

USER MANUAL

GT300 PLUS



CONTENTS

1. GENERAL VIEW OF YOUR INSTRUMENT
2. FEATURES OF YOUR INSTRUMENT
3. STATE ICONS
4. INSTALLATION AND GETTING STARTED OF GT300 PLUS
 - 4.1. Model without temperature control (N125000)
 - 4.2. Model with temperature control (N125100-125200-125400-125500)
 - 4.3. Installation and use of breakable thermocouple (000645)
 - 4.4. Installation of hook and cup for measure
5. USE AND MEASURE WITH GT300 PLUS
 - 5.1. Main Menu
 - 5.2. Measure
 - 5.3. Programs
 - 5.4. View Results
 - 5.5. Zero Adjustment
 - 5.6. Remote mode
 - 5.7. Parameters
 - 5.7.1. Language
 - 5.7.2. Date / Hour
 - 5.7.3. Sounds / Standby / Lighting
 - 5.7.4. Operator
 - 5.7.5. Units
 - 5.7.6. Measuring System
 - 5.7.7. Locked Mode
 - 5.7.8. Miscellaneous
 - 5.7.9. Zero Speed
 - 5.7.10. Density
 - 5.7.11. Printing
 - 5.7.12. Service
6. VERIFICATION OF YOUR DEVICE
7. TECHNICAL SPECIFICATION

1. GENERAL VIEW OF YOUR INSTRUMENT

The GT300 PLUS is available in three versions. Without temperature control, with Peltier effect air-cooled and with electric heating.



Model : N125000



Model : N125100, N125200, N125400 and N125500

Available models:

PN Instruments	Designation Instrument
N125000	GEL TIMER GT300 PLUS without temperature control
N125100	GEL TIMER GT300 PLUS electrical heating (Room to +300°C)
N125200	GEL TIMER GT300 PLUS electrical heating (Room to +300°C) with programmer
N125400	GEL TIMER GT300 PLUS with Peltier (+15 à + 60°C)
N125500	GEL TIMER GT300 PLUS with Peltier (+15 à + 60°C) with programmer

The GT300 PLUS (all model) is delivered with software VISCO RM, 2 user notice and:

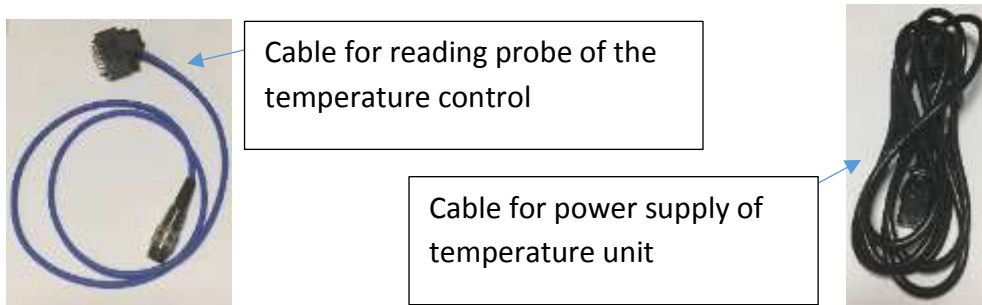


AC power adaptor for measuring head

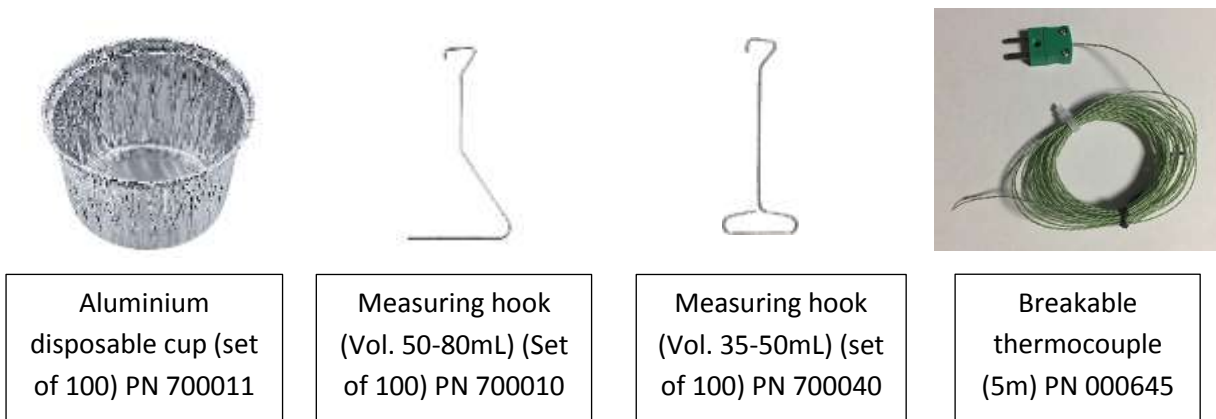


Fixture for hook

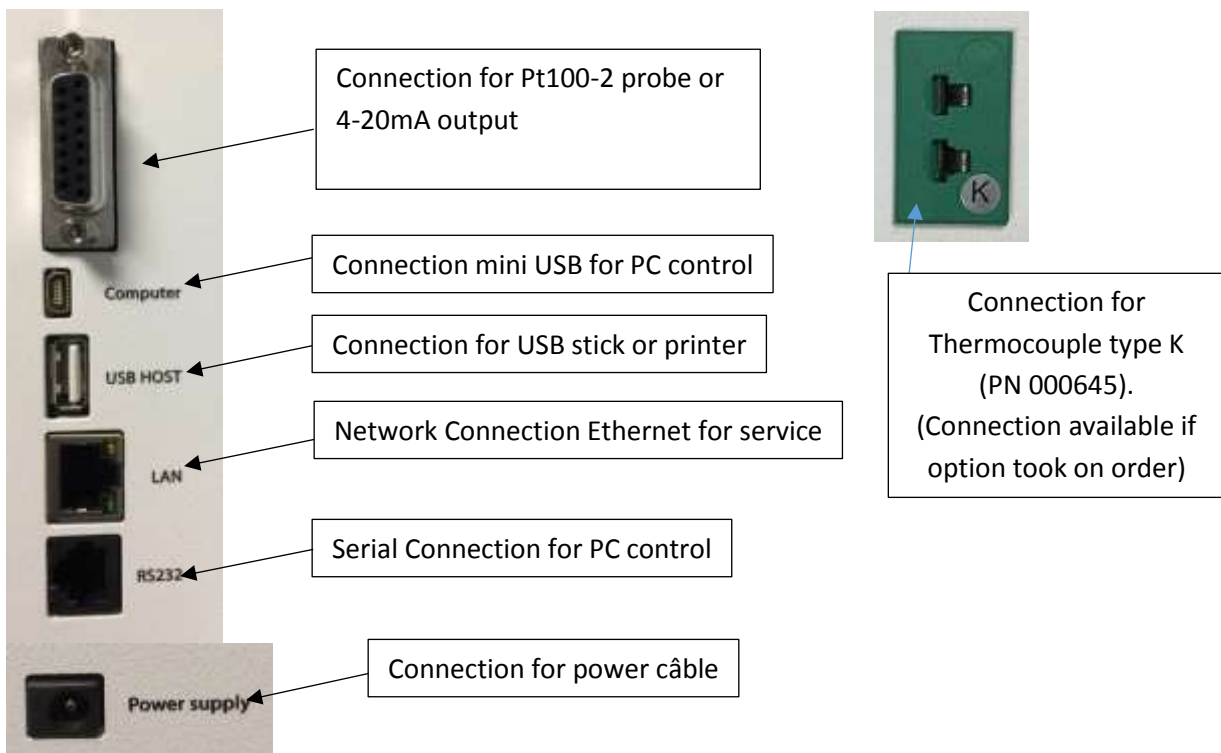
For models with temperature control:



