



UK Distributor - Duomo (UK)



EN

IST-3200.PT01.02

ST200PT

GAS SYSTEMS LEAK TEST



USER INSTRUCTIONS

TECNOCONTROL S.r.l.

Via Miglioli, 47 20090 SEGRATE (MI) Italy- Tel. (+39) 02 26922890 - Fax (+39)02 2133734
http: www.tecnocontrol.it e-mail: info@tecnocontrol.it

Duomo (UK) Ltd

5 The Furlong, Berry Hill Industrial Estate - Tel: 01905 797989
web: duomo.co.uk e-mail: sales@duomo.co.uk



Carefully read and retain both this instruction manual and the other documents enclosed with this product.

All the reference material associated with this product must be retained as it contains procedures to be carried out in the periodic maintenance and service operations.

INFORMATION AND CAUTIONS DURING USE



Please bear in mind that failure to carry out the maintenance operations can negatively affect the product operation and therefore not ensure its correct operation.

On request, TECNOCONTROL can carry out a periodic check and calibration and issue a Calibration Report.

TECNOCONTROL shall not be liable if the product is modified or used in a way that is non compliant with its intended use, outside its rated operating values or for applications different from those it was intended for.

Each operator is solely responsible for selecting and using the product and must comply with current health and safety standards. The product cannot be used in areas where flammable Ex. classified areas may be present.

The standards, regulations etc. mentioned above are those in force at the time of issuing this document. In any case, all the national standards applicable in the user's country must be complied with.

The information contained in this manual is accurate and updated at the time of its publication and is the result of our ongoing research and development program; the specifications of this product and the information contained in this manual may be changed without notice.



Clock. If there is no power supply, the clock will work with the Lithium Battery which, in normal operating conditions, lasts over 5 years. Should the Lithium battery go flat, the date and time must be reset (see [SETTINGS-Date and Time](#)) and the battery replaced with a new one as soon as possible.

Lithium Battery. To ensure a long life and a correct operation, the Lithium battery should never be allowed to go flat, but should be kept at least at 40% of its charge and be fully recharged before use.

Alkaline Batteries. This type of battery can be used instead of the main battery, if necessary.



DISPOSAL INFORMATION

This product, in accordance with European Directives on waste disposal and reduction in the use of hazardous substances in electrical/electronic equipment must, at the end its life, be disposed of separately from other waste by qualified European recycling centres, or returned to TECNOCONTROL for its disposal.

Correctly recycling and sending the scrapped equipment to a centre where it will be handled and disposed of in an environmentally friendly manner helps to avoid potential damages to the environment and to human health, as well as promoting the re-use and/or recycling of the materials it is made of.

NOTES FOR READING THESE INSTRUCTIONS

ST200PT	The product is supplied in a transport case without PRINTER.
ST200PT/S	The product is supplied in a transport case complete with PRINTER.
FIRMWARE	Program installed inside the microcontroller that controls all unit functioning.



Symbol alerting the reader about an important caution of the instructions.



This symbol indicates an additional information or explanation to these instructions.

Documento / Document name: IST-3200.PT01.02_ST200PT-EN (20.01.2020).docx			
Oggetto / Subject : ST200PT (EN)			
Rev.	Data / Date	Da / By	Notes
0	20/01/2020	UT/FG	Document issue

SUMMARY

INFORMATION AND CAUTIONS DURING USE	2
INTRODUCTION	5
Figure 1 – Transport case content and Spare Part Numbers.	6
INSTRUMENT DESCRIPTION	7
Figure 2 – ST200PT instrument	7
Password	7
Opening/Closing the Battery Compartment	7
Connections	8
Lithium battery (Main power supply)	8
Figure 3 – Li-Ion battery BA047	8
Alkaline batteries(alternative power supply)	8
Maintenance	8
Cleaning the Casing	8
TOUCH TYPE DISPLAY	9
KEYS (Touch-Screen):	9
Display – Initial screens	10
Instrument charging	10
Display – START-UP screens	11
Switching on the instrument	11
Main Menu	11
INSTRUMENT FUNCTIONS	12
Pressure gauge function (Manometer)	12
Pressure gauge - Relative Pressure	12
Pressure gauge - Graph	12
Pressure gauge - Differential Pressure	12
GAS leak test function	13
Gas Leak Test - Saving Preset Test 1 or 2	14
GAS leak test function - Start Test	14
Gas Leak Test - Test Report	15
GAS leak test - Print	15
REGISTRY Function	15
REGISTRY DATA - Customer list	16
REGISTRY DATA - Keyboard	16
ARCHIVE function	16
DATA LOGGER function	17
SETTINGS function	19
SETTINGS - Language	19
SETTINGS - Date and Time	19
SETTINGS - Save Data onto the SD	19
SETTINGS - Load Data onto the SD	20
SETTINGS - Select Printer	20
SETTINGS - Backlighting	20
SETTINGS - Update Firmware	20
USING THE PRINTER	22
IR PRINTER - Replacing the alkaline batteries	22
UNI 7129 - Gas systems for domestic use	24
Carry out the leak test (with Air):	24
Table 1 - UNI 7129 Limits of acceptability.	24
UNI 11137 - GAS SYSTEM	25
Table 2 - UNI 11137 Gas families and pressures to be used.	25
Carry out the preliminary test (with Gas):	25
Table 3 - UNI 11137 Limits of acceptability.	25
Carry out the test with the indirect method (with Air or Gas):	26
Table 4 - UNI 11137 Limits of acceptability.	26

UNI 11528 - GAS SYSTEM	27
<i>Carry out the leak test (with Air):</i>	27
Table 5 - UNI 11528 Limits of acceptability.	27
HIGH PRESSURE TEST	28
<i>Carry out the leak test (with AIR):</i>	28
Appendix	29
TECHNICAL SPECIFICATIONS	29
Power Supply	29
Instrument features	29
Measurement specifications	29
Data and interface management	29
Operating Conditions	29

INTRODUCTION

- The ST200PT is an electronic pressure gauge that can be used both for system leak tests and for static, dynamic and differential pressure measurements, with indication of minimum and maximum value measured.
- The equipment can carry out other measurements by means of optional external probes.
- It automatically measures the volume of a system if not already known to the operator.
- During the tests, it compensates for the changes of ambient temperature.
- Automatic or manual reset
- It displays the graph of the measurement in real time.
- Parameters can be programmed by the operator according to their requirements.
- With built in Clock and Calendar
- With built-in measurement Data-Logger function.
- It has an archive than can be exported/imported on a microSD-Card, which allows to manage the tests reports with the information supplied by the customer and the engineer who carried out the tests.
- ST200PT can carry out the leak tests in manual mode or by using the preset parameters, in compliance with the following standards:

UNI 7129 *Gas systems for domestic use and similar systems supplied by mains gas - Design, installation and commissioning - Part 1: Indoor system.*

UNI 11137 *Gas systems for domestic use and similar systems. General prescriptions and requirements for gas families 2 and 3. Guidelines for inspecting and resetting the gas tightness of indoor systems.*

UNI 11528 *Gas systems with heat output exceeding 35 kW - Design, installation and commissioning.*



All parameters preset in the equipment are based on compliance with both Italian (UNI) and European standards (EN). Should the instrument be used abroad or for different standards, the test parameters may be changed within the limits preset for each type of test. Should you have any queries, please contact Tecnocontrol.



THE LEAK TESTS MUST ONLY BE CARRIED OUT BY QUALIFIED AND AUTHORISED STAFF, ACCORDING TO THE REQUIREMENTS OF THE STANDARDS APPLICABLE FOR THE SYSTEM BEING TESTED.

THE OPERATOR IS RESPONSIBLE FOR KNOWING AND CORRECTLY APPLYING SUCH STANDARDS.

ACCORDING TO THE SELECTED TEST, THE FORMULAS AND CALCULATIONS CARRIED OUT BY THE INSTRUMENT COMPLY WITH THE RELEVANT STANDARDS LISTED ABOVE AND UPDATED WHEN THE INSTRUMENT WAS MANUFACTURED. THE ADDITION OF OTHER LEAK TESTS OR OF ANY UPDATES OF TECHNICAL STANDARDS OR OF OTHER INSTRUMENT FUNCTIONS WILL REQUIRE THE FIRMWARE TO BE UPDATED(see [SETTINGS – Update Firmware](#)).

