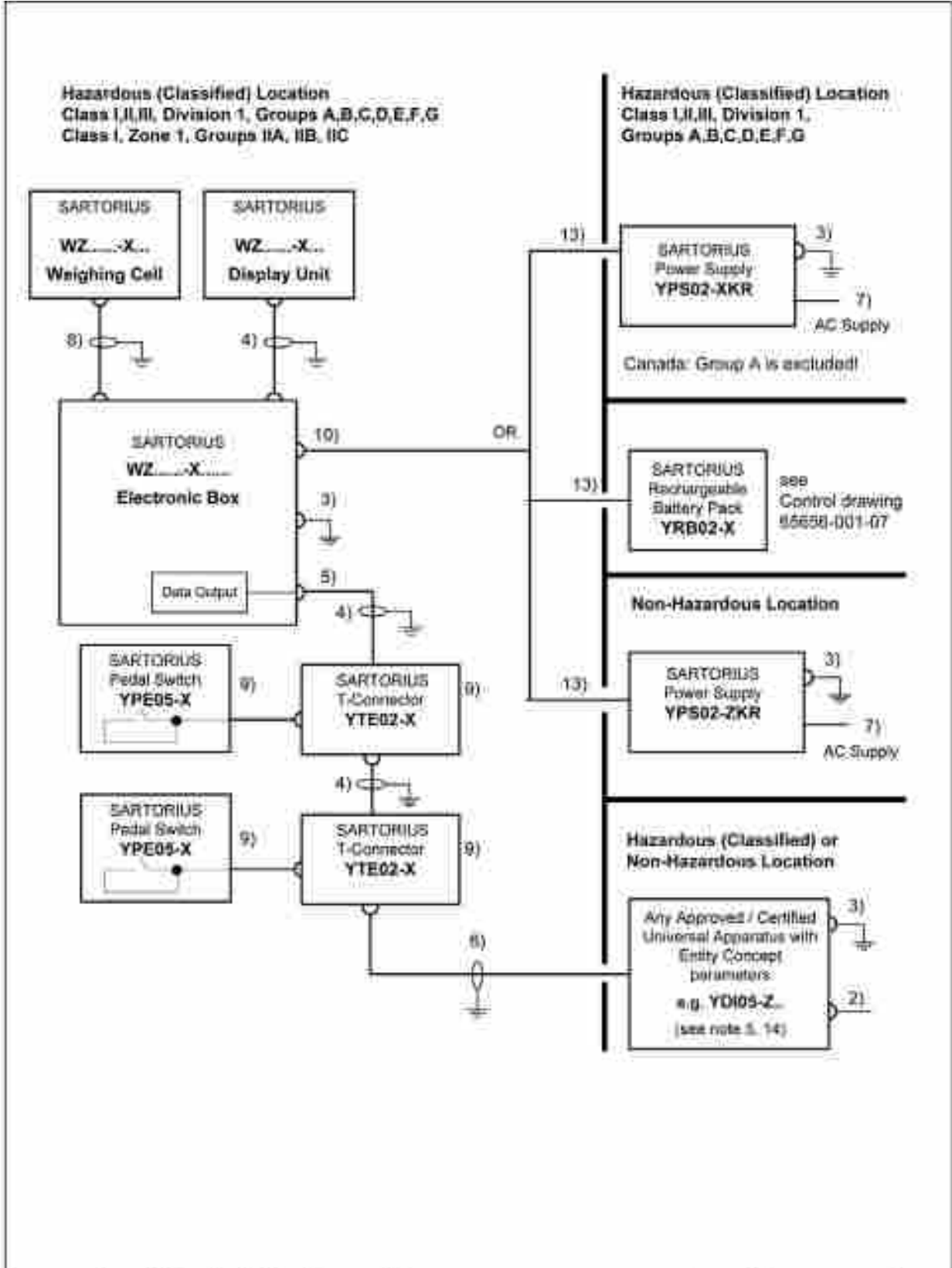
LR 56628-35 - January 21, 1999 - Update (-34) report to include Power Supply, Model YPS02-XKR

LR 56628-38 - April 15, 1999 - Update (-34) report to include alternate seal fitting used on Power Supply, Model YPS02-XKR explosion proof enclosure.

1153350 - November 27, 2000 - Update to include Class II and III to the YPS02-XKR and ZKR power supplies.

1268586 - December 14, 2001 - Update to include Models FCA and FCB and other miscellaneous changes.

1342401 - August 9, 2002 - Update to include minor circuit revisions. U.S. protection not affected.