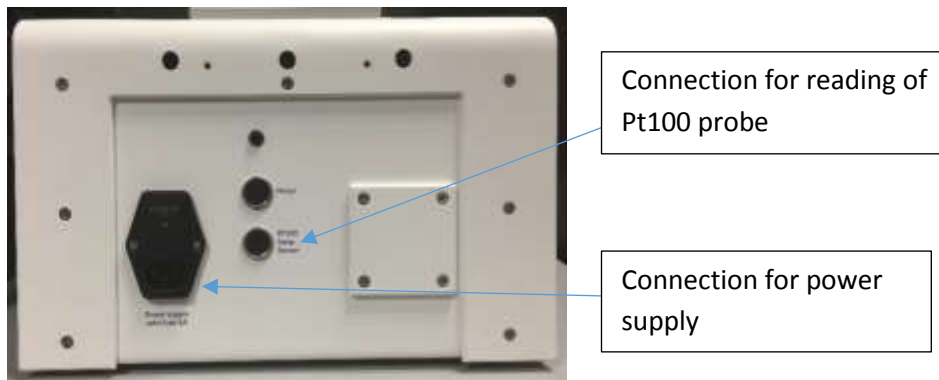
Accessories delivered with the GT300 PLUS (according to order):



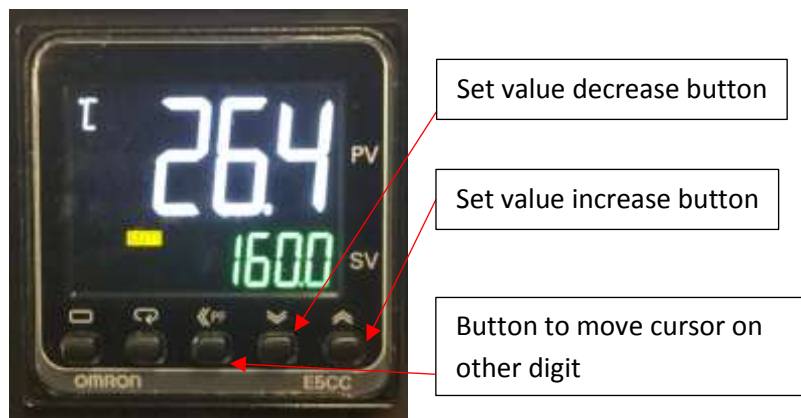
All models of GT300 PLUS have the following connections:



For models with temperature, the connection is as follows:



The temperature controller that equips the models N125100, N125200, N125400 and N125500 is the following:



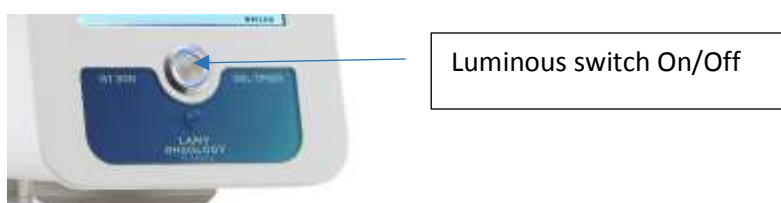
2. FEATURES OF YOUR INSTRUMENT

- **Touch screen**

The new GT300 PLUS is equipped with a 7 " colour touch screen. It gives you greater working comfort and a clearer view of your data and analysis results.

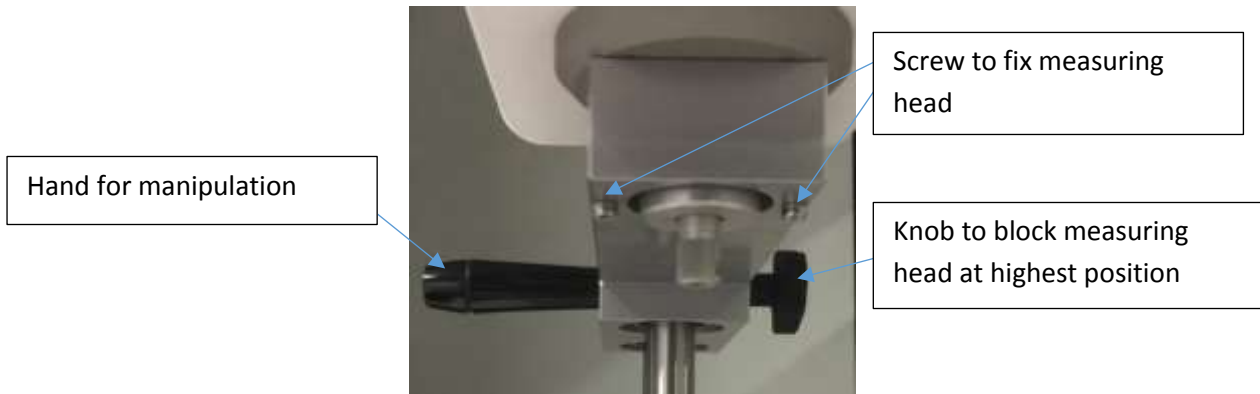
- **Bouton On / Off**

Always with the aim of improving your experience, LAMY RHEOLOGY has decided to equip all of its PLUS range with a luminous and design switch. It has been placed in the center of the device for greater intuitiveness. Another switch is placed on the back of the temperature control unit (depending on models).



- **Aluminium Arm**

The aluminium arm is equipped with the clamping knob allows you to maintain the measuring head at the highest position and a handle for easy handling. The measuring head is fixed to the arm by two screws on each side of the motor shaft.



- **Stain less steel rod**

The rods of the GT300 PLUS are made of stainless steel for a solid hold of the measuring head. They have a very long life. One of them is equipped with a ring with a tightening knob. It is used as a stop for a repeatable installation during measurement.



- **Aluminium stand (Model N125000)**

The stand is entirely made of anodized aluminum. It gives our instruments an unmatched stability (the maximum permissible temperature on the white part is 50 ° C).










- **Support with temperature control (Model: N125100, N125200, N125400 and N125500)**

The plate placed on the temperature unit is made of composite acting as a thermal barrier and thus reduces the risk of burns for the operator. It is fixed with four screws.



3 STATE ICONS

	No Device is connected to the instrument.
	Only one Device is connected to the instrument.
	Two Devices are connected to the instrument.
	Give to you the temperature of probe in the sample.
	Enable to go to parameters of instrument.
	Enable to come back to Main Menu.
	Enable to come back to previous menu.

