

EasyMax 102 LT

Personal Synthesis Workstation



METTLER TOLEDO

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1 Introduction

The METTLER TOLEDO EasyMax 102 LT is an easy-to-use personal synthesis workstation that allows you to run two reactions simultaneously in an accurate and reproducible way.





The main features of the EasyMax 102 LT are:

- Two independently controlled reactor zones
- Different volumes of reaction vessels: 100 mL and 50 mL reactors or vials for 25 mL and 8 mL.
- Overhead and magnetic stirring
- No oil or ice baths
- Minimize the size of your cryostat
- Easy touchscreen control
- Full compatibility with selected METTLER TOLEDO devices, including the DU SP-50, ECB, EasySampler and the SevenExcellence pH meter
- A Pt100 sensor measures the temperature of the reactor content for monitoring, temperature control and data capture.
- You can export the acquired data to another program for further processing.
- The EasyMax 102 LT offers you Tr, Tj and Tc limits as low as -90 °C (recommended minimal Tc is -60 °C).

Please also read the Operating Instructions for the full scope of functionalities of the device. The Operating Instructions can be found on the USB stick.

1.1 Scope of delivery

The following items are included in the EasyMax 102 LT Basic and EasyMax 102 LT Advanced:

Order number		Description	Quantity
		EasyMax 102 LT thermostat	1
51161883		TFT touchscreen 7", 1 m cable	1
11132570		Protective cover for touchscreen	1
51191125		PVC hose, soft, for reflux condenser, 5 m	1
51161187		PVC industrial hose for coolant, 15 bar, 2.5 m	2
51192239		PVC industrial hose for purge gas, 18 bar, 2 m	1
51161186		PVC hose for purge gas, 2 m	2

Order number		Description	Quantity
51191373		Y-piece for gas tubing	2
51191916		Reducing connector for purge gas tubing	1
51161827		Flowmeter set	1
51190324		Quick connect coupling for purge gas inlet	4
51192126		Hose clamp for PVC tube	8
51191914		Knurled screw, M6 x 10 (already mounted)	3
103298		Antistatic additive (4 pcs a 250 mL)	1
30565897		Hose connector set (M16x1)	1
		Insulation set for cooling connectors	1
		User Manual	1

If an item is missing, please contact your local support team.

1.2 Check on arrival

Check the following conditions once the package has arrived:

- The package is in good condition.
- The contents show no signs of damage (e.g. broken covers, scratches, etc.)
- The content is complete (see [Scope of delivery Page 3])

If any one of these condition is not fulfilled, please contact your local support team.

2 Safety Information

This thermostat has been tested for the intended purposes described in this document. However, this does not absolve you from the responsibility of performing your own tests of the product supplied by us regarding its suitability for the methods and purposes you intend to use it for. You should therefore observe the following safety measures.







We, Mettler-Toledo GmbH, accept no liability whatsoever if you do not observe the following rules and safety notes for safe operation of the thermostat.

2.1 Definition of signal warnings and symbols

Safety notes are indicated by signal words and warning symbols and contain warnings and information about safety issues. Ignoring safety notes can lead to personal injury, damage to the instrument, malfunctions and erroneous results.

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.
Note	(no symbol) for useful information about the product.

Meaning of safety symbols

	Electrical Hazard		Explosion		Burns / Hot Surface
	Rotating parts		Heavy load		General note

2.2 Intended use

The METTLER TOLEDO EasyMax 102 LT is a reactor system for performing parallel synthesis with 8 mL, 25 mL, 50 mL, 100 mL one-piece glass reactors and 100 mL high workup volume two-piece glass reactors. The device is designed to be used in a laboratory environment and operated in a fume hood. All users should be trained to work in a laboratory and with this device.

Always operate and use your device in accordance with the instructions contained in this manual; use it only together with equipment specified in this documentation.

Any other type of use and operation beyond the limits of these technical specifications without the written consent from Mettler-Toledo GmbH is considered as not intended.

2.3 Product-specific safety



WARNING

Risk of electric shock

- 1 Make sure to plug the power cable supplied into a power supply outlet that is grounded. A technical fault could otherwise result in serious injury or death.
- 2 Only use the METTLER TOLEDO power supply cable and AC power adapter designed for your instrument.



WARNING

Power failure

A power failure can lead to explosion with possibly fatal consequences.

- Implement appropriate measures like an uninterruptible power supply (UPS).



WARNING

Risk of explosion with critical reactions

Performing critical reactions could lead to explosions.

- Perform a safety analysis before starting an experiment with high hazardous potential for example by using a Differential Scanning Calorimeter.



WARNING

Risk of explosion due to damaged reactors

Explosion of a reactor could cause serious injury.

- Check the reactor before each use for damage (scratches, formation of cracks).



CAUTION

Hot parts when working above 50 °C

Touching hot parts can cause burns.

- Do not touch the cover plate of the device, the fixing ring, the reactor covers, attachments of the reactor or the overhead stirrer if you work above 50 °C.



CAUTION

Rotating parts of stirrer

Rotating parts of a running stirrer may lead to injuries.

- 1 Do not touch rotating parts of a stirrer.
- 2 Do not wear loose clothing and make sure jewellery and long hair do not get entangled in the stirrer.



NOTICE

Wrong coolant used

High chloride concentration or some additives in the coolant can lead to corrosion of the thermostat.

- 1 Do not use solutions of NaCl, CaCl₂ or DW-Therm.
- 2 Check compatibility with the wetted parts of the coolant system.



