Operating Instructions

Sartorius Combics 2 Ex Indicator

for Use in Areas at Risk to Explosion

Model CAIXS2

98648-019-74

Contents

Notes on Using These Instructions

- ▶ Please read these instructions carefully and completely before using, maintaining or repairing the device.
- ▶ Observe the safety instructions.
- ▶ These instructions are part of the product. Keep it in a safe and easily accessible location.
- ▶ If the instructions should be lost or misplaced, please contact Sartorius for a replacement or download the latest version from our website: www.sartorius.com

Symbols and Signs

The following symbols are used in this manual:

Warning symbol for various types of dangers.

This symbol indicates useful information and tips.

I/⏻, 1, This and similar symbols mean that the respective key should be pressed.

T T ..., This means that this key must be pressed more than once.

- ▶ Indicates a required action
- ▷ Describes the result of an action
1. If a procedure has multiple steps...
2. ... the steps are numbered consecutively
- – Indicates an item in a list

Menu Descriptions

In some cases, text descriptions are used to describe menu settings and in other cases only the number structure of the menu is used for faster orientation for experienced users (e.g. “Menu item 1.9« contains the parameter settings for calibration/adjustment). The Setup menu is shown on the display when “CODES” is selected as the language.

Technical advice/hotline:

Phone: +49 (0) 40 / 67960444
Fax: +49 (0) 40 / 67960474

E-mail:
technical.support.hh@sartorius.com

Warnings and Safety Precautions

The Combics CAIXS2 indicator complies with the European Council Directives as well as international regulations and standards for electrical equipment, electromagnetic compatibility, and the stipulated safety requirements. Improper use or handling, however, can result in damage and/or injury.

▶ Read these operating instructions carefully before use.
This will prevent damage to the equipment.
Please observe safety instructions 65015-750-16 in the safety information section.
Please also bear the following points in mind:

Make absolutely sure to unplug the indicator from the power before you connect or disconnect any electronic peripheral devices to or from the interface port.

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.

The operator shall be responsible for any modifications to the equipment and for any connections of cables or equipment not supplied by Sartorius and must check and, if necessary, correct these modifications and connections.
Warning when using RS-232 cables, purchased from other manufacturers:
These often have incorrect pin assignments for use with Sartorius equipment.
Connect only Sartorius accessories and options, since these are optimally designed for use with your device. Therefore, do not use any proprietary solutions. The operator shall be solely responsible for installation and testing of any modifications to Sartorius equipment, including connection of cables or equipment not supplied by Sartorius. Information on operational quality (in line with norms pertaining to immunity) is available on request.

Clean your equipment only as directed in the cleaning instructions (see “Care and Maintenance”).

The display value can be affected by extreme electromagnetic influences. Once the disturbance has ceased, the instrument can be used again in accordance with its intended purpose.
Information on operational quality is available upon request from Sartorius (in line with norms pertaining to immunity).

▶ If you have any problems with your device, contact your local Sartorius office, dealer or service center.

IP Protection

IP Rating

- The model meets the requirements of protection class IP69K.
- The IP65/IP69k protection rating is ensured only if the rubber gasket is installed and all connections are fastened securely (including the caps on unused sockets). Weighing platforms must be installed and tested by a certified technician.

Equipment Description

CAIXS2 The CAIXS2 Ex-Indicator offers the following features:
- robust and durable, thanks to its stainless steel housing
- easy to clean and disinfect
- easy to operate, thanks to the following features:
  - large backlit display elements (14 segments)
  - large keys with positive click action
- operation independent of the platform location
- range of interfaces for flexible use
- password protection to prevent unauthorized alteration of operating parameters.

CAIXS2 Offers the following practical functions:
- easy calibration via a separate key
- automatic tare for loading
- alibi memory installed optionally
- automatic printout for loading
- configurable print-out
- FlexPrint.

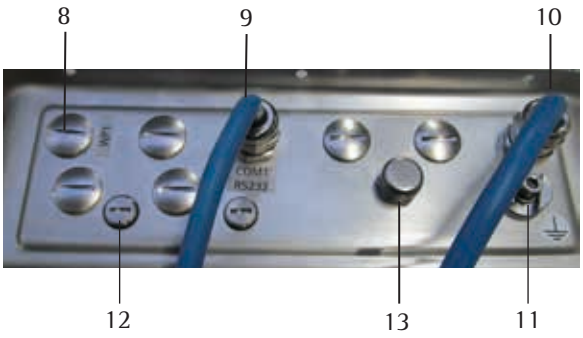
CAIXS2 Simplifies and speeds up your daily work with:
- integrated programs for applications (some can be combined):
  - counting
  - neutral measurement
  - averaging/animal weighing
  - weighing in percent
  - checkweighing
  - classification
  - totalizing
  - net-total formulation
- automatic initialization when the scale is switched on
- option to be controlled via an external computer using various protocols
- possibility of inputting tare values via the number block
- connection option for a second balance
- external battery
- product data memory.

Intended Usage

It is robust electrical equipment and suitable for use in daily quality control in industry for the tasks previously specified. The Combics 2 CAIXS2 Ex-Indicator is designed for use with suitable scales or weighing platforms that correspond to the described technical specifications. To do this, the CAIXS2 and accessories must be used within the parameters of the specifications (see Appendix).
The CAIXS2 Ex-Indicator meets the requirements set in EC Directive 94/9/EG for electrical equipment in category II 2 GD and as such is suitable for use in potentially explosive Zone 1 and Zone 21 atmospheres.
Any other use beyond this is considered improper.

CAIXS2 2

1 Display (for details, see “Operating Design” chapter)
2 On/Standby switch
3 General function keys: Zero, Tare, Switch function, Adjustment/ Calibration, Print/Data output (see “Operating Design”)
4 10 digit keypad for entering values
5 Additional function keys (see “Operating Design”)



Rear View

8 WP weighing platform connection
9 Connection options for COM1
10 Adapter cable with plug for EX power supply
11 Equipotential bonding conductor
12 Input for menu access switch (standard or legal-for-trade mode)
13 Vent valve

Installation

When a CAIXS2 indicator is ordered with special equipment, the desired options come pre-loaded from the factory.

Storage and Shipping Conditions

Excessive vibrations may compromise the safety of the equipment.

- Do not expose the equipment to unnecessarily extreme temperatures, moisture, shocks, blows or vibration.
- Permissible storage temperature: -20 to +60°C.

Installation Location

Avoid adverse influences at the place of installation:
- extreme temperatures (operating temperature: -10°C to +40°C)
- aggressive chemical vapors
- extreme moisture (according to IP protection rating).

Unpacking the Equipment

▶ After unpacking the device, check it for any visible damage as a result of rough handling during shipment.
▷ If you detect any damage, proceed as directed under “Safety Inspection” in the chapter entitled “Care and Maintenance.”
▶ Save the original packaging for any future transport.
Unplug all connected cables before packing the equipment.

Checking Package Contents

- Indicator
- Operating instructions
- Options (special accessories) as listed on the bill of delivery

Acclimatizing the Device

Condensation can form on the surfaces of a cold device when it is brought into a substantially warmer area.
▶ Allow the device to acclimatize for about 2 hours at room temperature, leaving it unplugged from the supply voltage.

Getting Started

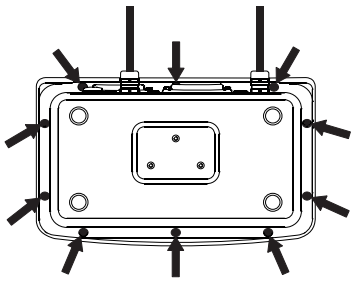
1.) Connect weighing platform to the indicator.
2.) CAIXS2 Indicators have an intrinsically safe data interface which can be connected to a computer (or any other peripheral device) using a barrier (e.g. YD105-Z).
3.) Connect the AC adapter.
4.) Configure the analog/digital converter (ADC).
5.) Carry out an alignment: Adjustment.

Connecting Weighing Platforms

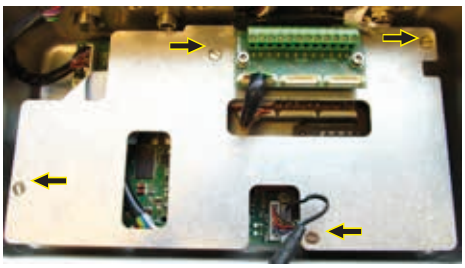
You can connect any intrinsically safe, analog Sartorius platform to your CAIXS2 Indicator. Refer also to the Verification of Intrinsic Safety, the EC Type Examination Certificate for the CAIXS2 and the load cell or analog weighing platform to be connected.

The load cell should be connected by a certified technician who has received specialized training from Sartorius. Any installation work that does not conform to the instructions in this manual results in forfeiture of all claims under the manufacturer's warranty.

Make sure the CAIXS2 is disconnected from the power before starting any connection work.



- ▶ Set up the weighing platform (see operating instructions for the weighing platform).
- ▶ Place the cable from the weighing platform next to the indicator.
- ▶ Open the Combics indicator:
  Loosen the ten cap nuts on the front panel. Remove the front panel.

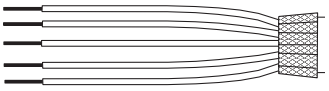


- ▶ Remove the cover plate by removing the 4 screws.
  Connection terminals are now visible.

Installing Connection and Interface Cables

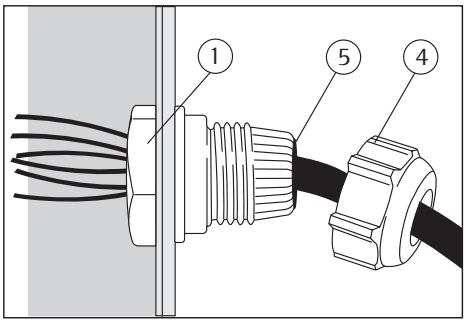
The cable gland (IP69K protection) is pre-mounted on the indicator.
Please use extreme caution when performing any work on the equipment that affects this cable gland.
You must use a torque wrench. The torque for this cable gland is 5 Nm.

Preparing the Cable



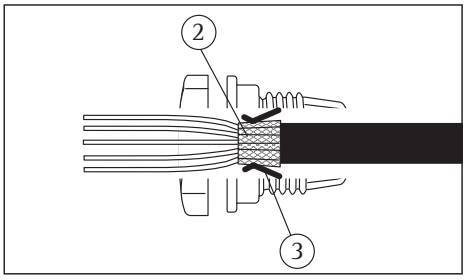
- Strip approx. 14 cm from the end of the cable.
- Shorten the shielding to approx. 2 cm and pull back over the insulation.
- Strip approximately 5 mm of the insulation from the wires of the connecting cable and affix ferrules to the wire ends.

Attaching the Cable Entry



Please use extreme caution when performing any work on the equipment that affects this cable gland.
You must use a torque wrench.
The torque for this cable gland is 5 Nm.

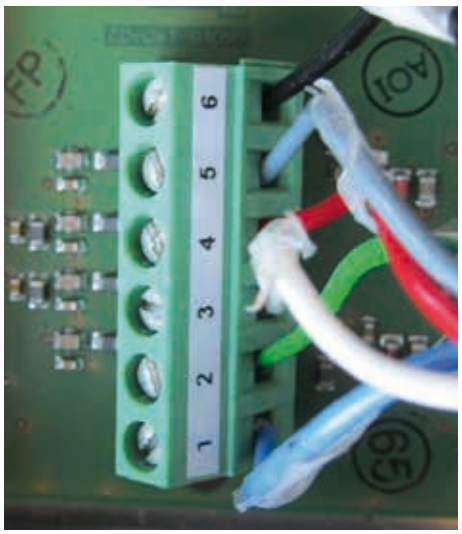
- Remove the protective caps from the bore hole on the indicator.
- Insert the included cable gland through the bore hole and secure from the inside using the locknut (1).



- Insert the cable through the cable gland until the shielding (2) comes into contact with the clamps (3). Tighten the screw-down nut (4) until the gasket (5) inserted between the screw-down nut and cable forms a small beaded rim.
- Check the shielding and clamps.

- Securely connect the wires of the connecting cable in accordance with the terminal assignments.

Connecting the Cable to the Analog/Digital Converter (ADC)



- Insert all cable wires through the ferrite case, wind them around the ferrite case and then reinsert back through the ferrite case.
- Screw the wires tightly into the clamps.

Pin Assignment

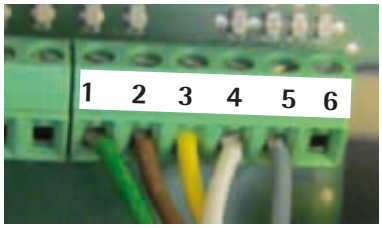
- Refer to the data sheet or operating instructions of the weighing platform for details on the assignment of wire colors/signals. Ensure any lines that are not assigned are insulated correctly.

Connect weighing platform to ADU, Option A15

1	EXC+	blue
2	Sense+	green
3	OUT+	white
4	OUT-	red
5	Sense-	gray
6	EXC-	black

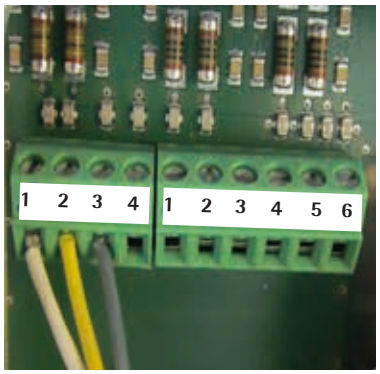
- When connecting a load receptor that uses 4-conductor technology (the cable of the weighing platform to be connected only has 4 lines), connect clamp pairs 1 and 2 (EXC+ and SENSE+), and 5 and 6 (SENSE- and EXC-) with a wire jumper.

Instead of an analog/digital converter (ADC), you could also install a data interface to connect an intrinsically safe digital weighing platform or balance (e.g. an IS.....-X).



Connection using RS232 (Option A16)

1	CTS	green
2	DTR	brown
3	RxD	yellow
4	TxD	white
5	GND	gray
6	GND	



Connection using RS485 (Option A19)

1	RxD-TxD-P	white
2	RxD-TxD-N	yellow
3	GND	gray
4	GND	

⚠ Insulate unused cable ends

Connecting Intrinsically Safe Data Cables

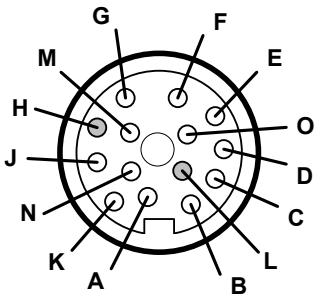
Connect intrinsically safe data cables to COM 1 (RS232, RS485 or RS422 and intrinsically safe control signals). For pin assignments on the data interface board, see 66015-741-50.

External voltage supply for AP1

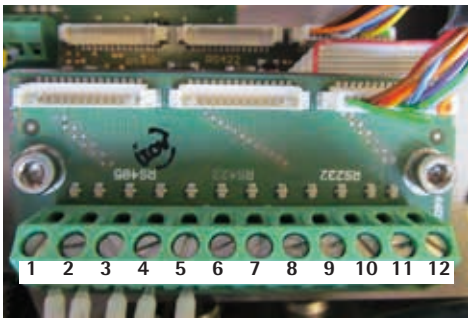
At AP1 connected IS platform requires an external
Voltage supply, see document 66015-741-50 Page 2/9.

Pin Allocations on the CAIXS2 Data Outputs (COM1)

Option	A21 RS232 +	A22 RS422	A23 RS485 +	Pin*)	Pin**)
	Digital I/Os		Digital I/Os		
	CTS	GND	GND	A	1
	RxD	GND	TxD-RxD_P	J	2
	TxD	TxD_N	TxD_RxD_N	K	3
	DTR	TxD_P	---	N	4
	GND	DRT_P	GND	C	5
	GND	RxD_N	GND	M	6
	GND	DTR_N	GND	B	7
	UNI_IN	---	UNI_IN	O	8
	SET	---	SET	D	9
	PAR	CTS_N	PAR	E	10
	MIN	CTS_P	MIN	F	11
	MAJ	RxD_P	MAJ	G	12



* 14-pin plug on adapter cable:



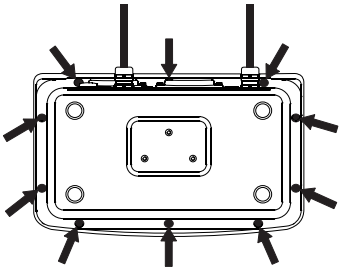
** 12-pin terminal block on the data adapter board:

Plug the 12-pin connection cable into the corresponding type of data output (see data sheet External Data Interface).

External voltage supply for COM1

At COM1 connected IS platform requires an external Voltage supply, see document 66015-741-50 Page 3/9.

▶ Insert the cover plate and tighten the screws.



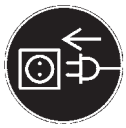
▶ Re-attach the front panel and tighten the ten cap nuts with a torque of 1 Nm.

Connecting the Device to AC Power

Power is supplied via an external power supply device, which is provided with the equipment.

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

Make sure that the voltage rating printed on the manufacturer's ID label is identical to that of your local mains voltage. If the voltage specified on the label or the plug design of the AC adapter do not match the rating or standard you use, please contact your Sartorius office or dealer.



▶ Check the voltage rating and plug design.
▶ The device must be plugged into a properly installed wall outlet.

Protection Class 1 Device

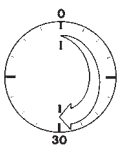
▶ The device must be plugged into a properly installed wall outlet that has a protective grounding conductor (PE).

Safety Precautions

If you use an electrical outlet that does not have a protective grounding conductor, ensure that an equivalent protective conductor is installed by a certified electrician (as specified in the applicable regulations for installation in your country).
The protective effect must not be negated by using an extension cord without a protective grounding conductor.

Before using for the first time, any superstructure parts must be completely installed.
Avoid connecting the equipment to lines that have a heavy electrical load, e.g. compressors, large machinery, etc.

Warm-Up Time



To deliver exact results, the device must warm up for at least 30 minutes after connection to AC power. Only after this time will the device have reached the required operating temperature.

Operating Design

Display and Keypad

1	Display
2	On/Standby key
3	Keys with no function
4	Zero key
5	Tare key
6	Function key unit conversion
7	Start calibration or adjustment
8	Print key (data output)
9	Toggle unit between normal and 10-fold higher resolution
10	View gross value (net value plus tare) View net value (gross value minus tare)
11	Product data memory
12	ID key for entering the operator ID
13	Numeric keypad
14	Toggle between application program and application- specific information
15	Display of applications and manual tare values
16	Toggle key (function depends on application)
17	OK key (function depends on application)
18	Reference value key (function depends on application)
19	Clear function key (function depends on active application)

Key Functions

I/⏻ **On/Standby switch**
When in Standby mode, STANDBY is displayed.

→0← **Zeroing key**
- Press key **for less** than 2 seconds: Zero
- Press key **longer** than 2 seconds: Display the adjustment/configuration counter

→T← **Tare key**
- Saves the numeric input as the tare weight
- Press key longer than 2 seconds: Save the preset tare weight

Fn **Function key**: Depending on the configuration in the Setup menu, switches between the
- first and second weighing unit
- results display and SQmin display.

ISO-Test **ISO test**: Start calibration or adjustment

Print key
- Press key **for less** than 2 seconds: Print
- Press key **longer** than 2 seconds: Print GMP footer

Toggle key: When a second platform is connected (COM1), this key toggles the display between the two readouts.

The following four keys are used for operating the individual applications. Their exact function is described in the respective section for the application.

CF **Delete key**: Deletes initialization values or totalizing memory. During numeric entry the last character entered is deleted.

REF **Reference value key**: Changes the set reference value.

OK **OK key**: Applies values or starts an application program.

Toggle key: Toggles between display modes within an application program.

Info **Info key**: Used to display application parameters and manual tare values (Info after pressing a follow-up key, e.g. →T←)

1, 2, 3 ... ·, 0 **Number block**: Used to enter numeric values

- ▶ To apply the value, press the corresponding function key (e.g. key →T← to save the entry as a manual tare value.
- ▶ To delete the last character entered, press the CF key.

Application toggle key: Toggles between available applications

ID **ID key**: Used to enter operator IDs

Mem **Save key**: Used to save values to the product data memory or load to the application

x10 **Resolution toggle key**: Toggles unit between normal and 10-fold higher resolution

B/G **Gross/Net value key**: Toggles between the gross or net value

Saving Settings in Weighing Mode

All application parameters saved (e.g. reference values) remain in memory and are available when:

- the device has been switched off and then on again
- you return to the originally selected application from a second one (e.g. when you switch from Averaging back to Counting. all parameters saved for Counting are available).

Applying the Tare Weight

- ▶ Place the tare object on the weighing platform.
- ▶ Press the T key.
- ▷ The value is applied as the tare value.

Input Through the Digital Control Port

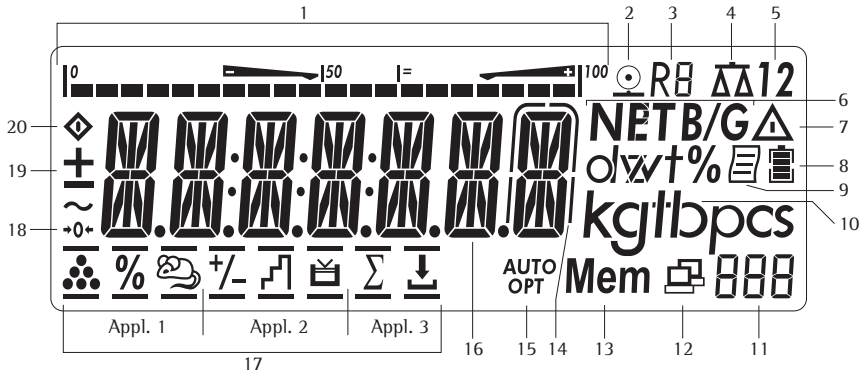
You can connect an external hard drive or foot switch to the control port (universal interface). You can assign one of the following functions to the control port in the SETUP / CTRL IO / INPUT / PARAMET / EXT.KEYB menu:

- key
- key (hold)
- →T← key
- ISO-Test key
- Fn key
- key
- OK key
- →0← key
- I/⏻ key
- CF key
- Info key
- key
- x10 key
- B/G key

The Display

There are two display modes:
- display for weighing (weighing values and calculated values)
- display in “Menu mode” (device settings).

Display in Weighing Mode



1 Bar graph showing 10% intervals
- shows the percentage of the weighing platform’s capacity that is “used up” by the load on the scale (0% = lower limit, 100% = upper limit)

or
- shows the measured value in relation to a target value (with the “Checkweighing” or “Classification” applications).

Minimum for checkweighing
Maximum for checkweighing
I= Target value for checkweighing

2 Symbol for active print job

3 **R**8 Displays the active range on multiple-range scales

4 Indicates active weighing platform; flashes to prompt calibration/ adjustment

5 **1 2** Selected weighing platform 1 or 2

6 **B/G NET** Net/Gross value on the main display (with tare in memory or preset tare)

7 Identifies the value on the main display as calculated (value not valid in legal metrology)

8 Battery charge status

9 GMP-compliant printing in progress

10 Weight unit of the value displayed

11 Numeric display; e.g. showing the reference value

12 Numeric display; e.g. showing the reference value
- Interface initialized (profibus/Ethernet)
- Flashes during data transfer (RS-232/485)

13 **Mem** Symbol for product data memory

14 In legal metrology, on equipment for which **e** is not equal to **d**, the digit bordered for identification is not taken into account

15 **AUTO/OPT**
- **AUTO**: Depending on the weight value, a reaction is triggered in the application
- **OPT**: Automatic optimization takes place for the Counting application

16 Measured value line: weight value or calculated value

17 Symbols for applications: An active application is identified by a line above and below the symbol ( ).

Application 1: “Counting”/ “Neutral Measurement”

“Weighing in percent”

“Averaging” (animal weighing)

Application 2: “Checkweighing”

“Classification”

“Checkweighing toward zero”
Manually batching toward “zero”

Application 3: “Totalizing”

“Net total formulation”

18 →0← The zero-setting symbol is displayed after the active scale or weighing platform has been zeroed (verified models only)

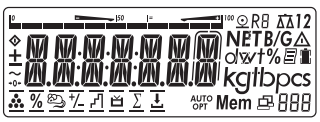
19 + − Plus or minus sign of the value displayed

20 Busy symbol indicates that an internal process is in progress

Menu Operating Concept

Switching to the Menu

I/⏻ ▶ Turn on the device.
If it is already on: turn off and then on again.

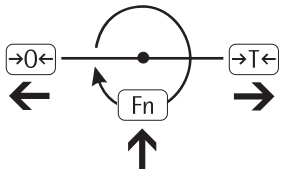


→T← ▶ During the display test, briefly press the →T← key.

▷ The menu will open. The top most level is always displayed (APPL.); for menu structure see page 136.

Navigating the Menu

You can navigate the menu using the keys with the white arrows under them.

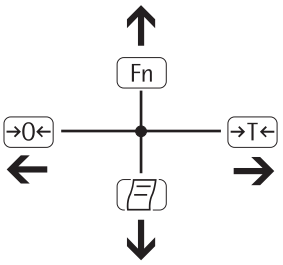


→0← Back to the superordinate menu level

Fn Access the next menu item on the same level
This continues to page through on the same level

→T← **Press less** than 2 seconds: Select the menu item and save
Press longer than 2 seconds: Exit the menu and switch to weighing mode

Print the menu settings starting from the current position, or print Info data



Entering Numbers and Letters (without a Number Block)

→0← – Press the key for **less** than 2 seconds: Activate character to the left of the currently active character (when first character is active: exit the input mode without saving changes)
– Press the key for **longer** than 2 seconds: Exit the input mode without saving changes

→0← – Press the key for **less** than 2 seconds:
Confirm currently active character and move 1 position to the right (after the last character: save input)

– Press key for **longer** than 2 seconds: Save current input and display the menu item

Fn – Cursor in first position, no characters entered yet: Delete character(s) and enter 0

– Change the displayed character; scroll forward (sequence: 0 ... 9, decimal point, minus sign, Z _ A, space)

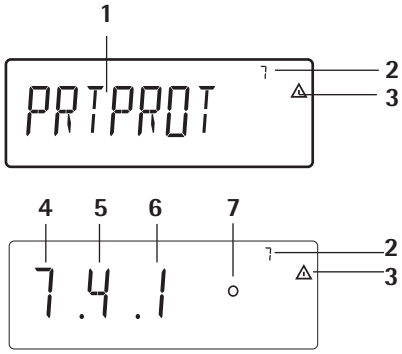
⌨ – Cursor in first position, no characters entered yet: Delete character(s) and enter a space

– Change the displayed character; scroll backward (sequence: space, A _ Z, minus sign, decimal point, 9 _ 0)

Enter number values (date and time, etc.) using the 10-key numeric keypad.

Menu Display

Both illustrations depict all of the main display elements and symbols that can be shown in Menu mode.



1 Selected menu item (e.g. printer for setting the connected printer)
2 Menu history (note at highest menu level in the Setup menu)
3 Note that other submenus are available

Display with the "CODES" language setting
4 First level in the Setup menu
5 Second level in the Setup menu
6 Third level in the Setup menu
7 Currently active setting

Saving Menu Settings

The parameters selected in the menu remain saved when you switch to weighing mode or turn off the device. You can block access to the SETUP menu by requiring a password to prevent unauthorized or accidental setting changes.

Configurations

Basic settings are made in the Menu mode by selecting the desired parameters. These are divided into the following groups (first menu level); for menu structure see page 136:

- Application parameter APPLIC.
- Function key FN-KEY
- Device parameter SETUP
- Device-specific information INFO
- User language LANGUAG.

When used in legal metrology, not all parameters can be accessed. Only those parameters that can be selected are displayed. Factory-set parameters are identified by an "*" in the list starting on page 137.

Printing Parameter Settings

▶ Access the Menu mode (see page 35).
▶ Press the ⎙ key.

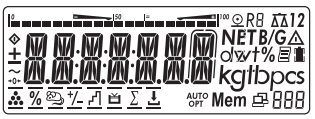
The scope of the printout depends on the position in the setup. It may take several seconds.

Language Settings

Example: Select the language "German." The factory setting for language is "English."
Menu: APPL / LANG.

I/⏻

▶ Turn on the device.



▶ While all segments are lit, press the →0← key briefly.

▷ The first item in the main menu is shown: APPL.

Fn Fn ...

▶ Press the Fn key until the LANGUAG. menu item is displayed for the language setting.

→T←

▶ Press the →T← key to access the language setting sub-menu.

▷ The currently set language is displayed.

Fn Fn ...

▶ Press the Fn key until GERMAN is displayed.

→T←

▶ Press the →T← key to save the selection.

▷ The small circle indicates that the setting has been saved.

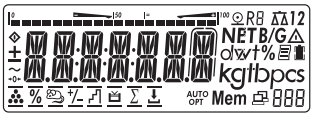
→0← Use the →0← key to exit the menu level to make additional settings if required.

or

→T← Press the →T← key longer than 2 seconds to exit the menu.

Setting Up Password Protection

I/⏻ ▶ Turn on the device.



▶ While all segments are lit, press the →0← key briefly.

▷ The first item in the main menu is shown: APPLIC.

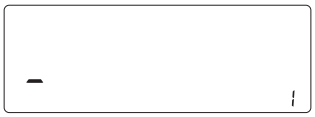
Fn Fn ... ▶ Press the Fn key until the SETUP menu item is displayed.

→T← ▶ Press the →T← key to open the SETUP sub-menu.

▷ The first parameter in the Setup sub-menu is displayed: WP-1.

Fn Fn ... ▶ Press the Fn key until BEN.-CODE is displayed.

→T← ▶ Press the →T← key to open the menu item.



▷ The position for the first character to be entered flashes.

⌸ Fn ▶ Use the ⌸ and Fn keys to select the desired character.
⌸ starts the character selection with A alphabetically and
Fn starts the character selection with 0 and counts upward.
Alternatively, enter a number value using the 10-key numeric keypad directly.

→T← ▶ To apply a character, press the →T← key.

▶ Enter all additional characters of the password as described above.
▶ Press and hold the →T← key to save the password.

→0← Use the →0← key to exit the menu level to make additional settings if required.

or

→T← Press the →T← key longer than 2 seconds to exit the menu.

Changing or Deleting Passwords

▶ In the SETUP sub-menu, open the BEN.CODE menu item as described above.
▷ The old password must be entered to change or delete a password.
▶ To change a password, overwrite the old password.
▶ To delete a password, enter spaces and press the →T← key.

Configuring Weighing Platforms

Service mode

Purpose The Service mode enables access to additional menu items in the Setup menu (SETUP) which are not displayed when the Service mode is not active. The most important calibration and adjustment work for the indicator and for the connected weighing platform can be carried out in the Service menu, e.g. ADC configuration.

When the Service mode is active, an "S" is shown in the top right-hand corner of the display. To deactivate the Service mode, restart the indicator (turn the indicator off and back on again).

In Service mode, the SETUP menu is expanded with the following parameters after entering the user password:

- S-DATE for entering the next service date
- SER.NO. for entering the device serial number
- MODEL with the model description
- S-SOMIN
- ALIB.MEM for deleting the alibi memory.

The Setup menu for WP 1 and WP2can be extended to include the following setting options to confugure the weighing platforms:

Param1

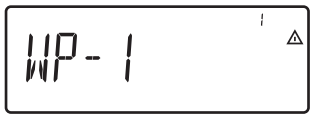
CAL.ADJ calibration, adjustment	1.9
LIN.INT internal linearization	1.9.5
LIN.EXT. external linearization with default weights	1.9.6
LIN.E.USR external linearization with user-defined weights (entered under 1.18)	1.9.7
SET.PREL. set the preload (not for use in legal metrology)	1.9.8
DEL.PREL delete the preload (not for use in legal metrology)	1.9.9
HNDJ.XT.G/CAL.ADJ enter the adjustment and linearization weights	1.18
CAL.ADJ. 1 enter adjustment weight	1.18.1
LIN.WT. 1 enter lin. weight 1	1.18.2
LIN.WT.2 enter lin. weight 2	1.18.3
LIN.WT.3 enter lin. weight 3	1.18.4
LIN.WT.4 enter lin. weight 4	1.18.5
ADJ.W/O.W adjust without weights (enter the characteristic data of the load cells)	1.19
NOM.LOAD. nominal load	1.19.1
RESOLUT resolution (only visible for older ADCs)*	1.19.2
SENSIT. 1 sensitivity in mV/V for cell 1 (or average value for all cells)	1.19.3
SENSIT.2 sensitivity in mV/V for cell 2	1.19.4
SENSIT.3 sensitivity in mV/V for cell 3	1.19.5
SENSIT.4 sensitivity in mV/V for cell 4	1.19.6
ZER.POIN zero point or offset of system in mV/V	1.19.7
SAVE. save values for 1.19	1.19.8
GEOG.DAT adjustment location (geograph. data; or alternatively the gravitational acceleration at the place of installation)	1.20
LATITUD latitude in degrees	1 20.1
ALTITUD elevation in meters above sea level	1 20.2
GRAVITY. gravitational acceleration	1 20.3
SAVE. save values for 1.20	1 20.4
ADC settings (see Analog/Digital Converter)	11
Apply the serial number of the IS weighing platform	12.1
Apply the serial number	12.1.1
Inactive (standard WP)	12.1.2

Activating the Service Mode

I/⏻ ... →T← ▶ Switch to the Menu mode.

Fn Fn ... ▶ Access the SETUP menu.

→T← ▶ Select SETUP.
If a password is requested at this point, enter the service password (see Appendix) and continue with “Saving the service password.”

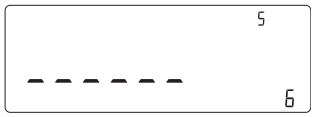


Fn Fn ... ▶ Access menu item U-CODE.

→T← ▶ Select BEN.CODE.

▶ Enter the service password (see Appendix).

→T← ▶ Apply the service password.
▷ The Service mode is active: an “S” appears in the top right-hand corner of the display.



→0← →0← ▶ Return to SETUP in the Service mode.

Analog/Digital Converter (ADC)

Purpose

Adjust the parameters of the analog/digital converter to the connected load cell or weighing platform. After ADC configuration, the ADC in connection with the load sensor is defined as a scale.

Once the ADC configuration has been locked, the indicator can no longer be used to influence weighing results. The scope of functions available in the weighing instrument is defined by the A/D converter. Weighing functions that can be activated include reading weight values, taring, adjustment, reading the tare value and saving/deleting the tare entry.

Setup information

- ADC configuration is only possible when the menu access switch is open. Close the menu access switch after ADC configuration, as otherwise there will not be any display of the conditions “overload” (H) and “underload” (L).
- Before ADC configuration, you must first set whether or not the weighing platform will be used as a standard or verifiable weighing platform under menu item 9.1.
- When the Service mode is activated, the ADC configuration takes place in the SETUP **menu** under WP-1 for the first weighing platform and under COM1/WP-2 for the second weighing platform.

If you return to the highest level of the Setup menu without saving the configuration parameters beforehand (menu item 11.10) any settings that have been made will be deleted.

- The settings are made in the corresponding Setup menu under menu item 11.
- Enter the maximum capacities in a suitable weight unit, without any decimal places (decimal places will be truncated by the rounding function).
- Entries made in the ADC configuration will not be affected by a menu reset (returning the setup parameters to their factory settings).

Factory settings/Reset menu			**9.1**
WT.PARA			
STANDRD	Standard configuration		9.1.3
RANGE	Ranges		11.3
	SINGLE	Single-range scale	11.3.1
	MULT.INT	Multi-interval scale	11.3.2
	MULT.RNG	Multiple-range scale	11.3.3
SINGLE	Single-range scale		11.4
	D	Scale interval d	11.4.1
	MAX	Max. load	11.4.4
MULT.INT	Multi-interval scale		11.5
	D	Scale interval d	11.5.1
	RANGE 1	Range 1	11.5.4
	RANGE 2	Range 2	11.5.5
	RANGE 3	Range 3	11.5.6
	MAX	Max. load	11.5.7
MULT.RNG	Multiple-range scale		11.6
	D	Scale interval d	11.6.1
	RANGE 1	Range 1	11.6.4
	RANGE 2	Range 2	11.6.5
	RANGE 3	Range 3	11.6.6
	MAX	Max. load	11.6.7
WT.UNIT	Available weight units		11.7
	FREE	User-defined /o	11.7.1
	G	Grams /g	11.7.2
	KG	Kilograms/kg	11.7.4
		...	
	T	Tons/t	11.7.21
	LB	Pound:ounces/lb o	11.7.22

CAL.UNIT	Calibration/Adjustment unit		11.8
	FREE	User-defined /o	11.8.1
	G	Grams /g	11.8.2
	KG	Kilograms/kg	11.8.3
		...	
	T	Tons/t	11.8.21
SAVE	Save configuration parameters		11.10
	YES	Yes	11.10.1
	NO	No	11.10.2

Setting Parameters for ADC Configuration

Standard or verifiable configuration

In ADC configuration, you must first select whether the weighing platform should be configured as a standard or verifiable (for use in legal metrology) weighing platform.

- Standard configuration STANDRD (9.1.3)
- Verifiable configuration VERIF. (9.1.4)

Configuration unit

1.WT.UNIT Menu item 1.7

The weight unit used in the ADC configuration must have previously been selected here.

Range selection

RANGE Menu item 11.3

Depending on the setting under this menu item, the Menu items 11.5, 11.6 and 11.7 will either be displayed or will not be displayed for further configurations.

- Single-range scale (11.3.1)
  The entire weighing capacity is divided into decimal numbers dependent on the smallest scale interval d and the maximum weight. The readability corresponds to the scale interval d.
- Multiple-range scale (11.3.2)
  A multiple-range scale has two or three weighing ranges. When the range limit for the lower weighing range is exceeded, the scale switches into the next highest weighing range (lower resolution). The scale only switches back to the lower weighing range (higher resolution) when the weighing platform has been completely unloaded after pressing the key →0←.
- Multi-interval scale (11.3.3)
  The function “Multi-interval scale” divides the weighing capacity into a maximum of three ranges with differing readability. The corresponding change takes place automatically at the defined range limits. Once the scale has been tared, the highest possible resolution is available even if the weighing platform is loaded.

Scale interval d

Scale interval d indicates the resolution of the weighing instrument.
The scale interval can only be entered in increments of 1, 2, 5, 10, 20, etc.
When “Verifiable configuration” is used, this menu item is not displayed. When using verifiable or verified weighing platforms (classes I and m), scale interval d is the same as verification scale interval e.

Verification scale interval e

Verification scale interval e indicates the resolution of the weighing instrument in legal metrology.
The scale interval can only be entered in increments of 1, 2, 5, 10, 20, etc.
When “Standard configuration” is used, this menu item is not displayed.

Maximum load (max. load)

The maximum load is the maximum amount of weight that may be placed on the weighing platform. When heavier weights are used the weighing instrument displays overload "H".
The scale intervals of the weighing instrument are calculated using the maximum load and the scale interval d (e.g. max. capacity = 15.000 kg, smallest scale interval d = 0.005 kg yields 3000 scale intervals).
In legal metrology the total number of intervals must be no more than 3000 e, and when using multi-interval scales there must not be more than 3000 e intervals per range.
In standard operation, as opposed to legal metrology, you can define a “Super Range” weighing instrument of over 3000 intervals. These parameters, however, may be influenced by physical restrictions.

Minimum load (min. load)

When “Standard configuration” is used, this menu item is not displayed.
The minimum load of the connected weighing platform is entered under this menu item. The minimum load for scales of class (III) is 20 e and 10 e for class (IIII).
Attention: The function of the minimum load setting is to warn operators that below this limit, the summation of tolerances might lead to significant measurement errors. In Germany, for example, initial weights below the minimum load are not allowed.

Available weight units

WT.UNIT Menu item 11.7
This menu item is used to select the weighing units that have been cleared for use in weighing. All units marked with a circle (o) have been cleared for use, multiple selection is possible.

Calibration/Adjustment unit

CAL.UNIT Menu item 11.8
This menu item is used to select the weighing unit that must be used for a calibration/adjustment. The selected unit is then valid as a calibration/adjustment unit even when a different unit is used during normal weighing operation.

Save parameters

SAVE Menu item 11.10
The ADC configuration data is saved by selecting Menu item 11.10.1.

Configuring the A/D Converter (ADC)

The weighing platform must already be connected.

Opening the Menu Access Switch

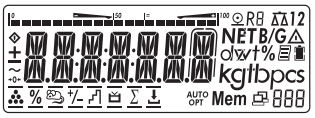
The menu access switch is located on the back of the indicator, behind the cover.

▶ Remove the cap.

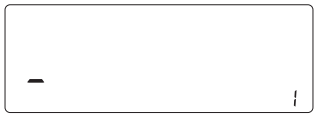
▶ Slide the switch to the right (= “open” position).

Menu Access Switch/Calibration Switch Cover

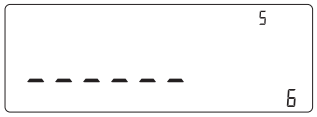
[I/⏻] ▶ Switch off and restart the device.



▶ While all segments are lit, press the [→0←] key briefly.



▷ ADC-CON appears briefly on the display, followed briefly by S-CODE.



▷ The cursor flashes on the display.

▶ Enter the service password (see Appendix).

[→T←] ▶ Confirm your entry using the [→T←] key.

▷ The device is in Service mode. This can be recognized by the small S in the top right of the display.

▶ Select the weighing platform to be configured, using the [Fn] key to switch to WP-2 if required.

[→T←] ▶ Confirm your selection using the [→T←] key.

▶ Select the Configuration mode using the [Fn] key: STANDRD or VERIF.

▶ Carry out ADC configuration (see menu tree).

▶ Once you have completed the configuration, save the data using the SAVE menu item.

▷ The indicator will restart automatically.

The A/D converter can now be treated like a standard weighing platform in connection with the load sensor.

▶ Close the menu access switch (left position) and reattach the cap.

Once ADC configuration has been completed, an adjustment of the weighing platform (calibration/adjustment and linearization) must be carried out (see “Calibration/Adjustment without Weights”).

Installation location in Germany

An exception to this is the setting for “Germany (Zone D)”: If during external adjustment of weighing equipment within Germany the geographical data
- geographical latitude: 51.00 degrees N
- elevation: 513 m

is entered, the weighing equipment can be used throughout Germany.
Gravitational acceleration for “Germany (Zone D)” is 9.810 m/s^2.
On delivery the geographical data for “Germany (Zone D)” is entered in the output device.
It is recommended to use the geographical data settings for “Germany (Zone D)” when adjusting and delivering the weighing equipment within Germany. Entering exact geographical data will lead to a higher level of accuracy but will also restrict the tolerance zone.

Setup information

- It is only possible to enter geographical data when the menu access switch is open.
- When the Service mode is active, geographical data can be entered in the SETUP menu under "WP- 1" for the first weighing platform and under COM 1/ WP-2 for the second weighing platform. The settings are made in the corresponding Setup menu under menu item 1.20.
- Either the “geographical latitude in degrees” (LATITUDE menu item 1.20.1) and “elevation in m above sea level” (ELEVATION menu item 1.20.2) or the value for gravitational acceleration (GRAVITY menu item 1.20.3). Gravitational acceleration takes precedence over the geographical latitude and elevation of the location: If it has been entered, input fields for latitude and elevation show the values 99999.99 and 9999999 respectively. If only elevation and latitude have been entered, 0000000 is displayed for gravitational acceleration.

