# Quantos Automated Dosing

## Powder Module
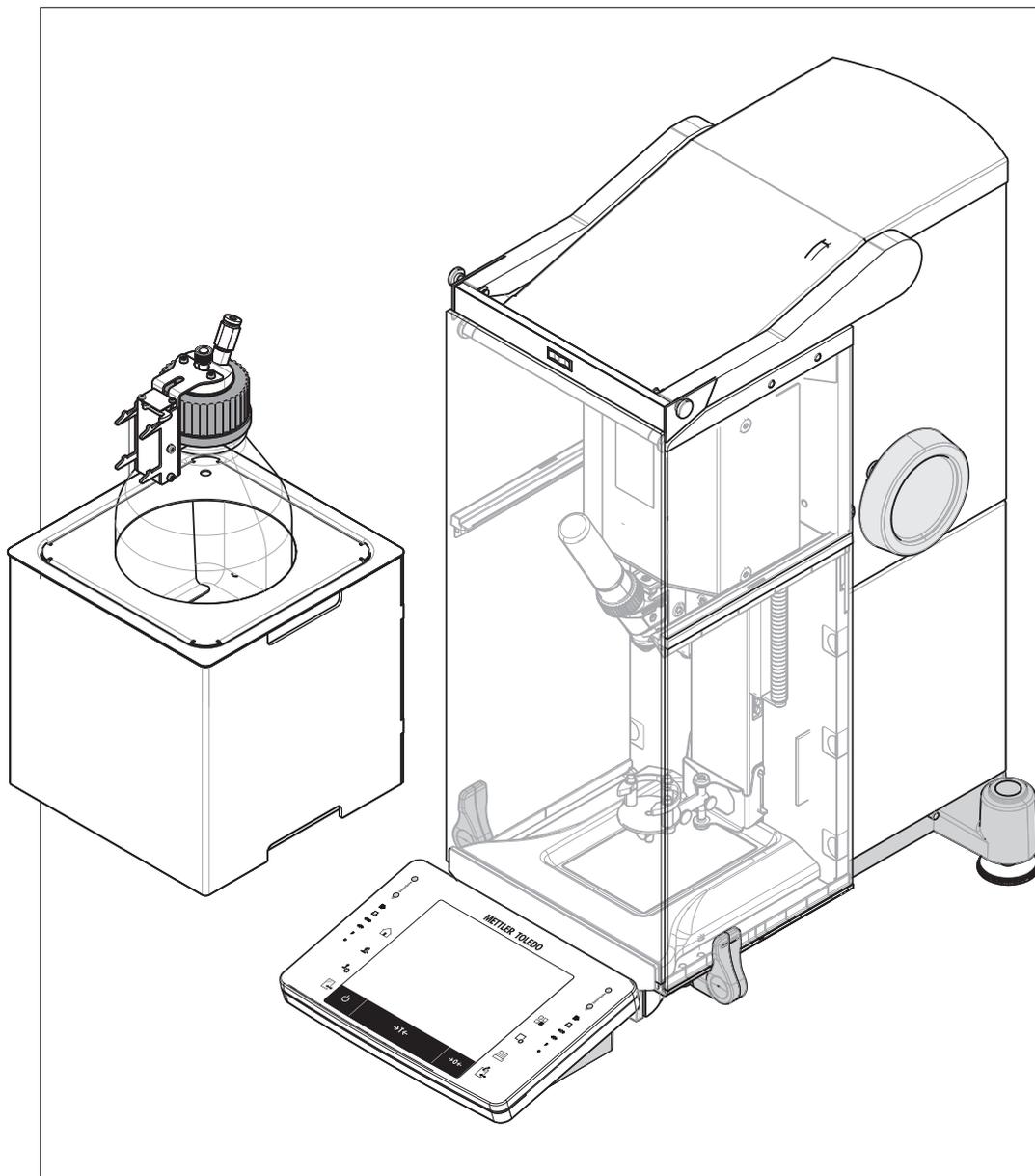
**METTLER TOLEDO**

# Table of Contents

# 1 Introduction

Thank you for choosing a METTLER TOLEDO instrument. The instrument combines high performance with ease of use.

This document is based on the software version V 2.21.

**Finding more information**

▶ www.mt.com/quantos

Search for documents ▶ www.mt.com/library

For further questions, please contact your authorized METTLER TOLEDO dealer or service representative.

▶ www.mt.com/contact

**Conventions and symbols**

Key and/or button designations and display texts are shown in graphic or bold text, e.g., ▤, **Printer**.

📝 **Note** For useful information about the product.



Refers to an external document.

**Elements of instructions**

- Prerequisites
1 Steps
2 …
   ⇨ Intermediate results
⇨ Results

# 2 Safety Information

- Read and understand the instructions in this manual before using the device.
- Keep this manual for future reference.
- Include this manual if you pass on the device to other parties.

If the device is not used according to the instructions in this manual or if it is modified, the safety of the device may be impaired and Mettler-Toledo GmbH assumes no liability.

## 2.1 Definitions of signal words and warning symbols

Safety notes contain important information on safety issues. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results. Safety notes are marked with the following signal words and warning symbols:

**Signal words**

| | |
|---|---|
| **WARNING** | A hazardous situation with medium risk, possibly resulting in death or severe injury if not avoided. |
| **CAUTION** | A hazardous situation with low risk, resulting in minor or moderate injury if not avoided. |
| **NOTICE** | A hazardous situation with low risk, resulting in damage to the instrument, other material damage, malfunctions and erroneous results, or loss of data. |

**Warning symbols**

 Electrical shock

 Toxic substance

 Explosion

 Inflammable substance

 Bruising

 General hazard: read the User Manual or the Reference Manual for information about the hazards and the resulting measures.

 Notice

## 2.2 Product-specific safety notes

### Intended use

This dosing system is designed to be used in analytical laboratories by trained staff. The dosing system is intended for weighing and dosing powder or liquid samples.

Any other type of use and operation beyond the limits of use stated by Mettler-Toledo GmbH without consent from Mettler-Toledo GmbH is considered as not intended.

### Responsibilities of the instrument owner

The instrument owner is the person holding the legal title to the instrument and who uses the instrument or authorizes any person to use it, or the person who is deemed by law to be the operator of the instrument. The instrument owner is responsible for the safety of all users of the instrument and third parties.

METTLER TOLEDO assumes that the instrument owner trains users to safely use the instrument in their workplace and deal with potential hazards. METTLER TOLEDO assumes that the instrument owner provides the necessary protective gear.

**Protective equipment**

Chemical-resistant gloves

Goggles

Lab coat

**Safety notes**

⚠ **WARNING**

**Death or serious injury due to electric shock**

Contact with parts that carry a live current can lead to death or injury.

1   Only use the approved METTLER TOLEDO power supply cable and AC/DC adapter with a current-limited SELV output.
2   Connect the power cable to a grounded power outlet, ensure correct polarity.
3   Keep all electrical cables and connections away from liquids and moisture.
4   Check the cables and power plug for damage and replace damaged cables and power plugs.

⚠ **WARNING**

**Injury and/or damage due to hazardous substances**

Chemical, biological or radioactive hazards can be associated with the substances processed by the instrument. During dosing procedures, small amounts of the dosed substance may become airborne and penetrate the instrument or contaminate its surroundings.

The substance characteristics and related hazards is the full responsibility of the instrument owner.

1   Be aware of possible hazards associated with the substance and take adequate safety measures, e.g., those stated on the safety data sheet provided by the manufacturer.
2   Make sure that every instrument part in contact with the substance will not get altered or damaged by the substance.

⚠ **WARNING**

**Injury or damage due to powder handling**

Powders may get compacted in the dosing head and block it. Too much force applied by the dosing head mechanism may lead to a break and potentially hazardous substances may get airborne.

1   Handle the dosing heads with care.
2   If the dosing head seems blocked, avoid further dosing. Remove the head from the instrument and turn it upside down to loosen the powder.
3   Cease work immediately in the event of leak or break.

## ⚠️ WARNING

**Injury and/or damage due to reacting, flammable, or explosive substances**

During the dosing procedure, substances could be combined and cause an exothermic reaction or explosion. This includes powders, liquids, and gases. It may lead to serious injuries and significant material damage.

The sample characteristics and related hazards is the full responsibility of the instrument owner.

1 Be aware of possible hazards associated with reacting, flammable, or explosive substances.
2 Ensure a working temperature low enough to prevent the formation of flames or an explosion.

## ⚠️ WARNING

**Injury or death due to toxic substances**

If you use toxic, explosive, or flammable liquids with the pump module, the exhaust air will be contaminated.

– Connect a tube to the exhaust air outlet to collect the contaminated air.

## ⚠️ WARNING

**Injury and/or damage due to reacting substances**

When pressure is released from the bottle, the air/gas in the bottle moves back towards the pump module. The air/gas coming from the coupled outlets mixes in the pump module. Molecules of the substances in the various bottles can get in contact through this contaminated air/gas.

1 Do not connect bottles with incompatible liquids to the same pump module simultaneously.
2 Before connecting a second, incompatible liquid to the pump module, disconnect the first bottle and purge the pump with clean air/gas.

## ⚠️ WARNING

**Injury and damage to pump or bottle due to high pressure**

High pressure from external gas can damage the pump or the bottle.

1 Use a regulator on the external gas line.
2 Ensure that the pressure of the external gas does not exceed 0.2 bar (2.9 psi).

## ⚠️ CAUTION

**Injury due to splashing liquids**

If the pressure in the bottle is not released, liquid might splash when removing the micro dosing valve, opening the bottle, or removing the liquid tube.

– Always release pressure by switching off the instrument before removing the micro dosing valve, opening the bottle, or removing the liquid tube.

## ⚠️ CAUTION

**Injury due to moving parts**

– Do not reach into the working area while parts of the instrument are moving.

## ⚠ CAUTION

**Injury due to sharp objects or broken glass**

Instrument components, e.g., glass, can break and lead to injuries.

– Always proceed with focus and care.

## NOTICE

**Damage to the instrument due to the use of unsuitable parts**

Using unsuitable parts with the instrument can damage the instrument or cause it to malfunction.

– Only use parts from METTLER TOLEDO that are intended to be used with your instrument.

## NOTICE

**Damage to the device**

The device contains no user-serviceable parts.

1 Do not open the device.

2 In the event of problems, please contact a METTLER TOLEDO representative.

## NOTICE

**Damage to the instrument due to inappropriate cleaning methods**

The instrument can be damaged by certain cleaning agents, solvents, or abrasives. If liquids enter the housing, they can damage the instrument.

