Operating Instructions

Quantos Automated Dosing

Powder Module
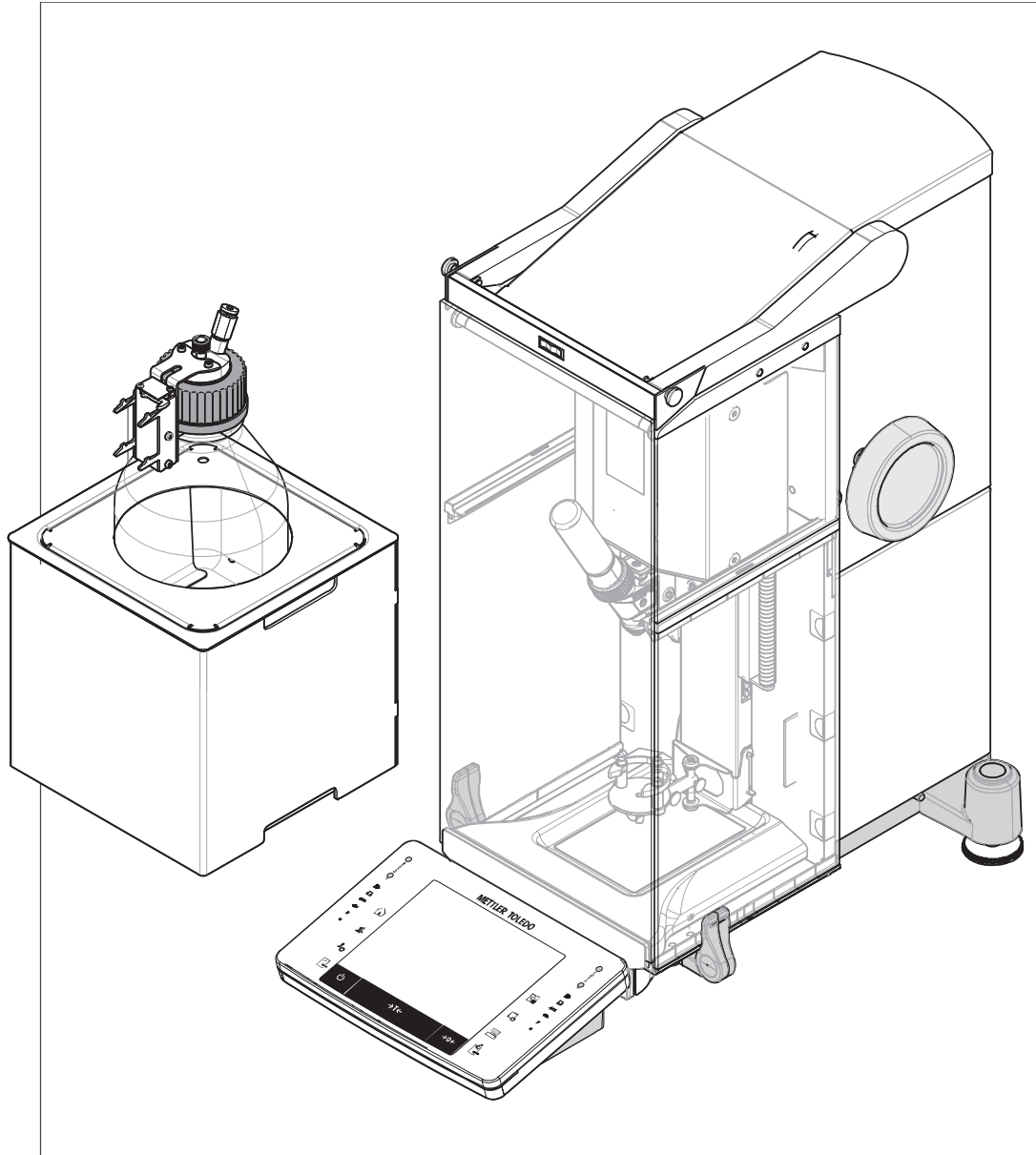
METTLER TOLEDO

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1 Introduction

Thank you for purchasing the Quantos dosing system.

Quantos is based on the renowned and reliable XPE series balances from METTLER TOLEDO. Besides the highly accurate dosing capabilities and ease of use, the Quantos provides connectivity to a variety of peripheral devices (e.g. barcode readers, label printers), and to a host computer.

This chapter contains basic information about the Quantos. Please read this chapter carefully, even if you already have experience with dosing systems or analytical balances.

Firmware version

The operating instructions are based on the initially installed terminal firmware (software) version V 2.00.

Finding more information

▶ www.mt.com/quantos

1.1 Conventions and symbols used in these operating instructions

For better readability the **Quantos Dosing System** is further referred to as **instrument**.

Key designations are indicated by a picture or text in square brackets (e.g. [🖨] or [**Printer**]).

These symbols indicate an instruction:

- prerequisites
1 steps
2 ...
⇨ results

2 Safety Information

2.1 Definition of warnings and symbols

Signal Words

WARNING	for a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.
CAUTION	for a hazardous situation with low risk, resulting in damage to the device or the property or in loss of data, or minor or medium injuries if not avoided.
Attention	(no symbol) for important information about the product.
Note	(no symbol) for useful information about the product.

Symbols

General hazard

Electrical shock

Inflammable or explosive substance

Explosion

2.2 Product specific safety notes

Always operate and use your instrument only in accordance with the instructions contained in this manual. The instructions for setting up your new instrument must be strictly observed.

If the instrument is not used according to these Operating Instructions, protection of the instrument may be impaired and METTLER TOLEDO assumes no liability.

Intended Use

Your Dosing System is used for weighing and dosing powder or liquid samples. Use the instrument exclusively for this purpose. Any other type of use and operation beyond the limits of technical specifications without written consent from Mettler-Toledo AG, is considered as not intended.

It is not permitted to use the instrument in explosive atmosphere of gases, steam, fog, dust and flammable dust (hazardous environments).

> ⚠ **CAUTION**
>
> **Damage of device**
>
> – For use only in dry interior rooms.
>
> – Do not open the instrument: It does not contain any parts which can be maintained, repaired, or replaced by the user. If you ever have problems with your instrument, contact your METTLER TOLEDO dealer.
>
> – Use only instrument accessories and peripheral devices from METTLER TOLEDO; they are optimally adapted to your instrument.

⚠ CAUTION

Damage of Device

Use only the original universal AC adapter delivered with your instrument.

Certain samples require special care!

With certain types of samples, there is a possibility of danger to personnel or damage of property. Please note that the user always has the responsibility and liability for damage caused by use of any types of samples!

CAUTION — Fire or Explosion

- Flammable or explosive substances.
- Substances containing solvents.

1. In cases of doubt, perform a careful risk analysis.
2. Working temperature that is low enough to prevent the formation of flames or an explosion.
3. Wear protective glasses.