• The transport case may contain:

 POWER SUPPLY <i>(for all models)</i> SPARE PART NUMBER: AL003	 USB-C CABLE <i>(for all models)</i> SPARE PART NUMBER: CA026	 LITHIUM BATTERY <i>(for all models)</i> SPARE PART NUMBER: BA047
 IR PRINTER PART NUMBER: ST338 <i>(supplied only with the ST200PT/S)</i>	FOR ST338 PRINTER  THERMAL PAPER 57 mm – 25 m <i>(to be ordered as a spare part)</i> SPARE PART NUMBER ZR102	
 CONNECTING TUBE <i>(for all models)</i>	 2 OFF THREADED FITTINGS WITH QUICK COUPLINGS <i>(for all models)</i>	
 3 WAY FITTING WITH QUICK COUPLINGS <i>(for all models)</i>	 1/4" MALE FITTING WITH QUICK COUPLING <i>(for all models)</i>	 ADJUSTABLE CONE WITH QUICK COUPLING <i>(for all models)</i>

Figure 1 – Transport case content and Spare Part Numbers.

INSTRUMENT DESCRIPTION



Figure 2 – ST200PT instrument

Password

Some of the functions of the instrument are protected by a Code (max. 6 numbers), reserved to authorised people:

“FACTORY”: *This menu is accessible only to Tecnocontrol for the factory settings.*

Opening/Closing the Battery Compartment

The back of the instrument features a cover that can be opened to access the Battery Compartment, the microSD-Card and the optional cards. The snap-on cover is opened by pressing on the knurled area and then sliding it downwards.



Before opening the Battery Compartment, if the Battery is in use, disconnect the USB cable. If the cable is not removed, the instrument can be irreversibly damaged.

Connections

USB-C Port: it is located on the left hand side of the instrument, protected by the rubber flap with the symbol . It is provided to recharge the lithium battery, to connect the instrument to the PC, to load any Firmware updates and for future use.

P_L and P_H pressure connections: located on the top of the instrument, they are the inputs for the pressure / leak measurements. The P_L socket is the input for low pressures **from -50 to +600 mbar** (Low). The P_H socket is the input for pressures **from -0.6 to +6 bar**.

Push-pull connector for external probes: located on the top, it is provided to connect the external probes.

Lithium battery (Main power supply)

The top right hand corner of the display shows the battery status.

	Low battery. Recharge the battery immediately to prevent the instrument from switching off.
	Battery half full
	Battery charging
	Instrument without battery, powered from the mains by means of an external power supply and a type C USB cable.

The Lithium Battery can be recharged even if it is disconnected from the instrument. The battery is charged by using the USB-C port; whilst charging, the LED will be orange; when the charge is completed, the LED will turn green.



Externally recharge the Lithium Battery; it allows the instrument to be used with a 2nd battery or with Alkaline batteries.

If necessary, the Lithium Battery can also be recharged on vehicles by connecting the USB cable to a suitable adaptor for mobile phones with a 5VDC / 2A output.



Figure 3 – Li-Ion battery BA047

Alkaline batteries(alternative power supply)

If necessary, the instrument can also operate with 4 AA alkaline batteries, but only for a limited time (30 to 90 minutes, as the alkaline batteries have a lower capacity than Lithium ones).



Please remember that to use alkaline batteries you need to remove the lithium battery. We recommend that good quality batteries are used in order to ensure a longer life; please remember that the batteries must be removed if the instrument is not used for a long time.



Rechargeable AA batteries can also be used, provided that they are recharged only externally, with a suitable battery charger.

Maintenance

Calibration check: *once a year, we recommend that the instrument is subjected to a complete overhaul by sending it to TECNOCONTROL, who will carry out a functional check of the instrument and its periodic calibration, issuing a Calibration Report.*

Connectors: periodically check that the **CONE**, the **TUBE**, the various **FITTINGS** and their **SEALS** are clean and in good conditions to ensure the pressure tightness during the tests. We recommend that they are replaced when worn, flattened or cracked.

Pressure connections (P_L/P_H): Make sure that no dirt or humidity is allowed to enter the pressure measurement connectors.

Electrical connectors: make sure that no dust or liquids enter the external probe connector or the USB port.

Battery: if the instrument is not used for long periods of time, periodically recharge (at least every 3 months) the lithium battery because, if it goes completely flat (discharge), it will damage the instrument.

Printer: if the printer is not used for long periods of time, please remove the batteries.

Cleaning the Casing

To clean the surface of the instrument casing, use a dry and soft cloth; do not use solvents or abrasive detergents, especially on the display.

USING THE TOUCH TYPE DISPLAY

The display is a 240x 320 pixel "Touch" type resistive colour display.

KEYS (TOUCH-SCREEN):

The outside of the instrument, on its right side, is fitted with one key only to switch the instrument on and off.

All the other available keys are "tactile" keys, available on the "Touch-Screen" according to the function being used. Most of the function keys are displayed in the top or bottom section of the display; the other keys, provided for specific functions, are active on the entire display.

The keys can be activated by pressing on the display; for best results, a finger nail or any pen suitable for displays with rubber can be used.

Every time the touch screen is pressed, to warn the user of the selected action, the internal buzzer will sound a short beep, but the touch key will turn green only when the key has been correctly pressed, or to highlight that a function is being carried out (ex. during printing)

	A pop-up windows will appear, containing a brief description of the current function.
	Redisplays the Main menu from any screen.
	Forward , scrolls the pages, if available.
	Backward , scrolls the pages, if available.
	Start , starts a test or enables a function.
	Saves the data entered and, where required, stores it in the memory or saves it on the SD-Card.
	Settings of the instrument or of the current function.
	Resets the value to zero, where required.
	Print , sends the data to the set-up (external) printer.
	Delete , deletes the data entered associated with the current function.
	Inserts or Edits the company Identification Data.
	Enters or Edits the selected Customer/Operator Master Data.
	Displays the selected report.
	On/Off key (only with the instrument off, charging).
	Cursor , indicates that the user can scroll through the data displayed on the screen.
	Starts the Data-Logger function
	Stops the Data-Logger function

Display – Initial screens

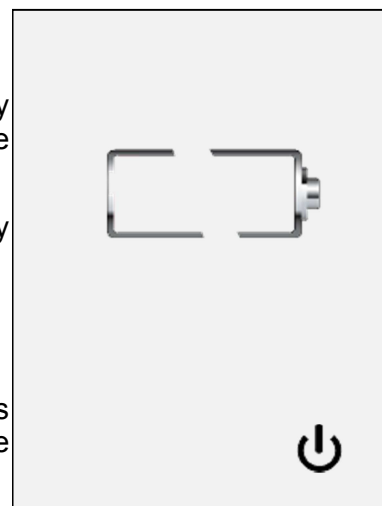
Instrument charging

When the instrument is off, but is connected to the power supply by means of the cable to the **USB PORT (TYPE C)**, the display shows that the battery is being charged.

The display shows that the lithium battery is being recharged, gradually turning the symbol completely green.

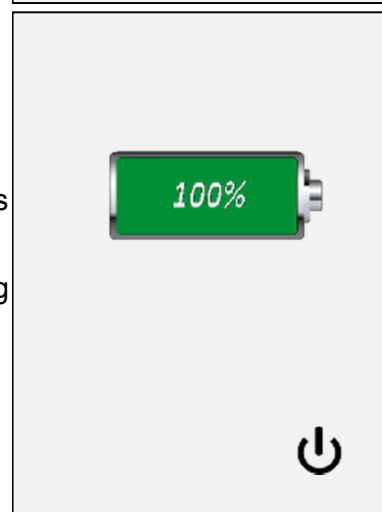


If alkaline batteries are inserted, the symbol will remain empty (as shown in the picture to the side) and the recharging function will not be enabled.



When the lithium battery is fully charged, the display graphically shows that the battery has reached its maximum charge.

From this screen the user can also switch the instrument on by pressing the touch key .



*The instrument, if connected to the power supply by means of the cable to the **USB PORT (TYPE C)**, can operate even if the lithium battery is not inserted or if the alkaline batteries are flat or not fitted.*

The instrument can also be recharged on vehicles by connecting the USB cable to a suitable adaptor with a 5VDC / 2 A output, such as those used for mobile phones. (See paragraph “Lithium battery”).