1 Only use a wet cloth with water and a mild detergent to clean the instrument or terminal.

2 Wipe off any spills immediately.

3 Make sure that no liquid penetrates the instrument.

# 3 Design and Function

## 3.1 Overview

### 3.1.1 Dosing unit
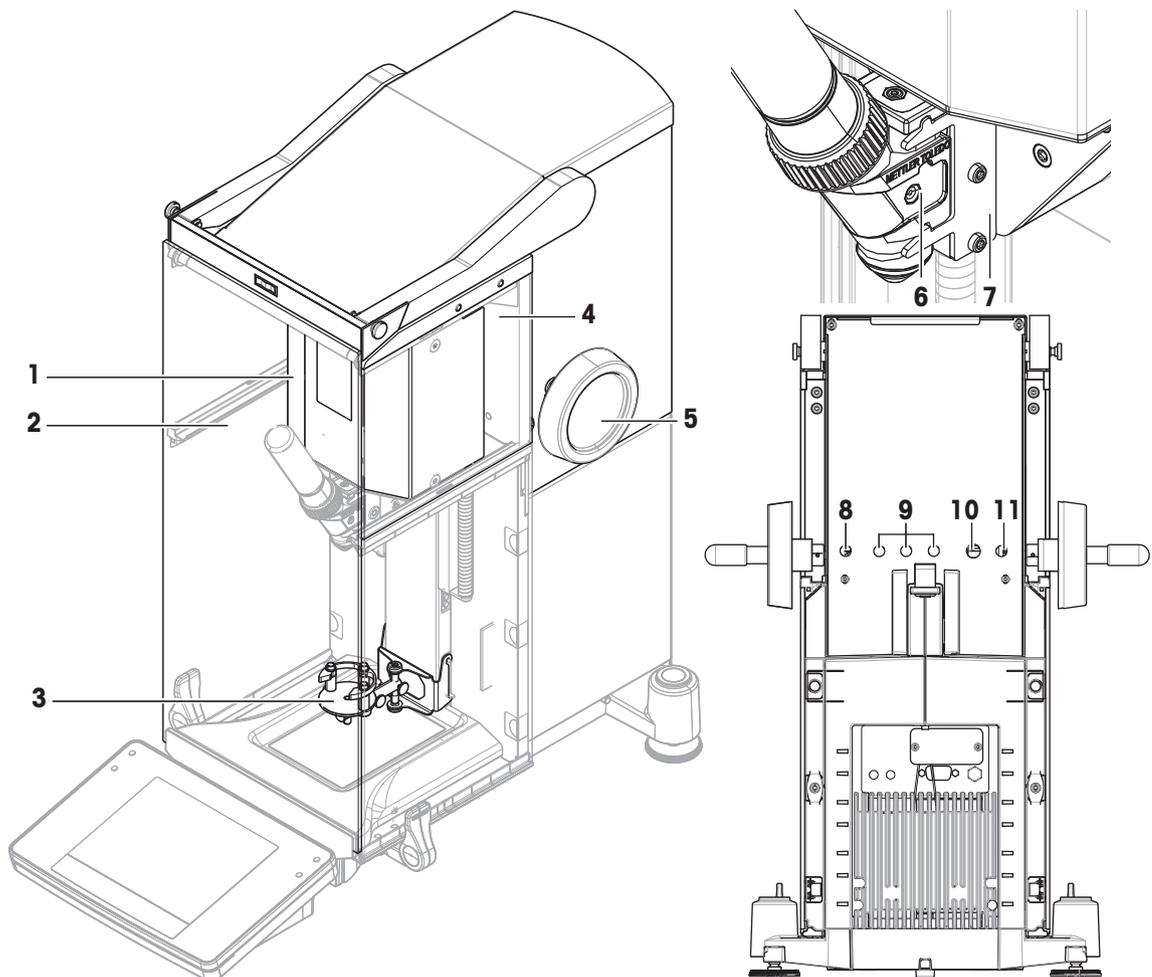


**Legend Powder Module**

| 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 |

### 3.1.2 Dosing heads and equipment
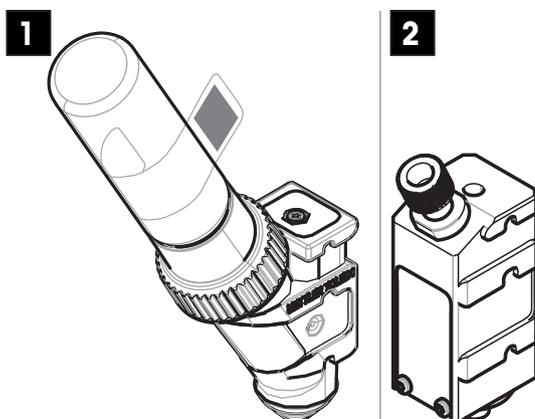


| 1 | **Powder dosing head (e.g. QH008-BNMW)**<br>This is the standard dosing head for powder dosing. It is used together with a vial. |
|---|---|
| 2 | **Liquid dosing head (e.g. QL001)**<br>This is the standard dosing head for liquid dosing. It is used together with a pump module and bottle. |

#### Powder dosing head

The spare cap included in the delivery may be used to close the dosing head without a vial. Vials and storage containers need to be purchased separately.

You can print a label with the dosing-head data from the RFID tag and affix this label to the dosing head.

#### Powder test head

This dosing head is provided with a vial filled with calcium carbonate ($CaCO_3$). The powder test head is equipped with a test function that dispenses 10 times a defined mass and reports the **Repeatability** and **Dosing time** results. If your instrument failed the tests, inform a METTLER TOLEDO service technician.

#### MinWeigh dosing head

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

#### See also

🗎 Technical Data ▶ Page 34

### 3.1.3 Data stored in the dosing head's RFID tag

Every dosing head is equipped with a integrated RFID tag (1) which stores and exchanges data with the instrument.

The following data is stored in the RFID tag 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 should be entered before using a new head for the first time to have the data available for reports and labels.
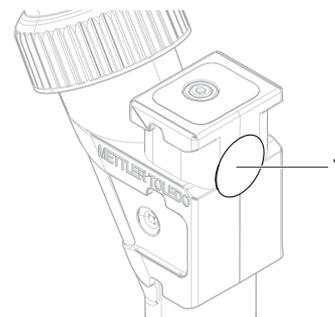


📝 **Note for powder dosing heads**

The counter for the remaining powder dosing cycles is based on the lifetime limit of the dosing head (max. 999). With every dosing cycle started, the counter is decreased by 1. If the counter drops to zero, the dosing head must be replaced. If the vial of the old head still contains a considerable amount of powder, you may remove the vial from the old dosing head and screw it onto the new dosing head. Copy the user data and the powder content value from the old dosing head to the new dosing head.

If the remaining quantity of powder is insufficient for the next dosing cycle, a warning message will appear.

# 4 Installation and Putting into Operation

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

## 4.1 Scope of delivery

> **NOTICE**
>
> **Damage to the instrument due to the use of unsuitable parts**
> Using unsuitable parts with the instrument can damage the instrument or cause it to malfunction.
> – Only use parts from METTLER TOLEDO that are intended to be used with your instrument.

**Q2 Powder module**

- Powder module
- Conductive front door
- 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
- User Manual

**QLL standard kit for bottles (optional)**

- Liquid head QL001
- Pressure-resistant bottle
- Bottle cap (GL45) with fitting and support
- Micro dosing valve tool

- Spare part set (incl. filter, sealing ring, fastening nut)
- Liquid tube
- Air tube

**QL2 pump module (optional)**

- Pump module
- Liquid side doors for Q2
- Muffler

- Bottle holder
- Drip pan
- CAN-cable

**Recommended options**

- Ethernet Option
- Ethernet / RS232 (Netcom kit)

- AntiStatic kit
- Cable box

**See also**

## 4.2 Selecting the location

An optimal location will ensure accurate and reliable operation of the instrument. The surface must be able to safely take the weight of the instrument when fully loaded. The following local conditions must be observed:

- The instrument must only be used indoors and up to a maximum altitude of 4000 m above sea level.
- Before switching on the balance, wait until all parts are at room temperature (+5 to 40 °C).
  The humidity must be between 10% and 80% non-condensing.
- The power plug must be accessible at all times.
- Firm, horizontal and vibration-free location.
- Avoid direct sunlight.
- No excessive temperature fluctuations.
- No strong drafts.
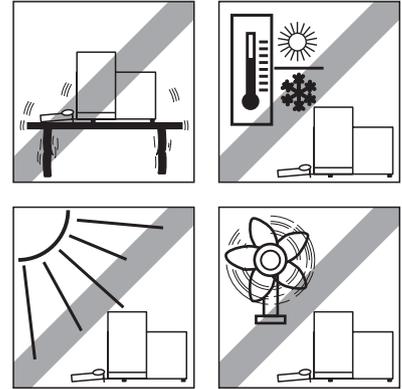
If the instrument is not horizontal at the outset, it must be leveled during commissioning.

## 4.3 Assembling powder module

The instrument is mounted and installed by a METTLER TOLEDO service technician.

## 4.4 Installing and removing dosing head

### Installing dosing head

Refer to your XPE Operating Instructions for further information on the function of the keys.

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.
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.
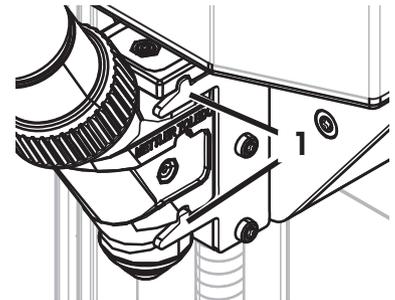
### Removing dosing head

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.
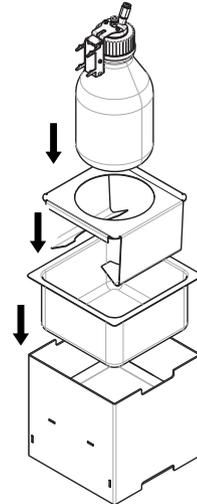
## 4.5 Assembling pump module and bottle

⚠️ **WARNING**

**Injury and damage to pump or bottle due to high pressure**

High pressure from external gas can damage the pump or the bottle.

1  Use a regulator on the external gas line.

2  Ensure that the pressure of the external gas does not exceed 0.2 bar (2.9 psi).

– Assemble pump module and bottle according to figure.

**Inserting and removing a liquid dosing head in and from the liquid dosing head support**

⚠️ **CAUTION**

**Injury due to splashing liquids**

If the pressure in the bottle is not released, liquid might splash when removing the micro dosing valve, opening the bottle, or removing the liquid tube.

– Always release pressure by switching off the instrument before removing the micro dosing valve, opening the bottle, or removing the liquid tube.