FCC / IC Statement

This device complies with Industry Canada licence-exempt RSS standard(s) and part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause interference, and
(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

3 Design and Function

3.1 Overview
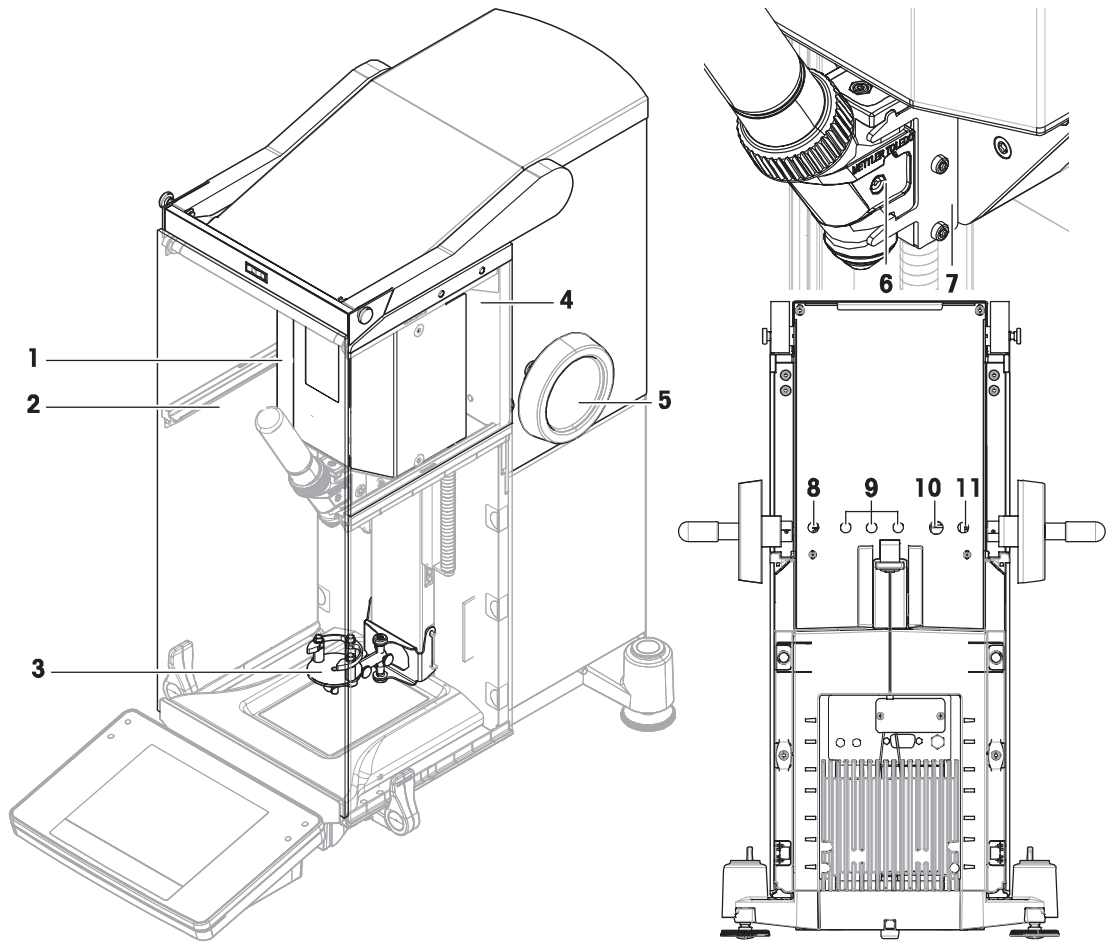
Powder module		Dosing head and backside	
1	Drive unit	**6**	Dosing head
2	Front door	**7**	Dosing head support
3	ErgoClip Quantos	**8**	Power supply cable (from AC adapter)
4	Upper side glass	**9**	Connector for autosampler and CAN devices
5	Head height adjustment handle	**10**	RS232C interface – cable to balance
		11	Power supply cable from powder module to balance

3.2 Dosing heads and equipment
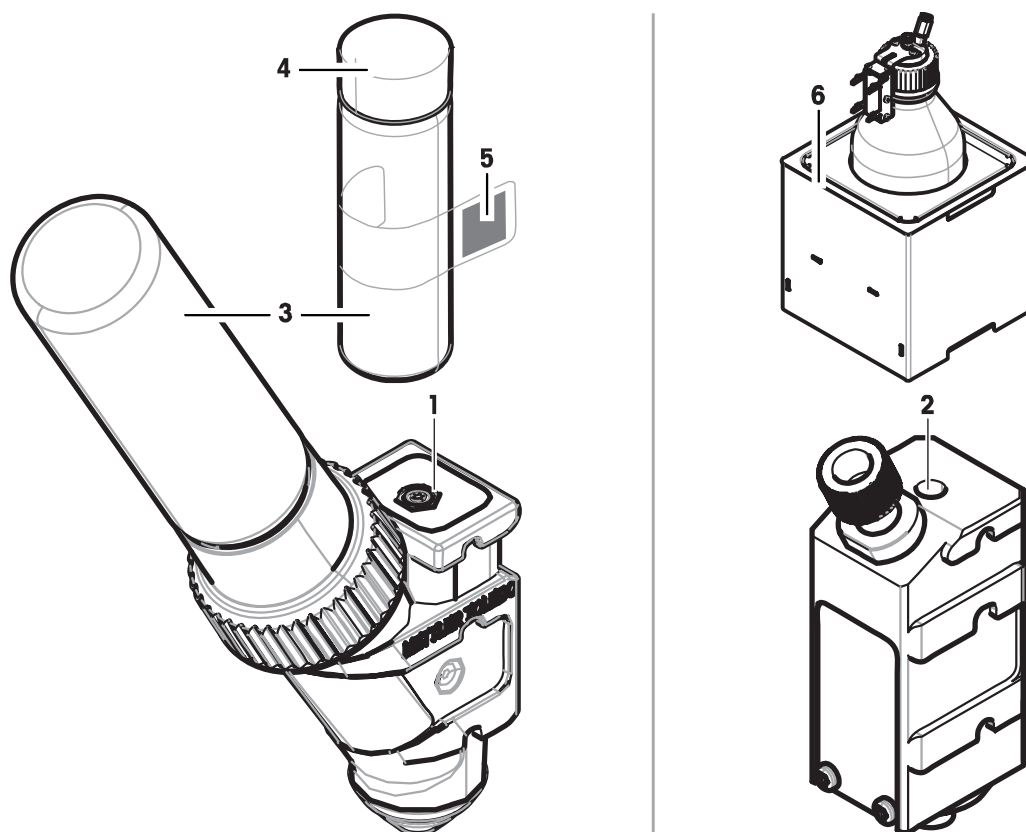
1	**Powder dosing head (QH008-BNMW)** This head is equipped with a powder storage container. This is the standard head for powder dosing.		
2	**Liquid dosing head (QL001)** This is the standard head for liquid dosing. It is used together with pump module and bottle (6).		
3	Sample vessel	5	Label containing the substance data
4	Cap for sample vessel	6	Pump module (QL2) with liquid bottle (QLL1000)

Powder dosing head

The dosing head is supplied in a plastic container. We recommend using this container when shipping a dosing head. The spare cap (4) included in the delivery may be used to seal the powder container (3) if you want to store it away from the head.

You can print a label (5) containing the powder data stored in the dosing head, affix this label to the powder container (3).

