

## **ATEQ F510** Version 1.16



## **ATEQ F520** Version 1.16



**[www.ateq.com](http://www.ateq.com)**



## REVISION OF THE F510 / F520 USER MANUAL

| <u>Edition/Revision</u> | <u>Reference</u> | <u>Date</u><br>(week/year) | <u>Chapters updated</u>  |
|-------------------------|------------------|----------------------------|--|
| First edition           | UM-17100A-U      | 11/2001                    | -----  |
| Second edition          | UM-17100B-U      | 26/2001                    | Chapter 1  |
| Third edition           | UM-17100C-U      | 27/2001                    | All, up grade version 1.0 to 1.1   |
| Fourth edition          | UM-17100E-U      | 23/2002                    | Version 1.14, new functions: peak hold, symmetrical recovery limits, sensor points, RC5 remote control, 5000 Pa range, start and selection of programs not taken into account during a reset. E mark to equal to the French version. |
| Fifth edition           | UM-17100F-U      | 08/2003                    | Modification chapter 1 paragraph 3.3.1.1) J1 Connector (Output codes / analogue outputs / temperature sensors).  |
| Sixth edition           | UM-17100G-U      | 26/2003                    | Up dating of the network and remote control connections (Lumberg M12 connectors) on the F510.  |
| Seventh edition         | UM-17100H-U      | 47/2003                    | All chapters, evolution of the programme to 1.16.  |
| Eighth edition          | UM-17100I-U      | 20/2005                    | Up dating the measurements characteristics in the preamble.  |
| Ninth edition           | UM-17100J-U      | 44/2005                    | Modification of the F510 instrument CE certificate.  |
|                         |                  |                            |  |
|                         |                  |                            |  |
|                         |                  |                            |  |



# Recommendations for leak testing instruments

## 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

|  |                                       |
|--|---------------------------------------|
| <b>PREAMBLE</b>                                | <b>5</b>                              |
| <b>1. DEFINITION OF THE ATEQ F520</b>          | <b>5</b>                              |
| <b>2. MEASUREMENT CHARACTERISTICS</b>          | <b>6</b>                              |
| 2.1. Pressure drop measurement                 | 6                                     |
| 2.2. Test pressure measurement                 | 6                                     |
| 2.3. Mechanical pressure regulation            | 6                                     |
| 2.4. Electronic pressure regulation            | 6                                     |
| <b>3. THE MAIN TYPES OF MEASUREMENT</b>        | <b>7</b>                              |
| 3.1. Direct/Pressure drop measurement          | 7                                     |
| 3.2. Indirect/ Pressure rise measurement       | 7                                     |
| 3.3. Sealed component measurement              | 7                                     |
| <b>4. THE THREE TYPES OF TEST</b>              | <b>8</b>                              |
| 4.1. Test with reference                       | 8                                     |
| 4.2. Test without reference                    | 8                                     |
| 4.3. Test with central zero                    | 8                                     |
| <b>5. DIRECT MEASUREMENT, PRESSURISATION</b>   | <b>9</b>                              |
| <b>6. SYMBOLS PRESENTATION</b>                 | <b>10</b>                             |
| <b>Chapter 1</b>                               | <b>INSTALLATION OF THE INSTRUMENT</b> |
| <b>1. APPEARANCE OF THE ATEQ F510</b>          | <b>11</b>                             |
| <b>2. APPEARANCE OF THE ATEQ F520</b>          | <b>12</b>                             |
| <b>3. INSTALLATION OF THE INSTRUMENT</b>       | <b>13</b>                             |
| 3.1. Layout of connectors on the F510 cabinet  | 13                                    |
| 3.2. Layout of connectors on the F520 cabinet  | 13                                    |
| 3.3. Connector details                         | 14                                    |
| <b>Chapter 2</b>                               | <b>USER INTERFACES</b>                |
| <b>1. APPEARANCE OF F510 FRONT PANEL</b>       | <b>23</b>                             |
| <b>2. APPEARANCE OF F520 FRONT PANEL</b>       | <b>24</b>                             |
| <b>3. DESCRIPTION OF THE KEYBOARD KEYS</b>     | <b>25</b>                             |
| 3.1. Navigation keys                           | 25                                    |
| 3.2. Cycle keys                                | 26                                    |
| <b>4. LOCKABLE SWITCH</b>                      | <b>26</b>                             |
| <b>5. REGULATOR</b>                            | <b>27</b>                             |
| <b>6. INFRARED INTERFACE</b>                   | <b>27</b>                             |
| <b>7. 4 LINE LCD DISPLAY</b>                   | <b>27</b>                             |
| <b>8. RAPID CONNECTORS</b>                     | <b>27</b>                             |
| <b>9. FUNCTIONS OF THE INDICATOR LIGHTS</b>    | <b>28</b>                             |
| <b>Chapter 3</b>                               | <b>START-UP AND SETTINGS</b>          |
| <b>1. POWERING-UP THE ATEQ F510, F520</b>      | <b>29</b>                             |
| <b>2. CREATION OF A TEST PROGRAM</b>           | <b>30</b>                             |
| 2.1. Choice of the program number              | 30                                    |
| 2.2. Test type selection                       | 31                                    |
| 2.3. Parameter settings                        | 33                                    |
| <b>3. DUPLICATION OF A TEST PROGRAM</b>        | <b>38</b>                             |
| <b>4. DELETING A PROGRAM OR A PROGRAM NAME</b> | <b>40</b>                             |
| <b>5. STARTING A CYCLE</b>                     | <b>41</b>                             |
| 5.1. Choice of the program to be run           | 41                                    |
| 5.2. Setting the test pressure                 | 42                                    |
| <b>6. STARTING A MEASUREMENT CYCLE</b>         | <b>46</b>                             |
| <b>7. STOPPING A CYCLE</b>                     | <b>46</b>                             |

|                  |                                    |
|------------------|------------------------------------|
| <b>Chapter 4</b> | <b>FUNCTIONS OF THE INSTRUMENT</b> |
|------------------|------------------------------------|

|   |            |
|---|------------|
| <b>1. MENU STRUCTURE.....</b>                 | <b>47</b>  |
| 1.1. Main menu.....                           | 47         |
| 1.2. "FUNCTIONS" menu when activated.....     | 54         |
| <b>2. CONFIGURATION MENU .....</b>            | <b>57</b>  |
| 2.1. Extended menus .....                     | 57         |
| 2.2. Automatic save.....                      | 82         |
| 2.3. Electronic regulator .....               | 82         |
| 2.4. Regulator control.....                   | 83         |
| 2.5. Piezo auto zero .....                    | 83         |
| 2.6. Date & Time .....                        | 83         |
| 2.7. RS232 .....                              | 84         |
| 2.8. RS485 .....                              | 87         |
| 2.9. Modbus.....                              | 87         |
| 2.10. Security .....                          | 87         |
| 2.11. Display Light.....                      | 88         |
| 2.12. External dump option .....              | 89         |
| 2.13. Change I/O configuration .....          | 90         |
| 2.14. Remote control (RC5) .....              | 91         |
| 2.15. Auto Setup.....                         | 92         |
| <b>3. SPECIAL CYCLES MENU.....</b>            | <b>94</b>  |
| 3.1. Special cycles available .....           | 94         |
| 3.2. Available service special cycles.....    | 96         |
| 3.3. Starting the special cycles.....         | 97         |
| 3.4. Starting the Service special cycles..... | 110        |
| <b>4. SERVICE MENU .....</b>                  | <b>113</b> |
| 4.1. Parameters service .....                 | 113        |
| 4.2. Service special cycles .....             | 114        |
| <b>5. RESULTS MENU .....</b>                  | <b>115</b> |
| <b>6. LANGUAGE MENU .....</b>                 | <b>115</b> |
| <b>7. STAND BY MENU .....</b>                 | <b>115</b> |
| 7.1. Standby using the menu .....             | 116        |

|                  |                    |
|------------------|--------------------|
| <b>Chapter 5</b> | <b>ACCESSORIES</b> |
|------------------|--------------------|

|  |            |
|--|------------|
| <b>1. ACCESSORIES SUPPLIED WITH THE INSTRUMENT .....</b> | <b>117</b> |
| 1.1. Power supply.....                                   | 117        |
| <b>2. OPTIONAL ACCESSORIES.....</b>                      | <b>118</b> |
| 2.1. Calibrated master leak .....                        | 118        |
| 2.2. Needle valve and Leak/Flow Calibrator (CDF) .....   | 119        |
| 2.3. Automatic connectors with expandable joints .....   | 120        |
| 2.4. Filtration kit.....                                 | 120        |
| 2.5. Simple remote controls.....                         | 121        |
| 2.6. RC5 remote front panel.....                         | 122        |
| 2.7. Intelligent remote control.....                     | 124        |
| 2.8. INSTALLATION OF THE INTERFACE BOARD F5 TO F3 .....  | 126        |

|                  |                       |
|------------------|-----------------------|
| <b>Chapter 6</b> | <b>ERROR MESSAGES</b> |
|------------------|-----------------------|

|                             |            |
|-----------------------------|------------|
| <b>ERROR MESSAGES .....</b> | <b>127</b> |
|-----------------------------|------------|

|                  |                             |
|------------------|-----------------------------|
| <b>Chapter 7</b> | <b>OPERATIONAL PROBLEMS</b> |
|------------------|-----------------------------|

|  |            |
|--|------------|
| <b>1. PHENOMENON NOTED.....</b>                                    | <b>131</b> |
| 1.1. Condition of the machine's seals .....                        | 131        |
| 1.2. Damaged instrument seals .....                                | 131        |
| 1.3. Bumper pad.....   | 131        |
| 1.4. Pneumatic air supply too low .....                            | 131        |
| 1.5. Pneumatic Link.....   | 131        |
| 1.6. Environment .....   | 132        |
| 1.7. Calibration .....   | 132        |
| 1.8. Concerns about reliability of the instrument's circuits ..... | 132        |

|                   |                         |
|-------------------|-------------------------|
| <b>Appendices</b> | <b>ATEQ F510 / F520</b> |
|-------------------|-------------------------|

|  |            |
|--|------------|
| <b>1. TECHNICAL CHARACTERISTICS F510 AND F520.....</b> | <b>133</b> |
| <b>2. F510 CASING DIAGRAMS.....</b>                    | <b>134</b> |
| <b>3. F520 CASING DIAGRAMS.....</b>                    | <b>135</b> |
| 3.1. Short case .....                                  | 135        |
| 3.2. Long case .....                                   | 136        |
| <b>4. CONVERSION TABLE .....</b>                       | <b>137</b> |
| <b>5. PARAMETERS SAVED.....</b>                        | <b>138</b> |
| <b>6. VALVES CODES USED IN YOUR APPLICATION .....</b>  | <b>139</b> |
| <b>7. PERSONNAL NOTES .....</b>                        | <b>140</b> |

|              |            |
|--------------|------------|
| <b>Index</b> | <b>141</b> |
|--------------|------------|



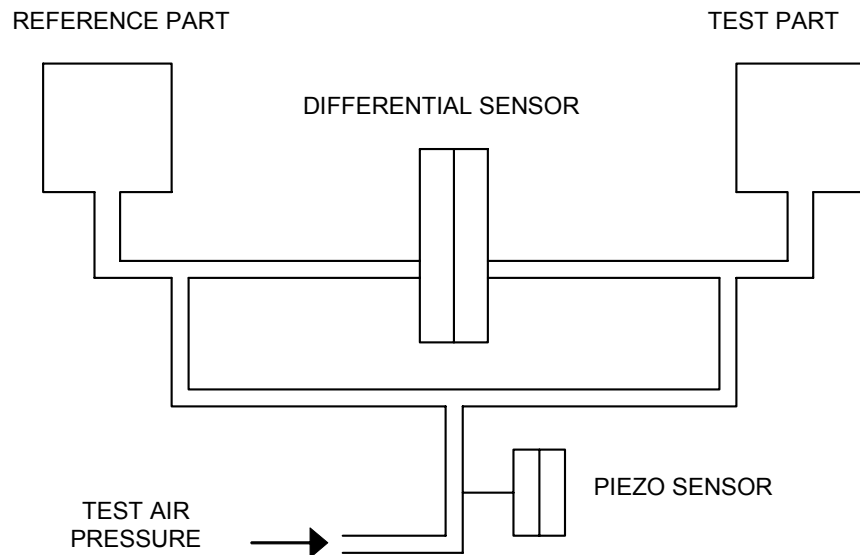
---

# PREAMBLE

---

## 1. DEFINITION OF THE ATEQ F520

The **ATEQ F510** and **ATEQ F520** are compact air/air leak detectors used to test the airtightness of parts on production lines. They are specially adapted for automatic and semi-automatic workbenches. The method used is based on the measurement of a small variation or drop in differential pressure between the test and reference parts, when both are filled to an identical pressure.



## 2. MEASUREMENT CHARACTERISTICS

### 2.1. PRESSURE DROP MEASUREMENT

| RANGE       | ACCURACY                           | RESOLUTION<br>Maximum |
|-------------|------------------------------------|-----------------------|
| 0 – 50 Pa   | +/- (2,5% of the pressure + 1 Pa)  | 0,01 Pa               |
| 0 – 500 Pa  | +/- (2,5% of the pressure + 1 Pa)  | 0,1 Pa                |
| 0 – 5000 Pa | +/- (2,5% of the pressure + 10 Pa) | 1 Pa                  |

### 2.2. TEST PRESSURE MEASUREMENT

| RANGE               | ACCURACY                             | RESOLUTION<br>Maximum |
|---------------------|--------------------------------------|-----------------------|
| P. E. = 75 mbar*    | +/- (1,5% of the pressure + 0,2 hPa) | 0,1 % P. E.           |
| P. E. < 0,3 bar     | +/- (1,5% of the pressure + 1 hPa)   | 0,1 % P. E.           |
| 0,3 ≤ P. E. ≤ 1 bar | +/- (1,5% of the pressure + 3 hPa)   | 0,1 % P. E.           |
| 1 < P. E. ≤ 5 bar   | +/- (1,5% of the pressure + 7.5 hPa) | 0,1 % P. E.           |
| 5 < P. E. ≤ 10 bar  | +/- (1,5% of the pressure + 15 hPa)  | 0,1 % P. E.           |
| 10 < P. E. ≤ 20 bar | +/- (1,5% of the pressure + 30 hPa)  | 0,1 % P. E.           |

\* Spécifique (relatif)

### 2.3. MECHANICAL PRESSURE REGULATION

- 80 kPa to - 2 kPa / 5 kPa to 50 kPa / 20 kPa to 400 kPa / 50 kPa to 800 kPa

### 2.4. ELECTRONIC PRESSURE REGULATION

- 80 kPa to - 2 kPa / 1 kPa to 10 kPa / 5 kPa to 50 kPa / 20 kPa to 200 kPa / 50 kPa to 500 kPa / 100 kPa to 1000 kPa / 100 kPa to 1600 kPa / 100 kPa to 2000 kPa.

For other specific pressures please contact ATEQ.

### 3. THE MAIN TYPES OF MEASUREMENT

There are three measurement methods:

Direct measurement, indirect measurement and sealed component measurement. These three methods apply to measurements taken both under pressure and in vacuum conditions.

The configuration is determined by the application and must be carried out prior to the use of the instrument.

#### 3.1. DIRECT/PRESSURE DROP MEASUREMENT

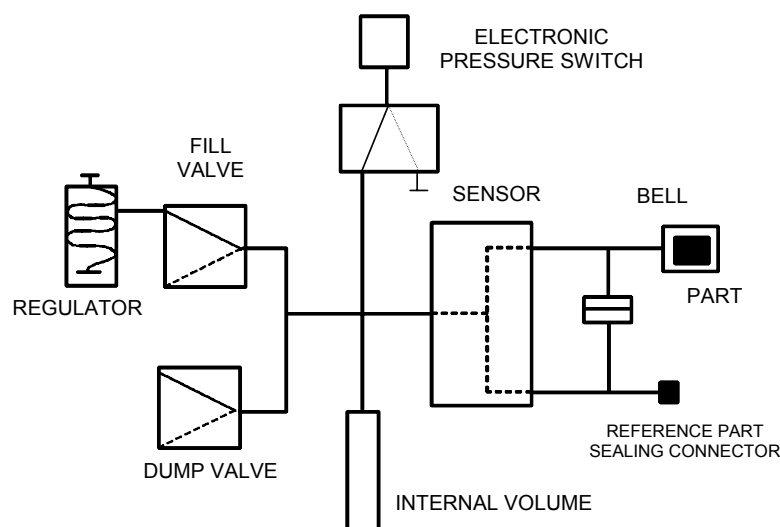
After filling the test and reference parts to the required pressure level, the instrument measures the differential pressure between the two volumes which are separated by the equalisation valve.

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

#### 3.2. INDIRECT/ PRESSURE RISE MEASUREMENT

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

#### 3.3. SEALED COMPONENT MEASUREMENT

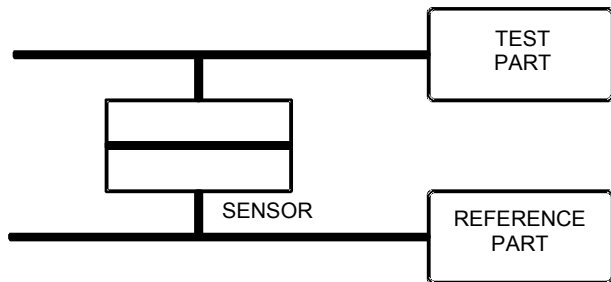


This test is for hermetically sealed parts, which can not be filled. They are placed inside a bell which is pressurised.

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

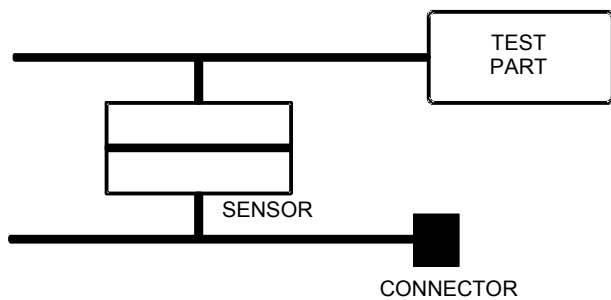
## 4. THE THREE TYPES OF TEST

### 4.1. TEST WITH REFERENCE



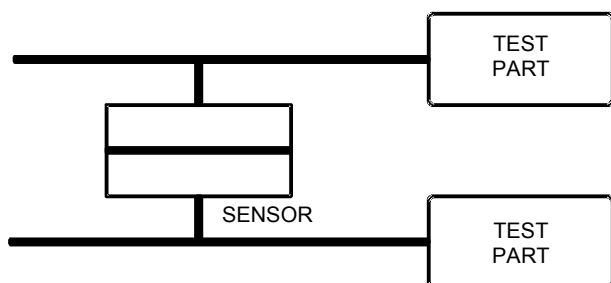
Measurement of a pressure variation between a test part and a reference part. The ideal measurement conditions are: part and reference part identical and identical **ATEQ** connections to both parts (identical lengths, diameters, and type of pipes). A measurement taken with a reference part saves time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

### 4.2. TEST WITHOUT REFERENCE



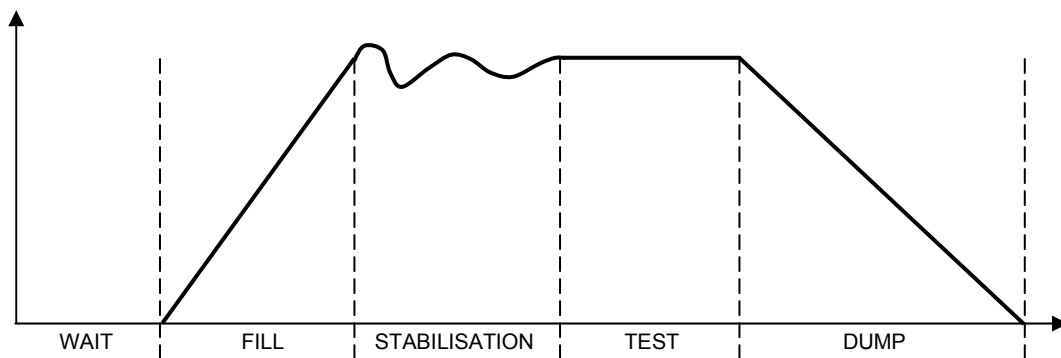
Measurement of a variation in pressure between a test part and a sealing connector on the reference side. A test without reference is not recommended unless parts with very small volumes are being tested. It is preferable always to have a certain volume on the reference side.