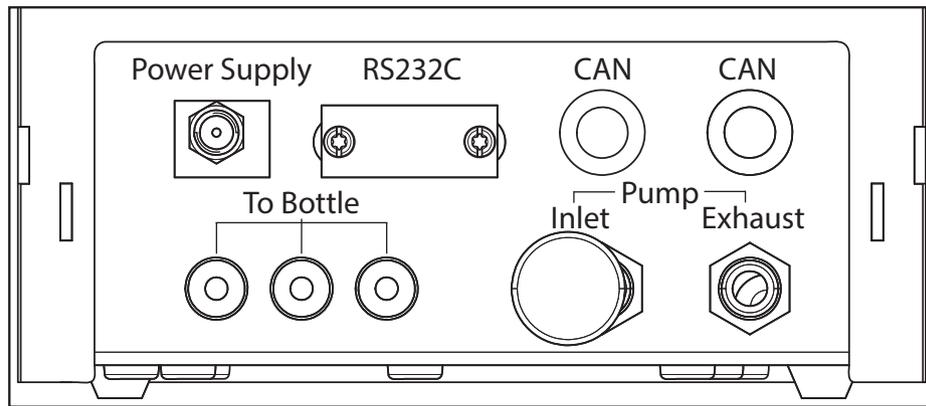1  Insert liquid dosing head in the liquid dosing head support.
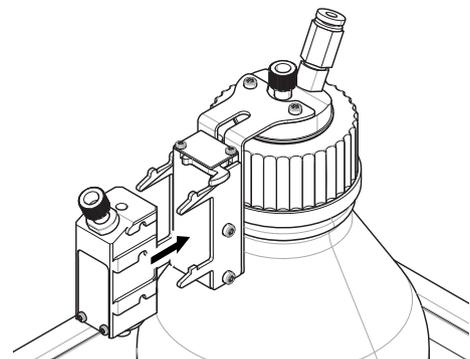
2 To remove liquid dosing head from the liquid dosing head support, pull the catch (1) to the front and remove liquid dosing head (2).
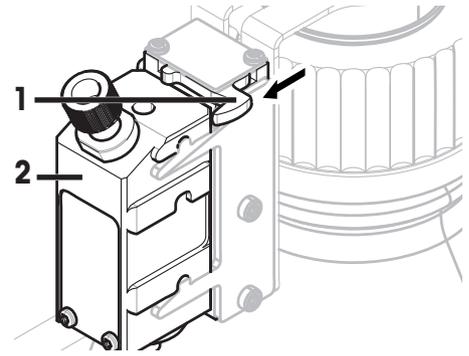
## 4.6 Connecting the tubes

### Connectors of pump module



### Tubes definition

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.

### Connecting the liquid tube

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

1 Place the sealing ring (1) on the table with the wider end on the table.

2 Take the end of the liquid tube and press it into the sealing ring.

⇨ This is the dosing-head end of the tube. The opposite end is the bottle end.

3 Thread the fastening nuts (2), paying attention to the orientation.

4 Thread the sealing ring (3) from the bottle end of the tube (slide until 220 mm from the end using the micro dosing valve tool). Pay attention to the orientation.
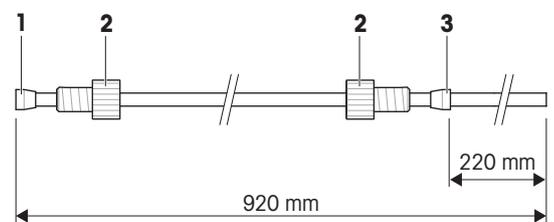
5  Insert the dosing-head end of the tube (4) in the dosing head (5).

6  Tightly fasten the fastening nut to the dosing head.

7  Insert the bottle end of the tube through the corresponding hole in the bottle cap (6). The tube should reach the bottom of the bottle.

8  Attach the suction filter to the bottle end of the tube.

9  Screw the cap to the bottle.
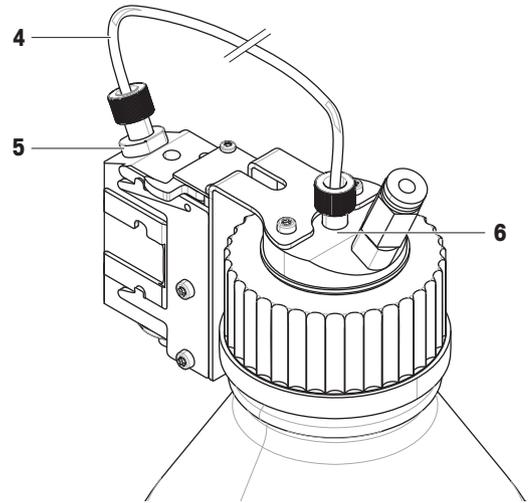


**Connecting the air tube**

⚠ **WARNING**

**Injury and/or damage due to reacting substances**

When pressure is released from the bottle, the air/gas in the bottle moves back towards the pump module. The air/gas coming from the coupled outlets mixes in the pump module. Molecules of the substances in the various bottles can get in contact through this contaminated air/gas.

1  Do not connect bottles with incompatible liquids to the same pump module simultaneously.

2  Before connecting a second, incompatible liquid to the pump module, disconnect the first bottle and purge the pump with clean air/gas.

**NOTICE**

**Damage to tube connectors due to mishandling**

If the tubes are not removed correctly, the connectors and therefore the pump module can be damaged.

Wrongly cut tubing can result in leaking connections.

1  To remove the tubes, press down the ring on the connector and pull out the tube carefully.

2  Cut the tubes with a tube cutter.

1 Connect the air tube (8) to the air inlet of the bottle (7)
2 Connect the other end of the air tube to the air outlet of the pump module (9).
3 Insert the muffler into the air inlet of the pump module (10) to absorb the noise.

When a tube is connected to the air outlet of the pump, the valve of the air outlet opens. Never leave a tube that 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.
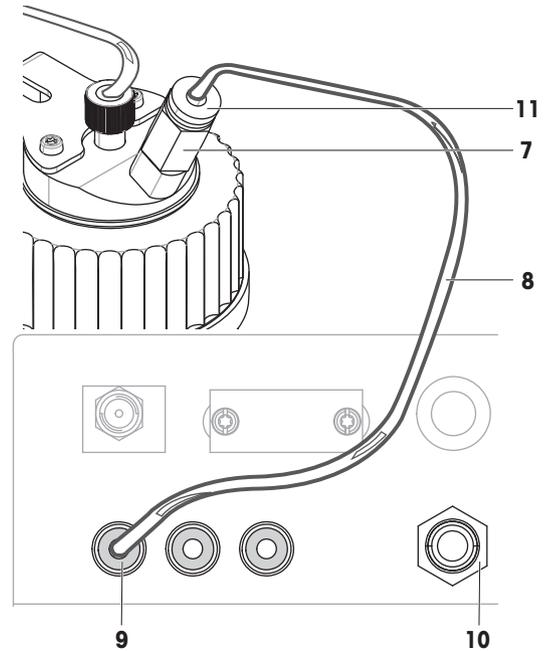
**Removing the air tube**

1 Remove the air tube (8) from the bottle by firmly pressing down the ring (11) at the air inlet (7).
2 If necessary, remove the air tube from the pump module by pushing the ring (9).
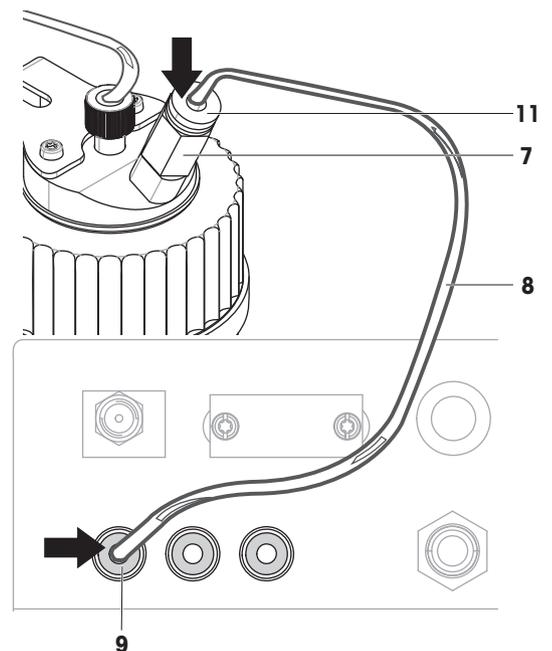
**Using the pump with external gas**

⚠ **WARNING**

**Injury and damage to pump or bottle due to high pressure**
High pressure from external gas can damage the pump or the bottle.
1 Use a regulator on the external gas line.
2 Ensure that the pressure of the external gas does not exceed 0.2 bar (2.9 psi).

1   The liquid can be protected by feeding an external gas, e.g., nitrogen, to the pump. Make sure that the pressure of the external gas does not exceed 0.2 bar (2.9 psi).

2   Remove the muffler from the air inlet of the pump module (10).

3   Connect the tube to the air inlet of the pump module (10).

📝 **Note**

Outer tube diameter: 6 mm
Pressure range: 0.1 to 0.2 bar (1.5 to 2.9 psi)



**10**
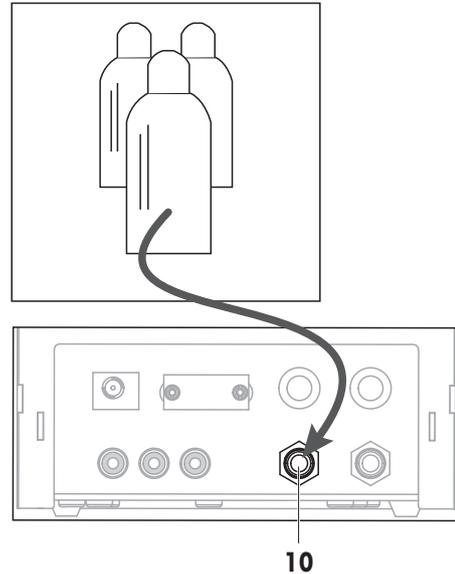
**Contaminated air by using toxic, explosive or flammable liquids**

⚠ **WARNING**

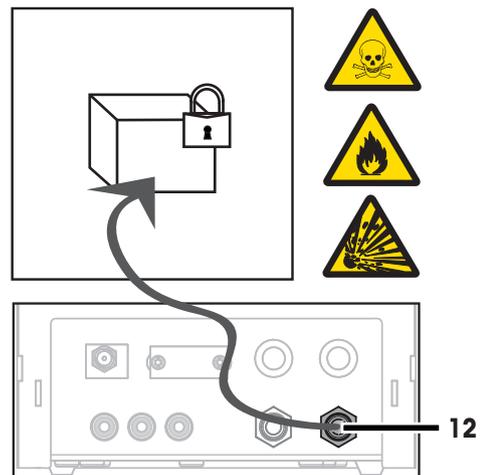**Injury or death due to toxic substances**

If you use toxic, explosive, or flammable liquids with the pump module, the exhaust air will be contaminated.

–   Connect a tube to the exhaust air outlet to collect the contaminated air.

–   Connect a tube to exhaust air outlet (12) to collect the contaminated air into a safe container.

📝 **Note**

Outer tube diameter: 6 mm



**12**

# 5 Operation

## 5.1 Powder dosing

### 5.1.1 Basic operation settings

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

**Navigation:** ⌷ > **Powder module** > **Mounted**

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** > **Mounted**
- RS232 device must be activated: ⊞ > **System** > **Peripherals** > **RFID / Quantos** > **RS232 built-in**
- If front door is used, front door must be defined as mounted: ⌷ > **Powder module** > **Mounted** > **Front door** > **Mounted**
- If liquid module is mounted, liquid module must be defined as mounted: ⌷ > **Liquid module** > **Mounted**

### 5.1.2 Working with powder module

If you tap **Start** with the liquid module, you get these options:

| | | | |
|---|---|---|---|
| ▶ | **Solution** | To prepare a solution with defined concentration solid/liquid in **mg/g**. | **See** [Prepare a solution ▶ Page 19] |
| | **Solid dosing** | To dose a powder. | **See** [Dosing powder ▶ Page 17] |
| | **Liquid dosing** | To dose a liquid. | **See** [Dosing liquid ▶ Page 18] |
| | **Cancel** | To return. | |

### 5.1.3 Dosing powder

**Navigation:** ⌷ > **Dosing steps** > **Dosing steps (solid)**…

The following procedure is described according to the standard factory settings. You can customize or disable the settings in the following menu:
To recreate the standard factory settings, choose **STD**.