NOTICE

Wrong connection or disconnection of cables

A wrong connection or disconnection of cables during operation could lead to instrument damage.

- 1 Before switching the device on, connect the cables of stirrers and sensors to their respective inputs and outputs.
- 2 Do not disconnect the cables while the instrument is operating.



NOTICE

Condensation of atmospheric moisture

The condensation of atmospheric moisture can cause corrosion of the instrument.

- 1 Always purge the instrument when it is in use. This removes any condensation that has formed.
- 2 Purge it with dry air, nitrogen or argon.
- 3 Always use the covers for vials and the high workup volume reactor below ambient temperatures.
- 4 We recommend to use a cover for an empty reactor zone, if it is cooled below ambient temperatures.



NOTICE

Reactor breaking due to freezing

The reactor can break or get stuck in the reactor zone of the thermostat when atmospheric moisture or any liquids freeze on the outside of the reactor or in the reactor zone of the thermostat.

- 1 Make sure the reactor zone of the thermostat and the reactor itself are clean and dry before inserting.
- 2 Make sure that when cooling below 0 °C, there is enough purge to minimize condensation.



NOTICE

Thermal shock

Glass parts of the instrument or the reactor could get damaged.

- Do not pour cold liquids into hot glassware and vice versa.



NOTICE

Risk of reactor breakage when sealed hermetically

Hermetical sealing could lead to pressure build-up when using gas or when the reactor is heated.

- Make sure venting is always possible.



NOTICE

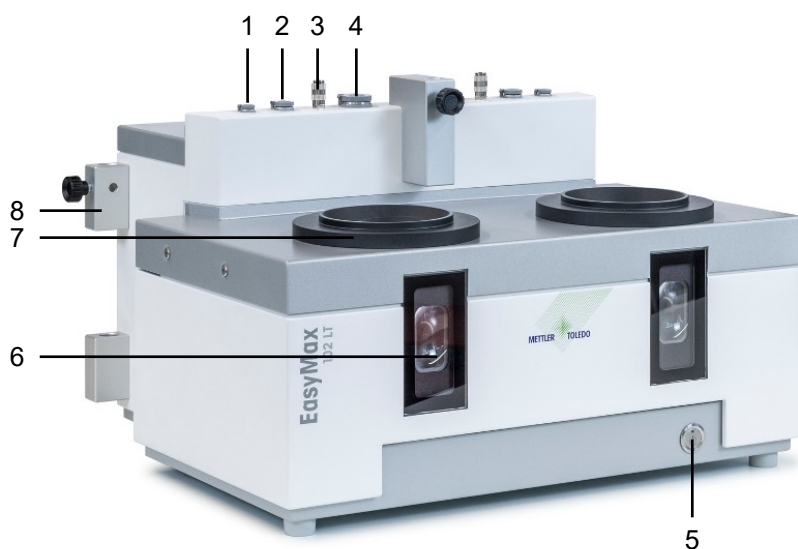
Leakage through small opening in reactor block and isolation ring

The leakage can cause damages or malfunctions within the instrument.

- Do not spray liquid in the reactor block between the isolation ring

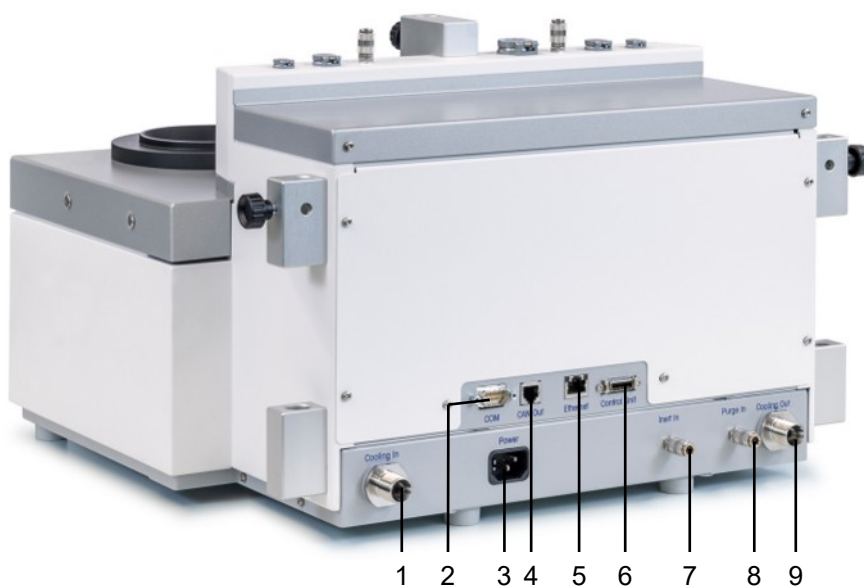
3 Overview

Front view



1	Tr sensor socket	2	Stirrer socket
3	Reactor purge gas outlet (quick connect coupling)	4	USB Socket
5	Power button	6	Window (with backlight)
7	Opening for reactors	8	Holder for lab bars

Back view



1	Cooling In	2	RS232
3	Power supply	4	CAN out
5	Ethernet connection	6	Touchscreen connection
7	Inert In connection	8	Purge In connection
9	Cooling Out		

4 Installation

4.1 Installation requirements

- The device should be installed in a fume hood.
- Make sure you install the device in accordance with the technical data.

Site requirements

The instrument has been developed for indoor operation in a well-ventilated area. Avoid the following environmental influences:

- Conditions outside of the ambient conditions specified in the technical data
- Powerful vibrations
- Direct sunlight
- Corrosive gas atmosphere
- Explosive atmosphere of gases, steam, fog, dust and flammable dust
- Powerful electric or magnetic fields

4.2 Unpacking and transporting device



⚠ CAUTION

Risk of injury due to heavy load

You can injure yourself by carrying the instrument alone.

