

METTLER TOLEDO



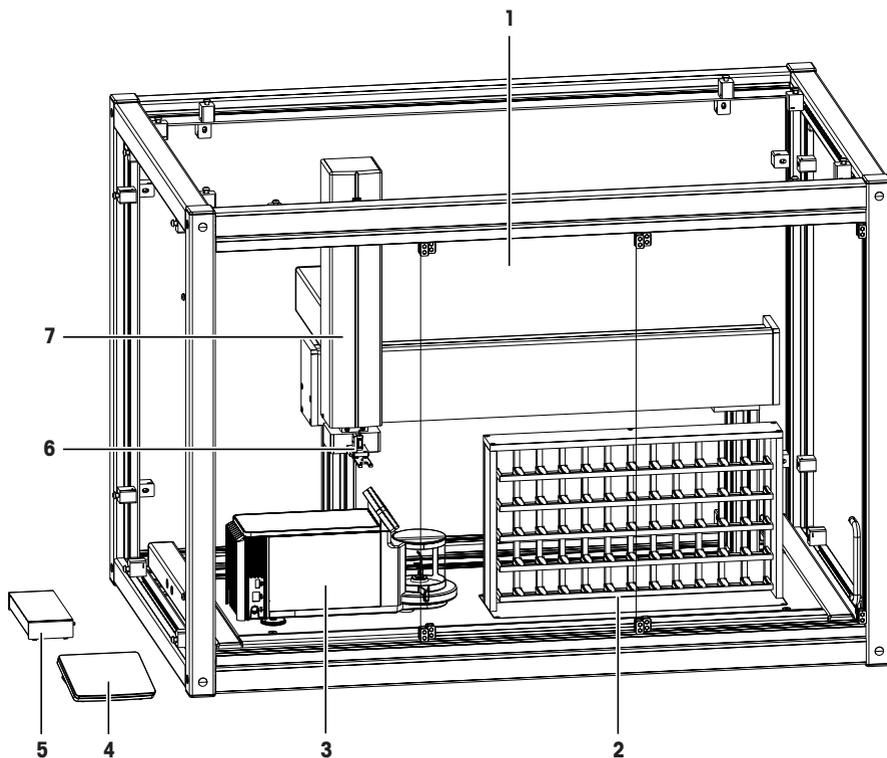


This User Manual is a brief instruction that provides information to handle with the first steps of the instrument in a safe and efficient manner. Personnel must have carefully read and understood this manual before performing any tasks.

For full information, always consult and download the Reference Manual (RM).

► [www.mt.com/e5-comparator-RM](http://www.mt.com/e5-comparator-RM)

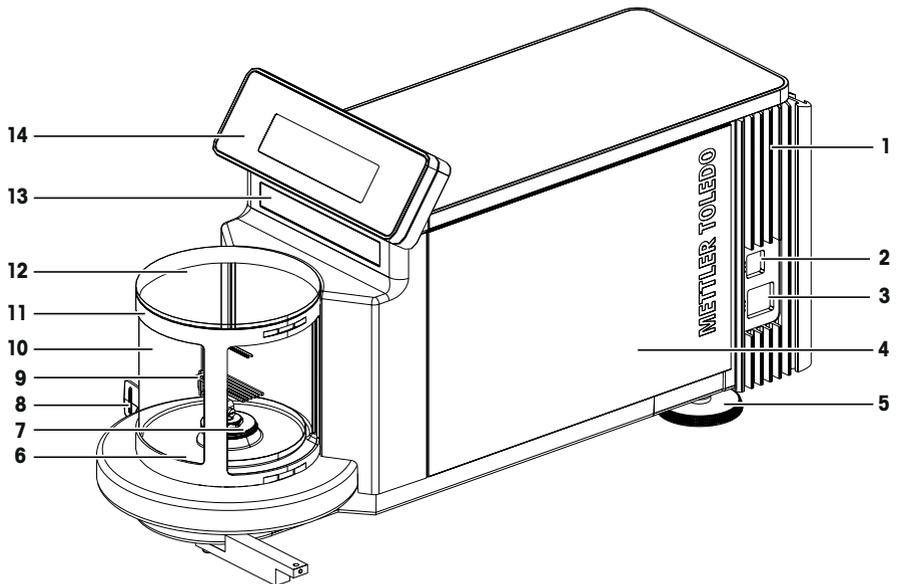
## Overview instrument



### Legend overview instrument

1	Weighing chamber accessible through sliding door	2	Weight magazine with 60 weight carriers
3	Balance (XPR6U mass comparator)	4	Balance terminal
5	Robot system control unit	6	Robot hand with light barrier
7	3-axis robot system		

## Overview XPR6U balance



### Legend overview balance

<b>1</b>	Cooling element	<b>2</b>	USB device
<b>3</b>	USB host	<b>4</b>	Weighing unit
<b>5</b>	Leveling screw	<b>6</b>	Weighing chamber plate
<b>7</b>	Drip tray	<b>8</b>	Door handle
<b>9</b>	Weighing pan	<b>10</b>	Weighing chamber
<b>11</b>	Glass draft shield	<b>12</b>	Glass draft shield cover
<b>13</b>	Model plate	<b>14</b>	Display

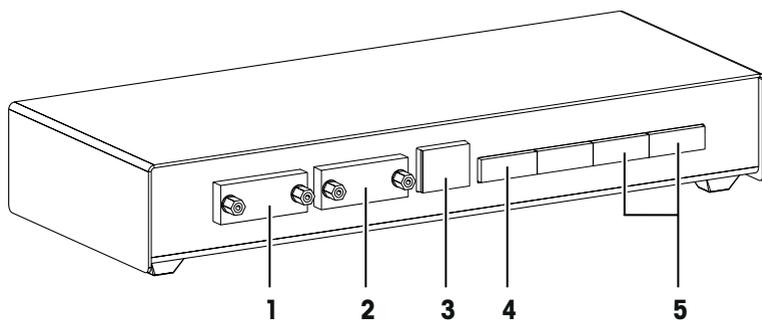
As balance the XPR6U comparator is used.



