Reference Manual

Quantos Automated Dosing

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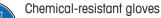
Any other type of use and operation beyond the limits of use stated by Mettler-Toledo GmbH without consent from Mettler-Toledo GmbH is considered as not intended.

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

 Gloves

 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 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.

Quantos Automated Dosing · Safety Information | 5

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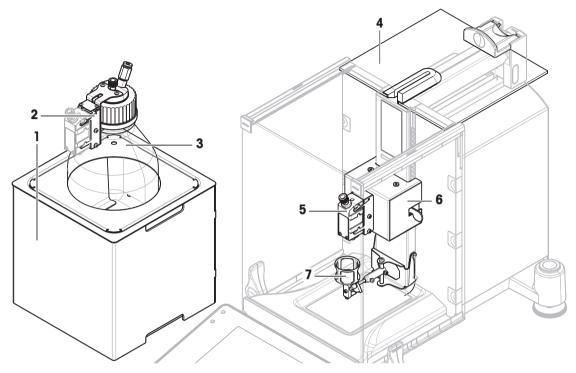
The instrument can be damaged by certain cleaning agents, solvents, or abrasives. If liquids enter the housing, they can damage the instrument.

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 Liquid module
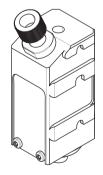
Legend Liquid Module

Pump module with bottle			Liquid kit with liquid dosing head	
1	Pump module (QL2)		**4**	Top glass liquid
2	Liquid dosing head support	(QLL standard kit for bottles)	**5**	Liquid dosing head (QL001)
3	Bottle		**6**	Liquid kit (QLX45)
			7	ErgoClip vial

3.1.2 Dosing head

Liquid dosing head

This is the standard head for liquid dosing. It is used together with pump module and bottle.

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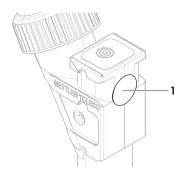
When no dosing head is installed the instrument will replace head-specific information with factory settings.

3.1.3 Data stored in the dosing head's RFID

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.

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.

QLX45 liquid kit

- Liquid kit QLX45
- Top glass liquid
- ErgoClip vial
- SmartGrid round
- Vial adapter 4 pcs
- MinWeigh door

- Screwdriver torx T8
- RS232C-cable
- Power supply
- Cable conduct
- Cable clip (cable conduct closure)
- User Manual

QLL standard kit for bottles

- 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

- 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

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.
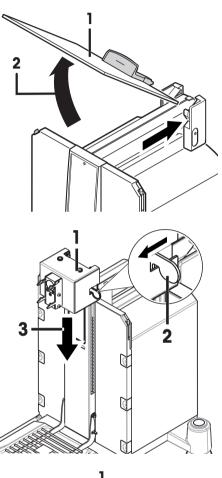
If the instrument is not horizontal at the outset, it must be leveled during commissioning.

4.3 Assembling the liquid module
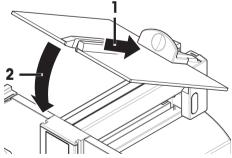
Assemble the balance according to your XPE Operating Instructions.

▶ www.mt.com/library

1   Remove top glass (1) by sliding it backwards and pulling it upwards (2) carefully.

2   Insert the liquid kit (1), pull 2 levers (2) towards you and slide liquid kit onto the rack.

    Note
    CAN-connector is on bottom of liquid kit.

3   To fix position of liquid kit, release 2 levers (2) and move liquid kit slightly.

    ⇨ Liquid kit locks down.

    ⇨ Liquid kit is mounted.

4   Insert the top glass liquid (1) into the rear guide.

5   Carefully fold top glass liquid (2) downwards.

4.4 Installing liquid dosing head on liquid kit

Installing liquid dosing head on liquid kit

1 Slide the liquid dosing head (1) onto the liquid kit (2) until it comes to a stop.

2 Press it down slightly until it is properly seated in the holding pins.
   Important
   Check that dosing head is inserted correctly.
   If there is just a small gap between dosing head and its support, press it down again.

3 Thread the liquid tube through slot in Quantos top glass.

Removing liquid dosing head from liquid kit

– To remove the liquid dosing head, press it slightly upwards and remove it to the front.

## 4.5 Assembling pump module and bottle
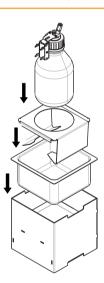
⚠ **WARNING**

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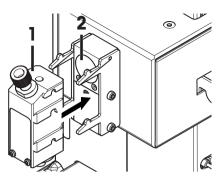
Inserting and removing a liquid dosing head in and from the liquid dosing head support

⚠ **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.
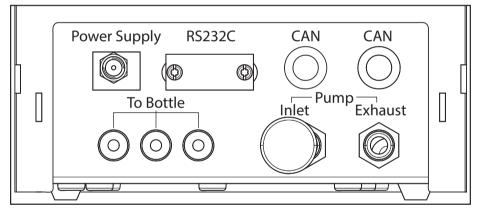
1   Insert liquid dosing head in the liquid dosing head support.