4 INSTALLATION AND GETTING STARTED OF GT300 PLUS

The installation of the GT300 PLUS is very simple. The measuring head is already screwed on the stem, it is sufficient to put the instrument on a stable table. No level of the device is needed.

4.1 Model without temperature control (N125000)

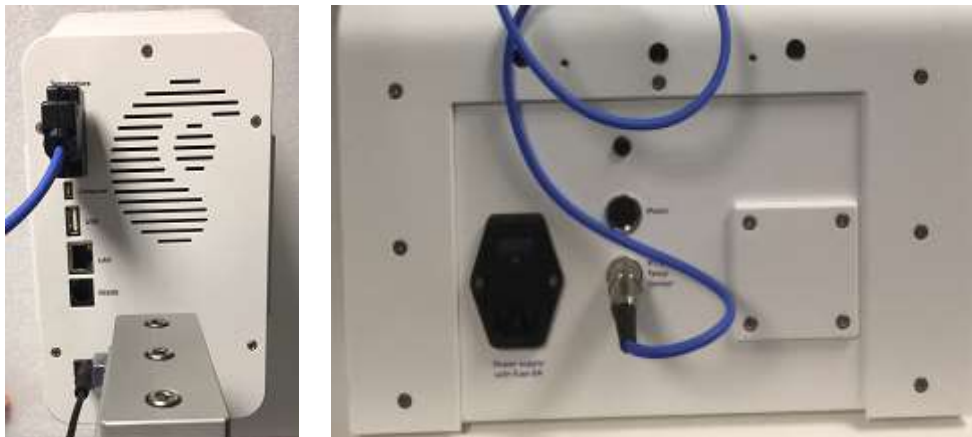
Connect the power cable of the measuring head. Start with the luminous button.

Make a motor zero (see section 5.5). This action must be repeated each time then unit is turned off and on again.

If you are using a breakable thermocouple, go to section 4.3, otherwise go to section 4.4.

4.2 Model with temperature control (N125100-125200-125400-125500)

Connect the power cable of the measuring head and temperature unit. Then connect the blue lead between the measuring head and the temperature control unit.

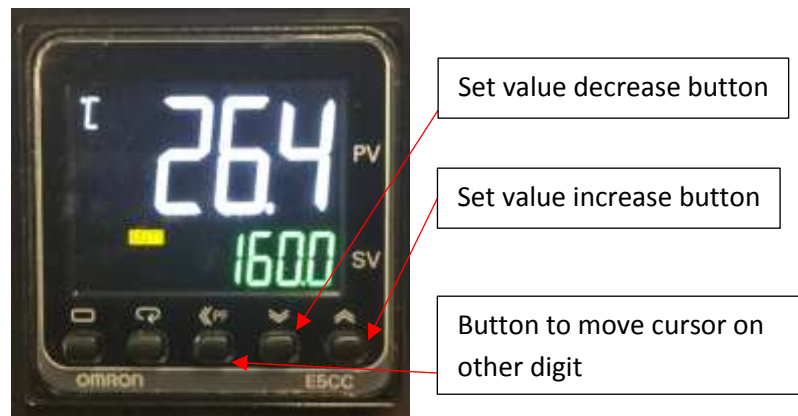


Switch on the measuring head and the temperature control unit. At the top right of the touch screen, the temperature of the Pt100 probe located in the warm-up unit is displayed. If this is not the case, check that the settings in the menu of the measuring head are correct (see section 5.7.8) or that the cable connecting the measuring head and the temperature setting unit is correctly connected. .

Make a motor zero (see section 5.5). This action must be repeated each time then unit is turned off and on again.

You can now set the desired temperature set value for your measurement. The heating can be carried out with or without a disposable cup (see section 4.4 for placing the cup).

To change the set value, press the arrows to adjust the desired temperature, the new set value will be taken into account after a few seconds without validation.



The value read at the bottom of the display is the temperature set value (SV). The PV value is the actual value of the controller. The value read on the screen of the GT300 PLUS is the real temperature value.

If you are using a breakable thermocouple, go to section 4.3, otherwise go to section 4.4.

[4.3 Installation and use of breakable thermocouple \(PN 000645\)](#)

Depending on the delivery, a breakable thermocouple can be used to measure the temperature in the sample during the measurement. You can connect it to the port on the back of the GT300 PLUS's measuring head. To display the value read by it, make sure that the settings of the measuring head are correct (see section 5.7.8).

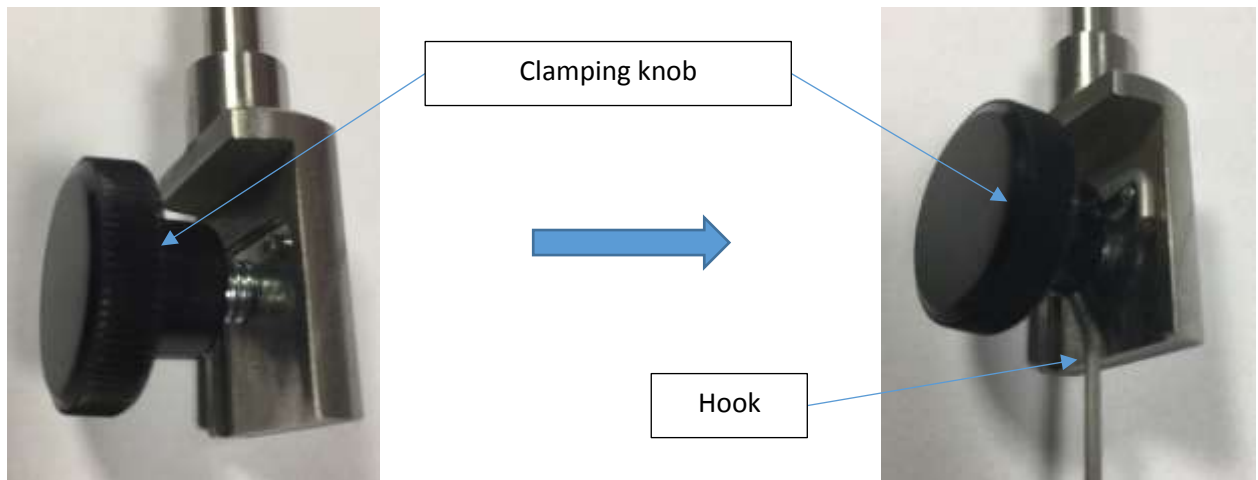
When the thermocouple is used with a GT300 PLUS model equipped with a heat-up unit, it is not possible for you to display on the GT300 PLUS touch screen in same time the temperature of the thermocouple and that of the probe Pt100 of the heat-up unit.

After each measurement, you can cut the two threads above the product. For a next measurement, you must strip the ends of the two cables and twist them again.