### 4.3. TEST WITH CENTRAL ZERO



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

## 5. DIRECT MEASUREMENT, PRESSURISATION

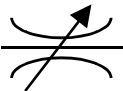
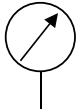
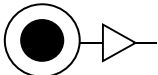
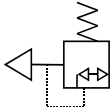

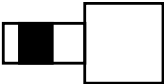
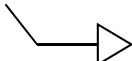


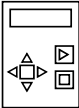
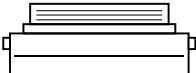
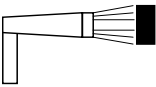







The measurement cycle consists of 5 phases:

|       | 1                    | 2                | 3                         | 4                | 5                |           |
|-------|----------------------|------------------|---------------------------|------------------|------------------|-----------|
| Start | <b>Coupling time</b> | <b>Fill time</b> | <b>Stabilisation time</b> | <b>Test time</b> | <b>Dump time</b> | Cycle end |

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

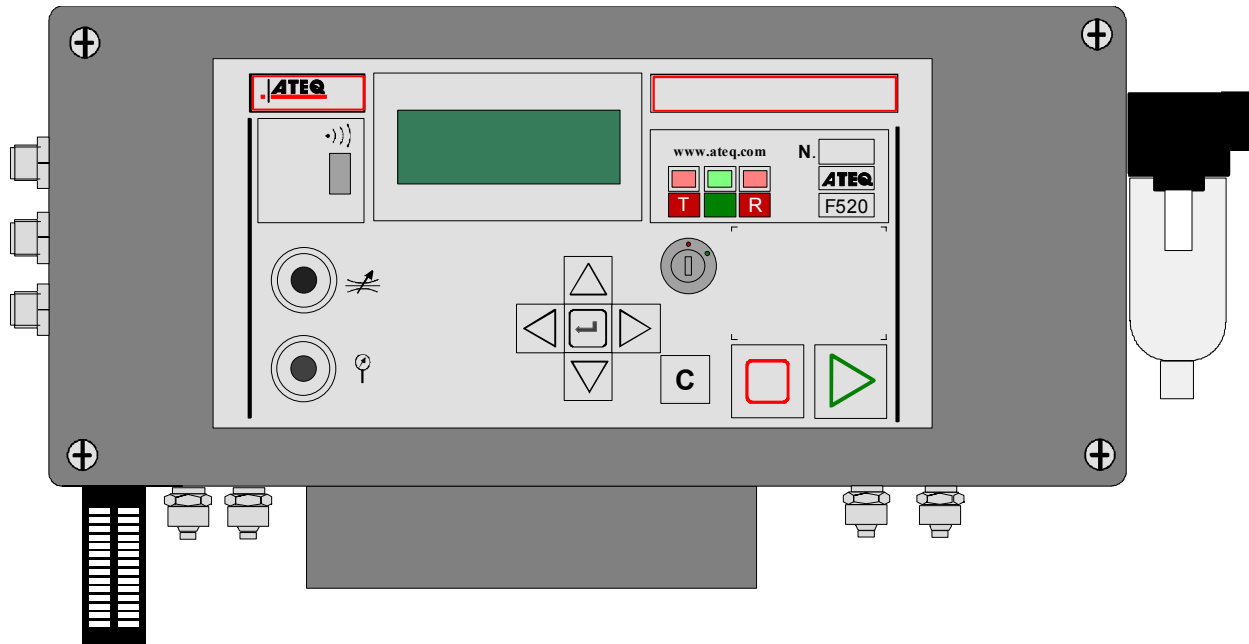
## 6. SYMBOLS PRESENTATION

| 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       | 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 bars. |
|    | 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.   |
|  | Bar code reader       | Connector for bar code reader plugging.   |
|  | 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

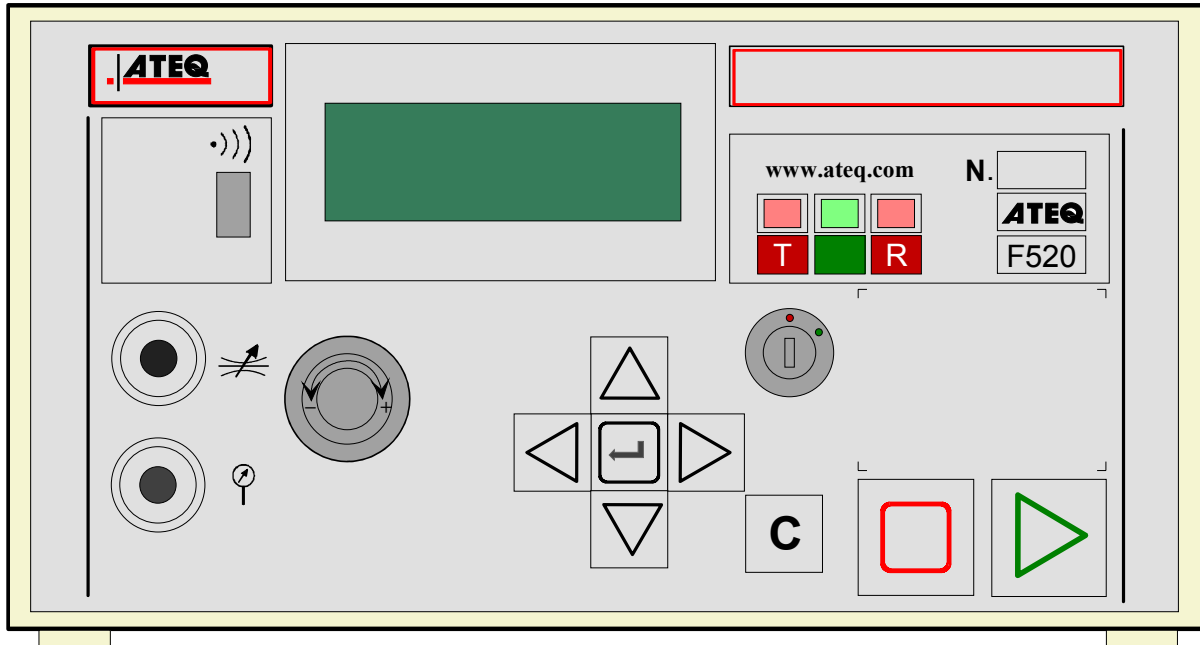
### 1. APPEARANCE OF THE ATEQ F510



The **ATEQ F510** is supplied in a water proof, moulded and painted sheet metal case (IP54).

The case has been reduced to facilitate the insertion and installation of the instrument. An external 24 V DC power supply unit is supplied with the instrument.

## 2. APPEARANCE OF THE ATEQ F520

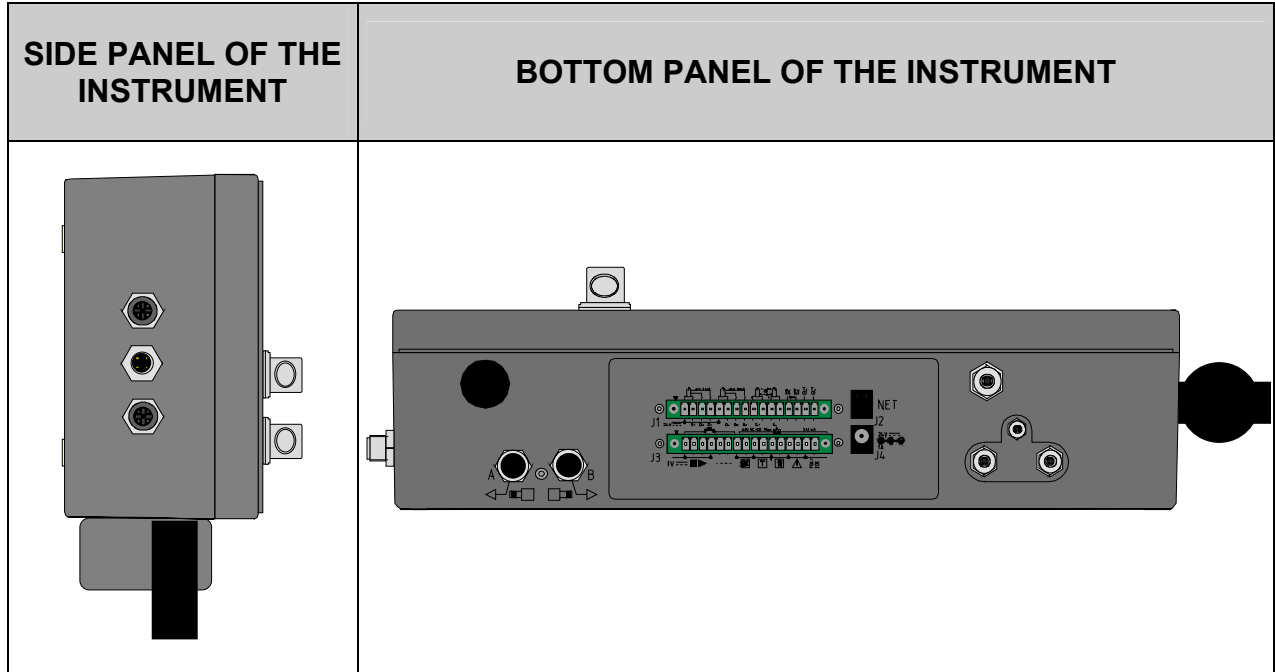


The **ATEQ F520** is supplied in a moulded, painted sheet metal case and rests on four rubber feet. The upper cover is attached to the main body by two screws.

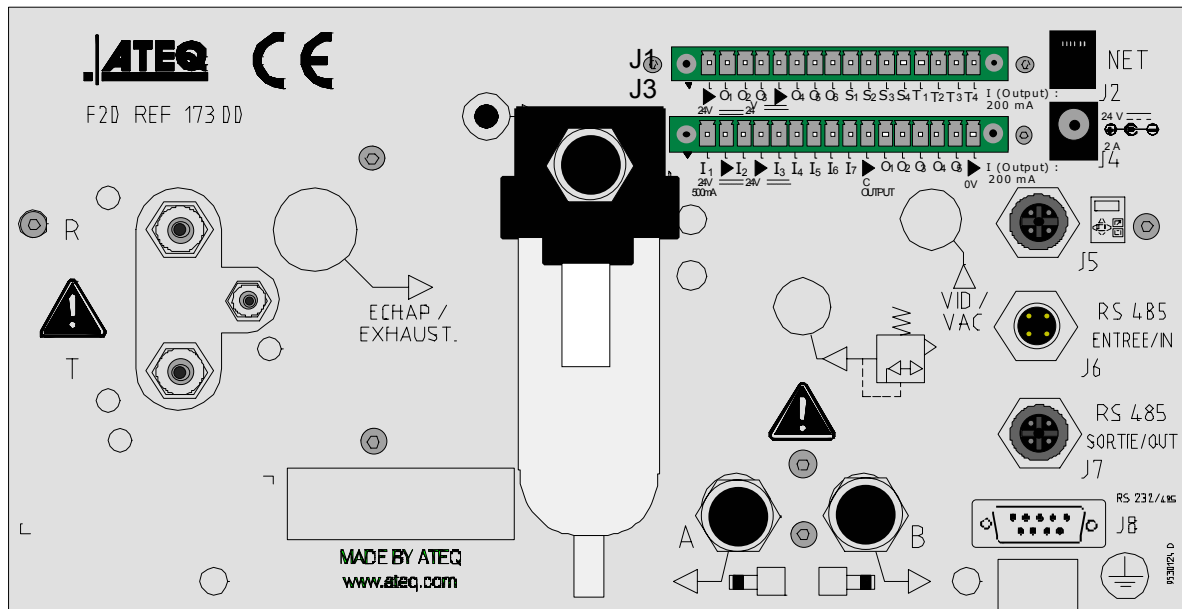
The case has been reduced to facilitate the insertion and installation of the instrument. An external 24 V DC power supply unit is supplied with the instrument.

### 3. INSTALLATION OF THE INSTRUMENT

#### 3.1. LAYOUT OF CONNECTORS ON THE F510 CABINET



#### 3.2. LAYOUT OF CONNECTORS ON THE F520 CABINET



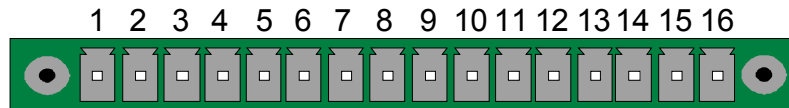
### 3.3. CONNECTOR DETAILS

#### 3.3.1. Electrical connectors

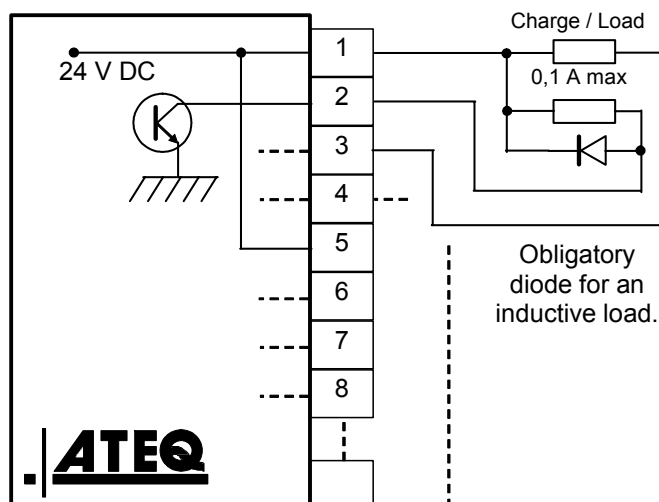
The **ATEQ F510 and F520** operate on a voltage of 24V DC either :

- ✓ using the 24V DC transformer supplied with the instrument,
- ✓ or via the networking cable when the instrument is a slave.

##### 3.3.1. 1) J1 Connector (Temperature sensor/ Output codes/ Analogue outputs)



|        |                                    |   |
|--------|------------------------------------|---|
| PIN 1  | COMMON (outputs 1, 2, 3) + 24 V DC | OUTPUT CODES<br>24V DC 100mA Max<br>Outputs |
| PIN 2  | Output n°1, open collector         |   |
| PIN 3  | Output n°2, open collector         |   |
| PIN 4  | Output n°3, open collector         |   |
| PIN 5  | COMMON (outputs 4, 5, 6) + 24 V DC |   |
| PIN 6  | Output n°4, open collector         |   |
| PIN 7  | Output n°5, open collector         | TEMPERATURE<br>SENSORS                      |
| PIN 8  | Output n°6, open collector         |   |
| PIN 9  | 12V Sensor power supply            |   |
| PIN 10 | 0V Sensor power supply             | ANALOGUE<br>OUTPUTS                         |
| PIN 11 | SENSOR n°1 input                   |   |
| PIN 12 | SENSOR n°2 input                   |   |
| PIN 13 | Analogue outputs n°1               |   |
| PIN 14 | COMMON (analogue output 1)         |   |
| PIN 15 | Analogue output n°2                |   |
| PIN 16 | COMMON (analogue output 2)         |   |

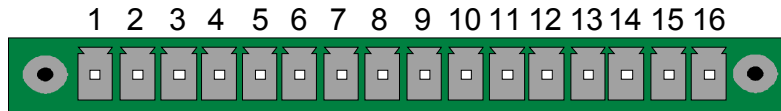


3.3.1. 2) J2 Connector



Telephone socket. Not used.

3.3.1. 3) J3 Connector (Binary inputs/outputs)



| Pin | Standard mode                | Compact mode                             |   |
|-----|------------------------------|--|---|
| 1   | Input 1<br>Reset             | Input 1<br>Reset                         | INPUTS<br>(Activation par<br>24 V DC)<br>Common<br>+ 24 V = 0,3 A<br>maxi |
| 2   | Common (+ 24 V)              | Common (+ 24 V)                          |   |
| 3   | Input 2<br>START             | Input 2<br>START                         |   |
| 4   | Common (+ 24 V)              | Common (+ 24 V)                          |   |
| 5   | Input 3<br>Program selection | Input 3<br>Program selection             |   |
| 6   | Input 4<br>Program selection | Input 4<br>Program selection             |   |
| 7   | Input 5<br>Program selection | Input 5<br>Program selection             |   |
| 8   | Input 6<br>Program selection | Input 6<br>Program selection             |   |
| 9   | Input 7<br>Program selection | Input 7<br>Program selection             |   |
| 10  | Floating common output       | Floating common output                   |   |
| 11  | Output 1<br>Pass part        | Output 1<br>Pass part cycle 1            |   |
| 12  | Output 2<br>Test error       | Output 2<br>Fail part<br>cycle 1 + alarm |   |
| 13  | Output 3<br>Reference error  | Output 3<br>Pass part cycle 2            |   |
| 14  | Output 4<br>Alarm            | Output 2 Fail part<br>cycle 2 + alarm    |   |
| 15  | Output 5<br>Fin de cycle     | Output 5<br>Fin de cycle                 |   |
| 16  | 0 V                          | 0 V                                      |   |

The compact mode is a software function which is activated in the **CONFIGURATION / CHANGE I/O / OUTPUT** menu.

**3.3.1. 4) Activating a program from the J3 connector inputs**

To activate a program from the J3 connector inputs, you have to select pins 5 to 9 (one or more). 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               |

**3.3.1. 5) J3 Connector (Binary inputs/outputs) programmable input**

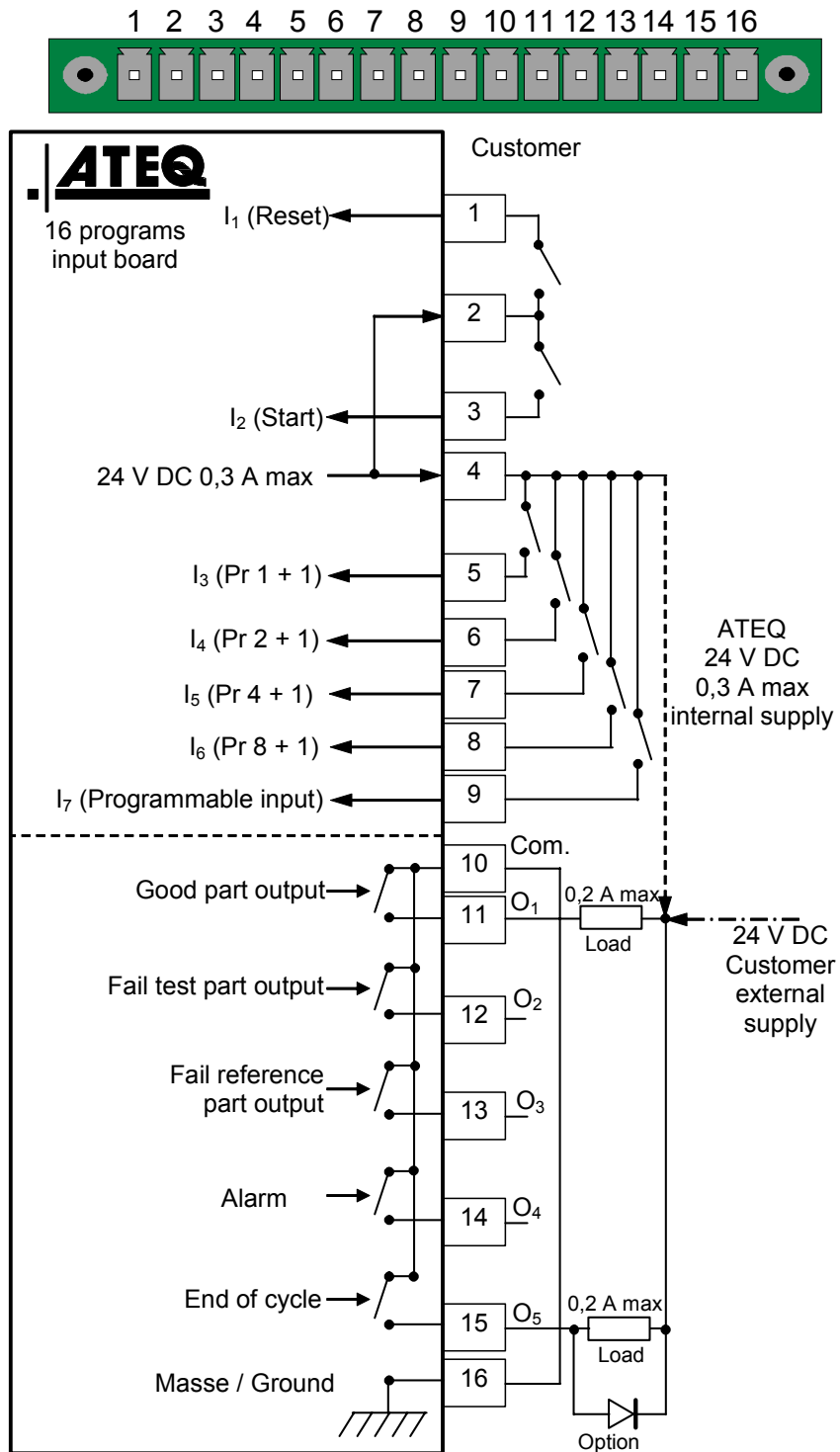
Input 7 (pin 9) parameters can be set in the **CONFIGURATION/CHANGE I/O** menu.

The functions which can be programmed and are available on this input are all the specials cycle:

- ✓ Program selection.
- ✓ Regulator 1 adjust request.
- ✓ Regulator 2 adjust request.
- ✓ Infinite fill request.
- ✓ Piezo auto zero request.
- ✓ Pass part sealed component learn request.
- ✓ Fail part sealed component learn request.
- ✓ Calibration check by volume request.
- ✓ Custom unit learn request.
- ✓ Custom unit check request.
- ✓ ATR learning cycle request.
- ✓ Volume calculation request.

Some possibilities appear only if the function is used.

3.3.1. 6) J3 Connector (binary inputs/outputs) diagram



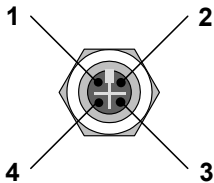
**Note:** The 24V power supply must be provided by the internal power supply of the ATEQ instrument (0,3A maximum) **OR** through an external power supply provided by the customer.

### 3.3.1. 7) J4 Connector



Used for connection of the power supply.  
The voltage must be 24 V DC with minimum current 1.25 A.  
The instrument can be supplied from the J3 connector relay board on the 24 V DC pin.

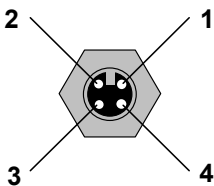
### 3.3.1. 8) J5 Connector (remote)



Used for connection of an intelligent remote control.  
(Lumberg female connector).

|       |                    |
|-------|--------------------|
| PIN 1 | Network            |
| PIN 2 | + 24V Power supply |
| PIN 3 | Network            |
| PIN 4 | 0V Earth           |

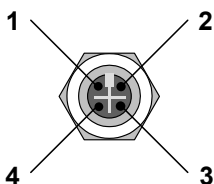
### 3.3.1. 9) J6 Input Connector (RS485)



Reserved for **ATEQ** network  
Used for communication with other **ATEQ** instruments.  
(Lumberg male connector).

|       |                    |
|-------|--------------------|
| PIN 1 | Network            |
| PIN 2 | + 24V Power supply |
| PIN 3 | Network            |
| PIN 4 | 0V Earth           |

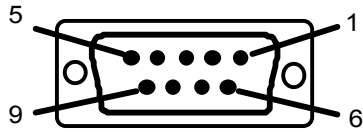
### 3.3.1. 10) J7 Output connector (RS485)



Reserved for **ATEQ** network  
Used for communication with other **ATEQ** instruments.  
(Lumberg female connector).

|       |                    |
|-------|--------------------|
| PIN 1 | Network            |
| PIN 2 | + 24V Power supply |
| PIN 3 | Network            |
| PIN 4 | 0V Earth           |

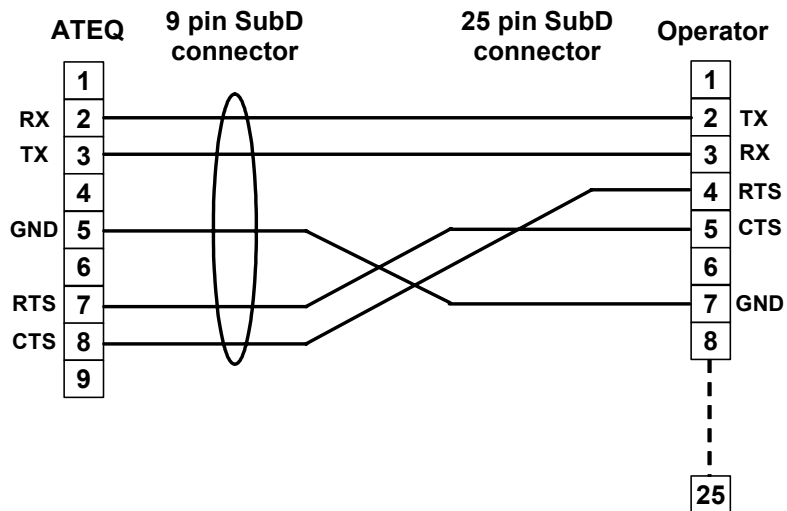
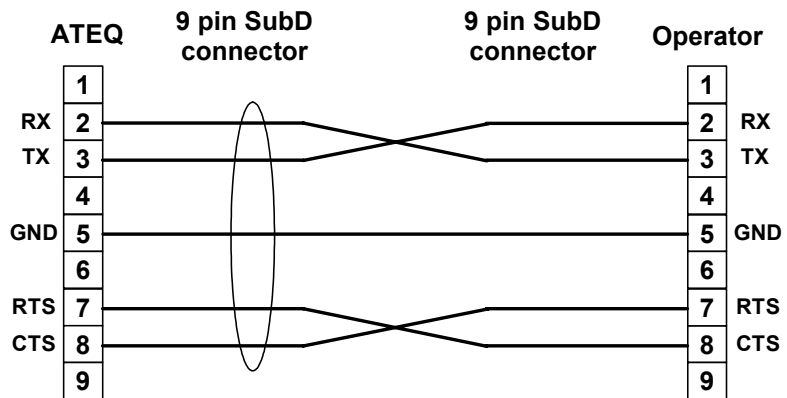
3.3.1. 11) J8 connector (RS232)



Enables the connection of a printer, bar code reader, PC and memory module.

|       |                     |
|-------|---------------------|
| PIN 1 | Not used            |
| PIN 2 | RXD data input      |
| PIN 3 | TXD data output     |
| PIN 4 | Not used            |
| PIN 5 | Earth/Ground        |
| PIN 6 | Not used            |
| PIN 7 | RTS request to send |
| PIN 8 | CTS clear to send   |
| PIN 9 | Not used            |

3.3.1. 12) Examples of RS232 cables



### 3.3.2. Pneumatic connectors

Pneumatic connectors can be on the front or rear panels of the **F520** instrument. On the **F510** instrument the connectors are only on the underside.

