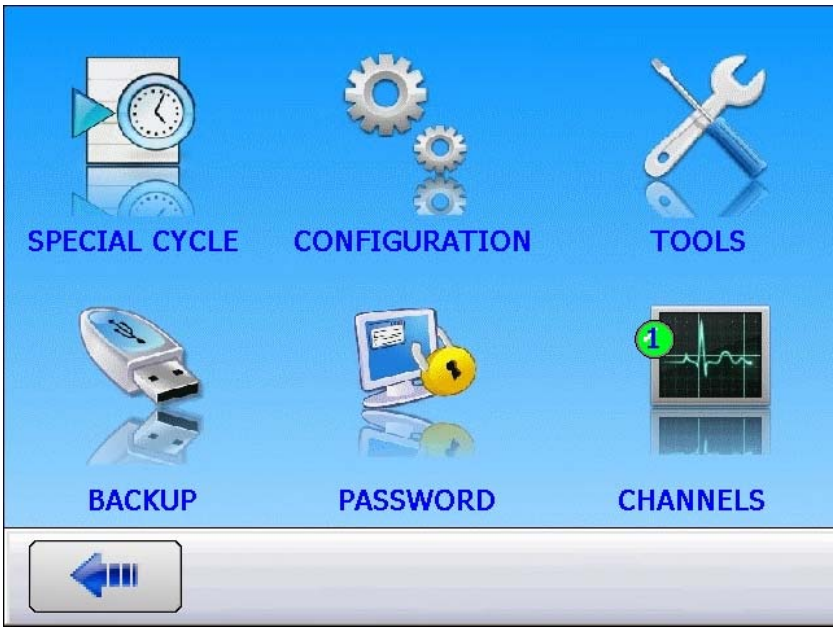
FUNCTIONS MISCELLANY

ATEQ F 5000SERIES



www.ateq.com

Reference: RF-FS5000C-U

REVISION OF THE F S5000 MANUAL

Due to continuing improvements, the information contained in this user manual, the features and design of this device are subject to be changed without prior notice.

Edition/Revision	**Reference**	**Date** (week/year)	**Chapters updated**
First edition	RF-FS5000A-F	45/2012	-----
Second edition	RF-FS5000B-F	35/2015	General update of the sheets.
Third edition	RF-FS5000C-F	10/2016	Update sheet #102, "Pneumatics connectors" and sheet #71, "Password".

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FUNCTIONS MANAGEMENT

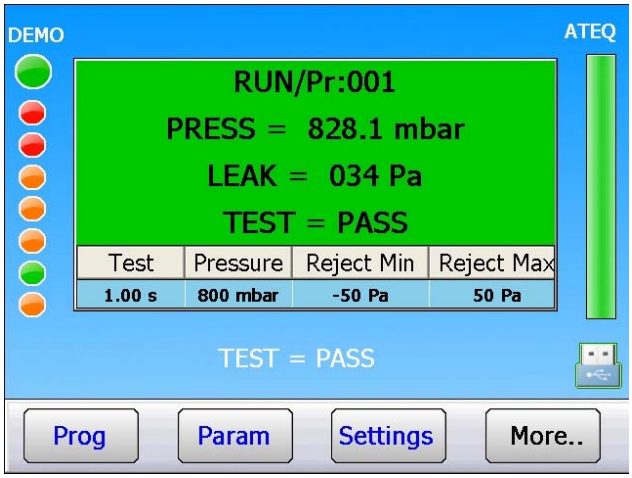
The instrument has many functions linked to the program. For ease of reading, these functions are hidden by default. To display the functions, follow the process below.

The extended menu functions allow personalization and add options to the test cycle.

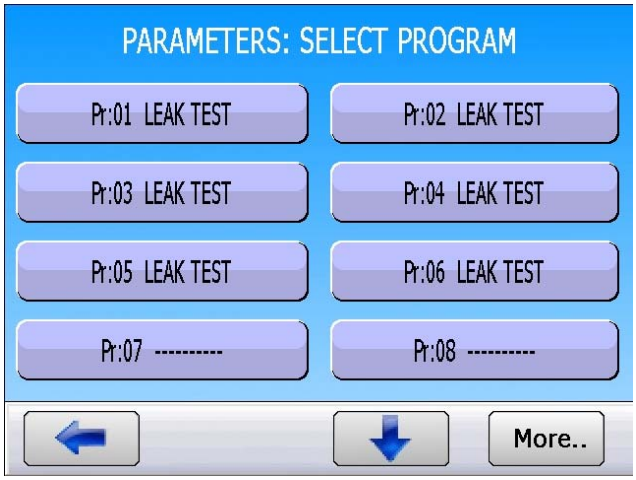
These functions must be activated in the **FUNCTION** menu for them to appear in the program options.

Process to display a function:

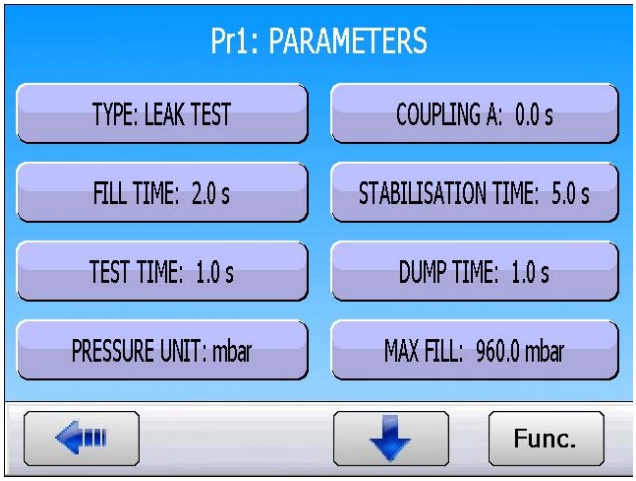
From the cycle menu, press "**Param**".



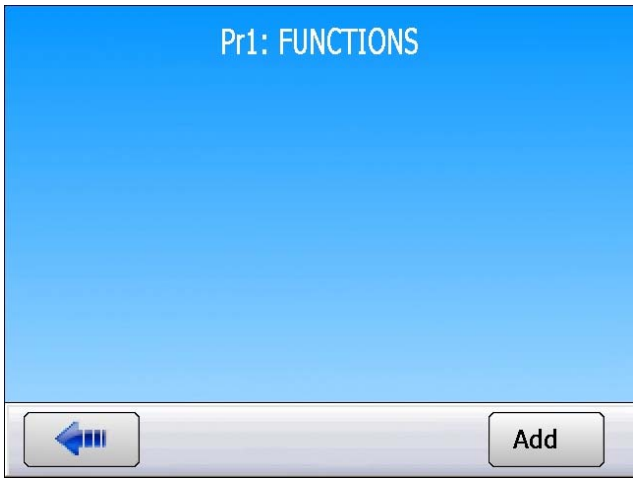
Select a program.



The program parameters are displayed, press "**Func.**".

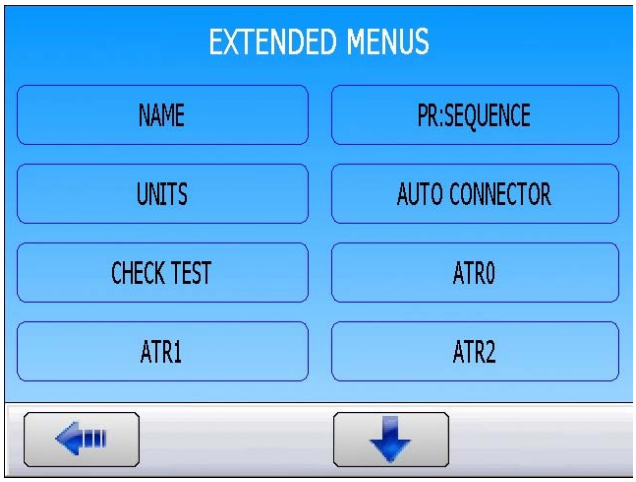


Press "**Add**".



The available functions are displayed.

To see all the functions, navigate all the pages by using the  and  arrows.



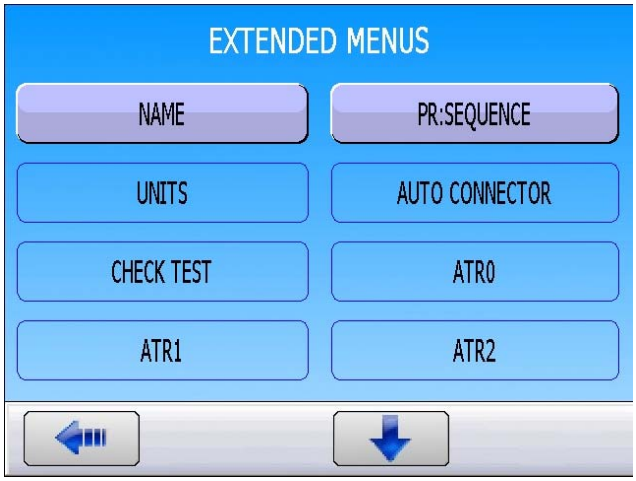
To display or hide a function, just press on its button.

Available function: 

Enabled function: 

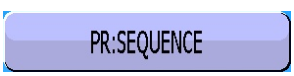
Exit the "**EXTENDED MENUS**" and go back to the previous page by pressing  .

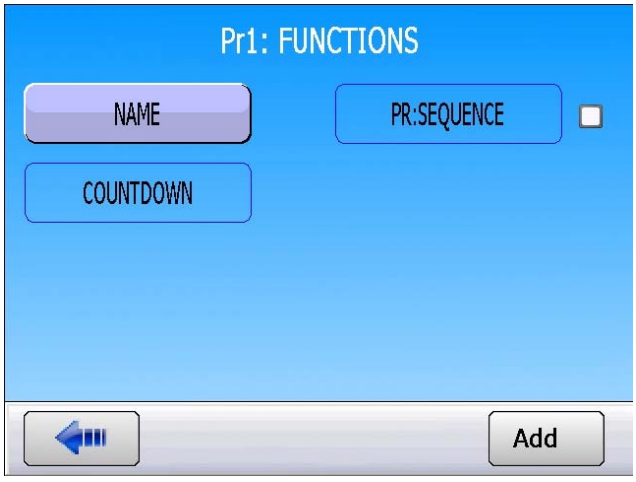
***Note**: by pressing a long time on the  button, will back to the test cycle menu.*



The specific functions of the program appear.

Available function: 

Enabled function: 



Activation of a function:

There's two kinds of function :

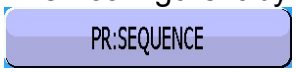
<u>Booleans functions:</u>

To enable the function, press it.

<u>Functions with additional parameters to set:</u>

Validate it by checking the box  .

Then configure it by pressing the function key:



.

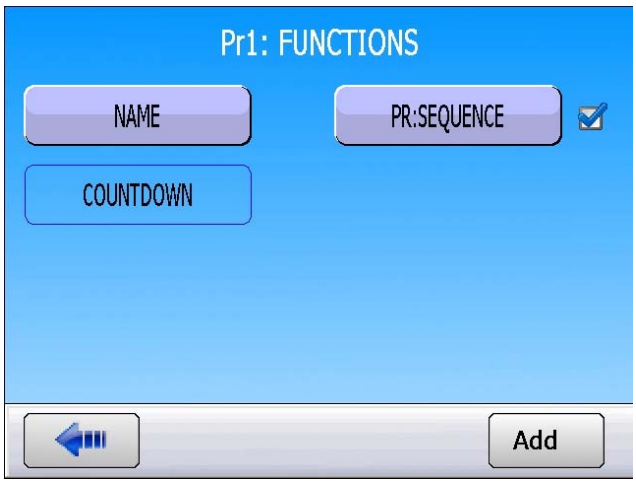
In the configuration menu of the function, press a parameter, then adjust the parameter to the desired value.

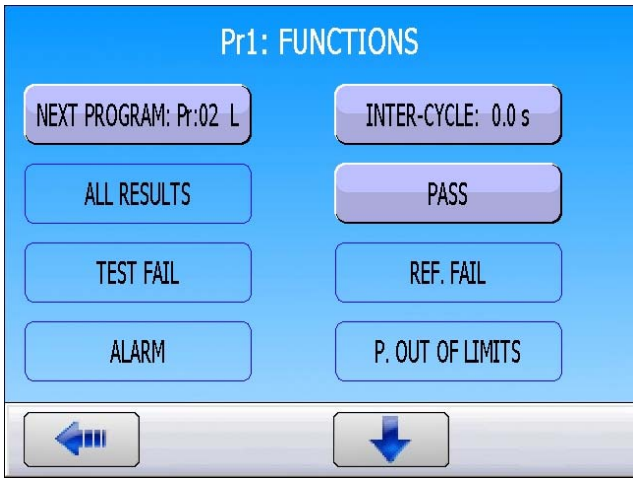
Once configured, go back to the program menu by pressing  .

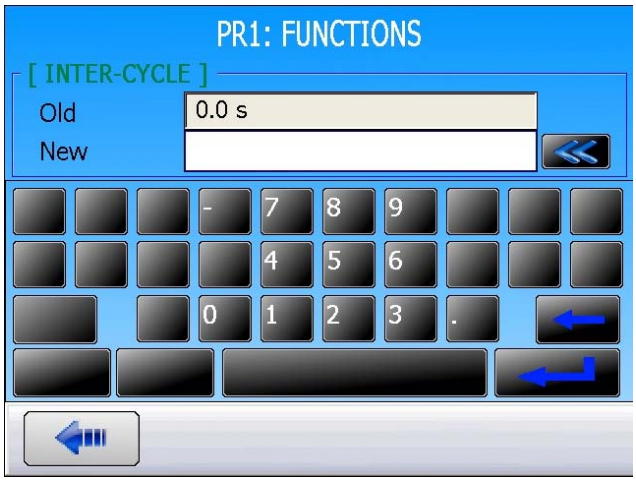
When a numerical value must be entered for a parameter, a keyboard appears on the screen, enter the new value in the "**New**" field then validate with the  key.

The  key erase the last character.

The  key erase the entire "**New**" field.



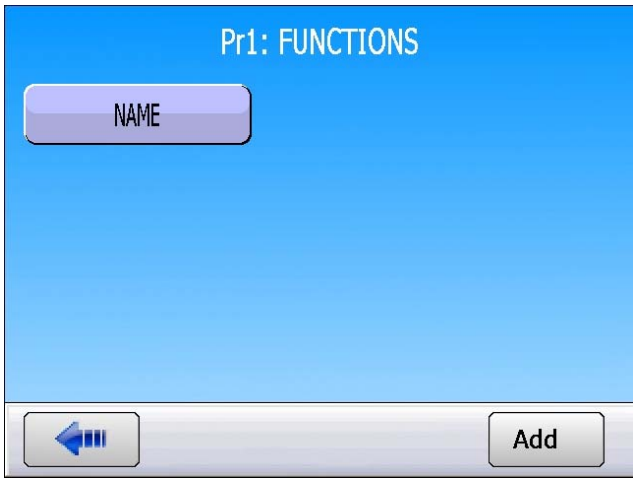




***Note**: the process is the same with an alphanumeric keyboard.*

NAME FUNCTION

This function allows identifying a program, for example the name of the tested part.



Press "**NAME**" to edit the function (an alphanumerical keyboard appears).

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

An alphanumeric keyboard appears to enter the name.

PROGRAM SEQUENCING FUNCTION

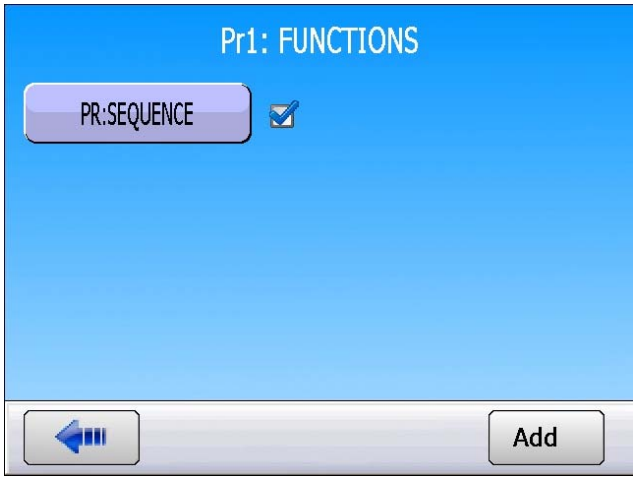
This function enables several tests to be carried out by the instrument one after the other. The instrument offers 8 program sequencing criteria.

The sequencing order can be edited; the choice of the following program is defined in the parameters. By default the programs are sequenced according to their original number P+1.

Activate the function in the program by checking the box  .

Then configure the function by pressing the: corresponding "**PR:SEQUENCE**".

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.



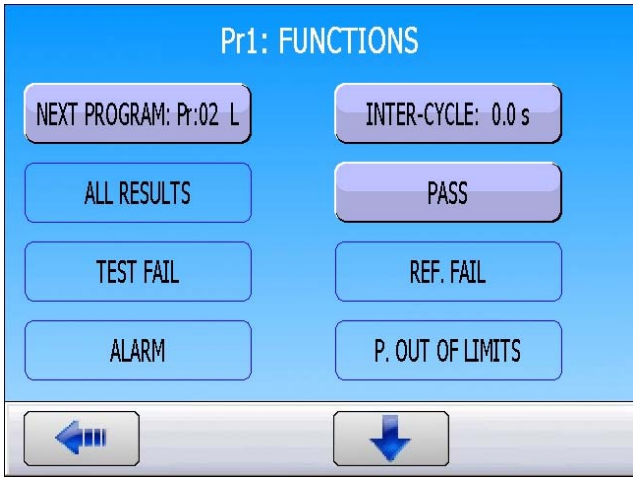
Associated parameters to be set:

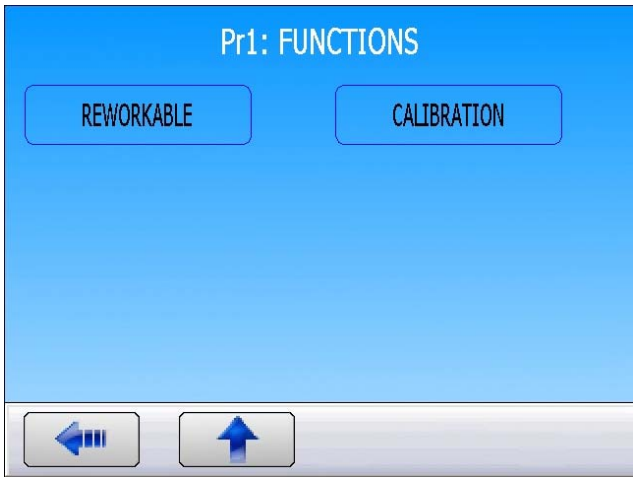
NEXT PROGRAM: next program to be chained.

INTER-CYCLE: wait or coupling time between the two cycles.

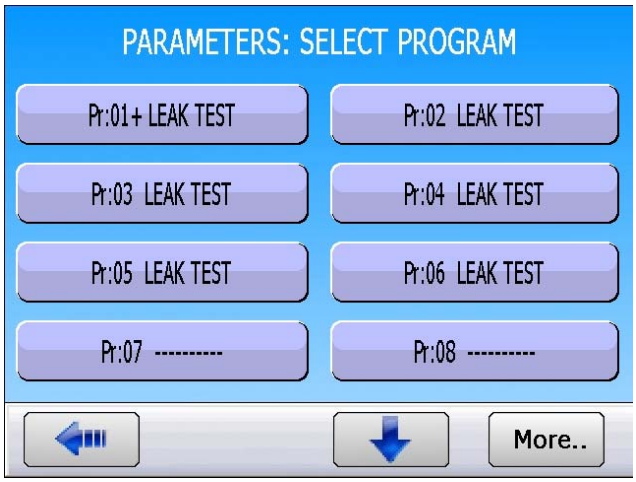
<u>Chaining conditions:</u>

- **ALL RESULTS**: always chains to the next program.
- **PASS**: chains on a good part.
- **TEST FAIL**: chain on a bad test part.
- **REFERENCE FAIL**: chain on a bad reference part.
- **ALARM**: chains if an alarm is triggered.
- **PRESSURE OUT OF LIMIT:** Chains if the pressure is out of the pressure limits. .
- **REWORKABLE**: chains if reworkable is valid.
- **CALIBRATION**: chains on calibration error.





When an active program is sequenced with another program, a "+" is displayed next to the program number.

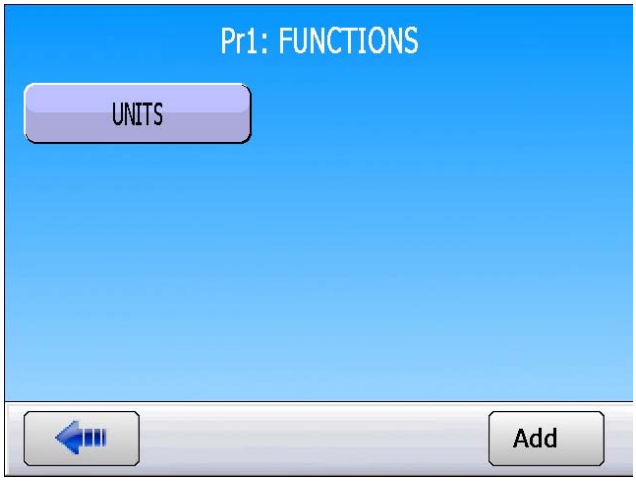


UNITS FUNCTION

This function allows the operator to choose the pressure and leak measurement units.

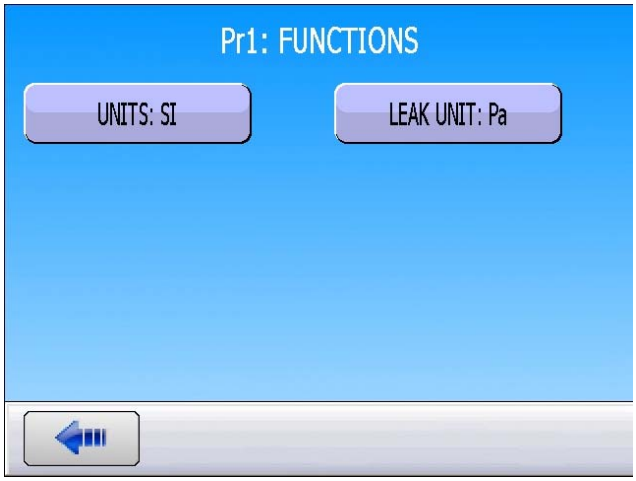
The different unit systems are: **SI** (International metric system, mm^3/s, cm^3/s, cm^3/min, cm^3/h, ml/s, ml/min and ml/h) **USA/SAE** (Anglo-Saxon unit system, $inch^3/s$, $inch^3/min$, $inch^3/h$, ft^3/s, ft^3/min and ft3/h) and **CUSTOM** measurement units.

If a custom measurement unit is used, it is possible to name it. This name will appear instead of the unit.

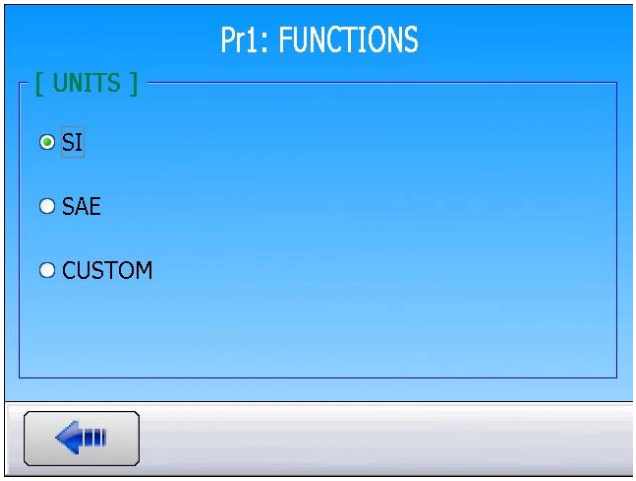


Press "**UNITS**" to edit the function.

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

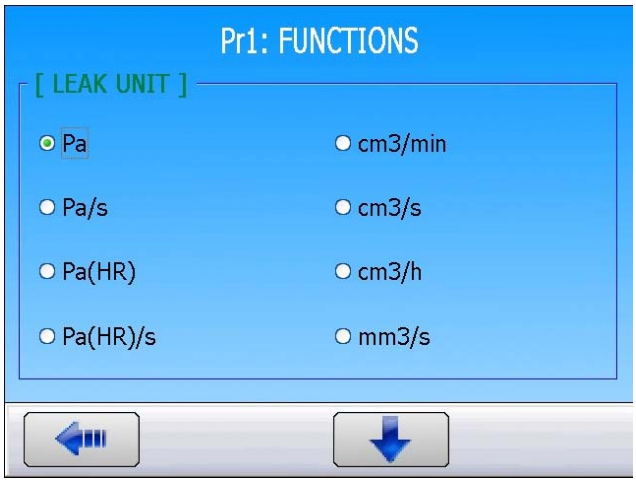


Press "**UNITS: XX**" to choose the units system.



Select the units system.

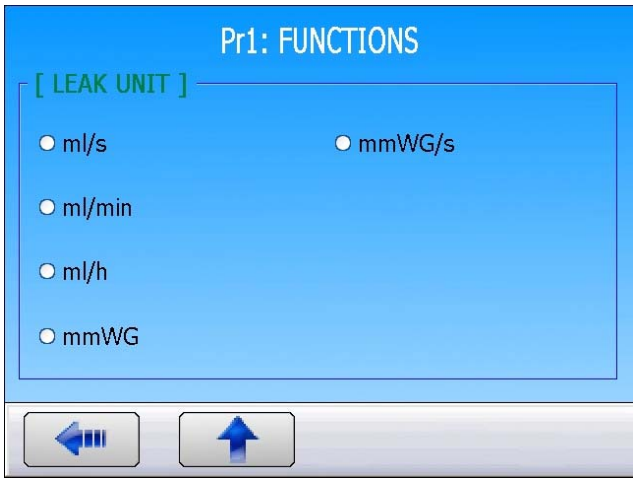
- **SI**,
- **SAE**,
- **CUSTOM**.

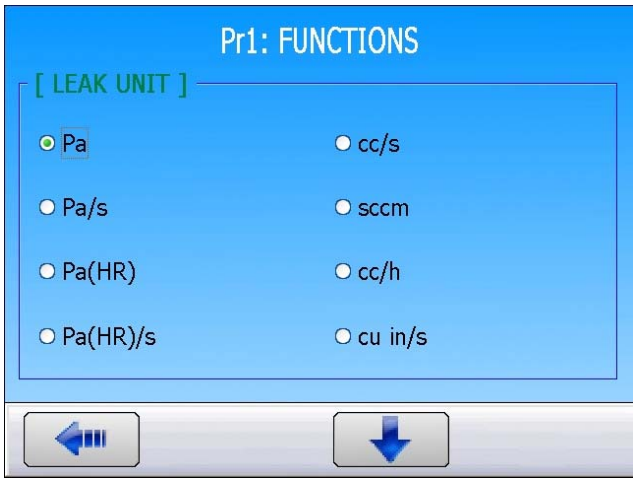


Select the leak unit.

SI Units System (Metric International System, mm^3/s, cm^3/s, cm^3/min, cm^3/h, ml/s, ml/min and ml/h).

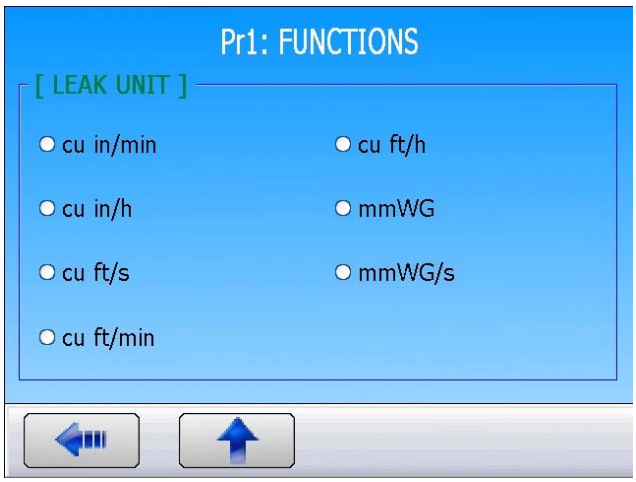
To see all the units, navigate all the pages by pressing the  and  arrows.





SAE Units System (Anglo-Saxons Units, $inch^3/s$, $inch^3/min$, $inch^3/h$, ft^3/s, ft^3/min and ft^3/h).

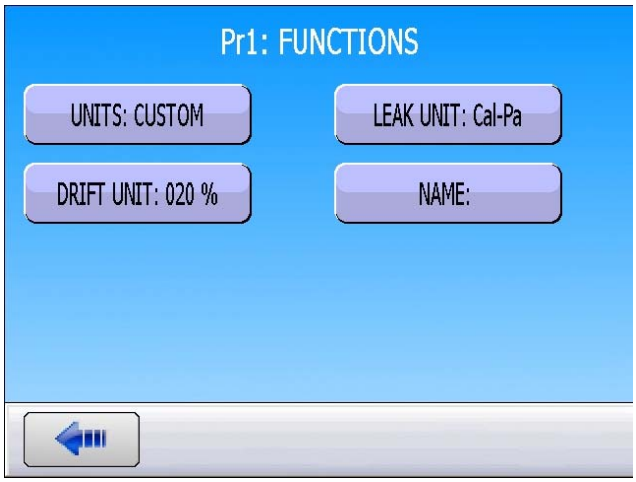
To see all the units, navigate all the pages by pressing the  and  arrows.



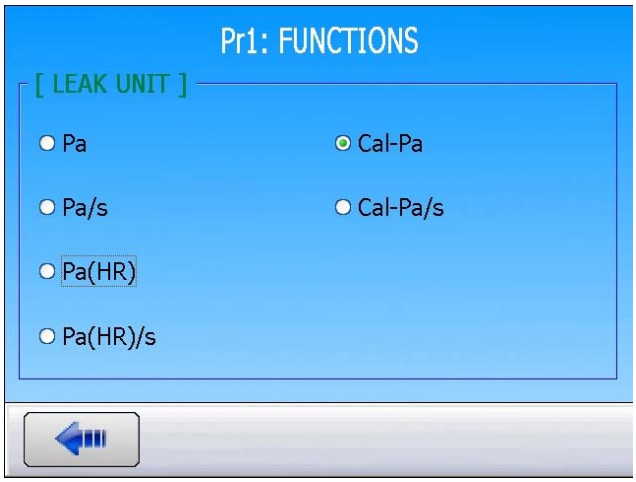
UNIT: CUSTOM personalized measurement units.

The **CUSTOM** unit option allows calibrating the device using a master leak. A learning special cycle is necessary for this operation (see the special cycle's sheet). The activation of this unit gives access to another special cycle for checking.

Press "**UNIT R.: xxxxx**".

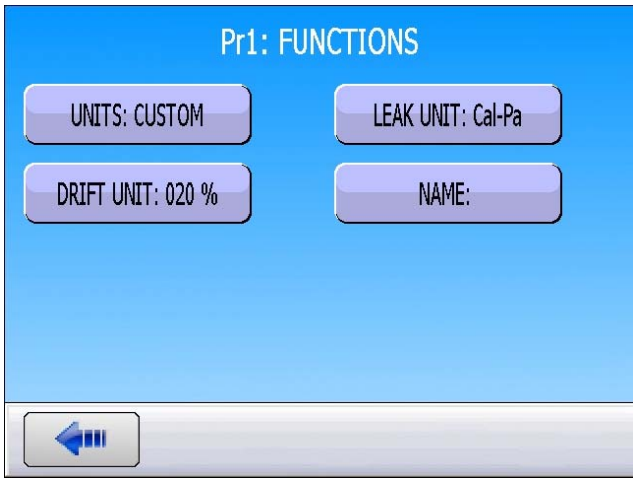


Select **Cal-Pa** or **Cal-Pa/s**.



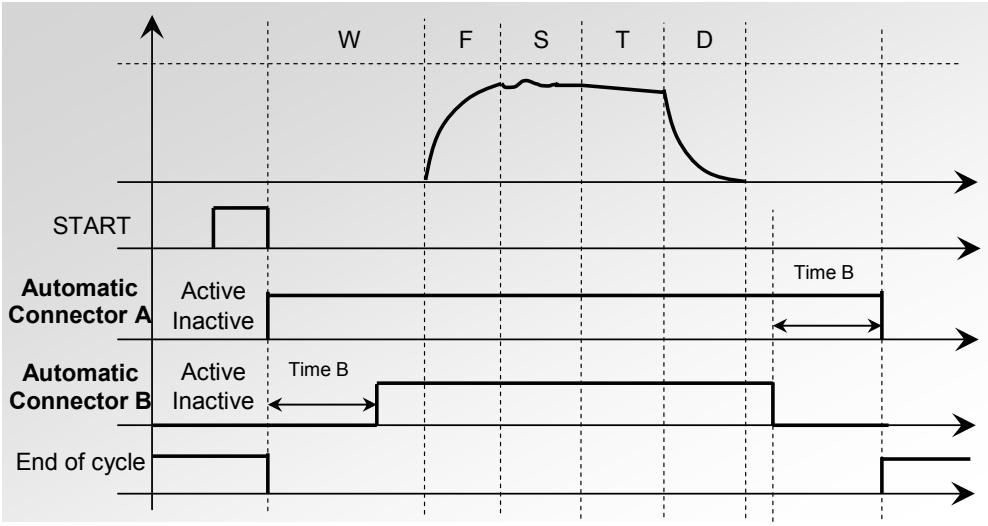
"**CAL Drift: XX%**": tolerance limit for the calibration drift. Checked using the "**CAL Check**" special cycle. If this value is exceeded, an alarm is triggered (default value: 20%).

"**NAME:**": Naming of the unit.



AUTOMATIC CONNECTORS FUNCTION

The automatic connector is a pneumatic control enabling the pilot of an external logic (valve, pneumatic device…). This control is activated at the start of the cycle and is released at the end of the cycle.



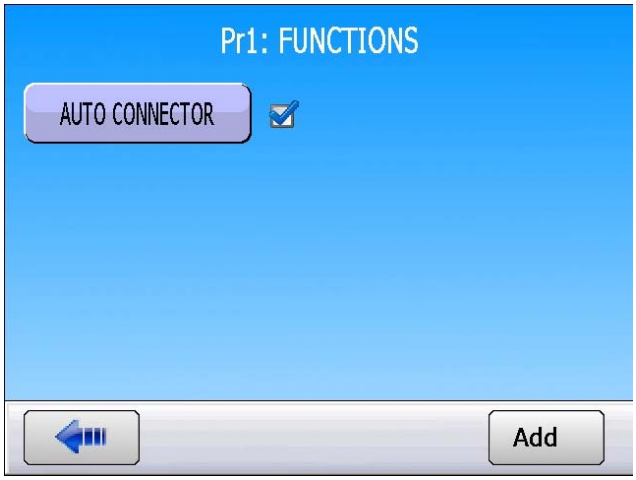
If several programs are sequenced, the automatic connectors are activated according to the times set as parameters in the first program and are deactivated according to the times set as parameters in the last program in the sequence.

Once an automatic connector has been activated, it will remain active for all cycles between the first and last program in the sequence.

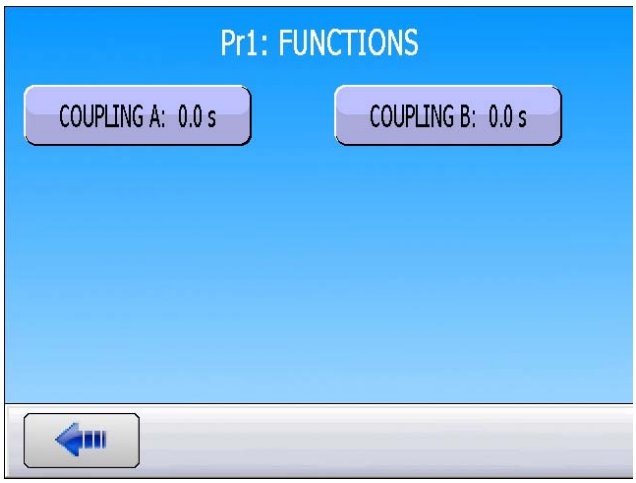
Activate the function in the program by checking the box  .

Press “**Add**” from the function menu to add the function if the button isn’t present on the screen.

Then configure the function by pressing "**AUTO CONNECTOR**".



Enter the values for the associated parameters: "**COUPLING A**" and "**COUPLING B**".



CALIBRATION CHECK FUNCTION

This function is used to verify that the test circuit is correct by measuring the effect of a known volume added to the test circuit. This can prevent the risk of passing bad parts when a test line has been twisted into a leak tight knot or if a valve in the test circuit fails to shift to the correct position. This function requires the addition of an optional solenoid valve and is performed at the end of a test on a passed part.

This auto-diagnostic check test can be carried out manually by the operator from the special cycle's menu, or automatically using programmable input 7 of the J3 connector programmed for this function. In these last two cases the first operation must be carried out manually in order to set the volume parameter.

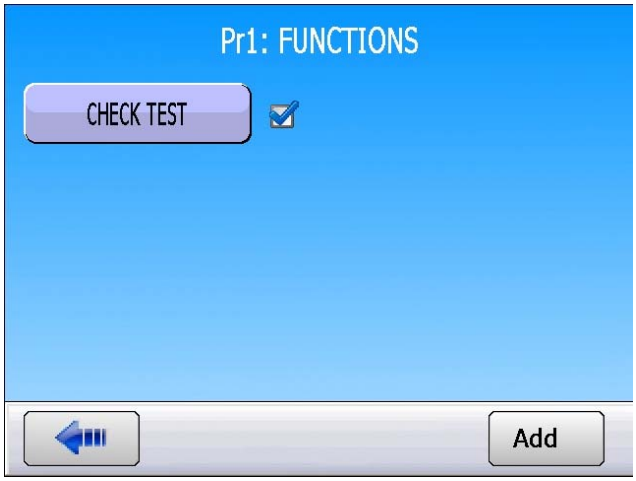
This cycle is only carried out if the test result is good and in this case you will see the messages **Pass** and **End of Cycle**. If the test result is bad, you will see the messages **Fail** and **End of Cycle**, and the auto-diagnostics cycle is not carried out. If the test on the part is good and the auto-diagnostics check is bad, you will see simultaneously the messages: **Pass**, **Alarm** and **End of Cycle**. The auto-diagnostics check parameters include:

- ✓ the **last measurement** value (not modifiable),
- ✓ the **maximum value** of the auto-diagnostics, (value of the expected pressure drop when volume is increased),
- ✓ the value of the accepted **drift** as a percentage, higher or lower in relation to the pressure drop.
- ✓ the auto-diagnostics **check time** must also be set so as to obtain repeatable values. The default setting for this time is zero and the parameter must be determined according to the volumes used.

Activate the function in the program by checking the box  .

Press “**Add**” from the function menu to add the function if the button isn’t present on the "**Functions**" screen.

Then configure the function by pressing on the "**CHECK TEST**" key.



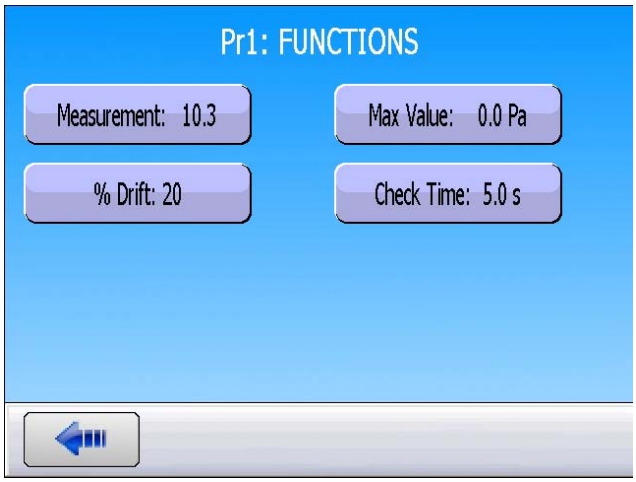
Enter the values for the associated parameters:

MEASUREMENT: (Measured by instrument)

MAX VALUE: Entered value of the pressure drop when the solenoid valve is open.

% Drift: Allowable +/- tolerance of the **Max Value**.

Check Time: Added test time to measure the pressure drop.



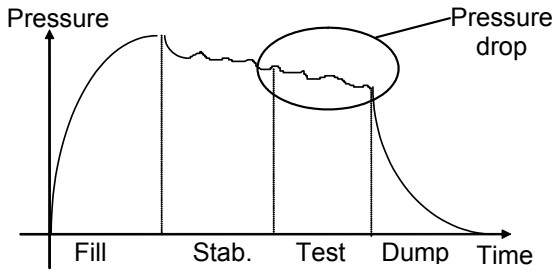
ATR 0 - 1 - 2 - 3 FUNCTIONS

1. PRINCIPLE

Problem:

Is the pressure drop occurring during the test time due to a leak or a transient effect?

The test environment is not always ideal for the measurement of pressure drops. There are several momentary events (ex: temperature or volume variations...) that can influence the measurement. They are called transient effects.



To avoid any interference, it is possible to increase the stabilization time to obtain the ideal measurement conditions during the test phase. However, increasing the stabilization time for each test may not be acceptable for optimal production speed.

Operational principle:

The principle consists of measuring the pressure variations caused by transient phenomena through the use of a learning cycle and then removing these variations from the final test result for a part.

Three ATR (**A**ttenuated **T**ransient **R**eduction) functions are available: ATR0, ATR1, ATR2 and ATR3. ATR1 and ATR2 are different because of their learning cycles.

1.1. ATR0

The initial value of the transient is known. Parameters must be set manually.

The ATR may only be used on parts that have identical behaviors during the test, in other words, parts that have an identical transient.

Associated parameters to be set are:

- **Start** (Initial value of the transient),
- **Transient** (actual, non modifiable value of the transient),
- **Percentage drift** (Drift tolerance on acquisition of the transient, as a % of the Reject level).

The "**start**" value is saved and subtracted from the final result of the tests.

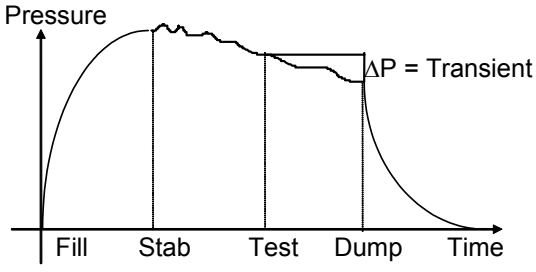
1.2. ATR1

The value of the transient is unknown. A special learning cycle must be carried out.

The learning cycle for this function must be carried out on a known good part.

The instrument performs a normal test cycle and considers that the pressure variation measured at the end of the cycle is the transient. This value is saved and subtracted from the final result of subsequent tests.

Reasoning: the part is a good part therefore the pressure drop measured is the transient.

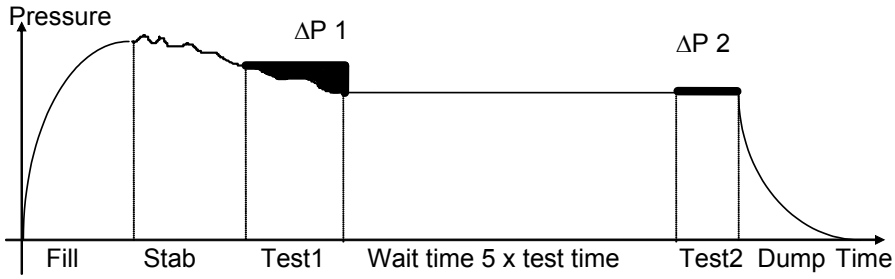


Associated parameters to be set:

- **Start** (Initial value of the transient),
- **Transient** (actual and non modifiable value of the transient),
- **Percentage drift** (Drift tolerance on acquisition of the transient, as a % of the Reject level).

1.3. ATR 2

The value of the transient is not known but the possible leak of the part is taken into account when the transient value is computed during the special cycle.



At the end of test time 1, the ATEQ saves the pressure variation ΔP1, function of the transient and the leak if there is one.

$$\Delta P1 = Leak + Transient$$

Following the waiting time (equivalent to 5 times the normal test time), we consider that the transient phenomena has disappeared. During the second test time, the ATEQ instrument measures a second pressure drop ΔP2 which corresponds to the leak.

$$\Delta P2 = Leak$$

By taking these two pressure variations, we can calculate the transient.

$$\Delta P1 - \Delta P2 = (Leak + Transient) - Leak = Transient$$

It is this transient which will be subtracted from the leak measurement of the following cycles.

Through the use of the ATR, the **ATEQ** instrument is able to differentiate a Pass part from a Fail part without being influenced by the transient effects whilst keeping a short stabilization time.

Associated parameters to be set:

- **Start** (Initial value of the transient),
- **Transient** (actual and non modifiable value of the transient),
- **Percentage drift** (Drift tolerance on acquisition of the transient, as a % of the reject level).

When a parameter is modified but no learning cycle has started, an **ATR** error occurs. The **Alarm** and **End of Cycle** outputs are activated.

A learning cycle may be carried out when the measured value is greater than the reject level. After the learning cycle, the **Pass** and **End of Cycle** outputs are activated.

1.4. ATR3

This is the same as the ATR2. The difference is, if the measurement result is negative, then the **measurement absolute value** is displayed.

Associated parameters to be set:

- **Start** (Initial value of the transient),
- **Transient** (actual and non modifiable value of the transient),
- **Percentage drift** (Drift tolerance on acquisition of the transient, as a % of the reject level).

1.5. TRANSIENT DRIFT

Due to the evolution of the test conditions (temperature variations...), the value of the transient can vary through time. It is therefore necessary to track its evolution.

To avoid having to carry out learning cycles too often, the **ATEQ** instrument saves the last ten values of parts considered as very good (result close to 0) and recalculates the transient using the average value.

Parts are considered as very good when their leak rate is lower than the “percentage drift” value of the reject level. This value can be modified between 0 % and 100 %.

$$\text{Transient} = \frac{\sum \text{of the value of the last 10 very good parts}}{10}$$

The transient attenuation (ATR) can only be used on parts that behave in a very similar way during the test, in other words, parts that have similar transients.

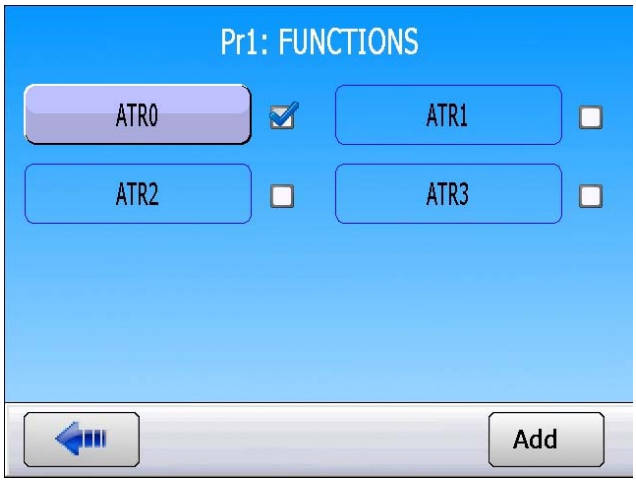
When the batch of parts changes or when the production is stopped for a certain time, it is necessary to carry out a new learning cycle, as the transient will change.

The **ATR** error appears if the difference between the transient and the initial (start) value is greater than the reject level.

The transient can evolve one way or the other; therefore it is preferable to have identical Test and Reference reject levels.

2. PROCEDURE

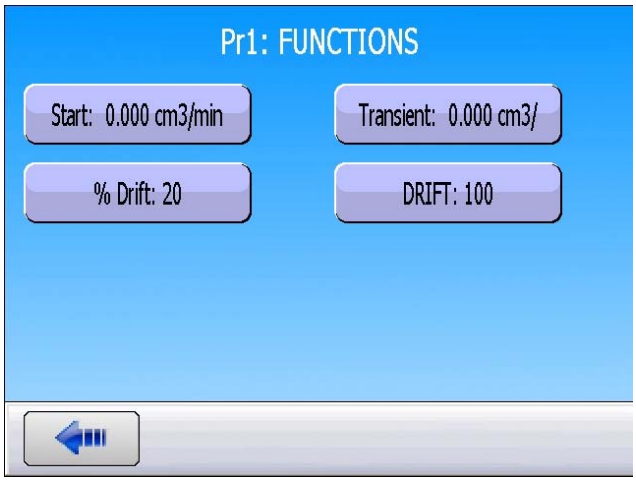
Go back to the "**FUNCTIONS**" menu of the program, validate the desired **ATR** function in the program by checking the box  .



Press "**Add**" from the function menu to add the function if the button isn't present on the function screen.

Then configure the selected **ATR** function, by pressing the corresponding button.

Selecting an ATR function cancels the others, only one ATR function by program.



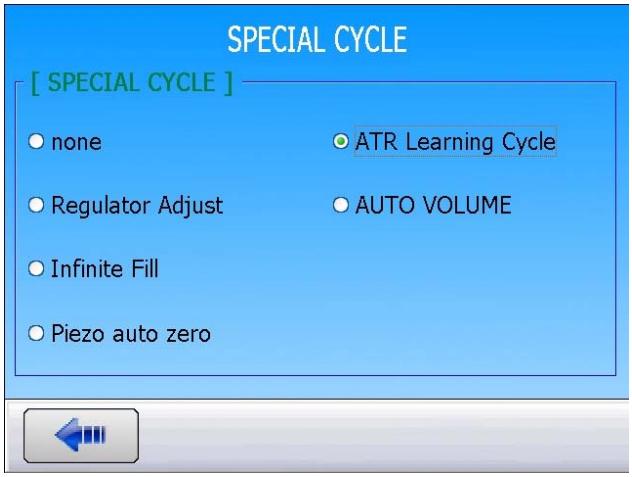
Adjust the parameters for the selected **ATR** mode.

3. CYCLE SPECIAL

Example with **ATR1** (the processes are the same for **ATR2** and **ATR3**).

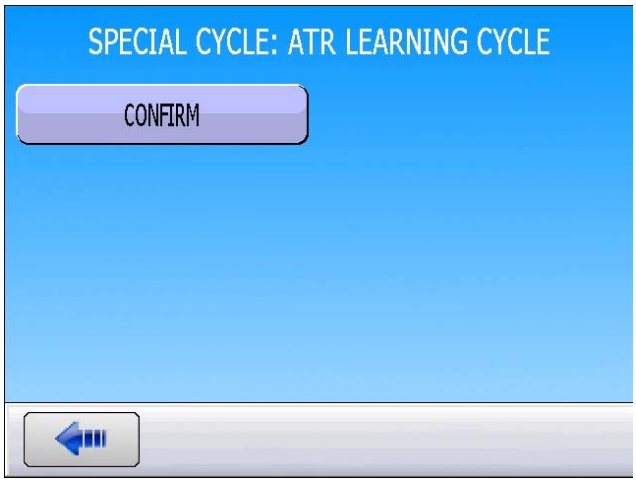
From the main menu, enter in the special cycle menu.

In the special cycle menu, select the "**ATR Learning cycle**".

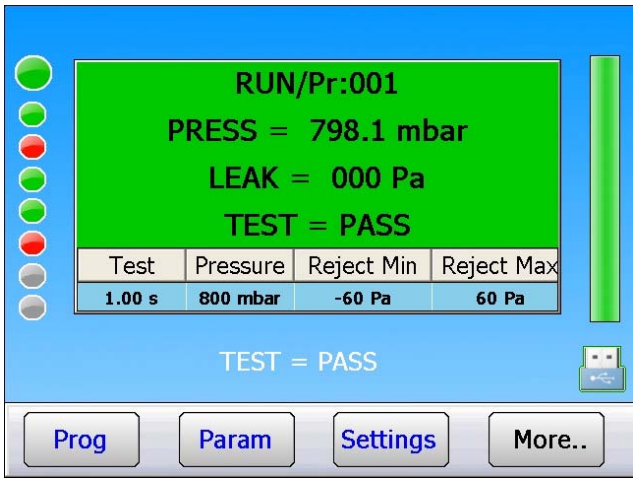


Press on "**CONFIRM**" if others parameters are displayed, please inform them (for others **ATR** modes).

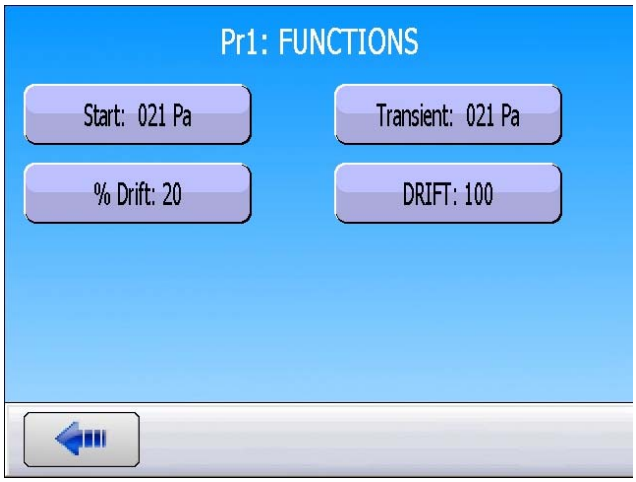
Press on the "**START CYCLE**" button to run the **ATR** learning special cycle.



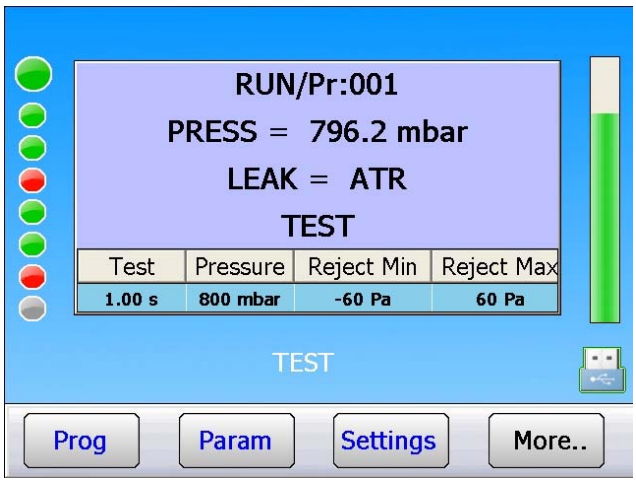
At the end the learning cycle, the result must be **Pass**.



You can check and/or modify the recorded parameters by the special cycle in the function menu of the current program.



At each test time the device displays the "**LEAK = ATR**" message to inform the **ATR** computing of the device.



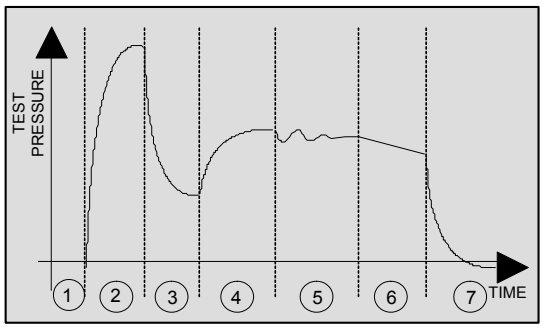
PRE-FILL AND FILL TYPES

1. PRE-FILL TYPE

The pre-fill function is used in three fields of application:

- large volume part test: to fill the part faster in order to reduce the cycle time (without pre-fill time),
- test on parts requiring an initial stretch so that they remain volumetrically stable for the duration of the test,
- part proof tests, where the pre-fill pressure exerts an elevated pressure on the test part to ensure the part will continue to operate successfully at its working pressure.

Insertion of the pre-fill and pre-dump times in the measurement cycle.



1) Coupling time,
2) Pre-fill,
3) Pre-dump,
4) Fill,
5) Stabilization,
6) Test,
7) Dump.

This function brings up the display of the words **"Regulator Adjust"** under "**Spe. Cycle**" so that the new pressure can be set.

<u>There are several types of pre-fill available:</u>

1.1. STANDARD (BY DEFAULT)

During Pre-Fill time, the Fill valve (and Pre-Fill valve in the case of mechanical regulators) opens allowing the regulator to supply air to the part at the regulator's set pressure.

Associated parameters to be set:

- **Max Pre-FILL** (maximum pre-fill pressure limit),
- **Pre-FILL** (pre-fill time),
- **Pre-DUMP** (pre-dump time).

1.2. INSTRUCTION

When the pressure reaches the instruction the device runs the following step.

Associated parameters to set:

- **Set Pre-Fill** (instruction/target value),
- **Pre-FILL** (pre-fill time),
- **Pre-DUMP** (pre-dump time).

***Notes**: with an electronic regulator, this works in the same manner as the Standard Fill Type. This function does not work with Vacuum regulators.*

1.3. BALLISTIC

This fill mode enables fluctuation in the air pressure (filling parts with a high level of deformation) and in particular allows the **Max Pre-Fill** limit to be exceeded without the cycle stopping and an error message being displayed.

Associated parameters to be set:

- **Pre-FILL** (pre-fill time),
- **Pre-DUMP** (pre-dump time).

1.4. RAMP (ELECTRONIC REGULATOR ONLY)

This fill mode applies only to electronic regulators and will allow the part to be slowly filled to the Pre-Fill pressure in a linear manner over the duration of the fill time.

1.5. PRE-FILL REGULATOR

This function applies when two regulators are installed in the instrument allowing the choice of which regulator is to be used for pre-fill (1 or 2).

2. FILL TYPE

This function provides a choice of these possible types of fill.

2.1. STANDARD (BY DEFAULT)

The default setting - during Fill time, the Fill valve opens allowing the regulator to supply air to the part at the regulator's set pressure.

Associated parameters to be set:

- **Max FILL** (maximum fill pressure limit),
- **Min FILL** (minimum fill pressure limit,
- **FILL Time** (duration fill valve is open)**.**

2.2. INSTRUCTION (SET)

This mode allows a Mechanical regulator to fill the part to a value less than the regulator's set pressure. When the pressure sensor in the instrument reads the **Set Fill** value, the Fill-Valve is closed and the test sequence continues.

Associated parameters to set:

- **Set Fill** (instruction/target value),
- **FILL** (maximum time the fill valve will remain open),
- **Max FILL** (maximum fill pressure limit),
- **Min FILL** (minimum fill pressure limit).

***Notes**: with an electronic regulator, this works in the same manner as the Standard Fill Type. This function does not work with Vacuum regulators.*

2.3. BALLISTIC

This fill mode enables fluctuation in the air pressure (filling parts with a high level of deformation) and in particular allows the maximum fill limit to be exceeded without the cycle stopping and an error message being displayed. However, once the test sequence enters the stabilization phase, the test pressure must be within the limits defined by **Max Fill** and **Min Fill**.

2.4. RAMP (ELECTRONIC REGULATOR ONLY)

This fill mode applies only to electronic regulators and will allow the part to be slowly filled to the test pressure in a linear manner over the duration of the fill time.

3. FILL REGULATOR

This function provides a choice of which of two regulators to use for the fill (1 or 2).

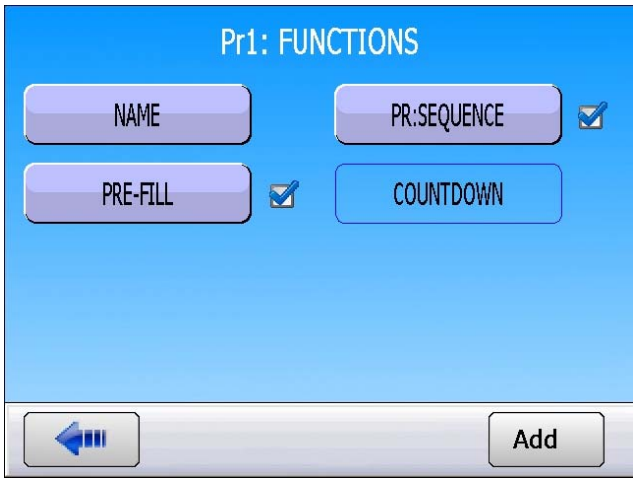
4. SETTING PROCEDURE

Validate the function in the program by checking the box  .

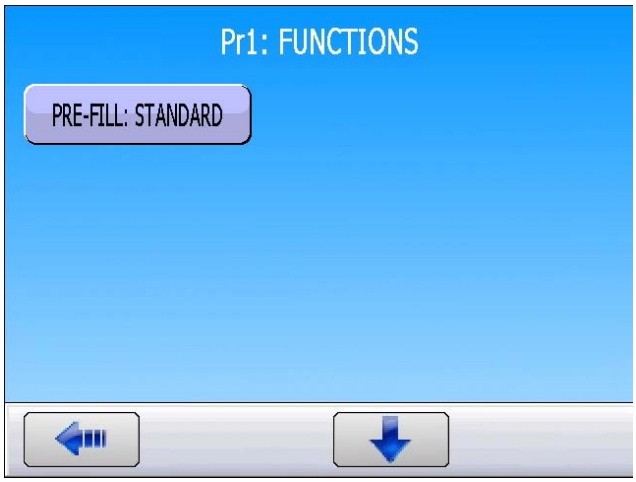
Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

Configure the function, by pressing the: 

button.

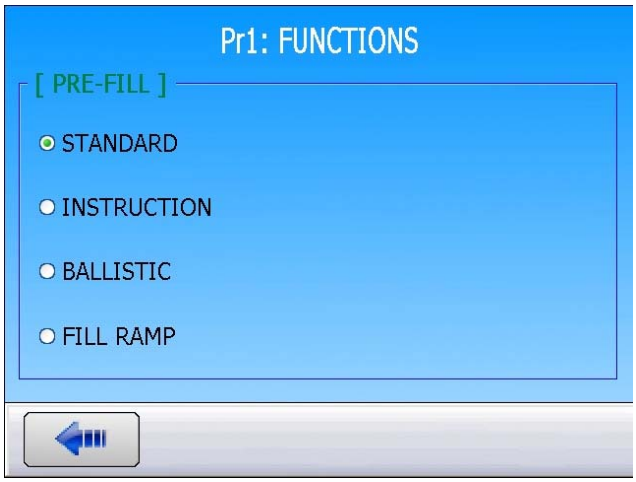


The "**PRE-FILL.**" button accesses to the pre-fill type window.



Choice of the pre-fill type.

Repeat the process for the fill type.



VALVES CODES / AUXILIAIRY OUTPUTS

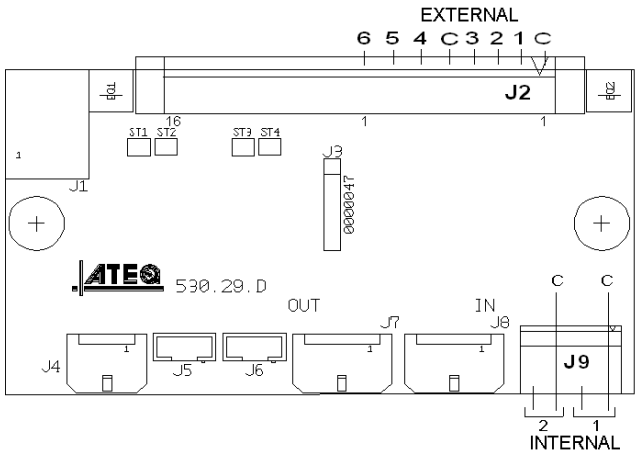
1. OPTIONAL VALVE CODE BOARD

The instrument has eight programmable electrical outputs (24V DC/100 mA maximum) on the (optional) J1 valve code board.

The "**Valve code**" outputs dedicated to predefined pneumatic functions are identified by the associated function's name: Stamping, automatic connector, etc… If they are not associated to a function but are available to the operator.

They are labeled: **Ext N** or **Int N** (N = position number).

A free used output is activated during the cycle.

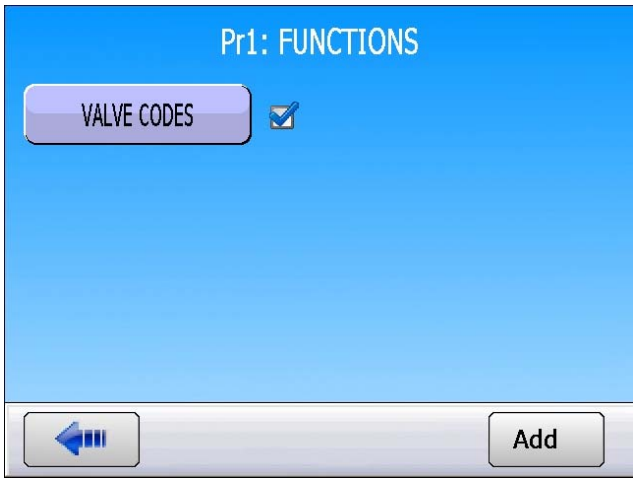


Internal valve codes are reserved to **ATEQ** manufacturing. Opening the instrument to access those **VOIDS THE WARRANTY**.

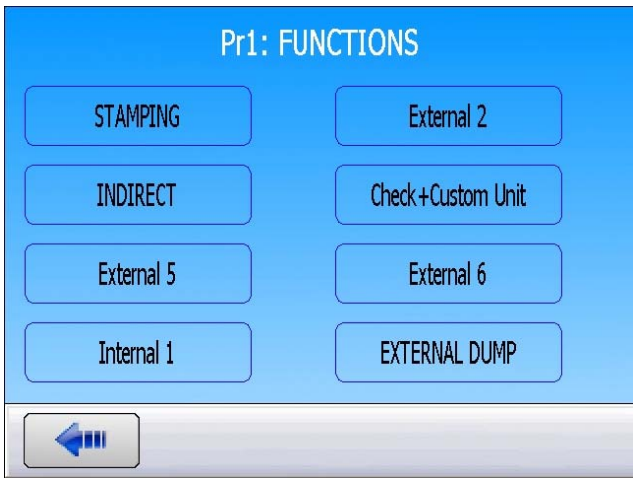
Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box ☑ .

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

Configure the function, by pressing "**VALVE CODES**".



Choose the pneumatic function or the "**Valve code**" output that is available.



2. 24V AUXILIARY OUTPUTS

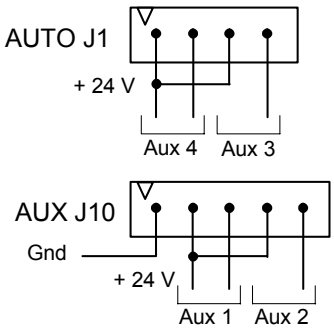
On the instrument main board there are four programmable electrical outputs (24V DC / 100 mA maximum, outputs).

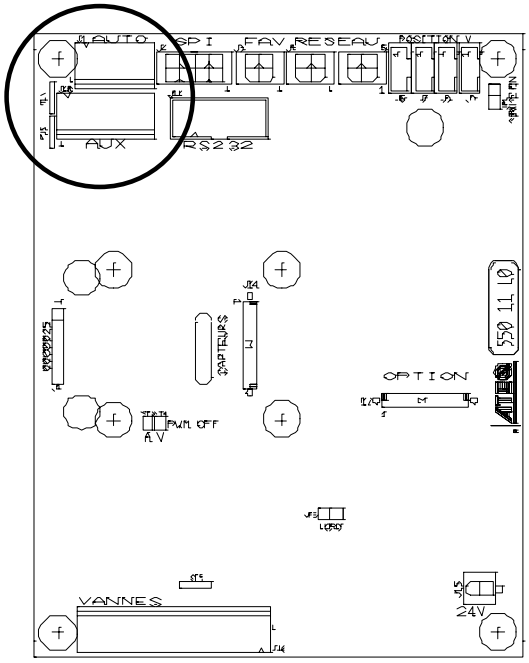
Unlike the **valve code** outputs, the **auxiliary outputs** reserved for a pneumatic function are identified by the name of the function: stamping, automatic connector, etc.

They are not associated to a function but are available to the operator.

They are labeled **Aux N** (N = position number).