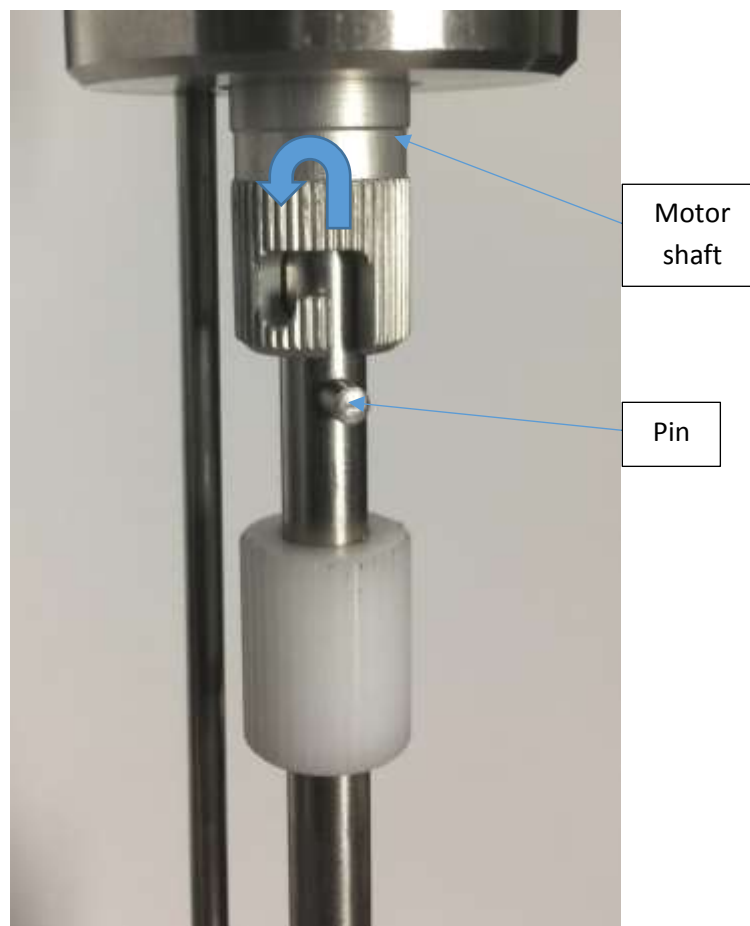


4.4 Installation of hook and cup for test

Depending on the order, the GT300 PLUS comes with fixture and hooks. To set the hooks, please unscrew the clamping knob, insert the hook and lock it by tightening.



Place the measuring head in the highest position and insert the bayonet coupling into the motor shaft by pushing and turning slightly so that the pin fits into the space provided.



Make sure the assembly is well aligned by slightly rotating the assembly. If necessary, reposition the hook by twisting slightly, taking care to hold the motor shaft with your other hand to prevent damage to the motor.

You can then set up the disposable cup that will accommodate the product.



Check that the disposable cup is touching the bottom of the well. Be careful not to burn if the bottom of the well is already in temperature.

Place the stop ring on the rod at the lowest position by unscrewing it completely. Lower the measuring head by holding it with the handle of the arm so that the hook is closer to the bottom and the walls of the bucket without touching it. Block the head in this position using the screw on the arm. Check by applying a slight rotation that there is no friction between the hook and the cup. If this is the case, move the measuring head again. Once the position is final, place the stop ring just below the arm and lock it with the knob. This then allows you to raise the head to the highest position while keeping the measurement position with the stop ring.

Fill the cup with your product. Make sure that the quantity is sufficient for the hook to be immersed. The quantity needed can be judged using water first.

Lower the measuring head to the stop ring. It is useless again to tighten the screw on the stem

5 USE AND MEASURE WITH GT300 PLUS


The measuring head of the GT300 PLUS has the same characteristics as the GT300 PLUS viscometer. Like this one, it can be used alone or with the Visco RM software.

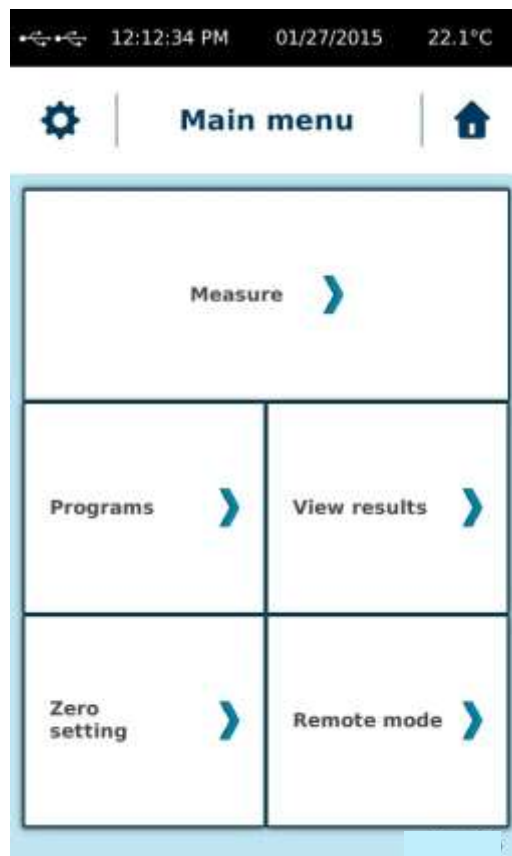
When it is controlled by a computer, the choice of the most judicious method is a constant speed measurement followed by the evolution of the viscosity as a function of time (see instructions for use of the software for programming). This will determine the inflection point when the reaction of your product begins.

Using the GT300 PLUS without the software only provides the time when the maximum torque of the instrument is reached. Since it is an automatic shutdown, no recording or reading of the result will be possible. It is therefore best to use it with the software.

When using the GT300 PLUS with or without software, the measurement will stop automatically when the maximum torque of the measuring head is reached.