These pneumatic outputs may take on the functionalities shown below depending on the configuration requested when the instrument was purchased.

| "Automatic connector A" output | "Automatic connector B" output     |
|--------------------------------|------------------------------------|
| Automatic connector A          | Automatic connector B              |
| Automatic connector A          | Marking (output code 1 used)       |
| Automatic connector A          | External dump (output code 2 used) |
| Marking (output code 1 used)   | Dump (output code 2 used)          |

#### 3.3.2. 1) Automatic connector A



Used for connection of an automatic pneumatic connector.

#### 3.3.2. 2) Automatic connector B



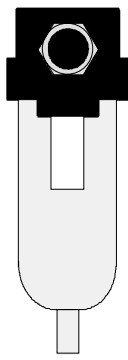
Used for connection of a second automatic pneumatic connector.

#### 3.3.2. 3) Pneumatic inputs/outputs

These outputs enable parts to be connected (test, reference). Depending on their position on the **F520** case (front or rear panel), the test and reference outputs may be reversed. The pressurisation output is used for the addition of **ATEQ** accessories (Y valve).

| F520 rear panel pneumatic outputs |   | F510 bottom panel pneumatic outputs   |
|-----------------------------------|---|---|
|                                   | <p>Reference output R</p> <p>Pressurisation output</p> <p>Test output T</p> | <p>R : reference output<br/>P : pressurisation output<br/>T : test output</p> |

## 3.3.2. 4) Pneumatic supply

|   |   |
|---|---|
|  | <p>Air supply is via the filter located on the rear panel of the instrument for the <b>F520</b>, or on the side for the <b>F510</b>.</p> <p><b>Note:</b> when an electronic regulator is used with test pressures above 800 kPa (8 bar) (normal service pressure), another "high pressure" input for the test circuit is installed on the instrument.</p> |
|---|---|

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 $\mu\text{m}$ and 0.1 $\text{mg}/\text{m}^3$ ) |
| • Dew point under pressure     | CLASS 2 | (- 40° dew)   |
| • Maximum concentration of oil | CLASS 1 | (0.01 $\text{mg}/\text{m}^3$ )                      |

**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.

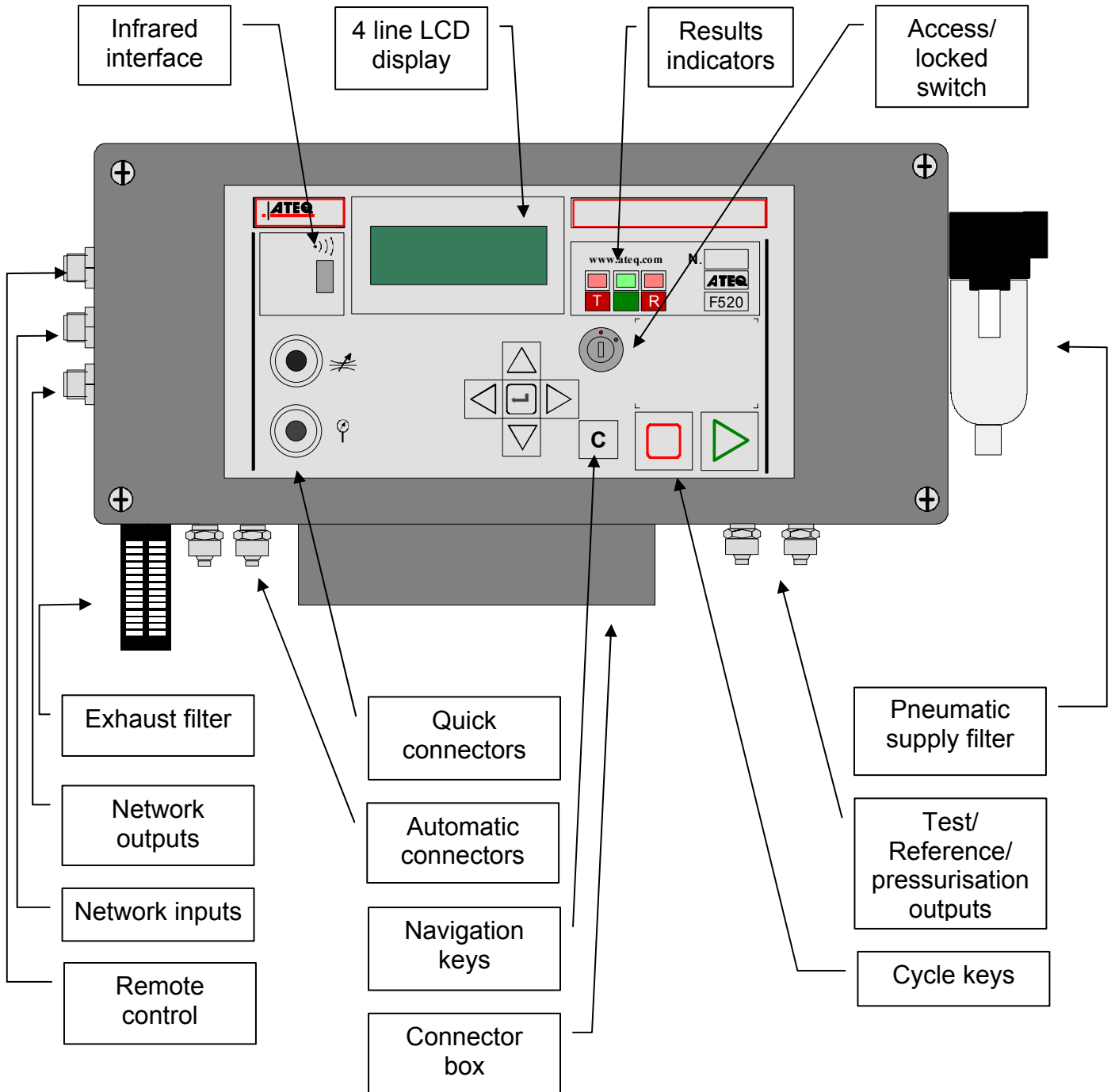
**When a mechanical regulator is used, the supply pressure must be a minimum of 100 kPa (1 bar) greater than test pressure with a minimum of 400 kPa (4 bar).**

**If an electronic regulator is used, the regulator input pressure must be at least 10% greater than the value of full scale on the electronic regulator + 100 kPa (+ 1 bar).**

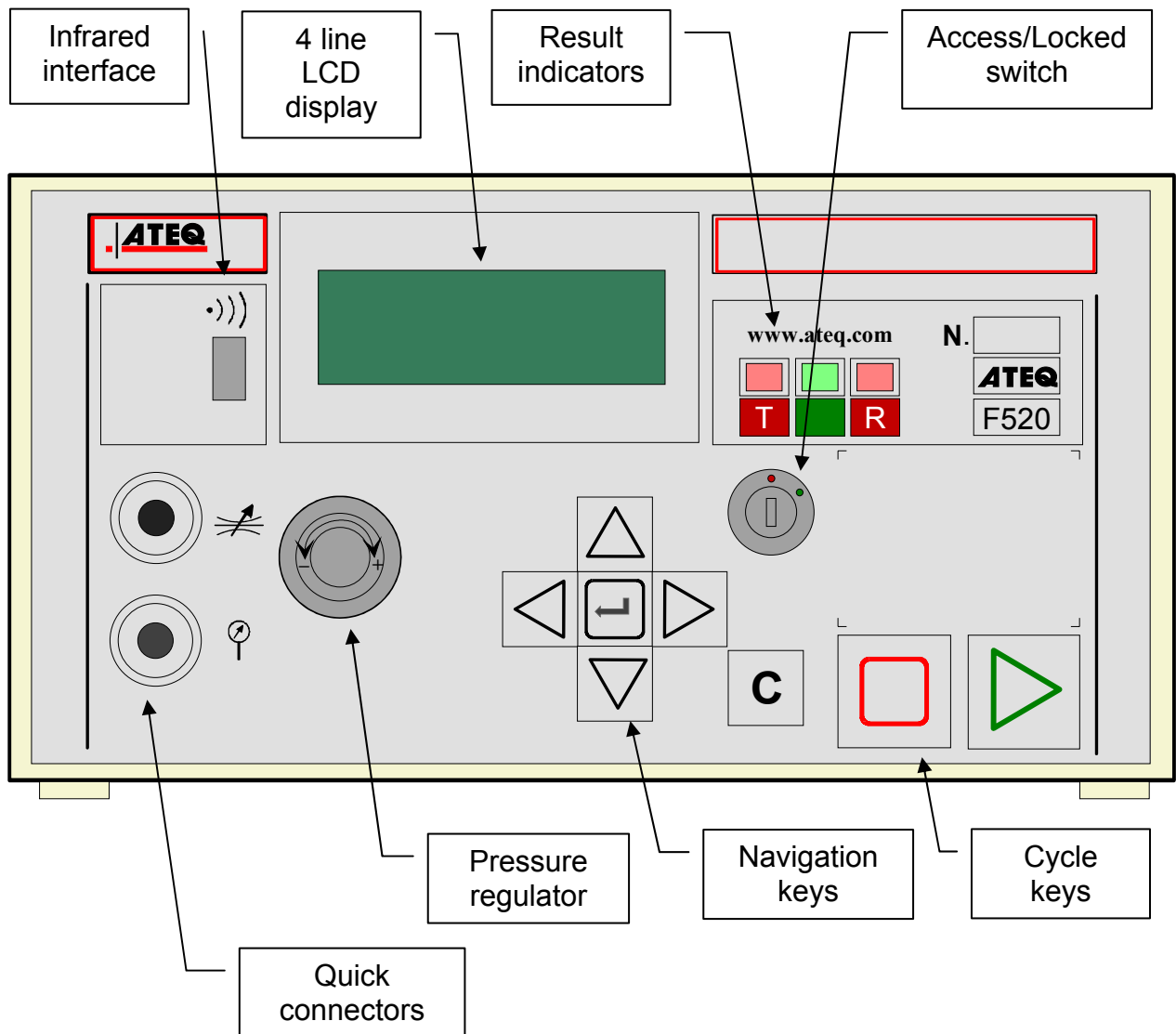


# Chapter 2 USER INTERFACES

## 1. APPEARANCE OF F510 FRONT PANEL

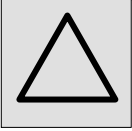
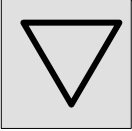
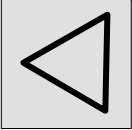
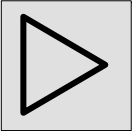

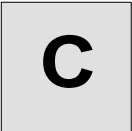


## 2. APPEARANCE OF F520 FRONT PANEL


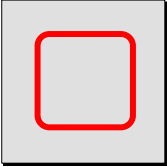


### 3. DESCRIPTION OF THE KEYBOARD KEYS

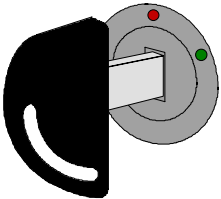
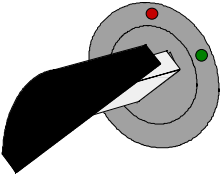
#### 3.1. NAVIGATION KEYS

| KEY   | FUNCTION   |
|---|--|
|    | Scroll up or<br>increase numerical values  |
|    | Scroll down or decrease numerical values   |
|   | Not used   |
|  | Not used   |
|  | <b>ENTER</b> key<br>Opening a menu<br>Entering a parameter<br>Confirmation of a parameter                            |
|  | « <b>C</b> » for <b>CANCEL</b><br>Return to the previous menu<br>or function<br>Escape without modifying a parameter |

3.2. CYCLE KEYS

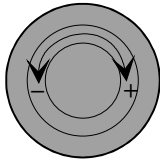
| KEY   | FUNCTION   |
|---|--|
|  | <p><b>START</b> key<br/>Starts a measurement cycle</p> |
|  | <p><b>RESET</b> key<br/>Stops a cycle in progress</p>  |

4. LOCKABLE SWITCH

| POSITION  | FUNCTION   |
|---|--|
|  | <p><b>LOCKED</b> position.<br/>Access to adjustable parameters not possible.</p> |
|  | <p><b>ACCESS</b> position.<br/>Adjustable parameters may be accessed.</p>        |

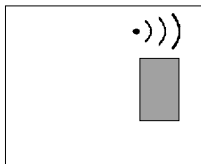
**Note:** whatever position the key is in (**LOCKED** or **ACCESS**), test cycles can be started and stopped.

## 5. REGULATOR



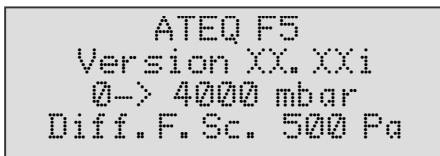
Used to adjust the test pressure

## 6. INFRARED INTERFACE



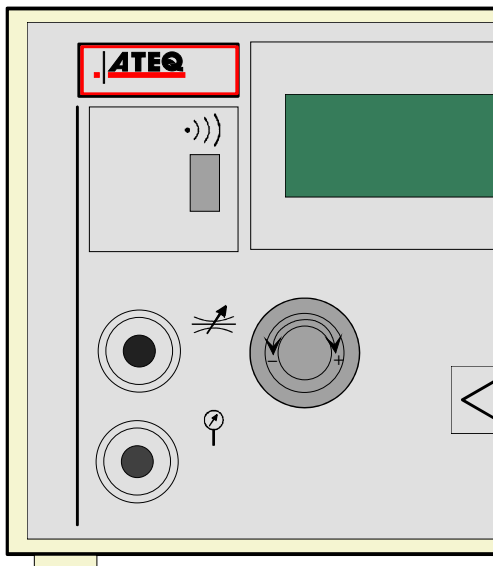
Enables communication of data (Key, PC, Leak/Flow Calibrator (CDF), etc....)

## 7. 4 LINE LCD DISPLAY



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

## 8. RAPID CONNECTORS




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

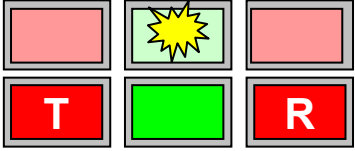
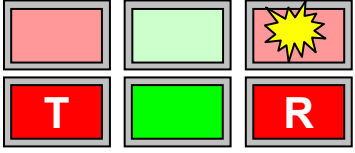
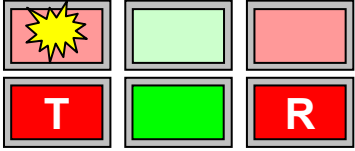
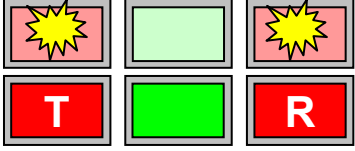

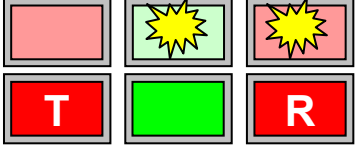
These enable pressure and calibration to be checked easily. The first is used for the regulator circuit. It enables the value of the test pressure shown by the instrument, measured with a pressure gauge or the **ATEQ Leak/Flow Calibrator (CDF)**, to be checked. This connector is not part of the measurement 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  $\text{cm}^3/\text{min}$  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.**

### 9. FUNCTIONS OF THE INDICATOR LIGHTS

The  symbol represents an indicator which is lit.

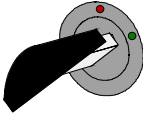

|  |  |
|--|--|
| <p>Test part PASS indicator</p>                            |    |
| <p>Reference side part FAIL indicator</p>                  |    |
| <p>Test side part FAIL indicator</p>                       |    |
| <p>Warning</p>   |  |
| <p>Stand-by<br/>(intermittently flashing indicator)</p>    |  |
| <p>Re-workable parts<br/>(indicators continuously lit)</p> |  |

## Chapter 3


**START-UP AND SETTINGS****1. POWERING-UP THE ATEQ F510, F520**

|   |  |   |
|---|--|---|
| <p>Supply the apparatus with 24 V DC.<br/>When powered up the instrument:</p> |  |   |
| <p>- displays version and the full scale of the sensors...</p>                |  | <pre>ATEQ F5 Version XX.XXi 0-&gt; 4000 mbar Diff. Range 500 Pa</pre> |
| <p>...then displays the main menu.</p>  |  | <pre>RUN/Pr: 001 PRESS = 0.000 bar  READY</pre>                       |

## 2. CREATION OF A TEST PROGRAM

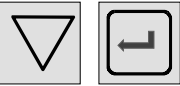
|   |   |  |
|---|---|--|
| <p>To modify the parameters, turn the key to the <b>ACCESS</b> position.</p>  |  | <pre> RUN/Pr: 001 PRESS = 0.000 bar  READY                     </pre>                  |
| <p>To access the main menu, press <b>ENTER</b>.<br/>In the main menu, place the cursor in front of the <b>PARAMETERS</b> menu.<br/>Confirm with the <b>ENTER</b> key.</p>   |  | <pre> MAIN MENU RUN PROG. : --- PARAMETERS SPE CYCLE : none                     </pre> |
| <p>The <b>PARAMETERS</b> menu is used to manage test programs.</p> <ul style="list-style-type: none"> <li>☞ If the various programs to be created have different parameters, they must be created one by one.</li> <li>☞ 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.</li> </ul> |   | <pre> PARAMETERS Copy-Paste Pr : 001 ----- Pr : 002 -----                     </pre>   |

### 2.1. CHOICE OF THE PROGRAM NUMBER

|   |   |  |
|---|---|--|
| <p>Position the cursor in front of the chosen program number and confirm with the <b>ENTER</b> key.</p> |  | <pre> PARAMETERS Copy-Paste Pr : 001 ----- Pr : 002 -----                     </pre> |
|---|---|--|

## 2.2. TEST TYPE SELECTION

Four types of test are available.

|   |   |  |
|---|---|--|
| <p>The <b>PARAMETERS</b> menu gives access to four possible types of test: leak test (<b>LEAK TEST</b>), pressure test (<b>BLOCKAGE</b>), desensitized mode test (<b>DESENSITIZED TEST</b>) and an operator test (<b>OPERATOR</b>); see the following paragraph for explanations.</p> <p>Put the cursor in front of the required test type and confirm with the <b>ENTER</b> key.</p> |  | <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">             PARAM/TYPE<br/>             LEAK TEST<br/>             BLOCKAGE<br/>             DESENSITIZED TEST           </div> |
|---|---|--|

### 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:

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

F(cm<sup>3</sup>/min) = leak flow

V (cm<sup>3</sup>) = volume of the test part

ΔP (Pa/s) = pressure drop

**Example :**

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

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

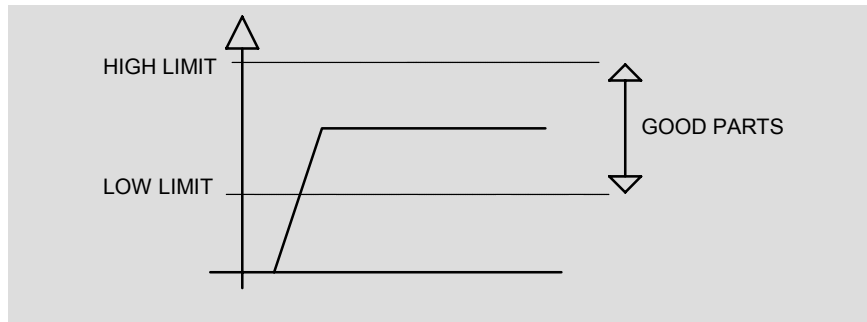
In all events, it must not be forgotten that the range of the sensor in Pa or Pa/s is limited to 50, 500 or 5000 Pa depending on the instrument configuration.

### 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. Desensitized mode test

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

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

☞ The Custom unit check function cannot be used in this mode.

### 2.2.4. Operator mode test

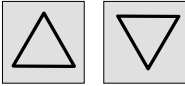

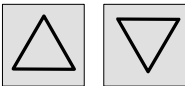

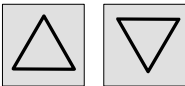

This type of test means that the operator can carry out operations on the part whilst under test, then to confirm these operation using a "START"  key if the operator

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.

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

### 2.3.1. Coupling time

Coupling times A and B are start of cycle parameters.

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

If an instrument is fitted with an automatic connector, Coupling time A delays the pressurisation of the test part by allowing the activation of a first cycle connector at the test start. Coupling time B allows the activation of a second automatic connector. These Coupling times ensure better stabilisation of the seals placed on the test part.

☞ 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.

Determine the TTLR by using the following formula:

$$\text{TTLR} = \sqrt[4]{\text{volume in cm}^3 \times \text{test pressure in mbar}}$$

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

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

### 2.3.3. Stabilisation time

This time is used to equalise the pressure between the **TEST** and **REFERENCE** components.

Two phenomena may interfere with the equalisation:

#### ✓ Different pipes

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

### ✓ Different volumes

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

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

- ✓ To determine the correct stabilisation time, it is necessary to set a long time so that the reading at the end of the test time is 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. Set the Fill instruction

This function gives the user the option not to have to adjust the test pressure manually using the regulator. Simply set the test pressure value and the instrument adjusts it automatically. This function can be used with a mechanical regulator (regulator with an adjustable tap) or an electronic regulator (no adjustment).

#### 2.3.9. 1) Setting

Simply set the regulator to a pressure which is higher than test pressure. When target fill pressure is reached, the air supply is automatically cut off and the instrument moves into stabilisation mode.

### 2.3.10. FAIL unit

Pa, Pa/s, (High Resolution) Pa, (High Resolution) Pa/s, Cal-Pa, Cal-Pa/s, cm<sup>3</sup>/min, cm<sup>3</sup>/s, cm<sup>3</sup>/h, mm<sup>3</sup>/s.

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).