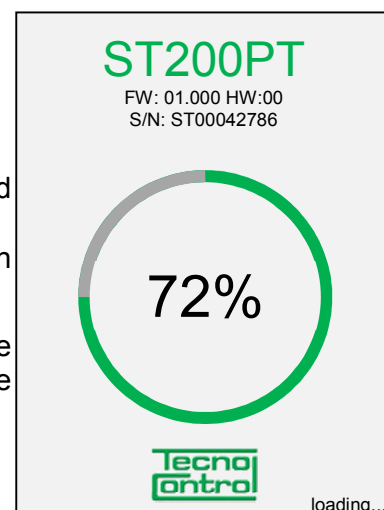
Display – START-UP screens

Switching on the instrument

The instrument is switched on and off with the **ON/OFF KEY** located on the right side of the instrument (See Fig.1).

When it is switched on, the instrument loads the program both graphically and with a sequential numeric count (from 0 to 100).

The display shows, as well as a product Number, the version of the Firmware (**FW**) installed, the version of the PCB fitted (**HW**) and the Serial Number (**S/N**) that uniquely identifies it.



Main Menu

When the start-up time has expired, the **main screen** will appear, showing the menus with the available functions, divided by pages.

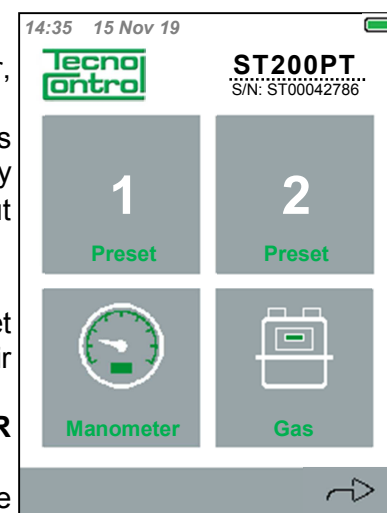
On the top left hand side there is a clock showing the hours, minutes and date, whilst the right icon shows the charging level of the battery  or if the instrument is connected to the mains power,  but only without batteries fitted or working.

The first page shows the first 4 touch keys.

The “1” and “2” menu keys are used to directly access the preset functions, which can be programmed by the user according to their requirements (see the next chapter).

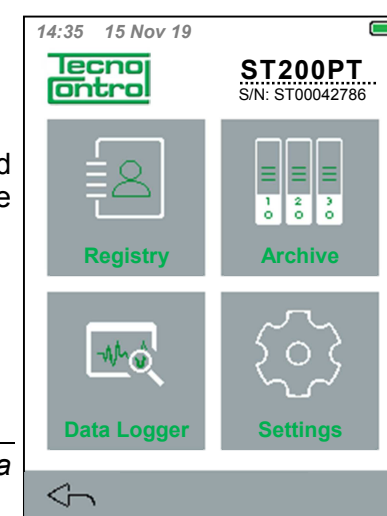
The other 2 menu keys are provided to access the **MANOMETER** function and the **GAS** leak tests.

At the bottom of the screen (touch keys area), press  to change page and view the other menu keys.



This page contains 4 additional keys to manage the data associated with the **REGISTRY**, **ARCHIVE**, **DATALOGGER** and, lastly, the instrument **SETTINGS** (See the relevant chapters that follow).

At the bottom of the screen (touch keys area) press  to go back.



In the pages with the touch keys bar at the top  it displays a brief explanation and  redisplay the **Main menu**.

INSTRUMENT FUNCTIONS



Pressure gauge function (Manometer)

From the main menu, press the key to access the Pressure gauge function. By pressing the key the Pressure measuring method can be changed, from **Relative P** to **Differential pressure** (See further in the chapter).



Pressure gauge - Relative Pressure

The **PRESSURE CONNECTION P_L** is used

The key **ZERO** allows the user to reset to value to zero before starting the measurement.



Make sure the instrument pressure limits are not exceeded. Pressures exceeding the sensor operating limits could cause it to break.

Pressure gauge - Graph

The graph is also a key; if enabled, it improves the display (**Focus ON**) by centering the scale on the current measurement.

If necessary press the key to print the measured value (**Pres.**), the minimum (**Pmin**) and the maximum (**Pmax**) value an the test temperature (**Temp.**).

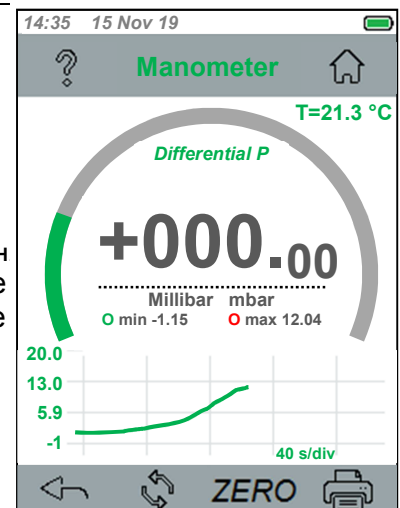
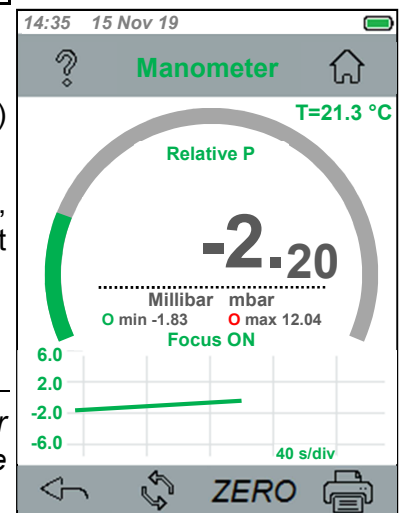
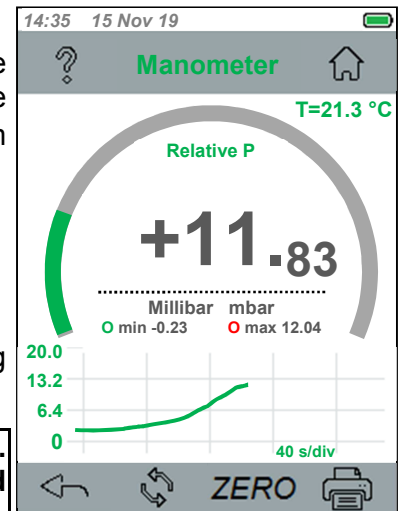
The key stops the test and redisplayes the main men.



Before pressing switch on the printer or, if the IR printer has been set up, it must be aligned to the IR PORT of the instrument.

Pressure gauge - Differential Pressure

Differential P: ----- uses both **PRESSURE CONNECTION P_L** and **P_H** . The keys, the graph and the indicators are the same as those described in the previous chapter, which deals with the Relative Pressure.





GAS leak test function

From the main menu, press this key to access the **GAS** function.

The list of the tests and the reference to applicable standards is displayed.

Each line is a touch key; press on the line to access the associated test.

Key  redisplay the main menu.



The parameters displayed can be different according to the selected test and standard. (See Leak Tests)

After making your selection, the data associated with the test is displayed.

Operator	Name of the operator who will carry out the test.
Customer	Customer's name.
System Volume	Automatic (the instrument will calculate the volume). Manual (if already known, the value must be entered).
Pressurizing	Automatic (the instrument uses the built-in pump). Manual (An external pump must be used).
Test pressure	Pressure value applied for the test.
Stabilizing	Time required to stabilize the pressure before the test.
Test time	Duration of the test at the test pressure.
Test Repetition	Number of times the test will be repeated.

At the bottom of the screen (touch keys area) press  to go back; to go to the next page, press .

Each line is a key; press the key to access the matching selection and change the value, if necessary (only if the change is allowed and is within the limits permitted by the standard for the test and standard selected).