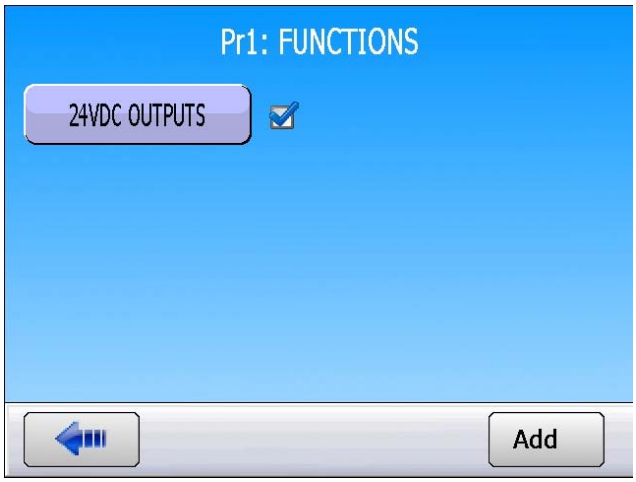
Associated parameters to be adjusted: Auxiliary 1, Auxiliary 2, Auxiliary 3, Auxiliary 4.



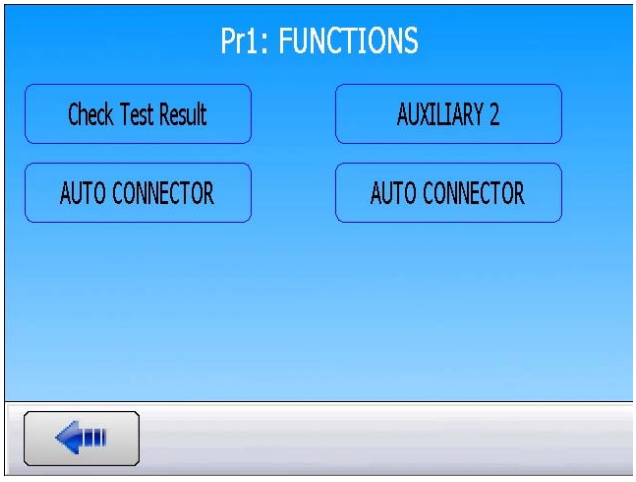


Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box  .

Configure the function, by pressing "**24VDC OUTPUTS**".



Choose the pneumatic function or the available "**Auxiliary Output**" output.



END OF CYCLE

This function enables the choosing of one of the different end of cycle depending on the configuration of the instrument (connection to a PLC…).

1. RELAY SEQUENCING RELATED TO DIFFERENT END OF CYCLE

In order to interface the **ATEQ** with its environment (PLC, PC …), the following timing charts supply the details of the sequencing of the electrical outputs (relay board on the J3 connector) and pneumatic outputs (automatic connectors), depending on the commands entered on the front panel or through the J3 connector (START, RESET).

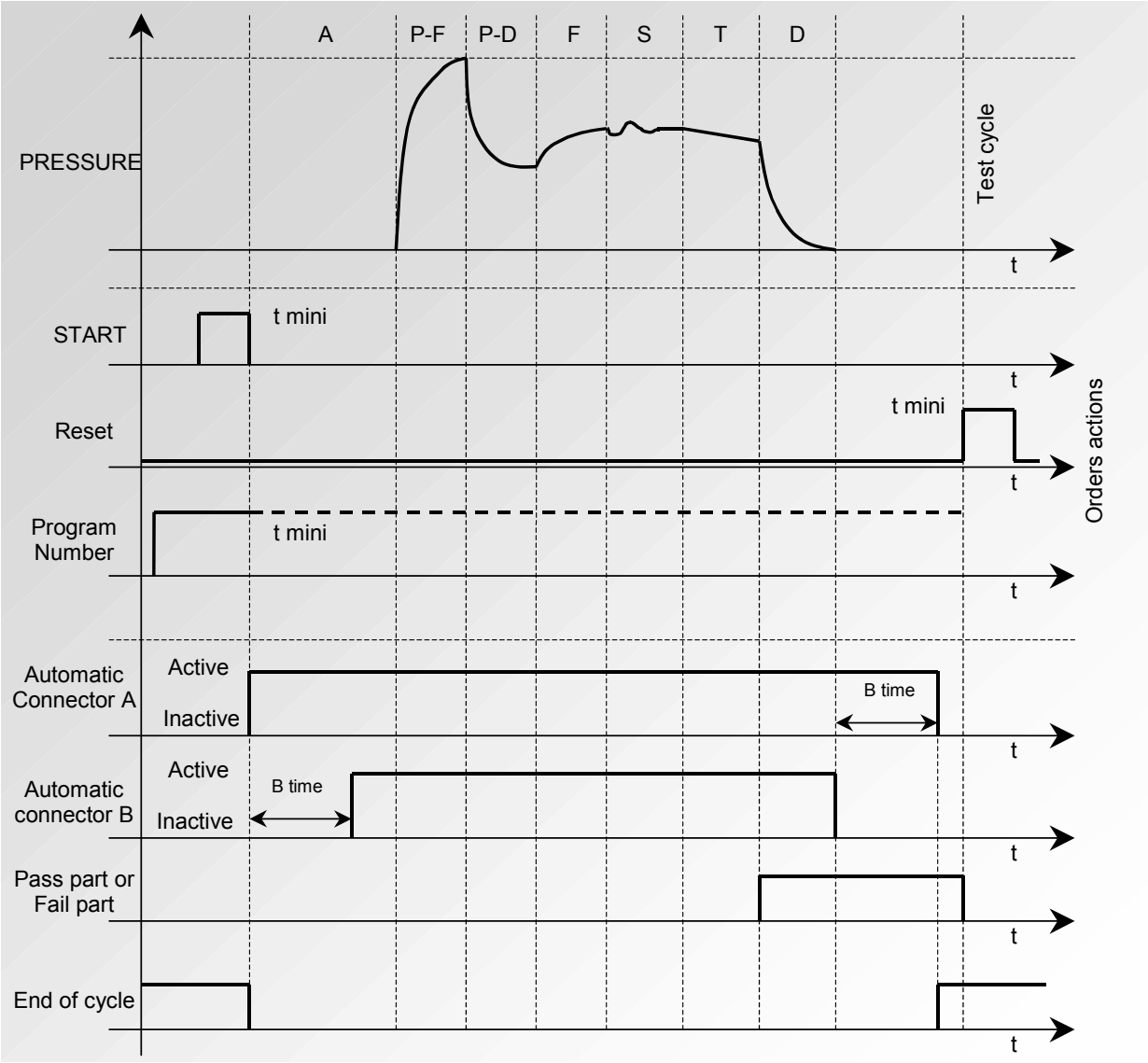
Legend	
A	Coupling time A
B	Coupling time B
P - F	Pre-fill time
P - D	Pre-dump time
F	Fill time
S	Stabilization time
#	Unspecified time occurring between the programmed test time and the pressing of the reset  key.
T	Test time
D	Dump time
START	Press the  key on the front panel or short pins 2-3 on the J3 connector.
RESET	Press the  key on the front panel or short pins 1-2 on the J3 connector.
Automatic Connector	Active (high level): the pneumatic output is active (air output). Inactive (low level): the pneumatic output is inactive (no air output).
PASS or FAIL	Fail part or Pass part relay on the J3 connector
EoC	End of cycle relay on J3 connector
t mini	Minimum time to accept an entry, 500 ms on connector J8 in the central module and 50 ms on connector J3 on a head.

Actual times are not those displayed but those on the print-out.

1.1. "AUTOMATIC RESET" CYCLE END

If the part is OK, the Pass part relay will be activated as soon as the test ends and remain so until the start of the following cycle. Following the dump time, the end of cycle relay is activated.

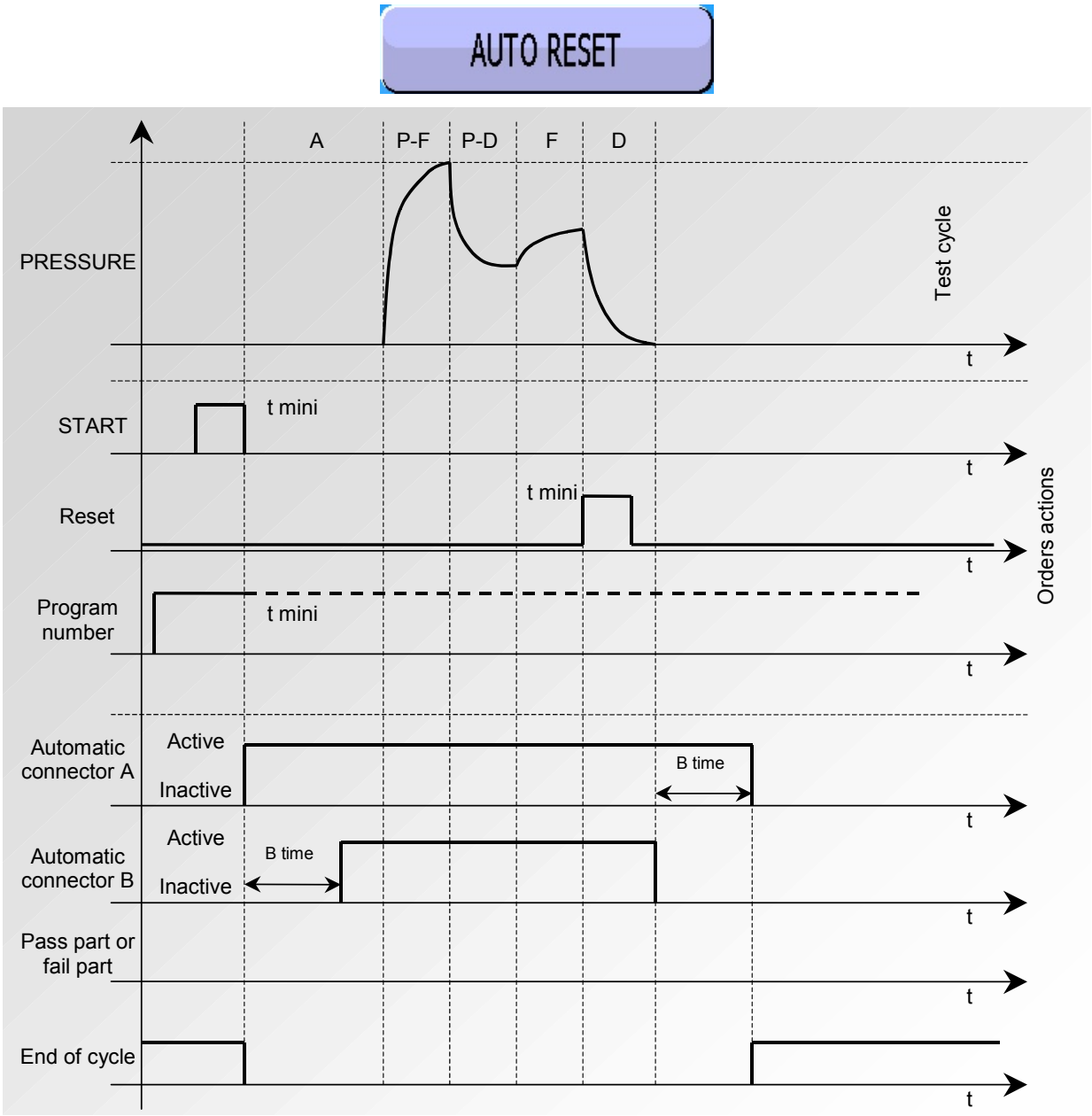
If the part is fail, the Fail part relay is activated as soon as the test is completed. The instrument automatically dumps and sends an end of cycle signal. A new cycle can then be started.



The active program is the one selected before starting up. It remains active even if the program inputs on the connector are no longer activated. This selection can only be modified during the inter cycle period.

To return to program 1, when a cycle is not in progress, press any program selection inputs.

1.2. ENDING A CYCLE WITH THE RESET KEY ("AUTOMATIC RESET" CYCLE END)



The active program is the one selected before starting up. It remains active even if the program inputs on the connector are no longer activated. This selection can only be modified during the inter cycle period.

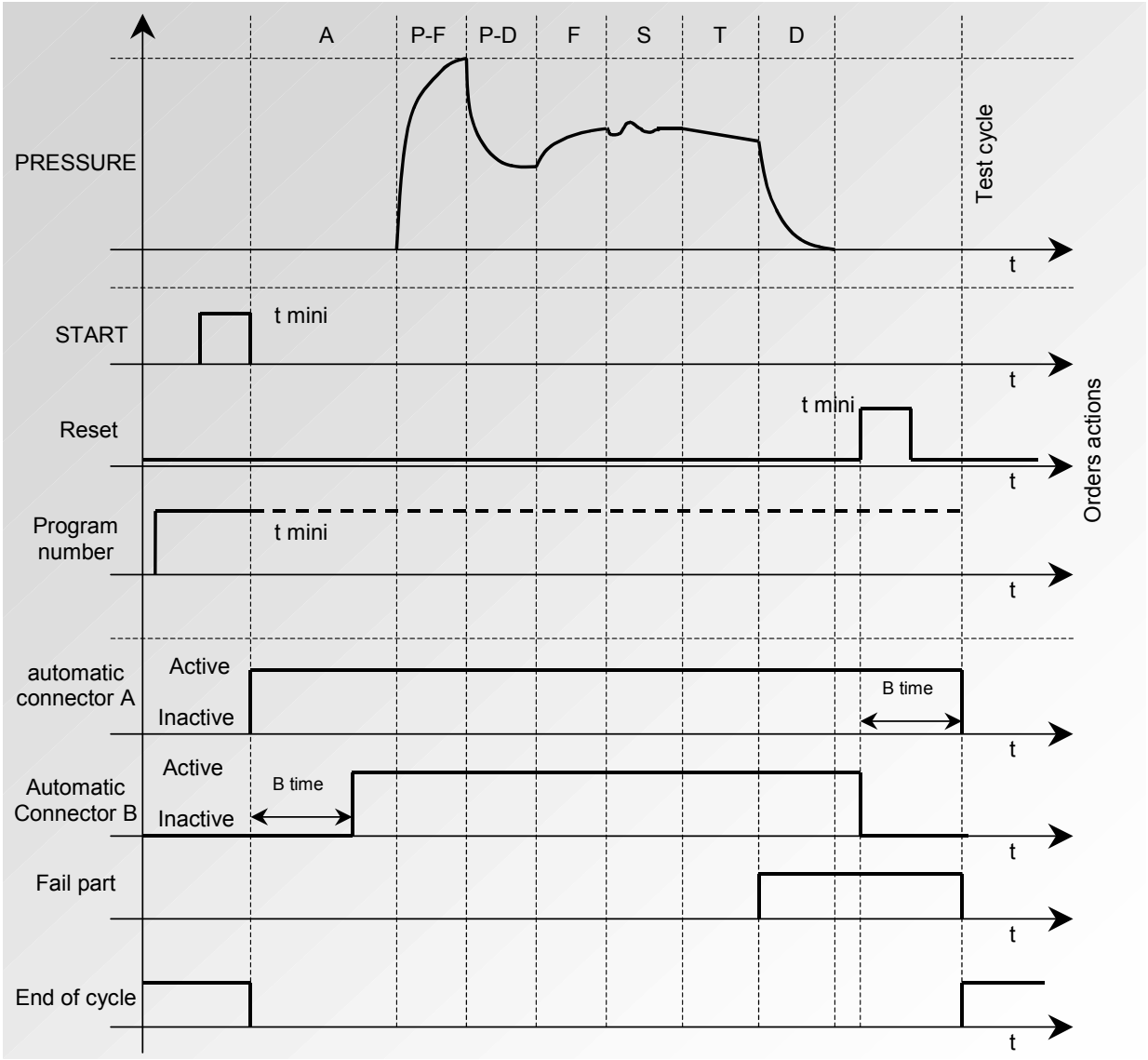
To return to program 1, when a cycle is not in progress, press any program selection inputs.

1.3. "RESET + DUMP" CYCLE END (AUTOMATIC DUMP)

If the part is OK, the Pass part relay is activated as soon as the test time is finished, and remains so (only in position 2) until the next cycle is started.

At the end of the dump time, the end of cycle relay is activated.

If the part is Fail, as soon as the test time is over, the Fail part relay is activated and remains so until the end of the cycle. The dump is then carried out. The cycle can be ended by pressing the **RESET**  key.



The active program is the one selected before starting up. It remains active even if the program inputs on the connector are no longer activated. This selection can only be modified during the inter cycle period.

To return to program 1, when a cycle is not in progress, press any program selection inputs.

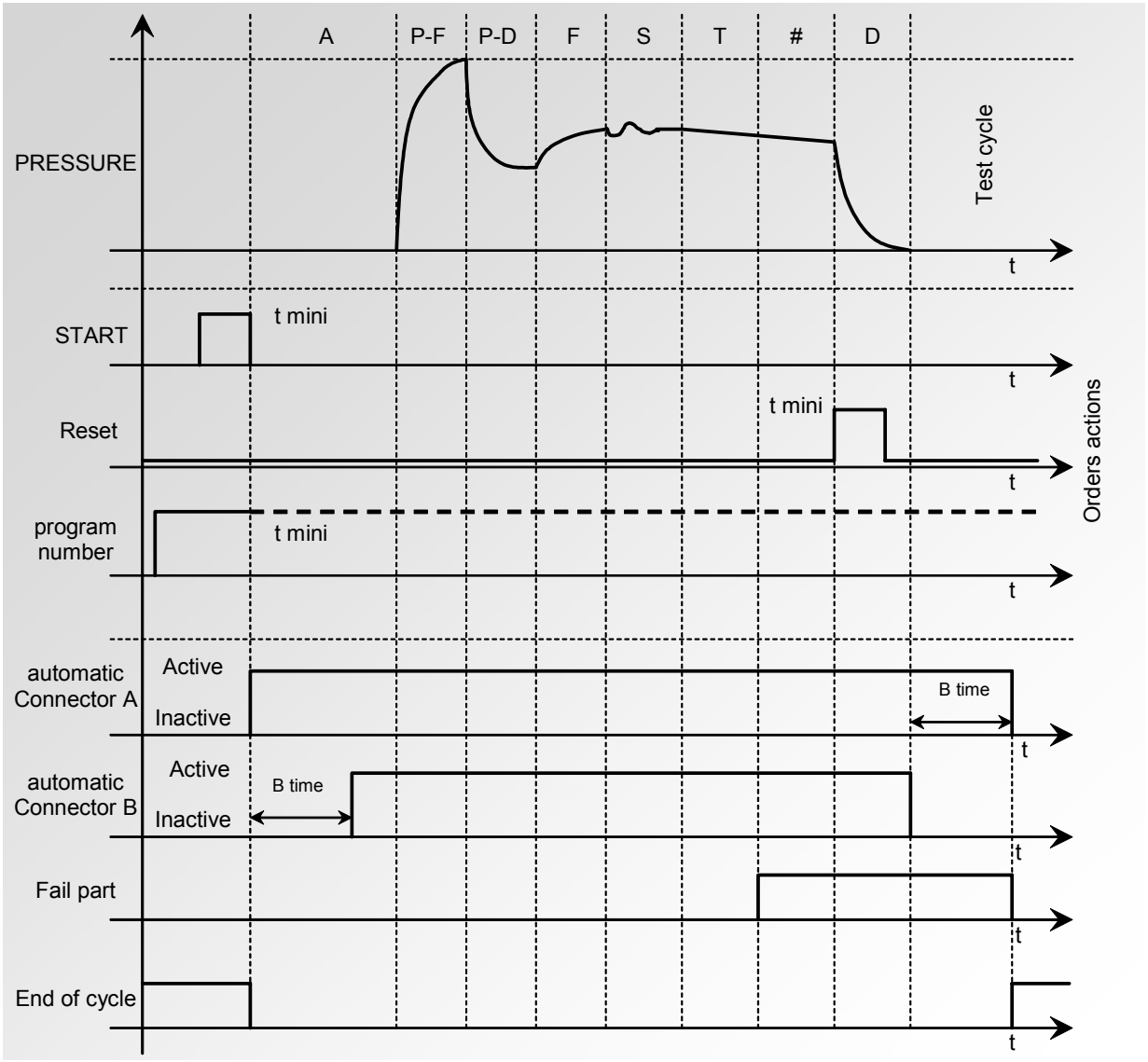
1.4. "FILL" CYCLE END

If the part is OK, the Pass part relay is activated at the end of the test time and remains so till the start of the next cycle.

At the end of the dump time, the end of cycle relay is activated (or at the end of coupling time B if a value has been set for it).

If the part is fail, as soon as the test time is finished the Fail part relay becomes and remains activated.

The instrument waits for a reset from the operator or the PLC to start the dump time and send the end of cycle signal.



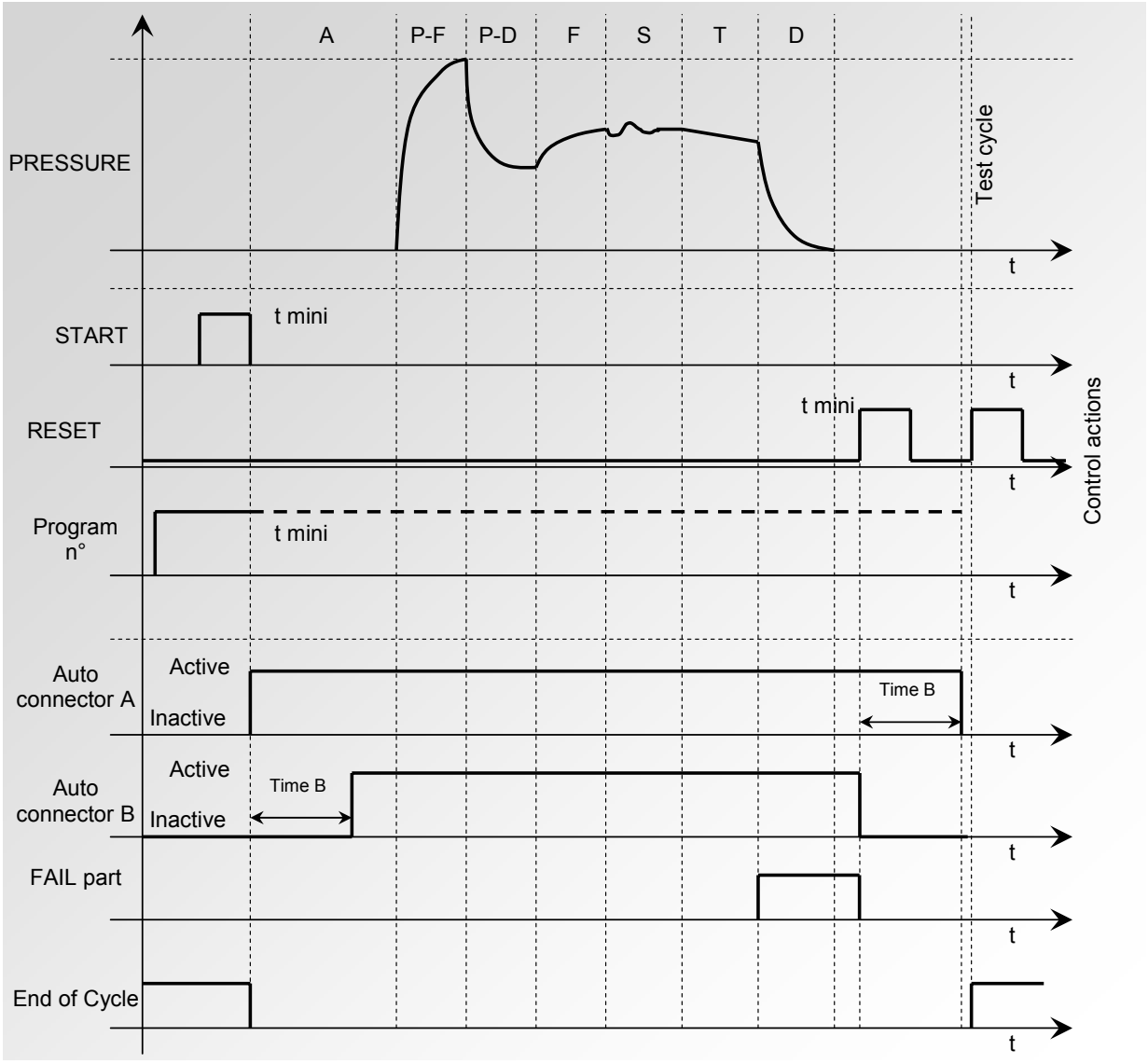
1.5. "DOUBLE RESET + DUMP" CYCLE END (AUTOMATIC DUMP)

If the part is OK, the Pass part relay is activated as soon as the test time is finished, and remains so until the next cycle is launched. At the end of the dump time, the end of cycle relay is activated (or after coupling time B if a value has been set for it).

If the part is Fail, as soon as the test time is over, the dump phase is carried out and the Fail part relay is activated

A first press on the **RESET**  key or activation of the **RESET** input cancels the result relay.

The End of Cycle is obtained by pressing a second time on the **RESET**  key or by activating the **RESET** input again.



The active program is the one selected before starting up. It remains active even if the program inputs on the connector are no longer activated. This selection can only be modified during the inter cycle period.

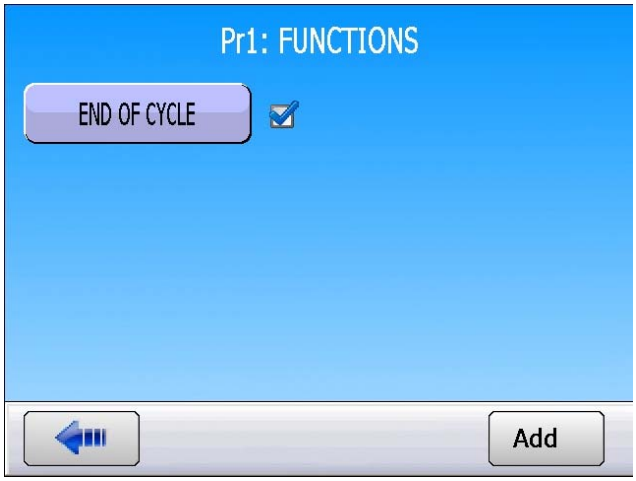
2. PROCEDURE

To return to program 1, when a cycle is not in progress, press any of the program selection inputs.

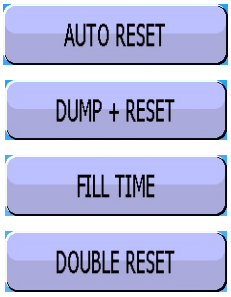
Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box  .

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

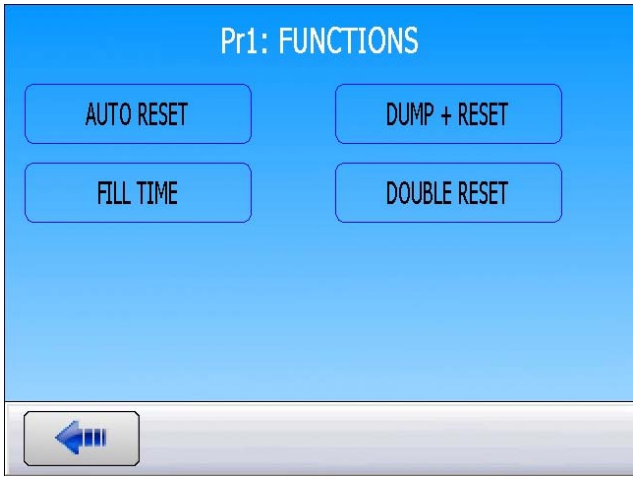
Configure the function, by pressing "**END OF CYCLE**"



Select the end of cycle mode:



For the end of cycle modes explanations, see above.



MINI VALVE

This function is dedicated to small part applications (volume below 10 cm^3) and has a base time of 0.01s instead of 0.1 s.

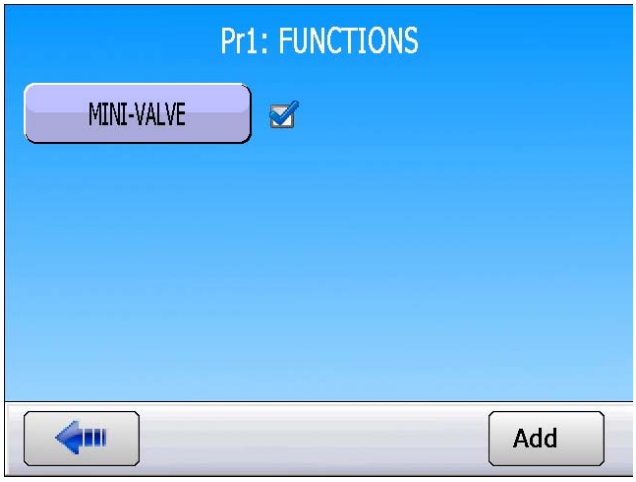
The programming of an **ATEQ** with a mini valve is identical to the programming of the standard **ATEQ**.

Parameter to be set is: **A-Z Diff** (differential Auto Zero). This time can be reduced as long as the obtained values are stable and repeatable.

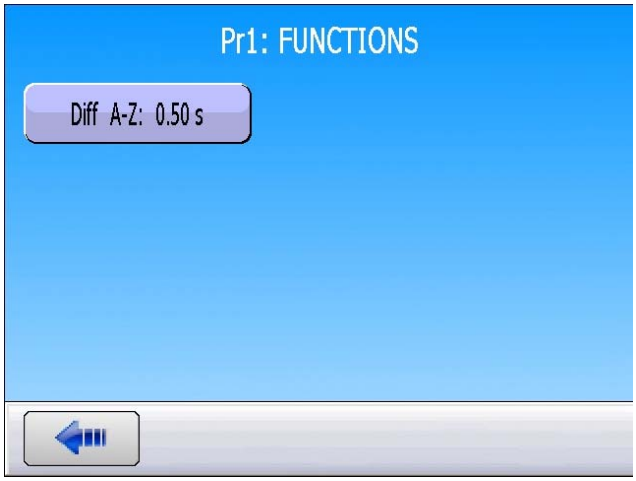
Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box .

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

Configure the function, by pressing the "**MINI-VALVE**".

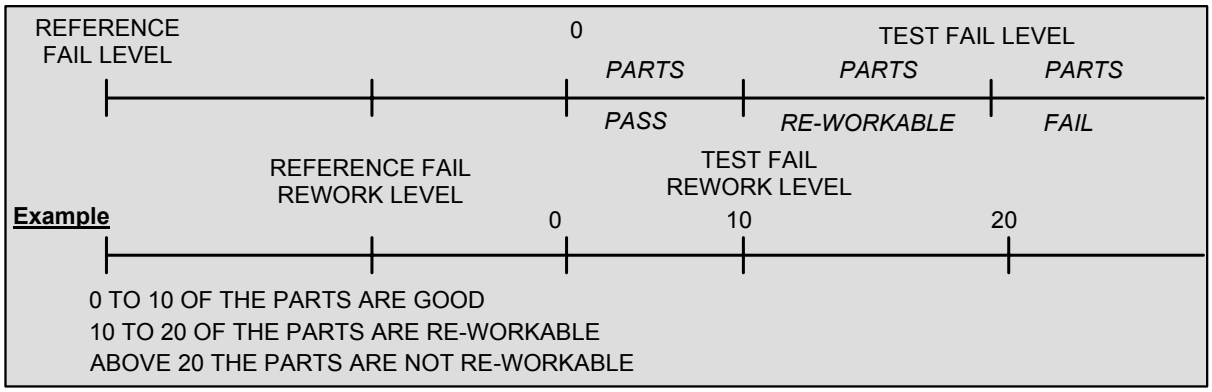


Adjust the differential Auto-Zero value if needed, the default value is proven stable.



REWORK LIMITS

This option offers the option of two reject levels: normal reject level (the fail part cannot be repaired) and a re-workable reject level (the part is fail but may be reworked to become acceptable). This option is often used in casting processes, when parts may be treated via impregnation.



The associated parameters to be set are: **Test REWORK** and **Ref. REWORK**.

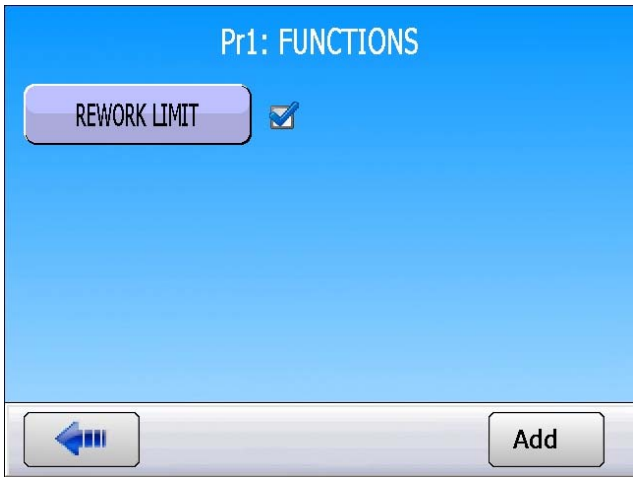
For re-workable parts, with multi-head configuration on the central unit or on the heads themselves, the Pass (POK) and Fail (NOK) outputs are both activated simultaneously.

When the recoverable reference reject value is zero, the program uses the symmetrical opposite sign value of the recoverable test reject (example: if the recoverable test reject is 10 Pa, then with the recoverable reference reject value set at zero, the program assumes the recoverable reference reject to be -10 Pa).

Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box .

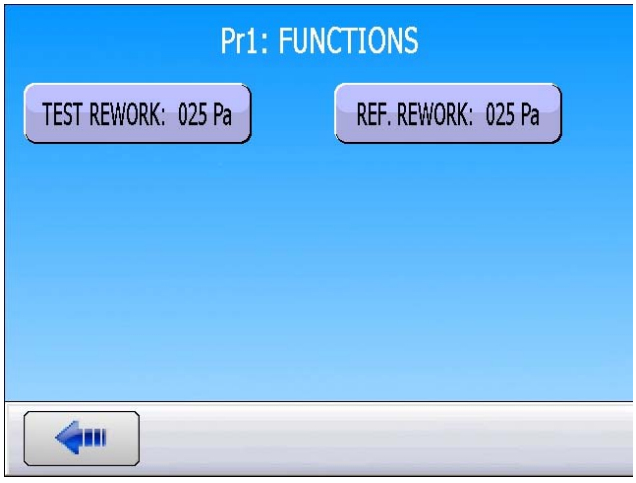
Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

Configure the function, by pressing "**REWORK LIMIT**".



Adjust the Rework values for the Test side and the Reference side.

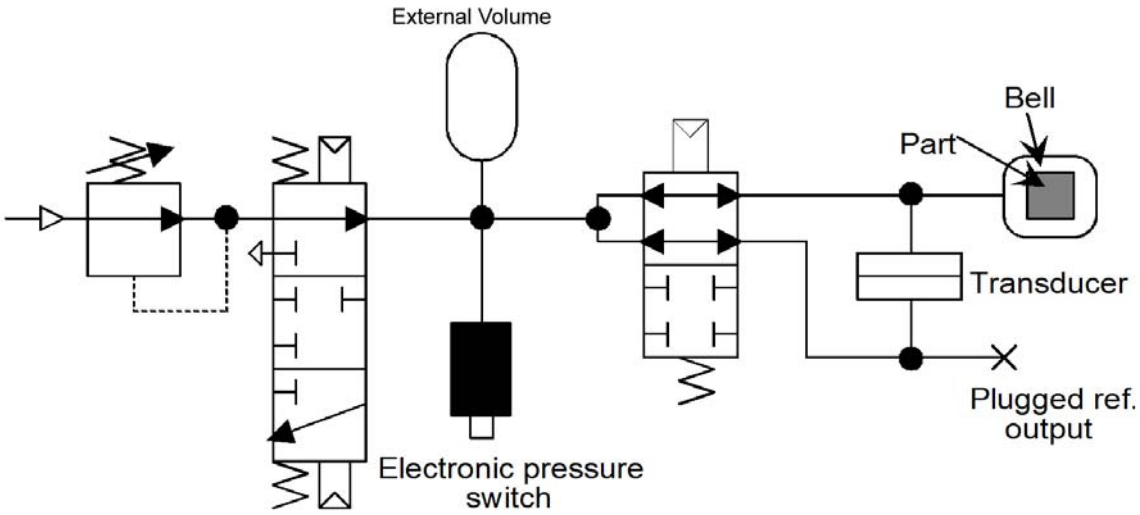
If the Reference value is set to 0, it assumes the same value as the Test with the opposite sign.



SEALED COMPONENTS

The sealed component mode is designed for leak measurement on sealed parts. These parts cannot be filled and it is impossible to measure the pressure drop to the atmosphere. The ATEQ's solution is to enclose the part in a sealed bell, to fill this bell and to measure the pressure drop in the part.

Principle



The external volume is connected to the pressurization port of the instruments valve.

1.1. VOLUME FILL

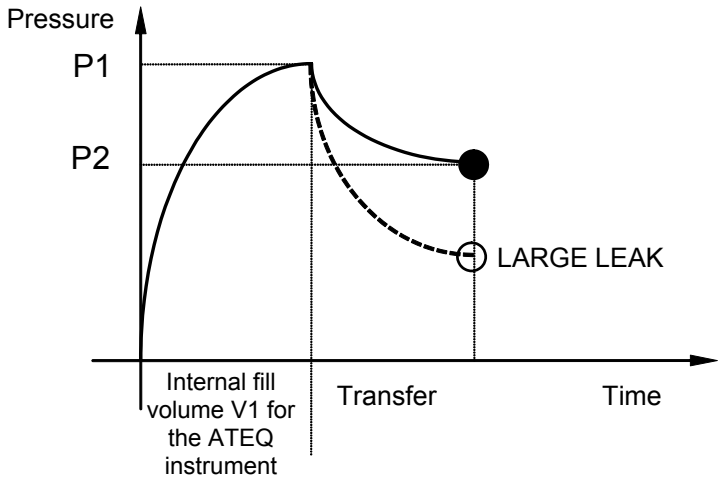
The external volume (V1) is filled to a pressure P1.

1.2. PART TRANSFER

The previously-filled internal volume (P1.V1) is opened to the chamber volume (V2), obtaining P2.V2. Through monitoring, the instrument detects large leaks. If the part has a large leak, the final pressure is lower than with a sealed part. Two limits (min. and max.) given as a percentage of the P1/P2 ratio are used to detect large leaks.

The solution is based on the relationship: **P1.V1 = P2.V2**

If the part is leaking, the final volume will be greater so the final pressure will be lower.



1.3. TEST MODES

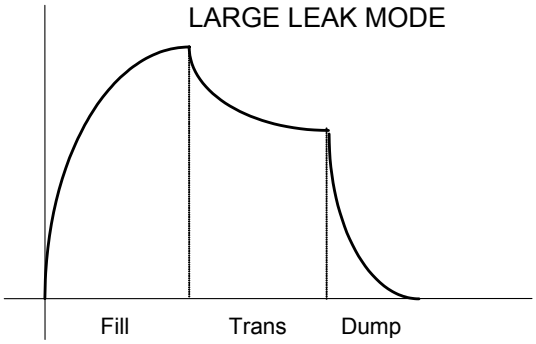
The **ATEQ** dedicated for sealed components can carry out the following tests:

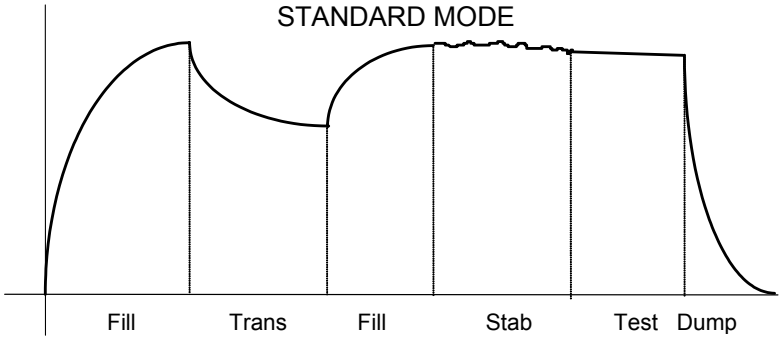
1. large leak test only,
2. large leak test followed by a finer leak test at a smaller pressure.

These two modes can be programmed from the instrument's front panel and are called:

- **Large leak** mode : Large leak test only,
- **Standard** mode : Large leak test, then small leak test.

Standard mode carries out a first cycle to identify large leaks and then adds a second cycle at nominal pressure to check for small leaks.





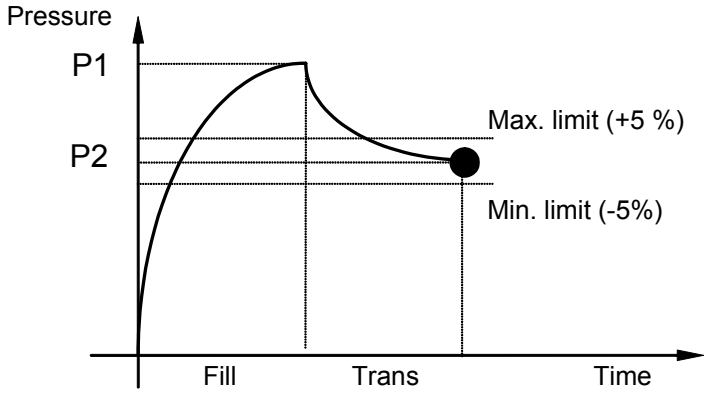
1.4. CARRYING OUT THE CYCLES AND SETTINGS

For the instrument to detect large leaks, two learning cycles must be carried out: one on a pass part and one on a fail part.

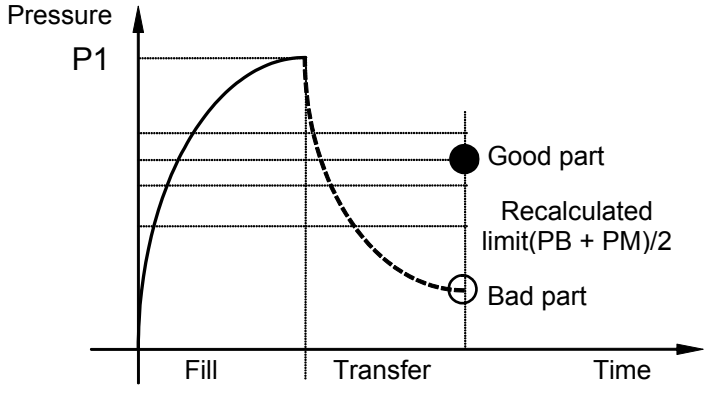
Learning cycles:

"PASS part" learning cycle: this cycle is compulsory before testing.

This P1 and P2 learning cycle automatically calculates and identifies the value of the pass part together with the maximum and minimum limits (+/- 5 % modifiable).



"FAIL part" learning cycle: this cycle is not compulsory. It calculates the actual minimum limit in relation to a fail part by taking an average between the value of a pass part and that of a fail part



The instrument allows for variations in input pressure. This is why the maximum and minimum parameters vary for each cycle.

At the end of a learning cycle (fill of the volume, volume transfer, dump) the **Pass part** and **End of Cycle** outputs are activated. If the volume is greater (large leak), the **Fail Part** and **End of Cycle** outputs are activated. If the volume is reduced (problem with the fixture) the **Alarm** and **End of Cycle** outputs are activated.

Learning cycles for pass parts and parts with a large leak are accessed through the main menu under special cycles.

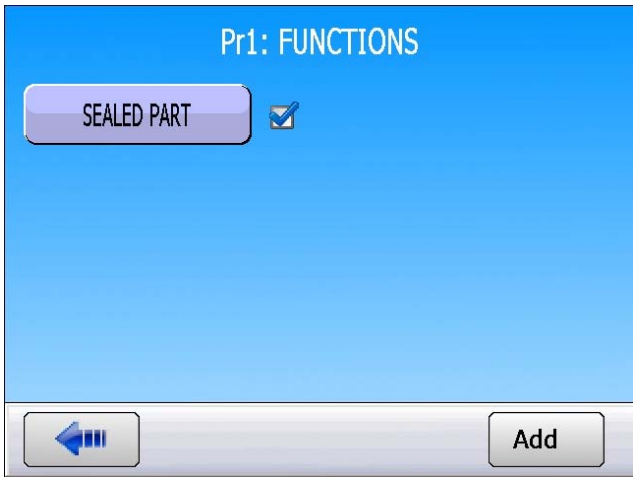
Test cycles cannot be carried out unless learning cycles have previously been carried out.

2. CONFIGURATION

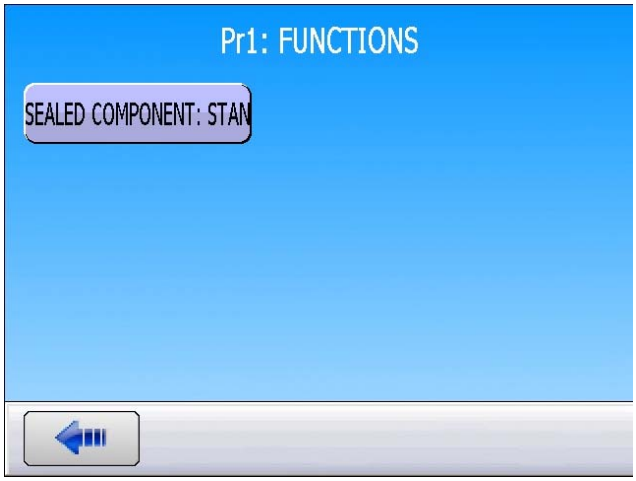
Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box  .

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

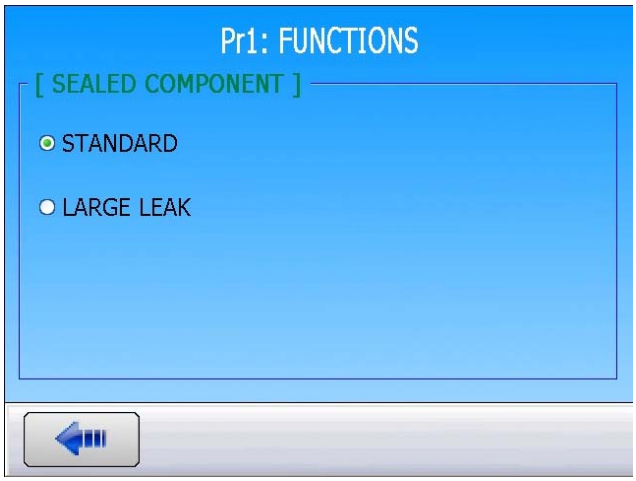
Configure the function, by pressing "**SEALED PART**".



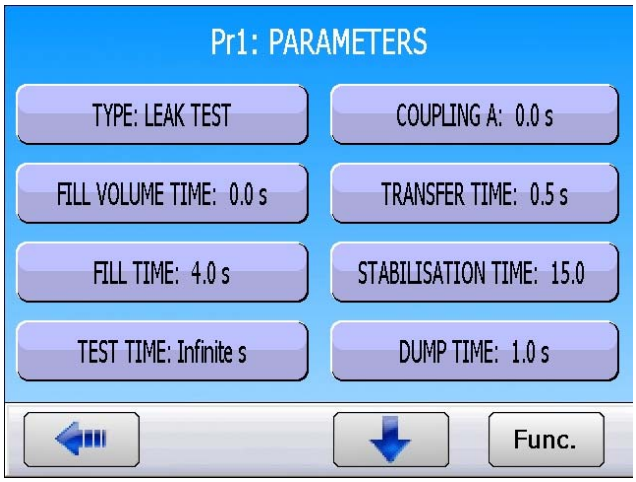
Select the sealed component test mode; press the "**SEALED COMPONENT: STAN**" button.



Select the mode: "**STANDARD**" or "**LARGE LEAK**".



When selected, two parameters are added to the program: "**Fill volume time**" and "**Transfer time**". Press each button to enter the relevant times.



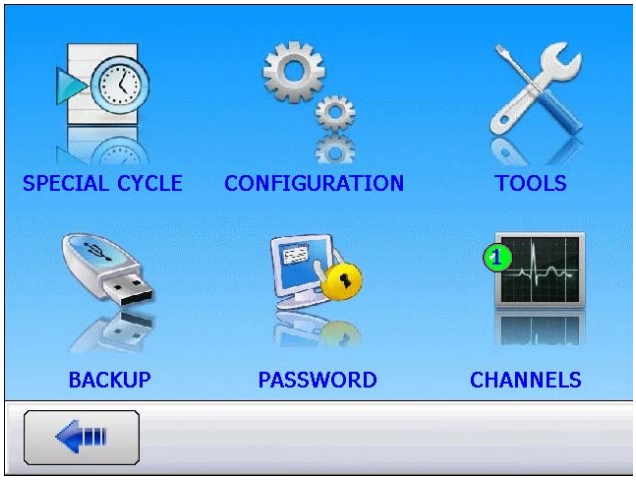
3. SEALED COMPONENT SPECIAL CYCLE LEARNING

For sealed components, learning cycles for Pass and Fail must be performed so that the instrument calculates the parameters.

As the learning cycles have not been carried out, the device cannot run test cycles.

- **Sealed PASS Part Learn:** This learning cycle calculates and identifies the value of the pass part together with the maximum and minimum limits (+/- 5 % modifiable). This cycle is compulsory for sealed component mode.
- **Sealed FAIL Part Learn:** this cycle allows learning the pressure parameters for a fail part by taking an average between the value of a pass part and that of a fail part. This cycle is not compulsory.

To run the special cycle, from the main menu, press "**SPECIAL CYCLE**".



The special cycle's menu is displayed, select "**Sealed PASS Part Learn**" cycle.

The cycle menu is displayed confirming the selection.

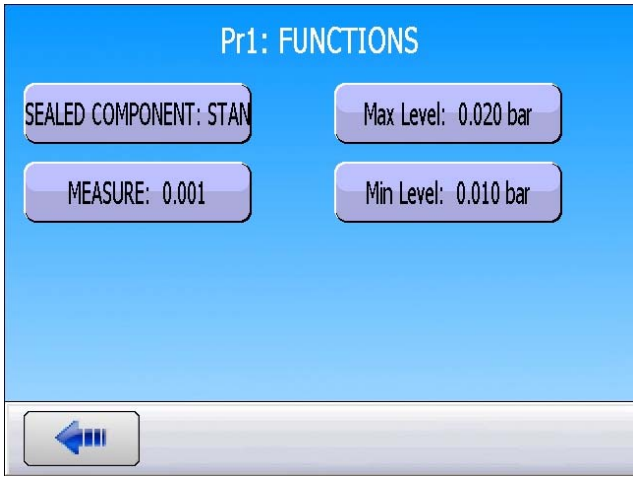
Ensure that a pass part is inside the chamber and run the special cycle by pressing the **START** key.

The learning cycle is running with the following steps **VOLUME FILL**, **VOLUME TRANSFERT** and **TEST**.

The final result must be **TEST = PASS**.

The finalised sealed component parameters can be reviewed and modified by the user in the "**FUNCTION/ SEALED COMPONENTS**" menu.

Do the same process for the **FAIL PART** learning cycle (this cycle is optional) with a fail part inside the chamber.



N TESTS

1. PRESENTATION

N test function: repetition of the test when the result is **near the reject level**.

It consists in conditionally repeating the test time to optimize the cycle time (rapid decision making on parts with large leaks or very good parts).

The bad parts (bad but close to the reject level) are subject to a longer test.

The instrument repeats the test time **3 times** maximum.

CYCLE PROGRESS:

Step 1: 0 < **Measured value** < Reject = **Good Part** (standard cycle).

Reject < **Measured value** < Tolerance **A** = **Run Test time Again**.

Measured value > Tolerance **A** = **Bad Part**.

Step 2: 0 < **Measured value** < Reject = **Bad Part** (standard cycle).

Reject < **Measured value** < Tolerance **B** = **Run Test time Again**.

Measured value > Tolerance B = **Bad Part**.

Step 3 (standard step) : 0 < **Measured value** < Reject = **Good Part** (standard cycle).

Measured value > Reject = **Bad Part**.

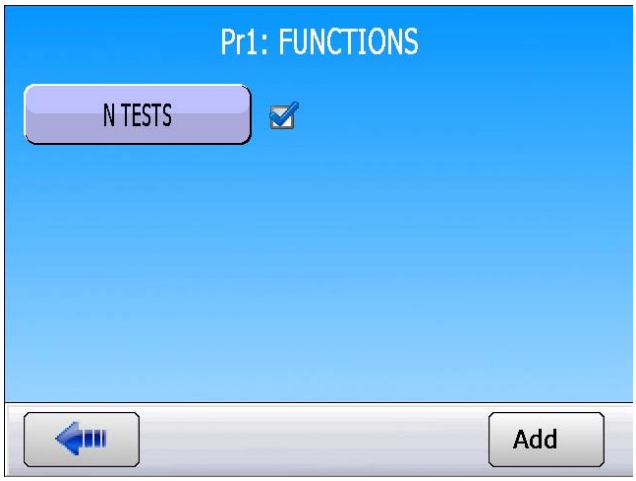
This function **cannot be enabled** in addition to the following functions: ATR; Operator Test; Burst Test; Temperature Correction; Blockage Test). During the CAL learning cycle CAL, this function is not activated.

2. CONFIGURATION

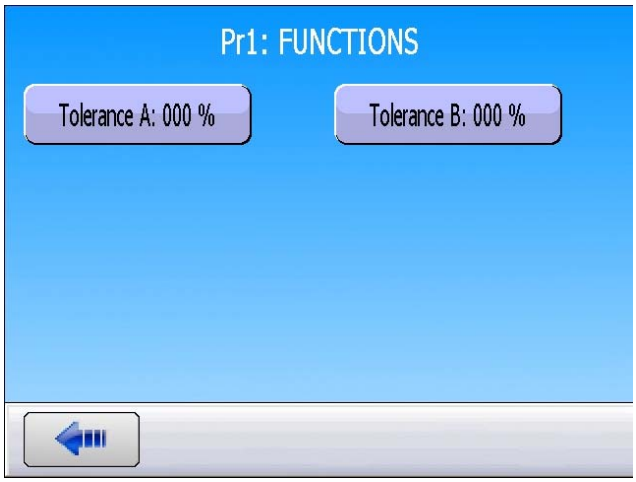
Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box  .

Press “**Add**” from the function menu to add the function if the button isn’t present on the "**Functions**" screen.

Configure the function, by pressing the “**N TEST**”.



Adjust the tolerances values **A** and **B** as a percent of the reject value.



REFERENCE VOLUME

1. PRESENTATION

The program uses the programmed test volume to measure the normal flow at the test port.

When the reference port volume is different the test port volume, it is possible to set parameters for the exact value of the reference volume to obtain correct measurements in the event of results displaying negative values.

This function may only be used with flow measurement units: cm^3/min, cm^3/s, cm^3/h, mm^3/s, ml/s, ml/min or ml/h.

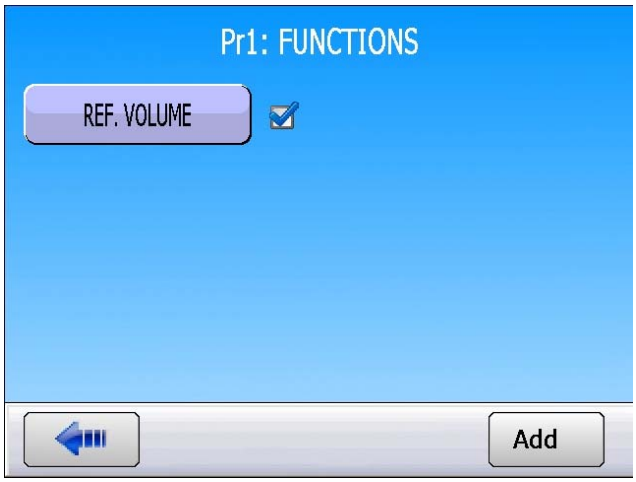
2. CONFIGURATION

Ensure that the reject unit is a flow unit (see above).

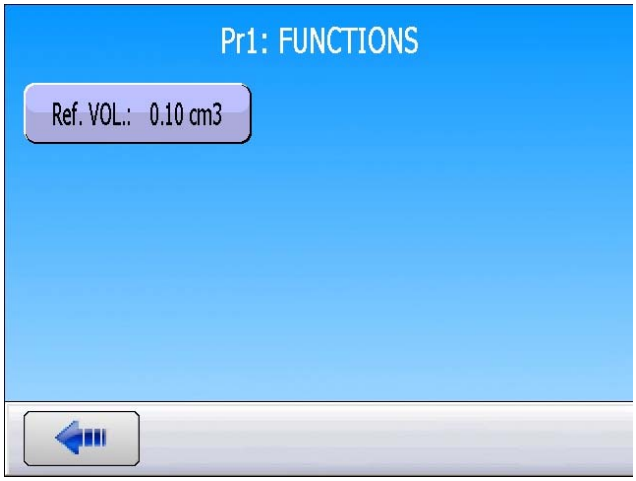
Press “**Add**” from the function menu to add the function if the button isn’t present on the "**Functions**" screen.

Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box  .

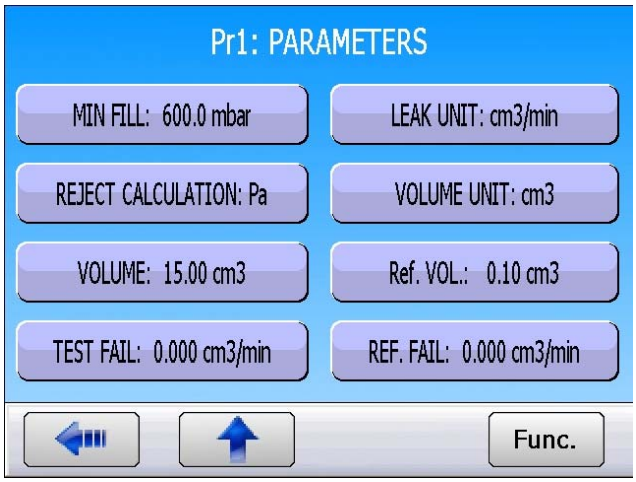
Configure the function, by pressing “**REF. VOLUME**”.



Press the button to adjust the reference volume value.



This parameter is also available in the program parameters by pressing "**Ref. VOL.**".



VOLUME COMPUTE

1. PRESENTATION

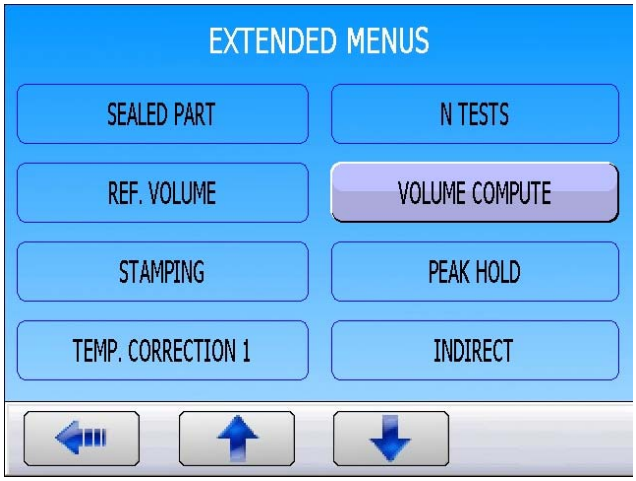
If a flow type unit is used, the parameter must be set for the total test volume. The volume compute function can be used to calculate it. The **End of Cycle** information is the only one capable of accepting a volume calculation request through the inputs and outputs.

Preparation of the instrument

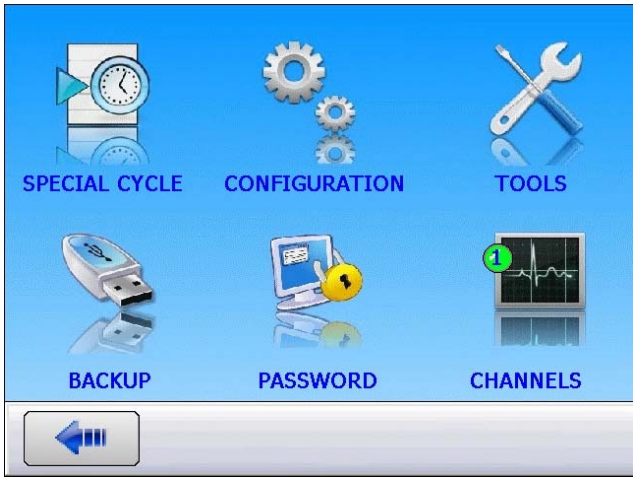
- ✓ Connect the instrument to a non leaking part.
- ✓ Connect a calibrated standard leak (orifice) to the quick disconnect on the instrument's measurement circuit.
- ✓ Run a special **Regulator** cycle to set the test pressure to the calibrated leak pressure.
- ✓ Carry out the special cycle **Volume compute** and enter the leak value.

2. CONFIGURATION

Ensure that the function is selected in the extended menu.



Back to the "**MAIN MENU**" and press "**SPECIAL CYCLE**" menu.



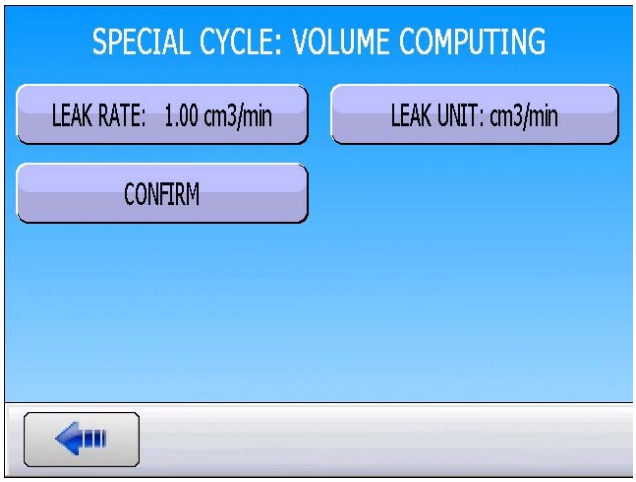
Select the "**Volume Computing**" special cycle.

The configuration menu for the volume computing is displayed. Enter the values of the master leak "**LEAK RATE**" and "**LEAK UNIT**".

When entered press on the "**CONFIRM**" button.

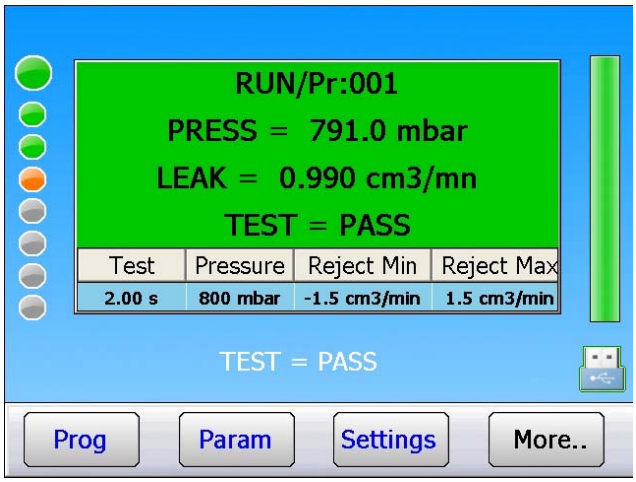
Plug a pass part on the test port and plug the master leak on the quick connector on the front face.

Then run the special cycle by pressing the **START** button.

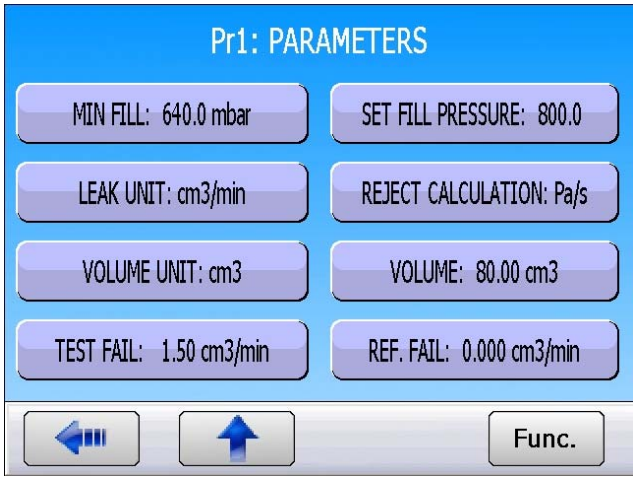


At the end of the test, the final result must be **PASS** and displays the master leak value (or a close value) if it's not the case, start again the process.

It's possible to adjust the volume value manually.



Back to the program parameters menu and check if the **VOLUME** value is modified and value is close of the plugged volume.



STAMPING FUNCTION

1. PRESENTATION

This option is used to activate a pneumatic output which marks the part (for example using a pneumatic cylinder).

Parameters can be set for the conditions and duration of marking.

This function is available either with an external output and either by a pneumatic output (one of the pneumatic outputs on the automatic connectors is used) and this option requires two electrical outputs:

- ✓ one internal for the pneumatic output cabling,
- ✓ one external for the "customer" cabling.

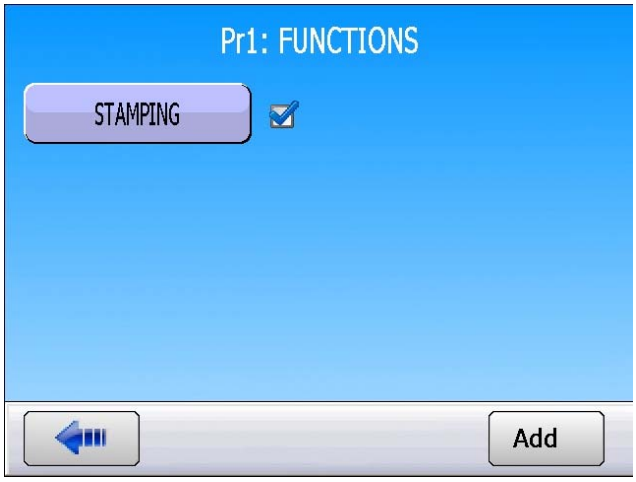
The output is activated at the end of test time for the programmed hold time.

2. CONFIGURATION

Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box  .

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

Configure the function, by pressing "**STAMPING**".



Adjust the stamping parameters.

DURATION = holding time.

Stamping conditions:

ALL RESULTS = all conditions,

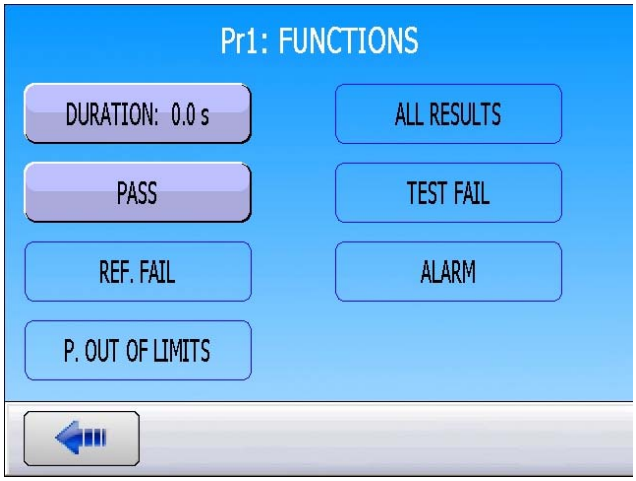
PASS = good part,

TEST FAIL = bad part on the test,

REF FAIL = bad part on the reference,

ALARM = alarm triggered,

P OUT OF LIMITS = pressure error.



TEMPERATURE CORRECTION 1

1. PRESENTATION

This function is used when temperature change within the part has a significant influence on the test result. This function will not work after part washers when any trace amounts of water exist in the part or if the fixture tooling causes volumetric changes in the test circuit during the correction measurement. The **TEMPERATURE CORRECTION** function enables the adjustment of the leak value of a part by measuring pressure variation caused by the changing temperature of the part.

There are two parameters to be set:

- ✓ The test time during which the study (learning) of this pressure should be carried out.

- ✓ The **percentage** of the variation to be taken into account.

Example: a pressure variation of 15 Pa during 2 test seconds, with a percentage of 60 %, will apply a correction of 9 Pa on each test result (15 x 60%= 9).

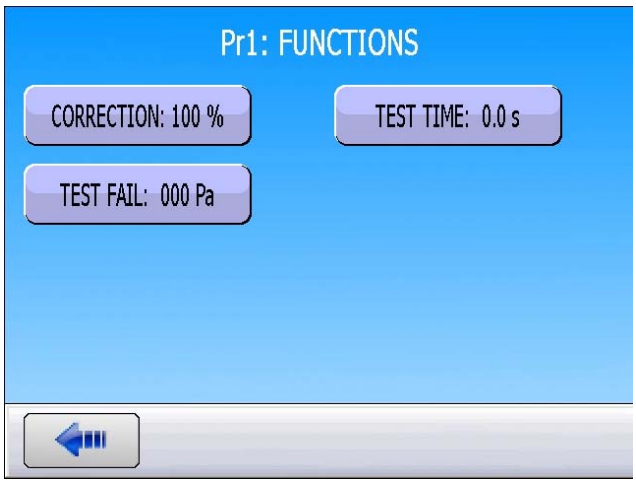
2. CONFIGURATION

Come back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box  .