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

📝 **Note**

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

- 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 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**.

⇨ Instrument doses powder.

⇨ The results are being displayed.

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

**See also**

📄 Working with function SafePos ▶ Page 27

## 5.2 Liquid dosing

### 5.2.1 Basic operation settings

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

▶ www.mt.com/library

**Navigation:** ⌷ > **Liquid module** > **Mounted**

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

Configure your settings in the following menu:

- Dosing must be chosen as application: ⌗ > **Dosing**
- Liquid module must be defined as mounted: ⌷ > **Liquid module** > **Mounted**
- RS232 device must be activated: ⌗ > **System** > **Peripherals** > **RFID / Quantos** > **RS232 built-in**

### 5.2.2 Dosing liquid

**Navigation:** ⌷ > **Dosing steps** > **Dosing steps (liquid)**

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

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 1 cm to 2 cm 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**.

📝 **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 Prepare a solution

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

Concentration          To calculate the concentration (C):

$$C = \text{mass of solid} / (\text{mass of solid} + \text{mass of liquid})$$

#### 5.2.3.1 Dosing powder manually

**Navigation:** 🔲 > **Dosing steps** > **Dosing steps (solution)** > **STD**

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

The following procedure is described according to the standard factory settings:

▪ 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**.

### 5.2.3.2 Dosing solution with pre-prepared solid

**Navigation:** ⬚ > **Dosing steps** > **Dosing steps (solution)** > **STD**

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

The following procedure is described according to the standard factory settings:

- 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 liquid.
10 Cap sample vessel and confirm with **OK**.
   ⇨ The results are being displayed.
11 To finish dosing process, confirm with **OK**.

### 5.2.3.3 Automated powder dosing

**Navigation:** ⬚ > **Dosing steps** > **Dosing steps (solution)** > **STD**

The following procedure is described according to the standard factory settings:

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

1 Tap **Start** > **Solution**.
2 Enter **User ID** and confirm with **OK**.
3 Enter **Sample ID** and confirm with **OK**.
4 Enter **Concentration [mg/g]** and confirm with **OK**.
5 Enter **Target solution [g]** and confirm with **OK**.
6 Place sample vessel on weighing pan and confirm with **OK**.
   ⇨ Instrument doses powder.
7 Insert liquid dosing head.
   ⇨ Instrument reads head.
   ⇨ Instrument doses liquid.
8 Cap vessel and confirm with **OK**.
   ⇨ Dosing results are displayed.
9 Confirm results 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 the bottle

⚠ **CAUTION**

**Injury due to splashing liquids**

If the pressure in the bottle is not released, liquid might splash when removing the micro dosing valve, opening the bottle, or removing the liquid tube.

– Always release pressure by switching off the instrument before removing the micro dosing valve, opening the bottle, or removing the liquid tube.

**Filling the bottle**

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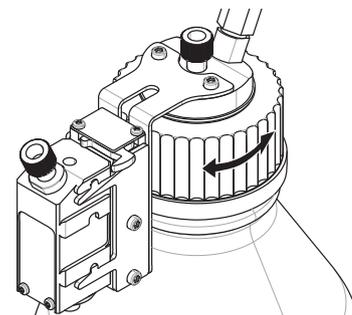Before the suction filter gets dry, refill the bottle.
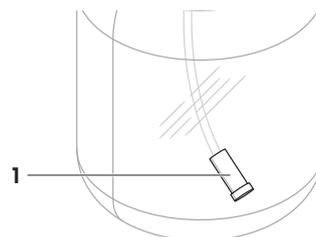
- Pressure is released.
1  Unscrew cap.
2  Fill in the liquid. (max. is shown on bottle, e.g., 1000 ml).
   📄 **Note**
   Do not exceed the maximum. The air above the liquid is necessary for dosing.
3  Screw cap on.
4  Check that the cap is tight.

**Changing the liquid of the bottle**

You have only one cap with dosing head and want to change the liquid:

- Pressure is released.
1  Unplug air tube.
2  Unscrew cap.
3  Remove the suction filter.
4  If the cap needs to be cleaned, remove the air tube.
   Unscrew the fastening nuts from the cap and the dosing head.
   Rinse the cap with the appropriate solvent or liquid.
   Insert both ends of the liquid tube at the dosing head and the cap, respectively.
5  If the liquid tube needs to be cleaned with a solvent, fill the bottle with the appropriate solvent.
   Screw the cap on the bottle.
   Insert the air tube on the cap.

Purge using the **Purge** function.
Unscrew the cap.
Dispose of the remainder of the solvent.

6   Attach a new suction filter.

7   Screw the cap on bottle with new liquid.

8   Check that the cap is tight.

9   Connect air tube to new bottle.

10  Purge using the **Purge** function.

**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.
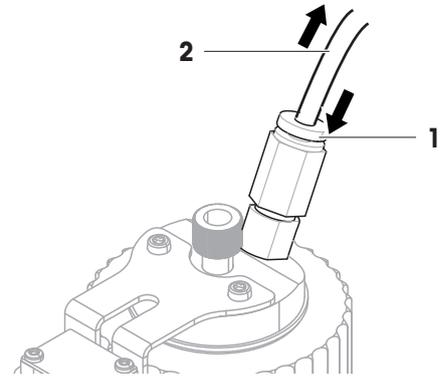
**See also**

▤   Cleaning the liquid module ▶ Page 29

## 5.3 Handling of dosing heads

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

Refer to your XPE Operating Instructions for further information on setting up the dosing head definition data.

▶ www.mt.com/library

### 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.

2   To return to the main window, tap **OK**.

### 5.3.2 Preparing a new dosing head for operation

The amount of user data that is required for setting up a dosing head is customizable. You can shorten the procedure.

**Preparing head**

■ Function key **Set content** is active.

1 Tap **Set content**.

2 Unscrew the vial from the new dosing head and put the vial on the weighing pan.

3 To tare the instrument, press →T←.

4 Pour your powder into the vial.

5 Store the net weight of the powder with **Set content** or note the value.

6 Screw the vial 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 **5 °C** and confirm with **OK**.

    ⇨  The instrument writes the user data on 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.

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

**Dose**  1   Enter the number of possible dosing according to the specification of your substance.
**limit**     Factory setting: depending on the dosing head **36** or **250** (max. 999).

          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

Refer to your XPE Operating Instructions for further information on defining data output.

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

- 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, confirm 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.

### 5.3.4 Unlocking head manually

Refer to your XPE Operating Instructions for further information on configuring the dosing steps.

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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.

- 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

**Activating and printing density for liquids**

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

1 Activate ⧉ > **Dosing steps** > **Dosing steps (liquid)** > **Density param.**.
2 Activate ⧉ > **Data output** > **Sample label** > **Text (liquid dosing)** > **Density param.**.
3 To print the volume, activate ⧉ > **Data output** > **Sample label** > **Text (liquid dosing)** > **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** > **Dosing steps (solution)** > **Density param.**.
2 Activate ⧉ > **Data output** > **Sample label** > **Text (solution)** > **Density param.**.
3 To print the volume, activate ⧉ > **Data output** > **Sample label** > **Text (solution)** > **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 active.

**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 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.

### 5.4.5 Working with function SafePos

When using small sample vessel, the dosing head needs to be lowered close to the vessel. 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 the dosing head with the sample vessel, e.g., while exchanging the sample vessel.

**Mounting SafePos**

Refer to your XPE Operating Instructions for information on settings for SafePos option.

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> **Note**
> The **SafePos** is mounted by a METTLER TOLEDO service technician.

**Selecting SafePos**

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

## 5.5 Handling of peripherals

Refer to your XPE Operating Instructions for information on configuration the peripherals.

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You can connect various peripherals to a Quantos system, e.g., a label printer, via the NetCom Kit.

# 6 Maintenance

Refer to your XPE Operating Instructions for further information.

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

## 6.1 Cleaning the dosing module

### ⚠ WARNING

**Risk of electric shock**

1   The power cable must be disconnected prior to cleaning and maintenance.
2   Use only the power cable from METTLER TOLEDO, if it needs replacing.
3   Ensure that no liquid comes into contact with the terminal or the AC adapter.
4   Never open the instrument housing, terminal, or AC adapter – they contain no components that can be cleaned, repaired, or replaced by the user.

### NOTICE

**Damage to the instrument due to inappropriate cleaning methods**

The instrument can be damaged by certain cleaning agents, solvents, or abrasives. If liquids enter the housing, they can damage the instrument.

1   Only use a wet cloth with water and a mild detergent to clean the instrument or terminal.
2   Wipe off any spills immediately.
3   Make sure that no liquid penetrates the instrument.

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).

**Cleaning the dosing chamber**

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

1   Switch off the instrument with ⏻.
2   To clean the dosing chamber thoroughly, fully open the side doors and the front door. **See** Glass Draft Shield
3   Remove the dosing head.
4   Carefully raise the front of the weighing pan and lift it out of the guide.
5   Lift the front part of the drip pan (located below the weighing pan), then pull the pan away from the instrument.
6   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.
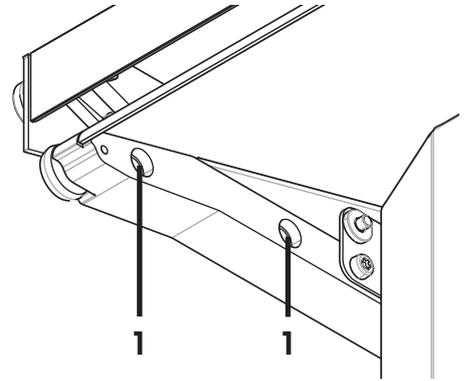


## 6.2 Cleaning the liquid module

⚠ **WARNING**

**Risk of electric shock**

1 The power cable must be disconnected prior to cleaning and maintenance.

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

3 Ensure that no liquid comes into contact with the terminal or the AC adapter.

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

**NOTICE**

**Damage to the instrument due to inappropriate cleaning methods**

The instrument can be damaged by certain cleaning agents, solvents, or abrasives. If liquids enter the housing, they can damage the instrument.

1 Only use a wet cloth with water and a mild detergent to clean the instrument or terminal.

2 Wipe off any spills immediately.

3 Make sure that no liquid penetrates the instrument.

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

1 Switch off the instrument with ⏻.

2 Remove liquid bottle, bottle holder and drip pan.

3 Clean all items.

4 Reinstall all items.

### 6.2.1 Cleaning the 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.

### 6.2.2 Cleaning the liquid dosing head

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

---

### ⚠ CAUTION

**Injury due to splashing liquids**

If the pressure in the bottle is not released, liquid might splash when removing the micro dosing valve, opening the bottle, or removing the liquid tube.

– Always release pressure by switching off the instrument before removing the micro dosing valve, opening the bottle, or removing the liquid tube.

---

 1 To release pressure of dosing head, switch off the instrument.

 2 Open the head with the micro dosing valve tool .
   ⚠ Be aware of any liquids draining from the tubing and the valve.

 3 Take out the micro dosing valve and clean it, e.g., in an ultrasonic bath.

 4 After the cleaning, reinstall the micro dosing valve.
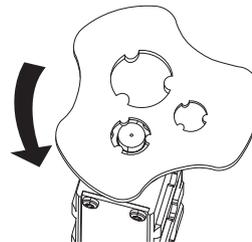


## 6.3 Adjusting the front door

**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** > **Mounted** > **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 sealing ring and fastening nut on liquid tube

---

### ⚠ CAUTION

**Injury due to splashing liquids**

If the pressure in the bottle is not released, liquid might splash when removing the micro dosing valve, opening the bottle, or removing the liquid tube.