Manual dosing head

This head has no powder container and the user has to dispense the powder manually. It is reduced to a tag equipped with a RFID chip that allows to enter substance data and to print respective data. The head has no lifetime limit because it has no dosing mechanism.

Powder test head

This head is equipped with a powder storage container filled with $CaCO_3$ and a RFID with a test function. It dispenses automatically 10 times a certain mass and reports the results. Check the results of the typical values > **Repeatability (sd), fine range** automated operation and dosing time. If your instrument didn't pass the tests, inform a METTLER Service Technician.

MinWeigh dosing head

The MinWeigh dosing head performs a MinWeigh test automatically by placing a test weight on given tare weights. The procedure will be repeated 10 times to define the **MinWeigh**.

Functional description

As soon as a head is inserted, the instrument automatically reads the data of the head. In addition, the instrument performs automatic adjustments concerning the **Dosing steps**, automatic door operation and other instrument settings.

When no dosing head is installed the instrument will replace head-specific information with factory settings.

See also

▤ Technical Data [▶ 32]

3.3 Data stored in the dosing head's RFID

Every dosing head is equipped with a Radio Frequency Identification chip (RFID) (1) that can store and exchange data with the instrument.

The following data is stored in the RFID of the head:

- **User data**

  This block holds information about the substance such as the name of the substance, the filling and expiry dates, the quantity, etc. This data can be edited by the user at any time and it should be entered before using a new head for the first time to ensure proper functioning of the instrument's internal monitoring routines, and to have the data available for reports and labels.

- **Internal data**

  This block holds information about the remaining amount of substance left in the container. This block of data cannot be modified by the user.
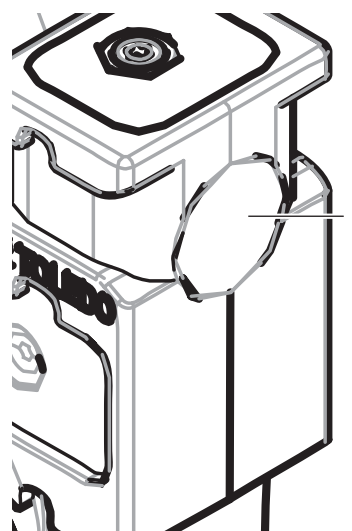
Note for powder

The counter for the remaining powder dosing cycles is based on the lifetime limit of the dosing head. With every dosing cycle started, the counter is decreased by 1. If the counter drops to zero, the head must be replaced. If the powder container of the old head still contains a considerable amount of powder, you may remove the powder container from the old head and screw it onto the new one. Just copy the user data and the powder content value from the old head to the new one.

If the remaining quantity of powder is insufficient for the next dosing cycle, a warning message will appear. You can unscrew and refill the powder container. Don`t forget to update the user data that the instrument works correctly.

4 Installation and Putting into Operation

Installation

Note

The instrument is installed by METTLER TOLEDO service engineers. This includes the wiring as well as the configuration of the interfaces and peripherals.

4.1 Scope of delivery

Powder module

- Powder module
- Front door (electro conductive inside)
- Set of upper side glasses for powder module
- Set of bolts for upper side glasses

- ErgoClip Quantos
- Front cover
- Type label (standard or approved balance), to be affixed to the powder module
- Dosing head starter kit

Recommended Options

- Ethernet Option
- Ethernet / RS232 (Netcom kit)
- AntiStatic kit
- Cable box

See also

- 📄 Accessories and Spare Parts [▶ 39]

4.2 Location

4.2.1 Selecting the location

Select a stable, vibration-free position that is as horizontal as possible. The surface must be able to safely carry the weight of a fully loaded instrument.
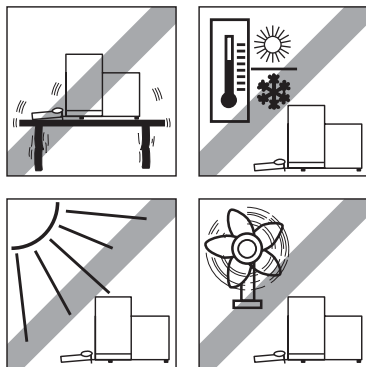
Observe ambient conditions.

Avoid the following:

- Vibrations
- Excessive temperature fluctuations
- Direct sunlight
- Powerful drafts (e.g. from fans or air conditioners)

See also

- 📄 Technical Data [▶ 32]

4.3 Assembling powder module

Note

The instrument is mounted and installed by a MT Service Technician.

4.4 Installing and removing dosing head

Installing dosing head

1 To open the front door, press key ⬚.

2 To open the side doors, press key ⬚.
   Note
   If you have an autosampler installed, these keys may have a
   different function. **See** Quantos Autosampler Operating
   Instructions for further information on the function of the
   keys.

3 Slide dosing head onto the dosing head support until it
   comes to a stop.

4 Press it down slightly until it is properly seated in the holding
   pins (1).
   Note
   The dosing head will be locked automatically, as soon as
   first dosing starts.

⇨ The dosing head is ready to dose.
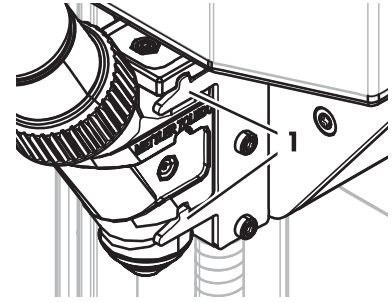
Removing dosing head

Once the dosing head has been locked, you have to unlock the head before removing it.

▪ Function key **Un/Lock** must be active.

1 Tap **Un/Lock**.

   ⇨ The dosing head is being unlocked.

2 Remove dosing head by pulling it outwards carefully.

4.5 Assembling pump module and bottle

> ⚠ **CAUTION**
>
> **Damage of Bottle because of high pressure!**
> If the bottle has to resist higher pressure than 1.5 bar (21 psi) it might get damaged.
> 1 Do not allow pressure higher than 1.5 bar (21 psi) in the bottle.
> 2 Wear protective glasses when working with the bottle.

– Mount pump module and bottle according to figure.
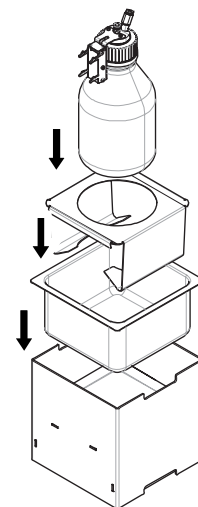
Inserting and removing liquid dosing head in and from the liquid dosing head support

1   Insert liquid dosing head in the liquid dosing head support.
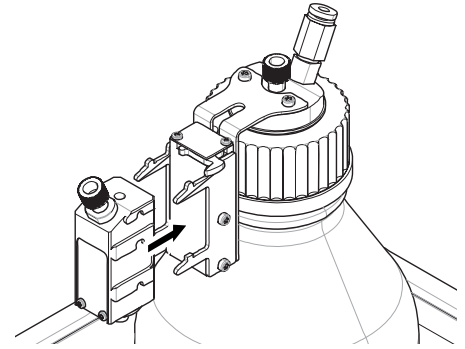
2   To remove liquid dosing head from the liquid dosing head
    support, pull the catch (1) to the front and remove liquid
    dosing head (2).
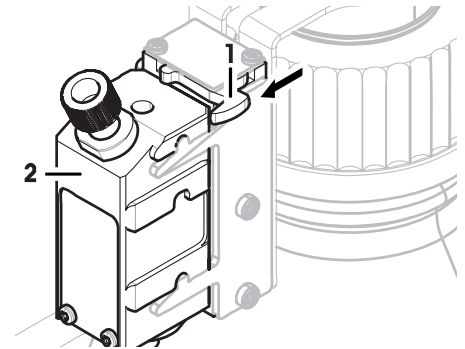
4.6 Connecting the tubes

