ATEQ

# USER MANUAL

# ATEQ F570P

**Version 1.01g (2ZL05)**

www.ateq.com

Reference : UM-21400A-U/2ZL

# REVISIONS OF THE ATEQ F570P/2ZL USER MANUAL

| **Edition/Revision** | **Reference** | **Date** week/year | **Chapters updated** |
|---|---|---|---|
| First edition | UM-21400A-U/2ZL | 44/2005 | - |
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# Recommendations for leak testing intruments

## Precautions for the test environment

- Keep the test area as clean as possible.

## Precautions for the operators

- **ATEQ** recommends that the operators using the instruments should have a suitable qualification and training with respect to the work bench requirements.

## General precautions

- Read the user manual before using the instrument,
- all electrical connections to the instrument must be equipped with a safety system (fuse, circuit breaker…) appropriate to its needs and complying with the standards,
- to avoid electromagnetic interference, the cable connections to the instrument should be less than two meters in length,
- it is essential that the electrical main is earthed,
- disconnect the electrical connections to the equipment before maintenance,
- cut the air supply for any kinds of operation on the pneumatic assembly,
- do not open the instrument when it is powered up,
- avoid water spillage near of the instrument,
- **ATEQ** is at your disposal for any further information concerning the use of the instrument under maximum safety conditions.

**We would like to bring to your attention that ATEQ will not be held responsible for any accident connected to the improper use of the instrument, to the work bench or to the lack of compliance with safety rules.**

# ATEQ, THE ASSURANCE OF A COMPETENT AFTER SALES SERVICE

## ■ THE ATEQ AFTER SALES SERVICE IS :

- a team of qualified technicians,
- a permanent telephone assistance,
- agencies close to you for faster reaction,
- a stock of spare parts available immediately,
- a car fleet for rapid intervention,
- a commitment to quality ...

## ■ THE OVERHAUL

ATEQ carries out the overhaul of your instruments at interesting prices.
The overhaul corresponds to the maintenance of the instrument (checking, cleaning, replacing of used parts) as part of preventive maintenance.
Preventive maintenance is the best way to guarantee reliability and efficiency. It allows the maintenance of a group of instruments in good operational order and prevent eventual break-downs.

## ■ MAINTENANCE KITS

The ATEQ After Sales Service proposes, two kits destined for the preventive maintenance of the pneumatic circuits of instruments.

## ■ CALIBRATION

This may be carried out on site or in our offices.
ATEQ is attached to the COFRAC and delivers a certificate following a calibration.

## ■ TRAINING COURSES

In the framework of partnership with our customers, ATEQ offers two types of training in order to optimise the usage and knowledge of our instruments. They are aimed at different levels of technician:

- method / control training,
- maintenance / upkeep training.

## ■ A TARGETED TECHNICAL DOCUMENTATION

A number of technical documents are at your disposal to allow you to intervene rapidly in the event minor breakdowns:

- problem sheets describing and offering solutions to the main pneumatic and electronic problems,
- several maintenance manuals.

## ■ A QUALITY GUARANTEE

The instruments are guaranteed for parts and labour in our offices:

- 2 years for leak detection equipment,
- 1 year for electrical tests to norms instruments,
- 1 year for the accessories.

Our After Sales Service is capable of rapidly answering all your needs and queries.

ATEQ recommends
to made realise by its departments
a revision and a calibration of the instruments
every year

# PREFACE

Dear Customer,

You have just purchased an **ATEQ** instrument, we thank you for the trust you have placed on our brand. This instrument has been designed to ensure a long and unparalleled life expectancy, and we are convinced that it will give you complete satisfaction during many long years of operation.

In order to maximise the life expectancy and reliability of your **ATEQ** instrument, we recommend that you install this instrument on a secured workbench and advise you to consult this manual in order to familiarise yourself with the functions and capabilities of the instrument.

Our **ATEQ** After Sales Service centre can give you recommendations based on your specific operation requirements.

**ATEQ**

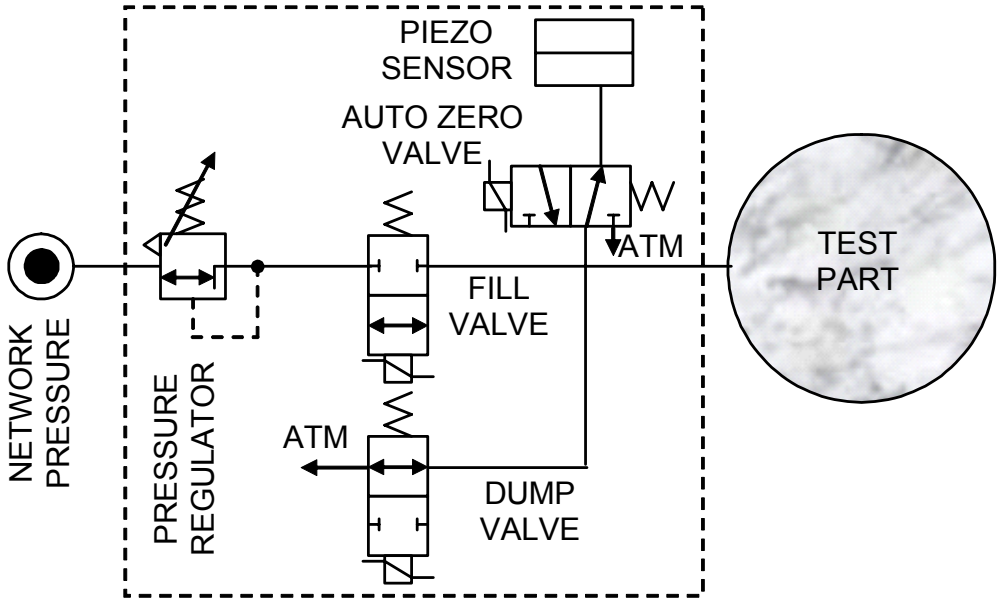
# TABLE OF CONTENTS

# PREAMBLE

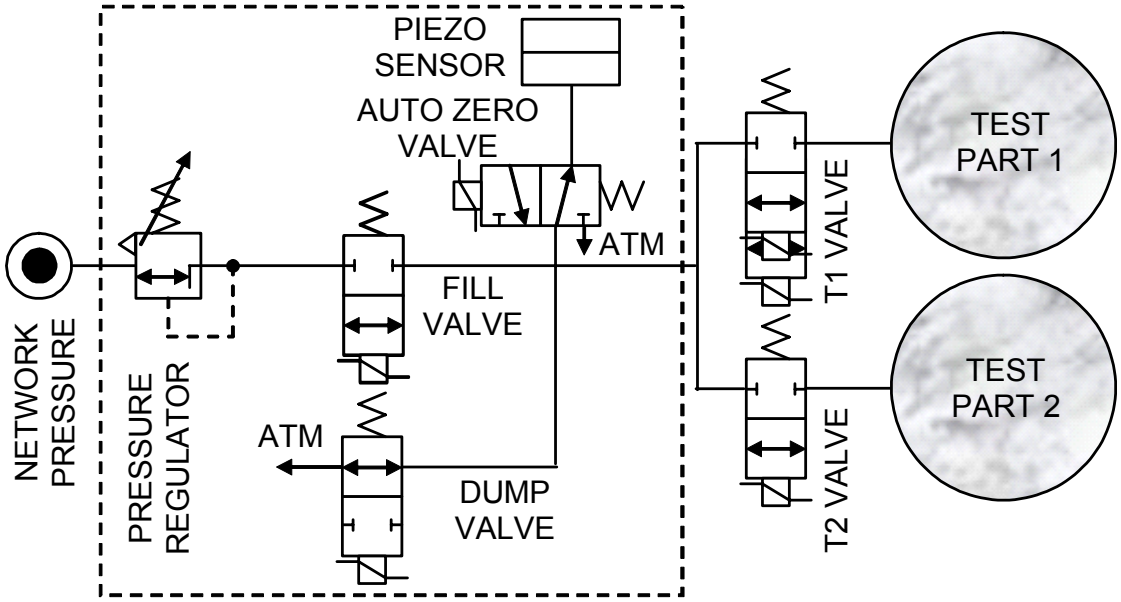
## 1. DEFINITION OF THE ATEQ F570P

The **ATEQ F570P** is an air/air leak detector used 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 pressure with a piezzo sensor.

### 1.1. SINGLE TEST CONFIGURATION




### 1.2. DOUBLE TEST CONFIGURATION



## 2. MEASUREMENT CHARACTERISTICS

### 2.1. MEASUREMENT RANGES

| PRESSURE RANGE | MESUREMENT RANGE | PRECISION | maximum RESOLUTION |
|---|---|---|---|
| **100 kPa** (1 bar) | 1 > 500 Pa | 2 % of the full scale | 1 Pa |
| | 1 > 1 000 Pa | | |
| | 1 > 5 000 Pa | | |
| | 10 > 10 000 Pa | | |

### 2.2. MECHANICAL PRESSURE REGULATION

1 kPa to 100 kPa.

## 3. THE MAIN TYPES OF MEASUREMENTS

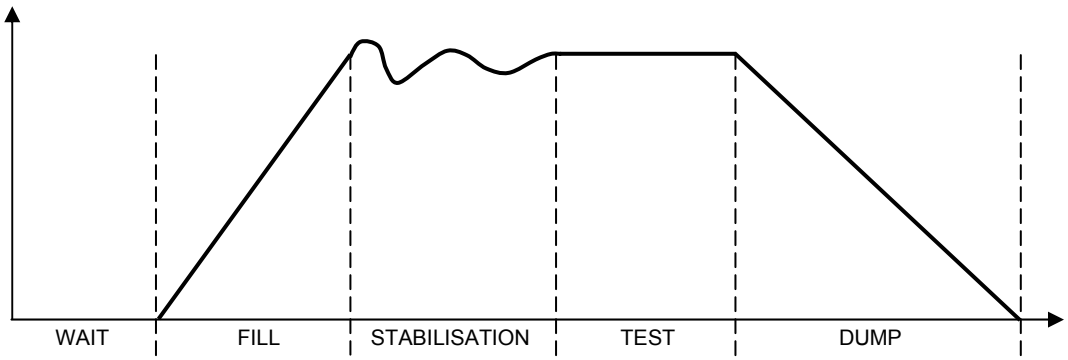
There is one main measurement methods that can be performed by the **ATEQ F570P**, direct measurement.

### 3.1. DIRECT/PRESSURE DROP MEASUREMENT

After filling the test part to the required pressure level, the instrument measures the drop in pressure.

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

## 4. DIRECT MEASUREMENT, PRESSURISATION

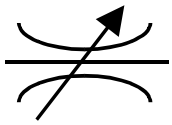
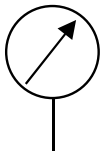
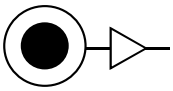
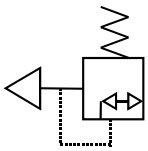
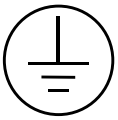
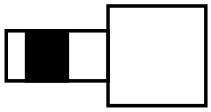
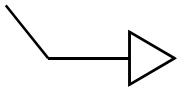
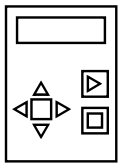
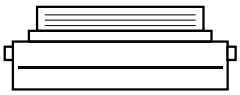


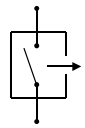
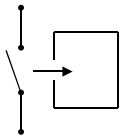
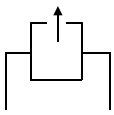
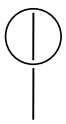

The measurement cycle consists of 5 phases:

| | **1** | **2** | **3** | **4** | **5** | |
|---|---|---|---|---|---|---|
| Start | **Wait** | **Fill** | **Stabilisation** | **Test** | **Dump** | Cycle end |

| | |
|---|---|
| **Start** | Cycle start. |
| The **wait** time | The time during which the sealing connections are made to the test parts before the part is filled. The instrument may be fitted with the valve code function. This valve is controlled for the duration of the cycle to enable the installation of the expandable joint connectors to be checked. |
| The **fill** time | Pressurisation of the test part. At the end of the fill time, the **ATEQ** instrument checks the test pressure. If this is not correct, the instrument will signal a test pressure fault. |
| The **stabilisation** time | The test part is completely cut off from the air supply, but remains pressurised to the test pressure level. Pressure and temperature will then stabilise in the part. If the test pressure is incorrect (a large leak), the test pressure will drop rapidly, the instrument will not move on to the test mode and will indicate a fault. |
| The **test** time | Time during which the pressure sensor measures the changes in pressure in the test part. The signal is electronically assessed and displayed, the part is then diagnosed as good or bad. |
| The **dump** time | Return of the part to the atmospheric conditions. |
| **Cycle end** | Once the dump has been carried out, the instrument emits a cycle end signal and the valve code function is deactivated. This valve can control one or more expandable connectors from the beginning to the end of the cycle. |

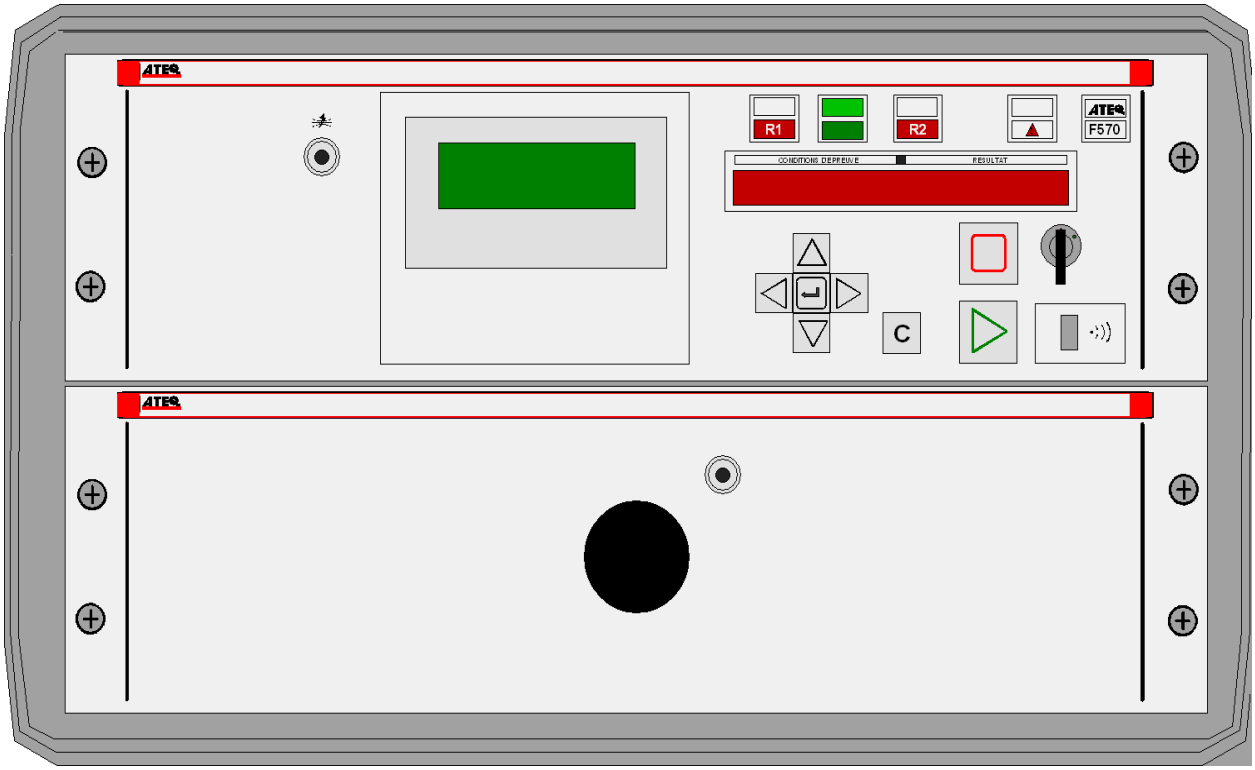
## 5. SYMBOLS PRESENTATION

| Symbol | Name | Function |
|---|---|---|
|  | Adjust leak connector | Pneumatic connector for the plugging of a calibrated leak (ruby kind) or an adjustable leak. |
|  | Pressure connector | Pneumatic connector for the plugging of a manometer for an external checking of the pressure. |
|  | Pressure supply | Pressure supply of the air supply from the 6 bar network. |
|  | Test circuit supply | Pneumatic connector (according to option) for the plugging of a supplementary pneumatic supply, used in case of test pressure greater than 8 bar. |
|  | Ground connector | Connector for the electric plugging to the ground. |
|  | Automatic connector | Pneumatic connector for the driving of an external logic or pneumatic components (pneumatic sealing connector). |
|  | Connector | Connector for pneumatic output. |
|  | Connector | Connector for pneumatic input. |
|  | Warning ! | Read and respect the instructions of the user manual, before plugging and using the instrument. |
|  | Remote control | Connector for a remote control. |
|  | Printer | Connector for printer plugging. |

| Symbol | Name | Function |
|---|---|---|
| BAR CODE | Bar code reader | Connector for bar code reader. |
|  | Output | Dry contact output. |
|  | Input | Dry contact input. |
|  | Infrared link | Infrared link, at this place there's the receiver and transmitter of the infrared link. |
|  | Analogue output | Analogue output. |
|  | Analogue input | Analogue input for the temperature sensor. |

# Chapter 1
# INSTALLATION OF THE INSTRUMENT

## 1. APPEARANCE OF THE ATEQ F570P



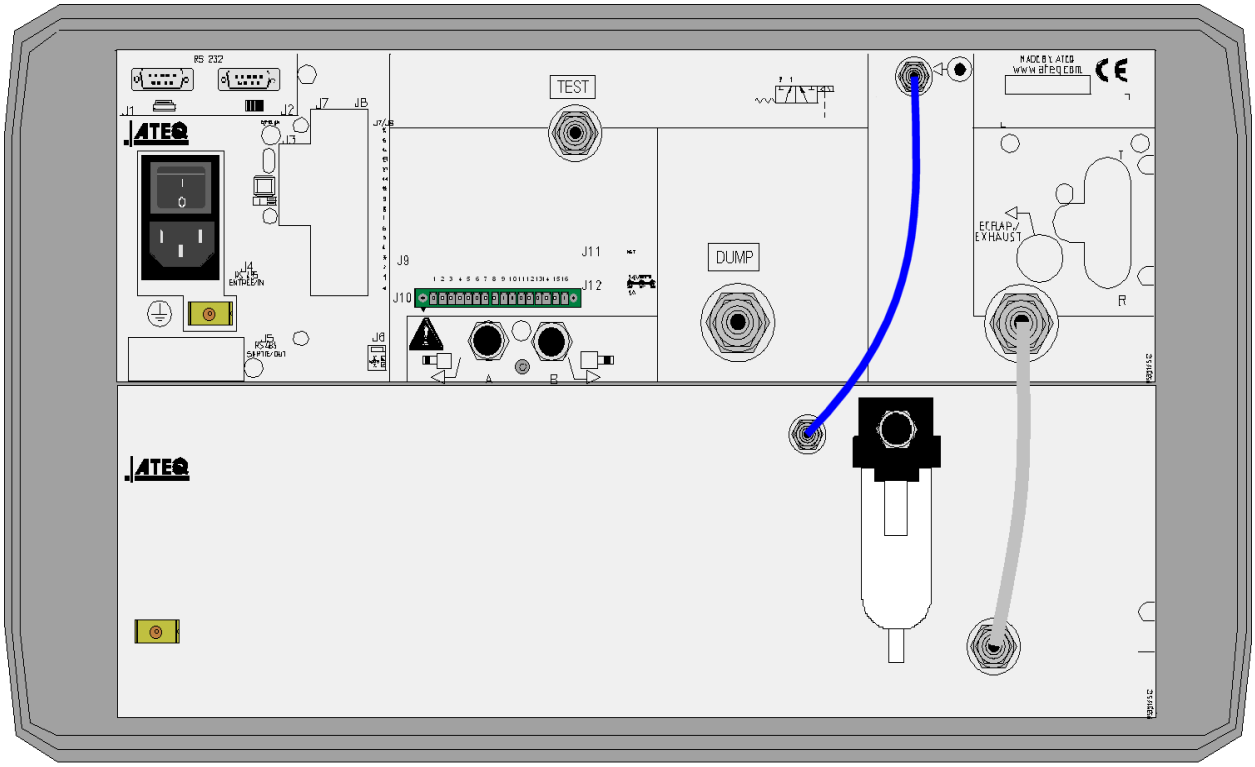

The **ATEQ F570P** comes in a 19” inch 6U format casing.

