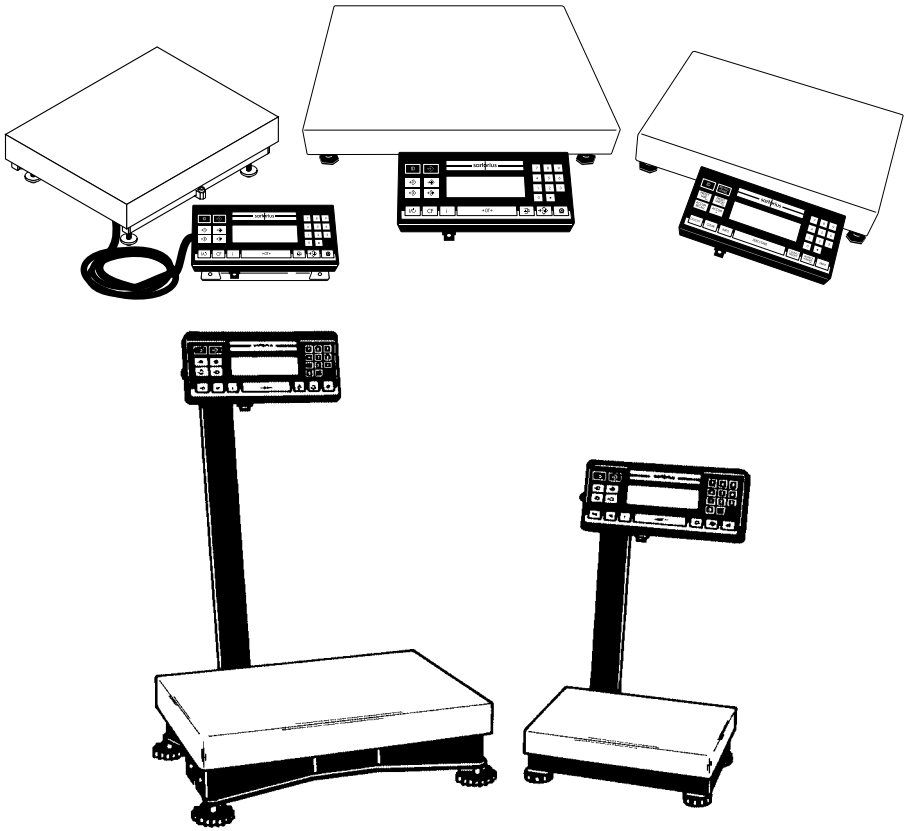
98648-009-86

Industrial
Weighing Technology

Sartorius
QC Models

Electronic Scale

Operating Instructions for Standard QC Models and
QC Models Verifiable for Use in Legal Metrology

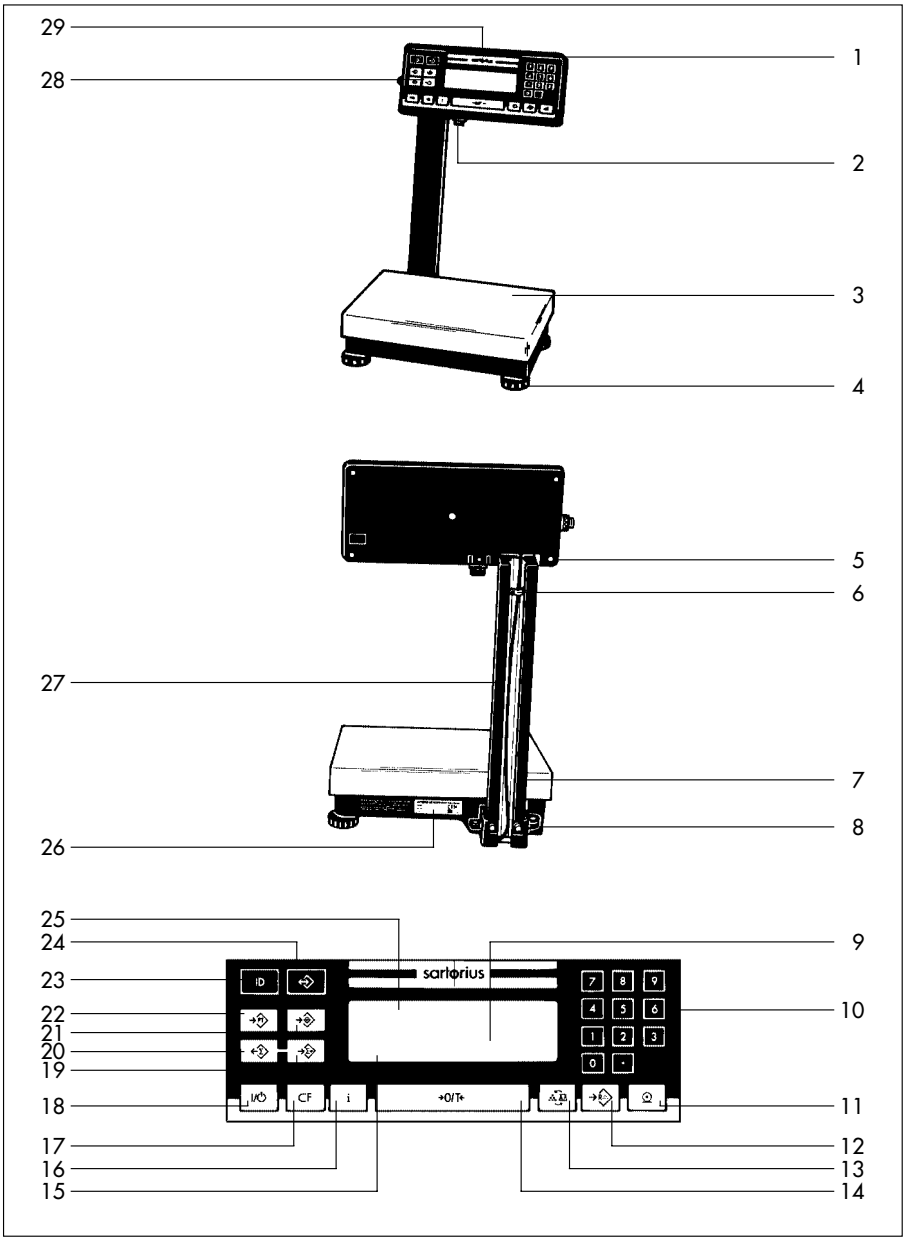


sartorius

Contents

QC 7 Models

Note: This illustration shows only the -L0CE model with raised display

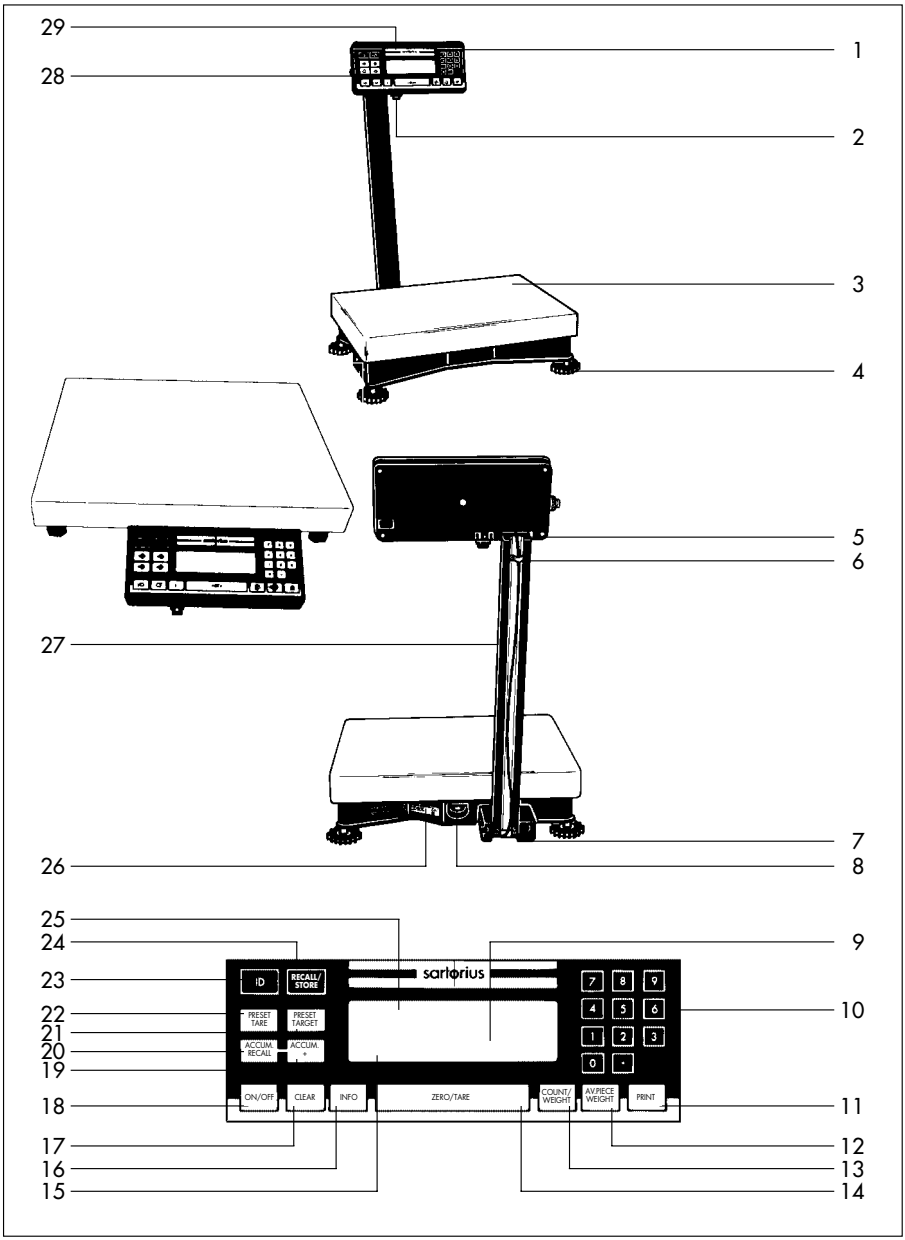


No.	Designation
1	Display unit
2	Power socket
3	Load plate
4	Leveling foot
5	Retainers for the display unit
6	Clip
7	Fastening screws for the support arm
8	Level indicator
9	Display
10	[0]–[9] and [•] number keys
11	[⊙]/[PRINT] Print key (data output)
12	[→R←]/[AVPIECE WEIGHT] Start key for counting mode
13	[⁂]/[COUNT/ WEIGHT] Key for toggling between weighing/counting applications, between reference sample quantity and average piece weight, or for toggling weight units for all models except QC34EDE-L0CE and QC64EDE-L0CE
14	[→0/T←]/[ZERO/TARE] Tare key – Zero/tare

No.	Designation
15	Display for application programs
16	[i]/[INFO] Info key
17	[CF]/[CLEAR] CF key
18	[I/⏻]/[ON/OFF] On/Off
19	[→Σ+←]/[ACCUM. +] Totalization memory – add
20	[←Σ→]/[ACCUM. RECALL] Data output – total
21	[→◈←]/[PRESET TARGET] Start checkweighing mode
22	[→PT←]/[PRESET TARE] Store value in tare memory
23	[ID]/[ID] Store ID for individual output values
24	[←◈→]/[RECALL/ STORE] Memory (recall/store)
25	Bar graph (linear range indicator)
26	Manufacturer's label
27	Support arm
28	Threaded cap on the interface port
29	ID label (only for scales verified for use in legal metrology)

Note: The keypad overlay shown here is the version for use in Europe.

QC 34 and QC 64 Models



No.	Designation
1	Display unit
2	Power socket
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4	Leveling foot
5	Retainers for the display unit
6	Clip
7	Fastening screws for the support arm
8	Level indicator
9	Display
10	[0]–[9] and [•] number keys
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13	[⁂]/[COUNT/ WEIGHT] Key for toggling between weighing/counting applications, between reference sample quantity and average piece weight, or for toggling between weight units for all models except QC34EDE-L0CE and QC64EDE-L0CE
14	[→0/T←]/[ZERO/TARE] Tare key – Zero/tare

No.	Designation
15	Display for application programs
16	[i]/[INFO] Info key
17	[CF]/[CLEAR] CF key
18	[I/⏻]/[ON/OFF] On/off
19	[→Σ+]/[ACCUM. +] Totalization memory – add
20	[Σ]/[ACCUM. RECALL] Data output – total
21	[→◈]/[PRESET TARGET] Start checkweighing mode
22	[→PT]/[PRESET TARE] Store value in tare memory
23	[ID]/[ID] Store ID for individual output values
24	[◈]/[RECALL/ STORE] Memory (recall/store)
25	Bar graph (linear range indicator)
26	Manufacturer's label
27	Support arm
28	Threaded cap on the interface port
29	ID label (only for scales verified for use in legal metrology)

Note: The keypad overlay shown here is the version for use with -0UR models in the US.

Important Note to Users

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

If you turn off the scale while it is running on power supplied by the battery pack and the external AC adapter YRB06Z is not plugged in for recharging, make sure to turn off the battery pack as well.

Note:
(For QC 34 and QC 64 models only)

Transport Locking Device

Do not remove the transport locking device until the scale is set up at the place of installation. Remove the load plate.
The transport locking devices (yellow) are located on the short sides of the scale.

Remove the transport locking devices (unfasten them using an Allen wrench) before initially operating the scale.

Verification Mark (Seal)

The law requires that a verified scale be sealed with a verification mark. The verification marks (seals) on a verified QC scale indicate that this scale may only be opened and serviced by authorized technicians, to ensure reliable and trouble-free operation and to avoid forfeiture of the warranty coverage. If a verification mark (seal) is damaged, please observe the national laws and regulations in effect at the place of installation.

Installation Instructions

Please read these installation and operating instructions carefully before you begin operating your new scale.

Intended Use

The QC series counting scales are ideal for use in production and in warehouse management. They are designed primarily for counting parts of identical weight and for the related applications: totalizing, checkweighing, documentation, counting and for storing data on articles weighed. You can connect a PC (for remote operation of your scale or for integration into a warehouse management system) or any of a variety of accessory devices to the data interface port of the scale (see the section entitled "Accessories (Options)").

If you are interested in using your Sartorius QC scale for any other purpose, please contact your Sartorius Service Center. Sartorius does not accept any liability connected with the use of their scales for other than their intended purposes.

Warranty

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

Storage and Shipping Conditions

Allowable storage temperature: –40°C...+70°C
–40°F...+158°F

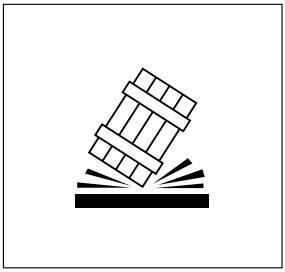
The packaging has been designed to ensure that the scale will not be damaged even if it is dropped from a height of up to 80 cm (about 31inches).

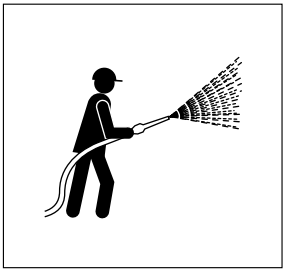
After unpacking the scale, please check it immediately for any visible damage as a result of rough handling during shipment.
If this is the case, proceed as directed in the section entitled "Safety Inspection."

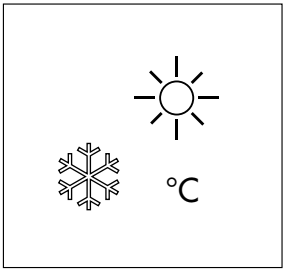
Save the box and all parts of the packaging for any future shipment of your scale. Before packing your scale, unplug all cables to prevent damage. Replace the screw cap (28) on the data interface port.

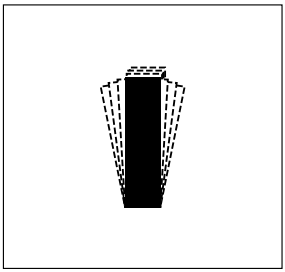
To ensure your scale's long service life:
Do not expose the scale unnecessarily to extreme temperatures, moisture, blows, shocks or vibration.

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









Ambient Conditions

Sartorius QC scales are designed to provide reliable weighing and counting results under normal ambient conditions encountered in industrial environments.

When choosing a location to set up your scale, observe the following so that you will be able to work with added speed and accuracy:

– Set up the scale on an even, stable surface (table or floor)
– Avoid extreme heat radiation from heaters or direct sunlight
– Protect the scale from drafts that come through open doors and windows
– Avoid areas that may subject the scale to extreme vibrations during weighing
– Protect the scale from aggressive chemical vapors

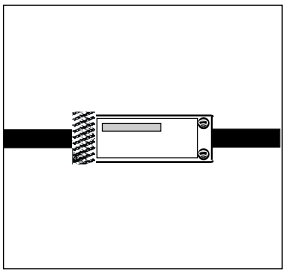
The scale may not be used in hazardous areas/locations where there is danger of explosion.

Do not expose the scale to extreme moisture over long periods of time. Moisture in the air can condense on the surfaces of a cold scale whenever it is brought to a substantially warmer place. If you transfer the scale to a warmer area, make sure to condition it for about 2 hours at room temperature, leaving it unplugged from AC power. Afterwards, if you keep the scale connected to AC power, the constant positive difference in temperature between the inside of the scale and the outside will practically rule out moisture condensation.

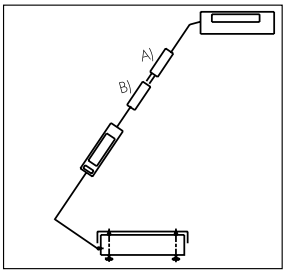
Note for QC Models Verifiable for Use in Legal Metrology:

Preparing the Scale for Verification as a Legal Measuring Instrument in the EU*:
After initially connecting the scale to the power supply (or after a relatively long power outage), allow the scale to warm up for at least 24 hours.

The scale can be adapted to your individual requirements through simple changes to code settings in the scale operating menu. For more information, see the section entitled "Scale Operating Menu."



Check the serial number on the display unit of the QC scale against the number on the tag of the scale cable.



Plug connector A into connector B.

Zone 2/Class I, Division 2 Hazardous Areas/Locations

You may operate the scale in a Zone 2 hazardous area in Europe or in a Class I, Div. 2 hazardous location (in the U.S. and Canada).
In this case, you must comply with the national electrical code and applicable safety regulations of your country (in Germany, according to DIN VDE 0165).

For information on the legal regulations currently applicable in your country, please ask your Sartorius office or dealer.

To install the power supply, please read the instructions in the section entitled "Getting Started."

If you operate the scale in a Zone 2/Class I, Div. 2 hazardous area/location, you will need to observe the installation conditions as described for the QC display unit in the section entitled "Getting Started."

The QC scale may not be operated in Zone 0, 1, 20, 21 or 22 hazardous areas/locations, as it does not have an EX approval certificate for these areas.

* = including the Signatories of the Agreement on the European Economic Area

Any tampering with the QC equipment by anyone, other than authorized by Sartorius service technicians, will result in forfeiture of all claims under the manufacturer's warranty!

The QC scale along with an ING2 power supply is suitable for use in the following hazardous area within the European Community:

Zone 2, Group II, temperature class T4 according to

EN 60079-14

In countries other than Germany, the QC scale may not be used in a Zone 2/Class I, Div. 2 hazardous area/location unless approval for use in such hazardous areas has been granted by the local authorities.

Pursuant to the German Directive for the Implementation of Regulations for Prevention of Accidents "Elektrische Anlagen und Betriebsmittel" (VBG 4) (Electrical Installations and Equipment) of April, 1986, and in conjunction with Article 10 of the Low Voltage Directive 72/23/EEC issued on February 19, 1973, by the European Community, it is hereby certified that the equipment delivered, the QC scale and accessories, has been manufactured and tested in compliance with the following DIN/VDE regulations:
DIN EN 60950
DIN EN 61010

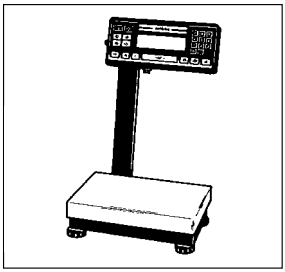
Fastening an Antitheft Locking Device

QC 7 Model:
To protect the scale from theft, attach it in a secure location using the lug located at the back of the scale.

QC 34 and QC 64 Models:
Thread a commercially available bicycle lock through one of the fins in the lower housing of the scale.

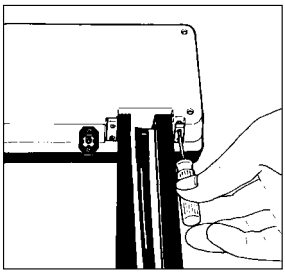
Setting Up the Scale

– QC 7 Models:



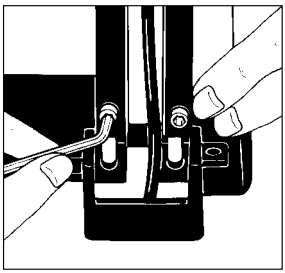
Carefully unpack the scale and accessories.

Mounting the Display Unit on a Table or Wall
(optional; order no. YDH01TS)



– Remove the retainers **(5)** from the support arm

– Remove the display unit

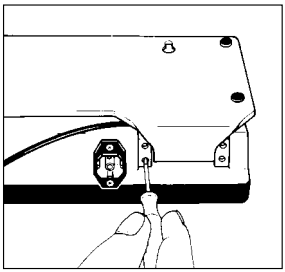


– Unfasten the screws on the display unit **(7)** and remove the retainers.

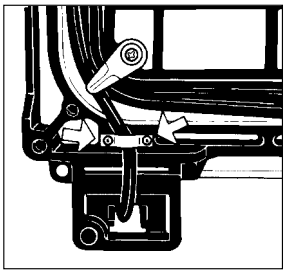
– Slide the clips **(6)** which hold down the cable in the raceway (channel) up and out of the support arm; then remove the cable from the raceway.

– Remove the support arm.

– Then slide the clips back onto the support arm.



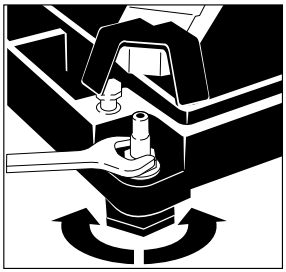
– Fasten the display unit holder to the display unit using the retainers **(5)**



– Unfasten the retaining plate from the back of the scale

– Unwind the cable as far as required and then refasten the retaining plate

Leveling the Scale Using the Level Indicator



● Level the scale using the level indicator as a guide.

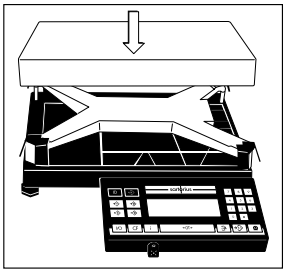
○ Extend the leveling feet (turn clockwise) to raise the scale

○ Retract the levelling feet (turn counterclockwise) to lower the scale.

● When the air bubble is exactly centered, use the open-end wrench (spanner) to tighten the locknuts.

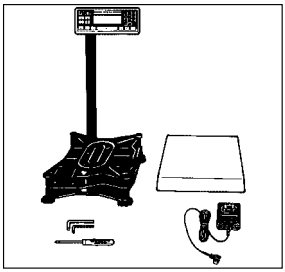
Important Note:

If you install the scale on a cart or trolley, it is sufficient to level the scale once. Scales used as legal measuring instruments are not allowed to be installed on a cart or trolley!