There is a special “**compute volume**” cycle which enables the volume of a part to be estimated, and there is a special “**Custom unit learn**” cycle to determine a basic unit of flow. (See chapter 4 paragraph 3.3.6 “volume compute” and paragraph 3.3.7 “manual calibration”).

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

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

### 2.3.11. Test FAIL

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.

### 2.3.12. Reference FAIL

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

**Note:** when the reference reject value is zero, the program allows for the absolute value of the test reject (for example : if the test reject is 10 Pa, and the reference reject value equal to zero, the program takes the reference reject to be – 10 Pa).

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

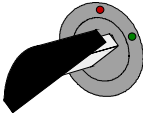

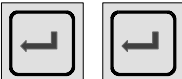

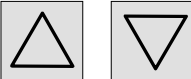


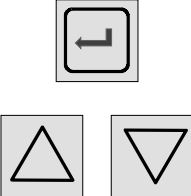
### 2.3.13. Functions



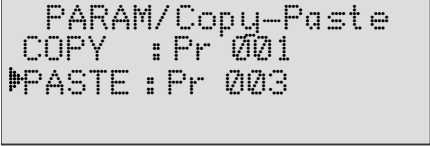


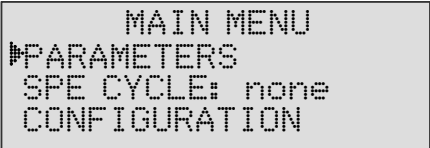
The **FUNCTION** menu gives access to additional parameters which must first be activated in the **CONFIGURATION** menu and then the **EXTENDED MENU**.

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

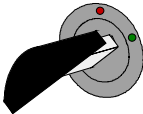
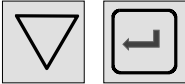






To activate these parameters, please refer to chapter 4 § 2.

### 3. DUPLICATION OF A TEST PROGRAM

|  |   |   |
|--|---|---|
| <p>To modify the parameters, turn the key to the <b>ACCESS</b> position.</p>   |    |   |
| <p>Starting from the main menu, position the cursor in front of the <b>PARAMETERS</b> function.</p>  |    | <pre> MAIN MENU RUN PROG.   : 01 PARAMETERS SPE CYCLE  : none                     </pre>    |
| <p>Confirm with the <b>ENTER</b> key. The cursor will appear in front of the Copy-Paste function. Confirm the function again using the <b>ENTER</b> key.</p> |    | <pre> PARAMETERS Copy-Paste Pr : 001 ENGINE Pr : 002 HEAD                     </pre>        |
| <p>Next, confirm the <b>COPY</b> function.</p>   |   | <pre> PARAM/ Copy-Paste COPY      : Pr --- PASTE     : Pr ---                     </pre>    |
| <p>Display the number of the program to be copied using the navigation keys. (In this case, program no.1).</p>   |  | <pre> PARAM/ Copy-Paste COPY      : Pr 001  4 PASTE     : Pr ---                     </pre> |
| <p>Confirm using the <b>ENTER</b> key.</p>   |  | <pre> PARAM/ Copy-Paste COPY      : Pr 001 PASTE     : Pr ---                     </pre>    |
| <p>Placer the cursor in front of the <b>PASTE</b> function.</p>  |  | <pre> PARAM/ Copy-Paste COPY      : Pr 001 PASTE     : Pr ---                     </pre>    |
| <p>Confirm with the <b>ENTER</b> key. Assign a number to this new program using the navigation keys (For example no.3).</p>                                  |  | <pre> PARAM/ Copy-Paste COPY      : Pr 001 PASTE     : Pr 003 4                     </pre>  |

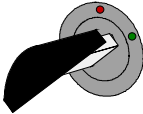


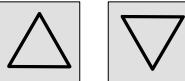

|   |   |  |
|---|---|--|
| <p>Confirm with the <b>ENTER</b> key,<br/>The display confirms that the<br/>program has been copied.</p>  |    |  |
| <p>The program no.1 parameters<br/>have now been copied into<br/>program no.3 parameters.<br/>In this example program no.3<br/>is an exact copy of program<br/>n°1.</p> |   |  |
| <p>Press the <b>CANCEL</b> key twice<br/>to return to the main menu.</p>  |   |  |

4. DELETING A PROGRAM OR A PROGRAM NAME

|   |   |   |
|---|---|---|
| <p>To modify the parameters, turn the key to the <b>ACCESS</b> position.</p>  |    |   |
| <p>Position the cursor in front of <b>PARAMETERS</b> function. Confirm with the <b>ENTER</b> key.</p>   |    | <pre> MAIN MENU RUN PROG.   : 01 PARAMETERS SPE CYCLE  : none                     </pre>          |
| <p>Position the cursor in front of the program number or the program name to be deleted.</p>  |    | <pre> PARAMETERS Copy-Paste Pr: 001 ENGINE Pr: 002 HEAD                     </pre>                |
| <p>Confirm once to enter the program.</p>   |   | <pre> PARAM/Pr001 TYPE : LEAK COUPL. A : 00.00 ε COUPL. B : 00.00 ε                     </pre>    |
| <p>Confirm a second time to gain access to the delete menu. There are two possibilities: delete the program name or delete the whole program.</p> |  | <pre> M/Pr001/TEST TYPE Delete name Reset program Delete custom name                     </pre>   |
| <p>1° Confirm a third time. The name of the program is deleted.</p>   |  | <pre> PARAMETERS Copy-Paste Pr: 001 ----- Pr: 002 HEAD                     </pre>                 |
| <p>2° Place the cursor in front of Program reset.</p>   |  | <pre> PARAM/Pr001/TEST TY Delete name Reset program Delete custom name                     </pre> |
| <p>Confirm with the <b>ENTER</b> key. The program is then deleted.</p>  |  | <pre> PARAMETERS Copy-Paste Pr: 001 ----- Pr: 002 HEAD                     </pre>                 |

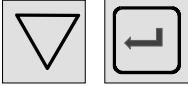
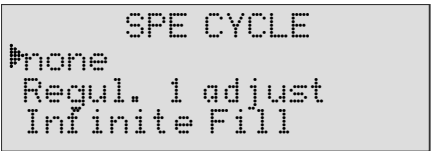

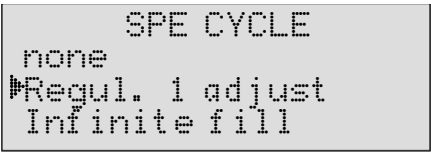
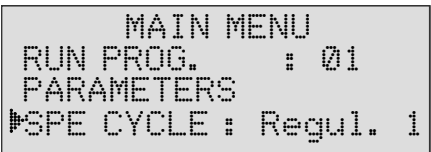

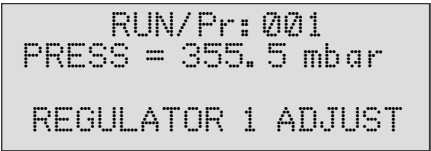
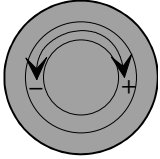
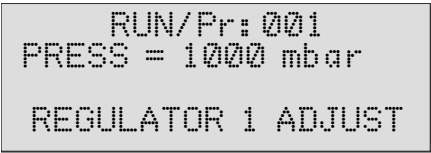

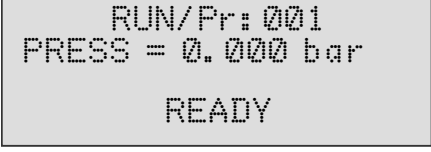
## 5. STARTING A CYCLE

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

|  |   |   |
|--|---|---|
| <p>Position the key in the <b>ACCESS</b> position.</p>   |    |   |
| <p>Starting from the main menu, place the cursor in front of the <b>RUN PROG.</b> function.</p>              |    | <pre> MAIN MENU ▶RUN PROG.:  001 PARAMETERS SPE CYCLE : none                     </pre>   |
| <p>Confirm with the <b>ENTER</b> key.</p>  |    | <pre> MAIN MENU ▶RUN PROG.   : 01 PARAMETERS SPE CYCLE : none                     </pre>  |
| <p>Display the number of the program required by scrolling through the numbers with the navigation keys.</p> |  | <pre> MAIN MENU RUN PROG.   : 04 ◀ PARAMETERS SPE CYCLE : none                     </pre> |
| <p>Confirm your choice with the <b>ENTER</b> key.</p>  |  | <pre> MAIN MENU ▶RUN PROG.   : 04 PARAMETERS SPE CYCLE : none                     </pre>  |

5.2. SETTING THE TEST PRESSURE

5.2.1. Manual setting with a mechanical regulator

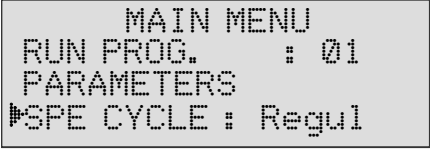




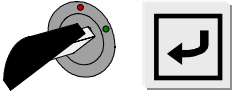
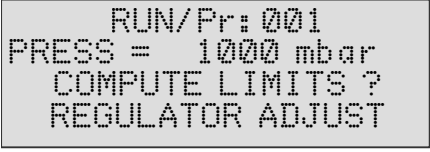

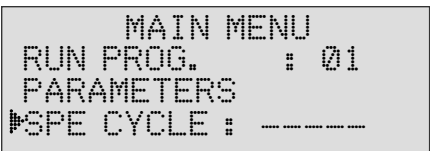
|   |   |  |
|---|---|--|
| <p>Position the cursor in front of the <b>SPE CYCLE</b> function and confirm with the <b>ENTER</b> key.</p> |    |    |
| <p>Next, position the cursor in front of Regulator adjust and confirm with the <b>ENTER</b> key.</p>        |    |    |
| <p>The display confirms that the special cycle has been selected.</p>                                       |   |    |
| <p>Press the <b>START</b> key to launch a special cycle.</p>  |   |   |
| <p>Set the test pressure by using the regulator.</p>  |  |  |
| <p>Once the pressure is set, press the <b>RESET</b> key to stop the special cycle.</p>                      |  |  |

If your instrument has two pressure regulators, see chapter 4, paragraph 3.3.1 "regulator" and 3.3.2 "regulator 2" for setting the two test pressures.

### 5.2.2. Setting a fill instruction with an electronic regulator

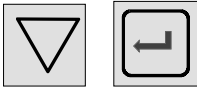
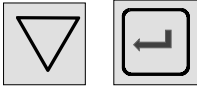





When instrument is fitted with an electronic regulator, the test pressure value is that shown since this is the fill target. No special cycle is required.



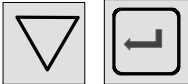
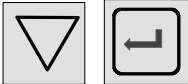

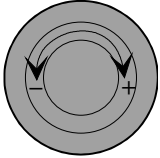

To enter a fill target see the previous section.

|   |   |  |
|---|---|--|
| <p>Select the special cycle "Regulator adjust" as the precedent paragraph.</p>  |   |    |
| <p>Press the <b>START</b> key to launch a special cycle.</p>  |    |    |
| <p>Adjust the value of the pressure instruction using the up and down arrows.</p>   |    |    |
| <p>To validate the new instruction, turn the key in <b>ACCES</b> position, then validate with the <b>ENTER</b> key.</p> <p><i>Note: to not validate the new instruction, do not execute this operation.</i></p> |  |  |
| <p>Press the <b>RESET</b> key to stop the special cycle.</p>  |  |  |


**Note:** the input pressure for an instrument with electronic regulator must be at least 100 kPa (1 bar) greater than test pressure.

### 5.2.3. Setting a fill instruction using a mechanical regulator


|   |   |  |
|---|---|--|
| <p>To access the filling instruction function, it must first be activated in the extended menus before the test program is created.<br/> Refer to chapter 4 § 2.1 « <b>EXTENDED MENUS</b> »<br/> and § 2.1.1 « <b>Activation of additional functions</b> ».<br/> Then refer to § 2.1.3.9) « <b>Fill mode</b> ».<br/> If the instrument is fitted with two regulators<br/> also refer to § 2.1.3.9) d) « <b>Fill regulator</b> »<br/> to identify which of the two regulators is the fill regulator.</p> |   |  |
| <p>When the special functions have been activated, return to the test program and select the <b>FUNCTION</b> menu. Confirm using <b>ENTER</b>.</p>  |    | <pre>PARAM/PR001 Test FAIL : 000 Ref. FAIL : 000 FUNCTIONS</pre>                     |
| <p>Then place the cursor in front of "<b>FILL MODE</b>" and confirm with the "<b>ENTER</b>" key.</p>  |    | <pre>PARAM/Pr001/FUNCTION PRE-FILL : No FILL MODE : No VALVE CODES : No</pre>        |
| <p>Validate the function with a "<b>Yes</b>" using the up and down arrows. Confirm with the "<b>ENTER</b>" key.</p>   |  | <pre>PARAM/Pr001/FUNCTION PRE-FILL : Yes FILL MODE : No VALVE CODES : No</pre>       |
| <p>The screen displays which kind of fill is selected. Confirm with the "<b>ENTER</b>" key.</p>   |  | <pre>PARAM/Pr001/FUNCTION PRE-FILL : STAND PRE-FILL REG : 1</pre>                    |
| <p>Next, place the cursor in front of <b>INSTRUCTION</b> and confirm using <b>ENTER</b>.</p>  |  | <pre>FUNCT/Pre-F/PreFILL STANDARD INSTRUCTION BALLISTIC</pre>                        |
| <p>Confirm again using <b>ENTER</b>.</p>  |  | <pre>CT/PRE_F/SetPreFILL SET PreFILL : 0.00 PRE-FILL : 00.0s PRE DUMP : 00.0s</pre>  |
| <p>Set a target value for the fill (the unit for the target point is that of the unit of pressure).</p>   |  | <pre>CT/PRE_F/SetPreFILL SET PreFILL : 0.004 PRE-FILL : 00.0s PRE DUMP : 00.0s</pre> |

|  |   |   |
|--|---|---|
| <p>Confirm using ENTER.<br/> <u>From now on, when the instrument is carrying out a cycle, it will stop the fill when the set target point is reached</u></p> |    | <pre>CT/PRE_F/SetPreFILL SET PreFILL : 2.00 PRE-FILL : 00.0s PRE DUMP : 00.0s</pre> |
| <p>Then the mechanical regulator must be set.<br/> Return to the main menu using the <b>CANCEL</b> key. (Several successive presses).</p>                    |    | <pre>MAIN MENU RUN PROG : 01 PARAMETERS SPE CYCLE : none</pre>                      |
| <p>Place the cursor before the <b>SPE CYCLE</b> function and confirm using <b>ENTER</b>.</p>   |    | <pre>SPE CYCLE none Regul. 1 adjust Regul. 2 Adjust</pre>                           |
| <p>Then place the cursor before Regulator adjust and confirm using <b>ENTER</b>.</p>   |    | <pre>SPE CYCLE none Regul. 1 Adjust Regul. 2 Adjust</pre>                           |
| <p>The display confirms that the special cycle has been selected.</p>  |   | <pre>MAIN MENU RUN PROG : 001 PARAMETERS SPE CYCLE : Regul. 1</pre>                 |
| <p>Press the <b>START</b> key to start the special cycle</p>   |  | <pre>RUN/Pr: 001 PRESS = 0.5 bar REGULATOR 1 ADJUST</pre>                           |
| <p>Turn the regulator wheel to pressurise. Take the pressure value above the target point.</p>   |  | <pre>RUN/Pr: 001 PRESS = 2.5 bar REGULATOR 1 ADJUST</pre>                           |
| <p>When the pressure has been set, press the <b>RESET</b> key to stop the special cycle</p>  |  | <pre>RUN/Pr: 001 PRESS = 0.000 bar READY</pre>                                      |

## 6. STARTING A MEASUREMENT CYCLE

|   |   |   |
|---|---|---|
| <p>Press the <b>START</b> key to start a measurement cycle.</p>   |  | <pre> RUN/Pr: 004 PRESS =0.500 bar  READY                     </pre>        |
| <p>The cycle phases are displayed on the LCD window:</p> <p><b>COUPLING,<br/>FILL,<br/>STABILISATION,<br/>TEST,<br/>DUMP.</b></p> |   | <pre> RUN/Pr: 004 PRESS =1.00 bar  STABILISATION                     </pre> |

## 7. STOPPING A CYCLE

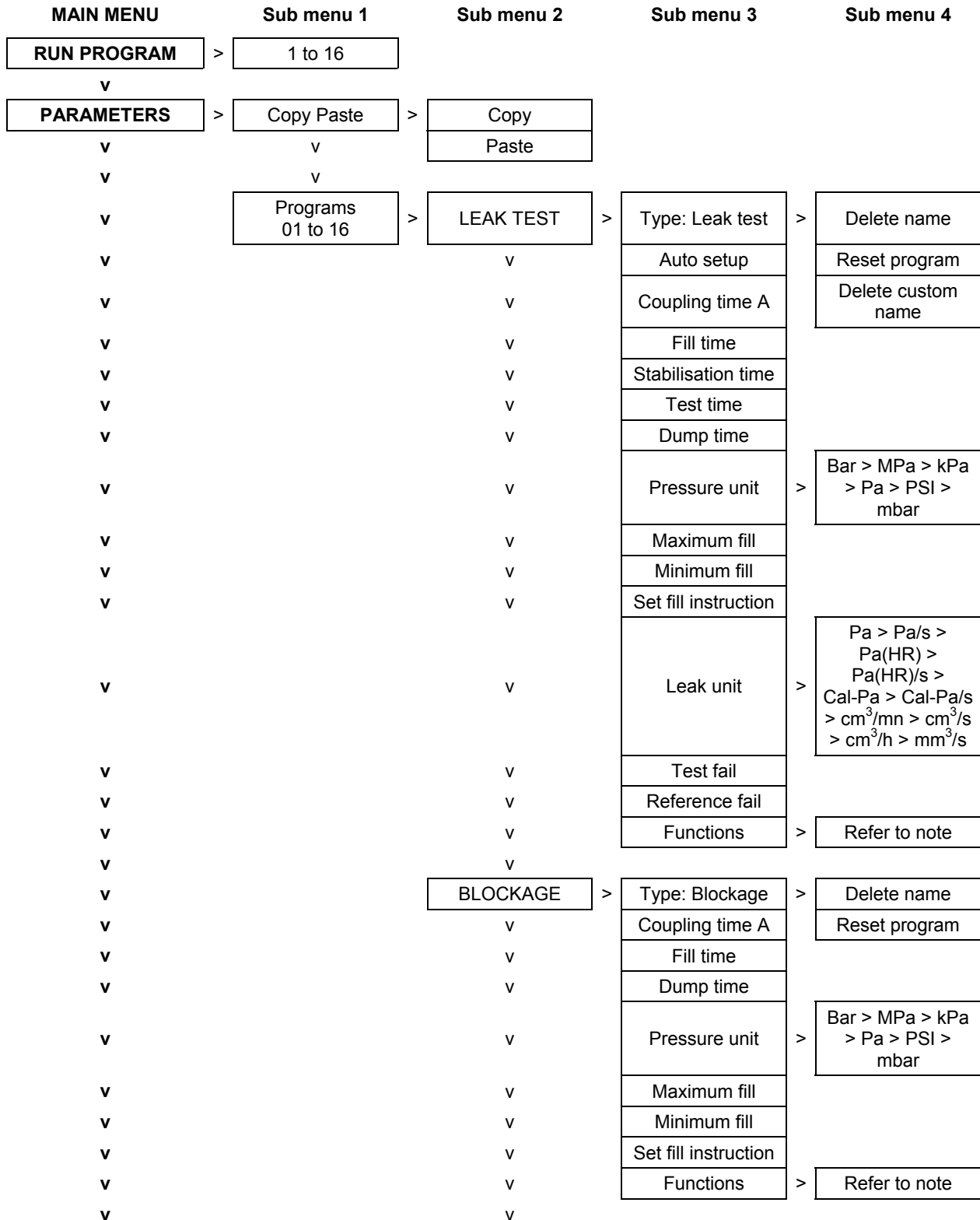
|   |   |  |
|---|---|--|
| <p>Press the <b>RESET</b> key to stop the measurement. The display "<b>READY</b>" indicates that the instrument is ready to perform a new measurement test.</p> |  | <pre> RUN/Pr: 004 PRESS =0.500 bar  READY                     </pre> |
|---|---|--|