The instrument is delivered with a 110/220 V power supply cable.

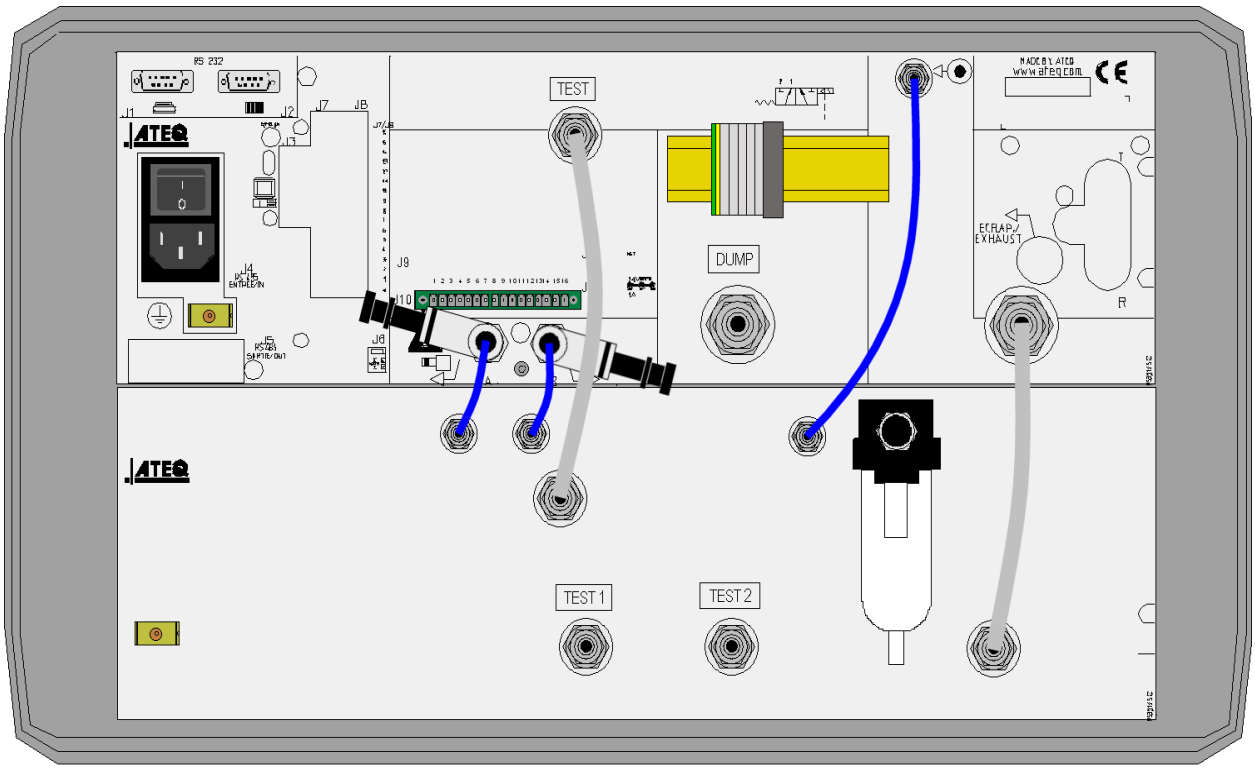
# 2. INSTALLATION OF THE INSTRUMENT

## 2.1. LAYOUT OF CONNECTORS ON THE F570P CABINET

### 2.1.1. Instrument with one test output




### 2.1.2. Instrument with two test outputs



## 2.2. ELECTRICAL CONNECTOR DETAILS

### 2.2.1. ON/Off switch

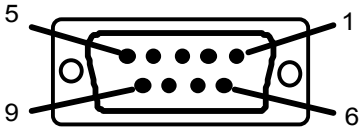

I: ON

O: OFF

### 2.2.2. Power supply

From 90 to 260 V AC / 50 W

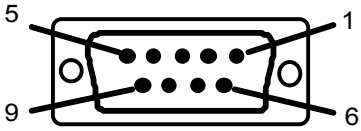
### 2.2.3. J1 Connector (RS232)




Used for connection of a printer or a PC.

| | | | |
|---|---|---|---|
| PIN 1 | Not used | PIN 6 | Not used |
| PIN 2 | RXD Data reception | PIN 7 | RTS request to send |
| PIN 3 | TXD Data emission | PIN 8 | CTS clear to send |
| PIN 4 | Not used | PIN 9 | Not used |
| PIN 5 | Earth | | |

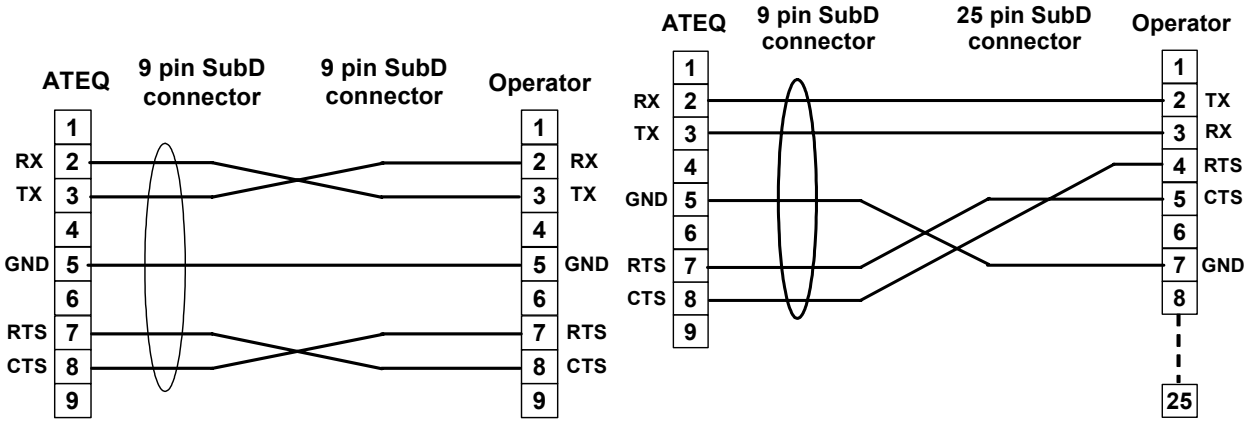
### 2.2.4. J2 Connector (RS232)



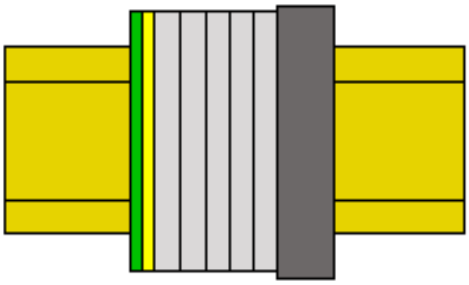

Allows the connection of a bar code reader.

| | | | |
|---|---|---|---|
| PIN 1 | Not used | PIN 6 | Not used |
| PIN 2 | RXD Data reception | PIN 7 | RTS request to send |
| PIN 3 | TXD Data emission | PIN 8 | CTS clear to send |
| PIN 4 | Not used | PIN 9 | Not used |
| PIN 5 | Earth | | |

### 2.2.4. 1) Examples of RS232 cables

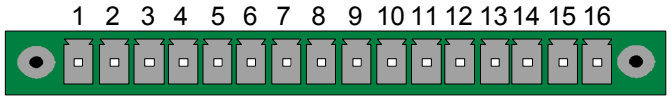



### 2.2.5. Connectors block



Allows the electric connection of the two vehicle test connectors. These connectors are on the instrument with two test outputs, on the back panel.

### 2.2.6. J10 Connector (I/O Inputs/Outputs)




| | | |
|---|---|---|
| PIN 1 | Reset (input 1) | DRY CONTACT INPUT<br><br>(Activation par 24 V DC) |
| PIN 2 | Common (+ 24 V) | |
| PIN 3 | START (input 2) | |
| PIN 4 | Common (+ 24 V) | |
| PIN 5 | Input 3 (program selection) | |
| PIN 6 | Input 4 (program selection) | |
| PIN 7 | Input 5 (program selection) | |
| PIN 8 | Input 6 (program selection) | |
| PIN 9 | Input 7 (programmable input) | |
| PIN 10 | Common | DRY CONTACT OUTPUT<br><br>60V AC / DC Max<br>200mA Max |
| PIN 11 | Part OK output | |
| PIN 12 | Test part default output | |
| PIN 13 | Reference part default output | |
| PIN 14 | Warning output | |
| PIN 15 | Cycle end output | |
| PIN 16 | 0 V | |

#### 2.2.6. 1) Activating a program from the J10 connector inputs

To activate a program from the J10 connector inputs, pins 5 to 8 must be selected (one or more at a time). Binary weight n + 1.

**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 |

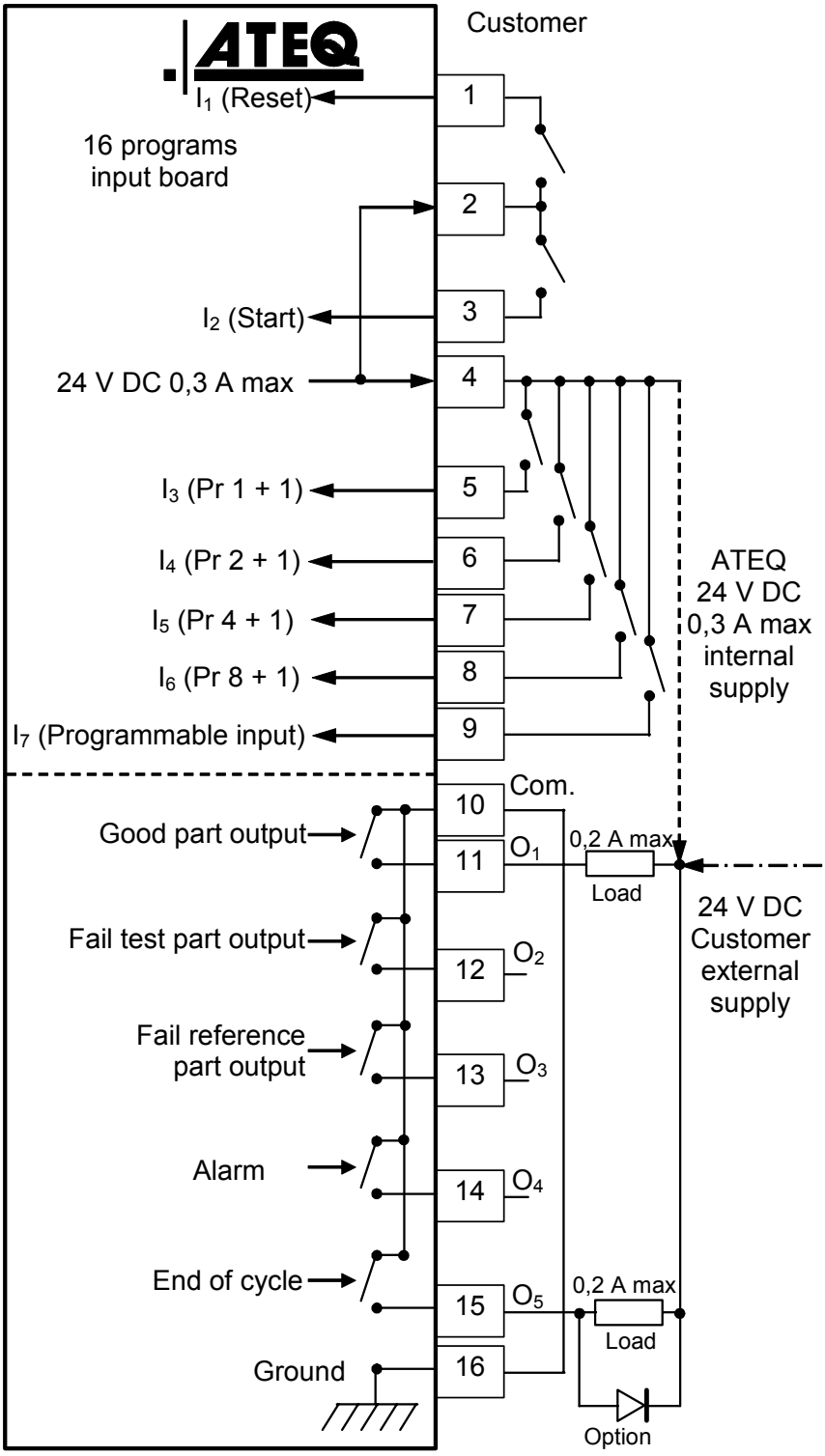
#### 2.2.6. 2) J10 Connector (I/O Inputs/Outputs)programmable input

Input 7 can be set up in the **CONFIGURATION/ INPUT OUPUT** menu.

- ✓ Selection of programs 17 to 32,
- ✓ Auto zero request,
- ✓ Regulator adjust request,
- ✓ ATR learn request.

Some possibilities only appear if the function is used.

### 2.2.6. 3) J10 Connector (I/O Inputs/Outputs) drawing




***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.*

## 2.3. PNEUMATIC CONNECTORS

### 2.3.1. Pneumatic connectors for instrument with one test output

Pneumatic connectors are on the back panel of the **F570P** instrument.

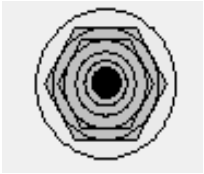
#### 2.3.1. 1) Output A

Used for connection of an automatic pneumatic connector.

#### 2.3.1. 2) Output B

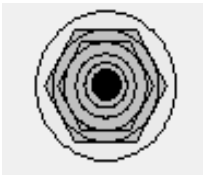
Used for connection of a second automatic pneumatic connector.

#### 2.3.1. 3) Test output



This output allows the connection to the test part.

#### 2.3.1. 4) Dump output

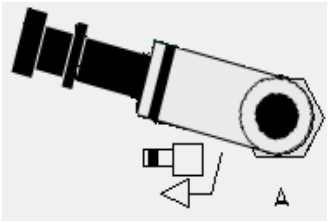


This output allows the dumping of the test part.

### 2.3.2. Pneumatic connectors for instrument with two test outputs

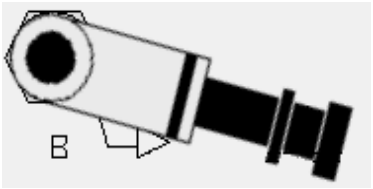
Pneumatic connectors are on the back panel of the **F570P** instrument.

#### 2.3.2. 1) Output A



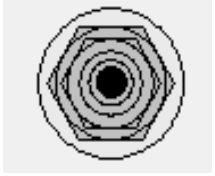

Used for connection of an automatic pneumatic connector. For using this connector, you have to remove the cap on the T connector

#### 2.3.2. 2) Output B



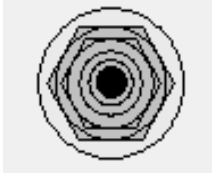

Used for connection of a second automatic pneumatic connector. For using this connector, you have to remove the cap on the T connector

#### 2.3.2. 3) Test output 1



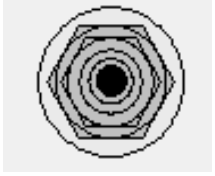
This output allows the connection to the first part.

#### 2.3.2. 4) Test output 2



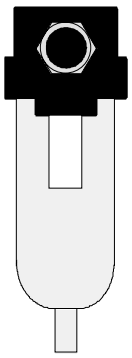
This output allows the connection to a second test part.

#### 2.3.2. 5) Dump output



This output allows the dumping of the test part.