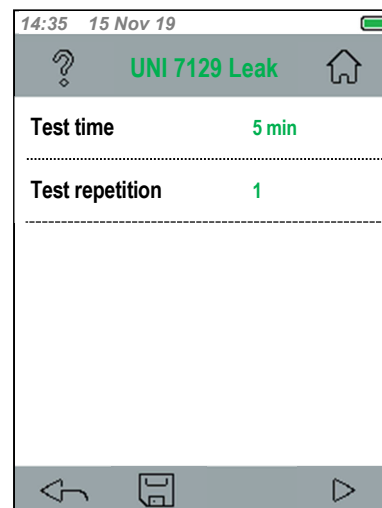
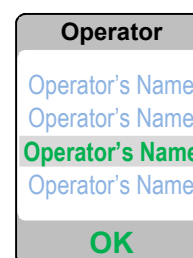
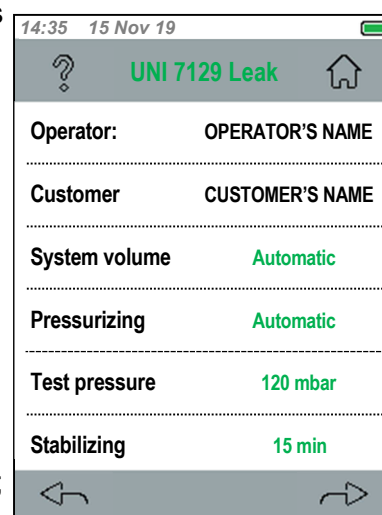
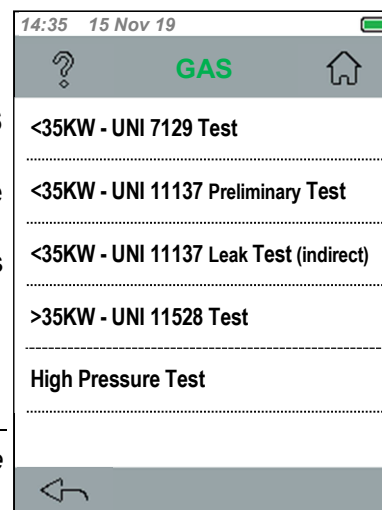
In the example to the side, after selecting "Operator" a pop-up window will appear, with the list of previously saved operator's names. Scroll through the list by swiping on the window, then press OK to confirm.

In the second page, the list of available data is continued.

If the data is as requested, you may:

Save it by pressing  as **Preset Test 1** or **Preset Test 2**.

Start the test by pressing the key .

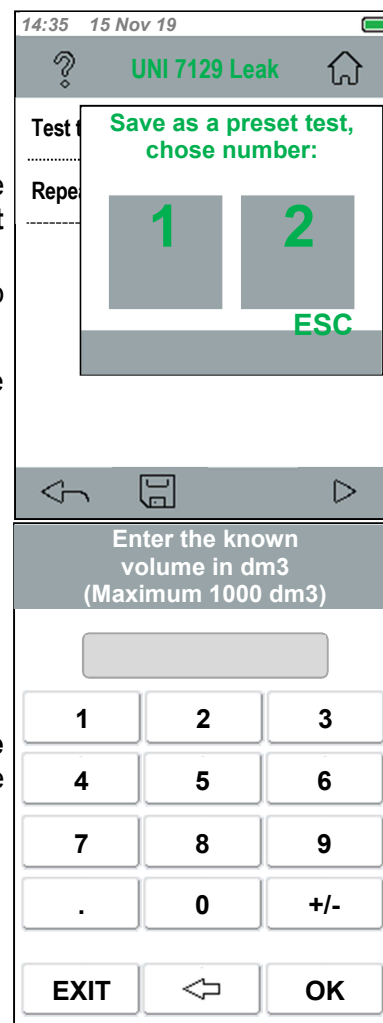


Gas Leak Test - Saving Preset Test 1 or 2

From the previous screen, if the data shown is as requested, it can be saved by pressing  and used as “Preset test 1” or “Preset Test 2”.

This selection allows the user to repeat the test or to speed up repetitive tests by accessing the test directly from the main menu.

In keys **1** and/or **2** a short description of the preset type of test will be displayed.



If the **Manual** method has been selected in the **System volume** parameters or in **Pressurizing**, a screen will appear, where the value can be entered by using the touch keyboard.

GAS leak test function - Start Test

After starting the test by pressing key  a pop-up window will appear, which suggests which **PRESSURE CONNECTION** to be used for that test.

After accepting the recommended socket by pressing “OK”, the test will be started.

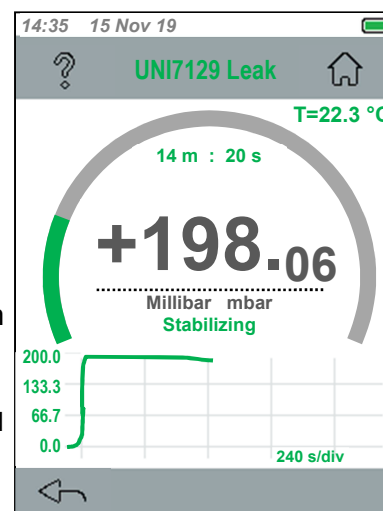
The display shows the time (**m : s**) left until the test is completed; under the measured pressure value, there is a brief message describing the current operation. Below the graph, the operation progress is displayed in real time.

Wait

Pressurizing The pump is taking the system to the requested pressure.

Stabilizing time required to stabilize the pressure entered.

Executing ... Calculation in progress



The messages displayed can be different according to the test and standard selected.

Gas Leak Test - Test Report

At the end of the test, the display will show the **REPORT** with the result obtained.

By using the cursor on the right hand side  the user can scroll through the other lines of the report.

By pressing key  the test is saved in the customer-based ARCHIVE (if entered) as well as the Date of execution. (See later chapter ARCHIVE MANAGEMENT).

By pressing key  the full Report will be printed.

To go back to the main menu, press .

14:35 15 Nov 19

? **REPORT** 

UNI 7129 Leak

Test started 15 Nov 19
Time: 15:20
Stabilizing: 15 min
Test time: 5 min
----- Test 1
Vol= 45.00 dm3
T1= 27.32°C
P1= 109.44 mbar
T2= 27.88°C
P2= 109.41mbar
DP= 0.03mbar
DPmax= 0.1mbar

ST200PT by Tecnocontrol
SN:ST00000001
----- FW: 01.00 HW:00
Company:
abcbdefg
TC/VAT no.: 000000000000
UNI 7129 Leak -----
Test Start: 15 Nov 19
Time: 15:20
----- Test 1
Vol= 45.00 dm3
T1= 27.32°C
P1= 109.44 mbar
T2= 27.88°C
P2= 109.41mbar
DP= 0.03mbar
DPmax= 0.1mbar
TEST PASSED -----
Customer: -----
Operator -----
Signature -----

GAS leak test - Print

If the key  has been pressed, the **REPORT** will be sent to the printer.

The receipt will show, in addition to the header with the instrument unique identification data, the Company's data, the Standard selected for the test, the Date and Time of the test and the values obtained (for the number of tests set) and, lastly, the Result obtained. The bottom of the receipt shows the Customer, the Operator who carried out the test and the space for the Signature.



REGISTRY Function

From the main menu, press this key to access the **REGISTRY DATA** function.

From here, your **CUSTOMERS LIST** can be managed.

By pressing  the **OPERATORS LIST** is accessed (where the items are **Surname, Name and Serial No.** = operator's number).

Or press  to go back.

Press  to access the **COMPANY** data (the following items are included: **Company, Address, TC/VAT no., POSTCODE, City, Gas Meter S/N and Notes**).

To scroll through the items, swipe with a finger to the centre of the display or use the letters shown to the side to search a surname.

To enter a new Customer/Operator, press on the first empty line available.

The line will turn green to highlight its selection.

Press  in order to enter a new Customer, Operator.

14:35 15 Nov 19

? **Customer List** 

1	SURNAME NAME	AB
		CD
2		EF
3		GH
4		IJ
		KL
5		MN
6		OP
		ST
7		UV
		WX
8		YZ

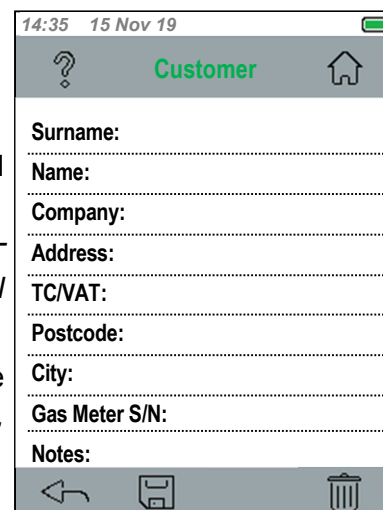
   

REGISTRY DATA - Customer list

After pressing the key , the **CUSTOMER** data will be displayed. Each line is a key, press on the line to access and enter the requested item. The touch screen will appear to allow the user to enter the text.