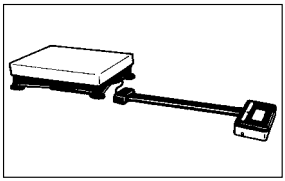


● Place the load plate on the scale base

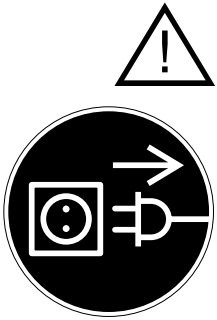
– QC 34 and QC 64 Models:



Carefully unpack the scale and accessories.



Place the scale on a table and lay the support arm and display unit next to it.

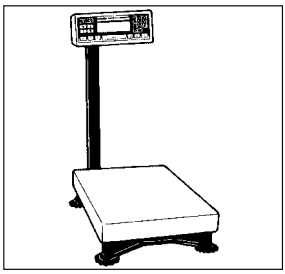


Always secure the transport locking devices before any transport of your scale. Unplug the scale from AC power and remove the load plate from the scale before changing the display mounting.

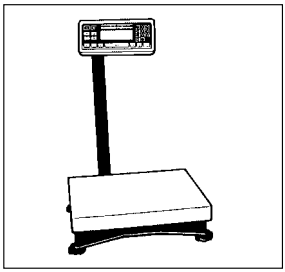
Mounting Options for the Display Unit

Note:
The following display mounting options apply to QC 34 and QC 64 models only.

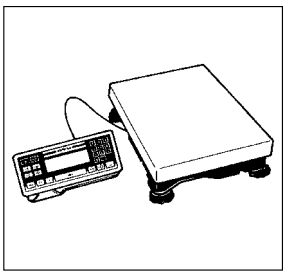
The display unit can be mounted as follows:



– on the short side of the scale (see page 1–14)



– on the back (long side) of the scale (see page 1–16)

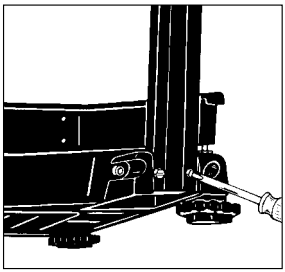


– as a remote display unit (see page 1–19); only possible with the display holder which is available as an option.

Mounting the Raised Display Unit on the Short Side of the Scale

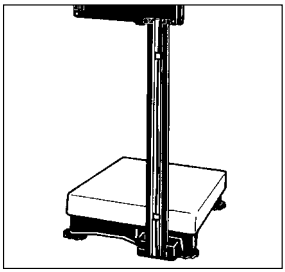
First, decide whether you want to mount the display on the short side or on the back (long side) of the scale.

Please follow the instructions given on page 1–12 before you begin to change the display mounting.

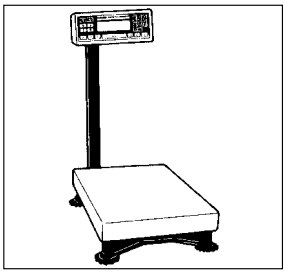


Fasten the support arm to the base.

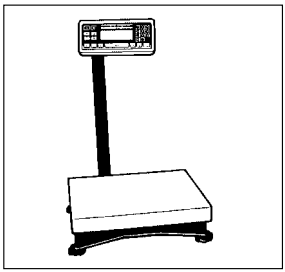
Note:
Use the center row of threaded drill holes when inserting the screws.



Slide the clips into position to keep the cable from slipping out of the raceway (channel).



Scale with the display unit mounted on the short side.

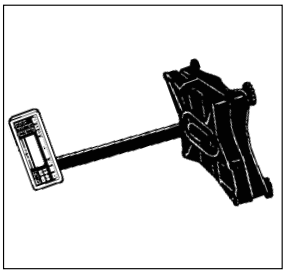


Scale with the display unit mounted on the back (long side).

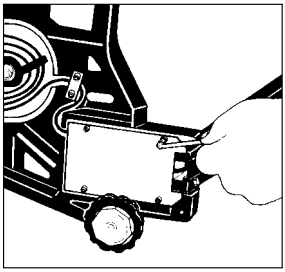
Note:
The cable routing will have to be changed, depending on the position of the display unit.

Mounting the Raised Display Unit on the Long Side of the Scale

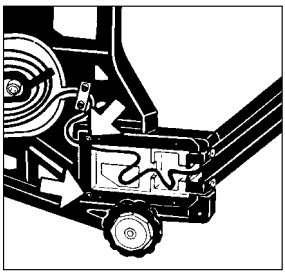
Please be careful that the scale does not fall over when disassembling and mounting the parts as described here and in the following steps. Follow the instructions given on page 1–12 before you begin to change the display mounting.



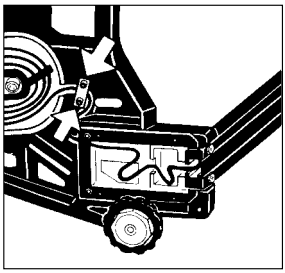
Lay the scale on its side to disassemble and mount the display unit.



Unfasten the Allen screws on the base plate and remove the base plate.

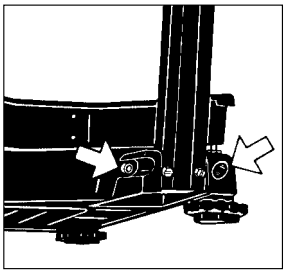


Remove the fastening screws.



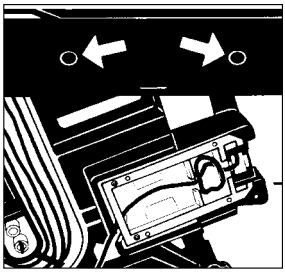
Remove the screws on the retainer plate.

Then set the scale back upright.



Remove the screws on the base **(7)**.

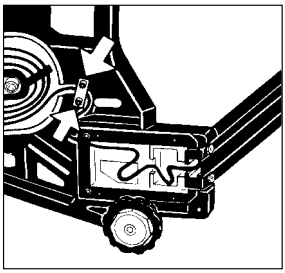
Lay the support arm along with the base and the display unit on a table.



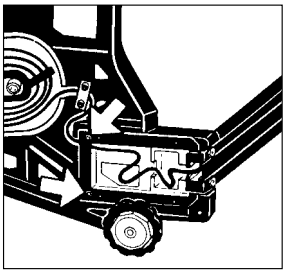
Remove the plugs from the long side of the scale (insert them in the holes on the short side). Loosely attach the display unit with the support arm and base to the long side of the scale with the Allen screws.

Lay the scale on its side again.

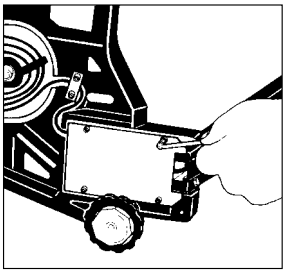
Thread the cable through the raceway.



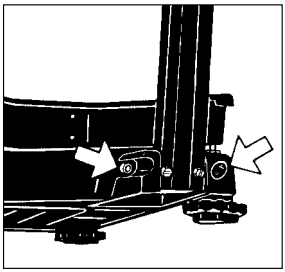
Refasten the retainer plate for the cable.



Refasten the frame with the fastening screws.



Refasten the base plate.



Set the scale back upright and tighten the Allen screws on the base.

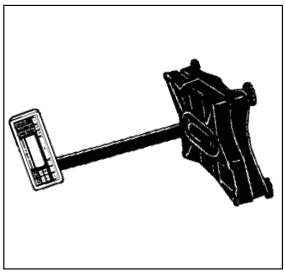
Follow these steps if you need to change the display mounting again.

Mounting the Remote Display Unit (Option)

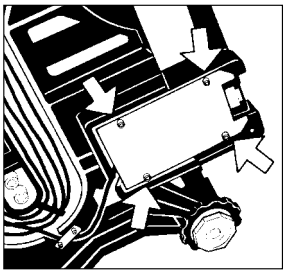
(only possible with the optional display holder; order no. YDH01TS)

Note:
You can also mount the display as a remote unit for the QC 7 model.

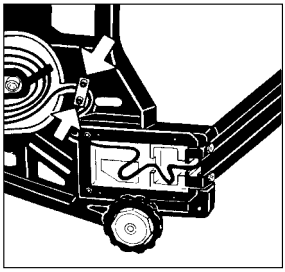
Please be careful that the scale does not fall over when disassembling and mounting the parts as described here and in the following steps. Follow the instructions given on page 1–12 before you begin to change the display mounting.



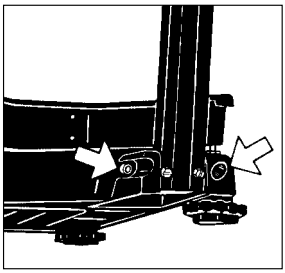
Lay the scale on its side to disassemble and mount the parts.



Unfasten the Allen screws on the base plate and remove it.

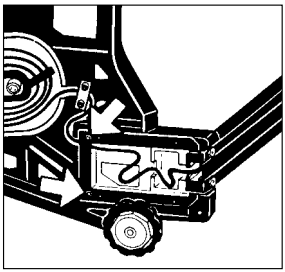


Remove the screws on the retainer plate.

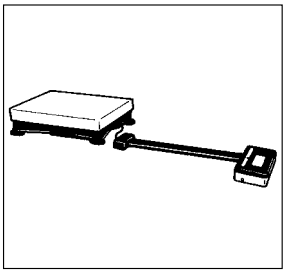


Remove the screws on the base **(7)** (see diagram on the left).

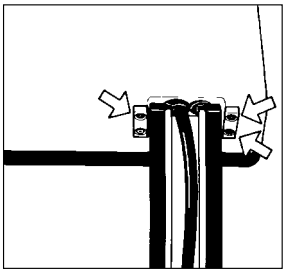
Then set the scale back upright.



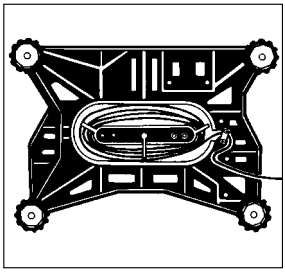
Remove the fastening screws.



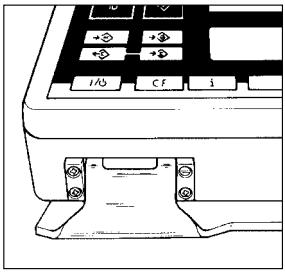
Lay the support arm along with the base and the display unit on a table.



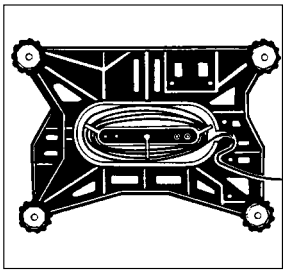
Unfasten the screws on the display unit **(5)** and remove the retainers.
Slide the clips which hold down the cable in the raceway up and out of the support arm.



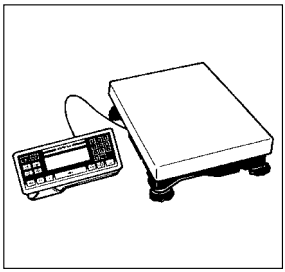
Unwind the cable as far as required.



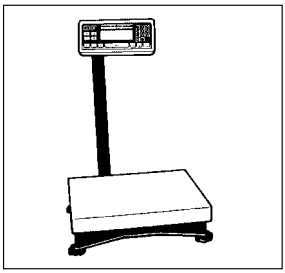
Mount the display unit on the display holder using the retainers you previously removed.



Now refasten the retainer plate for the cable.



Set the scale back upright.

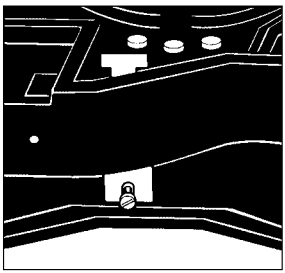


Set the load plate **(3)** on the scale.

Note:
(For QC 34 and QC 64 models only)

Transport Locking Device

Set up the scale at the place of installation and remove the load plate. The transport locking devices (yellow) are located on the short sides of the scale. Remove the transport locking devices (unfasten them using an Allen wrench) before initially operating the scale.



Verification Mark (Seal)

The law requires that a verified scale be sealed with a verification mark. The verification marks (seals) on a verified QC scale indicate that this scale may only be opened and serviced by authorized technicians, to ensure reliable and trouble-free operation and to avoid forfeiture of the warranty coverage. If a verification mark (seal) is damaged, please observe the national laws and regulations in effect at the place of installation.

Save the box and all parts of the packaging for any future shipment of your scale.

Place the load plate on the scale.

Level the scale at the place of installation using the leveling feet.

Using the Scale in Legal Metrology

(QC-...0CE Models)

As a weighing instrument, the QC is not allowed to be used for weighing goods intended for direct sale to the public, nor may it be used as a legal measuring instrument until it has been initially verified by Sartorius. If the scale is moved, it must be verified again at its new location. In this case, the scale must be verified and stamp-approved at the new location by your local weights and measures office.

Since the type-approval certificate for verification applies to non-automatic weighing instruments only, you must comply with your country's national regulations that apply to the place of installation of your weighing instrument for automatic operation with or without auxiliary devices installed.

To Be Filled Out by the Service Representative Authorized to Perform the Initial Verification*:

Verified on (date): _____

The verification is valid for the following scale location:

Company/Name: _____

Serial no.: _____

Address: _____

City/Post code: _____

Country: _____

or Zone: _____

* = Pursuant to Directive No. 90/384/EEC on non-automatic weighing instruments

Approved Auxiliary Measuring Devices

When using the load plate as a legal measuring instrument in the EU, you may connect to it only auxiliary measuring devices that have been approved for legal metrology. Metrologically relevant auxiliary devices, such as printers, additional display units, etc., must be type-approved for this purpose and marked by a green metrology sticker imprinted with a black "M." The auxiliary device must be verified in conjunction with the weighing instrument. If the auxiliary device is connected at a later date to a weighing instrument that has already been used in legal metrology, the responsible weights and measures office must be informed of the addition of the auxiliary device. The auxiliary device can be used in legal metrology, however, as soon as it has been properly connected if it has the green metrology sticker with a black "M."

Connecting the Scale to AC Power

The scale is powered by an AC adapter supplied with the scale. Make sure that the voltage rating printed on this unit is identical to that of your local line 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.

When you use the scale and associated equipment, you must comply with the national electrical code and applicable safety regulations of your country.

If you use the QC scale in a Zone 2/Class I, Div. 2 hazardous area/location, make sure to comply with the valid standards and regulations of your country, applicable to the installation of equipment in a Zone 2/Class I, Div. 2 hazardous area/location, e.g. in Germany with ElexV from 27.02.1980 (BGBI. I, P.214). Only authorized technicians are allowed to install the equipment in a Zone 2/Class I, Div. 2 hazardous area/location.

The female plug of the power cable must be securely fastened to the male socket on the QC display unit. On the other end of the power cable,
– either an explosion-proof plug-and-socket connection must be installed
– or the plug must be detached from the power cable and the power cable securely connected to a suitable junction box.

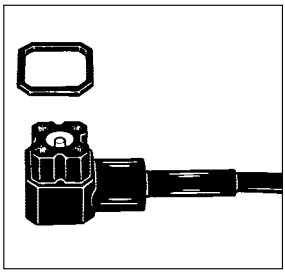
(Wiring Diagrams for Connecting the Scale to the AC power in Zone 2/Class I, Div. 2 Hazardous Areas/Locations)

Brown (live (**L**))

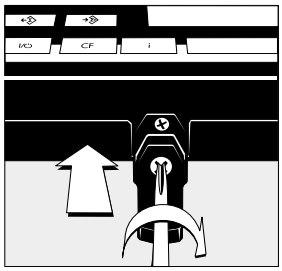
Blue (neutral (**N**))

Yellow/green (grounding conductor)

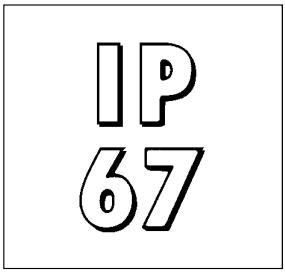
Hook up the scale to the power supply in conformance with the installation requirements of your country.



The IP 65-protected ING-2 no. 69 71899 AC adapter is completely encapsulated and can be installed as a stationary unit. To use a main feeder cable from the ceiling or to mount a CEE plug, you will have to make arrangements.
The IP 65 protection rating is ensured only if the square rubber gasket is installed and the plug is connected securely to form a hak-tight seal.



Ensure IP protection (Tighten the screw).



IP65 Protection (Painted Models) or IP67 Protection (Stainless Steel FEP-I, IGP-I, FES-I and IGS-I Models)

The weighing platform is dusth-tight and washdown-resistant in conformity with the IP65 or IP67 protection rating, depending on the model.
Legend to Protection Ratings
First digit: rating 6 indicates resistance to penetration by dust particles of a specified size. Second digit: rating 5 indicates resistance to splashes of water, as well as washdown-resistance. Rating 7 indicates resistance to penetration by water during 30 minute immersion up to a depth of 1 meter (apporoximately 3¼ feet).

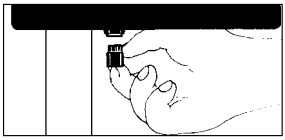
IP65 or IP67 protections is only guaranteed if:

– the junction box seal was installed by a qualified technician, and

– the connecting cables and cable glands were installed and connected by a qualified technician.

Use only original Sartorius AC adapters. Use of AC adapters from other manufacturers, even if these units have a registered approval rating from a national testing laboratory, requires the approval of an authorized Sartorius service technician.

To operate the scale using an external rechargeable battery pack, see the section entitled "Accessories (Options)".

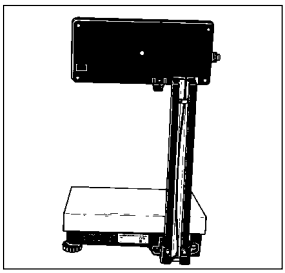


First insert the right-angle plug into the jack on the scale as shown **(2)** and tighten the screw.

The IP 65 protection rating is ensured only if the square rubber gasket is installed and the plug is connected securely to form a leak-tight seal.

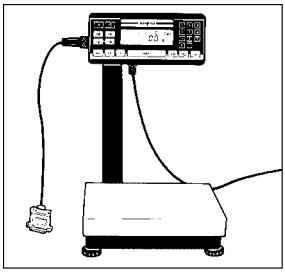
Installation within Safe Areas:
Plug the AC adapter into a wall outlet (mains).

Note:



Thread the AC adapter cable through the channel (raceway) on the support arm **(27)**.
Slide the clips **(6)** into position to keep the cable from slipping out of the raceway.

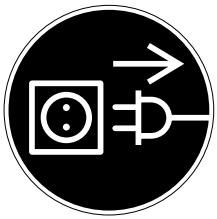
Safety Precautions



The AC adapter, rated to Class 2 (double insulation) can be plugged into any wall outlet without taking any additional safety precautions. The pole of the output voltage is connected to the scale housing, which can be grounded for operation.

The interface is also electrically connected to the scale housing (ground) (see also "Data Interface" on page 1–39).

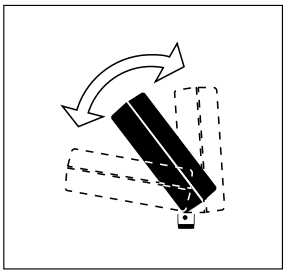
Connecting Electronic Peripheral Devices



Make absolutely sure to unplug the scale from the power supply before you connect or disconnect a peripheral device (e.g. printer, PC, etc.) to or from the interface port.

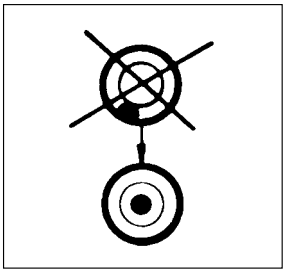
If you use the QC scale in a Zone 2/Class I, Div. 2 hazardous area/location, the QC equipment must be completely disconnected from AC power before you connect or disconnect any cables to or from the equipment. The same applies to all accessories operated with the system.

Adjusting the Display Unit



Adjust the display unit to the position desired.

Leveling the Scale Using the Level Indicator



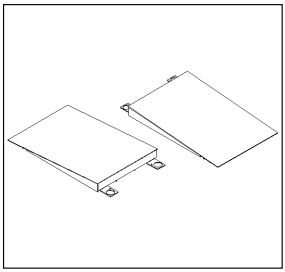
At the place of installation, level the scale using the leveling feet **(4)** as follows, so that the air bubble is centered within the circle of the level indicator **(8)**. Then check to make sure that all four feet are resting on the surface of the benchtop (stability test).

Extend leveling feet (turn clockwise) to raise the scale. Retract leveling feet (turn counterclockwise) to lower the scale.

Note:

When installing the scale on a transportable cart, a single setting is sufficient.
Equipment used as a legal weighing instrument is not allowed to be installed on a ramp.

Installing a Drive-on Ramp



(For the models FEP-I, IGP-I, FES-I und IGS-I)
The drive-on ramp must be installed and put into operation by a trained Sartorius dealer or service technician.

See the table in the "Accessories" list to order the drive-on ramp suited for use with your weighing platform.

Declaration of Conformity

CE Marking of Sartorius Devices

In 1985, the Council of the European Community approved a resolution concerninga new approach to the technical harmonization and standardization of national regulations. The organization for monitoring compliance with the directives and standards concerning CE marking is governed in the individual EU Member States through the implementation of the EC Directives adopted by the respective national laws.

Sartorius complies with the EC Directives and European Standards in order to supply its customers with weighing instruments that feature the latest advanced technology and provide many years of trouble-free service.

The CE mark may be affixed only to weighing instruments and associated equipment that comply with the applicable Directive(s):

Council Directive 89/336/EEC "Electromagnetic Compatibility (EMC)«

This Directive regulates the use of equipment that can cause electromagnetic interference or whose functioning can be influenced by such interference: The safety requirements are

– limitation of emissions
– defined immunity to interference

The Declaration of Conformity is included in this manual.

For further information concerning CE marking on Sartorius equipment, please request the corresponding brochure available under publication no. WYD6056-p98023.

Important Note:

Additional instruction manual(s) that belong to these Operating Instructions:

Guide to Verification of Weighing Instruments with the YCO01IS-0CE or YCO02IS-0CE.

Please carefully read, complete and file this Guide

CE Marking

The CE marking affixed to the equipment indicates that the equipment meets the requirements of the following Directive(s):

Council Directive 89/336/EEC "Electromagnetic compatibility (EMC)"

This Directive regulates the use of equipment that can cause electromagnetic interference or whose functioning can be influenced by such interference.

Applicable European Standards:

Limitation of emissions	EN 50081-1	Residential, commercial and light industry
	EN 50081-2	Industrial environment
Defined immunity to interference	EN 50082-1	Residential, commercial and light industry
	EN 50082-2	Industrial environment

Important Note:

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

Council Directive 73/23/EEC
"Electrical equipment designed for use within certain voltage limits"

Applicable European Standards:

EN 60950	Safety of information technology equipment including electrical business equipment
EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General requirements

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.

Weighing Instruments for Use in Legal Metrology: Council Directive 90/384/EEC "Non-Automatic Weighing Instruments"

This Directive regulates/the determination of mass in legal metrology.

For the respective Declaration of Conformity for weighing instruments that have been verified by SARTORIUS for use as legal measuring instruments and that have an EC Type-Approval Certificate, see the next page.

This Directive also regulates the performance of the EC verification by the manufacturer, provided that an EC Type-Approval Certificate has been issued and the manufacturer has been accredited by an officer of a Notified Body registered at the Commission of the European Community for performing such verification.