### 2.3.3. Pneumatic supply

| | |
|---|---|
|  | Air supply is via the filter located on the back panel of 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 guarantee.**

**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.

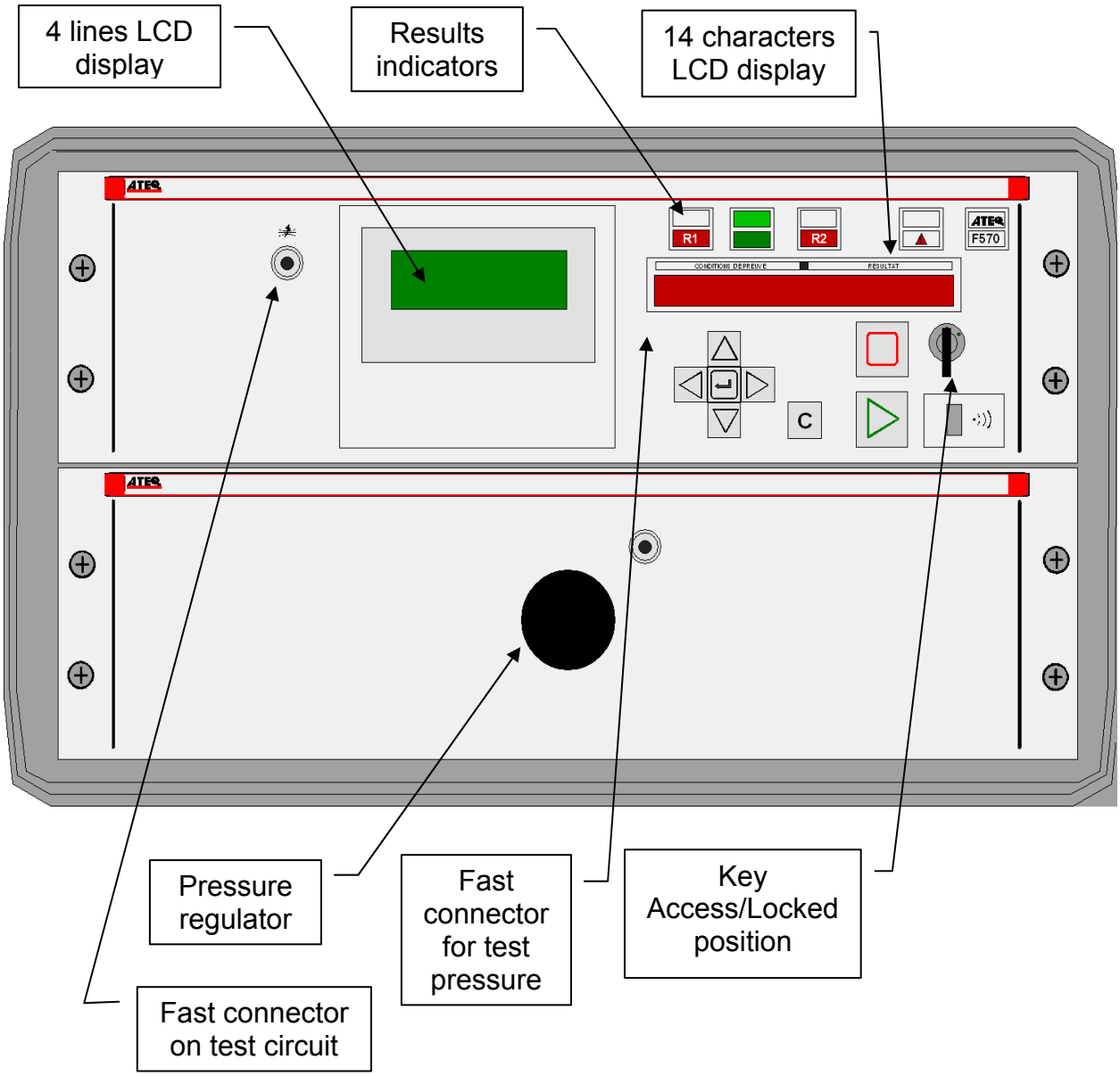
**Optimisation of operation:**

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

**When a mechanical regulator is used, the supply pressure must be a minimum of 100 kPa (1 bar) greater than test pressure with a minimum of 400 kPa (4 bar).**

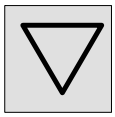
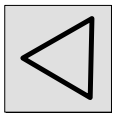
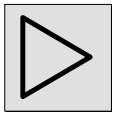
# Chapter 2
# USER INTERFACES

## 1. ATEQ F570P FRONT PANEL APPEARANCE

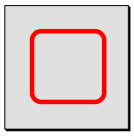


## 2. APPEARANCE OF THE KEYBOARD

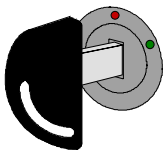
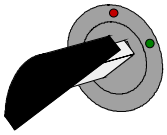
### 2.1. NAVIGATION KEYS

| KEY | FUNCTION |
|---|---|
|  | Scroll up or<br>increase numerical values |
|  | Scroll down or decrease numerical values |
|  | Not used |
|  | Not used |
|  | **ENTER** key , opening a menu , entering a parameter,<br>confirmation of a parameter |
| C | « **C** » for **CANCEL**, return to the previous menu or function<br>"Escape" without modifying a parameter |

### 2.2. CYCLE KEYS

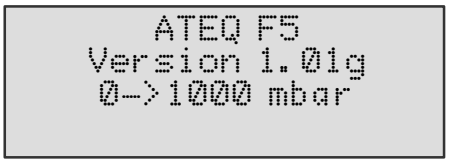
| KEY | FUNCTION |
|---|---|
|  | **START** key, starts a measurement cycle |
|  | **RESET** key, stops a cycle in progress |

### 3. LOCKABLE SWITCH

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

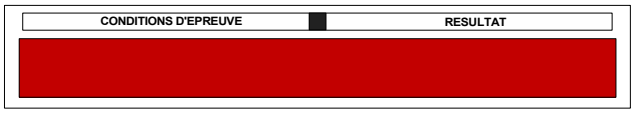
***Note**: whatever position the key is in (**LOCKED** or **ACCESS**), test cycles can be started and stopped.*

### 4. 4 LINE LCD DISPLAY



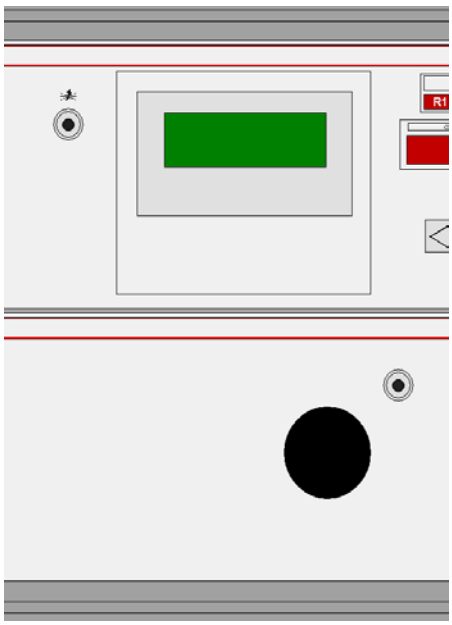

Used to display measurements and adjustable parameters. In the example opposite, 1.01g represents the program version for the instrument.

### 5. 14 CHARACTER LED DISPLAY




Allows the display of measurements and test phases.

### 6. RAPID CONNECTORS



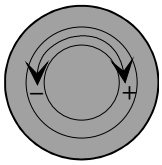
Two rapid connectors may be mounted on the front panel of the instrument.

These enable pressure and calibration to be checked easily. The first is used for the regulator circuit. It enables the value of the test pressure shown by the instrument, measured with a pressure gauge or the **ATEQ Leak/Flow Calibrator (CDF)**, to be checked. This connector is not part of the measurement circuit and cannot therefore interfere with the control.

The second is used to check the test circuit and enables, by use of a calibrated leak expressed in $cm^3$/min or another unit, calculation of the equivalent drop in pressure and, if required, calibration in this unit.

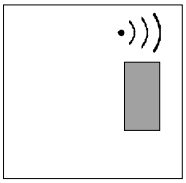
⚠ ***As this connector is part of the measurement circuit, all its connections must be air tight.***

## 7. REGULATOR




Used to adjust the test pressure

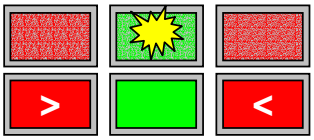
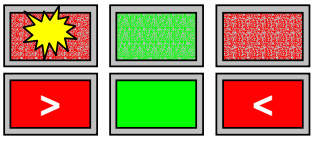
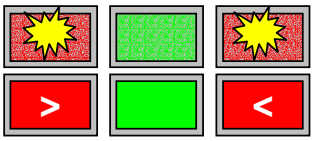
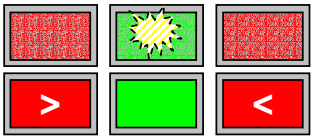
## 8. INFRA-RED INTERFACE



Not used.

## 9. FUNCTIONS OF THE INDICATOR LIGHTS

The  symbol represents an indicator which is lit.

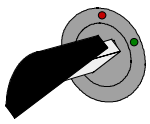
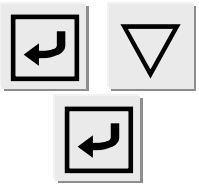
| | |
|---|---|
| Test part OK indicator. |  |
| Bad part indicator indicating a leak in excess of the rejection threshold for pressure measurements. |  |
| Warning. |  |
| Sleep<br>(intermittently flashing indicator) |  |

# Chapter 3
# START-UP AND SETTINGS

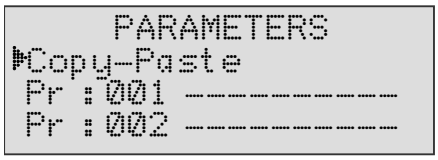
## 1. POWERING-UP THE ATEQ F570P

| | | |
|---|---|---|
| Supply the apparatus with 90 – 260 V AC.<br>When powered up the instrument: | | |
| - displays version and the full scale of the sensors… | | ATEQ F570P<br>Version 1.01g<br>1 –> 1000 mbar |
| …then displays the main menu. | | CYCLE/Pr :001<br>PRESS = 0.000 bar<br><br>READY |

## 2. CREATION OF A TEST PROGRAM

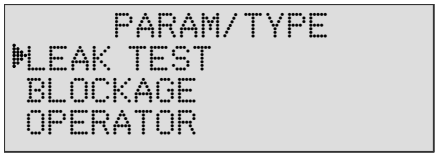
| | | |
|---|---|---|
| To modify the parameters, turn the key to the **ACCESS** position. |  | RUN/Pr:001<br>PRESS = 0.000 bar<br><br>READY |
| To access the main menu, press **ENTER**.<br>In the main menu, place the cursor in front of the **PARAMETERS** menu.<br>Confirm with the **ENTER** key. |  | MAIN MENU<br>RUN PROG. : ---<br>▶PARAMETERS<br>SPE CYCLE :Disabled |
| The **PARAMETERS** menu is used to manage test programs.<br><br>☞If the various programs to be created have different parameters, they must be created one by one.<br><br>☞If the programs have identical parameters, a base program can be created and then the **Copy-Paste** function can be used to duplicate the program as many times as is necessary. | | PARAMETERS<br>▶Copy-Paste<br>Pr :001 ----------<br>Pr :002 ---------- |

### 2.1. CHOICE OF THE PROGRAM NUMBER

| | | |
|---|---|---|
| Position the cursor in front of the chosen program number and confirm with the **ENTER** key. |  |  |

### 2.2. TEST TYPE SELECTION

Three test types are available.

| | | |
|---|---|---|
| The **PARAMETERS** menu gives access to three possible types of test: leak test (**LEAK TEST**), pressure test (**BLOCKAGE**) and an operator test (**OPERATOR**); see the following paragraph for explanations.<br>Put the cursor in front of the required test type and confirm with the **ENTER** key. |  |  |

#### 2.2.1. 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 |
| 0.0006 | = | constant | $\Delta P$ (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.

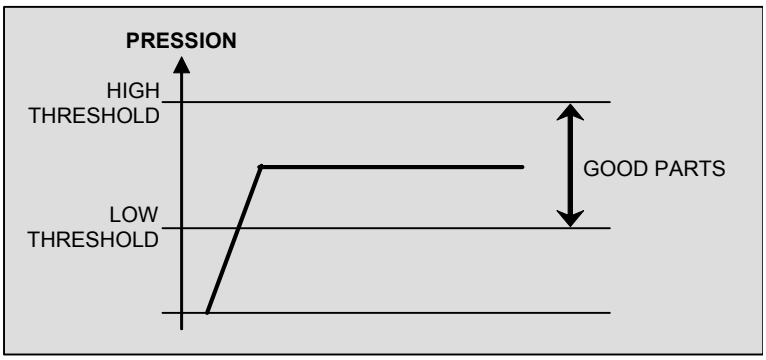
In all events, it must not be forgotten that the full scale of the sensor in Pa or Pa/s is limited to 500 Pa, 1000 Pa, 5000 Pa or 10000 Pa depending on the instrument configuration.

### 2.2.2. Blockage test mode

The blockage mode is used for rough measurement of a flow, based on measurement of back pressure. The standard pressure limits are used to classify the result as good or bad. The cycle only contains the fill phase and the reading is carried out during this phase.

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.




### 2.2.3. Operator mode test

This type of test means that the operator can carry out operations on the part whilst 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.

### 2.3. PARAMETER SETTINGS

Once the test type is chosen, the test cycle parameters must be set.

The procedure to follow for setting the test parameters is identical in each case.

**Example**: Coupling time A.

| | | |
|---|---|---|
| First, position the cursor in front of the chosen parameter using the navigation keys ( here, Coupl. A). | △ ▽ | PARAM/pr001<br>TYPE : LEAK TEST<br>▶COUPL. A: 00.00 s<br>FILL : 00.00 s |
| Then, confirm with the **ENTER** key. The cursor will move to the right of the display. | ↵ | PARAM/pr001<br>TYPE : LEAK TEST<br>COUPL. A: 00.00 s◀<br>FILL : 00.00 s |
| Modify the value using the navigation keys. | △ ▽ | PARAM/pr001<br>TYPE : LEAK TEST<br>COUPL. A : 00.03 s◀<br>FILL : 00.00 s |
| Once the value is modified, confirm with the **ENTER** key. | ↵ | PARAM/pr001<br>TYPE : LEAK TEST<br>▶COUPL. A : 03.00 s<br>FILL : 00.00 s |
| To move on to the next parameter, use the navigation keys. | △ ▽ | PARAM/pr001<br>TYPE : LEAK TEST<br>COUPL. A: 03.00 s<br>▶FILL : 00.00 s |
| To exit from the menu, use the **CANCEL** key. | C | PARAMETERS<br>Cut-Paste<br>Pr: 001 LEAK<br>▶Pr: 002 LEAK |

#### 2.3.1. Coupling time A

Coupling time A is part of the cycle and it delays the pressurisation of the test part by allowing the activation of a cycle connector at the test start.

☞Set this parameter using the method described in § 2.3.

### 2.3.2. 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** (TTLR), then to shorten it until a drop in pressure occurs due to thermal effects.

- ✓ 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) signifies 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.

☞Set this parameter using the method described in § 2.3.

### 2.3.3. Stabilisation time

This time is used to stabilise the pressure in the test circuit.

It is possible that a change in pressure occurs due to thermal exchanges between the components. If the instrument takes a measurement too early, the instrument will indicate the presence of 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 equal to zero.
- ✓ Set the stabilisation time to four times the length of the fill time.
- ✓ Carry out a cycle. When the instrument switches to the test period, the pressure must remain at zero.
- ✓ If there is a drop in pressure, there is a small leak present. Check the test part and the pneumatic connections and then start again.
- ✓ If the pressure is stable, the part does not contain a small leak and the stabilisation time is therefore too long. Progressively shorten and carry out cycles (wait one minute between each cycle) until you see the appearance of a drop in pressure. This indicates that the stabilisation time has become too short. Increase it slightly.

☞Set this parameter using the method described in § 2.3.

### 2.3.4. 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.

In the dP (Pa) mode, the pressure variation measured is the total of the pressure drop over the whole test time. 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.

☞Set this parameter using the method described in § 2.3.

### 2.3.5. Dump time

The instrument will as default propose a dump time of zero. This must be set by carrying out several tests.

☞Set this parameter using the method described in § 2.3.

### 2.3.6. Pressure units

The different units are bar, mbar, PSI, Pa, kPa, MPa. .

☞ Set this parameter using the method described in § 2.3.

### 2.3.7. 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 pressure monitoring is inoperative. Care should therefore be taken to avoid excess pressure being applied to the part during the test.

☞ Set this parameter using the method described in § 2.3.

### 2.3.8. Minimum fill

This function is used to set a minimum limit for the fill pressure. A warning is triggered if this limit is not reached.

☞ Set this parameter using the method described in § 2.3.

### 2.3.9. Reject unit

Pa, Pa/s, $cm^3$/min.

If a unit of flow is selected, two parameters will be added to the program:

- ✓ the choice of the flow calculation basis, in Pa or Pa/s
- ✓ the volume of the test part (+pipes).

☞ Set this parameter using the method described in § 2.3.

### 2.3.10. Test reject

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

☞ Set this parameter using the method described in § 2.3.

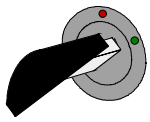
### 2.3.11. Functions

The **FUNCTION** menu gives access to additional parameters which must first be activated in the **CONFIGURATION** menu and then the **EXTENDED MENU**.

If no additional parameters are confirmed in the **EXTENDED MENUS**, the **FUNCTION** menu will be empty when selected.

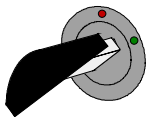
To activate these parameters, refer to chapter 4 § 2.

