



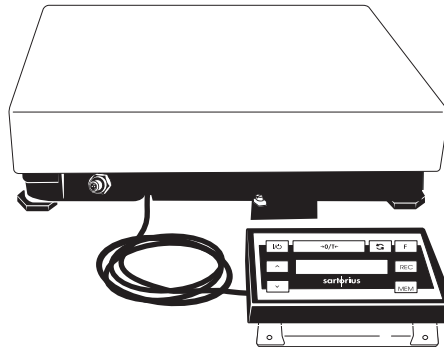
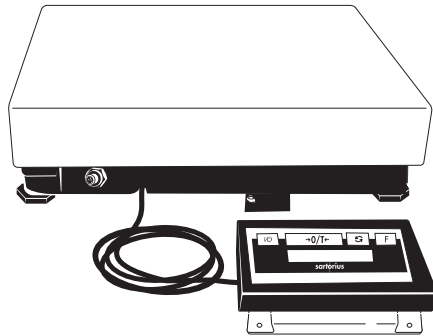
**GAMMA SCALE™**  
**Weighing Instruments**  
**Sales & Service**

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E-mail: [info@gammascale.com](mailto:info@gammascale.com)  
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98648-008-38

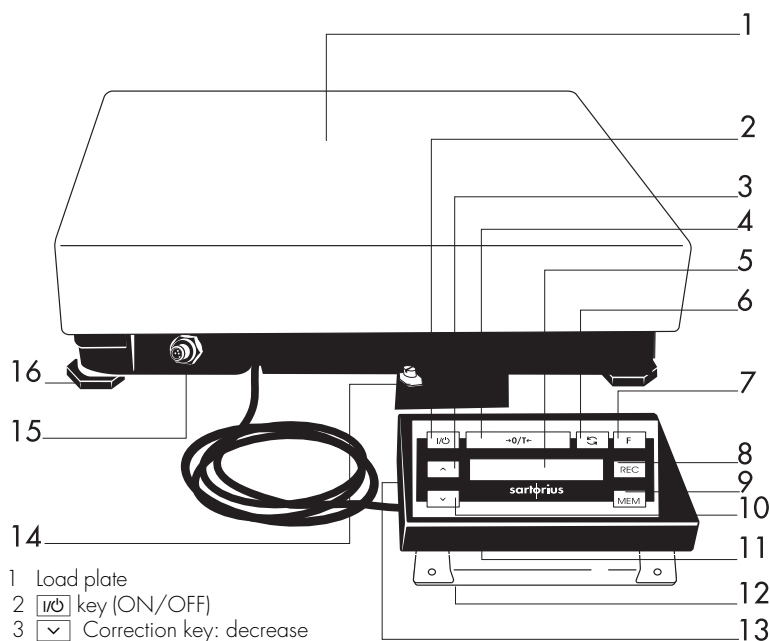
Sartorius  
PMA 35D-X, PMA 35D-X00C ,  
PMA 35D-X00CV1

Electronic Paint-Mixing Scales  
Installation and Operating Instructions



sartorius

## PMA 35D-X, PMA 35D-X000C, PMA 35D-X00CV1



- 1 Load plate
- 2 key (ON/OFF)
- 3 Correction key: decrease (only on the PMA 35D-X00C and PMA 35D-X00CV1)
- 4 Tare key
- 5 Display
- 6 key (TOGGLE) On the 35D-X/35D-X00C, you can toggle to two decimal places – from 0.5 g to 1.0 g – within the entire weighing range of – 0.5 g to 35 kg – or – 1 g to 35 kg – On the PMA 35D-X00CV1, you can toggle from g to Parts per pound within the entire weighing range
- 7 key (FORMULATION)
- 8 key (for displaying the final quantity in the recalculation mode (only on PMA 35D-X00C and PMA 35D-X00CV1)
- 9 key (MEMORY) (only on PMA 35D-X00C and PMA 35D-X00CV1)
- 10 Correction key: increase (only on PMA 35D-X00C and PMA 35D-X00CV1)
- 11 Display and control unit
- 12 Column
- 13 Data interface port (25-pin)
- 14 Terminal for connecting an equipotential bonding conductor (grounding terminal)
- 15 DC jack
- 16 Leveling foot

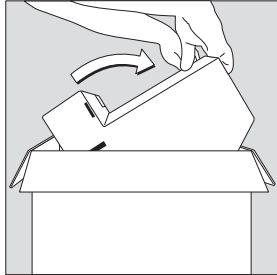
### Important Note to Users

Make sure to carefully read and follow sections marked with this symbol. They contain important safety instructions and information.