The legal basis allowing Sartorius to perform EC verification is constituted by the EC Council Directive No. 90/384/EEC on non-automatic weighing instruments that has been in effect since January 1, 1993, in the Internal Market as well as by the Certificate of Accreditation of the Sartorius AG Quality Management System issued by the Metrology Department of the Regional Administration Office of Lower Saxony, Germany ("Niedersächsisches Landesverwaltungsamt – Eichwesen") on February 15, 1993.

For information on the CE mark on Sartorius equipment and legal regulations currently applicable in your country, and to obtain the names of the persons to contact, please ask your local Sartorius office, dealer or service center.

Declaration of Type Conformity

DECLARATION OF TYPE CONFORMITY to Directive No. 90/384/EEC

This declaration is valid for non-automatic electromechanical weighing instruments for use in legal metrology. These weighing instruments accepted for legal metrological verification have an EC Type-Approval Certificate. The model(s) concerned is(are) listed below along with the respective type, accuracy class, and number of the EC Type-Approval Certificate:

Model	Type	Accuracy Class	EC Type-Approval Certificate No.
QC.....-S0CE	DI BG 200	(II)	D97-09-005
QC.....-L0CE	DI BG 300	(III)	D97-09-005
QC.....-S0CE	DN BG 200	(II)	D97-09-005
QC.....-L0CE	DN BG 300	(III)	D97-09-005

SARTORIUS AG declares, at its sole responsibility, that its weighing instrument types comply with the regulations of the Council Directive for Non-Automatic Weighing Instruments, No. 90/384/EEC of 20 June 1990; the associated European Standard "Metrological aspects of non-automatic weighing instruments," No. EN 45501; the amended, currently valid versions of the national laws and decrees concerning legal metrology and verification in the Member States of the European Union, the EU, and the Signatories of the Agreement on the European Economic Area, which have adopted this Council Directive into their national laws; and with the requirements stipulated on the Type-Approval Certificate for verification. This Declaration of Type Conformity is valid only if the ID label on the weighing instrument has the CE mark of conformity and the green metrology sticker with the stamped letter "M" (the two-digit number in large print stands for the year in which the mark has been affixed):

If these marks are not on the ID label, this Declaration of Type Conformity is not valid. Validity can be obtained, for example, by submitting the weighing instrument for final action to be taken by an authorized representative of SARTORIUS AG.
The period of validity of this Declaration of Type Conformity shall expire upon any tampering with, repair or modification of this weighing instrument or, in some Member States, on the date of expiration.
The operator of this weighing instrument shall be responsible for obtaining an authorized renewal of the verification, such as subsequent or periodic verification, of the weighing instrument for use as a legal measuring instrument.

Signed in Goettingen on this day of April 2, 1997

SARTORIUS AG
37070 Goettingen
Germany

Board of Management
(Dr. Claassen)

Board of Management
(Dr. Schmeißer)

OAW-113-2/02.96
P103EP00

EC Type-Approval Certificate

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

EG-Bauartzulassung
Zulassungsschein

EC Type approval certificate

Nr. D97-09-005 **1. Revision**

ausgestellt von *issued by*	Physikalisch-Technische Bundesanstalt Bundesallee 100 D - 38116 Braunschweig Bundesrepublik Deutschland
benannte Stelle *notified body*	0102
gemäß *in accordance with*	§ 13 des Eichgesetzes (verification act) vom 23. März 1992 (BGBl. I S.711) und § 7c (2) Eichordnung (*verification ordinance*) in der Fassung vom (*version of*) 21. Juni 1994 (BGBl. I S. 1293), entsprechend der Richtlinie (*implementing council directive*) 90/384/EWG, geändert durch (*amended by*) 93/68/EWG
ausgestellt für *issued to*	Sartorius AG Weender Landstraße 94 - 108 37075 Göttingen Bundesrepublik Deutschland
für *in respect of*	**Nichtselbsttätige elektromechanische Waage** ***Non automatic electromechanical weighing instrument***
Typ *type*	**DI BG 200, DI BG 300, DN BG 200, DN BG 300 und DO BG 300** Genauigkeitsklasse/class (II) Max 5 kg ... 64,2 kg; e = 1 g ... 10 g (III) Max 1 kg ... 300 kg; e = 2 g ... 500 g
gültig bis *valid until*	17.03.2007

Die Hauptmerkmale, Zulassungsbedingungen und Auflagen sind in der Anlage enthalten, die Bestandteil der Zulassung ist und 6 Seiten umfaßt.
The principal characteristics, approval conditions and special conditions if any are set out in the Appendix hereto, which forms part of the approval document and comprises 6 pages.
Diese 1. Revision ersetzt den Zulassungsschein Nr. D97-09-005 vom 18.03.1997 mit Anlage.
This first Revision replaces the EC Type approval certificate Nr. D97-09-005 dated 18.03.1997 with the Appendix.

Braunschweig, 26.06.1998
Geschäftszeichen: 1.14 - 98011350
Reference No:

Im Auftrag
By order
Baars
Baars

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 40

"EC Verification" – a Service Offered by Sartorius

Our service technicians authorized to perform the verification* of your weighing instruments that are acceptable for legal metrological verification can inspect and verify the metrological specifications at the place of installation within the Member States of the European Union and the Signatories of the European Economic Area.

"New Installation" Service

Initial verification is covered in our "New Installation" service package. In addition to initial verification, this package provides you with a series of important services which will guarantee you optimal results in working with your weighing instrument:

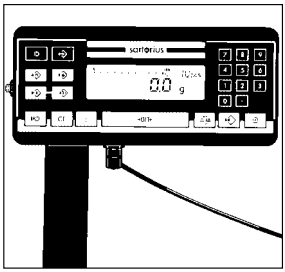
– Installation
– Startup
– Inspection
– Training
– Initial verification

Subsequent Verifications within the European Countries

The validity of the verification will become void in accordance with the national regulations of the country in which the weighing instrument is used. For information on verification and legal regulations currently applicable in your country, and to obtain the names of persons to contact, please ask your local Sartorius office, dealer or service center.

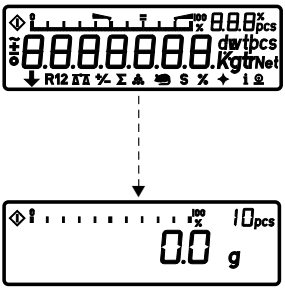
* in accordance with the accreditation certificate issued to Sartorius AG

Turning the Scale On and Off



Press the I/⏻/ON/OFF key **(18)** to turn the display on and off.

Self-Test

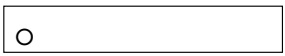


When the scale is switched on, an automatic self-test of the scale's electronic circuitry is performed.
At the end of the self-test, a zero readout is displayed. This means that the scale is ready for use.
If an error is found during the self-test, the display reads: "Err xx".

Note:
If the "Err xx" error code is displayed, see the "Troubleshooting Guide" in this manual.
For verified scales QC 7CCE-S0CE and QC 64EDE-S0CE, which have a verification scale interval "e" that is greater than the scale interval "d," the last digit on the display is bordered.

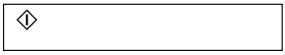
The display shows the following special codes for your information:

OFF*
displayed in the upper right corner indicates that the scale was disconnected from AC power (scale reconnected to AC power or power outage longer than 3 seconds).



O* displayed in the lower left corner means **Stand-by**
The display has been turned off by pressing I/⏻/ON/OFF **(18)**, or the scale shut itself off automatically (see Scale Operating Menu). The scale is now in the ready-to-operate mode and does not need to warm up.

* depends on the "Power-On Mode" setting in the scale operating menu



⏀ means Busy

Once you turn on the scale, the ⏀ symbol is displayed until you press a key. During operation, this symbol indicates that the scale is still busy processing a function and will not accept another command to perform any other functions at this time.

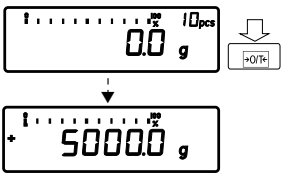
Important Note Concerning Scales Verifiable for Use as Legal Measuring Instruments:

A weight readout can be displayed in grams "**g**" or kilograms "**kg**" (depends on model).

In addition to grams and kilograms, you can also weigh in other international weight units on all standard scales. See the "Scale Operating Menu" in Part 2 of this manual.

For verified scales QC 7CCE-S0CE and QC 64EDE-S0CE, which have a verification scale interval "e" that is greater than the scale interval "d", the last digit on the display is bordered.

Taring

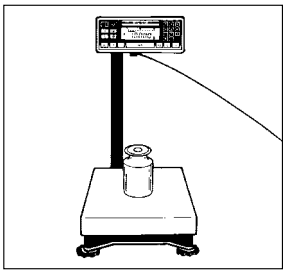


A weight can be determined with accuracy only from a defined zero point. Press the →0/T← / ZERO/TARE key **(14)** to zero the weight display. You can tare within the entire weighing range of the scale.

Simple Weighing

Place your sample on the load plate **(3)** to determine the weight. Read off the weight indicated on the display only after the weight unit "**g**" or "**kg**" appears as the stability symbol.

Calibration/Adjustment



"Calibration" technically means to determine the difference between the scale readout and the actual weight on the platform to determine the accuracy. Adjustment means to bring a scale to the level of accuracy required for its use.

Note:
For 0CE-series scales, the calibration function is **sealed** and **locked** after verification.

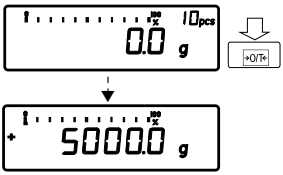
You must adjust or calibrate your new scale at the place of installation after each warmup period and before the first measurement. You must also re-adjust or recalibrate your scale each time you set it up in a different area or when the ambient conditions change (especially the temperature).

Menu code: 1 9 1*

Use only calibration weights with an accuracy equal to or better than the readability of your scale. You can find an overview of the calibration weight sets available in the section entitled "Accessories (Options)." You need an exact calibration weight.

Type	QC7CCE-S	QC34EDE-S	QC64EDE-S
Weight (g)	1x5,000	1x10,000	2x10,000
Accuracy class	F1	F1	F1

* = factory setting



When a zero readout is displayed, press the →0/T←/ZERO/TARE key **(14)**. This starts calibration. The calibration weight is displayed in grams.

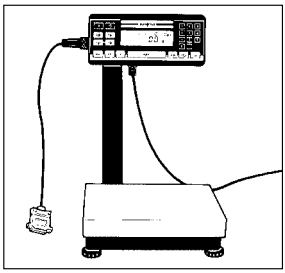
Errors or interference at the start of the calibration routine are indicated by the error code "Err 02." If this is the case, tare and press the →0/T←/ZERO/TARE key again when a zero readout appears.

Center the calibration weight on the load plate. The scale then calibrates automatically. At the end of calibration, the calibration weight readout and the stability symbol "**g**" or "**kg**" are displayed.

Blocking the Calibration Functions

You can block the calibration functions by setting code 1 9 7.

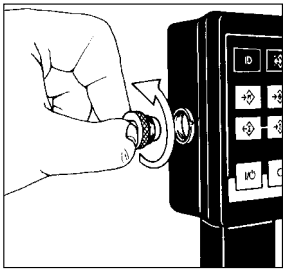
Data Interface



If you wish to record weighing data using a Sartorius Data Printer, plug the YCC01-0016M3 data cable into the interface port **(28)** of the scale. You do not need to adjust any settings!

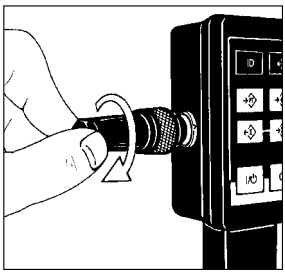
Connecting Electronic Peripheral Devices

Make absolutely sure to unplug the scale from AC power before you connect or disconnect a peripheral device (printer or PC) to or from the interface port. The IP 65 protection rating is ensured only if the square rubber gasket is installed and the plug is connected securely to form a leakproof seal.



Unscrew the protective cap **(28)** that covers the data interface port.

Note:
Keep the protective cap in a safe place where it will not get lost!



– Plug the connector into the interface port
– Secure the connector with the screw ring

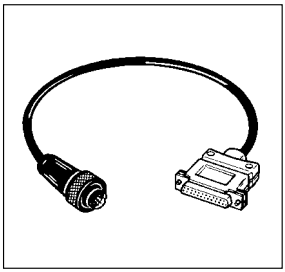
Note:

If you use the QC scale in a Zone 2/Class I, Div. 2 hazardous area/location, the QC equipment must be completely disconnected from AC power before you connect or disconnect any cables to or from the equipment. The same applies to all accessories operated with the system.

Press the ⊙/PRINT key **(11)** to output data.

For information on data output parameters and data ID codes, see the section entitled "Utilities for Printouts or Data Transfer." For details on the data interface (such as the data output or input format, pin assignment, etc.), see Part 4, "General Description of the Data Interface."

Interfacing Devices with the Scale

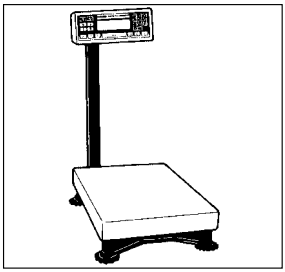


Please note that the interface port is electrically connected to the protective grounding conductor of the scale housing. The interface cables supplied as standard equipment are shielded and both ends of each cable are electrically connected to the connector cases. This connection may result in interference caused by ground loops or by transient currents if you have grounded the housing or connected the protective grounding conductor for line power. If necessary, connect an equipotential bonding conductor to the scale.

Troubleshooting Guide

Problem	Causes	Solution
No segments appear in the weight display **(1)**	– No AC power is available	– Check the AC power supply
	– The AC adapter is not plugged in	– Plug in the AC adapter
The weight display shows "**H**"	– The load exceeds the capacity of the scale	– Unload the scale
The weight display shows "**L**" or "**Err 54**"	– The load plate **(3)** is not in place	– Position the platform
The weight display briefly shows "**Err 02**"	– The display did not show a zero readout when the →0/T← / ZERO/TARE key **(14)** was pressed to calibrate	– Press the →0/T← / ZERO/TARE key **(14)**; then press the →0/T← / ZERO/TARE key again and hold it until the calibration weight is displayed
	– The scale is loaded	– Unload the scale
The special code "⚠" remains displayed	– None of the keys has been pressed since the scale was turned on	– Press a key
The weight readout changes constantly	– Unstable ambient conditions	– Set up the scale in another area
	– Too much vibration, or the scale is exposed to a draft	– Access the menu to select the correct code for the weighing environment (e.g. 1 1 4)
The scale cannot be stabilized	– There is a foreign object between the load plate and the scale housing	– Remove the foreign object
The weight readout is obviously wrong	– The scale is not calibrated	– Calibrate the scale (see page 1–36)
	– The scale was not tared before weighing	– Tare before weighing
	– The air bubble of the level indicator **(8)** is not within the circle	– Level the scale (see page 1–27)

Care and Maintenance



Service

Regular servicing by a Sartorius service technician will extend the service life of your scale and ensure its continued weighing accuracy. Sartorius can offer you service contracts, with your choice of regular maintenance intervals ranging from 1 month to 2 years.

Cleaning

Before cleaning the scale, unplug the AC adapter from the wall outlet.

Please do not use any aggressive cleaning agents (solvents or similar agents). Instead, use a piece of cloth which has been wet with a mild detergent (soap). Make sure that no liquid enters the scale housing. After cleaning, wipe the scale down with a soft, dry piece of cloth.

Note:
If the water that you use to clean the scale is too hot or cold, the difference in temperature between the water and the scale can cause condensation within the scale (according to EN 60529 on IP65 protection). This condensation may cause the scale to malfunction!

Safety Inspection

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

Safe operation is no longer ensured when
– there is visible damage to the AC adapter
– the AC adapter no longer functions properly
– the AC adapter has been stored for a relatively long period under unfavorable conditions.

Instructions for Recycling the Packaging

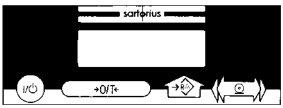
To ensure safe shipment, your scale has been packaged using environmentally friendly materials. After successful installation of the equipment, you should return this packaging for recycling.

For information on recycling old weighing equipment, consult your communal or municipal waste disposal center or local recycling depot.

Scale Operating Menu

Changing Settings in the Scale Operating Menu

In the operating menu, you can define how your scale will adapt to ambient conditions and also how it will work to meet your special requirements.
The **factory settings** of the scale operating menu are identified by an "*". You can select the functions not identified by an "*" by setting the respective menu codes. You can find the codes in the section entitled "Scale Operating Parameters" which starts on page 2 - 4. If you need to change any of the factory settings, we recommend that you enter these changes along with the date in the column headed by "Changes."



The keys have special functions for setting menu codes:

→R / AV.PIECE WEIGHT (12) = Increases a number by one with each press (the numbers change in cycles)

→0/T← / ZERO/TARE (14) = Confirms a code setting; stores a code setting and exits the menu

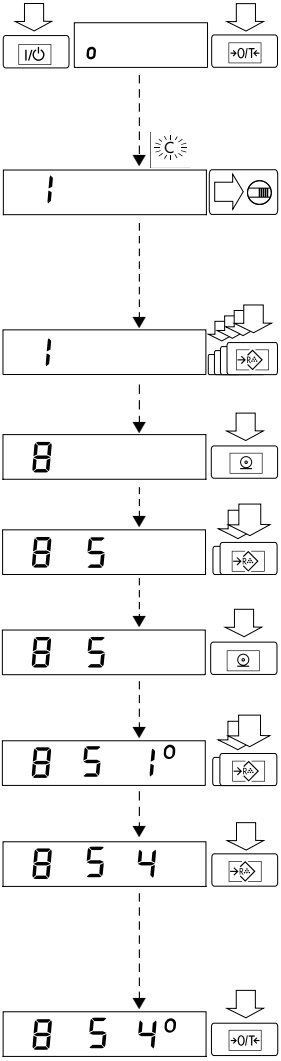
⊙ / PRINT (11) = Moves to the next of the three numbers of a code (1st – 2nd –3rd – 1st – etc.)

Now try changing a code to adapt your scale to a special power-on mode. The code for "Automatic power-on" is 8 5 4.

Changing Menu Code Settings

To select specific functions, you will need to change the respective menu code.
There are three steps to changing a code:

– Accessing the menu
– Setting the code
– Confirming and storing the code



Accessing the Menu

– Press I/⏻ / ON/OFF **(18)** to turn off the scale.
Turn the scale back on.
– While all segments are displayed, **briefly** hold down the →0/T← / ZERO/TARE key **(14)**.
– Release when "**1**" ("–**C**–") is displayed.

Note:
If you use the scale as a legal measuring instrument, the "external calibration" function is blocked. Only menu items that are permitted for scale operation in legal metrology can be read and changed by the user!

– Press →◇← / AV.PIECE WEIGHT **(12)** until "8" appears.

– Press ⊙ / PRINT until the 2nd number of the code appears.

– Press →◇← / AV.PIECE WEIGHT until "5" appears

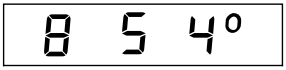
– Press ⊙ / PRINT until the 3rd number appears (when you move to this number, the previously set menu code will appear).

– Press →◇← / AV.PIECE WEIGHT to select "4."

– Confirming Code Changes
Press →0/T← / ZERO/TARE (**14**) to confirm the code you have just set (this is indicated by the "**o**" after the code).

Note:
– To store the new menu code setting, press →0/T← / ZERO/TARE **(14)** for more than two seconds until the self-test function starts.

Important Note:
Changes to the code settings are not stored if you turn off the scale by pressing I/⏻ / ON/OFF while selecting the code numbers or before saving a setting.



The current menu setting in the scale operating menu is identified by a small, superscript "o" after the last number. When you access the operating menu, the previously set code will be displayed after you have selected the right-hand number, which means the entire menu code setting is displayed. This makes it easy for you to check the previously set codes.

If you want to change several menu code settings, you do not have to press →0/T← / ZERO/TARE **(14)** after each change to exit the scale operating menu. You can also confirm individual settings.

Undoing All Menu Code Changes – Reset Function

The reset function lets you undo all menu code changes, which means you will obtain the original factory-set menu codes identified here by an "*".
To use this function, select code 9 – – 1°.
For information on confirming and storing menu code settings see the previous page.

Scale Operating Parameters

Adapting the Scale to Ambient Conditions

The scale can be adapted to the prevailing ambient conditions at the place of installation.

	Code			Changes
Very stable conditions	1	1	1	
Stable conditions	1	1	2	*
Unstable conditions	1	1	3	
Very unstable conditions	1	1	4	

Standard Weighing Mode – Manual Filling Mode

You can optimally adapt your scale to meet either of these requirements. In the manual filling mode, the display compensates for fluctuations of the load on the scale, giving you especially fast and stable readouts.

	Code			Changes
Standard weighing mode	1	2	1	*
Manual filling mode (e.g. if you need to package screws in certain quantities)	1	2	2	

Stability Range

The stability symbol will remain displayed in the case of a weight variation +/−.

	Code			Changes
0.25 digit	1	3	1	
0.5 digit	1	3	2	***
1 digit[1])	1	3	3	
2 digits[1])	1	3	4	* (**)
4 digits[2])	1	3	5	
8 digits[2])	1	3	6	

* Settings for standard models
** Settings for QC 7CCE-S0CE and QC 64EDE-S0CE models
*** Settings for QC 7-,34-,64- L0CE and QC 34EDE-S0CE models
[1]) blocked for all verifiable models of accuracy class (III).
[2]) blocked for all verifiable models

Stability Symbol Delay

This setting allows your scale to compensate for individual interfering factors which slowly subside. You will not need to make any changes in this code setting, as a rule.

	Code			Changes
No delay	1	4	1	
Short delay	1	4	2	*
Long delay	1	4	3	
Extremely long delay	1	4	4	

Tare Parameter

You can define when the scale will perform the taring operation.

	Code			Changes
At any time[1])	1	5	1	
Not until the readout is stable	1	5	2	*

Auto-Zero Function

When this zero tracking function is activated, any changes off the zero readout that are equal to a defined fraction of digits per second are automatically tared. If the deviation is less than the defined fraction, the internal taring function of the scale will be initiated (e.g. 0.5 digit per second). In other words, it ensures a stable zero.

	Code			Changes
Auto-Zero on	1	6	1	*
Auto-Zero off	1	6	2	

[1]) blocked for all verifiable models
* = factory setting

Calibration/Adjustment and Linearization Functions Using the →0/T← / ZERO/TARE Key
(hold down key for more than 2 seconds)

Important Note:
For verifiable scales used as legal measuring instruments the menu access switch is blocked and sealed. The external calibration is not permitted.

External Calibration and/or Linearization
The weights to be placed on the scale for linearization are indicated in the display one after the other, in increasing order.

Calibration/adjustment and linearization	Code			Changes
External calibration	1	9	1	*
External linearization	1	9	5	
Adjustment/calibration function blocked	1	9	7	**

* = factory setting
** = blocked for all veryfiable models

Weight Units

Note:
For verified scales approved for use as legal measuring instruments all weight units except g/kg are blocked.