## Chapter 4

# FUNCTIONS OF THE INSTRUMENT

### 1. MENU STRUCTURE

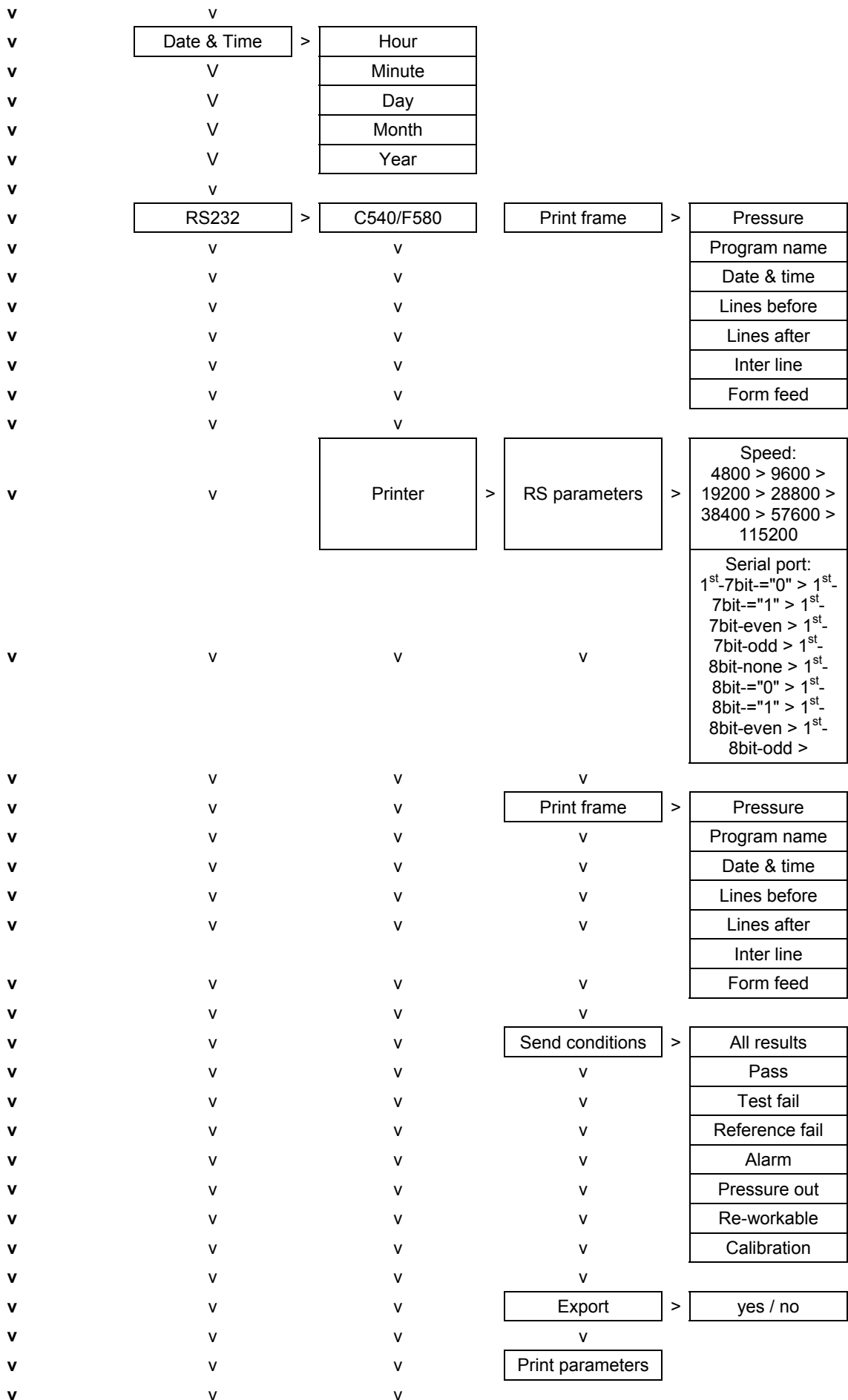
#### 1.1. MAIN MENU

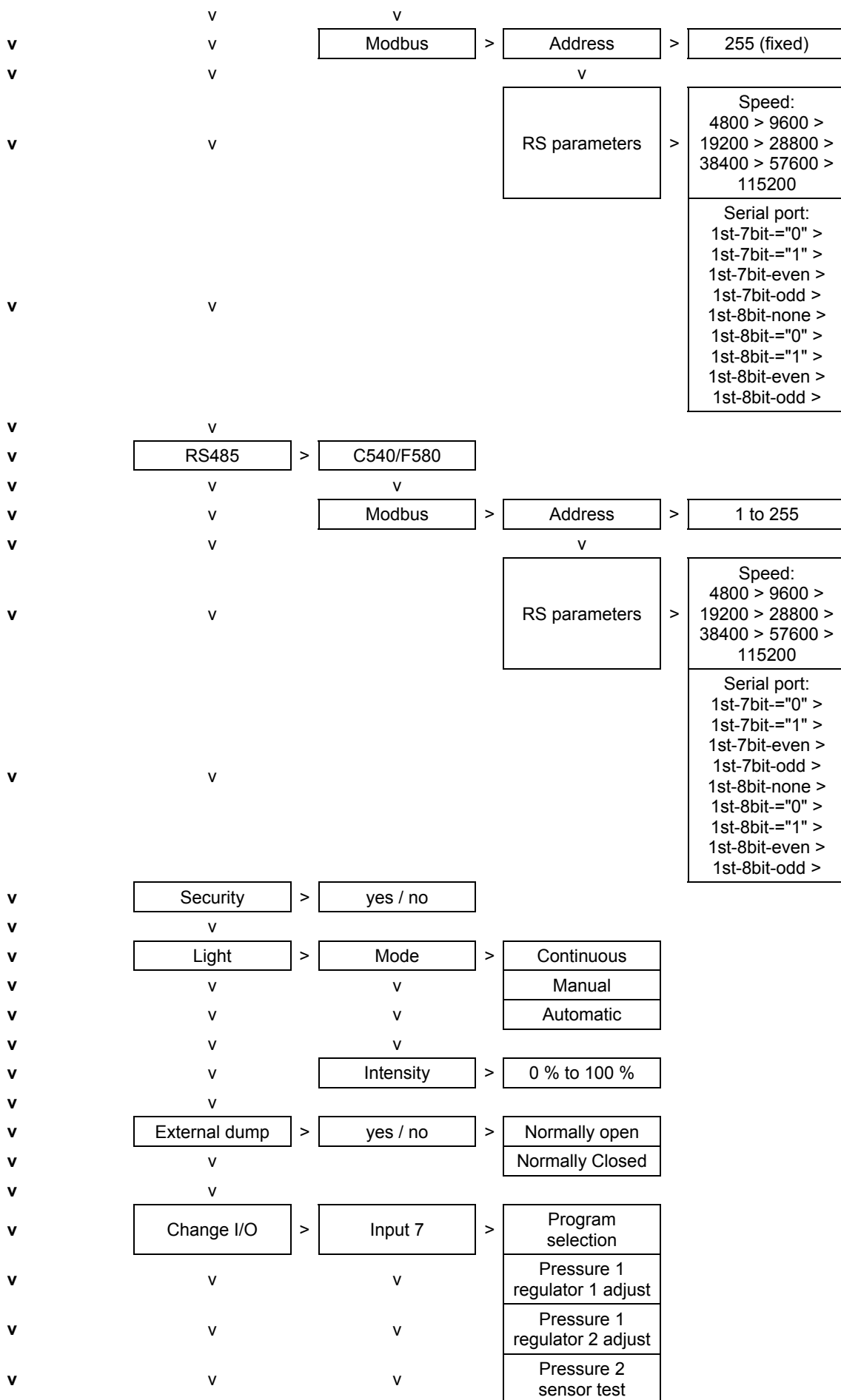




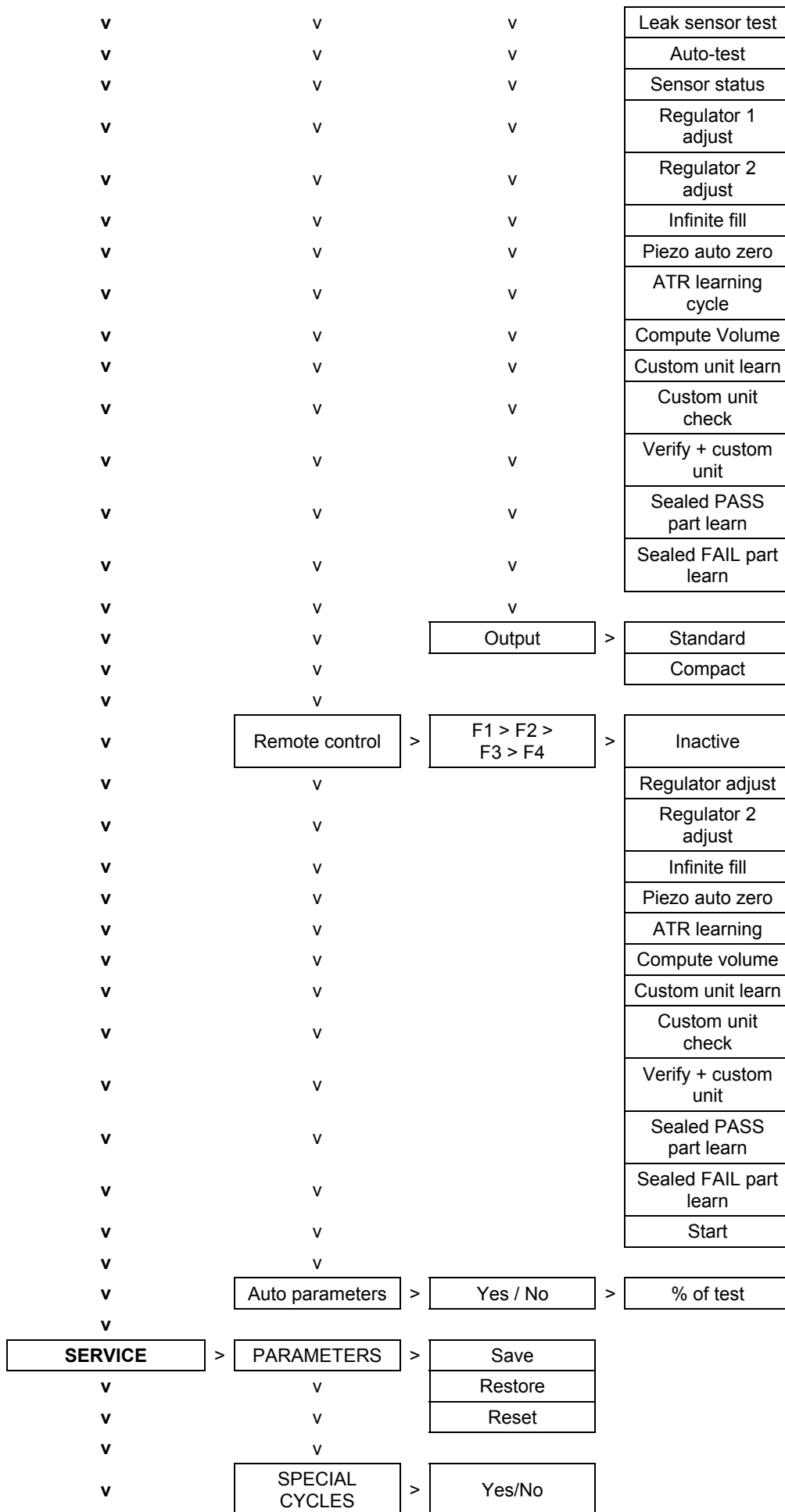
|                      |   |                             |   |                             |                          |
|----------------------|---|-----------------------------|---|-----------------------------|--------------------------|
| <b>CONFIGURATION</b> | > | <b>Extended menus</b>       | > | <b>Name</b>                 |                          |
| v                    |   | v                           |   | Program sequencing          |                          |
| v                    |   | v                           |   | Units                       |                          |
| v                    |   | v                           |   | Filter                      |                          |
| v                    |   | v                           |   | Automatic connector         |                          |
| v                    |   | v                           |   | Check test                  |                          |
| v                    |   | v                           |   | ATR0                        |                          |
| v                    |   | v                           |   | ATR1                        |                          |
| v                    |   | v                           |   | ATR2                        |                          |
| v                    |   | v                           |   | Pre-fill type               |                          |
| v                    |   | v                           |   | Fill mode                   |                          |
| v                    |   | v                           |   | Blow mode                   |                          |
| v                    |   | v                           |   | Valve codes                 |                          |
| v                    |   | v                           |   | 24 V outputs                |                          |
| v                    |   | v                           |   | End of Cycle                |                          |
| v                    |   | v                           |   | Mini valve                  |                          |
| v                    |   | v                           |   | Rework limits               |                          |
| v                    |   | v                           |   | Sealed part                 |                          |
| v                    |   | v                           |   | Peak hold                   |                          |
| v                    |   | v                           |   | Reference volume            |                          |
| v                    |   | v                           |   | Volume compute              |                          |
| v                    |   | v                           |   | Stamping                    |                          |
| v                    |   | v                           |   | Temperature correction 1    |                          |
| v                    |   | v                           |   | Indirect                    |                          |
| v                    |   | v                           |   | Sign                        |                          |
| v                    |   | v                           |   | Remote control              |                          |
| v                    |   | v                           |   |                             |                          |
| v                    |   | <b>Automatic save</b>       | > | yes / no                    |                          |
| v                    |   | v                           |   |                             |                          |
| v                    |   | <b>Electronic regulator</b> | > | None                        |                          |
| v                    |   | v                           |   | Regulator 1                 |                          |
| v                    |   | v                           |   | Regulator 2                 |                          |
| v                    |   | v                           |   | All                         |                          |
| v                    |   | v                           |   |                             |                          |
| v                    |   | <b>Regulator control</b>    |   | Automatic                   |                          |
| v                    |   | v                           |   | External                    |                          |
| v                    |   | v                           |   |                             |                          |
| v                    |   | <b>Auto piezo reset</b>     | > | yes / no                    | >                        |
| v                    |   | v                           |   |                             | <b>Number of minutes</b> |
| v                    |   | v                           |   |                             | <b>Number de cycles</b>  |
| v                    |   | v                           |   |                             |                          |
| v                    |   | <b>Pressure unit</b>        | > | Pa, PSI, mbar, bar, Mpa,kPa |                          |
| v                    |   | v                           |   |                             |                          |

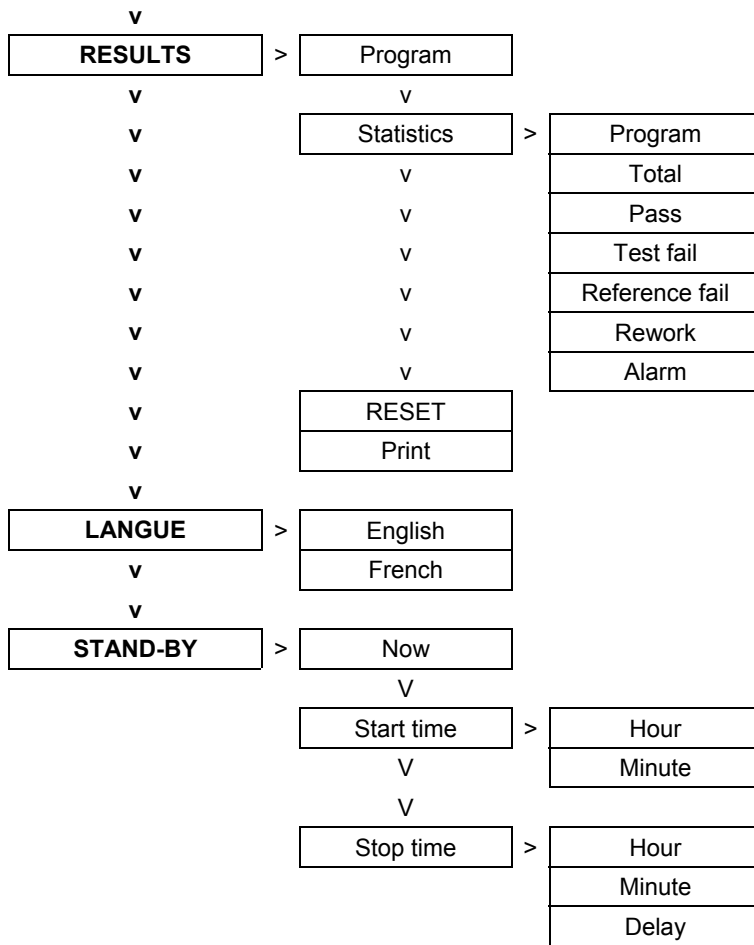
## Chapter 4 – Functions of the instrument





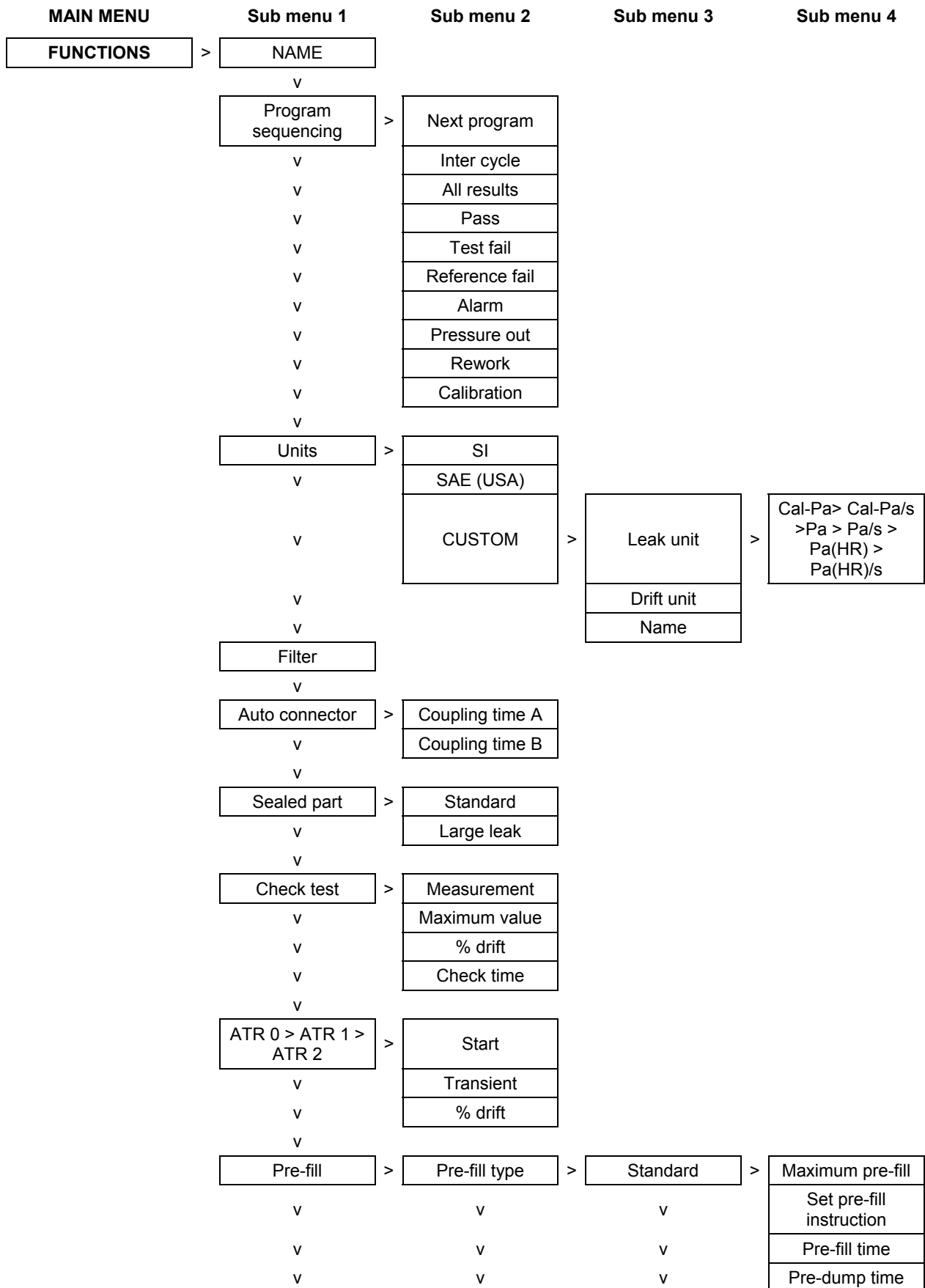
Chapter 4 – Functions of the instrument

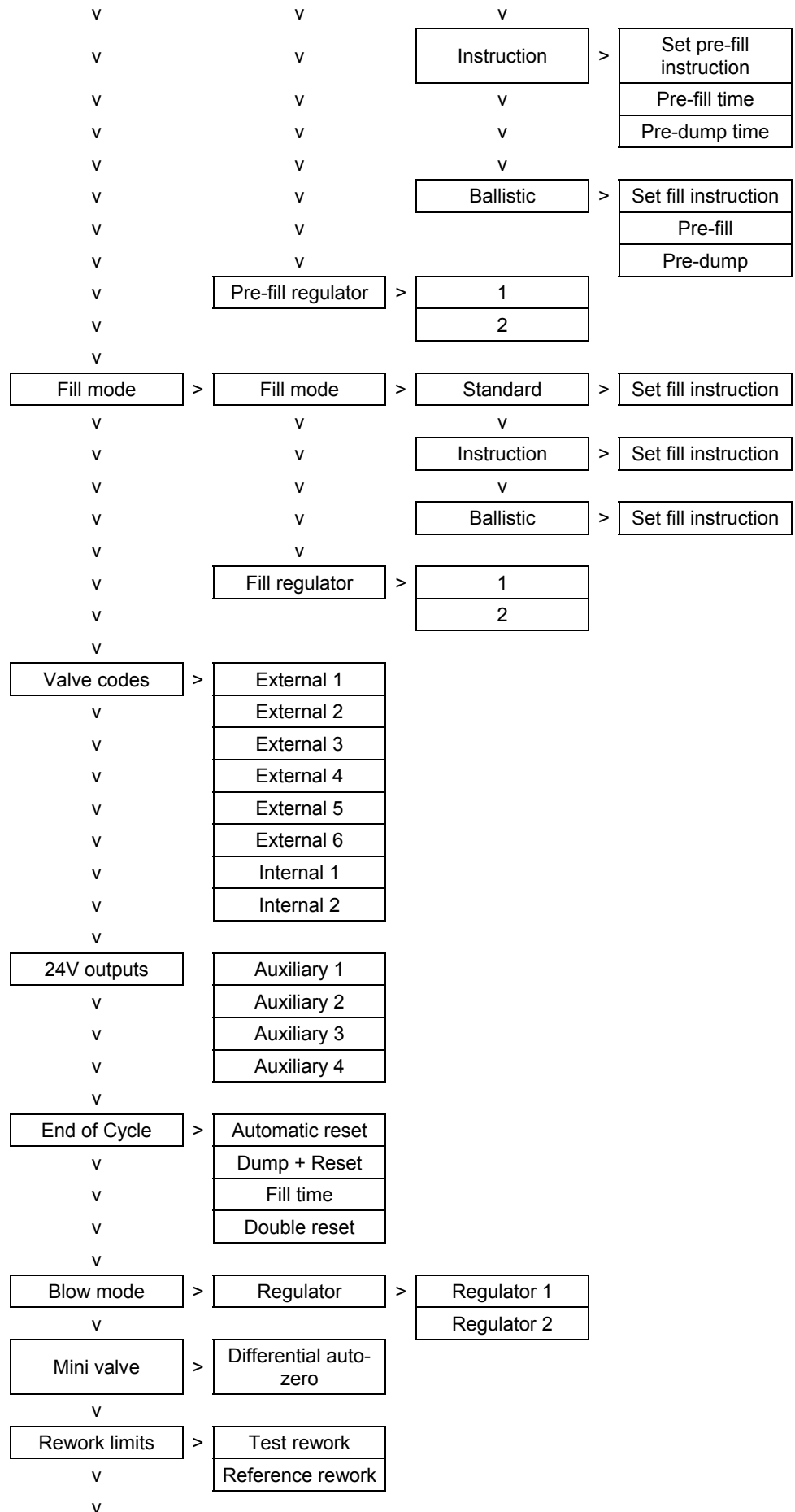


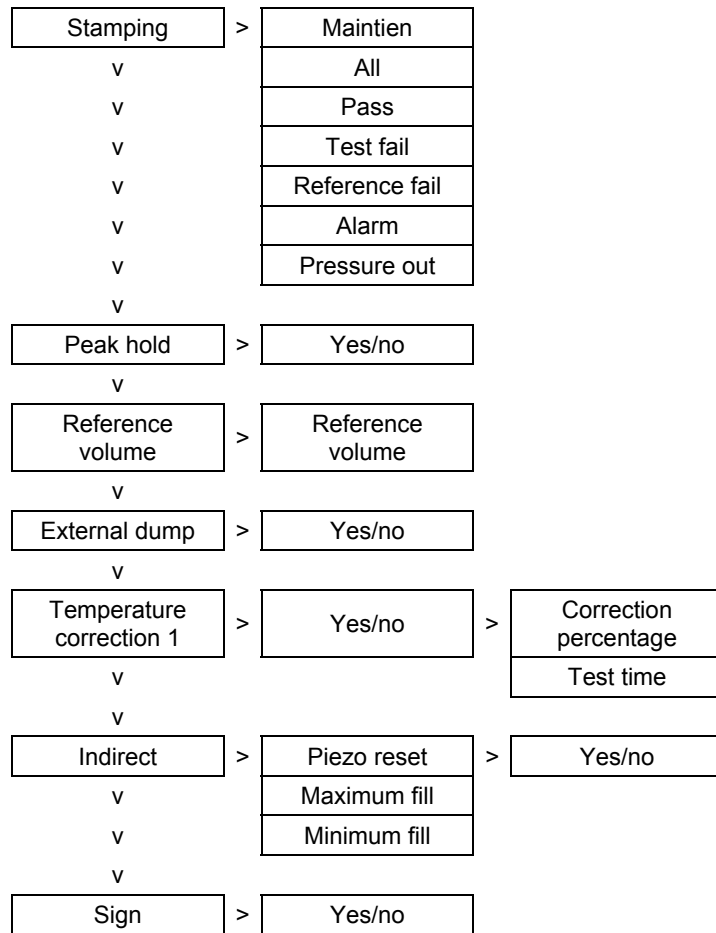


**Note:** the parameters which are in the **EXTENDED MENUS** can be found in the **FUNCTIONS** menu of a program when they are activated.