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

Then configure the function, by pressing "**TEMP. CORRECTION 1**".

Then adjust the temperature correction parameters.



INDIRECT OR RECOVERY MEASUREMENT

1. PRINCIPLE

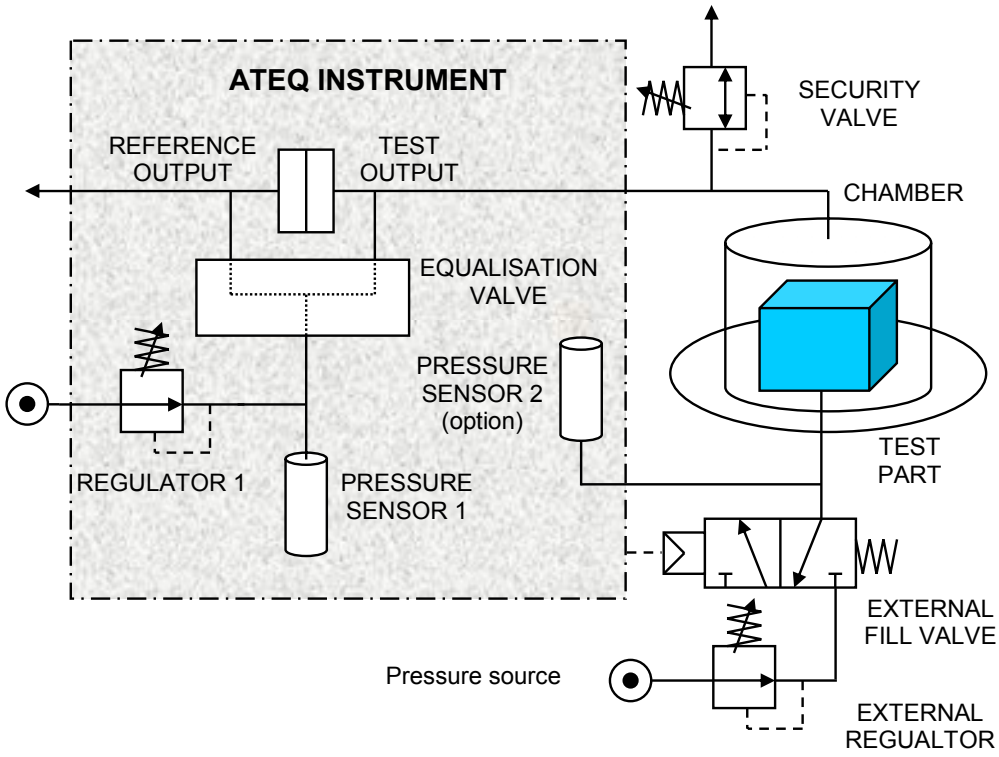
The test part is pressurized in a sealed chamber. The measurement circuit of the **ATEQ** instrument is connected to this chamber. The part is pressurized through the use of a second external regulator; the chamber is pressurized at low pressure via regulator 1 internal to the instrument.

If the part leaks, the pressure in the chamber will increase and will be detected by the **ATEQ** instrument.

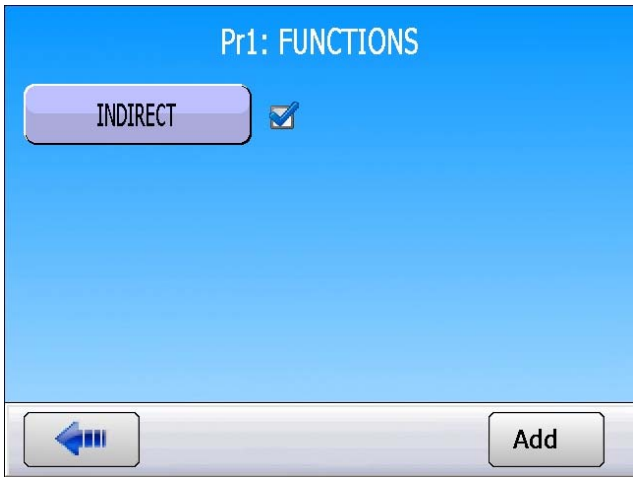
This method enables the testing of certain parts at high pressure whilst avoiding the associated problems.

The **ATEQ F** only controls and measures the pressure variation inside the chamber. In the event of a large leak, an (optional) electronic monitoring of the pressure in the chamber will allow the securing of the instrument.

The pressure monitoring is performed by an optional additional pressure sensor.



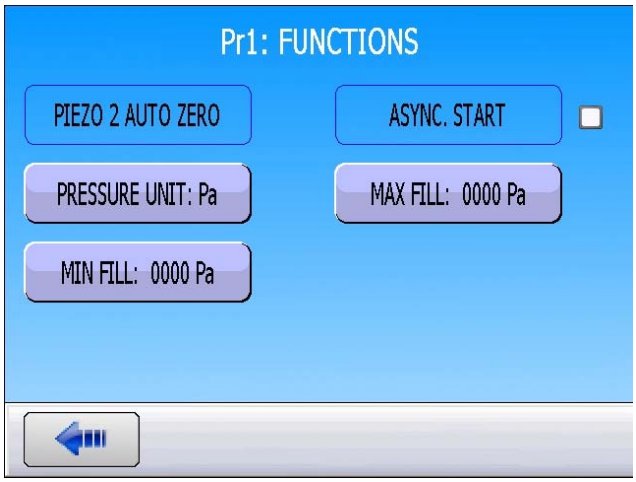
2. CONFIGURATION



Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box .

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

Configure the function, by pressing "**INDIRECT**".



Adjust the indirect mode parameters.

PIEZO 2 AZ: enables the setting up of and auto zero on the second pressure sensor.

*For the **Piezo 2 auto zero** function, if the high pressure sensor is not fitted with an Auto Zero valve, this parameter must be set to **"NO"**.*

The "**Min Fill**" and "**Max Fill**" parameters are the monitoring levels for the chamber.

The "**Pressure Unit**" parameter is the unit for the pressure applied to the chamber.

During the Fill and Stabilization steps, the two pressures (chamber and test part) are displayed. During the Test step, the leak is displayed.

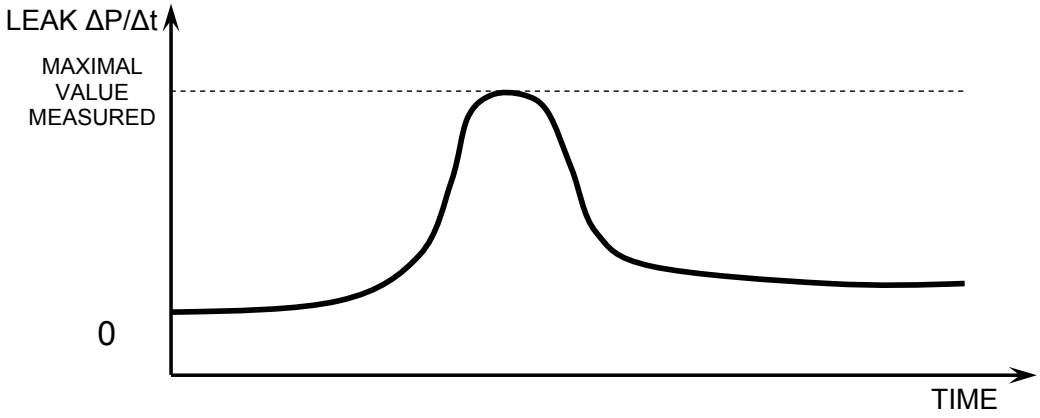
***Note**: the pressurization (low pressure) of the chamber enables the monitoring of the integrity of the measurement circuit and chamber.*

PEAK HOLD

1. PRINCIPLE

The peak hold mode is used to measure a part dynamically. The instrument measures the leak, which can change at a given moment during the test. The instrument stores the greatest pressure drop (ΔP/Δt) and then displays it at the end of the test.

This function is important in circumstances where the test part changes during the test cycle. The system checks the part for leaks in ΔP/Δt throughout the change and the leak is measured continuously. At the end of the test cycle, the instrument has stored the maximum instantaneous leak (the greatest leak) recorded during the test and displays the result.

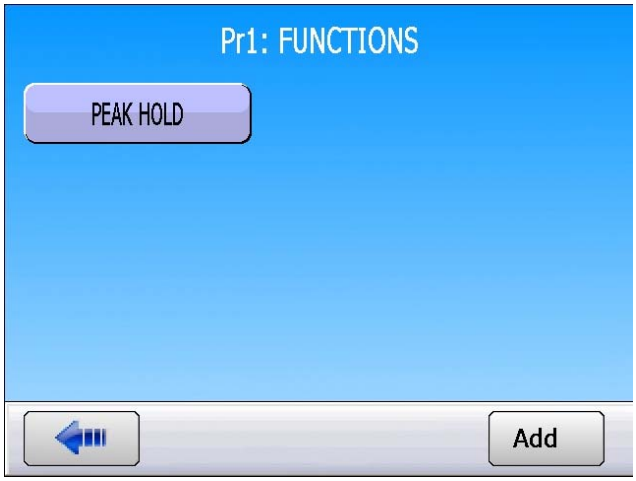


Peak measurement mode only works in ΔP/Δt and excludes the use of ATR mode.

2. CONFIGURATION

Validate the function in the program by pressing "**PEAK HOLD**".

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.



SIGN

1. PRESENTATION

The **SIGN** function enables reversing the sign (positive or negative) of the measurement result. This function is useful in case of a vacuum application or indirect measurements as it allows the display of a positive leak result.

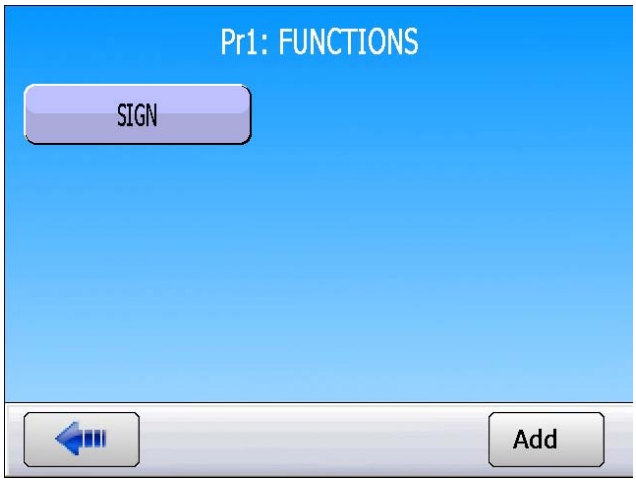
2. CONFIGURATION

Validate the function in the program by pressing the button.

Press “**Add**” from the function menu to add the function if the button isn’t present on the "**Functions**" screen.

The "**Sign**" function when validated, changes the leak value sign.

Example: if the result is -004 Pa, the display will be 004 Pa and vice versa.



FILTER

1. PRINCIPLE

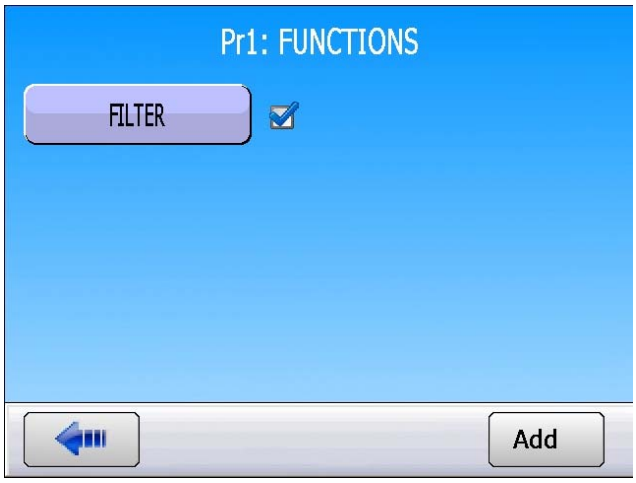
This function enables the slowing down of the sampling speed, by performing an average over the set measurement time; this makes the displays value more readable during quickly changing measurements value.

2. CONFIGURATION

Go back to the "**FUNCTIONS**" menu of the program, validate the function in the program by checking the box  .

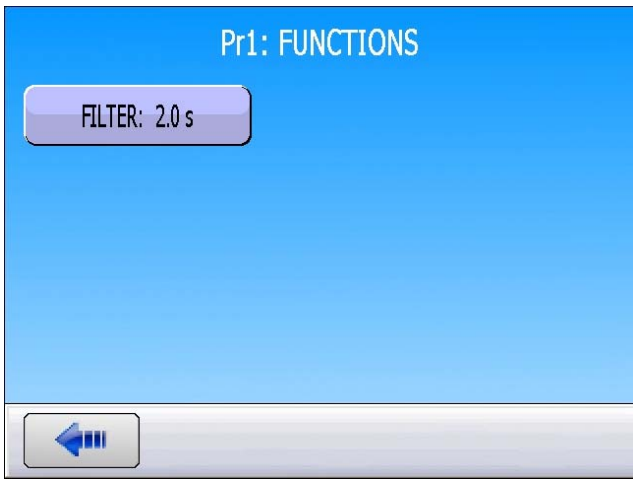
Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

Then configure the function, by pressing the "**FILTER**" key.



Adjust the Filter (time) parameter.

FILTER time: maximum duration of the averaging of the measured result.



SPECIAL CYCLE

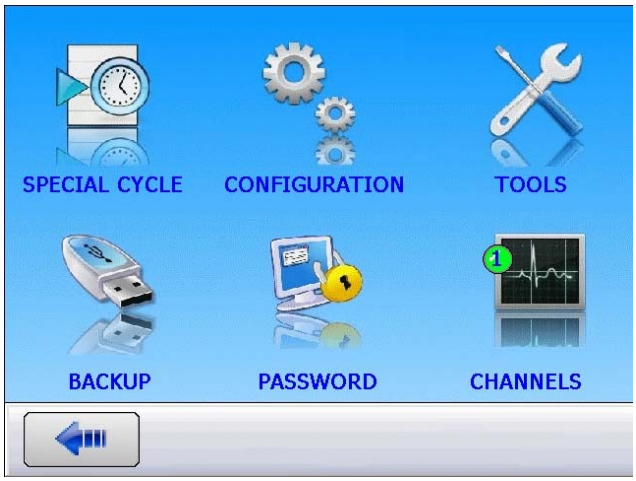
1. SPECIAL CYCLES AVAILABLE

The following list shows all the special cycles which are possible: the availability will vary depending on what is checked in the extended menus or according to the optional features built into the instrument.

Special cycle	Function
➢ none:	No special cycle selected.
➢ Regulator 1 adjust:	Cycle to set regulator number 1.
➢ Regulator 2 adjust:	Cycle to set regulator number 2.
➢ Infinite fill:	Cycle to pressurize test part under for an infinite time.
➢ Piezo auto zero:	Cycle to perform a zero of the pressure transducer and re-linearization of the electronic regulator.
➢ Sealed component learning, pass part:	Cycle to learn the pressure parameters for a good part in case of a sealed component measurement. This learning cycle is compulsory.
➢ Sealed component learning, fail part:	Cycle to learn the pressure parameters for a bad part in case of a sealed component measurement.
➢ Calibration check by volume:	Cycle started manually by the operator to carry out calibration check by volume with a good part.
➢ CAL learning:	Cycle to carry out learning in calibrated Pascal or Pascal/sec mode on a known standard leak.
➢ CAL check:	Cycle for auto-diagnostics in calibrated Pascal mode (see previous function) within a tolerance determined by percentage limits.
➢ ATR learning cycle:	Cycle to enter the ATR parameters if they are unknown. This should be performed after each start-up of the instrument, or after a long period with no test cycles.
➢ Volume compute:	Cycle to estimate the volume of the test circuit.

2. RUN A SPECIAL CYCLE

To run a special cycle, go to the main menu and select "**SPECIAL CYCLE**".



Select the special cycle from the list.

The device returns to the "**Cycle**" menu displaying the choice.

Press the ▷ key to run special cycle.

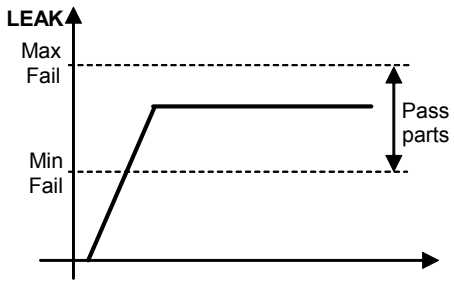
To stop, press the □ key.

In some cycles the stop is automatic.

FLOW LEVEL FUNCTION

The flow level function adds in the parameters a minimum fail parameter.

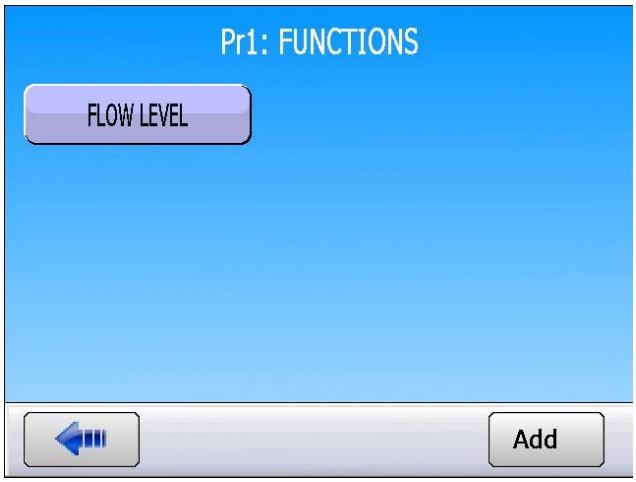
If the measurement result is below this level the part is declared fail.



Flow level procedure:

Validate the function in the program by pressing "**FLOW LEVEL**".

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.



Then the "**Min Fail**" parameter appears.

*As the "**Flow Level**" function is activated, the "**Reference Fail**" parameter disappears.*

NO NEGATIVE

1. PRINCIPLE

The **No Negative** function the measurement display becomes zero when the result is negative.

This function is useful when negative measurement results shouldn't be displayed to the user or sent to the PLC.

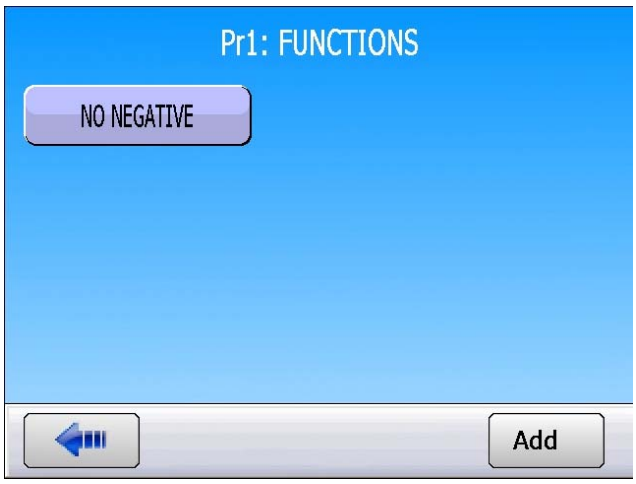
2. CONFIGURATION

Validate the function in the program by pressing "**NO NEGATIVE**".

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

The "**No Negative**" function, when validated displays the value 0 is the result is negative.

Example : if the measurement result is -014 Pa, then the display will be 000 Pa.



ABSOLUTE

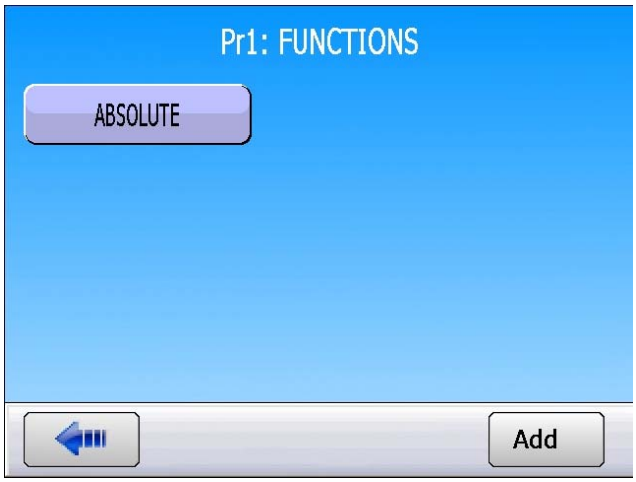
The **Absolute** function displays the absolute value of the result. This function is useful when negative measurement shouldn't be displayed to the user or sent to the PLC.

1. CONFIGURATION

Activate the function in the program by pressing the button. The "**Absolute**" function, when validated, displays the absolute value of the result.

Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.

Example: it the result is -014 Pa, the instrument will display 014 Pa.



DISPLAY MODE

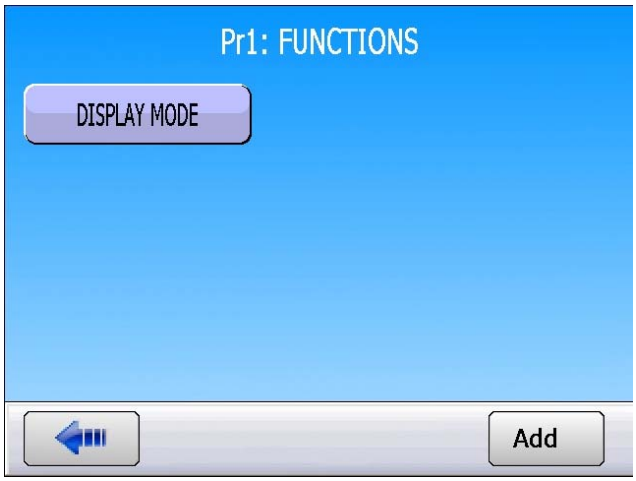
1. PRINCIPLE

The **DISPLAY MODE** function allows adjusting the number of decimal displayed by the instrument.

2. CONFIGURATION

Validate the function in the program by pressing “**DISPLAY MODE**”.

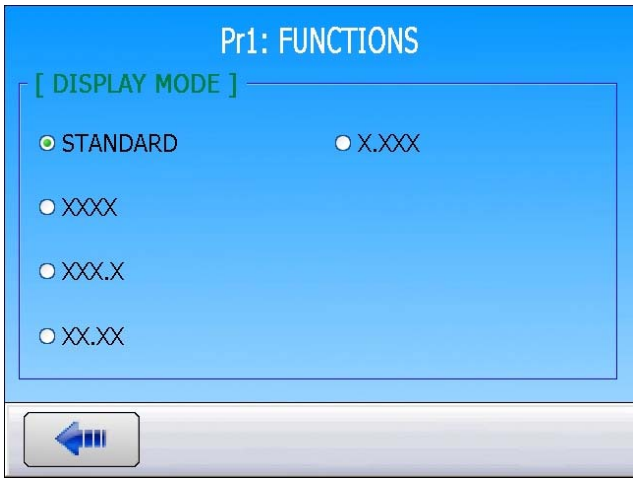
Press “**Add**” from the function menu to add the function if the button isn’t present on the "**Functions**" screen.



The window for the selection of the display format appears.

Select the preferred format.

*In the "**Standard**" mode, the instrument displays the result with the most optimized format.*



COUNTDOWN

1. PRINCIPLE

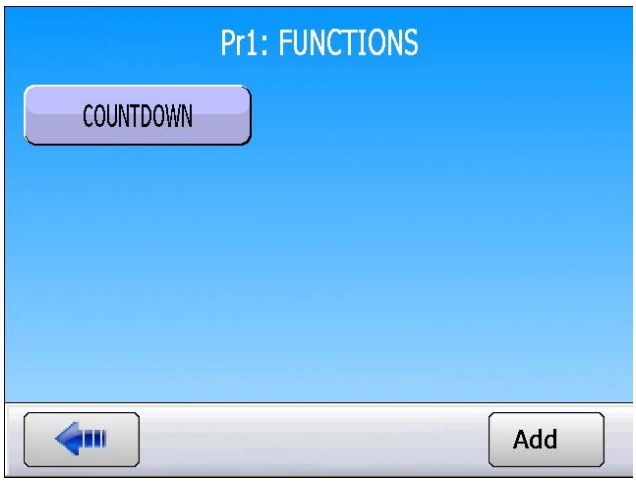
The **COUNTDOWN** function displays for each steps the remaining time to the next one.

This function is useful to inform the user of the remaining time.

2. CONFIGURATION

Validate the function in the program by pressing “**COUNTDOWN**”.

Press “**Add**” from the function menu to add the function if the button isn’t present on the "**Functions**" screen.



Back to the "**Cycle**" menu, at each step, Fill, Stabilization, etc. the remaining time is displayed in seconds for the current step.

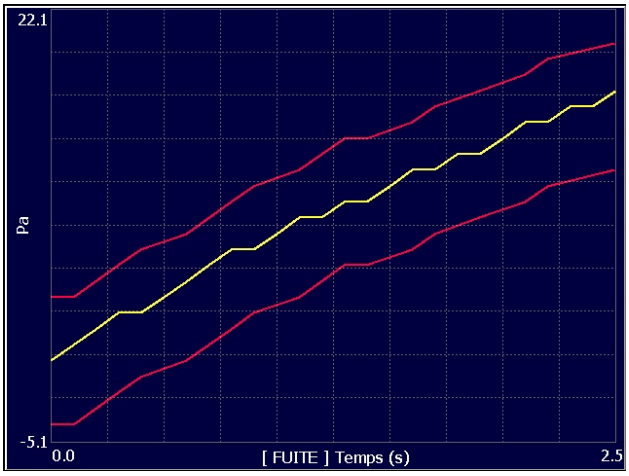
In this example, it remains 5 seconds before next step.

GABARITS

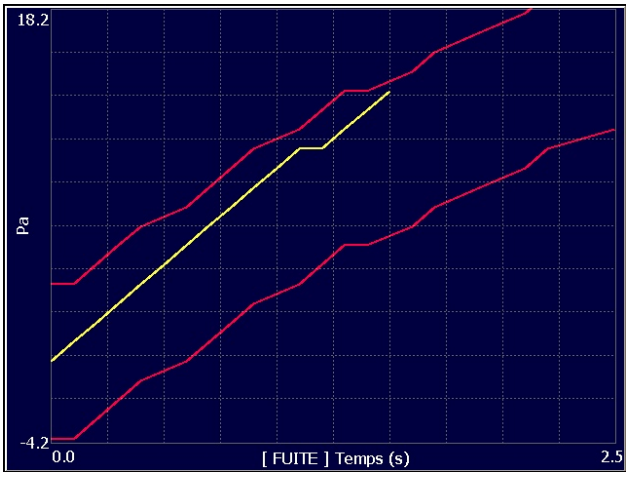
The gabarits are upper and lower curve tolerances around each pressure or leak curves. This is to monitor the pressure or the leak all long the test time measurement.

The curve created during the measurement must be between the upper and lower curve to be a pass part.

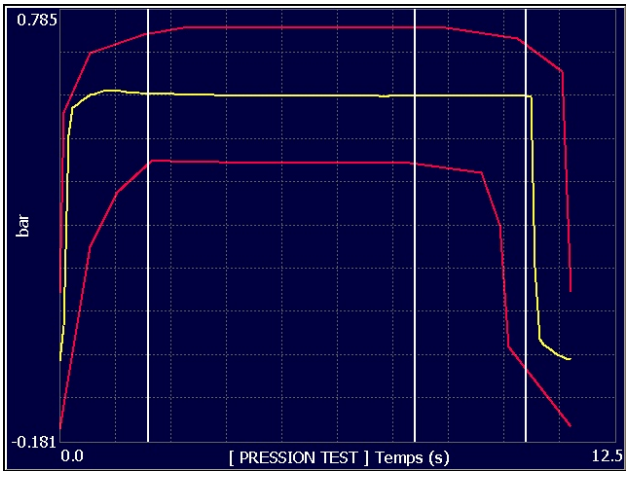
Example with a pass part (leak curve):



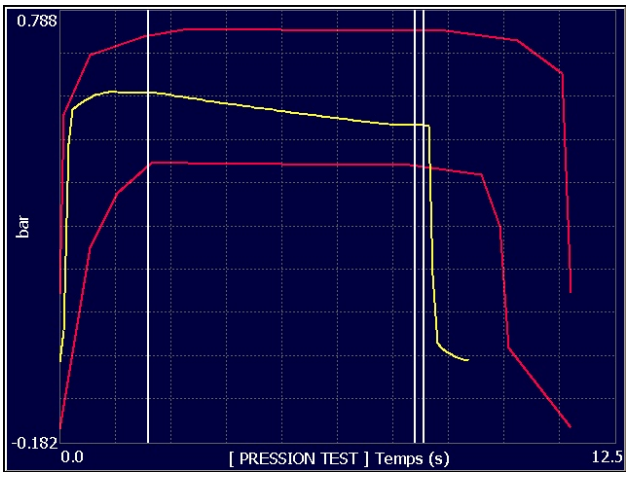
Example with a fail part (leak curve):



Example with a pass part (pressure curve) :



Example with a fail part (pressure curve) :



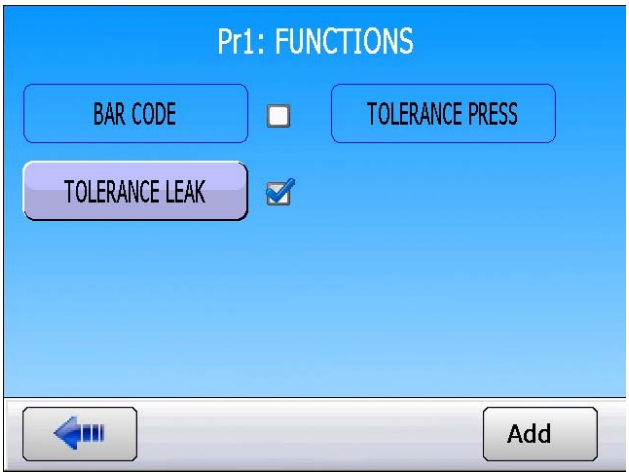
1. GABARITS ESTABLISHMENT

In first, do a measurement with a pass part or a master part. This is to have one or the curve(s) with the pass part characteristics or of the master part.

The following example will be with a leak measurement curves, the process for the pressure curve is the same.

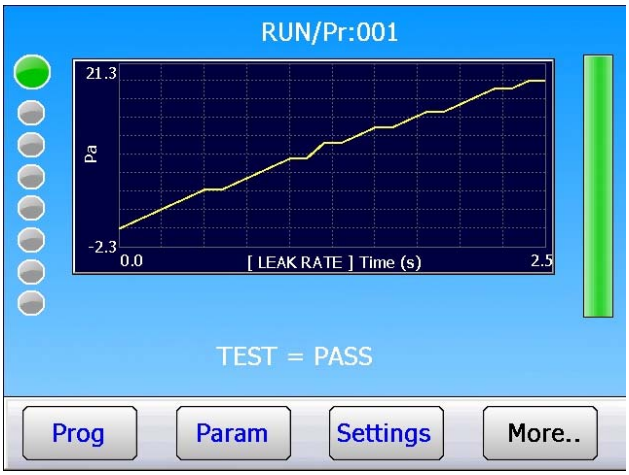
The two curves monitoring, pressure and leak can be simultaneous.

From the program **FUNCTIONS** menu, activate the "**TOLERANCE LEAK**" function by checking it  .

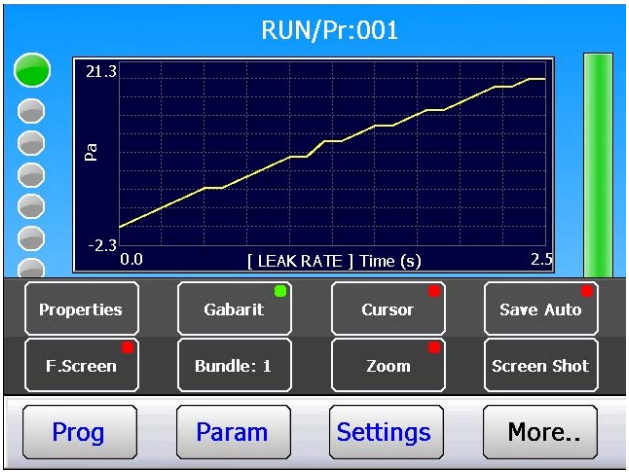


Back to the cycle screen and select the screen which displays the leak curve.

Carry on a cycle measurement with a pass part or a master part.

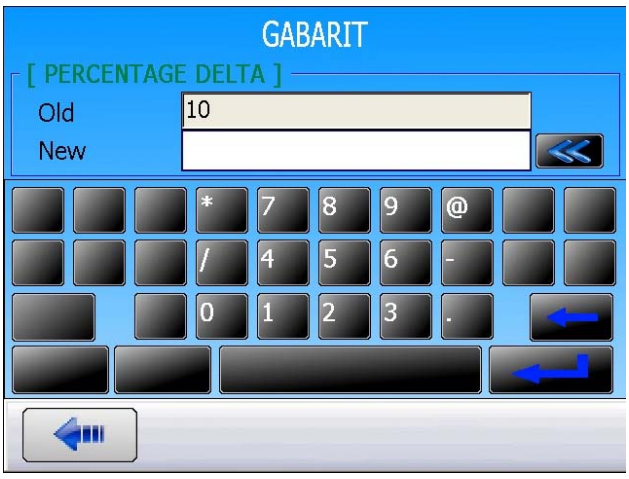


Once the measurement cycle is ended, press on the **More..** key to make appear the extended keyboard and then press the **Gabarit** key.

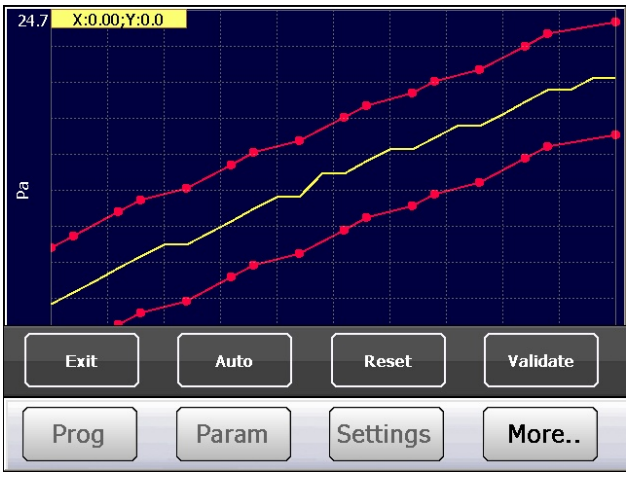


The editing screen for the gabarits is displayed. Press on the **Auto** key to automatically calculate the points for the limits curves.

Choose the percent value for the upper and lower (tolerance) around the curve (default value +/- 10%) and then validate.



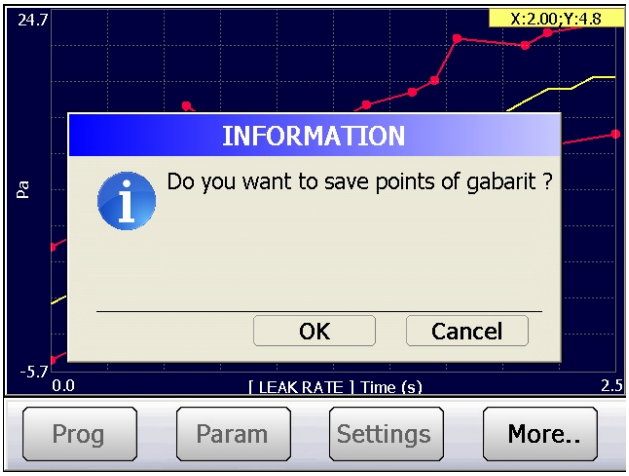
The limits curves are created around the measurement curve.



At any time the curves can be modified by moving the points, click and hold the point to move it until the hoped destination.

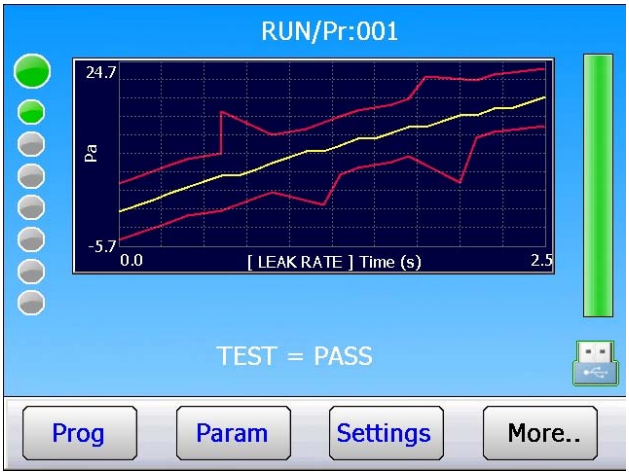
Press on **Validate** key to save the limits curve. The device ask to confirm, press on **OK** .

The **Reset** key is for reset all the curves limit points.



Press on the **Exit** key to get out of the limits curves edition menu.

The device can run tests cycles.



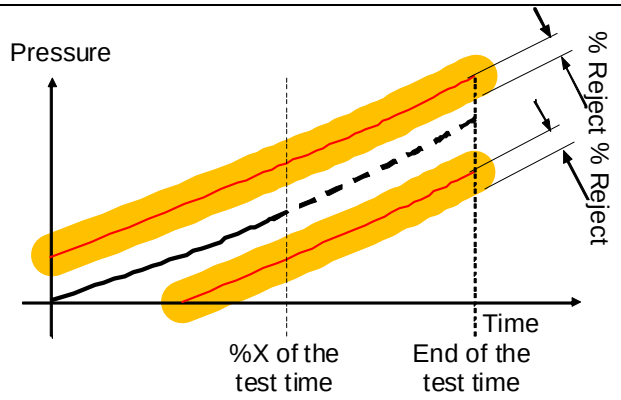
1.1. OPTIONS OF THE FUNCTION "TOLERANCE LEAK"

1.1.1. Predicting a leak at the end of test time

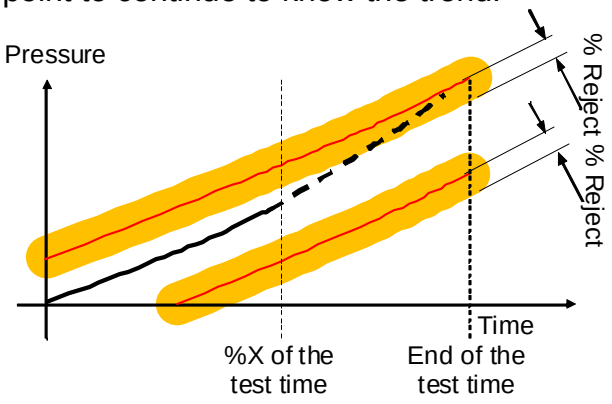
This option allows anticipating the final result and so decreasing the test time if the result is sure.

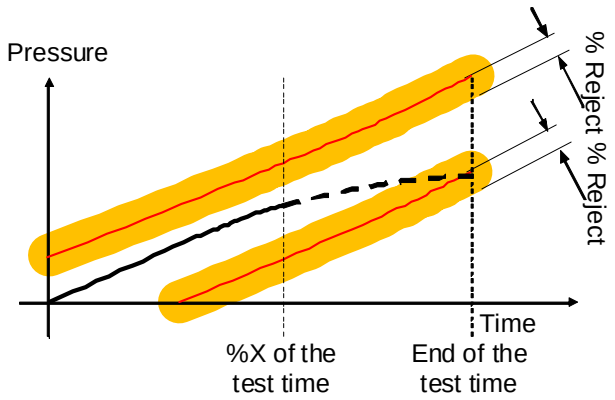
At X% of the test time, the instrument calculates the slope of the curve, and then determines if the curve stays on this slope and still be within the upper and lower curve limits at the end of the test time.

Part pass calculation in predicting, test cycle stop.

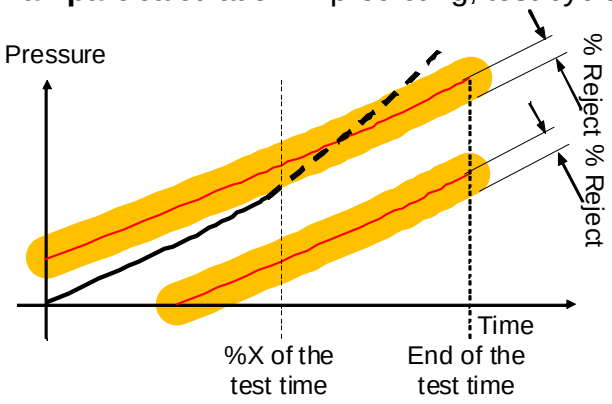


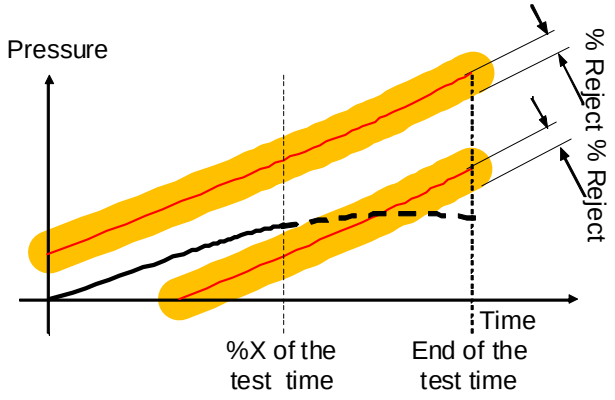
Uncertain calculation of the predicting part, no decision, the calculation will be done on the next point to continue to know the trend.





Fail part calculation in predicting, test cycle stop.



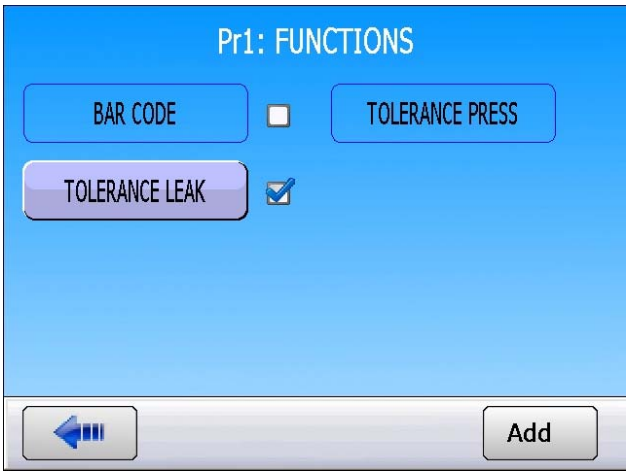


Restrictions:

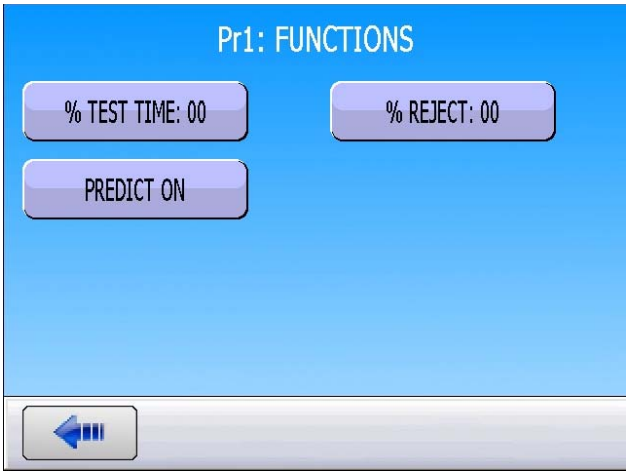
- The number of points of the upper and lower tolerances is equal to 16; do not work with a number lower than 16 points.

- The leak unit must not be a flow unit.

- Validity of calculate slope = coefficient of linearization square > 0.92.



By pressing the TOLERANCE LEAK key, three parameters appears:



% TEST TIME: 00 : Percent value of the test time for the beginning of the calculation.

% REJECT: 00 : Percent value of the uncertainty for the new calculation.

PREDICT ON : Activation of the function of result predicting.

DUMP OFF

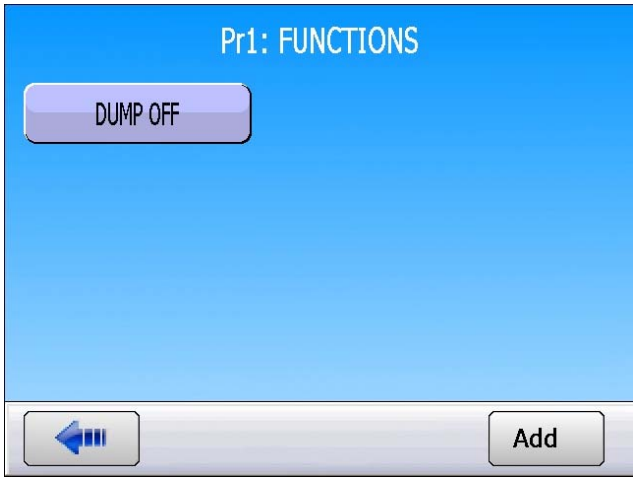
The "**Dump Off**" function when validated, cancels the dump step in the program parameters. The measurement cycle will run without dumping the test and reference parts.

The Test and Reference circuits and the parts connected to the instrument will stay pressurized.

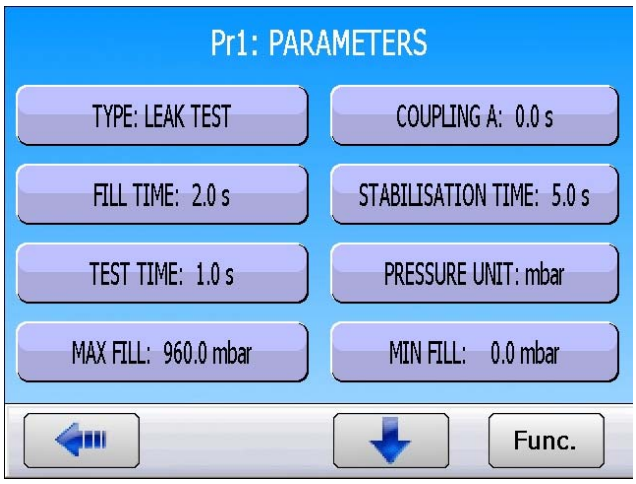
1. CONFIGURATION

Validate the function in the program by pressing "**DUMP OFF**".

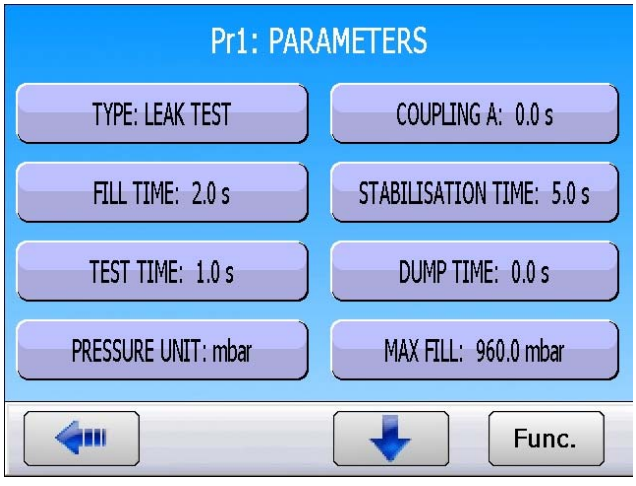
Press "**Add**" from the function menu to add the function if the button isn't present on the "**Functions**" screen.



When this function is validated, the dump step disappears from the test program parameters.



If the function is cancelled, the dump parameter in the program will have the value 0 (zero). It must be set with its new value.



SERVICE SPECIAL CYCLES

1. AVAILABLE SERVICE SPECIAL CYCLES

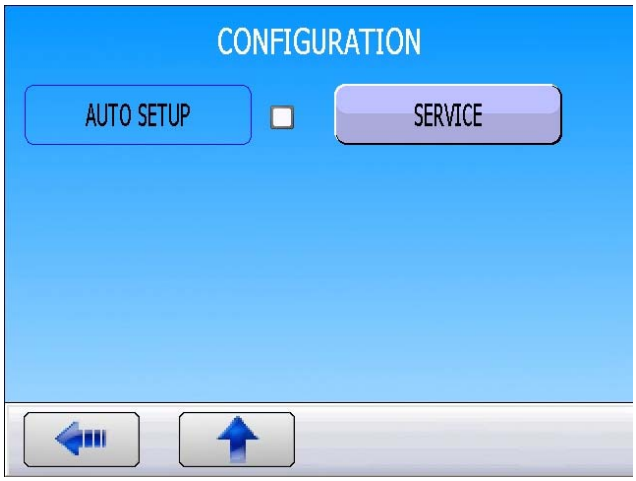
These special cycles enable the operator to adjust the pressures and service the valves and pressure sensors.

Special cycle	Function
➢ Calibration of pressure sensor 1 on regulator 1:	This cycle enables the calibration of the pressure sensor 1 with the pressure adjusted on regulator 1. A pressure gauge can be connected to the front panel quick disconnect, the test or the reference port. The display on the instrument can be compared to the pressure gauge.
➢ Calibration of pressure sensor 1 on regulator 2:	This cycle enables the calibration of the pressure sensor 1 with the pressure adjusted on regulator 2. A pressure gauge can be connected to the front panel quick disconnect, the test or the reference port. The display on the instrument can be compared to the pressure gauge.
➢ Calibration pressure sensor 2:	Identical to the previous special cycle with pressure sensor 2 if installed in the instrument.
➢ Differential sensor calibration:	This cycle enables the calibration of the differential sensor. It is important to ensure that the test pressure is 0.
➢ Sensor status :	This cycle enables the display of the measurement points for the sensors installed in the instrument: the differential sensor and the piezo pressure sensors.
➢ Valve Auto-test:	This special cycle enables the checking of the valve and the detection of a leak defect if there is one.

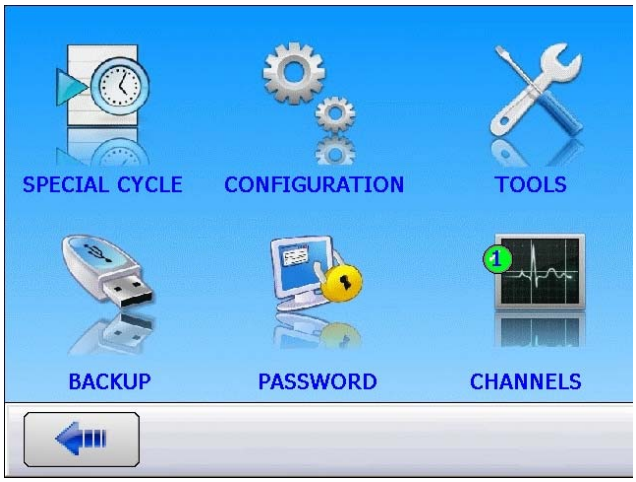
To run a special cycle, select it in the **Special Cycles** menu, then press the  button. To stop it, press the  button. In some cycles the stop is automatic.

1.1. ACTIVATION

To make appear the services special cycles, from the **CONFIGURATION** menu, press the "**SERVICE**" button.



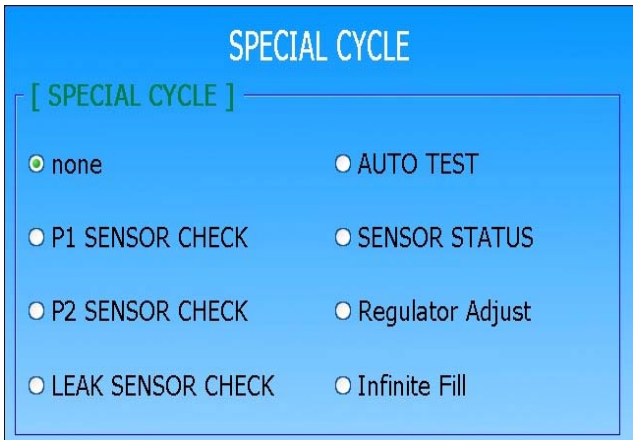
Back to the main menu, and select the "**SPECIAL CYCLE**" menu.



The service special cycles are displayed.

Select the special cycle to be run.

The cycle window appears; press the **START** key to run the special cycle.



1.2. STARTING THE SERVICE SPECIAL CYCLES

The service special cycles enable running predefined cycles to diagnose different system of the instrument (pressure sensors and valves).

1.2.1. Sensor calibration

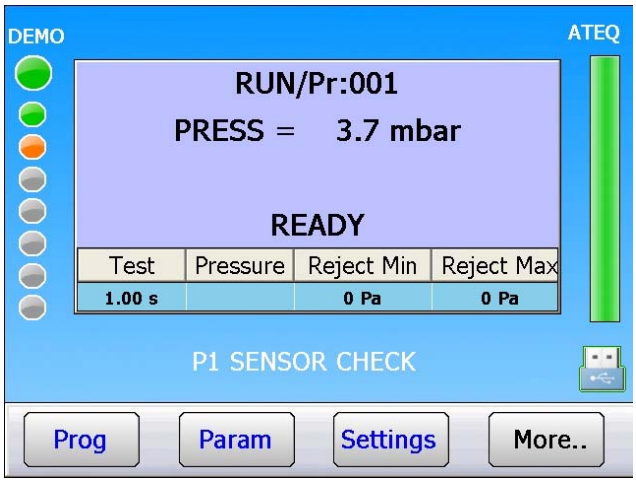
These special cycles enable the checking of the pressure and differential pressure sensors, they therefore enable the display of the values measured and their comparison with calibrated master leaks connected to the test outputs of the instrument.

1.2.1. 1) Piezzo sensors

This process is the same for the following special cycles: **P1 REG1 CHECK**, **P1 REG2 CHECK** and **P2 SENSOR CHECK**.

Press the **Start** key to run the special cycle.

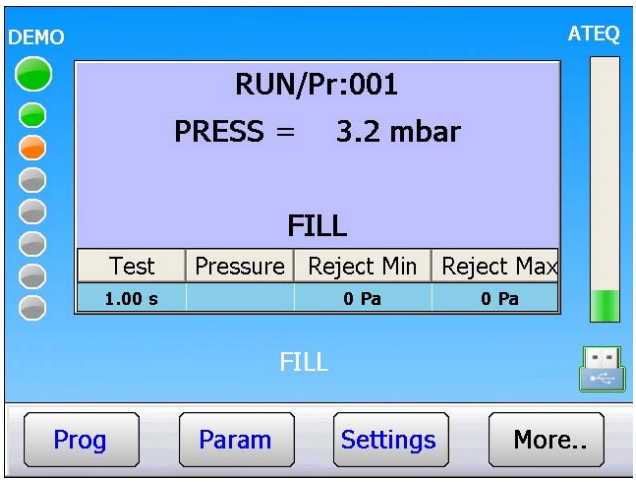
***Note**: the selected special cycle name is displayed onto the screen.*



The device carries out an infinite fill and displays the current pressure.

The sensor calibration is possible.

Stop the special cycle by pressing the **RESET** key.



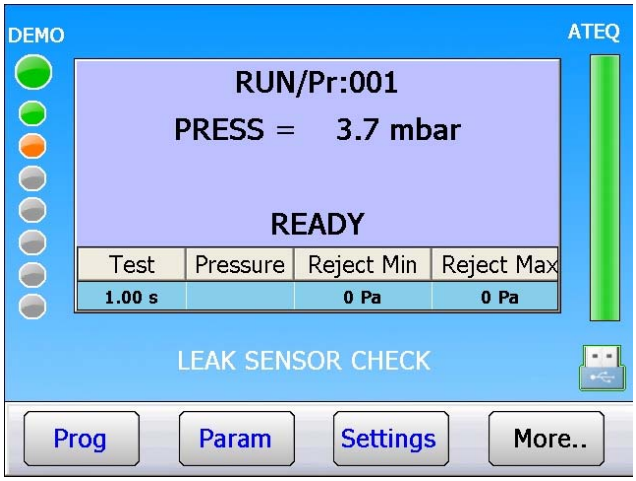
1.2.1. 2) Differential sensor

This cycle enables the calibration of the differential sensor. It is important to ensure that the test pressure is 0.

The device returns to the "**Cycle**" menu and displays the special cycle selection.

Press the **Start** to run the special cycle.

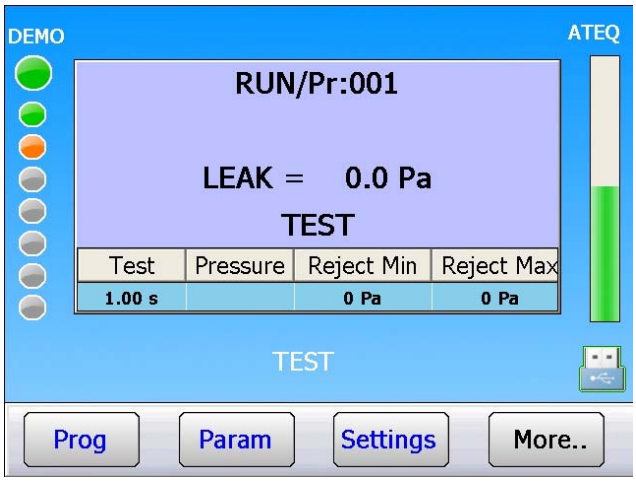
***Note**: the selected special cycle name is displayed onto the screen.*



The device carries out a dump, checks if the pressure is 0 then carries out a test and displays the measured pressure.

The verification of the sensor can start.

Stop the special cycle by pressing the **RESET** key.



1.2.2. Valve Auto-test

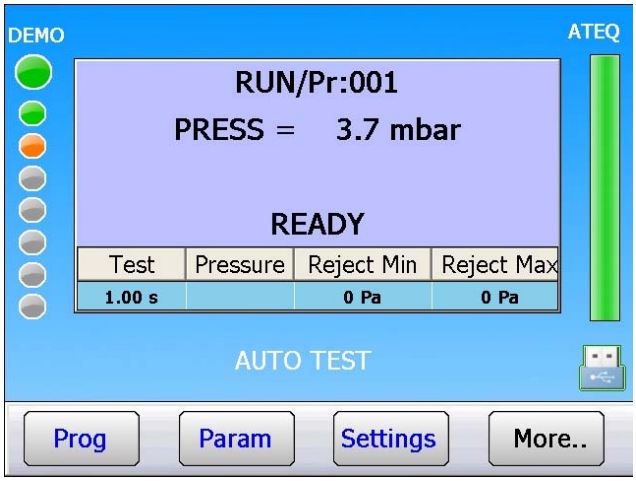
The **AUTO-TEST** cycle must only be carried out with caps on the test and reference port.

The test parameters are automatically configured according to the active program (test pressure) and the characteristics of the instrument.

The device returns to the "**Cycle**" menu and shows the special cycle selection.

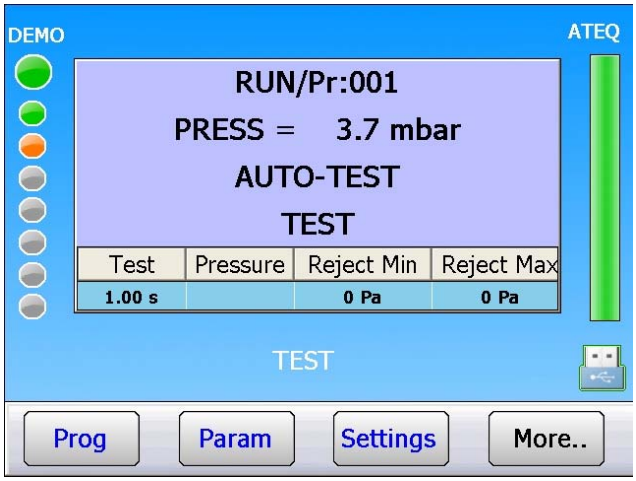
Press the **Start** to run the special cycle.

***Note**: the selected special cycle name is displayed onto the screen.*



Three complete cycles, Fill; Stabilization, Test and Dump are carried out.

During the Auto-test, the device displays the measured pressure.

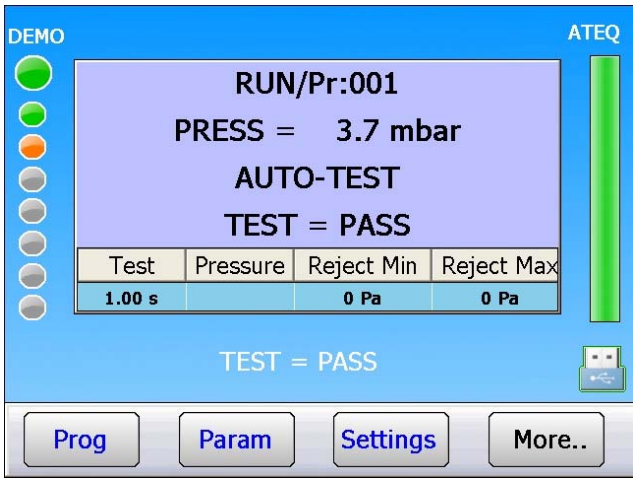


The cycle stops automatically, if the valve is functioning properly, the instrument displays "**TEST = PASS**".

If the valve is leaking or with a fault, the following message appears:

LEAK FAULT

TEST = FAIL

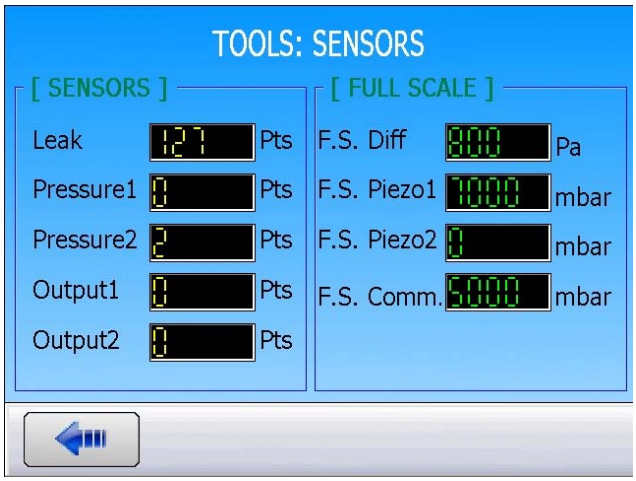


1.2.3. Sensor status

This menu enables the display the values in points measured by the sensors. The sensor status special cycle had been replaced by the new sensor status page for better legibility.

The instrument carries out a dump and displays the values in points of the various sensors (sensor's raw values).

The raw values are also available in the "**TOOLS**" menu, press "**SENSORS**" button.



CONFIGURATION MANAGEMENT

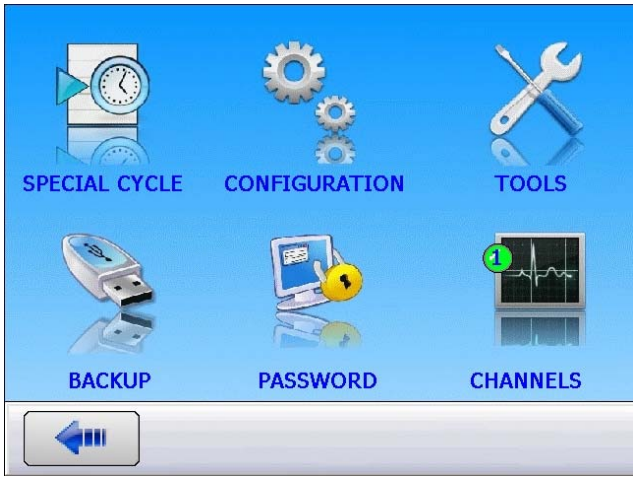
The "**CONFIGURATION**" menu allows configuring the instrument according to the user's preferences and its environment.

To access this menu, press the "**CONFIGURATION**" button

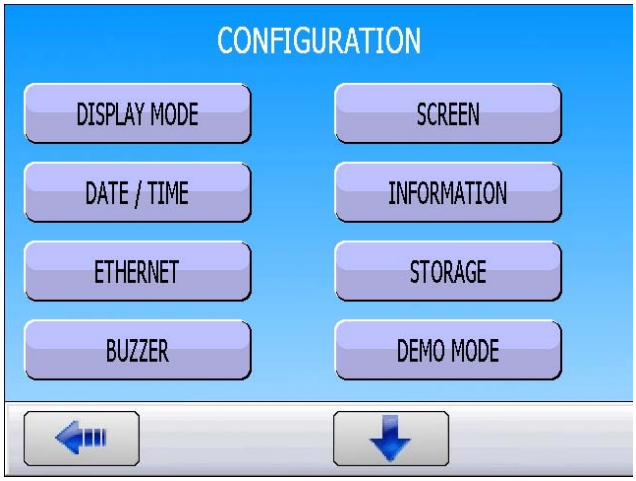
In some cases, the parameter must be validated.

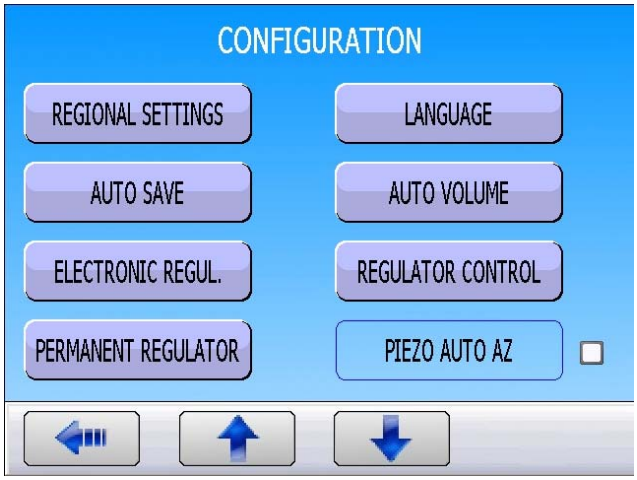
Configuration management procedure:

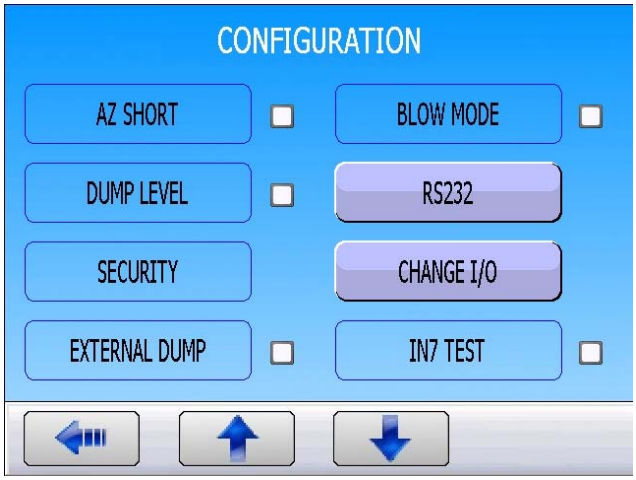
From the main menu, press "**CONFIGURATION**".

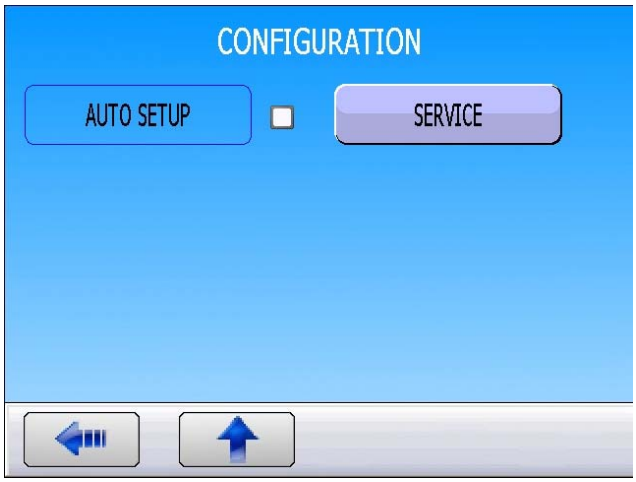


The different options are displayed.









To see all the functions, navigate all the pages using the  and  arrows.

To go back to the main menu, press the  button.