	Code***	Symbol	Conversation factor 1 g =	Code			Changes
User-definable unit		***	1.	1	7	1	
Grams		g	1.	1	7	2	*
Kilograms		kg	0.001	1	7	3	**
Carats		ct	5.	1	7	4	
Pounds	14	/lb	0.0022046226	1	7	5	
Ounces		oz	0.035273962	1	7	6	
Troy ounces		ozt	0.032150747	1	7	7	
Hong Kong taels	8	tlh	0.02671725	1	7	8	
Singapore taels	9	tls	0.02646063	1	7	9	
Taiwanese taels	10	tlt	0.02666666	1	7	10	
Grains		GN	15.43235835	1	7	11	
Pennyweights		dwt	0.643014931	1	7	12	
Parts per pound		o	1.1287667712	1	7	14	
Chinese taels	15	tlc	0.02645547175	1	7	15	
Mommes	16	m	0.2667	1	7	16	
Austrian carats	17	k	5.	1	7	17	
Tola	18	tol	0.0857333381	1	7	18	
Baht	19	bat	0.06578947436	1	7	19	
Mesghal	20	MS	0.217	1	7	20	

* = factory setting
** = factory setting for QC 34/QC 64EDE scales and scales verifiable for use as legal measuring instruments (QC 34EDE-L0CE and QC 64EDE-L0CE)
*** = some of the unit symbols printed on hard copy or output on a computer screen will differ from the way they are shown on the scale display.

Interface Parameter Settings

Baud Rate	Code			Changes
150 baud	5	1	1	
300 baud	5	1	2	
600 baud	5	1	3	
1,200 baud	5	1	4	*
2,400 baud	5	1	5	
4,800 baud	5	1	6	
9,600 baud	5	1	7	
19,200 baud	5	1	8	

Parity	Code			Changes
Mark	5	2	1	
Space	5	2	2	
Odd	5	2	3	*
Even	5	2	4	

Number of Stop Bits	Code			Changes
1 stop bit	5	3	1	*
2 stop bits	5	3	2	

Handshake Mode	Code			Changes
Software handshake	5	4	1	
Hardware handshake with 2 characters after CTS	5	4	2	*
Hardware handshake with 1 character after CTS	5	4	3	

* = factory setting

Utilities for Printouts or Data Transfer

Sartorius QC scales come standard with an interface.
You can plug a Sartorius printer or a computer into this interface port. In addition, you can choose to have data output from your scale to this on-line device either automatically or by pressing the ⊙/PRINT key.
The scale operating menu lets you define the various parameters for data output. For information on the data formats and for interfacing a computer or a different peripheral device, see Part 4, "General Description of the Data Interface."

Data Output Parameter

This parameter is coupled with the stability parameter; stability = stable readout or no motion is detected.
Print on request = data is output only when the ⊙/PRINT key is pressed or a software command is received
Auto print = continuous, automatic data output

	Code			Changes
Print on request regardless of stability	6	1	1	
Print on request after stability, with storage of the function	6	1	2	*
Print on request after stability, without storage of the function	6	1	3	
Auto print regardless of stability	6	1	4	
Auto print at stability	6	1	5	

Auto Print

You can stop and start automatic data output (auto print function) by pressing the ⊙/PRINT key **(11)**. To avoid operating errors or to ensure that the data will be output continuously in the automatic mode, you can block this function.

Start/stop auto print using the	Code			Changes
⊙/PRINT key	6	2	1	
Auto print not stoppable	6	2	2	*

* = factory setting

Data Output at Defined Intervals

You can reduce the volume of data in the "auto print" mode by defining the interval at which data will be output automatically. This auto print interval is based on the number of display updates.

Auto print interval	Code			Changes
1 display update	6	3	1	*
2 display updates	6	3	2	
5 display updates[1])	6	3	3	
10 display updates[1])	6	3	4	
20 display updates[1])	6	3	5	
50 display updates[1])	6	3	6	
100 display updates[1])	6	3	7	

Automatic Taring after Data Output

You can have the scale tare automatically (→0/T← / ZERO/TARE key function) after one of the following keys is pressed:

	Code			Changes
No function	6	4	1	*
Automatic taring after pressing the ⊙ / PRINT key	6	4	2	
Automatic taring after pressing the → / ACCUM. key	6	4	6	

Automatic Output of the Application Parameters

You can have the application parameters and results printed out or transferred to an on-line computer (e.g. checkweighing limits, tare memory, etc.) automatically when the application is activated.

	Code			Changes
Off	7	1	1	*
On	7	1	2	

[1]) blocked for all verifiable models
* = factory setting

Data ID Codes

To help you identify weights, piece counts, percentages, etc., a code letter is printed or displayed in front of these values.
If you set the code for "without data ID code," only net weights, results in percent and counting results will be output. You will find the data ID codes for a particular application program listed in the corresponding description. The ID code increases the data output format for each weight readout from 16 to 22 characters.

ID code for data output	Code			Changes
Without	7	2	1	
With	7	2	2	*

Automatic Output of the Tare Memory Data

If you have assigned the →T/PRESET TARE key **(22)** to the tare memory, the following values will be output automatically:

	Code			Changes
Last net value (individual value N1)	7	3	1	*
Tare memory data (tare balancing memory)	7	3	2	

This function only works in conjunction with the code setting 7 1 2 – "Automatic Output of the Application Parameters."

* = factory setting

Printout/Record Configuration

The printout/record can be configured to meet your special requirements. Depending on the menu code settings you select, you can have the weighing data output from your scale to a Sartorius printer (e.g. the YDP 03-0CE) or to an on-line computer. The data that is output also depends on the code settings.

The printout/record can have the following lines:

The ID code	designates:
`08-JAN-97  15:38:32`	Current date and time, taken from the printer (with YDP 03-0CE only)
`Maier and Co.`	First header line – manufacturer/company name, saved in non-volatile memory (up to 20 characters)
`Wiesbaden`	Second header line – enter data of your choice, saved in non-volatile memory (up to 20 characters)
`ArtNo.12345678901234`	Third header line – 6 characters –, saved in non-volatile memory Fourth header line – a field for entering additional identification data (up to 14 characters)
`nRef  +    10 pcs`	Reference sample quantity (piece count)*
`wRef  +9.4880 g`	Reference weight*
`n     +    22`	Current components – only with "Totalizing"*
`N1    +4744.0 g`	Current net value
`T1    +  56.0 g`	Tare memory*
`B     +4800.0 g`	Current gross value*
`Qnt   +   500 pcs`	Current piece count*
	Selectable line-feed (0 to 3 lines)

* These values are only output if you have selected the respective application (only with YDP 03-0CE printer)

Data Record Output

You can have the printout/record output automatically, or by pressing the ⊙/PRINT key (as often as you like), depending on the menu code selected (see following pages).

Output Date, Time and Number Entered

For additional documentation, you can enter up to **14 characters** (fourth header line) through the number pad (keys 0–9), for example to record article, order, customer or batch numbers. Information entered through the number pad (keys 0–9) is saved by pressing the ID key and automatically output with the printout/record. These entries can be overwritten at any time.

You can assign a fixed identification (third header line) of **up to 6 characters** to precede the 14-character identifier described above. This ID can be entered through an on-line computer, or by a Sartorius service technician. The on-line computer can also receive data from the scale. By connecting a printer, you can print the data received in the computer. These data are saved in non-volatile memory. For more information, see the section entitled "Interface Description."

You can choose between two printers:

Industrial printer	YDP01IS-0CE
Data printer	YDP03-0CE

Data output with data and time

The data output ID is different for each printer.
"Data Printer" can output the article no. (ID) with the date and time.
The industrial printer only prints the article no. (ID).
You can vary the data on the printout by changing the respective menu settings:

Code	YDP03-0CE Printer	YDP01IS-0CE Printer
7 4 1	No output	No output
7 4 2	Output date/time	Form feed only
7 4 3	Output article no. (ID)	Output article no. (ID)
7 4 4*	Output date/time and article no. (ID)	Output article no. (ID) and form feed

Printout/Record Header (Your Company Name)

You can enter information in the first and second header lines to identify the data that is output by your scale. This information can be entered through an on-line computer, or by a Sartorius service technician. The on-line computer can also receive data from the scale. By connecting a printer, you can print the data received in the computer. These data are saved in non-volatile memory. They are printed out together with each data output. For more information, see the section entitled "General Description of the Data Interface".

Output of 1st and 2nd headers	Code	Changes
No output	7 5 1	
Output first header only	7 5 2	
Output second header only	7 5 3	
Output both headers	7 5 4	*

* = factory setting

Output of "wRef" and "nRef"

Automatic output of the average piece weight, "wRef," and the reference sample quantity, "nRef":
Your scale calculates the average piece weight from the number of parts loaded and the weight of the pieces; the calculation begins when you press the →R← / AV PIECE WEIGHT key. This value can be output to a printer, depending on the code setting selected.

Output of "**wRef**" and "**nRef**"	Code			Changes
No output	7	6	1	
Reference sample quantity "**nRef**"	7	6	2	
Average piece weight "**wRef**"	7	6	3	
Piece count "**nRef**" and piece weight "**wRef**"	7	6	4	*

Output of Net-/Tare-/Gross Weights/Counting Result

Depending on the settings for tare memory and the counting application, the following data can be output to an on-line printer.

Output	Code			Changes
Output net weight or counting result	7	7	1	
Output net weight and piece count	7	7	2	
Output net weight/tare compensation/ gross weight or counting result	7	7	3	
Output net weight/tare compensation/ gross weight and counting result	7	7	4	*

Line Feed

You can configure your printer to add a line feed automatically at the end of a printout (1 to 3 lines). This means you can tear off the printout as soon as it is output, without having to press the line feed key on your printer.

Line feed	Code			Changes
No line feed	7	8	1	
Line feed – 1 line	7	8	2	
Line feed – 2 lines	7	8	3	
Line feed – 3 lines	7	8	4	*

* = factory setting

Additional Functions

Menu Access Function

You can define the function of the menu access switch by setting the code for the scale operating menu to "accessible." In this setting –C– (change) will be displayed on your scale whenever you access the menu. This means that you can change the menu codes any time regardless of the setting of the menu access switch.

Access to the scale operating menu	Code			Changes
Accessible: "–C–" on the display	8	1	1	* (**)

* factory setting for standard devices
** menu items not shown in scales of accuracy classes (II) and (III)

Beep Tone (Acoustic Signal)

If you wish, you can turn off the beep tone (acoustic signal).

Acoustic signal	Code			Changes
On	8	2	1	*
Off	8	2	2	

Blocking the Keys

You can block all of the keys on the scale (except the [I/⏻]/[ON/OFF] key).

Key functions	Code			Changes
Accessible	8	3	1	*
Blocked	8	3	2	

Note:

The keys can also be blocked by a control command given through the interface; see "Data Input Formats" in the section entitled "General Description of the Data Interface."

Blocking the Number Keys

You can also block the number keys by setting the respective code.

Number keys [0]–[9]	Code			Changes
Blocked	2	5	1	
Accessible	2	5	2	*

* = factory setting

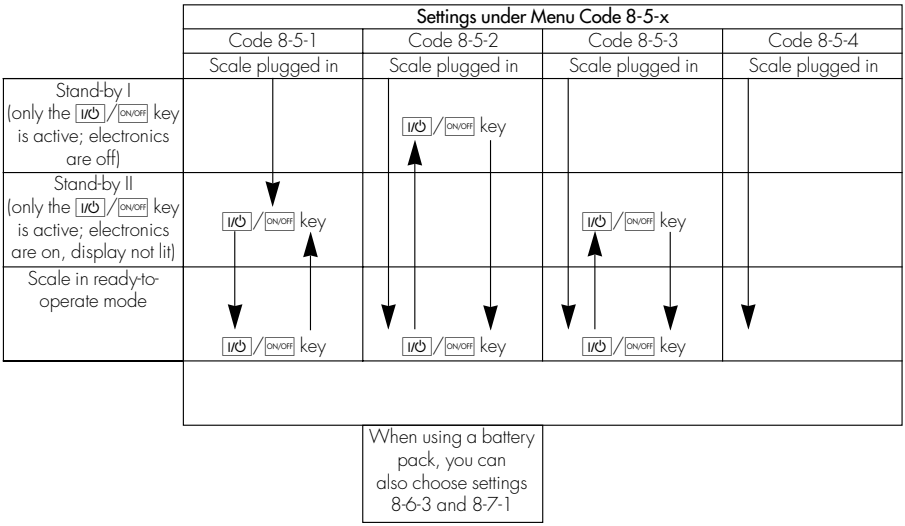
Universal Switch for Remote Control

You can connect an external universal switch to the interface of your scale for remote control of certain functions listed below. Set the appropriate menu code to define the function of this switch.

External key pad function		Code			Changes
⊙ / PRINT key **(11)**	Data output	8	4	1	*
→0/T← / ZERO/TARE key **(14)**	Zero/tare	8	4	2	
COUNT/WEIGHT key **(13)**	Toggle between weighing/ counting or between ref./pc.ct	8	4	3	
→PT / PRESET TARE key **(22)**	Store in tare memory	8	4	4	
→ / AV.PIECE WEIGHT key **(12)**	Start counting	8	4	5	
→ / PRESET TARGET key **(21)**	Start checkweighing	8	4	6	
→ Σ+ / ACCUM. + key **(19)**	Add to totalizing memory	8	4	7	
Block all keys		8	4	8	

Power-On Mode for QC Scales

The power-on mode can be set to meet your individual requirements. Your scale recognizes the power source (line power or battery pack).



* = factory setting

Display Backlighting

Depending on your individual workplace requirements, you can turn the display backlighting on or off.

Display backlighting	Code			Changes
On	8	6	1	
Off	8	6	2	
Automatic shut-off after 2 minutes	8	6	3	*

If you select "Automatic shut-off after 2 minutes," the display will shut off automatically after 2 minutes. If the displayed weight value does not change after 1 minute, the "⏀" symbol flashes on the display. **This automatic shut-off feature will help you save electricity (and money!)** After a second minute passes with no change in the display, the scale shuts down completely. You can use this advantage especially in battery operation. When you are ready to resume work with your scale, lightly touch the scale load plate.

Automatic Shut-Off With Code 8 5 2, or When Using the Battery Pack

When using batteries with your scale, the automatic shut-off feature should be switched on – it saves you electricity and money, plus you can work longer with your scale before having to recharge the batteries. If the displayed weight value does not change after 1 minute, the "⏀" symbol flashes on the display. After a second minute passes with no change in the display, the scale shuts down completely.
When you are ready to resume work with your scale, press I/⏻/ON/OFF key to turn it back on.

Automatic shut-off of the scale	Code			Changes
On	8	7	1	
Off	8	7	2	*

*= factory setting

Undoing All Menu Code Changes – Reset Function

This function enables you to reset all menu codes back to the original factory settings, which are identified by an "*" in this manual. This can be very useful, for instance when you are not sure what changes have been made in the code settings.

Reset function	Code	Changes
On (active)	9 – – 1	
Off	9 – – 2	*

Connecting the YDP01IS-0CE Printer to a QC Scale

You can connect a QC scale to a YDP01IS-0CE industrial printer rather than the YDP03-0CE printer via the cable supplied. You should make the following changes in the code settings of your QC scale:

Function	Code	Changes
9,600 baud	5 1 7	
Space parity	5 2 2	
2 stop bits	5 3 2	
Handshake: 2 characters	5 4 2	
Printout product no.: ID and line feed	7 4 4	*

Note:
The date/time printout is available only with the YDP03-0CE printer.
You can also print labels on the QC scale with the YDP01IS-0CE printer (without bar code printout).

*= factory setting

Application Programs

In addition to the weighing functions, your scale offers a variety of application programs for use in the rough world of everyday industrial tasks. The description of the application programs is divided into several parts. To aid you in making optimal use of these programs, your scale's display will show helpful symbols and abbreviations.

This manual contains simple working examples for each of the basic application program modes. The settings required to run the program and to generate documentation are given in a code table at the beginning of each example.
Your Sartorius scale can help you in counting parts, totalizing values, checking or storing the weight of parts or of a piece count.
With these functions, your Sartorius QC counting scale can help to ease your daily workload. The scale is set at the factory so that as a rule you do not need to make any changes. If you have special requirements, or if you wish to use the additional functions available in the application programs, you can change the appropriate settings in the scale operating menu accordingly.

The procedure for setting codes is described in detail in Part 2.

Additional settings for running a particular program and displaying or printing the data on hardcopy are listed in a table of codes before each practical example. For your convenience, we have indicated the factory-set codes with an "*".

One thing you should do when you want to set codes for a different program, or when someone else has already operated the scale, is:

Select the reset function (code 9 – – 1°) to change all menu codes back to the original factory settings.

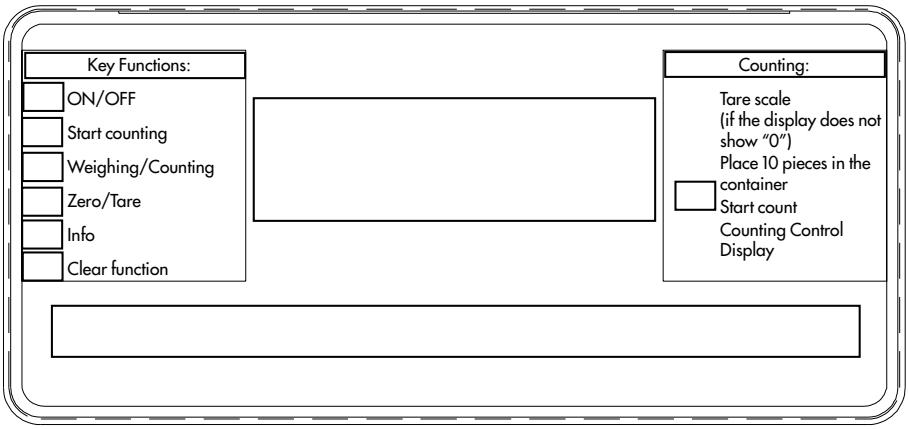
Note:

When using verified scales as legal measuring instruments, the external calibration function is blocked by menu code!

Insertable Instruction Cards for the Dust Cover

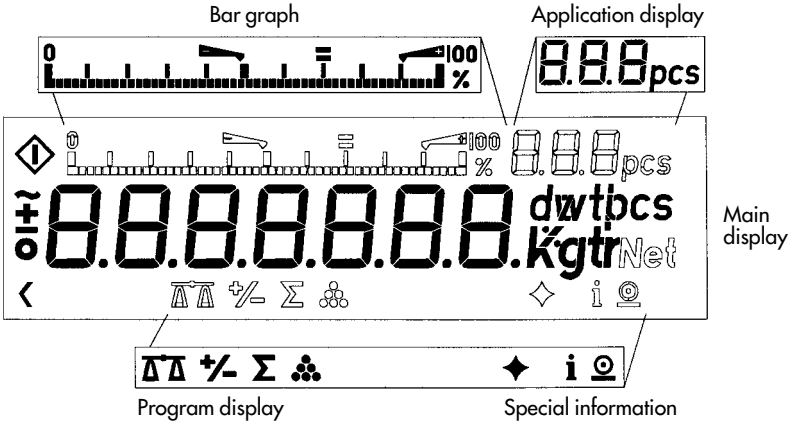
In the pocket at the back of this manual, you will find a sheet of instruction cards for various applications. Detach the cards of your choice and insert them in the pockets provided in the dust cover. These cards will make it easy for you to operate the scale.

Display Dust Cover:



(Suggested example)

Main Display of the QC Counting Scale:



Programs (Applications)

Counting (page 3–4)

Counting using your choice of reference piece count or reference weight.

Tare Memory (page 3–13)

Storing weighed values or numeric-key input of a weight with simultaneous subtraction of the stored value from the displayed value (subtraction of container weight).

Totalizing (page 3–15)

Summation of weighed values and piece counts (breaking bulk and portioning).

Over/Under Checkweighing (page 3–20)

Check net value or difference of weighed or counting values with visual support (filling guide) using analog display, e.g. for counting parts.

Individual Data ID Code (ID), C*, NUM (page 3–29)

Individual 14-digit entry of work order, article, customer, position or batch numbers. Optional 6-digit ID, e.g. for entry of "Article No:".

Memory (page 3–31)

User-definable assignment of and access to 25 memory modules for tare weights, part weights or target values.

Please note:

A number entered manually without a decimal point is always a piece count!

A number entered manually with a decimal point is always a weight value!

Counting

Counting → R→T / AV.PIECE WEIGHT key **Code 2 1 4***

Symbol displayed: ⁂

The counting program allows automatic conversion of weights into piece counts based on a reference sample quantity and weight. A weight readout is stored as a reference sample quantity (factory setting: 10 pcs = pieces).

General Functions in the Counting Program

Function/Application	Entry Mode	User Guide Display	Data Output ID
Clear the counting application function	CF / CLEAR key + → R→T / AV.PIECE WEIGHT key	**CF**	–
Display information: reference sample quantity "**nRef**" or average piece weight "**wRef**"	i / INFO key + → R→T / AV.PIECE WEIGHT key	**reF**	–
Data output: reference sample quantity "**nRef**" or average piece weight "**wRef**" With menu setting 7 1 2: automatic!	i / INFO key + ⊙ / PRINT key + → R→T / AV.PIECE WEIGHT key	**reF**	**nRef** **wRef**
Entry of an average piece weight "**wRef**"	Numeric keys 0–9 **and** · + → R→T / AV.PIECE WEIGHT key	–	–
Entry of a reference sample quantity "**nRef**"	Numeric keys 0–9 **without** · + → R→T / AV.PIECE WEIGHT key	–	–

A number entered manually without a decimal point is always a piece count!

A number entered manually with a decimal point is always a weight value!

* = factory setting

Changing the Reference Sample Quantity "nRef"

You can change the reference sample quantity in cycles by pressing [COUNT/WEIGHT] key. Use the number keys [0]–[9] and the [→0←]/[AVPIECE WEIGHT] key to enter piece counts. Choose from the following settings for the reference sample quantity: 5, 10, 20, 50, 100 and a user-definable number (factory setting: 999).

To change the ref. sample aty: press the [COUNT/WEIGHT] key **(13)** repeatedly and select the desired reference sample quantity, or enter directly using the numeric keys [0]–[9].

After the reference sample quantity "100 pieces," 999 (or another number) is displayed. You can overwrite this number directly using the numeric keys [0]–[9] (saved in non-volatile memory).
Note: This setting is **not** canceled by the reset code 9 – – 1°!

If the scale is not loaded with the corresponding number of pieces, the "Err 22" error code is displayed.

Make sure you enter the number for "reference sample quantity 'nRef'" without the decimal point ([·] key)!

A number entered manually without a decimal point is always a piece count!

You can exit this application at any time by pressing [CF]/[CLEAR] + [→0←]/[AVPIECE WEIGHT] or [COUNT/WEIGHT], and proceed with a new counting task.

Input of Reference Weight "wRef"

If you know the weight of a part, you can enter it directly as the reference weight "**wRef**" using the numeric keys [0]–[9].

Make sure you enter the number with the decimal point ([·] key)!

A number entered manually with a decimal point is always a weight value!

You can enter a number of up to 7 digits manually.

Display reference weight for 2 seconds when the counting function is started by pressing [→0←]/[AVPIECE WEIGHT]	Code			Changes
Blocked	3	9	1	*
Display	3	9	2	

* = factory setting

Simple Counting

The QC counting program is set at the factory so that you can begin counting without changing any settings.

If you want to change the factory-set reference sample quantity, press [COUNT/WEIGHT] **(13)** to select one of the settings (5, 10, 20, 50, 100 or user-definable quantity — this latter setting has been factory-set to 999*.

Place a container on the scale, press the [→0/T←]/[ZERO/TARE] key **(14)** to tare or use the "tare memory" application.
Start the automatic container taring function by pressing the [→Σ←]/[ACCUM.] key (see the section on "Tare Memory").

Count the corresponding number (e.g., 10 parts) into the container.