Surname, Name, Company, Address, TC/VAT (Tax Code or VAT number), **POSTCODE, Town, Gas Meter S/N** (Gas meter serial number) and any **Notes** (max.18 characters).

At the bottom of the screen (*touch keys*) press  to go back; if the parameters are those requested, they can be saved by pressing , or deleted by pressing .



REGISTRY DATA - Keyboard

To change the keyboard from lower to upper characters, press  (it will turn green) then press the key again to enter your selection.

The key  inserts a space between characters.

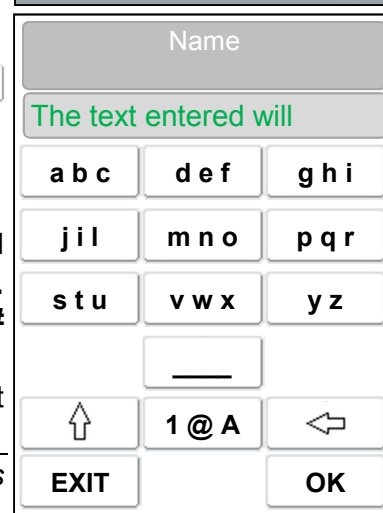
The key  deletes the characters entered.

Every time the key  is pressed, the keyboard with numbers will be displayed **0, 1 to 9**, then the first set of symbols **! \$ % & / () = * .** **will be displayed** followed by the remaining symbols **< > ? : + - _ # @ , .** Then the keyboard will redisplay the characters.

Press  to enter the value; press  to go back without entering any value.



Please remember that a touch key will turn green when it is pressed, to highlight that the command has been accepted.



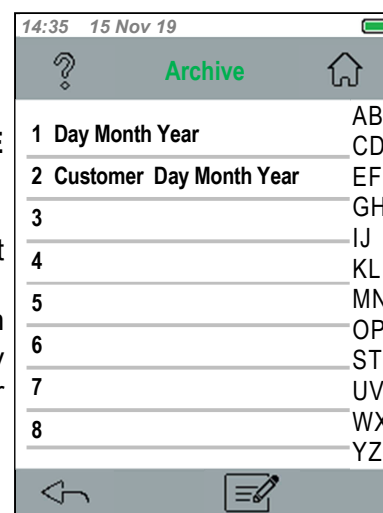

ARCHIVE function

From the main menu, press a key to access the **ARCHIVE** function.

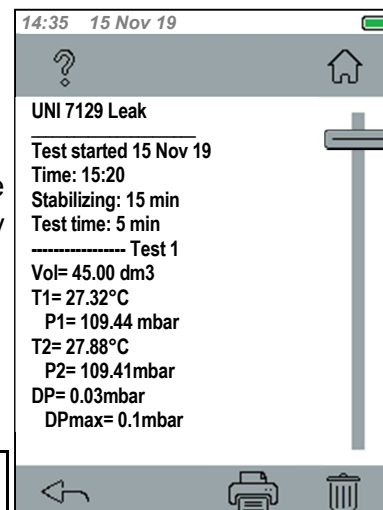
From here the **Leak tests** can be carried out.

The Tests are listed by Customer and Date; if the Test is not associated with the Customer, only the Test date will be displayed.

At the bottom of the screen (*touch keys*) press  to go back. Each line is a key; press on the line to select it (it will turn green) then, by pressing  the selected test will be displayed and then Printed or Deleted.



At the bottom of the screen (*touch keys*) press  to go back; if the archived report is the requested report, it can be sent to the printer by pressing , or deleted by pressing .



A DELETED Report can no longer be retrieved.

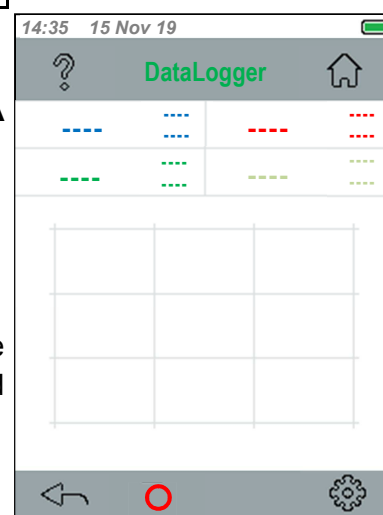


DATA LOGGER function

From the main menu, press this key to access the **DATA LOGGER** function.

From here 4 measured values Relative and Differential Pressure, Internal and External Temperature (**PUSH-PULL CONNECTOR FOR EXTERNAL PROBE**) CAN BE RECORDED. (connector with external probe connected to the input).

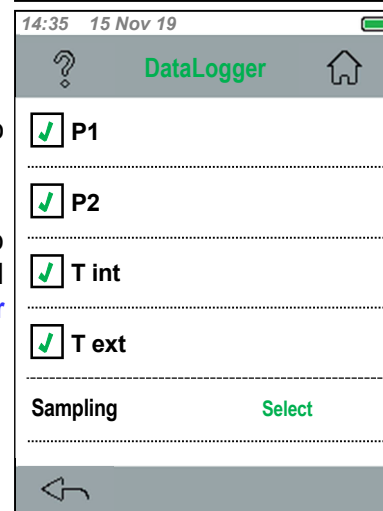
At the bottom of the screen (*touch keys*), press  to select the values to be recorded and the Sampling time. The recording is started by pressing  and is stopped by pressing . Press  to go back,



By pressing the key  a screen that allows the user to select the values to record will appear.

Sampling: this is the time interval in seconds between two measurements. Press the line (*it is a key*), the touch keyboard will appear to allow the desired value to be entered. (as described in chapter [MASTER DATA- KEYBOARD](#)).

Press  to go back to the previous screen.



After selecting the Values to be recorded and the Sampling Time, the recording is started by pressing .

If the instrument is not fitted with a microSD-Card, the warning pop-up window will appear.

The recording will still be started, but it will only be displayed on the graph. If the function is stopped or exited, the data will be deleted.



To insert the microSD-Card, first disconnect the USB cable (if in use), then open the cover of the battery compartment, remove the Battery or the Alkaline batteries. (also see the chapter INSTRUMENT DESCRIPTION - Opening/Closing the Battery Compartment).

After the recording is started, the graph of the values will appear in real time.

Press  to go back or  to stop the recording.

With the microSD-Card inserted for each recording cycle, a single file in CSV format, compatible with Excel, will be created.

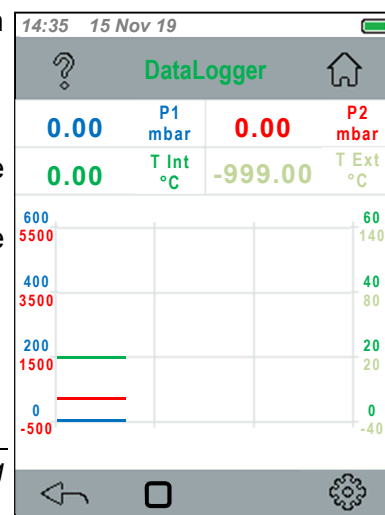
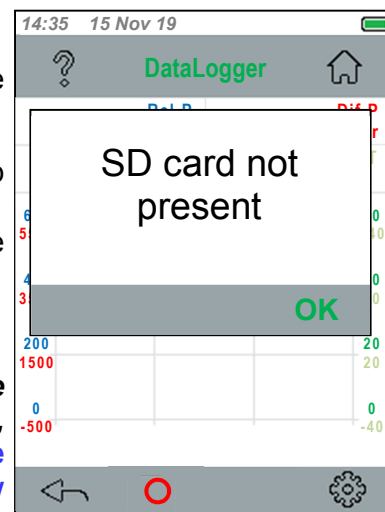
The files will be saved in the “**datalogger**” folder and every file name will contain the DATA_ORA.csv (values separated by ;).

By opening the files with Excel, the data will appear in this format:

h:m:s	P1	P2	T Int	T Ext
15:05	0.68	-0.68	21.16	-999.00
15:05	0.75	-0.75	21.23	-999.00



By pressing the key  during the recording, the recording will be stopped as if the key  had been pressed.



The microSD-Card will contain 3 Folders:



-  datalogger contains the CSV files generated by the DATALOGGER
-  factory contains unusable system files
-  system contains the files in the proprietary REGISTRY and ARCHIVE format.