## 3. DUPLICATION OF A TEST PROGRAM

| | | |
|---|---|---|
| To modify the parameters, turn the key to the **ACCES** position. |  | |
| Starting from the main menu, position the cursor in front of the **PARAMETERS** function. | △ ▽ | MAIN MENU<br>RUN PROG.: 001<br>▶PARAMETERS<br>SPE CYCLE :Disabled |
| Confirm with the **ENTER** key. The cursor will appear in front of the Copy-Paste function. Confirm the function again using the **ENTER** key. | ↵ ↵ | PARAMETERS<br>▶Copy-Paste<br>Pr :001 ENGINE<br>Pr :002 HEAD |
| Next, confirm the **COPY** function**.** | ↵ | PARAM/Copy-Paste<br>▶COPY :Pr ---<br>PASTE :Pr --- |
| Display the number of the program to be copied using the navigation keys. (In this case, program no.1). | △ ▽ | PARAM/Copy-Paste<br>COPY :Pr 001 ◀<br>PASTE :Pr --- |
| Confirm using the **ENTER** key. | ↵ | PARAM/Copy-Paste<br>▶COPY :Pr 001<br>PASTE :Pr --- |
| Placer the cursor in front of **PASTE**. | △ ▽ | PARAM/Copy-Paste<br>COPY :Pr 001<br>▶PASTE :Pr --- |
| Confirm with the **ENTER** key. Assign a number to this new program using the navigation keys (For example no.3). | ↵ ▽ △ | PARAM/Copy-Paste<br>COPY :Pr 001<br>PASTE :Pr 003 ◀ |

| | | |
|---|---|---|
| Confirm with the **ENTER** key, the display confirms that the program has been copied. |  | COPY IN PROGRESS |
| The program no.1 parameters have now been copied into program no.3 parameters.<br>In this example program no.3 is an exact copy of program n°1. | | PARAM/Copy-Paste<br>COPY :Pr 001<br>▶PASTE :Pr 003 |
| Press the **CANCEL** key twice to return to the main menu. | **C** **C** | MAIN MENU<br>▶PARAMETERS<br>SPE CYCLE:Disabled<br>CONFIGURATION |

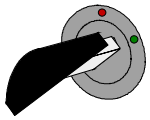
## 4. DELETING A PROGRAM OR A PROGRAM NAME

| | | |
|---|---|---|
| To modify the parameters, turn the key to the **ACCES** position. |  | |
| Position the cursor in front of **PARAMETERS** function. Confirm with the **ENTER** key. |  | MAIN MENU<br>RUN PROG.: 001<br>▶PARAMETERS<br>SPE CYCLE : Disabled |
| Position the cursor in front of the program number or the program name to be deleted. |  | PARAMETERS<br>Copy-Paste<br>▶Pr: 001 ENGINE<br>Pr: 002 HEAD |
| Confirm once to enter the program. |  | PARAM/Pr001<br>▶TYPE : LEAK<br>WAIT A: 00.00 s<br>WAIT B: 00.00 s |
| Confirm a second time to gain access to the delete menu. There are two possibilities : delete the program name or delete the whole program. |  | M/Pr001/TEST TYPE<br>▶Delete name<br>Program reset |
| 1°) Confirm a third time.<br>The name of the program is deleted. |  | PARAMETERS<br>▶Copy-Paste<br>Pr: 001 LEAK<br>Pr: 002 HEAD |
| 2°) Place the cursor in front of Program reset. |  | M/Pr001/TEST TYPE<br>Delete name<br>▶Program reset |
| Confirm with the **ENTER** key.<br>The program is then deleted. |  | PARAMETERS<br>▶Copy-Paste<br>Pr: 001 _____<br>Pr: 002 HEAD |

***Note**: if the "**Program delete**" operation is carried out first, then the program name is also deleted.*

## 5. STARTING A CYCLE

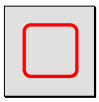
### 5.1. CHOICE OF THE PROGRAM TO BE RUN

| | | |
|---|---|---|
| Position the key in the **ACCESS** position. |  | |
| Starting from the main menu, place the cursor in front of the **RUN PROG.** function. | △ ▽ | MAIN MENU<br>▶RUN PROG.: 001<br>PARAMETERS<br>SPE CYCLE : Disabled |
| Confirm with the **ENTER** key. | ↵ | MAIN MENU<br>▶RUN PROG.: 001<br>PARAMETERS<br>SPE CYCLE : Disabled |
| Display the number of the program required by scrolling through the numbers with the navigation keys. | △ ▽ | MAIN MENU<br>RUN PROG. : 004 ◀<br>PARAMETERS<br>SPE CYCLE : Disabled |
| Confirm your choice with the **ENTER** key. | ↵ | MAIN MENU<br>▶RUN PROG. : 004<br>PARAMETERS<br>SPE CYCLE : Disabled |

## 6. STARTING A MEASUREMENT CYCLE

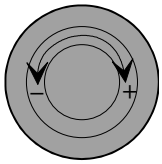
| | | |
|---|---|---|
| Press the **START** key to start a measurement cycle. | ▷ | RUN/Pr: 004<br>PRESS =0.500 bar<br><br>READY |
| The cycle phases are displayed on the LCD window and alphanumeric display:<br><br>**WAIT,**<br>**FILL,**<br>**STAB,**<br>**TEST,**<br>**DUMP.** | | RUN/Pr: 004<br>PRESS =1.00 bar<br><br>STABILISATION |

## 7. STOPPING A CYCLE

| | | |
|---|---|---|
| Press the **RESET** key to stop the measurement. The display "**READY**" indicates that the instrument is ready to perform a new measurement test. |  | RUN/Pr: 004<br>PRESS =0.500 bar<br><br>READY |

### 7.1. SETTING THE TEST PRESSURE

#### 7.1.1. Manual setting with a mechanical regulator

| | | |
|---|---|---|
| Position the cursor in front of the **SPE CYCLE** function and confirm with the **ENTER** key. |  | SPE CYCLE<br>▶Disabled<br>Regulator adjust<br>AZ piezo |
| Next, position the cursor in front of Regulator adjust and confirm with the **ENTER** key. |  | SPE CYCLE<br>Disabled<br>▶Regulator adjust<br>AZ piezo |
| The display confirms that the special cycle has been selected. | | MAIN MENU<br>RUN PROG. : 001<br>PARAMETERS<br>▶SPE CYCLE :Regul |
| Press the **START** key to launch a special cycle. |  | RUN/Pr: 001<br>PRESS = 355.5 mbar<br><br>REGULATOR 1 ADJUST |
| Set the test pressure by using the regulator. |  | RUN/Pr: 001<br>PRESS = 1000 mbar<br><br>REGULATOR 1 ADJUST |
| Once the pressure is set, press the **RESET** key to stop the special cycle. |  | RUN/Pr: 001<br>PRESS = 0.000 bar<br><br>READY |

# Chapter 4
# FUNCTIONS OF THE INSTRUMENT

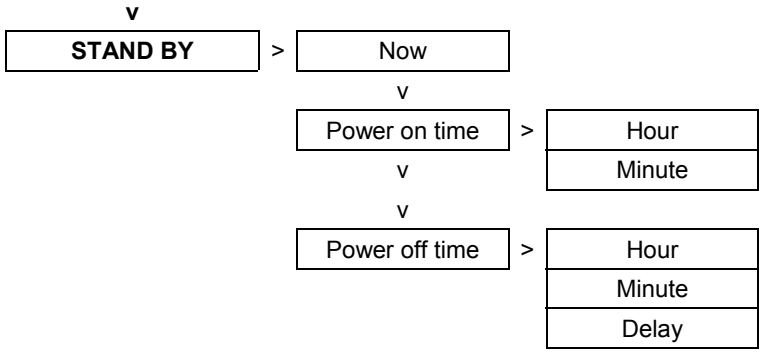
## 1. MENU STRUCTURE

### 1.1. MAIN MENU

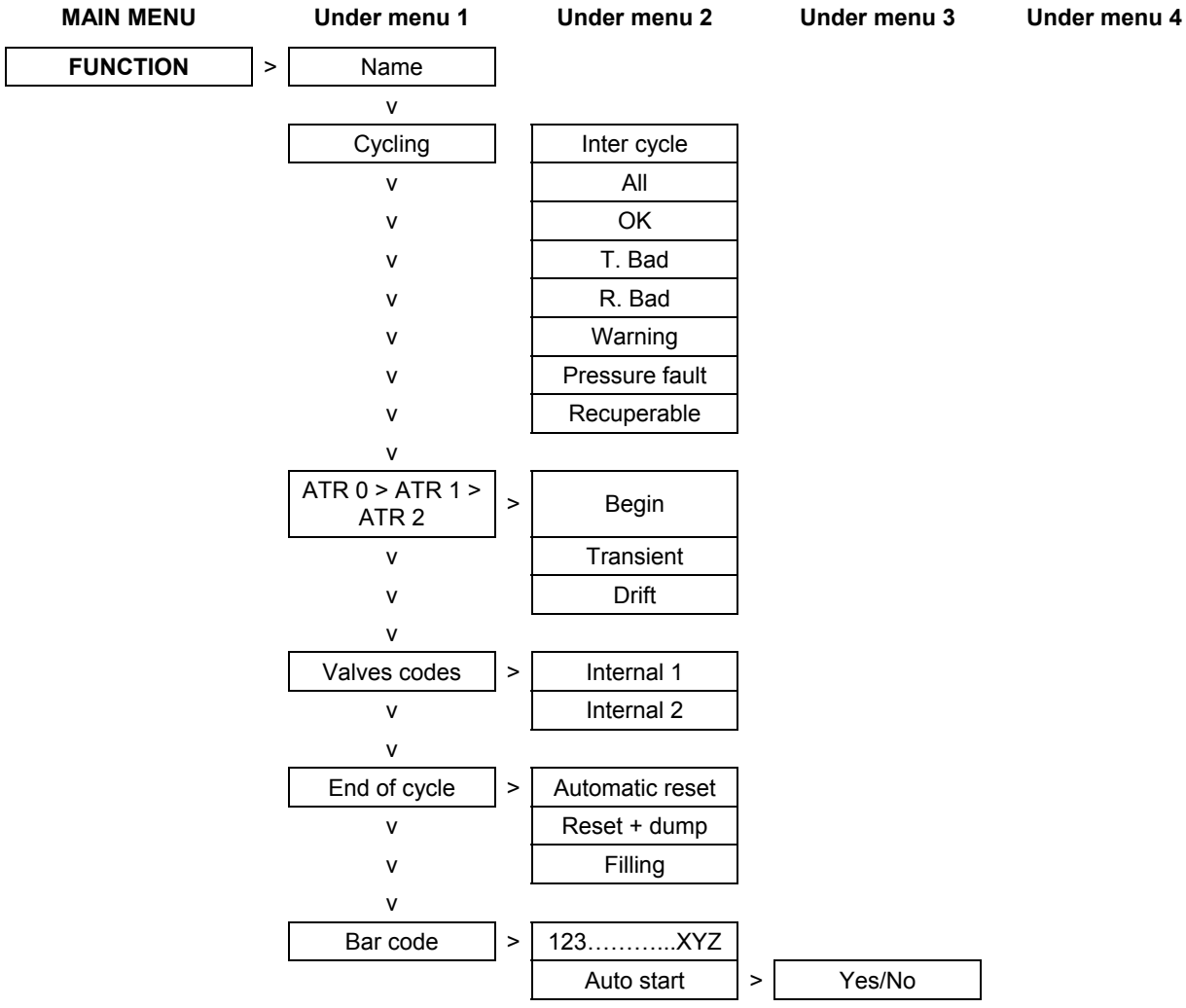
| MAIN MENU | Under menu 1 | Under menu 2 | Under menu 3 | Under menu 4 |
|---|---|---|---|---|
| **CYCLE PROG.** > | 1 to 32 | | | |
| **v** | | | | |
| **PARAMETERS** > | Copy Paste > | Copy | | |
| **v** | v | Paste | | |
| **v** | v | | | |
| **v** | Programs 01 to 32 > | LEAK > | Type : leak > | Reset name |
| **v** | | v | v | Delete program |
| **v** | | v | v | |
| **v** | | v | Range > | 1 > 500 Pa<br>1 > 1000 Pa<br>0.01 > 5.00 kPa<br>0.01 > 10.00 kPa |
| **v** | | v | Wait A | |
| **v** | | v | Fill | |
| **v** | | v | Stabilisation | |
| **v** | | v | Test | |
| **v** | | v | Dump | |
| **v** | | v | Pressure unit > | Bar > MPa > kPa > Pa > PSI > mbar |
| **v** | | v | Maximum Fill | |
| **v** | | v | Minimum Fill | |
| **v** | | v | Reject unit > | Pa > Pa/s > $cm^3$/mn |
| **v** | | v | Test fail | |
| **v** | | v | Functions > | Refer to note 1 |
| **v** | | v | | |
| **v** | | Blockage > | Type : blockage > | Reset name |
| **v** | | v | Wait A | Delete program |
| **v** | | v | Fill | |
| **v** | | v | Dump | |
| **v** | | v | Pressure unit > | Bar > MPa > kPa > Pa > PSI > mbar |
| **v** | | v | Maximum Fill | |
| **v** | | v | Minimum Fill | |
| **v** | | v | Functions > | Refer to note 1 |
| **v** | | v | | |
| **v** | | Operator > | Type : operator > | Delete name |
| **v** | | | Wait A | Delete program |
| **v** | | | Test | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| v | | | | Functions | > | See note | |
| v | | | | | | | |
| **SPECIAL CYCLES** | > | Disabled | | | | | |
| v | | Regulator adjust | | | | | |
| v | | AZ Piezo | | | | | |
| v | | Bar code | | | | | |
| v | | | | | | | |
| **CONFIGURATION** | > | Extended menus | > | Name | | | |
| v | | v | | Cycling | | | |
| v | | v | | ATR0 | | | |
| v | | v | | ATR1 | | | |
| v | | v | | ATR2 | | | |
| v | | v | | Valve codes | | | |
| v | | v | | Cycle end | | | |
| v | | v | | Bar code | > | First character | |
| v | | v | | | | Character number | |
| v | | v | | | | | |
| v | | Automatic piezo auto zero | > | yes / no | | | |
| v | | v | | | | | |
| v | | Hour | > | Hour | | | |
| v | | v | | Minute | | | |
| v | | v | | Day | | | |
| v | | v | | Month | | | |
| v | | v | | Year | | | |
| v | | v | | | | | |
| v | | RS232 | > | C540/F580 | | Print frame | > Pressure |
| v | | v | | v | | | Program name |
| v | | v | | v | | | Date & time |
| v | | v | | v | | | |
| v | | v | | Printer | > | RS parameters | > Speed: 4800 > 9600 > 19200 > 28800 > 38400 > 57600 > 115200 |
| v | | v | | v | | v | Serial port: 1st-7bit-="0" > 1st-7bit-="1" > 1st-7bit-even > 1st-7bit-odd > 1st-8bit-none > 1st-8bit-="0" > 1st-8bit-="1" > 1st-8bit-even > 1st-8bit-odd > |
| v | | v | | v | | v | |
| v | | v | | v | | Frame | > Pressure |
| v | | v | | v | | v | Personal |
| v | | v | | v | | v | Time keeper |
| v | | v | | v | | v | |
| v | | v | | v | | Send conditions | > All |
| v | | v | | v | | v | OK |

| | | | | | | |
|---|---|---|---|---|---|---|
| **v** | v | v | v | | | T. Bad |
| **v** | v | v | v | | | R. Bad |
| **v** | v | v | v | | | Warning |
| **v** | v | v | v | | | Pressure def. |
| **v** | v | v | v | | | Recuperable |
| **v** | v | v | v | | | |
| **v** | v | v | TLP | > | | Line 1X |
| **v** | v | v | v | | | Line 1Y |
| **v** | v | v | v | | | Line 2X |
| **v** | v | v | v | | | Line 2Y |
| **v** | v | v | v | | | Line 3X |
| **v** | v | v | v | | | Line 3Y |
| **v** | v | v | v | | | |
| **v** | v | v | Export | > | | yes / no |
| **v** | v | v | | | | |
| **v** | Security | > | Yes / No | | | |
| **v** | v | | | | | |
| **v** | Light | > | Mode | > | Continuous | |
| **v** | v | | v | | Manual | |
| **v** | v | | v | | Automatic | |
| **v** | v | | v | | | |
| **v** | v | | Intensity | > | 00 to 07 | |
| **v** | v | | | | | |
| **v** | I/O Configuration | > | Program selection | | | |
| **v** | v | | Regulator adjust | | | |
| **v** | v | | Auto zero piezzo | | | |
| **v** | v | | | | | |
| **SERVICE** | > Parameters | > | Save | | | |
| **v** | v | | Restore | | | |
| **v** | v | | Reset | | | |
| **v** | v | | | | | |
| **v** | Sensor | > | Pressure | | | |
| **v** | | | Leak | | | |
| **v** | | | | | | |
| **RESULTS** | > Program | | | | | |
| **v** | v | | | | | |
| **v** | Statistics | > | Program | | | |
| **v** | v | | Total | | | |
| **v** | v | | Good part (OK) | | | |
| **v** | v | | Failed part | | | |
| **v** | v | | Negative failed part | | | |
| **v** | v | | Recoverable | | | |
| **v** | Reset | | | | | |
| **v** | Print | | | | | |
| **v** | | | | | | |
| **LANGUAGE** | > English | | | | | |
| **v** | French | | | | | |




## 1.2. "FUNCTIONS" MENU WHEN ACTIVATED

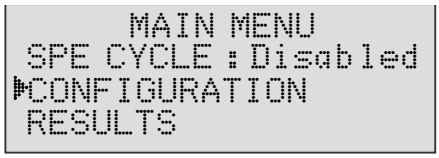
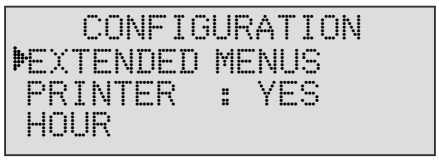
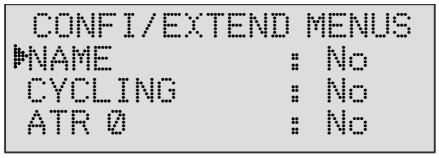
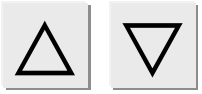
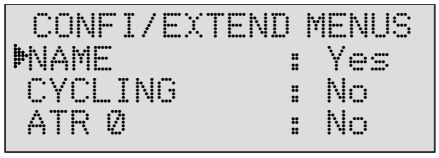
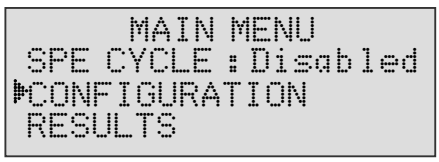


## 2. CONFIGURATION MENU

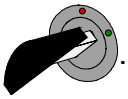
### 2.1. EXTENDED MENUS

The extended menus offer access to additional functions. If these functions are activated, they can be found in the **FUNCTION** menu when a program is created. If no additional functions are activated, the **FUNCTION** menu will be empty when a program is created.