Press the [→♦←]/[AV.PIECE WEIGHT] key **(12)** to start counting. If you add any number of parts to the container, the current piece count in **pcs** will be displayed.

Important Note:
If –**UPD**– is displayed, the scale will automatically recalculate the average piece weight, used as a reference, from the piece count and weight on the scale and you will hear a beep.

With the menu setting 7 1 2, the average piece weight (reference weight) and the reference sample quantity are output to an on-line printer after the last positions in the weight display have stabilized. If the reference weight has not been entered manually, the data output is generated after the reference weight has been calculated with up to 3 additional digits after the decimal point, depending on the scale type. If the reference weight was entered manually, the data output generated has the same number of digits as the value entered.

* = user-definable piece count

Storage of Reference Weight

To determine and optimize the reference weight "**wRef**" you can choose whether the weight calculated is stored according to the display accuracy, or with full accuracy according to the internal resolution. If you select the higher internal resolution you can choose whether the internal resolution is 10-fold or 100-fold that of the display accuracy. Weight values for 5, 10, 20, 50, 100 or xxx pieces is stored:

Value stored	e.g. with the QC7 up to	Code			Changes
According to display accuracy	(72,000 increments)	3	5	2	*
Internal resolution 10-fold	(720,000 increments)	3	5	3	
Internal resolution 100-fold	(7,200,000 increments)	3	5	4	

Minimum Load

In order to store a reference weight, the scale has to have the minimum load to ensure the counting accuracy. The weight required consists of 10 display increments:

QC7	0.1 g	QC7CCE-L0CE	2 g	QC7CCE-S0CE	0.1 g
QC34	0.5 g	QC34EDE-L0CE	10 g	QC34EDE-S0CE	5 g
QC64	1.0 g	QC64EDE-L0CE	20 g	QC64EDE-S0CE	1 g
QC5DCE-S	0.1 g	QC35EDE-S	0.5 g	QC65EDE-S	1 g
QC7DCE-S	0.1 g	QC35EDE-D	0.1/0.5 g	QC150FEG-S	2 g
QC7DCE-D	00.1/0.1 g	QC60FEG-S	1 g	QC35EDE-P	0.1/0.2/0.5 g
QC15DCE-S	0.2 g	QC65EDE-D	0.1/1 g		

If the weight on the scale is lighter, the error code "**Err 22**" is displayed. Please put the heavier weight on the scale!

* = factory setting

Criterion for Storage of Sample Weights and Tare Values
(Only necessary with very low piece weights)

To ensure that the calculation of the reference weights is as accurate and thus as reproducible as possible, you can set the scale for "increased stability." This means that the weight stored is even more precisely calculated, which means the reference weight is also more precise. Select the code 3 11 2 to extend the response time that elapses before the weight is stored and the average piece weight calculated, or before a tare weight is stored.

Storage criterion	Code	Changes
At stability	3 11 1	*
With "increased" stability	3 11 2	

Accuracy Test
(For very low piece weights)

You can select the limit parameter for storing the weighed value when determining the piece weight. The calculation of the reference weight begins only when you have placed enough pieces on the scale, and the limit – in display increments – has been exceeded.

After you start the "Counting" application by pressing →R◇/AV.PIECE WEIGHT key the **symbol**: ⁂ is displayed.
If the accuracy limit you selected has not been reached, the ⁂ symbol flashes, and the scale automatically switches to a special weighing mode.

* = factory setting

There are 3 different ways you can then re-start the counting process:

1. Press →R/AVPIECE WEIGHT again. The weighed value for calculation of the reference weight will now be stored with a longer weighing time and "increased stability."
2. Empty the container and place it on the scale again. Press →0/T←/ZERO/TARE or →PT/PRESET TARE. The tare value is now stored with a longer weighing time and "increased stability." Place the pieces back in the container and press →R/AVPIECE WEIGHT. The weighed value for calculation of the reference weight will now be stored with a longer weighing time and "increased stability."
3. Continue filling pieces into the container (increase the load). Press /COUNT/WEIGHT and increase the reference sample quantity to the new number of pieces, or enter the number of pieces manually using the 0 – 9 numeric keys. Press →R/AVPIECE WEIGHT to start the counting function. The weighed value for calculation of the reference weight will now be stored with a longer weighing time and "increased stability."

Once the weighed value has been stored, the ♣ symbol remains displayed and the scale returns to the fast weighing mode.

Monitoring of reference storage accuracy	Code			Changes
Without**	3	10	1	*
99.0% (100 display updates)	3	10	2	
99.5% (200 display updates)	3	10	3	
99.8% (500 display updates)	3	10	4	
99.9% (1,000 display updates)	3	10	5	

* = factory setting

** = minimum load (1 display update). If the weight on the scale is lighter, the error code "Err 22" is displayed.

Reference Sample Updating

After pressing →R◇/AV.PIECE WEIGHT to start the counting application, you can change the reference sample quantity as desired. You either can update the reference sample quantity manually, by pressing →R◇/AV.PIECE WEIGHT, or have it updated automatically during the counting process. Automatic reference sample updating is practical as long as the reference sample quantity is lower than 100 pieces. With this function, the reference weight is re-calculated after stability has been reached and after accuracy testing; the updated sample quantity is calculated from the total weight and the displayed number of pieces. The abbreviation –UPD– is displayed to indicate that the reference sample quantity is being automatically or manually updated. You should update the reference sample quantity when either half or twice the number of pieces is placed on the scale. Updating with approximately double the number of pieces can be repeated several times.

Reference sample updating	Code	Changes
Blocked	3 12 1	
Manual	3 12 2	
Automatic	3 12 3	*

Note:
The reference sample cannot be updated if you have entered the reference weight using the numeric keys!

Practical Example:
"Automatic Reference Updating with Constant Piece Weight"

Place the container on the scale

Press →0/T←/ZERO/TARE

Place the reference sample quantity (e.g. 10 pieces) in the container.

Press →R◇/AV.PIECE WEIGHT = Start counting function

Place nine more pieces in the container.
The reference weight is re-calculated from the total weight and the displayed number of pieces (reference sample updating). The abbreviation –UPD– is displayed, and an acoustic signal is given when the weight is stored.

* = factory setting

Practical Example: Simple Counting

The QC Counting Scale is set at the factory so that you can begin counting without changing any settings.

Step/Key	Display	Data Output
Place the container on the scale, press →0/T← / ZERO/TARE **(14)** to tare	0.0 g	
Place the appropriate number of pieces (e.g. 10) in the container	x.x g	
Press →R← / AV.PIECE WEIGHT **(12)**, the counting function starts.	10 pcs	

Place any number of pieces in the container; the display shows the number of pieces ("**pcs**").

Note:

When –**UPD**– is displayed, the scale automatically re-calculates the reference weight from the piece count on the scale and the current weight; this increases the accuracy.

If you want to change the factory set reference sample quantity, press COUNT/WEIGHT key **(13)** to select one of the pre-set numbers (5, 10, 20, 50, 100) or user-defined entry (factory setting 999*).

* = user-defined piece count to be stored in memory.

Practical Example: Changing the Reference Sample Quantity Using the [0] – [9] Numeric Keys

You are working in the Counting application, with a reference sample quantity of 10 pieces.

Step/Key	Display	Data Output
Remove the 10 pieces from the container and place the empty container back on the weighing pan.	0.0 g	
Before placing any more pieces in the container, you want to change the reference sample quantity.		
Enter the new reference sample quantity using the [0] – [9] numeric keys, e.g. 20 pieces.	20	
Place 20 pieces in the container and press [→0←] / [AV.PIECE WEIGHT] **(12)** to re-start the counting application.	20 pcs	

The reference sample quantity has now been changed to 20 pieces.

Tare Memory

Tare Memory → T / PRESET TARE key **Code 2 2 2***

Symbol displayed when a value is stored: Δ

Press → T / PRESET TARE key to store the tare weight. The balance is now automatically tared so you can weigh again starting with a zero readout.
If you have stored a value in the tare memory, a "1" will be printed or output after the ID code of this value to identify it as such on the printout or on the computer screen.

General Functions in the Tare Memory Program:

Function/Application	Entry Mode	User Guide Display	Data Output ID
Clear tare memory data net **(N)**, tare **(T)**, gross **(G)**	CF / CLEAR key **+** → T / PRESET TARE key	**CF**	–
Display information: Tare balancing Manual tare entry	i / INFO key **+** → T / PRESET TARE key	**tar** **Pt**	–
Display and print information Data output: tare memory data Tare balancing Manual tare entry	i / INFO key **+** ⊙ key **+** → T / PRESET TARE key	**tar** **Pt**	**T1** **PT1**
Numerical entry in the tare memory **(PT1)** Net Manual tare entry Gross	Numeric keys 0 – 9 **+** → T / PRESET TARE key	–	**N1** **PT1** **G**

Note:
A manually entered tare value with a decimal point corresponds to a weighed value!

* = factory setting

Tare Memory

	Code			Changes
Tare memory blocked	2	2	1	
Tare memory	2	2	2	
Tare memory – automatic	2	2	3	*

Practical Example: Auto-Container Tare – Net – Gross

Step/Key	Display	Data Output
→0/T← / ZERO/TARE	0.0 g	
Place the lightest-weight container you are working with on the weighing pan	+ 149 g	
and press →PT← / PRESET TARE key	+ 0.0 g	
Remove the container	– 149 g	
Place the next container on the scale		
Auto-container tare:	+ 0.0 g	

Once you initiate the tare memory function, all containers subsequently placed on the scale will be automatically tared at >70% of the weight of the first container.

* = factory setting

Totalizing

Totalizing → Σ / ACCUM. + key
Read Totalizing Memory ← Σ / ACCUM. RECALL

Code 2 7 2*

Symbol displayed: Σ

With the totalizing application you can totalize weighed values and piece counts, whereby the total value displayed can exceed the capacity of the scale many times over.

General Functions in the Totalizing Program:

Function/Application	Entry Mode	User Guide Display	Data Output ID
Clear the totalizing application	CF / CLEAR key + ← Σ / ACCUM. RECALL key	CF	–
Display transaction counter	i / INFO key + → Σ / ACCUM. + key	e.g. 1, 2, 3	–
Read data: Totalization memory data	i / INFO key + ← Σ / ACCUM. RECALL key		
Net		S–n	–
Tare		S–t	
Gross		S–b	
Counting		S–C	
Display and print information	i / INFO key +		
Data output:	⊙ / PRINT key +		
Contents of totalizing memory	← Σ / ACCUM. RECALL key		
Net		S–n	Sum–N1
Tare		S–t	Sum–T1
Gross		S–b	Sum–B
Counting		S–C	S–Qnt

Totalizing	Code	Changes
Totalizing blocked	2 7 1	
Totalizing accessible	2 7 2	*

* = factory setting

If you have selected "Automatic Output of Totalizing Application Data" in the scale operating menu, you can document both the individual weights totalized and the total of all weights when weighing individual samples.
Data output is generated automatically each time you press the →T←/ACCUM. + key.

	Data Output
Transaction counter (1, 2, 3 etc.)	n 1
Net value	N + 21.6 g

Automatic Output of Totalizing Application Data

	Code	Changes
Accessible	3 13 1	
Blocked	3 13 2	*

If the "Automatic Output of Totalizing Application Data" function is off, data output is only generated when you press the →T←/ACCUM. RECALL key (the current total is output).

	Data Output
Transaction counter (1, 2, 3 etc.)	n 3
Current total net value	Sum-N + 62.8 g

With the totalizing function, you can totalize individual weight values (net, tare, gross) or counting results that far exceed the actual capacity of the scale.

A partial amount is on the scale, but the total value is displayed.

Each time you store a value in the totalizing memory, the current transaction count is displayed briefly.

When you press and hold the →T←/ACCUM. + key, "SUM" appears in the user guide display and the current total (totalizing memory plus current weight value) is shown in the main display.

* = factory setting

Practical Example: Totalizing Symbol displayed: Σ Code 2 7 2*

and "Counting" Symbol displayed: ⁂ Code 2 1 4*

Totalizing
Read Totalizing Memory

[→Σ]/[ACCUM. +] key
[←Σ]/[ACCUM. RECALL] key
User guide display when you press [i]/[INFO] key
+ [←Σ]/[ACCUM. RECALL] key: S–n, S–t, S–b, S–C

Application: Totalizing bulk parts of equal weight or weight values, whereby the total value displayed can exceed the capacity of the scale many times over.

Note:
In this example, the containers all have the same weight.

Special menu code settings used in this example:

Function	Code
Automatic output of totalizing application data: on	3 13 1
Output all parameters	7 1 2

Step/Key	Display	Data Output
Place the empty container	+ 4.2 g	
Press the [→0/T←]/[ZERO/TARE] key	0.0 g	
Press the [⁂]/[COUNT/WEIGHT] key, Select reference sample quantity, e.g. 20 pcs	0.0 g	
Place 20 pieces in the container	+ 17.2 g	
Press the [→Σ]/[AVPIECE WEIGHT] key, begin counting	+ 20 pcs	
Data output		nRef + 20 pcs wRef + 0.8700 g
Press the [→Σ]/[ACCUM. +] key to store value in the totalizing memory. Transaction counter: 1 1st partial value	+ 20 pcs	nRef + 20 pcs wRef + 0.8700 g n 1 N + 17.7 g Qnt + 20 pcs

* = factory setting

Step/Key	Display		Data Output		
Remove container with pieces	–	4 pcs			
Remove pieces from the container					
Place the empty container on the scale					
Place the empty container on the scale		0 pcs			
Place pieces in the container	+	20 pcs			
Press the →Σ+/ACCUM. key to store the value in the totalizing memory					
Transaction counter 2			n		2
2nd partial value			N	+	17.4 g
			Qnt	+	20 pcs
Remove the container with the pieces	–	4 pcs			
Remove the pieces from the container					
Place the empty container on the scale		0 pcs			
Place pieces in the container	+	20 pcs			
Press the →Σ+/ACCUM. key to store the value in the totalizing memory					
Transaction counter 3			n		3
3rd partial value			N	+	17.4 g
			Qnt	+	20 pcs
Remove the container with the pieces	–	4 pcs			
Remove the pieces from the container					
Place the empty container on the scale					
Press and hold the →Σ+/ACCUM. key	+	60 pcs			
The user guide display shows **SUM**					

Step/Key	Display	Data Output
The residual sum can be filled to ...70 pcs	+ 70 pcs	
Press the [→0←]/[ACCUM. +] key briefly; the residual sum is totalized		
		n 4
		N + 8.6 g
Press the [←0→]/[ACCUM. RECALL] key to output the contents of the totalizing memory		
Number of partial values		n 4
Total sum net		Sum-N + 61.1 g
Total sum, counting result		S-Qnt + 70 pcs

Over/Under Checkweighing

For checkweighing, you can choose between two different programs:

Checking net weights → / PRESET TARGET key Code 2 6 2*
Checking variations in weight → / PRESET TARGET key Code 2 6 3

Symbol displayed: +/–

Checking net weights and checking variations in weighed values or calculated values, with analog display as visual aid.

Over/Under Checkweighing

This program is used to check whether samples are within a specific tolerance range, to sort and classify items, and to fill and batch samples. Symbols are displayed above the bar graph as visual aids for this range of programs: the "=" sign indicates the target weight, and "+" and "–" signs indicate over- and underweight limits.
Within the tolerance range, the response sensitivity of the bar graph is increased.

General Functions in the Over/Under Checkweighing Program

Function/Application	Entry Mode	User Guide Display	Data Output ID
Clear the over/under checkweighing application	CF / CLEAR key + → / PRESET TARGET key	CF	–
Display information: Target weight and tolerance ranges	i / INFO key + → / PRESET TARGET key		
Target weight		Set	
Min weight value		S –	–
Max weight value		S +	
Tolerance ranges when values entered via keypad:			
Delta min		d –	
Delta max		d +	

* = factory setting

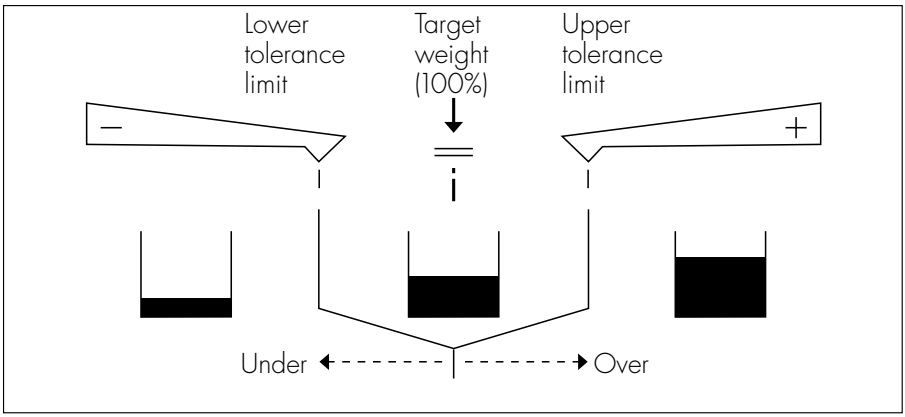
Function/Application	Entry Mode	User Guide Display	Data Output ID
Display and print information:	[i]/[INFO] key + [⊙]/[PRINT] key +		
Target weight	[→◈]/[PRESET TARGET] key	Set	Setp
Min weight value		S –	min
Max weight value		S +	max
Tolerance ranges when values entered via keypad:		or	
Delta min		d –	d min
Delta max		d +	d max
Numeric entry: Enter parameters for "Weight"	Numeric keys [0]–[9] and [·] + [→◈]/[PRESET TARGET] key		
Target weight		Set	
Min weight value		S –	–
Max weight value		S +	
Tolerance ranges when values entered via keypad:		or	
Delta min		d –	
Delta max		d +	
Numeric entry: Enter parameters for "Piece"	Numeric keys [0]–[9] without [·] + [→◈]/[PRESET TARGET] key		
Target piece count		Set	–
min piece count		S –	
max piece count		S +	
Tolerance ranges when values entered via keypad:		or	
Delta min		d –	
Delta max		d +	

A number entered manually without a decimal point is always a piece count!

A number entered manually with a decimal point is always a weight value!

Note:
When entering values via the keypad, enter deviations from the target weight, rather than absolute values.

Press the [→◈]/[PRESET TARGET] key key to start the "Over/Under Checkweighing" application. The tolerance limit symbol flashes in the bar graph. The user guide display shows "SET".
Enter your target value and values for the lower tolerance limit "S – –" and the upper tolerance limit "S – t". You can choose whether to enter a value as a piece count or a weight value – see the table on the preceding page. When you enter values using the [0] – [9] numeric keys, the scale sets the value in the weight/piece count checking application as a variation value; if a value is entered by adding or removing sample to or from the scale, this is set as an absolute value.
When the check limits are entered as weight values while a piece count is displayed, the checkweighing function is not active. The same applies vice versa, i.e. if piece count values are entered when a weight value is displayed.
The "**+/–**" symbol flashes in the display to indicate that the limit value entered does not correspond to the current display. Once you have started the "Over/Under Checkweighing" application, press the [→◈]/[PRESET TARGET] key key again to switch the display to "**LL**", the weight value, "**HH**" or "weight value/piece count only" display.



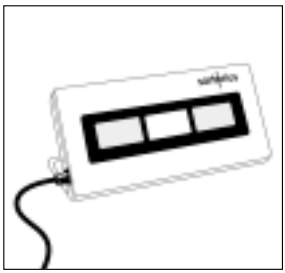
Entry of values can be interrupted at any time by pressing the [CF]/[CLEAR] key.
When the "Over/Under Checkweighing" application is active, press [CF]/[CLEAR] and [→◈]/[PRESET TARGET] key to clear the Set, Min. and Max. values. If you have turned off the scale by pressing [I/⏻]/[ON/OFF], you will need to enter the values again or load them from memory using the Memory function.

Printout of the Over/Under Checkweighing Program

You can choose to have the application data output automatically by selecting the menu code setting 4 2 1. Output is generated once the value has reached the GOOD range and after stability.

Data Output	Code	Changes
On	4 2 1	*
Off	4 2 2	

Triggering the Control Lines for the YRD11Z Checkweighing Display**



You can use the Sartorius Three-Segment Checkweighing Display Unit, model YRD11Z, as a visual aid during checkweighing.

For pure checkweighing applications, the external checkweighing display unit is recommended. When using the external display unit, set the menu code 4 3 3. This increases the readability speed when the values reach the GOOD range. When connecting the checkweighing display, you can define when the control lines are triggered by setting the appropriate menu code. The "control range" lies between approx. 30% of the lower tolerance limit and 170% of the upper tolerance limit.

Control lines are activated:	Code	Changes
Only within the control range	4 3 1	
Always	4 3 2	*
Only at stability within the control range	4 3 3	
Only at stability	4 3 4	

* = factory setting
** = with YCC01-0016M3 only

Checking Net Weights

Checking net weights → / PRESET TARGET key, user guide
display shows: **Set, S–, S+** Code 2 6 2*

Practical Example: Check weight Symbol displayed: **+/–**

Application: Checking the weight of bulk parts of identical weight;
e.g. checking packages of screws where the packages have the same weight, checking the fill quantity, sorting.

Use the numeric keys 0 – 9 to enter values.

Menu codes used in the example:

Function	Code
Output over/ under checkweighing: on	4 2 1
Output all parameters	7 1 2

Step/Key	Display	Data Output
Press the →0/T← / ZERO/TARE key	0.0 g	
Place a closed package of screws on the scale	+ 100.1 g	
Press the → / PRESET TARGET key The tolerance limit symbol flashes; the user guide display shows **SEt = target weight**	+ 100.1 g	
Press the → / PRESET TARGET key to store the weight value	+ 100.1 g	
The user guide display shows **S– – = min. weight**	+ 100.1 g	
Enter the tolerance values (e.g. 1 g) using the numeric keys	1 . 1.	
Press the → / PRESET TARGET key again the user guide display shows **S–t = d–max. weight**	+ 100.1 g + 100.1 g	

* = factory setting

Step/Key		Display	Data Output
Enter the tolerance values (e.g. 1 g) using the numeric keys		[1] [·] 1.	
Press the [→◈]/[PRESET TARGET] key again An acoustic signal is given (beep tone) and the data output is generated automatically.	+	100.1 g	Setp + 100.1 g d-min − 1.0 g d-max + 1.0 g
		LL	
Place the next package on the scale GOOD values are output automatically If the package is too heavy, this is indicated by HH in the display. If the weight value is in the GOOD range, output is generated automatically and an acoustic signal is given.	+	100.1 g HH	N + 100.1 g

Note:

A number entered manually without a decimal point is always a piece count!

A number entered manually with a decimal point is always a weight value!

Use in Combination with Other Programs

Practical Example: Checking Piece Count Symbol displayed: **+/−** and "Counting" symbol:

Application: Checking the piece count of bulk parts of identical weight; e.g. checking packages of screws where the packages must have the same weight; checking the fill quantity; sorting.