– Always release pressure by switching off the instrument before removing the micro dosing valve, opening the bottle, or removing the liquid tube.

---

**Note**

If liquid is leaking from the dosing head nut, replace the sealing ring and fastening nut at the dosing head. If pressure cannot be built in the bottle, replace the sealing ring and fastening nut at the bottle cap.

1  To release pressure of dosing head, switch off the instrument.

2  Unscrew the fastening nut at the dosing head or the bottle cap.

3  To access the sealing ring (1), slide back the fastening nut (2).

4  If changing the nut and ring at the bottle cap, remove the suction filter and slide the sealing ring all the way to the bottle-end of the tube.

5  Cut off tube above sealing ring (2). Check that the end of the tube is straight.

6  Remove fastening nut.

7  Thread new fastening nut, paying attention to the orientation.

8  Place the sealing ring (1) on the table with the wider end on the table.

9  Take the end of the liquid tube and press it into the sealing ring.

10 If replacing the nut and ring at the bottle cap, slide the ring 220 mm from the bottle-end of the tube using the micro dosing valve tool.

11 Insert the tube in the dosing head or the bottle cap.

12 To fasten sealing ring, tightly screw fastening nut.
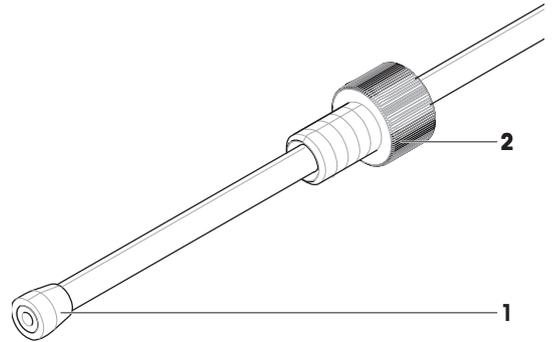
# 7 Troubleshooting

Refer to your XPE Operating Instructions for a list of possible error messages and remedies.

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| Symptom | Countermeasure |
|---------|----------------|
| Instrument hangs on startup. | • Switch off the high-voltage power adapter of the AntiStatic Kit.<br>• After successful startup, switch power adapter on again. |
| Lid drips. | • Change sealing rings and fastening nuts, **see** [Installing new sealing ring and fastening nut on liquid tube ▶ Page 31]. |
| Liquid dosing head drips. | • Check cap.<br>• Make sure there is not too much air in tubing and check air connector module. |
| Liquid dosing does not work. | • Check filter.<br>• Check that dosing head is installed correctly. If there is just a small gap between dosing head and its support, press it down slightly again. |

## 7.1 Fault prevention

The following information helps avoiding potential problems with your instrument.

### 7.1.1 Storing dosing heads

Protect your dosing heads by storing them in a dosing-head storage container. This prevents the powder from absorbing too much humidity.

In case of long-term storage:

- Check the instructions for storing a particular powder.
- Shake the dosing head so that the powder flows back to the vial.
- Remove the vial from the dosing head and screw on the supplied spare cap.

### 7.1.2 Preventing electrostatic charge

When preparing sample vessels electrostatic charge may build up. Electrostatic charge may make correct dosing impossible or adversely affect the dosing result.

Possibilities for electrostatic charge:

- sample vessels made of plastic
- wearing latex gloves

**AntiStatic Kit**

We recommend using the AntiStatic Kit to remove electrostatic charge. The following chapter describes the use of the AntiStatic Kit in the dosing procedure.

The instrument will be equipped with two ionizing electrodes (AntiStatic Kit) which are activated automatically when dosing or tapping **Start**. The two electrodes remove most of the electrostatic charge from your sample vessels.

Always make sure to install a dosing head before placing the sample vessel on the weighing pan. This way, ionizing is active when placing the sample vessel, which constantly removes the electrostatic charge. In addition, we recommend you do not touch the upper edge of the sample vessel (e.g., close to a vial opening) when handling it.

**Checking the sample vessel for electrostatic charge**

1  Install dosing head.
    ⇨ The AntiStatic Kit is active.
2  Locate the sample vessel on the weighing pan.
3  Check that the distance between the dosing head and the vessel is at least 5 cm and the opening of the vessel is aligned with the dosing head exactly.
4  Close all doors of the draft shield.
5  Press →T← to reset the display to zero, this switches the AntiStatic Kit off.
6  Slowly lower the dosing head to about 3 mm above the vessel and simultaneously watch the weight display.
    ⇨ If the displayed value remains stable (almost "0"), there is no electrostatic charge on the sample vessel.
    ⇨ If the displayed value is unstable, there is electrostatic charge on the sample vessel and you need to discharge the sample vessel.

**Discharging the sample vessel**

1  Install a dosing head or tap **Start**.
    ⇨ The AntiStatic Kit is active.
2  Grasp the sample vessel by its lower part and locate its upper edge in front of one of the two electrodes at a distance of about 50 mm for approximately 20 to 40 seconds.
    Repeat this procedure as needed.
3  Relocate the vessel on the weighing pan not touching its upper part.

If your sample vessel is made of plastic material it may be impossible to completely remove electrostatic charge and the displayed value fluctuates.

–  If the opening of the sample vessel is large enough, increase the distance between the dosing head and the sample vessel to more than 3 mm until the weight value in the displayed value remains stable.

# 8 Technical Data

Refer to your XPE Operating Instructions for further information.

## 8.1 General data

**Power supply**

| | |
|---|---|
| AC/DC adapter: | Primary: 100 – 240 V, -15%/+10%, 50/60 Hz |
| | Secondary: 12 V DC ±3%, 2.5 A (with electronic overload protection) |
| Cable for AC/DC adapter: | 3-core, with country-specific plug |
| Power consumption (balance, powder dosing module, and autosampler): | 12 V DC, 2.25 A |
| Polarity: | ⊖─◉─⊕ with a current limited SELV (Safety Extra Low Voltage) output |

**Protection and standards**

| | |
|---|---|
| Overvoltage category: | II |
| Degree of pollution: | 2 |
| Protection: | Protected against dust and water |
| Standards for safety and EMC: | See Declaration of Conformity |
| Range of application: | For use in closed interior rooms only |

**Environmental conditions**

| | |
|---|---|
| Height above mean sea level: | Up to 4000 m |
| Ambient temperature: | 5–40 °C |
| Relative air humidity: | Max. 80% up to 31 °C, linearly decreasing to 50% at 40 °C, noncondensing |

**Materials**

| | |
|---|---|
| Housing: | Die-cast aluminum, plastic, chrome steel and glass |

## 8.2 Explanatory notes for the METTLER TOLEDO AC adapter

The certified external power supply which conforms to the requirements for Class II double insulated equipment is not provided with a protective earth connection but with a functional earth connection for EMC purposes. This earth connection IS NOT a safety feature. Further information about conformance of our products can be found in the brochure "Declaration of Conformity" which is coming with each product.

In case of testing with regard to the European Directive 2001/95/EC the power supply and the instrument have to be handled as Class II double insulated equipment.

Consequently an earth bonding test is not required. Similarly it is not necessary to carry out an earth bonding test between the supply earth conductor and any exposed metalwork on the instrument.

Because the instruments are sensitive to static charges a leakage resistor, typically 10 k$\Omega$, is connected between the earth connector and the power supply output terminals. The arrangement is shown in the equivalent circuit diagram. This resistor is not part of the electrical safety arrangement and does not require testing at regular intervals.

Equivalent circuit diagram
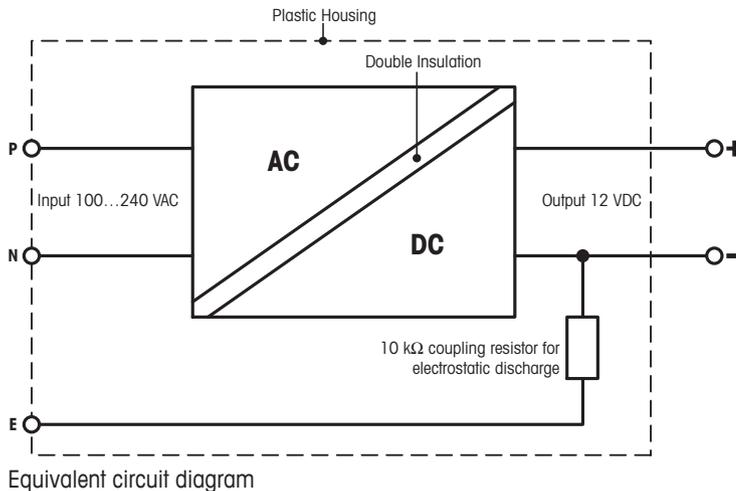
## 8.3  Powder module

| Dimensions | |
|---|---|
| Max. height of sample vessel | 178 mm |
| Min. height of sample vessel | 31 mm |
| Minimum opening of sample vessel (diameter) | 6 mm |
| Usable height of draft shield | 180 mm |
| Height of instrument (with open front door) | 675 mm |
| Number of sample vessels | 1 |
| Weight of powder dosing system (without terminal) | 15.5 kg |
| Weight of Q2 module | 7.3 kg |
| **Required Space** | |
| Depth without terminal and front door | 400 mm |
| Depth without terminal but with front door | 500 mm |
| Depth with terminal | 545 mm |
| Height | 680 mm |
| Width | 330 mm |