#### 2.1.1. Activation of the additional functions

| | | |
|---|---|---|
| In the main menu, place the cursor in front of the **CONFIGURATION** label |  |  |
| Confirm using the **ENTER** key. |  |  |
| Next, confirm the **EXPANDED MENUS** function with the **ENTER** key. The list of additional functions is then displayed. |  |  |
| To activate a function (e.g. the **NAME** function), confirm it with the **ENTER** key. Next, choose **YES** with the navigation keys and confirm again with the **ENTER** key. Start the operation again if you need to activate other functions. |  <br>  <br>  |  |
| Once all the chosen functions are activated, press the **CANCEL** key twice to return to the main menu. |  |  |

### 2.1.2. Setting the additional functions

✓ Place the key in the **ACCESS** position  .

✓ Create a new program (refer to chapter 3 § 2 "Creation of a test program").

✓ In the parameters list for this new program, confirm the **FUNCTIONS** parameter (refer to chapter 3 § 2.3 "Parameter settings").

**⚠ Only the functions which have been activated using the above method will appear in the FUNCTIONS parameter.**

### 2.1.3. List of additional functions

#### 2.1.3. 1) Name

This function is used to customise a program, for example to name a program after the part to be tested.

☞Select the option and enter settings if necessary.

#### 2.1.3. 2) Cycling

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

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

```
      MAIN MENU
▶RUN PROG.     : 01+
 PARAMETERS
 SPE CYCLE :none
```

Associated parameters to be set: INTER-CYCLE (wait). Chaining conditions: ALL RESULTS (under all result conditions), OK (part good), TEST FAIL (test part bad), REFERENCE FAIL (reference part bad), WARNING, PRESSURE DEFAULT (pressure error), RECUPERABLE.

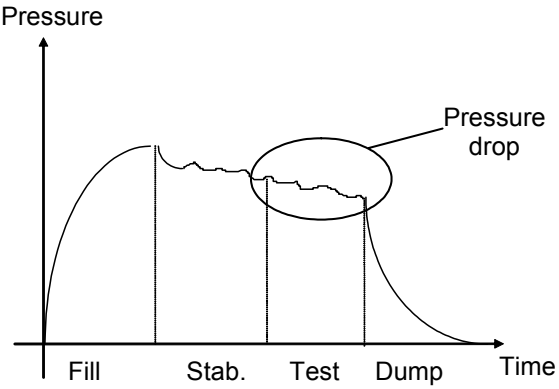
☞Select the option and enter settings if necessary.

### 2.1.3. 3) Transient attenuation (ATR)

✓ **Problem:**

Is this pressure drop which occurs 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. We call them transient effects.




To avoid any interference, it is possible to increase the stabilisation time to obtain the ideal measurement conditions during the test phase. However, increasing the stabilisation time for each test may not be acceptable at the normal 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 functions are available: ATR0, ATR1 and ATR2. ATR1 and ATR2 are different because of their learning cycles.

✓ **ATR0:**

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

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

Associated parameters to be set are: Start (Initial value of the transient), Transient (actual, non modifiable value of the transient) and Percentage drift (Drift tolerance on acquisition of the transient, as a % of the FAIL level).

☞ Select the option and enter settings if necessary.

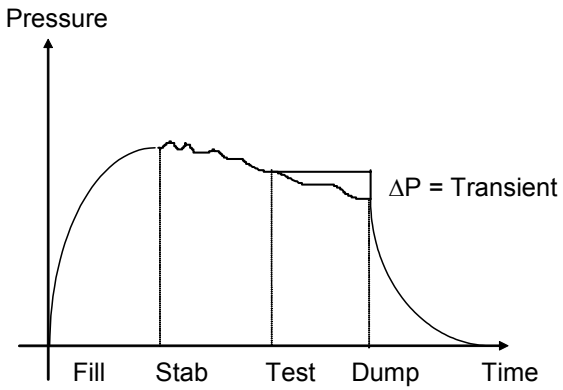
✓ **ATR1:**

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 good leak proof (PASS) part.

The instrument carries out 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 taken away from the final result of subsequent tests.

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

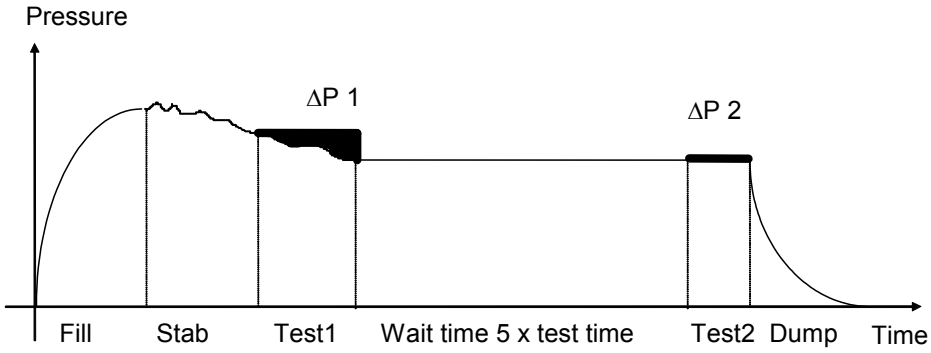


Associated parameters to be set: Start (Initial value of the transient), Transient (actual and non modifiable value of the transient), Percentage drift (Drift tolerance on acquisition of the transient, as a % of the FAIL level).

☞ Select the option and enter settings if necessary.

✓ **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 is there is one.

$$\Delta P1 = Leak + Transient$$

Following the waiting time (equivalent to 5 times the normal test time), we consider that transient phenomena have disappeared. During the second test time, the ATEQ instrument reads 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 taken away from the leak measurement of the following cycles.

Through the use of the ATR, the **ATEQ** instrument is able to differentiate a Good (PASS) part from a Bad (FAIL) part without being influenced by the transient effects whilst keeping a short stabilisation 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).

☞ Select the option and enter settings if necessary.

**For ATR learning cycles,** refer to paragraph 3.5 "ATR learning".

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

Learning may be carried out on a value greater than the reject (FAIL) level and the **Pass** and **End of Cycle** outputs are then activated.

✓ **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.

The parts are considered as very good when their leak rate is lower than the "percentage drift" value of the reject (FAIL) 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 which behave in very similar ways during the test, in other words, parts which generate 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 (FAIL) level.

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

#### 2.1.3. 4) Valve codes

The instrument has two programmable electrical outputs (24V DC/100 mA maximum). These outputs may be allocated to program numbers. They are generally used to select valves in a cycle sequence. The required outputs may be activated for each program. Associated parameters to be set: Internal 1, Internal 2.

☞ Select the option and enter settings if necessary.

### 2.1.3. 5) Cycle end

This function enables different cycle ends to be chosen, depending on the configuration of the instrument (connection to a PLC).

#### *a) Relay sequencing related to different cycle ends*

In order to interface the **ATEQ F570P** 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 J10 connector (START, RESET).

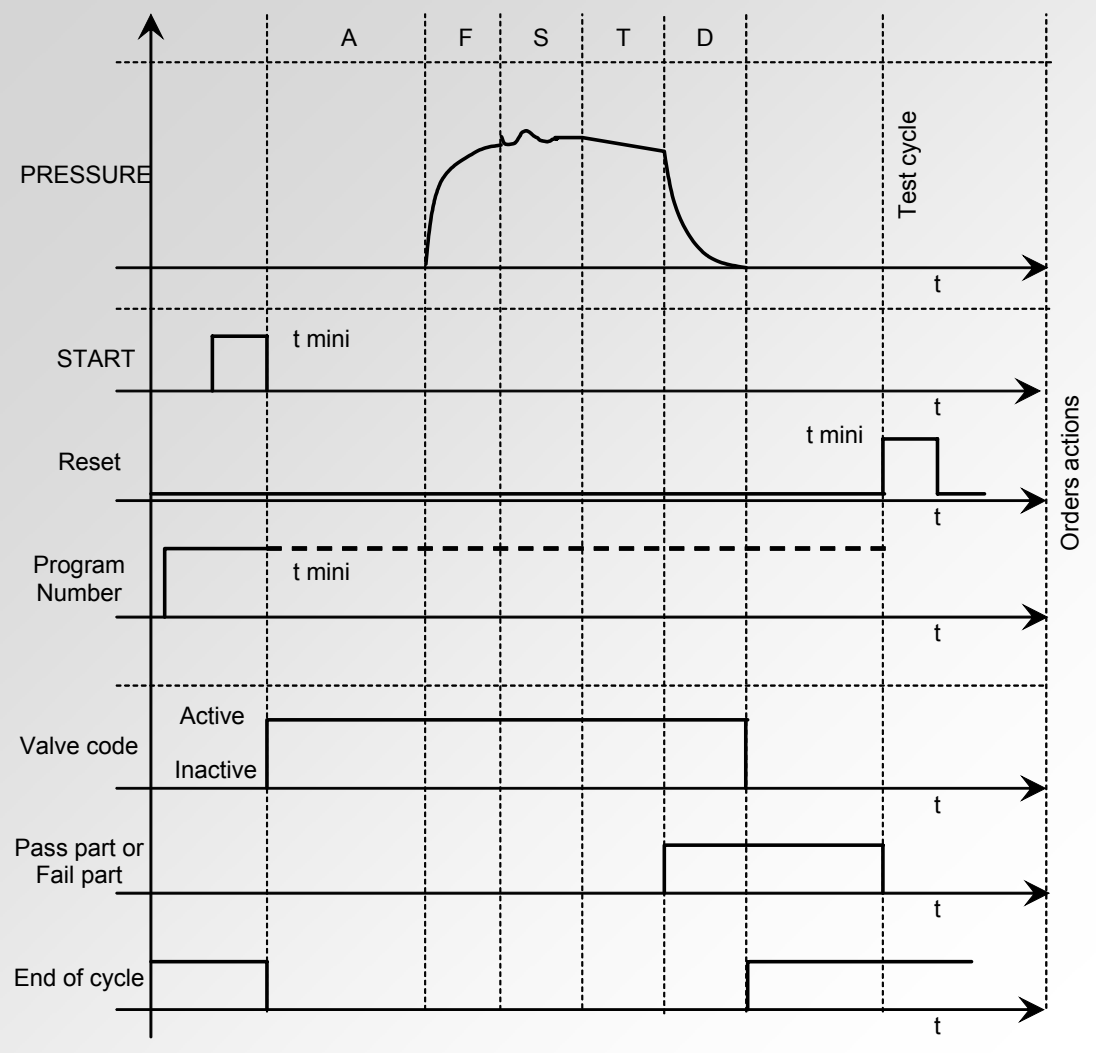
| **Legend** | |
|---|---|
| **A** | Wait time |
| **F** | Fill time |
| **S** | Stabilisation time |
| **#** | Unspecified time occurring between the programmed test time and the pressing of the reset  key. |
| **T** | Test time |
| **D** | Dump time |
| **START** | Press the  key on the front panel or make a contact between pins 2-3 on the J10 connector. |
| **RESET** | Press the  key on the front panel or make a contact between pins 1-2 on the J10 connector. |
| **Valve code** | Active (high level) : the pneumatic output is active (air output)<br>Inactive (low level) : the pneumatic output is inactive (no air output) |
| **BP or GP** | Bad part or Good part relay on the J10 connector |
| **EoC** | End of cycle relay on J10 connector |
| **t mini** | Minimum time to accept an entry: 50 ms on J10 connector. |

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

### *b) "Automatic RESET" cycle end*

If the part is OK, the Part OK 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 bad, the bad part relay is activated as soon as the test is completed. The instrument automatically dumps and sends a cycle end signal. A new cycle can then be launched.




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.

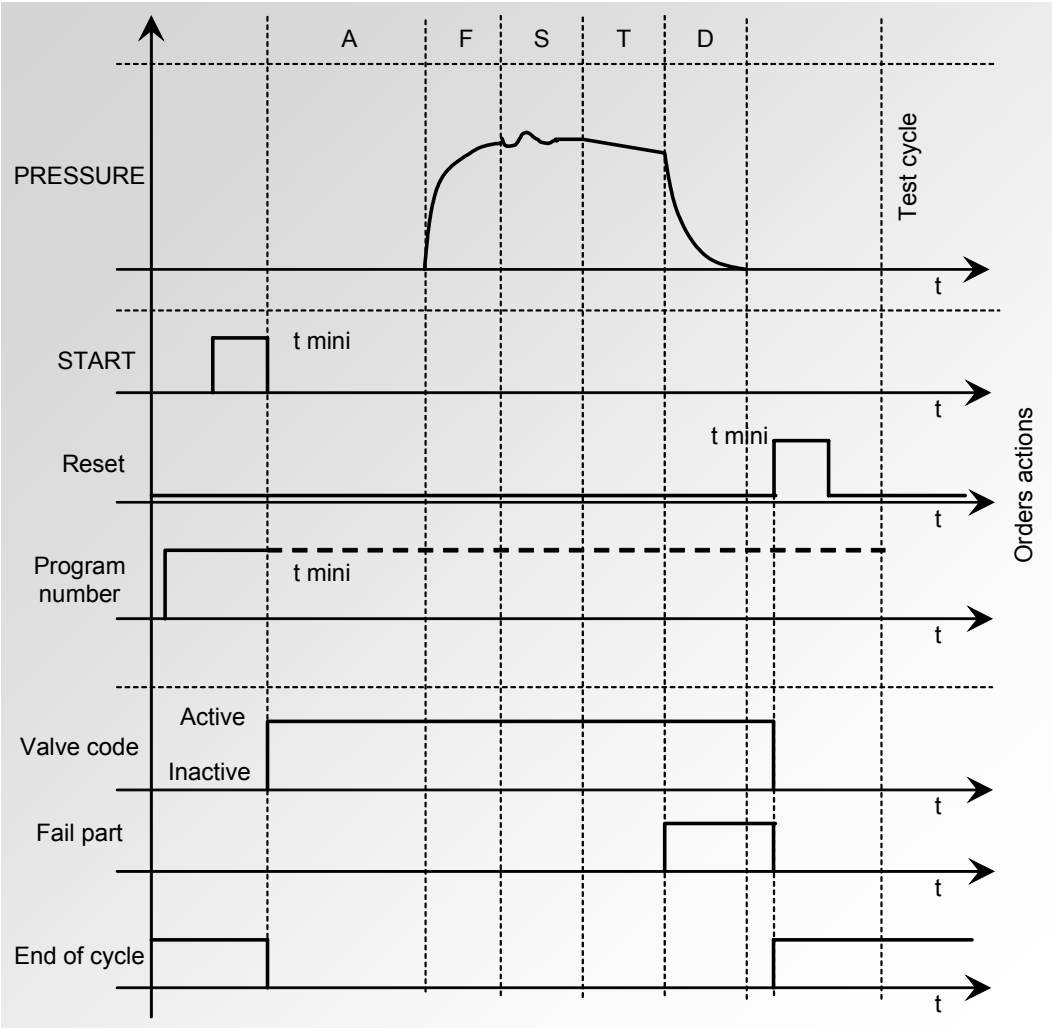
To return to program 1, when a cycle is not in progress, press any of the program selection inputs.

### *c) "RESET + dump" cycle end (automatic dump)*

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

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

If the part is Bad, as soon as the test time is over, the bad 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 of the program selection inputs.

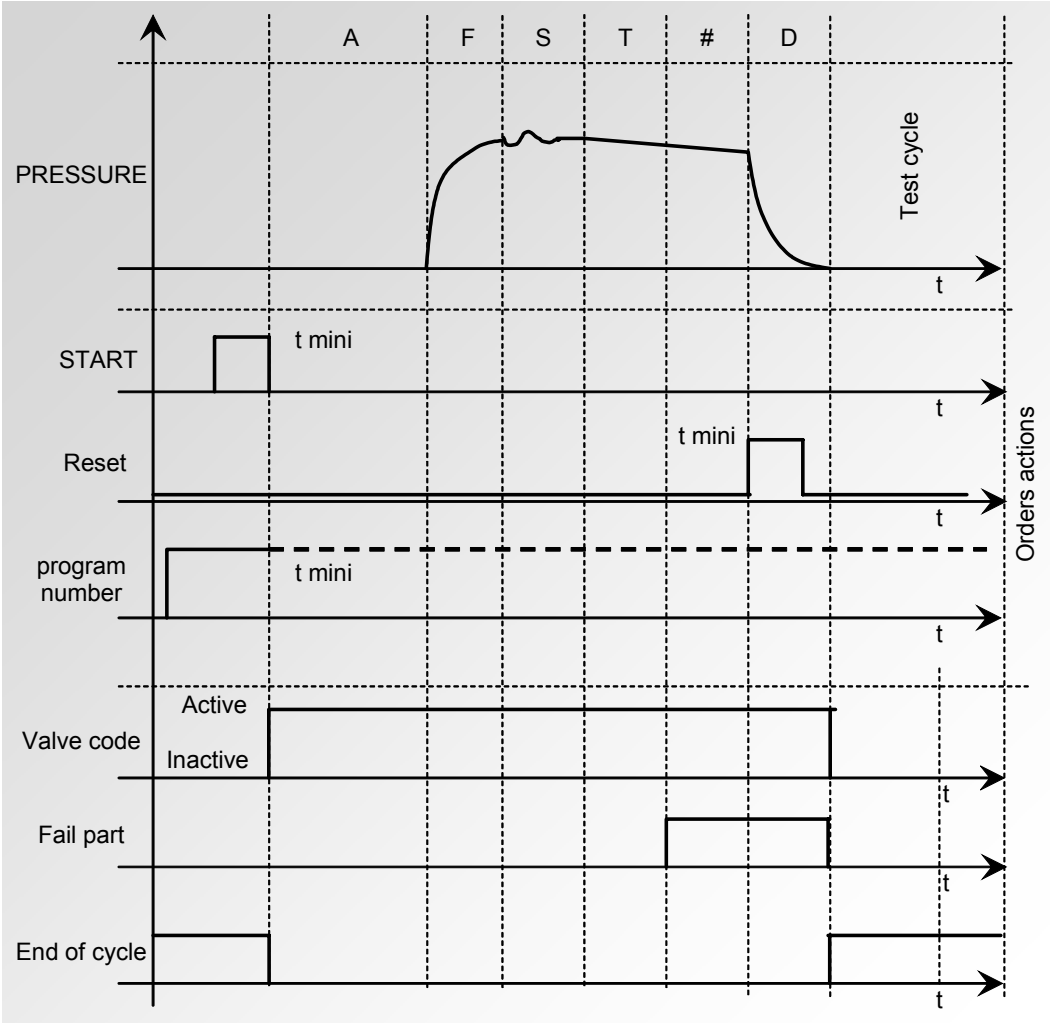
### *d) "Fill" cycle end*

If the part is OK, the good 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.