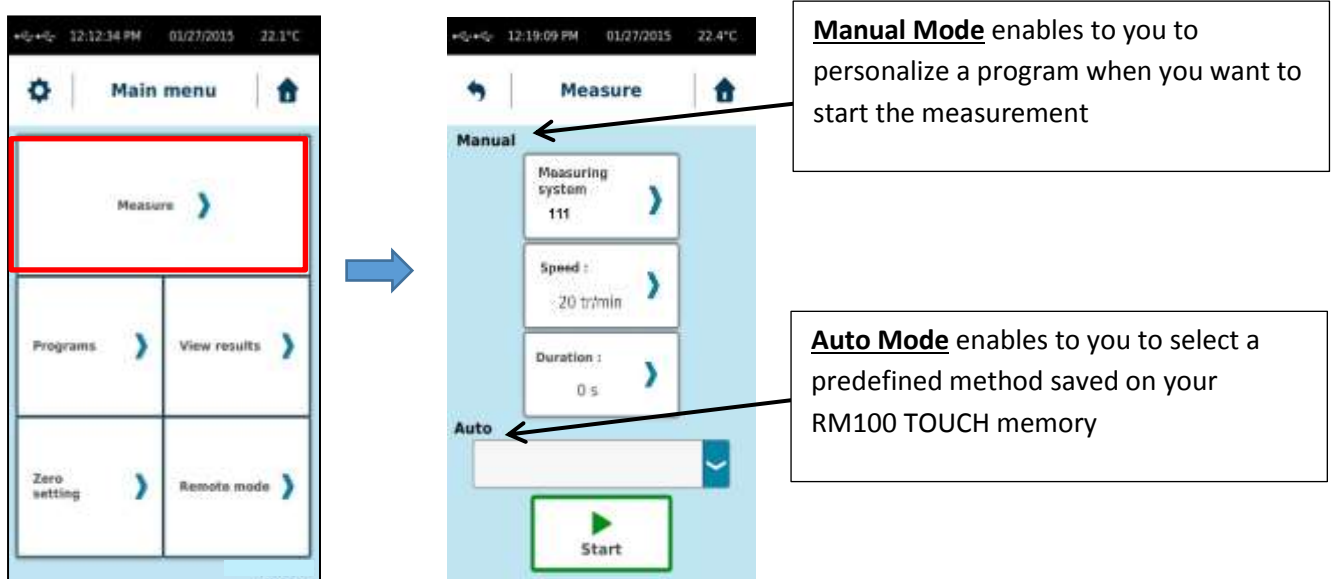
5.1 Main Menu

Main menu enable to you to browse between different tabs of your GT300 PLUS. Acces is always available by clicking. 

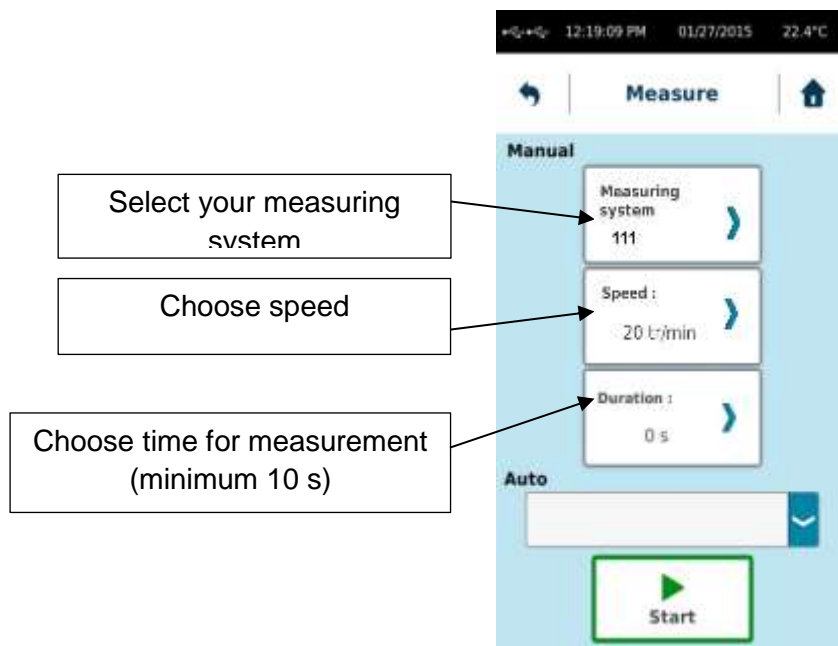


5.2 Measure

Measure tab is central part of your GT300 PLUS. Indeed, it enables to select a manual measure to define or choose one of stored method by "Auto".



Manual Mode enables to choose your measurement parameters like «Measuring System », « Speed » then « Time of measurement ».



The GT300 PLUS is used with disposable hooks. These are called "111" when you need to select the measurement system from the list. Regarding the choice of rotation speed, the ideal range is between 0.5 and 20 rpm. Too slow a speed at the beginning of the measurement can cause problems of too low torques and a too fast speed of the couples too high when the reaction of your product accelerates. The choice of speed will depend on the kinetics of your product.

A measurement time of 0 will not give you possibility to save data but will allow you to change the speed during the measurement. This is interesting when you have to choose the right speed to reach couples far enough from the lower limit indicated on the gauge.

Click on Start to start your measurement.



When it is over, you will see the results of your measurement. You will be able to choose to save and / or print your result (if a printer is connected) only if the measurement time is reached before the automatic shutdown in case of maximum torque.



Auto mode allows you to select pre-recorded programs. Select the program from the list and click "Start" to start your measurement. The display automatically adjusts to show the current measurement. At the end of measurement, instrument will ask you to save or print (if printer is connected).



5.3 Programs

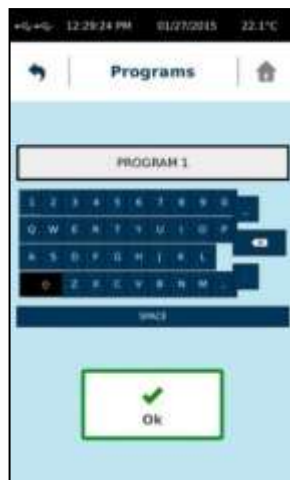
With **Programs** tab, you could define parameters for your standard measuring program and also delete it. We have one kind of program: "One point method".



In One point method, you will have one viscosity value at one constant speed.

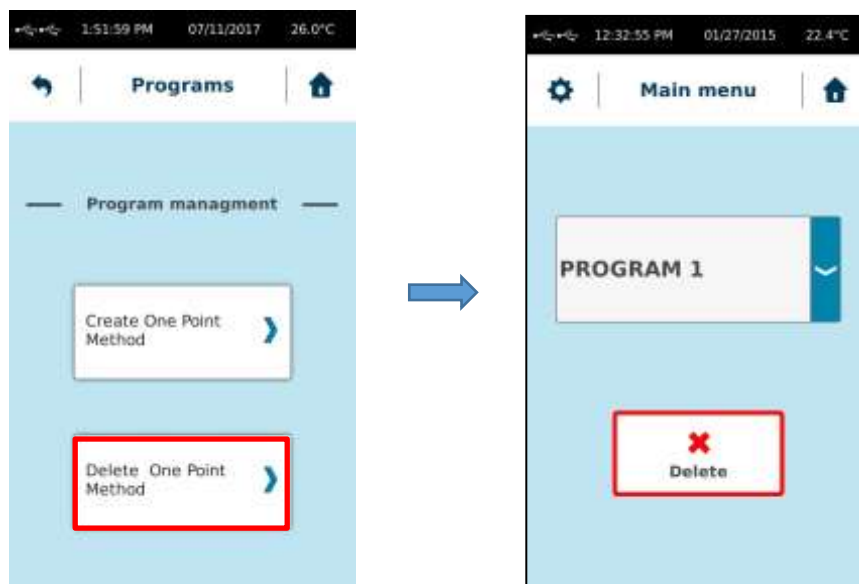


Then you click on create, you will get this screen where name of program need to be given.



When your Program is created, you will find it in **AUTO** list of **Measure** tab.