Dimensions in mm.
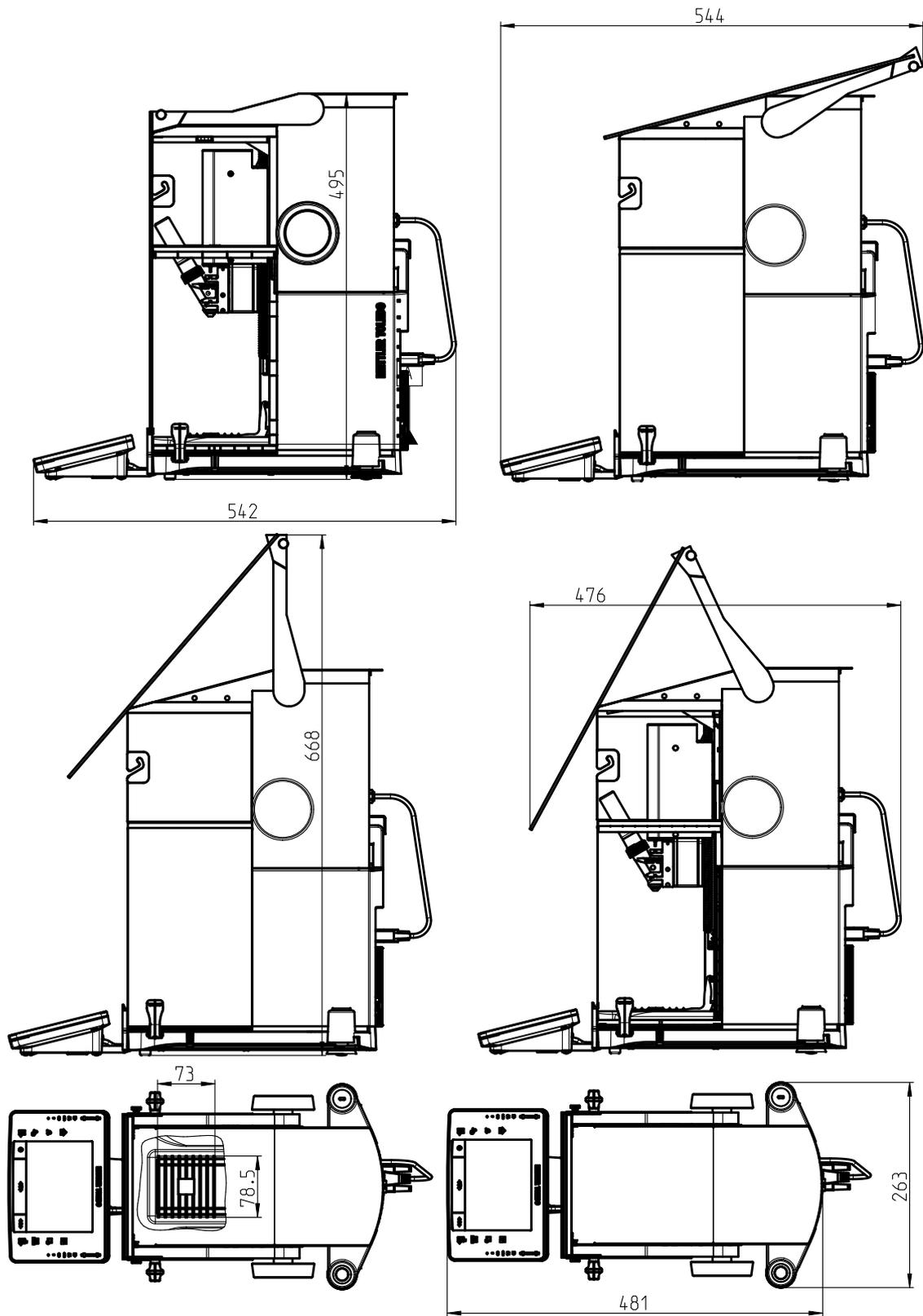
## 8.4 Liquid module

### Dosing Head

|  | QL001 | QL002 |
|---|---|---|
| **Dosing properties** | | |
| Suitable liquids: max. viscosity | 20 cP | 20 cP |
| **Typical values** | | |
| Dosing quantity offset [1] | 1 mg | 20 mg |
| Dosing quantity Repeatability (sd) [1] | 1 mg | 10 mg |
| Dosing time [1] | 30 s | 12 s |

[1] Liquid; quantity = $H_2O$; 5 g

### Tubing

|  | Outer Diameter | Inner Diameter | Length |
|---|---|---|---|
| Liquid tube (Dosing head > Bottle) | 3.2 mm | 1.6 mm | 920 mm |
| Air tube (Pump module > Bottle) | 4.0 mm | 2.4 mm | 660 mm |

### Suction Filter

|  |  |
|---|---|
| Tubing Outer Diameter | 3.2 mm |
| Filter pore size | 10 µm |

**Pump module with 1000 ml bottle**

Dimensions in mm.
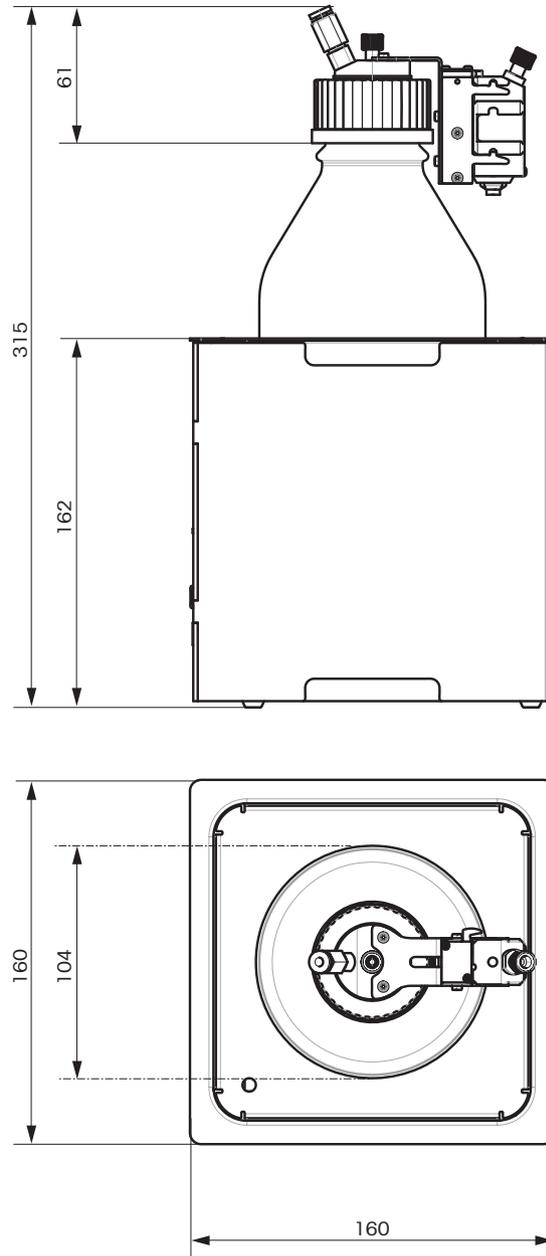
## 8.5 Material specifications

Materials in contact with powder or liquid to be dosed.

### 8.5.1 Powder dosing head QH008

| | Designation | Material |
|---|---|---|
| 1 | Dosing head body | PMP |
| 2 | Bushing | POM |
| 3 | Dosing pin | Stainless steel 1.4404 |
| 4 | Scraper | Stainless steel 1.4310 |
| 5 | Cone | Stainless steel 1.4404 |
| 6 | Insert | POM |
| 7 | Adapter cap | POM |
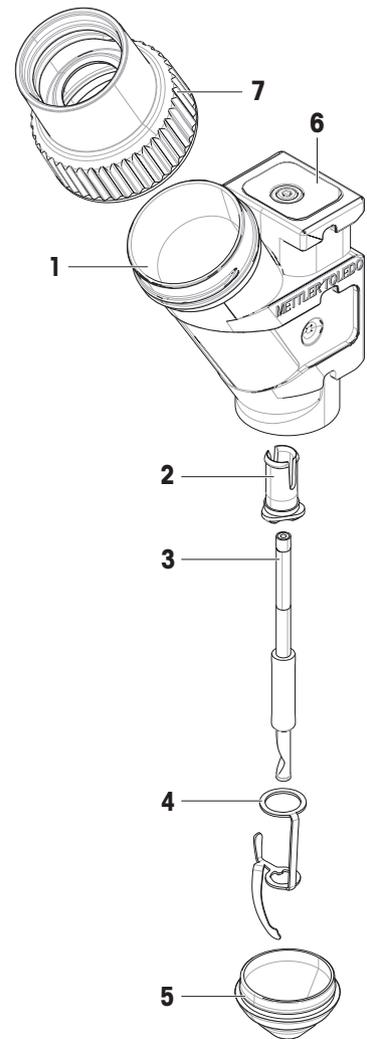
### 8.5.2 Powder dosing head QHO12

| | Designation | Material |
|---|---|---|
| 1 | Dosing head body | PMP |
| 2 | Bushing | POM |
| 3 | Dosing pin | Stainless steel 1.4404 |
| 4 | Scraper | Stainless steel 1.4310 |
| 5 | Cone | Stainless steel 1.4404 |
| 6 | Insert | POM |
| 7 | Adapter cap | POM |
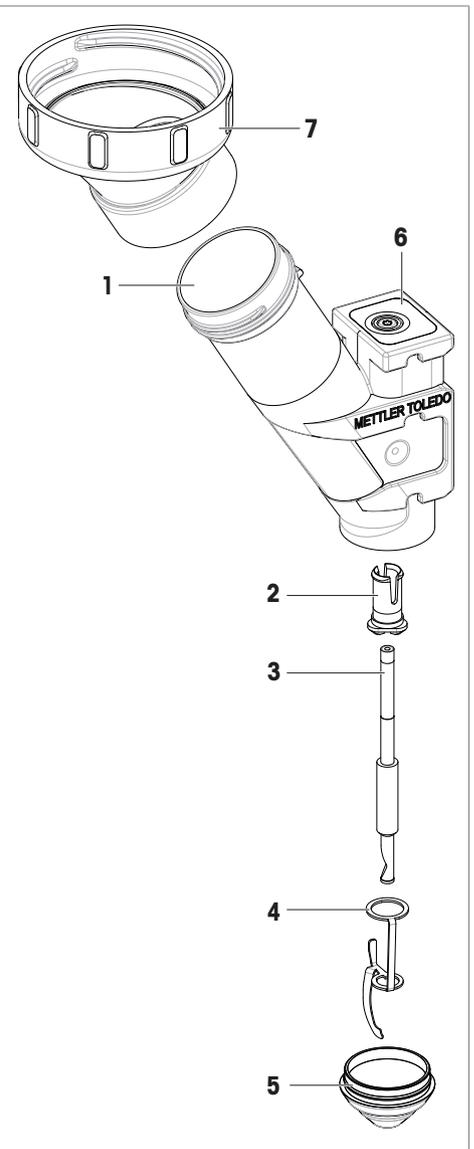
### 8.5.3 Powder dosing head QH002-CNMW

| | Designation | Material |
|---|---|---|
| **1** | Body | PP |
| **2** | Closing cap | PP |
| **3** | Dosing pin | PP (ESD) |
| **4** | Cone body | PP (ESD) |
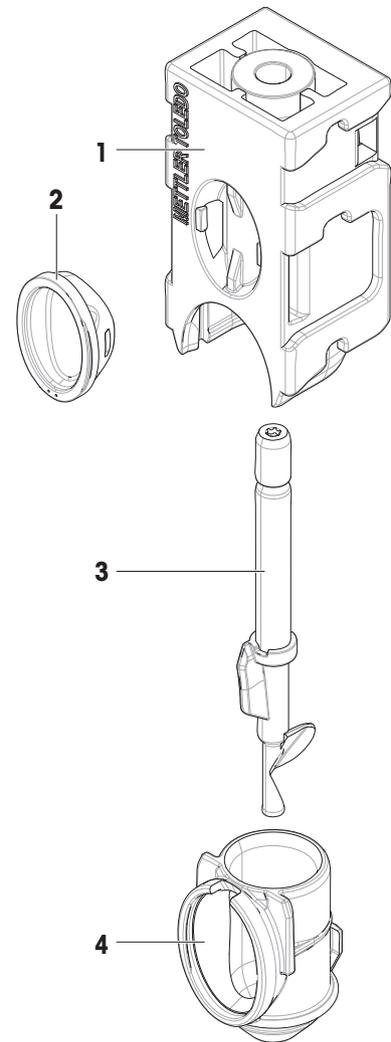
### 8.5.4 Powder dosing head QH012-LNJW