For full information, always consult and download the Reference Manual (RM).

► [www.mt.com/XPR-micro-RM](http://www.mt.com/XPR-micro-RM)

## Overview robot system control unit



### Legend overview robot system control unit

<b>1</b>	RS232C (balance control unit)	<b>2</b>	RS232C (PC with control software)
<b>3</b>	Ethernet (not applicable)	<b>4</b>	Socket for interface cable robot system
<b>5</b>	Sockets for AC/DC adapter		

# 1 Safety Information

Two documents named "User Manual" and "Reference Manual" are available for this instrument.

- The User Manual is printed and delivered with the instrument.
- The electronic Reference Manual contains a full description of the instrument and its use.
- Keep both documents for future reference.
- Include both documents if you transfer the instrument to other parties.

Only use the instrument according to the User Manual and the Reference Manual. If you do not use the instrument according to these documents or if the instrument is modified, the safety of the instrument may be impaired and Mettler-Toledo GmbH assumes no liability.

## 1.1 Further applicable documents



This User Manual is a brief instruction that provides information to handle with the first steps of the instrument in a safe and efficient manner. Personnel must have carefully read and understood this manual before performing any tasks.

For full information, always consult and download the Reference Manual (RM).

► [www.mt.com/e5-comparator-RM](http://www.mt.com/e5-comparator-RM)

## 1.2 Definitions of signal warnings 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



Heavy object



Crushing hazard



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

### Personal protective equipment



Chemical resistant safety gloves are intended to protect hands against aggressive chemicals.



The protective goggles protect the eyes from flying parts and liquid splashes.

## 1.3 Product specific safety notes

### Intended use

This instrument is designed to be used in laboratories by trained staff. The automated mass comparator is intended for measuring calibration weights using direct comparison or down-/upward calibration.

Any other type of use and operation beyond the limits of technical specifications without written 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.

### Trained personnel

Persons performing weighing processes must fulfill the following basic knowledge requirements regarding the handling of METTLER TOLEDO instruments and associated software:

- Are able to complete the tasks entrusted to them and independently detect and avoid any possible dangers.
- Have expertise and experience as well as their familiarity with all applicable regulations.
- Able to prove that they have undergone training.

### 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.



#### **CAUTION**

##### **Freely accessible parts, which can move automatically**

Injuries due to crushing are possible when reaching into the working area of the robot arm during adjustment procedures or during normal operation.

- Do not reach into the working area when the robot arm is moving.



#### **CAUTION**

##### **Damage on instrument due to incorrect moving or unsuitable location site**

Moving the instrument yourself might lead to injuries or might damage the instrument.

- 1 Contact a METTLER TOLEDO representative before changing the location of the instrument.
- 2 Do not carry the instrument yourself. It's total weight exceeds the acceptable limit in accordance to the applicable regulations.



## NOTICE

### Damage due to inappropriate use

Inappropriate use of the instrument may lead to significant material damage.

- 1 Installation, adjustment and repair work shall be carried out exclusively by specialists from METTLER TOLEDO. Never undertake any installation, adjustment or repair, unless duly instructed by the above mentioned specialists.
- 2 Do not open the instrument, the control units or the robot system. They do not contain any parts which can be maintained, repaired, or replaced by the user. If you ever have problems with your instrument, contact your METTLER TOLEDO dealer.
- 3 Use only original parts supplied or approved by the manufacturer.

A listing of all parts can be found in the Reference Manual (RM).

## 1.4 Warning notices on the instrument

The following symbols are attached to the instrument. They relate to the direct environment where they have been put up.

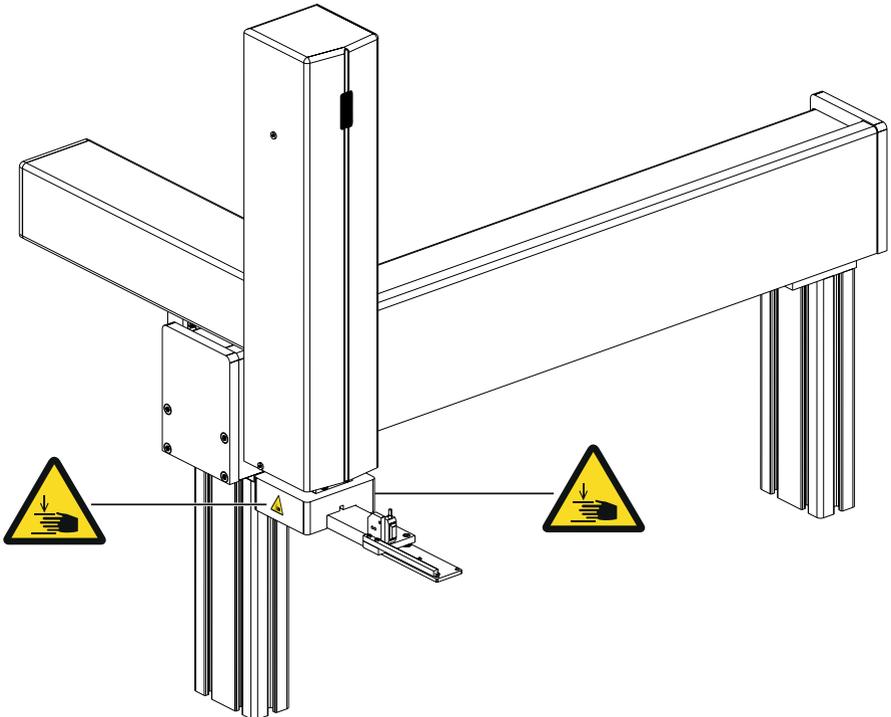


### CAUTION

#### Illegible signage

Stickers and signs can get dirty or become illegible. The risks can no longer be recognized and necessary operating instructions can no longer be adhered to. This presents a risk of injury.

- 1 Always keep safety, warning and operating notices in good legible condition.
- 2 Immediately replace damaged signs or stickers.