1.2. "FUNCTIONS" MENU WHEN ACTIVATED







## 2. CONFIGURATION MENU










### 2.1. EXTENDED MENUS

The extended menus offer access to additional functions

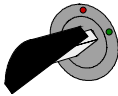
If these functions are activated, they can be found in the **FUNCTION** menu when a program is created.

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

|   |   |  |
|---|---|--|
| <p>In the main menu, place the cursor in front of the <b>CONFIGURATION</b> option.</p>  |    | <pre> MAIN MENU SPE CYCLE : None ▶CONFIGURATION RESULTS                     </pre>                                 |
| <p>Confirm using the <b>ENTER</b> key.</p>  |   | <pre> MAIN/CONFIGURATION ▶EXTENDED MENUS AUTO SAVE      : No ELEC. REG:     none                     </pre>        |
| <p>Next, confirm the <b>EXTENDED MENUS</b> function with the <b>ENTER</b> key. The list of additional functions is then displayed.</p>  |    | <pre> CONFIGI/EXTENDED MENU ▶NAME          : No PR: SEQUENCE   : No UNITS         : No                     </pre>  |
| <p>To activate a function (e.g. the <b>NAME</b> function), confirm it with the <b>ENTER</b> key. Next, choose <b>YES</b> with the navigation keys and confirm again with the <b>ENTER</b> key. Start the operation again if you need to activate other functions.</p> | <br> <br> | <pre> CONFIGI/EXTENDED MENU ▶NAME          : Yes PR : SEQUENCE  : No UNITS         : No                     </pre> |
| <p>Once all the chosen functions are activated, press the <b>CANCEL</b> key twice to return to the main menu.</p>   |     | <pre> MAIN MENU SPE CYCLE : none ▶CONFIGURATION SERVICE                     </pre>                                 |

### 2.1.2. Adjusting the additional function settings

- ✓ Place the key in the **ACCESS**  position.
- ✓ Create a new program (please refer to chapter 3 paragraph 2 « Creation of a test program »).
- ✓ In the parameters list for this new program, confirm the **FUNCTIONS** parameter (refer to chapter 3 paragraph 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) Program sequencing

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


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

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: NEXT PROGRAM, INTER-CYCLE (wait or coupling time between two cycles). Chaining conditions: ALL RESULTS (under all result conditions), PASS (part good), TEST FAIL (test part bad), REFERENCE FAIL (reference part bad), ALARM, PRESSURE OUT (pressure error), REWORKABLE (parts which can be repaired), CALIBRATION (calibration error).

 Select the option and enter settings if necessary.

### 2.1.3. 3) International units


This function allows the operator to choose the particular unit system required for the display of measurements and test results.

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

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


This name may be deleted in the **PARAMETERS / TEST TYPE** menu.

```
RAM/Pr001/TEST TYPE
#Delete name
Reset program
Delete Custom Name
```

 . Select the option and enter settings if necessary.

### 2.1.3. 4) Filter

This function enables the slowing or the acceleration of the sampling speed, by carrying out an average over the set measurement time; this will facilitate the reading of the measurement.

 Select the option and enter settings if necessary.

### 2.1.3. 5) Automatic connector


The automatic connector is a pneumatic control enabling the driving of an external logic (pneumatic sealing connector). This control is activated at the start of the cycle and is released at the end of the cycle (refer to “End of cycle” diagram § 2.1.3.13)

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

They remain active throughout all cycles between the first and last program in the sequence.

The various A coupling times are applied in between the programs.

Associated parameters to be set: COUPLING A, COUPLING B.

 Select the option and enter settings if necessary.

### 2.1.3. 6) Calibration check by volume test

A solenoid valve is used to create a pressure drop by increasing the volume at the end of a test on a good part.

This auto-diagnostic check test can be carried out manually by the operator from the specials cycles menu, or automatically using programmable input 7 of the J3 connector programmed for this function, or using a programmed function key on the optional RC5 keypad, if this is installed. In these last two cases the first operation must be carried out manually in order to set the volume parameter.

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

If the pressure drop is close to the diagnostic reject level set, this gives an auto-diagnostics fault (value of auto-diagnostic reject plus or minus X %).

The auto-diagnostics check parameters include:

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

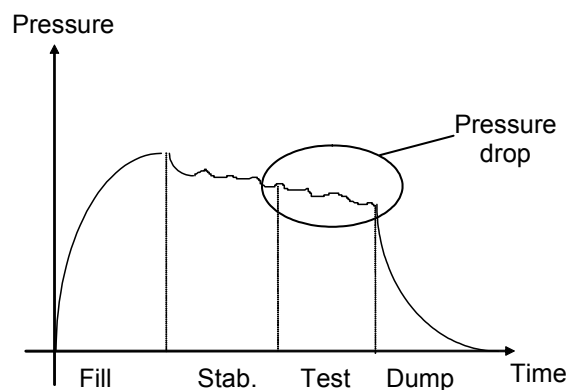
☞ Select the option and enter settings if necessary.

### 2.1.3. 7) 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).

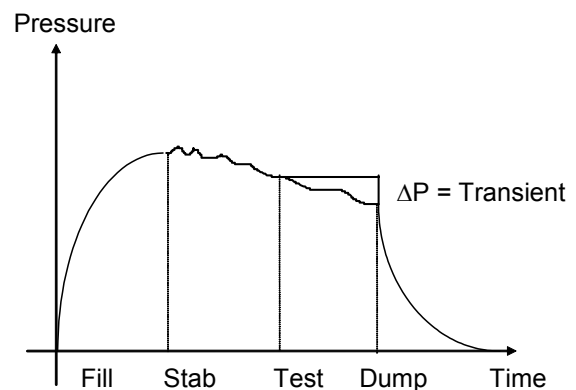
☞ Select the option and enter settings if necessary.

✓ **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.



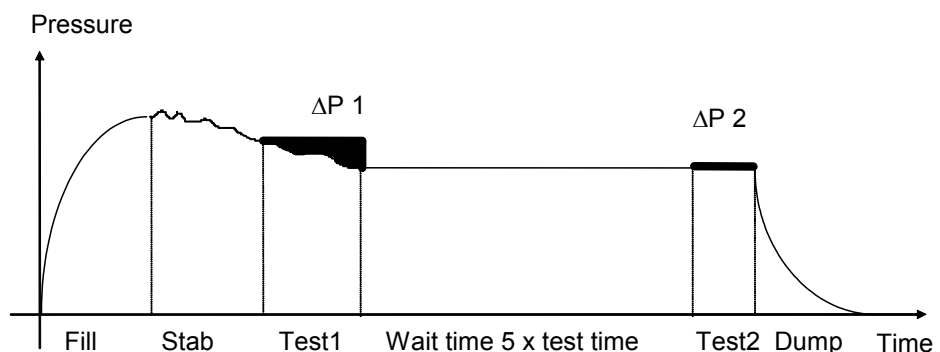
Reasoning: the part is good, therefore the pressure drop measured is the transient.

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  $\Delta P1$ , function of the transient and the leak is there is one.

$$\Delta P1 = \text{Leak} + \text{Transient}$$

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  $\Delta P2$  which corresponds to the leak.

$$\Delta P2 = \text{Leak}$$


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

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

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 3.3.10 "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.

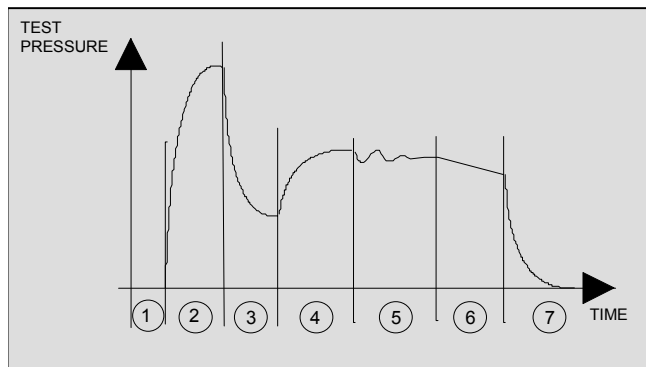
The transient can evolve one way or the other; therefore it is preferable to have identical Test and Reference reject levels.

### 2.1.3. 8) Pre-fill type

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

- ✓ large volume part test : to fill the part faster in order to reduce the cycle time (without pre-fill time),
- ✓ test on parts requiring a mechanical constraint so that they remain stable for the duration of the test,
- ✓ part burst tests, where the pre-fill pressure exerts a mechanical constraint similar to that of a mechanical resistance test on the test part.

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



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

This function brings up the display of the words “**regulator 2 adjust**” under “Spe. Cycle” so that the new pressure can be set.

There are several types of pre-fill available.

#### a) Standard

##### With a mechanical regulator

Set the value of the pre-fill pressure manually adjusting the regulator knob and start a **Pre-regulator 2 adjust** special cycle then set the associated parameters.

##### With an electronic regulator

Simply set the associated parameters.

Associated parameters to be set: **Max P-FILL** (maximum pre-fill pressure limit), **Pre-FILL** (pre-fill time), **Pre-DUMP** (pre-dump time).

### ***b) Instruction***

#### **With a mechanical regulator**

Set a target value for the pre-fill pressure and open the regulator to a pressure at least greater than the target. When the target pressure is reached, filling is stopped, the instrument moves on to the following phase in the cycle.

#### **With an electronic regulator**

Simply set the associated parameters.

Associated parameters to set: **Set Fill** (instruction/target value), **Pre-FILL** (pre-fill time), **Pre-DUMP** (pre-dump time).

**Note:** with an electronic regulator, the pressure and pre-fill time parameters can be set using either the **Standard** or **Instruction (Set)** functions.

### ***c) Ballistic***

This fill mode enables fluctuation in the air pressure (filling parts with a high level of deformation) and in particular allows the maximum fill limit to be exceeded without the cycle stopping and an error message being displayed. However, in order to move into stabilisation mode, the test pressure must be within the limits at end of the fill.

Associated parameters to be set: **Pre-FILL** (pre-fill time), **Pre-DUMP** (pre-dump time).

☞ Select the option and enter settings if necessary.

### ***d) Pre-fill regulator***

This function provides a choice of two regulators to be used for pre-fill (1 or 2).

☞ Select the option and enter settings if necessary.

## **2.1.3. 9) Fill mode**

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

### ***a) Standard***

#### **With a mechanical regulator**

Set the fill pressure value manually using the regulator knob and start a **regulator adjustment** special cycle.

#### **With an electronic regulator**

The fill pressure is set automatically to the chosen value when the test program is created.

### ***b) Instruction (Set)***

The user sets a target value for the fill pressure and opens the regulator to full flow. When the target pressure is reached, the air supply cuts off automatically.

Associated parameters to be set: **SET FILL** (fill target).

**c) Ballistic**

This fill type enables fluctuation in the air pressure (filling of parts with a high level of deformation) and in particular allows the maximum fill limit to be exceeded without the cycle stopping and an error message being displayed. However, in order to move to stabilisation mode, the test pressure must be correct.

**d) Fill regulator**

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

☞ Select the option and enter settings if necessary.

**2.1.3. 10) Blow mode**

When this option is activated, the instrument fills the part to low pressure and this is maintained between 2 cycles. This option is used when there is risk of increased damp or dust contamination when testing very dirty parts.

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

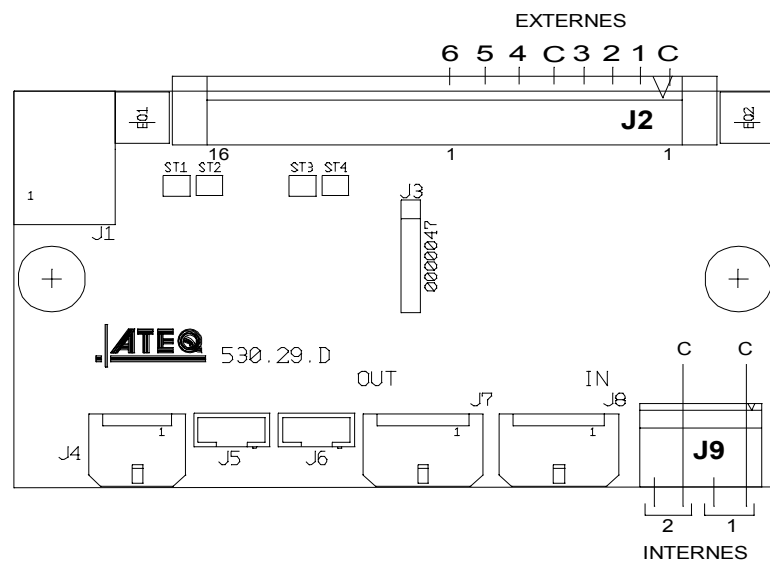
**2.1.3. 11) Valve codes**

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

The “valve code” outputs reserved to a pneumatic function are identified by the associated function’s name: Stamping, automatic connector, etc... When they are “free” and available to the operator they are called: internal or external with their position number.

Associated parameters to be set: External 1, External 2, External 4, External 5, External 6, Internal 1, Internal 2.

☞ Select the option and enter settings if necessary.



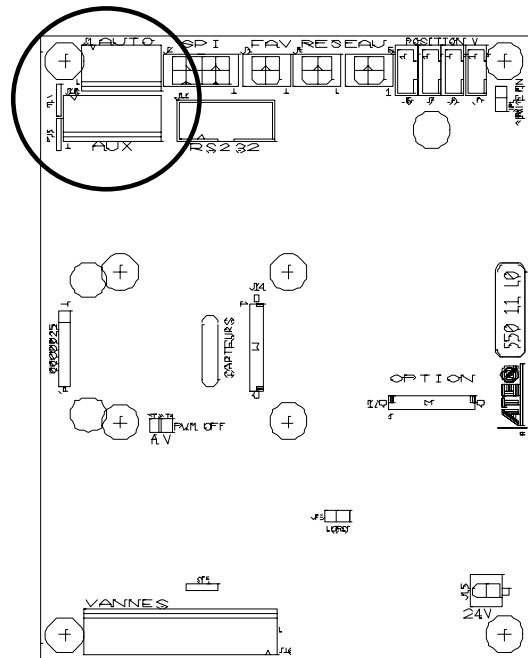
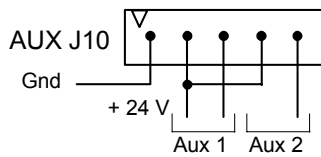
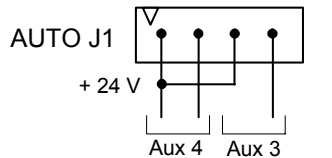
### 2.1.3. 12) 24V Auxiliary outputs

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

Unlike the **valve code** outputs, the **auxiliary outputs** reserved for a pneumatic function are identified by the name of the function: stamping, automatic connector, etc. When they are free and available for the operator to use they are called: auxiliary and the position number.

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

☞ Select the option and enter settings if necessary.






### 2.1.3. 13) End of Cycle

This function enables the choosing of an of different cycle ends depending on the configuration of an instrument (connection to a PLC...).

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

In order to interface the **ATEQ F510** and **F520** with their environments (PLC, PC ...), the following timing charts supply the details of the sequencing of the electrical outputs (relay board on the J3 connector) and pneumatic outputs (automatic connectors), depending on the commands entered on the front panel or through the J3 connector (START, RESET).

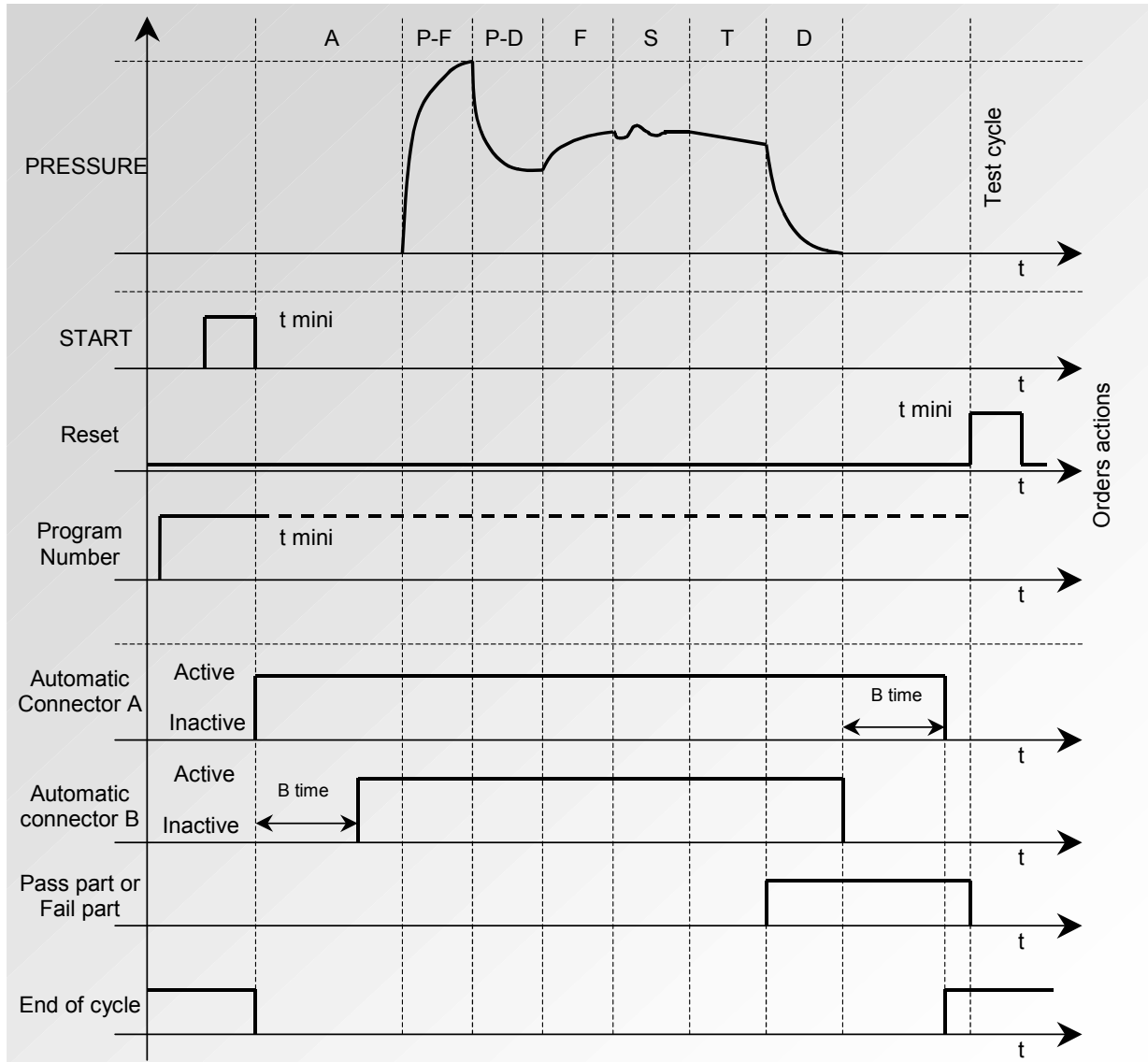
| Legend                     |  |
|----------------------------|--|
| <b>A</b>                   | Coupling time A  |
| <b>B</b>                   | Coupling time B  |
| <b>P - F</b>               | Pre-fill time  |
| <b>P – D</b>               | Pre-dump time  |
| <b>F</b>                   | Fill time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

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

**b) « Automatic RESET » cycle end**

If the part is OK, the Part PASS 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.

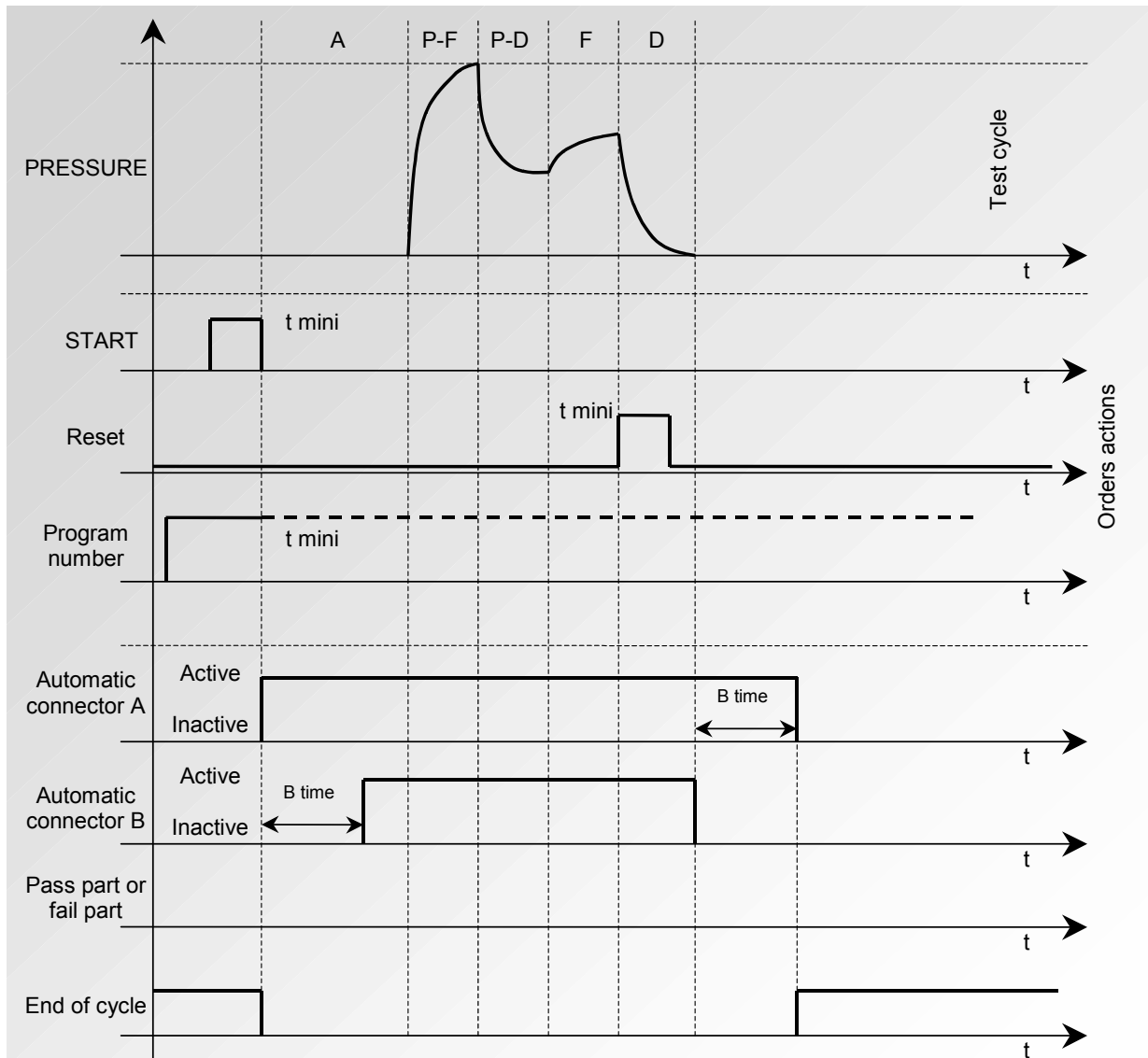
If the part is bad, the FAIL part relay is activated as soon as the test is completed. The instrument automatically dumps and sends a cycle end signal. A new cycle can then be launched.