Connectors of pump module
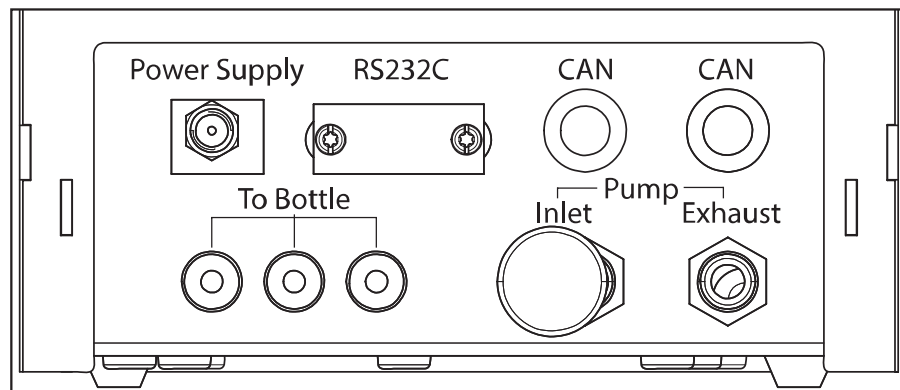
⚠ **CAUTION**

Dangerous liquids!
If you use toxic, explosive or flammable liquids, the exhaust air will be contaminated.
–   Use a tube for the exhaust air outlet.

⚠ **CAUTION**

High pressure!
If you feed pump with a protective gas with pressure higher than 0.2 bar (2.9 psi), the
pump module might get damaged.
1   Make sure the protective gas does not exceed the pressure range of 0.2 bar (2.9 psi).
2   Wear protective glasses when handling the protective gas.

Note
The thinner tube is used for transporting liquid from the bottle to the liquid dosing head. The slightly bigger tube is used for pumping air into the bottle. By adding air, pressure rises in the bottle. When pressure reaches min. 0.3 to max 0.5 bar (4.4 to 7.2 psi) the micro dispensing valve in the dosing head opens and liquid can ascend the liquid tube. The two tubes are further referred to as liquid tube and air tube.

- The liquid dosing head is inserted in the liquid dosing head support.

1 Connect liquid tube at bottle and at liquid dosing head.
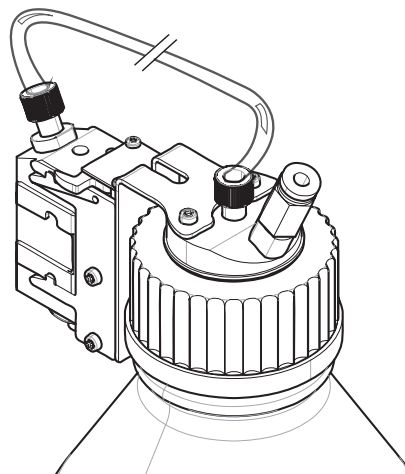
2 Connect air tube at bottle and at pump module.
   Note
   A tube in the air outlet to bottle opens the valve of the air outlet. Never leave a tube which is connected to the air outlet unconnected at the other end because pressure can not be built up.
   You can connect up to 3 bottles to the pump module. The instrument uses the liquid of the bottle, which is inserted in the pump module.
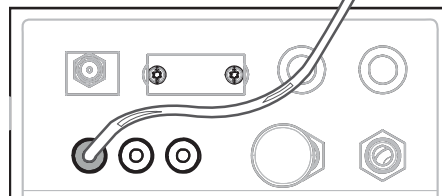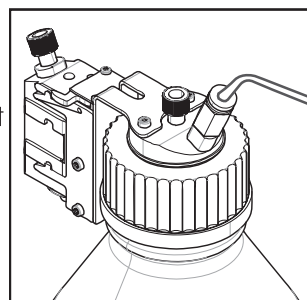
3 Insert muffle (1) into air inlet to absorb noise.

4 **WARNING Explosion hazard!**
   If you need to feed the pump with protective gas, e.g. nitrogen, make sure it does not exceed the pressure range of 0.2 bar (2.9 psi).
   Wear protective glasses.
   Do not insert muffle (1) but instead connect a tube to the air inlet.
   Note
   Outer tube diameter: 6 mm
   Pressure range: 0.1 ... 0.2 bar (1.5 ... 2.9 psi)
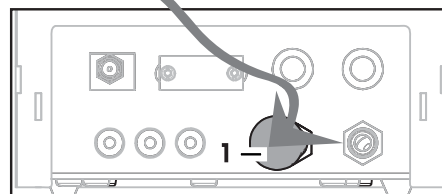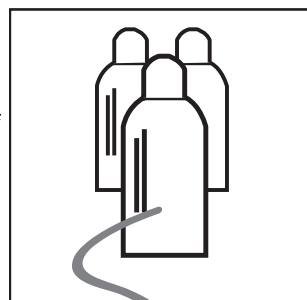
5 **WARNING Contaminated air!**
If you use toxic, explosive or flammable liquids, the exhaust air will be contaminated and the device can get damaged. Connect a tube to exhaust air outlet to absorb the air into a safe container.
Note
Outer tube diameter: 6 mm
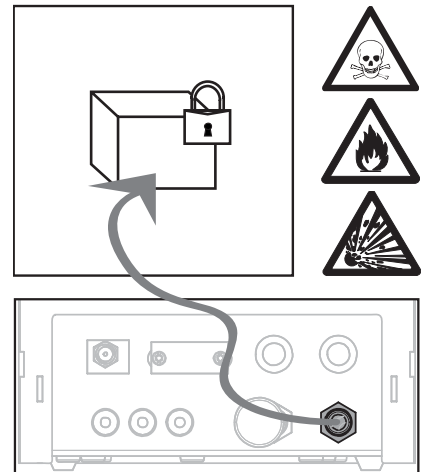
	NOTICE
	Damage on tube connectors because of mishandling!
	If the tubes are not removed correctly, the connectors and therefore the pump module can get damaged.
	– To remove tubes, press down ring on connector and pull out tube carefully.

5 Operation

5.1 Powder dosing

5.1.1 Basic operation settings

Note

If you dose powder for the first time, or after a master reset, check following settings:

- Dosing must be chosen as application: [⊞▪] > [**Dosing**]
- Powder module must be defined as mounted: [⌼] > **Powder module**... [**Define**] > [**Mounted**]
- RS232 device must be activated: [⊞▪] > [**System**] > [**Peripherals**] > **RFID / Quantos**...[**RS232 built-in**] > [**RS232 built-in**]
- If front door is used, front door must be defined as mounted: [⌼] > **Powder module**... [**Define**] > **Mounted**... [**Define**] > **Front door**... [**Define**] > **Front door**... [**Mounted**]
- If liquid module is mounted, liquid module must be defined as mounted: [⌼] > **Liquid module**... [**Define**] > [**Mounted**]

Configure your settings in the following menu:

Navigation: [⌼] > **Powder module**... [**Define**] > **Mounted**... [**Define**]

Note

Refer to your XPE Operating Instructions for further information on settings and parameters.