	<b>Date</b>	<b>Name</b>		<b>Title</b>		<b>Revision</b> 01	Sheet: 1 of 3
Written by	2011-07-07	Klausgrete		<b>Control Drawing</b>			
Reviewed by	2011-07-07	Klausgrete		<b>Drawing number</b> 35520-001-07			
Released by	2011-07-07	Klausgrete					

**ENTITY DATA FOR TERMINAL:**

**Data Output (Pos. 5) Input Parameters :**

**RS232** (combined circuits):  
(Pin A/J/K/N/M)  $U_i = 12.6\text{ V}$   $I_i = 340\text{ mA}^*$   $P_i = 1.06\text{ W}$   $C_i = 2\text{ nF}$   $L_i = 15\text{ }\mu\text{H}$   
 $U_i = 25.2\text{ V}^{**}$

**RS422** (combined circuits):  
(Pin A/B/C/E/F/G/J/K/M/N)  $U_i = 7.5\text{ V}$   $I_i = 500\text{ mA}^*$   $P_i = 800\text{ mW}$   $C_i = 53\text{ }\mu\text{F}$   $L_i = 17\text{ }\mu\text{H}$

**RS485** (combined circuits):  
(Pin J/K/L/M)  $U_i = 12.6\text{ V}$   $I_i = 810\text{ mA}^*$   $P_i = 2.5\text{ W}$   $C_i = 12\text{ nF}$   $L_i = 15\text{ }\mu\text{H}$

**Control Signals on RS232 or RS485 (per circuit):**  
(Pin C/D/E/F/G/M)  $U_i = 12.6\text{ V}$   $I_i = 10\text{ mA}$   $P_i = 30\text{ mW}$   $C_i = 4\text{ nF}$   $L_i = 0$   
(Pin B/D) only for use in combination with simple apparatus  $C_i = 4\text{ nF}$   $L_i = 0$

**TTY** (Pin G/H and D/F/J)  $U_i = 14.7\text{ V}$   $I_i = 50\text{ mA}$   $P_i = 265\text{ mW}$   $C_i = 2\text{ nF}$   $L_i = 10\text{ }\mu\text{H}$   
(Pin C/E and D/F/J)  $U_i = 14.7\text{ V}$   $I_i = 130\text{ mA}$   $P_i = 100\text{ mW}$   
 $C_i = 2\text{ nF}$   $L_i = 15\text{ }\mu\text{H}$

The circuits may be connected to the converter Type 726324-1.  $C_o = 820\text{ nF}$   $L_o = 2\text{ mH}$

**Data Output (Pos. 5) Output Parameters (combined circuits):**

**RS232** (combined circuits):  
(Pin A/J/K/N/M)  $U_o = 12.6\text{ V}$   $I_o = 131\text{ mA}^*$   $P_o = 411\text{ mW}$   $C_o = 1.15\text{ }\mu\text{F}$   $L_o = 2\text{ mH}$   
 $U_o = 25.2\text{ V}^{**}$   $C_o = 107\text{ nF}^{**}$

**RS422** (combined circuits):  
(Pin A/B/C/E/F/G/J/K/M/N)  $U_o = 12.6\text{ V}$   $I_o = 180\text{ mA}^*$   $P_o = 570\text{ mW}$   $C_o = 1.15\text{ }\mu\text{F}$   $L_o = 0.7\text{ mH}$   
 $L_{dRto} = 82\text{ }\mu\text{H}/\Omega\text{hm}$

**RS485** (combined circuits):  
(Pin J/K/L/M)  $U_o = 12.6\text{ V}$   $I_o = 85\text{ mA}^*$   $P_o = 270\text{ mW}$   $C_o = 1.15\text{ }\mu\text{F}$   $L_o = 5\text{ mH}$   
 $L_{dRto} = 118\text{ }\mu\text{H}/\Omega\text{hm}$

**Maximum length for a typical standard data cable:**

**RS232** limited by the RS232 standard to 25m ( 82 feet)

**RS422** 500 m (1,640 feet) for Group A,B,C,D and IIA, IIE, IIC; 1000 m (3,280 feet) for Group C, D and IIA, IIB



**TTY** 300 m (984 feet) for 1,200 bits; 150 m (492 feet) for 2,400 bits; 65 m (213 feet) for 4,800 bits; 30 m (98 feet) for 8,000 bits; 15 m (49 feet) for 19,200 bits; for Group A,B,C,D and IIA, IIB, IIC

**RS485** up to 1000 m (3,280 feet)  
with up to 8 Sartorius scales type FC8/CA15...X... or OIXS3... or WZ...X... CW3X... or FCT01.X...

when connected to Sartorius Interface Converter YDI05-Z... or Barner YDI01-Z... or YDI02-Z...  
the Barner YDI0...Z... contain Z985 zener barriers from Pepperl & Fuchs.