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

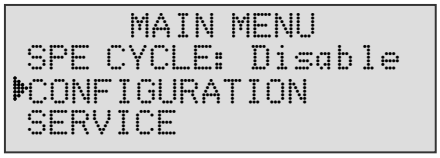
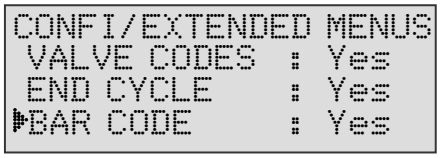
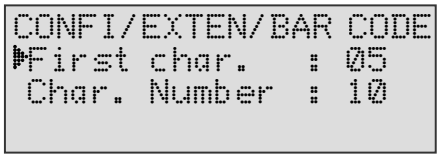
The instrument waits for a reset from the operator or the PLC to start the dump time and send the end of cycle signal.



### 2.1.3. 6) Bar code function

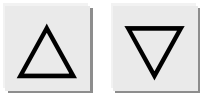
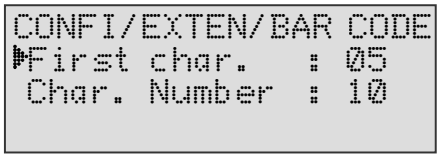
The option "Bar code" allows installing a bar code reader on the RS232 connector of the 5th series instrument. It allows the code reading and selects a test program and eventually launches the control test (if the option is validate). The number of characters reed by the bar code reader mustn't exceed **20**. If it is the instrument doesn't take in account the characters chain.

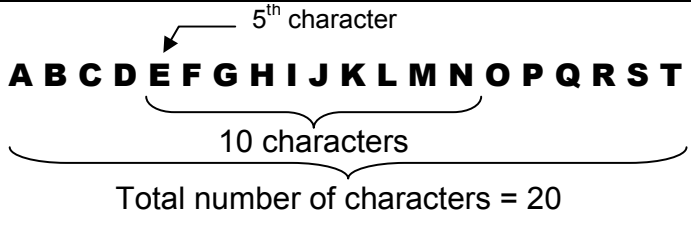
#### *a) Activation of the bar code function*

| | | |
|---|---|---|
| From the main menu, select the **CONFIGURATION** menu and then select the **EXTENDED MENUS**. |  |  |
| In the EXTENDED MENUS, select the **BAR CODE** function and validate by **YES**. |  |  |
| The bar code reading parameters appear, that it is advisable to inform. |  |  |

The parameter "**First Char.**" corresponds to the position of the first character to taking in account in the all characters chain. The parameter "**Char Number**" corresponds to the number of characters (chain size) to taking in account. The sum of these two parameters must be equal or inferior to the total number of characters contained in the chain plus 1.

$$\sum \text{Parameters} \leq \text{Number total of characters} + 1 \leq 20$$

| | | |
|---|---|---|
| Adjust the parameters value by using the up and down arrows, then validate with the **ENTER** key. |  |  |

| | |
|---|---|
| **Example:** in the opposite example, the selected program will be selected if the instrument is reading the characters chain:<br>**E F G H I J K L M N** |  |

| | |
|---|---|
|  | The specifics parameters for the **IRAN KODRO** installation are the following ones: |
| **BAR CODE** | ➢ First char: **15**<br>➢ Char number: **01** |

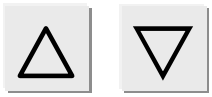
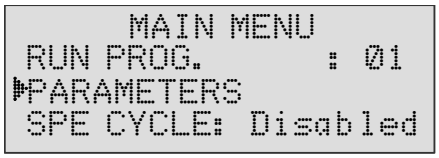
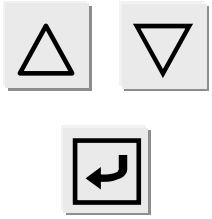
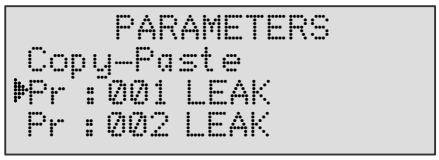
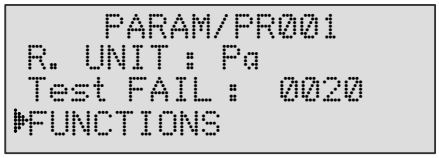
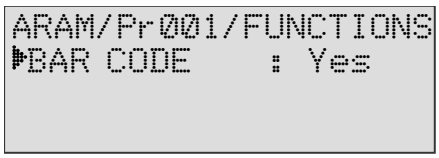
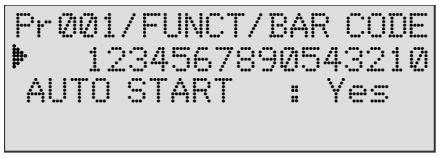
### *b) Chain characters parameter*

The programming of the characters chain is done from the special cycles.

| | | |
|---|---|---|
| In first select the current program in the **MAIN MENU**. |  | MAIN MENU<br>▶RUN PROG. : 01<br>PARAMETERS<br>SPE CYCLE: Disabled |
| Then check or validate in the **CONFIGURATION/ EXTENDED MENUS** menu the **BAR CODE** function. |  | CONFI/EXTENDED MENUS<br>VALVE CODES : Yes<br>END CYCLE : Yes<br>▶BAR CODE : Yes |
| Select in the **SPE CYCLE** menu. |  | MAIN MENU<br>▶SPE CYCLE: Disabled<br>CONFIGURATION<br>SERVICE |
| Then select the **BAR CODE** special cycle and validate with **ENTER**. |  | SPE CYCLE<br>Regulator adjust<br>Piezo auto zero<br>▶BAR CODE |
| The display confirms the selection of the **BAR CODE** special cycle. | | MENU PRINCIPAL<br>PROG. ACTIF : 001<br>PARAMETRES<br>▶CYCLE SPE: CODE BAR |
| Press the **START** key to launch the special cycle. The instrument goes in waiting of capture of the bar code. |  | CYCLE/Pr : 001<br><br>BAR CODE |
| Input (by using the bar code reader) the code. The characters are displayed in live on the screen. | | CYCLE/Pr : 001<br><br>EFGHIJKLMN<br>BAR CODE |
| Have patience a few moments, the code is recorded and the instrument is ready for use. At each time this character chain is reed, the instrument will select the corresponding test program number. | | CYCLE/Pr: 001<br>PRESS = 500.0 mbar<br><br>READY |

### *c) Program launch*

As soon as the bar code is recognised and that a program is attributed, the start of the cycle is automatically made.

| | | |
|---|---|---|
| From the main menu, put the cursor in front of **PARAMETERS**. |  |  |
| Select the program and validate with **ENTER**. |  |  |
| Then select the **FUNCTION** menu and validate with **ENTER**. |  |  |
| Validate by **YES** the function **BAR CODE**. |  |  |
| The characters chain is displayed, the parameter **AUTO START** allows to launch automatically the program when the corresponding bar code is reed. |  |  |

### 2.2. TIME

This function includes a clock (hours, minutes) and an internal calendar (day, month and year).

☞ Select the option and enter settings if necessary.

### 2.3. RS232

#### 2.3.1. C540/580

This function enables the configuration of the instrument so that it may be supervised by an ATEQ central module.

☞ Select the option and enter settings if necessary.

#### 2.3.2. Printer

This function enables the configuration of the instrument to enable the printing of the program data (parameters) as well as the test results. When the option is activated (YES), each time a cycle is started, the test results are systematically printed.

☞ Select the option and enter settings if necessary.

##### 2.3.2. 1) RS parameters

These parameters enable the configuration of the instrument enabling it to communicate with the printer.

Associated parameters to be set: Speed, Stop byte, number of data bytes, parity.

☞Select the option and enter settings if necessary.

##### 2.3.2. 2) Print frame

This function enables the configuration of the results printout.

Associated parameters to be set: **PRESSURE** (Display or not of the test pressure), **Personal** (Display of the program name when set), **Time keeper** (printing of the date and the time).

***a) Frame format***

The results frame is based on 40 columns.

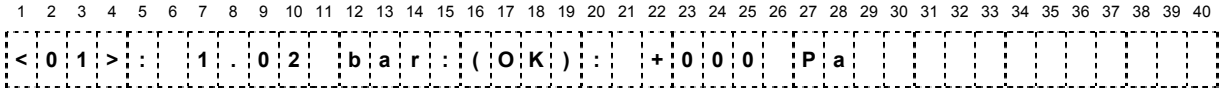
- ***Example for test OK result***

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| < | 0 | 1 | > | : | ( | O | K | ) | : | | | 0 | 2 | 7 | | P | a | | | | | | | | | | | | | | | | | | | | | | | | |

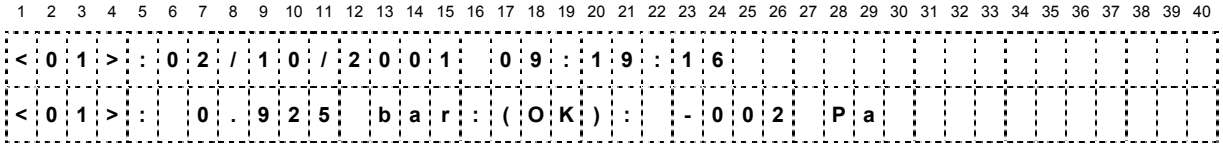
Frame detail:

| Columns | Characters |
|---|---|
| 1 | < |
| 2-3 | Figure indicating program number |
| 4 | > |
| 5 | : |
| 6 | ( |
| 7-8 | 2 letters indicating OK for good part<br>TD bad test part<br>RD bad reference part<br>AL for Alarm |
| 9 | ) |
| 10 | : |
| 11 | SPACE |
| 12 | +, - or nothing |
| 13 - 14 -15 | 3 figures indicating the leak value |
| 16 | SPACE |
| 17 > XX | 2 to 6 letters indicating the unit of measurement |

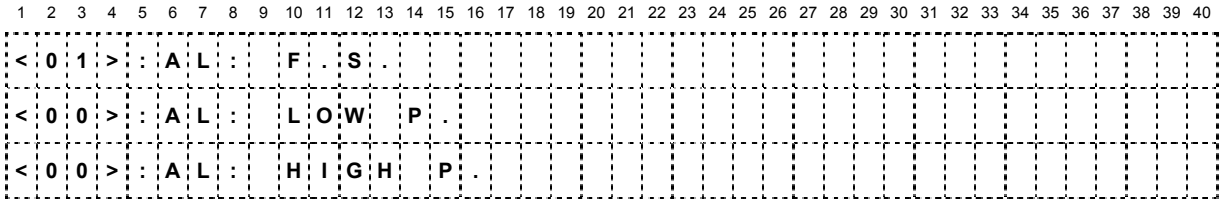
- ***Example for a test result with the pressure***




- ***Example for a test result with time & date***




- ***Example for a result with error***




Frame detail:

| Columns | Characters |
|---|---|
| 1 | < |
| 2-3 | Figure indicating program number |
| 4 | > |
| 5 | : |
| 6 | ( |
| 7 - 8 | 2 letters AL for ALARM |
| 9 | ) |
| 10 | : |
| 11 > XX | Error message relating to the fault |

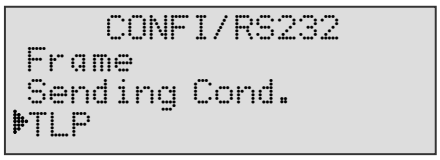
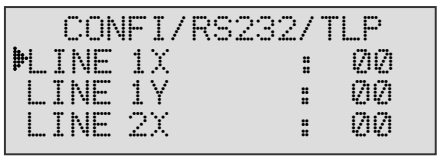
#### 2.3.2. 3) Sending conditions

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

Associated parameters to be set: **ALL** (all test results), **OK** (good parts), **T. BAD** (bad test parts), **R. BAD** (bad reference parts), **WARNING** (alarm), **PRESS DEF.** (incorrect pressure), **RECUPERABLE** (recoverable parts).

#### 2.3.2. 4) TLP

The TLP function allows to parameter the position of the printed lines of the tests results on small labels.

| | | |
|---|---|---|
| Select the TLP function in the **CONFIGURATION/ RS232** menu. |  |  |
| Then the lines 1, 2 and 3 in X and Y position are displayed. |  |  |

|  | The specifics parameters for the **IRAN KODRO** installation are the following ones: |
|---|---|
| **RS parameter** | ➢ Speed: 9600bds<br>➢ 1st/8 bits/without |
| **FRAME** | ➢ PRESSURE: Yes<br>➢ Personnal: Yes<br>➢ Time keeper: Yes |
| **SENDING CONDITIONS** | ➢ All: Yes (others parameters : No) |
| **TLP** | ➢ Line 1X: **190** Line 1Y: **50**<br>➢ Line 2X: **190** Line 2Y: **150**<br>➢ Line 3X: **190** Line 3Y: **250** |
| **EXPORT** | ➢ No |

**Label print example for IRAN KODRO installation:**

The label will be printed in the opposite example with the above parameters in function of the selected frame's parameters.

**1st line**: <program number>: car model: reed bar code.

**2nd line**: <program number>: date: hour.

**3rd line**: <program number>: test pressure: test result: test result value and the unity.

<03>:405:321321321321321

<03>:14/11/2005 08:52:44

<03>: 0.035 bar:(OK): 0020 Pa

***Note:** the printed reed bar code can be different than the programmed bar code for the vehicle selection.*

#### 2.3.2. 5) 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.

☞ Select the option and enter settings if necessary.

### 2.4. SECURITY

This function deactivates the **START** key on the instrument front panel. Programs can only be started from the instrument inputs (J10 connector).

☞ Select the option and enter settings if necessary.

### 2.5. I/O CONFIGURATION

This menu is used to configure programmable input 7 on connector J10 on the 16 program input/output board.

See the chapter 1, paragraph 2. 2. 6. 2) "J10 Connector (I/O Inputs/Outputs) programmable input".

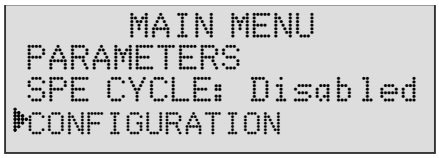
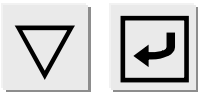
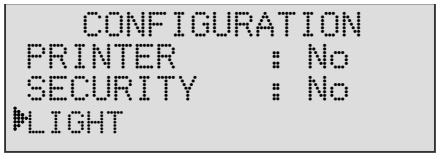
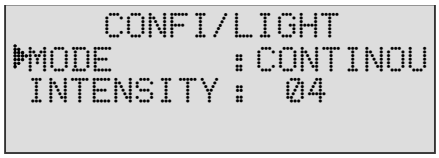
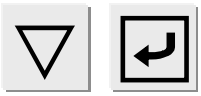
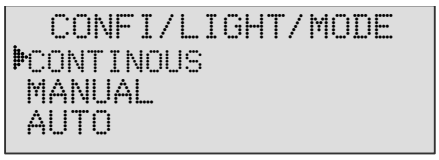
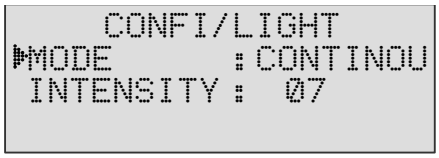
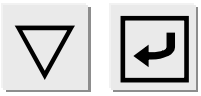
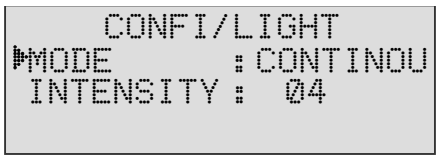
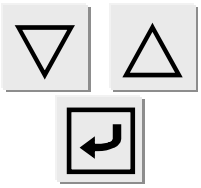
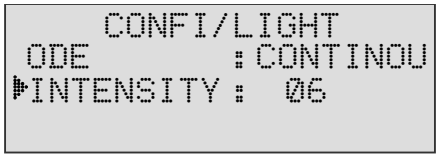
### 2.6. LIGHTING THE SCREEN

Screen illumination can be programmed and modified. The lighting can be adjusted according to the ambient conditions or the user's choice.

There are three lighting modes:

- ✓ **continuous** mode, display screen permanently lit whatever the conditions.
- ✓ **manual** mode, the screen remains lit for 20 minutes and if the keyboard has not been used by the end of this period the screen shuts down and only relights when the keyboard is touched again.
- ✓ **automatic** mode, which is identical to manual mode, with illumination of the screen also if an action is carried out from the external inputs (rear connectors).

Using these three modes, the lighting intensity of the screen can be programmed from 00 (screen off) to 07 (maximum lighting intensity).

| | | |
|---|---|---|
| In the main menu, position the cursor by the **CONFIGURATION** menu then confirm by pressing **ENTER**. |  |  |
| Move the cursor down until it is in front of the **LIGHT** menu then confirm by pressing **ENTER.** |  |  |
| Place the cursor in front of **MODE** to choose the required lighting mode and confirm using **ENTER.** |  |  |
| Select the lighting mode and confirm using **ENTER.** |  |  |
| To return to the previous menu, press the **C** button once |  |  |
| To select the lighting intensity for the display, place the cursor in front of the **INTENSITY** menu and confirm using **ENTER.** |  |  |
| Then select the lighting intensity from 00 (off) to 07 (maximum luminosity) and the new lighting intensity will be applied as soon as **ENTER** is pressed. |  |  |

## 3. SPECIAL CYCLES MENU

### 3.1. SPECIAL CYCLES AVAILABLE

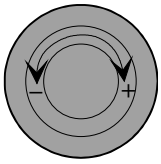
The following list shows all the special cycles which are possible: those available will vary depending on what is checked in the expanded menus or according to the optional extras requested at the time of manufacture of the instrument.

| Special cycle | Function |
|---|---|
| ✓ Inactive: | No special cycle selected. |
| ✓ Regulator adjust: | Cycles used to set the regulator. |
| ✓ Piezo auto zero: | Cycle used to carry out forced reset of the piezzo transducer and the electronic regulator. |
| ✓ ATR learning: | This cycle is used to enter the ATR parameters if they are not known. This should be done after each start-up of the instrument, or after a long period with no test cycles. |

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.