To adjust the configuration parameter, press the corresponding button:

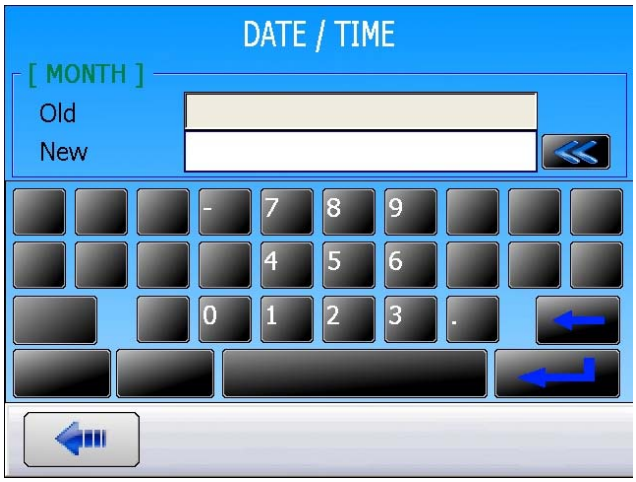
Some functions have additional options. These functions are validated using a check box.  .

Active function:

Non active function:

In the function configuration menu, select the additional options by pressing on the function button, then adjust the parameter to the desired value.

Once configured, go back to the main menu with the  button.



When a numerical or alphanumerical value is needed, a keyboard appears, enter the next value in the "**New**" field and validate with the  button.

The  button deletes the last character typed.

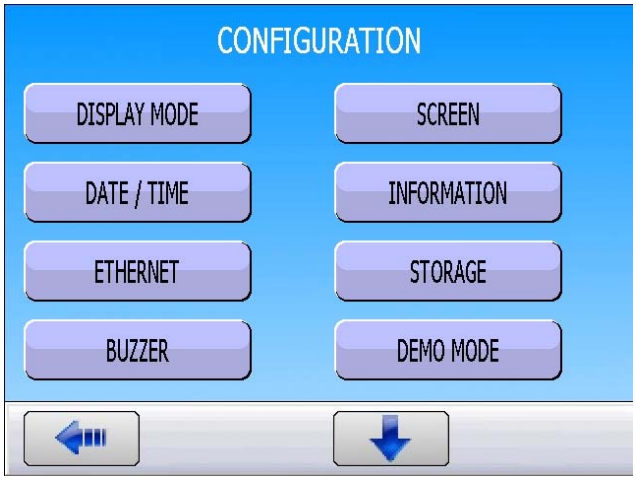
The  button deletes the entire "**New**" field.

DISPLAY MODE CONFIGURATION

This menu selects the display screens according to the user preferences.

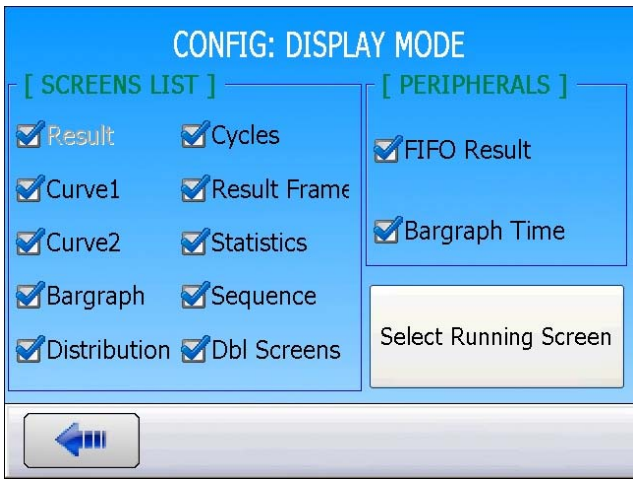
Display mode procedure:

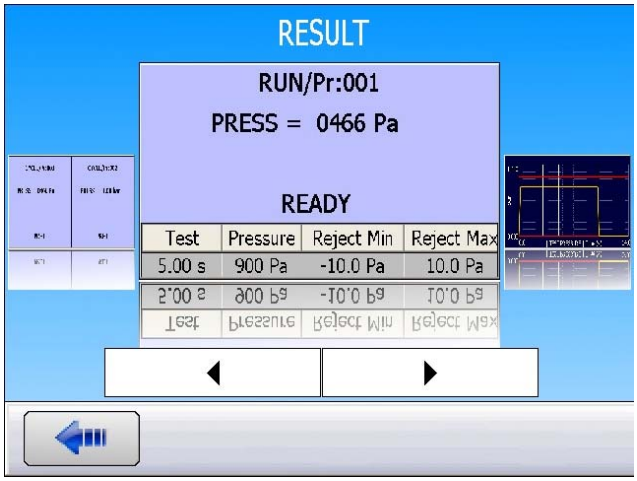
From the main menu, press "**CONFIGURATION**".



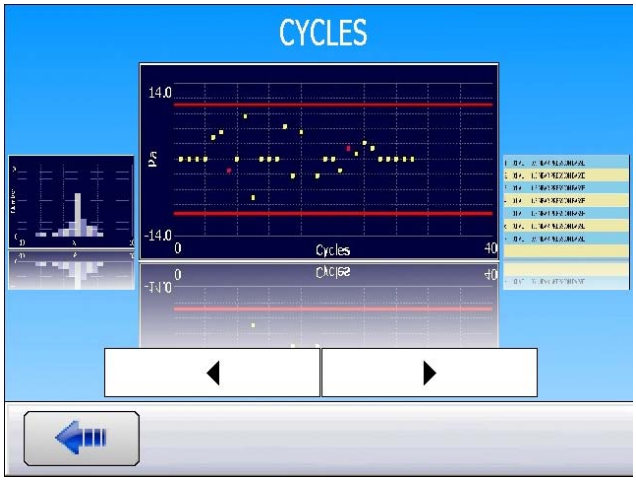
This window allows selecting the available views during the test cycle.

Check the box ☑ of each view to enable it.

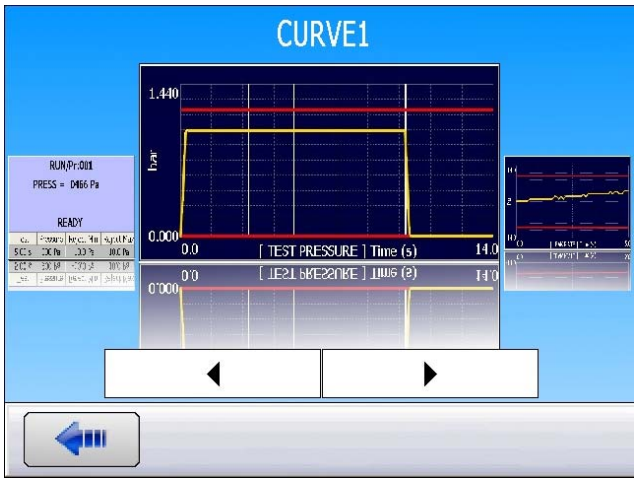




Standard cycle view.

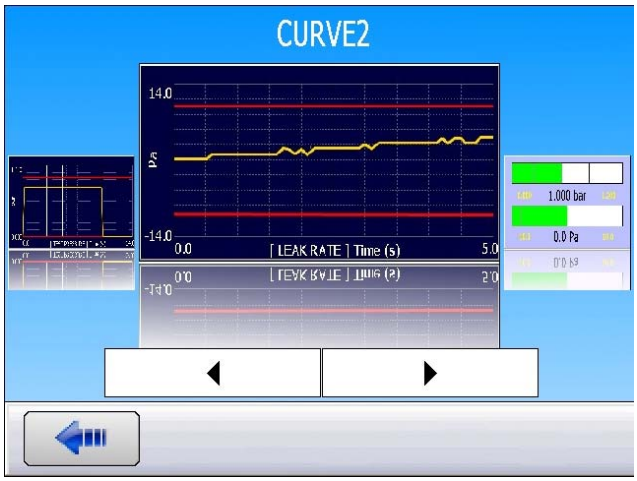


Each cycle result is displayed as a point. To visualize the results against the reject levels.

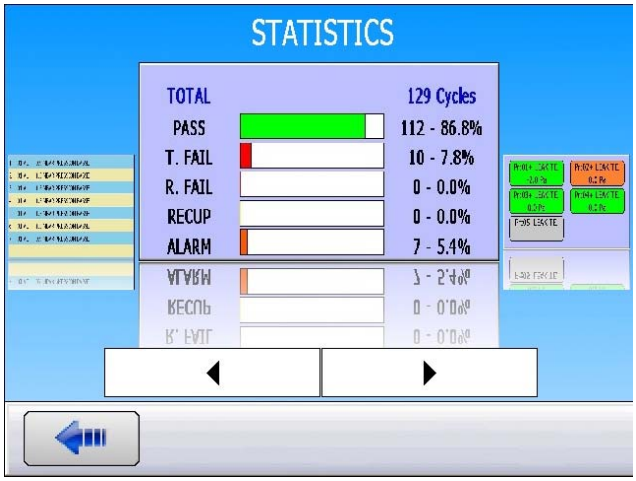


Pressure curve display (pressure sensor).

Result frame sent on the RS232 output.

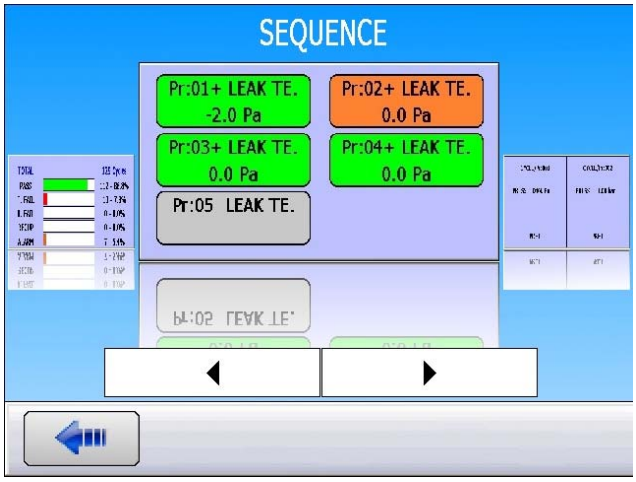


Leak curve display (differential sensor).

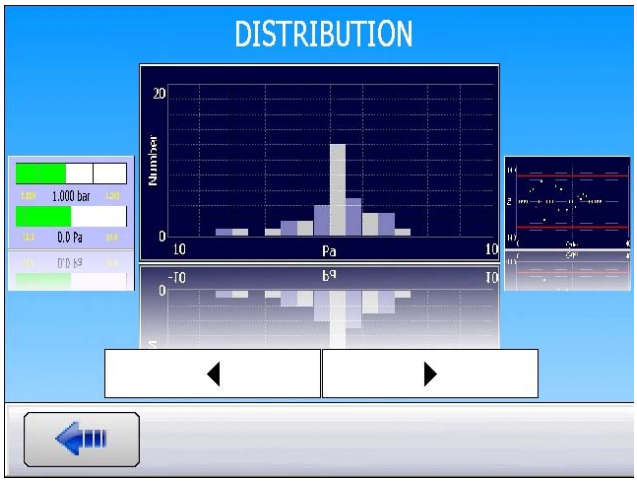


Number and percent of pass part, fail parts etc.

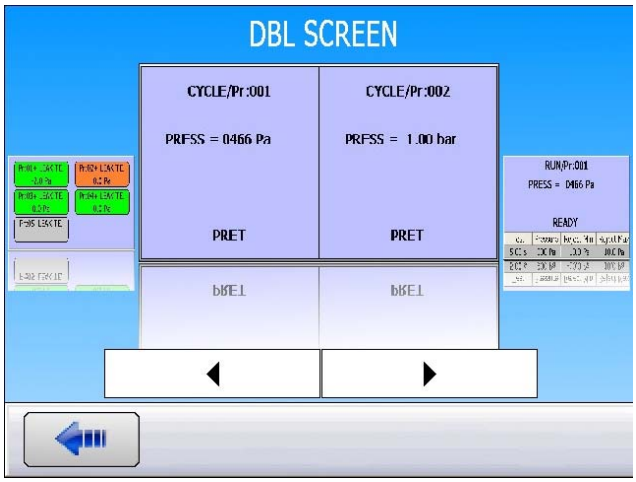
Display as a bar graph of pressure and leak values.



To view the programs chaining and their results.



Distribution of results which are divided into 20 classes. Each class represents 1/20th of the difference between the thresholds.

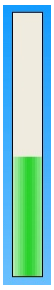


Displaying two cycles simultaneously, if two channels are installed.

The: Select Running Screen button allows selecting the default window.

FIFO Result

This option displays or hides the last results gauge.



Bargraph Time

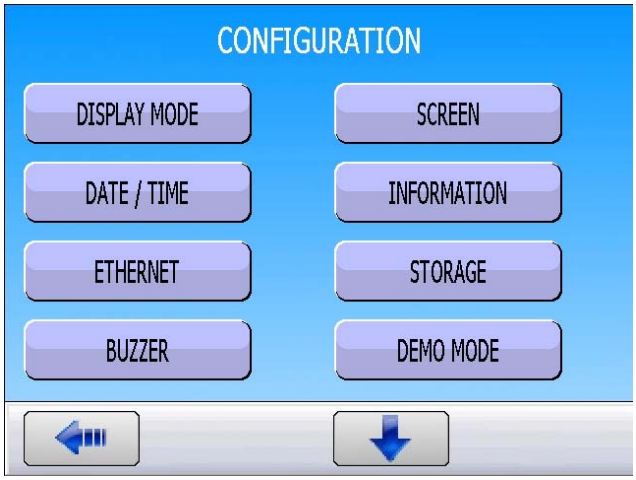
This option displays or hides the cycle progress bar graph.

SCREEN

This window allows configuring and calibrating the touch screen.

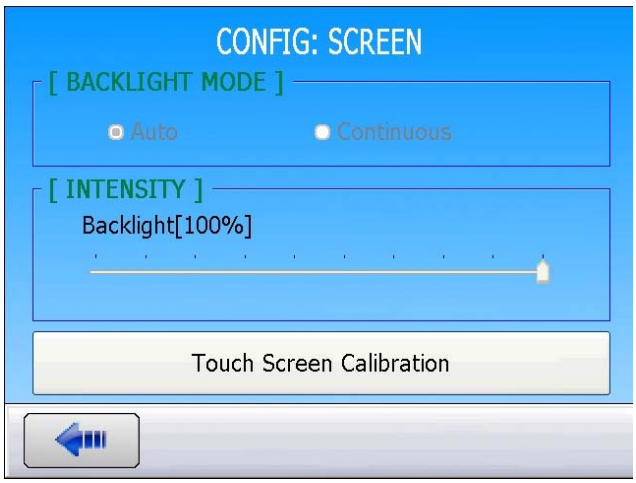
Screen procedure:

From the main menu, press "**CONFIGURATION**".



The displayed windows allow accessing to the screen adjustments.

The **[BACKLIGHT MODE]** and **[INTENSITY]** screen adjustments are not available for the user.

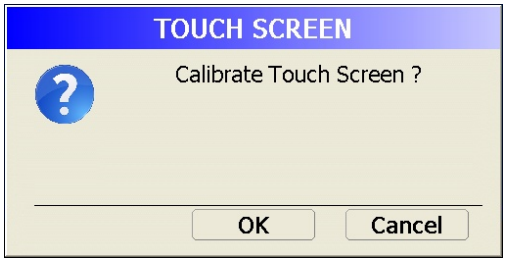


The "**Touch Screen Calibration**" key:

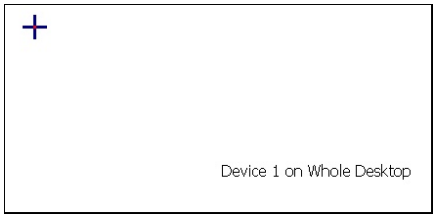
This option calibrates the touch screen.

This operation must be done only if the calibration was lost or drifter, only if it is impossible to click properly on the buttons.

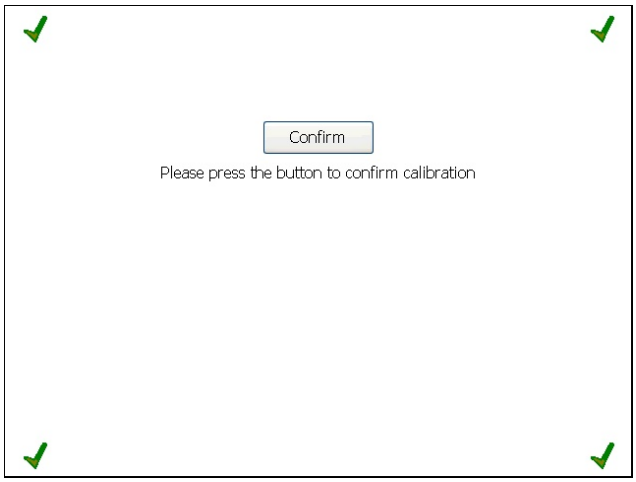
To continue, press **OK**, and then follow the prompts.



Press on each cross precisely when it appears.



At the end of the calibration the following screen appears; confirm the operation.



In case of bad calibration (important drift) it must connect a standard mouse on one USB port of the device to regain control and recalibrate.

***Note**: when irreversible failure of the touch screen, a mouse can be connected to one USB port of the device that can run normally.*

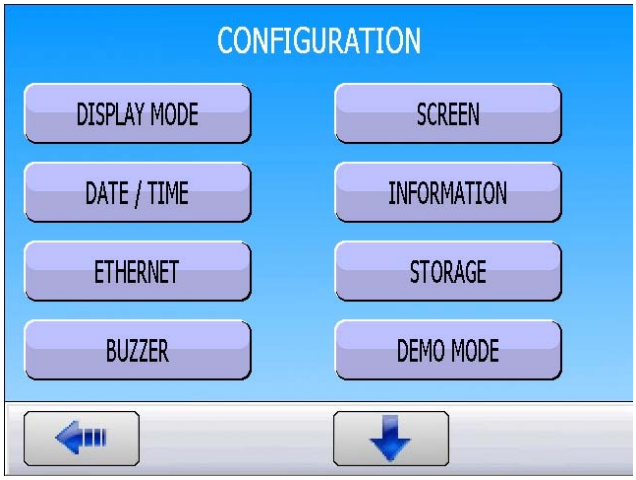
DATE / TIME

This function adjusts the date and the time of the instrument.

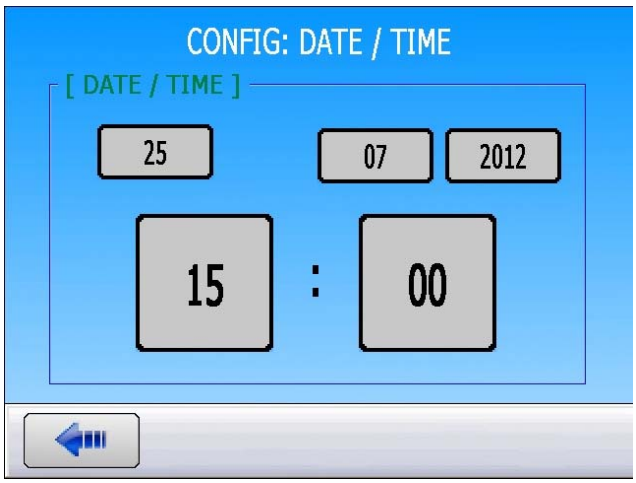
Date and time procedure:

From the main menu, press "**CONFIGURATION**".

Press “**DATE / TIME**”.



Press on each field to edit its value, the keyboard will appear, enter the new value and validate.

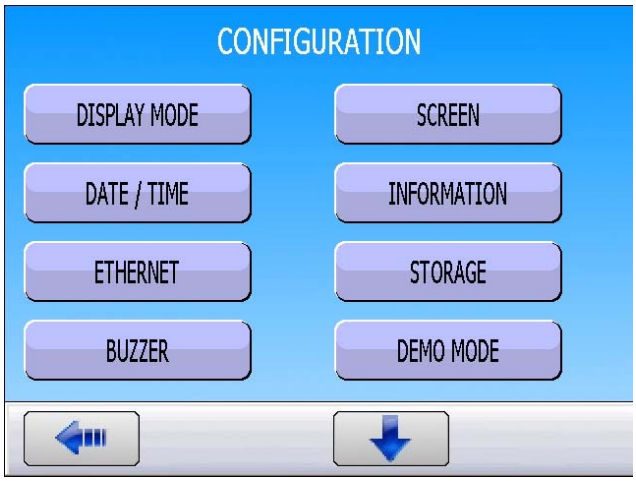


INFORMATION

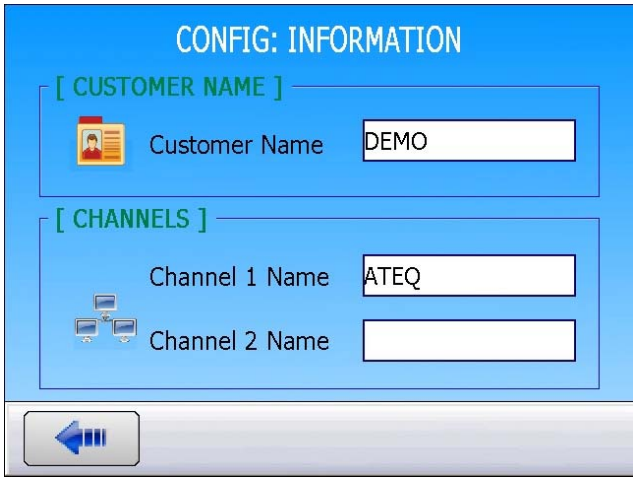
This menu allows naming the instrument, and the different channels, it identifies the instrument (results or on the network).

Naming procedure:

From the main menu, press "**CONFIGURATION**".



Press each fields to edit. The keyboard will appear, enter the new value and validate.

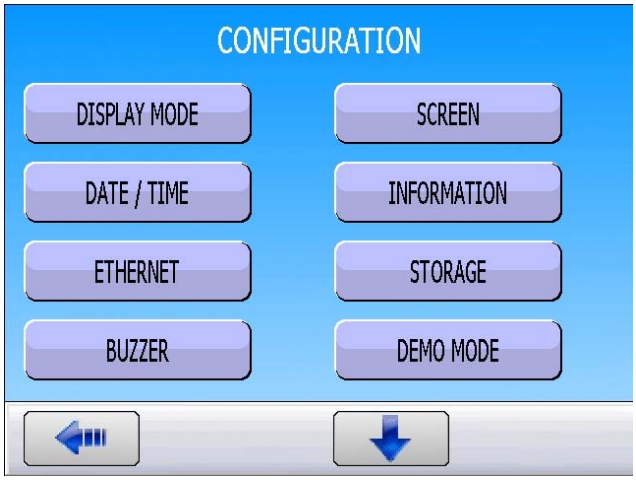


ETHERNET

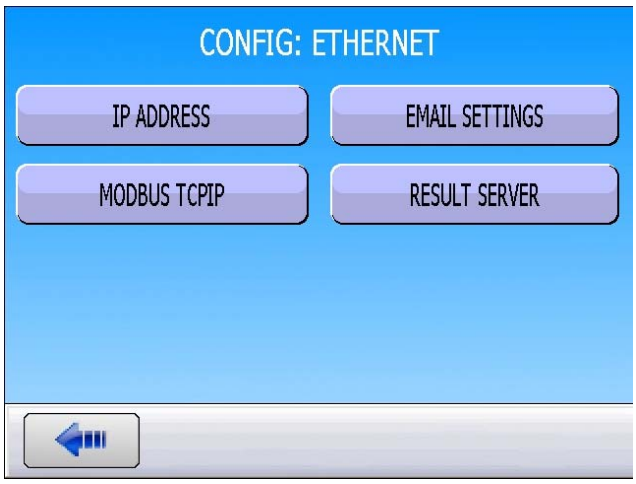
This menu configures the instrument Ethernet connection.

Ethernet procedure:

From the main menu, press "**CONFIGURATION**" then "**ETHERNET**".



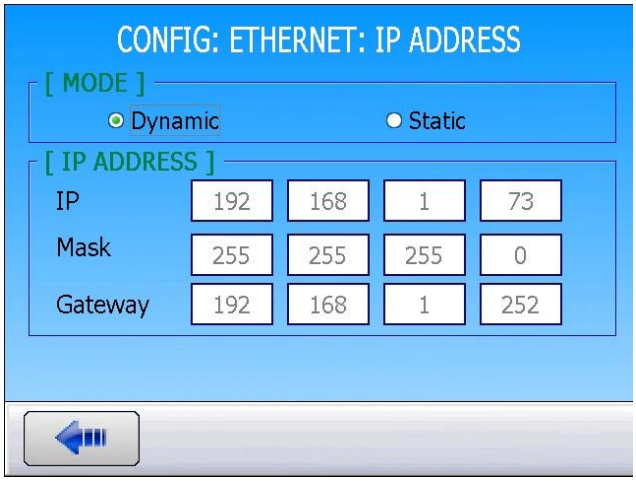
An Ethernet configuration window appears.



Press the "**IP Address**" button to enter the menu.

Two modes appear:

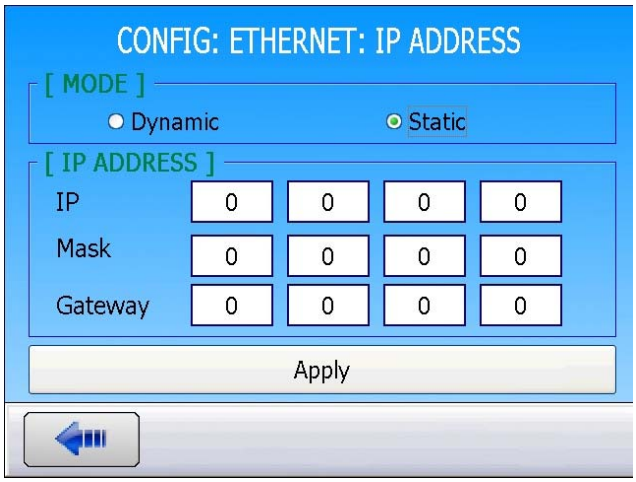
Dynamic mode: the network server (router) gives automatically an IP address to the device.



Static mode: the IP address must be entered manually.

Do not give an IP address in use by another device in the network, this can cause conflicts.

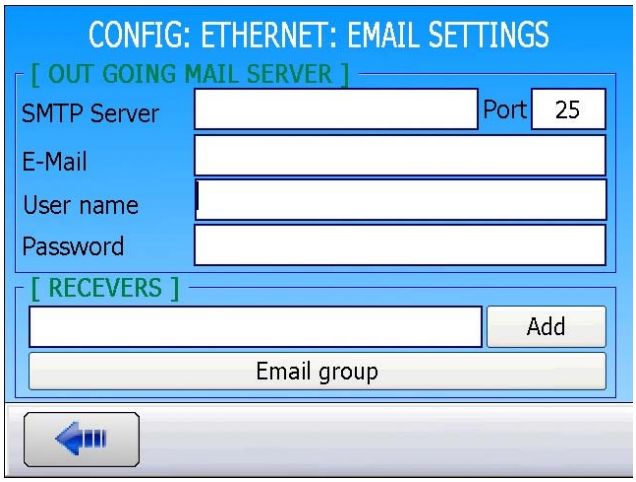
Contact your network administrator to receive an unused IP address, the "**Mask**" and "**Gateway**" values.



Press the "**Emails settings**" button to enter the configuration.

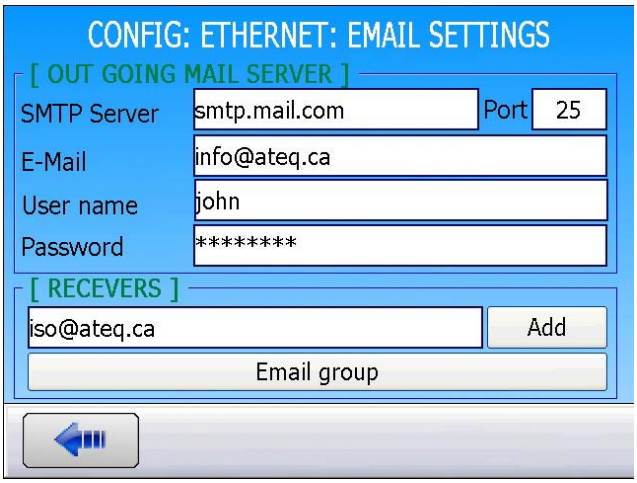
Then enter the parameters in the fields.

Contact your network administrator to obtain the parameters of the network.



[OUTGOING MAIL SERVER]

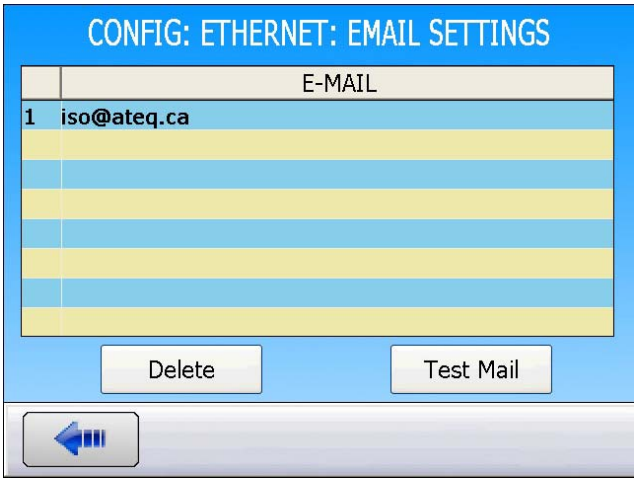
Enter your email credentials.

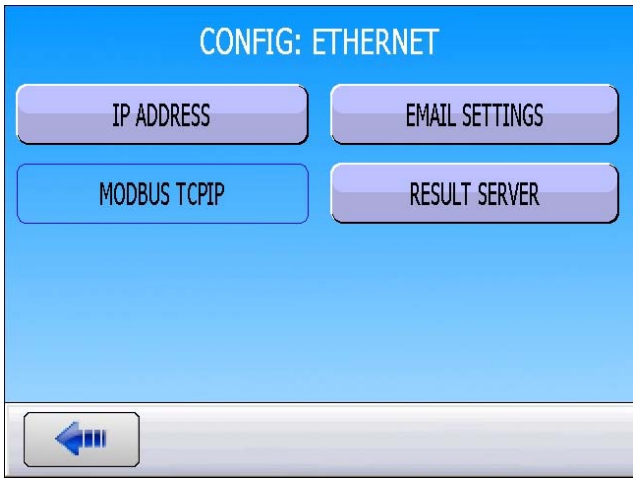


[RECEIVERS]

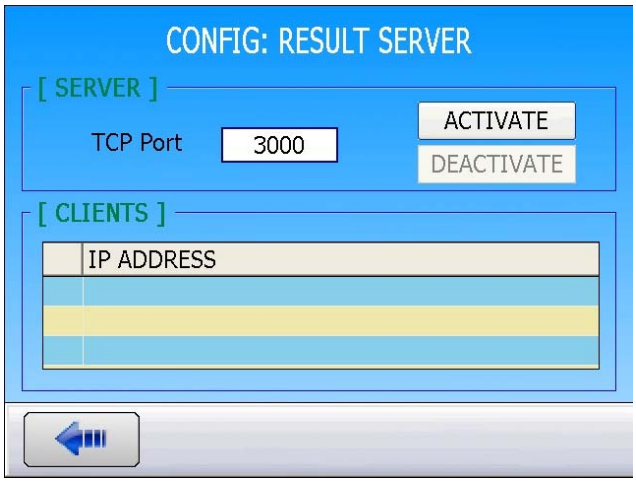
The instrument allows the user to create an email broadcast list. Enter another email address and press "**Add**" to add it to the email broadcast.

Press "**Email group**" to manage the email list in the broadcast.





The "**Modbus TCPIP**" button enable or not the Modbus communications function for the TCP/IP mode (Ethernet).

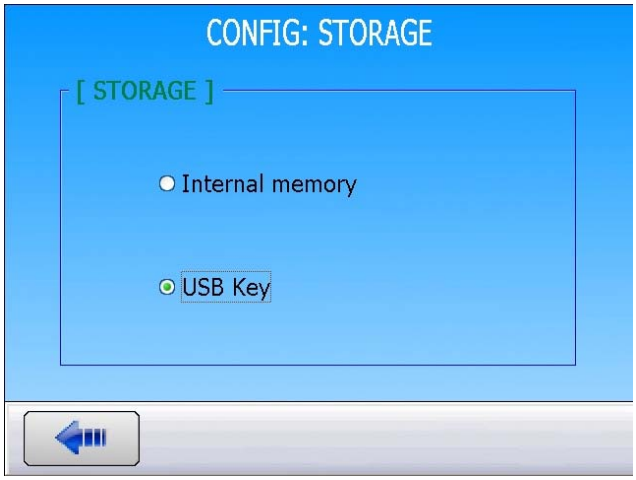


Click on the "**Results Server**" button to enter the configuration.

STORAGE

This menu defines the storage destination for the results files: Internal Memory or USB key.

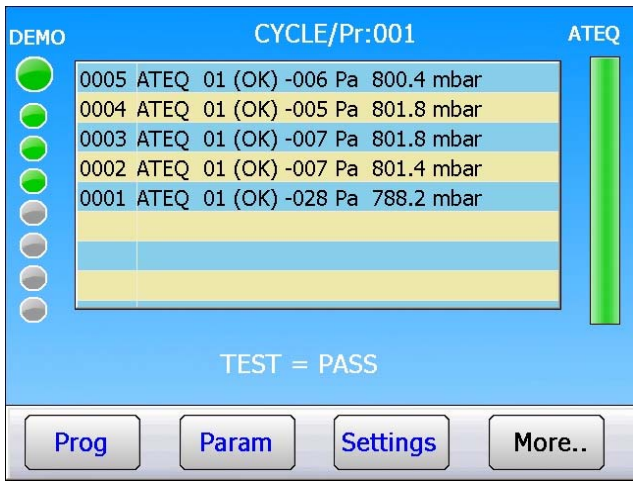
Storage procedure:



Select the destination for the results files.

In the "**USB Key**" mode, if no USB key is connected to the device; all the results will be lost.

To enable saving the cycle results into the memory or USB key, select the result display screen.



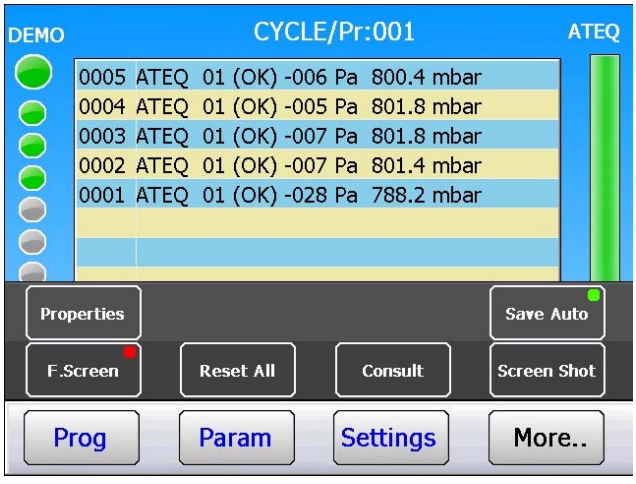
Press 

to display a pull-up menu.

Press "**Save Auto**" to toggle its status:

Green: Data will be saved.

Red: Data **will NOT** be saved.

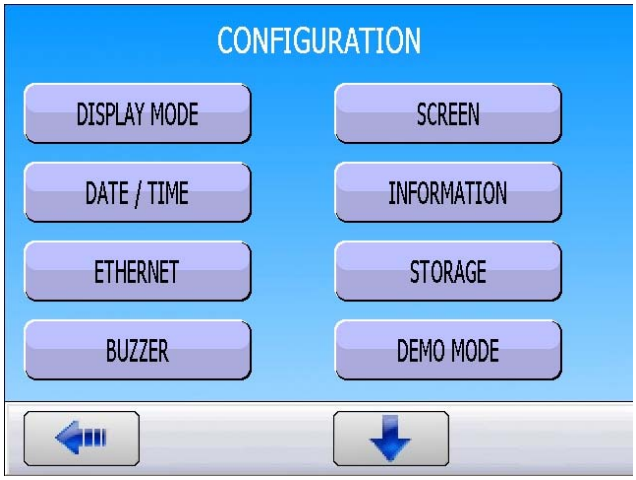


BUZZER

This menu is used to manage when the buzzer will sound.

Buzzer procedure:

From the “**CONFIGURATION**” menu, press "**BUZZER**".



Select the buzzer trigger mode:

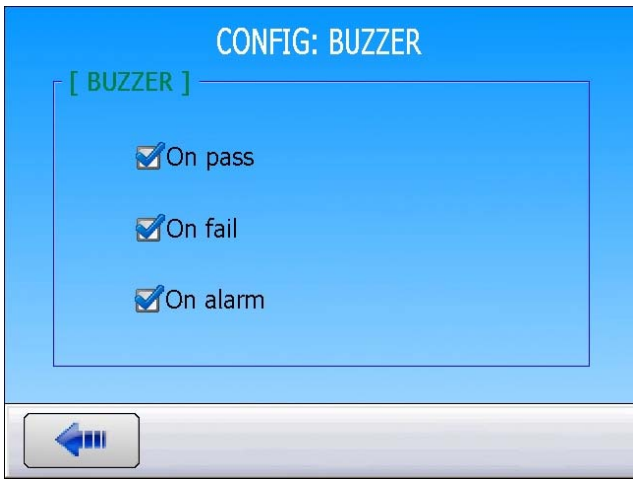
"**On Pass**": at each good part, the buzzer will sound.

"**On Fail**": at each bad part, the buzzer will sound.

"**On alarm**": if an alarm is triggered, the buzzer will sound to warn the user.

Several options can be checked.

Uncheck all options if you do not want the buzzer to sound.



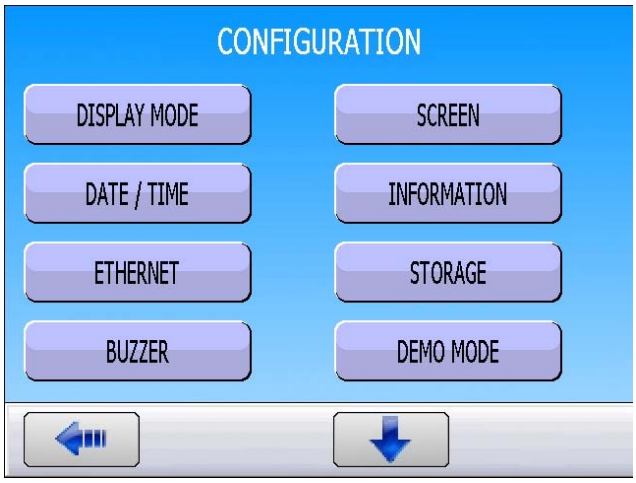
DEMO MODE

This menu activates the demonstration mode.

This mode simulates the instrument cycling (tests, curves, etc.). The instrument still requires an air supply.

Demo procedure:

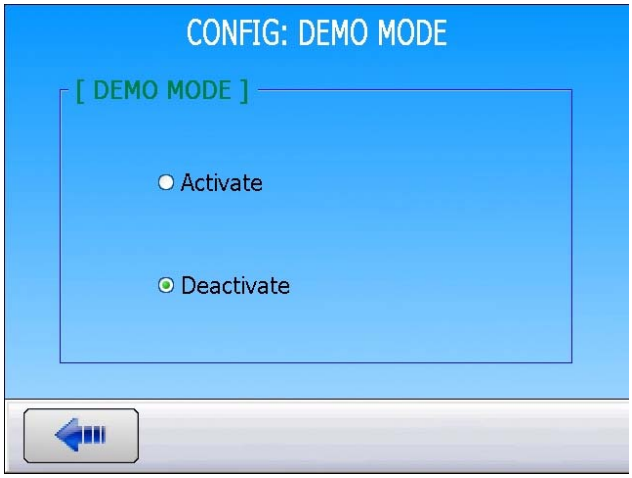
From the "**CONFIGURATION**" menu, press "**DEMO MODE**".



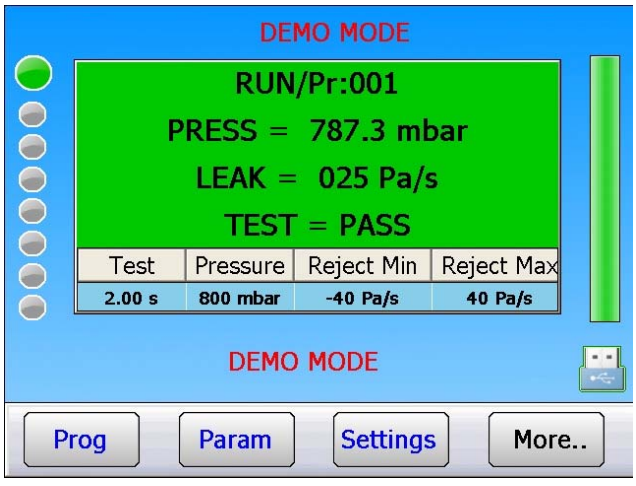
Select the option:

Activate: the DEMO mode is enabled.

Deactivate: the DEMO mode is disabled.



Example of display in Demonstration mode:



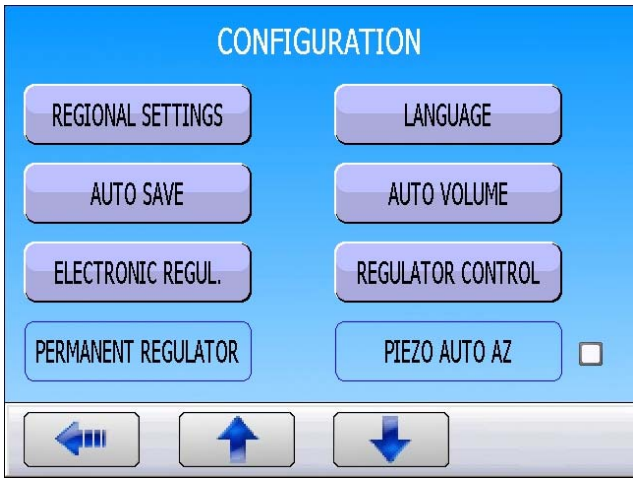
REGIONAL SETTINGS

This menu sets the regional parameters depending on your current location.

ATEQ makes this very easy to do and you can change decimal point, separator and set the date/hour formats all in one place. They will be used in the sent results files.

Regional settings procedure:

From the main menu, press "**REGIONAL SETTINGS**".



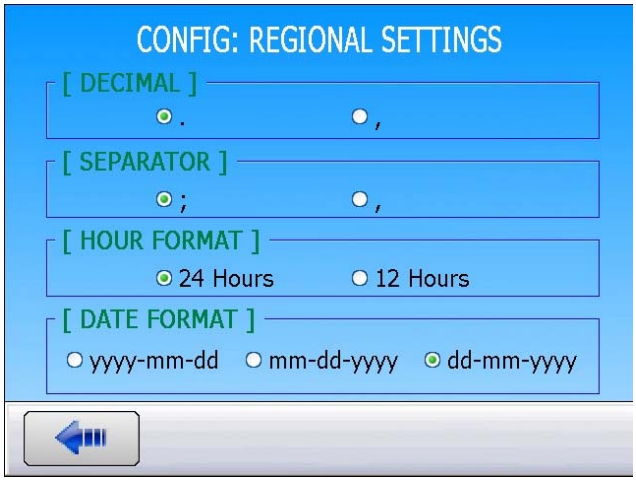
Select the display preferences:

The character for **Decimal** (point or comma).

The **Separator** (point comma or comma).

The **time** format (12h or 24h).

The display **date** format.

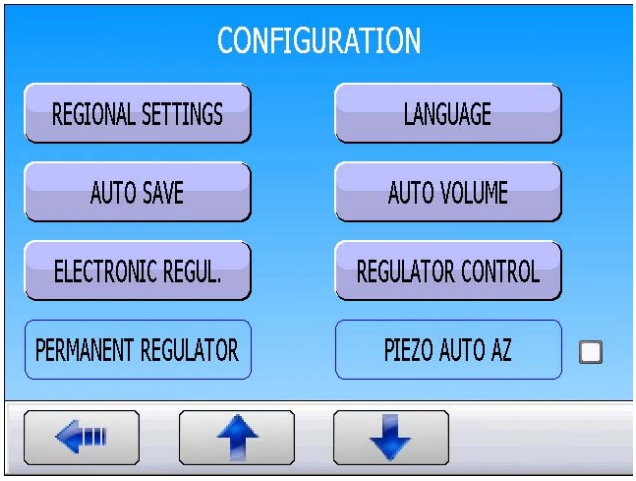


LANGUAGE

This function sets the language displayed by the instrument. Several languages are available. Two languages can be stored in the instrument's internal memory, English by default and one other optional language.

Language procedure:

From the main menu, press "**LANGUAGE**".



Select the language of the instrument.

AUTOMATIC SAVE

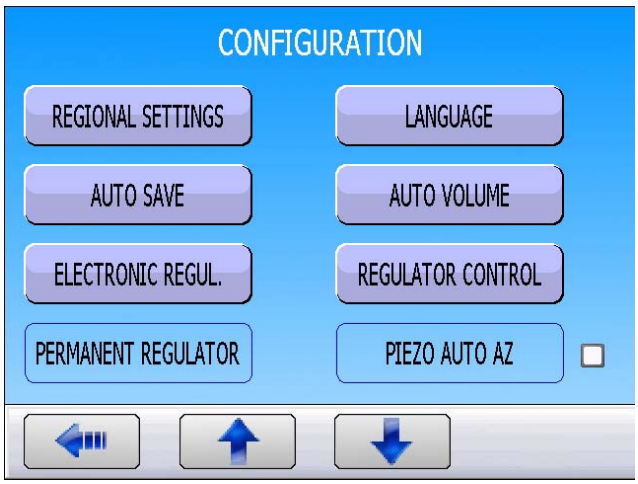
This function saves the test parameters from the volatile RAM memory of the instrument to its permanent flash memory.

When the "**AUTOMATIC SAVE**" function is validated, the parameters are saved automatically after changes are made.

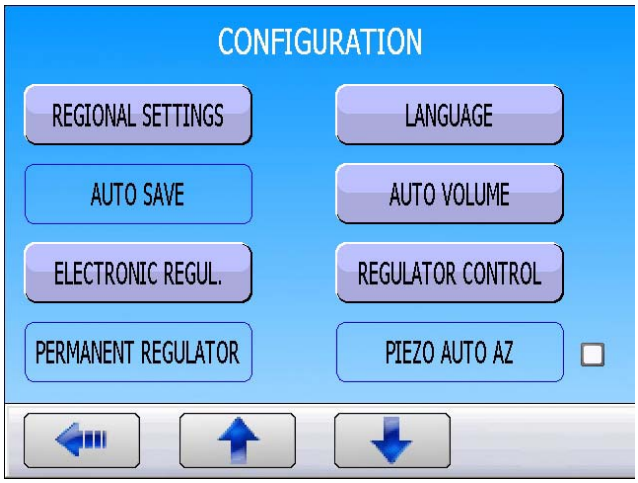
This function is useful if the parameters usually saved in the RAM are accidentally erased. The instrument will automatically read and restore the parameters from the flash to the RAM.

Automatic save procedure:

From the main menu, press "**AUTO SAVE**".



To cancel the automatic save, from the "**CONFIGURATION**" menu, press "**AUTO SAVE**".

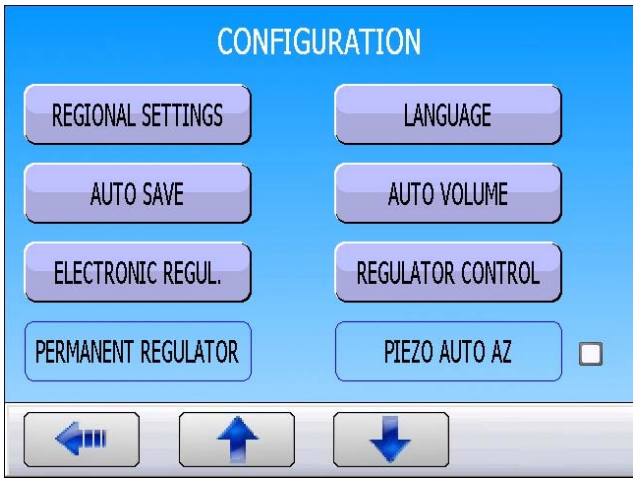


AUTOMATIC VOLUME

To be define.

Adjust process:

From the main menu, click on "**AUTO VOLUME**".



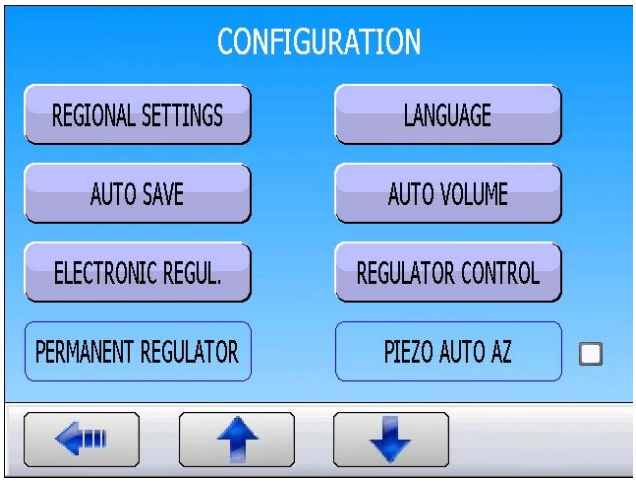
ELECTRONIC REGULATOR

The "**ELECTRONIC REGUL.**" is displayed when one or two electronics regulators are installed into the instrument.

This function allows selecting or not the electronic regulator.

Adjust process:

From the main menu, press "**ELECTRONIC REGUL.**".



Select the regulator or none.

REGULATOR CONTROL

The **REGULATOR CONTROL** function is displayed when an electronic regulator is installed in the instrument.

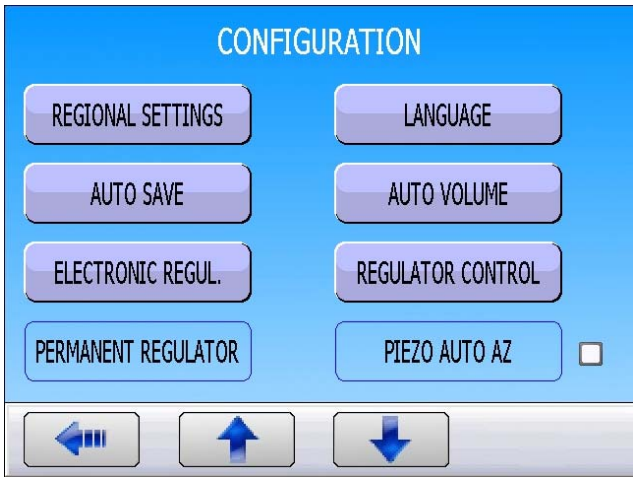
If there is no air pressure supply, the instrument will display **REGULATOR ERROR**.

When the instrument is configured on **EXTERNAL**, the instrument awaits a press on the **RESET**  key to resume operation.

When the instrument is configured on **AUTO** it constantly attempts to resume operation. A prolonged operation of the regulator in this mode and without compressed air could cause heating up and premature wear.

Regulator control procedure:

From the main menu, press "**REGULATOR CONTROL**".



Select the option:

AUTO: constantly attempts resuming regulator linearization.

External: Await a reset to resume (factory setting).

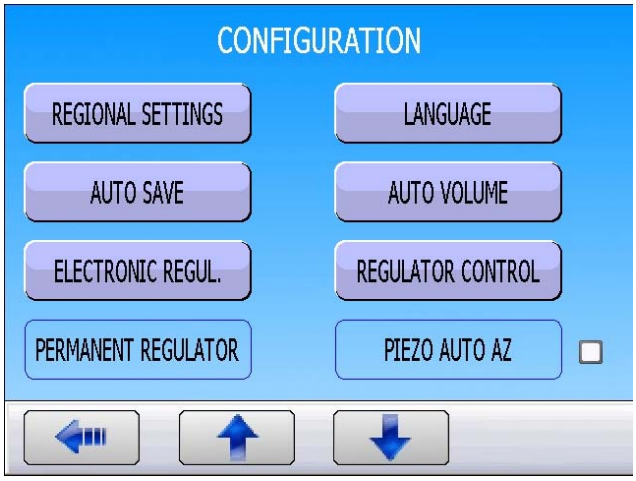
***ATEQ** strongly suggests leaving the setting to **External** except in particular circumstances.*

PERMANENT REGULATOR

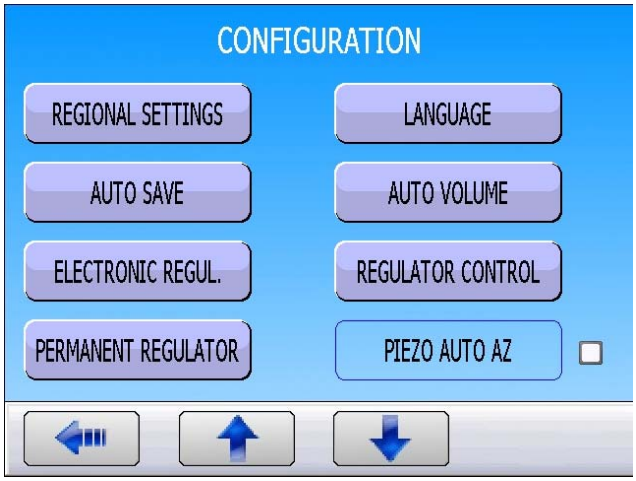
When an electronic regulator is used with a test part with a small volume and requiring a fast cycle time this function should be activated. The instrument will regulate the air pressure to the set fill value for the entire test sequence including the time between tests.

Permanent regulator procedure:

From the main menu, press "**CONFIGURATION**"



Validate the function by pressing "**PERMANENT REGULATOR**".



PIEZO AUTO ZERO

This function is to set the pressure sensor zero and calculate the electronic regulator characteristics. This operation must be carried out regularly.

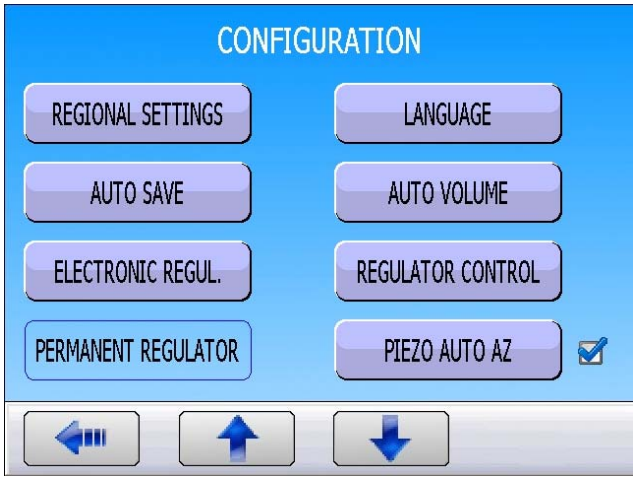
This function enables the setting of a frequency or a number of measurement cycles between two pressure sensor auto zeros. The piezo auto zero function zeroed the instrument pressure sensor to atmospheric pressure.

- **Number of minutes**: to set a time frequency between two auto zeros of 1 to 999 minutes. If set to zero, no auto-zero is performed.
- **Number of cycles**: to set a number of cycles between two auto zeros.

The two options can be set, in this case the first counter to expire will start the auto-zero, both counters will then be reset.

Piezo auto zero procedure:

Press the "**PIEZO AUTO AZ**" button to configure the counters.



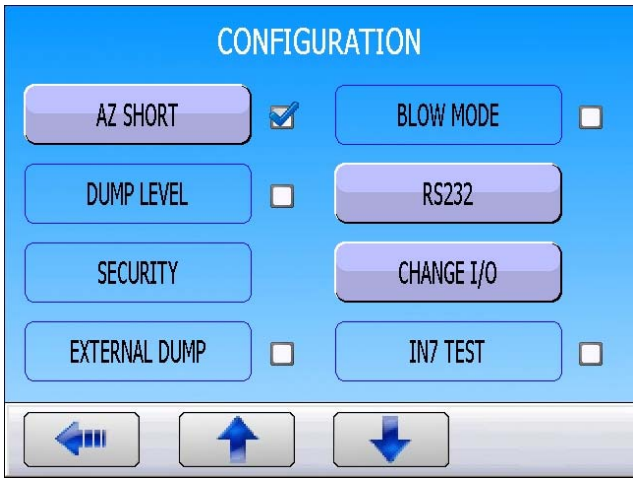
Press either buttons to change the counter: "**Number of minutes**" or "**Number of cycles**".

AUTO ZERO SHORT

Each time the instrument performs a pressure sensor (piezzo) auto zero, it also re-linearizes the electronic regulator. The linearization process might be too long for some application. Auto-zero short skips the linearization process and zeros the pressure sensor only.

Auto Zero short procedure:

From the "**CONFIGURATION**" menu, validate the function by checking the box  .



Press the "**AZ SHORT**" button to configure the auto zero time.

Then click on the "**AZ SHORT**" button to enter the value (the default value inside the instrument is optimized).

BLOW MODE

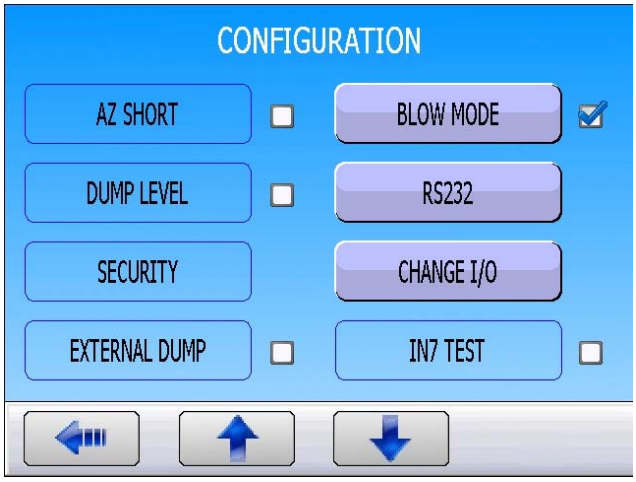
When this option is activated, the instrument's fill valve is left open between cycles. This option is used when there is risk of increased damp or dust contamination due to testing very dirty parts.

The regulator's set blow pressure (or set instruction with an electronic regulator) must always less than or equal to the maximum fill limit (or to the maximum pre-fill limit if it is activated).

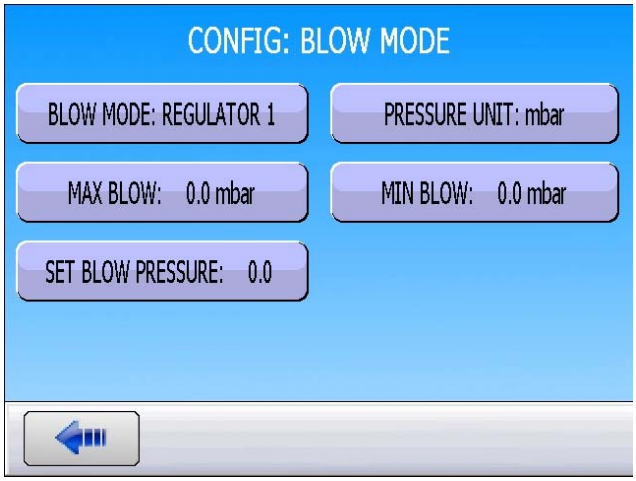
Blow mode procedure:

From the "**CONFIGURATION**" menu, validate the "**BLOW MODE**" function by checking the box  .

Then press "**BLOW MODE**" to configure the parameters.



Press each button to enter the different values.



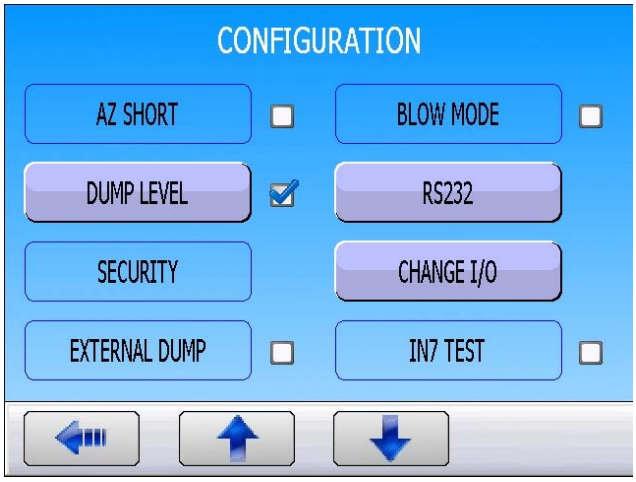
DUMP LEVEL

The function DUMP LEVEL monitors the pressure inside the part and warns the user with the message "**PART UNDER PRESSURE**". The end of cycle signal after the dump time doesn't goes high until the pressure of the tested is below the level entered into the function configuration.

Dump level procedure:

From the "**CONFIGURATION**" menu, validate the function by checking the box  .

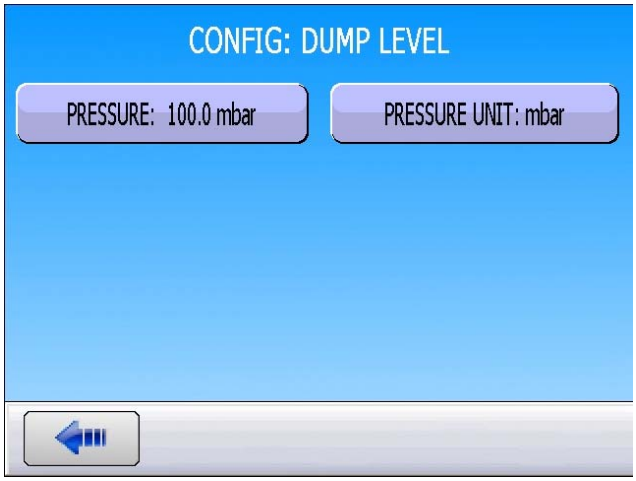
Press "**DUMP LEVEL**" to configure the level value.



Press the buttons to enter the value.

PRESSURE: Enter the pressure value defining when it is safe for the instrument to send the signal end of cycle on the J3 connector.

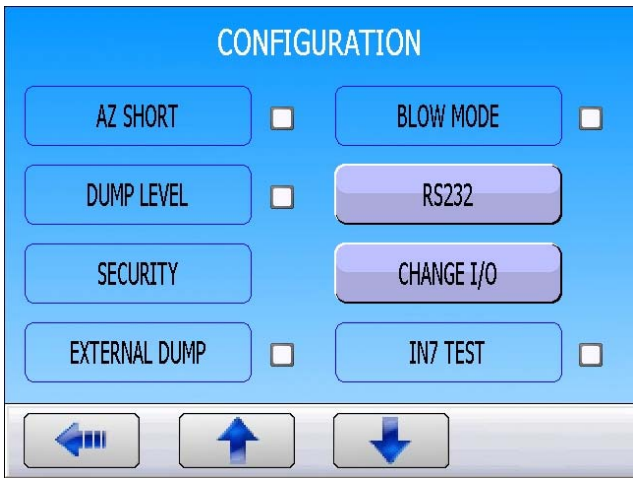
PRESSURE UNIT: select the pressure unit.



RS232

The "**RS232**" configures the RS232 link parameters. The RS232 can be connected to a printer or a computer for data collection.

From the "**CONFIGURATION**" menu, press the "**RS232**" button.



The **RS232** link configuration menu appears.

Select the option and enter settings if necessary.

C540/580: Not used.

Printer: (factory default) standard RS232 protocol to print or hyperterminal the program parameters as well as test results. When the option is activated, the RS232 broadcast the test results after each cycle.

Modbus: Configure the Modbus link (option) if installed. The frames parameters, RS parameters (speed, serial port) have to be set.

RS parameters: RS232 protocol parameters.

These parameters must be the same as the receiver device.

Transmit speed parameter.

Stop bit parameter, number of data bits, parity.

Print frame: This function enables the configuration of the result printout.

Associated parameters to be set: **PRESSURE** (Display or not the test pressure), **Prog. name** (Display of the program name when set), **Date & Time** (printing of the date and the time), **Lines before** (number of lines before the result), **Lines after** (number of lines after the result), **Inter line** (space between each line), **Form feed** (new page).

Examples of results frames.

Pass part frame:	<01>: <01>:30/05/2012 16:52:01 <01>: 487.8 mbar:(OK): 029 Pa
Fail part frame:	<01>: <01>:30/05/2012 16:53:36 <01>: 493.9 mbar:(DT): 114 Pa
Alarm frame:	<02>: <02>:30/05/2012 16:55:24 <02>: 486.4 mbar:(AL): >> F.S. TEST

Sending conditions: With this function you can choose which data is to be printed on the results sheet.

Associated parameters to be set: **ALL RESULTS** (all test results), **PASS** (number of good parts), **T. FAIL** (number of bad test parts), **R. FAIL** (number of bad reference parts), **ALARM** (number of times the alarm has been triggered), **PRESS OUT** (number of times pressure was incorrect), **REWORKABLE** (number of recoverable parts), **CALIBRATION**.

Export: This function can be used to create and send a special results frame which can be processed by a PC using Microsoft Excel.

This frame is of the same type as the print parameters frame except that the different character strings follow each other and are separated by a punctuation mark which enables the various boxes to be entered automatically in Microsoft Excel.

This frame is operated by connecting a computer to the instrument's RS 232 link.

Columns detail:

1) Personalization
2) Program Number
3) Test result message.
4) Numerical Test Value.
5) Test unit.
6) Numerical pressure value.
7) Pressure Unit.
8) Alarm Message.

8') Bar Code (option: depends of the device version).

9) Date.
10) Time.

Exports examples: (the following example is from a F5 version v1.18p device).

The character "→" represents a tab HT (09h).

The character "□" represents a space (20h).

The character "↵" represents a carriage return CR (0Dh).

Example 1:

- **ASCII**

TEST→01→(OK)→□□000→Pa→□501.8→mbar→→→23/01/2006→17:54:13→↵

- **Hexa**

54 45 53 54 **09** 30 31 **09** 28 4F 4B 29 **09** 20 20 30 30 30 **09** 50 61 **09** 20 35 30 31 2E 38 **09** 6D 62 61 72 **09 09 09** 32 33 2F 30 31 2F 32 30 30 36 **09** 31 37 3A 35 35 3A 31 39 **09** *0D*

- **Detail**

1		2		3		4		5		6		7	8 / 8'	9		10	
TEST	→	01	→	(OK)	→	□□000	→	Pa	→	□501.8	→	mbar	→→→	23/01/2006	→	17:54:13	→↵
54 45 53 54	**09**	30 31	**09**	28 4F 4B 29	**09**	20 20 30 30 30	**09**	50 61	**09**	20 35 30 31 2E 38	**09**	6D 62 61 72	**09 09 09**	32 33 2F 30 31 2F 32 30 30 36	**09**	31 37 3A 35 35 3A 31 39	**09***0D*

Example 2:

- **ASCII**

TEST→01→(AL)→→→□□□0.0→mbar→PRESSURE□LOW→→23/01/2006→18:00:13→↵

- **Hexa**

54 45 53 54 **09** 30 31 **09** 28 41 4C 29 **09 09 09** 20 20 20 30 2E 34 **09** 6D 62 61 72 09 50 52 45 53 53 55 52 45 20 4C 4F 57 **09 09** 32 33 2F 30 31 2F 32 30 30 36 **09** 31 38 3A 30 32 3A 31 36 **09** *0D*

- **Detail**

1		2		3		4		5		8	8'	9		10	
TEST	→	01	→	(AL)	→→→	□□□0.0	→	mbar	→	PRESSURE□LOW	→→	23/01/2006	→	18:00:13	→↵
54 45 53 54	**09**	30 31	**09**	28 41 4C 29	**09 09 09**	20 20 20 30 2E 34	**09**	6D 62 61 72	**09**	50 52 45 53 53 55 52 45 20 4C 4F 57	**09 09**	32 33 2F 30 31 2F 32 30 30 36	**09**	31 38 3A 30 32 3A 31 36	**09***0D*

Print parameters: by pressing this button, the program test parameters are printed or sent immediately.