Symbol	Meaning
	Indicates the possibility of personal injury due to crushing when the robot hand is moving up and down. Pay attention that the robot hand may move without any prior warning. Do not reach into the working area when parts of the instrument are moving.

## 1.5 Stopping in case of emergency

To stop the instrument in case of an emergency, proceed as follows:

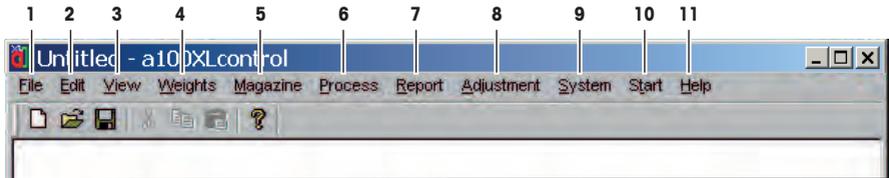
- 1 Switch off the power supply by pulling out the power plug.
- 2 Secure the instrument against switching on again.
- 3 Have fault repair performed by expert personnel or personnel of METTLER TOLEDO.
- 4 Before starting up again, check the instrument and make sure that there is no risk of danger.

## 2 Control software

All settings and the operation of the instrument are controlled with the software **e5control**. The software is installed on a notebook provided by METTLER TOLEDO.

The software is used to visualize the instrument data and measuring results and to interact with the instrument. The interaction encompasses starting and aborting weighing processes, configuring the instrument and defining process specific data (as comparison scheme etc.).

The following illustration gives an overview about the main functions of the software. For further information **see** Operation:



Nr.	Parameter	Description
1	<b>File</b>	Contains file related commands like creating a new file, opening an existing file, importing a text file, saving current file, quitting program etc.
2	<b>Edit</b>	Contains various functions to edit the file (similar to Windows).
3	<b>View</b>	Contains various functions to adapt the view (similar to Windows).
4	<b>Weights</b>	Gives access to the weights database which contains all relevant data on your standards and test weights.
5	<b>Magazine</b>	Opens the menu to identify and register the weights placed in the weight magazine.
6	<b>Process</b>	Opens the menu to set comparisons of which the weighing process shall consist, as well as its precise timing and sequence.
7	<b>Report</b>	Gives access to define the content of the report file.
8	<b>Adjustment</b>	Allows you to start the adjustment procedure using the built-in balance adjustment weights.
9	<b>System</b>	Contains various system settings.
10	<b>Start</b>	Hosts the command to start the measurement.
11	<b>Help</b>	Contains the help file and further information about the software.

### 3 Installation and Putting into Operation

#### 3.1 Selecting the location



#### CAUTION

##### Damage on instrument due to incorrect moving or unsuitable location site

Moving the instrument yourself might lead to injuries or might damage the instrument.

- 1 Contact a METTLER TOLEDO representative before changing the location of the instrument.
- 2 Do not carry the instrument yourself. It's total weight exceeds the acceptable limit in accordance to the applicable regulations.

#### Note

Ensure that at least 30 cm free space is available on the left side of the instrument to position the balance control unit and the robot system control unit. Its recommended to position the notebook on another table in order to avoid interferences due to vibrations.

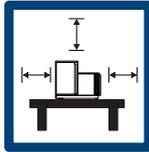
A balance is a sensitive precision instrument. The location where it is placed will have a profound effect on the accuracy of the weighing results.

#### Requirements of the location

According to the environmental condition, **see** chapter "General data".

##### Ensure there is:

- indoor on stable table
- with sufficient distance (> 30 cm)
- in level
- adequate lit



##### Avoid:

- direct sunlight
- vibrations
- strong drafts
- temperature fluctuations



#### 3.2 Scope of delivery

- 3-axis robotic system with all electric components
- 1 Magazine with 60 positions
- 1 XPR6U mass comparator
- 1 Draft shield
- 1 Controller (laptop)
- e5control software
- 30 Weight carriers design 1
- 12 Weight carriers design 2
- 18 Weight carriers design 3

- 1 Tweezer for 1 mg to 50 g
- 1 Tweezer for 1 g to 200 g
- 1 Rubber air bellow
- 1 User Manual
- 1 Declaration of conformity
- 1 Production certificate

### 3.3 Assembling the instrument



#### **CAUTION**

##### **Injury and property damage due to inappropriate assembling and commissioning of the instrument**

Errors during the assembling and commissioning can cause life-threatening situations and significant property damage.

- 1 Only allow assembling and commissioning to be handled by employees of the manufacturer or people authorized by the manufacturer.
- 2 Do not attempt to handle installation and location changes yourself.
- 3 Contact METTLER TOLEDO prior to perform any task not described in this manual.

### 3.4 Connecting and setting up the instrument



#### **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.



#### **NOTICE**

##### **Damage to the AC/DC adapter due to overheating**

If the AC/DC adapter is covered or in a container, it is not sufficiently cooled and will overheat.

- 1 Do not cover the AC/DC adapter.
- 2 Do not put the AC/DC adapter in a container.

#### **Handling the AC/DC adapters**

The balance is supplied with a universal AC/DC adapter or an AC/DC adapter with a country-specific power cable.

- Install the cables so that they cannot be damaged or interfere with operation.
- Insert the power cable in a grounded power outlet that is easily accessible.

#### **Note**

When the instrument is connected to the power grid, it starts automatically. To switch off the instrument and to disconnect it from the power supply, the power plug has to be plugged out.

#### **Setting up the instrument**

To power and set up the instrument proceed as follows:



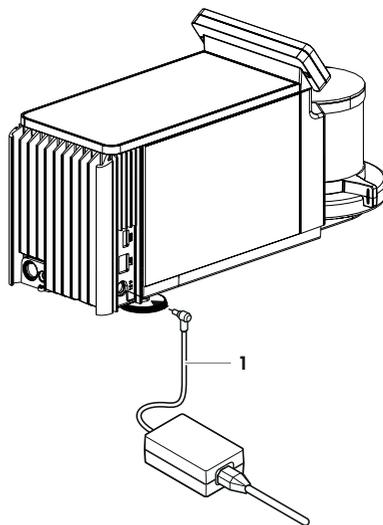
## NOTICE

### Damaged balance because of weight or weight carriers on robot hand or balance

If the robot hand or the balance are not empty during the start up procedure, the balance can get damaged.