- Never try to carry the instrument alone. At least two people are needed to carry the instrument.

Unpack the device

- 1 Grip the device under the base plate.
- 2 Lift the device up and out of the foam packing material.
- 3 Place the device on the lab bench.

Transport the device

- 1 Unplug the power adapter.
- 2 Disconnect the device properly from the cooling media.
- 3 Grip the device under the base plate.

4.3 Connecting power to the device



⚠ WARNING

Risk of electric shock

- 1 Make sure to plug the power cable supplied into a power supply outlet that is grounded. A technical fault could otherwise result in serious injury or death.
- 2 Only use the METTLER TOLEDO power supply cable and AC power adapter designed for your instrument.

- 1 The power supply connection is on the back side of the device.
- 2 Connect the instrument to the power supply using the included country-specific cable.
- 3 Insert the plug of the power cable into a grounded power outlet that is easily accessible.



4.4 Connecting a flowmeter

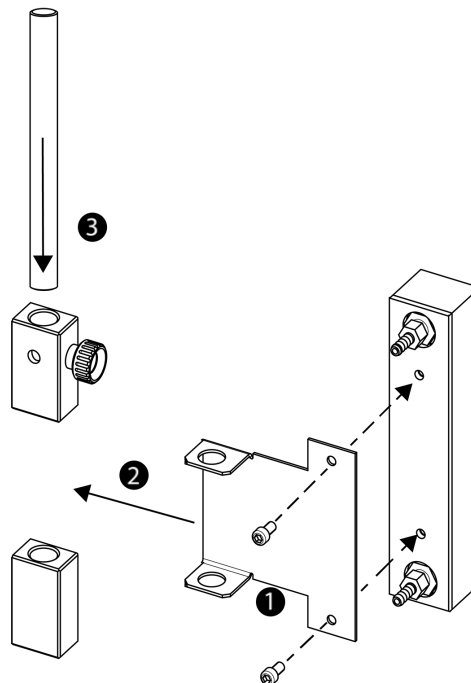


NOTICE

Damage of Flowmeter

The flowmeter is not resistant to any liquids other than water! Do not use it with other coolants.

- 1 Screw the flowmeter with the knurled screw onto the metal holder.
- 2 Insert the holder into the space between the lab bar holders.
- 3 Slide the lab bar through the lab bar holes and the holes of the metal holder.
- 4 Tighten the screw on the lab bar holder to fasten the lab bar.



4.5 Installing instrument cooling

There are two possibilities to cool the instrument:

- Connect to in-house coolant supply
- Connect to cryostat



NOTICE

Damage of Flowmeter

The flowmeter is not resistant to any liquids other than water! Do not use it with other coolants.



NOTICE

Wrong coolant used

High chloride concentration or some additives in the coolant can lead to corrosion of the thermostat.

- 1 Do not use solutions of NaCl, CaCl₂ or DW-Therm.
- 2 Check compatibility with the wetted parts of the coolant system.

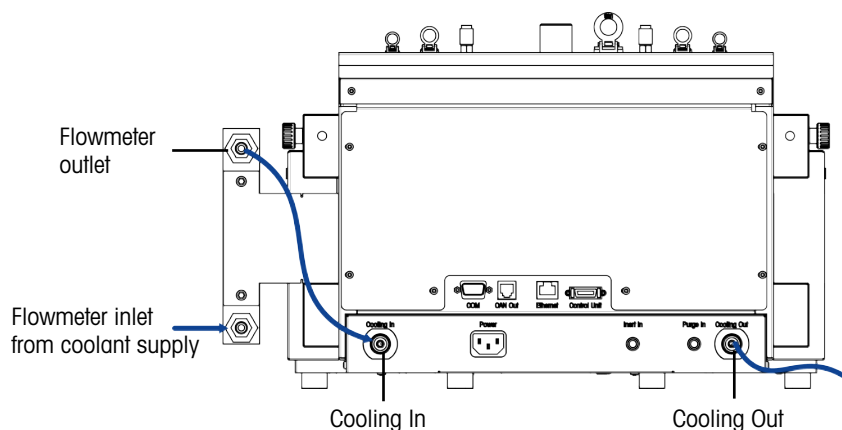
Insulation for cooling at sub ambient temperatures

To achieve good working conditions for sub ambient temperatures, the connections should be insulated with the provided insulation set. It is recommended to use insulated cooling hoses so that only the connection to the EasyMax LT has to be insulated with the provided insulation set.

- 1 Cut the insulation set tubes to suitable length to insulate the part between the hoses and the cooling connections of the device.
- 2 Use the insulation set and wrap it around each tube connector.

4.5.1 Connecting in-house coolant supply

The instrument needs a constant flow of the cooling medium.



The instrument is delivered with two PVC industrial tubes. If you use the flowmeter, you need a third piece which can be cut away from one of the delivered tubes.

- 1 Push one piece of the PVC industrial hose (51161187) over the cooling inlet of the coolant flowmeter.
- 2 Secure it with a hose clamp.
- 3 Connect it to the coolant supply.
- 4 Push the cut piece of the PVC tube over the outlet of the coolant flowmeter.
- 5 Connect the other end to the elbow coupling of the **Cooling In** on the back side of the instrument.
- 6 Secure both connections with a hose clamp.
- 7 Push the other PVC tube over the elbow coupling of the **Cooling Out** on the back side of the instrument.
- 8 Secure it with a hose clamp.
- 9 Connect it to the cooling outlet of the fume hood.