	<b>Date</b>	<b>Name</b>		<b>Title</b>		<b>sartorius</b>			
Written by	2011-07-07	Klausgrebe		<b>Control Drawing</b>					
Reviewed by	2011-07-07	Klausgrebe		<b>Drawing number</b>			<b>35520-001-07</b>	<b>Revision</b>	<b>01</b>
Released by	2011-07-07	Klausgrebe						<b>Sheet</b>	<b>2 of 3</b>

- 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>, Part 1, Section 18.
- 2) The apparatus must not be connected to any device that uses or generates in excess of 250Vrms or DC.
- 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. 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) The cable to the display unit and to the T-Connector model YTE02-X must be protected against damage.
- 5) 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, Ii, Pi of the intrinsically safe apparatus and the approved values of Ci and Li resp. Co and Lo of the associated apparatus are greater than Ci and Li of the intrinsically safe apparatus plus all cable parameters.
- 6) Optionally, the cable of any FMRC Approved (CSA Certified) Universal Apparatus with Entity Concept parameters (see note 5) can be connected directly to the data output of the weighing module; this cable must be protected against damage.
- 7) The apparatus must not be connected to any device that uses or generates in excess of 132Vrms or DC.
- 8) The cable to the weighing cell needs not be protected against damage.
- 9) These units are considered as non-certified simple apparatus. The levels as indicated in Table 9.3 of FMRC Class 3610 of Oct 1999 (in Table 3 of CAN/CSA-E79-11-95.) shall not be exceeded in the simple apparatus. When the parameters of the apparatus are not specified, based on the entity parameters of the weighing module output the temperature class has to be determined and the capacitance and inductance of the interconnecting cable may not exceed the Co and the Lo. The temperature class of the apparatus has to be determined.
- 10) Connection by means of polarized connector.
- 11) Ambient temperature range: 0°C ... +40°C (32°F ... +104°F)
- 12) **WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.**  
**AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE.**
- 13) Connection by non interchangeable cable type LIYC-Y-CY 4 x 0.5; max length: 50m (164 ft).
- 14) The Sartorius **Interface Converter YDI05-Z**, is approved/certified by FM for USA and Canada. See Certificate of Compliance and Control Drawing number 85710-800-07-A4.  
Furthermore Sartorius **Barriers YDI01-Z**, and **YDI02-Z**, may be used, which contain FM and CSA approved/certified Z065 zener barriers from Pepperl & Fuchs.
- 15) **WARNING: USE WET OR DAMP CLOTH TO CLEAN TO AVOID ELECTRIC STATIC DISCHARGE.**

	<b>Date</b>	<b>Name</b>		<b>Title</b>	<b>Control Drawing</b>		
Written by	2011-07-07	Klausgrebe		<b>Drawing number</b>	<b>35520-001-07</b>	<b>Revision</b>	<b>01</b>
Reviewed by	2011-07-07	Klausgrebe				<b>Sheet</b>	<b>3 of 3</b>
Released by	2011-07-07	Klausgrebe					

**YPS02-X.. /YPS02-Z..:**

Circuit	Vo	Io	Po	Co	Lo
V_1	12.6 V	133 mA	1.46 W	1 µF	300 µH
V_2	12.6 V	133 mA	1.46 W	1 µF	300 µH
V_3	8.6 V	187 mA	1.51 W	4 µF	300 µH
V_4	12.6 V	150 mA	1.68 W	1 µF	300 µH

**YPS02-Z.R**  
**Power supply**  
**(100-240 Vac)**  
**II (2)G [EEx ib] IIC**  
**II (1) D**

**YPS02-XV24 /YRB02-X:**

Circuit	Vo	Io	Po	Co	Lo
V_1	12.6 V	133 mA	1.43 W	0.5 µF	300 µH
V_2	12.6 V	133 mA	1.43 W	0.5 µF	300 µH
V_3	8.6 V	186 mA	1.49 W	0.8 µF	200 µH
V_4	12.6 V	150 mA	1.65 W	0.5 µF	300 µH