If you return to the highest level of the Setup menu without saving the configuration parameters beforehand (menu item 1.20.4) any settings that have been made will be deleted.

Procedure

- ▶ Open menu access switch.
  If the device is part of a verified weighing facility, this will only be possible if the verification seal is broken. The weighing equipment must then be verified again.
- ▶ Activate the Service mode.
- ▶ Select the weighing platform.
- ▶ Enter the geographical data for the place of adjustment under menu items 1.20.1 to 1.20.3 and save them under menu item 1.20.4. The data can be obtained from the relevant land registry or Ordnance Survey.
- ▶ Carry out external calibration.
- ▶ After the calibration, enter the geographical data for the place of installation under menu items 1.20.1 to 1.20.3 and save them under menu item 1.20.4.
- ▶ Close the menu access switch.
- ▷ The weighing equipment can now be operated at the place of installation, and within the abovementioned tolerance zone.

Note: The set geographical values are displayed during the adjustment procedure if the display of the data has been activated in the Setup menu under UTILIT menu item 8.12.2 (factory setting: 8.12.1, display deactivated).

When the display is activated the adjustment procedure is as follows:

- ▷ If the elevation and geographical latitude are used, after the start of the CAL adjustment procedure the word ALTITUD will appear briefly followed by the set elevation (in meters above sea level).
- ▶ Confirm the display using the →T← key (cancel using the →0←) key.
- ▷ Then the word "LATITUD" will be displayed briefly followed by the set geographical latitude in degrees.
- ▶ Confirm the display using the →T← key (cancel using the →0←) key.
- ▷ You are then asked to place the calibration weight on the weighing platform. If gravitational acceleration has been entered instead of elevation and geographical latitude, the word GRAVITY T will appear briefly, followed by the value set for gravitational acceleration.
- ▶ Confirm the display using the →T← key (cancel using the →0←) key.

Menu structure for entering the geographical data

GEOG.DAT	adjustment location (geograph. data; or alternatively the gravitational acceleration at the place of installation)	1.20
LATITUD	latitude in degrees	1.20.1
ALTITUD	elevation in meters above sea level	1.20.2
GRAVITY.	gravitational acceleration	1.20.3
SAVE.	save values for 1. 20	1.20.4

Entering Adjustment and Linearization Weights

Purpose Entering adjustment and linearization weights.

Setup information
- The Service mode must be activated in order for linearization weights to be entered under menu items 1.18.2 to 1.18.5 (see page 17).
- **Adjustment and linearization weights are entered in the SETUP menu** under WP-1 for the first weighing platform and under COM1/WP-2 for the second weighing platform. The settings are made in the corresponding Setup menu under menu item 1.18.
- The Service mode does not have to be activated in order for external user-defined adjustment weights to be entered under menu item 1.18.1.
- The adjustment and linearization weights must be entered in the unit selected for the ADC configuration under menu item 11.8.

Procedure
- ▶ Activate the Service mode (only necessary if linearization weights are going to be entered).
- ▶ Select the weighing platform.
- ▶ Enter the external user-defined adjustment weight under menu item 1.18.1.
- ▶ Enter the external linearization weight under menu items 1.18.2 to 1.18.5.

Menu structure for entering the adjustment and linearization weights

MAN.EXT.W enter the adjustment and linearization weights	1.18
LCAL.ADJ enter external user-defined adjustment weight (Service mode not required)	1.18.1
LIN.WT.1 enter lin. weight 1	1.18.2
LIN.WT.2 enter lin. weight 2	1.18.3
LIN.WT.3 enter lin. weight 3	1.18.4
LIN.WT.4 enter lin. weight 4	1.18.5

Function Allocation of the ISO-Test Key

Purpose The ISO-Test key is normally used for the calibration/adjustment function. For detailed information about calibration and adjustment, see “Operation” starting on page 47. The following additional functions can be allocated to the key when the Service mode is activated:
- external linearization with default weights (menu item 1.9.6)
- external linearization with the linearization weights (menu item 1.9.7) entered under menu item 1.18
- internal linearization (menu item 1.9.5)
- set preload (menu item 1.9.8) (only possible if not required for use in legal metrology)
- delete preload (menu item 1.9.9) (only possible if not required for use in legal metrology).

Once linearization has been completed, or after a preload has been set or deleted, the function of the ISO-Test key must be reallocated back to its original function in the Setup menu, e.g. external calibration/adjustment with default weights (setup, menu item 1.9).

Menu structure for the function allocation of the ISO-Test key

CAL.ADJ calibration, adjustment	1.9
CAL.EXT. calibration/adjustment with default weights (Service mode not required)	1.9.1
CAL.E-USR. calibration/adjustment with user-defined weights (entered under 1-18, Service mode not required)	1.9.3
LIN.INT internal linearization	1.9.5
LIN.EXT. external linearization with default weights	1.9.6
LINE.USR external linearization with user-defined weights (entered under 1.18)	1.9.7
SET.PREL. set the preload (only possible when used in non-legal metrology)	1.9.8
DEL.PREL. delete the preload (only possible when used in non-legal metrology)	1.9.9
BLOCKED key blocked	1.9.10

External Linearization

Setup information

- External linearization when weighing in legal metrology is only possible when the menu access switch is open.
- The “external linearization” function must be allocated to the [ISO-Test] key (menu item 1.9.6 or 1.9.7).

⚠ Once linearization has been completed, the [ISO-Test] key must be reallocated back to its original function in the Setup menu, e.g. external calibration/adjustment with default weights (Setup menu item 1.9).

Procedure

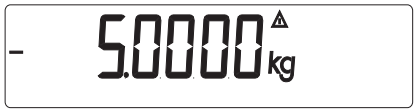
▶ For scales used in legal metrology: Open the menu access switch.

[→0←] ▶ Zero the weighing platform.

▶ Activate the Service mode.

[ISO-Test] ▶ Start linearization.

▶ After approximately 2 seconds you will be prompted to place the first linearization weight on the platform.

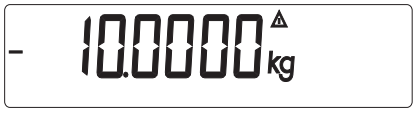


▶ Place the required weight on the platform.

▷ After a short time the difference between the measured value and the true weight of the sample will be displayed.

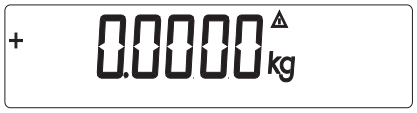
[→T←] ▶ Save the linearization weight (cancel using the [→0←]) key.

▷ You will then be prompted to place the second linearization weight on the platform.



▶ Repeat the procedure for all required linearization weights.

▷ After the last linearization weight has been saved you will be prompted to remove any load from the weighing pan.



▶ Unload the weighing pan.

▶ After a short period of time the zero point will be applied automatically and the indicator will automatically switch back to weighing mode.

▶ Re-close the menu access switch.

Set preload

Setup information

- Setting the preload when weighing in legal metrology is only possible using the "Zero at Power On" menu item.
- The "Set Preload" function (menu item 1.9.8) must be allocated to the [ISO-Test] key.

⚠ Once the preload has been set, the [ISO-Test] key must be reallocated back to its original function in the Setup menu, e.g. external calibration/adjustment with default weights (Setup menu item 1.9).

Procedure

[→0←] ▶ Zero the weighing platform.

▶ Place the preload weight on the weighing platform.

[ISO-Test] ▶ Start the "Set Preload" function.

▷ After a short period of time the preload will be applied and the indicator will automatically switch back to weighing mode.

Clearing the Preload

Setup information

- Clearing the preload when weighing in legal metrology is only possible using the “Zero at Power On” menu item.
- The “Clear Preload” function (menu item 1.9.9) must be allocated to the ISO-Test key.

⚠ Once the preload has been deleted, the ISO-Test key must be reallocated back to its original function in the Setup menu, e.g. external calibration/adjustment with default weights (Setup menu item 1.9).

Procedure

▶ Remove the preload weight from the weighing platform.

ISO-Test

▶ Start the “Clear Preload”.

▷ After a short period of time the preload will be deleted and the indicator will automatically switch back to weighing mode.

Adjustment without Weights

In the Service menu, adjustment without weights can be carried out by entering the characteristic data of the load cells.

Adjustment without weights may not be carried out on weighing equipment used in legal metrology.

Setup information

- Adjustment without weights is only possible when the menu access switch is open in the Service menu.
- When the Service mode is active, the parameters necessary for adjustment without weights can be entered in the SETUP menu under "WP- 1" for the first weighing platform and under COM1/WP-2 for the second weighing platform. The settings are made in the corresponding Setup menu under menu item 1.19.
- The "Nominal load" parameter must be entered in the "kg" unit.
- The "Resolution" parameter must be entered in the "kg" unit and must correspond to the scale interval "d" entered for the ADC configuration. This parameter is only available or visible with older ADCs.
- The "Sensitivity" parameter is entered in mV/V (see the data sheet for the value). - The "Zero Point" (Offset) parameter is entered in mV/V. This parameter is not visible with older ADCs.

The data entered is saved by selecting menu item 1.19.7. After saving, the data will no longer be able to be read.

Procedure

- ▶ Open the menu access switch.
- ▶ Activate the Service mode.
- ▶ Select the weighing platform.
- ▶ Enter the nominal load of the load cell(s) in kg under menu item 1.19.1. If the weighing platform has multiple load cells, the nominal load must be multiplied accordingly (e.g. 4 load cells, each of which has a capacity of 50 kg, will produce a nominal load of 200 kg).
- ▶ Enter the resolution in kg under menu item 1.19.2. The value must correspond to the scale interval d entered under menu item 11.4.1. This applies only to older ADCs.
- ▶ Enter the sensitivity of the load cells in mV/V under menu item 1.19.3. For weighing platforms with multiple load cells: Enter the individual values of the load cells in 1.19.3 to 1.19.6 or enter the average of all load cells in 1.19.3. Values for the zero point or the dead load are set under 1.19.7. This does not apply to older ADCs.
- ▶ Save the values for adjustment without weighing under menu item 1.19.8.
- ▶ Close the menu access switch.

Menu Structure for Adjustment without Weights

ADJ.W/O.W	adjust without weights (enter the characteristic data of the load cells)	1.19
NOM.LOAD	nominal load	1.19.1
RESOLUT	resolution (only visible for older ADCs)*	1.19.2
SENSIT.1	sensitivity in mV/V for cell 1 (or average value for all cells)	1.19.3
SENSIT.2	sensitivity in mV/V for cell 2	1.19.4
SENSIT.3	sensitivity in mV/V for cell 3	1.19.5
SENSIT.4	sensitivity in mV/V for cell 4	1.19.6
ZER.POIN	zero point or dead load in mV/V. (not for older ADCs)*	1.19.7
SAVE.	save values for 1.19	1.19.8

Operation

Weighing

This application is always available during operation.

Features:
- Zeroing by pressing →0←
- Storing the weight on the platform as a tare by pressing →T←
- Taring container weight automatically
- Using a 10-key keypad to enter tare weight
- Deleting tare values by entering 0 and →T← / CF and →T←
- Toggling the display using the Fn key between:
  - 1st and 2nd weight unit
  - SQmin
- Configuring the Fn key function in the “Fn key” Setup menu
- 10-fold increased resolution using the x10 key
- Toggling between the gross or net value using B/G Weighing with two weighing platforms
- Individual numeric ID codes for weight values
- Printing weight value:
  - GMP printout
  - Automatic printout
  - Automatic data output (see Data Interfaces chapter)

Automatic Taring (APPLIC menu item 3.7):
When the menu item is active (3.7.2), the first weight on the scale that exceeds the preset minimum load is stored in the tare memory at stability.
The scale returns to the initial state when the load on the scale is less than 50% of the minimum load.

Minimum load for automatic taring and automatic printing
(menu item 3.5):
You can set the following for the minimum load:
1 digit (no minimum load)
2 digits
5 digits
10 digits
20 digits
50 digits
100 digits
200 digits
500 digits
1000 digits

The “digits” here refer to the scale intervals for the connected weighing platform. If the interval is 1 g and 1000 digits are required, the minimum load is 1000 g (1000 intervals).

If the weighing platform interval is 5 g and the same number of digits as above is required, the minimum load is 5000 g.

When the load exceeds the minimum load limit, the weighing platform is tared automatically and/or a report printout is generated automatically; however, this requires the corresponding menu items to be active for automatic taring (menu item 3.7.2) and for automatic printing (menu 7.15.2).

Automatic printing (*PROTOC* menu item 7.15):
When the menu item (7.15.2) is active, the first weight value that exceeds the minimum load is printed.
If the menu item is also activated for automatic taring, it is only tared when the minimum load is exceeded. In this case, an automatic printout would only be generated when the second weight value exceeds the minimum load.

Main scale: first platform displayed on start-up
You can select the weighing platform to be displayed first when CAIXS2 is turned on in the Setup menu under "*UTILIT*" (menu item 8.11.).

Adjustment/Configuration Counter for Standard cales

Purpose Automatically record changes to adjustment and weighing parameters using two independent counters. The values remain saved for the life of the device.

▶ To display both counters, press and hold the →0← key for longer than 2 seconds.

▷ The “Configuration counter” is first of all shown in the weight display for 3 seconds (identified by a P). The “Adjustment counter” is then displayed for another 3 seconds (identified by a C). After 6 seconds, the information display turns off automatically.

Adjustment counter features:

- Counter limited to 9999
- Counter at “C 0000” for hardware commissioning
- Counter cannot be reset
- Counter is updated automatically when:
  - linearization, calibration/adjustment is successful
  - user calibration, adjustment or linearization weight is changed (menu 1.18.)
  - when the following parameters are changed:
    function of the CAL key (menu item 1.9.)
    zero setting range (menu item 1.11)
    tare/zero at power on (menu item 1.12)
    the above parameters are reset to factory settings (menu item 9.1.1).

Configuration counter features:

- Counter limited to 9999
- Counter at “P 0000” for hardware commissioning
- Counter cannot be reset
- Counter is updated automatically when:
  - the following parameters are changed:
    installation location (menu item 1.1.)
    application filter (menu item 1.2.)
    stability range (menu item 1.3.)
    taring (menu item 1.5)
    auto zero (menu item 1.6.)
    weight unit 1 (menu item 1.7.)
    weight unit 2 (menu item 3.1.)
    weight unit 3 (menu item 3.3.)
    the above parameters are reset to factory settings (menu item 9.1.1)
  - switching the Fn key to or from a 10-fold higher resolution
  - turning the application automatic taring on/off (menu item 3.7.)
  - the application parameters are reset to factory settings (menu item 9.1.1).

Device Parameters

Password Protection

Access to the SETUP device parameters and the APPLIC application parameters can be password-protected against unauthorized changes in the Setup menu under U-CODE (see page 38).

Keypad

The keypad can be blocked and released for entry (menu item 8.3) in the SETUP menu under UTILIT / PARAMETER / KEYS.

Automatic Shutoff of Combics

In the SETUP menu, the indicator can be set to shut off automatically using a timer under UTILIT / PARAMETER / AUTO.OFF (Menu item 8.7.).

Display Lighting

The following settings can be made for display lighting in the SETUP menu under UTILIT / PARAMETER / BACKLIT:

- on (8.8.1)
- off (8.8.2)
- off automatically using a timer (8.8.3).

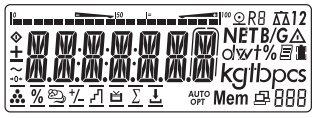
Timer

The timer for switching off the device and/or display lighting can be set to 2, 4 or 10 minutes (menu item 8.9) in the SETUP menu under UTILIT / PARAMETER / TIMER.

Example: Switch on the device, zero the scale, tare the container weight, place sample in the container, toggle display to gross weight or to second weight unit or 10-fold resolution.

I/⏻

▶ Turn on the device.

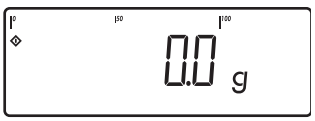


▶ All display segments appear (display test).

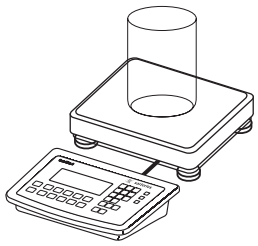
▷ The display for no load on the scale appears.

→0←

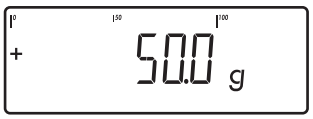
▶ Press the →0← key to zero the scale.



▷ The display for a zeroed scale appears.



▶ Place the container on the weighing platform.

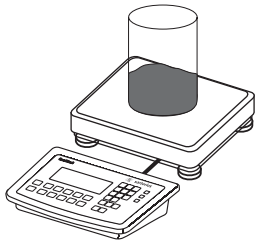


▷ The container weight is displayed.

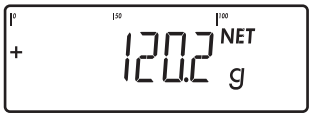
→T←

▶ Press the →T← key to tare the scale.

▷ The display for a tared scale with a container appears.



▶ Place a sample in the container (in this example, 120.2 g).



▷ The display for a tared scale with weighing results appears.

B/G

▷ Press the B/G key; the following is displayed:

▷ the gross weight (in this example, 170.2 g = 50 g for container + 120.2 g for sample)

Fn

or press the Fn key; the following is displayed:

▷ weight value in the second weight unit (in this example, kg)

x10

or press the x10 key; the following is displayed:

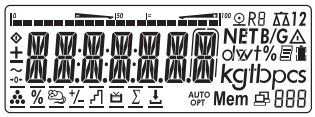
▷ weight value display with 10-fold resolution.
This display switches back automatically after 10 seconds.

▶ Press the key to print a report.

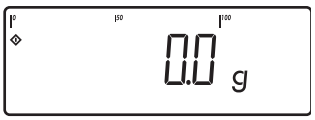
```
    EISENSCHMIDT
    GOETTINGEN
8/12/2013     3:10 PM
--------------------

G#      +    170.2 g
T       +     50.0 g
N       +    120.2 g
--------------------
```

Example Weighing: Enter value for tare using the numeric keys; print results.

▶ Turn on the device.



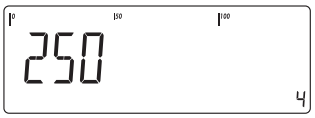
▶ All display segments appear (display test).



▷ The display for no load on the scale appears. When Combics 2 is turned on, it is ready for weighing and zeros itself automatically.
With no load on the scale, you can zero the weighing platform at any time by pressing →0← .

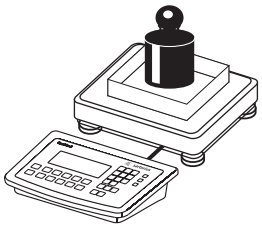
2 5 0

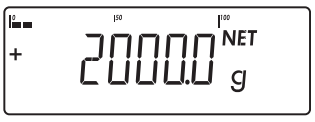
▶ Enter the tare weight using the keypad (e.g. 250 g).



▶ Press the →T← key to apply the tare value.

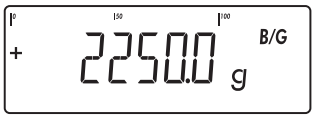
▶ Place the container and material to be weighed on the scale.





▷ The net weight value is displayed.

▶ Press the B/G key to display the gross weight.



▷ The gross value is displayed.

You can toggle between the gross and net display using the B/G key.

▶ Press the key to print a report.

```
--------------------        GMP header (only if GMP-compliant
                            printout is configured, menu 7.13)
8/12/2013    3:15 PM
Type          CAIXS2
Ser.no.     12345678
Vers.  C2 100.280810
BVers.      01-62-03 to 30
--------------------        End of GMP header
EISENSCHMIDT          Header
GOETTINGEN
BATCH NO.     123456        Identifier 1
CUSTOMER       6.789        Identifier 2
8/24/2013    3:15 PM
--------------------

G#      +      2250 g
T       +      0000 g
PT2     +       250 g
N       +      2000 g
--------------------
--------------------        GMP footer (only if GMP-compliant
                            printout is configured)
8/24/2013    3:16 PM
Name:

--------------------        End of GMP footer
```

0 + →T← To delete the tare weight entered, enter 0 using the number block and press →T←.

Calibration and Adjustment

Purpose

Calibration determines the difference between the value displayed and the actual weight on the platform. Calibration does not entail making any changes within the weighing equipment.

During **adjustment**, the difference between the measured value displayed and the true weight of a sample is corrected, or is reduced to an allowable level within maximum permissible error limits.

The temperature range (°C) listed on the ID label should not be exceeded during operation.

For servicing:

External calibration/adjustment for verified scales of accuracy class (III)

- External calibration/adjustment is blocked in legal metrology (switch cover is sealed).
- External calibration/adjustment is only possible after the seal is removed. If the seal is broken, the validity of verification will become void and you must have your scale re-verified.

Using a verified scale in legal metrology with internal adjustment equipment:

▶ Before use in legal metrology, the “internal adjustment” function should be carried out at the installation location.

Opening the Menu Access Switch

The menu access switch is located on the back of the indicator right next to the weighing platform connection (left-hand side).

▶ Remove the cap.

▶ Slide the switch to the right (= “open” position, not subject to legal verification).

Characteristics

Which of the following features are available depends on the weighing platform connected. These features can be configured in the SETUP menu:

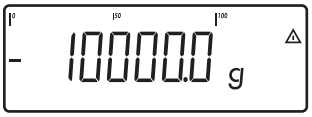
- external calibration/adjustment blocked in verified weighing instruments
- external calibration/adjustment with the standard weight or weight set by a user (not available on verified instruments): SETUP / WP-1 menu Menu item 1.9 “Calibration and Adjustment”
- specify the weight for external calibration/adjustment: SETUP / WP-1 menu Menu item 1.18 “enter adjustment weight”
- internal adjustment for IS weighing platforms (configure under: SETUP / WP-1 or COM1)
- block the (ISO Test) key to prevent use of the functions described above: SETUP / WP-1 menu Menu item 1.9 “Calibration and Adjustment”
- calibrate first; then adjust automatically or manually (not for verified weighing instruments): SETUP / WP-1 menu Menu item 1.10 “Calibration/Adjustment sequence”
- flashing (Δ/Δ) symbol as adjustment prompt. If more than one weighing platform is connected, the platform number is also displayed: SETUP / WP-1 menu Menu item 1.15. “Adjustment prompt”
- block external or enable calibration/adjustment: SETUP / WP-1 menu Menu item 1.16. “External calibration.”

Example 1
External calibration and manual adjustment with default weights (weighing parameters: factory settings).

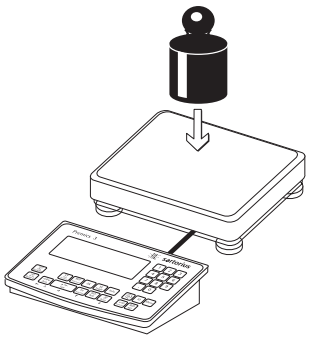
→0← 1.) Zero the scale.

ISO-Test 2.) Start calibration (e.g. when adjustment prompt flashes WP symbol).

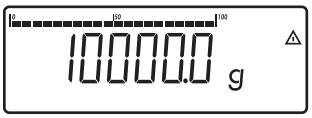
CAL.EXT. is displayed for two seconds.



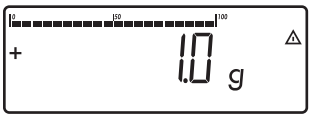
You are prompted to place the required weight on the platform (e.g. 10,000 g).



3.) Position the calibration/adjustment weight on the weighing platform.

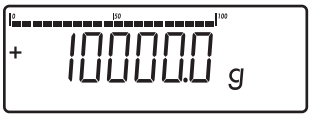


The difference between
the weight value and the true weight of the sample
will be displayed with plus/minus signs.




```
Ext.      calibration
Targ.  +      10000 g
Diff. +           1 g
```

A printout will be generated if the process is canceled using the →0← key.



ISO-Test 4.) Activate calibration/adjustment
(press the →0← key to cancel).

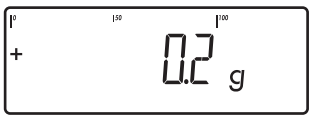
The adjustment weight is displayed
once adjustment is finished.

```
--------------------
02/24/2013     10:15
Type           CAIXS2
Ser.no.     12345678
Vers.  C2 100.280810
BVers.       01-26-03
--------------------
Ext.        Calibrate
Targ.  +      10000 g
Diff. +           1 g
Ext.       Adjustment
Diff. +           0 g
--------------------
02/24/2013     10:15
Name:
--------------------
```

A GMP-compliant printout is generated.

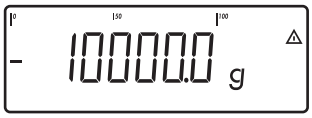
Software versions 01-26-03 to 01-26-30 can be printed.

Example 2
External calibration and manual adjustment with freely selectable adjustment weight (in the range 1/3 maximum load to maximum load).



→0← 1.) Zero the scale.

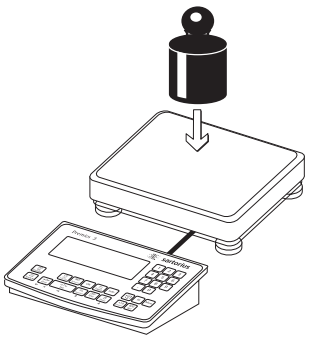
ISO-Test 2.) Start calibration
(e.g. when adjustment prompt flashes WP symbol).
CAL.EXT. is displayed for two seconds.



You are prompted to place the required weight on the platform (e.g. 10,000 g).

5 + →T←

3.) Using the number block, enter the desired CAL weight steps and confirm with →T← (in this example, 5000.0 g).
If the weight is too great or too small, an error message is displayed.



4.) Position the calibration/adjustment weight on the weighing platform.

The adjustment weight is displayed once adjustment is finished.

Remove the adjustment weight from the weighing platform.

SQmin Function

Purpose To display the allowable minimum sample quantity “SQmin” (sample quantity minimum) in accordance with the United States Pharmacopoeia (USP). According to USP guidelines, the uncertainty of measurement may not exceed 0.1% of the sample quantity when substances are weighed with the highest degree of accuracy for volume determination. This additional function ensures that weighing results lie within defined tolerance limits corresponding to the requirements of your quality assurance system.

Prerequisites The scale must be set up by a service technician to be able to use the SQmin function. The technician will determine the permitted minimum sample quantity and load this to your scale using the guidelines of your QA system. He or she will document this setting via a “Weighing module test as per USP” certificate in which the measurements and min. sample quantity are logged. The SQmin function ensures that the weighing results correspond to USP guidelines. These SQmin settings cannot be changed by the user.

Features

- Displaying the minimum sample quality: After you press the Fn key, the value is displayed in the text line for 4 seconds.
- If the minimum sample quantity has not been reached: The ⚠ symbol is displayed and weight values are marked with a “!” in the printout.
- GLP header: The minimum sample quantity entered for SQmin can be included on the printout.

Setting SQmin Parameters

The SQmin display must be turned on to use the SQmin function.

Menu: SETUP / SQMIN /

SQmin display:	DISPLAY	yes/no*
Print in GLP header:	GMP-DRK	yes/no*

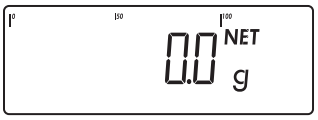
* = Factory setting

SQmin Operation

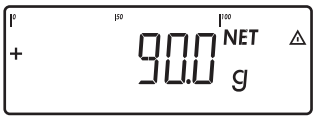
Example Determining sample weights while monitoring the minimum sample quantity (in this example, SQmin: 100 g).
Default setting: The SQmin display must be turned on.

[→T←]

▶ Place the container for the sample on the scale and tare.



▶ Place the sample on the scale.
▷ The minimum sample quantity is not reached (symbol ⚠).

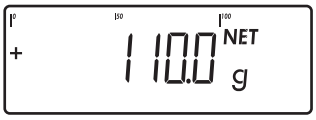


[⎙]

▶ Print the weight value.

```
|    N    +   90.0 !      |
```

▶ Place another sample on the scale.
▷ The minimum sample quantity is exceeded.



[⎙]

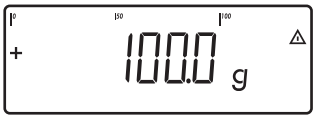
▶ Print the weight value.

```
|    N    + 110.0 g      |
```

[Fn]

▶ Briefly press the [Fn] key to toggle between the measured value and SQmin value.

▷ The value for the minimum sample quantity is displayed for four seconds.



Individual ID Codes (Identifiers)

You can assign codes (such as product name, batch number, etc.) for identification of measured values on printouts.

Features

- You can assign up to six ID codes.
- One name and one value can be assigned to each ID code.
- Displaying individual IDs: press the [ID] key.
- The name is left-justified and the value is right-justified on the printout. If the entire code is too long for one line, additional lines are printed.
- Enter ID code names in the Setup menu under SETUP / PRTPROT , menu item 7.4. The name can have a max. of 20 characters.
- Enter up to 40 characters for the value of the ID code. Press the [ID] key to activate the input mode.
- Individual characters of the ID can be deleted using the [CF] key.
- If both the name and value fields are empty, no ID code is printed.
- In the Setup menu, you can configure when and whether ID codes are printed (see “Configuring Printouts” page 96).

Settings for Individual ID Codes
Menu: SETUP/PRINT/PROTOC./ /HEADER

Factory settings for ID code names:
ID1: ID 1
ID2: ID2
ID3: ID3
ID4: ID4
ID5: ID5
ID6: ID6

There are no factory settings for ID code values.

Using Individual ID Codes

Example Enter ID code names. “Batch number” and “Customer” should be entered for ID 1 and ID 2.

I/⏻ ... →T← ▶ Open the menu.

Fn Fn ... →T← ▶ Select and open SETUP.

Fn Fn ... →T← ▶ Select and open PRINT.

→T← ▶ Open PROTOC..

→T← ▶ Open HEADLIN.

Fn Fn ... →T← ▶ Select and open INDENT. 1.

Fn ⌨ ... ▶ Enter the name for the first identification (use the Fn and ⌨ keys or the number block), e. g. “Batch number”.

→T← ▶ To save the entry, press the) →T← key.

Fn ... →T← ▶ Select and open INDENT. 2.

Fn ⌨ ... ▶ Enter a name for the 2nd ID, e.g. “customer”.

→T← ▶ To save, press the →T← key.

→0← →0← ... ▶ To exit the sub-menu, press the →0← key several times.

Application Programs

Overview of Applications and Functions

Usage	
Basic weighing	X
Send print job/data record to peripheral device	X
Label printer	X
Second scale connection option	optional (WP-2 using COM1)
Counting	X
Neutral measurement	X
Averaging (animal weighing)	X
Weighing in percent	X
Verification	X
Classification	X
Totalizing	X
Batching/counting to target value	X
Product data memory	X
Function	
Zero	X
Tare	X
Date/time	X
External battery (rechargeable)	optional
ID codes (6 codes, 40 characters each)	X
Automatic printout	X
Automatic taring	X
Manual taring	X
Unit conversion	X
Increased resolution	X
GMP printout	X

Combination of applications

Counting

With the Counting application, you can determine the number of parts to each have approximately equal weight (menu APPLIC. 1).

Features

- Save the reference weight “wRef” from the weighing platform.
- Enter the reference sample weight “wRef” using the keypad.
- Enter the reference sample quantity “nRef” using the keypad.
- Automatic average piece weight updating.
- Counting with two weighing platforms.
- Activate Info mode with the Info key.
- Toggle the display between quantity and weight using the ⇆ key.
- »Define the level of accuracy (display resolution) applied when a calculated reference sample quantity is saved.
- Automatic taring of container weight.
  Setting: APPLIC./AUT.TARE, menu item 3.7.
- Automatic initialization when the scale is switched on. The indicator is initialized with the most recently used values for reference sample quantity “nRef” and reference sample weight “wRef.” Setting: APPLIC./AUT.STRT, menu item 3.8.

Exit Application, Delete Parameters
The value of the reference sample weight in the reference memory remains active until it is deleted using the CF key, or is overwritten, or until the application is changed. The reference sample weight also remains saved after the scale is turned off.
You can assign different functions to the CF key to delete applications. When you clear applications, you can delete either the data stored for all applications or just selected data stored for the active application. Setting: APPLIC. / CLER.CF menu item 3.24.

Tare Function:
If you store a tare (weight value) by pressing the →T← key, you can later enter a tare value manually. The tare value you enter is added to the stored tare value. Setting: APPLIC./TARE.FNC. Menu item 3.25.1 (factory settings). A tare value entered manually overwrites any stored tare value (weight value). If you enter a tare value manually, a tare value (weight value) stored later overwrites the manually entered value. Setting: APPLIC./TARE.FNC menu item 3.25.2.

Restore factory default settings: APPLIC./RESET menu item 9.1.

Average Piece Weight
Before the quantity on the platform can be calculated, the average piece weight must be entered in the application. There are several ways to enter this value in the program:

Calculating the Reference Piece Weight

- Place the number of parts defined as the reference sample quantity on the weighing platform and calculate the average piece weight by pressing the OK key.
  or
- Place any number of parts on the connected weighing platform, enter the quantity using the keypad and select and calculate by pressing the REF key.

How the reference weight is calculated depends on the application setting for resolution. The value is either rounded off in accordance with the display resolution, or saved with 10-fold or 100-fold resolution.

Entering the Reference Piece Weight

The reference piece weight (i.e. the weight of one piece) can be entered using the keypad and saved with the [OK] key.

The entered value remains active until deleted by pressing the [CF] key or overwritten by a new value. It remains saved after the scale is switched off.

Preparation

▶ Open the *APPLIC./APPLIC.1/COUNT.* menu.

Available parameter settings

* = Factory setting

MIN.INIT Minimum load for initialization		3.6
1-DIGIT	1 scale interval*	3.6.1
2 DIGIT	2 scale intervals	3.6.2
5 DIGIT	5 scale intervals	3.6.3
10 DIG.	10 scale intervals	3.6.4
20 DIG.	20 scale intervals	3.6.5
50 DIG.	50 scale intervals	3.6.6
100 DIG.	100 scale intervals	3.6.7
200 DIG.	200 scale intervals	3.6.8
500 DIG.	500 scale intervals	3.6.9
1000 D	1000 scale intervals	3.6.10
RESOLUT Resolution for calculation of reference value		3.9
DISP.ACC.	Display accuracy*	3.9.1
10 FOLD	Display accuracy + 1 decimal place	3.9.2
100 FOLD	Display accuracy + 2 decimal places	3.9.3
*SAVE WT.*Parameter for saving weight values		3.11
STABIL	With stability*	3.11.1
ACC.STAB	With increased stability	3.11.2
REF.UPDT Reference sample updating		3.12
OFF	Off	3.12.1
AUTOMAT	Automatic*	3.12.3
REF.WP Reference weighing instrument		3.13
NO WP	No weighing platform selected	3.13.1*
WP 1	Weighing platform WP1	3.13. 2
WP 2	Weighing platform WP2	3.13. 3

[→T←] ▶ To save the setting, press the [→T←] key.

[→0←] [→0←] ... ▶ To exit setup: Press the [→0←] key several times.

Minimum load for initialization

You can set the minimum load here, i.e., the load that must be placed on the weighing platform in order to carry out the application. If the load on the platform is too light, the following will occur:

- error code *INF 29* appears
- the weighing platform is not initialized
- the preset reference sample quantity is saved.

Setting: *APPLIC./APPLIC.1/COUNT./MIN.INIT* menu item 3.6.

The minimum load can be set in 10 steps, from 1 to 1000 digits (see Available parameters). The “digits” here refer to the scale intervals in the connected weighing platform. If the interval of the connected platform is 1 g, for example, and 1000 digits are required, you must place at least 1000 g (= 1000 intervals = 1000 digits) on the weighing platform for initialization.

Resolution

The resolution indicates the accuracy used to determine the reference weight. The default setting is “display resolution.” The resolution is increased when “10-fold” or “100-fold” is selected. “10-fold” increases the resolution of the net value by one step (display resolution x 10), “100-fold” increases it two steps (display resolution x 100).
Setting: APPLIC./APPLIC. 1/COUNT./RESOLUT menu item 3.9.

Parameter for saving weight values

The weight on the platform is saved as a reference value as soon as the platform has stabilized. “Stability” is defined as the point at which the fluctuation of a measured value lies within a defined tolerance. The narrower the tolerance, the more stable the platform is at “stability”.
The “increased stability” setting has a lower tolerance so that the average piece weight saves is more accurate and the results more reproducible; however, the measurement time can take longer.
Setting: APPLIC./APPLIC. 1/COUNT./SAVE WT. menu item 3.11.

Reference sample updating

You can define whether or not the reference sample weight is updated automatically during weighing using this setting. The reference sample weight is updated automatically only when the following criteria are met:

1. “Automatic” must be set for reference sample updating in the menu.
2. The current piece count exceeds the original piece count by at least two.
3. The current piece count cannot be more than double the size of the original piece count. This limitation does not apply to the first update if the piece weight was entered via a keypad.
4. The current piece count is less than 1000.
5. The internally calculated piece count (such as 17.24 pcs) differs by less than ± 0.3 pcs from the nearest whole number (in this example: 17).
6. The weighing platform is stable in accordance with the parameter defined for saving weights.

If automatic reference sample updating is selected in the menu and the piece count (pcs) is displayed, the AUTO symbol is displayed below the bar graph. If the reference sample weight has been updated since you began weighing, the text line shows the OPT symbol. During an updating operation, OPT and the updated piece count are displayed briefly in the measured value line. The new reference sample weight and reference sample quantity are saved.
Setting: APPLIC./APPLIC. 1/COUNT./REF.UPDT menu item 3.12.

Counting with two weighing platforms

You can use two weighing platforms simultaneously with the Counting application. When using two platforms, you can choose from the following operating modes:
- Counting with two platforms of the same type
- Counting with one reference platform and one weighing platform.

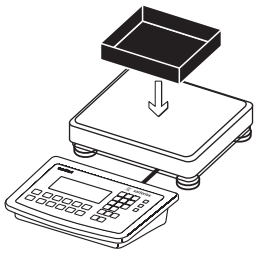
Counting with Two Platforms of the Same Type
Use this mode to count different types of sample material with different weights. For example, count the lighter-weight pieces on one platform and the heavier pieces on another. You can define one of the two scales as the reference scale. The reference scale is the first scale active when you switch on the device, regardless of the setting for automatic initialization of the Counting application.

Counting with One Reference Platform and One Weighing Platform
In this operating mode, the reference platform is a high-resolution weighing platform with a relatively low maximum capacity. The other platform is used for weighing heavier samples, and has a high capacity with a relatively low resolution. This allows you to both determine the reference sample weight with high resolution; i.e., very precisely, and to count large amounts of parts, without requiring an expensive high-resolution, high-capacity weighing platform.

The system can be configured to switch automatically to the reference platform for initialization (the measured value line shows *REF*). Following initialization, you can switch to the counting platform.
Setting: *APPLIC./APPLIC. 1/COUNT./REF.WP* menu item 3.13.

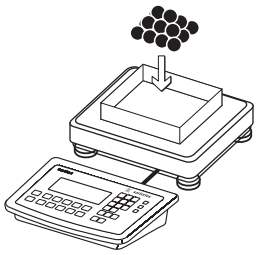
If automatic reference sample updating is enabled, the update is performed on the active platform; in other words, the system does not automatically switch to the reference platform.

Example: You need to determine an unknown number of parts and the measurements should be logged.
Configuration: The “Counting” application is selected, and printout has been set up.



▶ Place empty container on the scale.

[→T←] ▶ Tare the scale.
This is not required if the automatic tare function is active. The tare weight is saved automatically when you place the container on the platform.



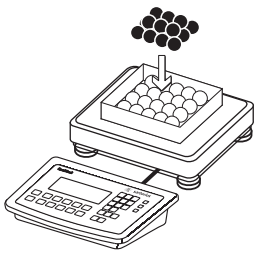
▶ Place any number of parts in the container for the reference quantity (in this example, 20 pcs).

[2] [0] ▶ Enter the number of parts using the keypad.

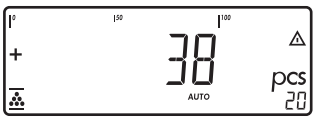
[REF] ▶ Start the calculation of the reference piece weight.

[REF] ▶ Set the number of reference parts using [REF]: 1, 2, 5, 10, 20, etc.

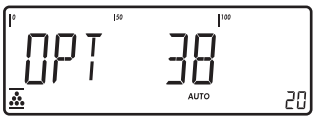
[OK] ▶ Start the calculation of the reference piece weight.



▶ Add a quantity of uncounted parts to the container.



▷ The result is displayed.



▷ If automatic reference sample updating is enabled, OPT appears in the display.

▶ Print results (Configuring Printouts see page 96).

```
nRef   +       38 pcs
wRef   + 0.003280 kg
G#     +    0.373 kg
T      +    0.248 kg
N      +    0.125 kg

Qnt           38 pcs
--------------------
```

Neutral Measurement NM

With this application you can measure the length, surface and volume of parts that have roughly the same specific weight. The o symbol is displayed as the unit (menu APPLIC.1).

Features

- Save the reference weight “wRef” from the weighing platform.
- Enter the reference weight “wRef” using the keypad.
- Enter the factor for calculation “nRef” using the keypad.
- Measuring with two weighing platforms.
- Activate Info mode with the Info key.
- Toggle the display between measurement and weight using the ⇆ key.
- The level of accuracy (display resolution) can be set when the calculated reference weight is applied.
- Automatic taring of container weight.
  Setting: APPLIC./AUT.TARE, menu item 3.7.
- Automatic initialization when the scale is switched on. The indicator is initialized with the most recently used values for reference sample quantity “nRef” and reference sample weight “wRef.”
  Setting: APPLIC./AUT.STRT, menu item 3.8 .

Exit Application, Delete Parameters

The value of the reference sample weight in the reference memory remains active until it is deleted using the CF key, or is overwritten, or until the application is changed.
The reference sample weight also remains saved after the scale is turned off.
You can assign different functions to the CF to delete applications. When you clear applications, you can delete either the data stored for all applications or just selected data stored for the active application.
Setting: APPLIC/CLER.CF menu item 3.24.

Tare Function:

If you store a tare (weight value) by pressing the →T← key, you can later enter a tare value manually. The tare value you enter is added to the stored tare value.
Setting: APPLIC./TARE.FNC menu item 3.25.1 (factory setting).

A tare value entered manually overwrites a stored tare value (weight value). If you enter a tare value manually, a tare value (weight value) stored later overwrites the manually entered value.
Setting: APPLIC./TARE.FNC menu item 3.25.2.

Restore factory default settings: APPLIC./RESET menu item 9.1.