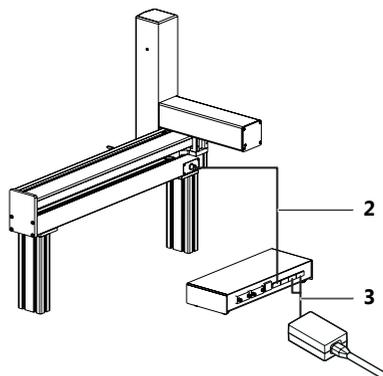
- Make sure to remove everything from the balance and the robot hand before powering on the balance.

- The instrument is complete and fully cabled by the manufacturer. The balance and the robot system power cables are not plugged in yet.
  - The robot hand and the balance pan are empty.
- Connect the power cable (1) to the balance.
- ⇒ The start-up procedure begins automatically. The balance door opens and closes again.
  - ⇒ The balance is now powered.
- 1 Ensure that the cable between the robot system and the robot system control unit (2) is plugged in.
  - 2 Plug in the power cable at the robot system control unit (3).



- ⇒ The robot system is now powered. The start-up procedure includes the following steps:

The instrument is set up and the weights can be loaded on the weight magazine, **see** Preparing the weight magazine. Prior to start weighing, wait at least 120 minutes after connecting the balance to the power supply. This allows the components to get at room temperature.



### Note

- If any of the following situations is detected, each robot axis is driven to its respective home position but no further action is taken:
  - Balance is turned off.
  - Interface connection is inactive.
  - Balance has been moved from its original position.

To ensure optimum weighing conditions, leave the robot system on all the time.

### 3.5 Preparing the weight magazine

Each test weight or standard used during the weighing process needs to be placed onto one weight carrier. The selection of the adequate weight carrier type is determined by the weight geometry.

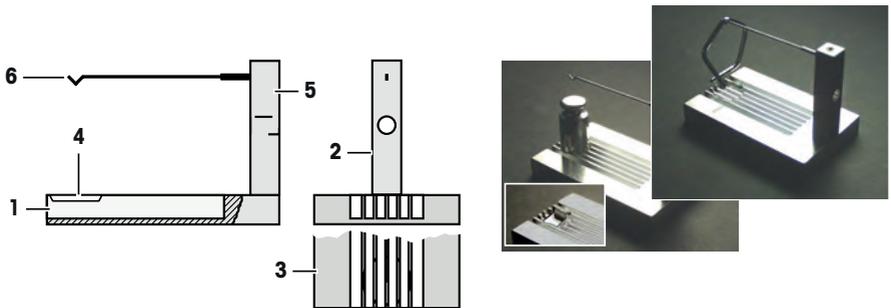
In order to ensure a trouble-free operation of the comparator and to minimize corner load errors, strict rules must be followed when it comes to choose the right carrier type. Consult and follow the weight carrier selection guide each time you load weights onto the magazine.

Pay attention to the following:

- Do not touch the weight carriers or the weights by hand. Use the delivered tweezers or powder free latex gloves.

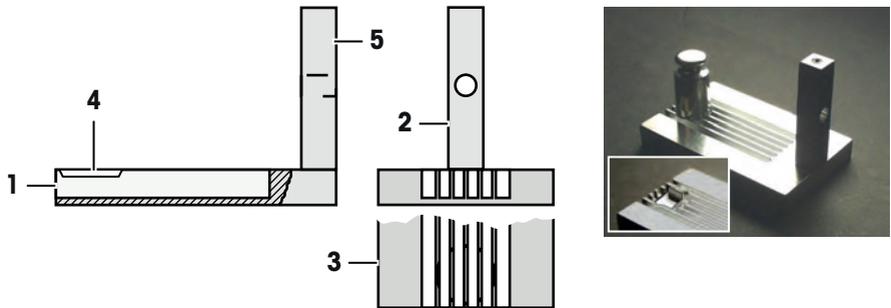
#### 3.5.1 Selecting a suitable weight carrier

##### Design 1



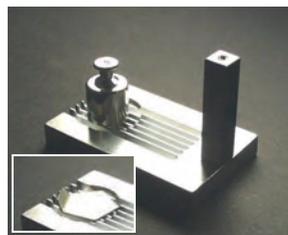
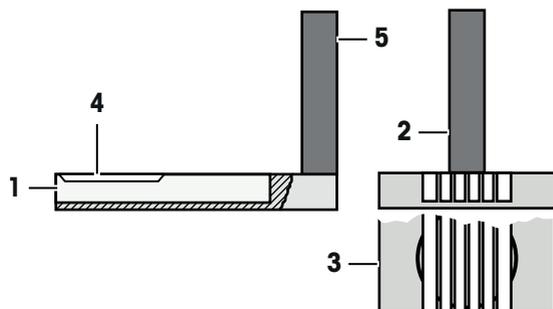
1	Side view	2	Front view
3	Top view	4	Sunken position for cylindrical and sheet weights
5	Grey handle for design nr. 1	6	hook for wire weights

##### Design 2



1	Side view	2	Front view
3	Top view	4	Sunken position for cylindrical and sheet weights
5	Grey handle for design nr. 2		

### Design 3



1	Side view	2	Front view
3	Top view	4	Sunken position for cylindrical and sheet weights
5	Red handle for design nr. 3		

### Choosing the correct insert

#### Note

- Weights which do not fit in one of the categories listed below must not be loaded on the carriers.
- Weights must never be placed over the edge of the sunken position.