**Non-hazardous area**

**YPS02-X.R**  
**Power supply**  
**(100-240 Vac)**  
**II 2 G EEx d [ib] IIC T4**  
**II 1 D T135°C IP65**

**Hazardous area**  
**Zones: 1, 2, 21, 22**  
**Gas: IIC T4**  
**Dust: T115°C / T135°C**

**YPS02-XV24**  
**Power supply**  
**(22-28 Vdc)**  
**II 2 G EEx e m [ib] IIC T4**  
**II 1 D IP6X T80°C**

Alternative connections

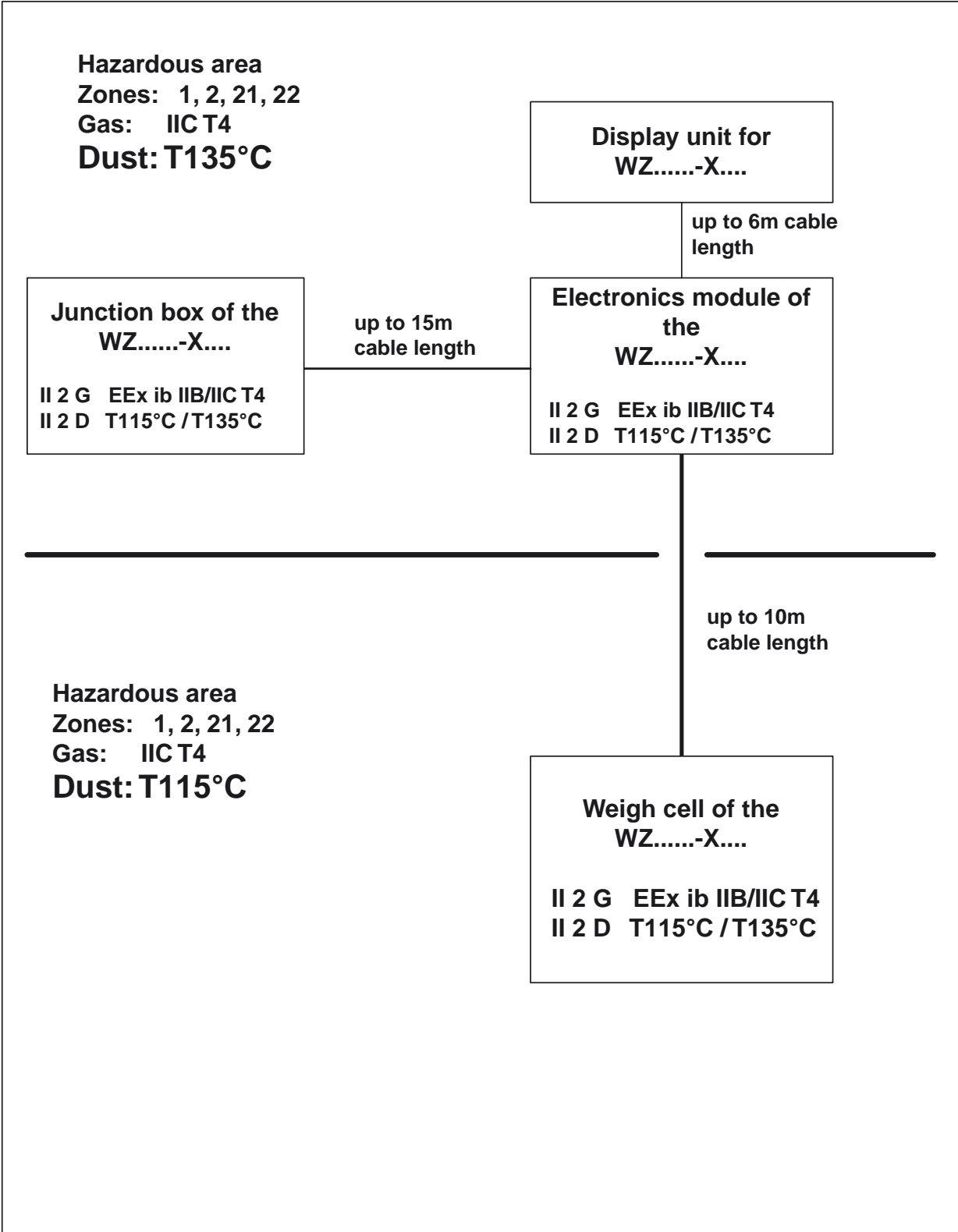
**YRB02-X**  
**EX rechargeable**  
**battery pack**  
**II 2 G EEx e m [ib] IIC T4**  
**II 1 D IP6X T80°C**



Sartorius cable;  
 permanently attached to  
 power supply / Ex-  
 protected-rechargeable  
 battery pack; flexible  
 installation; max. length:  
 50m

Circuit	Vi	Ii	Pi	Ci	Li
V_1	12.6 V	133 mA	1.68 W	2 nF	15 µH
V_2	12.6 V	133 mA	1.68 W	2 nF	15 µH
V_3	8.6 V	187 mA	1.61 W	300 nF	15 µH
V_4	12.6 V	150 mA	1.89 W	100 nF	15 µH

**WZ.....-X...**  
**Digital**  
**weigh cell**  
**II 2 G EEx ib IIC T4**  
**II 2 D T115°C / T135°C**

	Datum Date	Name	Material <b>WZ.....-X.... / Power Supply</b>		Maßstab / Scale
	Erstellt Written by	10.01.06	Klausgrete	<b>sartorius</b>	Benennung / Title
	Geprüft Reviewed by	10.01.06	Klausgrete		<b>Verification of Intrinsic Safety</b>
Freigabe Released by	10.01.06	Klausgrete	Ausgabe / Revision <b>01</b>	Änderung / Alteration ---	Blatt Sheet <b>1</b>
			Zeichnungs-Nr. / Drawing number <b>35520-001-60-A4</b>		von of <b>7</b>



	Datum Date	Name	Material WZ.....-X.... / Installation in Zone 2 and 22		Maßstab / Scale
	Erstellt Written by	10.01.06	Klausgrete	 <b>sartorius</b>	Benennung / Title
	Geprüft Reviewed by	10.01.06	Klausgrete		<b>Verification of Intrinsic Safety</b>
Freigabe Released by	10.01.06	Klausgrete	Ausgabe / Revision <b>01</b>	Änderung / Alteration ---	Zeichnungs-Nr. / Drawing number <b>35520-001-60-A4</b>
					von of
					<b>2</b>
					<b>7</b>