| | Designation | Material |
|---|---|---|
| **1** | Adapter cap | POM |
| **2** | Dosing head body | PMP |
| **3** | Dosing pin | PP (ESD) |
| **4** | Cone body | PP (ESD) |
| **5** | Insert | POM |
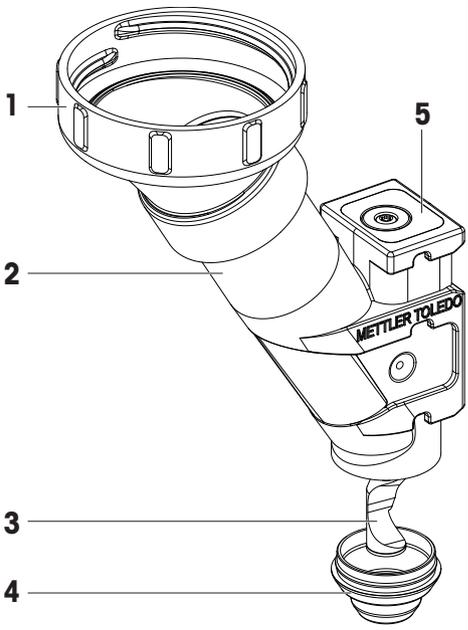
### 8.5.5 Liquid dosing heads QL001/QL002

| | Designation | Material |
|---|---|---|
| 1 | Fastening nut | PEEK |
| 2 | Sealing ring | ETFE |
| 3 | Fitting adapter | Stainless steel 1.4404 |
| 4 | O-Ring | FFKM |
| 5 | Solenoid valve | PEEK |
| | | Sapphire-Ruby |
| | | Stainless steel 1.4105IL |
| | | Stainless steel 1.14301 / 1.4306 |
| | | Stainless steel 1.4305 |
| 6 | Cap insert | PE |
| 7 | Bottle | Borosilicate glass |
| 8 | Tubing | FEP |
| 9 | Suction filter | PP |
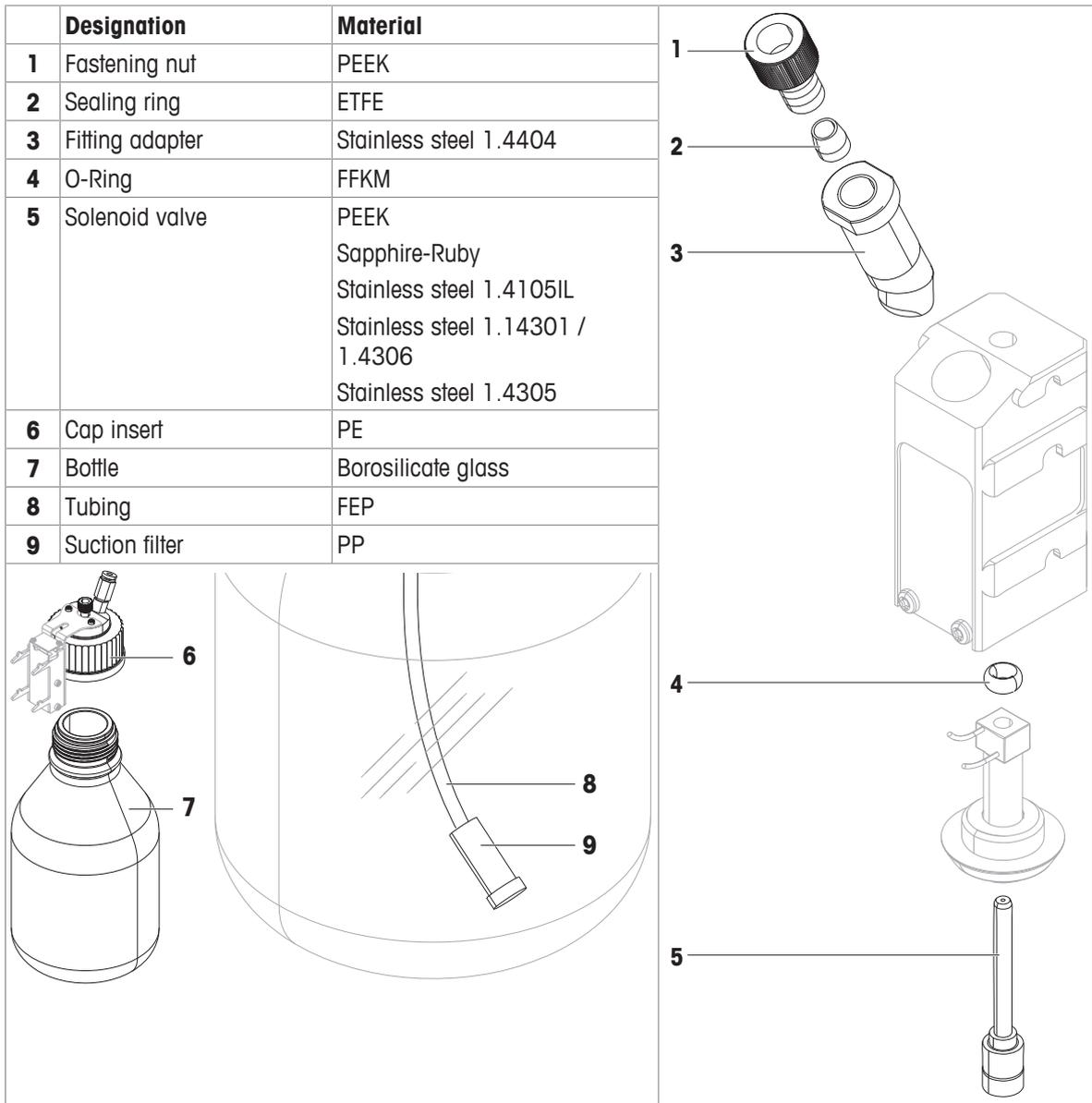


### 8.5.6 Glossary of terms used

Acronyms defined in ISO 1043: Plastics – Symbols and abbreviated terms.

| | | |
|---|---|---|
| **ETFE** | = | Ethylene tetrafluoroethylene |
| **FEP** | = | Fluorinated ethylene propylene (Teflon®) |
| **FFKM** | = | Perfluoroelastomer |
| **PE** | = | Polyethylene |
| **PEEK** | = | Polyetheretherketone |
| **PMP** | = | Polymethylpentene |
| **POM** | = | Polyoxymethylene |
| **PP** | = | Polypropylene |
| **PP (ESD)** | = | Polypropylene (electrostatic dissipative) |

# 9 Information on Standards

**FCC Rules**

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.

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.

## 10 Disposal

In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to other parties, the content of this regulation must also be related.

If working with hazardous substances, the instrument or part of it may be contaminated. Improper disposal of the instrument may result in environmental hazard. Take appropriate measures according to the risk posed by the substances used, e.g., instructions from the data sheet of the substances. Comply with local regulations for handling and disposal of environmentally-harmful substances; if necessary, get assistance from approved specialized waste disposal companies.

# 11 Accessories and Spare Parts

## 11.1 Accessories

| Description | Part No. |
|---|---|
| **Dosing heads** | |

| | Description | Part No. |
|---|---|---|
| | QH002-CNMW dosing head | |
| | 30 pcs. | 30083440 |
| | 60 pcs. | 30098264 |
| | 500 pcs. | 30244518 |
| | QH010-CNMW dosing head | |
| | 10 pcs. | 30132790 |
| | 40 pcs. | 30132791 |
| | 150 pcs. | 30046355 |
| | QH008-BNMW dosing head | 11141533 |
| | 10 pcs. | |
| | QH012-LNMW dosing head | 11141532 |
| | 10 pcs. | |
| | QH012-LNJW dosing head | 30366317 |
| | 10 pcs. | |
| | QH012-LNLW dosing head | 11150145 |
| | 10 pcs. | |
| | QH008-BNMP dosing head | 11150120 |
| | 10 pcs. | |
| | Storage containers with vials 125 ml (for QH012), 10 pcs. | 30036965 |

| | | |
|---|---|---|
| | Storage containers with vials 16 ml (for QH008), 10 pcs. | 30139824 |
| | QA075-P powder test head<br>filled with $CaCO_3$, for 15 tests of 10 automatically dispensed doses each | 11141506 |
| | QA000-W dosing head for MinWeigh test | 11141507 |
| | Dosing head starterkit<br>Set of various dosing heads. | 30132792 |
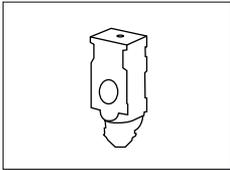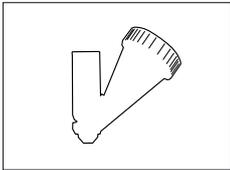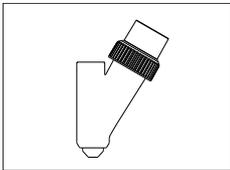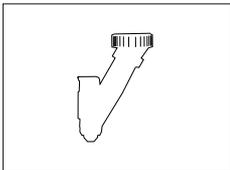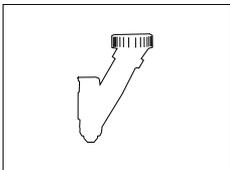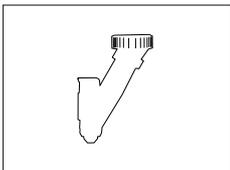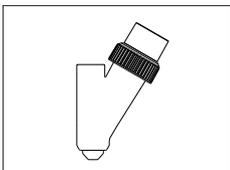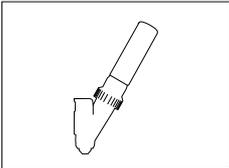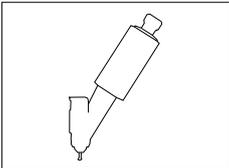
**Printers**
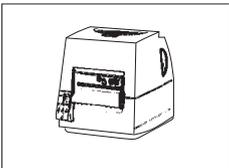
| | | |
|---|---|---|
| | CLS-631 Label printer for Quantos (RS232C/USB-A) | 11141820 |
| | Quantos label and ink ribbon kit | 30004309 |
| • NetCom Kit needed | | |

| | | |
|---|---|---|
| | RS-P25 printer for Quantos (RS232C) | 11141834 |
| | Ribbon cartridge, black, set of 2 pcs | 00065975 |
| | Paper roll (length: 20 m), set of 5 pcs | 00072456 |
| | Paper roll (length: 13 m), self-adhesive, set of 3 pcs | 11600388 |
| • NetCom Kit needed | | |

**Barcode reader**

| | | |
|---|---|---|
| RS232C Barcode Reader | | 21901297 |
| The following accessories are needed for operation (not included): | | |
| | RS232 F cable | 21901305 |
| | Null modem adapter | 21900924 |
| Plus one of the following: | AC adapter 5 V for EU | 21901370 |
| | AC adapter 5 V for US | 21901372 |
| | AC adapter 5 V for GB | 21901371 |
| | AC adapter 5 V for AU | 21901370<br>+ 71209966 |

**Optional interfaces**
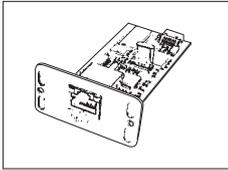
| | Ethernet Interface for connection to an Ethernet network | 11132515 |
|---|---|---|