To delete “One Point Method”, please do like this



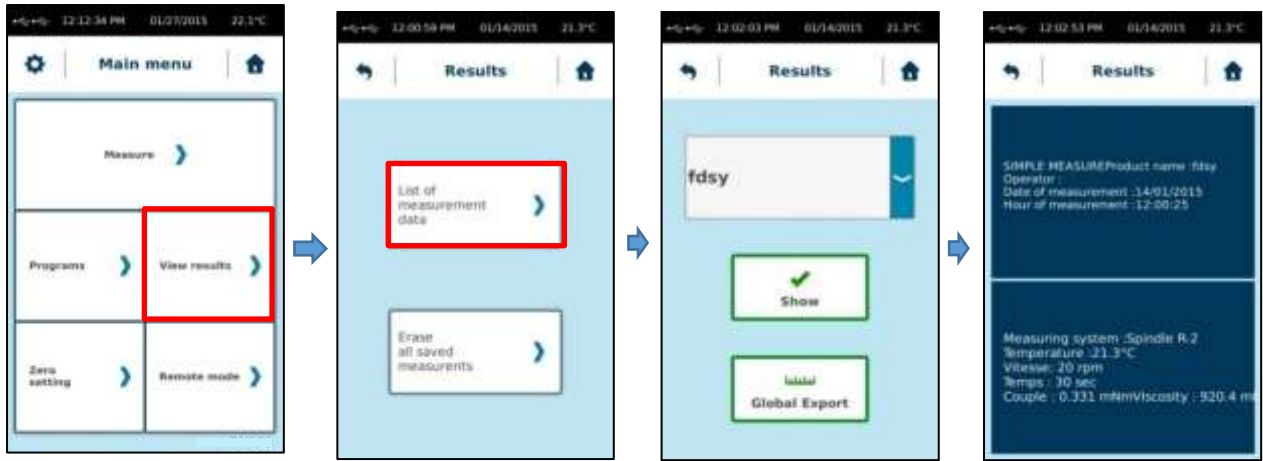
In **Programs** tab, press on « Delete one method ». Choose the Program you want to cancel then press « Delete »

5.4 View result

To read, delete or export the results of your measurement after saving, press on « View results » tab in Main menu.

List of measure

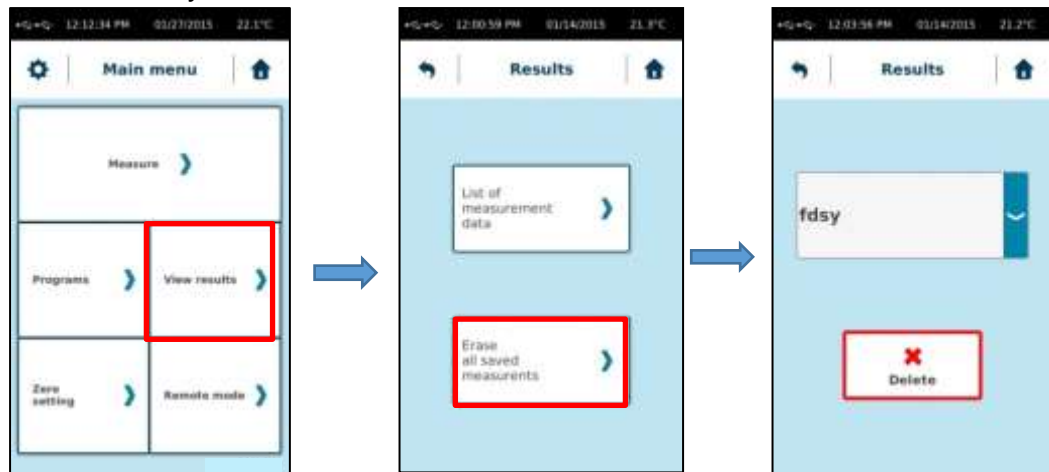
By click on this tab you could see all saved measurement made with your GT300 PLUS. You could select which one you want to read.



By click on “Global Export” tab, you could send all of those saved data to a USB key, placed in “USB” plug at the rear side of GT300 PLUS.

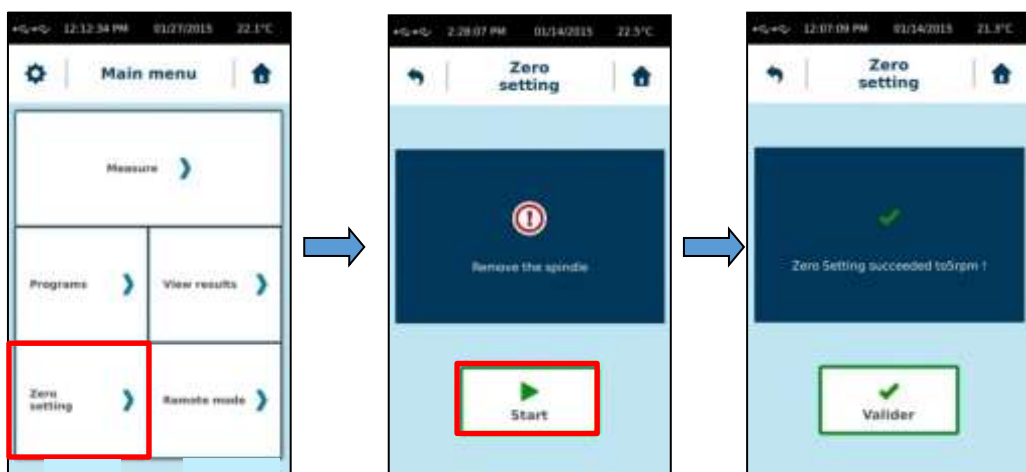
Delete Measure

By click on this tab you could delete all saved measure one by one as you want from your GT300 PLUS memory.



5.5. Zero Adjustment

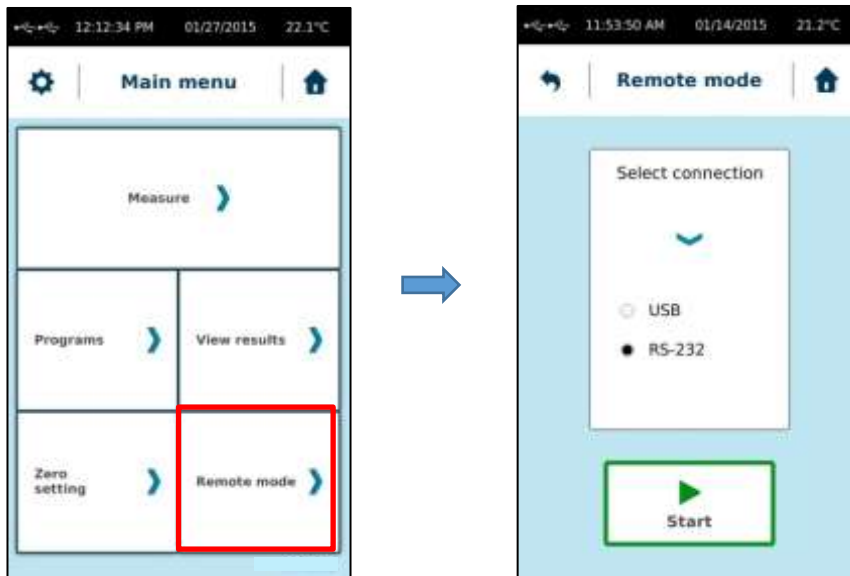
The zero setting allows you to calibrate your GT300 and to take account of the engine's empty friction. This operation must be done without a mobile. The rotational speed for zero adjustment is set at the factory. But if you want to change it, you can change it by going to the "Parameters" menu (see section 5.7.9). The shifting allows you to give you much more accurate measurements at specific speeds.