Example of print parameters frame:

Version 03.10i
27/07/2012 15:26:14

Pr 01

TYPE : LEAK TEST
COUPL. A : 0.0 s
FILL TIME : 2.0 s
STAB TIME : 5.0 s
TEST TIME : 1.0 s
DUMP TIME : 0.0 s
Max FILL : 960.0
Min FILL : 600.0
Set FILL : 800.0
Test FAIL : 000
Ref. FAIL : 000

Pr 02

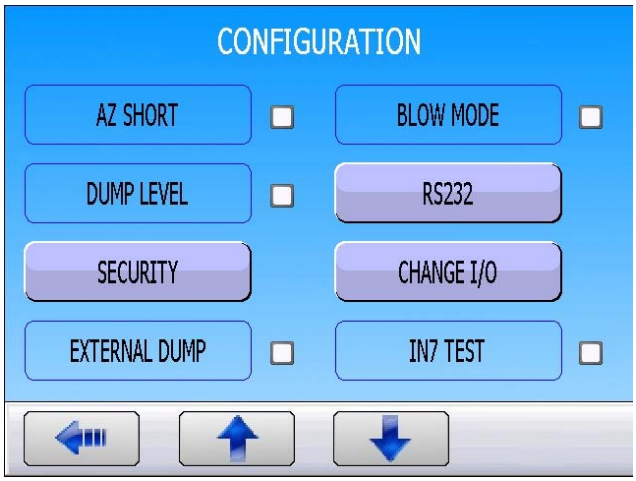
TYPE : LEAK TEST
COUPL. A : 0.0 s
FILL TIME : 5.0 s
STAB TIME : 4.0 s
TEST TIME : 4.0 s
DUMP TIME : 0.0 s
Max FILL : 600.0
Min FILL : 400.0
Set FILL : 500.0
Test FAIL : 100
Ref. FAIL : 000

SECURITY

This function deactivates the **START** key on the instrument front panel. Programs can only be started from the instrument relay board (J3 connector).

Security procedure:

From the **CONFIGURATION** menu, validate the function by pressing **SECURITY**. When it is validated, it is impossible to start a cycle from the **START** key located on the front panel.

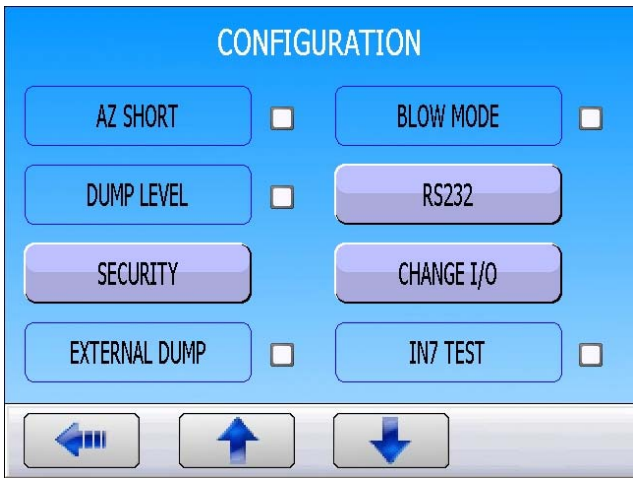


I/O CONFIGURATION

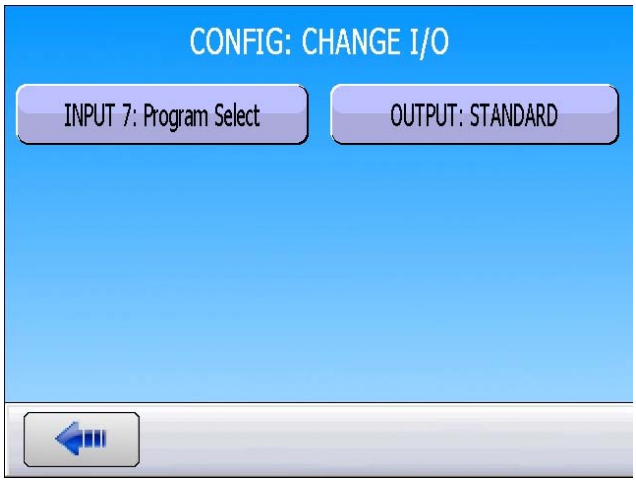
This menu configures the programmable input 7 on the connector J3 as well as the output mode ("**STANDARD**" or "**COMPACT**").

Configuration procedure:

From the "**CONFIGURATION**" menu, press "**CHANGE I/O** ".



The **O/I CONFIGURATION** menu displays 2 buttons "**INPUT 7: Xxx**" and "**OUTPUT: XXX**".



This menu is used to give a special function to the input 7 on connector J3 (relay board).

The various functions available on input 7 are: "**Program selection**", and functions in special cycles (depending on functions activated): "**Regulator adjust**", "**Infinite fill**", "**Piezo auto zero**", "**ATR learning cycle**", "**Volume compute**", "**Customer Unit Learning**", "**Check Customer Unit Learning**", "**Check test result**", "**Sealed Pass part learn**", "**Sealed Fail part learn**".

As well as the special maintenance cycles if that function is validated: "**Regulator 1 adjust**", "**Regulator 2 adjust**", "**Leak sensor check**", "**Valve Auto-test**", "**Sensor status**".

These functions are all the special cycles available in the instrument.

Two output modes are available on the J3 connector: **STANDARD** mode and **COMPACT** mode.

STANDARD: this is default the J3 connector configuration.

COMPACT: outputs are available on the J3 connector for the results of two chained cycles. Outputs 1 and 2 are reserved for the first cycle, outputs 3 and 4 for the second cycle, output 5 for the end of the chained cycles.

EXTERNAL DUMP (OPTIONAL)

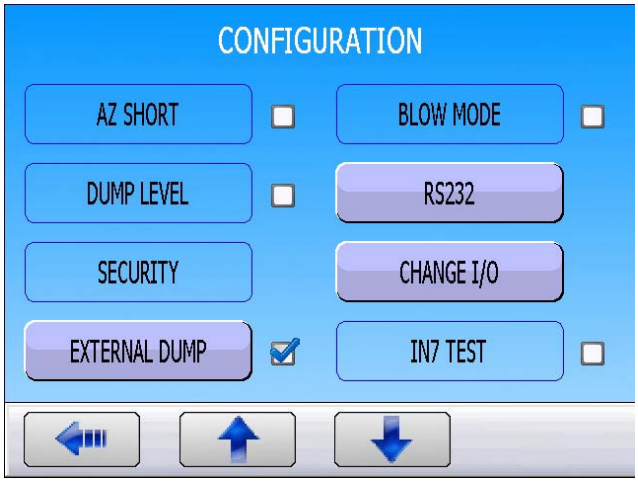
The external dump has the advantage to prevent impurities, liquid or any other particles to be vented through the instrument's internal valve and therefore protects it.

This option activates the pilot of an external dump valve (such as ATEQ leak tight 3/2 valve).

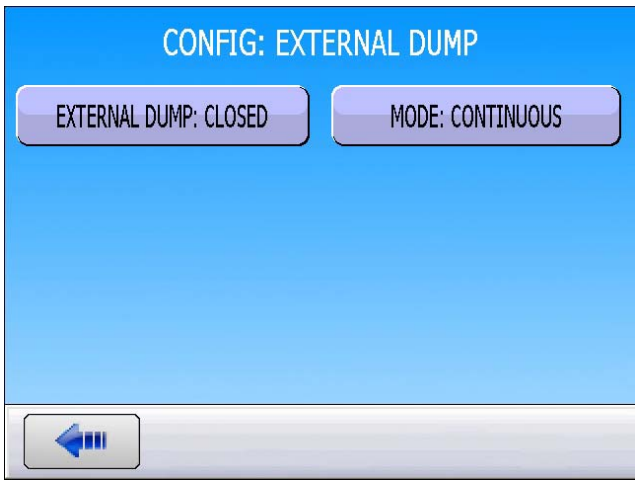
This option requires an external electrical or pneumatic pilot (contact ATEQ to add the option). If the instrument is equipped with this option, one of the internal and external valve codes or one of the autoconnector will be occupied.

External Dump procedure:

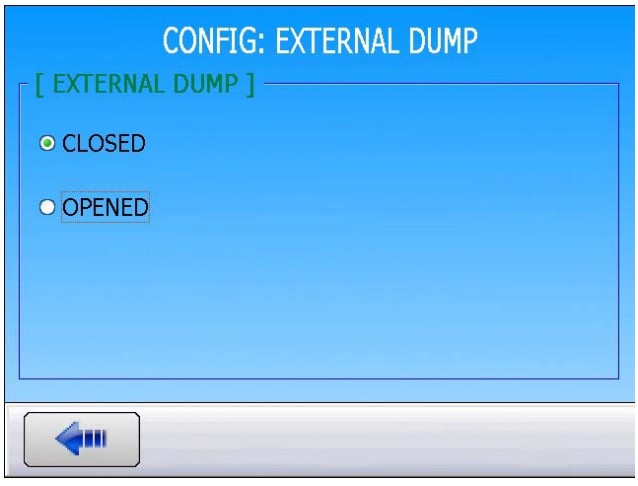
From the **CONFIGURATION** menu, activate the "**EXTERNAL DUMP**" function by checking it .



Press "**EXTERNAL DUMP**" to enter the function options.



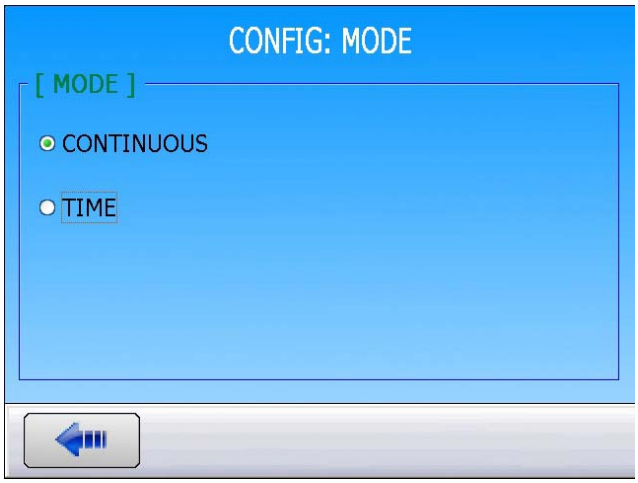
Press this button to select the external dump valve mode **NORMALLY CLOSED or NORMALLY OPEN**.



The menu **Dump MODE**, allows selecting how the external dump valve is piloted:

CONTINUOUS: the external dump valve stays activated until the start of a new cycle.

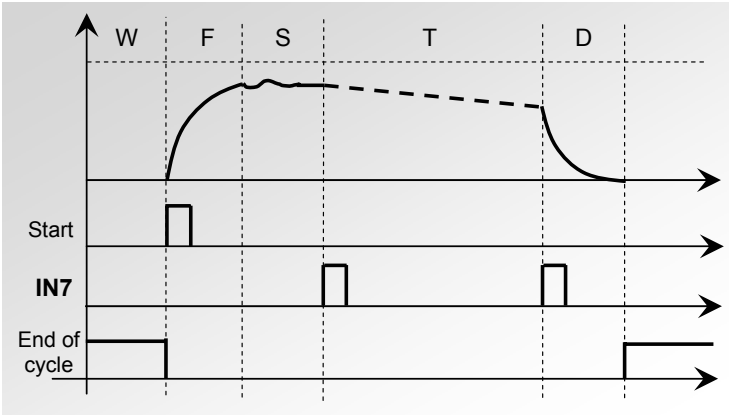
TIME: the external dump valve is activated during the cycle dump time only.



IN7 TEST

The "**IN7 test**" function leave the choice to the user to go to the test step, using the input 7 of the Inputs Outputs all or nothing connector.

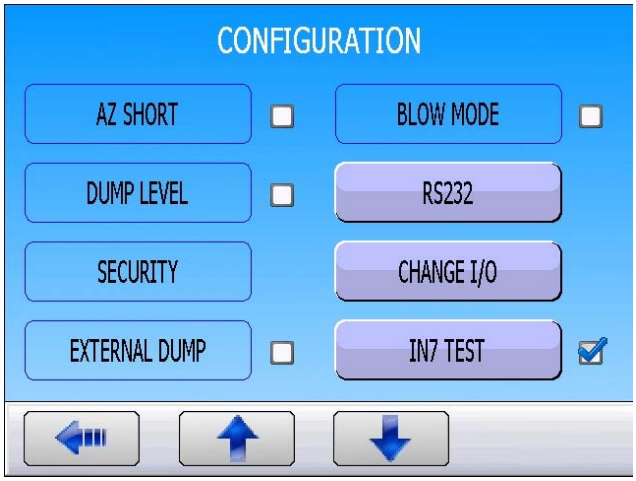
Cycle chart:



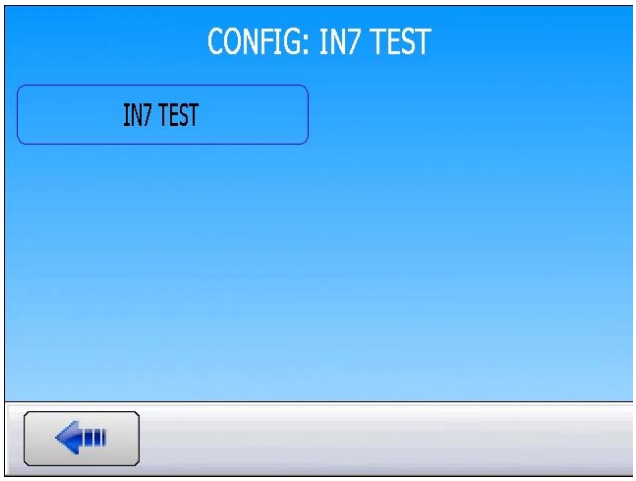
The jumps from "**Stabilization**" to "**Test**" and "**Test**" to "**Dump**" are validated by the input 7; the test time will be done by the user.

Adjust procedure:

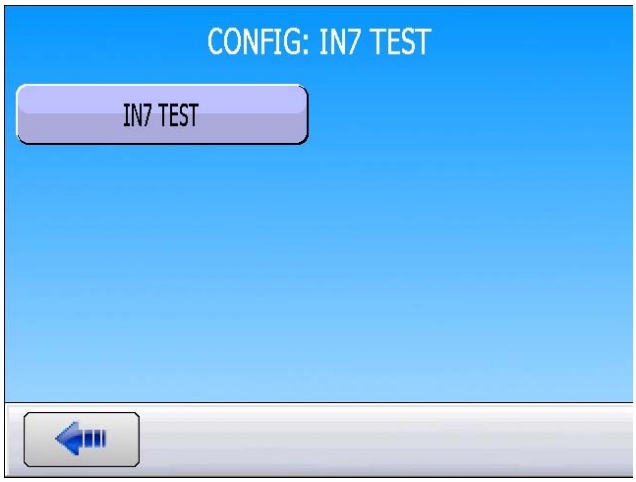
From the **CONFIGURATION** menu, activate the "**EXTERNAL DUMP**" function by checking it .



Then in the menu, click on the "**IN7 TEST**" button to enable the function.



The "**IN7 TEST**" function is enable.



AUTO SETUP

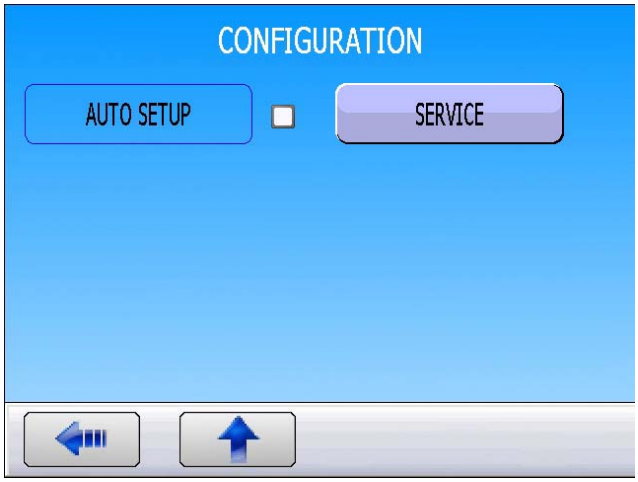
The auto setup function enables the automatic creation of a simple test program.

The various test parameters will be set depending on basic information that the operator enters into the instrument.

To create a program using the auto setup function, it is necessary to connect the instrument to a known **pass part.**

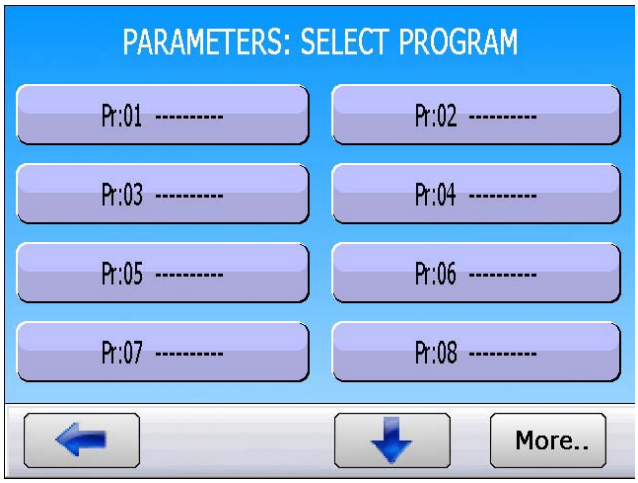
AUTO SETUP procedure:

1- From the "**CONFIGURATION**" menu, enable the "**AUTO SETUP**" function by checking the box .

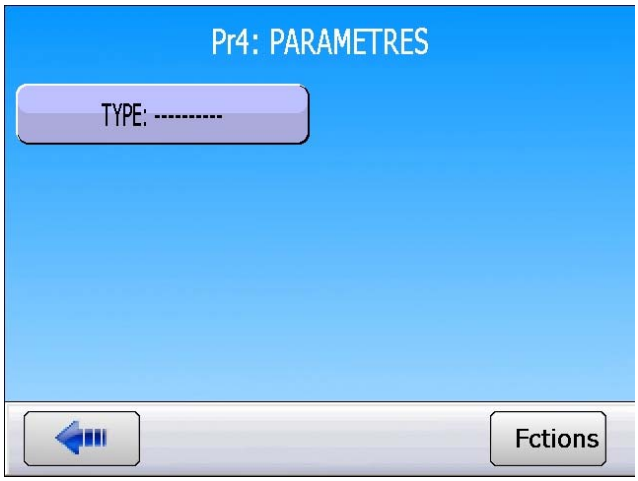


2- Navigate out of the "**CONFIGURATION**" menu, and navigate to the "**PARAMETER**" menu.

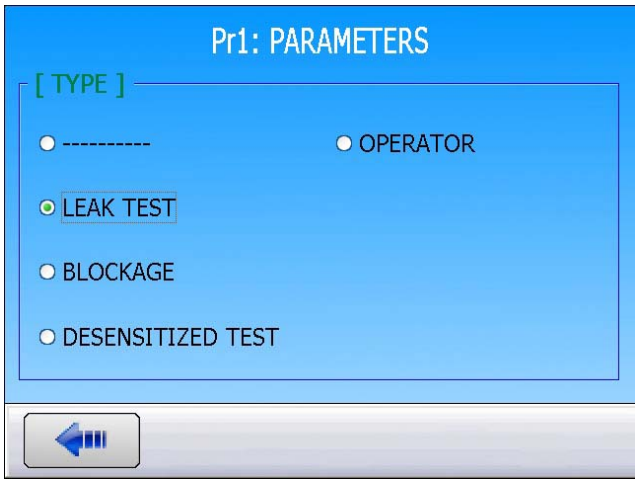
Press onto an empty program.



3- Press **"TYPE"** to select the type of program.



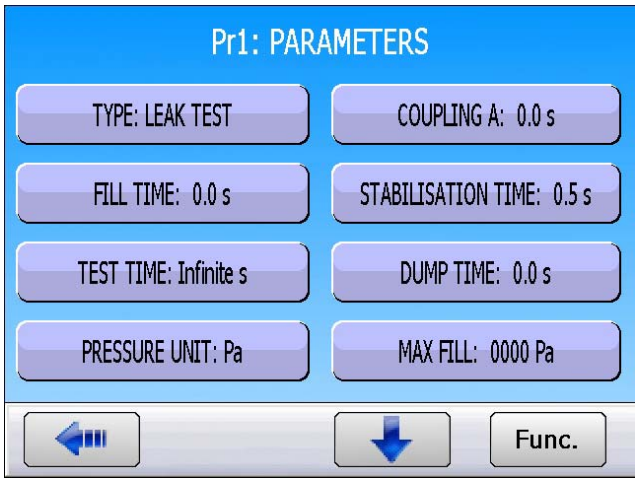
4- Press "**LEAK TEST"** in the program types.



Confirm the **AUTO SETUP** function.

Next select the parameters displayed:

- ✓ choice of an automatic connector (if option is installed),
- ✓ choice of the fill regulator (if double regulator is present),
- ✓ the wait time,
- ✓ the pressure unit,
- ✓ the pressure target,
- ✓ the reject unit, (if the reject unit is a flow, it is necessary to enter the volume units and the volume of the part)
- ✓ the test FAIL value,
- ✓ the test time (not necessary if a flow unit is selected).

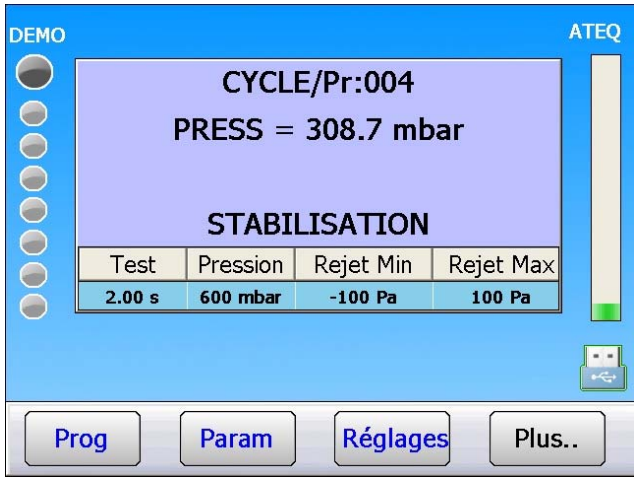


When all the parameters are entered, press on the "**START**" key. The instrument requests the regulator pressure to be set (in case of a mechanical regulator).

The instrument carries out several measurement cycles which set the different program parameters for the part being tested.

At the end of the measurement cycles the instrument must pass the part.

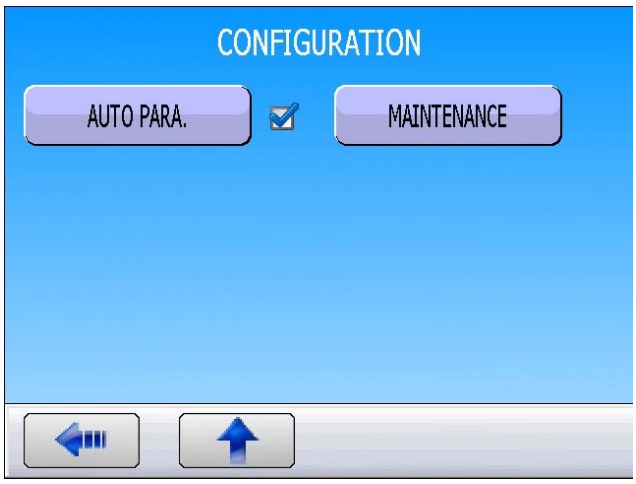
The test parameters are recorded in the program. The instrument is ready to test parts.



The test parameters computed by the instrument may be modified for an optimisation of the cycle time.

The test FAIL percentage, set to 20% by default, is reference value for the calculation of the time based parameters. It can be modified using the following procedures.

From the **CONFIGURATION** menu, press "**AUTO PARA**".



To set the test fail percentage, press **"% Test FAIL:** ".

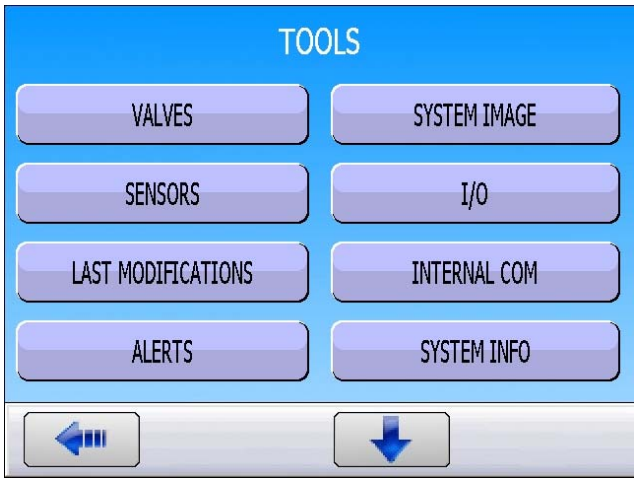
Example: for a pass part and a reject level of 10 cm3/min, the calculations will be done in such a way as to obtain a result of 2 cm3/min (for a test FAIL percentage of 20 %).

VALVE SERVICE

This menu gives the approximate state of the internal valves with the counters indications.

Valve maintenance procedure:

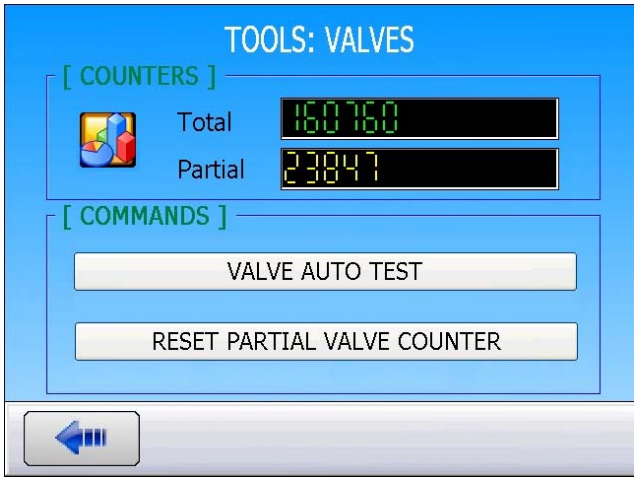
From the “**TOOLS**” menu, press “**VALVES**”.



Two valve counters are displayed: **Total** and **Partial**.

Total: total number of cycles the valve has performed.

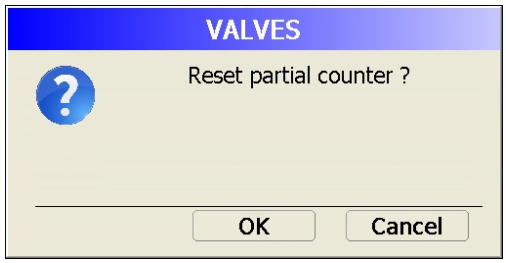
Partial: total number of cycles the valve has performed since the last counter reset.



RESET PARTIAL VALVE COUNTER

This button resets the valve cycle partial counter.

The total counter is managed by the **ATEQ** service department; it is reset to zero after the valve’s complete service.

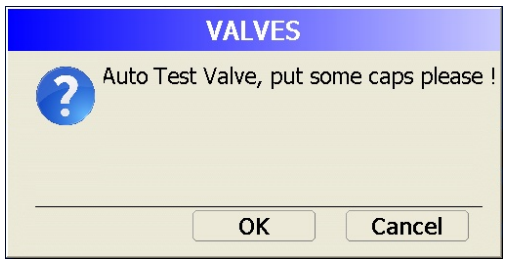


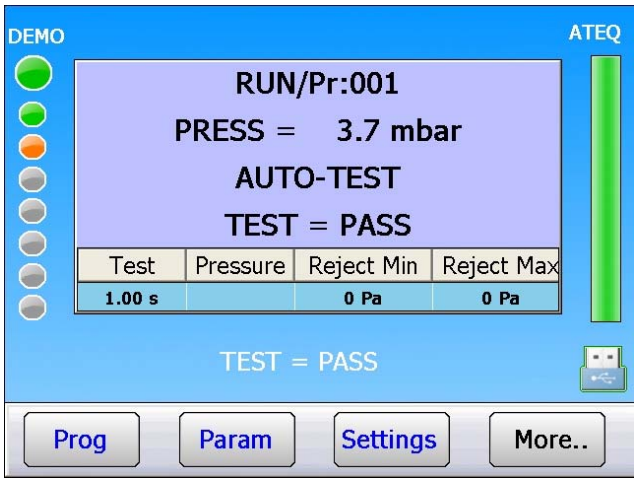
VALVE AUTO TEST

The “**VALVE AUTO TEST**” cycle must only be performed with the test and reference port capped off.

The test parameters are automatically set according to the active program (test pressure) and the instrument’s characteristics.

To launch the auto-test, validate by pressing **OK**, then press the **START** key.





The cycle stops automatically, if the valve is functioning properly, the instrument displays "**TEST = PASS**".

If the valve is leaking or with a fault, the following message appears:

LEAK FAULT

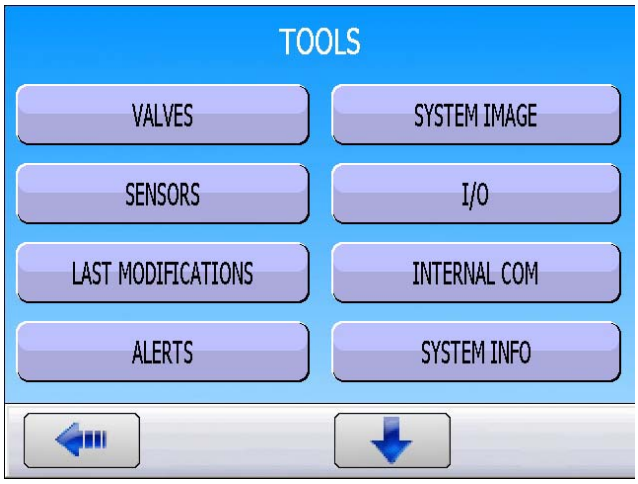
TEST = FAIL

SYSTEM IMAGE

This option saves the complete system settings, in order to restore the settings in case of a failure. The complete restoration will be identical to the last save.

System image procedure:

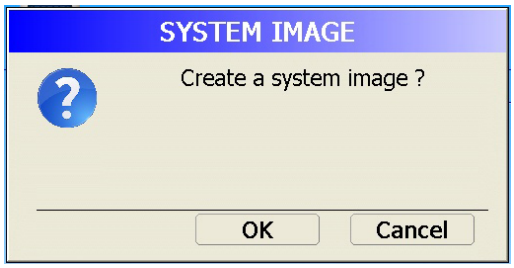
From the **TOOL** menu, press "**SYSTEM IMAGE**".



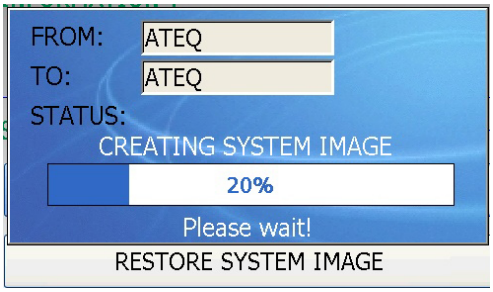
The instrument displays the date of the last system image.

To create an image, press "**CREATE A SYSTEM IMAGE**".

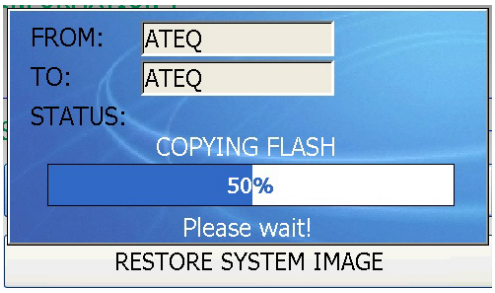
To confirm, press **OK**.



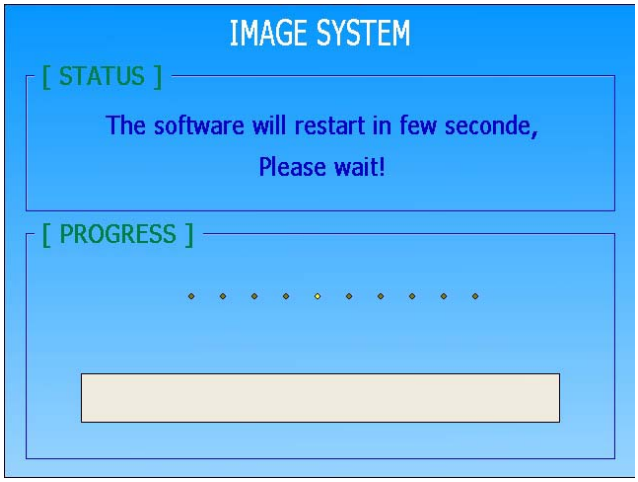
The creation of the image starts, the graph displays the progress.



Next step, the instrument copies the content of the flash memory.



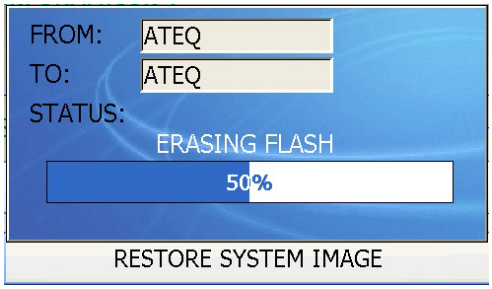
Wait for the instrument software to reboot.

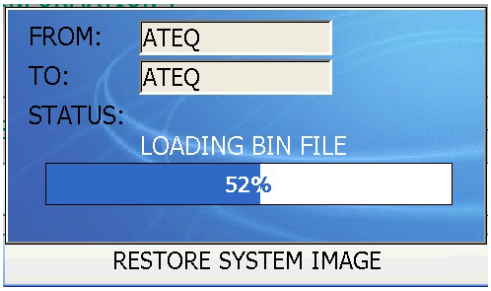


To restore a system image, press "**RESTORE SYSTEM IMAGE**".

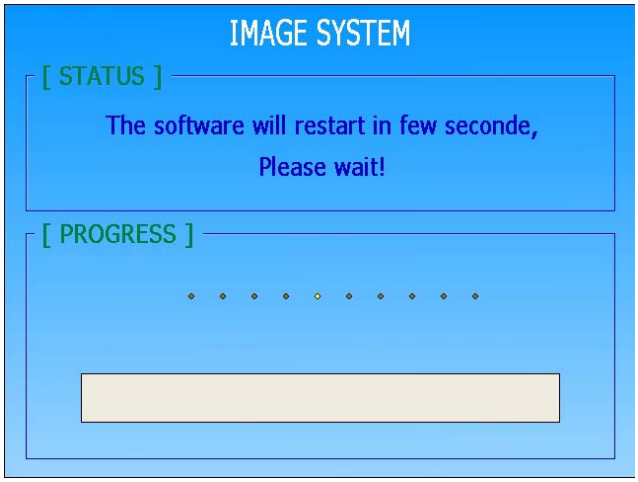
Confirm the selection by pressing **OK**.

The instrument goes through the process of restoring the image, the graph displays the progress.





Wait for the instrument software to reboot.

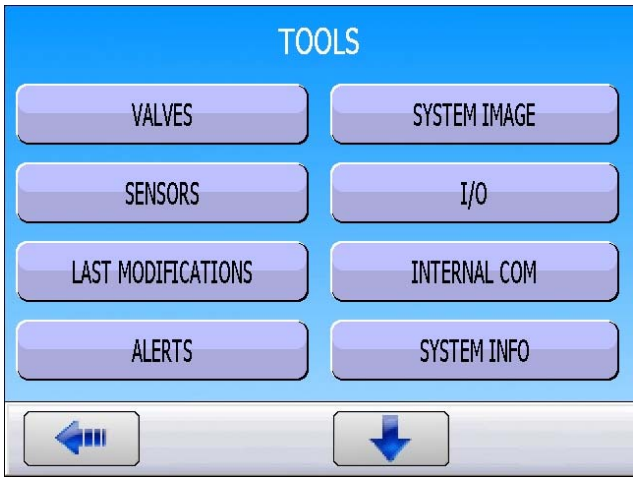


SENSORS

This menu displays the different sensor raw data points; it allows the user to check the health status of the different sensors.

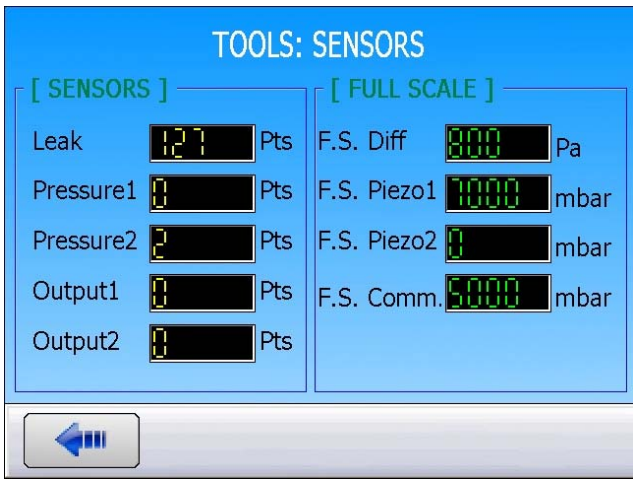
Sensor procedure:

From the "**TOOLS**" menu, press "**SENSORS**".



The instrument performs a dump cycle then displays the raw data points of the different sensors (left column).

The column on the right hand side displays the full scale of the sensors.



If the raw data point is close or equal to the full scale reading, the sensor might be defective. Contact **ATEQ** to service your instrument.

I/O

This menu is to check the states of each input and output of all the boards built in the device.

	Activated output.
	No activated input or output.
	Activated input.

Procedure:

From the "**TOOLS**" menu, press "**I/O**".

I/O of the main board (auxiliary outputs).

I/O of the relay board.

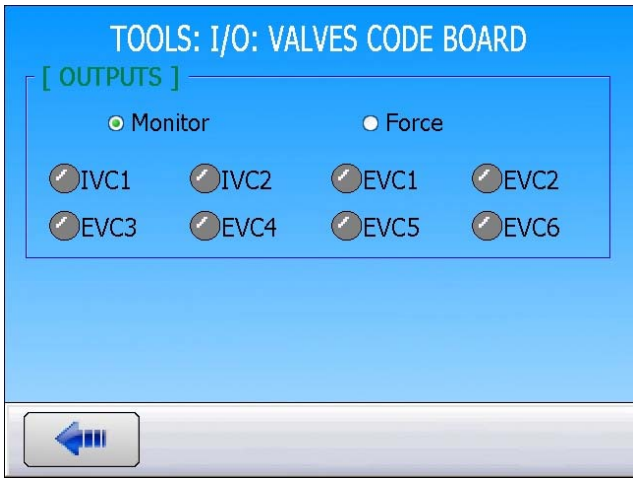
I/O of the valves codes board.

MAIN BOARD

I/O of the main board (auxiliary outputs).

RELAY BOARD

I/O of the relay board.



VALVES CODES BOARD

I/O of the valves codes board.

In **Monitor** mode: the user sees the I/O states, modified by the PLC or the device.

In **Force** mode: the user can change the I/O states.

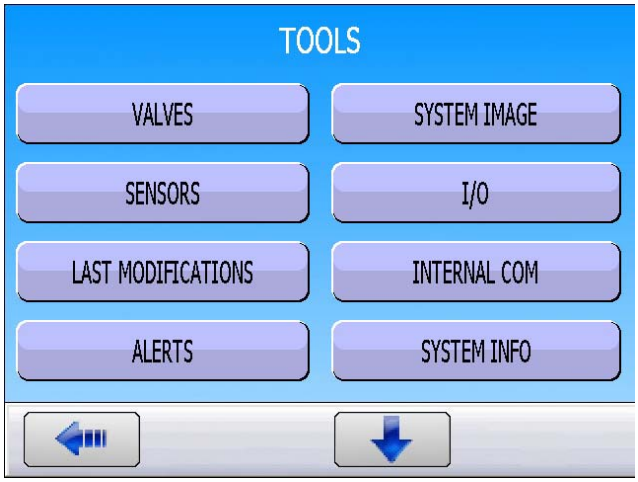
***Important** : we draw your attention to the fact that it is dangerous to change the output status, they can manipulate power actuators or material risks, mechanical, pneumatic, hydraulic, electrical or other which can cause serious personnal injury and damage to property..*

LAST MODIFICATIONS

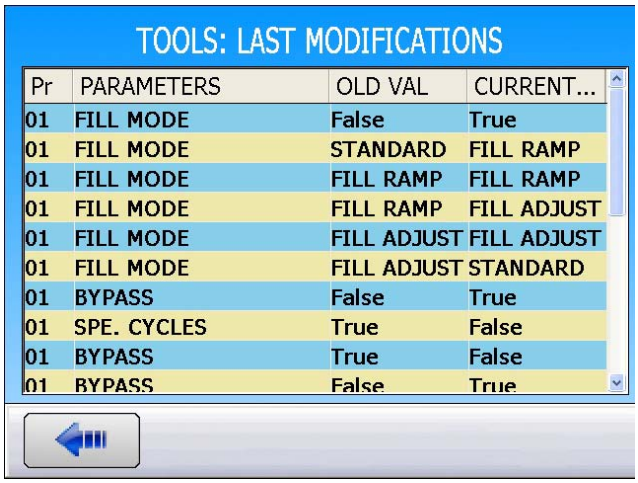
This menu displays the list of the last modifications of the cycle's parameters and functions.

Last modification procedure:

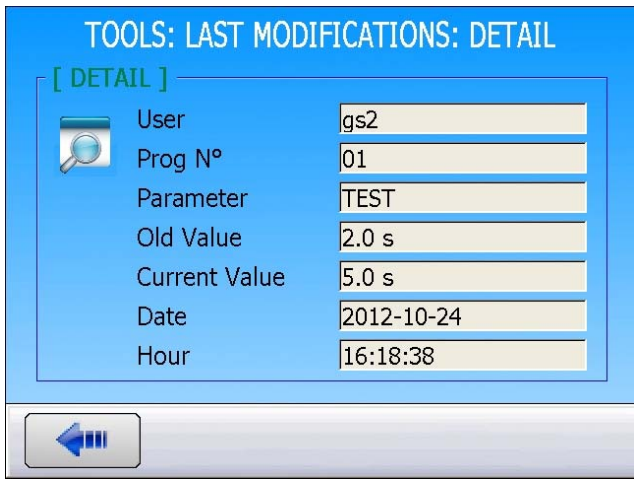
From the "**TOOLS**" menu, press "**LAST MODIFICATIONS**".



The list of the last parameters modifications is displayed on the screen; the list shows the current value and the old value.



Click on one item to display the modification details.



INTERNAL COMMUNICATION

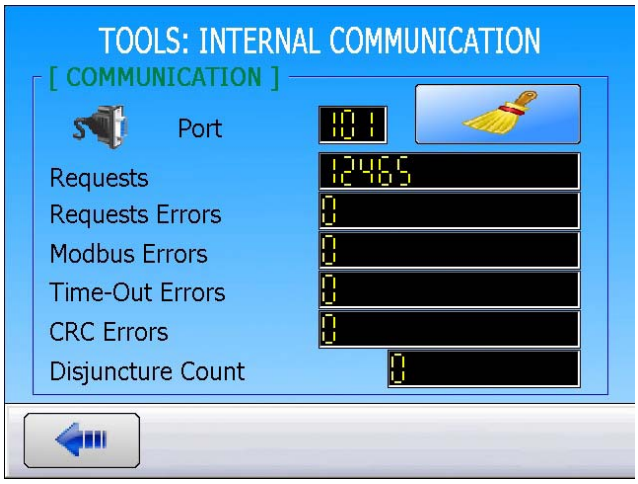
This menu checks proper communication between measurement channels and the central unit.

From the "**TOOL**" menu, press "**INTERNAL COM.**".

The internal communication window displays the different counters.

In case of proper communication, the "**Requests**" counter regularly increments.

Other counters should display zero or rarely increments.



ALERTS

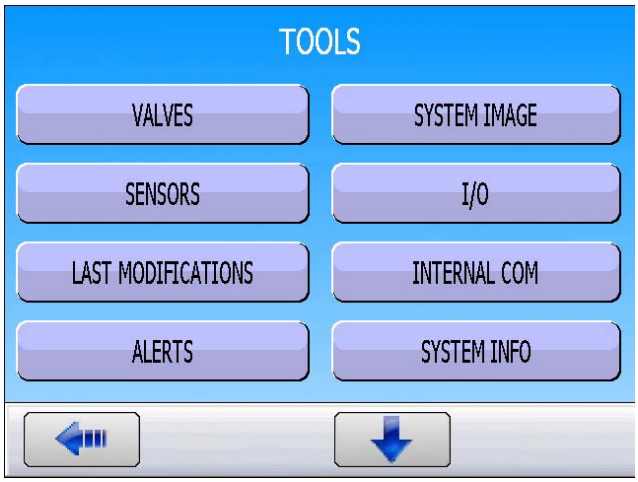
This menu configures the instrument to warn the operator in case of:

- several consecutive parts fail the test,
- several consecutive alarms,
- defined number of valve cycles is reached,
- the calibration date is passed due,
- a specified calendar frequency is reached.

Informational (cycle counter and history) emails can also automatically be sent at a predefined frequency.

Alarm setup procedure:

From the **MAINTENANCE** menu, press **ALERT**.



The alert window appears.

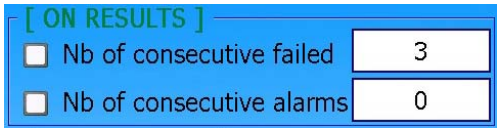
Chose the **[TYPE]** of alert:

- **Mail**: Email sent when the condition is true.
- **Display**: alarm is displayed on the screen.

Validate the alerts by checking the box  .

Then, enter the required value.

[ON RESULTS]



Consecutive number of BP = 3: after 3 consecutive parts failing the test, the alert will be active.

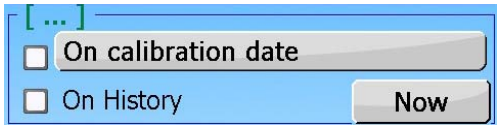
Number of consecutive alarms = X: After X alarms, the alert will be active.

[ON COUNTERS]

Valve counters = X: when the valve cycle counter reaches X, the alarm is active.

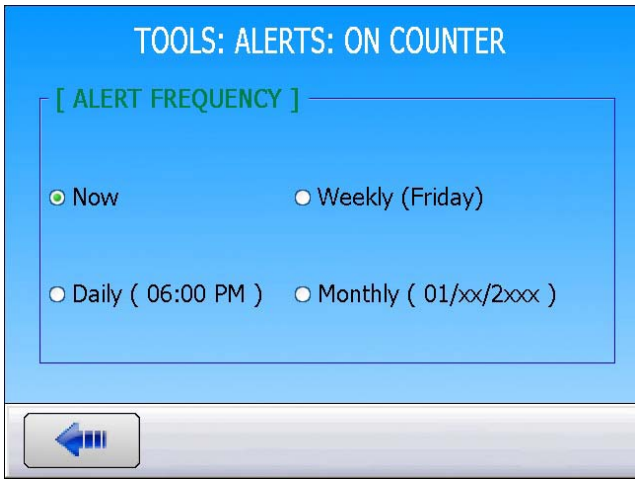
Cycle counter: Email the cycle counter based on the set frequency.

[…]



On the calibration date: when the date of calibration is passed due, the alarm is active.

"**History**": Alarm based on frequency (every day, week, month...)



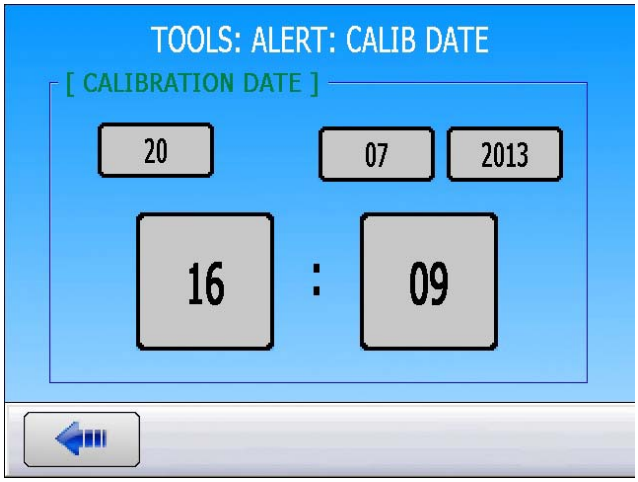
The "**Now**" button allows selecting the alert frequency, only available for email alerts.

Now: send the email right away.

Daily: send the email everyday at 6PM.

Weekly: send the email every Friday.

Monthly: send the email the 1st of every month.



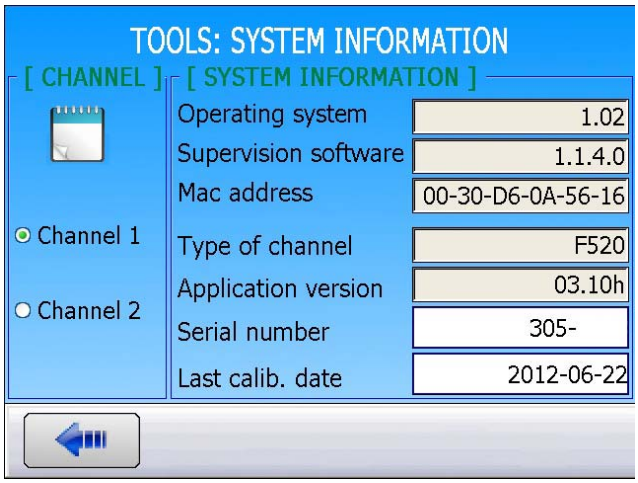
Pressing "**On calibration date**" opens a window to select the calibration date and time for the alert.

SYSTEM INFORMATION

This menu displays information regarding software versions and other useful instrument specific data.

From the "**MAINTENANCE**" menu, press "**SYSTEM INFO**".

The "**SYSTEM INFORMATION**" window displays information and system software versions.



KEYBOARD

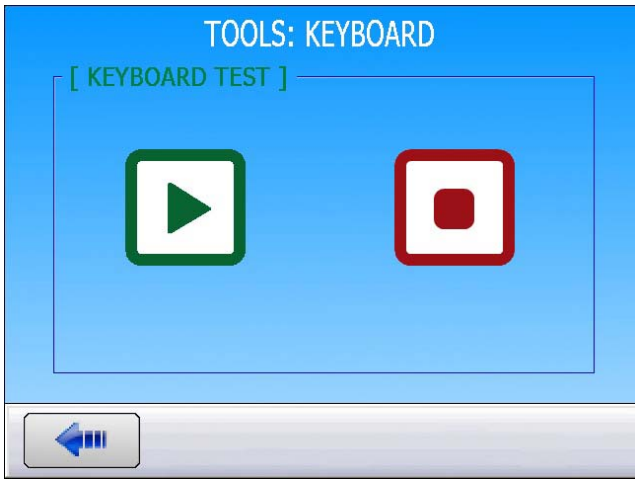
This menu tests the proper functioning of the front panel keys.

Keyboard procedure:

From the "**TOOLS**" menu, press "**KEYBOARD**".

The window displays the two front panel buttons "**START**" and "**RESET**".

The changing of the picture while pressing the button confirms the key is functioning properly.

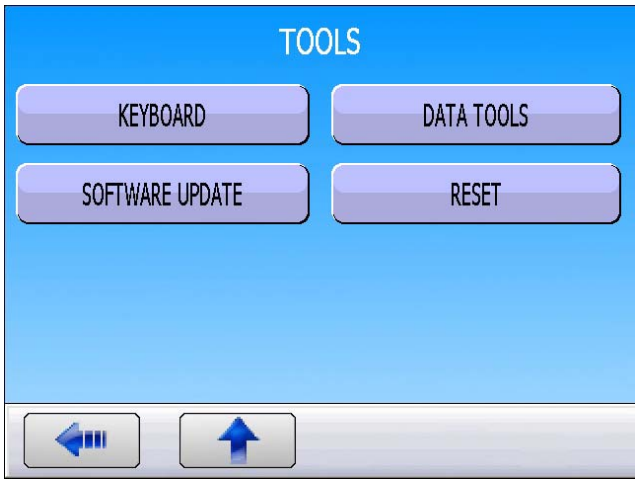


DATA TOOLS

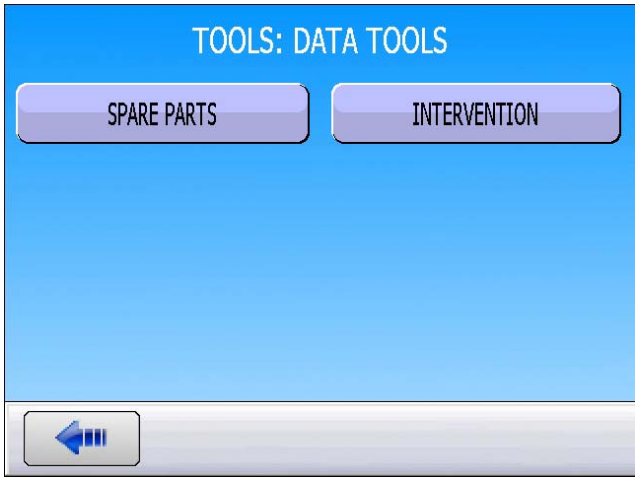
The data tool menu displays the spare parts list for the instrument, as well as the maintenance history and intervention dates.

Data Tools procedure:

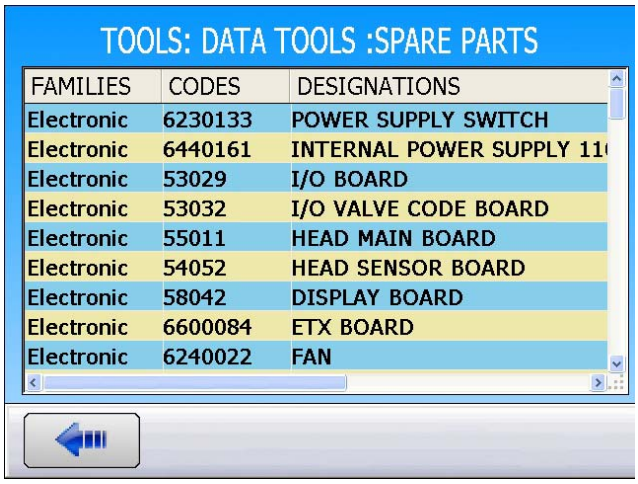
From the **MAINTENANCE** menu, press "**DATA TOOLS**".



The window displays two buttons: "**SPARE PARTS**" and "**INTERVENTION**".

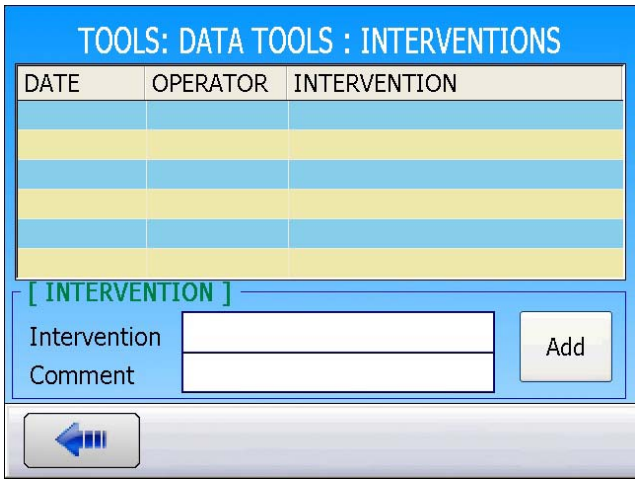


"**SPARE PARTS**" button: displays a list of the instrument spare parts.



"**INTERVENTION"** button: displays ATEQ technician interventions list

*Only **ATEQ** authorized technicians have access to enter comments.*

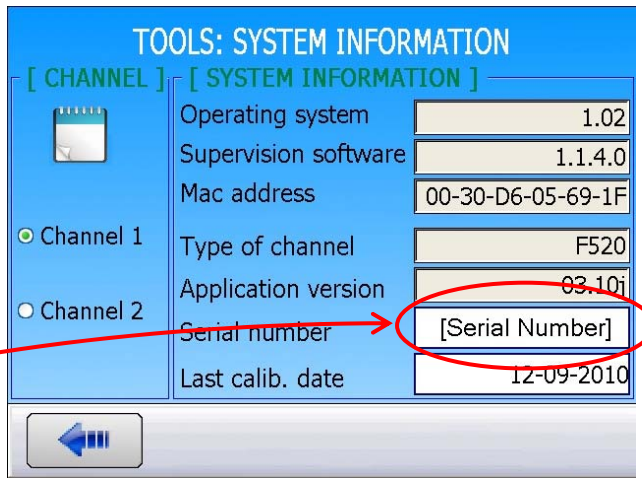


SOFTWARE UPDATE

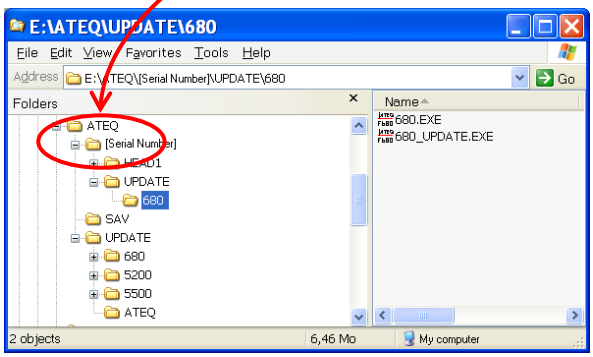
This menu updates the different software running on the instrument. It's done from an external USB key. All the updates will be sent by the ATEQ Company.

For the updates, following the device version, the files three is different.

The device version is displayed in the **SERVICE / SYSTEM INFO** in the field "**Supervision software**".

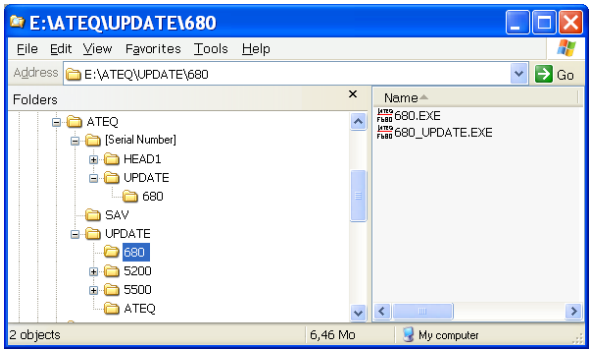


Version before 1.2 (<1.2.0.0) :



The "**UPDATE**" folder is under the "**[Serial Number]**" folder. The device will search the update program in this folder.

Version after 1.2 (≥ 1.2.0.0) :



*The device will search the update program in the "**UPDATE**" folder directly under the "**ATEQ**" folder.*

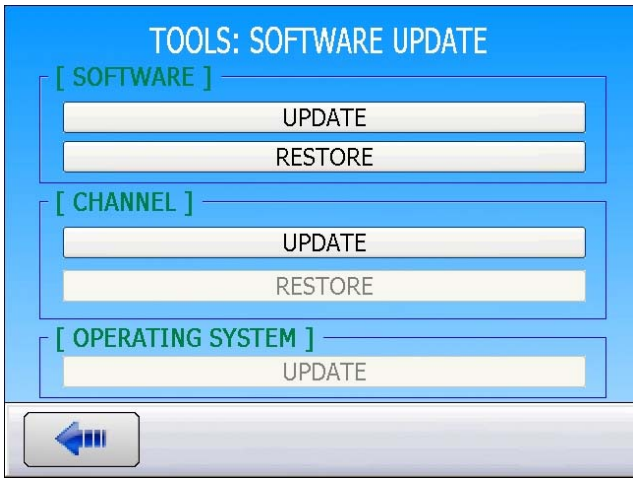
***Note**: if the serial number field is empty (no serial number in the device) the "**Serial Number**" folder doesn't exist. The device will search the update program in the "**UPDATE**" folder directly under the "**ATEQ**" folder.*

In all cases, the "**ATEQ\UPDATE**" folder (and its subdirectories) must exist.

1. UPDATE SOFTWARE

First, connect the external USB key with the update files on the device USB port.

From the "**SERVICE**" menu click on the "**UPDATE SOFTWARE**" button (page 2).



The software update window is displayed.

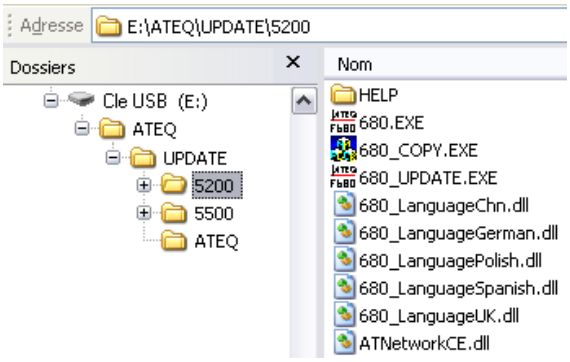
Following the installed updates, the "**Updates**" buttons are validates or not.

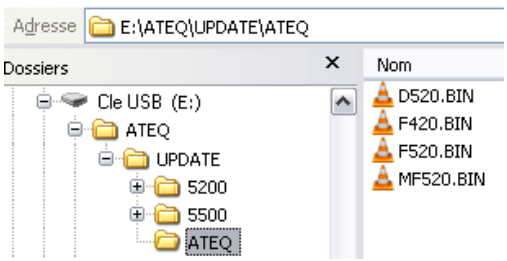
In case of previous updates, the "**Restore**" buttons are validate or not.

Click on the update button you want, here, head update.

Three updates types are available:

- The Operating System (Windows© CE). **[OPERATING SYSTEME]**
- The device software. **[SOFTWARE]**
- The channel(s) software. **[CHANNEL]**

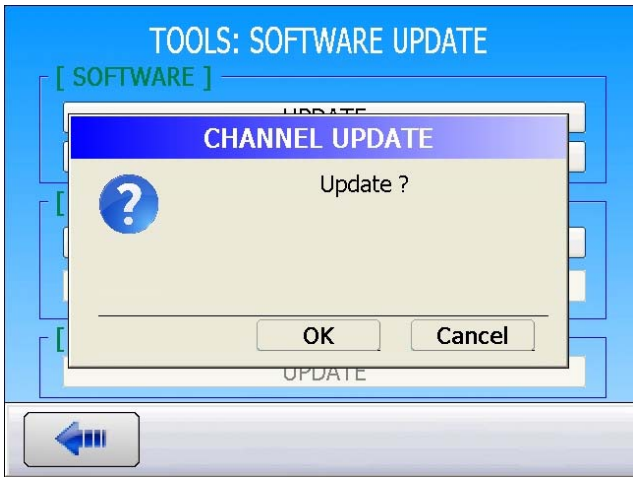




All the different updates will carry out in the same mean.

1.1. EXAMPLE: CHANNEL UPDATE

A confirmation window appears, validate by pressing the "**OK**" button.



The update process begins.

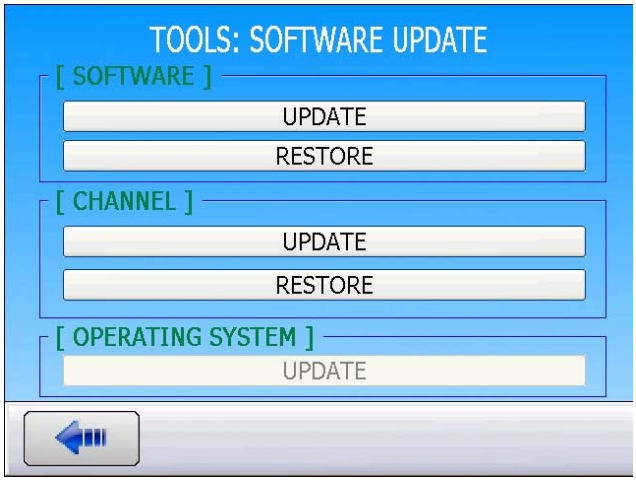
The update process can take several minutes. During this time, do not power of the device and do not extract the USB key, this can definitively break down the device.

1) Parameters download.
2) Flash memory copy.
3) Flash memory erasing.
4) BIN file loading.

Once the update is complete, the update screen appears.

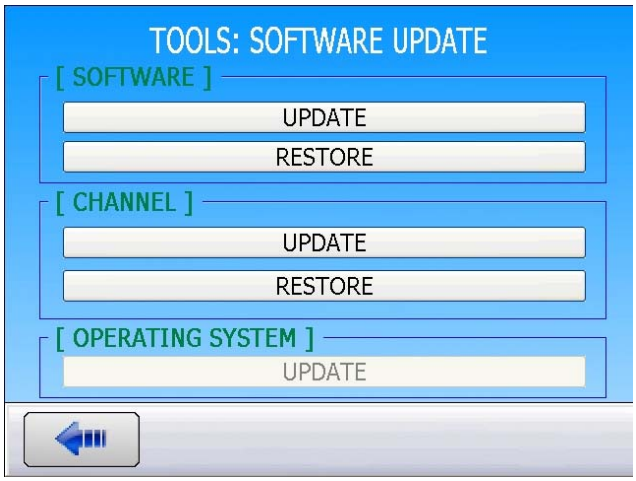
Do the same process for the others updates.

To validate the update, power off and on the device.



2. RESTORE PREVIOUS VERSION

In case of previous update, the "**Restore**" are validate or not.



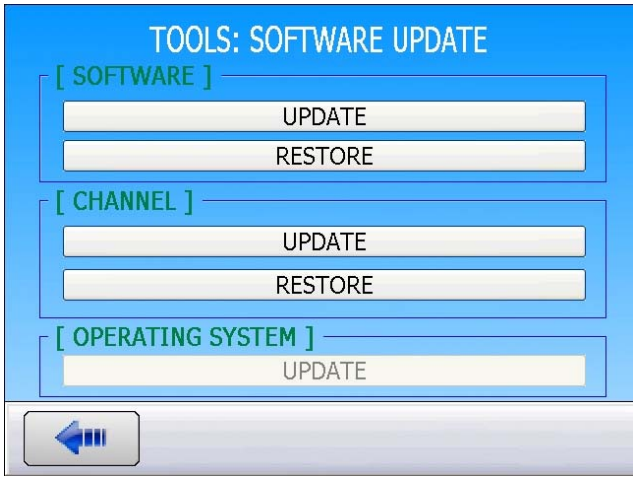
A confirmation window appears, validate by pressing the "**OK**" button. The process begins.

The restore process can take several minutes. During this time, do not power of the device and do not extract the USB key, this can definitively break down the device.

1) Flash memory erasing.

2) BIN file loading.

Once the restore is complete, the update window appears.



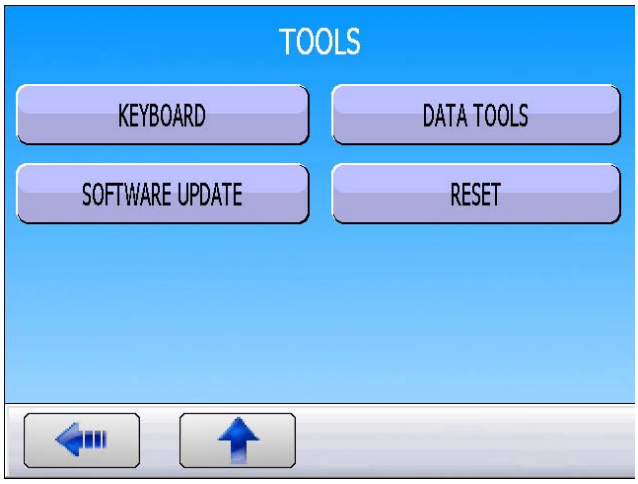
To validate the update, power off and on the device.

RESET PARAMETERS

This menu allows the user to perform a complete reset of the software or the channel (reset to factory configuration).

Reset procedure:

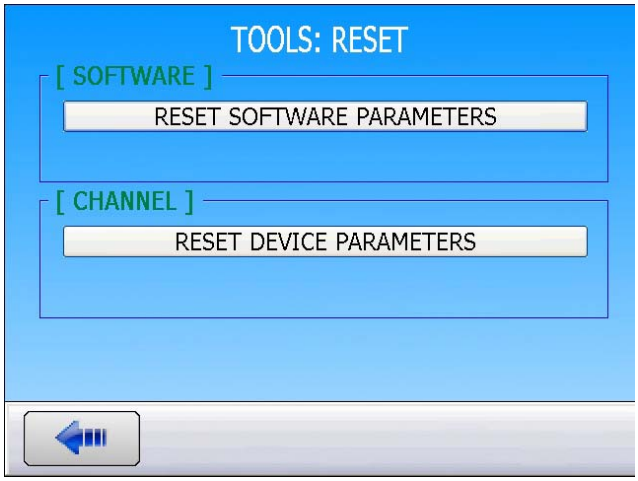
From the "**TOOLS**" menu, press "**RESET**".