SETTINGS function

From the main menu, press the **SETTINGS** key. The list of parameters that can be set up will appear, one page at a time. Each line is a key; press on the line to make changes.

Language Allows the user to select one of the available languages.

Date and Time Sets the Date and Time.

Saves Data on SD Saves the data on the SD-Card.

Loads Data from SD Imports the data from the SD-Card.

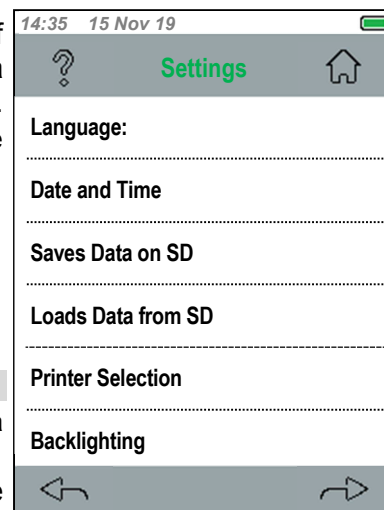
Printer Selection Allows the user to select the type of printer being used.

Backlighting changes the brightness of the display.

Factory **NOT ACCESSIBLE, RESERVED TO FACTORY SETTINGS.**

Update FW Allows the instrument Firmware to be updated to a more recent version.

At the bottom of the screen (touch keys area) press  to change page or  to go back.



SETTINGS - Language

Each line is a key; press the line to access the associated selection and edit or insert the requested value (only *if editable*).

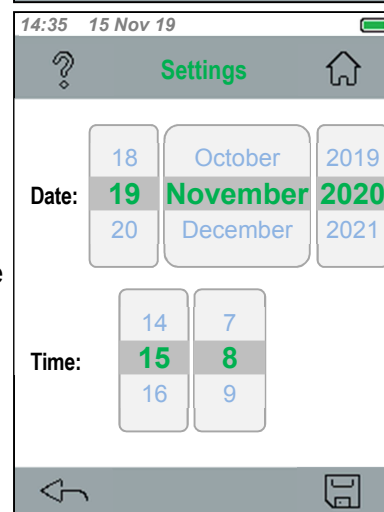
In the example, after selecting "Language" the list of available languages will appear. Scroll through the list by swiping on the window, the press  to confirm.

If the selection is as requested, it can be saved by pressing .



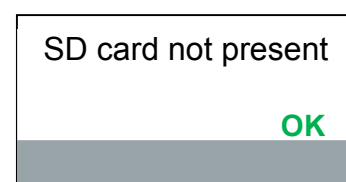
SETTINGS - Date and Time

For certain parameters, like "**Date and Time**" the procedure is the same as described above, but to save them the key  must be pressed.



SETTINGS - Save Data onto the SD

It is used to transfer data from the internal memory of the instrument to the microSD-Card, where two files will be created (in proprietary format), one with the REGISTRY, the second one with the ARCHIVE data. If a micro SD-Card has not been inserted in the instrument, the warning pop-up window will appear.



Each time they are saved, the two files will be overwritten. The previous data will no longer be available.

SETTINGS - Load Data onto the SD

It is used to transfer data from the microSD-Card onto the instrument internal memory.

The REGISTRY and the ARCHIVE data is stored in the “**system**” folder of the card. *It is advisable to make a copy of the card or in the PC by organizing the folders according to your requirements.*

If a SD-Card has not been inserted in the instrument, the warning pop-up window will be displayed, as shown above.



Every time the data is loaded onto the instrument, the previous data will be overwritten and will no longer be available.



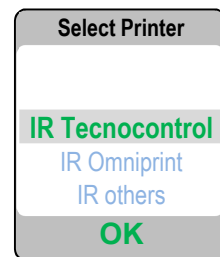
system

- ☐ Registry.dbk
- ☐ Registry_backup.dbk
- ☐ Archive.dbk
- ☐ Archive_backup.dbk

The _backup files are copies of the main files.

SETTINGS - Select Printer

It is used to select the different types of “**Printer**” according to the printer available. Currently, the only printer available it **IR Tecnocontrol (ST338)**.



SETTINGS - Backlighting

It is used to select the level of brightness of the display and to adapt it to your requirements and to the brightness of the environment.

After selecting the desired value, press **OK** to confirm it.



Please remember that high levels of backlighting will reduce the battery life.



SETTINGS - Update Firmware

Allows the instrument Firmware to be updated.

- 1-Download the zipped file from our site (.zip).
- 2-After downloading the file onto the PC, unzip the file.
- 3-Install the drivers contained in the downloaded file.
- 4-Then follow the instructions that will appear on the PC.



The FIRMWARE updates can be downloaded from our site at the product page:

[ST200PT](#) (Link to product).



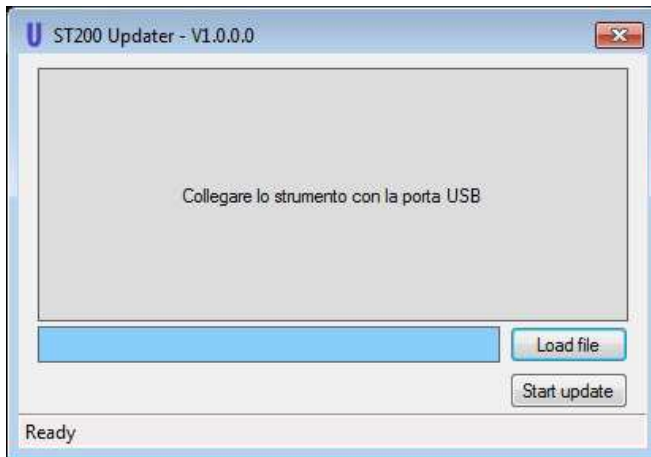
The USB-C connector must be inserted in the instrument socket with the metal smooth part upwards (the other side has a joining sign). If the PC does not acknowledge that a USB port is connected, turn the connector.



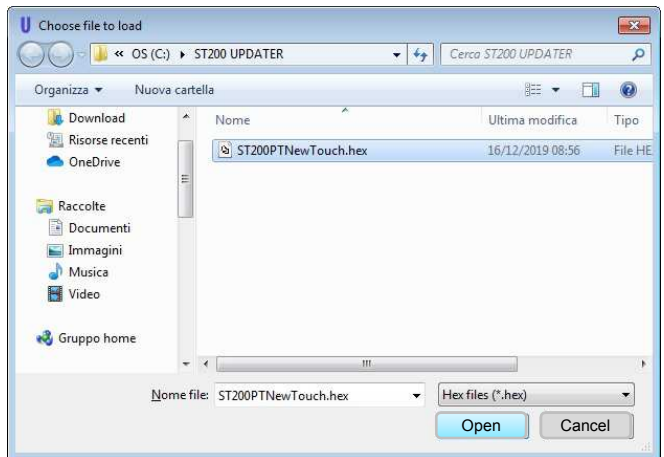
CORRECT SIDE



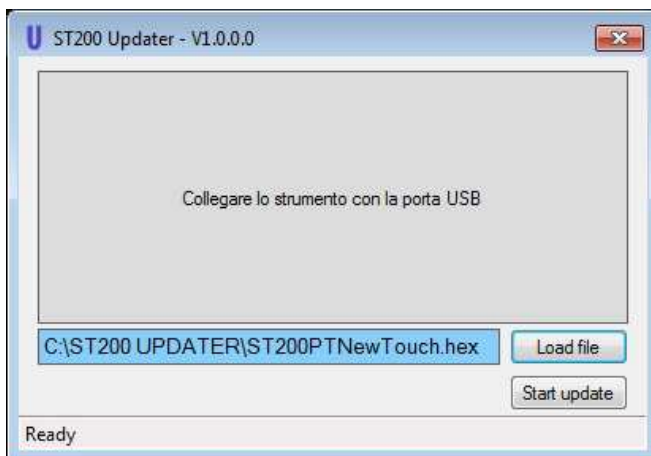
INCORRECT SIDE



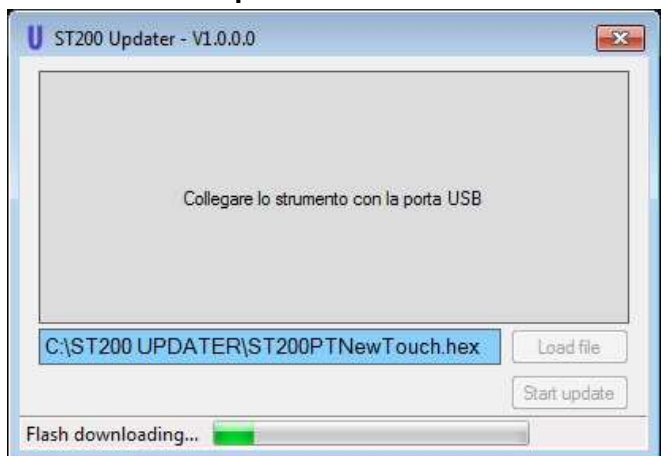
5- Connect the PC to the instrument by using a USB cable supplied and select **“Load file”**



6- Search the downloaded and unzipped file (.hex) in the PC, select it (click on the file) and select **“Open”**



7- Start updating the instrument by selecting **“Start update”**



8- Wait until the update has been loaded. Once completed, the bar will be full.