5.1.2 Working with powder module

If you touch [**Start**] with the liquid module, you get these options:

▶	[**Solution**]	To prepare a solution with defined concentration solid/liquid in **mg/g**.	**See** [Dosing solution ▸ 17]
	[**Solid dosing**]	To dose a powder.	**See** [Dosing powder ▸ 14]
	[**Liquid dosing**]	To dose a liquid.	**See** [Dosing liquid ▸ 16]
	[**Cancel**]	To return.	

See also

- Dosing liquid [▸ 16]
- Dosing solution [▸ 17]
- Dosing powder [▸ 14]

5.1.3 Dosing powder

Note

The following procedure is described according to the standard factory settings. You can customize or disable the settings in the following menu:

[⌼] > **Dosing steps**... [**Define**] > **Dosing steps (solid)**... [**Define**]

To recreate the standard factory settings, choose [**STD**].

Note

The **Dosing steps** of instruments equipped with accessories may slightly differ from the example below.

Note

To abort dosing procedure at any time, tap the cancel key [**C**].

The instrument then returns to the home screen.

- Powder dosing head is installed.
- Weighing pan is empty.
- ErgoClip is installed.

1 Tap [**Start**] > [**Solid dosing**].

2 Enter **User ID** and confirm with [**OK**].

3 **Note**
The **Sample ID** is not mandatory and the instrument does not check whether or not it is unique.
Enter **Sample ID** and confirm with [**OK**].

4 Enter the amount **Target quantity** [mg] required and confirm with [**OK**].

5 **Note**
To define appropriate tolerance for your **Target quantity**, **see** Target Quantities and Tolerances.
Entering 1% results in a tolerance range of +1%/–1%. For other possibilities **see** XPE Operating
Instructions.
Enter the **Tolerance** in percent and confirm with [**OK**].

6 Place sample vessel on weighing pan or ErgoClip and confirm with [**OK**].

⇨ The value at the bottom of the display shows the weight of the sample vessel.

7 **Note**
If SafePos is selected, there is no request to lower the dosing head. It will be lowered automatically as
soon as dosing starts.
Lower the position with the head height adjustment handle until dosing head is about 0.5 mm to 1 mm
above the sample vessel and confirm with [**OK**].

8 **Note**
To abort dosing during process, tap [**C**].
Check, if all necessary adjustments are completed:
To abort procedure, tap [**No**].
To start dosing, tap [**Yes**].

⇨ Pressure builds up.

⇨ Instrument doses liquid.

⇨ The results are being displayed.

9 To finish dosing process, confirm with [**OK**].

Congratulations, you have just successfully finished your first dosing!

See also

▤ Working with function SafePos [▶ 24]

5.2 Liquid dosing

5.2.1 Basic operation settings

Note

If you dose liquid for the first time, or after a master reset, check following settings:

- Dosing must be chosen as application: [⊞] > [**Dosing**]
- Liquid module must be defined as mounted: [⎗] > **Liquid module**... [**Define**] > [**Mounted**]
- Powder module must be defined as mounted: [⎗] > **Powder module**... [**Define**] > [**Mounted**]
- RS232 device must be activated: [⊞] > [**System**] > [**Peripherals**] > **RFID / Quantos**...[**RS232 built-in**] > [**RS232 built-in**]

Configure your settings in the following menu:

Navigation: [⎗] > **Liquid module**... [**Define**] > **Mounted**... [**Define**]

See XPE Operating Instructions for further information on settings and parameters.

5.2.2 Dosing liquid

Note

The following procedure is described according to the standard factory settings. You can customize or disable the settings in the following menu:

[⎗] > **Dosing steps**... [**Define**] > **Dosing steps (liquid)**... [**Define**]

To recreate the standard factory settings, choose [**STD**].

Note

To abort dosing procedure at any time, tap the cancel key [**C**].
The instrument then returns to the home screen.

- Liquid dosing head is installed.
- Weighing pan is empty.
- If required, ErgoClip is installed.

1   Tap [**Start**] > [**Liquid dosing**].

2   Enter **User ID** and confirm with [**OK**].

3   **Note**
The **Sample ID** is not mandatory and the instrument does not check whether or not it is unique.
Enter **Sample ID** and confirm with [**OK**].

4   Enter the amount **Target liquid [g]** required and confirm with [**OK**].

5   Place sample vessel on weighing pan or ErgoClip and confirm with [**OK**].

6   Lower position of dosing head until it is about 0.5 mm to 1 mm above the sample vessel and confirm with [**OK**].

7   **Note**
To abort dosing during process, tap [**C**].
Check, if all necessary adjustments are completed:
To abort procedure, tap [**No**].
To start dosing, tap [**Yes**].

    ⇨ Pressure builds up.

    ⇨ Instrument doses liquid.

    ⇨ The results are being displayed.

8   To finish dosing process, confirm with [**OK**].

Congratulations, you have just successfully finished your first dosing!

Note

- Bubbles in the tube do not impair the result, because the target result is weighed.
- If you dose liquids that might crystalize, clean the dosing head from time to time.

5.2.3 Dosing solution

Solution dosings work with a concentration **not** measured by volume [ml], but by weight [mg].

Concentration   To calculate the concentration (C):

C = mass of solid / (mass of solid + mass of liquid)

Dosing powder manually

If you have few solid samples you can leave the liquid dosing head installed.

Note
The following procedure is described according to the standard factory settings: [🔧] > **Dosing steps**...
[**Define**] > **Dosing steps (solution)**...[**Define**] > [**STD**]

- Liquid dosing head is installed.
- Weighing pan is empty.

1 Tap [**Start**] > [**Solution**] > [**Start manual dosing**].

2 Enter **Substance** and confirm with [**OK**].

3 Enter **Lot ID** of substance and confirm with [**OK**].

4 Enter **User ID** and confirm with [**OK**].

5 Enter **Sample ID** and confirm with [**OK**].

6 Enter **Concentration [mg/g]** and confirm with [**OK**].

7 Enter **Target solution [g]** and confirm with [**OK**].

8 Place sample vessel on weighing pan and confirm with [**OK**].

9 Dose manually the needed powder and confirm with [**OK**].

   ⇨ Dosing results are displayed.

10 Confirm results with [**OK**].

11 To start liquid dosing tap [**OK**].

   ⇨ Instrument doses liquid.

12 Cap vessel and confirm with [**OK**].

   ⇨ Dosing results are displayed.

13 Confirm results with [**OK**].

Dosing solution with pre-prepared solid

If you have sample vessels with already prepared solid e.g. a tablet you can leave the liquid dosing head installed.

Note
The following procedure is described according to the standard factory settings: [🔧] > **Dosing steps**...
[**Define**] > **Dosing steps (solution)**...[**Define**] > [**STD**]

- Liquid dosing head is installed.
- Mass of solid is known.
- Weighing pan is empty.