5.6. Remote Mode


This mode enables to drive GT300 PLUS by external VISCO RM software, supplied on option.

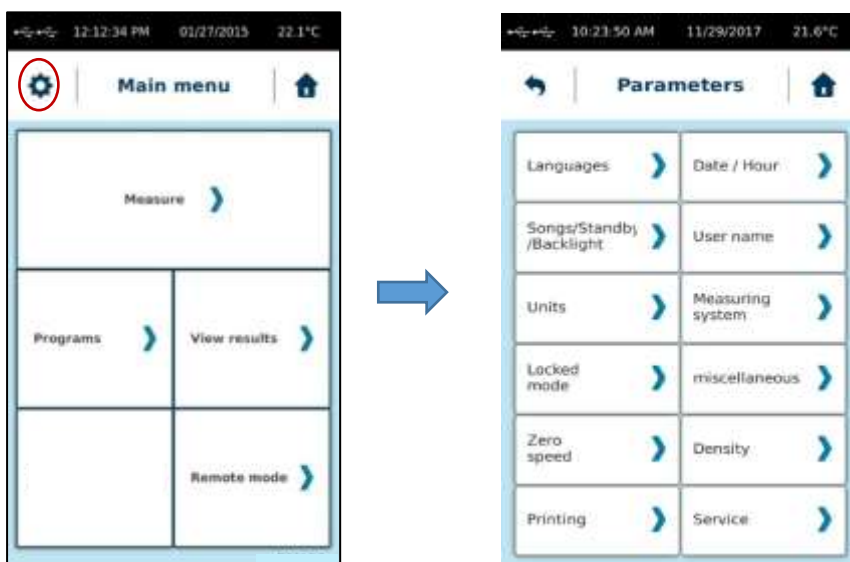
You must select the type of connection: USB or RS232 and connect the appropriate cable (delivered with software) to the computer, open the software, select the right COM port you're using on "SYSTEM" "CONFIGURATION" menu of software and press "Ok" to establish connection with external software.



Rq : With mini USB connection, respect strictly the order to start, and if any communication is possible re-connect the USB cable on computer and wait it is recognized before start the communication.

5.7 Parameters

Click on wheel  then you are on main menu.



5.7.1 Languages

Enable to you to select language of your GT300 PLUS.



5.7.2 Date / Hour

Enable to you to adjust hour and date of your GT300 PLUS.



5.7.3 Sounds / Standby / Lighting

Allow you to modify sounds, lighting and activate or not the Standby mode of your GT300 PLUS.



5.7.4 User Name

Operator mode will allow you to create different operators for your GT300. The use of the operators makes it possible to identify the person making the measurement. Operator management must always begin with the creation of the first account, which will become the administrator and thus create or delete another operator account. The account of an operator may or may not be associated with a password (here called PIN code).



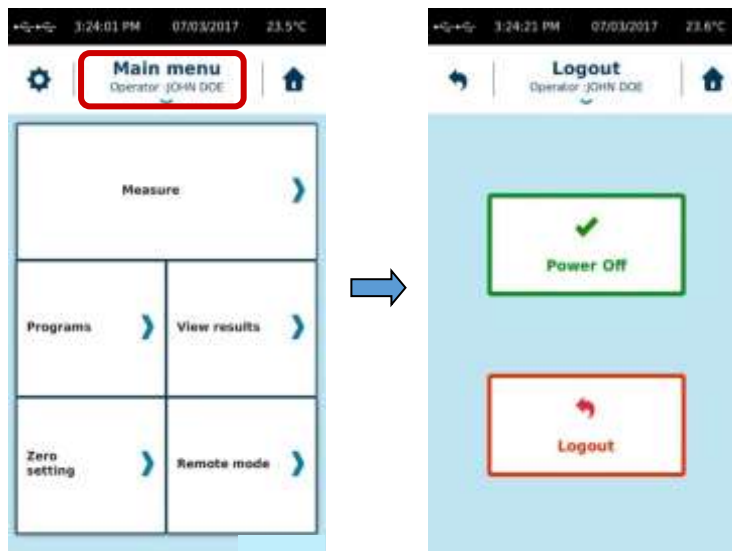
After specifying the name and password, the administrator will be named in red in the list.



You can now create another operator with or without a PIN. To use the operator accounts you must activate the mode. To delete an account, the administrator account must be used. Select the account you want to delete from the list and click on "Delete user name".



Once you have created an operator, you can select an operator. By returning to the Main Menu, you will see the name of the operator in use. By clicking on the arrow below the name of the operator, you can switch off the GT300 or change operator (Logout).



If the instrument is switched off and on again while operator mode is active, you will be asked to select the operator you want.



5.7.5 Units

Enable to you to change unit of viscosity values.



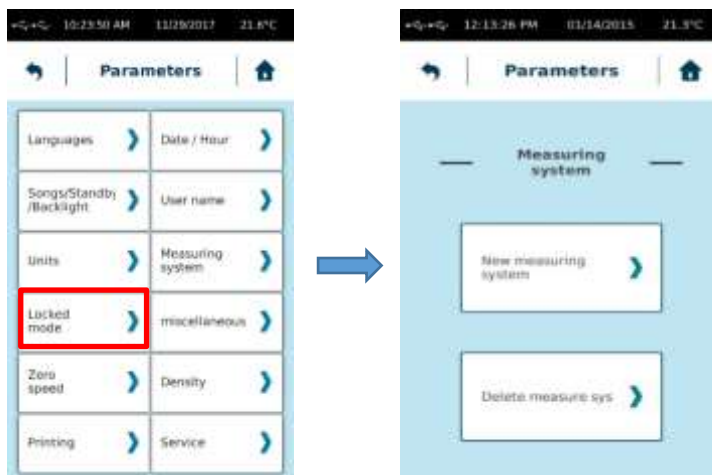
5.7.6. Measuring System

Allows you to add or remove a Measurement System. To create a measurement system, the instrument will ask for three constants and the name. Please contact LAMY RHEOLOGY for the usual constant values.



5.7.7. Locked Mode

This option allow you to block measuring parameters for all saved method (please see 5.3.) and parameters for simple measurement mode (see 5.2.)



When you click "Enable", the GT300 will ask you to save a 4-digit code that will be required to disable this protected mode. Each activation is independent and can be done with a different code. The protected mode is indicated by the presence of a padlock-like icon next to the USB symbols.

Once protected mode is activated, you will see this icon on GT300 Screen (please see picture below). Protected mode protect programs, measuring parameters and some menu as shown on pictures below



To disable protected mode, you have to go again in service and “Locked mode” and click on disable. You will have to use password.

5.7.8. Miscellaneous

This menu allows you to select the probe used by the GT300 PLUS to display the temperature or change the maximum torque value corresponding to the full scale of your recorder when using the 4-20mA analog output.



Regarding the box "Temperature input", you have four possibilities:

- "None" means that no probe is used to display the temperature on the GT300 PLUS screen
- "Pt100-1" is normally a temperature sensor directly installed on the measuring head next to the motor axis. This is not available on the GT300 PLUS.