Use only the adapter that is included in delivery (part no. 6965619) to connect a 9-pin connecting cable to the 25-pin data interface

Note:  
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by Sartorius AG could void the user's authority to operate the equipment.

## Getting Started

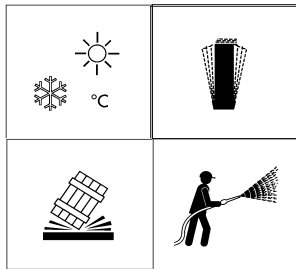


Remove the scale, load plate and AC adapter from the package. Immediately after unpacking the equipment, check it for any visible damage.



**Equipment Supplied:**  
Scale, load plate,  
AC adapter, data cable  
(25-pin - 9-pin)

Do not miss out on the benefits of our full warranty. Please contact your local Sartorius office or dealer for further information. If available, complete the warranty registration card, indicating the date of installation, and return the card to your Sartorius office or dealer.



Choose a suitable place to set up the scale. Avoid exposure to drafts, heat, moisture and vibration.

**⚠** Check that the voltage rating of the AC adapter matches that of your local line voltage (mains supply). If it does not match your local line voltage, contact your Sartorius office or dealer. Use only original Sartorius AC adapters! If you operate the scale in a hazardous area/location outside Germany, you must comply with the national electrical code and applicable safety regulations of your country. For information on the legal regulations currently applicable in your country, please ask your Sartorius office or dealer or your paint supplier.

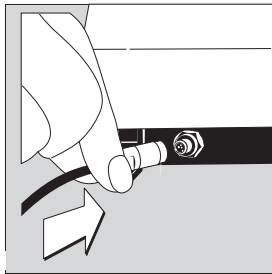
**⚠** The model 609308... AC adapter must be installed outside the hazardous area/location.

**⚠** Before you operate your scale in a hazardous area/location, the scale must be inspected either by a certified electrician or under the guidance and supervision of a certified electrician to make sure that the scale complies with the applicable regulations (in Germany, in accordance with Section 12 of the ElexV). Determine whether your scale must be reported to the technical inspection authorities (e.g., 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 which 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 three years.

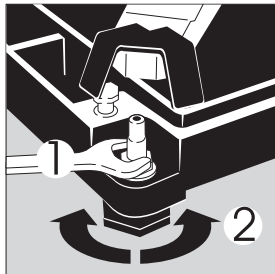
**⚠** Fasten the AC adapter cable to the balance. Tighten down the locking ring to secure the connection. Do not disconnect an energized cable during operation in a hazardous location/area.

**⚠** All applicable requirements (e.g., occupational safety regulations) must be observed during operation.

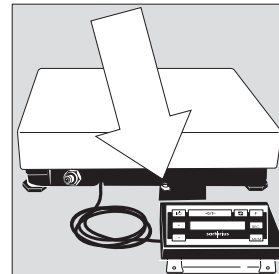
**⚠** Any tampering with the equipment by anyone, other than repair work done by authorized Sartorius service technicians, will invalidate the approval for use in hazardous areas/locations and result in forfeiture of all claims under the manufacturer's warranty.



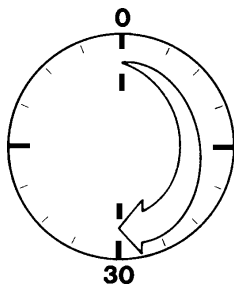
Connect the scale to AC power. Install the power cable and grounding cable with adequate protection so that they cannot be damaged.