4.5.2 Connecting cryostat cooling



NOTICE

Damage of Flowmeter

The flowmeter is not resistant to any liquids other than water! Do not use it with other coolants.



NOTICE

Risk of device malfunctioning

When using silicone oil as coolant adding the antistatic additive is required. It is recommended to renew the antistatic additive after a year.

- Ensure sufficient purging of the cryostat with dry nitrogen (check also instructions on purging of cryostat manufacturer).

Do not use the flowmeter with the cryostat in order to have full capacity.

The instrument needs a constant flow of the cooling medium.

- 1 Screw the insulated connection tube over the **Cooling In** on the back of the instrument.
- 2 Use a wrench to tighten the connection to the instrument.
- 3 Screw the second insulated connection tube over the **Cooling Out** on the back of the instrument.
- 4 Use a wrench to tighten the connection to the instrument.

4.6 Connecting instrument purge



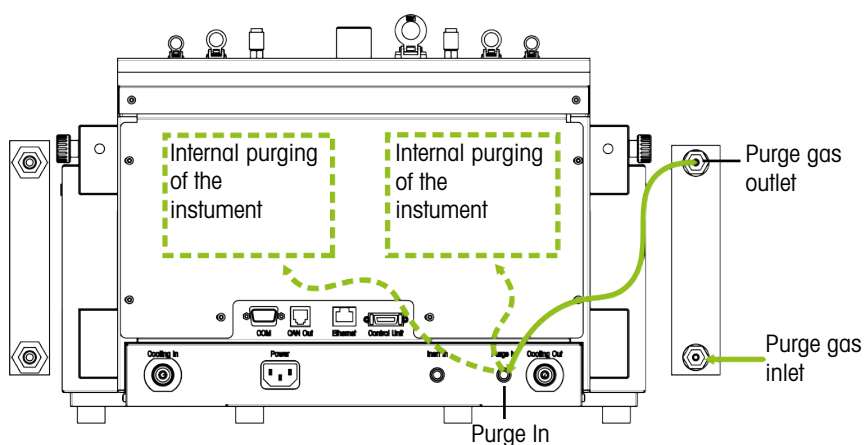
NOTICE

Condensation of atmospheric moisture

The condensation of atmospheric moisture can cause corrosion of the instrument.

- 1 Always purge the instrument when it is in use. This removes any condensation that has formed.
- 2 Purge it with dry air, nitrogen or argon.
- 3 Always use the covers for vials and the high workup volume reactor below ambient temperatures.
- 4 We recommend to use a cover for an empty reactor zone, if it is cooled below ambient temperatures.

To prevent corrosion by condensed atmospheric moisture, purge the instrument with a dry gas, e.g. dry air (humidity less than 10 ppm of water), dry nitrogen or dry argon.



- 1 Install the quick connect coupling (51190324) with the PVC tubing (51161186) on the purge gas inlet connector.
- 2 Secure it with a hose clamp.
- 3 Connect the PVC tubing to the gas supply.

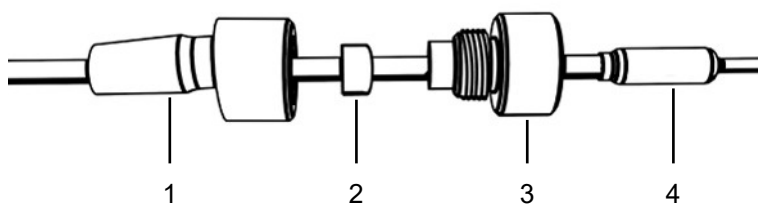
4.7 Connecting touchscreen to EasyMax

- 1 The touchscreen connection is on the back side of the instrument (see picture).
- 2 Connect the touchscreen cable to the socket.
- 3 Position the touchscreen so that it is always readable.



4.8 Installing a Tr sensor

For accurate temperature data and control at sub-ambient temperatures, we strongly recommend to use the Pt100 glass temperature sensor (30099798).



- 1 Slide a UNF 1/4" G 28 nut (3) over the sensor (4).

- 2 Slide a UNF 1/4" G 28 ferrule (2) over the sensor with the narrow end facing the nut.
- 3 Screw the nut lightly into the adapter (1) to press the ferrule into the nut.
- 4 Check that the Tr sensors does not touch the stirrer blades or other inserts.

Note Make sure the temperature sensor shows a sufficient immersion depth.

4.9 Installing one-piece reactors

Before you place the reactor in the thermostat, we recommend that you install the Tr sensor and other inserts in order to check their distance from the stirrer or the bottom of the reactor. We also recommend that you add the reagents and solvent for the starting volume and possibly check the fill level of the first fill. The Tr sensor must be sufficiently immersed in the reaction solution in order to give correct measurement values.

- 1 Install the half-moon blade on the stirrer shaft.
- 2 Connect the stirrer shaft to the stirrer.
- 3 Carefully insert the stirrer through the central opening.
- 4 Install the Tr sensor.
- 5 Fill the reactor with the reagents and solvents needed for the first fill.
- 6 Place the reactor in the reactor zone or place smaller reactors in a receptacle.

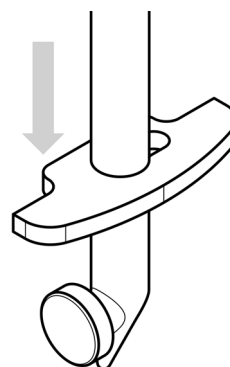
Consult the temperature sensor section in the Synthesis workstation catalog for appropriate immersion depth.