1 Tap [**Start**] > [**Solution**] > [**Enter predosed quantity**].

2 Enter the weight of the pre-dosed solid in **Enter predosed quantity** and confirm with [**OK**].

3 Enter **Concentration [mg/g]** and confirm with [**OK**].

4 Enter **Substance** and confirm with [**OK**].

5 Enter **Lot ID** of substance and confirm with [**OK**].

6 Enter **User ID** and confirm with [**OK**].

7 Enter **Sample ID** and confirm with [**OK**].

8 Place sample vessel on weighing pan and confirm with [**OK**].

9 **Note**
   To abort dosing during process, tap [**C**]
   Check, if all necessary adjustments are completed:
   To abort procedure, tap [**No**].
   To start dosing, tap [**Yes**].

   ⇨ Pressure builds up.

   ⇨ Instrument doses solid.

10 Cap sample vessel and confirm with [**OK**].

   ⇨ The results are being displayed.

11 To finish dosing process, confirm with [**OK**].

5.2.4 Releasing pressure

If you need to release the pressure in e.g. the bottle, switch off the instrument.

Switching Off

– Press [⏻] until **Off** appears in the display.

Note
Do not disconnect the instrument from the power supply except if you will not be using the instrument for an extended period.

5.2.5 Handling of bottle

Changing a bottle

If you have more than one bottle equipped with cap and dosing head:

▪ Pressure is released.

1 Install dosing head on dosing head support at the bottle.

2 Unplug air tube by pressing ring (1) down and pulling tube (2) out carefully at the same time.

3 To seal the bottle, insert pin into air tube fitting.

4 Take the new bottle.

5 Connect air tube to new bottle.

6 To continue dosing with the new bottle, install dosing head.
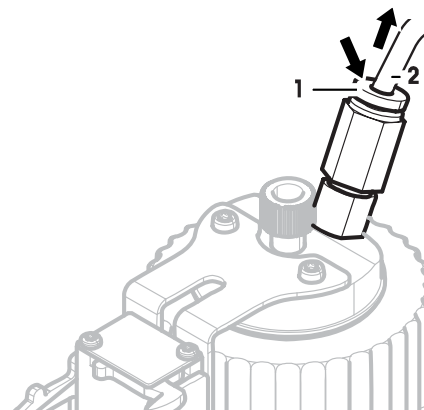
Filling bottle

The Inline frit filter has to be covered with liquid at all times.
Before the inline frit filter gets dry, refill the bottle.
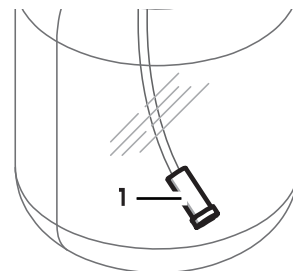
- Pressure is released.
1   Unscrew regular cap.
2   Fill in the liquid. (max. is shown on bottle e.g. 1000 ml)
    Note
    Do not exceed the maximum. The air above the liquid is
    necessary for dosing.
3   Screw on cap.
4   Check that the cap is tight.
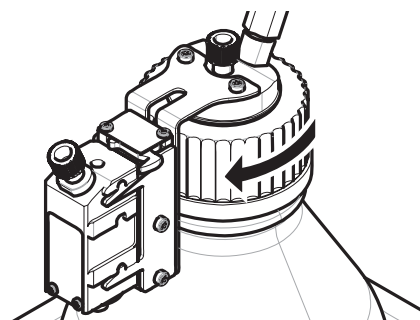
Changing the liquid of bottle

You have just one cap with dosing head and want to change the liquid:
- Pressure is released.
1   Unplug air tube.
2   Unscrew regular cap.
3   Unscrew inner PEEK nut.
4   Change the inner tube and the inline frit filter.
5   Screw the regular cap on new bottle.
6   Check that the cap is tight.
7   Connect air tube to new bottle.
8   Purge the contaminated external tube.

See also

🗎   Cleaning the liquid module [▶ 27]

5.3   Handling of dosing heads

This chapter provides some in-depth information about the dosing heads and explains how to prepare a
new head for operation.

5.3.1   Displaying dosing head information

The menu [**Info head**] displays information stored in the current dosing head.
- Function key [**Info head**] is active.
1   Tap [**Info head**].
    ⇨   The display shows the data stored in the dosing head.
        Note
        The amount of data displayed depends on the menu settings.
        See XPE Operating Instructions for information on defining the output of dosing head
        data.
2   To return to the main window, tap [**OK**].

5.3.2   Preparing a new head for operation

Note
The amount of user data that is required for setting up a dosing head is customizable. You can shorten the
procedure.
See XPE Operating Instructions for information on setting up the head definition data.

Preparing head

- Function key [**Set content**] is active.
1 Tap [**Set content**].
2 Unscrew the powder container from the new head and put the container on the weighing pan.
3 To tare the instrument, press [→T←].
4 Pour your powder into the powder container.
5 Store the net weight of the powder with [**Set content**] or note the value.
6 Screw the powder container to the dosing head again.
7 Insert the dosing head into the dosing unit.

Entering head data

- Function key [**Write head**] is active.
1 Tap [**Write head**].
  ⇨ The window **Substance** appears.
2 **Note**
  If a barcode reader is connected to your instrument and your substance provides a barcode, scan the product barcode instead of entering the name manually. The name of the substance appears in the respective information field and can be printed on the dosing reports or labels.
  Enter the name of the substance and confirm with [**OK**].
  (max. of 20 characters)
  ⇨ The window **Lot ID** appears.
3 Enter the **Lot ID** of your substance and confirm with [**OK**].
  (max. of 15 characters)
  ⇨ The window **Filling date** appears.
4 Enter the **Filling date** of your substance and confirm with [**OK**].
  ⇨ The window **Exp. date** appears.
5 **Note**
  Once the **Exp. date** is reached an error message appears and you will not be able to continue dosing.
  Enter the **Exp. date** of your substance and confirm with [**OK**].
  ⇨ The window **Content [mg]** appears.
6 Enter the noted value in [g] and confirm with [**OK**].
  Note
  With this value the counter calculates the remaining amount of substance.

The following two windows are for the first customizable field called **ID1** which may be used for entering additional data, e.g. about your substance or your company.

Note
In the course of this manual the default titles **ID1** and **Value 1** will be used.

7   Select **ID1 Name** which is the title of the first customizable field.

8   Change this identification and confirm with [**OK**].
    Factory setting: **ID1** (variable 1).
    (max. up to 10 characters)
    Example: If you want to save the storage temperature of 5 °C, enter **Storage**.

    ⇨ The new title will appear in the respective information field and on the labels and reports
        you print.

    ⇨ The window **ID1** appears.

9   Enter the contents of the first customizable field and confirm with [**OK**].
    Factory setting: **Value 1**
    (max. 15 characters)
    Example: If you want to save the storage temperature of 5 °C, enter **5oC** and confirm with
    [**OK**]..

    ⇨ The instrument writes the user data to the head and then a message of successful data
        transfer appears.