Reference Weight

In order to calculate the length, surface or volume of a given sample, the average weight of a reference quantity of the sample must be known (in the example below, the reference is 1 meter of electrical cable). There are different ways to enter the reference weight:

Calculating the Reference Weight

- Place the reference quantity (defined by the calculation factor) on the connected weighing platform and calculate the reference sample weight by pressing the OK key.

or

- Place any amount of the sample material on the connected weighing platform, enter the calculation factor through the keypad, and press the REF key to calculate the reference sample weight.

How the reference weight is calculated depends on the application setting for resolution. The resolution settings are either display resolution, display resolution 10-fold or display resolution 100-fold.

Entering the Reference Weight
The reference weight (e.g. the weight of one meter of electrical cable) can be entered using the keypad and saved by pressing the OK key.

The entered value remains active until deleted by pressing the CF key or overwritten by a new value. It remains saved after the scale is switched off.

Preparation

▶ Open the *APPLIC./APPLIC. I/NEUTR.M.* menu.

Available parameter settings

* = Factory setting

MIN.INIT	Minimum load for initialization		3.6
	1 DIGIT	1 scale interval	3.6.1*
	2 DIGIT	2 scale intervals	3.6.2
	5 DIGIT	5 scale intervals	3.6.3
	10 DIG.	10 scale intervals	3.6.4
	20 DIG.	20 scale intervals	3.6.5
	50 DIG.	50 scale intervals	3.6.6
	100 DIG.	100 scale intervals	3.6.7
	200 DIG.	200 scale intervals	3.6.8
	500 DIG.	500 scale intervals	3.6.9
	1000 D	1000 scale intervals	3.6.10
RESOLUT	Resolution for calculation of reference value		3.9
	DISP.ACC.	Display accuracy	3.9.1*
	10 FOLD	Display accuracy + 1 decimal place	3.9.2
	100 FOLD	Display accuracy + 2 decimal places	3.9.3
DEC.PLCS	Decimal places in displayed result		3.10
	WITHOUT	none	3.10.1*
	1 DEC.PL.	1 decimal place	3.10.2
	2 DEC.PL.	2 decimal places	3.10.3
	3 DEC.PL.	3 decimal places	3.10.4
SAVE WT.	Parameter for saving weight values		3.11
	STABL.	With stability	3.11.1*
	ACC.STAB	With increased stability	3.11.2
REF.WP	Reference weighing instrument		3.13
	NO WP	No weighing platform selected	3.13.1*
	WP 1	Weighing platform WP1	3.13.2
	WP 2	Weighing platform WP2	3.13.3

→T← ▶ To save the setting, press the →T← key.

→0← →0← ... ▶ To exit setup: Press the →0← key several times.

Minimum load for initialization

You can set the minimum load here, i.e., the load that must be placed on the weighing platform in order to carry out the application. If the load on the platform is too light, the following will occur:
- error code INF 29 appears
- the weighing platform is not initialized
- the preset reference sample quantity is saved.

Setting: APPLIC./APPLIC. I/NEUTR.M./MIN.INIT menu item 3.6.

The minimum load can be set in 10 steps, from 1 to 1000 digits (see Available parameters). The “digits” here refer to the scale intervals in the connected weighing platform. If the interval of the connected platform is 1 g, for example, and 1000 digits are required, you must place at least 1000 g (= 1000 intervals = 1000 digits) on the weighing platform for initialization.

Resolution

The resolution indicates the accuracy used to determine the reference weight. The default setting is “display resolution.” The resolution is increased when “10-fold” or “100-fold” is selected. “10-fold” increases the resolution of the net value by one step (display resolution x 10), “100-fold” increases it two steps (display resolution x 100).
Setting: APPLIC./APPLIC. I/NEUTR.M./RESOLUT menu item 3.9.

Decimal places

In neutral measurement, not only whole numbers but also decimal numbers (for example, 1.25 o electrical cabling) can be displayed. The number of decimal places displayed can range from none up to 3 places.
Setting: APPLIC./APPLIC. I/NEUTR.M./DEC.PLCS menu item 3.10.

Parameter for saving weight values

The weight on the platform is saved as a reference value as soon as the platform has stabilized. “Stability” is defined as the point at which the fluctuation of a measured value lies within a defined tolerance. The narrower the tolerance, the more stable the platform is at “stability”.
The “increased stability” setting has a lower tolerance so that the average piece weight saves is more accurate and the results more reproducible; however, the measurement time can take longer.
Setting: APPLIC./APPLIC. I/NEUTR.M./SAVE WT. menu item 3.11.

Measuring with two weighing platforms

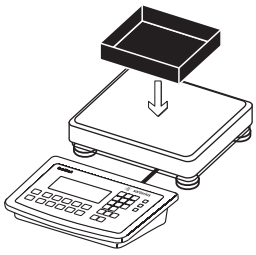
You can use two weighing platforms simultaneously with the Neutral Measurement application. When using two platforms, you can choose from the following operating modes:
- Counting with two platforms of the same type
- Counting with one reference platform and one weighing platform.

Neutral Measurement with Two Platforms of the Same Type
Use this mode to measure different types of sample material with different weights. For example, measure the lighter-weight samples on one platform and the heavier samples on another. You can define one of the two scales as the reference scale. The reference scale is the first scale active when you switch on the device, regardless of the setting for automatic initialization of the Neutral Measurement application.

Neutral Measurement with One Reference Platform and One Weighing Platform
In this operating mode, the reference platform is a high-resolution weighing platform with a relatively low maximum capacity. The other platform is used for weighing heavier samples, and has a high capacity with a relatively low resolution. This allows you to both determine the reference piece weight with high resolution; i.e., very precisely, and to measure large samples, without requiring an expensive high-resolution, high-capacity weighing platform.
The system can be configured to switch automatically to the reference platform for initialization (the measured value line shows REF).

Example:

Following initialization, you can switch to the counting platform.
25 m of electrical cable is to be measured.
Configuration: The “Neutral Measurement” application is selected, and printout has been set up (see “Configuration”).



▶ Place empty container on the scale.

[→T←]

▶ Tare the scale.
This is not required if the automatic tare function is active. The tare weight is saved automatically when you place the container on the platform.

[2] [4] [8]

▶ Enter the weight of 1 meter of cable using the keypad (in this example, 248 g).

[OK]

▶ Save the value entered.

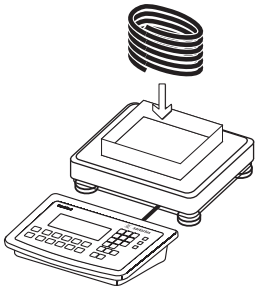
or

[REF]

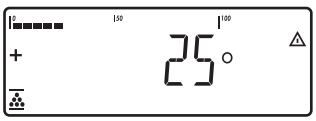
▶ Set the number of reference parts using [REF]: 1, 2, 5, 10, 20, etc.

[OK]

▶ Start the calculation of the reference piece weight.



▶ Place the desired amount of cable into the container (25 m in this example).



▷ The result is displayed.

[⎙]

▶ Print results (Configuring Printouts).

```
nRef   +         1 o
wRef   +     0.248 kg

G#     +     6.794 kg
T      +     0.541 kg
N      +     6.253 kg

Qnt              25 o
--------------------
```

Averaging (Animal Weighing)

With this application, you can calculate averages from several weighing operations. It is used when either the object to be weighed (e.g. animals) or the environment during weighing are unstable. Selection and settings in the APPLIC. / APPLIC. 1 / ANIM.WG menu.

Features

- Averaging started manually or automatically (... / START menu item 3.18).
  With manual start selected, the averaging routine begins when you press a key (provided the start conditions are met).
  With automatic start selected, the application begins when you place the first load on the platform (provided the start conditions are met).
- Enter the number of subweighing operations using the keypad.
- Use the REF key to select the number of measurements for averaging.
- Activate Info mode with the Info key.
- Toggle the display between “result of last measurement” and “current weight” by pressing the ⇆ key.
- Automatic printout of results (... / PRINT menu item 3.20).
- Automatic taring of container weight (APPLIC. / AUT.TARE menu item 3.7).
- Automatic start of averaging when the scale is turned on and a sample placed on the platform, provided start conditions are met (APPLIC. / AUT.START menu item 3.8).

Exit Application, Delete Parameters

The value of the reference sample weight in the reference memory remains active until it is deleted using the CF key, or is overwritten, or until the application is changed. The reference sample weight also remains saved after the scale is turned off.
You can assign different functions to the CF to delete applications. When you clear applications, you can delete either the data stored for all applications or just selected data stored for the active application.
Setting: APPLIC / CLEAR.CF menu item 3.24.

Tare Function:

If you store a tare (weight value) by pressing the →T← key, you can later enter a tare value manually. The tare value you enter is added to the stored tare value.
Setting: APPLIC. / TARE.FNC menu item 3.25.1 (factory setting).

A tare value entered manually overwrites a stored tare value (weight value). If you enter a tare value manually, a tare value (weight value) stored later overwrites the manually entered value.
Setting: APPLIC. / TARE.FNC menu item 3.25.2.

Restore factory default settings: APPLIC. / RESET menu item 9.1.

Number of measurements for averaging

You can enter the desired number of weight measurements to determine the average using the keypad. This value remains active until it is overwritten by another value. It also remains in memory when you switch to a different application program, or turn off the scale.

Start application

There are three ways to start the averaging routine:

- Manual start with preset number of subweighing operations: Place the sample on the platform and press the OK key.

– Manual start with user-defined number of subweighing operations: Place the sample on the platform and enter the number of weighing operations using the keypad. Press the REF key to save the number entered and begin weighing.
– Automatic start with preset number of subweighing operations: Measurement begins when you place the first sample on the platform, provided the start conditions are met.

Preparation

▶ Open the APPLIC./APPLIC. I/ANIM.WGmenu.

Available parameter settings

* = Factory setting

MIN.INIT	Minimum load for initialization		3.6
	1-DIGIT	1 scale interval*	3.6.1
	2 DIGIT	2 scale intervals	3.6.2
	5 DIGIT	5 scale intervals	3.6.3
	10 DIG.	10 scale intervals	3.6.4
	20 DIG.	20 scale intervals	3.6.5
	50 DIG.	50 scale intervals	3.6.6
	100 DIG.	100 scale intervals	3.6.7
	200 DIG.	200 scale intervals	3.6.8
	500 DIG.	500 scale intervals	3.6.9
	1000 D	1000 scale intervals	3.6.10
START	Start averaging		3.18
	MANUAL	Manual*	3.18.1
	AUTOMAT	Automatic	3.18.2
ACTIVTY	Animal activity		3.19
	0.1 PERC.	0.1% of animal/object	3.19.1
	0.2 PERC.	0.2% of animal/object*	3.19.2
	0.5 PERC.	0.5% of animal/object	3.19.3
	1PERC.	1% of animal/object	3.19.4
	2 PERC.	2% of animal/object	3.19.5
	5 PERC.	5% of animal/object	3.19.6
	10 PERC.	10% of animal/object	3.19.7
	20 PERC.	20% of animal/object	3.19.8
	50 PERC.	50% of animal/object	3.19.9
	100 PERC.	100% of animal/object	3.19.10
PRINT	Autom. printout of results		3.20
	MANUAL	Off*	3.20.1
	AUTOMAT	On	3.20.2
DIS.UNLD	Static display of result after load removed		3.21
	CLEARED	Display is fixed until unload threshold reached*	3.21.1
	PRESENT	Fixed display until CF is pressed	3.21.2

→T← ▶ To save the setting, press the →T← key.

→0← →0← ... ▶ To exit setup: Press the →0← key several times.

Minimum load for initialization

You can set the minimum load here, i.e., the load that must be placed on the weighing platform in order to carry out the application. If the load on the platform is too light, the following will occur:
– error code INF 29 appears
– the weighing platform is not initialized
– the preset reference sample quantity is saved.

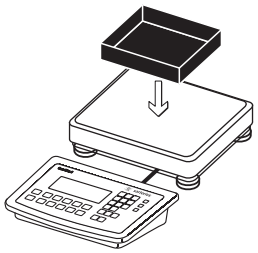
Setting: APPLIC./APPLIC. I/ANIM.WG/MIN.INIT menu item 3.6.

The minimum load can be set in 10 steps, from 1 to 1000 digits (see Available parameters). The “digits” here refer to the scale intervals in the connected weighing platform. If the interval of the connected platform is 1 g, for example, and 1000 digits are required, you must place at least 1000 g (= 1000 intervals = 1000 digits) on the weighing platform for initialization.

Start measurement The averaging routine does not begin until the fluctuation in weight value remains below a defined threshold over three consecutive measurements. The tolerance limit is defined as a percentage of the animal or object weight (for example, 0.1%, 0.2%, ..., 50%, 100%), configured in Setup under: ACTIVITY menu item 3.19.
If the “Averaging” parameter is set to 2%, for example, and the animal or object weighs 10 kg, measurement does not begin until the fluctuation in weight value remains below 200 g during three consecutive measurements.

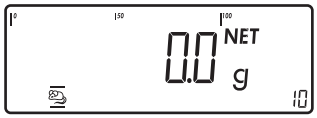
Display A calculated average value is shown continuously on the main display.
The ⚠ symbol indicates the calculated value.
You can toggle between the results display and the current scale display by pressing the [⇆] key.
Setting: APPLIC./APPLIC. I/ANIM.WG /DIS.UNLD 3.21.
You can select “Display is static until unload threshold reached” to have the display switch automatically to the weight readout when you unload the weighing platform (i.e., when the load is less than half the minimum load). The result of the most recent averaging operation is not saved.
If you select “Display is static until the [CF] key is pressed,” the calculated average remains displayed even after the weighing platform is unloaded, until you press the [CF] key or begin a new measurement.

Example: The weight of one mouse should be measured.
Configuration: The “Animal Weighing” application is selected, and printout has been set up (see “Configuration”).

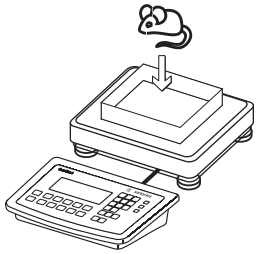


▶ Place empty container on the scale.

[→T←] ▶ Tare scale.
This is not required if the automatic tare function is active. The tare weight is saved automatically when you place the container on the platform.



▶ Place the mouse in the container.



[2] [0] ▶ Enter the number of sub-weighing operations using the keypad (in this example, 20 measurements).

[REF] ▶ Save the value entered and start the averaging.

or

REF ▶ Set the number of reference parts using REF: 1, 2, 5, 10, 20, etc.

→0← ▶ Start the calculation of the reference piece weight.

The averaging routine does not begin until the fluctuation in weight value remains below a defined threshold over three consecutive measurements. The number of subweighing operations remaining is shown in the numeric display.

▶ The averaging result is displayed.

▶ Print the results.

Note: If automatic printout of results is enabled, you do not need to press the key. The results are printed automatically.

Printout Configuration, see page 96.

```
mDef  +        20
T     +    0.292 kg
x-Net +    0.183 kg
--------------------
```

▷ When you unload the weighing platform, the display switches to the weight readout automatically, unless configured otherwise in the menu. The weighing instrument is ready for the next measurement.

Weighing in Percent %

With this application, you can use your weighing platform to obtain weight readouts in percent which are in proportion to a reference weight. **%** is displayed as the weight unit. Selection and settings in the *APPLIC. / APPLIC. I / PERCENT* menu.

Features

- Save the current weight value as reference weight “pRef”.
- Enter the reference weight “Wxx%” for 100% using the keypad.
- Enter the reference percentage “pRef” using the keypad.
- Display result as loss (difference) or residue.
- Display up to 3 decimal places (menu item 3.10).
- Weighing in percent with two weighing platforms.
- Activate Info mode with the Info key.
- Toggle between percent display and weight display using the ⇆ key.
- Automatic taring of container weight (*APPLIC. / AUT.TARE* menu item 3.7).
- Automatic initialization when the scale is switched on. The application is initialized with the most recently used data (*APPLIC. / AUT.STRT* menu item 3.8).

Exit Application, Delete Parameters

The value of the reference sample weight in the reference memory remains active until it is deleted using the CF key, or is overwritten, or until the application is changed. The reference sample weight also remains saved after the scale is turned off.

You can assign different functions to the CF key to delete applications. When you clear applications, you can delete either the data stored for all applications or just selected data stored for the active application.

Setting: *APPLIC / CLER.CF* menu item 3.24.

Tare Function:

If you store a tare (weight value) by pressing the →T← key, you can later enter a tare value manually. The tare value you enter is added to the stored tare value. Setting: *APPLIC. / TARE.FNC* menu item 3.25.1 (factory setting).

A tare value entered manually overwrites a stored tare value (weight value). If you enter a tare value manually, a tare value (weight value) stored later overwrites the manually entered value.

Setting: *APPLIC. / TARE.FNC* menu item 3.25.2.

Restore factory default settings: *APPLIC. / RESET* menu item 9.1.

To determine the weight of a sample relative to a reference weight, you need to define the reference percentage value. There are different ways to enter this value in the application:

Calculating the Reference Percentage Value

- Place the reference quantity (defined by the reference percentage value) on the connected weighing platform and press the OK key to initialize the application.

or

- Place any amount of the sample material on the connected weighing platform, enter the reference percentage value through the keypad, and press the REF key to initialize the application.

How the reference weight is calculated depends on the application setting that defines “Accuracy for saving weights”. The value is either rounded off in accordance with the display resolution, saved with 10-fold or 100-fold resolution.

Entering the Reference Percentage Value
The reference weight for 100% is entered using the keypad and the [OK] key is pressed to initialize the application.

The entered value remains active until deleted by pressing the [CF] key or overwritten by a new value. It remains saved after the scale is switched off.

Preparation

▶ Open the *APPLIC./APPLIC. I/PERCENT* menu.

Available parameter settings

* = Factory setting

MIN.INIT	Minimum load for initialization		3.6
	1-DIGIT	1 scale interval*	3.6.1
	2 DIGIT	2 scale intervals	3.6.2
	5 DIGIT	5 scale intervals	3.6.3
	10 DIG.	10 scale intervals	3.6.4
	20 DIG.	20 scale intervals	3.6.5
	50 DIG.	50 scale intervals	3.6.6
	100 DIG.	100 scale intervals	3.6.7
	200 DIG.	200 scale intervals	3.6.8
	500 DIG.	500 scale intervals	3.6.9
	1000 D	1000 scale intervals	3.6.10
RESOLUT	Resolution for calculation of reference value		3.9
	DISP.ACC.	Display accuracy	3.9.1*
	10 FOLD	Display accuracy + 1 decimal place	3.9.2
	100 FOLD	Display accuracy + 2 decimal places	3.9.3
DEC.PLCS	Decimal places in displayed result		3.10
	WITHOUT	none	3.10.1*
	1 DEC.PL.	1 decimal place	3.10.2
	2 DEC.PL.	2 decimal places	3.10.3
	3 DEC.PL.	3 decimal places	3.10.4
SAVE WT.	Parameter for saving weight values		3.11
	STABL.	With stability	3.11.1*
	ACC.STAB	With increased stability	3.11.2
REF.WP	Reference weighing instrument		3.13
	NO WP	No weighing platform selected	3.13.1*
	WP 1	Weighing platform WP1	3.13.2
	WP 2	Weighing platform WP2	3.13.3
CALC.DIS	Calculated values display		3.15
	RESIDUE	Residue	3.15.1*
	LOSS	Loss	3.15.2

[→T←] ▶ To save the setting, press the [→T←] key.

[→0←] [→0←] ... ▶ To exit setup: Press the [→0←] key several times.

Minimum load for initialization

You can set the minimum load here, i.e., the load that must be placed on the weighing platform in order to carry out the application. If the load on the platform is too light, the following will occur:

- error code *INF 29* appears
- the weighing platform is not initialized
- the preset reference sample quantity is saved.

Setting: APPLIC./APPLIC. I/PERCENT/MIN.INIT menu item 3.6.

The minimum load can be set in 10 steps, from 1 to 1000 digits (see Available parameters). The “digits” here refer to the scale intervals in the connected weighing platform. If the interval of the connected platform is 1 g, for example, and 1000 digits are required, you must place at least 1000 g (= 1000 intervals = 1000 digits) on the weighing platform for initialization.

Resolution

The resolution indicates the accuracy used to determine the reference weight. The default setting is “display resolution.” The resolution is increased when “10-fold” or “100-fold” is selected. “10-fold” increases the resolution of the net value by one step (display resolution x 10), “100-fold” increases it two steps (display resolution x 100).
Setting: APPLIC./APPLIC. I/PERCENT/RESOLUT menu item 3.9.

Decimal places

The number of decimal places displayed can range from none up to 3 places.
Setting: APPLIC./APPLIC. I/PERCENT/DEC.PLCS menu item 3.10.

Parameter for saving weight values

The weight on the platform is saved as a reference value as soon as the platform has stabilized. “Stability” is defined as the point at which the fluctuation of a measured value lies within a defined tolerance. The narrower the tolerance, the more stable the platform is at “stability”.
The “increased stability” setting has a lower tolerance so that the average piece weight saves is more accurate and the results more reproducible; however, the measurement time can take longer.
Setting: APPLIC./APPLIC. I/PERCENT/SAVE WT. menu item 3.11.

Weighing in Percent with two weighing platforms

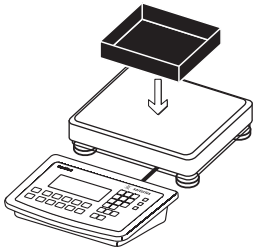
You can use two weighing platforms simultaneously with the Weighing in Percent application. When using two platforms, you can choose from the following operating modes:

- Weighing in Percent with two platforms of the same type
- Weighing in Percent with one reference platform and one weighing platform.

Weighing in Percent with Two Platforms of the Same Type
Use this mode to measure different types of sample material with different weights. For example, measure the lighter-weight samples on one platform and the heavier samples on another. You can define one of the two scales as the reference scale. The reference scale is the first scale active when you switch on the device, regardless of the setting for automatic initialization of the Neutral Measurement application.

Weighing in Percent with One Reference Platform and One Weighing Platform
In this operating mode, the reference platform is a high-resolution weighing platform with a relatively low maximum capacity. The other platform is used for weighing heavier samples, and has a high capacity with a relatively low resolution. This allows you to both determine the reference piece weight with high resolution; i.e., very precisely, and to measure large samples, without requiring an expensive high-resolution, high-capacity weighing platform.
The system can be configured to switch automatically to the reference platform for initialization (the measured value line shows REF). Following initialization, you can switch to the counting platform.

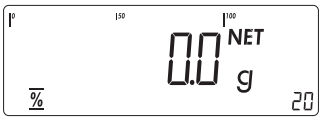
Example: 100% of a sample material should be weighed.
Configuration: The “Weighing in percent” application is selected, and printout has been set up.

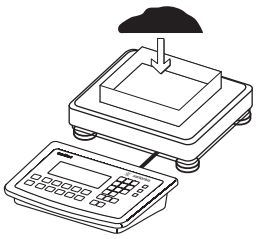


▶ Place empty container on the scale.

→T←

▶ Tare the scale.
This is not required if the automatic tare function is active. The tare weight is saved automatically when you place the container on the platform.

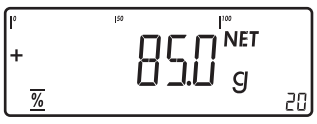




▶ Add reference material to the container in accordance with reference percentage value (in this example, 85 g).

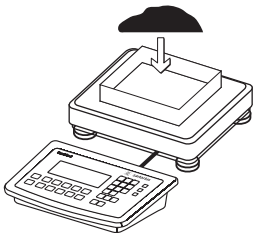
OK

▶ Start the calculation of the reference weight by pressing the OK key.

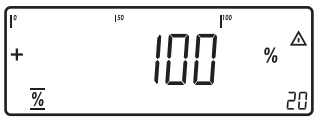


▷ The calculation is based on the active net weight value and the reference percentage value entered.

If the weight is too light, an error code is shown in the main display *INF 29*.
If this is the case, set the minimum load to a smaller number of digits.



▶ Add additional material until the reference percentage value has been reached (in this example, 100 g).



▶ Print the results.
Printout Configuration, see page 96.

```
pRef   +      20 %
wRef   +   0.085 kg

G#     +   1.080 kg
T      +   0.675 kg
N      +   0.423 kg

Prc    +     100 %
--------------------
```

Checkweighing

With this application, you can check whether the sample on the weighing platform matches a target value or lies within a given tolerance range. Checkweighing also makes it easy to fill sample materials to a specified target weight.
Selection and settings in the APPLIC. / APPLIC.2/ CHECK.WG menu.

Features

- Enter the nominal or target weight (set point) and the tolerance range delimiters either using the keypad or by saving the weight value of a load on the platform.
- Enter the tolerance limits as absolute values (Min and Max), as a percentage deviation from the target or as a relative deviation from the target.
  Setting: APPLIC./APPLIC.2/CHECK.WG/CHECK.RG menu item 4.5.
- The target value can be taken over as a weighed value from a weighing platform, and the upper and lower tolerance limits are defined as a percentage deviation from the target value (setting 4.5.2). The following percentages can be selected as the deviation: 0.1%, 0.2%, 0.5%, 1%, 1.5%, 2%, 3%, 5% or 10%, selection using the REF key.
- The target value, lower tolerance limit (minimum) and upper tolerance limit (maximum) can applied as weighed values from the weighing platform (menu item 4.5.1).
- The target value can be applied as weighed values and via asymmetrical percent limits (menu item 4.5.3).
- The target value can be applied as weighed values and via relative weight limits (menu item 4.5.4).
- Target value and tolerance limits checked during input; values must conform to: upper limit > target > lower limit > 1 digit.
- Checkweighing range: either 30% to 170% of the target, or from 10% to infinity.
- Results are shown on the main display, as a bar graph and LED as well as sent to control output ports for further processing.
- Toggle the main display between weight and tolerances limits by pressing the ⇆ key. If the weight in the readout is outside the tolerance range, “LL” (too low) or “HH” (too high) is displayed.
- Activate Info mode with the Info key.
- Automatic results printout (APPLIC./APPLIC.2/CHECK.WG/CHECK.RG menu item 4.6).
- Automatic taring of container weight (APPLIC./ AUT.TARE menu item 3.7).
- Automatic initialization when you switch on the scale with most recently saved application data (APPLIC./AUT.STRT menu item 3.8).

You can assign different functions to the CF key to delete applications. When you clear applications, you can delete either the data stored for all applications or just selected data stored for the active application.
Setting: APPLIC/CLER.CF menu item 3.24.

Tare Function:
If you store a tare (weight value) by pressing the →T← key, you can later enter a tare value manually. The tare value you enter is added to the stored tare value.
Setting: APPLIC./TARE.FNC menu item 3.25.1 (factory setting).

A tare value entered manually overwrites a stored tare value (weight value). If you enter a tare value manually, a tare value (weight value) stored later overwrites the manually entered value.
Setting: APPLIC./TARE.FNC menu item 3.25.2.

Restore factory default settings: APPLIC./RESET menu item 9.1.

Target value

Checkweighing entails comparing the current weight value to a defined target value. You can enter the value for this target using the keypad, or by saving the weight value indicated. You can also define upper and lower tolerance limits based on this target. You can do this by:

- entering absolute values using the keypad or placing the desired amount of weight on the platform and saving the value

or

- by entering each value using the keypad as a percentage deviation of the target weight

or

- by entering each value as an asymmetrical percentage deviation of the target weight that is selected via the keypad or using the REF key

or

- by entering a relative weight deviation from the target weight via the keypad.

The value remains valid until deleted by pressing the CF key or until overwritten by a new value. It remains saved after the scale is switched off.

Preparation

▶ Open the APPLIC./APPLIC.2/CHECK.WG menu.

Available Parameter Settings

* = Factory setting

MIN.INIT	Minimum load for initialization		3.5
	1 DIGIT	1 scale interval	3.5.1*
	2 DIGIT	2 scale intervals	3.5.2
	5 DIGIT	5 scale intervals	3.5.3
	10 DIG.	10 scale intervals	3.5.4
	20 DIG.	20 scale intervals	3.5.5
	50 DIG.	50 scale intervals	3.5.6
	100 DIG.	100 scale intervals	3.5.7
	200 DIG.	200 scale intervals	3.5.8
	500 DIG.	500 scale intervals	3.5.9
	1000 D	1000 scale intervals	3.5.10
AUT.STRT	Automat.	Automatic start of applications when you switch on the device with most recently saved application data	3.8
	AUTOMAT	Automatic (on)	3.8.1
	MANUAL	Manual (off)	3.8.2
TARE.FNC	Tare function		3.25
	NORMAL	Can add a preset tare if tare value is available; however no tare function possible	3.25.1*
	SPECIAL	When a preset tare is entered, the tare value is deleted; however, tare function activation is possible	3.25.2
CHECK.RG	Checkweighing range		4.2
	30- 170%	30 to 170%	4.2.1*
	10-MAX.L	10% to infinity	4.2.2

CTRL.SET	Activate SET control output		4.3
	OUTPUT	"SET" output	4.3.1*
	OP.READY	Ready to operate	4.3.2
OUTP.ACT	Port lines		4.4
	OFF	Off	4.4.1
	ALWAYS	Always on.	4.4.2
	STABIL	On at stability	4.4.3
	CHECK.RG	On within checkweighing range	4.4.4*
	STAB.CHK	On at stability within checkweighing range	4.4.5
INPUT	Parameter input		4.5
	TAR.MN.MX	Min, Max, target value	4.5.1*
	TARG.PER	Only target value with percent limits	4.5.2
	TAR.A.PER	Target value with asymmetrical percent limits	4.5.3
	TAR.TOL	Target value with relative tolerances	4.5.4
AUT.PRNT	Automatic printing		4.6
	OFF	Off	4.6.1*
	ON	On	4.6.2
	OK	Only values within tolerance	4.6.3
	NOT OK	Only values outside tolerance	4.6.4
APP.ZERO	Checkweighing toward zero		4.7
	OFF	Off	4.7.1*
	ON	On	4.7.2

[→T←] ▶ To save the setting, press the [→T←] key.

[→0←] [→0←] ... ▶ To exit setup: Press the [→0←] key several times.

Display

The result of a measurement is shown either as a weight value or in relation to the target.

Weight display: The measured value line always shows the weight value, even if it lies outside the tolerance range. The bar graph is displayed with symbols indicating lower limit, target and upper limit. Weights are shown logarithmically from 0 up to the lower tolerance limit, and linearly beyond that point.

Relation to target value: As "Weight display" above, with the exception that:

- LL appears in the main display if the weight value is less than the lower limit
- HH is shown on the main display if the weight value is higher than the upper tolerance limit.

Digital I|O Interface

The **Checkweighing** application supports the digital input/output interface.
The four outputs are activated as follows:

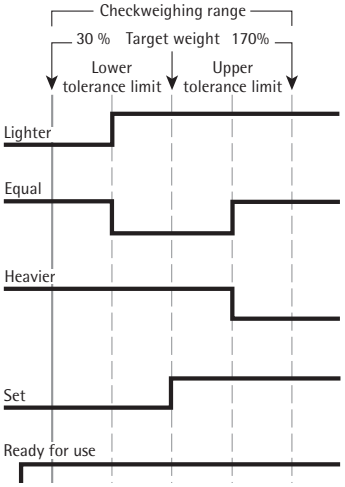
- Less than > red LED lights up
- Equal to > green LED lights up
- Greater than > yellow LED lights up
- Set.

The outputs can also be galvanically isolated using option A5.

Acoustic signal: An acoustic signal can be activated in addition to the green LED.
Setting: menu item 8.2.3.

In the APPLIC./APPLIC.2/CHECK.WG/OUTP.ACT menu, menu item 4.4, you can choose the following settings for the control outputs:

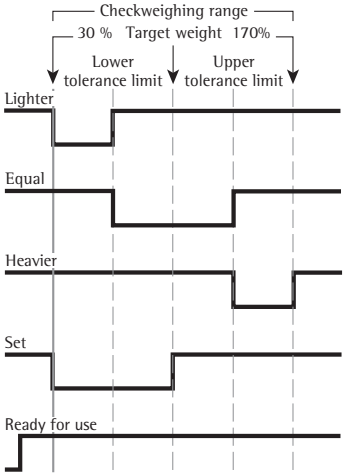
- off
- always on
- activated at stability
- on within the checkweighing range
- on at stability within checkweighing range.



Digital I|O Interface

– "SET" control output: set or ready for use

– port lines: always on



Digital I|O Interface

– "SET" control output: set or ready for use

– port lines: within the checkweighing range

The "SET" output normally changes its voltage level when the load is near the target weight. Alternatively, you can assign the "Ready for use" function to this port.
Setting: APPLIC./APPLIC.2/CHECK.WG/CTRL.SET menu item 4.3.
This makes it possible, for example, to connect a simple indicator for weighing or calculation results.
All data output ports have a high voltage level when the application is not initialized.

Output port specifications:

- When not in use, the voltage level is high: >3.7 V/+4 mA.
- When activated, the voltage level is low: <0.4 V/–4 mA.

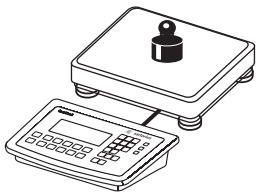
The outputs are not protected against short circuits and are not galvanically isolated.

Example 1: Checkweighing samples with a target weight of 1250 g and a tolerance range from -10 g to +30 g. The tolerance values should be entered as absolute values (lower and upper tolerance limit).
Configuration: The “Checkweighing” application is selected using the setting INPUT / TAR.MN.MX. a printout has been set up (see “Configuration”).

OK ▶ Start target value and tolerance entry using the OK key.

▷ The target value symbol flashes at the top of the display.

▶ Place a sample with the target weight (in this example, 1250 g) on the platform.



OK ▶ Save the target value.

▷ The minimum symbol flashes at the top of the display.

1 2 4 0 ▶ Enter lower limit value (in this example, 1240 g).

OK ▶ Save the lower limit value.

▷ The maximum symbol flashes at the top of the display.

1 2 8 0 ▶ Enter upper limit value (in this example, 1280 g).

OK ▶ Save the upper limit value.

▷ Because the sample with the target weight is still on the weighing platform, the weight is shown on the display with the checkweighing bars. The green LED indicates a value in the target range.
▶ Remove the sample with the target weight from the platform.
▶ The samples can now be placed on the platform and checked one after the other.

▷ The LEDs next to the display indicate the results:
yellow LED: sample too heavy
green LED: sample in tolerance range
red LED: sample too light.

(E) ▶ Print the results.
Note: If automatic printout of results is enabled, you do not need to press the (E) key. The results are printed automatically.
For Printout configuration: see page 96.

```
Setp   +    1.250 kg
Min    +    1.240 kg
Max    +    1.280 kg

G#     +    1.256 kg
T      +    0.000 kg
N      +    1.256 kg

Lim    +     0.48 %
W.Diff+    0.006 kg
--------------------
```

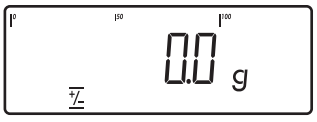
Target value
Minimum
Maximum

Gross weight
Tare weight
Net weight

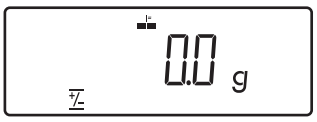
Percentage of deviation from target*
Absolute deviation from target

* When displayed in relation to target value:
If the weight is lighter than the lower limit, the display shows: LL
If the weight is heavier than the upper limit, the display shows: HH

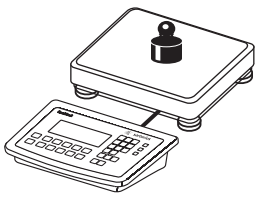
Example 2: Checkweighing samples with a target weight of 1250 g and a tolerance range from -10 g to +30 g. The tolerance values should be entered as a relative deviation from the target value.
Configuration: The “Checkweighing” application is selected using the setting *INPUT* / *TAR.TOL*, a printout has been set up (see “Configuration”).



OK ▶ Start target value and tolerance entry using the OK key.



▷ The target value symbol flashes at the top of the display.



▶ Place a sample with the target weight (in this example, 1250 g) on the platform.

OK ▶ Save the target value.

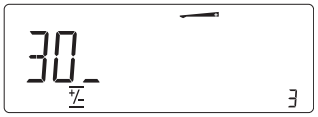
▷ The minimum symbol flashes at the top of the display.

1 0 ▶ Enter the maximum lower deviation (in this example, 10 g).

OK ▶ Save the lower limit value.

▷ The maximum symbol flashes at the top of the display.

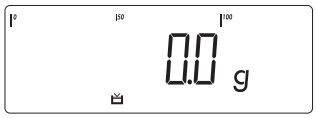
3 0 ▶ Enter the maximum upper deviation (in this example, 30 g).



OK ▶ Save the upper limit value.

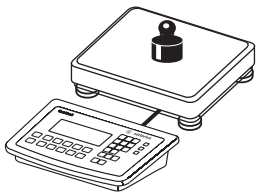
▶ Proceed as described in example 1.

Example 3: **Checkweighing toward zero** 🜨. Checkweighing samples with a target weight of 1250 g and a tolerance range from -10 g to +30 g.
Configuration: The “Checkweighing toward zero” application (*TOW.ZERO*) is selected as well as the *TAR.MN.MX* entry, and a printout has been set up (see “Configuration”).



OK ▶ Start target value and tolerance entry using the OK key.

▶ Place a sample with the target weight (in this example, 1250 g) ontheplatform.



OK ▶ Save the target value.

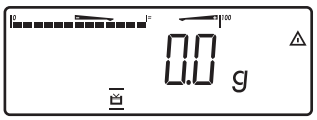
1 2 4 0 ▶ Enter lower limit value (in this example, 1240 g).

OK ▶ Save the lower limit value.

1 2 8 0 ▶ Enter upper limit value (in this example, 1280 g).

OK ▶ Save the upper limit value.

▶ Remove the sample with the target weight from the weighing platform.



▶ The samples can now be checked one after the other.

▷ The LEDs next to the display indicate the results:
yellow LED: sample too heavy
green LED: sample in tolerance range
red LED: sample too light.

▶ Print the results.
Note: If automatic printout of results is enabled, you do not need to press the key. The results are printed automatically.
Printout Configuration, see page 96.

Setp + 1.250 kg		Target value
Min + 1.240 kg		Minimum
Max + 1.280 kg		Maximum
G# + 1.256 kg		Gross weight
T + 0.000 kg		Tare weight
N + 1.256 kg		Net weight
Lim + 0.48 %		Percentage of deviation from target*
W.Diff+ 0.006 kg		Absolute deviation from target
----------		

* When displayed in relation to target value:
If the weight is lighter than the lower limit, the display shows: LL
If the weight is heavier than the upper limit, the display shows: HH

Classification

With this application, you can determine whether the weight of a given sample lies within the limits of a defined weight class (APPLIC.2 menu).

Features

- Classification with 3 or 5 weight classes.
  Setting: APPLIC./APPLIC.2/CLASS./PARAM.2/QTY. menu item 4.8.
- Enter the upper limits of weight classes using the keypad or by saving weight values from a load on the platform.
- Enter the upper limits of weight classes as absolute values or as a percentage of deviation from the upper limit of Class 1.
  Setting: APPLIC./APPLIC.2/CLASS./PARAM.2/INPUT menu item 4.9.
- Activate Info mode with the [Info] key.
- Toggle the main display between classification display and weight display by pressing the [⇆] key.
- Automatic results printout .
  Setting: APPLIC./APPLIC.2/CLASS./PARAM.2/PRINT menu item 4.10.
- Automatic taring of container weight.
  Setting: APPLIC./AUT.TARE, menu item 3.7.
- Automatic initialization when the scale is switched on.
  Setting: APPLIC./AUT.STRT, menu item 3.8.

Exit Application, Delete Parameters
The initialization values remain active until they are deleted using the [CF] key, overwritten, or until the application is changed. The class limits also remain saved after the scale is turned off.
You can assign different functions to the [CF] to delete applications. When you clear applications, you can delete either the data stored for all applications or just selected data stored for the active application.
Setting: APPLIC/CLER.CF menu item 3.24.

Tare Function:
If you store a tare (weight value) by pressing the [→T←] key, you can later enter a tare value manually. The tare value you enter is added to the stored tare value.
Setting: APPLIC./TARE.FNC menu item 3.25.1 (factory setting).
A tare value entered manually overwrites a stored tare value (weight value). If you enter a tare value manually, a tare value (weight value) stored later overwrites the manually entered value.
Setting: APPLIC./TARE.FNC menu item 3.25.2.

Restore factory default settings: APPLIC./RESET menu item 9.1.

Delimiters

To use the Classification application, you need to enter the delimiters that separate one class from another. Limits between the individual weigh classes are required for the classification. The lower limit of Class 1 is defined by the preset minimum load. The other classes are configured by defining their upper limits. There are two ways to enter the delimiters:
By **saving the weight value indicated**: Each upper limit value, with the exception of the highest class, is entered using the keypad or by saving the weight value of a load on the weighing platform.

By **entering a percentage**: The upper value of Class 1 is entered using the keypad or by saving the value indicated. Upper limits for the other classes are defined by entering a percentage of deviation from the upper limit of Class 1, using the keypad.

Example: Enter 100 g as the upper limit of Class 1. Then enter 15%. When working with 3 classes, this yields the following weight classes:

Class 0: up to the minimum load
Class 1: >minimum load - 100 g
Class 2: >100 g – 115 g
Class 3: >115 g - maximum load

When working with 5 classes, this yields the following weight classes:

Class 0: up to the minimum load
Class 1: >minimum load - 100 g
Class 2: >100 g – 115 g
Class 3: >115 g – 130 g
Class 4: >130 g – 145 g
Class 5: >145 g - maximum load

The values entered remain valid until deleted by pressing the CF key or until overwritten by a new value. They remain saved after the scale is switched off.

Preparation

▶ Open the APPLIC./APPLIC.2/CLASS menu.

Available parameter settings

* = Factory setting

MIN.INIT	Minimum load for initialization		3.6
	1 DIGIT	1 scale interval	3.6.1*
	2 DIGIT	2 scale intervals	3.6.2
	5 DIGIT	5 scale intervals	3.6.3
	10 DIG.	10 scale intervals	3.6.4
	20 DIG.	20 scale intervals	3.6.5
	50 DIG.	50 scale intervals	3.6.6
	100 DIG.	100 scale intervals	3.6.7
	200 DIG.	200 scale intervals	3.6.8
	500 DIG.	500 scale intervals	3.6.9
	1000 D	1000 scale intervals	3.6.10
CTRL.SET	Activate SET control output		4.3.
	OUTPUT	"SET" output	4.3.1*
	OP.READY	Ready to operate	4.3.2
OUTP.ACT	port lines		4.7
	OFF	Off	4.7.1*
	ALWAYS	Always on	4.7.2
	STABL.	On at stability	4.7.3
QTY.	Number of classes		4.8.
	3 CLASS	3 classes	4.8.1*
	5 CLASS	5 classes	4.8.2
INPUT	Parameter input		4.9.
	WEIGHTS	Weight values	4.9.1*
	PERC.TAG	Percentage values	4.9.2
PRINT	Automatic printing		4.10.
	MANUAL	Off	4.10.1*
	AUTOMAT	On	4.10.2

→T← ▶ To save the setting, press the →T← key.