Remove the load plate. Use a 13-mm open-end wrench to loosen the leveling foot (1). Turn the leveling foot (2) until the scale is level. Tighten the lock nut (1) with the wrench. Replace the load plate

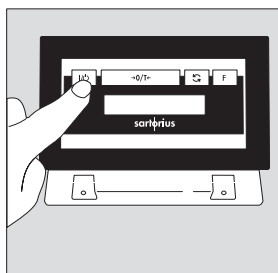


Ground the scale in the hazardous area/location. Connect an equipotential bonding conductor to the terminal (11).

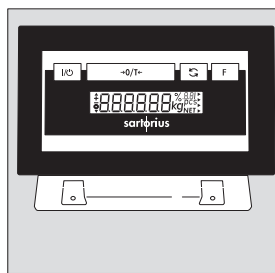


After connecting the scale to AC power, wait approx. 30 minutes for it to warm up.

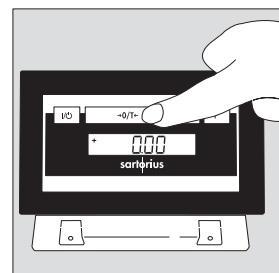
### Operating the Scale



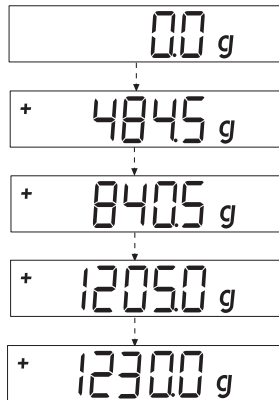
Turn on the scale using the **I/O** key (2).



After the scale has been turned on, it will automatically run a self-test. At the end of this test, 0.0 g is displayed.

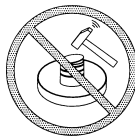


If a different readout is displayed, zero or tare the scale using the **0/T** key (4).



### Weighing with One Decimal Place

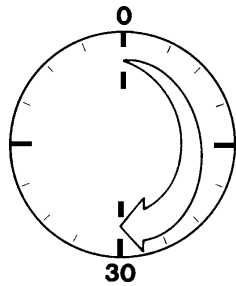
Place an empty paint can on the load plate (1).  
 Press  $\square \rightarrow 0.1 \leftarrow$  (4). The display shows "0.0 g."  
 Pour in the first component, and read off the weight as soon as the stability symbol appears; in this case, "g."  
 Pour in additional components until the desired weight of your formula is reached.  
 Remove the filled paint can from the load plate.



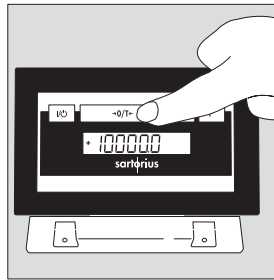
**⚠** Never use a hammer to close the lid of a paint can while it is still on the load plate, as this will damage the weighing system.

### Calibration/Adjustment

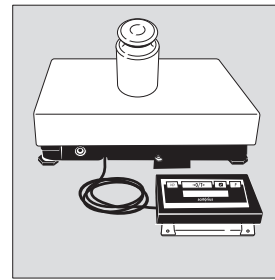
You can calibrate/adjust the scale by pressing the  $\square \rightarrow 0.1 \leftarrow$  key (4). To do so, menu code 1 5 1 must be selected. Calibration weight: 5,000 g; accuracy: class F1  $\pm$  0.075 g.



After connection to AC power and before each calibration/adjustment, allow the scale to warm up for approx. 30 min.



Hold down the  $\square \rightarrow 0.1 \leftarrow$  key (4) for 2 sec. When 5000 is displayed, release the key.



Center the calibration weight on the load plate (1). Calibration/adjustment is performed automatically. After calibration/adjustment, remove the calibration weight.

### Formulation Mode (Calculation by a Factor)

This mode enables you to weigh in amounts that are smaller or larger than that of your basic formula for a specific paint color (e.g., 25 l of a 1-l formula), without having to do any manual recalculation.

You can select from among the following factors (amounts) by pressing the  $\square \text{ F } \square$  key (7):

0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 10, 15, 20, 25.

As you pour in the components of your formula, the weight is displayed in "g."