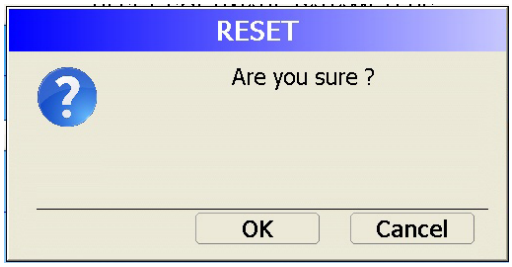
The reset window appears, two options are available:

[SOFTWARE] reset: reinitialize the configuration of the instrument software (configuration reset).

[CHANNEL] reset: reinitialize the measurement module (parameters reset).



After a reset request, a window pops up to confirm the action.

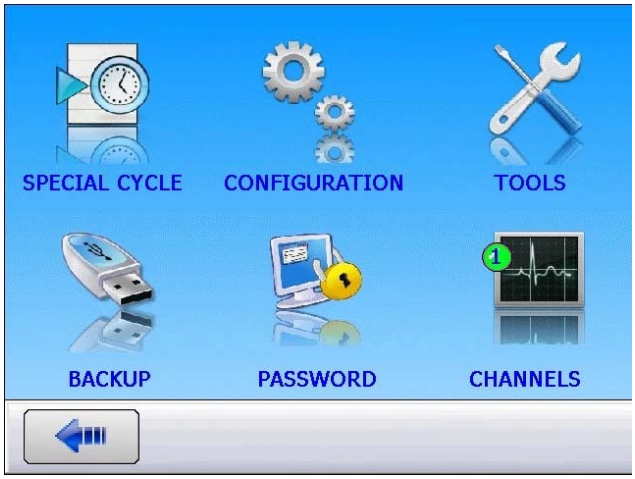


BACKUP

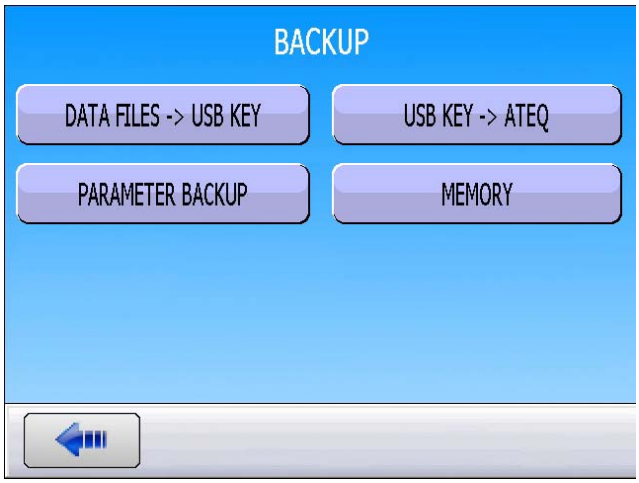
This menu is used to access files stored in the instrument for downloading or to uploading files to it. It also allows managing the different storage locations.

Upload / Download procedure:

From the main menu, press **BACKUP**

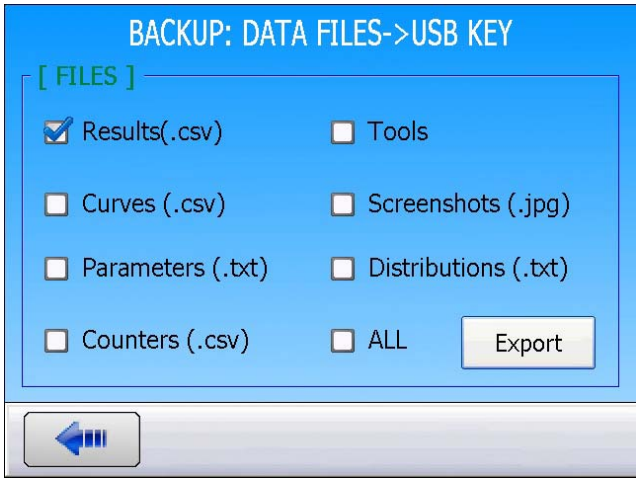


Various options are displayed.

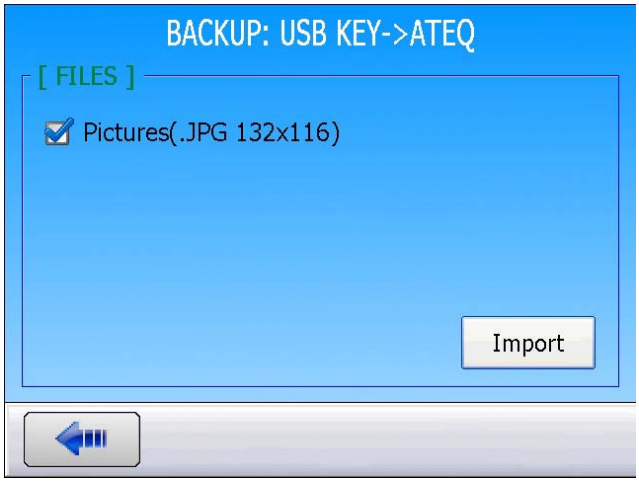


DATA FILES -> USB KEY: this menu allows saving the various files from the memory of the instrument onto an external USB key (connected to one of the USB ports located on the front panel).

Check  one or several of the types of the files needed, and then press **Export**.



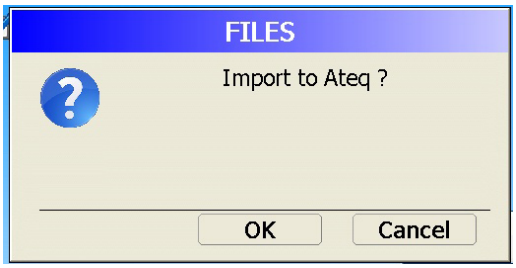
The instrument asks for confirmation. Click **OK**.



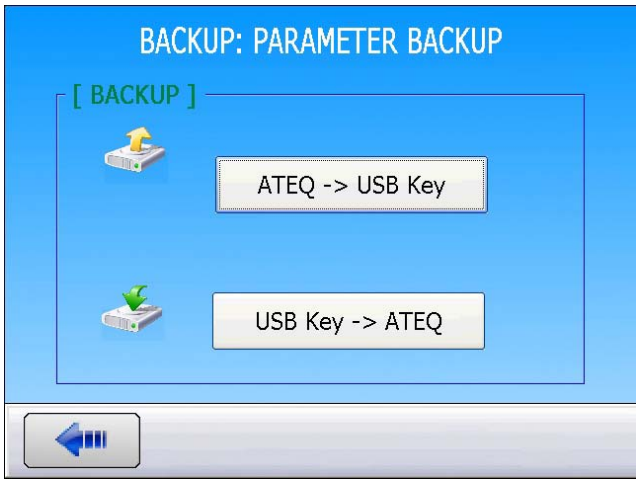
USB KEY -> ATEQ

USB KEY -> ATEQ: this window will be displayed; this menu allows the uploading of images (.jpg 132 x 116) from the USB key into the instrument's memory.

Check the type of file, then press **Import**.

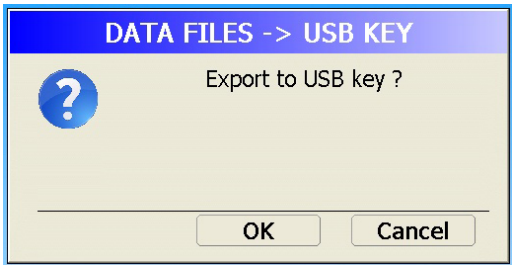


The instrument asks for confirmation. Click **OK**.



PARAMETER BACKUP

PARAMETERS BACKUP: this menu allows saving or restoring the parameters of all the programs onto a USB key and facilitate cloning.



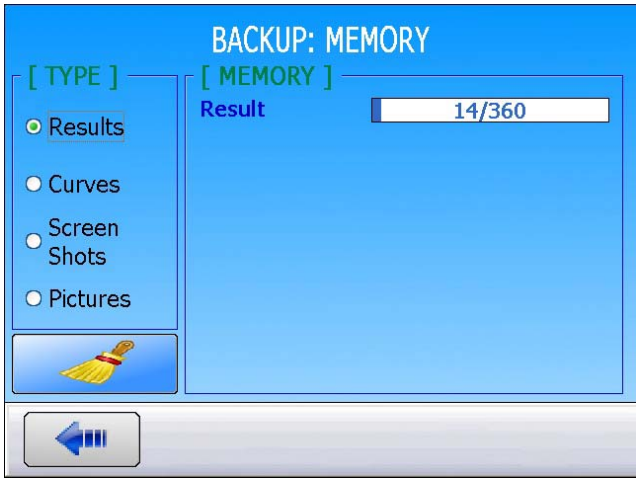
ATEQ -> USB Key

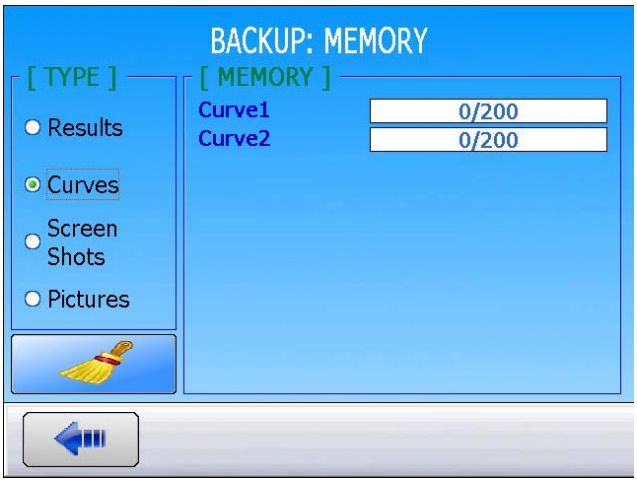
Export the parameters onto a USB key. The instrument asks for confirmation. Press **OK**.

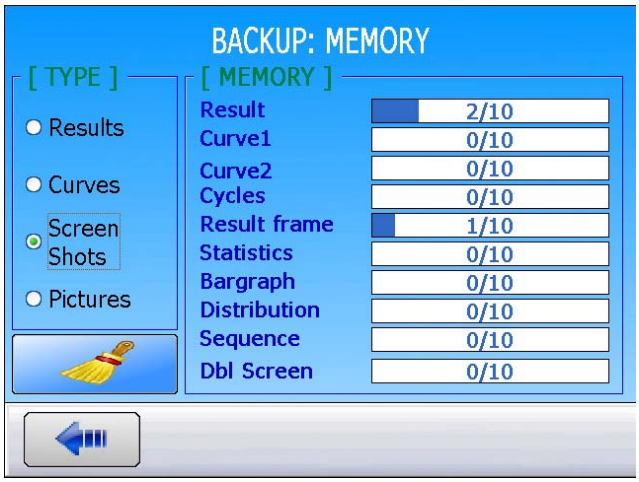
USB Key -> ATEQ

Restore the parameters from the USB key. The instrument asks for confirmation. Press **OK**.

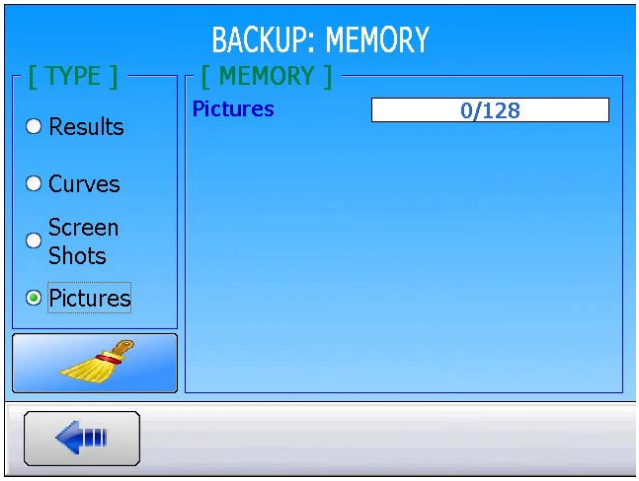
MEMORY: this menu allows managing the different files used by the instrument.







The bars graph shows the remaining memory left for each file type.



To erase (empty the memory), select the memory to erase and press:  .

The instrument asks for confirmation. Press **OK**.

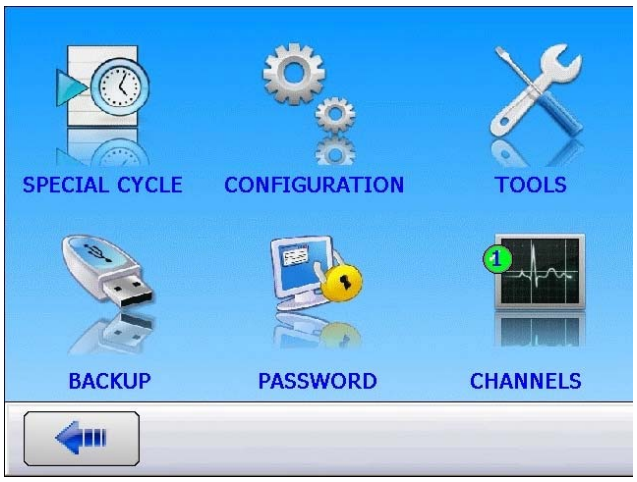
Note: the deletion is permanent.

PASSWORD

This menu allows adding new users and protecting the instrument depending on the rights of the user.

Password procedure:

From the main menu, press the **PASSWORD** icon.

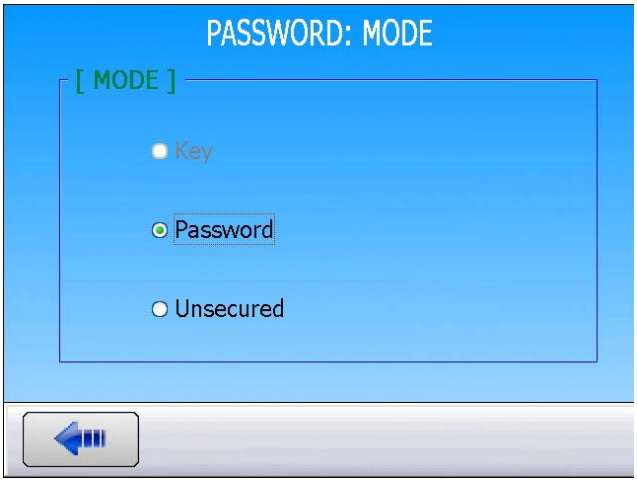


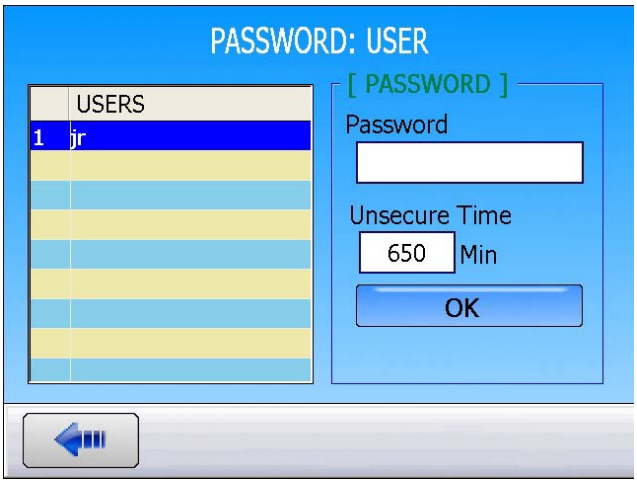
Le administrator account (**ADMIN**) has all the rights to manage the device. The password default is: **ADMIN**.

Various options are displayed.

This menu set the type of access or locking of the instrument.

- **Key** mode: If the option is installed, it is necessary to turn the key on the front panel to be able to set and modify parameters.
- **Password** mode: if password is selected, the password must be entered (by the user) to access the instrument parameters.
- **Unsecured** Mode: The instrument is not locked; everything is accessible and can be modified.



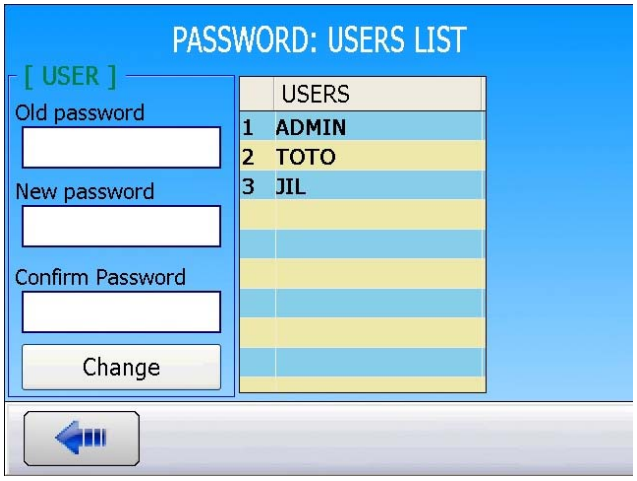


USER

To give access to a selected user, when the instrument is locked with a password.

The user must type his password to unlock the unsecure time feature.

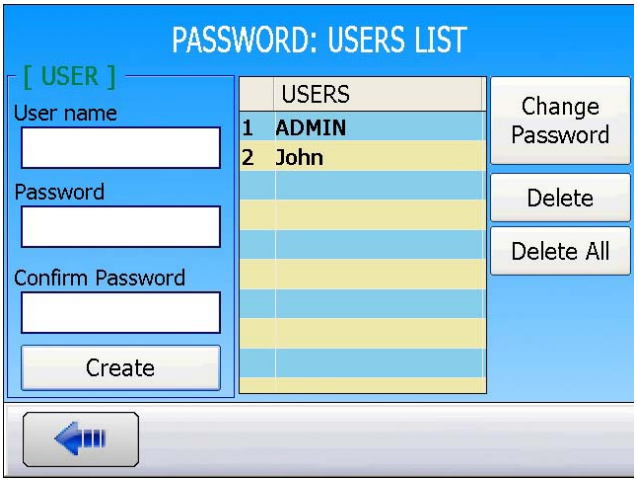
In the field **"Unsecured time"** the user enters the amount of time the instrument will not ask for the password again, in order to access the parameters (maximum of 650 min).



USERS LIST

User mode:

Displays all the users who have access to the instrument. This menu also allows changing the password for the selected user.



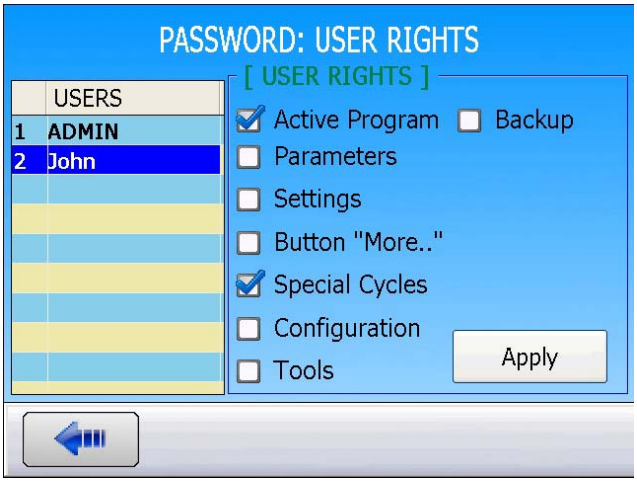
Administrator mode:

"**Create**" : to create a new user account. Fill the fields : "**User name**", "**Password**" and "**Confirm. Password**" before creation.

"**Change Password**" : to change the password of the selected ccount.

"**Delete**" : to delete definitively the selected account. Operation to do in case of lost password.

"**Delete All**" : delete all the accounts.



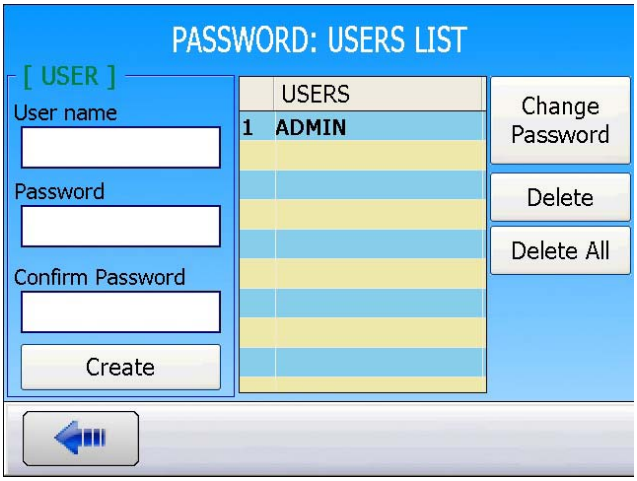
USER RIGHTS

Displays the rights of each user.

When the box is checked  , the access is granted. You must have ADMIN rights to be able to change the user rights.

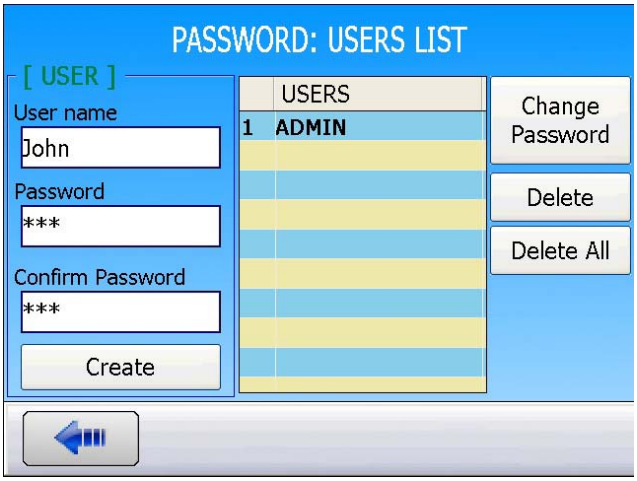
1. ADDING USERS

From the **PASSWORD** menu, press "**USER LIST**".



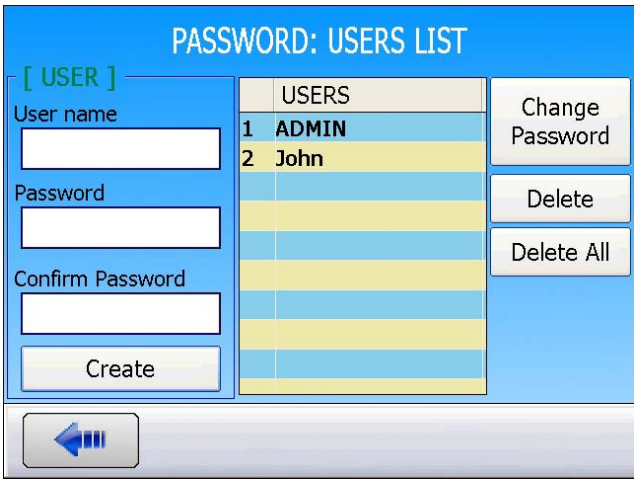
In the left hand side column, enter the new user name and password twice.

Press "**Create**" to create the new user.



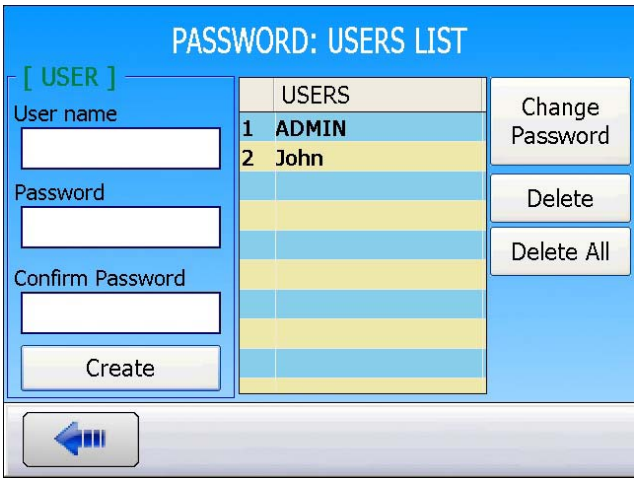
The instrument confirms the creation of the new user. Press "**OK**".

The new user appears in the User list.



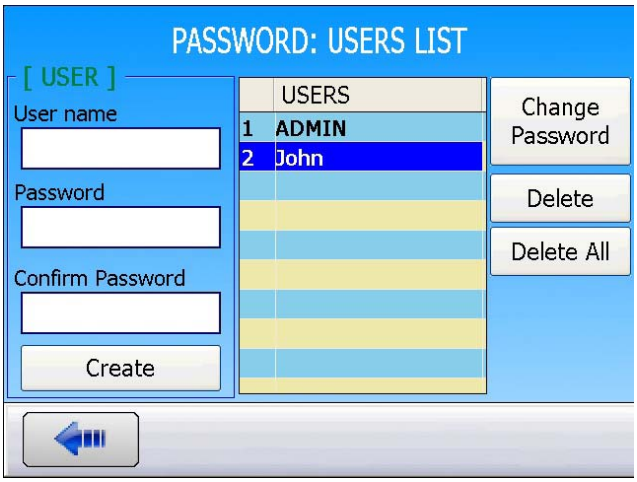
2. DELETING USERS

From the **PASSWORD** menu, press "**USER LIST**".



In the user list, select the user to delete by pressing on its name.

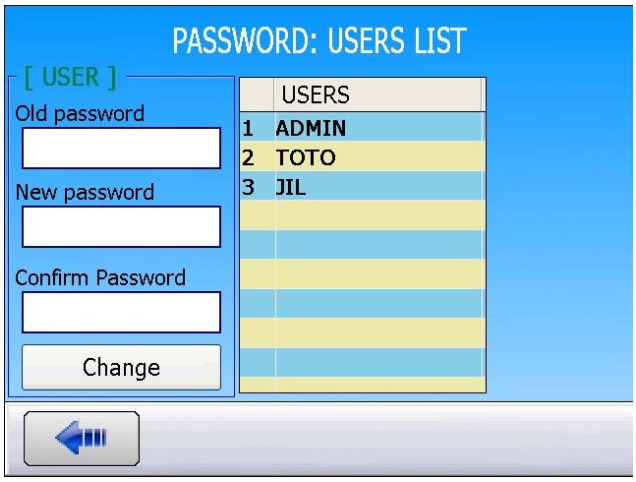
You now have the choice to change the password of the user, delete the user or delete all the users.



To delete the user, press "**DELETE**". The instrument asks for confirmation.

Press "**OK**" to delete the user.

3. LOST PASSWORD



If the **ADMIN** as lost is password, this process can delete the **ADMIN** password and allows to enter a new one:

From the **MAIN MENU** select the **PASSWORD** menu and then the **USERS LIST** menu.

Select the **ADMIN** account.

In the "**Old password**" field, enter the **2 8 3 7** code.

In the "**New password**" field enter your new password.

In the "**Confirm password**" field enter again the new password.

This will release your **ADMIN** password.

***Note**: this function for delete the password is effective from the v1.2.0.2 firmware version.*

MEASUREMENT PRINCIPLES

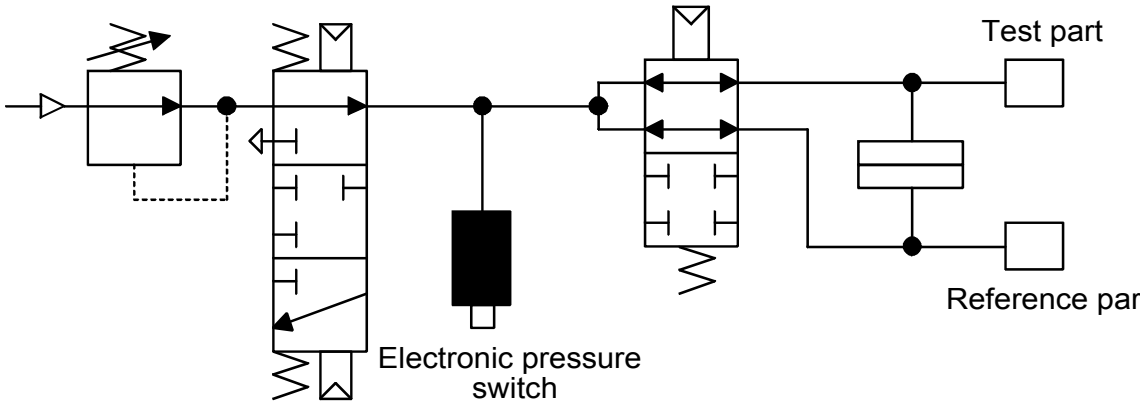
1. THE MAIN TYPES OF MEASUREMENT

The **ATEQ** is an air/air leak detector used to check the integrity of parts on the production line. It can also be used for sample and audit testing. The detection principle is based on the measurement of a low differential pressure variation or pressure drop between two parts, one to be tested and the other used as a reference. Both are filled at the same pressure.

There are three measurement methods: Direct measurement, indirect measurement and sealed component measurement. These three principles concern measurements carried out under pressure and under vacuum.

The configuration is determined by the application, and must be determined before ordering the instrument.

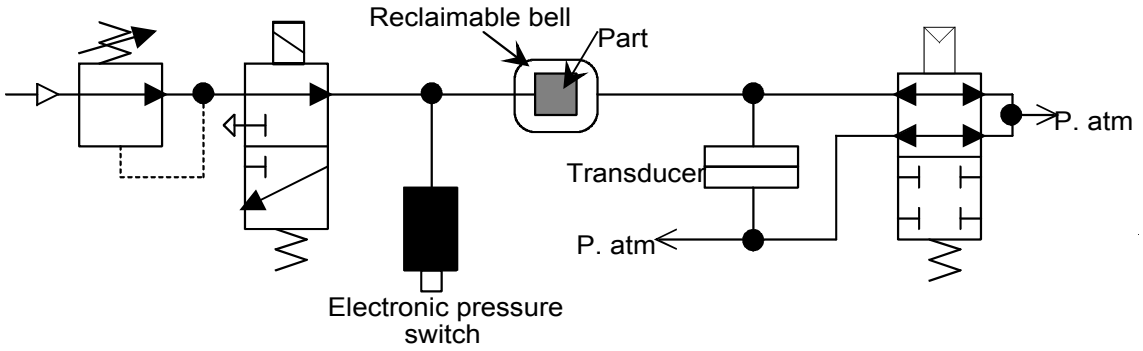
1.1. DIRECT OR PRESSURE DROP MEASUREMENT



After filling the test and reference parts to the required pressure level, the instrument measures the differential pressure between the two volumes which are separated by the equalization valve.

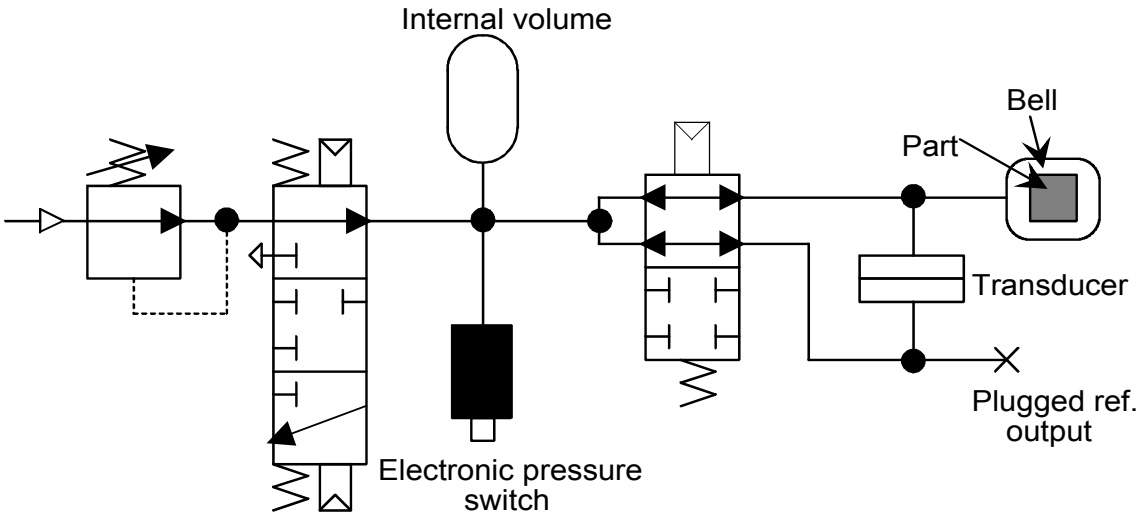
At the end of a cycle, the instrument empties the components via the dump valve.

1.2. INDIRECT PRESSURE RISE MEASUREMENT



The test part is placed in a sealed bell and the instrument is pneumatically connected to the bell. The part is externally pressurized (with up to 20 MPa or 200 bar) and the bell is lightly pressurized. In the event of a part leakage, the pressure in the bell will rise. This method allows certain parts to be tested at high pressure levels whilst avoiding the associated constraints. The instrument only tests and measures the pressure in the bell. In the event of a large leak, electronic monitoring of the pressure in the bell will switch the instrument to safety.

1.3. SEALED COMPONENT MEASUREMENT



This test is intended for sealed parts which cannot be filled at the test pressure. They are put into the bell. The bell is pressurized by dumping air from an intermediary volume. The difference in the amount of air from a good to bad part can be measured. The pressure in the bell is controlled according to the formula:

P1 V1 = P2 (V1 + V2)

V1 bell volume

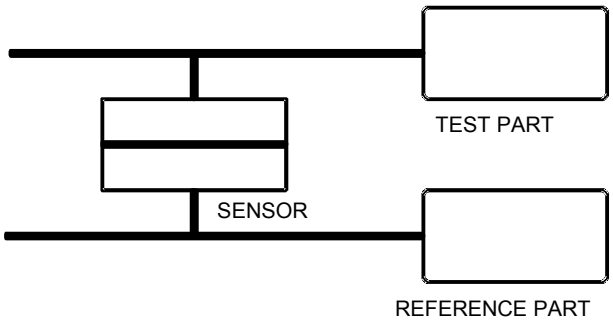
V2 reserve volume

The first and the third measurements may be carried out in comparison with a **reference**, **without reference or in central zero.**

TEST TYPES

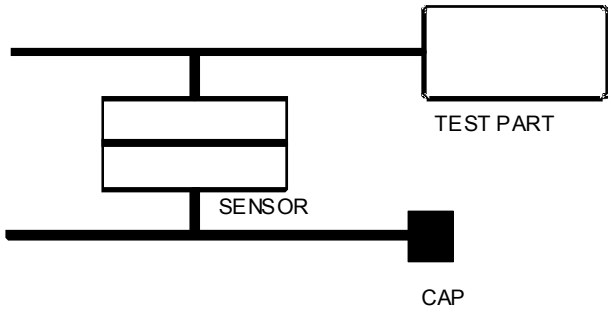
1. THREE TYPES OF TEST

1.1. TEST WITH REFERENCE



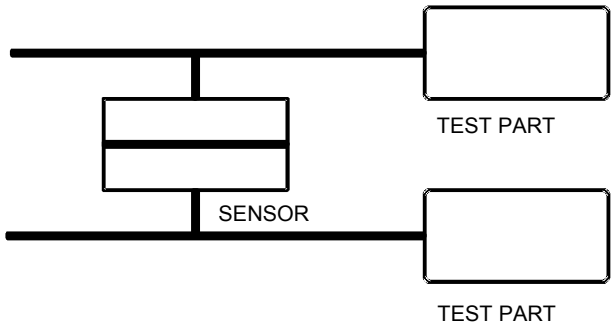
Measurement of a pressure variation between a test part and a reference part. The ideal measurement conditions are: part and reference part identical and identical **ATEQ** connections to both parts (identical lengths, diameters, and type of pipes). A measurement taken with a reference part saves time because the pressure equalization is more rapid. It is valid for parts which cannot be deformed and which mimic thermal and mechanical effects.

1.2. TEST WITHOUT REFERENCE



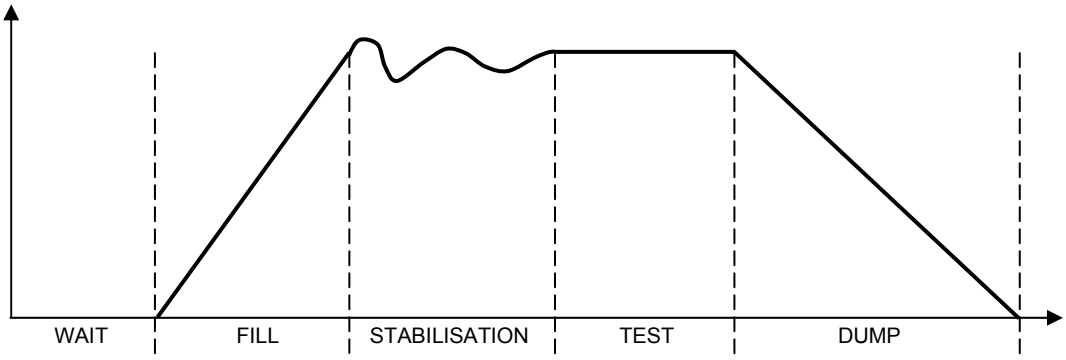
Measurement of a variation in pressure between a test part and a sealing connector on the reference side. A test without reference is not recommended unless parts with very small volumes are being tested. It is preferable always to have a certain volume on the reference side.

1.3. TEST WITH CENTRAL ZERO



It is possible to test two parts at the same time. One part is connected to the test side and the other to the reference side. The differential sensor measures the drop in pressure in one part in relation to the other. This method may be used when the number of bad parts is very low (generally less than 1%). The probability of having two bad parts at the same time is very low. This method is also used for deformable parts and parts with a constant temperature which is different from the ambient temperature. The central zero tests offer a considerable time gain (two parts tested simultaneously).

2. DIRECT PRESSURE MEASUREMENT



The measurement cycle consists of 5 phases:

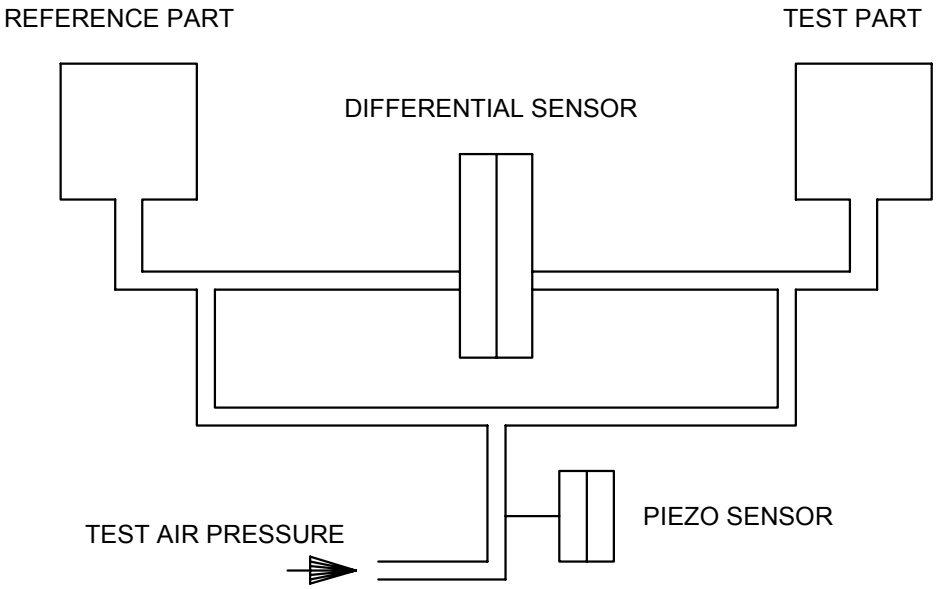
	1	2	3	4	5	
Start	**Coupling time** (wait)	**Fill time**	**Stabilization time**	**Test time**	**Dump time**	Cycle end

Start	Cycle start
Coupling time (wait)	The time during which the sealing connections are made to the test parts before they are filled. The instrument may be fitted with the optional automatic connector. This valve is controlled for the duration of the cycle to enable the checking of the installation of the expandable joint connectors.
Fill time	Pressurization of the test and reference parts. At the end of the fill time, the **ATEQ** instrument checks the test pressure against the pressure thresholds. If this is not correct, it will signal a test pressure fault.
Stabilization time	The test and reference parts are completely cut off from the air supply, but are pressurized to the test pressure. Pressure and temperature will then stabilize between the two parts which communicate and act similarly. If the test pressure is incorrect (a large leak on one of the volumes) the test pressure will drop rapidly, the instrument will not move on to the test mode and will indicate a fault.
The **test** time	The test and reference parts are isolated from each other and the leak sensor measures the difference in pressure between them. The signal is electronically assessed and displayed; the part is then diagnosed as good or bad.
The **dump** time	Return of the parts to atmospheric pressure.
End of Cycle	Once the dump has been carried out, the instrument sends the end of cycle signal and the automatic connector valve (optional) is deactivated. This valve can control one or more expandable connectors from the beginning to the end of the cycle.

DEFINITION AND CHARACTERISTICS

1. DEFINITION OF THE ATEQ 5000 SERIES

The **ATEQ 5000 series** is a state of the art touch color screen compact air/air leak detectors designed to test the air-tightness of parts on production lines. It is specially adapted for automatic and semi-automatic workbenches. The method used is based on the measurement of a small variation or drop in differential pressure between the test and reference parts, when both are filled to an identical pressure.



2. MEASUREMENT CHARACTERISTICS

2.1. PRESSURE DROP MEASUREMENT

RANGE	ACCURACY	maximum RESOLUTION
0 – 50 Pa	2% of the pressure +/- 0.5 Pa	0.1 Pa
0 – 500 Pa	2.5% of the pressure +/- 1 Pa	0.1 Pa
0 – 5000 Pa	2.5% of the pressure +/- 10 Pa	1 Pa

2.2. TEST PRESSURE MEASUREMENT

RANGE	ACCURACY	maximum RESOLUTION
F.S. = 75 mbar*	+/- (1.5% of the pressure + 0.2 hPa)	0.1 % FS
F.S. < 0.3bar	+/- (1.5% of the pressure + 1 hPa)	0.1 % FS
0.3 ≤ F.S. ≤ 1 bar	+/- (1.5% of the pressure + 3 hPa)	0.1 % FS
1 < F.S. ≤ 5 bar	+/- (1.5% of the pressure + 7.5 hPa)	0.1 % FS
5 < F.S. ≤ 10 bar	+/- (1.5% of the pressure + 15 hPa)	0.1 % FS
10 < F.S. ≤ 20 bar	+/- (1.5% of the pressure + 30 hPa)	0.1 % FS

** Specific relative.*

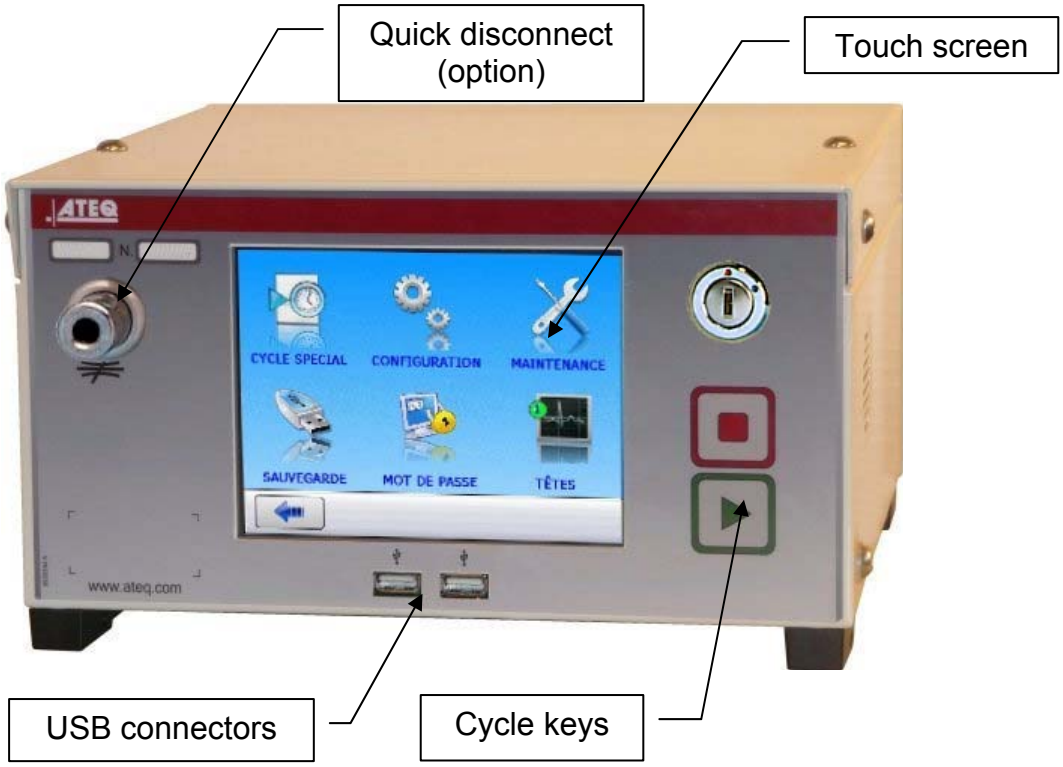
2.3. ELECTRONIC PRESSURE REGULATION

- 80 kPa to - 2 kPa / 1 kPa to 10 kPa / 5 kPa to 50 kPa / 20 kPa to 200 kPa / 50 kPa to 500 kPa / 100 kPa to 1000 kPa / 100 kPa to 1600 kPa / 100 kPa to 2000 kPa. For other pressure ranges please contact ATEQ.

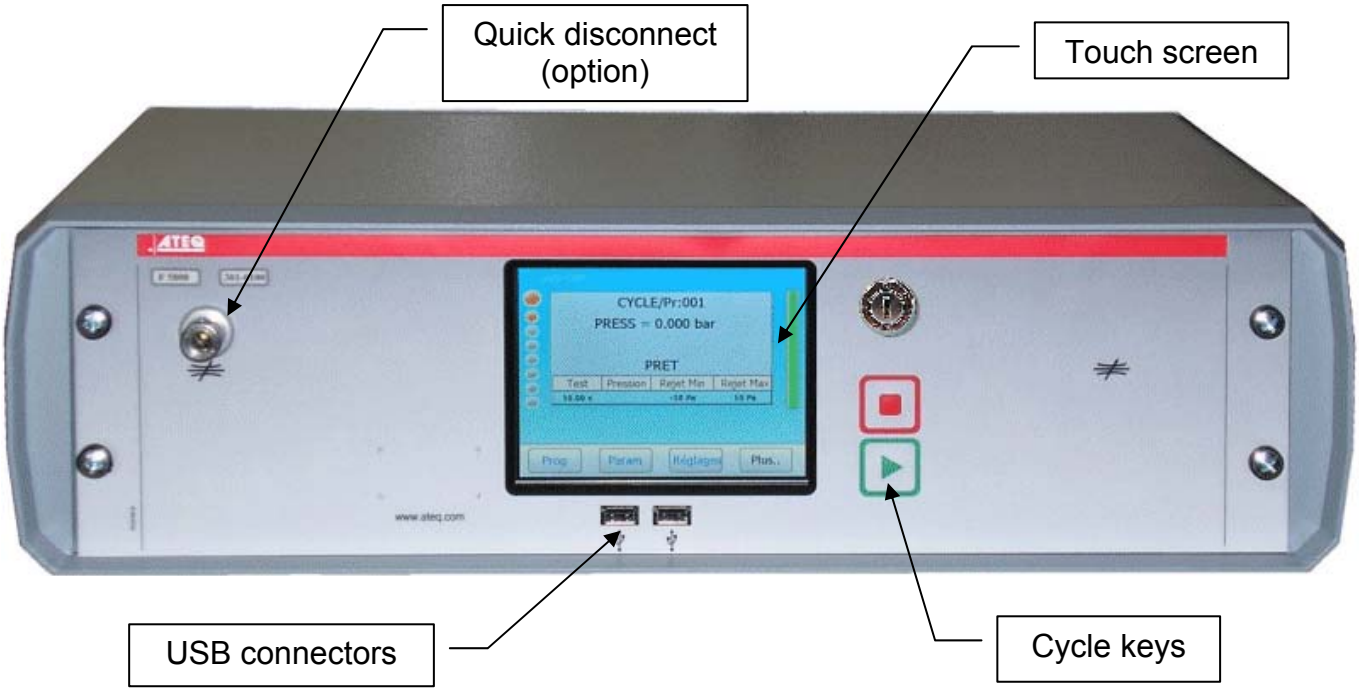
FRONT PANEL AND INTERFACES

1. APPEARANCE OF THE ATEQ FRONT PANEL

5200 case:



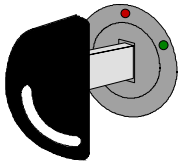
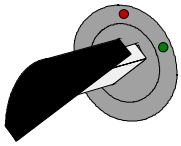
5800 case:



2. CYCLE KEYS

Cycle keys	FUNCTION
	**START** key: Starts a measurement cycle
	**RESET** key: Stops a cycle in progress

3. LOCKABLE SWITCH

POSITION	FUNCTION
	**LOCKED** position. Access to adjustable parameters not possible.
	**ACCESS** position. Adjustable parameters may be accessed.

3.1. QUICK DISCONNECT (OPTION)

An optional Staublï quick disconnect is installed on the front panel of the instrument.

As the quick disconnect is part of the measurement circuit, it can be used with a calibrated orifice to simulate a leak in the part, calibrate the instrument with different leak test units and check the calibration of the instrument.

The second function is to check the value of the test pressure shown by the instrument with a pressure gauge or the **ATEQ Leak/Flow Calibrator (CDF)**.

As this connector is part of the measurement circuit, all its connections must be air tight.

AIR SUPPLY

Air supply is via the filter located on the rear panel of the instrument.

When an electronic regulator is installed in the instrument with test pressures above 800 kPa (8 bar) (normal service pressure), another "high pressure" port for the regulator supply circuit is installed on the instrument.

It is essential that the air supplied is clean and dry. Even though there is a filter, supplied with the instrument, the presence of dust, oil or impurities may cause malfunction.

When the instrument is working in vacuum conditions, impurities must be prevented from being drawn into its interior. For this purpose we strongly recommend that a suitable airtight filter is installed between the test part and the instrument. This filter can be supplied by **ATEQ**.

The presence of impurities, oil or humidity in the air may cause deterioration which will not be covered by the warranty.

In accordance with ISO standard 8573-1 concerning classes of compressed air for measurement instruments in an industrial environment:

ATEQ recommends:

- Grain size and concentration CLASS 1 (0.1 µm and 0.1 mg/m^3)
- Dew point under pressure CLASS 2 (- 40° dew)
- Maximum concentration of oil CLASS 1 (0.01 mg/m^3)

ATEQ recommends the installation:

- of an air dryer to provide dry air at less than - 40° dew point,
- of a 25 micron and 1/100 micron double filter.

Optimisation of operation:

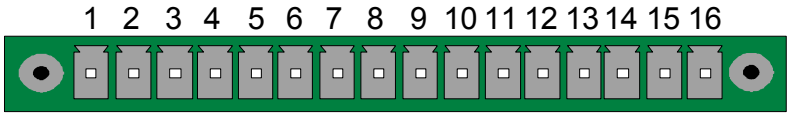
The supply pressure must always be between 4 and 8 bar to ensure that the pneumatic valves operate with optimum efficiency.

START-UP SETTING

1. POWERING UP THE ATEQ

The powering the **ATEQ 5000 series** can be done by two ways depending of the option ordered by the customer.

1. **Standard way**: with 90 to 240 V DC network with built in power supply. The instrument is used for sampling or laboratory setting: power the instrument with a power cord (instrument with built in power supply).
2. **Optional way**: The instrument is used for sampling or laboratory setting: power the instrument with the external power supply jack J4.
3. **Optional way**: with 24 V DC external power supply, the instrument is integrated into a machine: it should be powered through the J3 relay board connector (pins 2 / 4 and 16 see below).



For North America, the standard way to power the instrument is to supply 24V to pin 2 or 4 and ground pin 16 of the J3 connector.

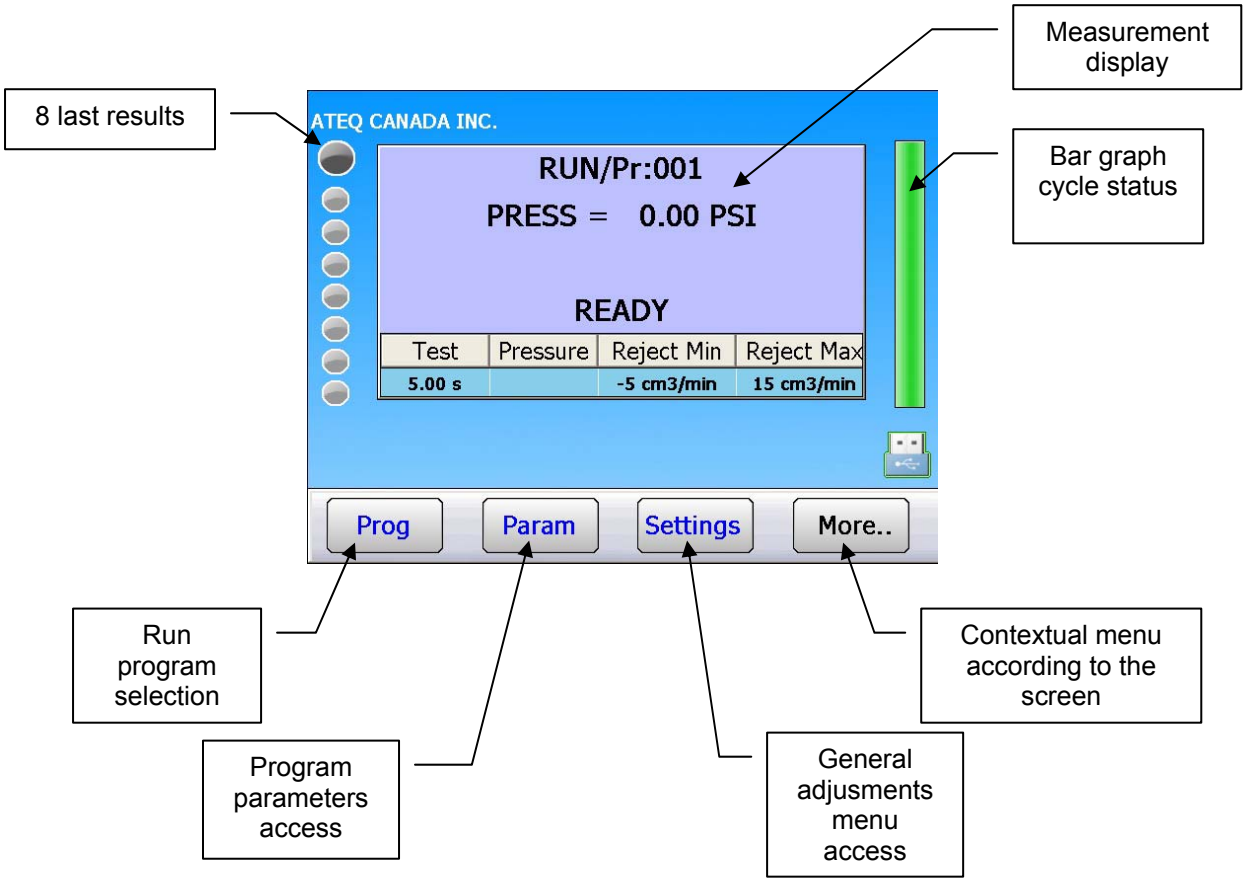
Start procedure:

The image on the right is displayed after power on.

Several messages are displayed on the screen while the instrument is booting up.

When the window on the right is displayed, the instrument is ready to test.

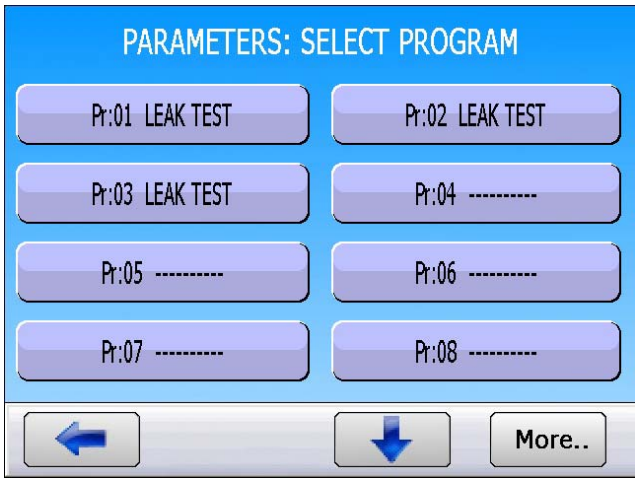
1.1. SCREEN DETAIL



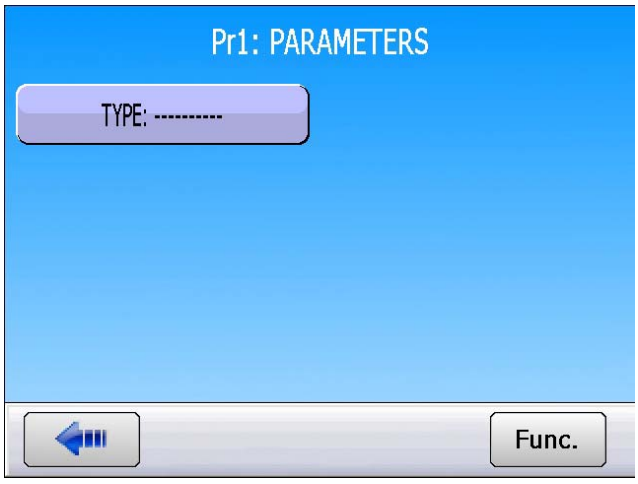
2. CREATION OF TEST PROGRAM

To access the parameters menu, press **Param.** The program list is displayed.

To create a new program, press an empty program (----------).



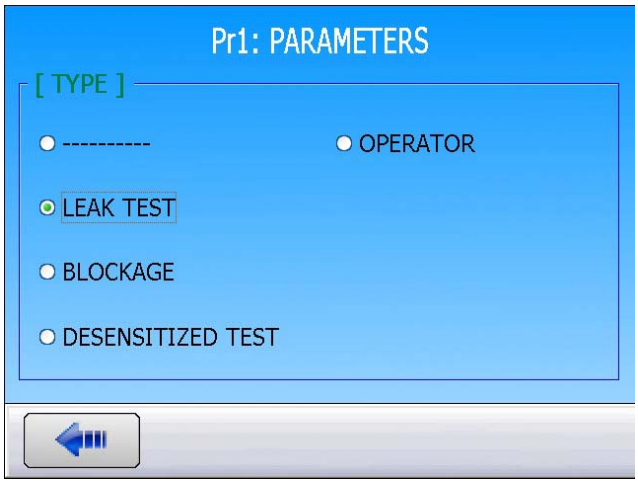
The instrument requires the type of test to be programmed, press "**TYPE**".



3. SELECTION OF THE TEST TYPE

Four types of test are available:

- Leak test (**LEAK TEST**)
- Pressure test (**BLOCKAGE**)
- Test in desensitized mode (**DESENSITIZED TEST**)
- Operator test (**OPERATOR**)



3.1. LEAK TEST

The leak test is most suitable for measuring small leaks (pressure drop). The following formula is used to convert a leak expressed in units of flow to a drop in pressure:

$$\Delta P\ (Pa/s) = \frac{F\ (cm^3/min)}{0{,}0006 \times V\ (cm^3)}$$

$F(cm^3/min)$ = leak flow

$V\ (cm^3)$ = volume of the test part

$\Delta P\ (Pa/s)$ = pressure drop

Example:

Part which has dP/dt = 50 Pa/s			Part which has dP/dt = 1 Pa/s		
Test	Pa/s	Pa	Test	Pa/s	Pa
1 s	50	50	1 s	1	1
2 s	50	100	2 s	1	2
3 s	50	150	3 s	1	3
.	.	.	.	.	.
.	.	.	.	.	.
n s	50	nx50	n s	1	n

The choice of working in Pa or in Pa/s depends on the application.

In all events, it must not be forgotten that the range of the sensor in Pa or Pa/s is limited to 50, 500 or 5000 Pa depending on the instrument configuration.

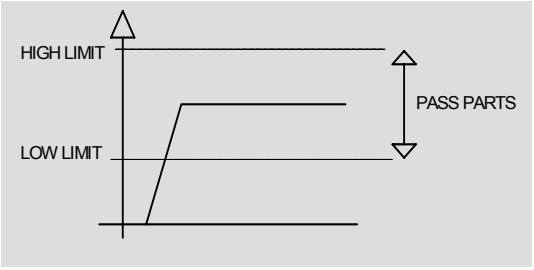
3.2. BLOCKAGE TEST

The blockage mode is used for rough measurement of a flow. The standard pressure limits are used to classify the result as good or bad.

If the pressure measured is below the minimum limit, then the flow is too large.

If the pressure measured is in excess of the maximum limit, then the flow is too small.

The cycle only contains the fill phase and the reading is carried out during this phase.



3.3. DESENSITIZED TEST

This mode is used for the measurement of large leaks, when the reject level required is above 500 Pa.

The unit used during the reading of the pressure drop in desensitized mode is the unit which is used for the display of the test pressure (identical resolution). The limits will also be indicated in this unit.

***Note**: the calibration mode cannot be used during this mode.*

3.4. OPERATOR TEST

This type of test means that the operator can carry out operations on the part while under test, then to confirm this operation using a **"START"**  key if the operator test is good, or **"RESET"**  key if the test is fail.

PROGRAM SELECTION

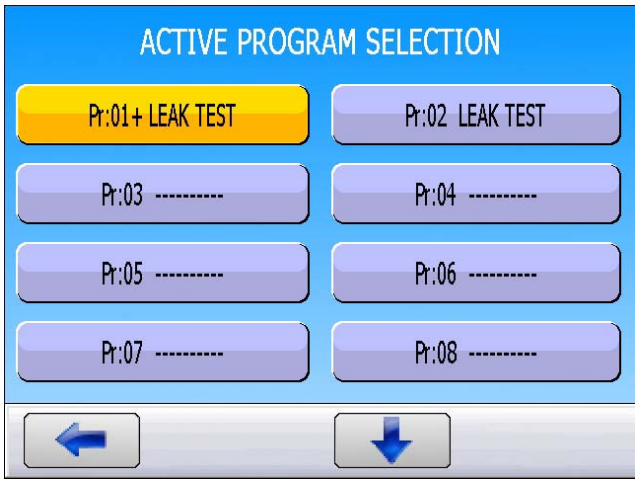
16 programs (32 programs optional) can be created in the instrument.

To select the program to run, please proceed as follow:

Program selection procedure:

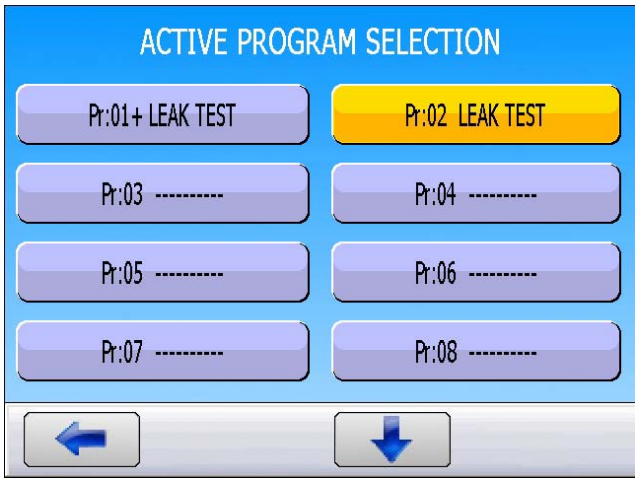
From the **CYCLE** menu, press 

The current program is displayed in yellow.



To select another program, press on the chosen program button, it will become yellow.

Press the back arrow to go back to the main screen.



PROGRAM PARAMETERS

1. PARAMETERS SETTINGS

After selecting a cycle type such as **LEAK**, the test cycle parameters must be set.

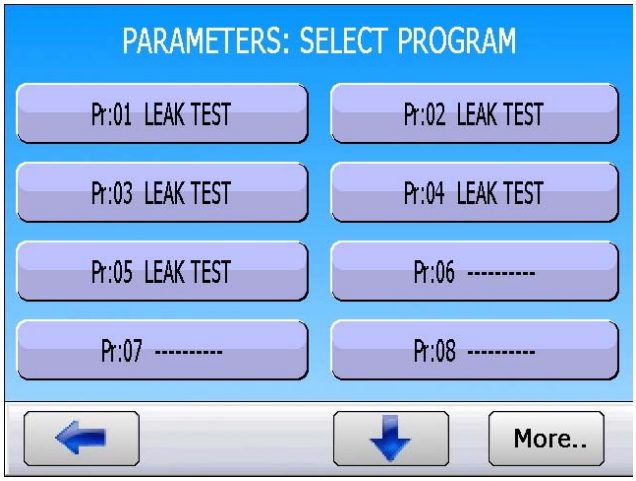
The procedure to set test parameters is identical for each timer (fill, stabilisation, test...)

The instrument can handle up to 32 different test programs (16 only are available through the J3 relay board).

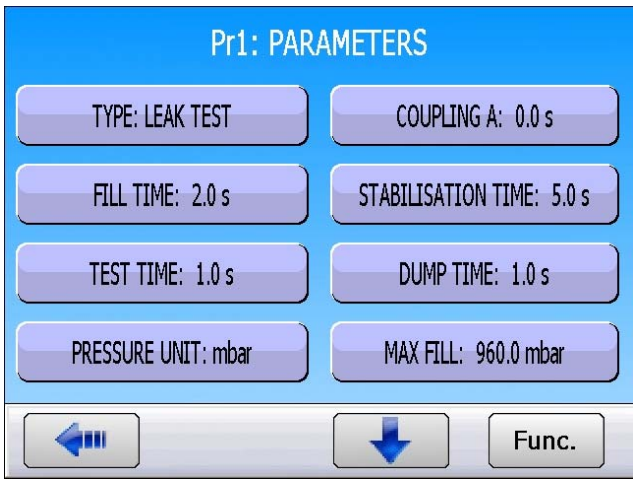
Parameters procedure:

From the **CYCLE**, Press: Param

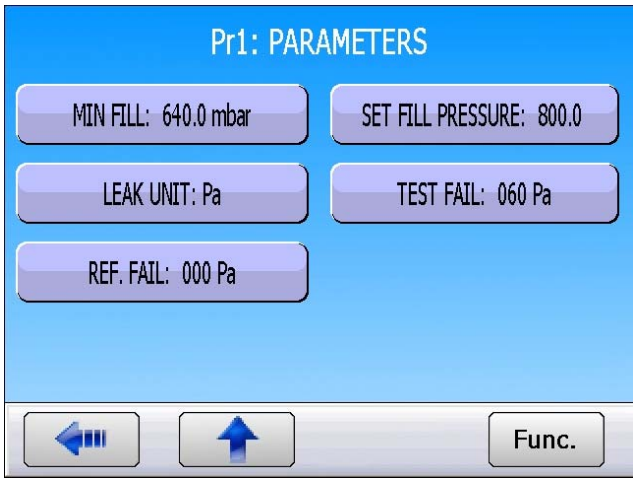
Select the program to edit.



The test parameters are displayed. Page 1/2.



Page 2/2.



Press the parameter button to be modified, the keyboard appears. Enter the value then validate with **Enter**.

2. PARAMETERS DEFINITION

2.1. COUPLING TIME

Coupling times A and B are the 1st timers of the cycle.

If there is no automatic connector, coupling time A is a part of the cycle.

If an instrument is fitted with an automatic connector, coupling time A delays the pressurisation of the test part by allowing the activation of a first cycle connector at the test start. Coupling time B allows the activation of a second automatic connector.

2.2. FILL TIME

This is the time allowed for the pressurisation of the part to be tested. It must not be too long (waste of time) or too short (the pressure in the component is at risk of not being sufficient due to drops in pressure caused by temperature changes).

To determine the appropriate fill time, it is necessary to set the **Fill Time** in order to make it **Too Long** (TLFT), then to shorten it until a drop in pressure occurs due to thermal effects.