→0← →0← ... ▶ To exit setup: Press the →0← key several times.

Minimum load for initialization

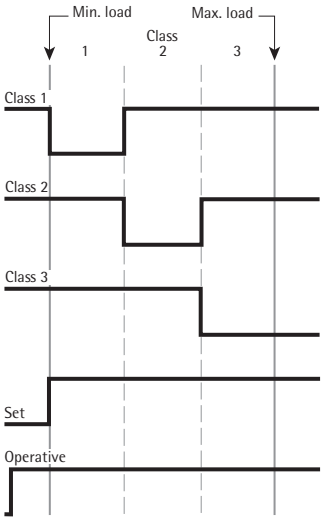
You can set the minimum load here, i.e., the load that must be placed on the weighing platform in order to carry out the application. If the load on platform is too light, then this is class 0.

Setting: APPLIC./APPLIC. I/COUNT./MIN.INIT menu item 3.6.

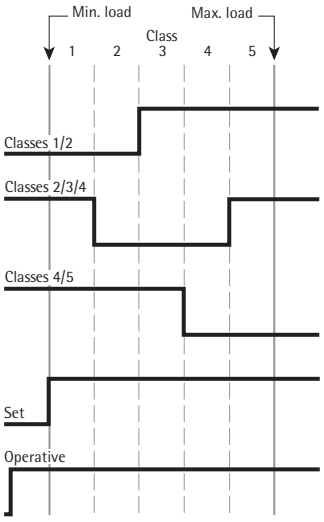
The minimum load can be set in 10 steps, from 1 to 1000 digits (see Available parameters). The “digits” here refer to the scale intervals in the connected weighing platform. If the interval of the connected platform is 1 g, for example, and 1000 digits are required, you must place at least 1000 g (= 1000 intervals = 1000 digits) on the weighing platform for initialization.

Display

The result of a given measurement is shown as either a weight value or a class number.
Weight display: The current weight is shown in the measured value line and the current class in the number display.
Display of classes: The current class is displayed in the measured value line.



Digital I|O Interface
Control lines when working with 3 classes

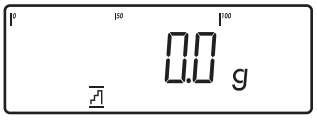


Digital I|O Interface
Control lines when working with 5 classes

In the APPLIC./APPLIC.3/CLASS./PARAM.2/OUTP.ACT menu, menu item 4.7, you can choose the following settings for the control outputs:
- off
- always on
- activated at stability.

The “SET” output normally changes its voltage level when the current weight exceeds the minimum load. Alternatively, you can assign the “Ready for use” function to this port.
Setting: APPLIC./APPLIC.3/CLASS./PARAM.2/CTRL.SET menu item 4.3.

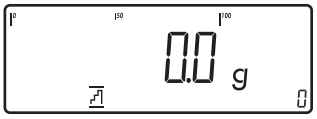
Example 2: There should be three classes.
Configuration: The “Classification” application is selected, and printout has been set up.



OK ▶ Enter the class limits using the OK key.

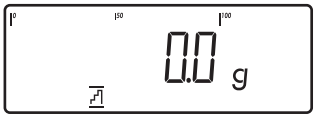
1 1 0 ▶ Enter the upper limit for Class 1 using the keypad (in this example, 110 g).

OK ▶ Save the upper limit for Class 1.

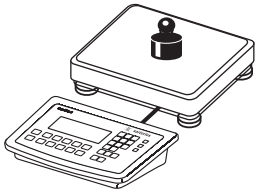


1 3 0 ▶ Enter the upper limit for Class 1 using the keypad (in this example, 110 g).

OK ▶ Save the upper limit for Class 1.



▶ Place the sample on the weighing platform.



▷ The result is displayed.

▶ Print the results.
Note: If automatic printout of results is enabled, you do not need to press the key. The results are printed automatically.
Printout Configuration, see page 96.

```
Lim1   +    0.110 kg
Lim2   +    0.130 kg

G#     +    0.118 kg
T      +    0.000 kg
N      +    0.118 g

Class            2
--------------------
```

Totalizing Σ

With this application, you can add weights to the totalizing memory. In addition to weight values, the number of separate values added to memory is also saved (APPLIC.3 menu).

Features

- You can weigh up to 999 items.
- Save values automatically: Simultaneous saving of net values and calculated values (if available).
  Setting: APPLIC./APPLIC.3/TOTALIZ menu item 3.16.
- Save weight values and calculated values from either Application 1 (for example, Counting, Weighing in Percent) or Application 2 (Checkweighing).
  Setting: APPLIC./APPLIC.3/TOTALIZ menu item 3.22.
- Current transaction number displayed in the number display (indicating the transactions already added).
- Weighing in up to a defined target, with the totalization memory content + current weight displayed in the text lines.
- Save weight values manually or automatically.
- Accurate calculation of total of weight values from two weighing platforms.
- Activate Info mode with the [Info] key .
- Automatic printout when value saved.
- Automatic taring of container weight.
  Setting: APPLIC./AUT.TARE, menu item 3.7.

Exit Application, Delete Parameters
The value of the totalizing memory remains valid until deleted by pressing the [CF] key.
You can assign different functions to the [CF] key to delete applications. When you clear applications, you can delete either the data stored for all applications or just selected data stored for the active application.
Setting: APPLIC/CLER.CF menu item 3.24.

Tare Function:
If you store a tare (weight value) by pressing the [→T←] key, you can later enter a tare value manually. The tare value you enter is added to the stored tare value.
Setting: APPLIC./TARE.FNC menu item 3.25.1 (factory setting).
A tare value entered manually overwrites a stored tare value (weight value). If you enter a tare value manually, a tare value (weight value) stored later overwrites the manually entered value.
Setting: APPLIC./TARE.FNC menu item 3.25.2 .

Restore factory default settings: APPLIC./RESET menu item 9.1.

The Signum has a totalizing memory for totalizing individual net and gross values. You can save weight values in totalizing memory manually or automatically.
Setting: APPLIC./APPLIC.3/TOTALIZ menu item 3.16.

- **Save value manually** by pressing the [OK] key.
  The value taken from the active platform is added to the value already saved in the totalization memory and the transaction counter value is increased by one. When a value is added manually, the program does not check whether the platform has been unloaded since the last time the [OK] key was pressed.

– Value saved automatically when the weighing platform is stable and the defined minimum load is exceeded.
  If the defined minimum load is not exceeded, you can save the item manually by pressing the 0 key. Regardless of these settings, the current value cannot be saved automatically unless the platform is unloaded before the next sample is placed on it. The weighing platform is considered to be unloaded when the load is less than 50% of the minimum load.

The number of items added to memory is shown in the number display.
Press the CF key to clear the totalizing memory. A printout is automatically generated.

With two weighing platforms connected, you can add values from both platforms to the totalizing memory. The displayed result is accurately calculated in the active weight unit.
Example: When you add 1.243 g (determined on a weighing platform with three decimal places) to 1.4 g (determined on a platform with 1 decimal place), the display shows 2.643 g.

Preparation

▶ Open the APPLIC./APPLIC.3/TOTALIZ. menu.

Available parameter settings

* = Factory setting

MIN.INIT	Minimum load for initialization		3.6
	1 DIGIT	1 scale interval	3.6.1*
	2 DIGIT	2 scale intervals	3.6.2
	5 DIGIT	5 scale intervals	3.6.3
	10 DIG.	10 scale intervals	3.6.4
	20 DIG.	20 scale intervals	3.6.5
	50 DIG.	50 scale intervals	3.6.6
	100 DIG.	100 scale intervals	3.6.7
	200 DIG.	200 scale intervals	3.6.8
	500 DIG.	500 scale intervals	3.6.9
	1000 D	1000 scale intervals	3.6.10
AUTO.SAV	Autosave		3.16.
	OFF	Off	3.16.1*
	ON	On	3.16.2
PRT.SAV.	Individual/Component printout when saved		3.17.
	OFF	Automatic printing off	3.17.1
	ON	Print the entire standard print configuration every time with the OK key	3.17.2*
VAL.FROM	Source of data for autosave		3.22.
	APPL. 1	Application 1	3.22.1*
	APPL. 2	Application 2	3.22.2
SAV.VAL.	Save value		3.23.
	NET	Net	3.23.1*
	CALCUL.	Calculation	3.23.2
	NET+CAL	Net and Calculated	3.23.3

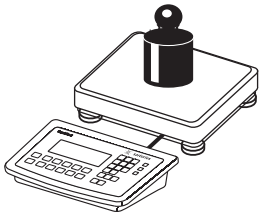
Printout

You can configure whether a printout is generated automatically when a weight value is stored in the totalizing memory or manually by pressing the ⎙ key.
Setting: APPLIC./APPLIC.3/TOTALIZ menu item 3.17.

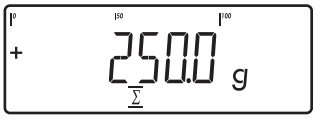
– You can print manually by pressing the ⎙ key (single printout): 3.17.1.
– Component log (single printout of an item): 3.17.2.

The total data record is printed when you clear the totalizing memory (by pressing the CF key).

Example: Totalizing weight values.
Configuration: The “Totalizing” application is selected, and printout has been set up. Setting: SETUP / PRINT / PROTOC. menu item 7.6.
Component log: menu item 7.7.
Total data record: menu item 7.8.



▶ Place the first weight on the weighing platform.



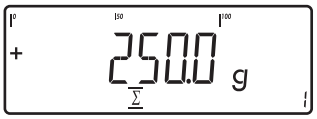
▷ The weight value is displayed.

OK

▶ Store first weight value in totalizing memory.

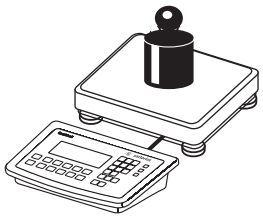
```
G#     +    0.250 kg
T      +    0.000 kg
N      +    0.250 kg
n                1
```

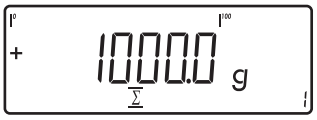
▷ Component weight is printed automatically (**configured component log**).



▷ The transaction counter value is increased by one (to 1).

▶ Remove the first weight from the weighing platform and place the second weight.





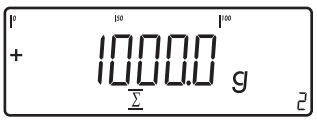
▷ The weight value is displayed.

OK

▶ Store second weight value in totalizing memory.

```
G#     +    1.346 kg
T      +    0.346 kg
N      +    1.000 kg
n                2
```

▷ Component weight is printed automatically (**configured component log**).



▷ The transaction counter value is increased by one (to 2).

[⇆] ▶ Toggle the display between individual value and total.

[CF] ▶ End totalizing.

```
G#     +    1.346 kg
T      +    0.346 kg
N      +    1.000 kg
n                2
------------------
```

▷ **Configured total data record is printed.**

Net Total Formulation

With this application, you can weigh in different components up to a defined total. Each component is saved in the net-total memory (APPLIC.3 menu).

Features

- Weigh in up to 999 components in series.
- Net total formulation **cannot** be combined with level 1 and 2 applications (APPLIC.1, APPLIC.2).
- Current component number displayed in the number line (indicating the component to be added).
- Toggle the display from "component mode" to "additive mode" by pressing the ⇆ key.
  - **Component mode**: Display the weight of the component currently on the platform (for 1 second after it is saved; then the platform is tared).
  - **Additive mode**: Display the weight of all components on the platform (after it is saved, the net weight of the last component added is displayed briefly).
- Toggle to a second weighing platform while weighing in.
- Activate Info mode with the Info key.
- Automatic component printout when it is saved.
  Setting: APPLIC./APPLIC.3/NET TOT menu item 3.17.

Printout

If the 3.17.2 menu item is selected, the entire component record is printed. If the 3.17.3 menu item is selected, the following items are generated only for the first component if it has been configured:
Blank line, dash line, date/time, time, ID1 ... ID6, header lines 1 and 2. For subsequent components, each "component" item ("Comp xx") is followed by a blank line.

- Automatic taring of container weight.
  Setting: APPLIC. / AUT.TARE menu item 3.7.
- Restore factory default settings.
  Setting: APPLIC. / RESET menu item 9.1.

Preparation

▶ Open the APPLIC./APPLIC.3/NET.TOT.menu.

Available parameter settings

* = Factory setting

MIN.INIT	Minimum load for initialization		3.6
	1 DIGIT	1 scale interval	3.6.1*
	2 DIGIT	2 scale intervals	3.6.2
	5 DIGIT	5 scale intervals	3.6.3
	10 DIG.	10 scale intervals	3.6.4
	20 DIG.	20 scale intervals	3.6.5
	50 DIG.	50 scale intervals	3.6.6
	100 DIG.	100 scale intervals	3.6.7
	200 DIG.	200 scale intervals	3.6.8
	500 DIG.	500 scale intervals	3.6.9
	1000 D	1000 scale intervals	3.6.10
PRT.SAV.	Individual/Component printout when saved		3.17
	OFF	Automatic printing off	3.17.1
	EACH.TIM.	Print the entire standard print configuration every time the OK key is pressed	3.17.2*
	ONCE	Print the entire standard print configuration once with the OK key	3.17.3

Minimum load

The minimum amount that a component must weigh before it can be saved in net-total memory.
Setting: APPLIC./APPLIC.3/NET.TOT. Menu item 3.6.

Once the limit is exceeded by the load, the value can be saved. If the load on platform is too light, the following will occur when you try to save a value:
- error code INF 29 appears
- a warning signal is emitted (double-beep)
- the weight value is not saved.

The minimum load required for automatic taring of the container weight on the platform (first weight) is configured under: APPLIC./MIN.TARE menu item 3.5.

The minimum load can be set in 10 steps, from 1 to 1000 digits (see Available parameters). The “digits” here refer to the scale intervals in the connected weighing platform. If the interval of the connected platform is 1 g, and 1000 digits are required, you must place at least 1000 g (= 1000 intervals) on the weighing platform for autotaring (only with the “Autotare first weight” option selected).

Net-total formulation with two weighing platforms

This mode is used for weighing large and small components at the same time. It is possible to toggle from the small-component platform to the large-component platform once during a measurement series. Once you toggle to the large-component platform, the →0← and →T← keys are available until a component is saved. For example, you can tare a partially-filled container taken from the small-component platform on the large component platform.

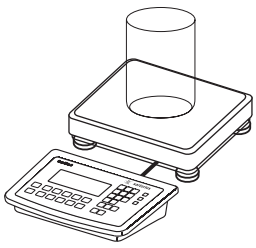
The value in component memory on the small-component platform is transferred to the large-component platform and the weight unit is converted, if necessary. The Component and Additive display modes are both available on the large-component platform.

The value read by the active platform is saved in component memory. The displayed result is accurately calculated in the active weight unit.

When you press CF to stop a measurement series the tare memories for both platforms are cleared, unless the large-component platform is an SBI instrument, in which case the platform is only tared.

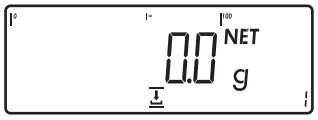
Example:

Three components of a formula should be weighed.
Configuration: The “Net-total formulation” application is selected, and printout has been set up.
Setting: APPLIC./APPLIC.3/NET TOT
Component log: SETUP / PRINT/PROTOC. menu item 7.7
Total data record: SETUP / PRINT/PROTOC. menu item 7.8

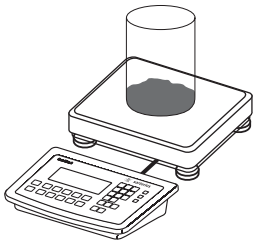


▶ Place empty container on the scale.

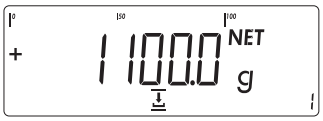
→T← ▶ Tare scale.
This is not required if the automatic tare function is active. The tare weight is saved automatically when you place the container on the platform.



▷ The prompt to fill and save the first component is shown.



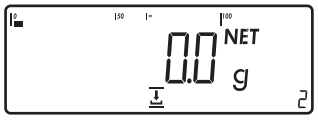
▶ Place the first component into the container (in this example, 1100 g).



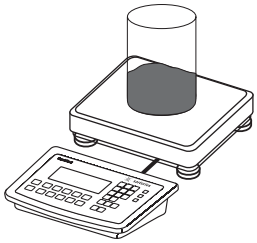
▷ The weight of the first component is displayed.

OK ▶ Save the weight of the first component using the OK key.

Cmp001+ 1.100 kg ▷ The component record is printed automatically.



▷ The weighing platform is tared and the component counter value is increased by one. The prompt to fill and save the second component is now displayed.

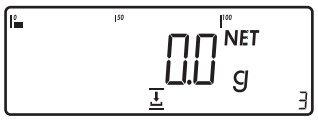


▶ Place the second component into the container (in this example, 525 g).

▷ The weight of the second component is displayed.

OK ▶ Save the weight of the second component using the OK key.

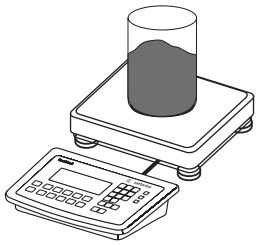
Cmp002+ 0.525 kg ▷ The component record is printed automatically.



▷ The weighing platform is tared and the component counter value is increased by one. The prompt to fill and save the third component is now displayed.

⇆ ▶ Toggle to the “additive mode” using the ⇆ key to display the total weight of all components.

▷ The value displayed equals the weight of components added up to now plus the current weight on the platform.



▶ Place the third component into the container until the desired total weight is reached (in this example, 2000 g).

▷ The total weight is displayed.

OK

▶ Save the weight of the third component using the OK key.

```
Cmp003+    0.375 kg
```

▷ The component record is printed automatically.

▷ The component counter value is increased by one. The prompt to fill and save the fourth component is now displayed.

CF

▶ End component weighing by pressing the CF key.

▷ Results are printed automatically (configured total data record).

```
n      +        3
Tot.cp+    2.000 kg
Cont.T+    0.296 kg

--------------------
```

Number of components
Content of component memory
Content of tare memory (container weight)

Combining Application Programs

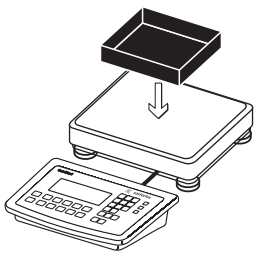
The following table shows how the applications described can be combined. The basic **weighing** function is available at all times; it does not need to be combined with a computational function.

Select programs one after the other: Toggle using the [D] key.

Application 1 (Basic Function)	Application 2 (Monitoring Function)	Application 3 (Cumulative-value Function)
Counting	–	Totalizing
Counting	Checkweighing	Totalizing
Counting	Checkweighing	–
Counting	Classification	–
Neutral measurement	–	Totalizing
Neutral measurement	Checkweighing	Totalizing
Neutral measurement	Checkweighing	–
Neutral measurement	Classification	–
Animal weighing	–	Totalizing
Animal weighing	Checkweighing	Totalizing
Animal weighing	Checkweighing	–
Animal weighing	Classification	–
Weighing in percent	–	Totalizing
Weighing in percent	Checkweighing	Totalizing
Weighing in percent	Checkweighing	–
Weighing in percent	Classification	–
–	–	Net-total formulation
–	Checkweighing	Totalizing

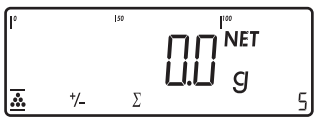
Example: "Portioning" (counting ⁂, checkweighing +/- with totalizing Σ)

Configuration:
Application 1: Counting (COUNT.)
Application 2: Checkweighing (CHECK.)
Application 3: Totalizing (TOTALIZ): Saved value: Net + Calculated (3.23.3)
Autosave: On (3.16.2)
Source of data: Application 2 (3.22.2)
Setup: Printout: PRT PROT 7.8. Printer 1: "Total: Print when FN pressed," then select the menu line items of your choice.

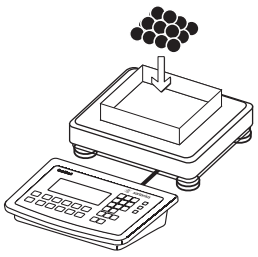


▶ Place empty container on the scale.

[→T←]

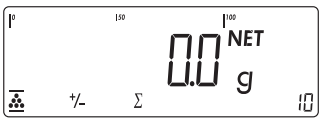


▶ Tare scale.
This is not required if the automatic tare function is active. The tare weight is saved automatically when you place the container on the platform.



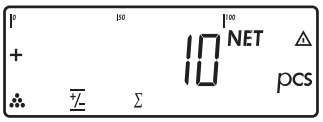
▶ Place any number of parts in the container for the reference quantity (in this example, 10 pcs).

OK ▶ Start the calculation of the reference piece weight.



▷ If the weight is too light, an error code is shown in the main display *INF 29*. Reduce the minimum load setting or increase the reference sample quantity setting and the number of parts in the container.

D ▶ Toggle to Checkweighing.



OK ▶ Start Checkweighing.

1 0 0 ▶ Enter target value, minimum and maximum (in this example, target 100 pieces, minimum 100 pieces, maximum 102 pieces).

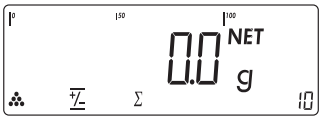
OK

1 0 0

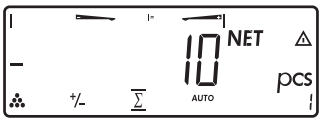
OK

1 0 2

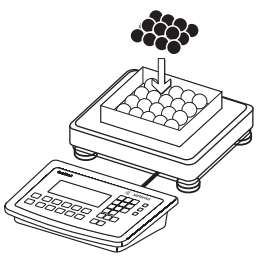
OK



D ▶ Toggle to totalizing.



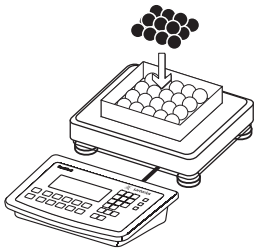
▶ Add desired number of pieces.

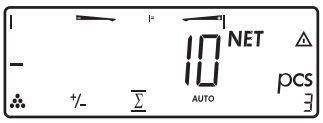


▷ The number of pieces is saved automatically.

▶ Unload the scale: Remove the samples.

▶ Perform further counting operations as desired.





[⇆] ▶ Toggle display from individual value to total.

[CF] ▶ End the portioning options and print the final evaluation.

Configured printout: Total.

```
--------------------
nRef   +        10 pcs
wRef   + 0.001000 kg
Setp   +       100 pcs
Min    +       100 pcs
Max    +       102 pcs

n               6
*N     +     0.600 kg
Total  +       600 pcs
--------------------
```

Configuring Printouts

Purpose

You can individually define each measurement printout. This should be carried out **after** setting the applications since some data in the printout is application-dependent.

In the “Print parameters” menu, single, component, and total data records can be configured, which contain the available print items for the respective applications. Using the total data record for “Totalizing” and “Net-total formulation” applications, you can define which parameters are printed using the CF key.

Features

- Six lists each with a max. length of 30 print items
  - Single printout Printer 1
  - Component printout Printer 1
  - Total data printout Printer 1
  - Single printout Printer 2
  - Component printout Printer 2
  - Total data printout Printer 2.
- Single, component, and total data records can be configured separately.
- Print single printout: (⎙) key.
  Auto printout of application when Setup menu is activated:
  - Animal weighing (averaging)
  - Checkweighing
  - Classification.
- Print component printout:
  Totalizing/Net-total formulation with the OK key: APPLIC./APPLIC.3/TOTALIZ printout: Component printout.
- Print total data printout:
  For selected application Totalizing/Net-total formulation with CF key.
- When switching to another application in Setup, only the application-dependent printout lists are deleted. The other printout lists remain saved.
- Print items can be deleted individually: Press and hold the →0← key.
- Print items “Form Feed” for record footer:
  Move to the next label start for printer type: YDP14IS: “Label” and YDP04IS, setting “Label, manual form feed”.
- ISO/GMP-compliant printout: The Setup menu configuration under “ISO/GMP-compliant printout” is also active for configured printouts.

Preparation ▶ Open Menu mode (see page 35).

Fn Fn ... ▶ Select the SETUP menu.

Fn Fn ...→T← ▶ Select and open the PRINT submenu.

Fn Fn ...→T← ▶ Select and open the PROTOC. submenu.

Available parameter settings

PROTOC.	Protocol		7
	HEADLIN.	Header and ID header input	7.4
	QTY.1	Quantity interface 1	7.5
	INDIV. 1	Standard interface 1	7.6
	COMPON.1	Component interface 1	7.7
	TOTAL 1	Result interface 1	7.8
	QTY.2	Quantity interface 2	7.9
	INDIV.2	Standard interface 2	7.10
	COMPON.2	Component interface	7.11

TOTAL 2	Result interface 2	7.12
GMP.PRT	ISO/GMP	7.13
DAT/TIM	Date without time	7.14
AUT.ONCE	Automatic printout after stability	7.15
FLEX.PRN	Flex print	7.16
DEC.SEP.	Decimal separator	7.17
ALIB.MEM	Alibi memory	7.18
RESET	Restore factory default settings	9
	Setting the factory settings	9.1

– The rows of the printout list can be called up and activated individually. Example: see under Configuration, menu item 7.6.

– The print selection set as active appears with the left selection bar on the display, e.g. gross, tare, net.

▶ Expand the printout: Press the →T← key. The selection bar appears on the right of the display.
▶ Select print items: Press the Fn key.
▶ Save the desired print items: Press the →T← key.
▶ Press the →0← key to change the print selection set as active. The selection bar appears on the left. The required print item is set as active and appears in the printout.

– Print items can be deleted individually from the active printout selection: Press and hold the →0← key.

▶ Save settings with the →T← key and exit Setup: Press the →0← key several times.

Additional functions

Printing the “Selection” and “List” Settings
LIST: Output of the current printout list
SELECT: Print currently selectable items

▶ When the selection bar is in LIST or SELECT: Press the key.

Printout (example)

```
Indiv.Prt
  List
====================
Net (N)
Gross (G#)
Tare
Tare (T2/PT2)
Piece count
====================
```

etc.

Example: Standard printout for data output from the “Counting” application.

Configuration:
- Application: Application 1: Counting
- Then access Setup: Printout: Printer 1: “Individual: print by pressing [E]”

Fn Fn ... ▶ Select the SETUP menu.

Fn Fn ...→T← ▶ Select and open the PRINT submenu.

Fn Fn ...→T← ▶ PROTOC. submenu should be selected and opened.

→T← →T← ... ▶ Press the →T← key until HEADER appears in the display.

Fn Fn ... ▶ Press the Fn key until INDIV. 1 appears in the display.

→T← ▶ Press the →T← key.

▷ The list of print items appears.

→T← ▶ Press the →T← key to go to the selection list.

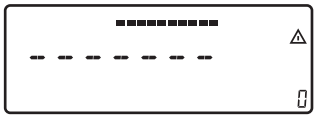
The first print item of the selection list is displayed.

Fn ▶ Press the Fn key to scroll through the available print items in the selection list.

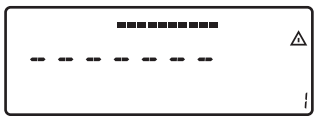
or

→T← ▶ Press the →T← key to add the displayed print item from the selection list to the list of print items.

Fn Fn ... ▶ Press the Fn key until the line row appears in the display.



→T← ▶ Press the →T← key to save the selection.



▷ The counter value is increased by one.

Fn Fn ... ▶ Press the Fn key until the “reference weight” entry is displayed.

→T← ▶ Press the →T← key to save the selection.

▶ You can now select additional print items in the same way.

→0← →0← ... ▶ To exit print item entry, press the →0← key until APPLIC. appears in the display.

▷

→T← ▶ Press and hold the →T← key (2–3 sec) to switch to weighing mode.

▶ Carry out weighing.

▶ Press the key to print the results.

Printout example

```
    --------------------
nRef  +         5 pcs
wRef   +        8 pcs
wRef  +    0.4000 g
```

Product Data Memory

Purpose

The product data memory stores initialization data and user data (product and tare values).

Features

- The product data memory has 100 memory cells for product or tare values. This means that e.g. 80 application memories and 20 tare memories are available.
- Each memory cell is uniquely identified by a number up to three digits.
- The product data memory can be used with the following applications:

  Application 1
  - Weighing
  - Counting
  - Neutral measurement
  - Animal weighing
  - Weighing in percent

  Application 2
  - Checkweighing
  - Classification
- Data records can be created, overwritten, and individually deleted.
- Data remains stored when the scale is switched off.

Saving Product Data (in this example in the “Counting” application)

▶ Start the Counting application.

▶ Enter a memory number and press and hold the Mem key (min 2 seconds).

Saving Preset Tare Values

▶ Allocate preset tare memory.

▶ Enter a memory number and press and hold the Tare key (min 2 seconds).

Activating Saved Product or Tare Values

▶ Enter a memory number and press the Mem key.

Displaying Information for a Specific Product or Tare Value

(CN) Enter a memory number and press the Info key.

- Use the Fn key to switch between wRef (average piece weight) and nRef (quantity).
- Use the →T← key to scroll the displayed value to the right.
- Use the Mem key to activate the displayed memory.
- Use the CF key (min. 2 seconds) to delete the displayed memory.

▶ Exit the mode using the CF key.

Displaying Information for all Product or Tare Memories

▶ Press the Mem key to display the first memory number.

- Press the Fn key to scroll through in lexical order (e.g. 1, 3, 333, 4, etc.).
- Use the Mem key to activate the selected memory number.
- Press the Info key to display the saved product values.
- Press and hold the CF key (min. 2 seconds) to delete the selected memory number.

▶ Exit the mode using the CF key.

Deleting Specific Memory Numbers

▶ Enter a memory number and press and hold the CF key.

Example: Using the Counting application with a stored average piece weight.
Configuration: Application: Counting (COUNT.)

Saving the Average Piece Weight

▶ Start the application.
▶ Determine the average piece weight using one of the methods described above.
▶ Enter the memory cell number using the keypad, and press and hold the Mem key (min 2 seconds).

Loading the Average Piece Weight or Reference Sample Quantity

▶ Enter the memory cell number and press the Info key.
– Use the Fn key to switch between wRef (average piece weight) and nRef (quantity).
– Use the →T← key to scroll the displayed value to the right.
– Use the Mem key to activate the displayed memory.
– Use the CF key (min. 2 seconds) to delete the displayed memory.
▶ Exit the mode using the CF key.

Overwriting Data in a Memory Cell

▶ Enter the memory cell number to be overwritten via the keypad.
▶ Press and hold the Mem key (min 2 seconds).
▷ The previous average piece weight is overwritten.

▶ To cancel without saving, press the CF key.

Deleting an Average Piece Weight

▶ Enter the memory cell number of the average piece weight to be overwritten.
▶ Press the Info key.
▶ Delete the displayed value by pressing and holding the CF key (min. 2 seconds).

Data Interfaces

The indicator is equipped with the following data interfaces:
– **COM1**: –Standard data interface (RS-232 (A21), 485 (A22), 422 (A23).

The interface can be configured in the SETUP menu for different input and output functions (e.g. printer, 2nd weighing platform, PC).

Warning when using third-party RS-232 connecting cables: the pin assignments may not be compatible with Sartorius equipment.

Specifications

Serial interface:	Interface operation: Full duplex
Level:	COM1: RS-232 or RS-422
Connection to device:	Weighing platforms Connection via screw terminals in the housing, cable routed into the housing via a cable gland.
Transmission rate:	150, 300, 600, 1200, 2400, 4800, 9600, 19200 baud (depending on the operating mode)
Number of data bits:	7, 8 bits
Parity:	Space, odd, even, none (depending on the operating mode)
Number of stop bits:	1 or 2
Handshake mode:	Software (XON/XOFF), hardware (1 character after CTS)
Protocols:	SBI, XBPI-232, XBPI-485, SMA
Network address [4]:	0, 1, 2, ..., 31
SBI: Manual data output:	Without stability, after stability, configurable printout
SBI: Auto data output:	Without stability, at stability, at user-defined intervals
SBI: Output format:	16 or 22 characters
Printout of application data:	Configurable printout

Configuring the Data Interface as a COM Port (DATPROT)

You can configure the interface as a COM port in either COM1 or UniCOM, "Data Protocol" (DATPROT) menu item.

SBI communication

This is a simple ASCII interface.

Data output is configured under menu items 6.1 and 6.3:

- Manual output of displayed value with or without stability (menu items 6.1.1 and 6.1.2).
- Automatic output of displayed value with or without stability (menu items 6.1.4 and 6.1.5) at intervals defined by display updates. The number of display intervals is set in menu item 6.3.
- Output of a configurable printout (menu item 6.1.7). Output is linked to the "Printouts" menu item (DATPROT), (see page 96 "Configuring Printouts").

If you do not activate and configure a user-definable data record, the printout simply contains the current value displayed on the display and control unit (weight with unit, calculated value, alphanumeric display).

SMA communication

Standardized communications protocol of the **S**cale **M**anufacturers **A**ssociation.

Data Input Format

You can connect a computer to your scale to send commands controlling weighing instrument functions and applications via the interface port.
All commands use the same data input format. They begin with the character **ESC** (ASCII: 27) and end with a carriage return **CR** (ASCII: 13) and **LF** (ASCII: 10). The total length of a command is anywhere from 4 characters (1 command character between the start and end described above) to a max. of 7 characters (4 command characters). This number can also be higher when sending texts.

The commands listed in the following table must each be supplemented with ESC **...** CR LF.

Example: The command character for output is "P" ("output to Port"). To trigger this command, send the string: "ESC P CR LF".

Command	Meaning
K	Weighing mode 1
L	Weighing mode 2
M	Weighing mode 3
N	Weighing mode 4
O	Lock keys
P	Send display value to data interface
Q	Output acoustic signal
R	Release keys
T	Tare and zero (combination tare function)
f3_	Zero (see also the "kZE_" command)
f4_	Tare without zeroing (see also "kT_" command)
i_	Information about the indicator, example of output: "C2/016202/1" Explanation: Indicator: Combics 2, software version: 016202, active weighing platform: 1
kF1_	F1: Trigger [Fn] key function
kF2_	F2: Trigger [CF] key function
kF3_	F3: Trigger [REF] key function
kF4_	F4: Trigger [OK] key function
kF5_	F5: Trigger [⇆] key function
kF6_	F6: Trigger [Info] key function
kF7_	F7: Trigger [ID1] key function
kF8_	F8: Trigger [Setup] key function
kF9_	F8: Trigger [REF] key function
kF10_	F8: Trigger [ISO-test] key function
kF11_	F8: Trigger [Fn] key function
kF12_	F8: Trigger [B/G] key function
kCF_	CF: Trigger [CF] key function
kP_	Trigger [🖨] key function Print at printer interface
kT_	Trigger [T] key function (Tare)
kNW_	Trigger [⚖] key function (toggle the weighing platform)
kZE_	Trigger [→0←] key function (Zero)
x1_	Output model designation of active weighing platform, example: "LP6200S-0C"
x2_	Output serial number of active weighing platform, example: "0012345678"
x3_	Output software version of active weighing platform, example: "00-42-01"
x4_	Output software version of indicator, example: "01-62-01"
x9_	Output serial number of indicator, example: "0012345678"
x10_	Output model of indicator, example: "CAW2P4-1500RR-LCE"
z1_	Input: printout header 1
z2_	Input: printout header 2
txx...x_	xx...x: text input, length corresponds to input, for display in the measured value line

The ASCII code for the "underline" character ("_") is 95 decimal.
Format for entering printout header lines: "ESC z x a ... a _ CR LF" with x=1 or 2 and a ... a: 1 to 20 characters for header x, followed by the underline, CR and LF characters.

Each line in a print job can contain up to 22 characters (up to 20 printable characters plus two control characters). The first 6 characters, called the “data header”, identify the subsequent value. You can suppress the header under menu item 7.2 in the “Printouts” menu; in this case, the print job has up to 16 characters (up to 14 printable characters plus two control characters).

Example: output without identification

```
     +    253 pcs
```

16 characters are printed

Example: output with identification

```
Qnt  +    253 pcs
```

22 characters are printed

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

Data Output Format with 16 Characters (without Data Header)

Normal Operation

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

+-: Plus or minus sign
*: Space
D: Digit or letter (max. 7 characters plus decimal point)
U: Unit symbol (1 to 3 letters followed by 2-0 spaces)
CR: Carriage return
LF: Line feed

Special Outputs

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

*: Space
– –: Final readout
H: Overload
HH: Overload in checkweighing
L: Underweight
LL: Underweight in checkweighing
C: Adjustment

Error Message

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

*:	Space
#:	Error code number (2 or 3 digits)

Example: Output weight value of +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 - or space
Position 2: Space
Positions 3-10: Weight value with decimal point. leading zeros are output as spaces.
Position 11: Space
Positions 12-14: Characters for unit of measure, space, or **!** sign as a symbol
Position 15: Carriage return
Position 16: Line feed

Data Output Format with 22 Characters

Normal Operation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
l	l	l	l	l	l	+	D	D	D	D	D	D	D	D	D	*	U	U	U	CR	LF
l	l	l	l	l	l	-	D	D	D	D	D	D	D	D	D	*	U	U	U	CR	LF
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	CR	LF

l: ID code character, right-justified with spaces
+-: Plus or minus sign
*: Space
D: Digit or letter (max. 7 characters plus decimal point)
U: Unit symbol (1 to 3 letters followed by 2-0 spaces)
CR: Carriage return
LF: Line feed

Special Outputs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S	t	a	t	*	*	*	*	*	*	*	*	-	-	*	*	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	*	*	*	H	*	*	*	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	*	*	*	H	H	*	*	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	*	*	*	L	*	*	*	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	*	*	*	L	L	*	*	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	*	*	*	C	*	*	*	*	*	*	*	CR	LF

*: Space
– –: Final readout
H: Overload
HH: Overload in checkweighing
L: Underweight
LL: Underweight in checkweighing
C: Adjustment

Error Message

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S	t	at	*	*	*	*	*	U	r	r	*	*	#	#	*	*	*	**	CR	LF	
S	t	at	*	*	*	*	*	U	r	r	*	#	#	#	*	*	*	**	CR	LF	

*: Space

#: Error code number (2 or 3 digits)

G#	Gross value
N	Net value
T	Application tare memory 1
T2	Application tare memory 2
Diff	Difference from adjustment value
Targ.	Exact adjustment weight value
Nom.	Exact adjustment weight for SBI printout
nRef	Reference sample quantity
pRef	Percentage of reference
wRef	Reference piece weight
Qnt	Result from “Counting” (piece count) and “Neutral Measurement” applications
mDef	Target value for animal weighing
x-Net	Animal weighing results
Setp	Target value for checkweighing
Diff.W	Absolute difference (e.g., in kg) in Checkweighing
Lim	Deviation in % in Checkweighing
Max	Upper tolerance for checkw.
Min	Min. tolerance for checkw.Stat Status
Classx	Classification
Limx	Class limit
D	Percentage (as loss)
Prc	Percentage (as residue)
Wxx%	Reference percentage weight
Cmpxxx	Component xxx
Cont.T	Contents of the tare memory in Net-total Formulation
S-Comp	Total of initial weighings for Net-total Formulation
PT2	Preset tare
n	Transaction counter
*G	Sum of gross weights in Totalizing
*N	Sum of net weights in Totalizing
Ser.no	Serial number of the platform or indicator

Example: Output of the weight value +1255.7 g

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

Positions 1-6: ID code, right-justified with spaces
Position 7: Plus +, or minus - or space
Position 8: Space
Positions 9-16: Weight value with decimal point. leading zeros are output as spaces (a comma can also be set instead of a decimal point, menu item 7.17)
Position 17: Space
Positions 18-20: Characters for unit of measure, space, or **!** sign as a symbol
Position 21: Carriage return
Position 22: Line feed

If the weight value is output with 10-fold increased resolution, this value is not permitted to be printed or saved in a weighing instrument operated in legal metrology in the SBI mode. In this case, the unit symbol is not included with output.

Configuring the Data Interface as a Printer Port (PRINTER)

You can connect one or two strip printers or one or two label printers to the Combics. Configure the COM1 and UniCOM interfaces as printer ports in the PRINTER menu item.

There are several actions that generate the command for outputting data to the printer port:

- Pressing the (E) key. If the operating menu is active, all menu settings under the active menu level are printed.
- Upon receipt of the "ESC K P _" SBI command.
  For details, see the section entitled “Data Input Format” in this chapter.
- In some applications, pressing a given key (e.g., to save a value or start a routine) also generates a print command. In this case, a configurable printout is generated with application-specific data.

The ⊙ and ◈ symbols are displayed when data is being output to the printer port.

Configuring a Printout

Printouts are configured in the SETUP menu under “Printouts” (SETUP / PRINT / PROTOC.). This should be carried out **after** configuring the application since some data in the printout is application-dependent.
You can configure a separate printout for each interface. Each printout is comprised of different information blocks that can be activated or deactivated via multiple selection in the menu.
For the “Totalizing” and “Net-total Formulation” applications, the totalizing/results printout can be configured independent of the individual/component printout.

Headers
2 headers each with a max. of 20 characters are available (e.g., for printing the company name).
Input: menu items 7.4.1 and 7.4.2. Empty headers are not printed.

Example Print image:

```
EISENSCHMIDT
 GOETTINGEN
```

In this example, the company name is printed centered because there are 4 and 5 spaces before the text.

GMP-Compliant Printouts

When this function, the printout is supplemented with a GMP header and a GMP footer (GMP: “Good Manufacturing Practice”).
Setting: menu item 7.13.

The GMP header precedes the first measured result. The GMP footer is printed either after each individual measurement result (”GMP-compliant printout always for 1 result”, 7.13.2) or after the last result in a series of measurements (”GMP-compliant printout always for several application results,” menu item 7.13.3).
To end a series of measured results, press and hold the (E) key. In this case, the E symbol is displayed after the GMP header is printed and remains in the display until the GMP footer is printed.

If you toggle to a different platform while a GMP printout of several measured results is being generated (7.13.3), the GMP footer for the platform used up to that point is generated when you press the (⇄) key. The GMP header for the other platform is included on the next printout generated.
A GMP-compliant printout is generated automatically at the conclusion of calibration/adjustment, linearization routines, as well as when you set or clear a preload.

When printing GMP-compliant printouts on label printers under menu setting 7.13.3, the relationship between the GMP header and footer is lost (printed on different labels). GMP-compliant printouts on label printers, therefore, should only take place using menu setting 7.13.2. Three examples of GMP headers and one example of a footer are shown in the following.