    ⇨ If a label printer is connected and automatic printing is selected, a label will be printed.
        Affix it to the dosing head.

    ⇨ If no automatic label printing takes place, press 🖶 while the message is displayed.

10 To return to the main window, confirm with [**OK**].

    ⇨ The new head is ready for dosing.

Note
The following information is not part of the default head definition sequence. If you want these fields to
appear when preparing a new head, select them.
See XPE Operating Instructions for information on setting up the head definition data.

    [**ID2**] There are 3 additional customizable fields called **ID2**, **ID3** and **ID4**, for entering the
              respective title and contents.

Dose 1 **Note**
limit   Change **Dose limit** only at the first time you set up a new dosing head. A change during the
             lifetime of a dosing head, may lead to an error that you can`t use your dosing head
             anymore.
             Enter the number of possible dosing according to the specification of your substance.
             Factory setting: **250**
             Example: If you have NaCl, change the limit to **100**.

        2 Confirm with [**OK**].

Retest 1 Enter the **Retest date** of your substance. Once the retest date is reached a warning appears.
date   You can decide to continue or to abort dosing. If you abort dosing, test your substance.

        2 Confirm with [**OK**].

5.3.3 Copying data from one head to another

If the counter for the remaining dosing cycles drops to zero, an error message appears and the head must
be replaced with a new one. If the powder container of the old head still contains a considerable amount of
powder, remove the powder container from the old head and screw it onto the new one.

- Function key [**Copy head**] is active.

1. Tap [**Copy head**].
   ⇨ Follow the instructions.
2. Install the source head. Make sure the previous (used) head is installed.
   ⇨ The data is copied from the head to the instrument's internal memory.
3. Install the target head. Make sure the new head is installed and confirm with [**OK**].
   ⇨ The data is now copied from the instrument's internal memory to the new head.
4. To return to the main window, conrifm with [**OK**]
   ⇨ The new head now contains all user and internal data, i.e. head is ready for dosing.

Note
Depending on your settings, a label and/or record with the head data will be printed automatically.
See XPE Operating Instructions for information on defining data output.

5.3.4 Unlocking head manually

You can configure the instrument that the head is unlocked automatically after each dosing cycle. If this feature is de-selected, unlock the head manually. **See** XPE Operating Instructions for information on configuring the dosing steps.

- Function key [**Un/Lock**] is active.
- Tap [**Un/Lock**].
   ⇨ Instrument releases head. Remove head.

Note
After having installed the head again you do not need to lock it manually. This is done automatically as soon as you start a dosing cycle or write data to the head.

5.4 Advanced features

5.4.1 Activating density

Quantos works gravimetric. Users who work with liquids normally think volumetric and need the parameter of density.

Activating and printing density for liquids

Formula: Volume [ml] = Mass [g] / Density [g/ml]

1. Activate [⬚] > **Dosing steps**... [**Define**] > **Dosing steps (liquid)**... [**Define**] > [**Density param.**].
2. Activate [⬚] > **Data output**... [**Define**] > **Sample label**... [**Define**] > **Text (liquid dosing)**... [**Define**] > [**Density param.**].
3. To print the volume, activate ⬚] > **Data output**... [**Define**] > **Sample label**... [**Define**] > **Text (liquid dosing)**... [**Define**] > [**Liquid vol.**].

Activating and printing density for solutions

Formula: Concentration volumetric [mg/ml] = Concentration gravimetric [mg/g] x Density [g/ml]

1. Activate [⬚] > **Dosing steps**... [**Define**] > **Dosing steps (solution)**... [**Define**] > [**Density param.**].
2. Activate [⬚] > **Data output**... [**Define**] > **Sample label**... [**Define**] > **Text (solution)**... [**Define**] > [**Density param.**].
3. To print the volume, activate ⬚] > **Data output**... [**Define**] > **Sample label**... [**Define**] > **Text (solution)**... [**Define**] > [**Vol. conc.**].

5.4.2 Working with sample counter

The sample counter is meant to assist you when dosing a given number of samples.

- Function key **Samples** is active.
- If you work with the sample counter, select the corresponding information fields.

1 Tap [**Samples**].

   ⇨ A numeric input field appears.

2 If you enter a value between 1 and 1000, you activate the sample counter.
   Factory setting = "0": sample counter is switched off.

3 Dose first sample.

   ⇨ After dosing is completed the counter has decreased by 1.

   ⇨ At the end **Last sample reached** appears.

4 Confirm with [**OK**].

   ⇨ The instrument resets both values to zero.

5.4.3 Changing the resolution of dosing result

The instrument is set ex works so that the dosing result is displayed at the maximum resolution (corresponds to 1d). You can change the resolution of the dosing result at any time. These function keys are greyed out when **MinWeigh** is on.

Relevant function keys:

1/10d	10x lower resolution
1/100d	100x lower resolution
1/1000d	1000x lower resolution

- The relevant function keys are active: **1/10d**, **1/100d** and **1/1000d**

1 Tap the relevant function key.

   ⇨ The dosing result switches to the chosen resolution.

2 To show the dosing result at the normal resolution, tap it again.

   ⇨ The dosing result switches back the maximum resolution.

5.4.4 Manual dosing

In some cases the dosing head may not be able to dose a particular substance properly or you want to dose a solid e.g. tablets or wax. In such a case you can revert to manual dosing. The dosing procedure is almost the same as in automatic mode except that you do the dosing.

Once the manual dosing head is installed, the instrument is prepared and automatically adapts a few procedures:

- **Dosing steps**: No lowering of the dosing head
- Door operation: If [⚙] > **General settings**... [**Define**] > **Side doors**... [**Define**] > [**Dosing**] is selected, doors will automatically open and close as needed.
- Autosampler: To prevent interference, the autosampler will be moved to **Home** position and disabled temporarily.

1 Install manual dosing head.

   ⇨ The instrument reads dosing head.

2 Tap [**Start**] > [**Solid dosing**].

3 Enter all required data.

4 Put sample vessel on weighing pan and confirm with [**OK**].

Dosing powder

5   Dose the powder into the sample vessel manually.

⇒ The SmartTrac cross-hair graph assists you. This is the coarse range indicator that helps you dosing the powder quickly until you approach the target area. As soon as the vertical bar (fine range indicator) starts moving to the right you should slow down the dosing procedure and carefully approach the target value in the middle between the two tolerance marks.
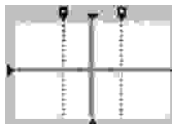
⇒ As soon as the quantity is within tolerance both indicator bars turn from red to green.

6   If the target quantity is reached, confirm with [**OK**].

⇒ The result of the manual dosing appears.

⇒ The label and/or record are printed. The validity item is followed by M stating that this was a manual dosing.

5.4.5 Working with function MinWeigh

The **MinWeigh** function ensures that the sample weight does not go below a certain limit (in reference to the tare weight) in order to meet the admissible tolerance for the measured values. The **MinWeigh** function must be mounted and programmed by a service engineer.

 As soon as **MinWeigh** is installed, the status icon appears in the upper right corner of the display. This icon and the light color of the weight value indicate that the minimum initial weight value has not yet been reached and that the current weight value may be outside the tolerance range specified in the quality assurance system.