Determine the TTLR by using the following formula:

$$TLFT = \sqrt[4]{\text{volume in cm}^3 \text{ x fill pressure in mbar}}$$

- ✓ Carry out a cycle. When the instrument switches to the stabilisation period, the pressure must remain stable.
- ✓ A pressure drop (since there will be no fall in pressure due to thermal effects) signals the presence of a large leak; check the test part and the pneumatic assembly components, then start again.
- ✓ If the pressure remains stable, the part does not contain a large leak and the fill time is too long. Shorten it progressively by carrying out cycles until a drop in pressure is noticeable.
- ✓ As soon as a fall in pressure due to thermal effects appears, the fill time has become too short. Increase it slightly.

2.3. STABILISATION TIME

- ✓ This time is used to equalise the pressure between the **TEST** and **REFERENCE** parts.

  Two phenomena may interfere with the equalisation:

  Different tubing

- ✓ The first phenomenon that may appear is a pressure variation between the components, caused by thermal effects. In fact, if the connection tubes are different (length or diameter) the target pressure will be reached faster in the part with the most favourable setup. If the instrument switches to test too early, the instrument will indicate the presence of a large leak.

  Different volumes

The second phenomenon which may appear is a pressure difference between the parts due to their differing volumes.

If, at the end of the fill time, the volumes are different, the component with the smaller volume will stabilise faster. If the instrument switches to test too early, the instrument will indicate a large leak.

- ✓ To determine the correct stabilisation time, it is necessary to set a long time so that the reading at the end of the test time is very close to zero.
- ✓ Set the stabilisation time to four times the length of the fill time.
- ✓ Carry out a cycle. When the instrument switches to test, the result must be close to zero.
- ✓ If there is a drop in pressure, there is a small leak present. Check the test part (or the reference part in case of a negative pressure drop) and the pneumatic connections then start again.
- ✓ If the pressure is stable, the part does not leak and the stabilisation time is therefore too long. Progressively shorten and carry out cycles (wait one minute between each cycle) until you start seeing of a drop in pressure. This indicates that the stabilisation time has become too short. Increase it slightly.

2.4. TEST TIME

The test time depends on the programmed reject level and operation mode.

In the dP/dt (Pa/s) mode, the variation in measured pressure is due to the drift in the pressure drop (similar as a speedometer in a car).

In the dP (Pa) mode, the pressure variation measured is the total of the pressure drop over the whole test time (similar as an odometer in a car). This mode is more unstable, but is more

sensitive. The instrument totals all the variations occurring due to variations in volume or temperature over the whole test time.

2.5. DUMP TIME

During the dump time, the instrument vents the part to atmosphere. The instrument will as default set a dump time of zero.

The dump valve stays opened until the next test cycle. In case of very low pressure, the dump time can be zero; the fixture will vent when opened.

2.6. PRESSURE UNITS

The different units are: bar, mbar, PSI, Pa, kPa, Mpa

2.7. MAXIMUM FILL

This function is used to set a maximum limit for the fill pressure. A warning is triggered if this limit is exceeded.

When test time is infinite, the maximum fill isn't monitored. Care should therefore be taken to avoid excess pressure being applied to the part during the test.

2.8. MINI FILL

This function is used to set a minimum limit for the fill pressure. A warning is triggered if this limit is not reached. When test time is infinite, the minimum fill isn't monitored.

***Note**: the minimum fill and maximum fill are automatically calculated with +/- 20% of the pressure instruction and can be manually modified.*

2.9. SET THE FILL PRESSURE

This function is available with electronic regulator equipped instruments. Simply set the test pressure value and the instrument adjusts it automatically.

2.10. REJECT UNIT

The different units are: Pa, Pa/s, Pa HR (high resolution), Pa HR/s (high resolution), Cal-Pa, Cal-Pa/s, cm^3/min, cm^3/s, cm^3/h, mm^3/s.

If a flow unit is selected, two parameters are added to the program:

- ✓ choice of the flow calculation using Pa or Pa/s,
- ✓ the volume of the part to be tested (in addition to tube and internal volume).

There is a special "**volume compute**" cycle which enables the volume of a part to be estimated.

***Note:** high resolution enables an extra figure to be displayed (i.e. 1/10 Pa)*

2.11. TEST FAIL

This function is used to set a limit level below which the part is considered to be bad. This is your test part reject level.

2.12. REFERENCE FAIL

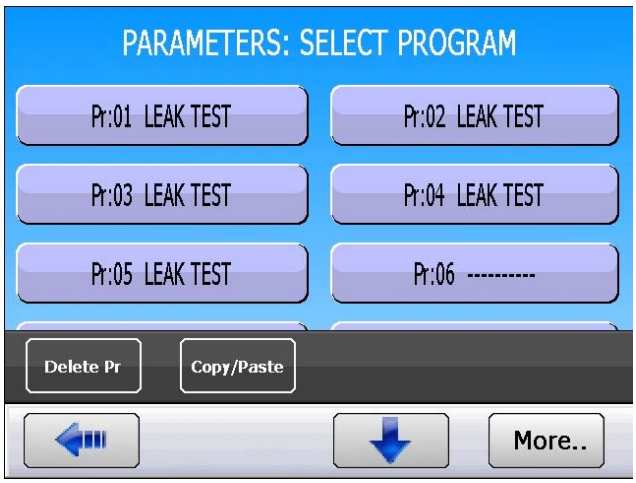
This function is used to set a limit level below which the reference part is considered to be bad. This is your reference part reject level.

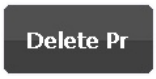
When the reject reference value is zero, the program automatically set an absolute value of the test reject (for example: if the test reject is 10 Pa, and the reference reject value equal to zero, the program internally set the reference reject to be – 10 Pa). The opposite is not true.

3. PROGRAMS MANAGEMENT

The "**More…**" button displays a pull-up menu.

In the program selection window, you can delete a program or copy/paste it into a new program

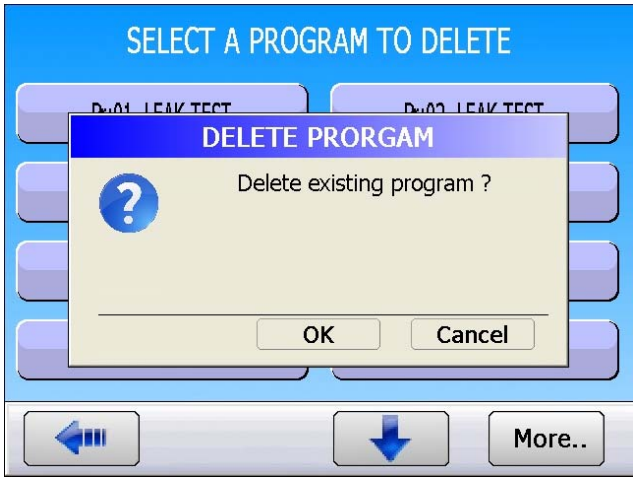




This button deletes the selected program.

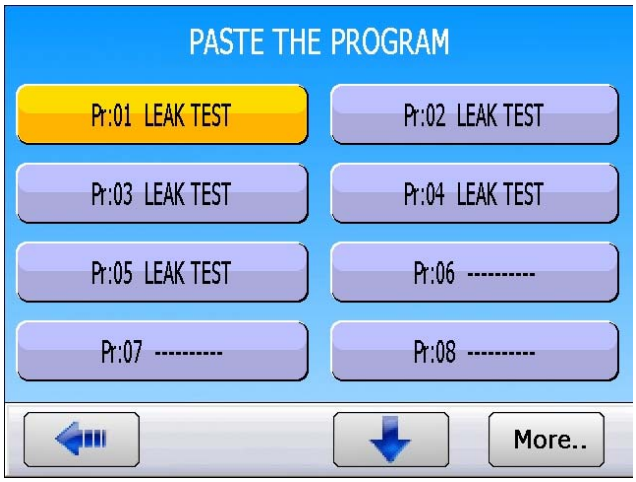
Press "**Delete Pr**", then, select the program you need to erase.

The instrument asks for confirmation, select **OK**.

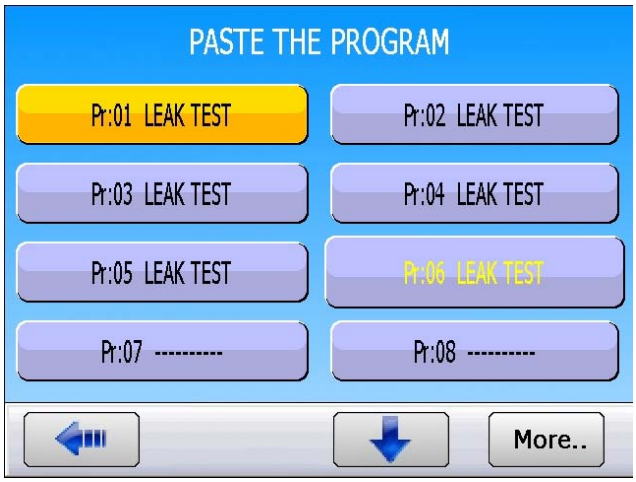


This button duplicates a program to another one.

Press “**Copy/Paste**”, select the program you need to copy (it becomes yellow),



Chose the program you wish to paste.



If the program to be pasted is empty, the parameters are pasted instantly.

If parameters are present inside the program, the message on the right will appear to confirm the erase.

TEST CYCLE MANAGEMENT

Test cycle management Procedure:

1. STARTING A CYCLE

1.1. TEST PRESSURE ADJUSTMENT

When instrument is fitted with an electronic regulator, the test pressure value is that shown since this is the fill target. No special cycle is required.

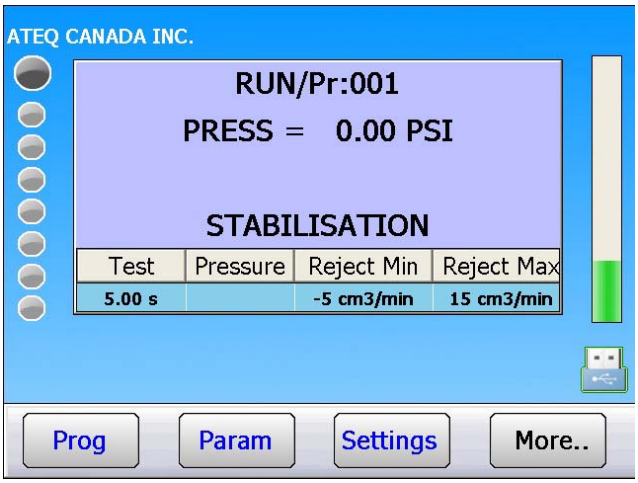
***Reminder**: the regulator input pressure must be at least 10% greater than the value of full scale on the electronic regulator + 100 kPa (+ 1 bar).*

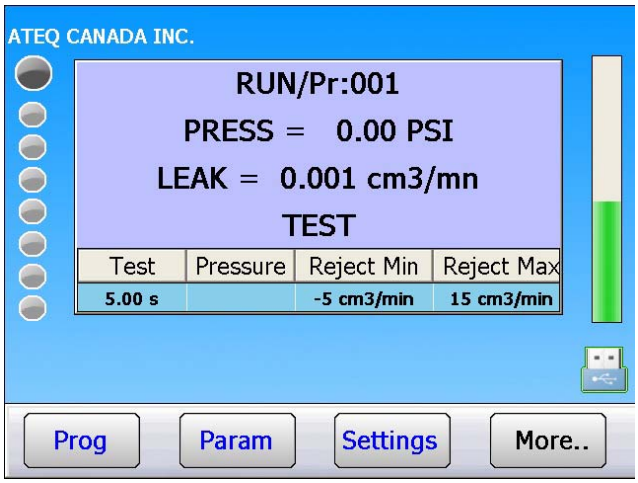
1.2. STARTING A MEASUREMENT CYCLE

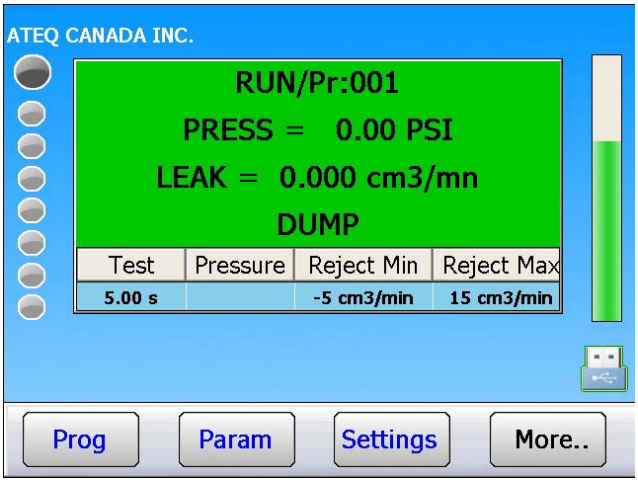
Press the **START** key to start a measurement cycle.

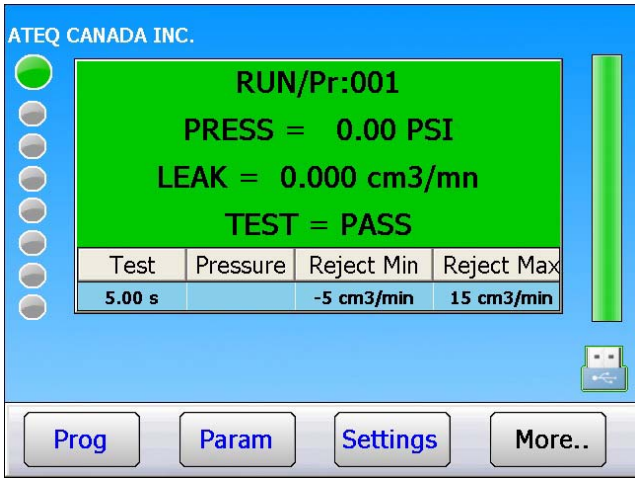
The cycle phases are displayed:

COUPLING
FILL
STABILIZATION
TEST
DUMP









1.3. STOPPING A CYCLE

Press the **RESET**  key to stop the measurement cycle. The display "**READY**" indicates that the instrument is ready to perform a new measurement cycle.

2. CHANGING THE DISPLAY

Several screens types are available. See sheet #33.

***Note**: to switch from one to the other in cycle mode, slide the finger on the touch screen from one side to the other.*

3. CONTEXTUAL MENU

Press "**More..**" to display a pull-up menu

In the cycle window, several bottoms appear to switch to full screen or navigate directly to the running program parameters or functions.

3.1. BUTTONS GENERALITIES

Some button have a light, its color shows the status of the function:

- **Red** dot = disable.

- **Green** dot = enable.

The "**Screen shot**" takes a screen shot of the present screen and stores it on the USB key if present or the instrument internal memory.

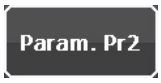
When the "**Save Auto**" function is enabled, the displayed results are automatically recorded the selected memory.

The backup records the result displayed on the screen, if it's a curve, the backup will be a picture.

To delete all the results and reset the graphs.

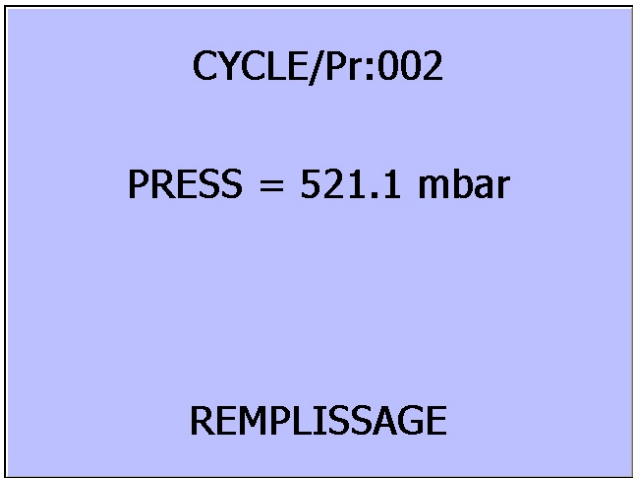
To display and consult the results of another program.

3.2. RESULTS VIEW



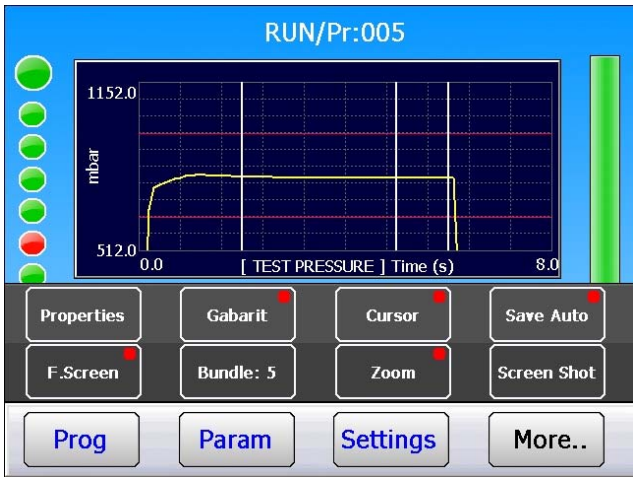
Direct access to the parameters of the current program.

Direct access to the functions of the current program.

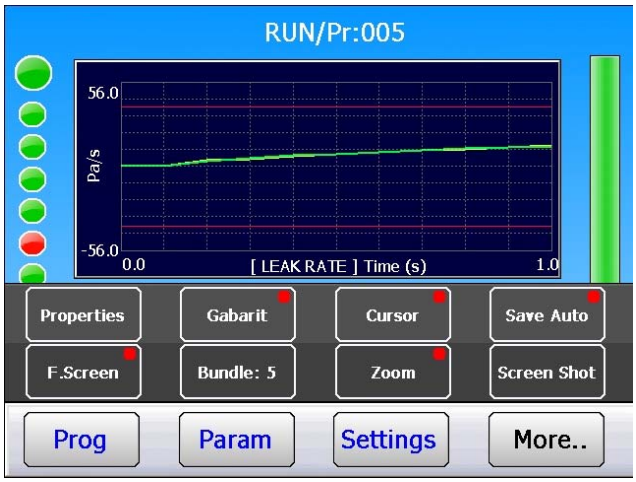


Full screen example.

3.3. CURVE 1 AND CURVE 2 VIEWS



Curve 1: displays the pressure curve.



Curve 2: displays the leak curve.

***Note**: the buttons of the contextual menus have the same functions for the 2 curves.*

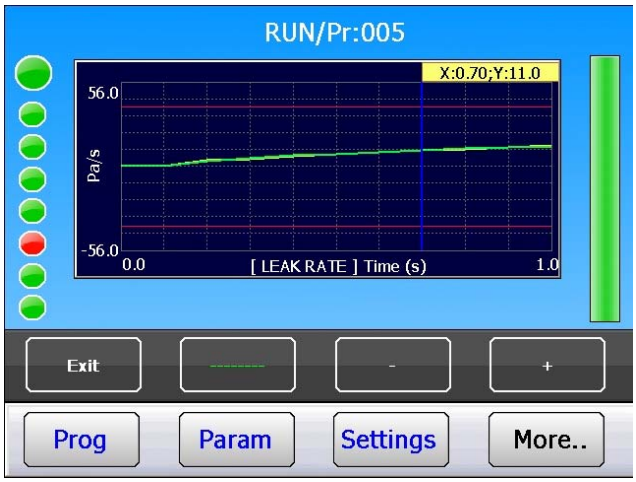
[MODE]: to configure the display of the Y axis for each curve.

- **Default (Full scale)**: the Y axis is the full scale of the sensor.
- **Auto**: the scale of the Y axis is automatically adjusted to the amplitude of the curve.

[LIMITS]: to **Display** or **Hide** the maximum and minimum pressure limits.

[ACQUISITION]: selection of the acquisition speed for the results for the curves. The standard mode is "**Normal**". If there is some acquisition problems, change by a faster acquisition: "**Average**", "**Fast**" or "**Turbo**" for the very short cycles.

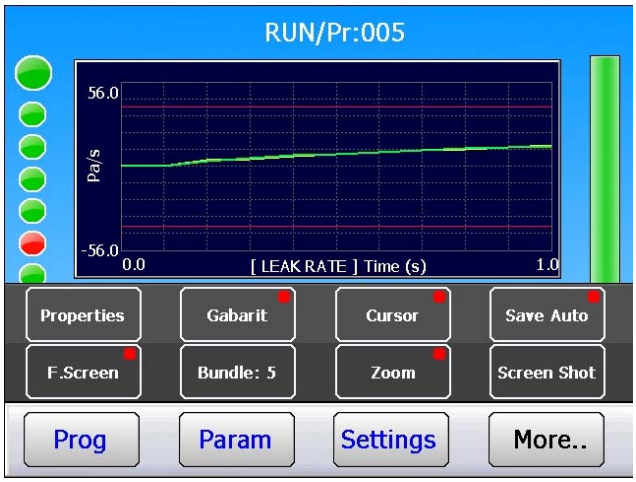
Not available.



Cursor

Cursor: display a vertical line, the coordinates to the cross of the curve and this line are displayed, move this line with the + or - buttons or touch the screen.

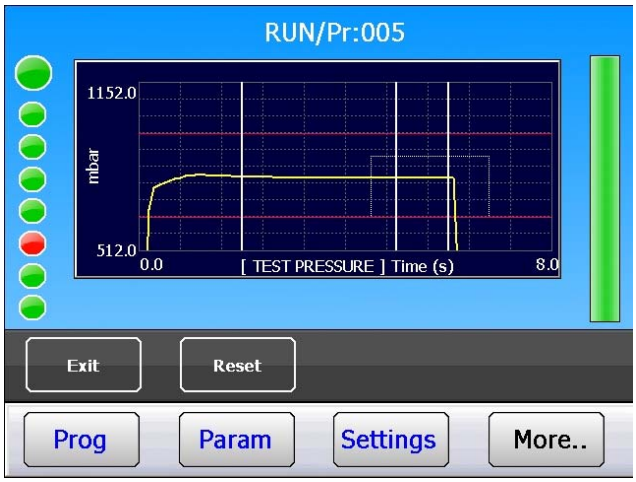
- **Y** = pressure value.
- **X** = time position.



Bundle: 5

Bundle Mode: this is to superimpose several curves. When this number is reached, the curves are deleted to display news ones.

Example "**Bundle**" adjusted on 5 on the "**Curve 2**" screen.



Zoom

Zoom: frame the area of the curve to zoom, to see the details of this part of the measurement.

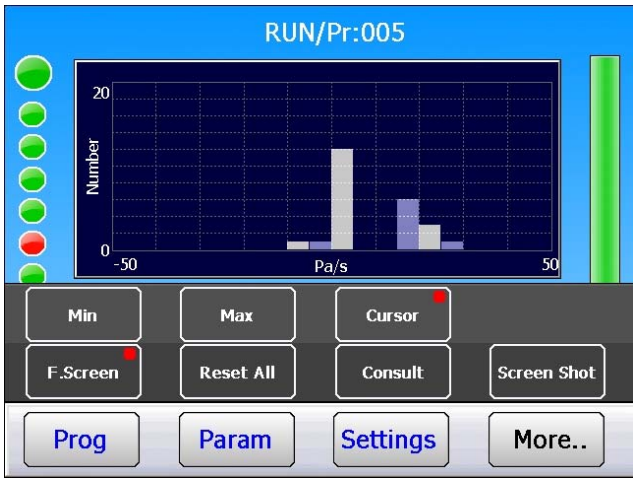
To cancel the zoom, press "**Reset**".

3.4. BARGRAPH VIEW

The up hand bar graph displays the current pressure and the maximum and minimum limits.

The low hand bar graph displays the leak and the rejects levels.

3.5. DISTRIBUTION VIEW

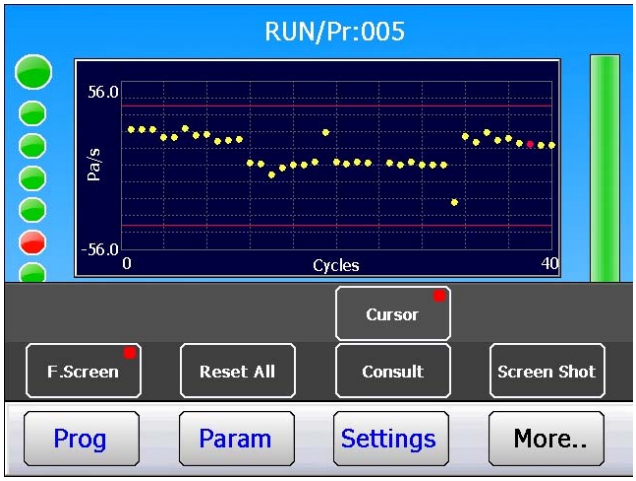


In this screen is displayed the distribution of the measurement results (between the configured levels) for the concerned program since the last reset. The results are divided in 20 classes. Each class represent a twentieth ($1/20^{th}$) of the difference between the minimum and the maximum level

***Warning**: the modification of one of these values resets all the distribution.*

See paragraph "**Curve 1 and Curve 2**".

3.6. CYCLES VIEW



Each measurement results is displayed as a dot.

3.7. FRAMES RÉSULTS VIEW

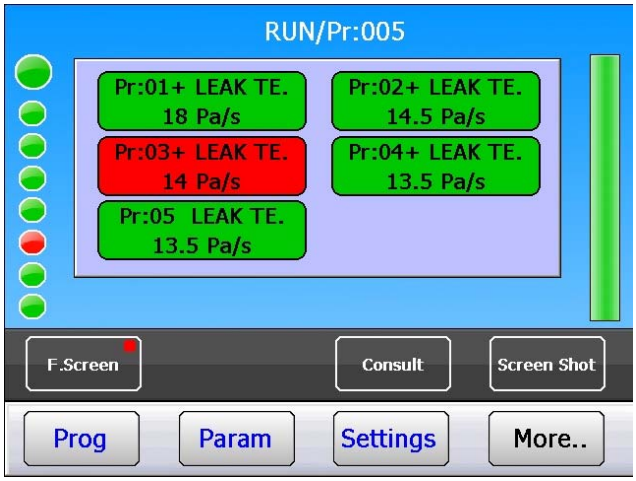
The "**Frame Results**": to display the measurement cycles.

To select the channel to display.

3.8. STATISTICS VIEW

Displays the number and percent of Pass parts, Fail parts etc.

3.9. SEQUENCE VIEW



To see the results of each program in case of sequenced programs.

ACCESSORIES

1. POWER SUPPLY

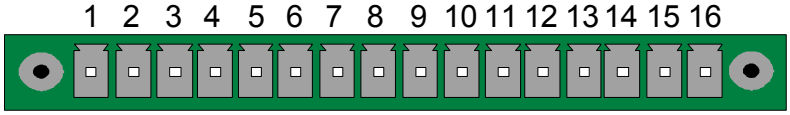
Three ways for powering the instrument, this is depending of its installation.

1. **Standard way**: with 90 to 240 V DC network with built in power supply. The instrument is used for sampling or laboratory setting: power the instrument with a power cord (instrument with built in power supply).

The instrument may come with a power.

2. **Optional way**: with 24 V DC external power supply, the instrument is integrated into a machine: it should be powered through the J3 relay board connector (pins 2 / 4 and 16 see below).

   When the instrument is integrated with a PLC, it is best to use the same 24 VDC power supply as the PLC. The 24 VDC is connected to the instrument using the relay board (J3) connector.



For North America, the standard way to power the instrument is to supply 24V to pin 2 or 4 and ground pin 16 of the J3 connector.

OPTIONAL ACCESSORIES

1. CALIBRATED MASTER LEAK

Calibrated leaks are used to check the instrument's calibration or to setup the reading in cc/min.

PRESSURE	Master leak type										
	A	**B**	**5**	**C**	**D**	**50**	**E**	**F**	**G**	**1000**	**5000**
2 kPa (20 mbar)			1,5	3,12	6,6	18	31,2	1,24	2,05	4,2	53
5 kPa (50 mbar)		2,3	4	7,4	17,5	42	1,3	2,6	5,25	11,3	132
15 kPa (150 mbar)	2,82	6,7	12	23	55	2,2	4	8,2	17	35,5	338
30 kPa (300 mbar)	4,8	12	24	46,8	2,12	3,6	7,6	22,4	40	74,5	700
50 kPa (500 mbar)	10	25	48	1,4	3,5	8	15,5	31	63	150	1142
100 kPa (1 bar)	23	56	1,8	3,3	8	19	37	74	149	360	2230
200 kPa (2 bar)	55	2,3	4,6	8,5	21	47	89	194	380	830	4343
400 kPa (4 bar)	2,5	6,6	12,1	23,3	56	125	220	540	1030	1500	8750
1 MPa (10 bar)	11,5	29	50	95	198	420	705	2310	3700	4450	

kPa.cm^3/h (bar.cm^3/h)

kPa.cm^3/min (bar.cm^3/min)

Note:** The values indicated above are given for information and may vary by +/- 20%. The true rate is precisely measured before delivery with an accuracy of +/- 5% up to 1MPa.cm^3/min (10 bar.cm^3/min) and +/- 3% from this value. **Special master leaks can be manufactured on request, within 5% of the requested value.

The calibrated leaks must be used with clean dry air.

- ✓ These leaks must not be dipped in or sprayed with water. It is essential that they are stored in their case after usage.
- ✓ The leaks must be checked periodically by the company's metrology department or by **ATEQ's** metrology service.
- ✓ Check that there is an O-ring seal and that it is in good condition.
- ✓ To check that the leak has not been plugged, attach a piece of flexible tubing to the leak and submerge its extremity in the water to look for bubbles. This test should be performed using a pressure instrument only not vacuum ATEQ instrument.

2. FILTRATION KIT

For a better reliability of the instruments, it is recommended to use clean dry air. The filtration kit must be connected to the air input located at the rear of the instrument.

It consist of a dust filtering cartridge (5µm) and another cartridge (0.01 µm) filtering residual oil pollution down to 0.01 ppm.

3. NEEDLE VALVE AND LEAK/FLOW CALIBRATOR

3.1. CDF60 (LOW FLOW CALIBRATOR)

The **ATEQ CDF60** Leak/Flow Calibrator checks the calibration of leak and flow measuring instruments as well as calibrated leaks and jets.

This light, compact and user friendly calibrator is essential for field or laboratory checks, when accuracy and repeatability cannot be compromised and large instruments are too bulky or too expensive.

This portable, compact and user-friendly instrument lets you adjust very accurately your leak or flow rate with a real time cc/min reading on the display.

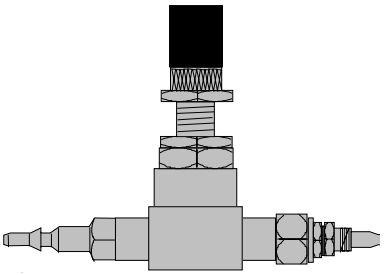
You can adjust any leak or flow rate within your measuring range, store test results and export them to an Excel spreadsheet.

The CDF60 is fully traceable to international standards and every unit has been calibrated in **ATEQ**'s state of the art calibration facility and is delivered with a calibration certificate.

3.2. CDF (LEAK/FLOW CALIBRATOR)

The **ATEQ** leak/Flow calibrator is a multiple range flow meter intended for checking leak testing equipment and particularly **ATEQ** instruments.

3.3. NEEDLE VALVE



Needle valves are used to verify the leakage limits. These valves have an adjustable leak and depending on the model allow adjustments of between a few cm3/h to several l/min.

These valves can be easily misadjusted and therefore require the frequent use of some means of checking the setting (ex: Leak calibrator ATEQ).

***Note:** It is strongly recommended that you do NOT leave a needle valve permanently connected on a leak detection instrument with automatic calibration every "n cycles".*

4. ATEQ 3/2 VALVE (Y-VALVE)

The ATEQ valve and mini valve are 2 positions, 3 ways spring returned, pressurized and leak-tight valves. The valve comes with either a pneumatic or electric pilot.

The choice of a leak tight valve is extremely important when installed in the leak test circuit.

5. QUICK CONNECTORS WITH EXPANDABLE JOINTS

ATEQ quick connectors designed to be used manually or integrated into the leak tester's fixture. They connect the leak tester to your part reliably and assure leak tightness. Several connectors may be connected to the same manifold, piloted by an **ATEQ**, a PLC or manually.

They easily adapt to a large number of fittings and opening of varied dimensions. Their use ensures that non-machined walls can be guaranteed airtight.

There are 4 basic versions of the **ATEQ** quick connectors:

- ✓ SA for external connections,
- ✓ SI for internal connections,
- ✓ SAG and SIG for internal and external threads.

They come black anodized with engraved markings. Different types of seals are available depending on the requirements.

5.1. OPERATION

The connector is positioned manually, automatically or using cylinder.

Compressed air goes through the pilot port via a three way valve. The pressure pushes the piston which compresses the seal. The air tightness is therefore ensured.

5.2. STANDARD DIMENSIONS

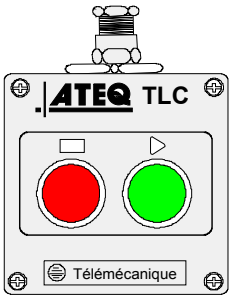
SAG and SIG have been designed for internal and external threads. For the time being, they are available in the following sizes: 1/2", 3/4", 1", 11/4", 11/2", 2", BSP.

The SA and SI are designed for internal and external tubes/bore with dimensions from 3 to 80 mm for the external diameters (SA), and from 10 to 75 mm for internal diameters (SI).

6. REMOTE CONTROLS

The remote control allows remote control and selection of various settings for **ATEQ instruments**. This remote control is connected to the instrument's relay board.

6.1. RESET/START REMOTE



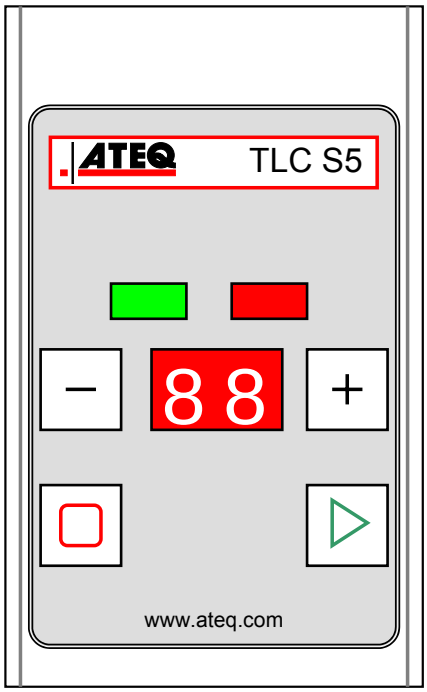
6.2. S5 FOUR-FUNCTION REMOTE CONTROL

This remote control has four functions which can be used to control a series 5000 instrument remotely.

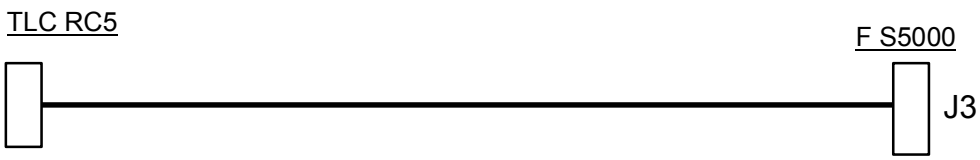
The four functions on this remote control are as follows:

- ✓ Reset and start cycle.
- ✓ Increase or decrease program numbers.
- ✓ Display the selected program number.
- ✓ Display the test result, green indicator light for Pass, red indicator light for Fail or alarm.

***Note**: a program number can only be changed (increase or decrease) when no test cycle is running.*



6.3. CONNECTION DIAGRAM



ERROR MESSAGES

The **ATEQ** instrument can display error messages if there are operational problems.

MESSAGE DISPLAYED	PROBLEM
>> F.S. REF.	Reference error. Leak in excess of the full scale. **Action**: check the reference circuit, part or fixture. Could also be an increase of pressure inside the test part.
>> F.S. TEST	Test error. Leak in excess of the full scale. **Action**: check the test circuit, part or fixture. Could also be an increase of pressure inside the reference part.
> F. SCALE	Pressure in excess of the full scale. **Action**: decrease the target pressure inside the program or the mechanical regulator (if equipped).
DEF CAPTEUR	Differential transducer error. **Action**: contact ATEQ service department for repair (probably water or oil in the instrument's test circuit).
PRESSURE TOO HIGH	Pressure in excess of the maximum threshold. **Action**: check regulator settings, pressure limits, check whether the right regulator has been selected if there are two.
PRESSURE TOO LOW	Pressure below the min. threshold. **Action**: check supply pressure and regulator settings, the pressure limits, and whether the right regulator has been selected if there are two.
ATR ERROR	ATR error. **Action**: run another ATR learning cycle or check the ATR parameters.
CAL ERROR	Customer Unit Learning error. **Action**: carry out another learning cycle.
UNIT DRIFT FAIL	Custom unit drift following a custom unit check request. **Action**: check the programmed percentage of drift, the master leak, the test pressure...
VALVE ERROR	Commutation fault in the equalisation valve. **Action**: check supply pressure; contact ATEQ service department for repair.

MESSAGE DISPLAYED	PROBLEM
REGULATOR ERROR	**1)** The electronic regulator is not able to initialise correctly. **2)** The input pressure on the regulator must be at least 10 % of regulator full scale + 100kPa (+ 1 bar). **Action**: check supply network pressure or pressure at the regulator input. Contact ATEQ if the problem persists.
PR: XXX ERROR	PROG error: an empty program has been selected through the relay board (I/O board). **Action**: enter program parameters or select another program.
PPPP	Too many digits to display with the selected unit of pressure. **Action**: change unit or modify the minimum and maximum pressure limits if these and the test pressure can be used with this unit.
LEARNING ERROR	Sealed component learning fault. **Action**: carry out a sealed component learning cycle.
VOLUME <	Sealed component fault. Insufficient pressure drop, so volume abnormally small. **Action**: check the pneumatic test circuit (e.g. kinked tubing, blocked or other cause).
VOLUME >	Sealed component large leak fault. **Action**: Ensure that there is no leak in the pneumatic test circuit between the ATEQ instrument and the test part (e.g. cut tubing, torn or other cause) and also check that the chamber is airtight.
AUTO-TEST ERROR	Auto test error. The valve auto test cycle result is bad. **Action**: check that caps have been placed on the test and reference outputs, if the problem persists, the valve is leaking, it should be serviced or replaced.

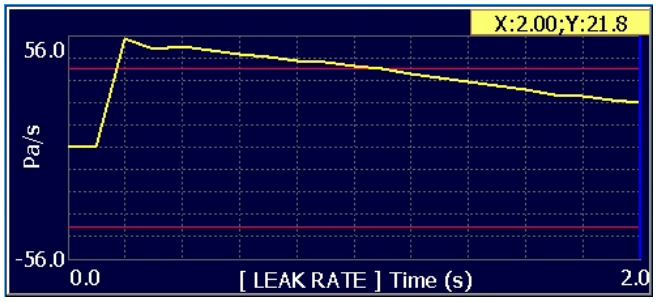
ATF FUNCTION

1. PRINCIPLE

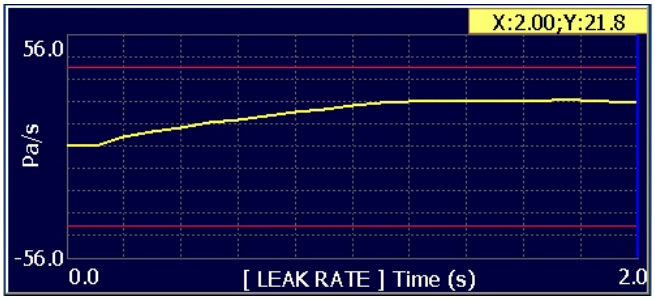
This function is only available with the units with a time: Pa/s, cm^3/min, cm^3/s, cm^3/h, etc..

This is to absorb the importants leak variations at the starting of the measurement, by the programmed time.

Example: for the same part, test time = 5s, ATF = 2s (final leak about 8 PA/s).



Without ATF

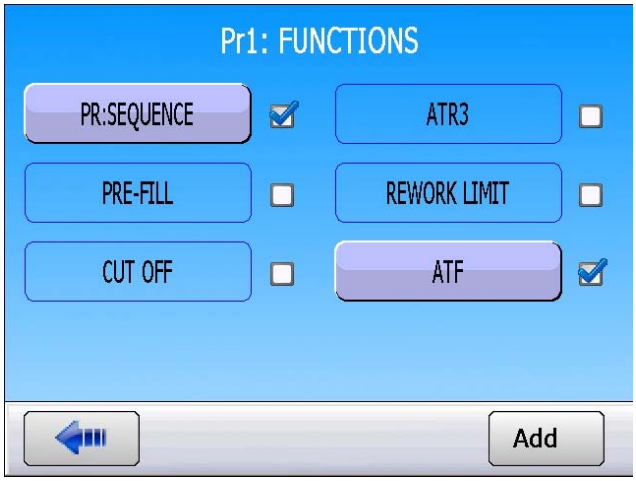


With ATF

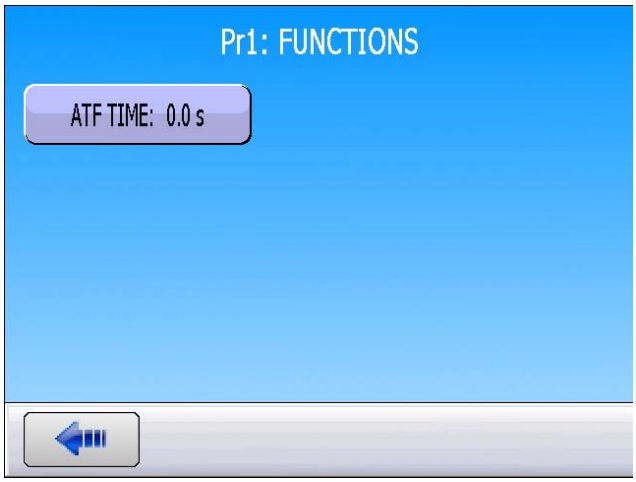
Procedure:

Ensure that the function is selected in the extended menu. (Press "**Add**" from the function menu to add the function if the button isn't present on the screen).

From the program **FUNCTIONS** menu, activate the "**ATF**" function by checking it  .



***Remind**: this function appears only with leak units with time, else it don't be displayed.*



Press “**ATF**” to access the function options.

Press “**ATF TIME: 0.0 s**” to enter the absorb time.

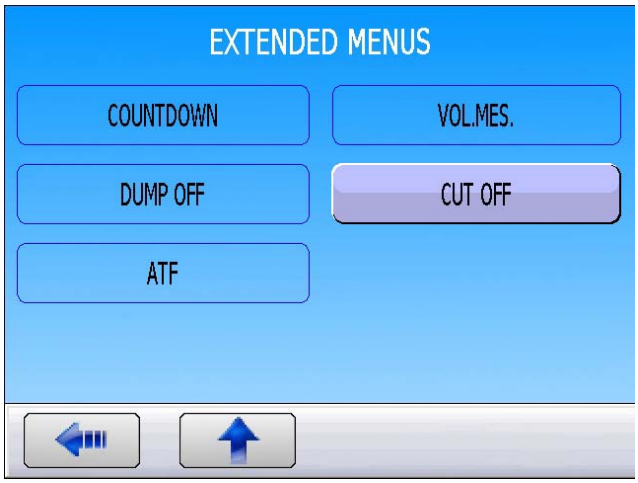
CUT OFF

1. PRESENTATION

The **CUT OFF** function displays any measurements below a set percentage of the reject value as zero.

2. CONFIGURATION

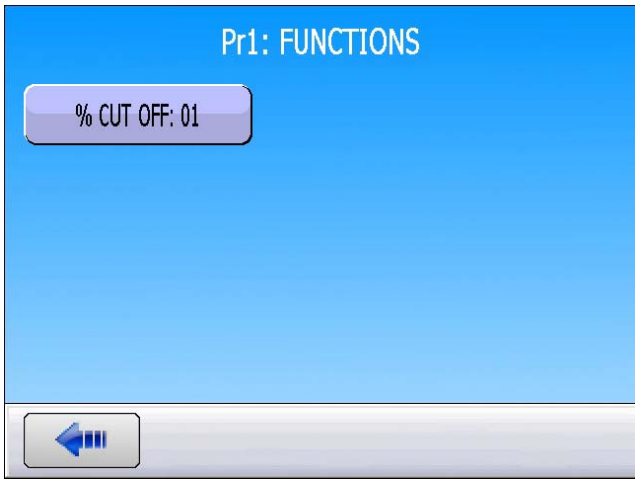
Ensure that the function is selected in the extended menu. (Press "**Add**" from the function menu to add the function if the button isn't present on the screen).



From the program **FUNCTIONS** menu, activate the "**CUT OFF**" function by checking it  .

Press "**CUT OFF**" to access the function options.

Press "**% CUT OFF: 01**" to enter the percentage of the reject value below which will be displayed as a zero reading.



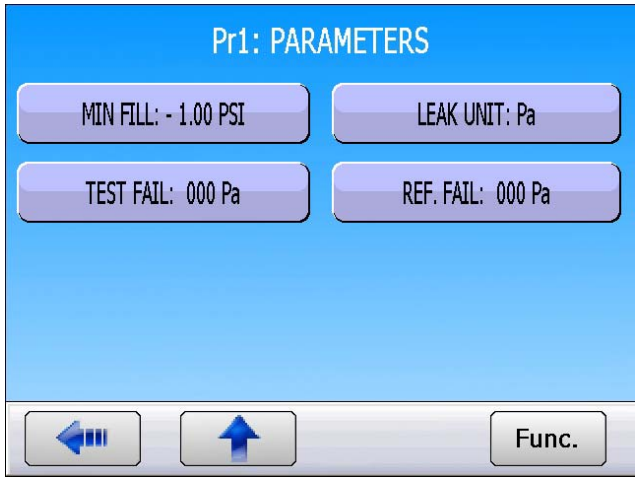
DISPLAYING RESULTS IN FLOW UNIT

The sensor that measures the leak is making a pressure drop measurement. To convert the pressure measurement in flow unit, the instrument needs to be given the volume of the test circuit.

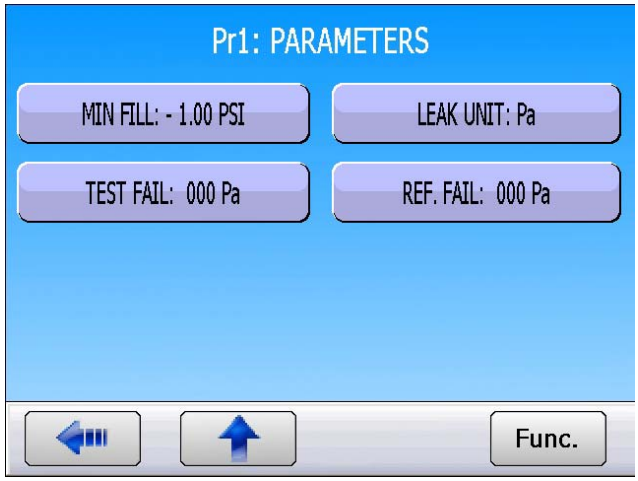
CC/MIN procedure:

From the running window, press "**Param**" to access the program parameters.

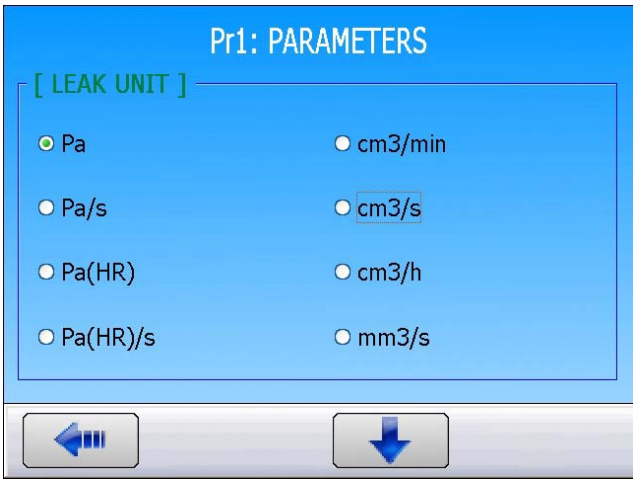
Press the down arrow to go to the parameter (second page).



In this page, press "**LEAK UNIT: Pa**"

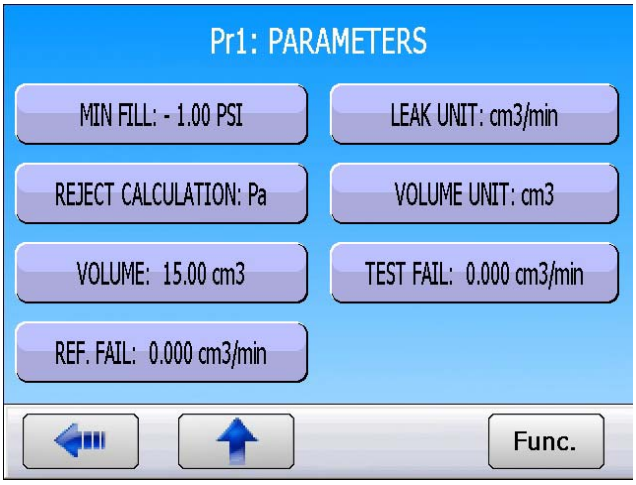


Change the **LEAK UNIT** from **Pa** to **cm3/min** or any other (flow unit) unit you would like to use.

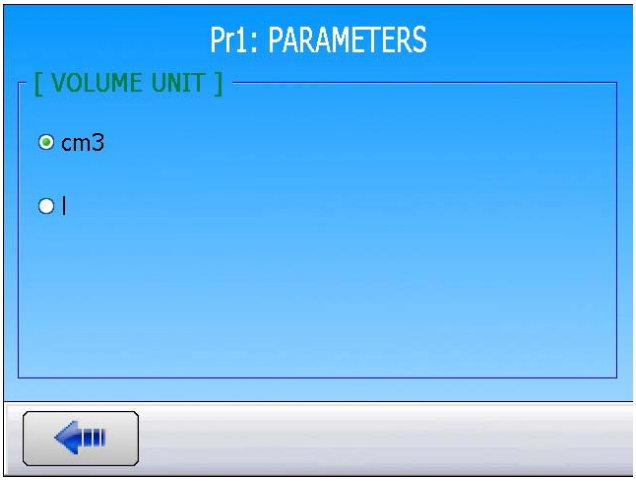


The parameter page changes to reflect the new fields: "**VOLUME UNIT**" and "**VOLUME**".

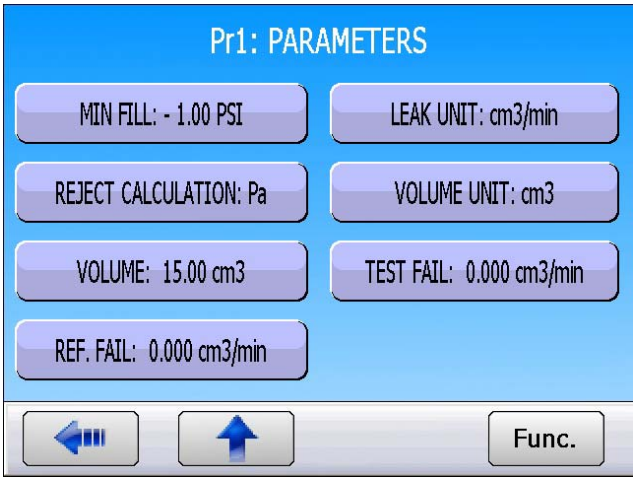
Press "**VOLUME UNIT**".



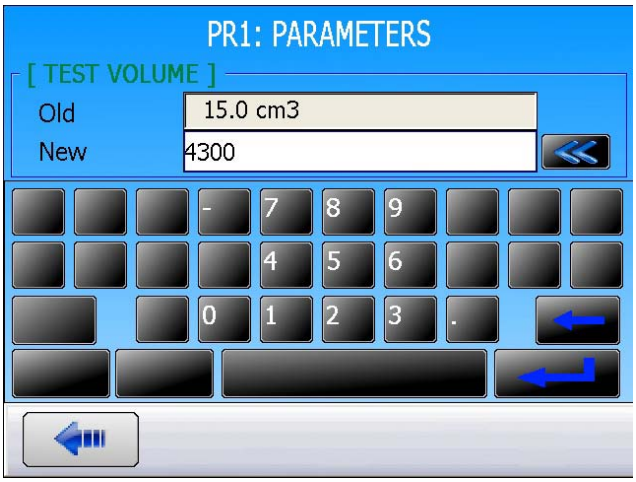
Select the Volume unit of your choice.



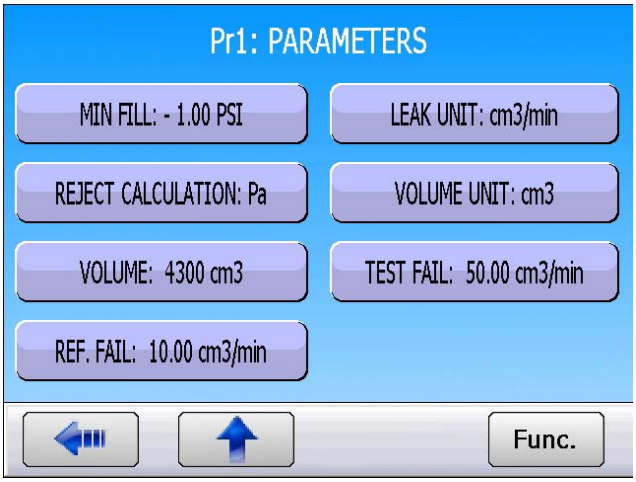
Back to the parameter page, select "**VOLUME**".



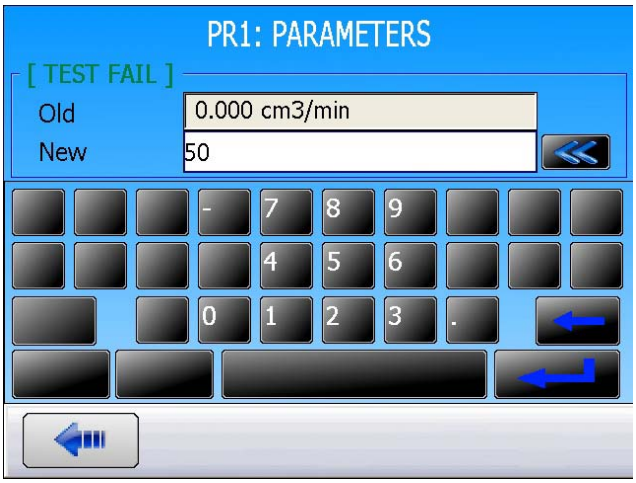
Enter the estimated value of the volume of the part to be tested, in the unit previously selected (cm3 in this example). The volume is the volume internal of the instrument + the volume of the tubing + volume of the part. The volume will be readjusted later.



Back to the Parameter page, select "**TEST FAIL**".

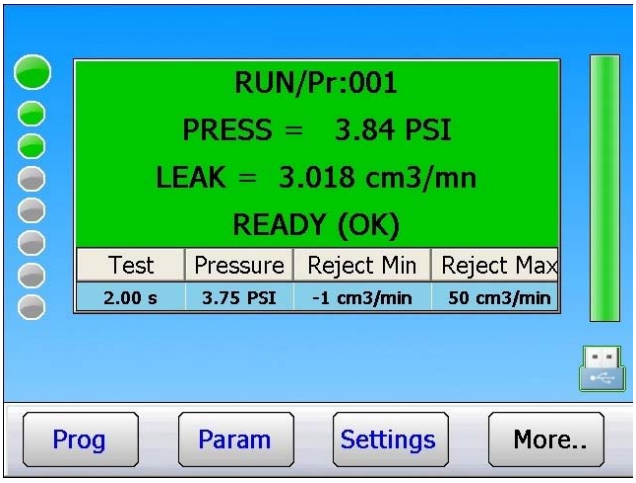


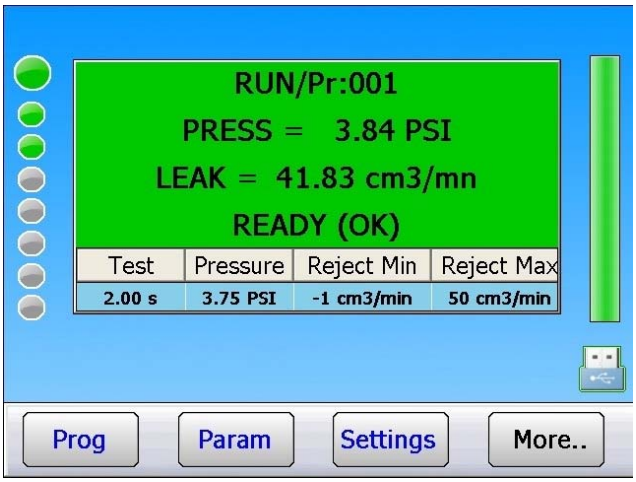
Enter the reject level for the leak test in the unit previously selected.



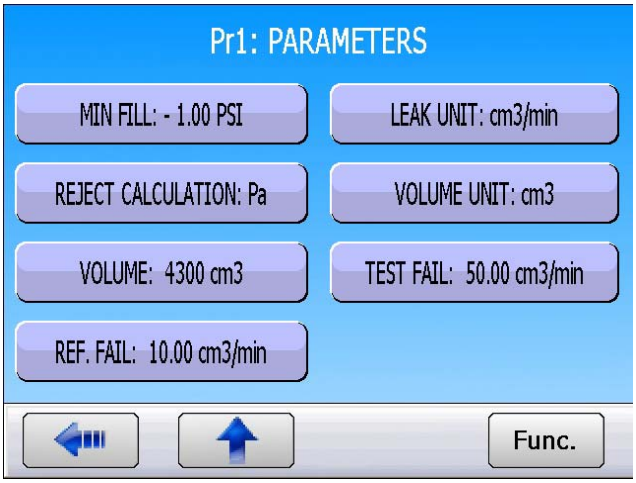
Start a cycle with a known pass part and take note of the result value. Wait a minute.

Start another cycle with the same part but with the orifice connected to the instrument. The result displayed on the instrument should be: **Test result w/o leak + Value of the leak**.



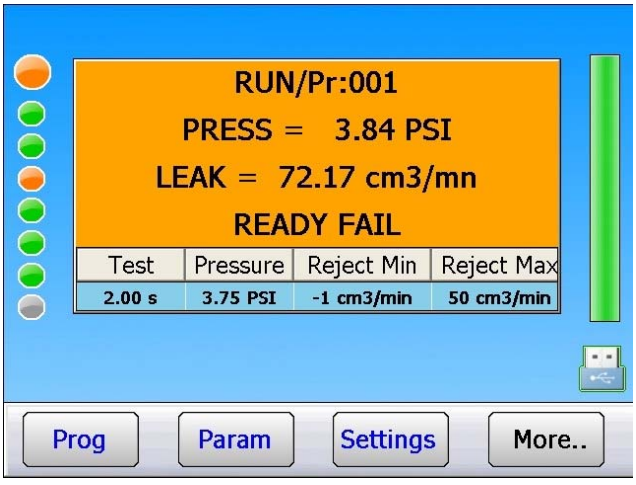


If the result displayed on the instrument is different than test result w/o leak + Value of the leak: we need to adjust the volume value inside the program parameters.



Back to the Parameter page, press "**VOLUME**".

The relationship of the volume and the result is linear. If the displayed result is 10% higher than the calibrated leak value + Test result w/o leak, reduce the volume by 10%. Wait one minute between test cycles to ensure accurate results. Repeat as necessary.



The formula that the instrument uses to convert Pa/s to cc/min is:

$$\textbf{Leak in Pa/s} = \frac{\textbf{Leak in cc/min}}{\textbf{Volume x 0.0006}}$$

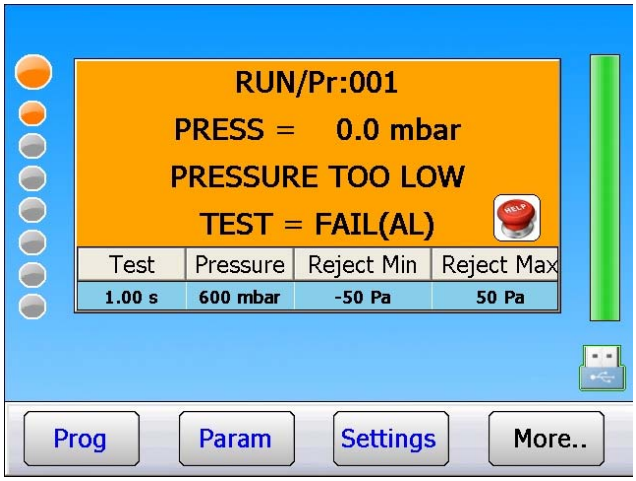
ONLINE HELP

1. PRINCIPLE

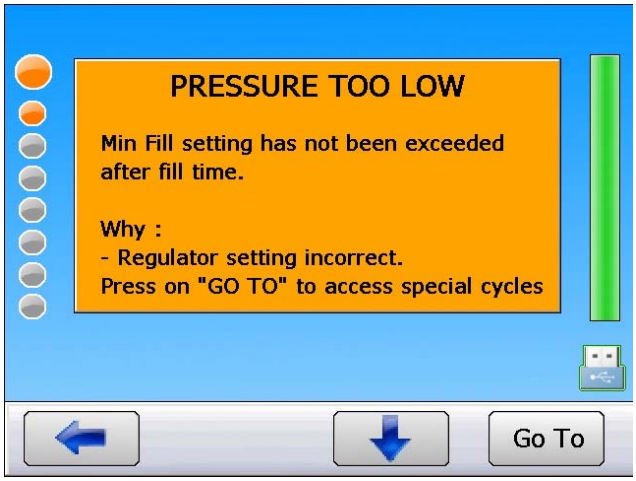
When an alarm is triggered, the "**Online help**" function helps you to cancel and solve this alarm.

2. FUNCTIONNING

When the alarm is triggered, the message is displayed. Press the **HELP** button to enter in the Online help mode.



The Online help menu appears, it learning the event that comes and the likely reason.



In some cases, the device suggests to solve the issue, for that press the **GO TO** button.

The device displays the appropriate menu to solve the issu (here the special cycles menu to adjust the pressure regulator).

VNC / DEVICE REMOTE CONTROL

1. PRINCIPLE

The **VNC** function is to visualize and control the environment of a remote **ATEQ 5000 series** device through an Ethernet network.

VNC = Virtual Network Computing.

This protocol allows making technical support, administration and service by using the remote mouse and display.

Basis configuration:

- An **ATEQ 5000 series** device with the Ethernet connection.
- A remote personal computer with an Ethernet connection with a **VNC** server software.

If the two devices are not in the same local network (LAN) an Internet link is essential.

The rights and the configuration of the connections used in the network and through Internet must be provided by your network administrator of your company, for example for a **VPN** network (Virtual Private Network).

Each device plugged in the network must have different **IP** addresses (Internet Protocol) else communications issues will appear that can disrupt the entire network.

These **IP** addresses are manually assigned or automatically with a router (DHCP Protocol) it's the case of company networks with several devices or computers plugged (for further information, please contact your network administrator).

2. HARDWARE INSTALLATION

2.1. LOCAL AREA NETWORK INSTALLATION

Connect the devices between them like the following scheme.

2.2. INSTALLATION FOR COMMUNICATION THROUGH INTERNET

The starting up and the running are the same for the local network or through Internet communications, except the accesses are configured and allowed by the administrator of the host network (**VPN** network access).

2.3. DIRECT CONNECTION INSTALLATION

The direct connection between the **ATEQ** device and the **PC** is possible, for that; plug them by using an Ethernet **crossed** cable.

The network must be configured in the manual mode for the **IP addresses** and **Ports** (see above "Manual network configuration").

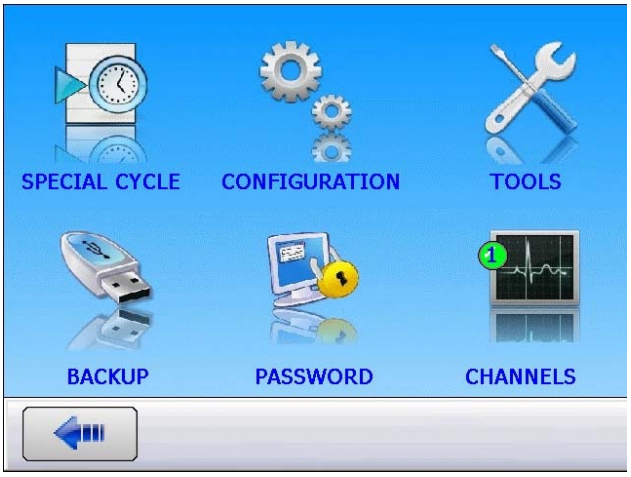
This configuration is not very useful, except for checking the communication between the **ATEQ** device and the **PC**.

3. MANUAL NETWORK CONFIGURATION

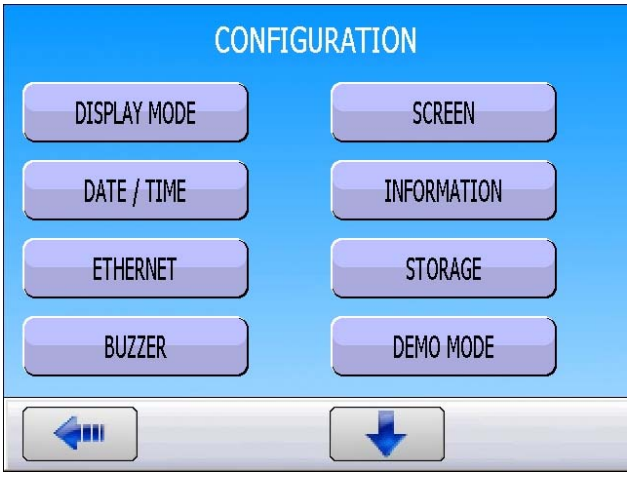
This is to configure manually a local independent network, containing a PC and an **ATEQ 5000 series** device.

3.1. ATEQ DEVICE CONFIGURATION

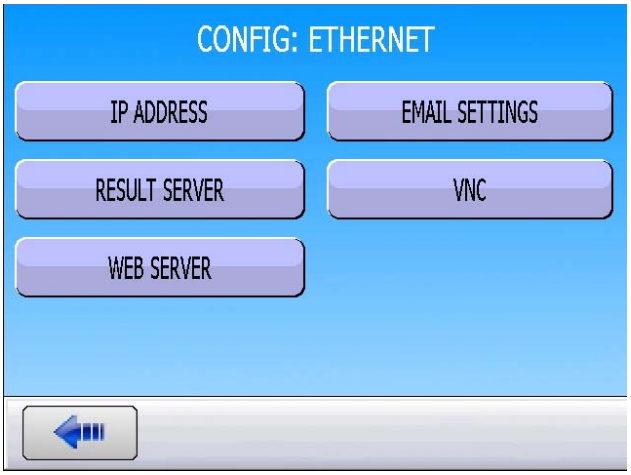
From the main menu click on "**CONFIGURATION**".



Click on the "**ETHERNET**" button.



The Ethernet configuration menu is display, click on the "**IP ADDRESS**" button.



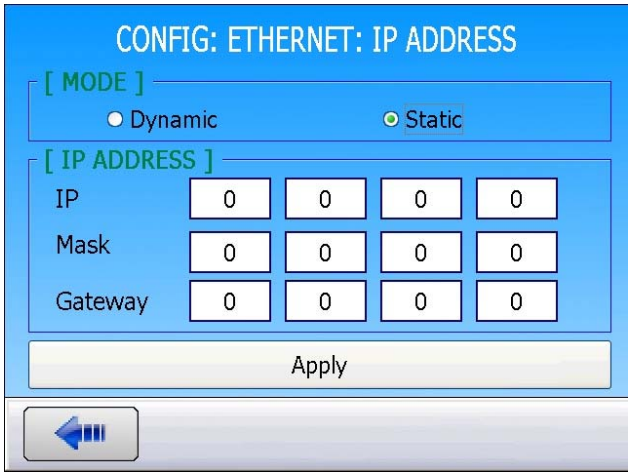
The **IP** address configuration menu appears, select the "**Static**" mode and assign the addresses, examples:

IP: 192.168.0.2.