Weighing platform WP 1:

`--------------------`	Dash line
`14.01.2013  09:43`	Date/time
`Type  CAIXS2`	Combics Type
`Ser.no.  12345678`	Combics serial no.
`Vers.  C2 100.280810`	Software version Application
`BVers.  01-62-03`	Software version Basic software
`--------------------`	Dash line

Weighing platform WP 2 (xBPI printout):

`--------------------`	Dash line
`14.01.2013  9:45 AM`	Date/time
`Type  CAIXS2`	Combics Type
`Ser.no.  12345678`	Combics serial no.
`Vers.  C2 100.280810`	Software version Application
`BVers.  01-62-03`	Software version Basic software
`Type  IS12000S`	Platform type
`Ser.No  12345678`	Platform serial no.
`--------------------`	Dash line

Weighing platform WP 2 (SBI printout):

`--------------------`	Dash line
`14.01.2013  9:45 AM`	Date/time
`Type  CAIXS2`	Combics Type
`Ser.no.  12345678`	Combics serial no.
`Vers.  C2 100.280810`	Software version Application
`BVers.  01-62-03`	Software version of basic version
`Type  SBI`	(Platform type)
`--------------------`	Dash line

GMP footer:

`--------------------`	Dash line
`14.01.2013  9:45 AM`	Date/time
`Name:`	Field for signature
	Blank line
`--------------------`	Dash line

Sample Printouts

For details on the individual information blocks, see “Configuring Printouts” above. For details on configuring the header lines, refer to the chapter of the respective application.

“Weighing” application:
If selected, an empty line will be printed.

```
     HEADER LINE1
     HEADER LINE2
1/14/2013    9:43 AM
--------------------

G#      +    1.402 kg
T      +     0.200 kg
N      +     1.202 kg
--------------------
```

Display with ID of weighing platform

```
--------------------

Ser.no.     80705337

G#      +    1.402 kg
T      +     0.200 kg
N      +     1.202 kg
--------------------
```

“Counting” application:
The initialization data contains the reference sample quantity and the reference sample weight. The results data contains gross, net and tare weight and the piece count as a result.

```
--------------------
nRef           10 pcs
wRef  +      0.035 kg

G#      +    1.402 kg
T      +     0.212 kg
N      +     1.190 kg

Qnt            34 pcs
--------------------
```

"Neutral Measurement" Application:
The initialization data block contains the reference sample quantity and reference weight. The results block contains gross, net and tare weight and the piece count as a result.

```
--------------------
Ref              2 o
wRef   +     1.200 kg

G#     +    14.700 kg
T      +     0.300 kg
N      +    14.400 kg

Qnt             12 o
--------------------
```

"Weighing in Percent" Application:
The initialization data contains the reference percentage and the reference sample weight. The results data shows gross, net and tare weights, as well as the percentage, which is shown as either the loss or the residual amount.

Percentage = residual

```
--------------------
pRef           100 %
Wxx%   +      2.100 kg

G#      +     1.859 kg
T      +      0.200 kg
N      +      1.659 kg

Prc              79 %
--------------------
```

Percentage = loss:

```
--------------------
pRef           100 %
Wxx%   +      2.100 kg

G#      +     0.641 kg
T      +      0.200 kg
N      +      0.441 kg

D                21 %
--------------------
```

"Checkweighing" Application:
The initialization data contains the target weight, the min. weight, and the max. weight. The results data always contains the gross, net and tare weight. Additional results can be printed in 2 different display types:
– Weight display:
In the OK and nonconforming range, the deviation from the target weight is always printed as a percentage and absolute deviation.
– Relation to target value:
In the OK range, the deviation from the target weight is printed as a percentage and absolute deviation.
In the nonconforming range, "HH" is printed for exceeding the weight and "LL" for falling below the weight.
OK range in the weight and tolerance limit display.

```
--------------------
Setp   +     1.300 kg
Min    +     1.235 kg
Max    +     1.365 kg

G#     +     1.312 kg
T      +     0.000 kg
N      +     1.312 kg

Lim    +      0.92 %
Diff.W+      0.012 kg
--------------------
```

Result outside (over) "OK" range; "Threshold" printout:

```
--------------------
Setp   +     1.300 kg
Min    +     1.235 kg
Max    +     1.365 kg

G#     +     1.400 kg
T      +     0.000 kg
N      +     1.400 kg

Stat      HH
--------------------
```

Example with 2 transactions:

```
     HEADER LINE1
     HEADER LINE2
1/14/2013    9:43 AM
--------------------
G#     +    1.400 kg
T      +    0.200 kg
N      +    1.200 kg
n               1

G#     +    3.400 kg
T      +    0.200 kg
N      +    3.200 kg
n               2
```

Single printout (menu setting 3.17.2). Complete standard printout configuration is printed for each transaction.
Example: print 2nd transaction

```
     HEADER LINE1
     HEADER LINE2
1/14/2013    9:43 AM
--------------------
G#     +    2.400 kg
T      +    0.200 kg
N      +    2.200 kg
n               2
```

Standard printout
The transaction counter is not printed.
Example: print 2nd transaction

```
G#     +    2.400 kg
T      +    0.200 kg
N      +    2.200 kg
```

Print menu parameters:
All active sub-items of the currently displayed menu are printed:

```
--------------------
MENU
       SETUP
WP1
--------------------
  1
   1.1
             1.1.2
             1.2.1
1.3.2
...
  1.18
   1.18.1
    CAL.
         10.000 kg
```

etc.

GMP-Compliant Printouts

"Linearization" printout

```
--------------------
1/14/2013    1:00 PM
Type           CAIXS2
Ser.no.     12345678
Vers.  C2 100.280810
BVers.      01-62-03
--------------------

Linearization
Wt.1 +       7.00 kg
Wt.2 +      15.00 kg
Wt.3 +      22.00 kg
Wt.4 +      30.00 kg
           completed
--------------------
1/14/2013    1:02 PM
Name:

--------------------
```

Calibration/adjustment printout

```
--------------------
1/14/2013    1:50 PM
Type           CAIXS2
Ser.no.     12345678
Vers.  C2 100.280810
BVers.      01-62-03
--------------------

External calibration
Targ. +     30.00 kg
Diff. -      0.03 kg
External adjustment
Diff. +      0.00 kg
--------------------
1/14/2013    1:52 PM
Name:

--------------------
```

Setting the preload printout

```
--------------------
1/14/2013    1:50 PM
Type           CAIXS2
Ser.no.     12345678
Vers.  C2 100.280810
BVers.      01-62-03
--------------------
Set preload
            completed
--------------------
1/14/2013    1:52 PM
Name:
--------------------
```

Clearing the preload printout

```
--------------------
1/14/2013    1:50 PM
Type           CAIXS2
Ser.no.     12345678
Vers.  C2 100.280810
BVers.      01-62-03
--------------------

Clearing the preload
            completed
--------------------
1/14/2013    1:52 PM
Name:

--------------------
```

Weighing printout with multiple results (Example: 2 results):

```
--------------------
1/14/2013    9:43 AM
Type           CAIXS2
Ser.no.     12345678
Vers.  C2 100.280810
BVers.      01-62-03
--------------------

     HEADER LINE1
     HEADER LINE2
1/14/2013    9:43 AM
--------------------
G#     +     2.40 kg
T       +    0.20 kg
N      +     2.20 kg
--------------------
     HEADER LINE1
     HEADER LINE2
1/14/2013    9:44 AM
--------------------
G#     +     3.40 kg
T       +    0.30 kg
N      +     3.10 kg
--------------------
1/14/2013    9:45 AM
Name:

--------------------
```

Error Codes

Errors are divided into the following:
- Dynamic errors are displayed for the duration of the error with an error code (e.g. INF 01).
- Temporary errors are displayed for 2 seconds (e.g. INF 07).
- Fatal errors are displayed continuously (e.g. ERR 101; a reset is required to clear these).

Display	Cause	Remedy
No display segments	No power present	Check power supply
--------	Key has no function in this status	
Flashing ⚠	Battery defective or time changed	Set time
H	Weighing range exceeded	Unload the balance
L or ERR 54	Weighing pan is not in place	Position the weighing pan
ERR 101–104	Key is stuck Key pressed when switching on	Release key or contact your local Sartorius Service Center
ERR 320	Operating program memory faulty	Contact your local Sartorius Service Center
ERR 335	Verified weighing platform not compatible with the connected terminal	Connect a compatible weighing platform
ERR 340	New EEPROM loaded (Service)	Turn the scale off and then on again. If the error code Err340 is still displayed, please contact your local Sartorius Service Center
ERR 341	RAM has lost data; battery is dead	Leave the scale connected to power for at least 10 hours
ERR 343	Loss of data in the memory area for transaction numbers in external alibi memory	Contact your local Sartorius Service Center
INF 01	Data output not compatible with output format	Set output format correctly
INF 02	Adjustment condition was not maintained e.g., not tared or weighing pan loaded	Calibrate only when zero is displayed Unload the scale, press →T← key to tare
INF 03	Adjustment could not be completed within a certain time.	Allow to warm up again and repeat the adjustment process
INF 06	Built-in adjustment weight defective	Contact your local Sartorius Service Center
INF 07	Function not allowed in scales verified for use in legal metrology	Contact your local Sartorius Service Center
INF 08	The load on the scale is too heavy to zero the readout	Check whether “Tare/zero at power on” (1.12) is set
INF 09	Taring is not possible when the scale gross weight is zero	Zero the scale
INF 10	Tare key is blocked when there is data in the tare memory	The application program data must be deleted before taring
INF 18	Preload is too light	
INF 19	Preload is too heavy	
INF 29	Minimum load not reached	Reduce min. load (under Application, menu item 3.6)
INF 30	BPI ID (BPI byte) not deleted in current weighing platform (COM1 is fixed on XBPI data communication)	Reset weighing parameters to factory settings for current weighing platform
INF 31	Interface handshake activated (XOFF, CTS)	Send XON, unblock CTS
INF 71	Cannot store the current weight value (e.g., control limits too low or too high)	None
INF 72	Cannot store the current weight value (e.g., the transaction counter has reached its limit)	None
INF 73	Data cannot be written or read	Contact your local Sartorius Service Center
INF 74	Function is blocked (e.g., menu is locked, device is already configured to another interface)	None
NO WP	No weighing platform connected	Connect weighing platform

Care and Maintenance

Service

Regular servicing by a Sartorius technician will extend the service life of your equipment and ensure its continued weighing accuracy. Sartorius offers its customers service contracts with regular maintenance intervals ranging from one month to two years. The frequency of the maintenance intervals depends on the operating conditions and the operator's tolerance requirements.

Repairs

Disconnect the power supply to the defective equipment immediately (unplug the power cord from the mains supply). Repair work must be performed by authorized Sartorius service technicians using original spare parts. Repairs performed by untrained persons may result in considerable hazards for the user.

If a cable or cable gland is damaged or defective, replace the cable as a complete unit with all its connectors.

Do not open the indicator while it is carrying current. Wait at least 10 seconds after disconnecting it from power before beginning to open the equipment. Proper fitting of all surfaces is essential for the IP rating of the housing; for this reason the device must be opened and closed by a certified technician.

Cleaning

Indicators are designed in compliance with European Hygienic Equipment Design Group (EHEDG) directives on suitable measures to avoid contamination, so that they are particularly easy to clean and disinfect.

Disconnect the power supply to the indicator (unplug the power cord from the mains supply). If necessary, disconnect the data cable.

Make sure that no liquid enters the indicator.

Do not use aggressive cleaning agents (solvents or similar agents).

Do not spray the device with water or blow with compressed air.

- ▶ Clean the indicator with a cloth lightly moistened with a soap solution. For use in the food industry, use a cleaning agent suitable for that particular working environment.
- ▶ Wipe the indicator with a soft, dry cloth.

Cleaning the Stainless Steel Surfaces

- Only use conventional household cleaning agents that are suitable for stainless steel.
- Only use solvents for cleaning stainless steel parts.

▶ All stainless steel parts should be cleaned at regular intervals: Rub stainless steel surfaces with a moist cloth, with a cleaning agent if required, then remove all residue from the surface.
▶ Allow device to dry. For additional protection, protective oil may be applied.

Replacing the Dust Cover

Damaged dust covers should be replaced immediately.

▶ Remove damaged dust cover.
▶ Place the new dust cover on the indicator and press it over the edge of the front and rear side of the device until it is fixed in place.

Safety Inspections

Safe operation of the device is no longer ensured when:

- there is visible damage to the device or power cord
- the integrated power supply for the indicator no longer functions properly
- the device has been stored for a relatively long period under unfavorable conditions (e.g. excessive humidity)

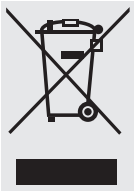
If there is any indication that safe operation of the device is no longer warranted:
▶ Disconnect the power supply to the device (unplug the power cord from the mains supply) and make sure the device cannot be used for the time being.
▶ Notify your nearest Sartorius Service Center.

Maintenance and repair work may only be carried out by service technicians:
- who have access to the required maintenance manuals

and
- who have attended the appropriate training workshops.

The seals on the device indicate that the device may only be opened and maintained by authorized specialist personnel, so that the correct and safe operation of the device is ensured and the guarantee remains valid.

Disposal



If the packaging is no longer needed, it can be disposed of by local waste disposal authorities. The packaging is made of environmentally friendly materials that can be used as secondary raw materials. If you no longer require the packaging, you can dispose of it free of charge in Germany through the Vfw dual system (contract number D-59101-2009-1129). In Germany, you can dispose of this material using the VfW dual system (contract number D-59101-2009-1129).

The equipment, including accessories and batteries, should not be disposed of as regular household waste.
EU legislation requires its Member States to collect electrical and electronic equipment and dispose of it separately from other unsorted municipal waste so that it may be recycled.

In Germany and several other countries, Sartorius itself assumes responsibility for the return and conformant disposal of its electronic and electrical products. Such equipment may not be thrown out with household waste or brought to collection centers run by local public disposal operations – not even by small commercial operators. For disposal in Germany and in the other member nations of the European Economic Area (EEA), please contact our local service technicians or our Service Center in Goettingen, Germany:

Sartorius Industrial Scales GmbH & Co. KG
Leinetal 2
37120 Bovenden, Germany

SWT GÖ: WEEE reg. no. DE 49923090

In countries that are not members of the European Economic Area (EEA) or where no Sartorius subsidiaries or dealerships are located, please contact your local authorities or a commercial disposal operator.

Prior to disposal and/or scrapping of the equipment, any batteries should be removed and disposed of at local collection points.

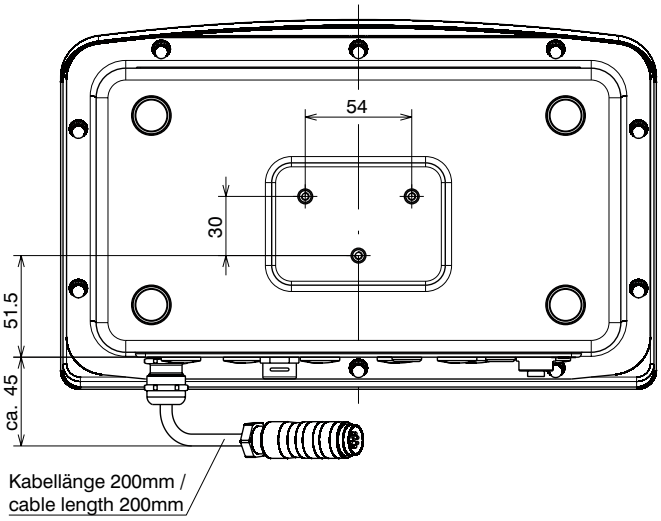
Sartorius will not take back equipment contaminated with hazardous materials (ABC contamination) – either for repair or disposal. Please refer to our website (www.sartorius.com) or contact the Sartorius Service Department for more detailed information regarding repair service addresses or the disposal of your device.

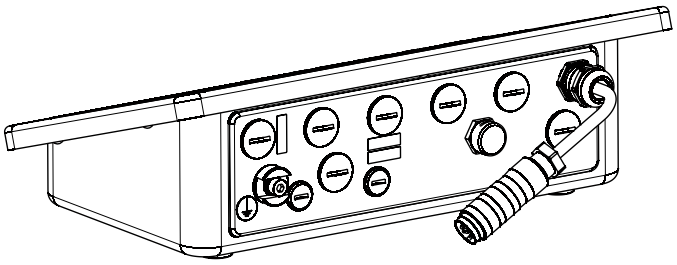
Specifications

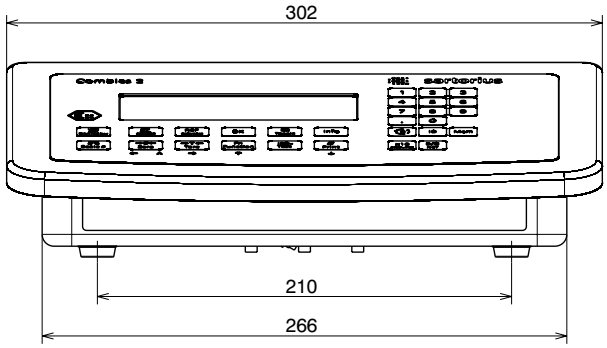
ADC Scale Interface

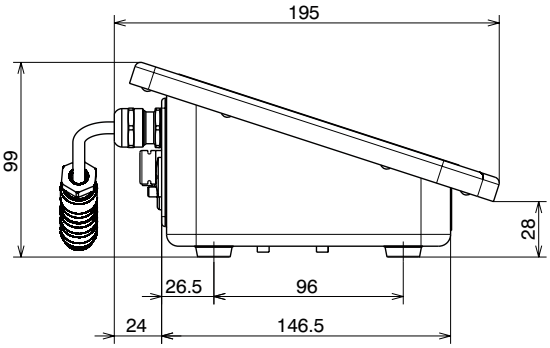
When used in standard applications (as opposed to legal metrology):	
– Display resolution	≤ 62500 d
– Using the equipment in legal metrology:	
Load cell connection:	
– Supply voltage	2,5 V
– Bridge impedance	83 Ω to 2000 Ω
– Available sensor technology	4-conductor or 6-conductor technology
When used in legal metrology:	
– Available sensor technology	6-conductor technology
– Max. cable length per gage	150 m/mm^2
– Lowest permissible input signal for Pind = 0.5	0.2 µV/e
– Fraction of tolerance for this module: for Delta U_{min} 0.2 µV/e	0.5
Measurement signal	0 mV to 7.5 mV
"Lowest permissible input signal when used in non-legal metrology":	0.02 µV/d
Measurement signal for dead load	0 mV to 2.5 mV
Sensitivity	4 million digits max. (internal)
Digital protective interface	According to EN 45501
Data interface	Bidirectional intrinsically safe RS-232 interface "COM 1" with intrinsically safe control outputs (digital I/Os) for connection to suitable intrinsically safe equipment. Alternatives: Bidirectional intrinsically safe RS-422 interface "COM 1" or bidirectional intrinsically safe RS-485 interface "COM 1" with intrinsically safe control outputs (digital I/Os).
Additional data interface:	Optional
Display	20 mm LCD, 14-segment plus status symbols, backlit
Housing: – Material – Protection class according to EN 60529	Stainless steel 1.4301 IP69
Temperature range	Storage temperature -20°C to +60°C, operating temperature -10°C to +40°C
Power supply	Only via suitable and where applicable country-specific EX power supply provided by Sartorius model YPS02-X.. / YPS02-Z.. / YPSC01-X / YPSC01-Z: 100-240Vac (± 10%), 50/60Hz; max. 25VA or 40-80VA with YPSC01-. or via Ex battery pack YRB02-X
Explosion protection	See EC Type Examination Certificate in the Appendix
Emissions	In accordance with EN61326-1:2006 (IEC61326-1: Class A
Defined immunity to interference	In accordance with EN61326-1:2006 (IEC61326-1): Industrial areas
Electrical safety	In accordance with EN61010-1 (IEC61010-1)

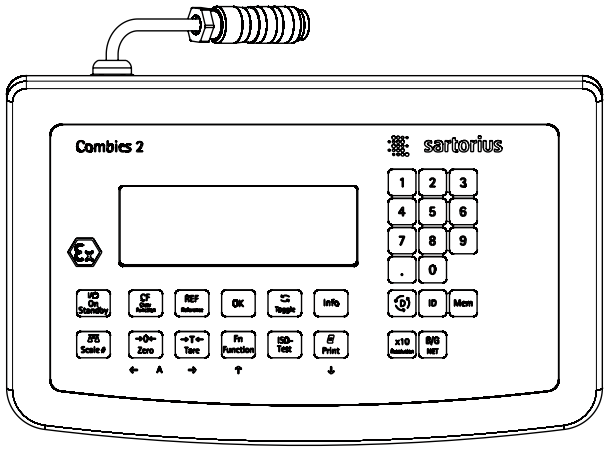
CAIXS2 Dimensions

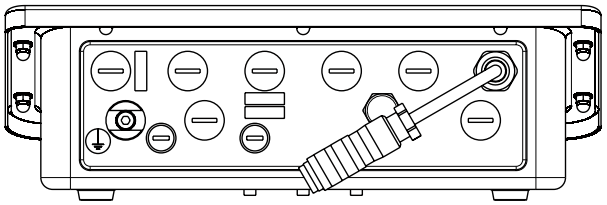










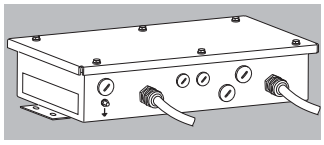
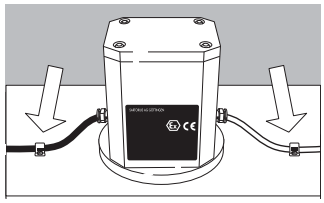
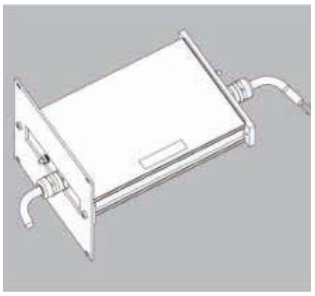
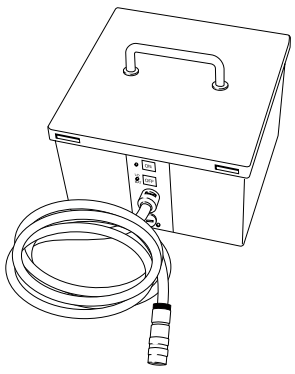


All dimensions are given in millimeters

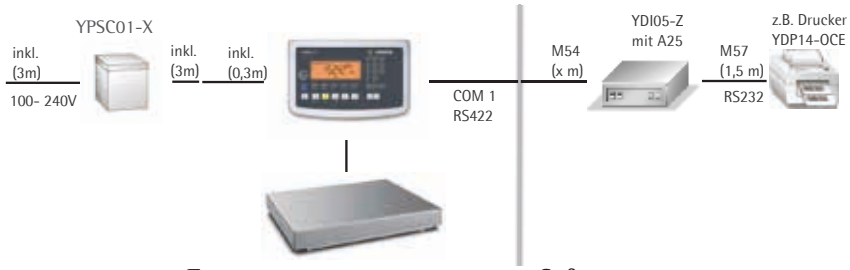
Accessories

Item	Order No.
RS-232 interface for digital platform (A16)	YDO07-X
Cable to connect interface converter YDI05-Z to indicator CAIXS2, open cable end for installation on indicator using cable gland, 14-pin round connector, IP65, 0.2 m	YCC02-XR14F02
Cable to connect platform to indicator CAIXS2, open cable ends for installation on indicator using cable gland, 14-pin round connector, IP65, 6 m (RS-232, RS-485)	YCC02-XR14M6
Non-prefabricated cable LiY6x(2x0,14C)Y sheath color blue; recommended e.g. for RS-422 interfaces, digital IN, 1 m = 1 unit	YCC422-X
Non-prefabricated cable 2x0,22 LiYCY sheath color blue; recommended e.g. for interface RS-485, 1 m = 1 unit	YCC485-X
Round plug for individual cable assembly, 14-pin, IP65	69Y03166
Cable gland for cables with diameter 4.5 to 9 mm, IP67, M16 x 1.5	YAS04CIS
Interface converter made of stainless steel for installation in non-hazardous area, for connection of peripheral devices in non-hazardous area, in version RS-232-RS-232 or RS-422-RS-232	YDI05-Z
2 dust covers for CAIXS2	YDC01CI-X
SNLE Sartorius Nice Label Express	YAD02IS
WinScale	YSW03
SartoCollect	YSC02
Sartorius GMP Connect	YSW03-0001
Sartorius OPC Server	6289OPC
	Option
Option of connecting to an intrinsically safe digital weighing platform such as IS-X (conversion to RS-232 interface required) or intrinsically safe FC/FCA-X, EB-X balance, using RS-232 to connect to CAIXS2	A16
Also: Factory assembly of connection cable YCC02-XR14M6 (see accessories)	M20
Option of connecting IS-X platform to CAIXS2 via RS485/XBPI	A19
Also: Factory assembly of connection cable YCC02-XR14 M6 (see accessories)	M26

Power Supply

Item		Order No.
 AC adapter, for use in explosive atmospheres 100–240 V 14-pin round plug (30 cm)	ATEX USA Canada	YPSC01-X YPS02-XUR YPS02-XKR
 AC adapter outside explosive atmospheres 100-240 V range	ATEX USA/Canada	YPSC01-Z YPS02-ZKR
 AC adapter outside explosive atmospheres 24 V	ATEX	YPS02-XV24
 External battery for installation in explosive area	YRB02-X USA/Canada	

Configuration example



“Installation”, a Service Offered by Sartorius

“Installation” Service in Germany
Our “Installation” service package provides the following services:
– Installation
– Commissioning
– Inspection
– Training

If you would like Sartorius to install the indicator, please request this service from a customer service employee.

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CE

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

Hersteller *Manufacturer*	**Sartorius Industrial Scales GmbH & Co. KG** **Leinetal 2, D-37120 Bovenden, Germany**

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

Geräteart *Device type*	Combics Indikator *Combics indicator*
Baureihe *Type series*	**CAIXS2-....**

in der von uns in Verkehr gebrachten Ausführung mit den grundlegenden Anforderungen der folgenden Europäischen Richtlinien übereinstimmt und die anwendbaren Anforderungen der im Anhang 1 aufgelisteten harmonisierten Europäischen Normen erfüllt:
in the form as delivered complies with the essential requirements of the following European Directives and meets the applicable requirements of the harmonized European Standards listed in the Annex 1:

2004/108/EG *2004/108/EC*	Elektromagnetische Verträglichkeit *Electromagnetic compatibility*
94/9/EG *94/9/EC*	Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen *Equipment and protective systems intended for use in potentially explosive atmospheres*
2011/65/EU *2011/65/EU*	Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS) *Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)*

Jahreszahl der CE-Kennzeichenvergabe / *Year of the CE mark assignment:* **13**

Sartorius Industrial Scales GmbH & Co. KG
Bovenden, 2013-12-20

Dr. Bodo Krebs
Senior Vice President

i. V.
Dr. Dieter Klausgrete
Head of International Certification Management

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

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

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

Anhang 1 / *Annex 1*

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

2004/108/EG *2004/108/EC*	EN 61326-1:2006 Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV- Anforderungen – Teil 1: Allgemeine Anforderungen *Electrical equipment for measurement, control and laboratory use - EMC requirements – Part 1: General requirements*
94/9/EG *94/9/EC*	EN 60079-0:2012 Explosionsfähige Atmosphäre – Teil 0: Geräte - Allgemeine Anforderungen *Explosive atmospheres - Part 0: Equipment - General requirements* EN 60079-11:2012 Explosionsfähige Atmosphäre - Teil 11: Geräteschutz durch Eigensicherheit „i" *Explosive atmospheres – Part 11: Equipment protection by intrinsic safety „i"*
2011/65/EU *2011/65/EU*	EN 50581:2012 Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe *Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances*

Anhang 2 / *Annex 2*

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

Kennzeichnung *Marking*	II 2G Ex ia IIC T4 Gb II 2D Ex ia IIIC T80°C Db	
Zertifizierung *Certification*	EG-Baumusterprüfbescheinigung Nummer: *EC-Type Examination Certificate number:*	FM13ATEX0085X
QAN	Anerkennung der Qualitätssicherung Produktion *Production Quality Assessment Notification*	
	durch FM Approvals Ltd, benannte Stelle Nr. 1725 für Anhang IV nach Artikel 9 der Richtlinie 94/9/EG: *by FM Approvals Ltd, notified body number 1725 in accordance with Article 9 of Directive 94/9/EC:*	FM13ATEXQ0093

* * * * * *

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

In the following the expression „device" refers to the indicator type CAIXS2. The expression „equipment" refers to the indicator type CAIXS2 and to the other connected devices.

1) Install the equipment in compliance with applicable laws, rules and regulations, ordinances and standards. In particular, be sure to conform to the European Standards EN 60079-14 (Explosive atmospheres – Part 14: Electrical installations design, selection and erection). For more information see „Verification of Intrinsic Safety" 66015-751-60 (ATEX) and „Control Drawing" 66015-751-07 (for use in the USA and in Canada).
2) Be sure to follow the installation, operating, maintenance and servicing instructions for the connected devices given in the manuals supplied.
3) The device shall be installed in such a way that it is protected against the entry of solid foreign objects or water capable of impairing the safety of the apparatus. Reduce the risk of mechanical damage to a minimum.
4) The equipment must be powered by a suitable certified/approved power supply or battery pack with intrinsically safe circuits as described in the certificate of this equipment.
5) Exposure to UV radiation is not allowed!
6) Prior to opening the equipment, disconnect the power supply or make sure that there is no potentially explosive atmosphere or any other explosion hazard in the surrounding area!
7) The data cables connected to the equipment are considered as intrinsically safe circuits. The connections are secured against accidental disconnections and may only be plugged in or disconnected when the power is switched completely off.
8) Output not used must be safeguarded by appropriate sealing cap (maybe in the scope of delivery) so that the IP6x protection rating is maintained.
9) The injection of any external voltage must be avoided by suitable installation of the connected cables!
10) Check the correct function of the data transfer before you use the equipment in a hazardous location.
11) If the equipment does not operate properly, unplug it immediately from line power (mains supply)! If the device shows visible damages, unplug it and make sure that it will not be used anymore.
12) All metal parts must be electrically connected to the terminal for the equipotential bonding conductor (PA). The equipment operator is obligated to connect a lead with a gauge of at least 4 mm² (cross section) to the PA terminal located on the side of the housing. The low resistance of this connection to the PA busbar must be checked when the system is installed at the intended place of use. The shielding of the connecting cables may only be used for grounding when no impermissible difference in voltage is generated and, if necessary, the shielding is able to conduct the equipotential current.
13) Avoid generating static electricity. Use only a damp cloth to wipe down the equipment. The equipment operator shall be responsible for preventing any risks caused by static electricity.
14) Keep chemicals and other agents, which can corrode the housing seals and cable sheaths, away from the equipment. These agents include oil, grease, benzene, acetone and ozone. If you are not sure about the safety of a certain substance, please contact the manufacturer.
15) Use equipment only in the temperature ranges indicated. Avoid exposing the equipment to heat.
16) The equipment operator is responsible for any non-Sartorius cables used.
17) Check the EX approval marking (particularly the group for gases/dusts and temperature class/code) on all equipment in the hazardous area before operation to ensure that this approved equipment is permitted to be operated in this area.
18) At reasonable intervals, have your equipment installation checked for proper functioning and safety by a trained and certified technician.
19) If your equipment needs to be repaired, use only original spare parts supplied by the manufacturer!
20) Any tampering with the equipment by anyone, other than repair work done by authorized Sartorius service technicians, will result in the loss of EX conformity and in the forfeiture of all claims under the manufacturer's warranty. Only authorized specialists may open the equipment by working to Sartorius rule.
21) Modifications, including those to be carried out by Sartorius employees, may be permitted only after the express written authorization has been obtained from Sartorius.
22) If the housing has been opened, close the housing with a tightening torque of 1 Nm.
23) If the housing has been opened again after the first field wiring, the gasket must be replaced!

Ex	2013-08-08	sartorius	Safety Instructions	CAIXS2	
	Dr. D. Klausgrete		66015-751-16	Revision 00	Sheet 1 of 1

Menu Structure

Overview of the complete menu structure; the individual setting parameters are listed on the following pages.
The indicator only displays the menus that correspond to the available hardware.

APPLIC.	**Set and select applications** (see page 137)
- APPLIC.1	Basic weighing function, Counting applications ⁂ , Neutral measurement ⁂nM, Animal weighing, Weighing in percent %
- APPLIC.2	Checkweighing +/- , Classification applications
- APPLIC.3	Net-total formulation , Totalizing Σ applications
- AUT.TARE	Automatic taring: 1. weight tared
- MIN.TARE	Minimum load for automatic tare and printout
- AUT.STRT	Automatic start of application
- CLER.CF	Selective deleting with the CE key
- TARE.FCT	Tare function
- RESET	Factory settings for all applications
FN-KEY	**Defines functions of the Fn key** (see page 141)
- OFF	
- 2ND.UNIT	
SETUP	**Adjusts device settings to user requirements** (see page 141)
- WP 1	Settings for weighing platform 1
- COM 1	Settings for the RS-232 interface
- CTRL IO	Universal input setting
- PRINT	Printout settings
- UTILIT.	Settings for additional functions
- TIME	Time setting
- DATE	Date setting
- U-CODE	User password entry for locking the Setup menu
- S-DATE	only visible in Service mode; applications
- SER.NO.	only visible in Service mode; serial number
- MODEL	only visible in Service mode; serial number
- S-SQMIN	only visible in Service mode;
- SQMIN	Activates display or GMP-compliant printout
- ALIB.MEM	
INFO	**Displays device-specific information** (see page 151)
- SERVICE	Service date
- TERM	Indicator serial number
- WP- 1	Weighing platform 1 device data
- WP-2	Weighing platform 2 device data
- FLEXINF	FlexPrint settings
- ALIB.MEM	Alibi memory settings
LANGUAG.	**Language setting for display and printout** (see page 151)
- DEUTSCH	
- ENGLISH	
- US.MODE	
- FRANC	
- ITAL	
- ESPANOL	
- CODES	
ADC.CON	**ADC configuration settings** (see page 152)
- VERIF.	
- STANDARD	

Menu Applications

* = Factory setting

APPLIC./APPLIC.1 WEIGH. **Weighing**

APPLIC./APPLIC.1/ COUNT. **Counting**

MIN.INIT	Minimum load for application		3.6
	1 DIGIT	1 scale interval	3.6.1*
	2 DIGIT	2 scale intervals	3.6.2
	... see "WEIGHING"		
	1000 D	1000 scale intervals	3.6.10
RESOLUT	Resolution for calculation of reference value		3.9
	DISP.ACC.	Display accuracy	3.9.1*
	10 FOLD	plus 1 decimal place (10 fold)	3.9.2
	100 FOLD	plus 2 decimal places (100 fold)	3.9.3
SAVE WT.	Parameter for saving weight values		3.11
	STABIL	With stability*	3.11.1
	ACC.STAB	With increased stability*	3.11.2
REF.UPDT	Reference sample updating		3.12
	OFF	Off	3.12.1
	AUTOMAT	Automatic	3.12.3*
REF.WP	Reference weighing instrument		3.13
	NO WP	No weighing platform selected	3.13.1*
	WP 1	Weighing platform 1	3.13.2
	WP 2	Weighing platform 2	3.13.3

REF.WP Reference weighing instrument 3.13
- NO WP — No weighing platform selected — 3.13.1*
- WP 1 — Weighing platform 1 — 3.13.2
- WP 2 — Weighing platform 2 — 3.13.3

APPLIC/APPLIC.1 NEUTR.M Neutral Measurement

MIN.INIT Minimum load for application 3.6
- 1 DIGIT — 1 scale interval — 3.6.1*
- 2 DIGIT — 2 scale intervals — 3.6.2
- ... see "WEIGHING"
- 1000 D — 1000 scale intervals — 3.6.10

RESOLUT Resolution for calculation of reference value 3.9
- DISP.ACC. — Display accuracy — 3.9.1*
- 10 FOLD — plus 1 decimal place (10 fold) — 3.9.2
- 100 FOLD — plus 2 decimal places (100 fold) — 3.9.3

DEC.PLCS Decimal place in displayed result 3.10
- WITHOUT — none — 3.10.1
- 1 DEC.PL — 1 decimal place — 3.10.2
- 2 DEC.PL. — 2 decimal places — 3.10.3
- 3 DEC.PL. — 3 decimal places — 3.10.4

SAVE WT. Parameter for saving weight values 3.11
- STABIL — With stability* — 3.11.1
- ACC.STAB — With increased stability* — 3.11.2

REF.WP Reference weighing instrument 3.13
- NO WP — No weighing platform selected — 3.13.1*
- WP 1 — Weighing platform 1 — 3.13.2
- WP 2 — Weighing platform 2 — 3.13.3

APPLIC./APPLIC.1 ANIM.WG. Animal Weighing (Averaging)

MIN.INIT Minimum load for application 3.6
- 1 DIGIT — 1 scale interval — 3.6.1*
- 2 DIGIT — 2 scale intervals — 3.6.2
- ... see "WEIGHING"
- 1000 D — 1000 scale intervals — 3.6.10

START Start averaging 3.18
- MANUAL — manual — 3.18.1*
- AUTOMAT — automatic — 3.18.2*

ACTIVTY Animal activity 3.19
- 0.1 PERC. — 0.1% of animal/object — 3.19.1
- 0.2 PERC. — 0.2% of animal/object — 3.19.2*
- 0.5 PERC. — 0.5% of animal/object — 3.19.3
- 1 PERC. — 1% of animal/object — 3.19.4
- 2 PERC. — 2% of animal/object — 3.19.5
- 5 PERC. — 5% of animal/object — 3.19.6
- 10 PERC. — 10% of animal/object — 3.19.7
- 20 PERC. — 20% of animal/object — 3.19.8
- 50 PERC. — 50% of animal/object — 3.19.9
- 100 PERC. — 100% of animal/object — 3.19.10

PRINT Automatic printout 3.20
- MANUAL — manual — 3.20.1*
- AUTOMAT — automatic — 3.20.2*

DIS.UNLD Static display of result after load removed 3.21
- CLEARED — Display is fixed until unload threshold reached — 3.21.1*
- PRESENT — fixed display until CF is pressed — 3.21.2

APPLIC./APPLIC.1 PERCENT Weighing in Percent

MIN.INIT Minimum load for application 3.6
- 1 DIGIT — 1 scale interval — 3.6.1*
- 2 DIGIT — 2 scale intervals — 3.6.2
- ... see "WEIGHING"
- 1000 D — 1000 scale intervals — 3.6.10

RESOLUT Resolution for calculation of reference value 3.9
- DISP.ACC. — Display accuracy — 3.9.1*
- 10 FOLD — plus 1 decimal place (10 fold) — 3.9.2
- 100 FOLD — plus 2 decimal places (100 fold) — 3.9.3

DEC.PLCS Decimal place in displayed result 3.10
- WITHOUT none 3.10.1
- 1 DEC.PL 1 decimal place 3.10.2
- 2 DEC.PL. 2 decimal places 3.10.3
- 3 DEC.PL. 3 decimal places 3.10.4

SAVE WT. Parameter for saving weight values 3.11
- STABIL With stability* 3.11.1
- ACC.STAB With increased stability* 3.11.2

REF.WP Reference weighing instrument 3.13
- NO WP No weighing platform selected 3.13.1*
- WP 1 Weighing platform 1 3.13.2
- WP 2 Weighing platform 2 3.13.3

CALC.DIS Calculated values display 3.15
- RESIDUE Residue 3.15.1*
- LOSS Calculation 3.15.2

APPLIC./APPLIC.2 OFF

APPLIC./APPLIC.2 CHECK.WG **Checkweighing**

CHECK.RG Checkweighing range 4.2
- 30- 170% 30 to 170% 4.2.1*
- 10-MAX.L 10% to infinity 4.2.2

CTRL.SET Activate SET control output 4.3
- OUTPUT "SET" output 4.3.1*
- OP.READY Ready to operate (for process control systems) 4.3.2

OUTP.ACT Port lines 4.4
- OFF off 4.4.1
- ALWAYS always 4.4.2
- STABIL on at stability 4.4.3
- CHECK.RG on within checkweighing range 4.4.4*
- STAB.CHK On at stability within checkweighing range 4.4.5

INPUT Parameter input 4.5
- TAR.MN.MX Min, Max, target value 4.5.1*
- TARG.PER. Only target value with percent limits 4.5.2
- TAR.A.PER Target value with asymmetrical percent limits 4.5.3
- TAR.TOL Target value with relative tolerances 4.5.4

AUT.PRNT Automatic printing 4.6
- OFF off 4.6.1*
- ON on 4.6.2
- OK Only values within tolerance 4.6.3
- NOT OK Only values outside tolerance 4.6.4

APP.ZERO Checkweighing toward zero 4.7
- OFF off 4.7.1*
- ON on (Symbol 🖷 is displayed) 4.7.2

APPLIC./APPLIC.2 CLASS. **Classification**

PARAM. 1 Parameter 1

MIN.INIT Minimum load for application 3.6
- 1 DIGIT 1 scale interval 3.6.1*
- 2 DIGIT 2 scale intervals 3.6.2
- ... see "WEIGHING"
- 1000 D 1000 scale intervals 3.6.10

PARAM.2 Parameter 2

CTRL.SET Activate SET control output 4.3
- OUTPUT "SET" output 4.3.1*
- OP.READY Ready to operate (for process control systems) 4.3.2

OUTP.ACT Port lines 4.7
- OFF off 4.7.1
- ALWAYS always 4.7.2
- STABIL on at stability 4.7.3*

QTY. Number of classes 4.8
- 3 CLASS 3 classes 4.8.1*
- 5 CLASS 5 classes 4.8.2

INPUT Parameter input 4.9
- WEIGHTS Weight values 4.9.1*
- PERC.TAB Percentage values 4.9.2

PRINT Automatic printing 4.10
MANUAL manual 4.10.1*
AUTOMAT automatic 4.10.2*

APPLIC.3 OFF

APPLIC/APPLIC.3 NET.TOT. **Net-Total**

MIN.INIT Minimum load for application 3.6
1 DIGIT 1 scale interval 3.6.1*
2 DIGIT 2 scale intervals 3.6.2
... see "WEIGHING"
1000 D 1000 scale intervals 3.6.10

PRT.SAV. Individual/Component printout when saved 3.17
OFF Automatic printing off 3.17.1
EACH.TIM. Print the entire standard print configuration every time with the OK key function 3.17.2*
ONCE Print the entire standard print configuration once with the OK key 3.17.3

APPLIC./APPLIC.3/TOTALIZ **Totalizing**

MIN.INIT Minimum load for application 3.6
1 DIGIT 1 scale interval 3.6.1*
2 DIGIT 2 scale intervals 3.6.2
... see "WEIGHING"
1000 D 1000 scale intervals 3.6.10

AUTO.SAV Autosave 3.16
OFF Off 3.16.1*
ON On 3.16.2

PRT.SAV. Individual/Component printout when saved 3.17
OFF Automatic printing off 3.17.1
EACH.TIM. Print the entire standard print configuration every time with the OK key function 3.17.2*
ONCE Print the entire standard print configuration once with the OK key 3.17.3

VAL.FROM Value source for automatic saving 3.22
APPL. 1 Application 1 3.22.1*
APPL.2 Application 2 3.22.2

SAV.VAL. Save value 3.23
NET Net 3.23.1*
CALCUL. Calculation 3.23.2
NET+CAL Net and calculated 3.23.3