### 3.2. REGULATOR

This special cycle enables the main regulator pressure to be set.

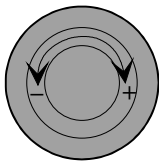
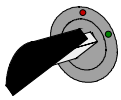
| | | |
|---|---|---|
| Position the cursor in front of **SPE CYCLE** and confirm using the **ENTER** key. |  | SPE CYCLE<br>▶Disabled<br>Regulator adjust<br>AZ Piezo |
| Next, position the cursor in front of **REGULATOR ADJUST** and confirm using the **ENTER** key. |  | SPE CYCLE<br>Disabled<br>▶Regulator adjust<br>AZ Piezo |
| The display confirms that the special cycle has been selected. | | MAIN MENU<br>RUN PROG.: 005<br>PARAMETERS<br>▶SPE CYCLE: Regul |
| Press the **START** key to start the special cycle. |  | RUN/Pr : 001<br>PRESS = 355.5 mbar<br><br>REGULATOR 1 ADJUST |
| Adjust the value of the pressure with the regulator. |  | RUN/Pr : 001<br>PRESS = 500.0 mbar<br><br>REGULATOR 1 ADJUST |
| Once the pressure is adjusted, press the **RESET** key to stop the special cycle. |  | RUN/Pr : 001<br>PRESS = 0.000 bar<br><br>READY |

### 3.3. AUTOMATIC CALCULATION OF LIMITS

This function enables maximum and minimum pressure monitoring limits to be programmed in relation to the settings on the selected regulator.

The limit values calculated automatically are plus or minus 20% of the measured value.

Calculation and automatic input of the limits are done in the active program.

| | | |
|---|---|---|
| Confirm the special regulator setting cycle. | | MAIN MENU<br>RUN PROG. : 001<br>PARAMETERS<br>▶SPE CYCLE: Regul. |
| Press the **START** button to run the special cycle. |  | RUN/Pr:001<br>PRESS = 1.00 bar<br><br>REGULATOR ADJUST |
| If necessary, adjust the test pressure value using the regulator. |  | RUN/Pr:001<br>PRESS = 1.50 bar<br><br>REGULATOR ADJUST |
| Now, when the switch is turned to **ACCESS** position, the question : **CALCULATE LIMITS ?** appears on the screen. |  | RUN/Pr:001<br>PRESS = 1.50 bar<br>COMPUTE LIMITS ?<br>REGULATOR ADJUST |
| Confirm calculation by pressing **ENTER.** The instrument calculates the limits and enters them in the cycle program parameters. |  | COMPUTING LIMITS |
| When the operation is completed, press the **RESET** button to stop the special cycle. |  | RUN/Pr:001<br>PRESS = 1.50 bar<br><br>READY |

### 3.4. PIEZO AUTO ZERO

Used for compulsory reset to zero of the piezo sensor.

| | | |
|---|---|---|
| In the main menu, place the cursor in front of **SPE CYCLE** and confirm using **ENTER**. |  | MAIN MENU<br>RUN PROG: 001<br>PARAMETERS<br>▶SPE CYCLE: Inactive |
| Next, place the cursor in front of **AZ Piezo** function and confirm using **ENTER**. |  | SPE CYCLE<br>Disable<br>Regulator adjust<br>▶AZ Piezo |
| The display confirms that the special cycle has been selected. | | MAIN MENU<br>RUN PROG.: 001<br>PARAMETERS<br>▶SPE CYCLE: AZ Piezo |
| Press the **START** key to start the reset. |  | RUN/Pr :001<br>PRESS = 355.5 mbar<br><br>RESET |
| Once the reset is carried out, the cycle ends automatically. | | RUN/Pr :001<br>PRESS = 355.5 mbar<br><br>READY |

***Note**: the auto zero cycle is an automatic cycle which is carried out approximately every 5 minutes. It is used to initialise the pressure transducers in relation to atmospheric pressure.*

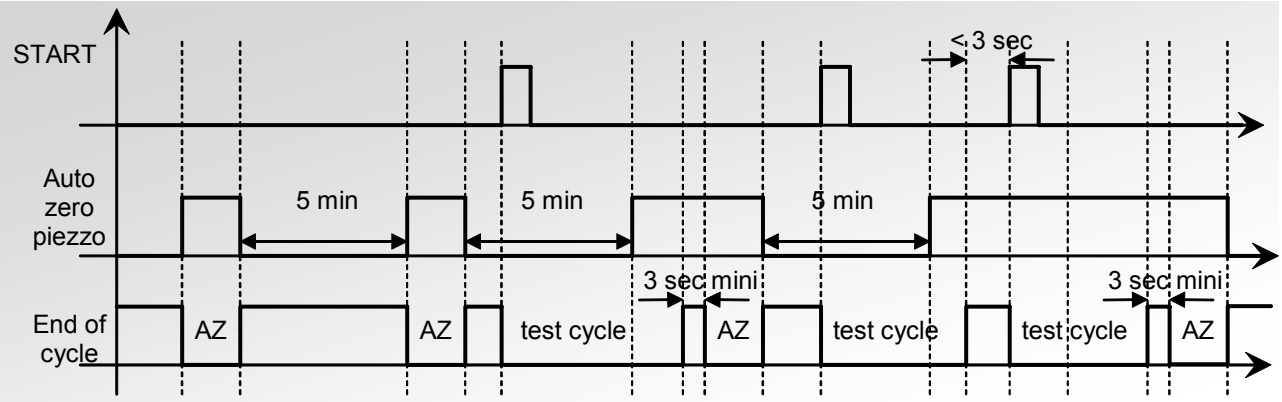
For automatic devices it may be necessary to inhibit the auto zero cycle.

| | | |
|---|---|---|
| To inhibit the automatic zero cycle, go to the **CONFIGURATION** menu then confirm using **non**. |  | CONFIGURATION<br>EXTENDED MENUS<br>▶AZ PIEZO AUTO: No<br>HOUR |

**Attention :** If an auto zero cycle is not carried out regularly, measurement errors may occur and result in false readings for the air tightness of parts. A request for auto zero may be made automatically or via input 9 on connector J10, programmed for this function, or via a programmed function key on the optional RC5 keypad, if this is installed.

***Note**: during the auto zero cycle, the start cyle and stop cycle keys are inoperative, as is the selection of the program number using the inputs (key strokes are not stored in the memory). To restart a normal cycle or select the program, wait until the auto zero cycle has completely finished.*

### 3.4.1. Timing chart for auto zero cycle



### 3.5. ATR LEARNING

If the transient values are not known, a transient learning cycle must be carried out so that the instrument can calculate and enter the values. These learning cycles are located as shortcuts in the special cycles menu, on input 9 of connector J10 programmed for this function or on a programmed function key on the optional RC5 keypad, if this is installed. .

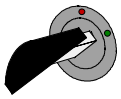
| | | |
|---|---|---|
| If no transient learning has been carried out, the message **ATR DEFAULT** will appear. | | RUN/Pr:001<br>PRESS = 1.50 bar<br>LEAK = ATR DEFAULT<br>READY (NO OK) |
| To carry out the learning, select the **SPE CYCLE** menu. |  | MAIN MENU<br>RUN PROG. : 001<br>PARAMETERS<br>▶CYCLE SPE : Disabled |
| Then select the **ATR LEARN.** menu. |  | SPE CYCLE<br>Infinite fill<br>Piezo auto zero<br>▶ATR Learn. |
| The display confirms that the special cycle has been selected. | | MAIN MENU<br>RUN PROG. : 001<br>PARAMETERS<br>▶CYCLE SPE : ATR |
| Press the **START** button to start the learning cycle. At the end of the cycle, the display gives the test result for the good part. |  | RUN/Pr:001<br>PRESS = 1.50 bar<br>LEAK = 002 Pa<br>READY (OK) |
| The instrument carries out a test cycle, then continues the cycle by carrying out a learning cycle. When the cycle has been completed, the transient values are recorded. | | RUN/Pr:001<br>PRESS = 1.50 bar<br>LEAK = 002 Pa<br>ATR Learn. |
| To view the transient values, press **ENTER**.<br>***Note**: these values can be modified manually.* |  | ATR2<br>▶Begin. : -000<br>Transient : -003<br>DRIFT : 020 % |

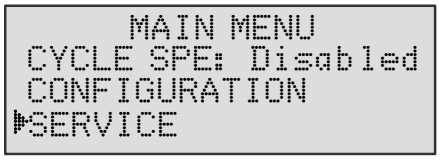
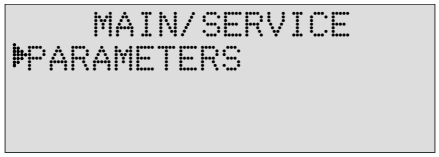
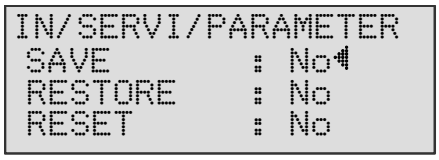
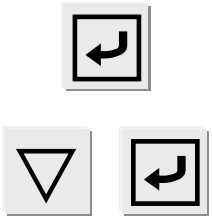
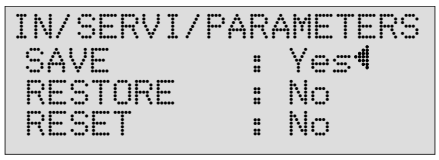
# 4. SERVICE MENU

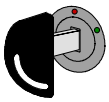
## 4.1. PARAMETERS SERVICE

This menu is used to manage the memory containing the test cycle parameters.

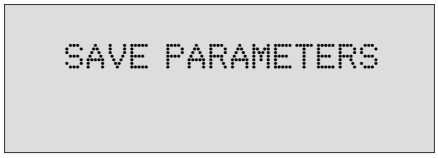
- ✓ Save maintenance parameters menu: used to save the configuration of the parameters in the current test.
- ✓ Restore maintenance parameters menu: used to restore a previously saved configuration.
- ✓ Erase maintenance parameters menu: used to delete the current configuration.

To access the menu, put the switch to **ACCESS** position. 

| | | |
|---|---|---|
| In the main menu, place the cursor in front of **SERVICE** and confirm using **ENTER**. |  |  |
| Then place the cursor in front of **PARAMETERS** and confirm using **ENTER**. |  |  |
| Then place the cursor in front of the action required :<br><br>**SAVE**: save current parameters,<br><br>**RESTORE**: replace current parameters by those stored in the memory,<br><br>**ERASE**: delete current parameters and return to intial configuration.<br><br>and confirm using **ENTER**. |  |  |
| To activate an operation, confirm using **ENTER**. Then choose **YES** using the arrows then confirm again using **ENTER**. |  |  |

Turn the switch to **LOCK** position. 

***Note**: if the parameters have been modified, then current and saved parameters are therefore different, when the instrument begins to operate, the following message is displayed on the screen.*




This message is not jamming and disappears after a few seconds. It allows to inform that a parameters saving can be necessary. In this case three solutions arises :

1) **Restore** the saved (current parameters will be lost).
2) **Save** the current parameters in the memory (the parameters already in the memory will be lost).
3) **Nothing to do** and working with the current parameters.

## 5. RESULTS MENU

This function is used for:

- ✓ detailed display of the test results : number of parts tested, number of good parts, number of bad reference parts, number of bad parts, number of recovered parts, number of times the alarm is triggered (each indicator is expressed as a % value),
- ✓ resetting the results memory,
- ✓ printing the results (number of good parts, number of bad parts. )

## 6. LANGUAGE MENU

This function is used to select the language displayed by the instrument.

Two languages can be stored in the instrument: French and English.

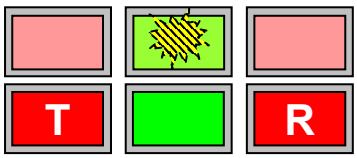
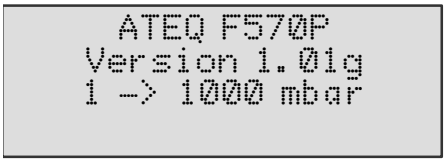
## 7. STAND BY MENU

This function is used to switch off the instrument without disconnecting it. Standby can be immediate or programmed with start and stop times.

There are two ways to achieve immediate standby:

Either through the standby menu,

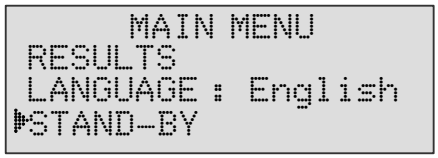
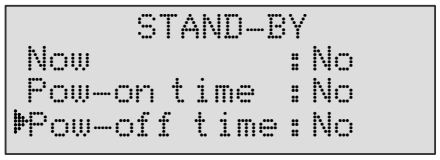
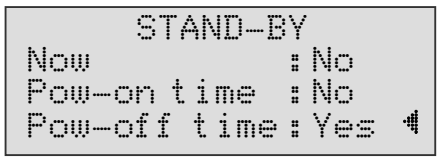
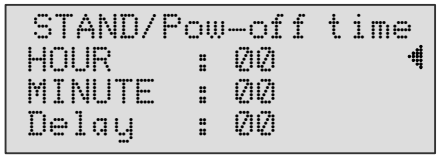
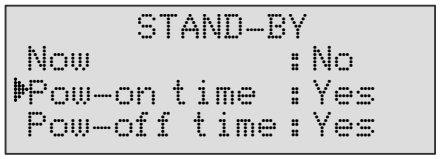
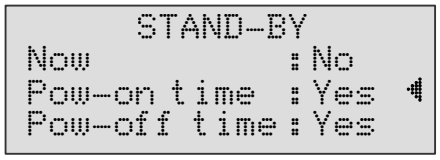
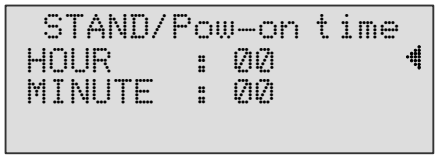
Or by pressing the **RESET**  button for more than three seconds.

| | | |
|---|---|---|
| ***Note**: when the instrument is on standby, the display is off and only the yellow indicator light flashes approximately every 3 seconds.* | |  |
| To reactivate the instrument, simply press any key on the front panel or activate any input. | |  |

☞ Select the option and enter settings if necessary.

### 7.1. STANDBY USING THE MENU

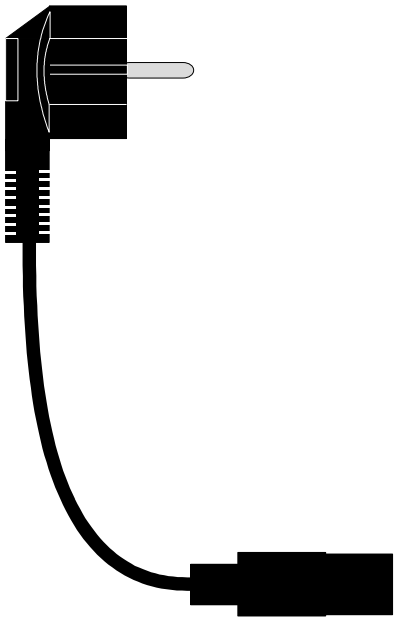
Standby using the menu enables start and stop times for the instrument to be programmed.

| | | |
|---|---|---|
| In the main menu, position the cursor beside **STANDBY** and confirm by pressing **ENTER**. |  |  |
| To program automatic standby at a given time, position the cursor beside **POW-OFF TIME.** |  |  |
| Confirm the **POW-OFF TIME** parameter using **YES.** |  |  |
| Then set parameters for the time (hours and minutes) when the standby must take effect. "**TIME DELAY**" is the delay (in minutes) between the programmed time and actual standby. |  |  |
| To program the start-up time for the instrument, position the cursor beside **POW-ON TIME.** |  |  |
| Confirm the **POW-ON TIME** parameter using **YES.** |  |  |
| Then set parameters for the instrument start time (in hours and minutes). |  |  |

# Chapter 5
# ACCESSORIES

## 1. ACCESSORIES SUPPLIED WITH THE INSTRUMENT

### 1.1. MAINS POWER CABLE



The power supply cable of the **F570P** allows its connection to the mains supply network (from 90 to 260V AC).

## 2. OPTIONAL ACCESSORIES

### 2.1. CALIBRATED LEAK

Calibrated leaks are used to check the instrument's calibration.

| 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 | |

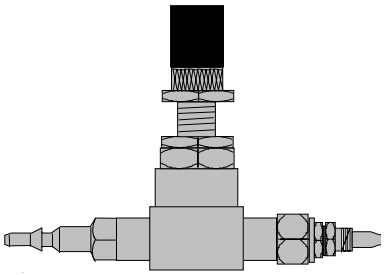
**kPa.cm$^3$/h** (bar.cm$^3$/h)  **kPa.cm$^3$/min** (bar.cm$^3$/min)

***Note:** the values indicated above are given for information and can 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 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 department.
- ✓ Check that there is an O-ring seal and that it is in good condition.
- ✓ The instrument zero check must be done by replacing the leak with a sealing connector and not by sealing off the leak itself.
- ✓ To check that the leak has not been blocked, attach a piece of flexible tubing to the leak and submerge its extremity in water to watch for bubbles.

## 2.2. NEEDLE VALVE AND LEAK/FLOW CALIBRATOR (CDF)

### 2.2.1. Needle valve

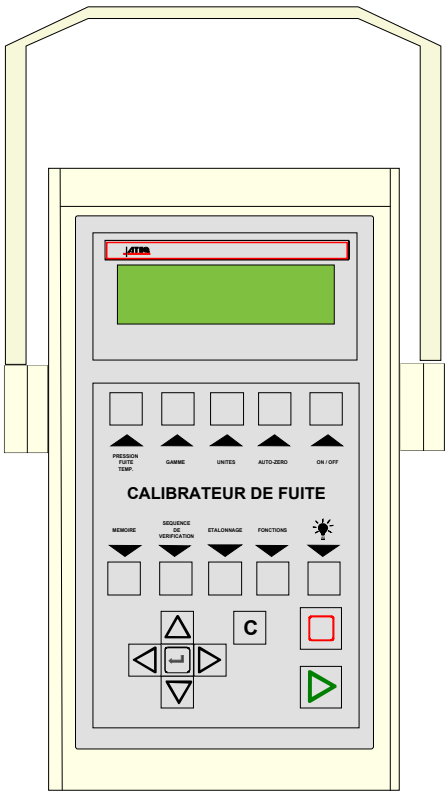


Needle valves are used to calibrate the leakage limits. These valves have an adjustable leak and depending on the model allow adjustments of between a few $cm^3/h$ to several l/min.