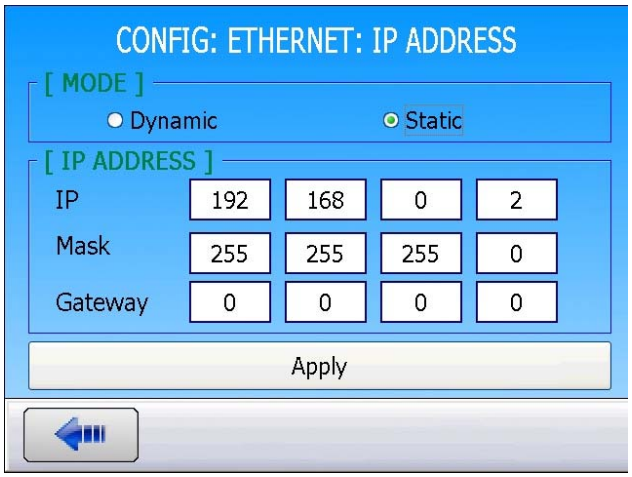
Mask: 255.255.255.0.

***Notes**: the 192.168.X.Y addresses ranges are reserved for privates networks.*

*If others **ATEQ** devices are plugged, they must have others IP addresses, example 192.168.0.3 ; 192.168.0.4, etc.*



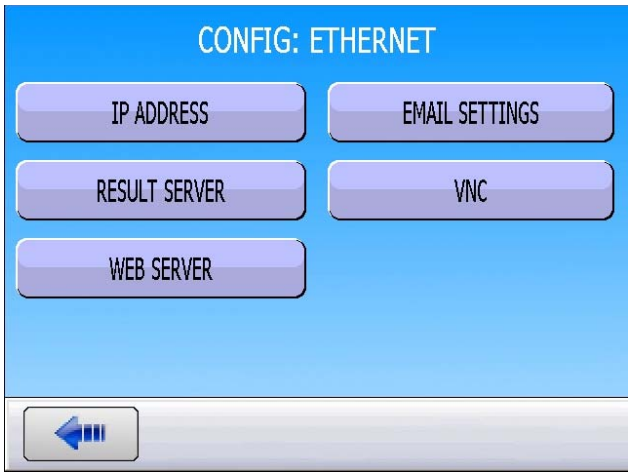
Click on the "**Apply**" button to validate the modifications.



Here "**Gateway**" can remain 0.0.0.0. It's the address of the component which allows Internet connection.

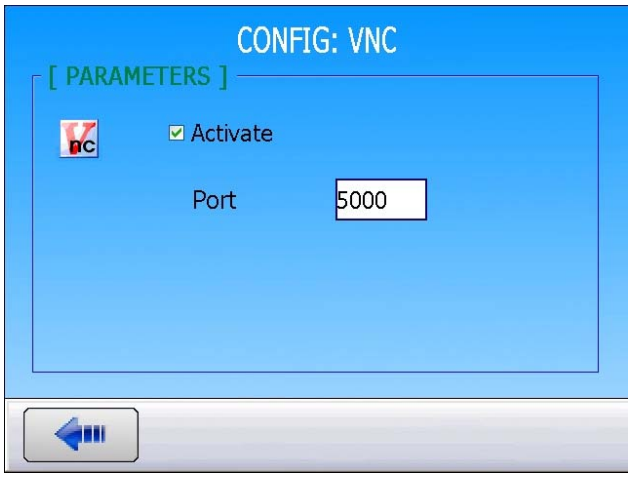
In case of external link (Internet) the gateway **IP** address will be provided by your network administrator.

Then return to the **ETHERNET** menu. Click on the "**VNC**" button.



In the "**VNC**" menu, activate the function and enter the port.

The **5000** default port can remain if no other one is provided by your network administrator.

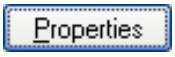


3.2. COMPUTER CONFIGURATION

Enter the network configuration menu; double click on the icon "**Local Area Connection**".

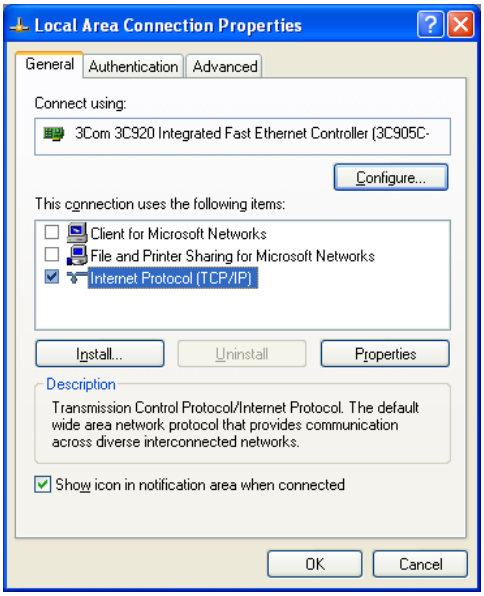
The local connection state is displayed.

Click on the "**Properties**" button to configure the network.



Select the "**Internet Protocol (TCP/IP)**" line.

and click on the "**Properties**" button.



The "**Internet Protocol (TCP/IP) Properties**" menu is displayed.

Check the "**Use the following address**" box and in the fields, enter the following addresses:

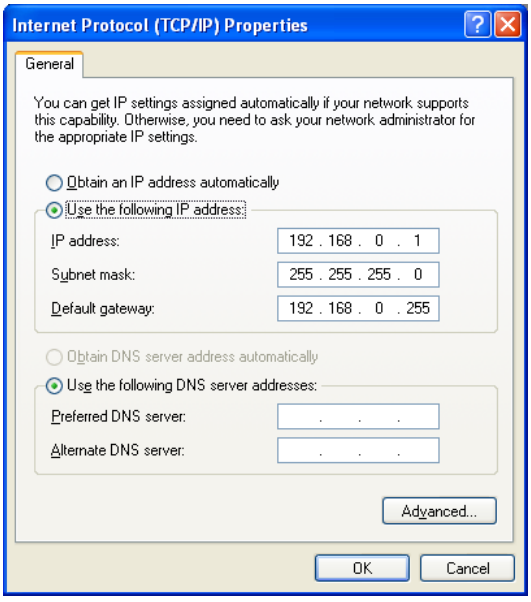
IP Address: **192.168.0.1**.

Subnet Mask: **255.255.255.0**.

Default gateway, example: **192.168.0.255** or enter the address provided by your network administrator.

Do not fill the DNS server addresses.

Click on "**OK**".



4. AUTOMATIC NETWORK CONFIGURATION (DHCP)

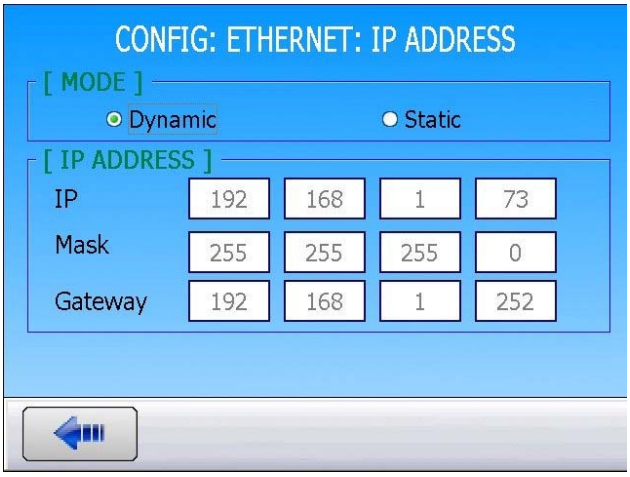
In several company networks, a "**Router**" assigns automatically the **IP** addresses to the components plugged. This device manages all the **IP** addresses to avoid duplicates and communications issues ensuing.

4.1. ATEQ DEVICE CONFIGURATION

In the "**Configuration/Ethernet/ IP Address**" menu validate the "**Dynamic**" mode.

At the next connection to the network, an IP address will be assign to the device.

Keep the **IP address** displayed for use with the **VNC** software later.

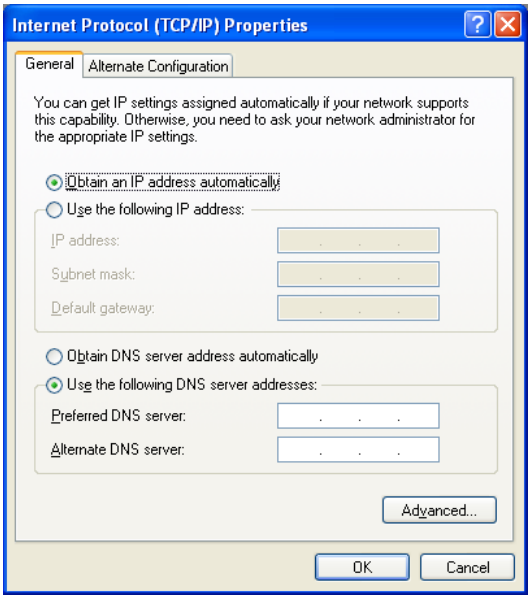


4.2. PERSONAL COMPUTER CONFIGURATION

Enter the "**Internet Protocol (TCP/IP) Properties**" menu.

Check the "**Obtain an IP address automatically**" box.

Click on "**OK**".



5. SOFTWARE INSTALLATION

Get **VNC server** software, several are available. Contact your network administrator that will give you the **VNC server** software used in your company.

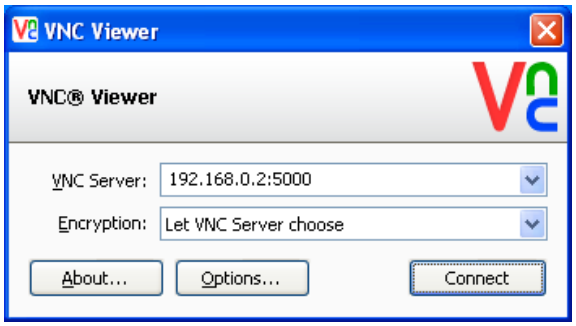
For our examples we will use the "**VNC Viewer**" free software.

5.1. SOFTWARE RUNNIG

Power on all the devices.

On the PC, start the "**VNC Viewer**" software.

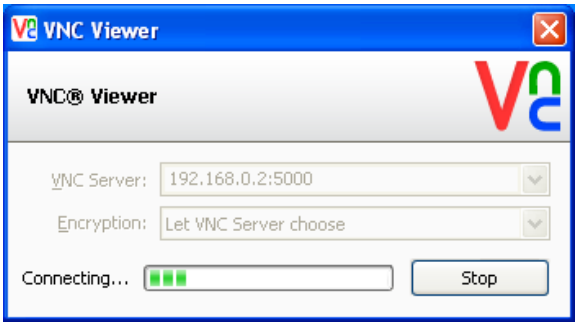
The first window for entering the server IP address is displayed.



In the field "**VNC Server**", enter the **ATEQ** device **IP address** followed by the communication port (colon separated) here it will be: **192.168.0.2:5000.** The port **5000** must be the same as entered in the **ATEQ** device.

Click on "**Connect**" 

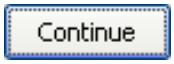
***Note** : in the case of IP address automatically assigned, you must know the ATEQ device one and enter it (with the port) in the field "**VNC Server**"*



The "**VNC Viewer**" software will search for the **ATEQ** device in the network.

The "**VNC Viewer**" software prompts a confirmation for an Unencrypted connection.

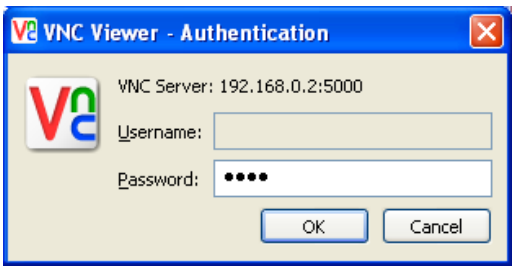
Click on "**Continue**".



***Note**: if the "**Do not warn me about…**" box is checked, this message won't appear again for the next connections with this IP address/port.*

The authentication window is displayed. Enter the password: **ateq** (lowercases only)

***Note**: this password is set and can't be modified.*



The **ATEQ** device screen appears in live on the PC monitor.

The remote control allows visualizing the screen and accessing to the entire **ATEQ** device configuration.

***Note**: for **security** reasons, it's not possible to run a measurement or a special cycle (start or stop).*

BAR CODE (OPTION)

1. DEFINITION

The "**Bar code**" option enables to install a bar code reader on a **USB** port of the **ATEQ** device.

It enables on reading of the code to select a test program and eventually to launch the test of control (if the option is validated).

The quantity of characters read by the reader should not exceed **22**. Beyond the unit will not take into account the character string (bar code string).

2. BAR CODE READER CONFIGURATION

The bar code reader advised for a good functioning is the model **DATALOGIC Gryphon I GD4100** (USB).

DATALOGIC

Gryphon™ I GD4100

General Purpose Corded Handheld
Linear Imager Bar Code Reader

For the reader configuration, follow this process:

1) Enter in programming mode of the reader by flashing this code (right hand) "**ENTER/EXIT PROGRAMMING MODE**"..

ENTER/EXIT PROGRAMMING MODE

2) Reset the reader to factory settings by flashing this code (right hand) "**Factory Default Settings**".

Factory Default Settings

3) Program the reader by flashing the code (right hand) "**USB Keyboard (with standard key encoding)**".

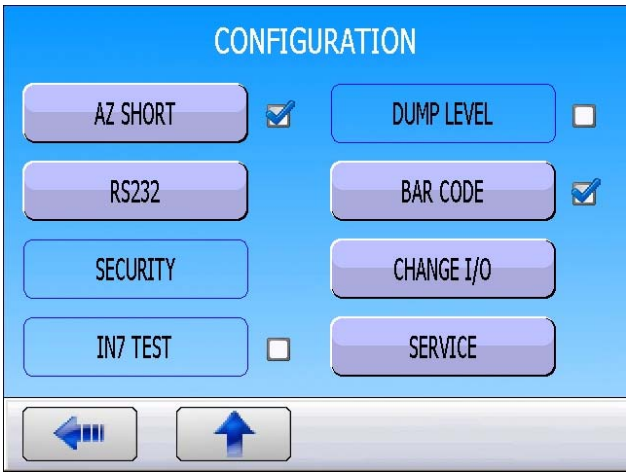
4) Close the programming mode by flashing the first bar code (below) "**ENTER/EXIT PROGRAMMING MODE**".

Select USB Keyboard (with standard key encoding)

3. CONFIGURATION DE L'APPAREIL ATEQ

From the "**CONFIGURATION**" menu

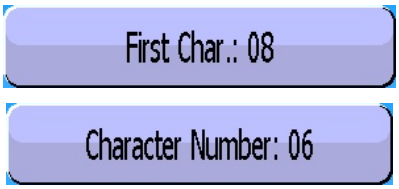
Activate the **BAR CODE** function in the program by checking the box ☑ .



And then, enter into the "**BAR CODE**" configuration menu by pressing the button.

***Warning**: at each parameter or configuration change will delete all the learnings. That will necessary to learn all the codes for each program.*

Then, press the configuration buttons for the bar code reader.



The parameter "**First character**" 

corresponds to the position of first character to take into account in the total string of characters.

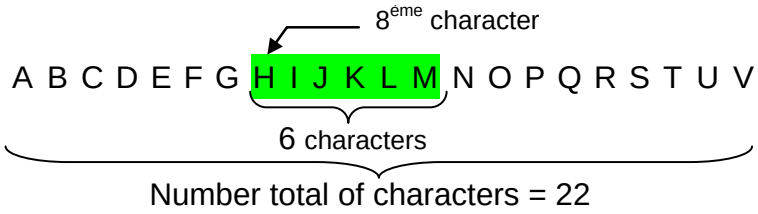
The parameter "**Char Number**" 

corresponds to the quantity of characters (or the length of the chain) to take into account.

The sum of the two captured parameters must be lower or equal to the total quantity of characters contained in the chain plus 1.

$$\sum \text{Parameters} \leq \text{Total quantity of characters} + 1 \leq 22$$

Example:



In our example above (1st = 08 and nb = 6) the program will be selected if the unit reads the character chain: **H I J K L M**.

***Note**: if a same characters string is on several programs, the program with the smallest number will be selected the others will be ignored.*

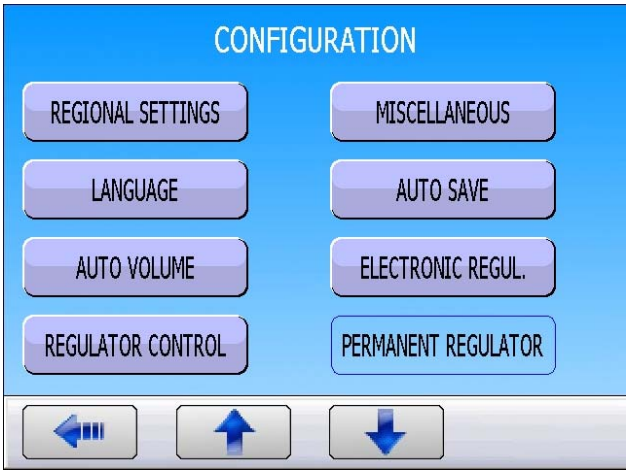
If **validated**, once the bar code is read the test cycle will start the corresponding program.

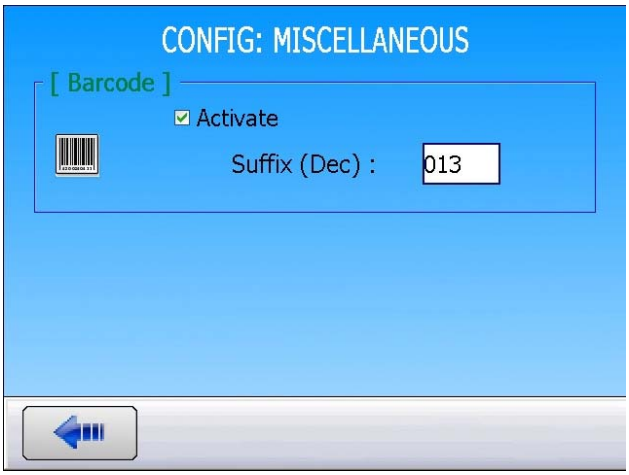
If **not validated** once the bar code is read, the test cycle will start with the current program regardless the read code.

If **validated**, it must flash a new bar code before each start cycle.

If **not validated** the device will save in its memory, the read bar code for all the following programs, until a new bar code will be read.

Then enter in the "**MISCELLANEOUS**" parameter.



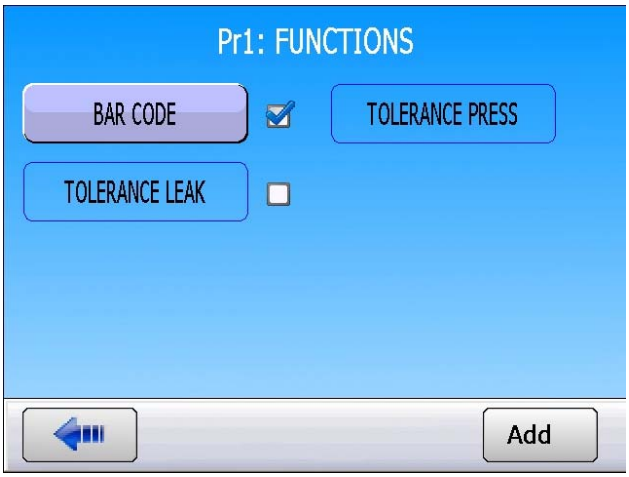


In the "**Bar Code**" section activates the function and check the suffix value.

This suffix will be applied at the end of the bar code reader frame to notify to the device that the frame is ended.

013 = CR in decimal (Carriage Return)

4. FUNCTION CONFIGURATION



Activate the function in the program by checking the box  .

Then configure the function, by pressing the  button.

The configuration menu appears.

The "**NUM. BAR CODE**" parameter is the one that will contain the read bar code of the selected program.

The "**AUTO START**" parameter will start the program once the code is read.

5. PARAMETER SETTING OF THE STRINGS (LEARNING)

The characters string learning will be done from the special cycles.

From the main menu, enter the special cycle menu.

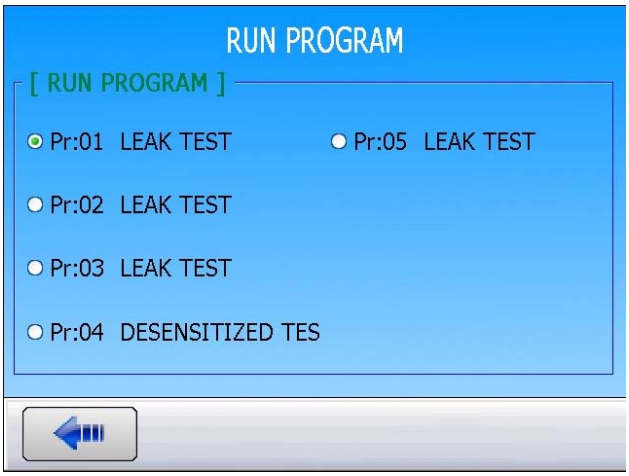
In the special cycle menu, select the special cycle "**BAR CODE**".

The device displays the button with the program number associate to the bar code number.

Press on the 

button to display all the existing programs in the device.

Select the program to associate to the bar code.



The device confirms the special cycle **CODE READER**. Press the "**START CYCLE**" button.

***Note**: the device displays the current program number that can be different than the one that was selected for the bar code.*

The device is waiting for the bar code.

Then flash the code by using the bar code reader. The captured characters are displayed.

The code is recorded; the device is ready to run. At each reading of this code, the device will select the corresponding program and will start the test cycle if the "**AUTO START**" parameter is validated.

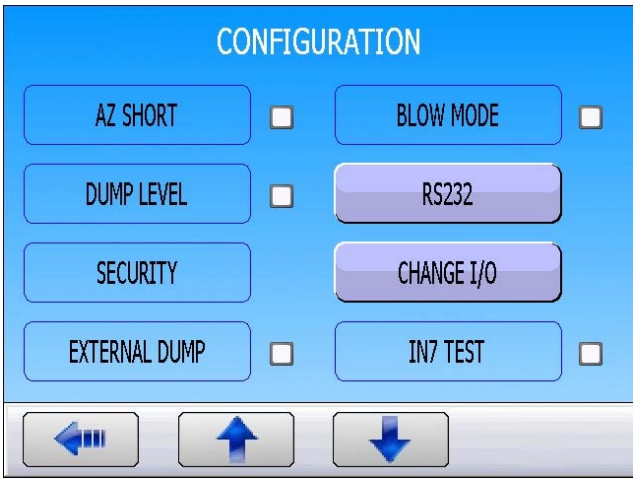
If the flashed code is unknown, the message "**DEF. BAR CODE**" is displayed.

LABELS (PRINTING)

The "**LABELS**" menu is to configure the printing on labels.

This function is used for all label printers that support: EPL2 or ZPL2 languages.

From the "**CONFIGURATION**" menu, press the "**RS232**" button.



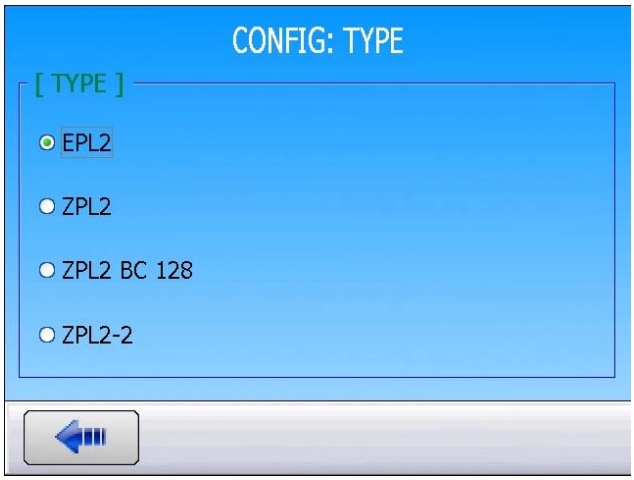
The **RS232** link configuration menu appears.

Click on the "**LABEL**" button.

You should connect a printer compatible with this feature.

The printer configuration menu for the labels appears.

The "**Type: EPL2**" button is to select the printer language.



Selection among: EPL2, ZPL2, ZPL2 BC 128 (with bar code reader) and ZPL2-2.

Select the appropriate language of your printer.

Refer to the documentation fitted with the printer.

Printer languages Detail (examples):

EPL2/ZPL2

Line 1 : Name **and** Bar code Number (if entered)

Line 2 : Date and Time

Line 3 : Test Result

ZPL2-2

Line 1 : Name **or** Bar code Number

Line 2 : Date and Time

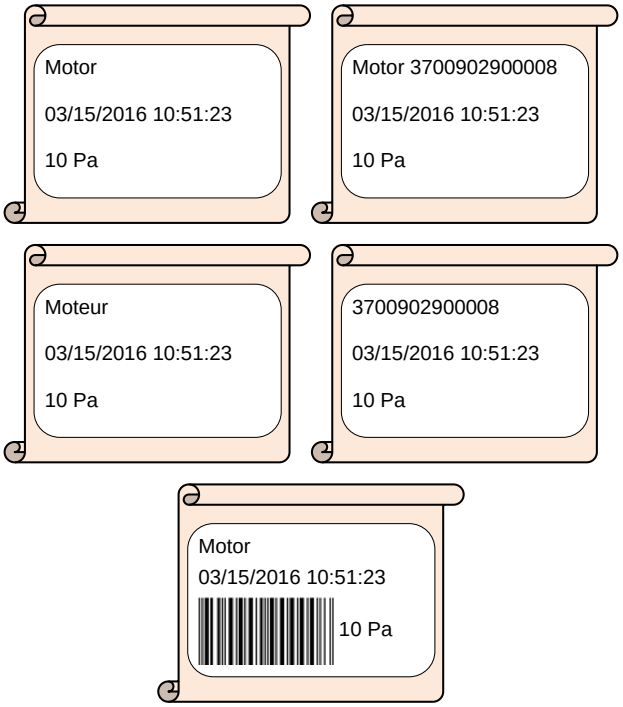
Line 3 : Test Result

CB2PL2 (ZPL2 with bar code)

Line 1 : Name

Line 2 : Date and Time

Line 3 : Bar code (picture) and Test Result

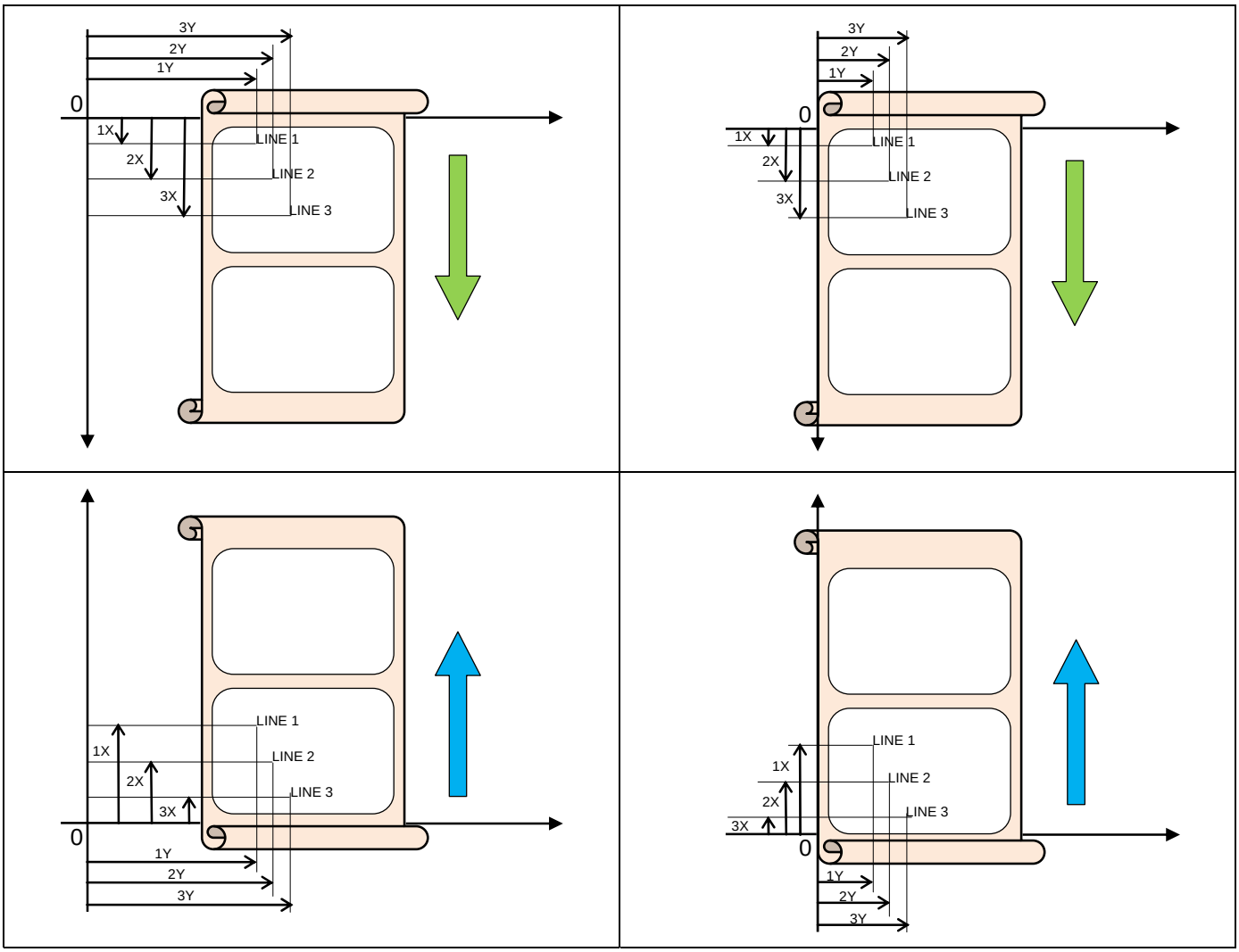


The "**LINE**" parameters are to position the three lines of messages.

The units of the values of these parameters are "**Pixels**"

See examples below:

Warning: following the printer model and following the paper output direction, the origin point can be different, refer to the user manual of the used printer.



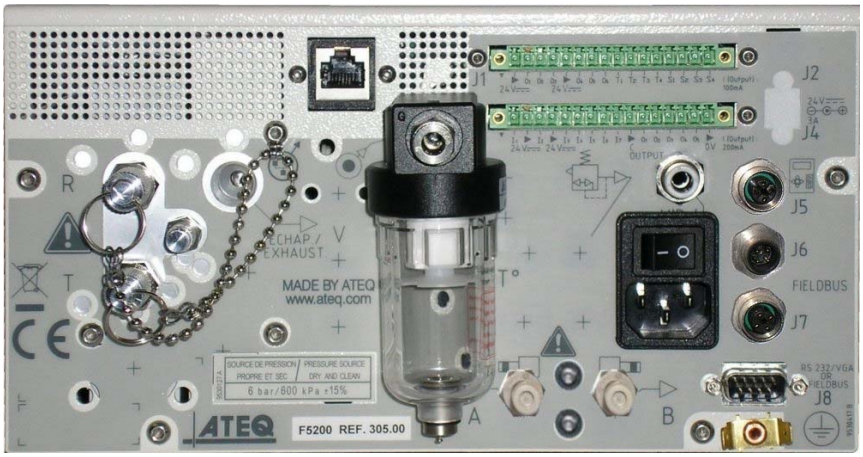
ELECTRIC CONNECTORS (F5200)

1. FRONT PANEL CONNECTOR

1.1. USB CONNECTOR

Allows the connexion of various **USB** compatible devices (mouse, keyboard, USB key etc…).

2. REAR FACE CONNECTOR

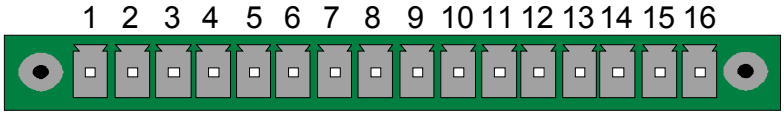


3. ON /OFF POWER SWITCH (INTERNAL POWER SUPPLY EQUIPPED INSTRUMENTS)

ATEQ instrument internal power supply operates with a voltage between 100 and 240 V AC.

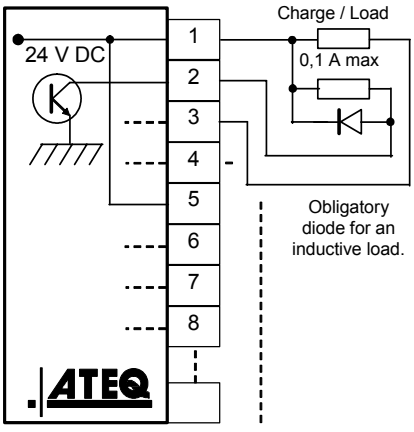
4. REAR PANEL CONNECTORS

4.1. J1 CONNECTOR OUTPUT CODES/ANALOG OUTPUTS

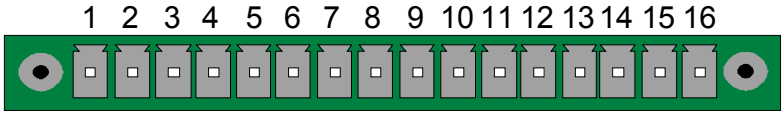


Temperature sensor/ Output codes/ Analog outputs

PIN 1	COMMON (outputs 1, 2, 3) + 24 V DC	OUTPUT CODES 24V DC 100mA Max Outputs
PIN 2	Output n°1, open collector	
PIN 3	Output n°2, open collector	
PIN 4	Output n°3, open collector	
PIN 5	COMMON (outputs 4, 5, 6) + 24 V DC	
PIN 6	Output n°4, open collector	
PIN 7	Output n°5, open collector	
PIN 8	Output n°6, open collector	
PIN 9	12V Sensor power supply	TEMPERATURE SENSORS
PIN 10	0V Sensor power supply	
PIN 11	SENSOR n°1 input	
PIN 12	SENSOR n°2 input	
PIN 13	Analog outputs n°1	ANALOG OUTPUTS
PIN 14	COMMON (analog output 1)	
PIN 15	Analog output n°2	
PIN 16	COMMON (analog output 2)	



4.2. J3 CONNECTOR INPUTS/OUTPUTS



Binary inputs/outputs

Pin	Standard mode	Compact mode	
1	Input 1 Reset	Input 1 Reset	INPUTS (Activated with 24 V DC) Common + 24 V = 0,3 A maxi
2	Common (+ 24 V)	Common (+ 24 V)	
3	Input 2 START	Input 2 START	
4	Common (+ 24 V)	Common (+ 24 V)	
5	Input 3 Program selection	Input 3 Program selection	
6	Input 4 Program selection	Input 4 Program selection	
7	Input 5 Program selection	Input 5 Program selection	
8	Input 6 Program selection	Input 6 Program selection	
9	Input 7 Program selection	Input 7 Program selection	
10	Floating common output	Floating common output	DRY CONTACT OUTPUTS 60V AC / DC Max 200mA Max
11	Output 1 Good part	Output 1 Good part cycle 1	
12	Output 2 Bad part Test	Output 2 Bad part cycle 1 + alarm	
13	Output 3 Bad part Reference	Output 3 Pass part cycle 2	
14	Output 4 Alarm	Output 2 Bad part cycle 2 + alarm	
15	Output 5 End of cycle	Output 5 End of cycle	
16	0 V	0 V	

The compact mode is a software function which is activated in the **CONFIGURATION / CHANGE I/O / OUTPUT** menu.

4.2.1. Program selection from the J3 connector inputs

The various test programs can be selected individually according to a binary combination of the connector inputs.

Pin combinations for program selection

Program number	Pin 5 (Input 3)	Pin 6 (Input 4)	Pin 7 (Input 5)	Pin 8 (Input 6)
1	0	0	0	0
2	1	0	0	0
3	0	1	0	0
4	1	1	0	0
5	0	0	1	0
6	1	0	1	0
7	0	1	1	0
8	1	1	1	0
9	0	0	0	1
10	1	0	0	1
11	0	1	0	1
12	1	1	0	1
13	0	0	1	1
14	1	0	1	1
15	0	1	1	1
16	1	1	1	1

The bits for the program selection must be held for 500ms then the start signal must be held high for 500 ms. Afterwards all bits can be released. The selected program will start.

4.2.1. 1) 3.2.2 J3 Connector (Binary inputs/outputs) programmable input

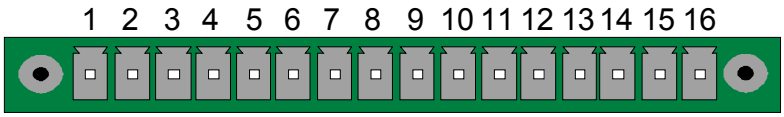
Input 7 is an input that can be programmed to activate different functions.

The programmable functions available with the input are all the specials cycle:

- ✓ Program selection.
- ✓ Regulator 1 adjust request.
- ✓ Regulator 2 adjust request.
- ✓ Infinite fill request.
- ✓ Pressure sensor auto zero request.
- ✓ Good part sealed component learn cycle request.
- ✓ Bad part sealed component learn cycle request.
- ✓ Calibration check by volume request.
- ✓ Custom unit learn request.
- ✓ Custom unit check request.
- ✓ ATR learning cycle request.
- ✓ Volume calculation request.

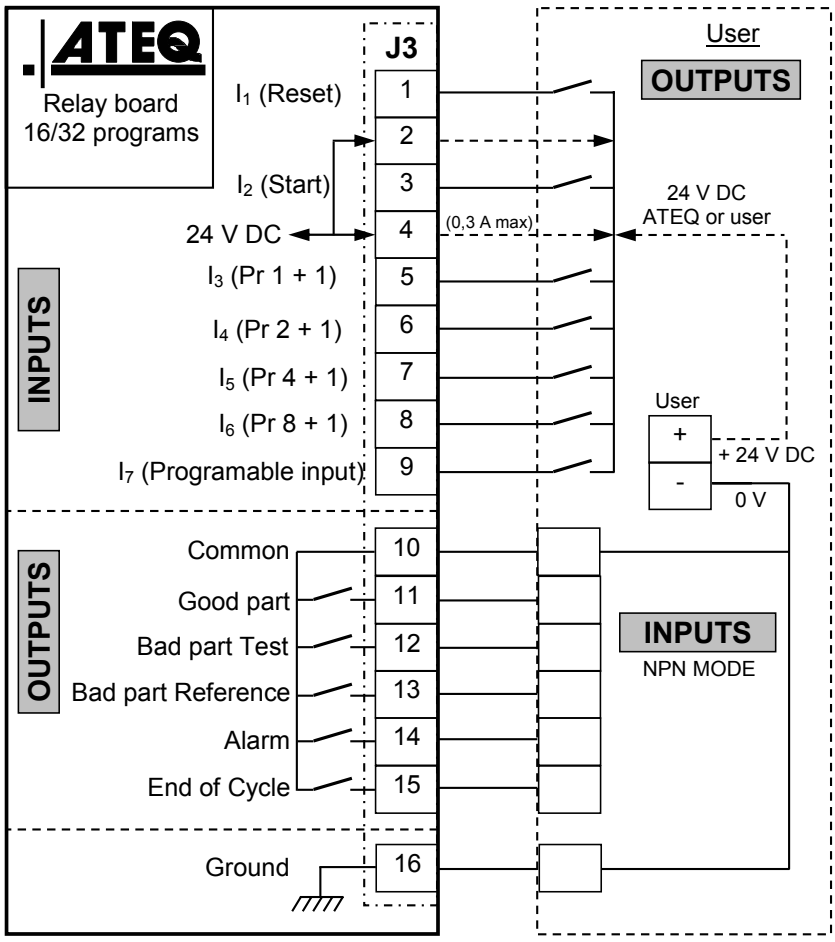
Some functions appear only if the function is activated in a program.

J3 Connector (binary inputs/outputs) diagram



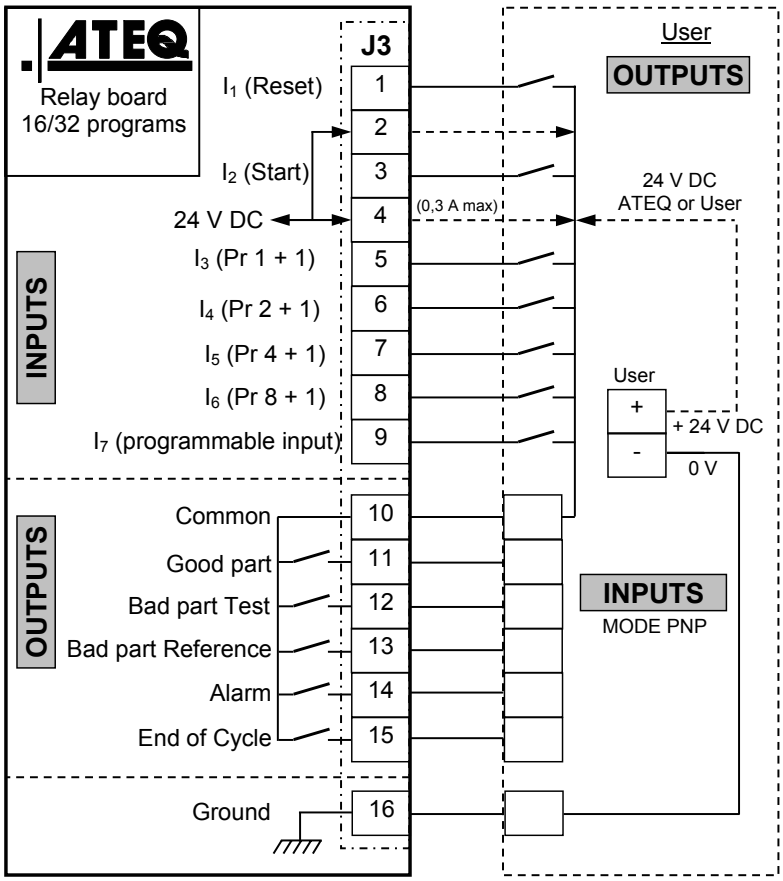
The standard way to power the instrument is to supply 24V to pin 2 or 4 and ground pin 16 of the J3 connector.

4.2.1. 2) PLC NPN mode connection



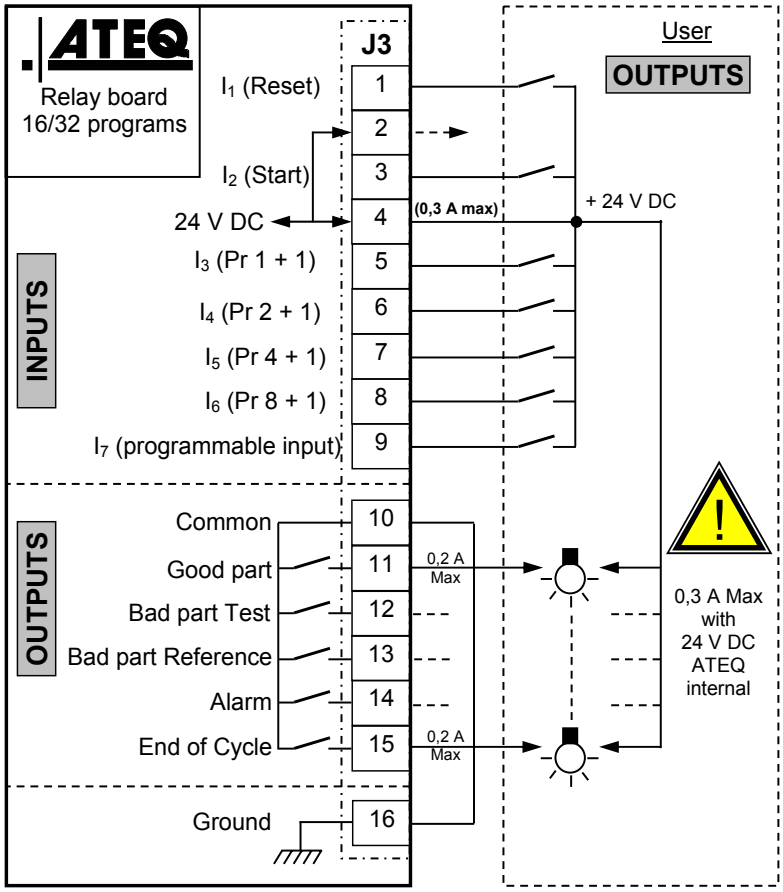
***Note**: The 24V power supply must be provided by the internal power supply of the ATEQ instrument (0,3A maximum) **OR** through an external power supply provided by the customer.*

4.2.1. 3) PLC PNP mode connection



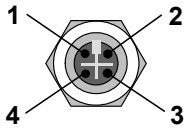
***Note**: The 24V power supply must be provided by the internal power supply of the ATEQ instrument (0,3A maximum) **OR** through an external power supply provided by the customer.*

4.2.1. 4) Light connection



***Note**: The 24V power supply must be provided by the internal power supply of the ATEQ instrument (0,3A maximum) **OR** through an external power supply provided by the customer.*

4.3. J5 CONNECTOR REMOTE (OPTION)

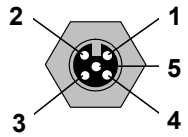


Used for connecting an intelligent remote control (female connector M12).

J5 connector can also be used to power up the instrument.

PIN 1	Network
PIN 2	+ 24V Power supply
PIN 3	Network
PIN 4	0V Ground

4.4. J6 INPUT CONNECTOR DEVICENET (OPTION)

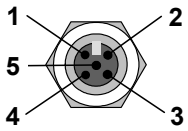


Proprietary **ATEQ** network.

Used for communicating with other **ATEQ** instruments (male connector M12).

PIN 1	Network
PIN 2	+ 24V Power supply
PIN 3	Network
PIN 4	0V Ground

4.5. J7 OUTPUT CONNECTOR DEVICENET (OPTION)

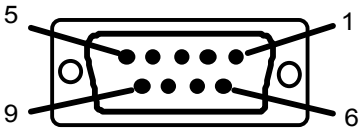


Proprietary **ATEQ** network.

Used for connecting an intelligent remote control (female connector M12).

PIN 1	Network
PIN 2	+ 24V Power supply
PIN 3	Network
PIN 4	0V Ground

4.6. J8 CONNECTOR (RS232) OR PROFIBUS OR EXTERNAL SCREEN

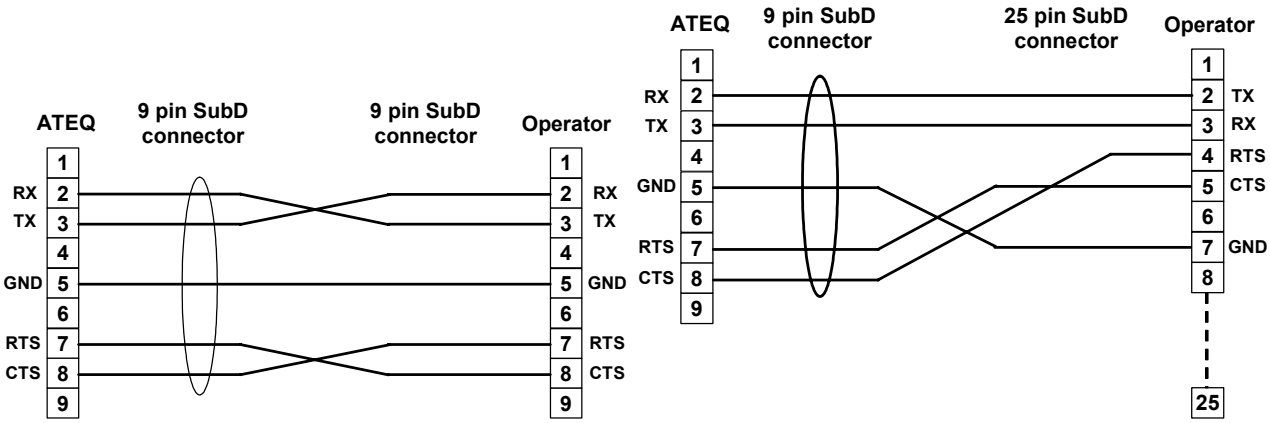


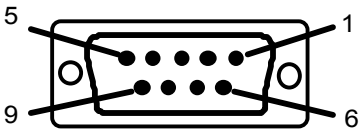
RS232 : Connecteur SubD 9 points mâle.

Enables the connection of a printer, bar code reader, PC or memory module.

PIN 1	Not used	PIN 6	Not used
PIN 2	RXD data input	PIN 7	RTS request to send
PIN 3	TXD data output	PIN 8	CTS clear to send
PIN 4	Not used	PIN 9	Not used
PIN 5	Ground		

4.6.1. Examples of RS232 cable

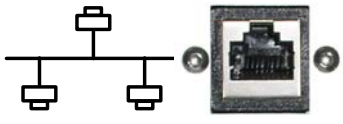




Profibus : Connecteur SubD 9 points femelle.

Ecran externe : Connecteur SubD 9 points.

4.7. J9 ETHERNET CONNECTOR



The Ethernet connector is used to connect the instrument to an Ethernet network (company network), TCP/IP protocol.

4.8. J2 PHONE CONNECTOR

Phone network connector: not used.

ELECTRIC CONNECTORS (F5800)

1. FRONT PANEL CONNECTOR

1.1. USB CONNECTOR

Allows the connexion of various **USB** compatible devices (mouse, keyboard, USB key etc…).

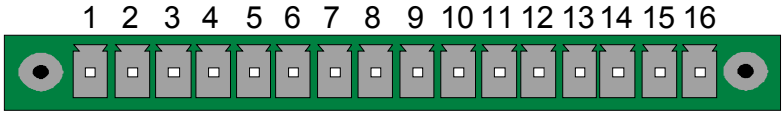
2. REAR FACE CONNECTOR

3. ON /OFF POWER SWITCH (INTERNAL POWER SUPPLY EQUIPPED INSTRUMENTS)

ATEQ instrument internal power supply operates with a voltage between 100 and 240 V AC.

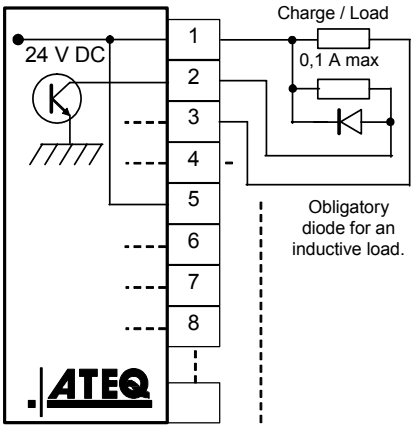
4. REAR PANEL CONNECTORS

4.1. J1 CONNECTOR OUTPUT CODES/ANALOG OUTPUTS

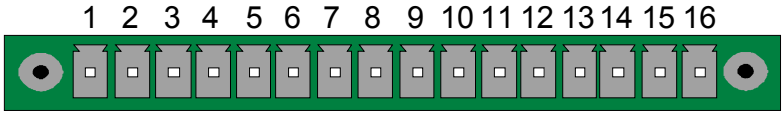


Temperature sensor/ Output codes/ Analog outputs

PIN 1	COMMON (outputs 1, 2, 3) + 24 V DC	OUTPUT CODES 24V DC 100mA Max Outputs
PIN 2	Output n°1, open collector	
PIN 3	Output n°2, open collector	
PIN 4	Output n°3, open collector	
PIN 5	COMMON (outputs 4, 5, 6) + 24 V DC	
PIN 6	Output n°4, open collector	
PIN 7	Output n°5, open collector	
PIN 8	Output n°6, open collector	
PIN 9	12V Sensor power supply	TEMPERATURE SENSORS
PIN 10	0V Sensor power supply	
PIN 11	SENSOR n°1 input	
PIN 12	SENSOR n°2 input	
PIN 13	Analog outputs n°1	ANALOG OUTPUTS
PIN 14	COMMON (analog output 1)	
PIN 15	Analog output n°2	
PIN 16	COMMON (analog output 2)	



4.2. J3 CONNECTOR INPUTS/OUTPUTS



Binary inputs/outputs

Pin	Standard mode	Compact mode	
1	Input 1 Reset	Input 1 Reset	INPUTS (Activated with 24 V DC) Common + 24 V = 0,3 A maxi
2	Common (+ 24 V)	Common (+ 24 V)	
3	Input 2 START	Input 2 START	
4	Common (+ 24 V)	Common (+ 24 V)	
5	Input 3 Program selection	Input 3 Program selection	
6	Input 4 Program selection	Input 4 Program selection	
7	Input 5 Program selection	Input 5 Program selection	
8	Input 6 Program selection	Input 6 Program selection	
9	Input 7 Program selection	Input 7 Program selection	
10	Floating common output	Floating common output	DRY CONTACT OUTPUTS 60V AC / DC Max 200mA Max
11	Output 1 Good part	Output 1 Good part cycle 1	
12	Output 2 Bad part Test	Output 2 Bad part cycle 1 + alarm	
13	Output 3 Bad part Reference	Output 3 Pass part cycle 2	
14	Output 4 Alarm	Output 2 Bad part cycle 2 + alarm	
15	Output 5 End of cycle	Output 5 End of cycle	
16	0 V	0 V	

The compact mode is a software function which is activated in the **CONFIGURATION / CHANGE I/O / OUTPUT** menu.

4.2.1. Program selection from the J3 connector inputs

The various test programs can be selected individually according to a binary combination of the connector inputs.

Pin combinations for program selection

Program number	Pin 5 (Input 3)	Pin 6 (Input 4)	Pin 7 (Input 5)	Pin 8 (Input 6)
1	0	0	0	0
2	1	0	0	0
3	0	1	0	0
4	1	1	0	0
5	0	0	1	0
6	1	0	1	0
7	0	1	1	0
8	1	1	1	0
9	0	0	0	1
10	1	0	0	1
11	0	1	0	1
12	1	1	0	1
13	0	0	1	1
14	1	0	1	1
15	0	1	1	1
16	1	1	1	1

The bits for the program selection must be held for 500ms then the start signal must be held high for 500 ms. Afterwards all bits can be released. The selected program will start.

4.2.1. 1) 3.2.2 J3 Connector (Binary inputs/outputs) programmable input

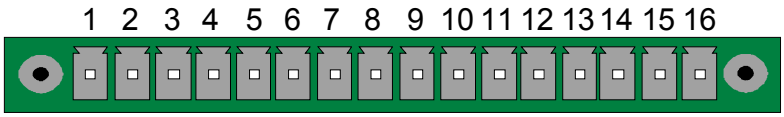
Input 7 is an input that can be programmed to activate different functions.

The programmable functions available with the input are all the specials cycle:

- ✓ Program selection.
- ✓ Regulator 1 adjust request.
- ✓ Regulator 2 adjust request.
- ✓ Infinite fill request.
- ✓ Pressure sensor auto zero request.
- ✓ Good part sealed component learn cycle request.
- ✓ Bad part sealed component learn cycle request.
- ✓ Calibration check by volume request.
- ✓ Custom unit learn request.
- ✓ Custom unit check request.
- ✓ ATR learning cycle request.
- ✓ Volume calculation request.

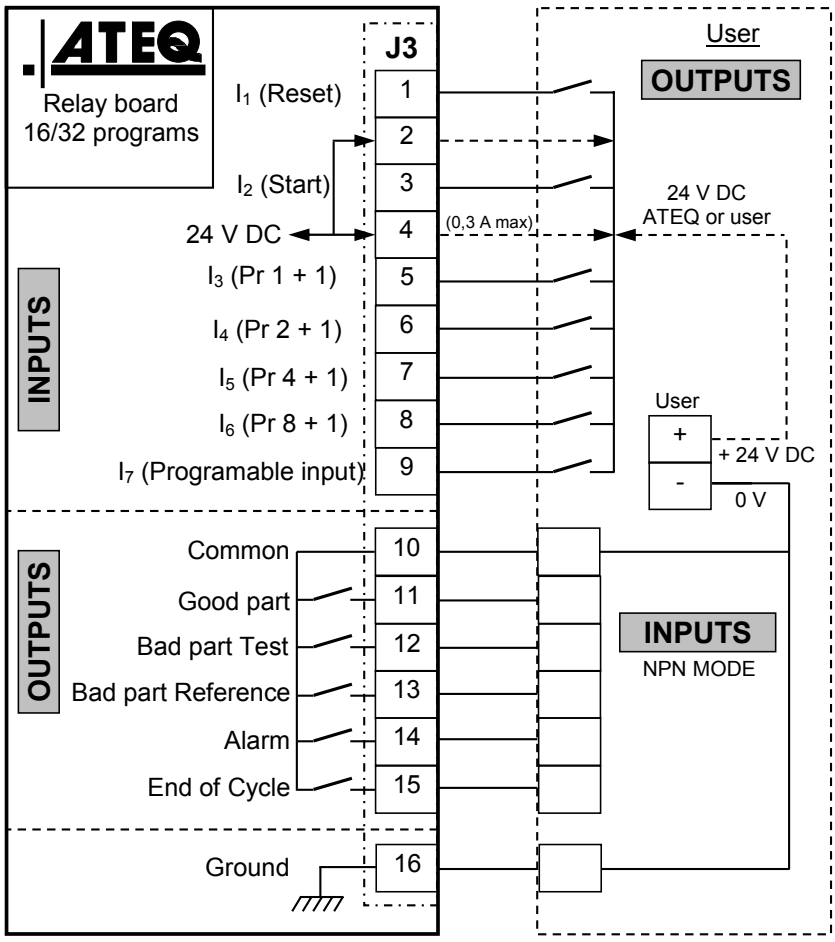
Some functions appear only if the function is activated in a program.

J3 Connector (binary inputs/outputs) diagram



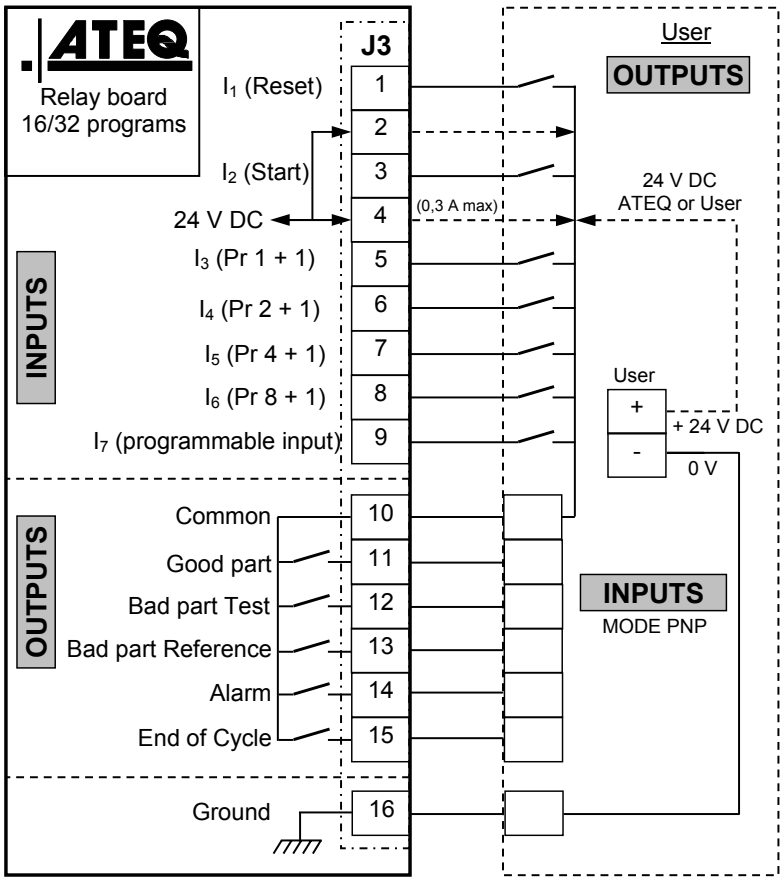
The standard way to power the instrument is to supply 24V to pin 2 or 4 and ground pin 16 of the J3 connector.

4.2.1. 2) PLC NPN mode connection



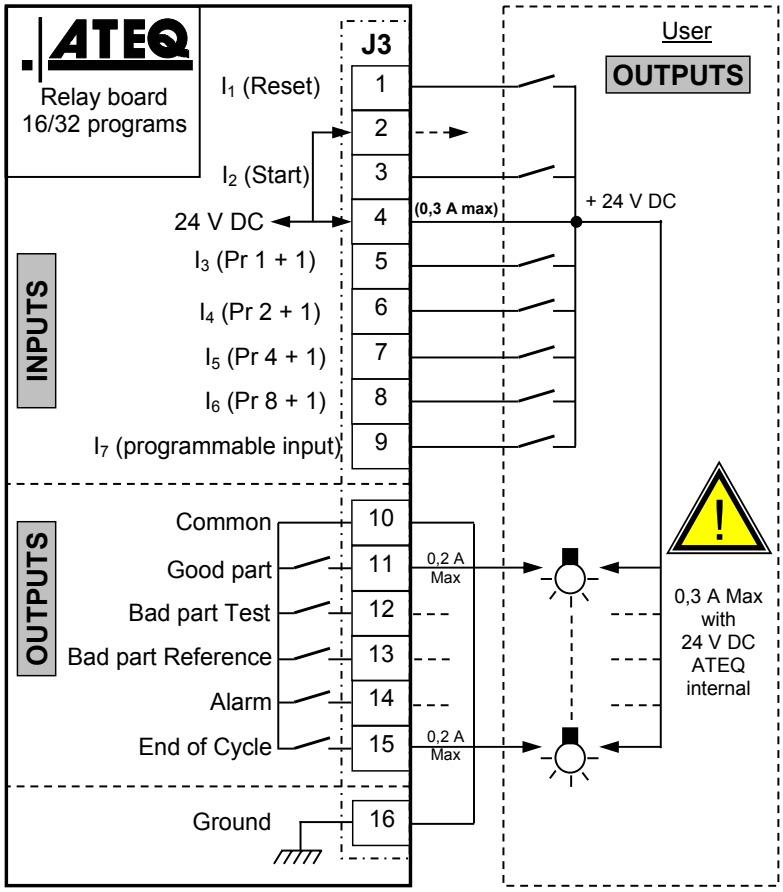
***Note**: The 24V power supply must be provided by the internal power supply of the ATEQ instrument (0,3A maximum) **OR** through an external power supply provided by the customer.*

4.2.1. 3) PLC PNP mode connection



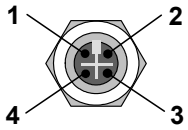
***Note**: The 24V power supply must be provided by the internal power supply of the ATEQ instrument (0,3A maximum) **OR** through an external power supply provided by the customer.*

4.2.1. 4) Light connection



***Note**: The 24V power supply must be provided by the internal power supply of the ATEQ instrument (0,3A maximum) **OR** through an external power supply provided by the customer.*

4.3. J5 CONNECTOR REMOTE (OPTION)

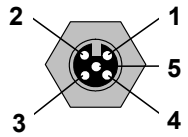


Used for connecting an intelligent remote control (female connector M12).

J5 connector can also be used to power up the instrument.

PIN 1	Network
PIN 2	+ 24V Power supply
PIN 3	Network
PIN 4	0V Ground

4.4. J6 INPUT CONNECTOR DEVICENET (OPTION)

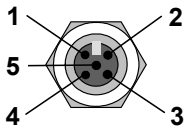


Proprietary **ATEQ** network.

Used for communicating with other **ATEQ** instruments (male connector M12).

PIN 1	Network
PIN 2	+ 24V Power supply
PIN 3	Network
PIN 4	0V Ground

4.5. J7 OUTPUT CONNECTOR DEVICENET (OPTION)

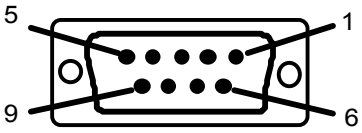


Proprietary **ATEQ** network.

Used for connecting an intelligent remote control (female connector M12).

PIN 1	Network
PIN 2	+ 24V Power supply
PIN 3	Network
PIN 4	0V Ground

4.6. J8 CONNECTOR (RS232) OR PROFIBUS OR EXTERNAL SCREEN

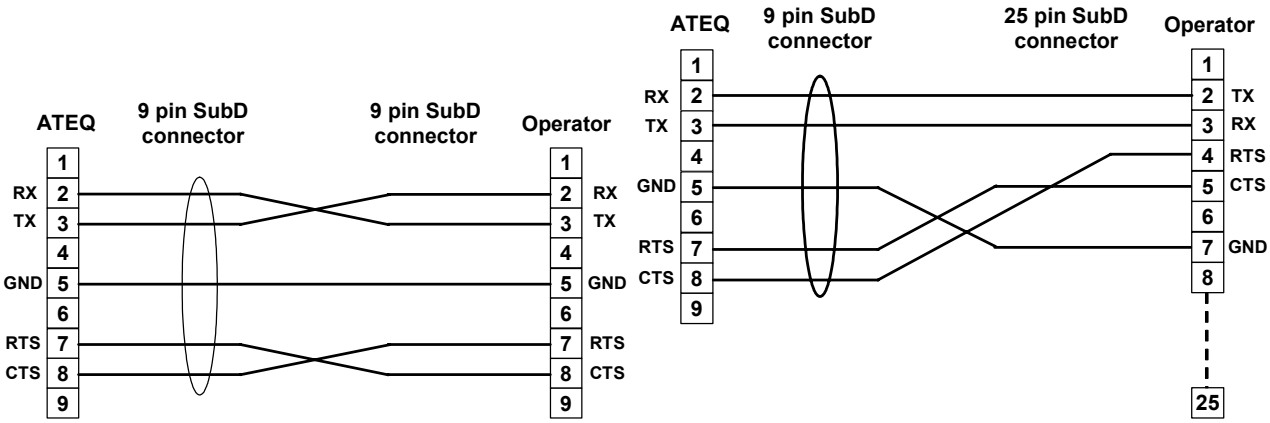


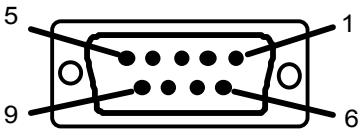
RS232 : Connecteur SubD 9 points mâle.

Enables the connection of a printer, bar code reader, PC or memory module.

PIN 1	Not used	PIN 6	Not used
PIN 2	RXD data input	PIN 7	RTS request to send
PIN 3	TXD data output	PIN 8	CTS clear to send
PIN 4	Not used	PIN 9	Not used
PIN 5	Ground		

4.6.1. Examples of RS232 cable

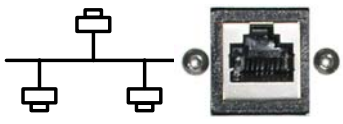




Profibus : Connecteur SubD 9 points femelle.

Ecran externe : Connecteur SubD 9 points.

4.7. J9 ETHERNET CONNECTOR



The Ethernet connector is used to connect the instrument to an Ethernet network (company network), TCP/IP protocol.

4.8. J2 PHONE CONNECTOR

Phone network connector: not used.

PNEUMATIC CONNECTORS

The pneumatic connectors are located at the back of the instrument.

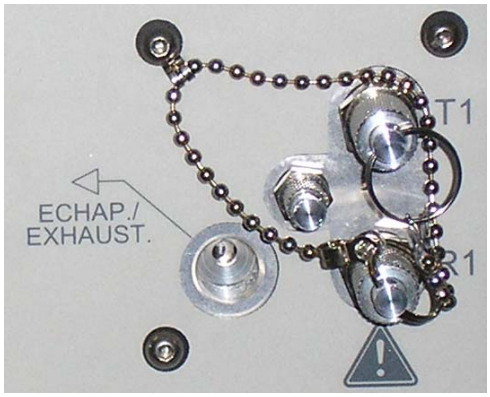
1. PNEUMATIC TEST PORTS

These ports enable the parts to be connected (test and reference). The pressurization port can be connected to the ATEQ 3/2 valve or special sealed component instruments.

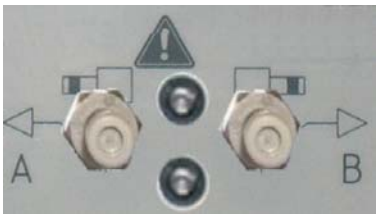
Inputs/outputs on the **F5200** instrument rear panel:

Reference port R		Exhaust output
Test port T		Pressurization port or Sealed component port

Inputs/outputs on the **F5800** instrument rear panel:

Pressurization port or Sealed component port		Test port T1
Exhaust output		Reference port R1

2. AUTOMATIC CONNECTOR A AND B (OPTIONAL)



The automatic connectors A and B are dedicated for the pneumatic pilots of valves or to close simple fixtures.

3. PNEUMATIC SUPPLY

See sheet #77 "**Pneumatic supply**".