APPLICATION/AUT.TARE Automatic taring

AUT.TARE 1st Weight tared 3.7
OFF Off 3.7.1*
ON On 3.7.2

APPLICATION/MIN.TARE Minimum load for automatic taring and automatic printing

MIN.TARE Minimum load for automatic taring and printing 3.5
1 DIGIT 1 scale interval 3.5.1*
2 DIGIT 2 scale intervals 3.5.2
... see "WEIGHING"
1000 D 1000 scale intervals 3.5.10

APPLICATION/AUT.STRT For"On" automatic start of application with the last saved initialization data

AUT.STRT Automat. start of application with the last saved settings 3.8
AUTOMAT Automatic (on) 3.8.1*
MANUAL manual (off) 3.8.2

APPLIC./CLER.CF Selective deleting with the CF key

CLER.CF Selective deleting with the CF key 3.24
ALL.APPL. Deletes all applications 3.24.1*
SEL.APPL Only deletes selected application 3.24.2

APPLIC./TARE.FNC Tare function

TARE.FNC Tare function settings 3.25
NORMAL Can add a preset tare if tare value is available; however no tare function possible 3.25.1*
SPECIAL When a preset tare is entered, the tare value is deleted; however, tare function activation is possible 3.25.2

APPLIC./RESET Resets all applications to factory settings

RESET	Restore all applications to factory default settings		9.1
	YES	Yes (restore factory settings)	9.1.1
	NO	No (retain user-defined settings)	9.1.2*

Menu Key Assignment for the Fn Key

* = Factory settings

FN-KEY

- OFF — Fn key not assigned
- 2ND.UNIT — Display 2nd unit*
- SOMIN

Setup Menu (Device Settings)

SETUP/WP-1/RS-232 Depending on the connected complete scale
SBI-STDS / SBI.EICH / XBPI.232 / ADU-232

SETUP/WP-1/RS-485 Depending on the connected complete scale
IS-485 / ADU-485

SETUP/WP-1/INTERN. PARAM.1

AMBIENT	Adapting the scale to ambient conditions (filter adjustment)		1.1
	V.STABLE	very stable	1.1.1
	STABLE	stable	1.1.2*
	UNSTABLE	unstable	1.1.3
	V.STABLE	very stable	1.1.4
APP.FILT	application filter		1.2
	FINAL.RD.	final readout	1.2.1*
	FILLING	filling mode	1.2.2
	REDUC.	low filtering	1.2.3
	OFF	without filtering	1.2.4
STAB.RNG	Stability range		1.3
	MAX.ACC.	maximum accuracy (1/4 digit)	1.3.1*
	V.ACC.	very accurate (1/2 digit)	1.3.2
	ACC.	accurate (1 digit)	1.3.3
	FAST	fast (2 digits)	1.3.4
	V.FAST	very fast (4 digits)	1.3.5
	MAX.FAST.	maximum speed (8 digits)	1.3.6
STAB.DLY	Stability delay		1.4
	NONE	no delay	1.4.1
	SHORT	short delay	1.4.2*
	MEDIUM	medium-length delay	1.4.3
	LONG	long delay	1.4.4
TARE	Tare mode		1.5
	W./O.STAB	on	1.5.1
	AFT.STAB	off	1.5.2*
AUT.ZERO	Auto zero		1.6
	ON	on	1.6.1*
	OFF	off	1.6.2
I.WT.UNIT	Weight unit (depends on the weighing platform type)		1.7
	1)not for use in legal metrology		
	GRAM	gram/g	1.7.2*
	KILOGR.	Kilograms/kg	1.7.3
	CARAT	carats/ct[1)]	1.7.4
	POUND	pounds/lb[1)]	1.7.5
	OUNCE	ounces/oz[1)]	1.7.6
	TROY.OZ.	troy ounces/ozt[1)]	1.7.7
	HK TAEL	Hong Kong taels/tlh[1)]	1.7.8
	SNG.TAEL	Singapore taels/tls[1)]	1.7.9
	TWN.TAEL	Taiwan taels/tlt[1)]	1.7.10
	GRAIN	Grains/GN[1)]	1.7.11
	PENNY.WT.	Pennyweights/dwt[1)]	1.7.12
	MILLIGR.	Milligrams/mg[1)]	1.7.13
	PART./PD	Parts per Pound//lb[1)]	1.7.14
	CHN.TAEL	Chinese taels/tlc[1)]	1.7.15
	MOMME	Mommes/mom[1)]	1.7.16
	KARAT	Austrian karats/K[1)]	1.7.17

	TOLA	Tola/tol[1]	1.7.18
	BAHT	Baht/bat[1]	1.7.19
	MESGHAL	Mesgahl/MS[1]	1.7.20
	TON	tons/t	1.7.21
I.DIS.DIG.	Display accuracy		1.8
	ALL	all digits	1.8.1*
	-1.WT.CHA	reduced by one digit	1.8.2
	RES.*10	10-fold increased resolution	1.8.14
	+DIV.2	Increase resolution by 2 scale intervals	1.8.15
	+DIV.1	Increase resolution by 1 scale interval	1.8.16
CAL.ADJ	Calibration, adjustment		1.9
	CAL.EXT.	External calibration/adjustment with default weight	1.9.1*
	CAL.E.AUT.	External cal./adjustment, weight is detected (see 1.18.1)	1.9.2
	CAL.E.USR.	External calibr./adjustment with user-defined weight	1.9.3
	CAL.INT.	Internal calibration/adjustment (for IS scales only)	1.9.4
	INT.LIN.	Internal linearization (for IS scales only)	1.9.5[1]
	EXT.LIN.	External linearization with default weights	1.9.6[1]
	LIN.E.USR	External linearization with user-defined weights	1.9.7[1]
	SET.PREL.	Set the preload	1.9.8
	DEL.PREL.	Delete the preload	1.9.9
	BLOCKED	Key blocked	1.9.10
CAL.SEQ.	Calibration/adjustment sequence		1.10
	AUTOMAT	Calibration with automatic adjustment	1.10.1
	MANUAL	Calibration with manual adjustment	1.10.2*
ZERORNG.	Zero range		1.11
	1PERC.	1 percent/max.load	1.11.1
	2PERC.	2 percent/max.load	1.11.2
	5PERC.	5 percent/max.load	1.11.3*
INIT.ZER.	Zero at power on		1.12
	1PERC.	1 percent/max.load	1.12.1*
	2PERC.	2 percent/max.load	1.12.2
	5PERC.	5 percent/max.load	1.12.3
ON.TARE	Tare/zero at power on		1.13
	ON	On	1.13.1*
	OFF	Off	1.13.2
ISOCAL	Adjustment prompt		1.15
	OFF	Off	1.15.1*
	ADJ.PROM	On	1.15.2
CAL.EXT	External calibration/adjustment		1.16
	ACTIVATED	Activated	1.16.1*
	BLOCKED	Blocked	1.16.2
CAL.UNIT	Weight unit for calibration		1.17
	GRAM	gram	1.17.1*
	KILOGR.	Kilogram	1.17.2
	TONS	ton	1.17.3
	POUND	pound	1.17.4
MAN.EXT.W	Manual entry of external weights		1.18
	CAL.ADJ.	cal/adj. weight	1.18.1
	LIN.WT.1	linearization weight 1	1.18.2[1]
	LIN.WT.2	linearization weight 2	1.18.3[1]
	LIN.WT.3	linearization weight 3	1.18.4[1]
	LIN.WT.4	linearization weight 4	1.18.5[1]
ADJ.W/O.W	Adjustment without weights[1]		1.19
	NOM.LOAD	Nominal load	1.19.1
	RESOLUT	resolution	1.19.2
	SENSIT.1	Sensitivity 1	1.19.3
	SENSIT.2	Sensitivity 2	1.19.4
	SENSIT.3	Sensitivity 3	1.19.5
	SENSIT.4	Sensitivity 4	1.19.6
	ZER.POIN	Zero point	1.19.7
	SAVE	Save parameters	1.19.8
GEOG.DAT	Geographical data[1]		1.20
	LATITUD	latitude	1.20.1
	ALTITUD	altitude	1.20.2
	GRAVITY	gravitational acceleration	1.20.3
	SAVE	Save parameters	1.20.4

[1] Only in Service mode

SETUP / WP-1 / INTERN. PARAM.2

2ND.UNIT 2nd weight unit (depends on the weighing platform type) 3.1

[1] not for use in legal metrology

GRAM	gram/g	3.1.2*
KILOGR.	Kilograms/kg	3.1.3
CARAT	carats/ct[1]	3.1.4
POUND	pounds/lb[1]	3.1.5
OUNCE	ounces/oz[1]	3.1.6
TROY.OZ.	troy ounces/ozt[1]	3.1.7
HK TAEL	Hong Kong taels/tlh[1]	3.1.8
SNG.TAEL	Singapore taels/tls[1]	3.1.9
TWN.TAEL	Taiwan taels/tlt[1]	3.1.10
GRAIN	Grains/GN[1]	3.1.11
PENNY.WT.	Pennyweights/dwt[1]	3.1.12
MILLIGR.	Milligrams/mg[1]	3.1.13
PART./PD	Parts per Pound//lb[1]	3.1.14
CHN.TAEL	Chinese taels/tlc[1]	3.1.15
MOMME	Mommes/mom[1]	3.1.16
KARAT	Austrian karats/K[1]	3.1.17
TOLA	Tola/tol[1]	3.1.18
BAHT	Baht/bat[1]	3.1.19
MESGHAL	Mesgahl/MS[1]	3.1.20
TON	Tons/t	3.1.21

2.DIS.DIG. Display accuracy 3.2

ALL	all digits	3.2.1*
-1.WT.CHA	reduced by 1 decimal place for load change	3.2.2
RES.*10	10-fold increased resolution	3.2.14
+DIV.2	Increase resolution by 2 scale intervals	3.2.15
+DIV.1	Increase resolution by 1 scale interval	3.2.16

SETUP / WP-1 / INTERN. RESET Factory settings

WT.PARA Restore factory default settings 9.1

NO	No	9.1.1*
YES	Yes	9.1.2

SETUP / WP-1 / INTERN. ADC-CON Analog/Digital converter configuration (ADC)[1]

STANDRD.	Standard
VERIF.	Verifiable

SETUP / WP-1 / OFF

SETUP / COM-1 OFF

SETUP / COM-1 WP-2 Weighing platform 2

RS-232*
SBI.STD
SBI.EICH
*SBI-232
ADU-232

	Menus 1.1 to 1.8 same as for WP1	
	Calibration/Adjustment	1.9
	External calibration/adjustment; default weight*	1.9.1
	External calibration/adjustment; weight can be selected (1.18.1)	1.9.3
	Internal cal/adj	1.9.4
	ISO-test key locked	1.9.10
	Menus 1.10 to 9.1 same as for WP1	
	ADC-232	
	Menus 1.1 to 9.1 same as for WP1	

[1] Only in Service mode

SETUP/COM-1 DAT.PROT Data protocols

CONFIG. SBI*

BAUD Baud rate			5.1
	150	150	5.1.1
	300	300	5.1.2
	600	600	5.1.3
	1200	1200	5.1.4
	2400	2400	5.1.5
	4800	4800	5.1.6
	9600	9600	5.1.7*
	19200	19200	5.1.8
PARITY Parity			5.2
	SPACE	Space Only if 7 data bits is selected	5.2.2
	ODD	Odd	5.2.3*
	EVEN	Even	5.2.4
	NONE	None	5.2.5
STOPBIT Number of stop bits			5.3
	1STOP	1 stop bit	5.3.1*
	2STOP	2 stop bits	5.3.2
HANDSHK Handshake mode			5.4
	SOFTW.	Software handshake	5.4.1
	HARDW.	Hardware handshake, 1 character after CTS	5.4.3*
DATABIT Number of data bits			5.6
		7 bits*	5.6.1
		8 bits	5.6.2
MAN./AUT. Data output (manual/automatic)			6.1
	IND.W/O	Manual, without stability	6.1.1
	IND.AFTR	Manual, at stability	6.1.2*
	AUT.W/O	Automatic, without stability	6.1.4
	AUT.WITH	Automatic, with stability	6.1.5
	PROT.PRN	Protocol printout for computer (PC)	6.1.7
AUT.CYCL Time-dependent automatic data output			6.3
	EACHVAL	1 display update	6.3.1*
	AFTR.2	2 display updates	6.3.2
	AFTR.10	10 display updates	6.3.4
	AFTR.100	100 display updates	6.3.7
LINE Data output: Line format			7.2
	16.CHAR	For raw data: 16 characters	7.2.1
	22.CHAR	For other applications: 22 characters	7.2.2*
SIGN Data output: Sign format			7.3
	+DEACT.	Plus sign deactivated	7.3.1
	+ACT.	Plus sign activated	7.3.2*
SETTING Factory settings for COM1: SB			9.1
	YES	Yes	9.1.1
	NO	No*	9.1.2

xBPI-232

SMA

BAUD Baud rate			5.1
	150	150	5.1.1
	300	300	5.1.2
	600	600	5.1.3
	1200	1200	5.1.4
	2400	2400	5.1.5
	4800	4800	5.1.6
	9600	9600	5.1.7*
	19200	19200	5.1.8

Numeric menu 5.2 to 5.6 similar to SBI

* = Factory setting

SETUP/COM-1 PRINTER Printer configuration

YDP20

CONFIG.

BAUD Baud rate			5.1
	1200	1200	5.1.4*
	2400	2400	5.1.5
	4800	4800	5.1.6
	9600	9600	5.1.7
	19200	19200	5.1.8
PARITY Parity			5.2
	SPACE	Space Only if 7 data bits is selected	5.2.2
	ODD	Odd	5.2.3*
	EVEN	Even	5.2.4
	NONE	None	5.2.5
STOPBIT Number of stop bits			5.3
	1STOP	1 stop bit	5.3.1*
	2STOP	2 stop bits	5.3.2
HANDSHK Handshake mode			5.4
	SOFTW.	Software handshake	5.4.1
	HARDW.	Hardware handshake, 1 character after CTS	5.4.3*

YDP14IS

	LINE	Strip printer*
	LABEL	Label printer

UNI-PRINT Universal printer

CONFIG.

BAUD Baud rate			5.1
	150	150	5.1.1
	300	300	5.1.2
	600	600	5.1.3
	1200	1200	5.1.4
	2400	2400	5.1.5
	4800	4800	5.1.6
	9600	9600	5.1.7*
	19200	19200	5.1.8
PARITY Parity			5.2
	SPACE	Space Only if 7 data bits is selected	5.2.2
	ODD	Odd	5.2.3*
	EVEN	Even	5.2.4
	NONE	None	5.2.5
STOPBIT Number of stop bits			5.3
	1STOP	1 stop bit	5.3.1*
	2STOP	2 stop bits	5.3.2
HANDSHK Handshake mode			5.4
	SOFTW.	Software handshake	5.4.1
	HARDW.	Hardware handshake, 1 character after CTS	5.4.3*
DATABIT Number of data bits			5.6
		7 bits	5.6.1*
		8 bits	5.6.2

YDP04IS*

LINE	Strip printer*
LABEL	Label printer
LABFF	Label printer with manual feed

SETUP / CTRL IO

INPUT

PARAMET.

EXT.KEYB Function for external key 8.4

PRINT	Trigger (print) key function*	8.4.1
PRNT.LNG.	Trigger (print) key function (press and hold)	8.4.2
TARE	Trigger →T← key function	8.4.3
ISO.TEST	Trigger ISO-Test key function	8.4.4
FN	Trigger Fn key function	8.4.5
SCALE.NR	Trigger (scale) key function	8.4.6
OK	Trigger OK key function	8.4.7
Z/TARE	combined zero/tare function	8.4.8
ZERO	Trigger →0← key function	8.4.9
ON.STBY	Trigger I/⏻ key function	8.4.10
CF	Trigger CF key function	8.4.11
INFO	Trigger Info key function	8.4.12
(-B-)	Trigger (D) key function	8.4.13
X 10	Trigger x10 key function	8.4.14
B/G NET	Trigger B/G key function	8.4.15

* = Factory setting

SETUP / PRINT 7

PROTOC. Printouts			7
HEADLIN. Header entry			7.4
	LINE 1	Line 1	7.4.1
	LINE 2	Line 2	7.4.2
	IDENT. 1	Identifier 1	7.4.3
	IDENT.2	Identifier 2	7.4.4
	IDENT.3	Identifier 3	7.4.5
	IDENT.4	Identifier 4	7.4.6
	IDENT.5	Identifier 5	7.4.7
	IDENT.6	Identifier 6	7.4.8
QTY.1 Printout quantity to COM1			7.5
	1PRNT.0	1 printout	7.5.1*
	2PRNT.0	2 printouts	7.5.2
INDIV. 1 Single and results printout for all other applications, user-defined			7.6
COMPON.1 Component printout for net total and totalizing, user-defined			7.7[1)]
TOTAL 1 Totalizing results, user-defined			7.8[1)]
GMP.PROT ISO/GMP printout			7.13
	OFF	Off	7.13.1*
	ON	On	7.13.2
DAT/TIM Date and time			7.14[1)]
	DAT.+TIM	Date and time	7.14.1
	DAT.ONLY	Date only	7.14.2
AUT.ONCE Automatic printout after stability			7.15
	OFF	Off	7.15.1*
	ON	On	7.15.2
FLEX.PRN FlexPrint			7.16
	OFF	Off	7.16.1*
	ON	On	7.16.2
DEC.SEP. Weight value decimal separator			7.17
	PERIOD	Period	7.17.1*
	COMMA	Comma	7.17.2
DAT.RECORD Printout of Alibi and product data memory			7.18
	ALL	Print all data records	7.18.1
	SPEC.	Number of data record to be printed (enter no.)	7.18.2*
RESET Reset factory settings			

SETUP / UTILIT. 8

PARAMET

KEYS	Unblock keys		8.3
	ALL +	Release all	8.3.1*
	- ALL	All blocked	8.3.2
	-NUM.PAD	Number pad locked	8.3.3
	-SCALE.N	[⚖] key locked	8.3.4
	- ZERO	key [→0←] locked	8.3.5
	- TARE	key [→T←] locked	8.3.6
	- FN	key [Fn] locked	8.3.7
	-ISO.TST	[ISO-Test] key locked	8.3.8
	- PRINT	[⎙] key locked	8.3.9
	- x 10	[x10] key locked	8.3.10[1)]
	-B/G.NET	[B/G] key locked	8.3.11[1)]
	- CF	[CF] key locked	8.3.12[1)]
	- REF	[REF] key locked	8.3.13[1)]
	- OK	[OK] key locked	8.3.14[1)]
	-TOGGLE	[⇆] key locked	8.3.15[1)]
	- INFO	[Info] key locked	8.3.16[1)]
	- (-D-)	D key locked	8.3.17[1)]
	- ID	d key locked	8.3.18[1)]
	- MEM	R key locked	8.3.19[1)]
AUTO.OFF	Automatic shutoff of display and control unit		8.7
	TIMER	Automatic shutoff via timer (see 8.9)	8.7.1
	WITHOUT	no automatic shutoff	8.7.2*
BACKLIT	Display lighting		8.8
	ON	On	8.8.1*
	OFF	Off	8.8.2
	AUTO.OFF	Automatic shutoff via timer (see 8.9)	8.8.3
TIMER	Timer for automat. shut-off		8.9
	1+1 MIN	After 1 minute warning displayed for 1 minute then off	8.9.1*
	2+2 MIN	After 2 minutes warning displayed for 2 minutes then off	8.9.2
	5+5 MIN	After 5 minutes warning displayed for 5 minutes then off	8.9.3
		Warning information: **⚖ 12** flash simultaneously	
START.WP	Main scale: first platform displayed on start-up		8.11
	WP- 1	Weighing platform 1	8.11.1*
	WP-2	Weighing platform 2	8.11.2
DIS.GEOG.	Show geographical data before calibration/adjustment		8.12
	ON	On	8.12.1
	OFF	Off	8.12.2*

RESET — Reset factory settings

SETUP / TIME

00.00.00 Enter: hours.minutes.seconds (e.g. 14.10.30), confirm with the [→T←] key

SETUP / DATE

00.00.00 Enter: day.month.year (e.g. 13.08.10), confirm with the [→T←] key U.S. mode: month.day.year (e.g. 08.13.10)

SETUP / U-CODE

-------- Enter, change, delete user password (max. 8 characters)

Only in Service mode: SETUP / S-DATE

Date XXX entry

Only in Service mode: SETUP / SER.NO.

2345 Serial number

Only in Service mode: SETUP / MODEL

CL2000 i — Model description

Only in Service mode: SETUP / S-SOMIN

SOMIN i
SOMIN2

* = Factory setting

SETUP / SQMIN

DISPLAY SQmin value display
- NO — No*
- YES — Yes

GMP PRT. GMP-compliant printout
- NO — No*
- YES — Yes

SETUP / ALIB.MEM
- CLEAR — Deletes the Alibi memory (Service only)
- PERIOD — Entry of the save intervals in days (0 to 255)

Menu Info (Device Information)

* = Factory setting

INFO / SERVICE Service date
Input: day.month.year (e.g. 13.08.10), confirm with the →T← key
U.S. mode: month.day.year (e.g. 08.13.10)

INFO / TERM Indicator
- CL2000 1 — Model type
- 12345 — Serial number (complete display with the →T← key)
- 01-62-01 — Indicator version number (complete display with the →T← key)
- C2 10 2008 10 — Software version (complete display with the →T← key)
- PCB03 — Main PC board type

INFO/WP- 1 1st weighing platform
- 00-42-51 — Software version 1st weighing platform
- 51.53 — Geographic latitude in degrees
- 151 — Geographic altitude in meters
- 9.81 — Acceleration of gravity, m/s2 (however no latitude and longitude then)
- SWITCH — Menu access switch

INFO / WP-2 2nd weighing platform (e. g. IS weighing platform)
- YC00 1 IS — Type description of 1st weighing platform
- 01.02.07 — Software version 2nd Weighing platforms
- 10404354 — Serial number
- 51.53 — Geographic latitude in degrees
- 151 — Geographic altitude in meters
- 8.91 — Acceleration of gravity, m/s2

INFO / FLEXINF FlexPrint
- ------- — File name
- ID--- — ID
- V.--- — Version

Language Menu (Language Settings for Display, Calibration and Gmp-Compliant Printouts)

* = Factory setting

LANGUAGE Factory setting: LANGUAG.
- DEUTSCH — German
- ENGLISH — English*
- U.S.MODE — English with U.S. date/time
- FRANC. — French
- ITAL. — Italian
- ESPANOL — Spanish
- CODES — Mixed menu display: English and number menu structure

* = Factory setting

ADC Settings Menu

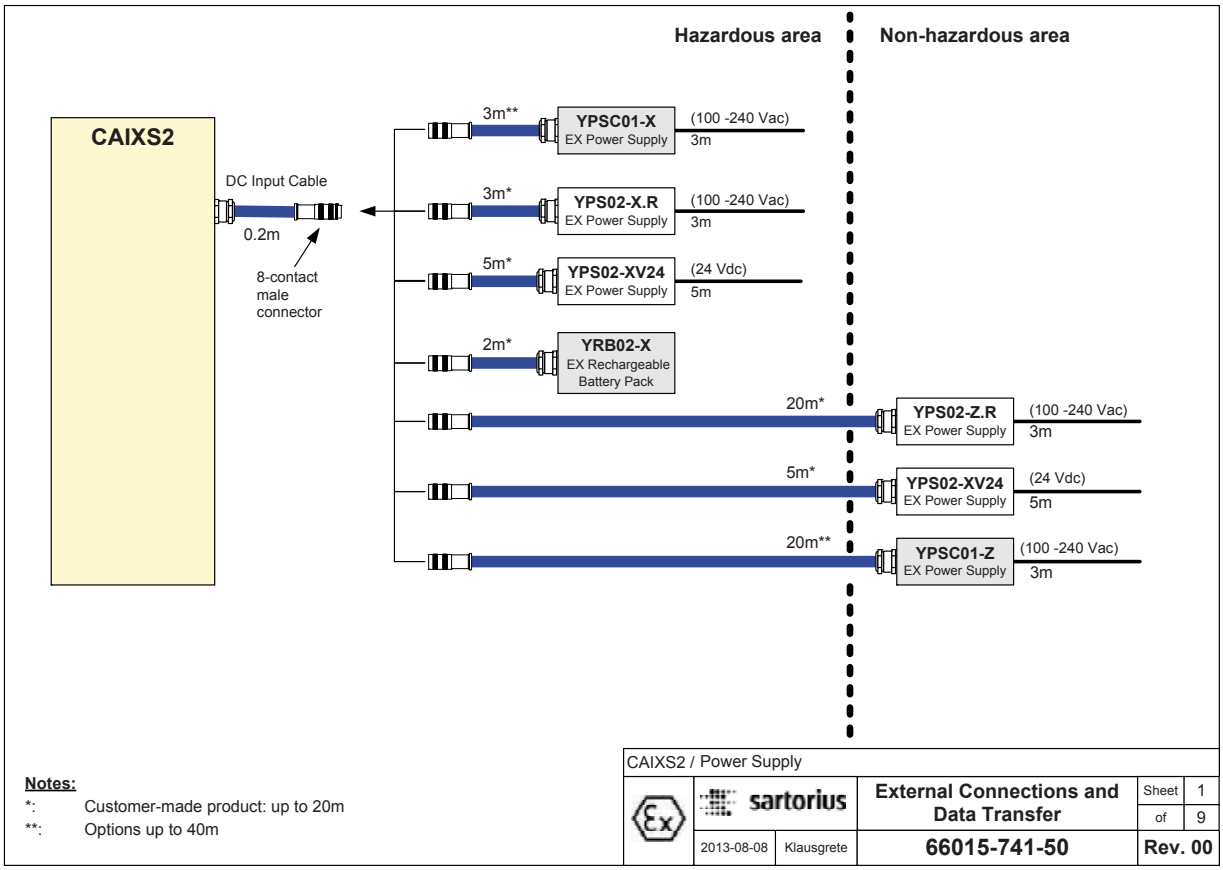
ADC.CON

STANDRD	Standard configuration			9.1.3
	RANGE	Ranges		11.3
		SINGLE	Single-range scale	11.3.1
		MULT.INT	Multi-interval scale	11.3.2
		MULT.RNG	Multiple-range scale	11.3.3
	SINGLE	Single-range scale		11.4
		D	Scale interval d	11.4.1
		MAX	Max. load	11.4.4
	MULT.INT	Multi-interval scale		11.5
		D	Scale interval d	11.5.1
		RANGE 1	Range 1	11.5.4
		RANGE 2	Range 2	11.5.5
		RANGE 3	Range 3	11.5.6
		MAX	Max. load	11.5.7
	MULT.RNG	Multiple-range scale		11.6
		D	Scale interval d	11.6.1
		RANGE 1	Range 1	11.6.4
		RANGE 2	Range 2	11.6.5
		RANGE 3	Range 3	11.6.6
		MAX	Max. load	11.6.7
	WT.UNIT	Available weight units		11.7
		FREE	User-defined /o	11.7.1
		G	Grams /g	11.7.2
		KG	Kilograms/kg	11.7.4
		...		
		T	Tons/t	11.7.21
		LB	Pound:ounces/lb oz	11.7.22
	CAL.UNIT	Calibration/Adjustment unit		11.8
		FREE	User-defined /o	11.8.1
		G	Grams /g	11.8.2
		KG	Kilograms/kg	11.8.3
			...	...
		T	Tons/t	11.8.21
	SAVE	Save configuration parameters		11.10
		YES	Yes	11.10.1
		NO	No	11.10.2

* = Factory setting

WT.UNIT	Available weight units		11.7
	FREE	User-defined /o	11.7.1
	G	Grams /g	11.7.2
	KG	Kilograms/kg	11.7.4
		...	...
	T	Tons/t	11.7.21
	LB	Pound:ounces/lb oz	11.7.22
CAL.UNIT	Calibration/Adjustment unit		11.8
	FREE	User-defined /o	11.8.1
	G	Grams /g	11.8.2
	KG	Kilograms/kg	11.8.3
		...	...
	T	Tons/t	11.8.21
SAVE	Save configuration parameters		11.10
	YES	Yes	11.10.1
	NO	No	11.10.2

* = Factory setting


Hazardous area
Non-hazardous area
CAIXS2
DC Input Cable
0.2m
8-contact male connector
3m**
YPSC01-X
EX Power Supply
(100 -240 Vac)
3m
3m*
YPS02-X.R
EX Power Supply
(100 -240 Vac)
3m
5m*
YPS02-XV24
EX Power Supply
(24 Vdc)
5m
2m*
YRB02-X
EX Rechargeable Battery Pack
20m*
YPS02-Z.R
EX Power Supply
(100 -240 Vac)
3m
5m*
YPS02-XV24
EX Power Supply
(24 Vdc)
5m
20m**
YPSC01-Z
EX Power Supply
(100 -240 Vac)
3m
Notes:
*: Customer-made product: up to 20m
**: Options up to 40m
CAIXS2 / Power Supply
sartorius
External Connections and Data Transfer
Sheet 1
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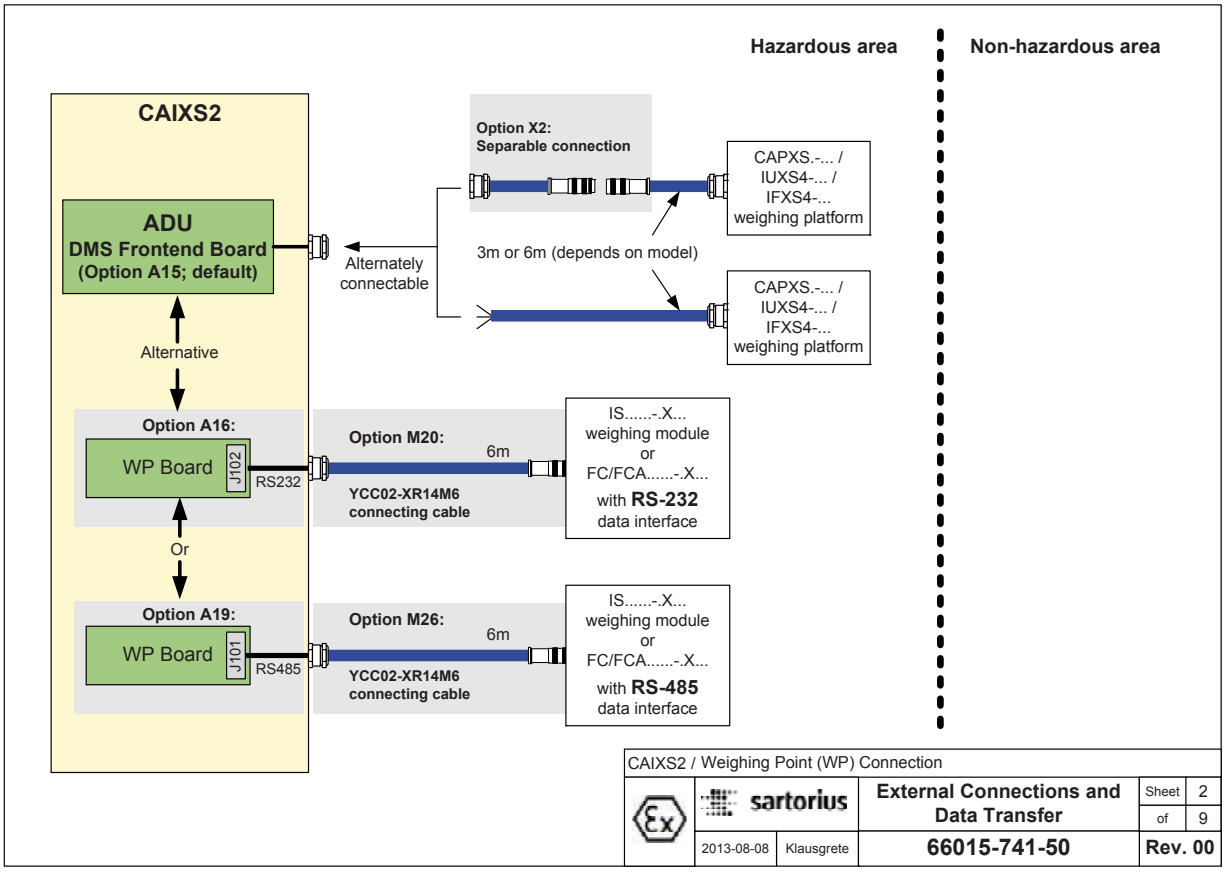
Hazardous area
Non-hazardous area
CAIXS2
ADU
DMS Frontend Board
(Option A15; default)
Alternative
Option A16:
WP Board
J102
RS232
Or
Option A19:
WP Board
J101
RS485
Alternately connectable
Option X2:
Separable connection
3m or 6m (depends on model)
CAPXS.-... / IUXS4-... / IFXS4-... weighing platform
CAPXS.-... / IUXS4-... / IFXS4-... weighing platform
Option M20:
6m
YCC02-XR14M6
connecting cable
IS.....-.X... weighing module or FC/FCA.....-.X... with RS-232 data interface
Option M26:
6m
YCC02-XR14M6
connecting cable
IS.....-.X... weighing module or FC/FCA.....-.X... with RS-485 data interface
CAIXS2 / Weighing Point (WP) Connection
sartorius
External Connections and Data Transfer
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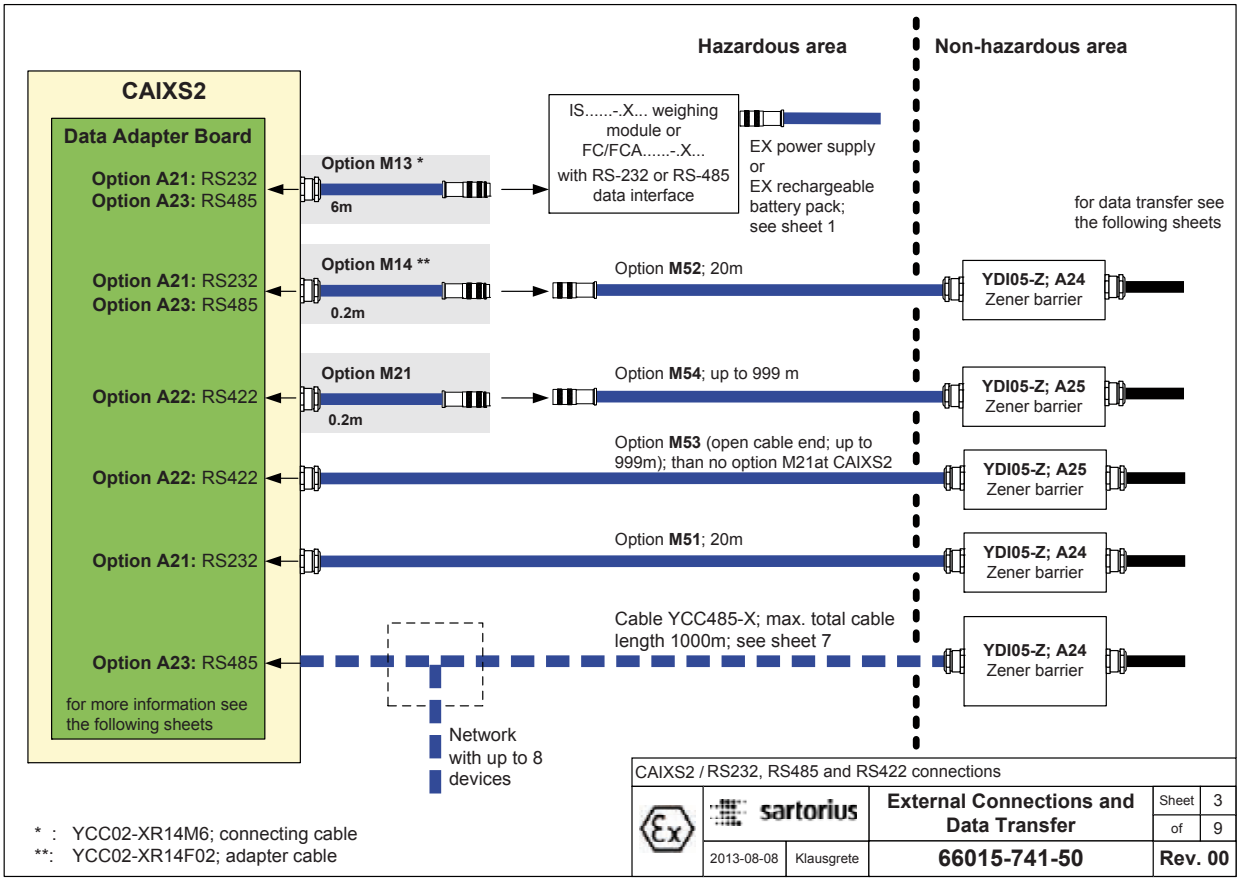

* : YCC02-XR14M6; connecting cable
**: YCC02-XR14F02; adapter cable

CAIXS2 / RS232, RS485 and RS422 connections			
sartorius	External Connections and Data Transfer	Sheet	3
		of	9
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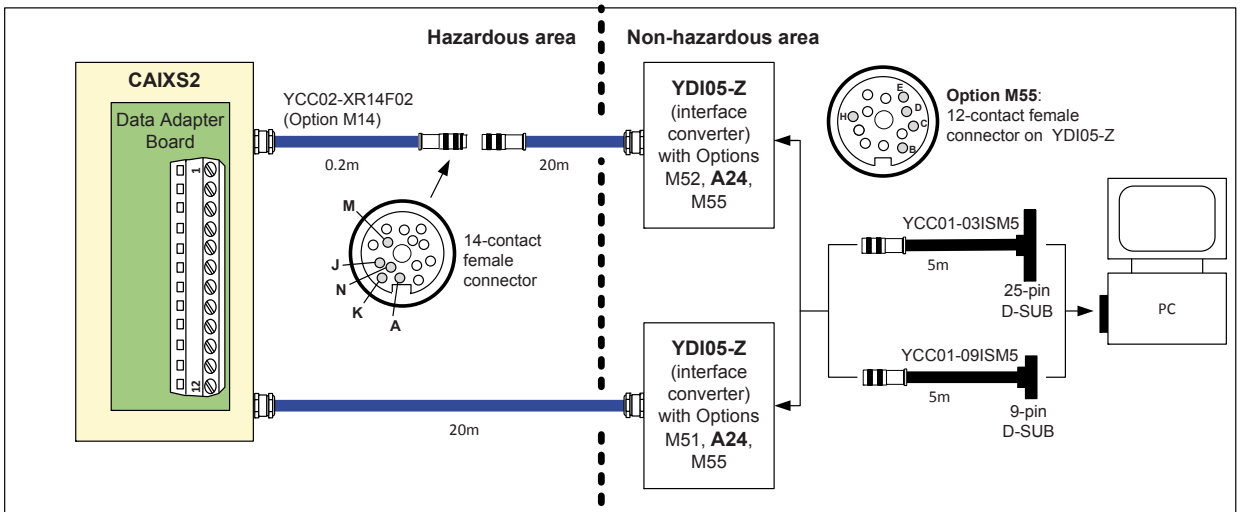

Data adapter board		14-contact		12-contact	25-contact *	9-contact	
TxD	3	K	yellow	B	3	2	RxD
DTR	4	N	green	D	5	8	CTS
RxD	2	J	white	C	2	3	TxD
CTS	1	A	brown	H	20	4	DTR
Signal_GND	5	M	gray	E	7	5	Signal_GND

*: Pin 1 = shield (housing)

Important note:
Max. voltage V_m of any electrical apparatus connected to the Zener barrier must not exceed 250V. Zener voltage V_z is 12.6V.

CAIXS2 / RS-232 connection to a PC			
sartorius	External Connections and Data Transfer	Sheet	4
		of	9
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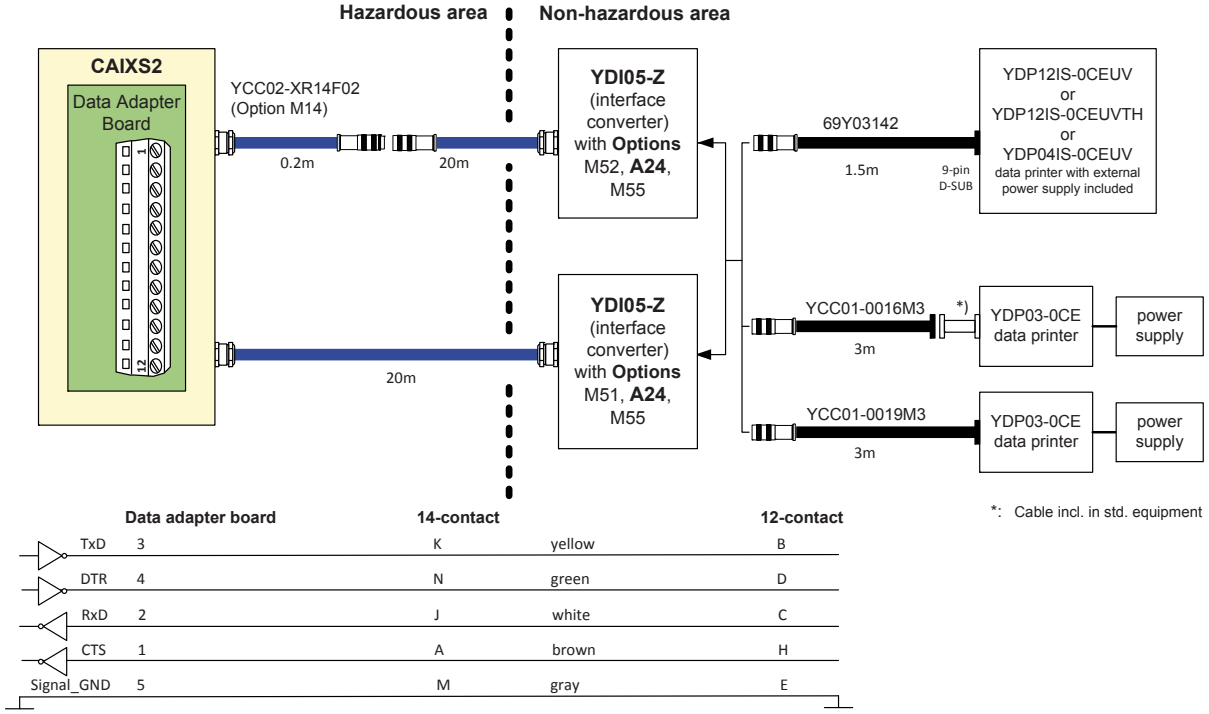

Important note:
Max. voltage V_m of any electrical apparatus connected to the Zener barrier must not exceed 250V. Zener voltage V_z is 12.6V.