Menu codes used in the example:

Function	Code
Output of application data: on	4 2 1
Output all parameters	7 1 2

Step/Key	Display		Data Output
Place empty container on the scale	+	31.9 g	
Press the →0/T← / ZERO/TARE key		0.0 g	
Press / COUNT/WEIGHT to select the reference sample quantity		rEF 20 pcs	
Place 20 pieces in the container	+	17.5 g	
Press / AV.PIECE WEIGHT, activate the counting application	+	20 pcs	
The current piece count and current reference weight are output			nRef + 20 pcs wRef + 0.8750 g
Fill-in required quantity	+	200 pcs	
Press the / COUNT/WEIGHT key	+	200 pcs	
Press the / PRESET TARGET key, activate checkweighing	+	200 pcs	
The tolerance limit symbol flashes; the user guide display shows **SEt = target weight**			
Press the / PRESET TARGET key to store the weight value	+	200 pcs	
The user guide display shows **S− − = d − min. weight**	+	200 pcs	

Step/Key	Display	Data Output
Enter the tolerance value (e.g. 1 piece) using the numeric keys	1	
	+ 1 pcs	
Press →◈/PRESET TARGET key again to store the value	+ 200 pcs	
The user guide display shows **S–t = d – max. weight**	+ 200 pcs	
Enter the tolerance value (e.g. 1 piece) using the numeric keys	1	
	+ 1 pcs	
Press →◈/PRESET TARGET key again to store the value	+ 200 pcs	

An acoustic signal is given (beep tone) and the data output is generated automatically.		`Setp + 200 pcs`
		`d-min + 1 pcs`
		`d-max + 1 pcs`

Remove the container	LL	
Place the next package on the scale GOOD values are output automatically	+ 200 pcs	`Qnt + 200 pcs`

Note:

A number entered manually without a decimal point is always a piece count!

A number entered manually with a decimal point is always a weight value!

Checking Variations in Weight

Checking Variations in Weight [→◈]/[PRESET TARGET] key, user guide display:
dif, d –, d + **Code 2 6 3**

Note:
Press the [→◈]/[PRESET TARGET] key to toggle between **LL**, **HH**, variations and net value.

Practical Example: Checking the Variations in Weight by Piece Count
Symbol displayed: +/–

Application: Checking the piece count of bulk parts of identical weight; e.g. checking packages of screws where the packages must have the same weight; checking the fill quantity; sorting.

In the example, the tolerance range is entered using the numeric keys [0] – [9]

Menu codes used in the example:

Function	Code
Output of application data: on	4 2 1
Output all parameters	7 1 2

Step/Key	Display	Data Output
Place empty container on the scale	+ 55.7 g	
Press the [→0/T←]/[ZERO/TARE] key	0.0 g	
Press [⁂]/[COUNT/WEIGHT] to select the reference sample quantity	rEF 20 pcs	
Place 20 pieces in the container	+ 17.6 g	
Press [→◈]/[AV.PIECE WEIGHT], activate the counting application	+ 20 pcs	
The current piece count and reference weight are output		nRef + 20 pcs wRef + 0.8800 g
	+ 200 pcs	
Press the [→◈]/[PRESET TARGET] key	+ 200 pcs	
The tolerance limit symbol flashes; the user guide display shows **SEt = target weight**		
Press the [→◈]/[PRESET TARGET] key to store the value	+ 200 pcs	

Step/Key	Display	Data Output
The user guide display shows **S– – = d – min. weight**	+ 200 pcs	
Enter the tolerance value (e.g. 1 piece) using the numeric keys	[1] 1 g	
Press the [→◈]/[PRESET TARGET] key again	+ 100.1 pcs	
The user guide display shows **S–t = d – max. weight**	+ 200 pcs	
Enter the tolerance value (e.g. 1 piece) using the numeric keys	[1] + 1 g	
Press the [→◈]/[PRESET TARGET] key again	+ 200 pcs	
An acoustic signal is given and data output is generated automatically.		Setp + 200 pcs d–min – 1 pcs d–max + 1 pcs Diff + 0 pcs
GOOD values are output automatically. If the package is too heavy, this is indicated by **HH** in the display. If the weighed value is within the GOOD range, output is generated automatically and an acoustic signal is given.	HH	

Note:

A number entered manually without a decimal point is always a piece count!

A number entered manually with a decimal point is always a weight value!

Individual Data ID Code

Individual Data ID Code [ID]/[ID] key **Code 2 8 2***

You can enter up to 14 digits, or 13 digits plus a decimal point, using the numeric keys. The display shows a maximum of 7 digits.
The number entered is stored in non-volatile memory. You can overwrite this value, or delete it by pressing [CF]/[CLEAR] and **ID**. The individual data ID code is output with the application data.

General Functions in the Individual Data ID Code Application

Function/Application	Entry Mode	User Guide Display	Data Output ID
Clear the individual data ID code application	[CF]/[CLEAR] key + [ID]/[ID] key	**CF**	–
Display information: First half of the **ID (H)** Last half the **ID (L)**	[i]/[INFO] key + [ID]/[ID] key	 **IdH** **IdL**	 –
Print information: First half of the **ID (H)** Last half the **ID (L)**	[i]/[INFO] key + [⊙]/[PRINT] key + [ID]/[ID] key	 **IdH** **IdL**	 **IdH** **IdL**
Store ID in memory (14 digits)	Numeric keys [0]–[9] + [ID]/[ID] key	–	–
K* – Output (7 digits)	Numeric keys [0]–[9] + [i]/[INFO] key	–	**K***
NUM* – Output (7 digits)	Numeric keys [0]–[9] + [⊙]/[PRINT] key	–	**NUM**

* = factory setting

ID function	Code			Changes
Blocked	2	8	1	
Accessible	2	8	2	*

Example: Storing ID Data

Enter using numeric keys [0]–[9] (max. 14 digits) + [ID]/[ID] key (store).

Printout

[⊙]/[PRINT] key

The ID code	designates:
`30-JAN-95 16:52:32`	Current date and time, from printer (only with YDP03-0CE)
`Maier and Co.`	First header line – manufacturer/company name, stored in non-volatile memory (20 characters)
`Wiesbaden`	Second header line – manufacturer/company name, stored in non-volatile memory (20 characters)
`ID 12345678901234`	Third header line – 6 characters (user entry, stored in non-volatile memory) Fourth header line – additional ID data – plus max. 14 characters (user entry)
`N 23.2 kg`	

The ID code	designates:
`ID 12345678901234`	Current date and time, from printer (only with YDP03-0CE) ID Header – 6 characters (user entry, stored in non-volatile memory) plus max. 14 characters (user entry).

* = factory setting

Memory

Memory	→ / RECALL/STORE key	Code 2 9 2*
Start Memory Function	→ / RECALL/STORE key – press briefly	
Store Data using the Memory Function	→ / RECALL/STORE key – press and hold	

Symbol Displayed: ⁂ or Δ Δ or +/– flashes in the display.

Note:

The flashing symbol indicates the application you are currently working in and the values you can store.

User guide display: MEM

In the "Memory" application, you can store up to 25 values; tare values or tare compensation (e.g. empty container weight) can be stored under **Tare**, reference values under **Ref**, target weights under **Set**, checkweighing limits under "Min" and "Max", etc.

General Functions in the Memory Program

Function/Application	Entry Mode	User Guide Display	Data Output ID
Load the last memory position selected (default: the 1st position)	→ / RECALL/STORE key	MEM	–
Storing values in a memory position: Reference value "wRef" = Ref	Memory position 1 to 25 + → / RECALL/STORE key – press and hold + →RAS / AV.PIECE WEIGHT key		
	or		
Tare value = Tare	→T / PRESET TARE key	MEM	–
	or		
Target weight = Set	→ / PRESET TARGET key		
Free memory = Free			

* = factory setting

Function/Application	Entry Mode	User Guide Display	Data Output ID
Load the value stored in a memory position: Reference value "wRef" = Ref Tare value = Tare Target weight = Set Free memory = Free	Memory position 1 to 2 5 + ⇔/RECALL/STORE key – press briefly	MEM Ref Tare Set Free	–
Delete the selected memory position (1 to 25 positions)	CF/CLEAR key + memory location 1 to 2 5 + ⇔/RECALL/STORE key – press briefly	CF	–
Display information: Memory location 1 to 25 Type of value in memory: Tare value = Tare Reference value = Ref Target weight = Set Free memory = Free		MEM	–
Display and print information: Data output: contents of memory Type of value in memory: Tare value = Tare Reference value = Ref Target weight = Set Free memory = Free	i/INFO key + ⊙/PRINT key + memory location 1 to 2 5 + ⇔/RECALL/STORE key – press briefly	MEM	MEM Memo Tare Memo Ref Memo Set Memo Free

Memory

With the memory function accessible, there are 25 memory locations available that you can use to store individual tare values, reference values for the counting function, or checkweighing limits.

ID memory function	Code	Changes
Blocked	2 9 1	
Accessible	2 9 2	*

Practical Example: Storing Values in Memory

Start an application program:

Either counting, tare memory, or over/under checkweighing

Step/Keys	Display
Store values in memory Select a memory position between 1 and 25 (e.g. 5), Press and hold the →0← / RECALL/STORE key Press the →PCS← / AV.PIECE WEIGHT key. The values from the Counting application are stored in memory location 5.	MEM
Select a memory location between 1 and 25 (e.g. 6), Press and hold the →0← / RECALL/STORE key Press the →⊕← / PRESET TARGET key. The values from the Checkweighing application are stored in memory location 6.	MEM
Select a memory location between 1 and 25 (e.g. 7). Press and hold the →0← / RECALL/STORE key Press the →PT← / PRESET TARE key. The values from the Tare Memory application are stored in memory location 7.	MEM

Loading Stored Values

Use the following key functions to load values that you have stored using the Memory application:
Select a memory position between 1 and 25 (e.g. 5).
Press the →0← / RECALL/STORE key briefly. The Counting application starts automatically with the stored values loaded.

* = factory setting

Memory Table

Memory	Application	Abbreviation	Value
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Example:

17	Tare memory	tar	100 g

Error Codes in the Applications

Your Sartorius Counting Scale comes equipped with an automatic function-monitoring feature. In case of function errors, error codes are shown in the main display and output to the port until the error is corrected.
Display format: Err YXX
Data output format with header (menu setting 7 2 2): Stat ERR YXX
One type of error generates the same error code in all application programs.

Operating and Routine Errors

Your scale recognizes operating errors. Codes indicating operating errors are shown for 2 seconds in the main display.

Error code:	Error:
Err 01:	Display overflow
Err 02:	Zero point error when adjustment/calibration routine was started (unload the scale)
Err 03:	Zero point error when adjustment/calibration routine ended or time has run out (internal)
Err 10:	→0/T← / ZERO/TARE key blocked when →PT / PRESET TARE key is active
Err 11:	→PT / PRESET TARE key pressed with non-permissible value, e.g. negative value
Err 12:	→PT / PRESET TARE key pressed when the value was not within the permitted range (overflow, range limits)
Err 22:	Error when starting the counting function (weight <10 digits)
Err 23:	Error when starting an application
Err 30:	⊙ / PRINT key pressed with BPI mode active (internal)
Err 50:	Temperature sensor switch defective (internal)
Err 53:	Temperature sensor switch not functioning (internal)
Err 54:	Balance load below minimum limit
Err 55:	Balance load above maximum limit
Err 64:	Numeric entry not permitted
Err 70:	Wrong numeric entry format

Note:
Other error codes:
Switch the scale OFF and then back ON using the I/⏻ / ON/OFF key. If the error code is still displayed, please contact our Service Unit.

General Description of the Data Interface

General Information

This description has been written for users who wish to connect their Sartorius QC counting scale, which has a built-in V24/V28-RS-232C(-S)*) interface port as a standard feature, to a computer or different peripheral device.
By using an on-line computer, you can change, activate and monitor the functions of the scale. You can also use the interface port to access the control lines for the over/under checkweighing function. In addition, an external universal switch for remote control of various functions can be connected to the data interface port on the scale.

If you interface an original Sartorius accessory, such as a Sartorius Data Printer or a similar unit, with a scale that has the factory-set menu codes, you do not need to change any settings.

Interfacing Devices with the Scale

Please note that the interface port is electrically connected to the protective grounding conductor (protective earth = PE) of the scale housing. The cabling supplied as accessory components is shielded and electrically connected on both ends to the cases of the connectors. This electrical connection may result in interference caused by ground loops or by transient currents if you have grounded the housing or connected the protective grounding conductor for AC power. If necessary, connect an equipotential bonding conductor to the scale.

*) = Sartorius pin assignment

General Specifications

Type of interface	Serial point-to-point connector
Operating mode	Asynchronous, full-duplex
Standard	V28, RS-232C specification
Handshake mode*)	2-wire interface: via software (XON/XOFF) 4-wire interface: via hardware handshake lines with Clear To Send (CTS) and Data Terminal Ready (DTR)
Transmission rates*)	150; 300; 600; 1,200; 2,400; 4,800; 9,600; 19,200 baud
Character coding	7-bit ASCII
Parity*)	Mark, space, odd, even
Synchronization*)	1 start bit; 1 or 2 stop bits
Data output format*) of the scale	16 or 22 characters
Character format*)	– 1 start bit – 7-bit ASCII – 1 parity bit – 1 or 2 stop bits

*) = can be changed by the user

Data Output Formats

Depending on the menu code setting:
7 2 1 = without data ID code
or *7 2 2* = with data ID code

data will be output with either 16 (code *7 2 1*) or 22 characters (code *7 2 2*).

For a data output of 22 characters, a 6-character ID precedes the 16 characters reserved for the weight or other value.

Data Output Format with 16 Characters

Display segments that are not activated ("+" or "–" sign, leading zeros other than zeros before the decimal point) are output as spaces.

The following data block format is output according to what is displayed on the scale:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
+		*	*	*	*	*	*								
		10^6	10^5	10^4	10^3	10^2	10^1	10^0			*	*	*		
*	*	0	0	0	0	0	0	0		*				CR	LF
			.	.	.	.	.	.	.						
											U	U	U		
–				10^5	10^4	10^3	10^2	10^1	10^0						
				0	0	0	0	0	0						
				*	*	*	*	*	*						

* = space; U = Unit

When data are output without decimals, the decimal point is suppressed (except when a certain display mode is selected).

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
+			*	*	*	*	*	*			*	*	*	CR	LF
*	*	*	10^6	10^5	10^4	10^3	10^2	10^1	10^0	*					
–				0	0	0	0	0	0		U	U	U		

Data output example: +1255.7 g

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

Characters:

1st	Plus or minus sign or space
2nd	Space
3rd–10th	Weight with a decimal point; leading zeros = space
11th	Space
12th–14th	Unit symbol or space
15th	Carriage return (CR)
16th	Line feed (LF)

If the weighing system has not stabilized, no unit symbol will be output.

Unit symbols:

Note:
When the scale is used as a legal measuring instrument, all units except g/kg are blocked.

* * *	No stability parameter	t l t	Taiwanese taels
o * *	Grams (o)	G N *	Grains
g * *	Grams	d w t	Pennyweights
k g *	Kilograms	/ l b	Parts per Pound
c t *	Carats	t l c	Chinese taels
l b *	Pounds	m o m	Mommes
o z *	Ounces	K * *	Austrian carats
o z t	Troy ounces	t o l	Tola
t l h	Hong Kong taels	b a t	Baht
t l s	Singapore taels	MS *	Mesghal

* = space, U = Unit

Special Codes

Special codes are output only if the scale operating menu code 611, 614 or 615 is set (see the section entitled "Data Output Parameter").

Special status-dependent codes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*	*	*	*	*	*	A	B	*	*	*	*	*	*	CR	LF

The following status codes are output for "A B":

* * : Tare
C * : Calibrate
– – : All numerals indicated in stable readout
H * : Overload
L * : Underload

Special error-dependent codes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*	*	*	E	R	R	*	X	Y	Z	*	*	*	*	CR	LF

X = one-place error code: *, 0, 1, 2
Y Z = two-place error index code

* = space

Data Output with ID Code

When data with an ID code is output, the ID code consisting of 6 characters precedes the data with the 16-character format.

During data output, all characters are shifted to the right by 6 places.

1st 7th 22nd character

C	C *	C *	C *	C *	C *	V *	*	x *	x .	x .	x .	x .	x .	x .	x	*	U *	U *	U *	CR	LF

V = Plus or minus sign
* = Space
x = Digit
U = Unit
. = Decimal point
K = Letter for an ID comment
CR = Carriage Return
LF = Line Feed

When special codes are output, the letters "Stat" for status code are assigned to the 1st through the 4th characters of the data string.

Status-dependent string:

1st 7th 13th14th 22nd character

S	t	a	t	*	*	*	*	*	*	*	*	A	B	*	*	*	*	*	*	CR	LF

A, B = status codes

Error-dependent string:

1st 7th 10th – 12th 14th – 16th 22nd character

S	t	a	t	*	*	*	*	*	E	R	R	*	X	Y	Z	*	*	*	*	CR	LF

Data Input Formats

Commands can be input via the scale interface port to control the scale functions.

Control commands with upper-case letters or special characters are distinguished from those with lower-case letters.

Format for Control Commands

Each character must be transmitted with a start bit, a 7-bit ASCII-coded character, a parity bit, and one or two stop bits.

You can define the parity, baud rate, handshake mode and the number of stop bits by programming the respective codes in the scale operating menu (see page 2–8).

Formats:

ESC	K	CR	LF

ESC	K	X	_	CR	LF

ESC = Escape (ASCII 27)
K = Command character (see next page)
X = Number
_ = Underline (ASCII 95)
CR = Carriage Return (ASCII 13)
LF = Line Feed (ASCII 10)

The characters CR and LF do not have to be transmitted in the data string.

Interface Commands

Control Commands with Upper-Case Letters

The command <ESC> <S>, for example, causes the processor to reinitialize (turns the scale off and back on again).
The scale will operate according to the commands available up until the processor is reinitialized. Once the scale has been turned on, the processor will always recognize the codes entered by the user in the scale operating menu.

Note:
The ESC 0 command (block keypad) does not block the I/⏻ / ON/OFF key!

Control Commands with Lower-Case Letters

All the functions of the application programs that can be selected by pressing the appropriate keys can also be activated by commands.

Standard:
Each control command with the lower-case letters f, s, t, x or z must be terminated by an underline (ASCII = 95).

Command:	Function
ESC K	Switch to 1st Weighing Mode (very stable amb. conditions)
ESC L	Switch to 2nd Weighing Mode (stable amb. conditions)
ESC M	Switch to 3rd Weighing Mode (unstable amb. conditions)
ESC N	Switch to 4th Weighing Mode (very unstable amb. cond.)
ESC O	Block keypad
ESC P	⊙ / PRINT function key
ESC Q	Acoustic signal
ESC R	Release keypad
ESC S	Restart/Self-test
ESC T	Tare

Command:	Function
ESC f0	[COUNT/WEIGHT] key – Toggle betw. weighing/counting, or betw. ref./pc. ct.
ESC f1	[PRESET TARE] key – Store in tare memory
ESC f2	[AVPIECE WEIGHT] key – Start – counting
ESC f3	[PRESET TARGET] key – Start – checkweighing
ESC f4	[ACCUM. +] key – add to totalizing memory
ESC f5	[ACCUM. RECALL] key – Data output – totalizing result
ESC f6	[ID] / [ID] key
ESC s0	[i] / [INFO] Info key (special function)

ESC s3	[CF] / [CLEAR] key – Clear function
ESC s4	[RECALL/STORE] function key (brief)
ESC s5	[RECALL/STORE] function key (long)

ESC txxxxx	Number keys [0]–[9] and [·] (special function)
ESC x1	Output model number
ESC x2	Output serial number

ESC z0	Input ID header
ESC z1	Input header 1 (company name)
ESC z2	Input header 2 (company name)

BASIC Program

Sample of a BASIC program to save your company name and ID as header lines.

```
1000 ON ERROR GOTO 10000
1010 CLS
1011 PRINT "Enter the fixed 2-line header and ID label"
1012 "Sartorius QC Series Counting Scale with PC Connecting Cable
     (1200Bd,O,7,1)"
1013 INPUT "Your PC interface, i.e. COM1 or COM2 (enter 1 or 2)"; a
1015 IF a = 1 THEN OPEN "com1:1200,o,7,1,CS1000,DS0,CD0,PE"
     FOR RANDOM AS #1
1016 IF a = 2 THEN OPEN "com2:1200,o,7,1,CS1000,DS0,CD0,PE"
     FOR RANDOM AS #1
1018 PRINT ""
1019 PRINT " "Sample:          Note:                    Delivery:"
1030 PRINT " Smith and Jones   Printed line 1 (max. 20 char.)  (empty)"
1040 PRINT " Nail Factory      Printed line 2 (max. 20 char.)  (empty)"
1050 PRINT " Art No:           ID prefix (max. 6 char.)        ID"
1070 PRINT " ____________________________________________________________"
1080 PRINT "Characters allowed:  !#$%&'()*+,-./ 01234567890:;<=>?@"
1085 PRINT "                     ABCDEFGHIJKLMNOPQRSTUVWXYZ[]^_"
1090 PRINT "                     abcdefghijklmnopqrstuvwxyz"
1095 PRINT "The special characters ü,ä,ö,ß... must be entered as ue,ae,oe,ss..."
2000 PRINT " _____________________ "
2010 PRINT "Your entry:          Print header 1: _____________________"
2020 PRINT "Your entry:          Print header 2: _____________________"
2030 PRINT "Your entry:          ID prefix :     _____________________"
2031 LOCATE 15, 39: INPUT d1$: LOCATE 16, 39: INPUT d2$:
     LOCATE 17, 39: INPUT d3$
2040 IF LEN(d1$) < 21 AND LEN(d2$) < 21 AND LEN(d3$) < 7 THEN 2100
2050 PRINT "Error:  Maximum number of characters exceeded!":  BEEP
2060 FOR i = 1 TO 1000: NEXT i
2070 GOTO 1010
2100 LOCATE 19, 41: PRINT d1$: LOCATE 20, 41: PRINT d2$: LOCATE 21,
     41: PRINT d3$
2110 PRINT #1, CHR$(27); "z1"; d1$; "_": REM for 1st print header
2120 PRINT #1, CHR$(27); "z2"; d2$; "_": REM for 2nd print header
2130 PRINT #1, CHR$(27); "z0"; d3$; "_": REM for ID header
2140 PRINT #1, CHR$(27); "t12345678901234_":
     REM 14-digit numeric entry for ID
2141 PRINT #1, CHR$(27); "f6_"
```

```
2150 PRINT #1, CHR$(27); "P": REM Pass print command to QC
2160 REM     Catch output; dum$ catches Date/Time command
2161 INPUT #1, dum$, e1$, e2$, e3$, e4$
2162 CLOSE #1
2170 LOCATE 19, 4: PRINT e1$: LOCATE 20, 4: PRINT e2$: LOCATE 21,
       4: PRINT e3$
2500 LOCATE 22, 4: PRINT "...in the QC...        The End!        ...Your Entry..."
2600 INPUT a
2700 GOTO 1000
10000 LOCATE 23, 1: PRINT "Error:", ERDEV$, ERDEV: BEEP:
FOR i = 1 TO 5000: NEXT i
```

Or an even simpler version:

```
1 REM Enter the print header in your QC.  Your values replace the "*" (ä=ae, ..).
2 OPEN "COM*:1200,O,7,1,CS1000,DS0,CD0,PE"
  FOR RANDOM AS #1:                  REM interface COM* (*=1, 2, ...)
3 PRINT #1, CHR$(27);
  "z1********************_":  REM your company name in place
                                     of the 20*
4 PRINT #1, CHR$(27);
  "z2********************_":  REM your company name in place
                                     of the 20*
5 PRINT #1, CHR$(27);
  "z0******_":                       REM your ID in place of the 6*
6 CLOSE #1
```

Numeric Input

ESC	t	x	x .	x .	x .	x .	x .	x .	x	_	CR	LF

x = Any number which may include a plus or minus sign; can have anywhere from 1 to 7 places
. = Decimal point: "." or "_"= underline (ASCII = 95)

The numeric value may not have more than 7 digits (excluding the decimal point).