#### Note:

The flashing arrow  $\blacktriangledown$  on the display means that the weight shown is not valid for use in legal metrology (not legal for trade).

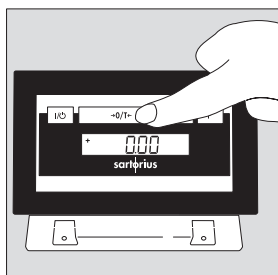
**Example:**

Let's suppose you want to weigh only 250 l of a basic formula for a total amount of 1 l. With the recalculating mode, you do not need to manually recalculate the individual components.

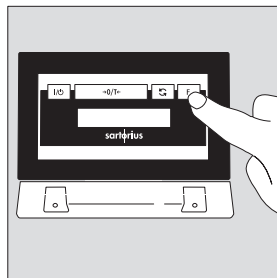
The basic formula for 1 liter is:

- 250 g green paint
- + 250 g red paint
  
- + 500 g blue paint

Total: 1000 g



1. Place the empty paint can on the load plate and tare.



2. Press the **[F]** key (7) once.



3. "25" is displayed next to the weight.



4. Slowly pour in the first component, "250 g" of green paint, until the display shows "250 g".



5. Pour in the second component, "250 g" of red paint, until "500 g" is displayed.



6. Pour in the last component, "500 g" of blue paint, until "1000 g" is displayed.

We have come to the end of our example. According to the display, exactly 1000 g was poured in, but the paint can actually contains only 250 g by weight according to the factor you selected, .25. Follow the same procedure for any other conversion factor.

**Weighing Using the Recalculating Mode (Model PMA35D-X000C Only)**

Let's suppose that you poured in too much of one color component for a given formula (e.g., with 4 components). In addition, let's assume that you previously poured in all of the other amounts exactly according to each of the values you entered and saved by pressing the [MEM] key (9). Use the correction keys, **[v]** (3) and **[^]** (10), to correct the weight displayed to the value given in the formula. Then press the **[v]** key (3) to start the recalculating mode; "C" flashes on the display. The scale automatically calculates and displays the amounts in "g" to add for each of the other components that you already poured in. This will ensure that the total result of your formula for these components will be correct. After pouring in these amounts, you can continue to add the remaining components of your formula.

**Important Note:**

You can correct an incorrect amount any number of times. However, the total (liter) quantity in the paint can will increase each time you correct a component. Press the [REC] key (8) to check how much the total quantity (in liters) will be. The arrow **▼** on the display means that the weight shown is not valid for use in legal metrology (not legal for trade).

Example:

+ 1180 g

1. Place an empty paint can on the load plate (1).  
+ 118.0 g

0.0 g

2. Press the  $\square$  key (4).  
0.0 g

+ 500 g

3. Pour in the 1st component.  
+ 50.0 g

ST 01

4. Press the [MEM] key (9).  
ST 01

+ 110.0 g

5. Pour in the 2nd component.  
+ 110.0 g

ST 02

6. Press the [MEM] key (9).  
ST 02

+ 2030 g

7. Pour in the 3rd component.  
+ 203.0 g  
Oops! You poured in too much.  
The correct weight for the formula is 200.0 g.

+ 203.0 g

8. Press the  $\square$  key (10) to start the recalculation mode.  
A "C" (= correct) flashes on the display.

+ 200.0 g

9. Press the  $\square$  key (10) to correct the value to:  
+ 200.0 g

ST 03

10. Press the [MEM] key (9).  
ST 03

- 1.5 g

11. Add the 1st component; "C1" flashes on the display.  
- 1.5 g

0.0 g

12. Fill to 0.0 g.  
0.0 g

ST 01

13. Press the [MEM] key (9).  
ST 01

- 2.0 g

14. Pour in the 2nd component; "C2" flashes on the display.  
- 2.0 g

0.0 g

15. Fill to 0.0 g.  
0.0 g

+ 2000 g

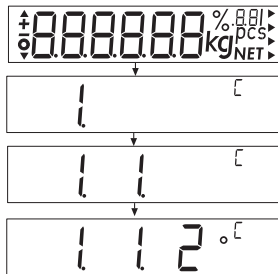
16. Press the [MEM] key (9); the scale now automatically returns to the formula weighing mode.  
+ 200.0 g

A 1.03

17. Press the [REC] key (8) to check what the total weight will be "A" = Amount (displayed in liters)  
A 1.03

+ 1000.0 g

18. Pour in the 3rd component.  
+ 1000.0 g  
We have come to the end of our example.



### Accessing the Menu

Press **[ON]** (2) to turn off the scale. Press **[ON]** again to turn the scale back on; briefly press the **[ON]** key (4) during the automatic self-test. "1" is now displayed.