4.9.1 Installing a half moon stirrer blade

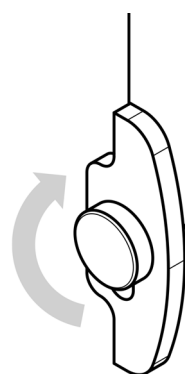
Glass shaft with half moon stirrer blade and PTFE shaft with half moon stirrer blade.

Install half moon blade on glass shaft

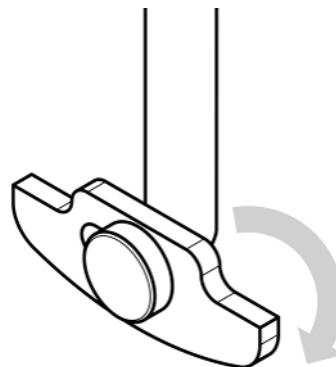
- 1 Slide the half moon blade over the glass shaft and slide it to the bottom.



- 2 Turn the stirrer blade so that its cut-out aligns with the glass spike and move it over the glass spike.

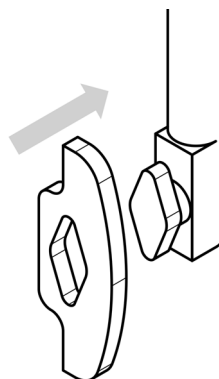


- 3 Turn the half moon blade to a horizontal position.

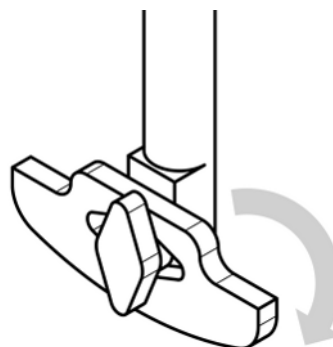


Install half moon blade on PTFE shaft

- 1 Fit the half moon blade to the bottom of the stirrer shaft.



- 2 Turn the stirrer blade to a horizontal position.



4.10 Turn on Device

- Power is connected.
- Cooling is connected and running.
- Purging of instrument is connected and running.
- Touchscreen is connected
- Press the ON/OFF button on the front side of the instrument.
 - ➔ You should hear an audible click and the LED illuminates.
 - ➔ The touchscreen shows a splash screen during start up phase.
- ➔ You can use the device as soon as the mainscreen appears.

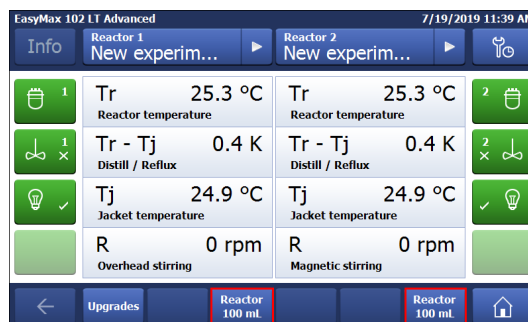
5 Operation

All operations can be changed individually for reactor zone 1 or 2.

The use of covers below ambient conditions is necessary to prevent condensation in the reactor block. Please refer to the catalogue to find a suitable cover for the vial/reactor glass.

5.1 Select reactor type

1 Tap **Reactor 100 mL**.

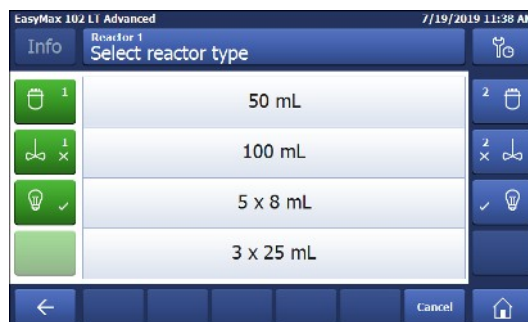


2 Tap the **Reactor type** field.



3 Select the reactor type that is installed.

➔ Make sure the safety settings for the reactor are still within the range.



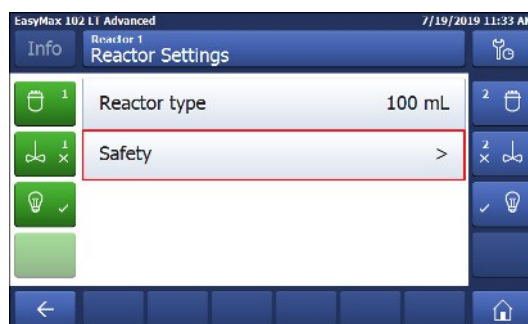
5.2 Change safety settings

1 Tap the Reactor button.



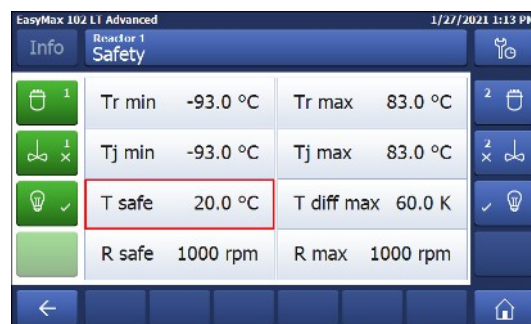
2 Tap on the **Safety** field.

3 Change the necessary parameters according to your experiment and setup.



5.2.1 Change safety temperature (T safe)

- 1 Tap on **T safe**.
- 2 Enter a value for **T safe** that is valid for your experiment.
- 3 Tap **OK**.