**Hazardous area**

**Zones: 1, 2, 21, 22**

**Gas: IIC T4**

**Dust: T135°C**

**RS-232 <sup>1</sup>**

Vi	12.6 V <sup>2</sup> / 25.2 V <sup>3</sup>	Vo	12.6 V <sup>2</sup> / 25.2 V <sup>3</sup>
Ii	340 mA *	Io	131 mA *
Pi	1.08 W *	Po	411 mW *
Ci	2 nF	Co	1.15µF <sup>2</sup> / 105 nF <sup>3</sup>
Li	15 µH	Lo	2 mH
		Lo/Ro	86 µH/ohm <sup>2</sup> 43 µH/ohm <sup>3</sup>

**WZ.....-X....  
Digital weigh cell**

**II 2 G EEx ib IIC T4  
II 2 D T80°C / T135°C**

**RS-232  
Data output port**

Use of commercially available shielded cable (e.g., LiYCY) permitted; length limited by function to **25m**.

**YDO02C-X <sup>1</sup>**

Vi	12.6 V	Vo	11.8V <sup>2</sup> / 23.6 V <sup>3</sup>
Ii	---	Io	62 mA *
Pi	---	Po	0.18 W *
Ci	0 nF	Co	1.41 µF <sup>2</sup>
Li	0 mH	Lo	125nF <sup>3</sup>
		Lo/Ro	8 mH 175 µH/ohm

**CIXS3  
Indicator**

**YDO02C-X  
RS-232  
data output  
or RS-232 over  
COM1 or COM2**



**II 2 G EEx ib IIC T4  
II 1 D IP6X T135° C**

**RS-232 data output port <sup>1</sup> COM1 (LV1) or COM 2 (LV3)**

V <sub>i</sub>	12.6 VV <sub>Uo</sub>	V <sub>o</sub>	11.8 V <sup>2</sup> / 23.6V <sup>3</sup>
I <sub>i</sub>	328 mA*	I <sub>o</sub>	124 mA*
P <sub>i</sub>	960 mW *	P <sub>o</sub>	70 mW *
C <sub>i</sub>	0 nF	C <sub>o</sub>	1.5 µF <sup>2</sup> / 130nF <sup>3</sup>
L <sub>i</sub>	0 mH	L <sub>o</sub>	2.2 mH
		Lo/Ro	97 µH/ohm

**Remarks:**

- 1: Combined circuits
- 2: Measured against ground
- 3: Between signal lines
- \*: Ohmically limited

	Datum Date	Name	Material <b>WZ.....-X.... / RS-232 connection to CIXS3</b>		Maßstab / Scale
	Erstellt Written by	10.01.06	Klausgrete	 <b>sartorius</b>	Benennung / Title
	Geprüft Reviewed by	10.01.06	Klausgrete		<b>Verification of Intrinsic Safety</b>
Freigabe Released by	10.01.06	Klausgrete	Ausgabe / Revision <b>01</b>	Änderung / Alteration ---	Zeichnungs-Nr. / Drawing number <b>35520-001-60-A4</b>
					von of
					<b>7</b>

**YDI05-Z.. 1**

Vo	12.4 V	Vi	12.6 V
	24.8 V <sup>3</sup>		25.2 V <sup>3</sup>
I <sub>o</sub>	260 mA *	I <sub>i</sub>	any
P <sub>o</sub>	800 mW *	P <sub>i</sub>	any
Co	1.24 μF <sup>2</sup>	Ci	0
	112 nF <sup>3</sup>		
Lo	400 μH	Li	0
Lo/Ro	44 μH/ohm		
	22 μH/ohm <sup>3</sup>		

**Z966 1 in YDI02-Z..**

Vo	12 V
	24 V <sup>3</sup>
I <sub>o</sub>	328 mA *
P <sub>o</sub>	0.96 W *
Co	1.41 μF <sup>2</sup>
	125 nF <sup>3</sup>
Lo	300 μH
Lo/Ro	36 μH/ohm
	36 μH/ohm <sup>3</sup>

**YCO01-Y 1**

Vo	11.8 V	Vi	12.6 V
	23.6V <sup>3</sup>		25.2 V <sup>3</sup>
I <sub>o</sub>	123 mA *	I <sub>i</sub>	131mA
P <sub>o</sub>	361 mW *	P <sub>i</sub>	any
Co	1.5 μF <sup>2</sup>	Ci	0.5 nF
	129nF <sup>3</sup>		
Lo	2 mH	Li	0.8 μH
Lo/Ro	98 μH/ohm		
	98 μH/ohm <sup>3</sup>		

**Non-hazardous area**

**YDI05-Z.. Interface converter**

II (2) GD [EEx ib] IIC or

**Z966 Zener barrier 4**

in YDI02-Z..: II (2) G [EEx ib] IIC or

**YCO01-Y Interface converter 5**

II (2) GD [EEx ib] IIC or

II 3 (2)GD EEx nR[ib]IIC T4

**Hazardous area****Zones: 1, 2, 21, 22****Gas: IIC T4****Dust: T115°C / T135°C**

Standard 6-wire cable; wires up to 0.5mm≤ diameter with max. 250nF/km, 750μH/km and min. 34 ohm/km has 22μH/ohm. Cable length ( **flexible installation** ) is limited by the RS-232 specifications to **less than 25m**.