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) Ending a cycle with the RESET key (« Automatic RESET »  
Cycle end)**



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

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

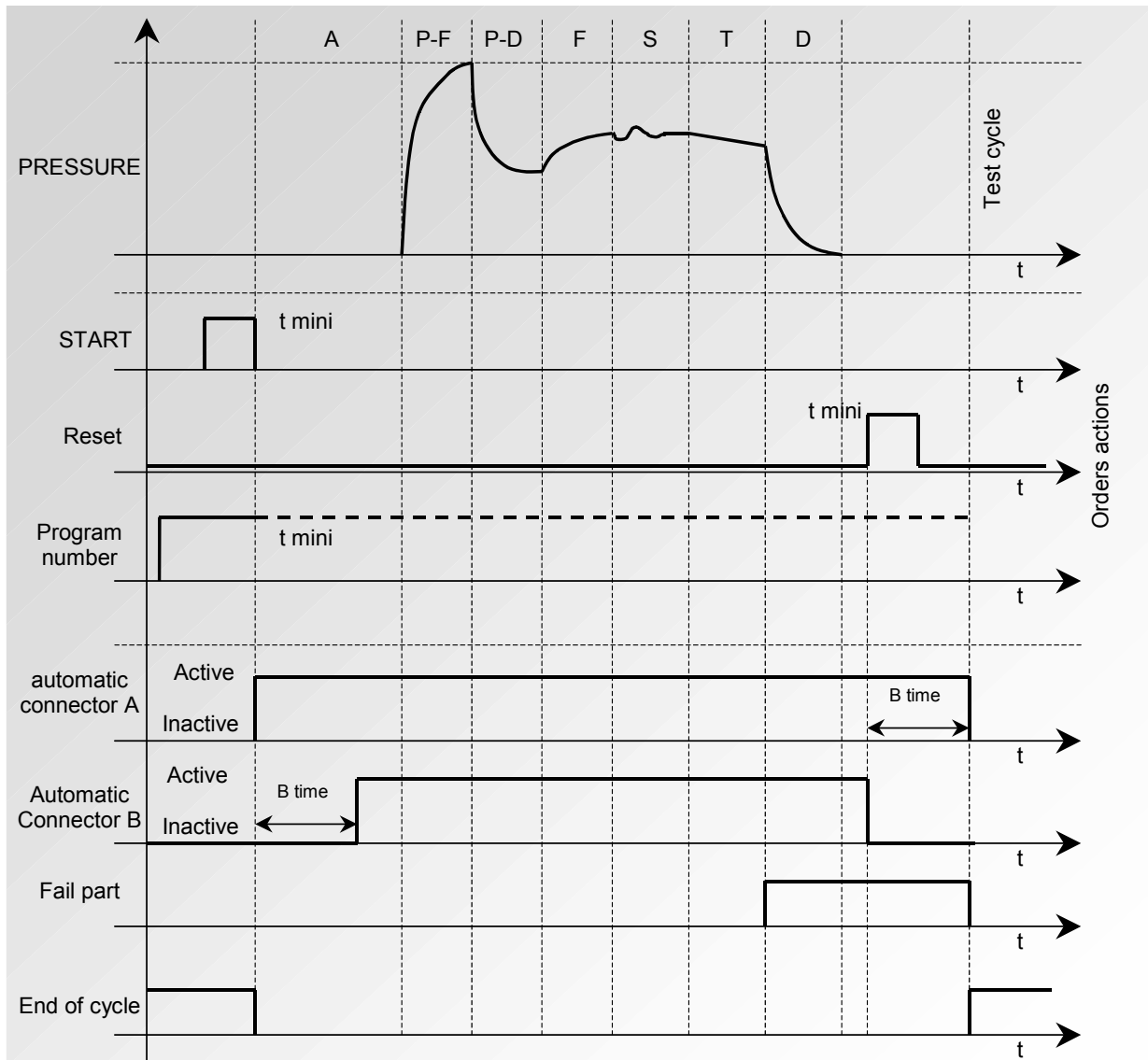
**d) « RESET + dump » cycle end (automatic dump)**

If the part is OK, the part PASS 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 FAIL part relay is activated and remains so until the end of the cycle. The dump is then carried out. The cycle can be

ended by pressing the **RESET**  key.



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

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

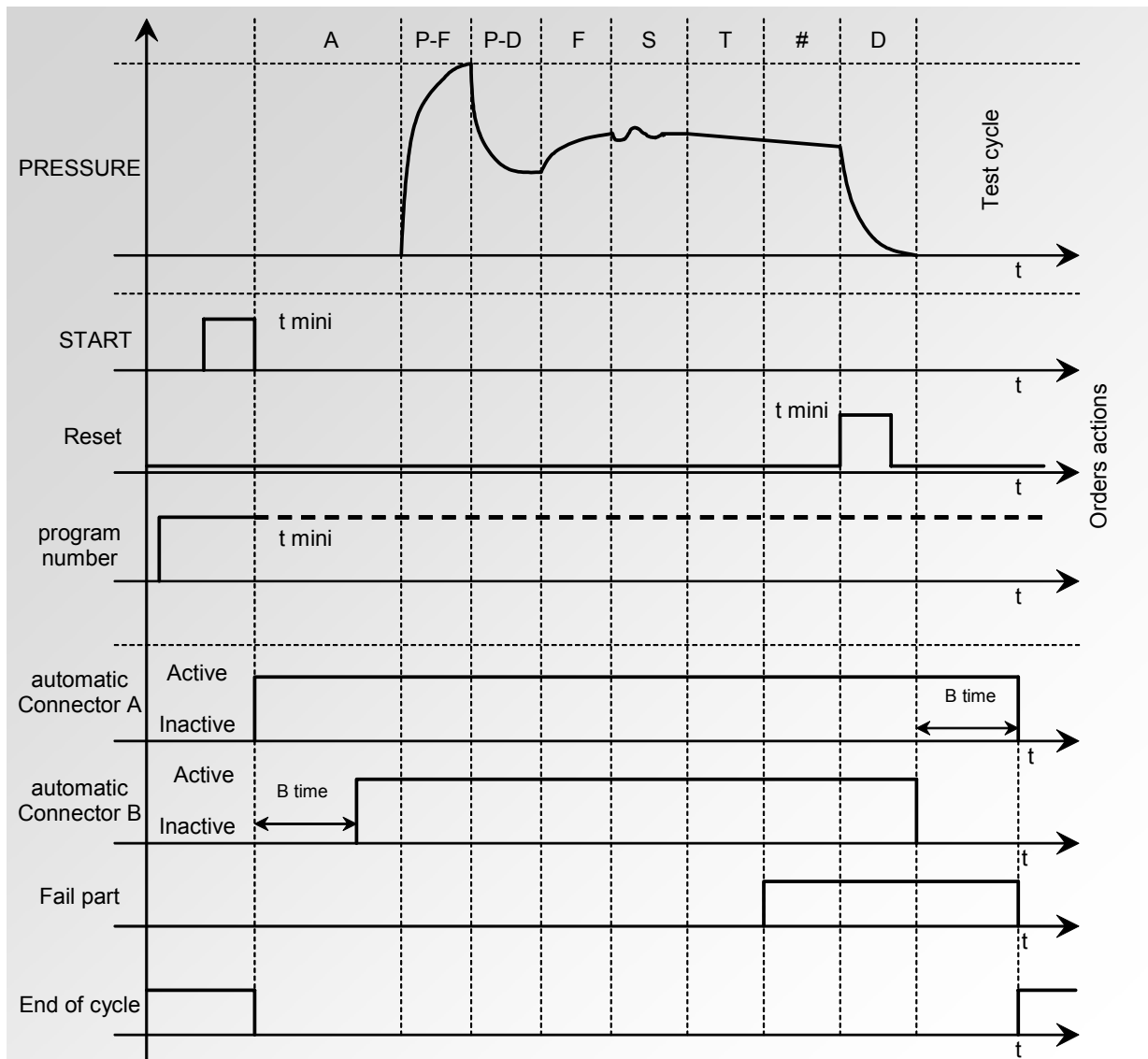
e) « Fill » cycle end

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

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

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

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



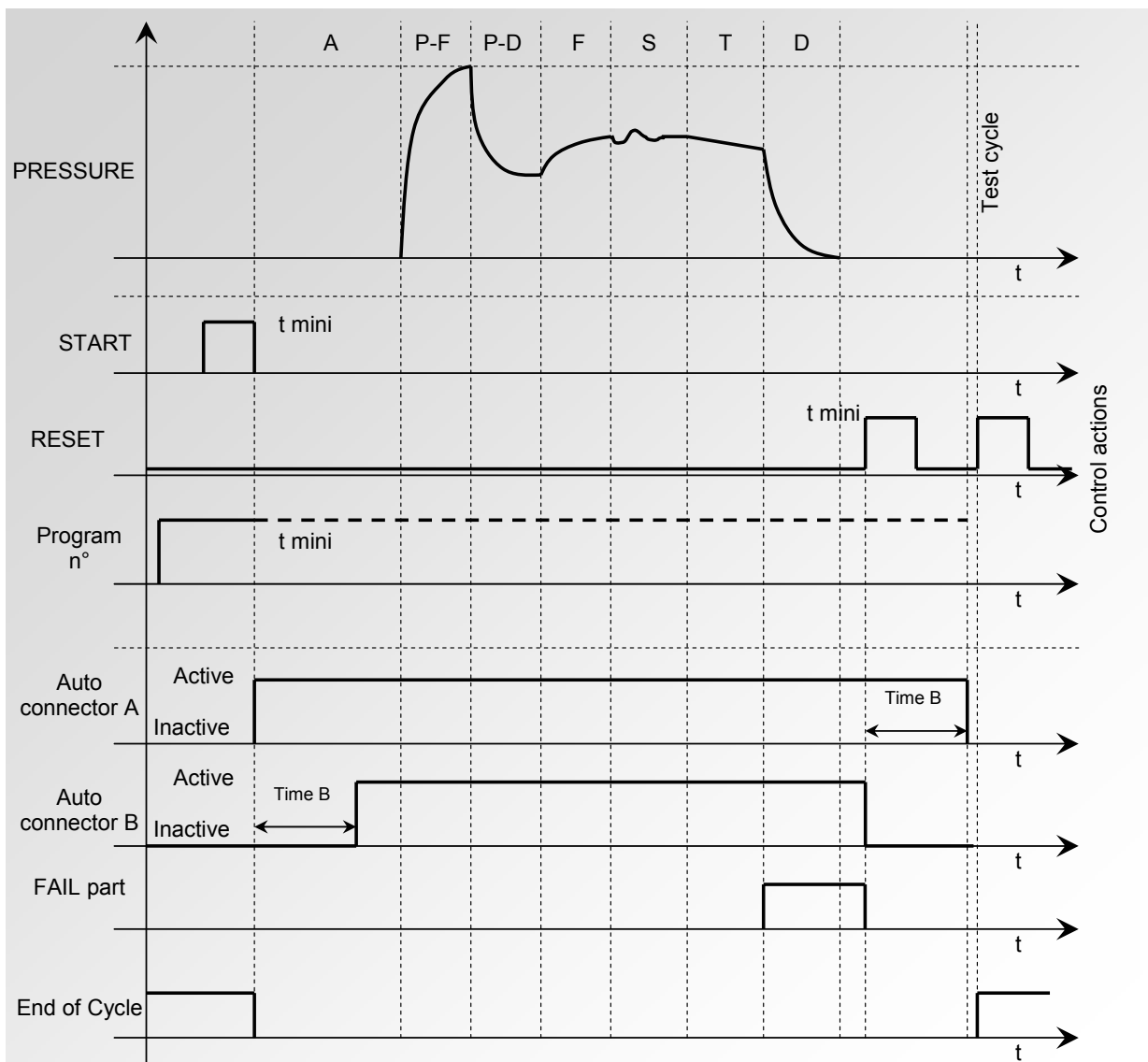
**f) « Double RESET + dump » cycle end (automatic dump)**

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

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

A first press on the **RESET**  key or activation of the **RESET** input cancels the result relay. The End of Cycle is obtained by pressing a second time on the **RESET**

key or by activating the **RESET** input again.



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

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

### 2.1.3. 14) Mini valve

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

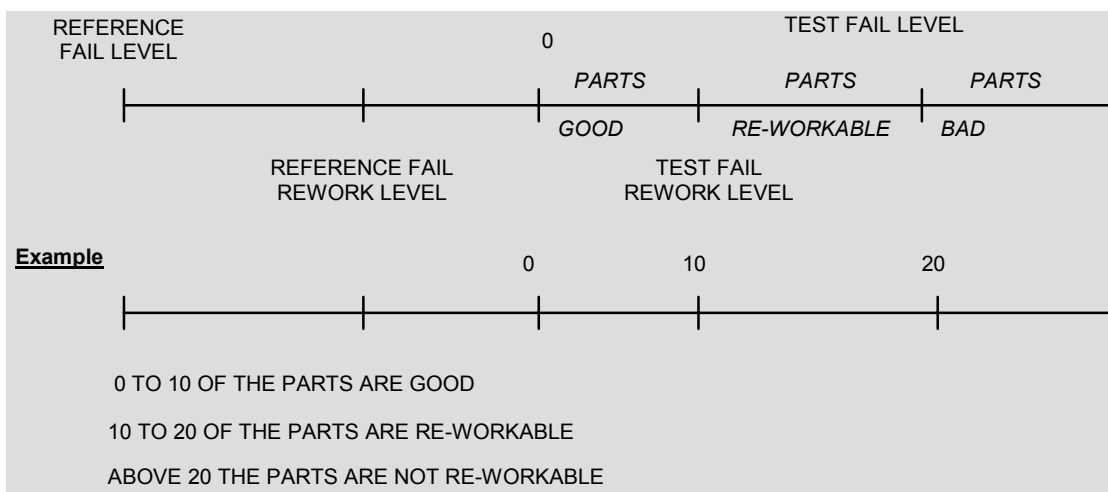
The programming of an **ATEQ F510 or F520** with a mini valve is identical to that for the standard **ATEQ F510 or F520**.

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

☞ Select the option and enter settings if necessary.

### 2.1.3. 15) Rework limits

This option offers the option of two reject (FAIL) levels: non-tolerance level (the bad part cannot be worked on) and a re-workable reject level (the part is bad but may be reworked to become acceptable. This option is particularly used in casting, when parts may be treated via impregnation. )



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

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

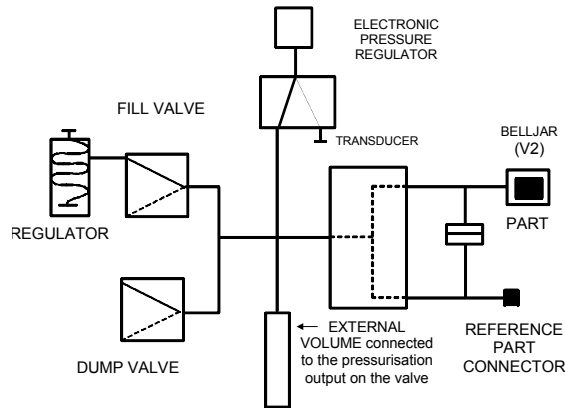
**Note:** when the recoverable reference reject value is zero, the program uses the symmetrical absolute value of the recoverable test reject (e.g.: if the recoverable test reject is 10 Pa, then with the recoverable reference reject value equal to zero, the program takes the recoverable reference reject to be – 10 Pa).

☞ Select the option and enter settings if necessary.

2.1.3. 16) Sealed components

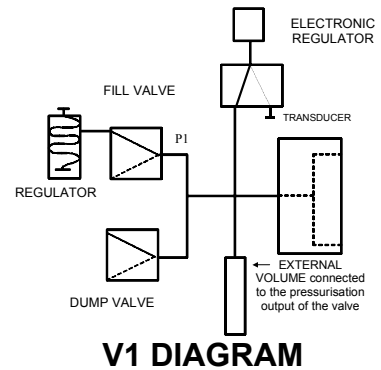
Sealed component mode is used to measure leaks on airtight parts. They are placed under a bell which is then pressurised.

a) Principle



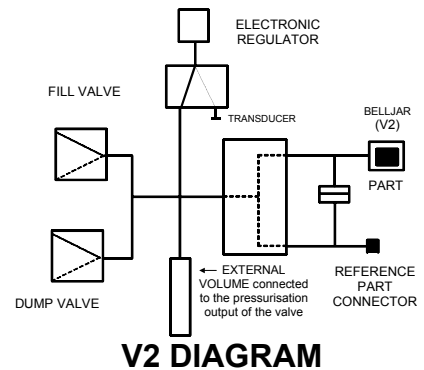
b) Volume fill

The internal pneumatic circuit (if required, an external volume can be added) of the **ATEQ F510** or **F520** (V1) is filled to a pressure P1.



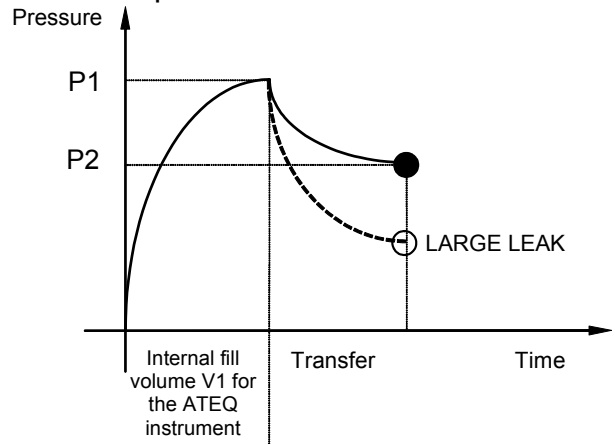
c) Part transfer

The previously-filled internal volume is opened to the bell jar volume (V2). We thus obtain P2 and V2.



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

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



**d) Test modes**

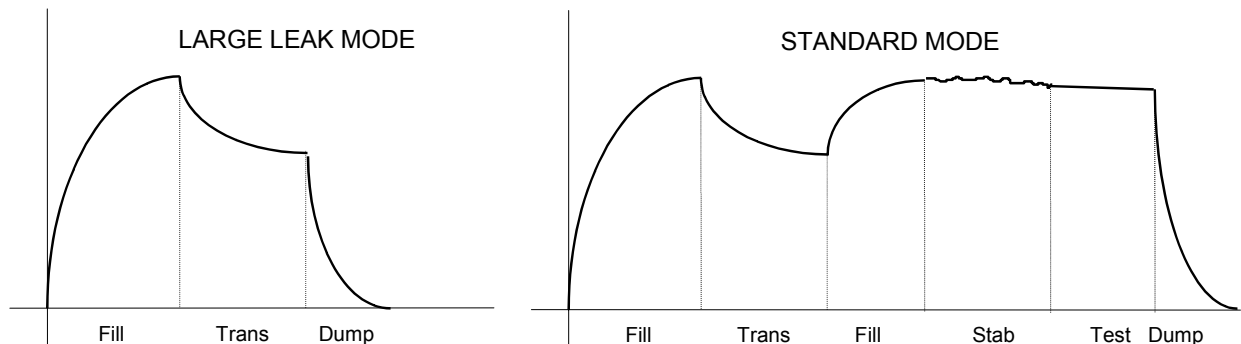
The **ATEQ F510** or **F520** for sealed components can carry out the following tests:

1. Only the large leak test,
2. The large leak test, then the small leak test at a weaker final pressure

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

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

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



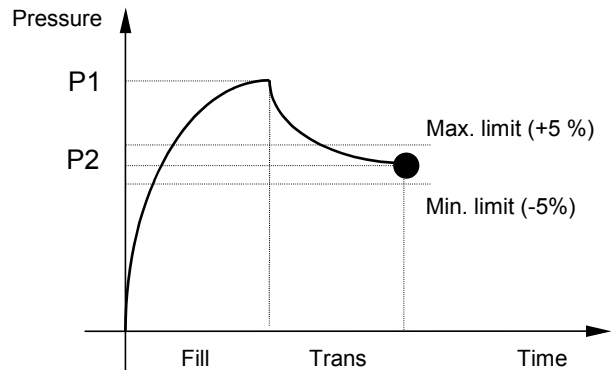
e) Carrying out the cycles and settings

So that the instruments can detect large leaks, two learning cycles must be carried out: one on a good part and one on a bad part.

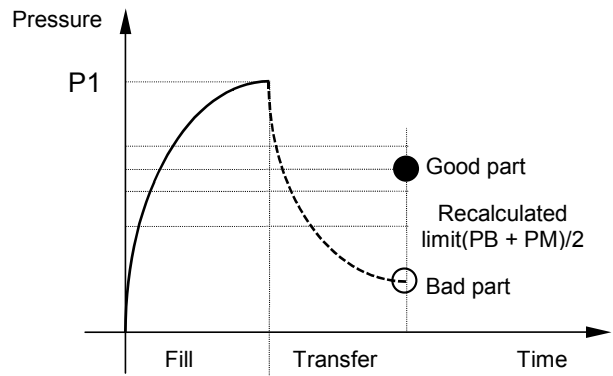
Learning cycles:

**"PASS part" learning cycle:** this cycle is compulsory before control tests.

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



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



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

At the end of a learning cycle (fill of the volume, volume transfer, dump) the **part PASS** and **End of Cycle** outputs are activated. If the volume is greater (large leak), the **Test error** and **End of Cycle** outputs are activated. If the volume is reduced (problem with the control jig) the **alarm** and **End of Cycle** outputs are activated.

Learning cycles for good parts and parts with a large leak are accessed through the main menu under special cycles. Please Refer to paragraph 3.3.9. "Sealed component learning".