9- The instrument will be automatically restarted, indicating that the update has been correctly loaded. Close the screen on the PC and disconnect the USB port.

USING THE PRINTER

LED: It indicates the operating status of the printer.

“MODE” KEY: on/ off and paper feeding.

- to switch the printer on, press and release the key; the LED will remain lit.
- to feed the paper hold down the key.
- to switch the printer off press and release the key; the LED will go off.

THERMAL PAPER LOADING:

- to replace the paper open the paper roll compartment by lifting the clear window in the point shown.

Take out the used roll and, if necessary, use the Mode Key to remove the residual paper from the printer. Make sure that there are no residues of paper. Then insert the new paper roll by pushing the edge through the feeding slot by using the **Mode** key to push the paper forward.



IR PRINTER - Replacing the alkaline batteries

Remove the cover of the battery compartment located on the back of the printer.

Remove the 4 alkaline batteries and insert the new ones ensuring their correct polarity.



For a longer printing time, we recommend using good quality alkaline batteries.



Remove the batteries if the printer will not be used for a long time.

Aligning the printer IR Port with the instrument IR Port to ensure the correct printing data transfer.



UNI 7129 – Gas systems for domestic use and similar systems supplied by mains gas - Design, installation and commissioning - Part 1: Indoor system.

This standard is applied to domestic systems and similar systems using fuel gases (family 1, 2, and 3 in accordance with EN 437) supplied by the mains gas (UNI 9165 and UNI 10682). Criteria for building and renovating full or partial indoor systems, connected to equipment with a maximum heat output not exceeding 35 kW.

The leak test must be carried out before connecting the system to the gas meter, before connecting the equipment and before it is commissioned. In addition, if a part of the system is not visible (ducted, below the ground etc.) the leak test must be carried out before covering these section of pipes.

UNI 11137 - Gas systems for domestic use and similar systems. General prescriptions and requirements for gas families 2 and 3. Guidelines for inspecting and resetting the gas tightness of indoor systems.

This standard is applied to domestic systems or to similar systems to be enabled, started or restarted, supplied with family 2 gases (natural Gas) and family 3 gases (LPG) specified by standard UNI EN 437 and included in the field of application of standards UNI 7129, UNI 7131, UNI 8723 and UNI 10738.

The lead test can be carried out in two different ways. For systems with volume <18dm³, the PRELIMINARY TEST can be carried out only with GAS at operating pressure. Or the INDIRECT METHOD can be used.

UNI 11528 - Gas systems with heat output exceeding 35 kW - Design, installation and commissioning.

The standard set out the criteria for the design, installation and commissioning of commercial systems (family 1, 2 and 3) or of battery or cascade installed systems with a total heat output higher than 35 kW. It is also applied to the renovation of commercial systems or of parts of such systems. It is not applied to gas systems installed in industrial processing cycles and in systems covered by standard UNI 8723.

The leak test must be carried out for non-domestic systems (connected to single pieces of equipment with a heat output > 35 kW, or to battery or cascade installed systems with a total heat output > 35 kW)

UNI 7129 - Gas systems for domestic use

CARRY OUT THE LEAK TEST (WITH AIR):

NEW GAS FIRED DOMESTIC SYSTEM WITH A HEAT OUTPUT < 35 KW

1. Make sure that the system is closed (gas shutoff valve fitted upstream of the meter and shutoff valves towards each piece of equipment).

Connect the **ST200PT** to any point of the system.



As shown in the chapter GAS LEAK TEST, the values are preset in accordance with the standard but, if necessary, they can be changed.

Parameter	Preset value	Notes on parameter editing
System volume	Automatic	can be set to: Automatic or Manual
Pressurizing	Automatic	can be set to: Automatic or Manual
Test pressure	120 mbar	Settable from 100 to 150 mbar
Stabilizing	15 min	Can be set to 1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60, 120, 240 and 1440 minutes
Test time	5 min	Can be set to 1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60, 120, 240 and 1440 minutes
Test repetitions	1	Settable from 1 to 3

2. On the ST200PT, start the leak test.
3. Wait until the instrument conveys air to the system, stabilizes the pressure and completes the test for the time set.
4. At the end, the instrument will calculate and display the test result (PASSED or FAILED). Print and/or save the test

Table 1 - UNI 7129 Limits of acceptability.

System internal volume	Test time	Allowable pressure drop
$Vol \leq 100 \text{ dm}^3$	5 minutes	DPmax=0.5 mbar
$100 < Vol \leq 250 \text{ dm}^3$	5 minutes	DPmax=0.2 mbar
$Vol > 250 \text{ dm}^3$	5 minutes	DPmax=0.1 mbar



The systems subjected to maintenance for repairs or changes must be rechecked by repeating the Leak Test as required by standard UNI 7129-1.

UNI 11137 - GAS SYSTEM

For this standard, the instrument is able to carry out the **PRELIMINARY TEST with GAS** and the **TEST with the INDIRECT METHOD (with AIR or GAS)**.

Table 2 - UNI 11137 Gas families and pressures to be used.

Family 1 gas (manufactured Gas)	Reference pressure for test with gas (p_g)	1 000 Pa
	Test pressure with air (p_a)	5 000 Pa
Family 2 gas (Natural Gas)	Reference pressure for test with gas (p_g)	2 200 Pa
	Test pressure with air (p_a)	5 000 Pa
Family 3 gas (LPG)	Reference pressure for test with gas (p_g)	3 000 Pa
	Test pressure with air (p_a)	5 000 Pa

CARRY OUT THE PRELIMINARY TEST (WITH GAS):

SYSTEM TO BE CHECKED WITH VOLUME $<18\text{dm}^3$ BY USING GAS AT ITS OPERATING PRESSURE.

1. The system volume will be automatically calculated by the instrument, but it is essential to know beforehand if it is $<18\text{dm}^3$.
2. Open and close the windows to ventilate the environments.
3. Close the main gas shutoff valve (located upstream of the meter, if it is included in the test, or downstream, if it is not included in the test).
4. Connect the **ST200PT** to the system in an accessible point and select the **Gas Family** being used and if the test will include (YES) or not (NO) the **Shutoff valve (main gas valve)**.



As shown in the chapter **GAS LEAK TEST**, the values are preset in accordance with the standard but, if necessary, they can be changed.

Parameter	Preset value	Notes on parameter editing
System volume	Automatic	can be set to: Automatic or Manual
Gas Family	Natural gas - Family 2	Settable: Fam. 1 (Town gas), Fam. 2 (natural gas) or Fam. 3 (LPG).
Test time	1 min	Automatic (Fam. 1 and 2 = 1 min, Fam.3 = 2.5 min).
Stabilizing	15 min	Can be set to 1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60, 120, 240 and 1440 minutes
Test repetitions	1	Settable from 1 to 3
Shut-off Device Test	YES	can be set to: YES or NO

5. Re-open the meter valve to convey gas in the system until the pressure in the pipes is stabilized, as shown [above in Table 2](#) according to the Gas "Family" being used. Then close the main gas shutoff valve (located upstream of the meter, if it is included in the test, or downstream, if it is not included in the test).
6. On the ST200PT, start the leak test.
7. Wait until the device pressurizes the system, stabilizes the pressure and completes the test for the time set.
8. At the end, the instrument will calculate and display the test result (PASSED or FAILED). Print and/or save the test.

Table 3 - UNI 11137 Limits of acceptability.