6-wire cable, type PR6136 (L<sub>max</sub> = 1.1mH/km; C<sub>max</sub> = 220nF/km; R<sub>min</sub> = 26ohm/km: 43μH/ohm): **under 25m** (see above).

**RS-232 1**

Vi	12.6 V <sup>2</sup> / 25.2 V <sup>3</sup>	Vo	12.6 V <sup>2</sup> / 25.2 V <sup>3</sup>
I <sub>i</sub>	340 mA *	I <sub>o</sub>	131 mA *
P <sub>i</sub>	1.08 W *	P <sub>o</sub>	411 mW *
Ci	2 nF	Co	1.15μF <sup>2</sup> / 105 nF <sup>3</sup>
Li	15 μH	Lo	2 mH
		Lo/Ro	86 μH/ohm <sup>2</sup>
			43 μH/ohm <sup>3</sup>

**Remarks:**

- 1: Combined circuits
  - 2: Measured against ground
  - 3: Between signal lines
  - 4: BAS01ATEX7005; II (1) GD [EEx ia] IIC; parameter(s) converted
  - 5: Approved for Zones 2 and 22 hazardous areas with gas: IIC / IIB T4 and dust: T80°C; only when USB connection is sealed and restricted breathing is maintained.
- \*: Ohmically limited  
 \*\*: Option; passive wiring only (not Zone 20)

YPE05-X  
Foot switch  
\*\*

YTE02-X  
T-connector\*\*

RS-232  
Data output port

**WZ.....-X....**  
**Digital weigh cell**

**II 2 G EEx ib IIC T4**  
**II 2 D T115°C / T135°C**

	Datum Date	Name	Material <b>WZ.....-X.... / RS-232 Data Output Port</b>			Maßstab / Scale
	Erstellt Written by	10.01.06	Klausgrete		Benennung / Title <b>Verification of Intrinsic Safety</b>	Blatt Sheet
	Geprüft Reviewed by	10.01.06	Klausgrete		Zeichnungs-Nr. / Drawing number <b>35520-001-60-A4</b>	<b>4</b>
	Freigabe Released by	10.01.06	Klausgrete	Ausgabe / Revision <b>01</b>	Änderung / Alteration <b>---</b>	von of
					<b>7</b>	

**YDI05-Z.. 1,7**

Vo	12.4 V	Vi	12.6 V
	24.8V <sup>3</sup>		25.2 V <sup>3</sup>
Io	130 mA <sup>*</sup> )	Ii	any
Po	400 mW	Pi	any
Co	1.24 µF <sup>2</sup>	Ci	0
	112nF <sup>3</sup>		
Lo	2 mH	Li	0
Lo/Ro	180 µH/ohm		
	70 µH/ohm <sup>3</sup>		

**Z966 1,6 in YDI01-Z**

Vo	12 V
	24V <sup>3</sup>
Io	614mA
Po	0.48W
Co	1.41 µF <sup>2</sup>
	125nF <sup>3</sup>
Lo	1.38mH
Lo/Ro	57 µH/ohm

**YCO01-Y 1**

Vo	7.2 V	Vi	12.6 V
	8.0 V <sup>3</sup>		25.2 V <sup>3</sup>
Io	207 mA <sup>*</sup>	Ii	1.5 A
Po	330 mW	Pi	2.5 W
Co	13.5 µF <sup>2</sup>	Ci	1 nF
	8.4 µF <sup>3</sup>		
Lo	0.7 mH	Li	1.6 µH
Lo/Ro	36 µH/ohm		
	36 µH/ohm <sup>3</sup>		

**Non-hazardous area**

**YDI05-Z.. Interface converter**

II (2) GD [EEx ib] IIC or

**Z966 Zener barrier 7)**

(in YDI01-Z) II (2) G [EEx ib] IIC or

**YCO01-Y Interface converter 8**

II (2) GD [EEx ib] IIC or

II 3 (2)GD EEx nR[ib]IIC T4

**Hazardous area**

**Zones: 1, 2, 21, 22**

**Gas: IIC T4**

**Dust: T115°C / T135°C**

Up to 7 additional **WZ.....-X.... / CIXS3 / FC/FCA/IS.....-X.. 4** or **FCT01-X.. 5**

**Data cable:**

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

**RS-485 data output port 1**

Vo	12.6 V	Vi	12.6 V
Io	85 mA <sup>*</sup>	Ii	810mA <sup>*</sup>
Po	0.27 W	Pi	2.5 W
Co	1.15 µF <sup>2</sup>	Ci	12 nF
Lo	5 mH	Li	15 µH
Lo/Ro	130 µH/ohm		