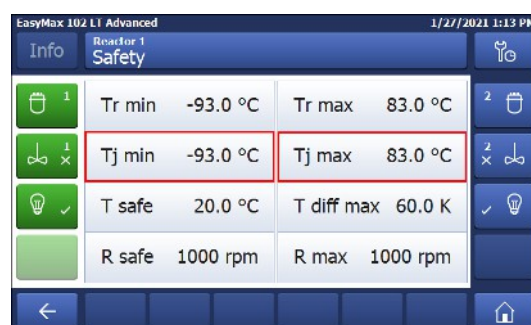
5.2.2 Change reaction temperature limits (Tr)

- 1 Tap on **Tr max** or / and **Tr min**.
- 2 Enter a value for **Tr max** and **Tr min** that is valid for your experiment.
- 3 Tap **OK**.



5.2.3 Change range of jacket temperature (Tj)

- 1 Tap on **Tj min** or / and **Tj max**.
- 2 Enter a value for **Tj min** and **Tj max** that is valid for your experiment.
- 3 Tap **OK**.



5.2.4 Change T diff max

- 1 Tap on **T diff max**.
- 2 Enter a value for **T diff max** that is valid for your experiment.
- 3 Tap **OK**.



5.2.5 Change Rsafe

- 1 Tap on **Rsafe**.
- 2 Enter a value for **Rsafe** that is valid for your experiment.
- 3 Tap **OK**.



5.2.6 Change Rmax

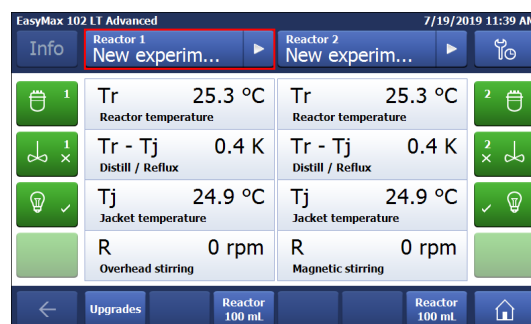
If you use any glass stirrer or metal anchor stirrer blade, please ensure that the Rmax is reduced to 500 rpm.

- 1 Tap on **Rmax**.
- 2 Enter a value for **Rmax** that is valid for your experiments.
- 3 Tap **OK**.



5.3 Start an experiment

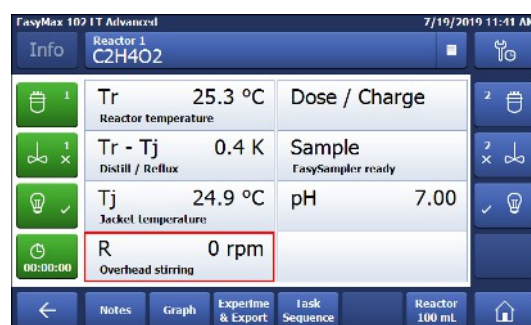
- 1 Tap the experiment button on the main screen.
 - 2 Enter an **experiment name**.
 - 3 Tap **Start** to start the experiment.
- ➔ All tasks that are executed will be saved under the experiment and available for export.



5.4 Change stirrer speed

Note The value cannot be higher than the safety limit value.

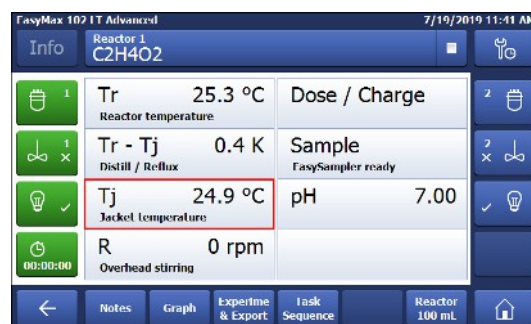
- A stirrer is connected.
- 1 Tap on the **R** field.
 - 2 Enter the desired value.
 - 3 Tap **Start**.
- ➔ The stirrer will immediately start stirring.



5.5 Change Tj

Note The value cannot be higher than the safety limit value.

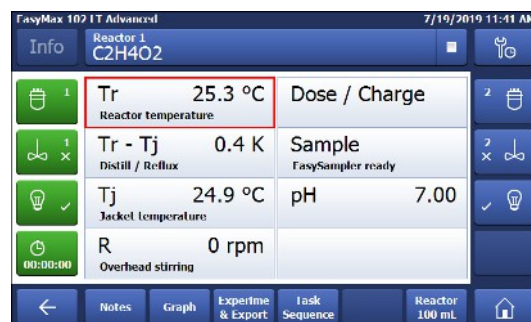
- 1 Tap the **Tj** value field on the main screen.
 - 2 Enter the end temperature for **Tj**.
 - 3 Tap **Start** to initiate the task.
- ➔ The task will start immediately.



5.6 Change Tr

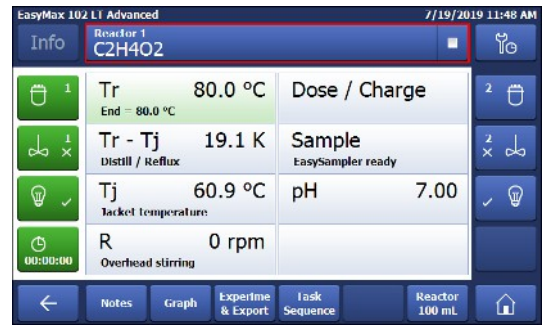
Note The value cannot be higher than the safety limit value.