Set the desired code as follows:

Press **[ON]** (4) until the desired number is displayed.

Press **w** (6); the middle number appears. Press **[ON]** (4) until the desired number is displayed. Press **[S]** (6); the third digit appears.

Press **[ON]** (4) until the desired number is displayed. Then press **[S]** (6) for 2 seconds until "o" appears. This symbol indicates that the new code has been set. Hold down **[ON]** (4) for 2 seconds until an automatic self-test is run. Then release this key. The new code is now saved.

### Important Codes:

Adaptation to ambient conditions

You can adapt the scale to the ambient conditions that prevail at the place of installation.

	Code
Very stable conditions	1 1 1
Stable conditions (factory setting)	1 1 2°
Unstable conditions	1 1 3
Very unstable conditions	1 1 4

To obtain a detailed list of the menu codes, please ask your nearest Sartorius office, dealer or paint supplier.

## Care and Maintenance

### Cleaning

Use only naphtha or alcohol to clean the scale.

**⚠** Do not wash down the scale with water or dry it with compressed air.

### Safety Inspection

**⚠** If there is any indication that safe operation of the scale with the AC adapter is no longer warranted, turn off the power and disconnect the equipment from AC power immediately. Lock the equipment in a secure place to ensure that it cannot be used for the time being.

In this case, notify your Sartorius office, dealer or paint supplier. Only service technicians who are authorized by Sartorius and have access to the required maintenance manuals are allowed to perform maintenance and repair work on the equipment.

Safe operation of the equipment is no longer ensured when:

- there is visible damage to the equipment
- the equipment no longer functions properly.

Always unplug the scale before connecting peripheral equipment. You can choose the 9-pin or 25-pin data output port.



## Troubleshooting Guide

Problem	Causes	Solution
No segments appear on the weight display	- No AC power available	- Check the AC power supply
The display shows "L"	- The load plate is not in place	- Position the load plate
The display shows "H"	- The load on the pan exceeds the scale's capacity	- Unload the scale
The weight readout changes constantly	- Unstable ambient conditions - Too much vibration or the scale is exposed to a draft	- Set up the scale in another area - adapt the scale to the particular weighing environment
The weight readout is obviously wrong	- Scale not adjusted - The scale was not tared (zeroed) before weighing	- Adjust scale Tare/zero before weighing

## Storage and Shipping Conditions

Storage temperature: - 40 to + 70°C / - 40 to + 158°F

Read and follow the instructions given in the section entitled "Safety Inspection." If you need to return this equipment, disconnect all cables before shipping to prevent damage. Remove any splashes or spill of paint. Please enclose a description of the equipment failures/faults.

## CE Marking

### Note:

⚠ The seal marking affixed to the equipment indicates that the equipment may be opened and serviced only by technicians authorized by Sartorius to ensure proper functioning and safe operation of this equipment. Otherwise, you will invalidate the warranty.

The equipment meets the requirements of the following Council Directives:

89/336/EEC "Electromagnetic Compatibility (EMC)"

Applicable European Standards:

Limitation of emissions: EN 50081-1 Residential, commercial and light industry

EN 50081-2 Industrial environment

Defined immunity to interference: EN 50082-1 Residential, commercial and light industry

EN 50082-2 Industrial environment

### Note:

The operator shall be responsible for any modifications to Sartorius equipment and for any connections of cables or equipment not supplied by Sartorius and must check and, if necessary, correct these modifications and connections. On request, Sartorius will provide information on the minimum operating specifications (in accordance with the Standards listed above for defined immunity to interference).