Example

When working according to GMP the admissible tolerance is 1%, k=2, while the more restrictive USP standard allows for 0.10%, k=2.

Now start dosing as usually. While dosing, the weight value first appears in a light color indicating that the minimum initial weight has not yet been reached. As soon as the minimum weight is reached, the color of the weight value turns solid and the status icon disappears.

Note

If several reference tare values (and their corresponding minimum initial weight values) have been programmed by the service engineer, the required minimum initial weight value changes automatically, depending on the tare weight.

At the end of the dosing cycle the result of the **MinWeigh** function will be shown at the bottom of the display:

- **VALID** (result is in tolerance)
- **INVALID** (result is out of tolerance)

If you include **MinWeigh** in your sample labels and/or records the result will also appear in the printout.

 Note
If the status icon **MinWeigh test** appears, contact the customer service department. A service engineer runs the **MinWeigh** test as soon as possible.

5.4.6 Working with function SafePos

When using small sample vessel the dosing head needs to be lowered close to the container. In most cases the dosing head needs to be raised again after dosing to remove the sample vessel. The **SafePos** option automatically moves the dosing head to a safe distance from the sample vessel to prevent contact of head and container e.g. during exchange of sample vessel.

Mounting SafePos

The **SafePos** is mounted by a METTLER TOLEDO Service Engineer.

See XPE Operating Instructions for information on settings for SafePos option.

Selecting SafePos

SafePos

Setup

- Function keys **SafePos** and **Setup** are active.

1 Tap [**Setup**].
   ⇨ Window **Setup** appears.

2 Make sure **SafePos** is selected.

3 Tap [**Start adjustments**].
   ⇨ Window **SafePos** for adjustment appears.

4 Follow the instructions of the adjustment procedure.

Note
A new adjustment of the dosing height is required only when switching to a different sample vessel.

6 Maintenance

Note

Also **see** XPE Operating Instructions for further information.

Please contact your METTLER TOLEDO dealer for details of the available service options. Regular servicing by an authorized service engineer ensures constant accuracy for years to come and prolongs the service life of your instrument.

6.1 Cleaning the dosing module

Clean your instrument, e.g. the dosing chamber (including the drip pan), the housing, and the terminal using the brush supplied with it. The maintenance interval depends on your standard operating procedure (SOP).

Please observe the following notes

⚠ **WARNING**

Risk of electric shock

– The instrument must be disconnected from the power supply.

– Use only the power cable from METTLER TOLEDO, if it needs replacing.

– Ensure that no liquid comes into contact with the dosing unit, the terminal or the AC adapter.

– Never open the instrument housing, terminal or AC adapter – they contain no components, which can be cleaned, repaired or replaced by the user.

⚠ **CAUTION**

Damage of terminal

On no account use cleaning agents which contain solvents or abrasive ingredients, as this can result in damage to the terminal overlay.
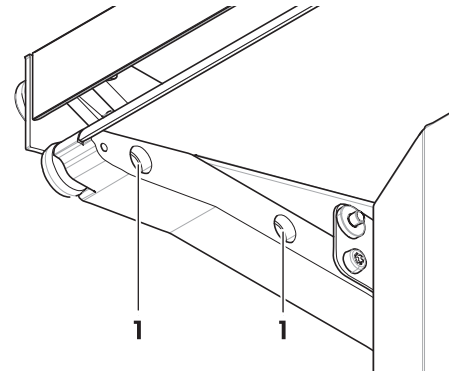
Cleaning

Your instrument is made from high quality, resistant materials and can therefore be cleaned with a commercially available, mild cleaning agent.

1 To clean the dosing chamber thoroughly, fully open the side doors and the front door. **See** Glass Draft Shield

2 Remove the dosing head.

3 Carefully raise the front of the weighing pan and lift it out of the guide.

4 Lift the front part of the drip pan (located below the weighing pan), then pull the pan away from the instrument.

5 Replace these parts and make sure they are in the correct position.

Cleaning the side windows

1 Unscrew both screws **1**. Both upper side windows are fastened with two screws that are accessible from the inside.

2 Remove the side window by carefully pulling it away from the instrument.

3 Clean the side windows.

6.2 Cleaning the liquid module

Your instrument is made from high quality, resistant materials and can therefore be cleaned with a commercially available, mild cleaning agent. If your flow rate is decreasing, clean your instrument.

1 Remove liquid bottle, bottle holder and drip pan.

2 Clean all items.

3 Reinstall all items.

Suction Filter

1 **Once a week**, check visually that the suction filter is clean.

2 At least **once a year**, change suction filter. Maintenance interval depends on the liquid used.

Purging the liquid dosing head

▪ Check that the liquid sample vessel is big enough for your **Purge time [sec]**.

1 Tap [**Purge**].

2 Place sample vessel and confirm with [**OK**].

⇨ **Purge time [sec]** opens.

3 Based on the liquid you used, enter purge time in [sec] and confirm with [**OK**].

⇨ Pressure builts up.

⇨ Instrument purges.

Cleaning the liquid dosing head

If purging is not enough, clean the liquid dosing head as follows.

⚠ **CAUTION**

Splashing liquids because of remaining pressure in dosing head!

If you don't release the pressure of the dosing head, liquid might splash when opening dosing head or removing liquid tube.

1 Always release pressure of dosing head by opening the bottle before removing liquid tube.

2 Wear protective glasses.

1. To release pressure of dosing head, open bottle.
2. Open the head with the special bolt driver.
3. Take out the micro dispensing valve and clean it, e.g in a ultrasonic bath.
4. After the cleaning reinstall the micro dispensing valve.
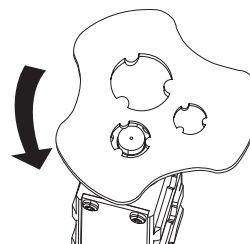
6.3 Adjusting the front door

Adjusting the front door

The adjustment of the front door is required if the door does not close completely or if there is a sound when the door hits the lower stop.

1. Tap [⚙] > **Powder module** > [**Define**] > **Mounted** > [**Define**] > [**Maintenance**] > [**Execute**].
   ⇨ The front door slightly opens.
2. To close the front door step by step until the glass enters the lower guide rail, touch the lower arrow key.
3. Confirm with [**OK**].
   ⇨ The door opens slightly and then closes again.

If you hear a hard sound when the door hits the stop, repeat the adjustment procedure and take care not to move the door too far down.

6.4 Installing new ferrule on liquid tube

⚠ CAUTION

Splashing liquids because of remaining pressure in dosing head!

If you don't release the pressure of the dosing head, liquid might splash when opening dosing head or removing liquid tube.

1. Always release pressure of dosing head by opening the bottle before removing liquid tube.
2. Wear protective glasses.

Note

If the liquid tube is leaky, replace ferrules. There are 3 ferrules, located one each at the seals of the liquid tube.

1. To release pressure of dosing head, open bottle.
2. To access the ferrule, slide PEEK nut (1) back.
3. Cut off ferrule (2). Check that the end of the tube is straight.
4. Thread PEEK nut.
5. Thread new ferrule. Check that the face of the ferrule is alligned to the face of the tube.
6. To fasten ferrule, screw PEEK nut tight.