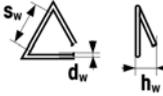
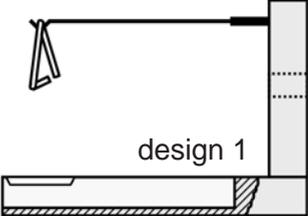
In the mode **down/upward calibration** combinations of up to three weights can be weighed:

- Design nr. 1 or 2: up to **three** weights, placed each on its own carrier, can be weighed.
- Design nr. 1 or 2 in combination with design nr. 3: up to **two** weights, placed each on its own carrier, can be weighed (3-weight combination forbidden).

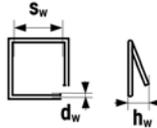
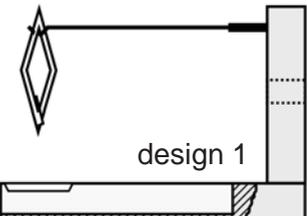
### Cylindrical with knob

Weight shape	Weight dimension	Weight carrier selection and weight positioning
	<b>diameter:</b> $4 \text{ mm} \leq d_c \leq 8.2 \text{ mm}$ <b>height:</b> $h_c \leq 16 \text{ mm}$	
	<b>diameter:</b> $8.2 \text{ mm} \leq d_c \leq 14 \text{ mm}$ <b>height:</b> $h_c \leq 16 \text{ mm}$	

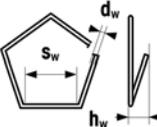
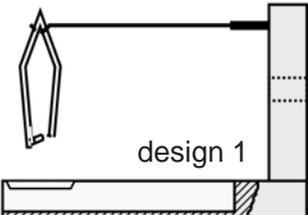
### Wire, triangular

Weight shape	Weight dimension	Weight carrier selection and weight positioning
	<p><b>triangle inner side:</b>  <math>5.5 \text{ mm} \leq s_w \leq 18 \text{ mm}</math></p> <p><b>wire diameter:</b>  <math>0.05 \text{ mm} \leq d_w \leq 1.5 \text{ mm}</math></p> <p><b>height:</b>  <math>h_w \leq 6 \text{ mm}</math></p>	 <p>design 1</p>

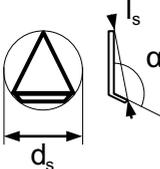
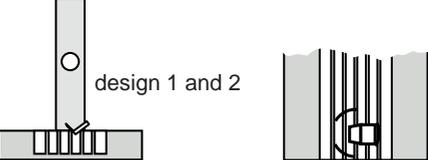
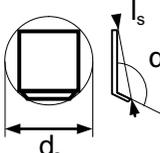
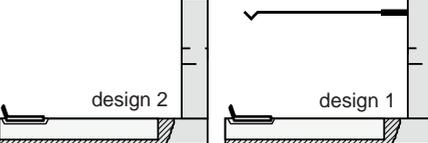
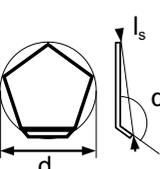
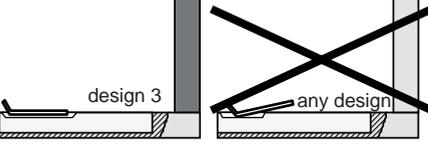
### Wire, square

Weight shape	Weight dimension	Weight carrier selection and weight positioning
	<p><b>square inner side:</b>  <math>5.5 \text{ mm} \leq s_w \leq 12 \text{ mm}</math></p> <p><b>wire diameter:</b>  <math>0.05 \text{ mm} \leq d_w \leq 1.5 \text{ mm}</math></p> <p><b>height:</b>  <math>h_w \leq 6 \text{ mm}</math></p>	 <p>design 1</p>

### Wire, pentagonal

Weight shape	Weight dimension	Weight carrier selection and weight positioning
	<p><b>pentagon inner side:</b>  <math>5.5 \text{ mm} \leq s_w \leq 12 \text{ mm}</math></p> <p><b>wire diameter:</b>  <math>0.05 \text{ mm} \leq d_w \leq 1.5 \text{ mm}</math></p> <p><b>height:</b>  <math>h_w \leq 6 \text{ mm}</math></p>	 <p>design 1</p>

### Sheet, polygonal

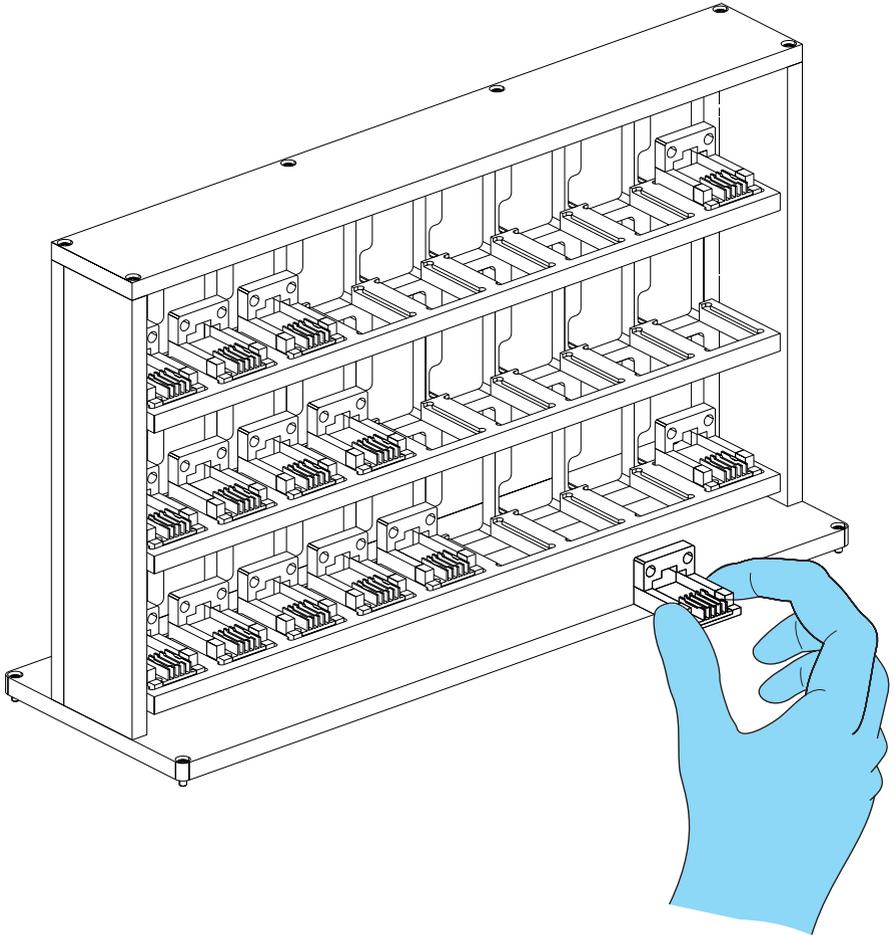
Weight shape	Weight dimension	Weight carrier selection and weight positioning
	<p><b>diameter circumscribed circle:</b>  <math>d_s \leq 4 \text{ mm}</math></p> <p><b>distance <math>l_s</math>:</b>  <math>l_s \geq 3 \text{ mm}</math></p> <p><b>angle sheet-handle:</b>  <math>\alpha \geq 90^\circ</math></p>	
	<p><b>diameter circumscribed circle:</b>  <math>4 \text{ mm} \leq d_s \leq 8.2 \text{ mm}</math></p>	
	<p><b>diameter circumscribed circle:</b>  <math>8.2 \text{ mm} \leq d_s \leq 14 \text{ mm}</math></p>	