Each control command with the lower-case letters f, s, t, x and z must be terminated by an underline (ASCII = 95).

Table of ASCII Characters for Decimals 000 through 127

Char	Dec	Char	Dec	Char	Dec	Char	Dec	Char	Dec	Char	Dec	Char	Dec
NULL	000	DC3	019	°	038	9	057	L	076	_	095	r	114
SOH	001	DC4	020	‘	039	:	058	M	077	`	096	s	115
STX	002	NAK	021	(	040	;	059	N	078	a	097	t	116
ETX	003	SYNC	022	)	041	<	060	O	079	b	098	u	117
EOT	004	ETB	023	*	042	=	061	P	080	c	099	v	118
ENQ	005	CAN	024	+	043	>	062	Q	081	d	100	w	119
ACK	006	EM	025	,	044	?	063	R	082	e	101	x	120
BELL	007	SUB	026	–	045	@	064	S	083	f	102	y	121
BS	008	ESC	027	.	046	A	065	T	084	g	103	z	122
HT	009	FS	028	/	047	B	066	U	085	h	104	{	123
LF	010	GS	029	0	048	C	067	V	086	i	105	|	124
VT	011	RS	030	1	049	D	068	W	087	j	106	}	125
FF	012	OS	031	2	050	E	069	X	088	k	107	~	126
CR	013		032	3	051	F	070	Y	089	l	108	Δ	127
SO	014	!	033	4	052	G	071	Z	090	m	109		
SI	015	”	034	5	053	H	072	[	091	n	110		
DLE	016	#	035	6	054	I	073	\	092	o	111		
DC1	017	$	036	7	055	J	074	]	093	p	112		
DC2	018	%	037	8	056	K	075	^	094	q	113		

The ASCII characters for decimal equivalents 128 through 255 can be also used.

Synchronization and Data Output Parameters

Definition

During data communication between the scale and an on-line device (computer), "telegram-style" information consisting of ASCII characters is transmitted by the interface.

For error-free data communication, the interface parameters including the baud rate, parity and handshake mode, as well as the character format, must be the same for both units.

You can change these parameters in the scale operating menu so that they match those of the on-line device.
In addition to these parameter settings, you can define the data output parameter of the scale so that data are transmitted depending on various conditions – see "Utilities for Printouts or Data Transfer".

If you do not plug a peripheral device into the interface port on the scale, this will not generate an error message. In this case, data will be output but not received.

Handshake

The scale interface (Sartorius Balance Interface = SBI) has a 23-byte transmit buffer and a 40-byte receive buffer

You can access the scale operating menu to define various handshake parameters:

Software handshake:	controlled by "XOFF" and "XON"
Hardware handshake:	after "CTS" send 2 characters
	after "CTS" send 1 character

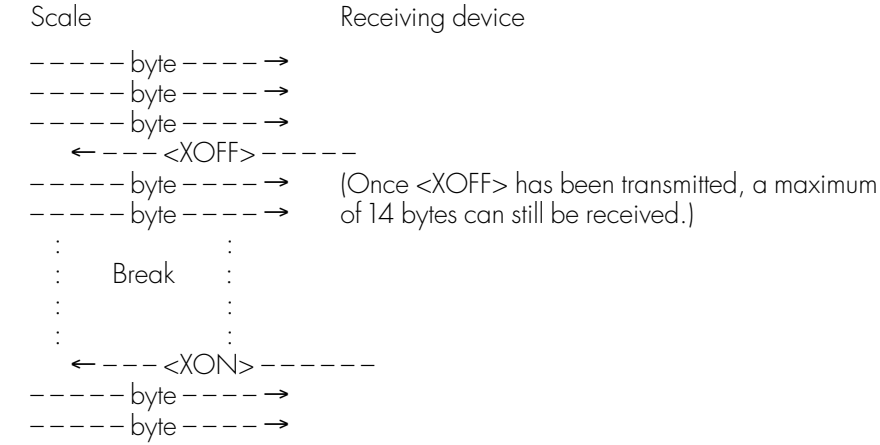
What happens when you define a software handshake?

Receiving device:
"XOFF" will not be transmitted until the receive buffer has stored the 26th character. The enable command "XON" is given after the buffer has transmitted all characters up to the 14th character.

If the device addressed does not understand the control command, the receiving device continues to operate additionally with a hardware handshake after it has received another 6 characters.

For data communication with a software handshake, "XON" must be sent by a device when it is turned on in order to enable another online device to exchange data.

Sequence:



Transmitting device:

The importance of handshake control for data transmission becomes especially apparent
– when the continuous automatic data output parameter is defined
– when data output is controlled by application programs

Once <XOFF> has been received, it prevents further transmission of characters. When <XON> is received, it re-enables the transmitting device to send data. The transmitting device is always enabled for sending data after it has been switched on.

If data transmission is interrupted by the control line (CTS) or the command <XOFF> while a data block is being output from an application program (only for printing a section of text with several lines of data), the readout will be locked into the display at the same time.

Data output will be blocked until the interface receives an enabling signal.

Activating a Data Output Process

You can define the data output parameter so that output is activated either automatically or when a print command is received. You have two options for the automatic mode: data output can be either synchronous with the scale display or activated at defined intervals (to select the parameter, see "Utilities for Printouts or Data Transfer").

Data Output by Print Command

The print command can be transmitted by a software command or by pressing the corresponding key.

In addition to an interface cable for a different device, you can connect an external universal switch for remote control to the scale interface port using the YCC01-0016M3 adapter cable (for the print function, see Part 2). For the switch, use pins 8 (ground) and 15 of this port and a cable up to 1.5 m or 5 ft. long (RS-232C).
Use pins e (ground) and m on the 12-pin round connector.
If data output is requested by a software command (see the section on "Data Input Formats"), you can install a 15 m (50 ft) cable for RS-232C, or a 300 m (984 ft) cable for RS-423.

Automatic Data Output

In the "auto print" operating mode, the data are output to the interface port without requiring a print command. You can choose to have data output automatically at defined print intervals with or without the stability parameter.

If you select the auto print setting, data will be transmitted immediately the moment you turn on the scale. This data output function is described in Part 2, under "Utilities for Printouts or Data Transfer."

Interface Parameter Settings

Utilities

Data output-parameter	Code	Changes
W/o stability	6 1 1	
After stability	6 1 2	*
At stability	6 1 3	
Auto w/o stability	6 1 4	
Auto after stability	6 1 5	

Automatic data output	Code	Changes
Stop with key	6 2 1	
not stoppable	6 2 2	*

Print interval after	Code	Changes
1 disp.update	6 3 1	*
2 disp.updates	6 3 2	
5 disp.updates[1]	6 3 3	
10 disp.updates[1]	6 3 4	
20 disp.updates[1]	6 3 5	
50 disp.updates[1]	6 3 6	
100 disp.updates[1]	6 3 7	

Data ID codes	Code	Changes
Without	7 2 1	
With	7 2 2	*

[1]) blocked for all models verifiable for use as legal measuring instruments

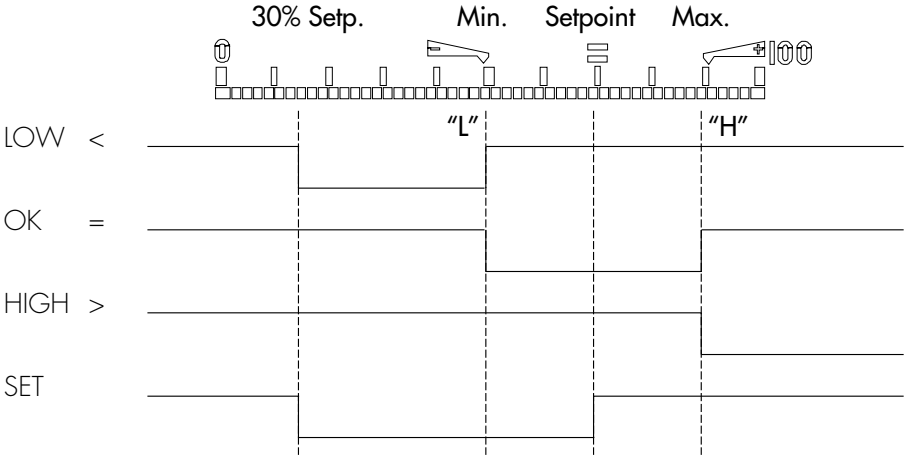
* = factory setting

Control Lines

When using the "over/under checkweighing" application program, you can use the voltage level of four data output port lines to control an external online display or control instrument. The voltage levels of the data output ports will change according to various patterns, depending on the reference weight limit and on the lower and upper weight limits.

Example: Control lines used only within check range:
Lower limit 30%; upper limit ∞% from setpoint

Menu code: 4 3 2*



Note:

When not in use, the voltage level is high: >2.4 V/+2 mA.

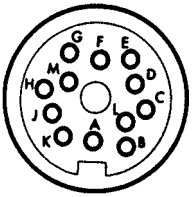
When in active use, the voltage level is low: <0.4V/−2 mA.

Caution: the output ports are not protected against short circuits!

Pin Assignment Chart for 12-pin Round Connector

Interface Connector:

Round connector



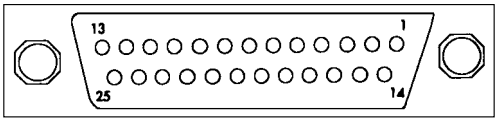
B (TXD) send
C (RXD) receive
D (DTR)
H (CTS)
E (SGN GND)

Signal	IP65 circular ring 12-pin	25-pin (with DB25-scale adapter cable)
>	A	18
TXD	B	2
RXD	C	3
DTR	D	20
SGND	E	7, 8, 14
+5 V	F	13, 25, 12
<	G	16
CTS	H	5
=	J	17
Universal switch	K	15
SET	L	19
+12 V	M	11
ensure a low-ohm connection between shielding and plug housing		

Cabling Diagram (Adapter cable – round – DB25 for Scale)

Female Interface Connector:

25-position D-Submini DB25S with screw lock hardware
Pin labeling of the 25-position D-SUB connector:



Front view of the connector

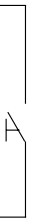
Male Connector Used:
(please use connectors with the same specifications)

25-pin D-Submini DB25, with integrated shielded cable clamp assembly (Amp type 826 985-1C) and fastening screws (mate screws for female screw lock, Amp type 164 868-1)

Note for use with commercially available RS-232 cable:
RS-232 cables purchased elsewhere often have pin assignments that differ from those of Sartorius connecting cables. Always check the cabling diagrams of the equipment used before installation, and disconnect any lines that have inappropriate assignments (e.g. pin 6). Failure to do so may result in faulty functioning or even irreparable damage to your scale or the connected peripheral devices.

Pin Assignment:

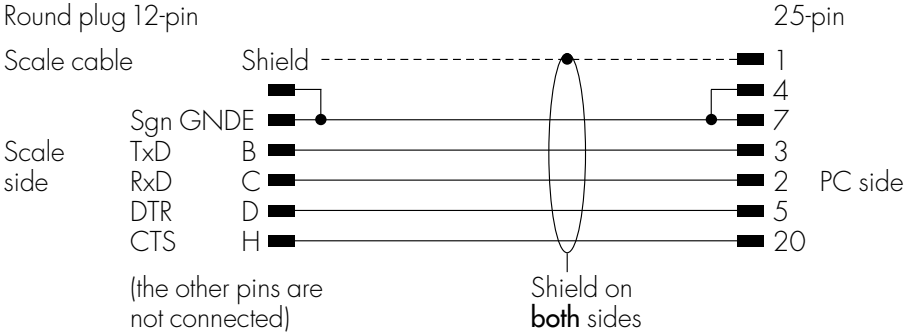
Pin 1: Shield
Pin 2: Data Output (TxD)
Pin 3: Data Input (RxD)
Pin 4: Not Connected
Pin 5: Clear to Send (CTS)
Pin 6: Internally Connected
Pin 7: Internal Ground (GND)
Pin 8: Internal Ground (GND)
Pin 9: Not Connected
Pin 10: Not Connected
Pin 11: +12 V
Pin 12: +5 V Connection for a switch
Pin 13: +5 V
Pin 14: Internal Ground (GND)
Pin 15: Universal Switch
Pin 16: <
Pin 17: =
Pin 18: >
Pin 19: SET
Pin 20: Data Terminal Ready (DTR)
Pin 21: Not Connected
Pin 22: Not Connected
Pin 23: Not Connected
Pin 24: Not Connected
Pin 25: +5 V



Cabling Diagram

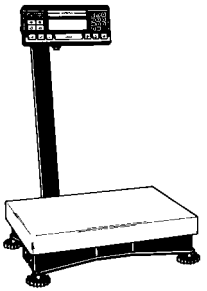
(Adapter cable – YCC03ISM5 – round – DB25-PC)
Diagram for interfacing a computer or a peripheral device to the scale using the RS-232C/V24 standard and interface cables up to 15 m (50 ft) long.

Cabling Diagram
Connection assignments for the cable from the QC scale to an RS-232 PC interface.

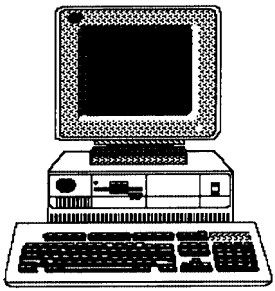


Scale

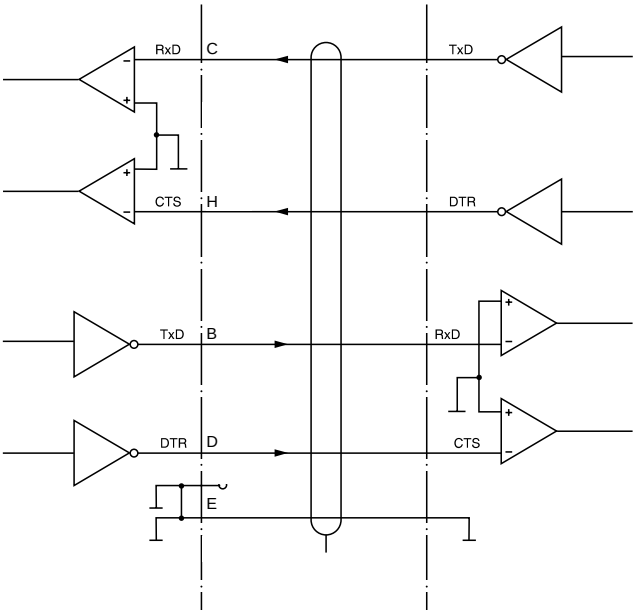
PC



V24



Female connector



	PC	
	25-pin	9-pin
RxD	2	3
CTS	20	4
TxD	3	2
DTR	5	8

Specifications

Model		QC34EDE-S	QC64EDE-S
Weighing range structure	kg	34	64
Readability	g	0.5	1
Reproducibility (standard deviation)	g	≤±1	≤±2
Linearity	g	≤±1	≤±2
Response time (average)	s	≤1.5	≤1.5

Model		QC7CCE-D	QC34EDE-D	QC64EDE-D
Weighing range I	kg	0.72	3.4	6.4
Weighing range II	kg	7.2	34	64
Readability range I	g	0.01	0.1	0.1
Readability range II	g	0.1	0.5	1
Reproducibility (standard deviation)	g	≤±0.2	≤±1	≤±2
Linearity	g	≤±0.2	≤±1	≤±2

Model		QC7CCE-S0CE	QC34EDE-S0CE	QC64EDE-S0CE
Type		DI BG 200	DN BG 200	DN BG 200
Accuracy class*		(II)	(II)	(II)
Weighing range	kg	7.2	34	64
Readability/scale interval d*	g	0.1	5	1
Verification scale interval e*	g	1	5	10
Selectable weight units	g, kg			
Minimum capacity	g	5	250	50
Operating temperature range	°C	–10°C – +30°C		

Model		QC34EDE-P
Weighing range I	kg	6
Weighing range II	kg	15
Weighing range III	kg	34
Readability range I	g	0.1
Readability range II	g	0.2
Readability range III	g	0.5
Reproducibility (standard deviation)	g	≤±1
Linearity	g	≤±1

* = EC Directive No. 90/384/EEC on non-automatic weighing instruments applies

Model		QC7CCE-L0CE	QC34EDE-L0CE	QC64EDE-L0CE
Type		DI BG 300	DN BG 300	DI BG 300
Accuracy class		(III)	(III)	(III)
Weighing range	kg	7.2	34	64
Readability/scale interval d*	g	2	10	20
Verification scale interval e*	g	2	10	20
Minimum capacity	g	40	200	400
Selectable weight units	g, kg			
Operating temperature range	°C	–10°C … +40°C		

Standard models (non verifiable) with stainless steel load plate

Model		QC150IGP-I	QC300IGP-I
Load plate dimensions	mm x mm	800 x 600	800 x 600
Maximum weighing capacity	kg	150	300
Lowest readability (d)	g	5	10
Preload	kg	74	150
Overload capacity	kg	300	600
Linearity	g	20	40
Repeatability	g	10	20
Net weight	kg	43	43
Dust and water protection according to DIN (German industrial standard)		IP65	IP65
Operating temperature range	°C	–10°C … +40°C	

Stainless steel models (non verifiable)

Modell		QC60FES-I	QC150FES-I	QC150IGS-I	QC300IGS-I
Load plate dimensions	mm x mm	500 x 400	500 x 400	800 x 600	800 x 600
Maximum weighing capacity	kg	60	150	150	300
Lowest readability (d)	g	2	5	5	10
Preload	kg	30	40	74	150
Overload capacity	kg	120	300	300	600
Linearity	g	8	20	20	40
Repeatability	g	4	10	10	20
Net weight	kg	15	15	43	43
Dust and water protection according to DIN (German industrial standard)		IP67	IP67	IP67	IP67
Operating temperature range	°C	–10°C … +40°C			

* = EC Council Directive 90/384/EEC on non-automatic weighing instruments; applies to the EU and Signatories of the Agreement on the European Economic Area

Model		QC7DCE-S	QC15DCE-S	QC35EDE-S	QC60FEG-S
Weighing capacity	kg	7.5	15	35	60
Readability	g	0.1	0.2	0.5	1
Repeatability (standard deviation)	g	±0.2	±0.4	±1	±2
Linearity	g	±0.2	±0.6	±1.5	±4
Response time (average)	s	≤1.5	≤1.5	≤1.5	≤1.5
Load plate size	mm	320×240	320×240	400×300	500×400

Model		QC65EDE-S	QC150FEG-S
Weighing capacity	kg	65	150
Readability	g	1	2
Repeatability (standard deviation)	g	±2	±4
Linearity	g	±5	±8
Response time (average)	s	≤1.5	≤1.5
Load plate size	mm	400×300	500×400

Model		QC7DCE-D	QC35EDE-D	QC35EDE-P	QC65EDE-D
Weighing range I	kg	0.75	3.5	6	6.5
Weighing range II	kg	7	35	15	65
Weighing range III	kg			35	
Range I readability	g	0.01	0.1	0.1	0.1
Range II readability	g	0.1	0.5	0.2	1
Range III readability	g			0.5	
Repeatability (standard deviation)	g	±0.2	±1	±1	±2
Linearity	g	±0.2	±1	±1	±2
Response time (average)	s	≤1.5	≤1.5	≤1.5	≤1.5
Load plate size	mm	320×240	400×300	400×300	400×300

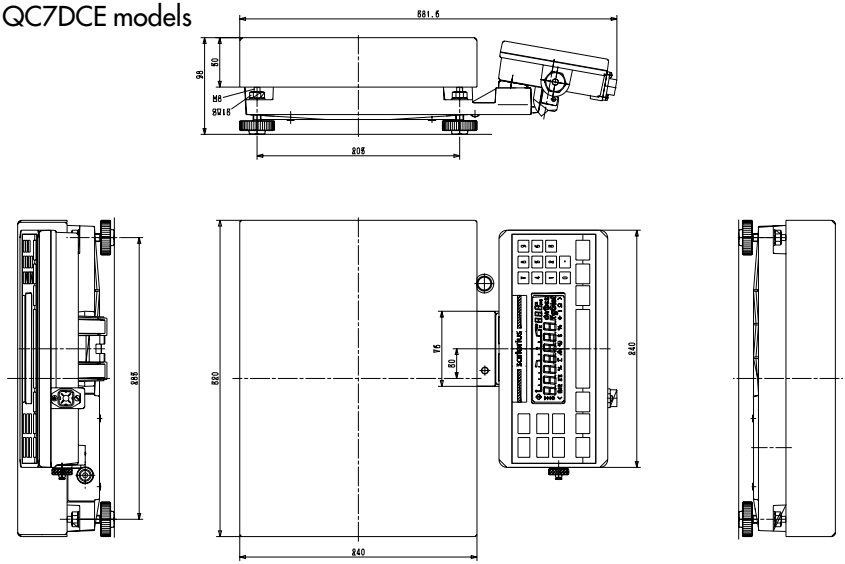
General Specifications

Load capacity (models QC 7, 35, 65)		14 kg	70 kg	130 kg
Display update (depends on the filter level selected) and data printout/ record rate interface	s	0.1–0.4		
Ambient temperature range*	K	273...313 (0...+40°C)		
Operating temperature range*	°C	10°C–30°C		
Sensitivity drift* within 283...303K	/K	$\leq \pm 6 \cdot 10^{-6}$	$\leq \pm 10 \cdot 10^{-6}$	$\leq \pm 10 \cdot 10^{-6}$
Dust protection/splash-down protection acc. IEC 529		IP 65 (display unit and scale)		
Pan size (models QC 7, 35, 65)	mm	265x215	417x307	417x307
Net weight (models QC 7, 35, 65)	kg	5.5	11	11
Selectable weight units*		g, kg, ct, lb, oz, ozt, tlh, tls, tlt, GN, dwt, /lb, tlc, mom, K, tol, bat, MS		
Selectable application programs		Counting; tare memory; checkweighing; totalizing, memory, records/printouts		
Automatic zero-tracking function		Standard feature		
Bulit-in interface		RS-232 C-S/V24-V28, RS-423/V10; 7-bit; parity: even, mark, odd, space; transmission rate: 150...19,200 baud; 1 or 2 stop bits, software/hardware handshake		
AC power source power requirements	V~	via AC adapter 230 or 115, –20%...+15%		
Frequency	Hz	48–63		
Power consumption (average)	VA	10		
Standard features/equipment supplied:				
Dust cover with plastic protective keypad		x	x	x
Display unit		x	x	x
AC adapter		x	x	x
Allen wrench 2.5 mm (QC 35, 65)			x	x
Allen wrench 4 mm (QC 35, 65)		x	x	x
Screwdriver (QC 35, 65)			x	x
Operating manual with brief instructions		x	x	x

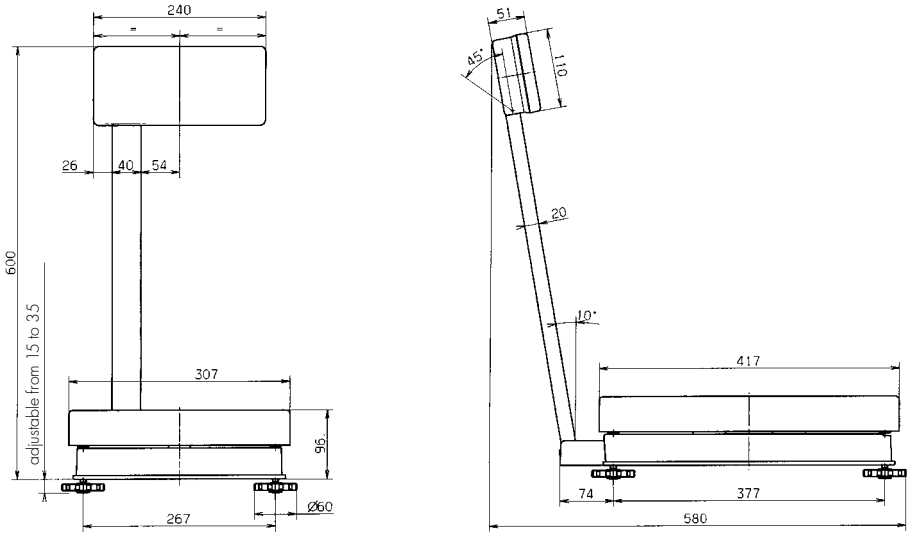
* not valid for 0CE devices

Dimensions (Scale Drawings)

QC7DCE models

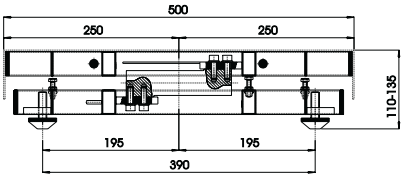


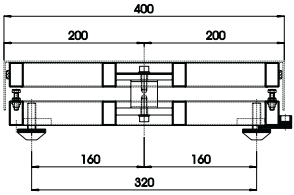
QC34EDE-S, QC64EDE-S, -D, -P and -S0CE/-L0CE models

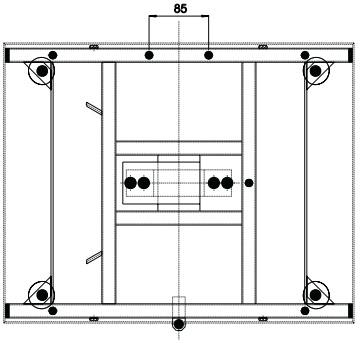


Note: All dimensions in millimeters.