CAIXS2 / RS-232 Connection to a Printer				
	sartorius	External Connections and Data Transfer	Sheet	5
			of	9
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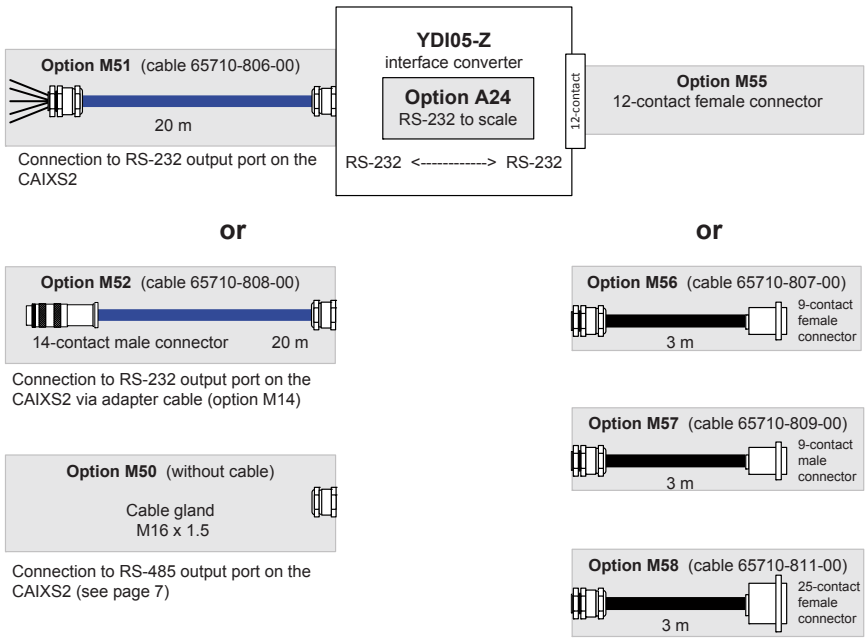

Note: The options on this page are options of the YDI05-Z interface converter.

CAIXS2 / Optional Cables with YDI05-Z (RS232 to CAIXS2)				
	sartorius	External Connections and Data Transfer	Sheet	6
			of	9
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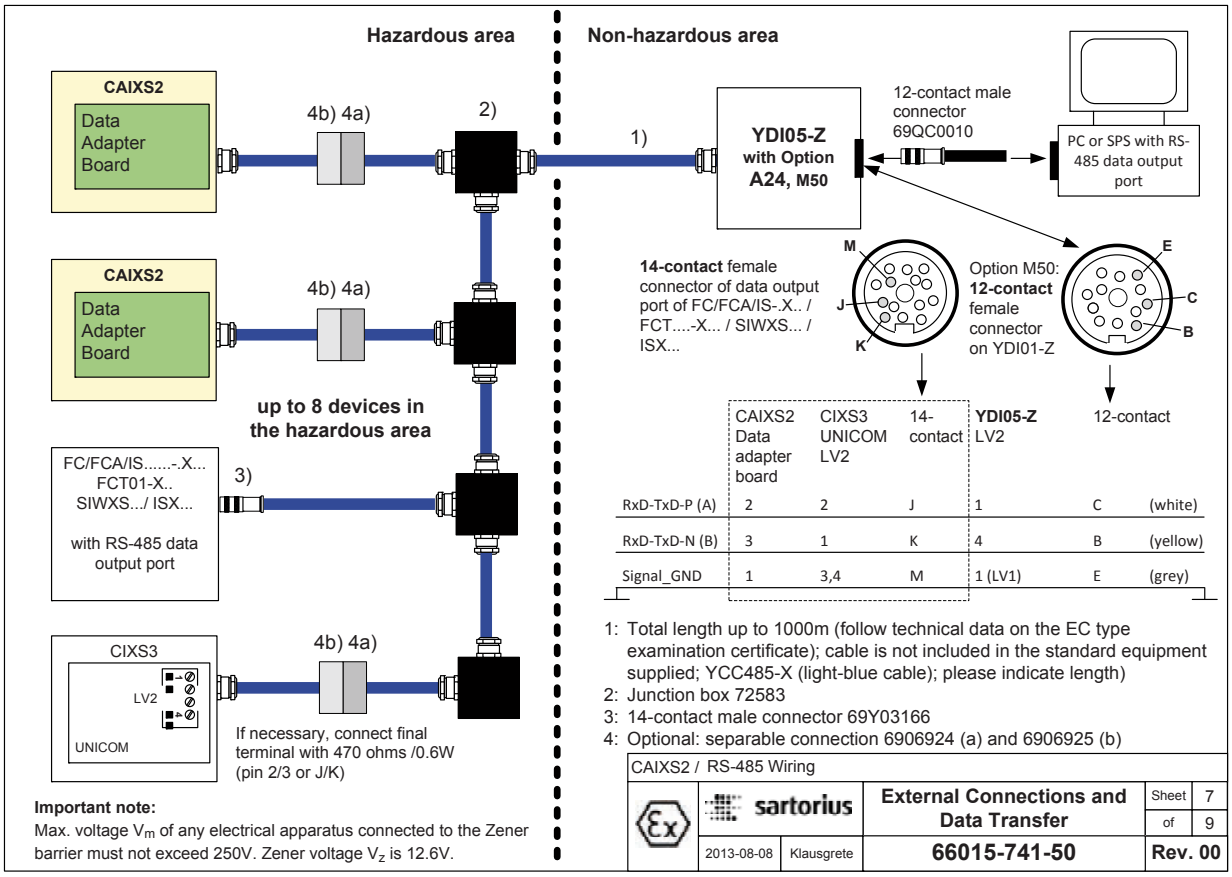
Hazardous area
Non-hazardous area
CAIXS2
Data Adapter Board
4b) 4a)
2)
1)
YDI05-Z with Option A24, M50
12-contact male connector 69QC0010
PC or SPS with RS-485 data output port
CAIXS2
Data Adapter Board
4b) 4a)
up to 8 devices in the hazardous area
FC/FCA/IS.....-X...
FCT01-X..
SIWXS.../ ISX...
with RS-485 data output port
3)
CIXS3
LV2
UNICOM
4b) 4a)
If necessary, connect final terminal with 470 ohms /0.6W (pin 2/3 or J/K)
14-contact female connector of data output port of FC/FCA/IS-.X.. / FCT....-X... / SIWXS... / ISX...
M
J
K
Option M50: 12-contact female connector on YDI01-Z
E
C
B
12-contact
CAIXS2 Data adapter board
CIXS3 UNICOM LV2
14-contact
YDI05-Z LV2
RxD-TxD-P (A) 2 2 J 1 C (white)
RxD-TxD-N (B) 3 1 K 4 B (yellow)
Signal_GND 1 3,4 M 1 (LV1) E (grey)
1: Total length up to 1000m (follow technical data on the EC type examination certificate); cable is not included in the standard equipment supplied; YCC485-X (light-blue cable); please indicate length)
2: Junction box 72583
3: 14-contact male connector 69Y03166
4: Optional: separable connection 6906924 (a) and 6906925 (b)
Important note:
Max. voltage V_m of any electrical apparatus connected to the Zener barrier must not exceed 250V. Zener voltage V_z is 12.6V.
CAIXS2 / RS-485 Wiring
sartorius
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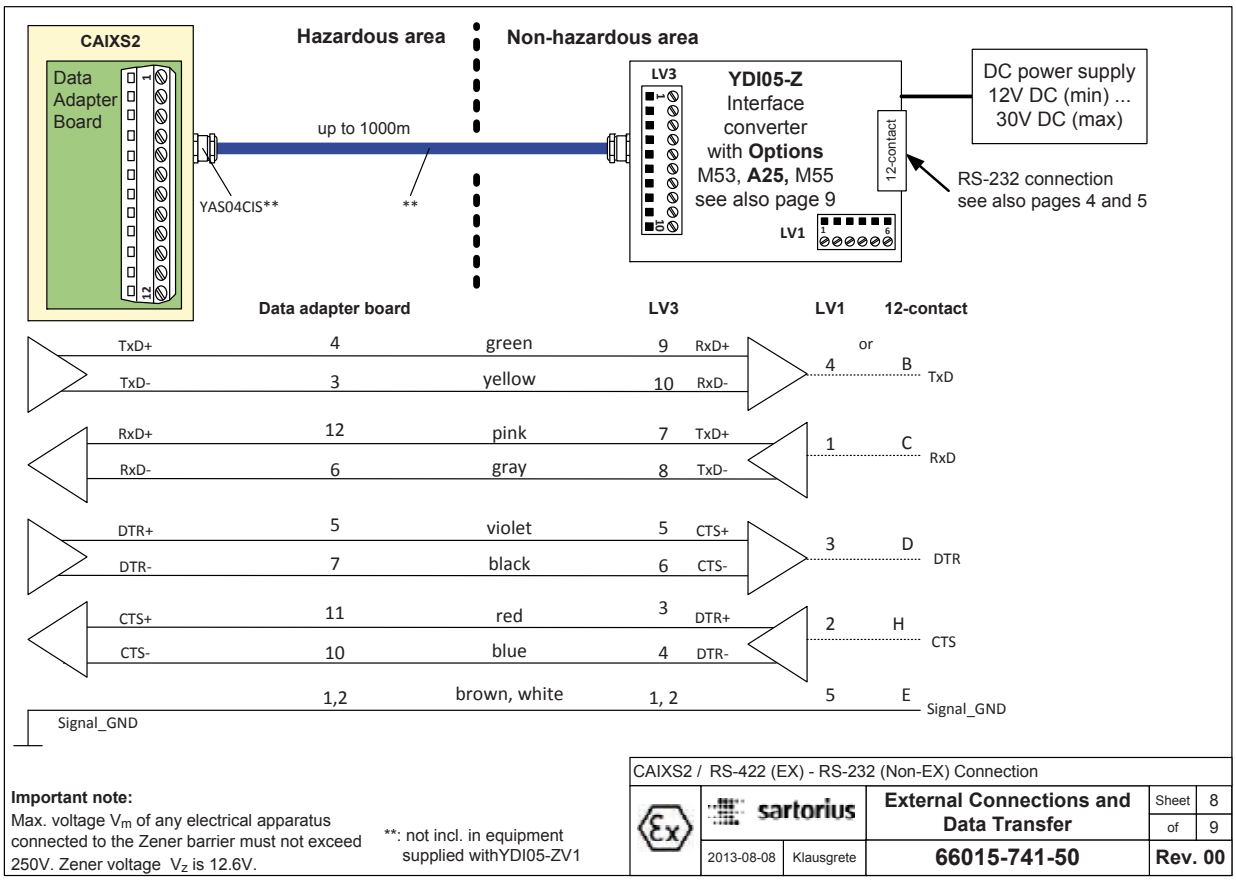
CAIXS2
Data Adapter Board
Hazardous area
Non-hazardous area
up to 1000m
YAS04CIS**
**
LV3
YDI05-Z Interface converter with Options M53, A25, M55 see also page 9
LV1
12-contact
DC power supply 12V DC (min) ... 30V DC (max)
RS-232 connection see also pages 4 and 5
Data adapter board
LV3
LV1
12-contact
TxD+ 4 green 9 RxD+
TxD- 3 yellow 10 RxD-
or
4 B TxD
RxD+ 12 pink 7 TxD+
RxD- 6 gray 8 TxD-
1 C RxD
DTR+ 5 violet 5 CTS+
DTR- 7 black 6 CTS-
3 D DTR
CTS+ 11 red 3 DTR+
CTS- 10 blue 4 DTR-
2 H CTS
1,2 brown, white 1, 2
5 E Signal_GND
Signal_GND
Important note:
Max. voltage V_m of any electrical apparatus connected to the Zener barrier must not exceed 250V. Zener voltage V_z is 12.6V.
**: not incl. in equipment supplied withYDI05-ZV1
CAIXS2 / RS-422 (EX) - RS-232 (Non-EX) Connection
sartorius
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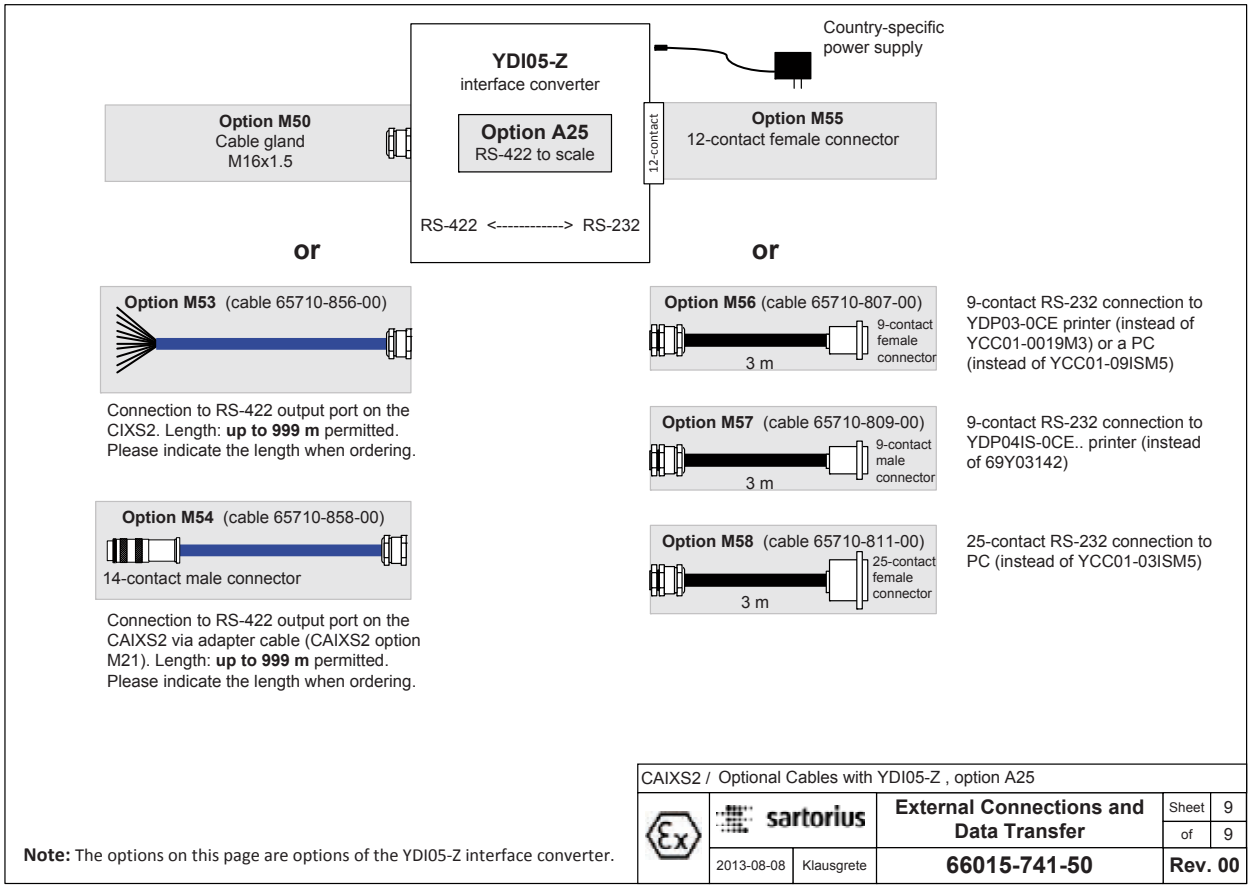
YDI05-Z
interface converter
Option A25
RS-422 to scale
RS-422 <----------> RS-232
Country-specific
power supply
Option M50
Cable gland
M16x1.5
12-contact
Option M55
12-contact female connector
or
or
Option M53 (cable 65710-856-00)
Connection to RS-422 output port on the CIXS2. Length: up to 999 m permitted. Please indicate the length when ordering.
Option M54 (cable 65710-858-00)
14-contact male connector
Connection to RS-422 output port on the CAIXS2 via adapter cable (CAIXS2 option M21). Length: up to 999 m permitted. Please indicate the length when ordering.
Option M56 (cable 65710-807-00)
9-contact female connector
3 m
9-contact RS-232 connection to YDP03-0CE printer (instead of YCC01-0019M3) or a PC (instead of YCC01-09ISM5)
Option M57 (cable 65710-809-00)
9-contact male connector
3 m
9-contact RS-232 connection to YDP04IS-0CE.. printer (instead of 69Y03142)
Option M58 (cable 65710-811-00)
25-contact female connector
3 m
25-contact RS-232 connection to PC (instead of YCC01-03ISM5)
Note: The options on this page are options of the YDI05-Z interface converter.
CAIXS2 / Optional Cables with YDI05-Z , option A25
sartorius
External Connections and Data Transfer
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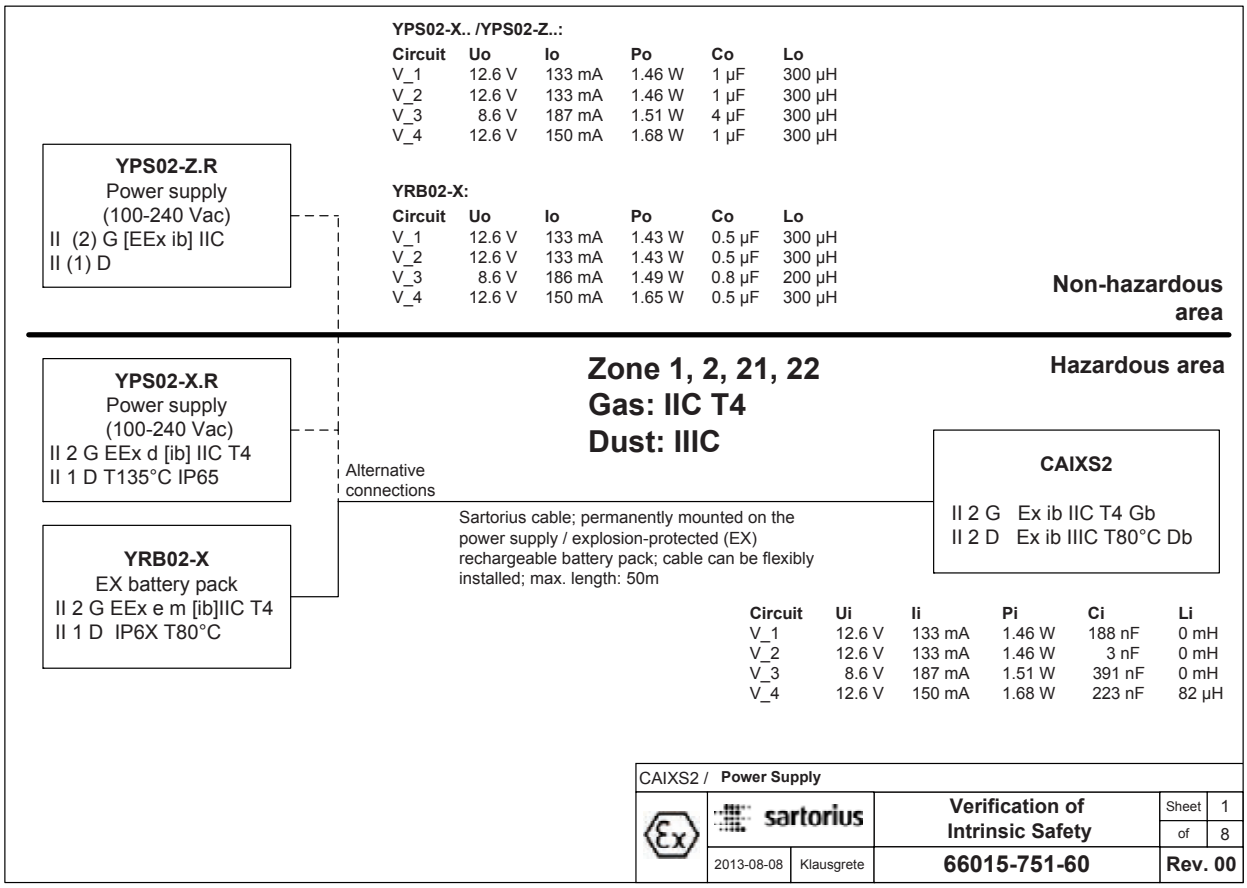

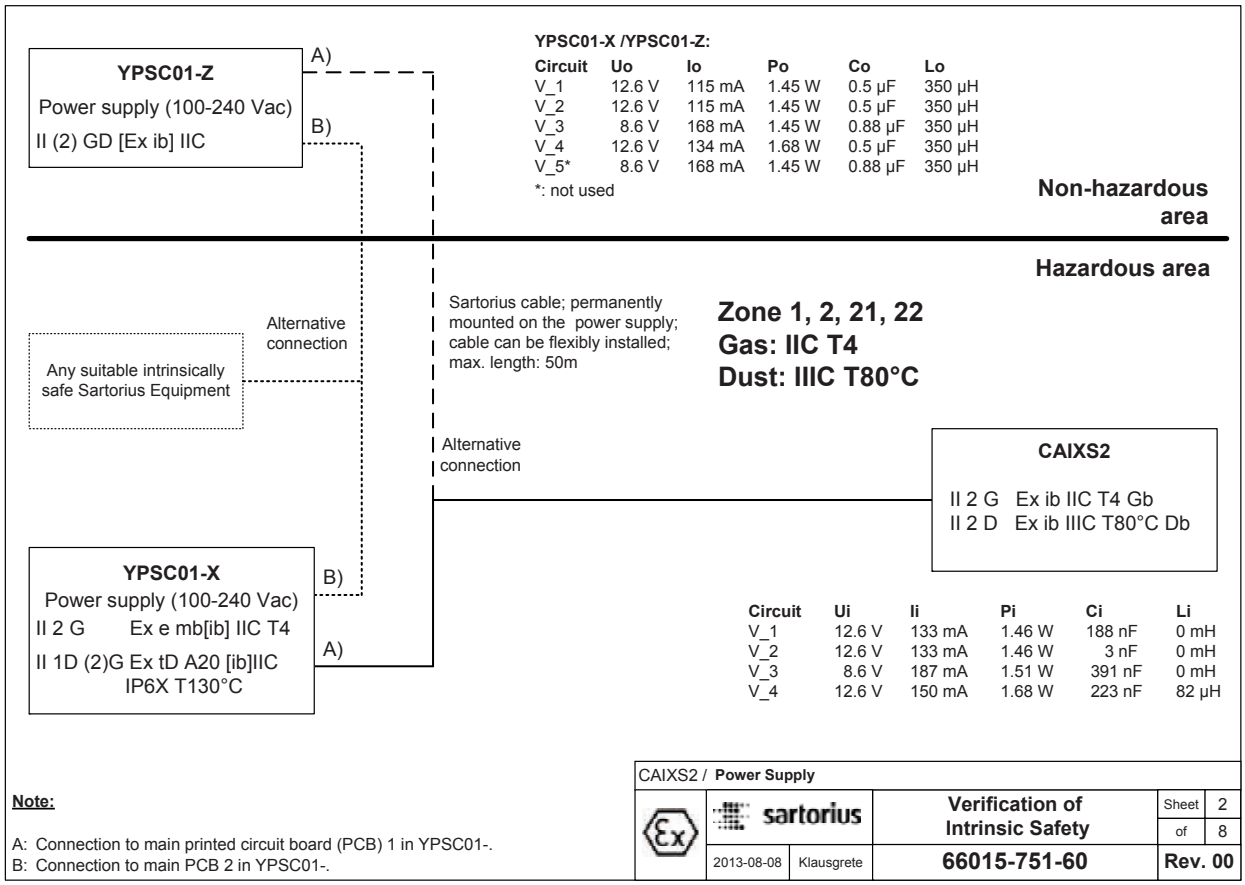

Note:

A: Connection to main printed circuit board (PCB) 1 in YPSC01-.
B: Connection to main PCB 2 in YPSC01-.

Zone 1, 2, 21, 22
Gas: IIC T4
Dust: IIIC

Sensor cable for weighing platform

Functionality requires cables with a low resistance rating.

Recommended: **LiYCY 6x...²** with 700µH/km maximum, 130nF/km maximum (wire versus wire) and 170nF/km maximum (wire vs. ground) can be installed flexibly up to lengths of 500m. (max.150m/mm2)

The 6-wire **cable, type PR6136,** (Lmax = 1.1 mH/km; Cmax = 220nF/km; Rmin = 26 ohms/km) can be used up to 500m.

For cables **longer than 50m,** the screen (shield) of the cable may not be connected to the housing of the weighing platform, or the weighing platform and the indicator must be connected with limited resistivity (e.g., by connecting to an equipotential grounding busbar).

CAIXS2 / **Connection of an Analog Weighing Platform**				
Ex	sartorius	**Verification of Intrinsic Safety**	Sheet	3
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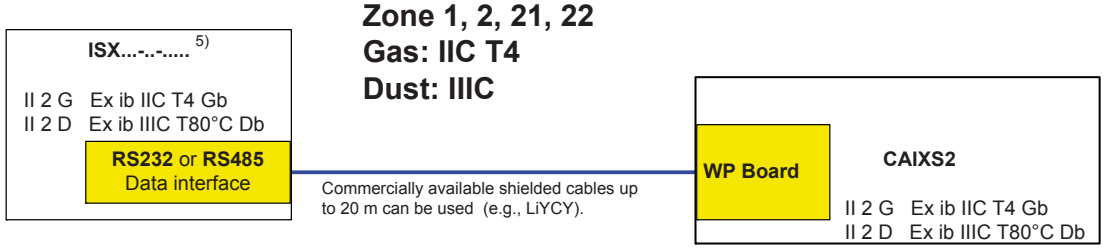
Zone 1, 2, 21, 22
Gas: IIC T4
Dust: IIIC



RS232 parameters (A/J/K/N/M) 2)

Ui	12.6 V 3) / 25,2 V 4)	Uo	10,0 V 3) / 20,0 V 4)
Ii	328 mA*	Io	101 mA*
Pi	any	Po	253 mW
Ci	2,2 nF 3) / 0.5nF 4)	Co	3 µF 3) 217nF 4)
Li	0 mH	Lo	3 mH
		L0/Ro	140 µH/Ω

RS232 parameters (A/J/K/N/M or 1/2/3/4/5/6 of J102) 2)

Ui	12.6 V 3) / 25.2 V 4)	Uo	10.8 V 3) / 21.6 V 4)
Ii	328 mA*	Io	110 mA*
Pi	any	Po	295 mW
Ci	3nF 3) / 0.5nF 4)	Co	2.1 µF 3) 174nF 4)
Li	0 mH	Lo	2 mH
		L0/Ro	120 µH/Ω

RS485 parameters (J/K/M) 2)

Ui	see table 1	Uo	5.2 V
Ii	see table 1	Io	210 mA***
Pi	any	Po	263 mW
Ci	260 nF	Co	78 µF
Li	0 mH	Lo	600 µH
		Lo/Ro	125 µH/Ω

RS485 parameters (J/K/M or 1/2/3 of J101) 2)

Ui	see table 1	Uo	5.4 V
Ii	see table 1	Io	74 mA*
Pi	any	Po	183 mW
Ci	260 nF	Co	50 µF
Li	0 mH	Lo	600 µH
		Lo/Ro	135 µH/Ω

Table 1 (Rmin = Ui / Ii)

Ui	±12.4V	12.0V	6.0V
Ii	130 mA***	164mA***	any
Rmin	95Ω	73Ω	---

Note:

1: Per circuit
2: Combined circuits
3: Versus ground
4: Between the signal lines
5: SIWXSBB.-3-06-H.. and ISXBB.-3-06-H.. models **may not be used** in zone 21 and zone 22
*: Resistively limited

CAIXS2 / **Connection of a Digital Weighing Platform**				
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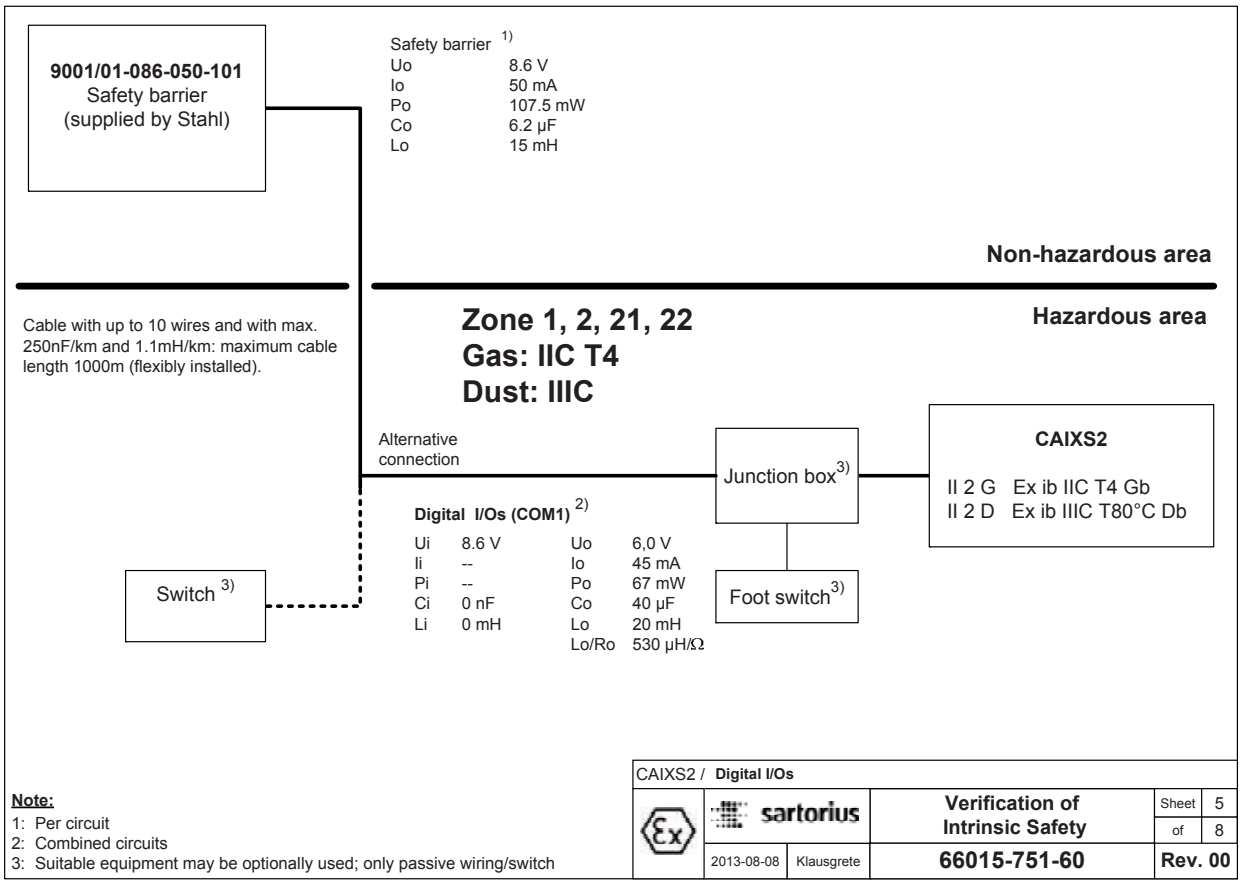
9001/01-086-050-101
Safety barrier
(supplied by Stahl)
Safety barrier 1)
Uo 8.6 V
Io 50 mA
Po 107.5 mW
Co 6.2 µF
Lo 15 mH
Non-hazardous area
Cable with up to 10 wires and with max. 250nF/km and 1.1mH/km: maximum cable length 1000m (flexibly installed).
Zone 1, 2, 21, 22
Gas: IIC T4
Dust: IIIC
Hazardous area
Alternative connection
Junction box3)
CAIXS2
II 2 G Ex ib IIC T4 Gb
II 2 D Ex ib IIIC T80°C Db
Digital I/Os (COM1) 2)
Ui 8.6 V
Ii --
Pi --
Ci 0 nF
Li 0 mH
Uo 6,0 V
Io 45 mA
Po 67 mW
Co 40 µF
Lo 20 mH
Lo/Ro 530 µH/Ω
Switch 3)
Foot switch3)
Note:
1: Per circuit
2: Combined circuits
3: Suitable equipment may be optionally used; only passive wiring/switch
CAIXS2 / Digital I/Os
sartorius
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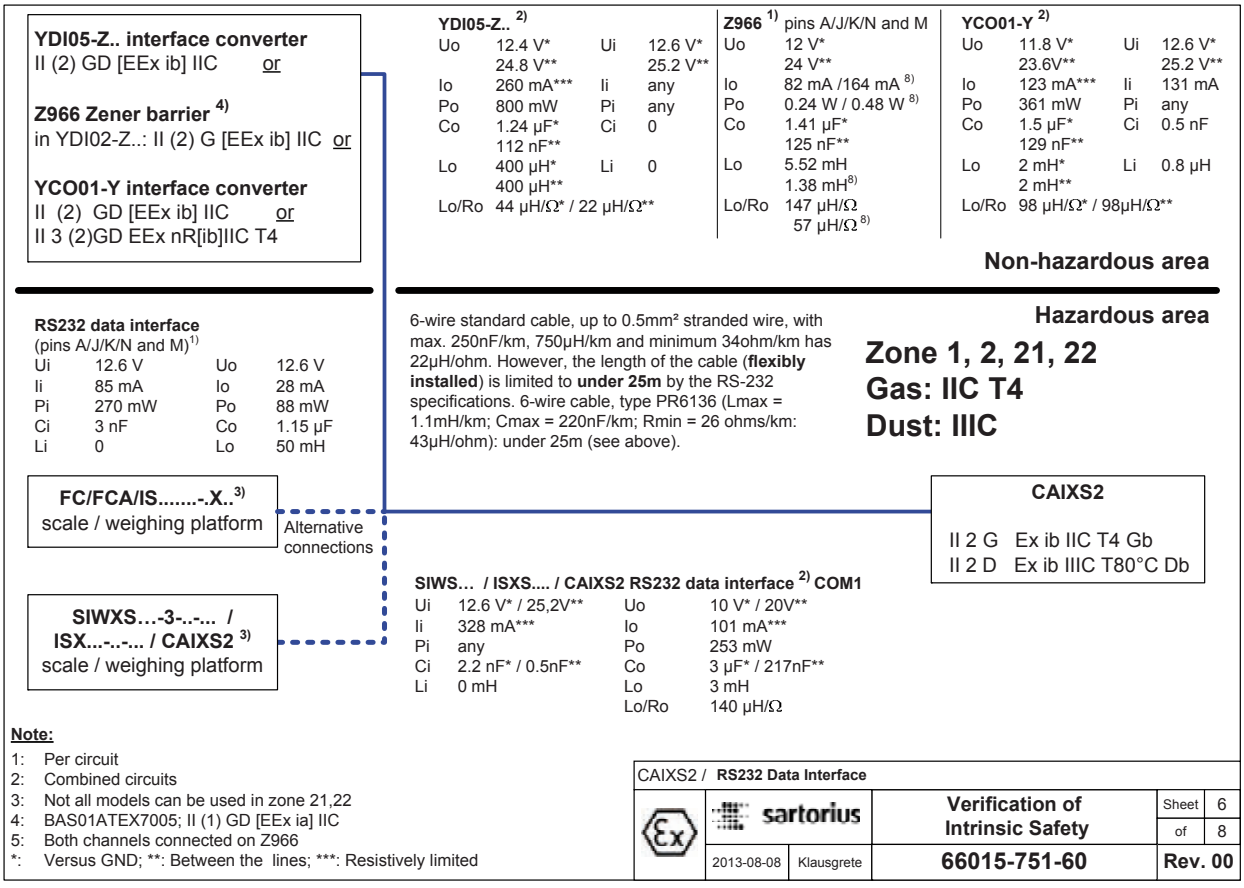
YDI05-Z.. interface converter
II (2) GD [EEx ib] IIC or
Z966 Zener barrier 4)
in YDI02-Z..: II (2) G [EEx ib] IIC or
YCO01-Y interface converter
II (2) GD [EEx ib] IIC or
II 3 (2)GD EEx nR[ib]IIC T4
YDI05-Z.. 2)
Uo 12.4 V* / 24.8 V**
Io 260 mA***
Po 800 mW
Co 1.24 µF* / 112 nF**
Lo 400 µH* / 400 µH**
Lo/Ro 44 µH/Ω* / 22 µH/Ω**
Ui 12.6 V* / 25.2 V**
Ii any
Pi any
Ci 0
Li 0
Z966 1) pins A/J/K/N and M
Uo 12 V* / 24 V**
Io 82 mA /164 mA 8)
Po 0.24 W / 0.48 W 8)
Co 1.41 µF* / 125 nF**
Lo 5.52 mH / 1.38 mH8)
Lo/Ro 147 µH/Ω / 57 µH/Ω 8)
YCO01-Y 2)
Uo 11.8 V* / 23.6V**
Io 123 mA***
Po 361 mW
Co 1.5 µF* / 129 nF**
Lo 2 mH* / 2 mH**
Lo/Ro 98 µH/Ω* / 98µH/Ω**
Ui 12.6 V* / 25.2 V**
Ii 131 mA
Pi any
Ci 0.5 nF
Li 0.8 µH
Non-hazardous area
RS232 data interface
(pins A/J/K/N and M)1)
Ui 12.6 V
Ii 85 mA
Pi 270 mW
Ci 3 nF
Li 0
Uo 12.6 V
Io 28 mA
Po 88 mW
Co 1.15 µF
Lo 50 mH
6-wire standard cable, up to 0.5mm² stranded wire, with max. 250nF/km, 750µH/km and minimum 34ohm/km has 22µH/ohm. However, the length of the cable (flexibly installed) is limited to under 25m by the RS-232 specifications. 6-wire cable, type PR6136 (Lmax = 1.1mH/km; Cmax = 220nF/km; Rmin = 26 ohms/km: 43µH/ohm): under 25m (see above).
Hazardous area
Zone 1, 2, 21, 22
Gas: IIC T4
Dust: IIIC
FC/FCA/IS.....-.X..3)
scale / weighing platform
Alternative connections
CAIXS2
II 2 G Ex ib IIC T4 Gb
II 2 D Ex ib IIIC T80°C Db
SIWXS…-3-..-... / ISX...-..-... / CAIXS2 3)
scale / weighing platform
SIWS… / ISXS.... / CAIXS2 RS232 data interface 2) COM1
Ui 12.6 V* / 25,2V**
Ii 328 mA***
Pi any
Ci 2.2 nF* / 0.5nF**
Li 0 mH
Uo 10 V* / 20V**
Io 101 mA***
Po 253 mW
Co 3 µF* / 217nF**
Lo 3 mH
Lo/Ro 140 µH/Ω
Note:
1: Per circuit
2: Combined circuits
3: Not all models can be used in zone 21,22
4: BAS01ATEX7005; II (1) GD [EEx ia] IIC
5: Both channels connected on Z966
*: Versus GND; **: Between the lines; ***: Resistively limited
CAIXS2 / RS232 Data Interface
sartorius
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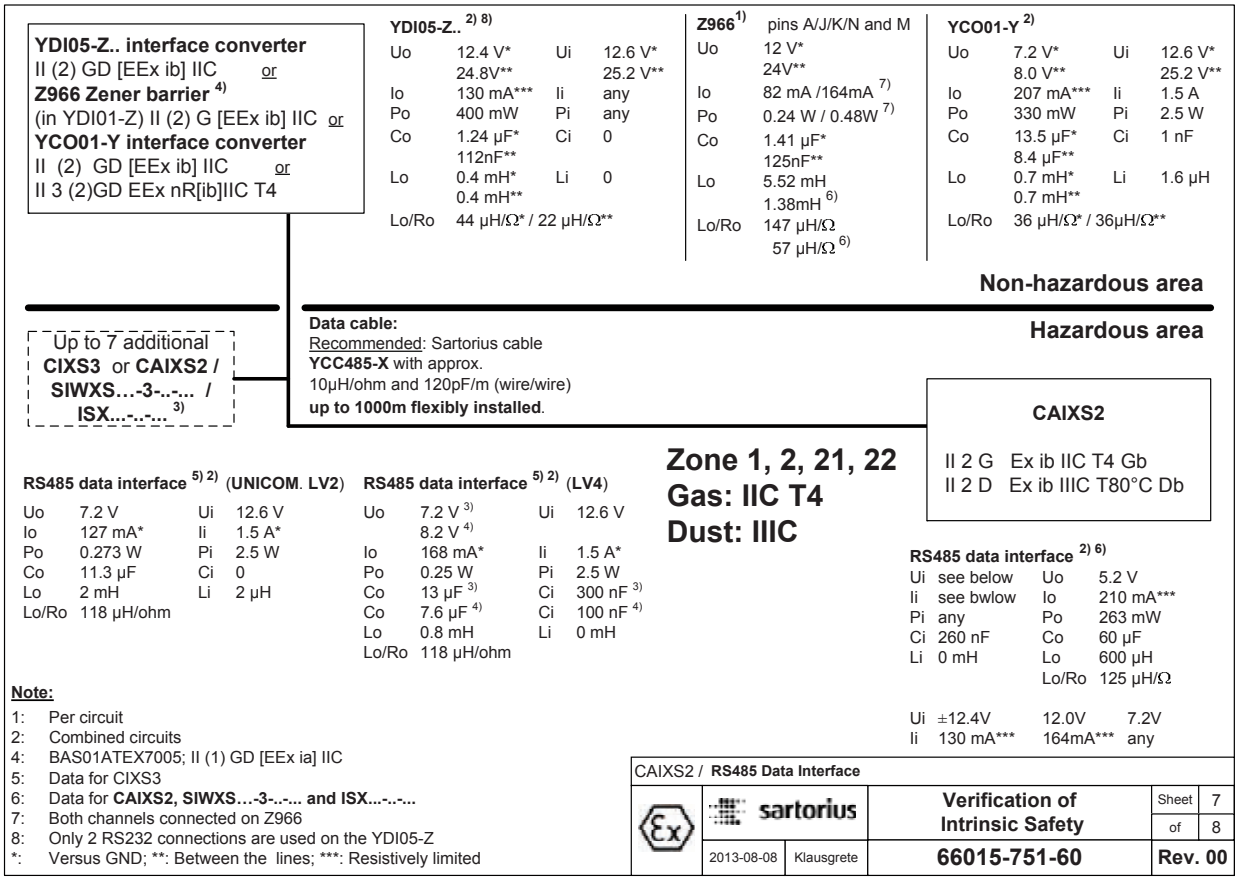

Note:

1: Per circuit
2: Combined circuits
4: BAS01ATEX7005; II (1) GD [EEx ia] IIC
5: Data for CIXS3
6: Data for **CAIXS2, SIWXS…-3-..-... and ISX...-..-...**
7: Both channels connected on Z966
8: Only 2 RS232 connections are used on the YDI05-Z
*: Versus GND; **: Between the lines; ***: Resistively limited

CAIXS2 / **RS485 Data Interface**			
sartorius		**Verification of Intrinsic Safety**	Sheet 7 of 8
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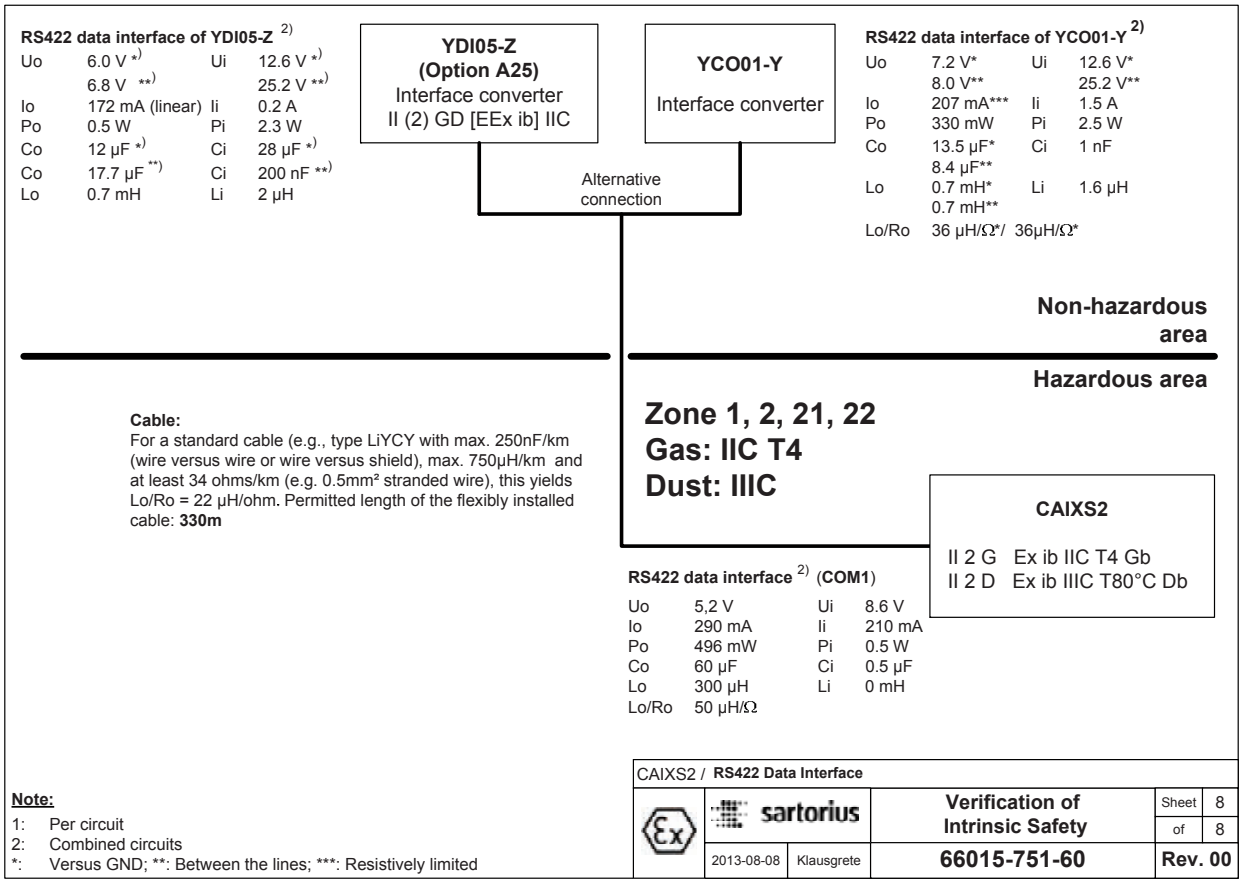

Note:

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

CAIXS2 / **RS422 Data Interface**			
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FM Approvals
1151 Boston Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
T: **781 762 4300** F: 781-762-9375 www.fmapprovals.com

CERTIFICATE OF COMPLIANCE

HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

CAIXS2-ab Intrinsically Safe Indicator
IS / I, II, III / 1 / ABCDEFG / T4 – Entity 66015-751-07
I / 1 / Ex ia IIC / T4

a = U or V or blank
b = blank or up to three numbers (not relevant to safety)

Specific Conditions of Use
1. The front panel of the intrinsically safe indicator type CAIXS2-…. is non-metallic and shall not be used where UV light or radiation may impinge on the enclosure.
2. The device shall be installed in such a way that it is protected against the entry of solid foreign objects or water capable of impairing the safety of the apparatus. Reduce the risk of mechanical damage to a minimum.
3. After the first installation, the gasket must be replaced each time the enclosure is opened.