### 3.5.2 Loading the weight magazine

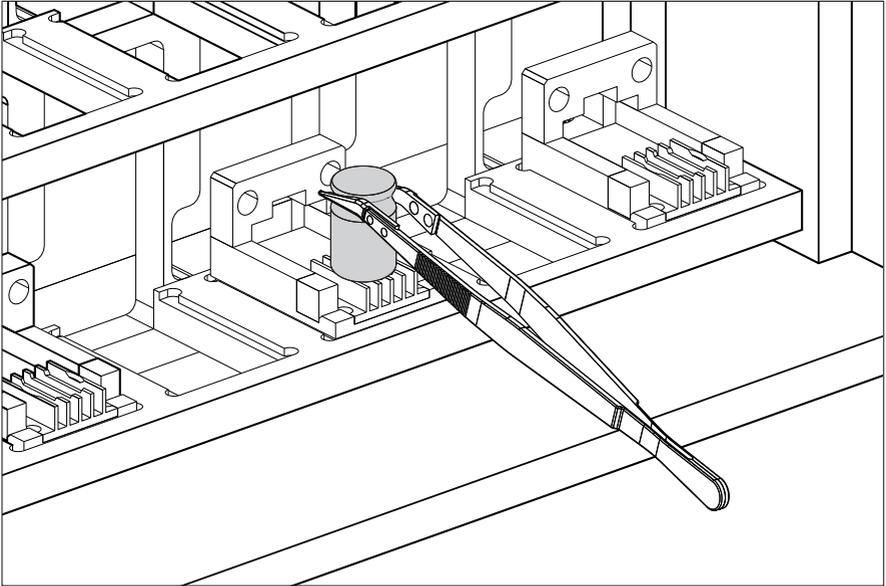
To place the weights onto their respective weight carrier in the magazine proceed as follows:

- The instrument has been started successfully, **see** Setting up the instrument.
- 1 Open the weighing chamber doors.
  - 2 Insert the respective weight carriers design nr. 1 or design nr. 3 into the weight magazine. To position the weight carriers correctly, pay attention to the following:
  - 3 - The carriers must be centered within the sunken frame of the magazine position.

4 - Do not touch the weight carriers by hand. Use the delivered tweezers or powder free latex gloves.



- 5 Place the weights on the respective weight carriers using the delivered tweezers. Do not touch the weights by hand. Pay attention to place the weights the right way on the right carrier type.



- 6 Once the magazine is loaded, close the weighing chamber doors.

## 4 Performing a simple weighing



For full information, always consult and download the Reference Manual (RM).

► [www.mt.com/e5-comparator-RM](http://www.mt.com/e5-comparator-RM)

### Connecting software with system

- 1 Select **System** > **Comparator serial port...** > **Serial port** to connect the software with the system. Enter the port to which the interface cable is connected.
- 2 Enter In **Robot system controller type** and **Balance type** the types in use.

### Starting the weighing process

- 1 Select **Start** > **Start measurement** to start the weighing process
  - ⇒ A window to enter the report file name opens.
- 2 Enter name and location of the measurement report file and confirm with **Save**.
  - ⇒ The window **Weighing process settings** opens.
- 3 To start the weighing process, confirm the message with **OK**.
  - ⇒ The weighing process starts.
  - ⇒ The weighing process monitor opens.

### Adjust settings

- 1 Start **e5control**.
  - ⇒ A new blank setting file is opens.
- 2 Select **Weights** to enter and edit standards data and test weights data. The default password to change the currently stored data is "" (empty character string = no character).
- 3 Select **Magazine** > **Places allocation...** > **Allocation of weight magazine places** to identify and register the position of the test weights on the weight magazine.
- 4 Select **Process** > **Settings...** > **Weighing process settings** to set the comparisons of which the weighing process shall consist, the precise timing and the sequence.
- 5 Set following parameters:
  - **Weighing mode**
  - **Pre-run requested**
  - **History-specific pause requested**
  - **Start delay**
  - **No. of nonreported preweighings per group (0-5)**
  - **No. of reported comparisons per group (1-20)**
  - **No. of series (1-20)**
  - **Stabilisation time (10-60 s)**
  - **Integration time (0-60 s)**
  - **Comparison scheme**
  - **Sensitivity check**
  - **Sensitivity check standard**
- 6 Select **Process** > **Settings...** > **Weighing process settings** > **Series scheme** to determine the series scheme.
- 7 Select **Report** > **Contents...** to define the contents of the report file

## 5 Maintenance

To guarantee the functionality of the balance and the accuracy of the weighing results, a number of maintenance actions must be performed by the user.