**RS-485 Data output port**

**WZ.....-X.... Digital weigh cell**

**II 2 G EEx ib IIB/IIC T4  
II 2 D T115°C / T135°C**

**Cable: install as stationary and protected equipment!**

For cables with a maximum of 125 pF/m (wire versus wire):

Number of units in the hazardous area	Cable length m	Lo/Ro or µH/ohm	Lo µH/km
2	1000	61	400
4	1000	34	115
6	1000	22	46
8	1000	17	25
8	100	17	250
8	35	17	710

See also table in KEMA 02ATEX1108X, page 3/4

**Remarks:**

- 1: Combined circuits
- 2: Measured against ground
- 3: Between signal lines
- 4: Not all models can be used in Zones 21,22
- 5: Cannot be used in Zones 21,22
- 6: BAS01ATEX7005; II (1) GD [EEx ia] IIC
- 7: Only 2 RS-232 ports for YDI05-Z are used
- 8: Approved for Zones 2 and 22 hazardous areas with gas: IIC / IIB T4 and dust: T80°C; only when USB connection is sealed and restricted breathing is maintained.

\* : Ohmically limited

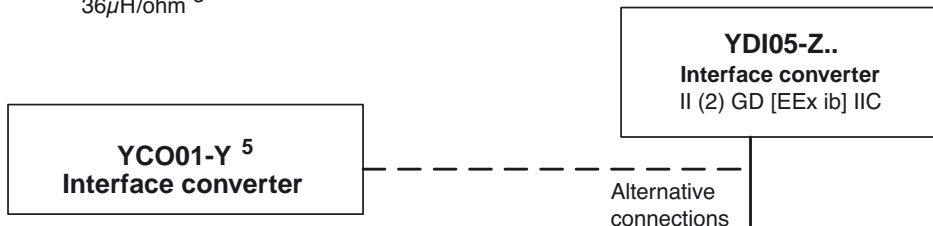
	Datum Date	Name	Material <b>WZ.....-X.... / RS-485 Data Output Port</b>		Maßstab / Scale
	Erstellt Written by	10.01.06	Klausgrete		Benennung / Title
Geprüft Reviewed by	10.01.06	Klausgrete	<b>Verification of Intrinsic Safety</b>		Blatt Sheet
Freigabe Released by	10.01.06	Klausgrete	Ausgabe / Revision <b>01</b>	Änderung / Alteration <b>---</b>	Zeichnungs-Nr. / Drawing number <b>35520-001-60-A4</b>
					von of <b>7</b>

**RS-422 data output port of YCO01-Y <sup>1</sup>**

Vo	7.2 V	Vi	12.6 V
	8.0 V <sup>3</sup>		25.2 V <sup>3</sup>
Io	207 mA *	Ii	1.5 A
Po	330 mW	Pi	2.5 W
Co	13.5 $\mu$ F <sup>2</sup>	Ci	1 nF
	8.4 $\mu$ F <sup>3</sup>		
Lo	0.7 mH	Li	1.6 $\mu$ H
	3 mH (IIB)		
Lo/Ro	36 $\mu$ H/ohm		
	36 $\mu$ H/ohm <sup>3</sup>		

**RS-422 data output port of YDI05-Z <sup>1</sup>**

Vo	6.0 V	Vi	12.6 V
	6.8 V <sup>3</sup>		25.2 V <sup>3</sup>
Io	172 mA *	Ii	0.2 A
Po	0.5 W *	Pi	2.3 W
Co	12 $\mu$ F <sup>2</sup>	Ci	28 $\mu$ F <sup>2</sup>
	17.7 $\mu$ F <sup>3</sup>		200 nF <sup>3</sup>
Lo	0.7 mH (IIC)	Li	2 $\mu$ H
	5 mH (IIB)		



**Non-hazardous area**

**Hazardous area**  
**Zones 1, 2, 21, 22**  
**Gas: IIC / IIB T4**  
**Dust: T115°C / T135°C**

**Cable:**  
 Standard 10-wire cable; wires up to 0.5mm $\leq$  diameter with max. 250nF/km, 1000 $\mu$ H/km and min. 34 ohm/km has 30 $\mu$ H/ohm. Cable length (**flexible installation**) is limited by capacity to **1000m**.

**RS-422 data output port <sup>1</sup>**

Vo	12.6 V	Vi	7.5 V
Io	180 mA *	Ii	0.5 A *
Po	0.57 W *	Pi	0.9 W
Co	1.15 $\mu$ F (IIC)	Ci	5.5 $\mu$ F <sup>4</sup>
	7.4 $\mu$ F (IIB)		
Lo	0.7 mH (IIC)	Li	17 $\mu$ H
	4 mH (IIB)		
Lo/Ro	62 $\mu$ H/ohm (IIC)		
	250 $\mu$ H/ohm (IIB)		

**RS-422**  
Data output port

**WZ.....-X....**  
**Digital weigh cell**

**II 2 G EEx ib IIB/IIC T4**  
**II 2 D T115°C / T135°C**

**Remarks:**

- 1: Combined circuits
- 2: Measured against ground
- 3: Between signal lines
- 4: Measured against the ground and limited internally to 8.7V
- 5: Approved for Zones 2 and 22 hazardous areas with gas: IIC / IIB T4 and dust: T80°C; only when USB connection is sealed and restricted breathing is maintained.
- \* : Ohmically limited