- "Pt100-2" allows the display of the temperature read by the probe located in the heat-up unit. This is the default setting for all GT300 PLUS models with temperature control.

- "Thermocouple" must be used when a thermocouple is connected to the back of the measuring head. This is particularly the case when the thermocouple breakable is used to directly measure the temperature of the sample.

The "Max torque" box allows you to change the maximum torque that will be sent to the analog recorder that will be connected (oscilloscope or card). This function does not limit the torque of the GT300 PLUS during a measurement.

5.7.9. Zero Speed

Enable you to adjust the rpm value for the zero adjustment.



5.7.10. Density

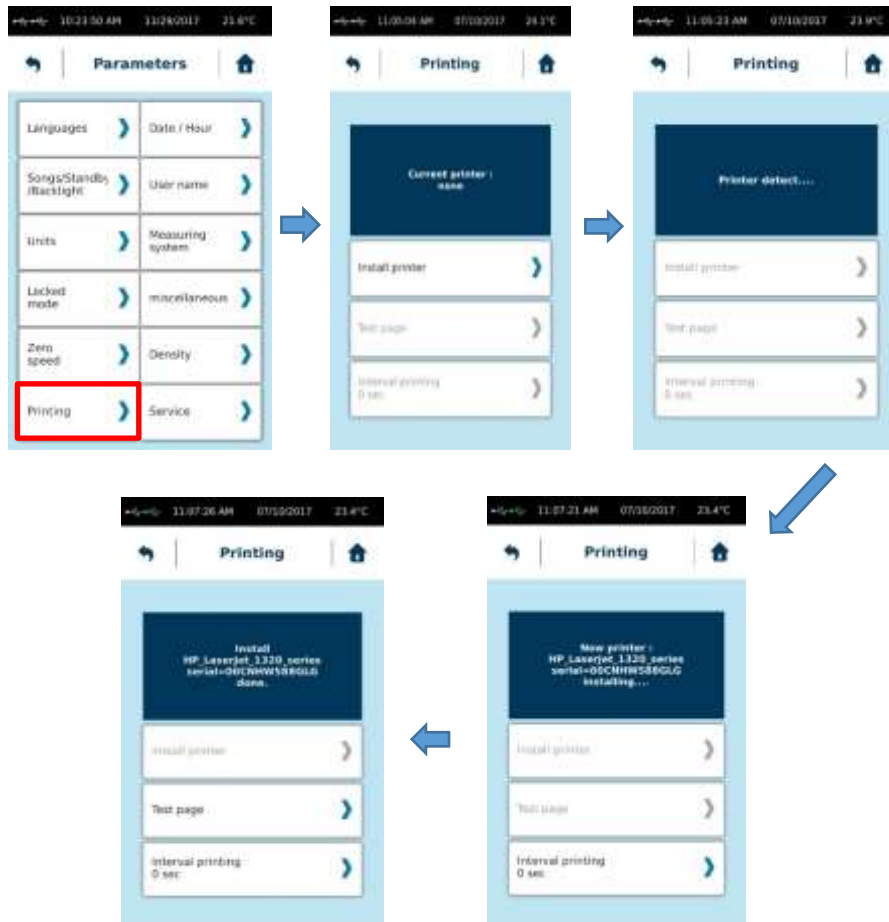
Enable to you to enter density value of your product to measure in order to calculate his kinematic viscosity.



5.7.11. Printing

Allows you to connect a printer, print a test page, and choose the print interval time you want during measurement.

The GT300 can be connected to all printers with a PCL5 print protocol. This includes many A4 printers or Dymo. The connection is made to the "USB host" port on the back of the instrument. Once the printer is connected, simply click on "Install Printer"



5.7.12. Service

Reserved to LAMY RHEOLOGY engineers.



6 VERIFICATION OF DEVICE

Your instrument is calibrated at the factory with an ASTM R2 mobile or MS DIN11 measuring system (see calibration certificate) and a certified oil with a viscosity close to 1000 mPa.s. The verification method differs depending on the measurement system selected. You may decide to perform the verification with your own measurement systems, but it is highly recommended to use one of the two measurement systems mentioned above. In case other systems are used, please contact LAMY RHEOLOGY for the most appropriate verification method.

Viscosity measurement on a 1000 mPa.s standard silicon oil with a ASTM 2555 R2 measuring system.

- Adjust the automatic zero in the air, without any spindle, until it stops and validate.
- Fill the 600ml beaker with the standard oil.
- Insert the 600ml beaker in a controlled temperature unit like EVA LR system or thermostatic bath.
- . Attach the spindle R2 to the viscometer and immerse the spindle in the oil at the good level (mark on the spindle).
- Wait for 15 minutes until the standard oil rise the good temperature.
 - Select on the instrument the measuring system R2, select 50 rpm for the speed, select 30 seconds for the measuring time, and start the measurement.

Viscosity measurement on a 1000 mPa.s standard silicon oil with a defined DIN11 measuring system.

- Adjust the automatic zero **in the air, without any spindle**, until it stops and validate.
- Fill the measuring tube DIN 1 with the standard oil.
- Attach the spindle MK-DIN 1 to the viscometer and fix the tube to the viscometer
- Insert the measuring system in a controlled temperature unit like a EVA DIN system or thermostatic bath.
- Wait for 10 minutes until the standard oil rise the good temperature.
 - Select on the instrument the measuring system DIN11, select 50s-1 for the speed, select 30 seconds for the measuring time, and start the measurement.

For both method, result at the end of the measurement must be within +/-5% of the standard viscosity value. If the measure is out, your instrument might need to be recalibrated.

Check if the error does not come from a wrong filling, a wrong zero adjustment, a wrong spindle rotation, or a wrong temperature value.

Please contact LAMY RHEOLOGY in case of problems.

1. CARACTERISTIQUES TECHNIQUES

Type of instrument: Rotating springless viscometer / gel timer with 7" Touch screen

Rotation speeds: Unlimited number of speeds between 0.3 and 1500 rpm

Torque range: From 0.05 to 30 mNm

Temperature: The GEL TIMER GT 300 is also available in temperature control version from 15 °C to 300°C (according to models).

Accuracy: +/- 1 % of the full scale

Repeatability: +/- 0,2 %

Display: Viscosity – Speed – Torque – Time – Temperature, Choice of viscosity units: cP/Poises or mPa.s / Pa.s – Shear rate

Language: French/English/Russian/Spanish

Supply voltage: 90-240 VAC 50/60 Hz

Analog output: 4 - 20 mA

PC connections: RS232 Port and USB

Printer connection: USB Host Port – Compatible PCL/5

Options: Breakable Thermocouple (PN 000645)

Dimensions and weight: Head: L180 x W135 x H250 mm, Stand for GEL TIMER: D610 x W340 x H650 mm, Weight: 15 kg.



LAMY RHEOLOGY

11 A, rue des Aulnes
69410 Champagne au Mont d'Or (France)

Tel : 33 (0)4 78 08 54 06

Fax : 33 (0)4 78 08 69 44

contact@lamyrheology.com