Electrical Parameters
Connections to the DC Supply Adapter Cable

Circuit	Ui	Ii	Pi	Ci	Li
V_1	12.6 V	133 mA	1.46 W	188 nF	0.0 mH
V_2	12.6 V	133 mA	1.46 W	3 nF	0.0 mH
V_3	8.6 V	187 mA	1.51 W	391 nF	0.0 mH
V_4	12.6 V	150 mA	1.68 W	223 nF	0.1 mH

Connections to the Data Adapter Board (COM1)

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

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

For the RS485 communication

To verify the availability of the Approved product, please refer to www.approvalguide.com

Ui	±12.4 V	12 V	7.2 V
Ii	130 mA***	164 mA***	3.3A***
Rmin	95.4 Ω	73.2 Ω	2.2 Ω

RS485 (Rmin = Ui / Ii is the minimum output resistance of the combined circuits of the associated apparatus connected to the CAIXS2-….)

Output parameters of the CAIXS2-…. (COM1)

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

Input/Output parameters for the WP Board

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS485	5.4 V	74 mA***	183 mW	50 µF	600 µH	135 µH/Ω
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	±12.4 V	130 mA***	†	260 nF	0 mH	
	12.0 V	164 mA***				
	6.0 V	3.3 A***				

***: resistively limited
†; Any. The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input. A consideration only need to be taken for the cable parameters and that will be defined by the SIWXS… or ISX….

Rmin of the external intrinsically safe circuit is defined by Ui / Ii and is;

Ui	±12.4V	12.0V	6.0V
Rmin	95.4Ω	73.2Ω	2.2Ω

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS232	10.8 V*	110 mA***	295 mW	2.14 µF	2 mH	120 µH/Ω
	21.6 V**	55 mA		174 nF		
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	12.6 V*	328 mA***	†	3 nF	0 mH	
	25.2 V**			0.5 nF		

*: versus ground; **: between the lines; ***: resistively limited
†; Any. The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input. A consideration only need to be taken for the cable parameters and that will be defined by the SIWXS… or ISX….

DMS Front End Board
Uo = 11.8 V
Io = 147mA
Po = 1.49 W
Co = 770 nF
Lo = 300 µH

Equipment Ratings:
Intrinsically safe for Class I, II and III, Division 1, Groups A, B, C, D, E, F and G Hazardous (Classified) Locations per Entity concept in accordance with 66015-751-07. Intrinsically safe for Class I, Zone 1, Group IIC Hazardous (Classified) Locations per Entity concept in accordance with 66015-751-07.

FM Approved for:

Sartorius Industrial Scales GmbH & Co. KG
Leinetal 2, 37120 Bovenden Germany

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

FM Class 3600	2011
FM Class 3610	2010
FM Class 3810	2005
ANSI/IEC 60529	2004
ANSI/ISA 60079-0	2009
ANSI/ISA 60079-11	2011

Original Project ID: 0003049923 Approval Granted: December 23, 2013

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date

FM Approvals LLC

J.E. Marquedant
Group Manager, Electrical

23 December 2013
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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CERTIFICATE OF COMPLIANCE

HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

CAIXS2-ab Intrinsically Safe Indicator
IS / I, II, III / 1 / ABCDEFG / T4 – Entity 66015-751-07
I / 1 / Ex ia IIC / T4

a = U or V or blank
b = blank or up to three numbers (not relevant to safety)

Specific Conditions of Use
1. The front panel of the intrinsically safe indicator type CAIXS2-…. is non-metallic and shall not be used where UV light or radiation may impinge on the enclosure.
2. The device shall be installed in such a way that it is protected against the entry of solid foreign objects or water capable of impairing the safety of the apparatus. Reduce the risk of mechanical damage to a minimum.
3. After the first installation, the gasket must be replaced each time the enclosure is opened.

Electrical Parameters
Connections to the DC Supply Adapter Cable

Circuit	Ui	Ii	Pi	Ci	Li
V_1	12.6 V	133 mA	1.46 W	188 nF	0.0 mH
V_2	12.6 V	133 mA	1.46 W	3 nF	0.0 mH
V_3	8.6 V	187 mA	1.51 W	391 nF	0.0 mH
V_4	12.6 V	150 mA	1.68 W	223 nF	0.1 mH

Connections to the Data Adapter Board (COM1)

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

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

For the RS485 communication

To verify the availability of the Approved product, please refer to www.approvalguide.com

Ui	±12.4 V	12 V	7.2 V
Ii	130 mA***	164 mA***	3.3A***
Rmin	95.4 Ω	73.2 Ω	2.2 Ω

RS485 (Rmin = Ui / Ii is the minimum output resistance of the combined circuits of the associated apparatus connected to the CAIXS2-….)

Output parameters of the CAIXS2-…. (COM1)

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

Input/Output parameters for the WP Board

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS485	5.4 V	74 mA***	183 mW	50 µF	600 µH	135 µH/Ω
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	±12.4 V	130 mA***	†	260 nF	0 mH	
	12.0 V	164 mA***				
	6.0 V	3.3 A***				

***: resistively limited
†; Any. The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input. A consideration only need to be taken for the cable parameters and that will be defined by the SIWXS… or ISX….

Rmin of the external intrinsically safe circuit is defined by Ui / Ii and is;

Ui	±12.4V	12.0V	6.0V
Rmin	95.4Ω	73.2Ω	2.2Ω

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS232	10.8 V*	110 mA***	295 mW	2.14 µF	2 mH	120 µH/Ω
	21.6 V**	55 mA		174 nF		
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	12.6 V*	328 mA***	†	3 nF	0 mH	
	25.2 V**			0.5 nF		

*: versus ground; **: between the lines; ***: resistively limited
†; Any. The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input. A consideration only need to be taken for the cable parameters and that will be defined by the SIWXS… or ISX….

DMS Front End Board
Uo = 11.8 V
Io = 147mA
Po = 1.49 W
Co = 770 nF
Lo = 300 µH

Equipment Ratings:
Intrinsically safe for Class I, II and III, Division 1, Groups A, B, C, D, E, F and G Hazardous (Classified) Locations per Entity concept in accordance with 66015-751-07. Intrinsically safe for Class I, Zone 1, Group IIC Hazardous (Classified) Locations per Entity concept in accordance with 66015-751-07. Intrinsically safe for Zone 21 Group IIIC Hazardous (Classified) Locations per Entity concept in accordance with 66015-751-07

FM Approved for:

Sartorius Industrial Scales GmbH & Co. KG
Leinetal 2, 37120 Bovenden Germany

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

CAN/CSA C22.2 No. 0-M91	2006
CAN/CSA C22.2 No. 142-M1987	2004
CAN C22.2 No.157-92	1992 (2006)
CSA C22.2 No. 1010.1	2004

Original Project ID: 0003049923 Approval Granted: December 23, 2013

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date

FM Approvals LLC

J.E. Marquedant
Group Manager, Electrical

23 December 2013
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

1 **EG-BAUMUSTERPRÜFBESCHEINIGUNG**

2 **Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen – Richtlinie 94/9/EG**

3 **EG-Baumusterprüfbescheinigung Nr.: FM13ATEX0085X**

4 **Gerät oder Schutzsystem: (Typenbezeichnung und Name)** **CAIXS2-…. Eigensicherer Indikator**

5 **Name des Antragstellers:** **Satorius Industrial Scales GmbH & Co. KG**

6 **Adresse des Antragstellers** **Leinetal 2**
37120 Bovenden
Germany

7 Die Bauart dieses Gerätes oder Schutzsystems und der verschiedenen zulässigen Ausführungen ist in der Anlage zu dieser Bescheinigung und den darin genannten Unterlagen festgelegt.

8 FM Approvals Ltd, benannte Stelle Nummer 1725 gemäß Artikel 9 der Richtlinie 94/9/EG vom 23.März 1994, bescheinigt die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie.

Die Ergebnisse der Prüfung sind im vertraulichen Prüfbericht Nr.:

3049923 vom 23. December, 2013 festgehalten.

9 Die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen, mit Ausnahme derjenigen, die in Abschnitt 15 der Anlage zu dieser Bescheinigung genannt sind, wurde durch Übereinstimmung mit folgenden Dokumenten festgestellt:

EN 60079-0:2012, EN 60079-11:2012 and EN 60529:1991+ A1: 2000

10 Falls das Zeichen "X" hinter der Bescheinigungsnummer steht, wird in der Anlage zu dieser Bescheinigung auf besondere Bedingungen für die sichere Anwendung des Gerätes hingewiesen.

11 Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf Konstruktion, Überprüfung und Tests des spezifizierten Gerätes oder Schutzsystems in Übereinstimmung mit der Richtlinie 94/9/EG. Weitere Anforderungen der Richtlinie betreffen den Herstellungsprozess und die Lieferung dieses Gerätes oder Schutzsystems. Beide werden nicht von dieser Bescheinigung abgedeckt.

Die Markierung des Gerätes oder Schutzsystems muss folgende Angaben enthalten:

II 2 G Ex ia IIC T4 Gb -10°C ≤ Ta ≤ +40°C
II 2 D Ex ia IIIC T80°C Db -10°C ≤ Ta ≤ +40°C

Mick Gower
cn=Mick Gower
c=GB
2013.12.23 15:27:26 Z

Mick Gower
Certification Manager, FM Approvals Ltd.

Issue date: 23rd December 2013

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ANLAGE

zur EG-Baumusterprüfbescheinigung Nr. FM13ATEX0085X

13 **Beschreibung des Gerätes oder Schutzsystems:**

Der eigensichere Indikator Typ CAIXS2-…. wird für die Datenverarbeitung und -anzeige in einem Wägesystem eingesetzt. An die im Gerät eingebaute Analog-/Digital-Wandlerkarte, die durch eine RS232/RS485-Datenausgangskarte zum Anschluss digitaler Wägeplattformen oder Waagen Waagen ersetzt werden kann, können eigensichere analoge Wägeplattformen oder oder Wägezellen angeschlossen werden. Darüber hinaus ist die Datenübertragung über eine eigensichere RS232-, RS485- oder RS422-Datenausgangskarte mit und ohne digitale E/A-Signale möglich. Umgebungstemperaturbereich: -10 °C bis +40 °C.

CAIXS2-ab Eigensicherer Indikator
a = U oder V oder leer
b = leer oder bis zu drei Ziffern (nicht sicherheitsrelevant)

Elektrische Parameter

Anschlüsse an das DC-Stromadapterkabel

Schaltkreis	Ui	Ii	Pi	Ci	Li
V_1	12.6 V	133 mA	1.46 W	188 nF	0.0 mH
V_2	12.6 V	133 mA	1.46 W	3 nF	0.0 mH
V_3	8.6 V	187 mA	1.51 W	391 nF	0.0 mH
V_4	12.6 V	150 mA	1.68 W	223 nF	0.1 mH

Anschluss an das Data Adapter Board (COM1)

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

*: = an Masse; ** = zwischen den Leitungen; ***: = mit Widerstandsbegrenzung

Für die RS485 communication

Ui	±12.4 V	12 V	7.2 V
Ii	130 mA***	164 mA***	3.3A***
Rmin	95.4 Ω	73.2 Ω	2.2 Ω

RS485 (Rmin = Ui / Ii ist der minimale kombinierte Ausgangswiderstand der an den CAIXS2-…. angeschlossenen zugehörigen Geräte)

Ausgangsparameter für CAIXS2-…. (COM1)

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

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ANLAGE

zur EG-Baumusterprüfbescheinigung Nr. FM13ATEX0085X

Eingangs-/Ausgangsparameter für die WP-Karte

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS485	5.4 V	74 mA***	183 mW	50 µF	600 µH	135 µH/Ω
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	±12.4 V	130 mA***	†	260 nF	0 mH	
	12.0 V	164 mA***				
	6.0 V	3.3 A***				

***: mit Widerstandsbegrenzung
† beliebig. Die Eingangsleistung vom SIWXS… oder ISX… ist aufgrund der Widerstandsbegrenzung am Eingang für den CAISX2-…. unkritisch. Zu berücksichtigen sind lediglich die Kabelparameter, die durch den SIWXS… oder ISX…. vorgegeben werden.

Der Rmin des externen eigensicheren Schaltkreises wird von Ui / Ii bestimmt und beträgt:

Ui	±12.4V	12.0V	6.0V
Rmin	95.4Ω	73.2Ω	2.2Ω

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS232	10.8 V*	110 mA***	295 mW	2.14 µF	2 mH	120 µH/Ω
	21.6 V**	55 mA		174 nF		
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	12.6 V*	328 mA***	†	3 nF	0 mH	
	25.2 V**			0.5 nF		

*: gegen ground; **: zwischen den Leitungen; ***: mit Widerstandsbegrenzung

DMS Front End Board
Uo = 11.8 V
Io = 147mA
Po = 1.49 W
Co = 770 nF
Lo = 300 µH

14 **Besondere Bedingungen für den sicheren Gebrauch:**

1. Die Frontplatte des eigensicheren Indikators Typ CAIXS2-…. besteht nicht aus Metall und darf nicht an Einsatzorten installiert werden, wo das Gehäuse UV-Licht oder -Strahlung ausgesetzt ist.
2. Das Gerät muss so installiert werden, dass es vor eindringenden Festkörpern oder Wasser und einer hierdurch bedingten Beeinträchtigung der Gerätesicherheit geschützt ist. Das Risiko mechanischer Schäden ist auf ein Minimum zu reduzieren.
3. Nach der Erstinstallation ist die Dichtung nach jedem Öffnen des Gehäuses auszuwechseln.

15 **Sicherheits-und Gesundheitsanforderungen**

Die relevanten EHSRs, die nicht durch die in diesem Zertifikat aufgeführten Normen behandelt wurden identifiziert und in dem vertraulichen Prüfbericht in Artikel 8 identifiziert bewertet.

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ANLAGE

zur EG-Baumusterprüfbescheinigung Nr. FM13ATEX0085X

16 **Prüf- und Beurteilungsverfahren sowie Bedingungen:**

Diese EG-Baumusterprüfbescheinigung ist das Ergebnis der Prüfung eines vorgestellten Produktmusters in Übereinstimmung mit den Bestimmungen der speziellen maßgeblichen Vorschrift(en) und der Beurteilung der vorgelegten Begleitdokumente. Sie schließt keine Beurteilung der gesamten Produktion ein.

Diese Bescheinigung kann herangezogen werden, um den Anspruch des Herstellers auf CE-Kennzeichnung zu stützen. Hingegen übernimmt FM Approvals Ltd keine Verantwortung dafür, dass das Gerät in allen Anwendungen mit allen geltenden Richtlinien übereinstimmt.

Diese Bescheinigung wurde gemäß dem für FM Approvals Ltd geltenden ATEX-Bescheinigungsschema erstellt.

17 **Schedule Drawings**

In der Anlage enthaltene Pläne Die Anlage zu dieser Bescheinigung enthält eine Liste der signifikanten Teile der technischen Dokumentation, die bei der benannten Stelle in Kopie vorliegt.

18 **Bescheinigungsverlauf**

Die Details der Nachträge zu dieser Bescheinigung sind nachstehend beschrieben:

Date	Description
23rd December 2013	Original Issue.

FM Approvals Ltd. 1 Windsor Dials, Windsor, Berkshire, UK. SL4 1RS
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APPROVAL REPORT

Project No:	3049923
Class:	3610
Product Name:	CAIXS2-….
Product Type:	Intrinsically Safe Indicator
Name of Listing Company:	Sartorius Industrial Scales GmbH & Co. KG
Address of Listing Company:	Leinetal 2, 37120 Bovenden Germany
Customer ID:	146319
Customer website	www.sartorius.com

Prepared by

N Ludlam

Nicholas Ludlam

Senior Engineering Specialist

Reviewed by

Timothy Adam

Technical Team Manager

J.E. Marquedant

James E. Marquedant

Group Manager

23 December 2013

Date of Approval

FM Approvals
1151 Boston-Providence Turnpike
PO Box 9102
Norwood, MA 02062

FM APPROVALS PROJECT NO: 3049923

1 INTRODUCTION

1.1 Sartorius Industrial Scales GmbH & Co. KG requested Approval of the apparatus listed in Section 1.4 for compliance with the standards listed in;

1.1.1 Section 1.3.1 as Intrinsically Safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G hazardous (Classified) locations in accordance with drawing 66015-751-07, Intrinsically Safe for Class I, Zone 1, Group IIC hazardous (Classified) locations and Intrinsically Safe for Zone 21, Group IIC hazardous (Classified) locations;

1.1.2 Section 1.3.2 as Intrinsically Safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G hazardous locations, Intrinsically Safe for Class I, Zone 1, Group IIC hazardous locations in accordance with drawing 66015-751-07; and

1.1.3 Section 1.3.3 as Intrinsically Safe II 2 G, Ex ia IIC T6 and II 2 D Ex ia IIIC T80°C.

1.2 This report may be freely reproduced only in its entirety and without modification.

1.3 Standards

1.3.1 United States Standards

Title	Number	Issue Date
Electrical Equipment for Use in Hazardous (Classified) Locations – General Requirements	FM Class 3600	2011
Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II & III, Division I, Hazardous (Classified) Locations	FM Class 3610	2010
Electrical Equipment for Measurement, Control and Laboratory Use	FM Class 3810	2005
Degrees of Protection Provided by Enclosures (IP Code)	ANSI/IEC 60529	2004
Explosive atmospheres - Part 0: Equipments-General Requirements	ANSI/ISA 60079-0	2009
Explosive atmospheres - Part 11: Equipment protection by intrinsic safety “i”	ANSI/ISA 60079-11	2011

1.3.2 Canadian Standards

Title	Number	Issue Date
General Requirements – Canadian Electrical Code, Part II	CAN/CSA C22.2 No. 0-M91	2006
Process Control Equipment – Industrial Products	CAN/CSA C22.2 No. 142-M1987	2004
Intrinsically Safe and Non-incendive Electrical Equipment for use in Hazardous Locations	CAN C22.2 No.157-92	1992 (2006)
Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements	CSA C22.2 No. 1010.1	2004

FM APPROVALS PROJECT NO: 3049923

1.3.3 ATEX Standards

Title	Number	Issue Date
Electrical apparatus for explosive gas atmospheres. Part 0: General Requirements	EN 60079-0	2012
Explosive atmospheres Part 11: Equipment protection by intrinsic safety “i”	EN 60079-11	2012
Degrees of protection provided by enclosures (IP Code)	EN 60529 +A1	1991 2000

1.4 Listing

The product will appear in the Approval Guide, an on-line resource of FM Approvals, as follows:

1.4.1 US Listings

Hazardous Location Equipment - United States Indicators Digital
CAIXS2-ab Intrinsically Safe Indicator
IS / I, II, III / 1 / ABCDEFG / T4 – Entity 66015-751-07
I / 1 / AEx ia IIC / T4 Entity 66015-751-07
21 / AEx ia IIIC / T80°C Entity 66015-751-07

a = U or V or blank
b = blank or up to three numbers (not relevant to safety)

Specific Conditions of Use
1. The front panel of the intrinsically safe indicator type CAIXS2-…. is non-metallic and shall not be used where UV light or radiation may impinge on the enclosure.
2. The device shall be installed in such a way that it is protected against the entry of solid foreign objects or water capable of impairing the safety of the apparatus. Reduce the risk of mechanical damage to a minimum.
3. After the first installation, the gasket must be replaced each time the enclosure is opened.

Electrical Parameters
Connections to the DC Supply Adapter Cable

Circuit	Ui	Ii	Pi	Ci	Li
V_1	12.6 V	133 mA	1.46 W	188 nF	0.0 mH
V_2	12.6 V	133 mA	1.46 W	3 nF	0.0 mH
V_3	8.6 V	187 mA	1.51 W	391 nF	0.0 mH
V_4	12.6 V	150 mA	1.68 W	223 nF	0.1 mH

Connections to the Data Adapter Board (COM1)

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

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

FM APPROVALS PROJECT NO: 3049923

For the RS485 communication

Ui	±12.4 V	12 V	7.2 V
Ii	130 mA***	164 mA***	3.3A***
Rmin	95.4 Ω	73.2 Ω	2.2 Ω

RS485 (Rmin = Ui / Ii is the minimum output resistance of the combined circuits of the associated apparatus connected to the CAIXS2-….)

Output parameters of the CAIXS2-…. (COM1)

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

Input/Output parameters for the WP Board

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS485	5.4 V	74 mA***	183 mW	50 µF	600 µH	135 µH/Ω
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	±12.4 V	130 mA***	†	260 nF	0 mH	
	12.0 V	164 mA***				
	6.0 V	3.3 A***				

***: resistively limited
†; Any. The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input. A consideration only need to be taken for the cable parameters and that will be defined by the SIWXS… or ISX….

Rmin of the external intrinsically safe circuit is defined by Ui / Ii and is;

Ui	±12.4V	12.0V	6.0V
Rmin	95.4Ω	73.2Ω	2.2Ω

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS232	10.8 V*	110 mA***	295 mW	2.14 µF	2 mH	120 µH/Ω
	21.6 V**	55 mA		174 nF		
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	12.6 V*	328 mA***	†	3 nF	0 mH	
	25.2 V**			0.5 nF		

*: versus ground; **: between the lines; ***: resistively limited
†; Any. The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input. A consideration only need to be taken for the cable parameters and that will be defined by the SIWXS… or ISX….

DMS Front End Board
Uo = 11.8 V
Io = 147mA
Po = 1.49 W
Co = 770 nF
Lo = 300 µH

1.4.2 Canadian Listings

Hazardous Location Equipment - Canada Indicators Digital

FM APPROVALS PROJECT NO: 3049923

CAIXS2-ab Intrinsically Safe Indicator
IS / I, II, III / 1 / ABCDEFG / T4 – Entity 66015-751-07
I / 1 / AEx ia IIC / T4 Entity 66015-751-07

a = U or V or blank
b = blank or up to three numbers (not relevant to safety)

Specific Conditions of Use
1. The front panel of the intrinsically safe indicator type CAIXS2-…. is non-metallic and shall not be used where UV light or radiation may impinge on the enclosure.
2. The device shall be installed in such a way that it is protected against the entry of solid foreign objects or water capable of impairing the safety of the apparatus. Reduce the risk of mechanical damage to a minimum.

Electrical Parameters
Connections to the DC Supply Adapter Cable

Circuit	Ui	Ii	Pi	Ci	Li
V_1	12.6 V	133 mA	1.46 W	188 nF	0.0 mH
V_2	12.6 V	133 mA	1.46 W	3 nF	0.0 mH
V_3	8.6 V	187 mA	1.51 W	391 nF	0.0 mH
V_4	12.6 V	150 mA	1.68 W	223 nF	0.1 mH

Connections to the Data Adapter Board (COM1)

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

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

For the RS485 communication

Ui	±12.4 V	12 V	7.2 V
Ii	130 mA***	164 mA***	3.3A***
Rmin	95.4 Ω	73.2 Ω	2.2 Ω

RS485 (Rmin = Ui / Ii is the minimum output resistance of the combined circuits of the associated apparatus connected to the CAIXS2-….)

Output parameters of the CAIXS2-…. (COM1)

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

Input/Output parameters for the WP Board

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS485	5.4 V	74 mA***	183 mW	50 µF	600 µH	135 µH/Ω
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	±12.4 V	130 mA***	†	260 nF	0 mH	
	12.0 V	164 mA***				
	6.0 V	3.3 A***				

FM APPROVALS PROJECT NO: 3049923

***: resistively limited
†; Any. The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input. A consideration only need to be taken for the cable parameters and that will be defined by the SIWXS… or ISX….

Rmin of the external intrinsically safe circuit is defined by Ui / Ii and is;
Ui ±12.4V 12.0V 6.0V
Rmin 95.4Ω 73.2Ω 2.2Ω

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS232	10.8 V*	110 mA***	295 mW	2.14 µF	2 mH	120 µH/Ω
	21.6 V**	55 mA		174 nF		
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	12.6 V*	328 mA***	†	3 nF	0 mH	
	25.2 V**			0.5 nF		

*: versus ground; **: between the lines; ***: resistively limited
†; Any. The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input. A consideration only need to be taken for the cable parameters and that will be defined by the SIWXS… or ISX….

DMS Front End Board
Uo = 11.8 V
Io = 147mA
Po = 1.49 W
Co = 770 nF
Lo = 300 µH

1.4.3 ATEX Listings

Hazardous Location Equipment - Europe (ATEX) Transmitters Pressure

CAIXS2-ab Intrinsically Safe Indicator
FM13ATEX0085X
II 2 G Ex ia IIC T4 Gb -10°C ≤ Ta ≤ +40°C
II 2 D Ex ia IIIC T80°C Db -10°C ≤ Ta ≤ +40°C

a = U or V or blank
b = blank or up to three numbers (not relevant to safety)

Specific Conditions of Use
1. The front panel of the intrinsically safe indicator type CAIXS2-…. is non-metallic and shall not be used where UV light or radiation may impinge on the enclosure.
2. The device shall be installed in such a way that it is protected against the entry of solid foreign objects or water capable of impairing the safety of the apparatus. Reduce the risk of mechanical damage to a minimum.
3. After the first installation, the gasket must be replaced each time the enclosure is opened.

Electrical Parameters
Connections to the DC Supply Adapter Cable

Circuit	Ui	Ii	Pi	Ci	Li
V_1	12.6 V	133 mA	1.46 W	188 nF	0.0 mH

FM APPROVALS PROJECT NO: 3049923

V_2	12.6 V	133 mA	1.46 W	3 nF	0.0 mH
V_3	8.6 V	187 mA	1.51 W	391 nF	0.0 mH
V_4	12.6 V	150 mA	1.68 W	223 nF	0.1 mH

Connections to the Data Adapter Board (COM1)

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

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

For the RS485 communication

Ui	±12.4 V	12 V	7.2 V
Ii	130 mA***	164 mA***	3.3A***
Rmin	95.4 Ω	73.2 Ω	2.2 Ω

RS485 (Rmin = Ui / Ii is the minimum output resistance of the combined circuits of the associated apparatus connected to the CAIXS2-….)

Output parameters of the CAIXS2-…. (COM1)

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

Input/Output parameters for the WP Board

Circuit	**Uo**	**Io**	**Po**	**Co**	**Lo**	**Lo/Ro**
RS485	5.4 V	74 mA***	183 mW	50 µF	600 µH	135 µH/Ω
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	±12.4 V	130 mA***	†	260 nF	0 mH	
	12.0 V	164 mA***				
	6.0 V	3.3 A***				

***: resistively limited

†; Any. The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input. A consideration only need to be taken for the cable parameters and that will be defined by the SIWXS… or ISX….

Rmin of the external intrinsically safe circuit is defined by Ui / Ii and is;

Ui	±12.4V	12.0V	6.0V
Rmin	95.4Ω	73.2Ω	2.2Ω

Circuit	**Uo**	**Io**	**Po**	**Co**	**Lo**	**Lo/Ro**
RS232	10.8 V*	110 mA***	295 mW	2.14 µF	2 mH	120 µH/Ω
	21.6 V**	55 mA		174 nF		
	Ui	**Ii**	**Pi**	**Ci**	**Li**	
	12.6 V*	328 mA***	†	3 nF	0 mH	
	25.2 V**			0.5 nF		

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

FM APPROVALS PROJECT NO: 3049923

†; Any. The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input. A consideration only need to be taken for the cable parameters and that will be defined by the SIWXS… or ISX….

DMS Front End Board
Uo = 11.8 V
Io = 147mA
Po = 1.49 W
Co = 770 nF
Lo = 300 µH

2 DESCRIPTION

The intrinsically safe indicator type CAIXS2-…. is used for data handling and indication in a weighing system. Intrinsically safe analog weighing platforms or load cells can be connected to the internal analog digital converter board, which can be replaced by a RS232 /RS485 data output board for connection of intrinsically safe digital weighing platforms or scales. Additional data transfer can be done by an intrinsically safe RS232, RS485 or RS422 data output board with and without digital I/O signals.

Operation Temperature Ranges:
The ambient operating temperature range of the Super Pressure Transmitter is -10°C to 40°C.

3 EXAMINATIONS AND TESTS

3.1 US & Canadian Examination

Samples of the intrinsically safe indicator type CAIXS2-…. were submitted for examination and testing. The intrinsically safe indicator type CAIXS2-…. samples were considered to be representative of the product line and were examined, tested, and compared to the manufacturer's drawings. All data is on file at FM Approvals along with other documents and correspondence applicable to this program.

All testing and analysis considered appropriate was conducted and verified to be in compliance with the Standards defined in Sections 1.3.1 and 1.3.2.

3.2 ATEX Examination

The examination and tests were conducted under FM Approvals Project 3049922, IECEx Test Report Number US/FME/ExTR13.0005/00. The test and constructional requirements of EN 60079-0:2012 and EN 60079-11:2012 are based on those of IEC 60079-0:2011 and IEC 60079-11:2011. The European versions of these standards differ from the equivalent IEC versions in a number of ways. Where the differences are published in the IECEx Bulletin, these were reviewed as part of this examination. Where the standards are not addressed in the IECEx bulletin, a comparison between the IEC and EN standards was conducted. The product was also found to comply with the published National European Deviations.

FM APPROVALS PROJECT NO: 3049923

The equipment, identified in 1.4.3, has been assessed against and found to be in conformity with, the Essential Health and Safety Requirements (EHSR's) of the ATEX Directive. The record of the EHSR assessment has been retained by FM Approvals.

4 MARKING

4.1 Product intended for use in Canada shall be provided with caution and warning labels in English and French.

4.2 A copy of label drawing 1000004644 is attached to this report. The labels contain all the information as required by the standards.

5 REMARKS

5.1 For guidance on U.S. installations, see ANSI/ISA-RP12.06.01, Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations.

5.2 Installations shall comply with the manufacturer's instructions.

5.3 Tampering and replacement with non-factory components may adversely affect the safe use of the system.

5.4 The products(s) discussed in this report were certified by FM Approvals under a Type 3 Certification System as identified in ISO Guide 67.

5.5 Installations in the US shall comply with the relevant requirements of the National Electrical Code® (ANSI/NFPA-70 (NEC®).

5.6 Installations in Canada shall comply with the relevant requirements of the Canadian Electrical Code (CSA C22.1).

5.7 Installations in Europe shall comply with the relevant requirements of EN 60079-14 and applicable National regulations.

5.8 FM Approvals accepts no responsibility for the compliance of the equipment identified in 1.4.3 against all applicable Directives in all applications.

6 SURVEILLANCE AUDIT

The design and manufacturing facilities at the following location(s) shall be visited on a routine basis. The facility processes and quality control procedures in place have been determined to be satisfactory to manufacture product identical to that tested and Approved. A Form 797 shall be submitted to FM Approvals for requesting to manufacture product at any additional or alternate manufacturing facilities which are not listed below.

Design	**Manufacturing**
Sartorius Industrial Scales GmbH & Co. KG	Sartorius Industrial Scales GmbH & Co. KG
Leinetal 2, 37120 Bovenden Germany	Leinetal 2, 37120 Bovenden Germany

FM APPROVALS PROJECT NO: 3049923

7 MANUFACTURER'S RESPONSIBILITIES

7.1 Documentation that is applicable to this approval is on file at FM Approvals and listed in the Documentation File, Section 8, of this report. No changes of any nature shall be made unless notice of the proposed change has been given and written authorization obtained from FM Approvals. The Approved Product - Revision Report, FM Approvals Form 797, shall be forwarded to FM Approvals as notice of proposed changes.

7.2 The manufacturer shall supply copies of Control Drawing number 66015-751-07 with each transmitter. The manufacturer shall make additional copies available upon request.

7.3 The manufacturer shall make any Special Conditions of Use available to the user of the Product.

7.4 The manufacturer shall carry out verifications or tests necessary to ensure that the electrical equipment produced complies with the documentation listed in section 8.

7.5 In accordance with the Master Agreement, the manufacturer shall make full and immediate disclosure to FM Approvals of all information concerning any defect in, or potential hazard of, the product or service manufactured or provided by the Customer which is Approved by, or being examined by, FM Approvals. The manufacturer shall make all necessary arrangements for the investigation of complaints / anomalies applicable to this approval and shall keep records of all complaints / anomalies including actions taken.

8 DOCUMENTATION

See attached blueprint report.

9 CONCLUSION

9.1 The apparatus described in section 1.4.1 and 1.4.2 meets FM Approvals requirements. Since a duly signed Master Agreement is on file for this manufacturer, US and Canadian Approval is effective the date of this report.

9.2 On the basis of the described examination and tests, it is concluded that the apparatus identified in Section 1.4.3 of this report meets the requirements for the issue of an EC Type Examination Certificate by FM Approvals Limited as requested in the application and as noted in Section I of this report. Issue date is effective the date of the EC Type Examination Certificate.

PROJECT DATA RECORD: 0003049923

ATTACHMENTS:
Control Drawing 66015-751-07 (1 sheet)
Label Drawing 1000004644 (1 sheet)
Blueprint Report (3 sheets)

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx FME 13.0005X	Issue No: 0	Certificate history: Issue No. 0 (2013-12-09)
Status:	Current	Page 1 of 3	
Date of Issue:	2013-12-09		
Applicant:	Sartorius Industrial Scales GmbH & Co. KG Leinetal 2, 37210 Bovenden Germany		
Electrical Apparatus:	CAIXS2... Intrinsically Safe Indicator		
Optional accessory:			
Type of Protection:	Intrinisc Safety 'i'		
Marking:	Ex ia IIC T4 Gb -10 °C ≤ Ta ≤ +40 °C		

Approved for issue on behalf of the IECEx Certification Body: Mick Gower

Position: Certification Manager

Signature:
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

FM Approvals Ltd
1 Windsor Dials
SL4 1RS Windsor
United Kingdom

FM Approvals
Member of the FM Global Group

IECEx Certificate of Conformity

Certificate No:	IECEx FME 13.0005X	Issue No: 0
Date of Issue:	2013-12-09	Page 2 of 3
Manufacturer:	Sartorius Industrial Scales GmbH & Co. KG Leinetal 2, 37210 Bovenden Germany	
Additional Manufacturing location(s):		

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

STANDARDS:

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

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

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

TEST & ASSESSMENT REPORTS:

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

Test Report:

GB/FME/ExTR13.0004/00

Quality Assessment Report:

GB/FME/QAR13.0021/00

IECEx Certificate of Conformity

Certificate No:	IECEx FME 13.0005X	Issue No: 0
Date of Issue:	2013-12-09	Page 3 of 3

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The intrinsically safe indicator type CAIXS2-.... is used for data handling and indication in a weighing system. Intrinsically safe analog weighing platforms or load cells can be connected to the internal analog digital converter board, which can be replaced by a RS232 /RS485 data output board for connection of intrinsically safe digital weighing platforms or scales. Additional data transfer can be done by an intrinsically safe RS232, RS485 or RS422 data output board with and without digital I/O signals. Ambient temperature range: -10 °C to +40 °C.

CAIXS2-ab Intrinsically Safe Indicator

a = U, V or blankb = blank or up to three numbers (not relevant to safety)

CONDITIONS OF CERTIFICATION: YES as shown below:

1. The front panel of the intrinsically safe indicator type CAIXS2-.... is non-metallic and shall not be used where UV light or radiation may impinge on the enclosure.
2. The device shall be installed in such a way that it is protected against the entry of solid foreign objects or water capable of impairing the safety of the apparatus. Reduce the risk of mechanical damage to a minimum.
3. After the first installation, the gasket must be replaced each time the enclosure is opened.

Annex:

Annex to IECEx FME 13_0005X.pdf

Attachment to IECEx FME 13.0005X issue No.:0

FM Approvals Ltd.
1 Windsor Dials,
Windsor, Berkshire, UK. SL4 1RS
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www.fmapprovals.com

Electrical Parameters

Connections to the DC Supply Adapter Cable

Circuit	Ui	Ii	Pi	Ci	Li
V_1	12.6 V	133 mA	1.46 W	188 nF	0.0 mH
V_2	12.6 V	133 mA	1.46 W	3 nF	0.0 mH
V_3	8.6 V	187 mA	1.51 W	391 nF	0.0 mH
V_4	12.6 V	150 mA	1.68 W	223 nF	0.1 mH

Connections to the Data Adapter Board (COM1)

Circuit	Ui	Ii	Pi	Ci	Li
RS232	12.6 V*/25.2 V**	328 mA***	any	2.2 nF*/0.5nF**	0 mH
RS422	8.6 V	210 mA	0.5 W	0.5 µF	0 mH
RS485	see below	see below	any	230nF	0 mH
Digital I/O	8.6 V	any	any	0 µF	0 mH

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

For the RS485 communication;

Ui	±12.4 V	12 V	7.2 V
Ii	130 mA***	164 mA***	3.3A***
Rmin	95.4 Ω	73.2 Ω	2.2 Ω

RS485 (Rmin = Ui / Ii is the minimum output resistance of the combined circuits of the associated apparatus connected to the SIWXS…. or ISX…)

Output parameters of the CAIXS2-….. (COM1)

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

Input/Output parameters for the WP Board

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS485	5.4 V	75 mA***	183 mW	50 µF	600 µH	135 µH/Ω
	Ui	Ii	Pi	Ci	Li	
	±12.4 V	130 mA***	†	260 nF	0 mH	
	12.0 V	164 mA***				
	6.0 V	3.3 A***				

***: resistively limited

†; Any; The input power from the SIWXS… or ISX… is not critical to the CAISX2-…. as the circuit is resistively limited at the input.

Rmin of the external intrinsically safe circuit is defined by Ui / Ii and is;

Ui	±12.4V	12.0V	6.0V
Rmin	95.4Ω	73.2Ω	2.2Ω

Circuit	Uo	Io	Po	Co	Lo	Lo/Ro
RS232	10.8 V*	110 mA***	295 mW	2.14 µF	2 mH	120 µH/Ω
	21.6 V**	55 mA		174 nF		
	Ui	Ii	Pi	Ci	Li	
	12.6 V*	328 mA***	†	3 nF	0 mH	
	25.2 V**			0.5 nF		

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

Attachment to IECEx FME 13.0005X issue No.:0

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†; Any; The input power from the SIWXS... or ISX... is not critical to the CAISX2-.... as the circuit is resistively limited at the input.

DMS Front End Board
Uo = 11.8 V
Io = 147mA
Po = 1.49 W
Co = 770 nF
Lo = 300 µH

Appendix: General Password

After selecting the “Setup” menu item a request to enter the access password "CODE" will be displayed for 2 seconds.

▷ The first digit in the display flashes.

Numbers and the point can be entered via the number pad.

Select characters using the Fn and ⊟ keys.

Fn key displays: Numbers in ascending order (0 to 9)
then the characters . and -
then letters in descending order (from _Z to A)

⊟ key displays: Letters in alphabetical order A to Z
then the characters - and .
then numbers in descending order 9 to 0

Fn or ⊟ ▶ Press the Fn or ⊟ keys multiple times until the desired character is displayed.

→T← ▶ Confirm the displayed character using the →T← key.

▷ The second digit in the display flashes.
▶ Enter all additional characters in the same way.
▷ If the password is longer than 7 characters the first character will be displaced to the left and out of the display.

→T← ▶ Confirm the entered password using the →T← key.

→0← ▶ Exit the menu level using the →0← key.

→T← hold ▶ Press and hold the →T← key to switch to the Operating mode.

General password:
40414243

Service password:
202122

Sartorius Industrial Scales GmbH & Co. KG
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37120 Bovenden, Germany

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Fax: 49.551.309.83.190
www.sartorius-intec.com

Date:
June 2014, Sartorius,
Bovenden, Germany

Printed in Germany.
Printed on bleached, chlorine-free paper
KT- RS
Publication no.: WCA6014-e14066