- A Tr sensor is connected to the thermostat.
- 1 Tap the **Tr** value field on the main screen.
 - 2 Enter the end temperature for **Tr**.
 - 3 Tap **Start** to initiate the task.



5.7 End an experiment

- 1 Tap on the Stop button on the mainscreen.
- 2 Select your preferred option for experiment end conditions.
- 3 Tap **OK**.
➔ Your experiment is stored on the device and can be exported.



6 Maintenance

Maintenance tasks have to be performed in accordance with the instructions given in this chapter. After performing any maintenance tasks, it should be ensured that the device still meets all safety requirements.

6.1 Update Firmware

The latest firmware versions and instructions for installation are available on the following website:
<https://community.autochem.mt.com/?q=software>

6.2 Checking the Reactor

To check the reactor vessel for possible damage (scratches and cracks), it must be empty, clean, dry and open. Small hairline cracks can be detected by refraction using an additional light source (focused, not dispersed light).

6.3 Cleaning the Instrument



CAUTION

Hot instrument parts

Touching hot parts of the instrument can result in burnings.

- Do not clean the instrument before all parts have reached room temperature.



NOTICE

Damage to the device due to incompatible cleaning agents

Inappropriate cleaning agents could damage the housing of the device.

- 1 Use the described cleaning agent.
- 2 Should you use other cleaning agents, ensure that they are compatible with the housing material.

The housing of the instrument is not watertight (i.e. splash proof). We therefore recommend that you clean it with a damp cloth using ethanol.

If you have questions about the compatibility of cleaning agents, contact your authorized METTLER TOLEDO dealer or service representative.

6.4 Exchange insulation set tubes

We recommend to exchange the insulation set tubes in case of damage. This ensures good cooling conditions. The insulation tubes are not provided by METTLER TOLEDO as a spare part. Please contact a local supplier with the following specifications:

Material: Armaflex AF

Dimensions:

- Inner diameter: 19-20.5 mm (for tubes Ø18mm)
- Insulation thickness: 14 mm -> outer diameter: 47-50 mm

6.5 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.



7 Technical Data

Certifications regarding this product can be found at <https://www.mt.com/us/en/home/search/compliance.html/>
The product name of your device is the model number.

Directives, standards and REACH regulation

SVHC candidate substances according to REACH (Article 33)

Material	CAS No.
Decamethylcyclopentasiloxane	541-02-6
Dodecamethylcyclohexasiloxane	540-97-6
Octamethylcyclotetrasiloxane	556-67-2

United States of America

This equipment has been tested and found to comply with the limits for a **Class B** digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

Power supply

AC Power Adapter rating	Voltages	100 - 240 VAC
	Frequency	50 Hz / 60 Hz
	Permissible voltage fluctuation	±15%
Instrument rating	Power Consumption	Max. 1000 VA

Connections

USB	Support of USB 2.0
Electrical connectors	RS232, USB, CAN, Ethernet and touchscreen
Cable length	Limited to 3 m for RS232, USB, CAN

Ambient Conditions

Humidity	Max. relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C, non-condensing
Altitude	Up to 2000 m
Overvoltage category	II
Pollution degree	2
Ambient temperature	5 °C...40 °C
Usage	For indoor use only

Materials

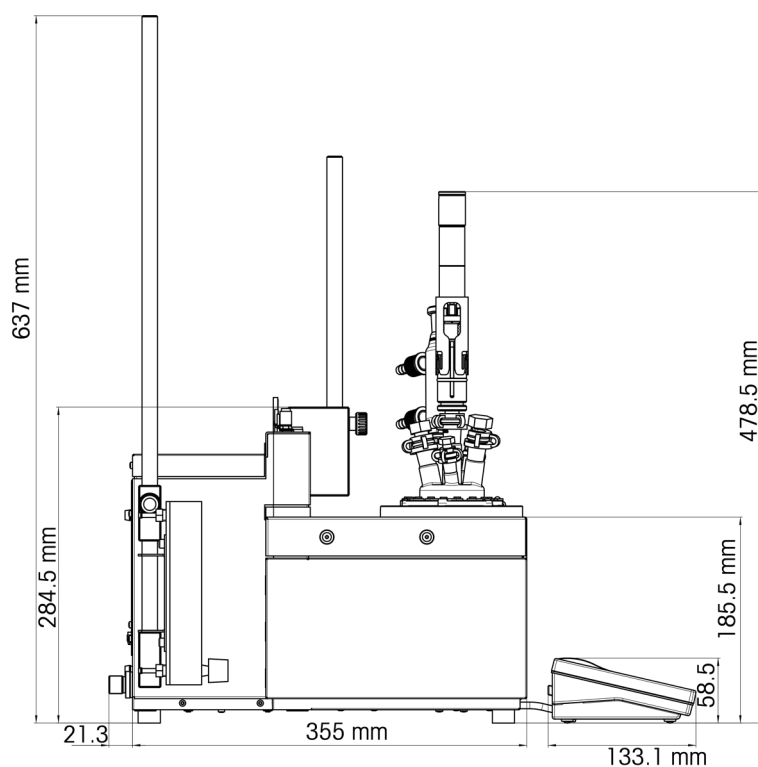
Cover plate	Stainless steel coated with PFA/FEP
Housing material	Powder-Coated stainless steel
Connectors for purge gas	Stainless steel, nickel-plated brass
Purge gas lines	PVC, FEP, PP, PVDF, PTFE, aluminum