System internal volume	Test time	Allowable pressure drop
$\text{Vol} \leq 18\text{dm}^3$	15 minutes	$\text{DP}_{\text{max}}=0.5\text{ mbar}$

CARRY OUT THE TEST WITH THE INDIRECT METHOD (WITH AIR OR GAS):

SYSTEM TO BE CHECKED OR RESTARTED BY USING AIR.

1. Close the main gas shutoff valve (located upstream of the meter, if it is included in the test, or downstream, if it is not included in the test).
2. Connect the **ST200PT** to the system in any accessible point and select the **Gas Family** being used, the **Type of Test** if it will be carried out with Gas or Air and if the test will include the **Shutoff valve (main gas valve)** (**YES**) or not (**NO**).



As shown in the chapter **GAS LEAK TEST**, the values are preset in accordance with the standard but, if necessary, they can be changed.

Parameter	Preset value	Notes on parameter editing
System volume	Automatic	can be set to: Automatic or Manual
Pressurizing	Automatic	can be set to: Automatic or Manual
Gas Family	Natural gas - Family 2	Settable: Fam. 1 (Town gas), Fam. 2 (natural gas) or Fam. 3 (LPG).
Test Type	Gas	can be set to: Gas or Air
Stabilizing	15 min	Can be set to 1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60, 120, 240 and 1440 minutes
Test time	1 min	Automatic (Fam. 1 and 2 = 1 min, Fam. 3 = 2.5 min)
Test repetitions	3	Settable from 1 to 3
Shut-off Device Test	YES	can be set to: YES or NO

1. On the ST200PT, start the leak test.
2. Wait until the instrument pressurizes the system, stabilizes the pressure and completes the test for the time set.
3. At the end, the instrument will calculate and display the test result (PASSED or FAILED). Print and/or save the test.

Table 4 - UNI 11137 Limits of acceptability.

Family	Leak			Test time
1 and 2	$Q_t \leq 1 \text{ dm}^3/\text{h}$	$1 < Q_t \leq 5 \text{ dm}^3/\text{h}$	$Q_t > 5 \text{ dm}^3/\text{h}$	1 minute
3 (LPG)	$Q_t \leq 0.4 \text{ dm}^3/\text{h}$	$0.4 < Q_t \leq 2 \text{ dm}^3/\text{h}$	$Q_t > 2 \text{ dm}^3/\text{h}$	2.5 minutes
	Standard compliant system	The system is usable but must be subjected to maintenance within 30 days.	Closing the system	



The systems subjected to maintenance for repairs or changes must be rechecked by repeating the Leak Test as required by standard UNI 7129-1.

UNI 11528 - GAS SYSTEM

<i>Type of system</i>	<i>Test pressure</i>	<i>Test time</i>
6th type non-underground	1 bar	4 hours
6th type underground	1 bar	24 hours
7th type non-underground	0.1 bar	30 minutes
7th type underground	1 bar	30 minutes

CARRY OUT THE LEAK TEST (WITH AIR):

COMMERCIAL SYSTEMS WITH A SINGLE, BATTERY OR CASCADE GAS FIRED EQUIPMENT WITH A TOTAL HEAT OUTPUT > 35 KW.

1. Make sure that the system is closed.
2. Connect the **ST200PT** to the system in an accessible point and select the System Type being used "**System Type**".



As shown in the chapter GAS LEAK TEST, the values are preset in accordance with the standard but, if necessary, they can be changed.

<i>Parameter</i>	<i>Preset value</i>	<i>Notes on parameter editing</i>
System type	6th type non-underground	can be set to: 6th type non-underground, 6th type underground, 7th type non-underground, 7th type underground
Stabilizing	15 min	Can be set to 1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60, 120, 240 and 1440 minutes
Test time	4 hours	Automatic (value based on the selected Type)
Test pressure	1 bar	Automatic (value based on the selected Type)

3. On the ST200PT, start the leak test.
4. Blow air in the system by using a compressor or a manual pump; the instrument will wait until the pressure is stabilized, then it will complete the test for the time set.



When the air is blown in the system with a compressor, increase the pressure slowly and gradually to avoid too much strain on the instrument pressure sensor. **Do not exceed the maximum pressure values of the instrument.**

5. At the end, the instrument will calculate and display the test result (PASSED or FAILED). Print and/or save the test.

Table 5 - UNI 11528 Limits of acceptability.

No pressure drop allowed

HIGH PRESSURE TEST

CARRY OUT THE LEAK TEST (WITH AIR):

DIFFERENT SYSTEMS WHERE A LEAK TEST IS REQUIRED.

1. Connect the **ST200PT** to the system in an accessible point and select the available parameters.



As shown in the chapter GAS LEAK TEST, the values are preset in accordance with the standard, but can all be changed according to the type of test to be carried out.

2. Pressurize the system up to the value

Parameter	Preset value	Notes on parameter editing
Test pressure	5000 mbar	Can be set from 1000 to 5500 mbar
Stabilizing	15 min	Can be set to 1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60, 120, 240 and 1440 minutes
Test time	2.5 min	Can be set to 1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60, 120, 240 and 1440 minutes

3. On the ST200PT, start the leak test.
4. The instrument carries out the Reset operation (Resetting), then the system must be pressurized up to the set value.
5. Blow air in the system by using a compressor or a manual pump; the instrument will wait until the pressure is stabilized, then it will complete the test for the time set.
6. At the end of the test, the instrument will show the test results. The operator must assess whether to consider the test as PASSED or FAILED and act accordingly. Print and/or save the test.

Appendix

TECHNICAL SPECIFICATIONS	
Power Supply	
Power supply / Battery charger (<i>External</i>)	Input AC 100 to 240 / 50 to 60Hz Output 5VCC / 2A
Interchangeable and rechargeable battery, also independently from the instrument.	Li-Ion 3.7 V / 5000 mAh
Battery life ⁽¹⁾	From 6 to 14 hours according to the type of tests carried out.
Charging time	Approximately 4 hours
Alkaline batteries (<i>in alternative to the Main Battery</i>)	4 off Alkaline AA batteries (not <i>included</i>)
Power cable	USB cable with USB-C connector
Instrument features	
Display	Backlit colour 240x 320 pixel "Touch Screen" display.
Keyboard	ON/OFF key + keys built in the resistive "Touch" resistive display.
Audible / other alarms	Internal buzzer / Vibration
Built-in pump	Pressurizing capacity up to 600 mbar
Support	Built-in magnets
External Probe Connection (<i>Optional</i>)	Push-Pull connector
Pressure Connection	2 off male connectors (<i>quick coupling DN-5</i>)
Measurement specifications	
LOW pressure range	from -50 to 600 mbar
LOW pressure resolution	0.1 mbar
HIGH Pressure range	from -0.6 to 6 bar
HIGH Pressure range Resolution	0.1 mbar
Differential Pressure	± 1 bar
Differential Pressure Resolution	0.1 mbar
System Volume Calculation	Integrated in dm ³
Internal temperature	+5 to +40 °C
Temperature Resolution	0.1 °C
Data and interface management	
Built-in memory	Flash
MicroSD-Card (<i>not included</i>)	SD and SDHC max 32Gb / SDXC FAT32 formatted max 32Gb.
Supported printer (<i>Optional</i>)	Infrared ST338 (<i>only supplied with mod.ST200PT/S</i>)
Built-in data connection	Type C USB port
Data connection (<i>Optional board</i>)	<i>Bluetooth + Wi-fi</i>
Operating Conditions	
Operating temperature/Humidity ⁽²⁾	+5 to +40 °C / 5 to 95% rh
Storage Temperature/Humidity ⁽²⁾	+20 to +50 °C / 5 to 95% rh
Dimensions and Protection Rating	210 x 80 x 43 mm IP40
Instrument weight ⁽¹⁾	approx. 500 g
Case weight (<i>complete with accessories</i>)	approx. 2 g

(1) The battery life is calculated within a minimum and maximum range, taking into consideration that, according to the type of tests carried out, the power required can vary greatly, specially when the built-in pump is used. In addition, the battery life is also affected by the display level of back lighting and potential effects such as ageing, temperature etc.

(2) With the Li-Ion battery in the instrument



The Serial Number is printed both on the Test Label located on the back of the instrument and displayed on screen with the Firmware, Hardware version (data visible when the instrument is switched on and on the main screens).