### 5.1 Maintenance table

Maintenance action	Recommended interval	Remarks
Performing an internal adjustment	<ul style="list-style-type: none"><li>• Daily</li><li>• After cleaning</li><li>• After leveling</li><li>• After changing the location</li></ul>	<b>see</b> chapter "Internal adjustment"
Performing routine tests (eccentricity test, repeatability test, sensitivity test). METTLER TOLEDO recommends to perform at least a sensitivity test.	<ul style="list-style-type: none"><li>• After cleaning</li></ul>	<b>see</b> below
Cleaning	Depending on the degree of pollution or your internal regulations (SOP), clean the instrument: <ul style="list-style-type: none"><li>• After every use</li><li>• After change of sample</li></ul>	<b>see</b> chapter "Cleaning the balance"



For full information, always consult and download the Reference Manual (RM).

► [www.mt.com/XPR-micro-RM](http://www.mt.com/XPR-micro-RM)

### 5.2 Performing routine tests

There are several routine tests. Depending on your internal regulations, specific routine test must be performed by the user.

Mettler-Toledo GmbH recommend to perform a sensitivity test after cleaning and reassembling the balance or after updating the software.

Mettler Toledo can help you to define the routine tests to be performed based on your process requirements. Please contact your local METTLER TOLEDO representative for additional information.



For full information, always consult and download the Reference Manual (RM).

► [www.mt.com/XPR-micro-RM](http://www.mt.com/XPR-micro-RM)

### 5.3 Maintaining robot system

Apart from cleaning no regular maintenance is required by the instrument owner.

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

### 5.4 Cleaning

#### 5.4.1 Cleaning agents

In the following table, cleaning tool and cleaning agents recommended by Mettler-Toledo GmbH are listed.

		Tools			Cleaning agents						
		Paper tissue	Brush	Dishwasher	Water	Acetone	Ethanol (70%)	Isopropanol (70%)	Hydrochloric acid (3-10 %)	Sodiumhydroxide (0.2-1.0 M)	Peracetic acid (2-3%)
Around the balance	Lab bench or weighing table	✓	(R)	n.a.	(R)	(D)	✓	R	(D)	(D)	(D)
	Balance housing	✓	(R)	—	R	—	R	✓	R	R	R
	Top housing	✓	(R)	—	R	—	R	✓	R	R	R
	Bottom housing	✓	(R)	—	R	—	R	✓	R	R	R
	Back housing	✓	(R)	—	R	—	R	✓	R	(R)	R
	Feet	R	(R)	—	R	—	R	✓	R	R	R
Balance terminal	Terminal	✓	—	—	✓	(R)	(R)	(R)	R	R	R
	Display	✓	—	—	✓	(R)	R	R	R	R	R
Balance draft shield	Glass pans	R	(R)	✓	R	(R)	R	R	R	R	R
	Glass free pans	R	(R)	—	R	—	✓	R	R	R	R
	Non-removable handles and frames	✓	(R)	—	R	(R)	(R)	✓	R	R	R
Weighing area	Weighing pan	✓	(R)	—	R	(R)	✓	R	R	R	R
	Drip tray	R	(R)	✓	R	—	(R)	(R)	—	—	R

Symbol descriptions:

✓: Best recommendation by Mettler-Toledo GmbH, can be used without limitation.

R: Recommended by Mettler-Toledo GmbH, can be used without limitation

(D): Depending on the material used: individual durability and resistance to acid and alkali must be evaluated.

(R): Partially recommended by Mettler-Toledo GmbH (for selected balance line only, please check the respective operating instructions, might also depend on your internal regulations).

— Not recommend

## 5.4.2 Cleaning the components

### Overview

Periodically, clean the following parts of the instrument:

System part	Task	Tool	Notes
Weighing chamber	Free from dust.	Soft cloth	
Balance: <ul style="list-style-type: none"> <li>• Weighing pan</li> <li>• Drip tray</li> <li>• Housing</li> <li>• Terminal</li> </ul>	Free from dust.	Supplied brush	Make sure the position of the balance remains absolutely unchanged.
Weight magazine: <ul style="list-style-type: none"> <li>• Weights</li> <li>• Weight carriers</li> </ul>	Free from dust.	Soft brush	Make sure the centering holes underneath the carriers are clean as well.  Do not leave weight carriers, which are not in use in the weight magazine. Store them in a dust free environment.
Robot system: <ul style="list-style-type: none"> <li>• Robot hand</li> <li>• 3 carrier-centering cones</li> </ul>	Free from dust.	Soft brush	Do not use compressed air or petroleum-based solvents
<ul style="list-style-type: none"> <li>• Robot hand light barrier</li> </ul>	In case of a malfunction of the robot hand light barrier, clean light barrier.	Soft brush	Do not use any solvent or ethanol!



### WARNING

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

Contact with parts carrying a live current can lead to injury and death.

- 1 Disconnect the instrument from the power supply prior to cleaning and maintenance.
- 2 Prevent liquid from entering the instrument, terminal or AC/DC adapter.



### NOTICE

#### Damage due to improper cleaning

Improper cleaning can damage the weighing cell or other essential parts.

- 1 Do not use any cleaning agents other than the ones specified in the Reference Manual or Cleaning Guide.
- 2 Do not spray or pour liquids on the instrument. Always use a moistened lint-free cloth or a tissue.
- 3 Always wipe out from inside to outside of the instrument.

#### Protective equipment:

- Gloves
- Goggles

The following procedures describe the cleaning of the weighing pan and all components.

#### Around the balance

- Remove any dirt or dust around the balance and avoid further contaminations.

#### Cleaning the balance

- 1 Use a lint-free cloth moistened with a mild cleaning agent to clean the surface of the balance.

- 2 Remove powder or dust at first with a disposable tissue.
- 3 Remove sticky substances with a damp lint-free cloth and a mild solvent (e.g. isopropanol or ethanol 70%).