	Datum Date	Name	Material <b>WZ.....-X.... / RS-422 Data Output Port</b>			Maßstab / Scale	
	Erstellt Written by	10.01.06	Klausgrete		Benennung / Title	---	
	Geprüft Reviewed by	10.01.06	Klausgrete		<b>Verification of Intrinsic Safety</b>	Blatt Sheet	<b>6</b>
Freigabe Released by	10.01.06	Klausgrete	Ausgabe / Revision <b>01</b>	Änderung / Alteration ---	Zeichnungs-Nr. / Drawing number <b>35520-001-60-A4</b>	von of	<b>7</b>

TTY-10 Data output port <sup>1)</sup> (LV6)

Vo 12.6 V  
 Io 11 mA  
 Po 127 mW  
 Co 400 nF (IIC) 700nF (IIB)  
 Lo 500 µH

**YCO01-Y <sup>2</sup>**  
**Interface converter**  
**TTY-(10mA) Data output port**

**Non-hazardous area**

**Hazardous area**  
**Zones 1, 2, 21, 22**  
**Gas: IIC / IIB T4**  
**Dust: T115°C / T135°C**

Sartorius cable **YCCTTY10-X** (4\*0.5 mm<sup>2</sup> (LiYC)YCY) or Sartorius cable **YCC232-X** (5\*0.5 mm<sup>2</sup> LiYCY); each laid **fixed and shielded**

Length is limited by function to:  
 up to 300 m up to 1200 bit/s  
 up to 150 m up to 2400 bit/s  
 up to 65 m up to 4800 bit/s  
 up to 30 m up to 9600 bit/s  
 up to 15 m up to 19200 bit/s

TTY Data output port <sup>1)</sup>

Vi 14.7 V  
 Ii 50 mA or 130mA  
 Pi 265 mW or 100 mW  
 Ci 2 nF  
 Li 15 µH



**TTY**  
**Data output port**

**WZ.....-X....**  
**weigh cell**

**II 2 G EEx ib IIB/IIC T4**  
**II 2 D T115°C / T135°C**

**Remarks:**

- 1: Per circuit
- 2: Approved for Zones 2 and 22 hazardous areas with gas: IIC / IIB T4 and dust: T80°C; only when USB connection is sealed and restricted breathing is maintained.

	Datum / Date	Name	Material <b>WZ.....-X.... / TTY Data Output Port</b>			Maßstab / Scale
	Erstellt / Written by	10.01.06	Klausgrete	 <b>sartorius</b>	Benennung / Title	---
	Geprüft / Reviewed by	10.01.06	Klausgrete		<b>Verification of Intrinsic Safety</b>	Blatt / Sheet
Freigabe / Released by	10.01.06	Klausgrete	Ausgabe / Revision	Änderung / Alteration	Zeichnungs-Nr. / Drawing number	von / of
			<b>01</b>	---	<b>35520-001-60-A4</b>	<b>7</b>

Reparaturanforderung|Extern \*<sup>1)</sup>  
Return for repair|external \*<sup>2)</sup>



sartorius

**Einwander | Sender**

Kunden-Nr. | Customer ID

Name | Name \*<sup>1)</sup>

Straße | Street \*<sup>1)</sup>

PLZ | Zip code \*<sup>1)</sup>

Ort | City \*<sup>1)</sup>

Land | Country \*<sup>1)</sup>

Anspruchpartner | Contact person \*<sup>1)</sup>

TEL.-Nr. | Phone \*<sup>1)</sup>

Fax-Nr. | Fax \*<sup>1)</sup>

Auftragsnummer | Order no.

Rechnungsnummer | Invoice no.

**Gerät | Equipment**

Type | Model \*<sup>1)</sup>

Fabr.-Nr. | Serial no. \*<sup>1)</sup>

- Reparatur | Repair  
 Garantie | Warranty

- Kostenvoranschlag | Estimate  
 Reklamation | Complaint

Bitte eine detaillierte Fehlerbeschreibung angeben, bzw. welche Arbeiten schon ausgeführt wurden. Garantiesprüche und Reklamationen sind zu begründen. Sollte kein Garantiespruch bestehen, wird automatisch ein Kostenvoranschlag erstellt.

Please describe the failure or defect in detail and/or any repairs that have already been carried out. In case of warranty claims or complaints, please specify the reasons for your request. If your warranty has already expired, we will automatically send you an estimate.

**Fehlerbeschreibung | Begründung**

**Description of failure or defect | Reasons and/or explanation:**

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

Einwander | Sender

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

Einwandedatum | Shipping date

Unterschrift | Signature

\*<sup>1)</sup> Bitte dem Gerät beilegen | Please attach to the equipment  
\*\*<sup>2)</sup> Pflichtfeld | Required field

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