## Specifications

Model		PMA 35D-X	PMA35D-X000C
Weight range	kg	35	35
Readability	g	0.5/1	0.5/1
Tare range (subtractive)	kg	- 35	- 35
Max. overload capacity	kg	70	70
Max. linearity	g	≤ 2	≤ 2
Repeatability	≤ g	1	1
Sensitivity drift	1/K	≤ ± 10 ppm	
at + 10° C to 30° C			
Integration time, can be selected externally	s	1.6 to 6.4	
Stability range can be selected externally	digit	0.25 to 4	
Allowable ambient operating temperature	°C	0 to + 40	
Moisture-proof rating		Class F Non-condensing	
Scale housing (WxDxH)	mm	400x 425 x approx. 90	
Load plate (WxDxH)	mm	400 x 300 x 53	
Net weight	kg	8	
Calibration weight	kg	10, class F2 or better	
Dust and water protection rating of the weighing platform	IP	54	
Dust and water protection rating of the display and control unit	IP	40	
Power consumption	VA	average: 8	
Interface		RS-232C	
- Format		7-bit ASCII, 1 start bit, 1 or 2 stop bits	
- Parity		odd, even, mark, or space	
- Transmission rates		150 to 9600 baud	
- Handshake		Software or hardware	
Power supply			
- 609308-011	EC	230 V, 50-60 Hz	
- 609308-61	USA/CDN	120 V, 50-60 Hz	
- 609308-211	GB	230 V, 50-60 Hz	
YDS03-XGR	GB	230 V, 50-60 Hz	
YDS03-XKR	USA/CDN	120 V, 50-60 Hz	

Data output, 25-pin:



Pin 1: shield, pin 2: transmit data (TXD), Pin 3: receive data (RXD),

Pin 5: clear to send (CTS), pin 20: data terminal ready (DTR), pins 7, 14: (SGN GND)

If the weighing instrument is installed in a hazardous area/location, any electrical circuits connected to the data output port must be intrinsically safe. The specifications listed in the KEMA Certificate 98ATEX0609X (see below) must be observed.

### Accessories

Calibration weight YCW713-00 1 x 10,000 g

### Note:

If you need extra literature for your equipment, you can order it directly from your local Sartorius office.



## AMENDMENT 1

to EC-TYPE EXAMINATION CERTIFICATE KEMA 98ATEX0609 X

Manufacturer: **Sartorius AG**

Address: **Weender Landstraße 94-108, 37075 Göttingen, Germany**

### Description

The Precision Weighing Instrument model range of the Model PMA7500.-X.. and Weighing Cell Model PMA7500.-X..W and PMA7500.-X..AM is extended by the Precision Weighing Instrument Model PMA35.-X... and Weighing Cell Model PMW35.-X..., and are constructed in accordance with the documentation stated below.

### Electrical data

#### Precision Weighing Instrument Model PMA35.-X...:

supply circuit .....  
(BU10, 3 pins) in type of explosion protection intrinsic safety  
EEx ib IIB, only for connection to a certified  
intrinsically safe circuit, with following maximum  
values:

$$\begin{aligned} U_i &= 9,3 \text{ V} \\ I_i &= 186 \text{ mA} \\ P_i &= 1,73 \text{ W} \end{aligned}$$

Effective internal capacitance  $C_i = 3,5 \mu\text{F}$   
Effective internal inductance is negligibly small

data output circuit .....  
(BU9, 9 pins) in type of explosion protection intrinsic safety  
EEx ib IIB, only for connection to a certified  
intrinsically safe circuit, with following maximum  
values:

$$\begin{aligned} U_i &= 12,6 \text{ V} \\ I_i &= 85 \text{ mA} \\ P_i &= 0,27 \text{ W} \end{aligned}$$

Effective internal capacitance  $C_i = 0,85 \mu\text{F}$   
Effective internal inductance is negligibly small

data output circuit .....  
(BU3, 25 pins) in type of explosion protection intrinsic safety  
EEx ib IIB, only for connection to a certified  
intrinsically safe circuit, with following maximum  
values:

$$\begin{aligned} U_i &= 12,6 \text{ V} \\ I_i &= 85 \text{ mA} \\ P_i &= 0,27 \text{ W} \end{aligned}$$