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
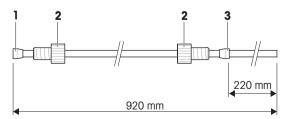
Tubes definition
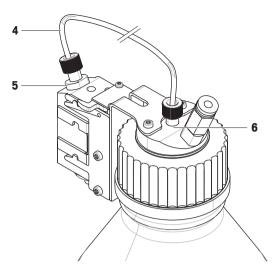
The thinner tube is used for transporting liquid from the bottle to the liquid dosing head. The slightly bigger tube is used for pumping air into the bottle. By adding air, pressure rises in the bottle. When pressure reaches min. 0.3 to max 0.5 bar (4.4 to 7.2 psi) the micro dispensing valve in the dosing 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.
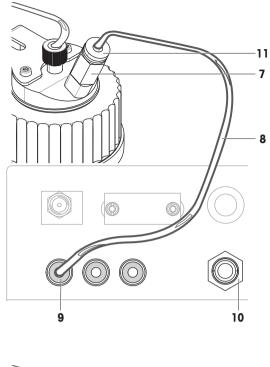
1. Connect the air tube (8) to the air inlet of the bottle (7)
2. Connect the other end of the air tube to the air outlet of the pump module (9).
3. Insert the muffler into the air inlet of the pump module (10) to absorb the noise.
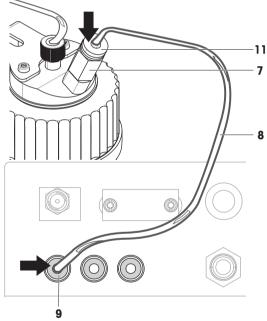
When a tube is connected to the air outlet of the pump, the valve of the air outlet opens. Never leave a tube that is connected to the air outlet unconnected at the other end because pressure can not be built up.

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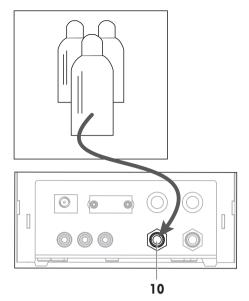
1 The liquid can be protected by feeding an external gas, e.g., nitrogen, to the pump. Make sure that the pressure of the external gas does not exceed 0.2 bar (2.9 psi).

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
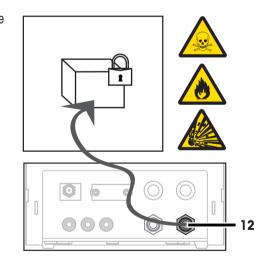
⚠ **WARNING**

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

4.7 Wiring the liquid module

⚠️ **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.

📝 **Note**

The balance is supplied with an AC/DC adapter and a country-specific power cable. The AC/DC adapter is suitable for use with the following voltage range:
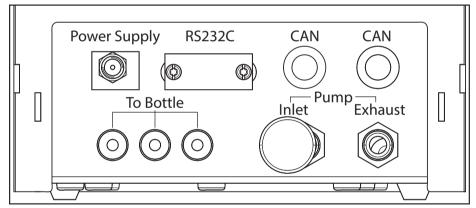
100 – 240 V AC, 50/60 Hz.

Important

Wire the components before turning the balance on.
After turning the balance on, if the message **Wrong head type mounted** appears, check wires.
Make sure you connect CAN-cables before connecting power supplies.
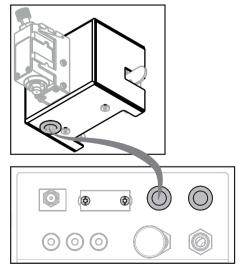
Connectors of pump module
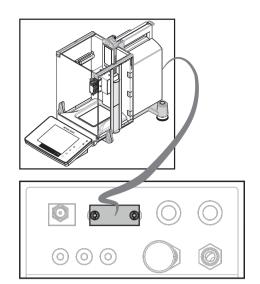
Power supply and RS232C-connector are covered with a faceplate. Remove faceplate.
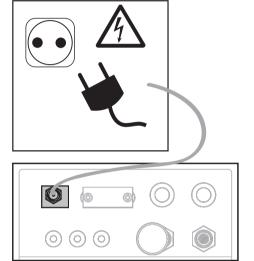
1 Connect pump module with liquid kit via CAN-cable.
   There are 2 CAN-connectors on the pump module. There is no preference which one to take.
2 Remove left side glass and exchange one clip with the cable clip included in the scope of delivery.
3 Guide CAN-cable through cable clip and insert left side glass.

4   Connect pump module with balance via standard RS232C-cable.

⇨ Liquid module is connected.

1   Connect power cable of liquid module to power socket and local power supply.
2   Connect power cable of balance to power socket and local power supply.

5 Operation

5.1 First steps

5.1.1 Basic operation settings

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

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**
- Powder module must be defined as unmounted: 🔲 > **Powder module** > **Unmounted**
- RS232 device must be activated: 🔡 > **System** > **Peripherals** > **RFID / Quantos** > **RS232 built-in**

5.1.2 Working with liquid 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
	Solid dosing	To dose a powder.	**See** Manual dosing
	Liquid dosing	To dose a liquid.	**See** Dosing liquid
	Cancel	To return to home screen.	