### **Cleaning all removable parts**

- Clean all removed part with a damp cloth or a tissue and a mild cleaning agent or clean them in a dishwasher up to 80 °C.



#### **Note**

Useful details to avoid soiling are described in the METTLER TOLEDO "SOP for Cleaning a Balance".

## 6 Technical Data

### 6.1 General data

#### Automated weight handler

Weight handler	For automatic determination of test weights, by direct comparison of one test weight with one standard, or, as an option, by down-/upward calibration - comparison between combinations of up to three weights, as described in [Selecting a suitable weight carrier ▶ Page 15].
Measuring time (typical)	15 min. for a series of 5 'one-vs.-one' A-B-A comparative weighing, 30 min. for a series of 5 'three-vs.-one' A-B-A comparative weighing
Test weights / standards	Knob-, wire-, sheet-shaped weights (common shapes) with a nominal value of 1 mg - 5 g and geometry as described in [Selecting a suitable weight carrier ▶ Page 15].
Weight magazine	60 places
Control software	Microsoft® Windows®-based <b>e5control</b> , compatible with WindowsXP®, Windows®7, Windows®8 and Windows®10
Data interface	RS232C to controller

#### Balance - METTLER TOLEDO XPR6U Comparator

Readability:	0.1 µg
Maximum capacity:	6.1 g
Electrical weighing range:	6.1 g
Repeatability:	Determined as standard deviation of 5 x A-B-A comparative weighing: <ul style="list-style-type: none"><li>• 0-1 g: <math>s \leq 0.15 \mu\text{g}</math></li><li>• 1-2 g: <math>s \leq 0.25 \mu\text{g}</math></li><li>• 2-6 g: <math>s \leq 0.40 \mu\text{g}</math></li></ul>
Linearity:	$\pm 2 \mu\text{g}$
Setting time (typical):	20 s
Adjustment:	Motorized adjustment of the electrical range at a keystroke (built-in 2 x 3 g adjustment weights) or adjustment by means of an external selectable adjustment weight

#### Power supply

Balance AC/DC adapter:	Primary: 100 – 240 V AC, -15%/+10%, 50/60 Hz Secondary: 12 V DC $\pm 3\%$ , 2.5 A (with electronic overload protection)
Balance power consumption:	12 V DC $\pm 3\%$ , 2.25 A, maximum ripple: 80 mVpp
Polarity:	 with a current limited SELV (Safety Extra Low Voltage) output
Robot system AC/DC adapter:	Primary: 100 – 240 V AC, $\pm 10\%$ , 50/60 Hz Secondary: 24 V DC, $\pm 5\%$ , 2.1 A (with electronic overload protection)
Robot power consumption:	24 V DC $\pm 5\%$ , 1.5 A
Cable for AC/DC adapter:	3-core, with country-specific plug
Power consumption robot system:	36 VA max. (24 V DC 1.5 A)

### 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

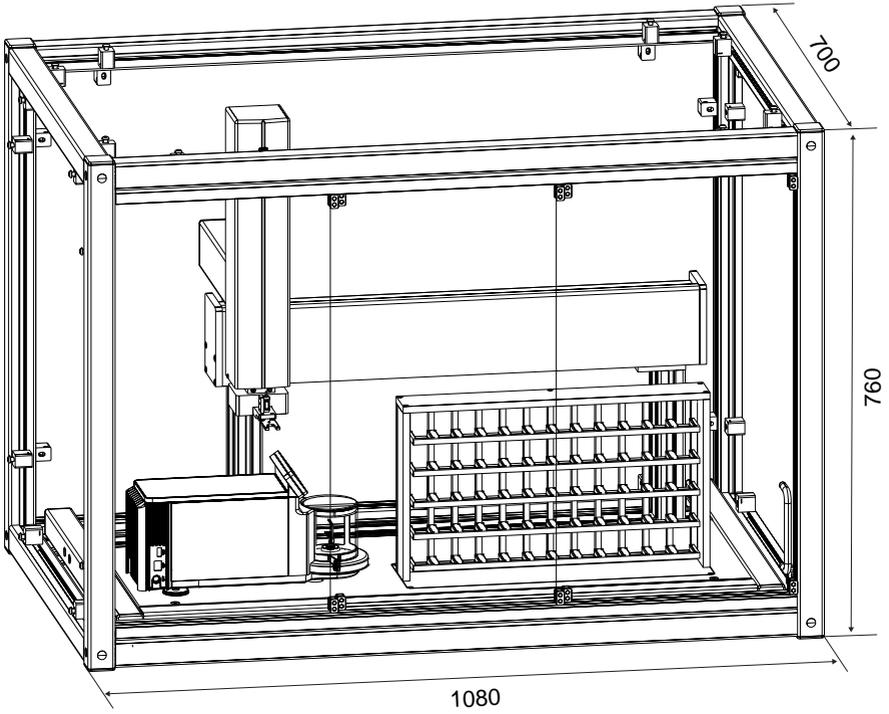
### Environmental conditions

Height above mean sea level:	Up to 2000 m
Ambient temperature:	17 – 27 °C ( $\pm$ 0.5 °C / 12 hour)
Relative air humidity:	45 – 60 %, non-condensing
Vibrations:	A set-up in a "vibration-free" room is required
Warm-up time:	<b>24</b> hours after connecting the balance to the power supply; when switched on from standby-mode, the balance is ready for operation immediately.

### Dimensions

Instrument (robot system and balance) (w x d x h / net weight)	1080 mm x 700 mm x 760 mm / 50 kg
--	-----------------------------------

## 6.2 Dimensions



## 7 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.





# 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](http://www.mt.com/GWP)

[www.mt.com/lab-robotic-MC](http://www.mt.com/lab-robotic-MC)

For more information

**Mettler-Toledo GmbH**

Im Langacher 44  
8606 Greifensee, Switzerland  
[www.mt.com/contact](http://www.mt.com/contact)

Subject to technical changes.  
© Mettler-Toledo GmbH 08/2018  
30385934A en



30385934