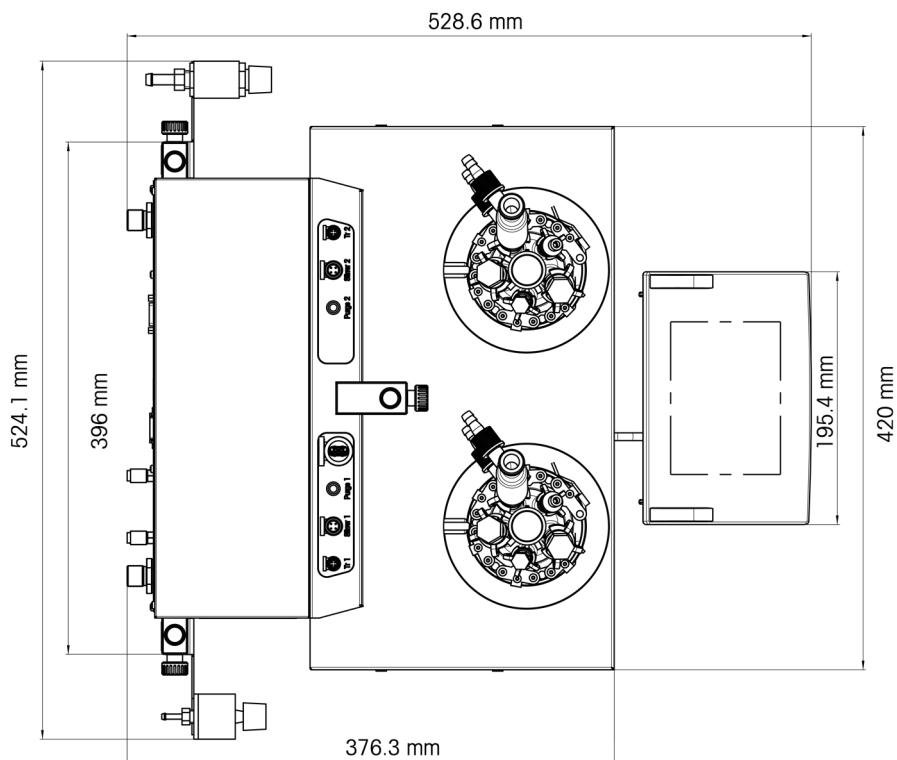
Coolant system (wetted parts)	PVC, PTFE, PVDF, copper, stainless steel
Holder for lab bars	Aluminium
LEMO connectors for Tr sensor and overhead stirrer	Chrome-plated brass with protection cap in PSU
Reactor window	Borosilicate glass 3.3
Receptacles for reactors	Anodized aluminum
Fixing rings of thermostats	PTFE C25
USB connector	Stainless steel with protection cap in PSU
On/Off switch	Stainless steel
Reactors	Borosilicate glass 3.3 and PTFE
Magnetic stirrer	PTFE coated
Overhead stirrer shaft	Borosilicate glass 3.3, Alloy 22 or PTFE
Touchscreen	PA 12, aluminum
Protective cover for Touchscreen	Barex®

Device

Weight incl. touchscreen	21 kg
Backlight	2 LED per reactor

Dimensions





7.1 Thermostat

Power

Heating	360 W per thermostat
Cooling	Max. 150 W per thermostat

Temperatures

Range	Tj: - 90 °C to 80 °C Tr: - 90 °C to 80 °C* Tc: - 90 °C to 60 °C * The maximum and minimum Tr depends on heat transfer through the jacket and heat generated by the reaction.
Resolution	Tj: 0.1 K Tr: 0.1 K
Maximum permissible errors	±1.0 K for the whole range, for Tr and Tj sensor
Data recording interval	Every 2 seconds

7.2 Reactors

Volumes	100 mL (only one-piece and high workup volume two-piece) 50 mL (only one-piece) 25 mL 8 mL
Pressure	0.05 bar to ambient pressure

Cover for reactors

100 mL glass cover	<ul style="list-style-type: none"> • 2 x ST10/19 • 3 x ST14/23 <ul style="list-style-type: none"> – 1x ST14/23: Central port for stirrer
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7.3 Stirrer

Overhead stirrer

Operating mode	Control to constant value or ramp
Data recording interval	Every 2 seconds
Speed range	50 to 1000 rpm
Torque	Max 59 mNm (for continuous operation)

Magnetic stirrer

Speed range	50 to 1000 rpm
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7.4 Cooling

Cooling medium	<ul style="list-style-type: none"> Water (unpolluted); otherwise install a filter Ethylene glycol Silicone oil Other cooling media have to be compatible with the wetted materials of the cooling system [Technical Data Page 21]
Min. flow of cooling media	2 L/min
Cooling types	In-house coolant supply or cryostat
Max. pressure of cooling media	<ul style="list-style-type: none"> Without flowmeter: 3.5 bar With flowmeter: 2 bar

Temperature (Tj)	In-house coolant supply	Cooling power of cryostat
> - 10 °C	At 15 °C	1000 W at 20 °C
- 65 °C	At 15 °C	Min. 150 W at -20 °C
- 80 °C	not possible	Min. 390 W at -60 °C

Recommended minimal Tc is -60 °C.

7.5 Purge gas

Instrument purge gas

Max. inlet pressure	7 bar
Min. gas flow	4 L/min
Connector on device	Purge In see [Connecting instrument purge Page 12]
Humidity of purge gas	Less than 10 ppm of water

Reactor purge gas

Max. inlet pressure	7 bar
Min. gas flow	As required by experiment
Connector on device	Inert In see Operating Instructions section 4.7 Connecting reactor purge

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