Effective internal capacitance  $C_i = 0,9 \mu\text{F}$   
Effective internal inductance is negligibly small



**AMENDMENT 1**

to EC-TYPE EXAMINATION CERTIFICATE KEMA 98ATEX0609 X

**Electrical data** (continued)

Weighing Cell Model PMW35.-X...:

supply and data output circuit ..... in type of explosion protection intrinsic safety  
(BU9, 15 pins) EEx ib IIB, only for connection to a certified  
intrinsically safe circuit, with following maximum  
values:

$U_i$	=	9,3	V
$I_i$	=	186	mA
$P_i$	=	1,73	W

Effective internal capacitance  $C_i = 4,5 \mu F$   
Effective internal inductance is negligibly small

All other data remain unchanged.

**Documentation**

signed

- |  |   |            |
|--|---|------------|
| 1. Description No. 35409-000-06-A4, Rev. 00  | ) |            |
| 2. Drawing No. 35409-000-05-A1/A4 (3 sheets) | ) | 01.04.1999 |
| 35409-000-33-A4                              | ) |            |
| 3. Samples                                   | ) |            |

Arnhem, 5. May 1999  
by order of the Board of Directors of N.V. KEMA

C.M. Boschloo  
Certification Manager

Code: II 2 G EEx ib IIB T4

[99.1929]

° This Amendment may only be reproduced in its entirety and without any change

Page 2/2



(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 98ATEX2752 X**
- (4) Equipment or protective system: **Power Supply Type 609308-..1**
- (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, 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. 82752.

- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
- EN 50014 : 1992 + prA1      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:

**Ex II (2) G [EEEx ib] IIC**

Arnhem, 21 December 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 98ATEX2752 X

(15) **Description**

The Power Supply Type 609308-..1 provides one intrinsically safe output channel for intrinsically safe scales. The maximum length of the interconnection cable Type LiYY 2 x 0,5 mm<sup>2</sup> 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 output circuit ..... in type of explosion protection intrinsic safety  
(terminal, LTG1, LTG2) EEx ib IIC, with the following maximum values:

$$\begin{array}{rcl} U_o & = & 8,7 \quad \text{V} \\ I_o & = & 185 \quad \text{mA} \\ P_o & = & 1,61 \quad \text{W} \end{array}$$

Maximum allowed external capacitance  $C_o = 4,1 \mu\text{F}$   
Maximum allowed external inductance  $L_o = 5 \mu\text{H}$

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 instructions**

The Power Supply Type 609308-..1 must be installed outside the hazardous area.

Inside the hazardous area, the Power Supply Type 609308-..1 must be mounted in an enclosure which is suitable for this purpose. The combination shall be separately investigated and certified.

**Routine test**

The transformer shall, before mounting into the apparatus, withstand per Clause 8.1.5 of EN 50020 - 1994 without breakdown the application of 2500 V between the primary and secondary winding.

(16) **Report**

KEMA No. 82752



**SCHEDULE**

(13)

(14)

to EC-Type Examination Certificate KEMA 98ATEX2752 X

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

For the ambient temperature range and the electrical data see (15).

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

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

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

(19) **Test documentation**

signed

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|--|------------|
| 1. Product compliance report ANNEX II,<br>65530-700-70-A4, Rev. 00 | 23.09.1998 |
| 2. Description No. 65530-700-06-A4, Rev. 00 (9 pages)              | 06.11.1998 |
| 3. Drawing No. 65530-000-05-A3 )                                   |            |
| 65530-000-30-A3 )  |            |
| 65530-700-95-A3 (2 sheets) )                                       | 23.09.1998 |
| 11. 1881. 060 -, Rev. e )  |            |
| 11. 1881. 060 - 02, Rev. f )                                       |            |
| 65530-000-60-A3 )  |            |
| 65530-700-90-A3 )  | 06.11.1998 |
| 65530-700-62-A4, Rev. 00 )   |            |

4. Samples

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