These valves can be easily disturbed and therefore require the frequent use of some means of checking the setting (CDF).

***Note:** it is strongly recommended that you do NOT leave a needle valve permanently connected on a leak detection machine with automatic calibration every "n cycles"*.

### 2.2.2. CDF (Leak/flow Calibrator)




The **Leak/Flow calibrator** is a multiple range **ATEQ** flow meter intended for checking leak testing equipment and particularly **ATEQ** instruments. It measures a loss of charge with a differential sensor, which is connected to a calibrated flow tube.

## 2.3. AUTOMATIC CONNECTORS WITH EXPANDABLE JOINTS

**ATEQ** automatic connectors are used so that accurate and reliable assemblies can be built to check air tightness. They simplify the work of the operator as they are self-locking thanks to the use of a pneumatic valve supplied from the mains compressed air supply. Several connectors may be controlled by the same remote, powered by an **ATEQ** or another logic.

They adapt easily to a large number of fittings and apertures of varied dimensions. Their use ensures that non-machined walls can be guaranteed airtight.

There are four basic versions of **ATEQ** automatic connectors :

- ✓ SA for external connections,
- ✓ Si for internal connections,
- ✓ SAG and SIG for threaded and tapped connections.

They are either in anodised aluminium or stainless steel as standard. Different types of joints are available depending on the elasticity required.

### 2.3.1. Operation

The connector is positioned manually or automatically using a jack or cylinder.

Compressed air is allowed through the control aperture via a three part valve. The pressure pushes the cylinder which squashes the connector. The air tightness is therefore perfect and there will be no leakage in the connector seals.

### 2.3.2. Standard dimensions

SAG and SIG have been designed for threaded and tapped caps. For the time being, they are available in gas norm. Sizes, which are: 1/2", 3/4", 1", 11/4", 11/2", 2", BSP.

The SA and SI are designed for smooth nozzles, with dimensions from 3 to 80 mm for the external diameters (SA), and from 10 to 75 mm for the internal diameters (SI).

## 2.4. FILTRATION KIT

Clean, dry air must be used to ensure the reliability of the instruments.

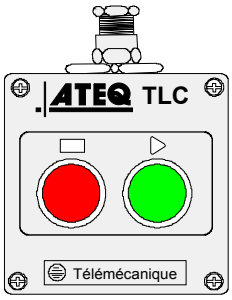
The filtration kit is connected to the air input on the rear panel of the instrument.

It consists of a dust filtering cartridge (5µm) and another cartridge (0.01 µm) giving residual oil pollution equal to 0.01 ppm.

## 2.5. SIMPLE REMOTE CONTROL

The remote control allows control and selection of various settings remotely for instruments in the **ATEQ** range.

### 2.5.1. Casing reset/start



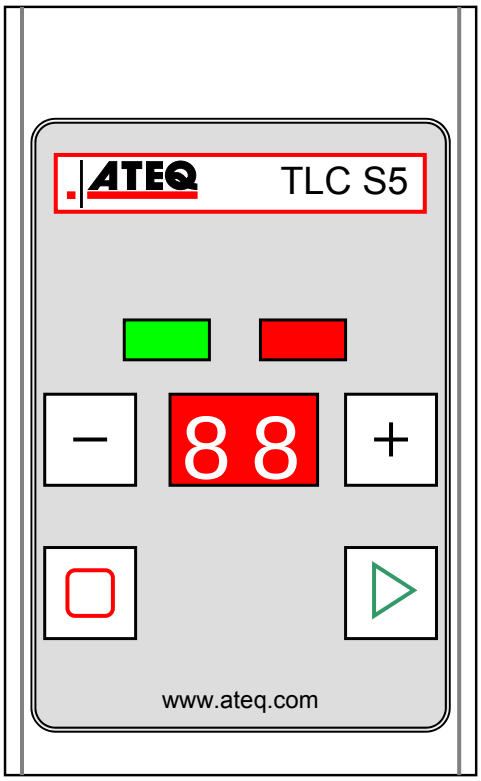

### 2.5.2. S5 four-function remote control

This remote control has four functions which can be used to control a series 5 instrument remotely.

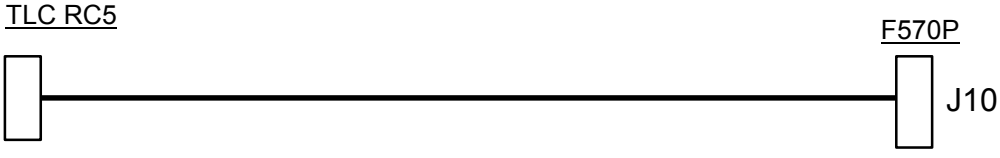
The four functions on this remote control are as follows :

- ✓ **RESET** and **START** cycle.
- ✓ **Increase** or **decrease** program numbers.
- ✓ Display the **number** of the selected program.
- ✓ 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.*

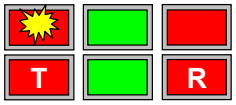
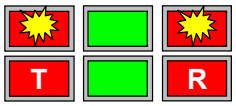
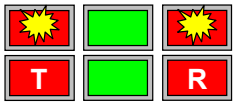
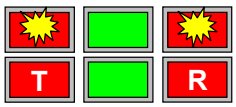
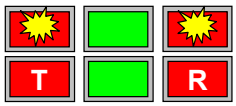
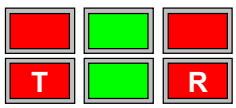


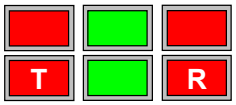
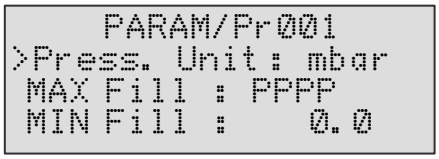

#### 2.5.2. 1) Connection diagram



# Chapter 6
# ERROR MESSAGES

The **ATEQ F570P** can display error messages if there are operational problems.

| PROBLEM | LIT INDICATORS | MESSAGE DISPLAYED |
|---|---|---|
| Test error. Leak in excess of the full scale.<br>**Action**: check the test circuit. |  | CYCLE/Pr001<br>PRESS=0.942 bar<br>LEAK=>>F.S TEST<br>READY (NO OK) |
| Pressure in excess of the full scale.<br>**Action**: decrease the pressure using the mechanical regulator knob. |  | CYCLE/Pr001<br>PRESS=> FULL SCALE<br><br>READY (NO OK) |
| Pressure in excess of the max. threshold.<br>**Action**: check regulator settings, pressure limits, check whether the right regulator has been selected if there are two. |  | CYCLE/Pr001<br>PRESS=1.02 bar P><br><br>READY (NO OK) |
| Pressure below the min. threshold.<br>**Action**: check the network pressure and regulator settings, the pressure limits, and whether the right regulator has been selected if there are two. |  | CYCLE/Pr001<br>PRESS=0.000 bar P<<br><br>READY (NO OK) |
| ATR error.<br>**Action**: run another ATR learning cycle or check the ATR parameters. ATR fault. |  | CYCLE/Pr001<br>PRESS=0.942 bar<br>LEAK=ATR DEFAULT<br>READY (NO OK) |
| PROG error: the I/O's have selected a program with no parameters.<br>**Action**: enter program parameters. |  | CYCLE/Pr.:009<br>ERROR |

| PROBLEM | LIT INDICATORS | MESSAGE DISPLAYED |
|---|---|---|
| Inappropriate size for the selected unit of pressure.<br>**Action**: change unit or modify the minimum and maximum pressure limits if these and the test pressure can be used with this unit. |  |  |

# Chapter 7
# OPERATIONAL PROBLEMS

## 1. PHENOMENON NOTED

If a test machine begins to detect too many bad parts (statistically, more than three consecutively), it is advisable to carry out a **check on the whole unit.** The quality of the manufacture and operation of the leak detector should be the last things considered.

### 1.1. CONDITION OF THE MACHINE'S SEALS

This is the no.1 defect as the seals are subject to high levels of dirt contamination (alumina, shavings). Regular cleaning of the seals is an effective remedy.

### 1.2. DAMAGED INSTRUMENT SEALS

There is a possibility that the seals may be cut by shavings or worn by repetitive squashing. This can be prevented by regular servicing and replacement of the seals.

### 1.3. BUMPER PAD

This is a defect which may occur after a certain amount of time as the bumper pads may be worn, or if the pressure settings in the air cylinder are inadvertently disturbed. Check the stability of the measurement and that the bumper pads are correctly installed.

### 1.4. PNEUMATIC AIR SUPPLY TOO LOW

This anomaly can cause false measurements (large leaks or erratic measurements). The air supply to the cells must be higher than the minimum of 4 bar and it is essential that it is greater than the minimum test pressure of 1 bar. Also check that sealing connectors are being used correctly.

### 1.5. PNEUMATIC LINK

The link and reference pipes will age and break with time. The pipes and seals must conform to the required quality. **ATEQ** recommends the use of RILSAN PA11 pipes and AVS type joints.

### 1.6. ENVIRONMENT

A measurement may be affected by a variation in background temperature (sun, draughts, storage of parts outdoors, handling of the test part by the operator, ...).

The dampness of parts may cause errors in the readings (insufficient drying after washing, outdoor storage, condensation, presence of water in the fixture, ...).

### 1.7. CALIBRATION

**ATEQ** does not accept any liability in regard to calibrations and settings to its instruments which are not carried out by its own personnel.

### 1.8. CONCERNS ABOUT RELIABILITY OF THE INSTRUMENT'S CIRCUITS

If all the other checks do not resolve the problem, the instrument's circuit may be checked.

Proceed as follows :

- ✓ Segregate the instrument from its environment (pneumatic assembly),
- ✓ Connect up the instrument (test output),
- ✓ Choose an unused program,
- ✓ Set the parameters as follows :
  - ⇒ the regulator to the test pressure,
  - ⇒ the pressure monitoring thresholds to +/- 20 % of the test pressure,
  - ⇒ wait time A 0 seconds,
  - ⇒ fill time 4 seconds,
  - ⇒ stabilisation time 10 seconds,
  - ⇒ test time 10 seconds,
  - ⇒ dump time 1 second,
  - ⇒ reject level maximum,
  - ⇒ unit Pa/sec,
  - ⇒ function all functions cancelled.

Run two consecutive cycles.

The post test time result should not exceed 2 Pa/sec.

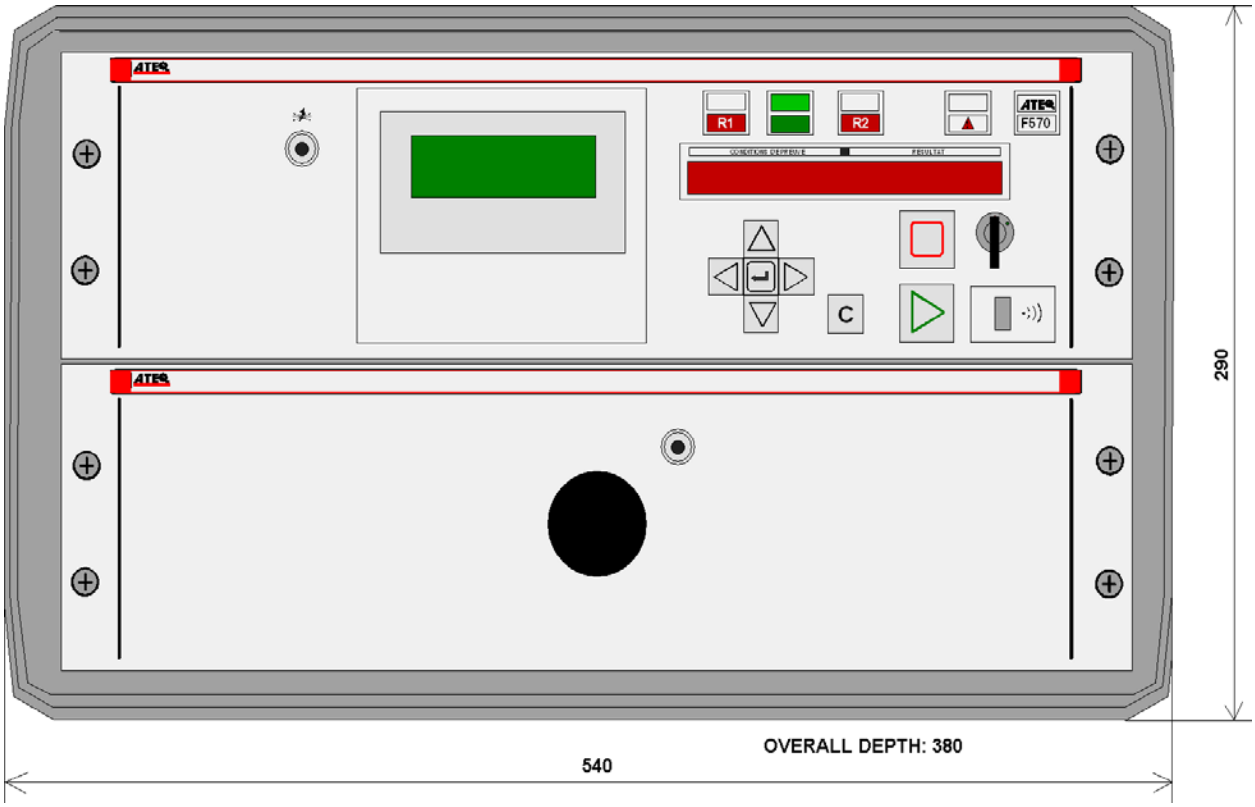
# Appendices
# ATEQ F570P

## 1. TECHNICAL CHARACTERISTICS OF THE F570P

| | **F570P** |
|---|---|
| **Dimensions**<br>H x L x D (mm): | 290 x 540 x 380 |
| **Power supply:** | 90 - 260 VAC / 50 W |
| **Electric connections:** | 3 pins connector |
| **Pneumatic connections:** | 8/10 |
| **Weight** (kg)**:** | About 15 |
| **Format:** | 19 inches |
| **Temperatures:** | |
| Operational: | +10°C to +45°C |
| Storage: | 0°C to +60 °C |

## 2. MECHANICAL DEFINITION DRAWINGS OF F570P

All the dimensions are in millimetres.



## 3. CONVERSION TABLE

**TO**

| **FROM** | **Pa** | **kPa** | **bar** | **mbar** | **mmH2O** | **atm** | **Torr** | **psi** | **inH2O** | **inHg** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Pa** | 1 | $10^{-3}$ | $10^{-5}$ | $10^{-2}$ | 0.10197 | $9.8692\ 10^{-6}$ | $7.5\ 10^{-3}$ | $1.45\ 10^{-4}$ | $4.01\ 10^{-3}$ | $2.95\ 10^{-4}$ |
| **kPa** | $10^{3}$ | 1 | $10^{-2}$ | 10 | 101.97 | $9.8692\ 10^{-3}$ | 7.5 | 0.145 | 4.01 | 0.295 |
| **bar** | $10^{5}$ | $10^{2}$ | 1 | $10^{3}$ | 10197 | 0.98692 | 750 | 14.5 | 401.46 | 29.53 |
| **mbar** | $10^{2}$ | $10^{-1}$ | $10^{-3}$ | 1 | 10.197 | $9.8692\ 10^{-4}$ | 0.75 | $1.45\ 10^{-2}$ | 0.401 | $2.95\ 10^{-2}$ |
| **mmH2O** | 9.806 | $9.8067\ 10^{-3}$ | $9.8067\ 10^{-5}$ | $9.8067\ 10^{-2}$ | 1 | $9.6784\ 10^{-5}$ | $7.3556\ 10^{-2}$ | $1.4223\ 10^{3}$ | $3..937\ 10^{-2}$ | $2.895\ 10^{-3}$ |
| **atm** | $1.013\ 10^{5}$ | 101.33 | 1.0133 | 1013.3 | 10332 | 1 | 760 | 14.695 | 406.78 | 29.921 |
| **Torr** | 133.32 | 0.13332 | $1.3332\ 10^{-3}$ | 1.3332 | 13.595 | $1.3158\ 10^{-3}$ | 1 | $1.9337\ 10^{-2}$ | 0.535 | $3.937\ 10^{-2}$ |
| **psi** | 6897.8 | 6.8948 | $6.8948\ 10^{-2}$ | 68.948 | 703.07 | $6.8045\ 10^{-2}$ | 51.71 | 1 | 27.68 | 2.036 |
| **inH2O** | 249,09 | 0.2491 | $2.4909\ 10^{-3}$ | 2.4909 | 25.400 | $2.4583\ 10^{-3}$ | 1.8683 | $3.61\ 10^{-2}$ | 1 | $7.35\ 10^{-2}$ |
| **inHg** | 3386.4 | 3.3864 | $3.3864\ 10^{-2}$ | 33.864 | 345.32 | $3.3421\ 10^{-2}$ | 25.4 | 0.491 | 13.595 | 1 |

## 4. PARAMETERS STORED

| | PARAMETERS | Program n° | Program n° | Program n° | Program n° |
|---|---|---|---|---|---|
| **TIME** | Waiting | | | | |
| | Fill | | | | |
| | Stabilisation | | | | |
| | Test | | | | |
| | Dump | | | | |
| **REJECT** | Test reject | | | | |
| **PRESS** | Max. Pressure | | | | |
| | Min. Pressure | | | | |
| | Test Pressure | | | | |
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## 5. VALVES CODES USED IN YOUR APPLICATION

PROGRAM GROUP:

| PROGRAM | VALVE CODE | FUNCTION |
|---|---|---|
| **01** | | |
| **02** | | |
| **03** | | |
| **04** | | |
| **05** | | |
| **06** | | |
| **07** | | |
| **08** | | |
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| **29** | | |
| **30** | | |
| **31** | | |
| **32** | | |

## 6. USER NOTES

# Index