5.1.3 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.

5.1.4 Prepare a 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)

5.1.4.1 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**.

5.1.4.2 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**.

5.1.5 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 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.**.

5.3 Handling of liquid dosing head

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

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

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.

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.

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

5.4 Handling the bottle
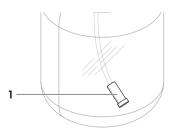
⚠ **CAUTION**

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.

1 ————

- 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.
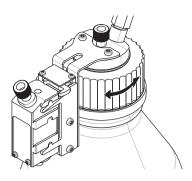
Changing a bottle
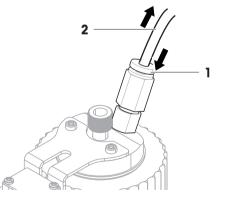
If you have more than one bottle equipped with cap and dosing head:
- Pressure is released.
1 Install dosing head on dosing head support at the bottle.
2 Unplug air tube by pressing ring (1) down and pulling tube (2) out carefully at the same time.
3 To seal the bottle, insert pin into air tube fitting.
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 26

5.5 Advanced features

5.5.1 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.

5.5.2 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.

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 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.

6.1.1 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.

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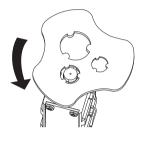
If purging is not enough, clean the liquid dosing head as follows.

⚠️ **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.

6.2 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.
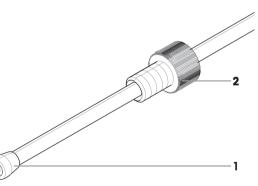
– Always release pressure by switching off the instrument before removing the micro dosing valve, opening the bottle, or removing the liquid tube.

📝 **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.

▶ www.mt.com/library

Symptom	Countermeasure
Instrument hangs on startup.	• Switch off the high-voltage power adapter of the AntiStatic Kit. • 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 27].
Liquid dosing head drips.	• Check cap. • Make sure there is not too much air in tubing and check air connector module.
Liquid dosing does not work.	• Check filter. • 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.

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 (liquid module):	12 V DC, 2.0 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
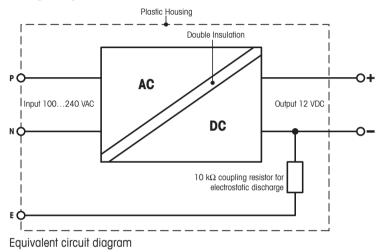
8.2 Explanatory notes for the METTLER TOLEDO AC adapter

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 kΩ, 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 Model-specific data

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

8.4 Material specifications

Materials in contact with liquid to be dosed.

8.4.1 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

8.4.2 Glossary of terms used
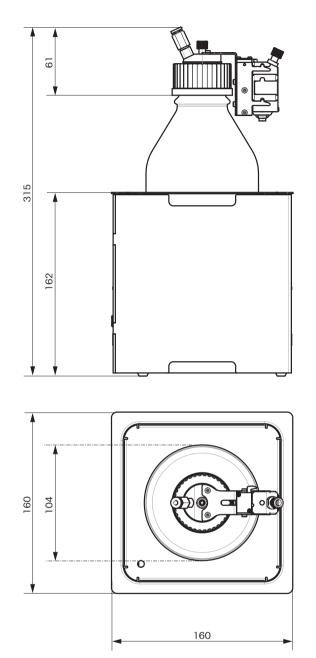
Acronyms defined in ISO 1043: Plastics – Symbols and abbreviated terms.

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)

8.5 Dimensions

Pump module with 1000 ml bottle

Dimensions in mm.

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.

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 + 71209966

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
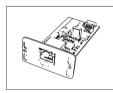
Country-specific 3-Pin power cable with grounding conductor.

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

Optional interfaces
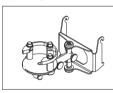
Ethernet Interface for connection to an Ethernet network   11132515

ErgoClips

ErgoClip Quantos   11141570

ErgoClip Vial   30260822

SmartGrid Round   30020966
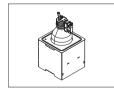
Various

Pump module QL2   30008317

	QLL standard kit for bottles	30008318

	QLL standard kit for small bottles	30237340

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

	Integrable antistatic kit incl. pair of multiple-point electrodes and power supply	11141829
	NetCom Kit	11141832
	Cable Box	11141845
	Grey drip tray	30038741

11.2 Spare parts

	Description	Part No.
	MinWeigh door	11106749
	Top glass door	30025650
	6-pole CAN cable Length: 60 cm	30005904
	Side door conductive	11106263
	Liquid dosing head QL001	30080473
	Micro dosing valve 001	30348196
	Suction filter for 1/8" OD	30007832
	Spare parts for QLL standard kit	30025649

Spare parts for QLL standard kit
- 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
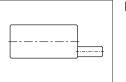
Spare parts for QLL standard kit small   30460218

- 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

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

▶ **www.mt.com/GWP**

For more information

30259563