**Power supplies**
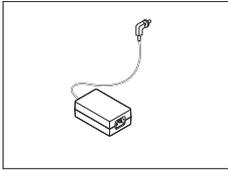
| | AC/DC adapter (without power cable) 100–240 V AC, 0.8 A, 50/60 Hz, 12 V DC 2.5 A | 11107909 |
|---|---|---|
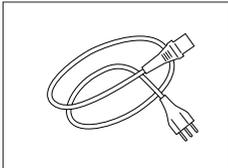
Country-specific 3-Pin power cable with grounding conductor.

| | |
|---|---|
| Power cable AU | 00088751 |
| Power cable BR | 30015268 |
| Power cable CH | 00087920 |
| Power cable CN | 30047293 |
| Power cable DK | 00087452 |
| Power cable EU | 00087925 |
| Power cable GB | 00089405 |
| Power cable IL | 00225297 |
| Power cable IN | 11600569 |
| Power cable IT | 00087457 |
| Power cable JP | 11107881 |
| Power cable TH, PE | 11107880 |
| Power cable US | 00088668 |
| Power cable ZA | 00089728 |

**ErgoClips**
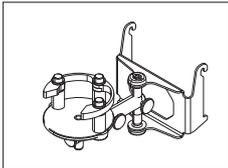
| | ErgoClip Quantos | 11141570 |
|---|---|---|

| | ErgoClip Vial | 30260822 |
|---|---|---|
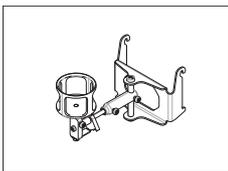
**ErgoDiscs**
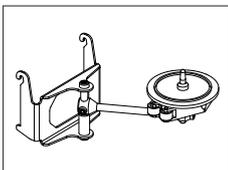
| | ErgoDisc support plate | 11141750 |
|---|---|---|
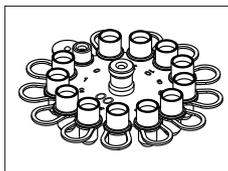
ErgoDisc plate (12 pos)

| | |
|---|---|
| capsule size 00 | 11141754 |
| capsule size 0 | 11141751 |
| capsule size 1 | 11141755 |
| capsule size 2 | 11141758 |
| capsule size 3 | 11141752 |
| capsule size 4 | 30336822 |

## Various
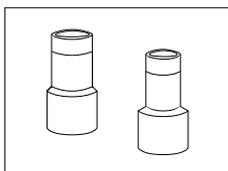
**Vial adapters** (POM)

| | |
|---|---|
| 8.5 mm × 15 mm (5 pcs.) | 30428901 |
| 9 mm × 25 mm (5 pcs.) | 30428902 |
| 9.5 mm × 25 mm (5 pcs.) | 30428903 |
| 10 mm × 25 mm (5 pcs.) | 30428904 |
| 10.5 mm × 25 mm (5 pcs.) | 30428905 |
| 11 mm × 30 mm (5 pcs.) | 30428906 |
| 11.5 mm × 30 mm (5 pcs.) | 30428907 |
| 12 mm × 20 mm (5 pcs.) | 30428908 |
| 12.5 mm × 30 mm (5 pcs.) | 30428909 |
| 13.5 mm × 20 mm (5 pcs.) | 30428910 |
| 14.5 mm × 25 mm (5 pcs.) | 30428911 |
| 15.5 mm × 25 mm (5 pcs.) | 30428912 |
| 16.5 mm × 25 mm (5 pcs.) | 30428913 |
| 17.5 mm × 25 mm (5 pcs.) | 30428914 |
| 18.5 mm × 25 mm (5 pcs.) | 30428915 |
| 19.5 mm × 25 mm (5 pcs.) | 30428916 |
| 20.5 mm × 25 mm (5 pcs.) | 30428917 |
| 21.5 mm × 25 mm (5 pcs.) | 30428918 |
| 22.5 mm × 25 mm (5 pcs.) | 30428919 |
| 23.5 mm × 25 mm (5 pcs.) | 30428920 |
| 27.5 mm × 25 mm (5 pcs.) | 30428921 |
| 28.5 mm × 25 mm (5 pcs.) | 30428922 |
| 29.5 mm × 35 mm (5 pcs.) | 30428923 |
| 31.5 mm × 30 mm (5 pcs.) | 30428924 |
| 33.5 mm × 15 mm (5 pcs.) | 30459921 |
| 35.5 mm × 15 mm (5 pcs.) | 30459922 |
| 37.5 mm × 15 mm (5 pcs.) | 30459923 |
| 40.5 mm × 15 mm (5 pcs.) | 30459924 |
| 44.5 mm × 15 mm (5 pcs.) | 30459925 |
| 48 mm × 15 mm (5 pcs.) | 30459926 |
| 52 mm × 15 mm (5 pcs.) | 30459927 |
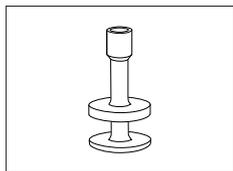
**Capsule adapters** (stainless steel)

| | |
|---|---|
| size 000 (5 pcs.) | 30006416 |
| size 00 (5 pcs.) | 30006417 |
| size 0 (5 pcs.) | 30006418 |
| size 1 (5 pcs.) | 30006419 |
| size 2 (5 pcs.) | 30006430 |
| size 3 (5 pcs.) | 30006431 |
| size 4 (5 pcs.) | 30006432 |
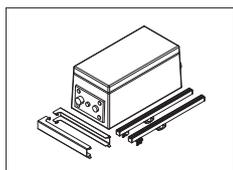


Integrable antistatic kit incl. pair of multiple-point electrodes and power supply — 11141829



NetCom Kit — 11141832
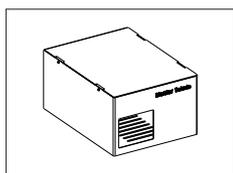


Cable Box — 11141845



Grey drip tray — 30038741

## Quantos modules

The following Accessories must be mounted and installed by a METTLER TOLEDO service technician.
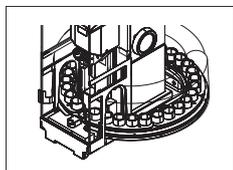


Autosampler QS30 — 11141300
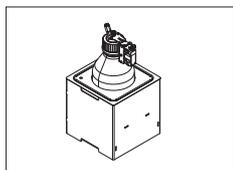


Pump module QL2 — 30008317
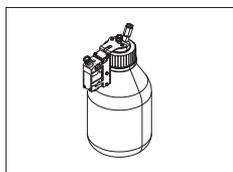


QLL standard kit for bottles — 30008318

QLL standard kit for small bottles                                    30237340

## 11.2 Spare parts

**Spare parts powder module (Q2)**

| Drawing | Pos | Description | Part No. |
|---------|-----|-------------|----------|
|  | 1 | Front door powder module (Q2) | 11141855 |
| | | Front door XPE56Q | 30079864 |
| | 2 | Side window left | 30303176 |
| | 3 | Side window right | 30303177 |
| | 4 | Side door (conductive) | 11106263 |
| | 5 | Terminal complete with firmware | 30087553 |

| | Description | Part No. |
|---|-------------|----------|
|  | 6-pole CAN cable<br>Length: 60 cm | 30005904 |
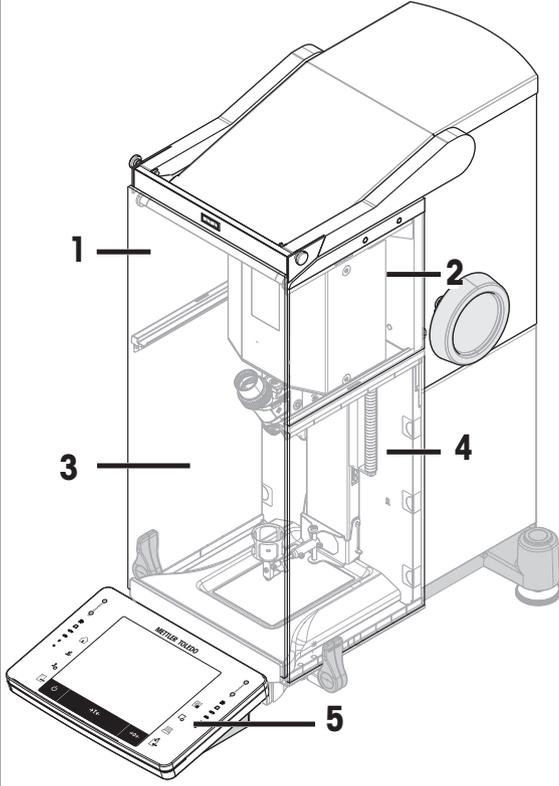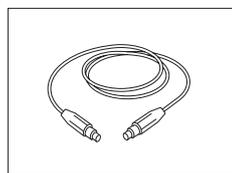
**Spare parts liquid dosing**
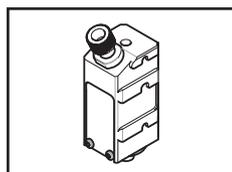
| | Description | Part No. |
|---|-------------|----------|
|  | Liquid dosing head QL001 | 30080473 |
|  | Micro dosing valve 001 | 30348196 |

| | Spare parts for QLL standard kit | 30025649 |
|---|---|---|
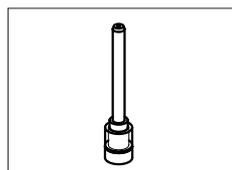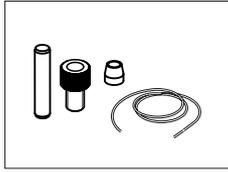
- Tubing OD 4, ID 2.4 (2m)
- Tubing OD 3.2, ID 1.6 (3m)
- Sealing ring, flangeless ferrule 1/8" gb P300X (10 pcs.)
- Fastening nut, ferrule flangeless P347X (5 pcs.)
- Closure, pin ISO 2338 4H8 × 20, A1 (5 pcs.)
- Suction filter for 1/8" OD
- Micro dosing valve tool
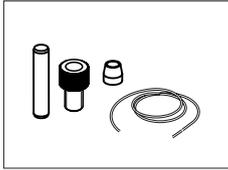
| | Spare parts for QLL standard kit small | 30460218 |
|---|---|---|

- Tubing OD 4, ID 2.4 (2m)
- Tubing OD 1.6, ID 0.8 (3m)
- Sealing ring, flangeless ferrule 1/16" gb P200X (10 pcs.)
- Fastening nut, ferrule flangeless nut P247X (5 pcs.)
- Closure, pin ISO 2338 4H8 × 20, A1 (5 pcs.)
- Micro dosing valve tool
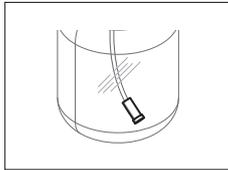
| | Suction filter for 1/8" OD | 30007832 |
|---|---|---|
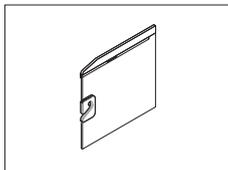
Side windows (for liquid dosing)

| Left | 11141854 |
|---|---|
| Right | 11141853 |

| | Muffler | 30378287 |
|---|---|---|

# Index

# GWP®
## Good Weighing Practice™

GWP® is the global weighing standard, ensuring consistent accuracy of weighing processes, applicable to all equipment from any manufacturer It helps to:
- Choose the appropriate balance or scale
- Calibrate and operate your weighing equipment with security
- Comply with quality and compliance standards in laboratory and manufacturing

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For more information

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