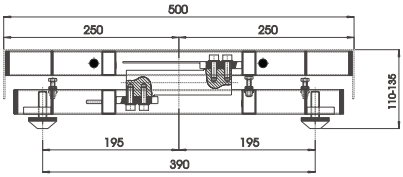
For painted scales: QC150IGP-I, QC300IGP-I and -L0CE models

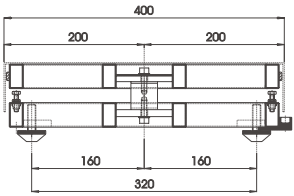


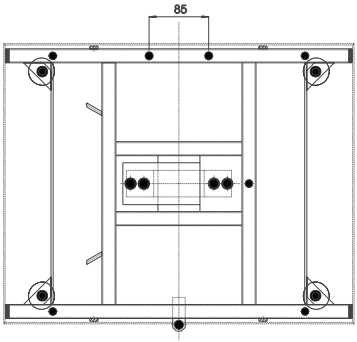




For stainless steel scales: QC60FES-I, QC150FES-I and -L0CE models



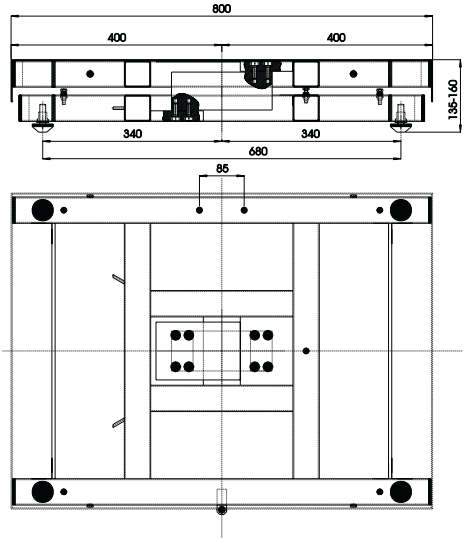


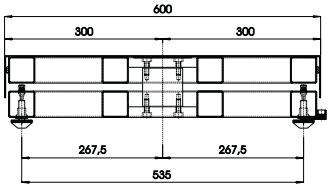


Note: All dimensions in millimeters.

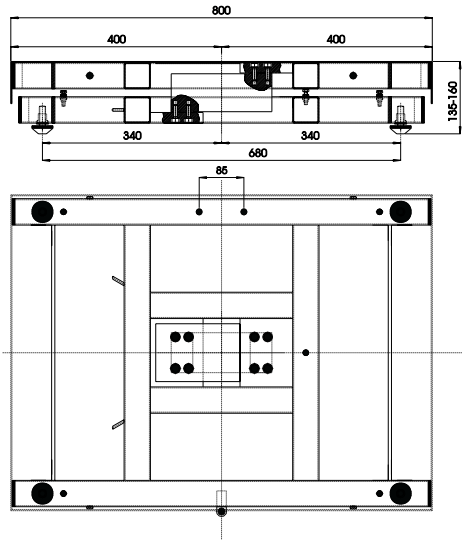
Dimensions (Scale Drawings)

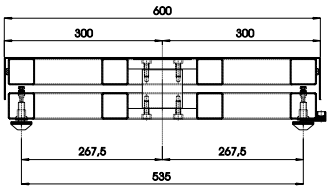
For painted scales: QC150IGP-I, QC300IGP-I and -L0CE models





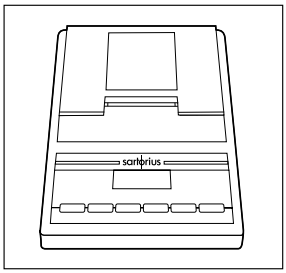
For stainless steel scales: QC150IGP-I, QC300IGS-I and -L0CE models



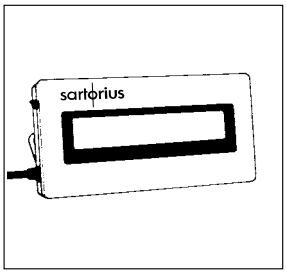


Note: All dimensions in millimeters.

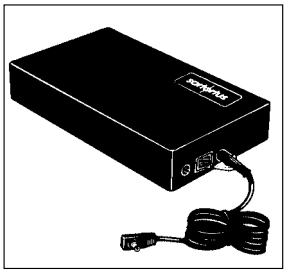
Accessories (Options)



Data Printer with date/time, statistical evaluation of data; Print speed approx. lines/sec. 1.5 Printer pan size (W x D x H) in mm 150x138x43	YDP 03-0CE*
Paper rolls, 5 units, 50 m each/ 164 feet (spare part)	6906937
paper rolls, 5 units, 14 m each/ 50 feet (spare part)	6906920
Ink ribbon for printer (spare part)	6906918

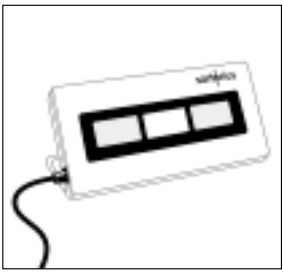


Remote display (can be connected via the interface port)	
– reflective	YRD 12 Z*
– transmissive (for overhead projectors)	YRD 13 Z*
Hand switch for remote control	YHS01*
Weight fork for knob weights	
(5 kg)	YAW 44
(10 kg	YAW 51
Connecting cable between QC interface (display unit) and isi industrial terminal	YCC01-04ISM3



External battery pack; hours of operation, approx. 28 h (rechargable for AC adapter)	YRB06Z
Adapter cable for use with car battery (12 V) or external supply. Connection: Hirschmann male connector	YCC01-0010M3

* Only in combination with adapter cable YCC01-0016M3



Display holder	YDH 01TS
Dust cover with insert cards	6960iB01
AC adapter STNG6-2, EURO	6971886
AC adapter STNG6-2, GB	6971888
Table AC adapter (IP-65 protection) ING-2	6971899
Gasket for AC plug, secondary (spare part)	6971915
Foot screw (QC7CCE-S) (spare part)	69QC0004
Foot screw (QC34EDE-S, QC64EDE-S) (spare part)	69QS0054
3 segment external checkweighing display RED – GREEN – RED incl. T-connector	YRD 11Z*
Connecting cable for use with Sartorius equipment (round male connector acc. RS-232-DB25) Standard interface MP8/MC1 (3 m/118 inches)	YCC01-0016M3
Connecting cable for use with a PC Round male connector acc. PC-DB25 (5 m/197 inches)	YCC01-03ISM5
Extension cable (Round male connector/round female connector IP65) (6 m/236 inches)	YCC01ISM6
Adapter cable PC 25 pol. D-Sub/ PC 9 pol. D-Sub (0.2 m). Only in combination with connecting cable YCC01-03ISM5!	6965619
Round connector, 12-pin (IP 65 protection)	69 QC0010
Round connector, 12-contact (IP 65 protection)	69 QC0011
Protective cap for data interface port (spare part)	69QS0062

* Only in combination with adapter cable YCC01-0016M3

Painted drive-on ramp: 1200 x 800 mm (L x W)	**YAR01IWA**
Stainless steel drive-on ramp: 1200 x 800 mm (L x W)	**YAR05IWA**
Set of stainless steel floor fasteners (2 fastening plates, 4 special dowel screws)	**YFP01I**

External standard calibration weights:

For models:	Accuracy class (OIML R111)	Weight in kg	Order no.
QC7CCE-S	F1	1 x 5	**YCW 654-00**
QC34EDE-S	F1	1 x 10	**YCW 713-00**
QC64EDE-S	F1	2 x 10	**YCW 713-00**
QC5DCE-S	±25 mg	1 x 5	**YSS 653-00**
QC7DCE-S	±25 mg	1 x 5	**YSS 653-00**
QC7DCE-D	±25 mg	1 x 5	**YSS 653-00**
QC15DCE-S	±25 mg	1 x 5	**YSS 653-00**
QC35EDE-S	F1	1 x 10	**YCW 7138-00**
QC35EDE-D	F1	1 x 10	**YCW 7138-00**
QC35EDE-P	F1	1 x 10	**YCW 7138-00**
QC60FEG-S**	F1	2 x 10	**YCW 7138-00**
QC65EDE-D**	F1	2 x 10	**YCW 7138-00**
QC65EDE-S**	F1	2 x 10	**YCW 7138-00**
QC150-FEG-S**	M1	1 x 50	**YCW 7559-00**

** Sartorius offers you external calibration service for your equipment.

BalanceReader software for collecting data that are transmitted by your Sartorius balance to a commercially available personal computer. These data are read into spreadsheets and stored. The stored spreadsheets can be further processed using commercially available standard software (Excel, Lotus 1-2-3, etc.). This applications kit includes the following software and equipment: – 3½" and 5¼" program diskettes – program description – interface cable – adapter (25-pin to 9-pin)	YAK 10 PC-0002*
SartoWedge data transfer software program incl. connecting cable (scale/PC) enables you to have data, recorded by your Sartorius scale/balance, input directly into any application program you are running on your PC (DOS or Windows).	YSW01*
Universal remote control switches with menu code definable ⊙/PRINT key, →0/T←/ZERO/TARE key, ⚖/COUNT/WEIGHT key, →PT/PRESET TARE key, →R/A/AV.PIECE WEIGHT key, →◈/PRESET TARGET key, →Σ/ACCUM. + key functions, (selectable in the operating menu)	
Foot switch	7223*
Foot switch with T-connector	YPE 01 Z*
Hand switch with T-connector	7226*
T-connector	7258*
Rolls keeping device with 7 rolls (for QC34/64)	YRT01IB-0001
Display holder for table installation (max. 1.5 m/59 inches distance to the scale)	YDH 01TS
IP 65-protected AC table adapter (3 m/118 inches primary cable, 1.5 m/59 inches secondary cable)	69 71899
Below balance weighing device (only for models QC34EDE-S and QC64EDE-S)	YSH 01IB

For further information about the use of your scale and/or the spare parts, please contact one of our local Sartorius service center, office or dealer.

* Only in combination with adapter cable YCC01-0016M3

Index

Brief Instructions for QC Counting Scales

Key Functions

Key	Function
I/⏻ / ON/OFF	Turns the scale on and off
CF / CLEAR	Clears functions
i / INFO	Information
→0/T← / ZERO/TARE	Zeros the display
/ COUNT/ WEIGHT	Toggles between weighed value and percentage
/ PRINT	Outputs data (prints)
/ AVPIECE WEIGHT	**Application programs:** Counting,
/ PRESET TARE	Tare memory,
/ ACCUM +	Totalizing memory,
/ ACCUM RECALL	Data output – total readout mode,
/ PRESET TARGET	Checkweighing,
ID / ID	ID,
/ RECALL/ STORE	Memory

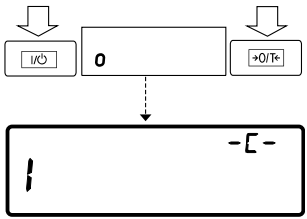
Simple Weighing

- Press →0/T← / ZERO/TARE to zero the display
- Press →0/T← / ZERO/TARE or → PT / PRESET TARE to tare the container on the pan
- Place sample/object on the pan/in the container
- Wait until the stability symbol "g/kg" is displayed; then read off the weight

Setting a Menu Code

Turn off the scale; then turn it back on. While all segments are displayed, briefly hold down →0/T← / ZERO/TARE.

"1" and "-C-" appear in the user guide display.
(If "-L-" appears, set the menu code 8 1 1.)

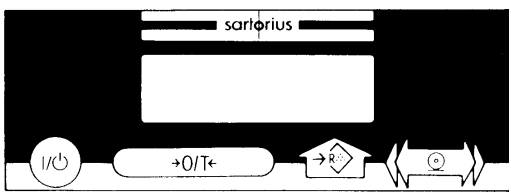


To select a menu code, press →R← / AVPIECE WEIGHT (increases a number in increments) and ⊙ / PRINT (advances to the next number). (see diagram)

Press →0/T← / ZERO/TARE to confirm your selection.

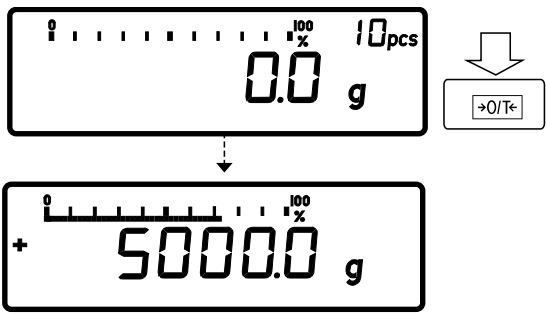
Press ⊙ / PRINT to move to the first number on the left

Hold down →0/T← / ZERO/TARE for 2 seconds to store the menu code change(s)



External adjustment/ calibration (code 1 9 1)
External linearization (code 1 9 5)
Unload weighing pan.
Tare the scale.
Press →0/T← / ZERO/TARE: 0.0 g or 0 kg.

Press →0/T← / ZERO/TARE and hold for 2 seconds:



Place required weight on the pan: 5 kg/10 kg
(for the required weight, see "Specifications" in the manual).

Menu Code Settings at a Glance

These charts summarizing the menu parameters are intended to give you a quick-reference guide.

The most important menu codes for the weighing mode:

Amb. conditions	Code
Very stable	1 1 1
Stable	1 1 2*
Unstable	1 1 3
Very unstable	1 1 4

Weighing/filling	Code
Std. weighing	1 2 1*
Filling	1 2 2

Stability range

When the stability symbol is displayed, the weight readout is stable within the defined range.

	Code
0.25 digit	1 3 1
0.5 digit	1 3 2
1 digit	1 3 3
2 digit	1 3 4*
4 digit	1 3 5
8 digit	1 3 6

Stability symbol delay	Code
No delay	1 4 1
Short delay	1 4 2*
Long delay	1 4 3
Extremely long delay	1 4 4

Auto Zero	Code
On	1 6 1*
Off	1 6 2

* = factory setting, model QC34

** = factory setting, model QC64

Note:

The only difference between the two models is the factory-set menu code for the weight unit.

Weight units

	Range	Code
Grams (o)	1 7 1	
Grams	1 7 2	*
Kilograms	1 7 3	**
Carats	1 7 4	
Pounds	1 7 5	
Ounces	1 7 6	
Troy ounces	1 7 7	
Hong Kong taels	1 7 8	
Singapore taels	1 7 9	
Taiwanese taels	1 7 10	
Grains	1 7 11	
Pennyweights	1 7 12	
Parts/pound	1 7 14	
Chinese taels	1 7 15	
Mommes	1 7 16	
Austrian carats	1 7 17	
Tola	1 7 18	
Baht	1 7 19	
Mesghal	1 7 20	

Display Modes

Highest possible accuracy	Code 1 8 1*
Last numeral blanked when load changes	1 8 2
Rounding factor 1	1 8 3
Rounding factor 5	1 8 4
Rounding factor 10	1 8 5
1% accuracy	1 8 6
0.5% accuracy	1 8 7
0.2% accuracy	1 8 8
0.1% accuracy	1 8 9
0.05% accuracy	1 8 10
0.02% accuracy	1 8 11
0.01% accuracy	1 8 12
PolyRange function	1 8 13

Adjustment/Calibration and Linearization Functions

	Code
External calibration	1 9 1*
External linearization	1 9 5
Calibration function locked	1 9 7

Application Programs

Counting

	Code
→0← / AV.PIECE WEIGHT key blocked	2 1 1
Counting	2 1 4*

Tare memory

	Code
→T← / PRESET TARE key blocked	2 2 1
Tare input memory	2 2 2
Tare input memory auto.	2 2 3*

Clearing the stored reference weight/value

	Code
CF / CLEAR clears all stored values	2 4 1
CF / CLEAR selec. clearing	2 4 3*

Number keys

	Code
Number keys 0–9 – blocked	2 5 1
Accessible	2 5 2*

Checkweighing

	Code
⊕/⊖ / PRESET TARGET key blocked	2 6 1
Net checkweighing	2 6 2*
Diff. checkweighing	2 6 3

* = factory setting

Totalizing

	Code
→0← / ACCUM + and ⊕/⊖ / ACCUM RECALL keys blocked	2 7 1
Totalizing	2 7 2*

Individual data ID

	Code
ID / ID key blocked	2 8 1
ID / ID function Accessible	2 8 2*

Memory

	Code
⊕/⊖ / RECALL/STORE key blocked	2 9 1
⊕/⊖ / RECALL/STORE function Accessible	2 9 2*

Storage of the reference weight/value

	Code
Acc. to the display acc.	3 5 2*
10-fold higher resolution	3 5 3
100-fold higher resolution	3 5 4

Average pieceweight output

	Code
Blocked	3 9 1*
Store by pressing →0← / AV.PIECE WEIGHT	3 9 2

Accuracy test	Code
None	
(min. load 1 increment)	3 10 1*
99.0% (100 incr.)	3 10 2
99.5% (200 incr.)	3 10 3
99.8% (500 incr.)	3 10 4
99.9% (1000 incr.)	3 10 5

Criterion for storing ref. weight and tare value	Code
At stability	3 11 1*
At "increased" stability	3 11 2

Reference optimizing	Code
Blocked	3 12 1
Manual	3 12 2
Automatic	3 12 3*

Forced print when → / ACCUM. is pressed	Code
Printout is output	3 13 1
Blocked	3 13 2*

Checkweighing	Code
Printout is output	4 2 1
Blocked	4 2 2*

Control through control lines	Code
Only in check range	4 3 1
Always	4 3 2*
Only at stability in check range	4 3 3
Only at stability	4 3 4

Data Interface	
Baud rate	Code
150 baud	5 1 1
300 baud	5 1 2
600 baud	5 1 3
1,200 baud	5 1 4*
2,400 baud	5 1 5
4,800 baud	5 1 6
9,600 baud	5 1 7
19,200 baud	5 1 8

Parity	Code
Mark	5 2 1
Space	5 2 2
Odd	5 2 3*
Even	5 2 4

Number of stop bits	Code
1 stop bit	5 3 1*
2 stop bits	5 3 2

Handshake mode	Code
Software	5 4 1
Hardware w/2 characters	5 4 2*
Hardware w/1 character	5 4 3

* = factory setting

Utilities

Data output	Code
W/out stability	6 1 1
After stability	6 1 2*
At stability	6 1 3
Auto w/o stability	6 1 4
Auto after stability	6 1 5

Autoprint

	Code
Stop/start using key	6 2 1
Not stoppable	6 2 2*

Autoprint interval after

	Code
1 display update	6 3 1*
2 display updates	6 3 2
5 display updates	6 3 3
10 display updates	6 3 4
20 display updates	6 3 5
50 display updates	6 3 6
100 display updates	6 3 7

Automatic Tare

	Code
No automatic taring	6 4 1*
Auto tare when [⊙]/[PRINT] is pressed	6 4 2
Auto tare when [→0←]/[ACCUM.] is pressed	6 4 3

Output of Application Parameters

	Code
Off	7 1 1*
All parameters	7 1 2

Data ID Code

	Code
Without	7 2 1
With	7 2 2*

Auto output of the tare memory data

	Code
Last net value	7 3 1*
Tare memory data (total)	7 3 2

Data Output with Time + (ID)

	Code
No output	7 4 1
Output date & time	7 4 2
Output article ID no.	7 4 3
Output article no., date & time (only with YDP03-0CE)	7 4 4*

* = factory setting

Record Header (Your Co. Name)

Output of header lines 1 and 2	Code
No output	7 5 1
Output 1st header line	7 5 2
Output 2nd header line	7 5 3
Output both header lines	7 5 4*

Output of "wRef" and "nRef"

Output: in record/printout	Code
No output	7 6 1
Piece count "nRef"	7 6 2
Avg. piece weight "wRef"	7 6 3
Piece count "nRef" and piece weight "wRef"	7 6 4*

Output: Net/Tare/Gross/ Counting Result

Output: in record/printout	Code
Net value or piece count	7 7 1
Net val. and piece count	7 7 2
Net/tare comp./gross or counting result	7 7 3
Net/tare comp./gross and counting result	7 7 4*

Line Feed

	Code
No line feed	7 8 1
Line feed – 1 line	7 8 2
Line feed – 2 lines	7 8 3
Line feed – 3 lines	7 8 4*

Additional Functions

Menu access	Code
Accessible "-C-" in display	8 1 1*
Blocked "-L-" in display	8 1 2

Acoustic Signal (Beep Tone)

	Code
On	8 2 1*
Off	8 2 2

Key Functions

	Code
Accessible	8 3 1*
Blocked	8 3 2

Universal Switch

	Code
I/⏻ / PRINT key	8 4 1*
→0/T← / ZERO/TARE key	8 4 2
⚖ / COUNT/WEIGHT key	8 4 3
→ / PRESET TARE key	8 4 4
→ / %/PIECE/WEIGHT key	8 4 5
→ / PRESET TARGET key	8 4 6
→ / ACCUM. + key	8 4 7
Blocked	8 4 8

Power-on Mode

	Code
I/⏻ / ON/OFF key active, electronics on, display blank	8 5 1
I/⏻ / ON/OFF key active, electronics off, w/AC power: backlighting off after 2 min.	8 5 2*
I/⏻ / ON/OFF key active, electronics on, display blank, w/battery power: auto shut-off off after 2 min.	8 5 3
Auto shut-off after 2 min.	8 5 4

Display Backlighting

	Code
On	8 6 1
Off	8 6 2
Auto shut-off after 2 min	8 6 3*

Automatic Power – Down of Scale

	Code
On	8 7 1
Off	8 7 2*

Reset Function

This function enables you to reset all menu codes back to the original factory settings, which are identified here by an "*".

Reset function	Code
On	9 – – 1
Off	9 – – 2*

*= factory setting

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