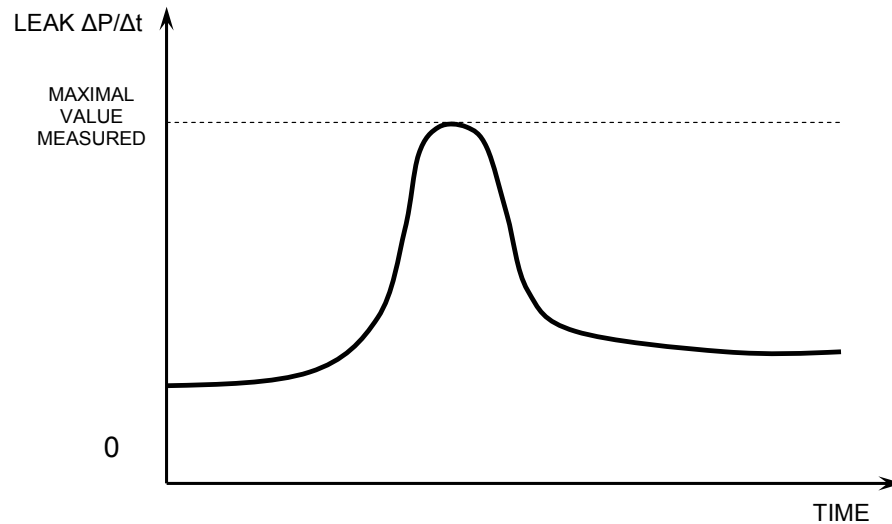
☞ Select the option and enter settings if necessary.

⚠ Test cycles can not be carried out unless learning cycles have previously been carried out.

### 2.1.3. 17) Peak hold

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

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









**Note:** peak measurement mode only works in  $\Delta P/\Delta t$  and excludes the use of ATR mode.

### 2.1.3. 18) Reference volume

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

When the reference output volume is different from that of the test output, it is possible to set parameters for the exact value of the reference volume to obtain correct measurements in the event of results in negative figures.

This function may only be used with flow measurement units.

|  |   |   |
|--|---|---|
| <p>Confirm the function in the <b>CONFIGURATION/EXTENDED MENUS</b> menu</p>            |   | <pre>MAIN/CONF/EXTENDED SEALED PART : No PEAK HOLD   : No REF. VOLUME : Yes</pre> |
| <p>Confirm the function in the <b>PARAMETERS /PROGRAM/FUNCTIONS</b> menu.</p>          |   | <pre>ARAM/Pr001/FUNCTIONS ▶ REF. VOLUME : Yes</pre>                               |
| <p>Enter the value of the reference volume in the <b>PARAMETERS /PROGRAM</b> menu.</p> |   | <pre>01/FUNCT/REF. VOLUME Ref. VOL. : 0.000 L</pre>                               |

### 2.1.3. 19) Volume compute

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

#### Preparation of the instrument

- ✓ Connect to the instrument a part with no leak.
- ✓ Connect a known standard leak to the rapid connector on the instrument's measurement circuit.
- ✓ Run a special **Regulator** cycle to set the test pressure for the known standard leak (refer to § 3.3.1 « Regulator »).
- ✓ Carry out the special **Volume compute** cycle by giving the leak value.
- ✓ The value of the volume is updated within the program.

### 2.1.3. 20) Stamping function

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

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



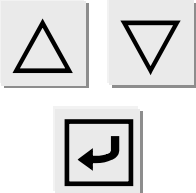

This option requires two electrical outputs:

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

One of the pneumatic outputs on the automatic connectors is used.

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

Use the following procedure to use the inking function.

|   |   |   |
|---|---|---|
| <p>First, in the <b>CONFIGURATION</b> menu, confirm the <b>STAMPING</b> function.</p>           |    | <pre>MAIN/CONF1/EXTENDED REF. VOLUME : No VOLUME COMP. : No #STAMPING : Yes</pre> |
| <p>In the program's <b>PARAMETERS/FUNCTIONS</b> menu, confirm the <b>STAMPING</b> function.</p> |   | <pre>ARAM/Pr001/FUNCTIONS #STAMPING : Yes REF. VOLUME : No PEAK HOLD : No</pre>   |
| <p>Set the inking duration value (can be set between 0 and 650 seconds).</p>                    |  | <pre>Pr001/FUNCT/STAMPING #DURATION : 00.5 s ALL RESULTS : No PASS : Yes</pre>    |
| <p>Then select the inking conditions from those offered.</p>                                    |  | <pre>Pr001/FUNCT/STAMPING DURATION : 00.5 s ALL RESULTS : No #PASS : Yes</pre>    |

### 2.1.3. 21) Temperature correction 1

The **TEMPERATURE CORRECTION** function enables the adjustment of the leak value of a part through the study of the pressure variation caused by differences in the temperature of the part and the environment.

There are two parameters to be set:

- ✓ The test time during which the study (learning) of this pressure should be carried out.
- ✓ The percentage of the variation to be taken into account.

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

2.1.3. 22) Indirect or recovery measurement

a) Principle

The test part is pressurised under a sealed bell. The measurement circuit of the **ATEQ** instrument is connected to this bell. The part is pressurised through the use of a second regulator (reg 2) and the fill valve, the bell is filled with a low pressure via regulator 1.

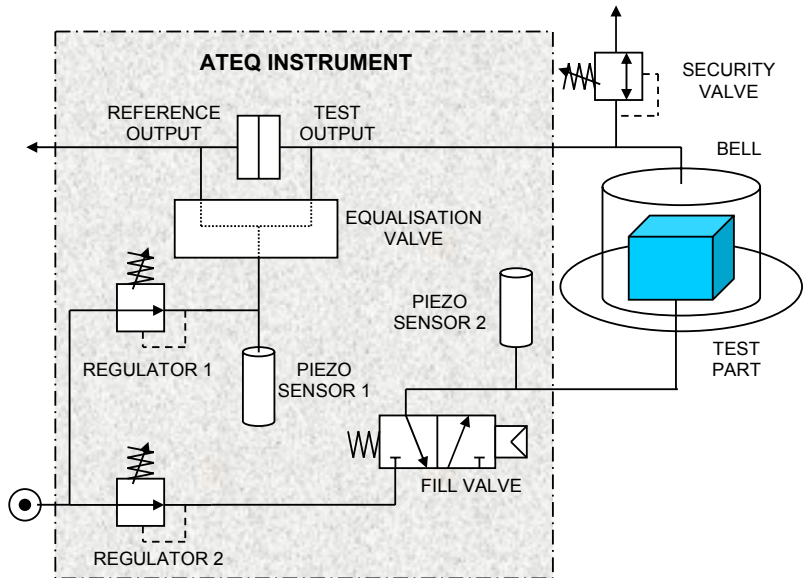
If the part leaks, the pressure in the bell will increase and will be detected by the **ATEQ** instrument.

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

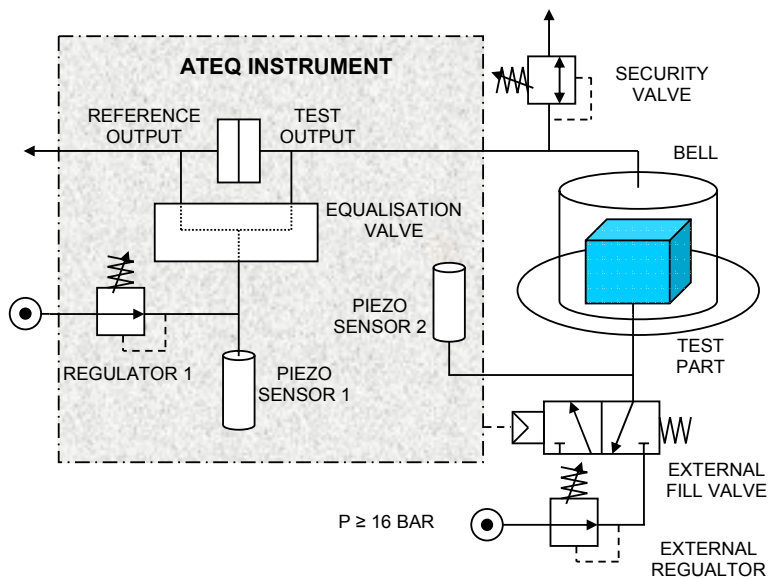
The **ATEQ F520 or F510** only controls and measures the pressure rise in the bell. In the event of a large leak, an electronic monitoring of the pressure in the bell will allow the securing of the instrument.

The pressure monitoring is carried out by two electrical piezo sensors.





Principle with test pressure under 16 bars.




Principle with test pressure in excess of 16 bars.




**b) Setting the parameters**

|   |   |   |
|---|---|---|
| <p>Confirm with a <b>Yes</b> the <b>Indirect mode</b> function in <b>Configuration / Extended menus</b>.</p>        |  | <pre>ARAM/Pr001/FUNCTIONS ▶PEAK HOLD      : No TEMP CORR. 1   : No INDIRECT       : Yes</pre> |
| <p>Confirm with <b>Yes</b> the <b>Indirect mode</b> function in the <b>Parameters / Functions</b> menu</p>          |  | <pre>PARAM/Pr001/FUNCTION PEAK HOLD      : No TEMP CORR. 1   : No ▶INDIRECT     : Yes</pre>   |
| <p>The instrument displays the parameter menu for the part pressure supply monitoring limits which must be set.</p> |  | <pre>Pr001/FUNCT/INDIRECT PIEZO 2 AZ    : No ▶Max. FILL   : 2.00 Min. FILL    : 1.00</pre>    |
| <p>The pressure monitoring limits for the bell must be entered in the test parameters menu.</p>                     |  | <pre>PARAM/Pr001 Press. UNIT   : bar ▶Max. FILL   : 1.50 Min. FILL    : 1.00</pre>            |

**Note:** the pressurisation (low pressure) of the bell, enables the monitoring of the integrity of the measurement circuit and bell.


|   |   |   |
|---|---|---|
| <p>The <b>PIEZO 2 AZ</b> function enables the setting up of and auto zero (reset) on the second piezo sensor.</p> |  | <pre>Pr001/FUNCT/INDIRECT ▶PIEZO 2 AZ    : No Max. FILL     : 2.00 Min. FILL     : 1.00</pre> |
|---|---|---|

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

|  |   |   |
|--|---|---|
| <p>During the fill and stabilisation phases, the two pressures are displayed.<br/>First line, pressure applied to the part, second line, pressure in the bell.</p> |  | <pre>RUN/Pr: 001 PRESS = 1.50 bar PRESS = 0.400 bar STABILISATION</pre> |
| <p>Then, during the test, the leak is displayed.</p>   |   | <pre>RUN/Pr: 001 PRESS = 1.50 bar LEAK = -004 Pa TEST</pre>             |

### 2.1.3. 23) Sign

The **SIGN** function enables the inversion of the sign (positive or negative) of the measurement result. This function is useful in the event of vacuum or recovery measurement as it allows the display of a positive leak result.

|  |   |   |
|--|---|---|
| <p>The <b>Sign</b> function (when it is validated) changes the sign for the leak value. <b>Example:</b> if the result is -004 Pa, then the display will be 004 Pa.</p> |  | <pre>PARAM/Pf001/FUNCTION TEMP. CORR. 1 : Yes INDIRECT      : Yes SIGN          : Yes</pre> |
|--|---|---|

## 2.2. AUTOMATIC SAVE

This function has for main objective to save the test parameters from the RAM memory of the instrument to its flash memory.

When this function is not validated, each time the key switch is turned from the **ACCESS** to the **LOCKED** mode, the instrument displays **NO PARAMETERS SAVED IN FLASH**. The save operation can be carried out manually in the **SERVICE PARAMETERS** menu.

When the **AUTOMATIC SAVE** function is confirmed with a **YES**, the parameters are saved automatically when the key is turned from the **ACCESS** to the **LOCKED** position.

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

## 2.3. ELECTRONIC REGULATOR

The **ELECTRONIC REGULATOR** function appears when one or two electronic regulators are installed in the instrument.


This function enables the shutting off of one or both regulators if they are not required.

## 2.4. REGULATOR CONTROL

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

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

When the instrument is configured on **EXTERNAL**, the instrument awaits a press on the





**RESET**  key to resume operation.

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


## 2.5. PIEZO AUTO ZERO

This function enables the setting of the frequency or of the number of measurement cycles between two Piezo auto zeros.

- **Number of minutes:** to set a time space between two auto zeros of 1 to 999 minutes. When the dial is on zero, no auto-zero is carried out.
- **Number of cycles:** to set a gap of a certain number of cycles between two auto zeros is carried out.


|   |   |   |
|---|---|---|
| <p>Confirm with <b>Yes</b> the <b>PIEZO AUTO AZ</b> in the <b>Configuration</b> menu.</p> |   | <pre>MAIN/CONFIGURATION REGUL. CTRL : Ext. PIEZO AUTO AZ: Yes Press. UNIT : MPa</pre> |
| <p>Then, enter the frequency parameter and/or number of cycles.</p>                       |   | <pre>/CONFI/PIEZO AUTO AZ N. OF MINUTE: 05 N. OF CYCLES: 00</pre>                     |

**Note:** the two options can be set, in this case the first counter to expire will launch the auto-zero, both counters will then be reset.

 Select the option and enter settings if necessary.

## 2.6. DATE & TIME

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

 Select the option and enter settings if necessary.

## 2.7. RS232

### 2.7.1. 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.

### 2.7.2. Print frame

Not operational.

### 2.7.3. 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.

#### 2.7.3. 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.

#### 2.7.3. 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), Prog. name (Display of the program name when set), Date & Time (printing of the date and the time), Lines before (number of lines before the result), Lines after (number of lines after the result), Inter line (space between each line), Form feed (new page).

**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**

```

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 > : 1 . 0 2   b a r : ( O K ) :   + 0 0 0   P a
    
```

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

```

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 > : 0 2 / 1 0 / 2 0 0 1   0 9 : 1 9 : 1 6
< 0 1 > : 0 . 9 2 5   b a r : ( O K ) :   - 0 0 2   P a
    
```

• **Example for a result with error**

```

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 > : A L : P I E Z O   F . S .
< 0 0 > : A L : P R E S S U R E   L O W
< 0 0 > : A L : P R E S S U R E   H I G H
    
```

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 |

### 2.7.3. 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 RESULTS** (all test results), **PASS** (number of good parts), **T. FAIL** (number of bad test parts), **R. FAIL** (number of bad reference parts), **ALARM** (number of times the alarm has been triggered), **PRESS OUT** (number of times pressure was incorrect), **REWORKABLE** (number of recoverable parts), **CALIBRATION**.

### 2.7.3. 4) 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.

### 2.7.3. 5) Print parameters

When this option is confirmed the test parameters are printed immediately.

## a) Example of a parameters print frame

| 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 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| V | e | r | s | i | o | n | 0 | 1 | .  | 1  | 6  | b  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 2 | 3 | / | 0 | 7 | / | 2 | 0 | 0 | 3  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| P | r | 0 | 1 | P | R | O | G | R | A  | M  | N  | A  | M  | E  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| T | Y | P | E | : | L | E | A | K |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| C | O | U | P | L | I | N | G | A | :  | 0  | 0  | .  | 1  | s  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| F | I | L | L | : | 0 | 1 | . | 0 | s  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| S | T | A | B | : | 0 | 1 | . | 0 | s  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| T | E | S | T | : | 0 | 2 | . | 0 | s  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| D | U | M | P | : | 0 | 1 | . | 0 | s  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| M | a | x | . | F | I | L | L | : |    |    |    |    | 2  | .  | 4  | 0  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| M | i | n | . | F | I | L | L | : |    |    |    |    | 1  | .  | 6  | 0  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| T | E | S | T | F | A | I | L | : |    |    |    |    | 0  | 1  | 0  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| R | E | F | . | F | A | I | L | : |    |    |    |    | 0  | 0  | 0  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

**Note:** The "PROGRAM NAME" characters are printed when a program name has been set in the parameters.

## 2.8. RS485

This function enables the configuration of the RS485 output to a C540 central or F580 when the instrument is installed in a network.

☞ Select the option and enter settings if necessary.

## 2.9. MODBUS

This function enables the configuration of the Modbus link when the instrument is installed in this type of network. The frame parameters, RS parameters (speed, serial port) must be entered.

☞ Select the option and enter settings if necessary.

## 2.10. SECURITY

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

☞ Select the option and enter settings if necessary.







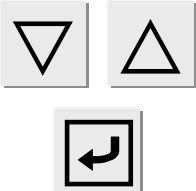
### 2.11. DISPLAY LIGHT

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 100% (maximum lighting intensity).

|  |   |   |
|--|---|---|
| <p>In the main menu, position the cursor by the <b>CONFIGURATION</b> menu then confirm by pressing <b>ENTER</b> .</p>  |    | <pre> MAIN MENU PARAMETERS SPE CYCLE: none CONFIGURATION                     </pre>           |
| <p>Move the cursor down until it is in front of the <b>LIGHT</b> menu then confirm by pressing <b>ENTER</b>.</p>   |    | <pre> MAIN/CONFIGURATION RS485 : C540/580 SECURITY : No LIGHT : No                     </pre> |
| <p>Place the cursor in front of <b>MODE</b> to choose the required lighting mode and confirm using <b>ENTER</b>.</p>   |  | <pre> MAIN/CONFI/LIGHT MODE : AUTO INTENSITY : 50%                     </pre>                 |
| <p>Select the lighting mode and confirm using <b>ENTER</b>.</p>  |  | <pre> MAIN/CONFI/LIGHT/MO CONTINUOUS MANUAL AUTO                     </pre>                   |
| <p>To return to the previous menu, press the <b>C</b> button once</p>  |  | <pre> MAIN/CONFI/LIGHT MODE : CONTINUOUS INTENSITY: 50%                     </pre>            |
| <p>To select the lighting intensity for the display, place the cursor in front of the <b>INTENSITY</b> menu and confirm using <b>ENTER</b>.</p>                          |  | <pre> MAIN/CONFI/LIGHT MODE : CONTINUOUS INTENSITY : 50%                     </pre>           |
| <p>Then select the lighting intensity from 00% (off) to 100% (maximum luminosity) and the new lighting intensity will be applied as soon as <b>ENTER</b> is pressed.</p> |  | <pre> MAIN/CONFI/LIGHT MODE : CONTINUOUS INTENSITY : 75%                     </pre>           |

### 2.12. EXTERNAL DUMP OPTION




This option can be used to control a dump valve outside the instrument (for example: a remote Y valve).

The advantage of external dumping is to protect the instrument's measurement circuit by preventing impurities, liquids or any other particles from flowing back into it.

This option requires two electrical outputs:

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

Use the following procedure to use the external dump function.

|   |   |  |
|---|---|--|
| <p>First, check or confirm the <b>EXTERNAL DUMP</b> function in the <b>CONFIGURATION</b> menu.</p>  |    | <pre>MAIN/CONFIGURATION SECURITY      : No LIGHT EXT. DUMP     : Yes</pre>                 |
| <p>After confirming the function, select the mode for the dump valve, <b>NORMALLY CLOSED</b> or <b>NORMALLY OPEN</b>.</p>   |   | <pre>AIN/CONFI/EXT. DUMP NORMALLY CLOSED NORMALLY OPEN</pre>                               |
| <p>Then in the <b>PARAMETERS /FUNCTIONS OF THE PROGRAM</b> menu, confirm the <b>EXT. DUMP</b> function and at each end of cycle the external dump output will be activated.</p> |  | <pre>PARAM/Pr-001/FUNCTIONS EXT. DUMP     : Yes TEMP. CORR. 1 : No INDIRECT     : No</pre> |

If the instrument is fitted with this option, internal and external valve codes 2 are no longer available.

## 2.13. CHANGE I/O CONFIGURATION

Please refer to Chapter 1, paragraph 3.3.1.5) "Connector J3 (Binary inputs/outputs) programmable input".

### 2.13.1. Input 7 (IN7)

This menu is used to configure programmable input 7 on connector J3 on the 16-program input/output board.

Refer to Chapter 1, paragraph 3.3.1.5) "Connector J3 (binary Inputs/Outputs) programmable input".

The various functions which can be set on input 7 are: "Program selection", "Pressure 1 Regulator 1 check test", "Pressure 1 Regulator 2 check test", "Pressure 2 Sensor check", "Leak sensor check", "Valve Auto-test", "Sensor status", "Regulator 1 adjust", "Regulator 2 adjust", "Infinite fill", "Part regulator", "Piezo auto zero", "ATR learning cycle", "Volume compute", "Sealed Pass part learn", "Sealed Fail part learn", "Check test result".

These functions represent all the special cycles available.

### 2.13.2. Output

Two output modes are available: **STANDARD** mode and **COMPACT** mode.

They enable the configuration of the outputs available in two different ways.

For the wiring of the outputs, please refer to chapter 1 paragraph 3.3.1.3) J3 connector (Binary Inputs/Outputs).





The compact mode enables the output of test results for two sequenced cycles maximum. Outputs 1 and 2 are reserved to the first cycle, outputs 3 and 4 to the second, output 5 for the general cycle end.

### 2.14. REMOTE CONTROL (RC5)

The remote control menu is used, if an eight-function keypad is installed, to program special menu shortcuts or the "start" function on the four keys (F1, F2, F3 and F4) available on this remote control.

This function is valid only if a keypad is connected to the instrument, which will automatically detect it.

The "start" function is used to configure a function key to simulate a keypad with bi-manual controls (start cycle with a function key and start cycle pressed simultaneously).

|  |   |   |
|--|---|---|
| <p>In the main menu, position the cursor beside the <b>CONFIGURATION</b> menu then confirm by pressing <b>ENTER</b>.</p> |    | <pre> MAIN MENU PARAMETERS SPE CYCLE: none CONFIGURATION                     </pre>               |
| <p>Then in the <b>CONFIGURATION</b> menu, position the cursor beside the <b>REMOTE CONTROL</b> menu then confirm</p>     |    | <pre> MAIN / CONFIGURATION EXT. DUMP      : CHANGE I/O REMOTE CTRL.  :                     </pre> |
| <p>Select the key to be programmed from <b>F1</b> to <b>F4</b>, then confirm.</p>  |  | <pre> MAIN/CONF1/REMOTE F1 : none F2 : none F3 : none                     </pre>                  |
| <p>From the relevant special menus offered, select the function to associate with the key.</p>                           |  | <pre> /REMOT/F1 : none none Regulator adjust. Infinite fill                     </pre>            |

**Notes:**

*When a function is programmed on an "F" key, it is deleted from the menu so that it can not be installed on another "F" key.*

*The special cycle appears and can be programmed if it has been activated in at least one of the test programs.*

*The programmed special cycle appears on the same key as all the programmes but will be inoperative if it has not been activated in the current program.*





### 2.15. AUTO SETUP

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

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


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

To create a test program with auto setup, follow the procedure below:

|   |   |   |
|---|---|---|
| <p>Confirm with a <b>Yes</b> the <b>AUTO SETUP</b> Function in the <b>Configuration</b> menu.</p> |   | <pre> MAIN /CONFIGURATION Est. DUMP      : No CHANGE I/O ▶AUTO SETUP   : Yes                     </pre> |
| <p>Enter the <b>PARAMETERS</b> menu and select an empty program</p>                               |   | <pre> PARAMETERS Pr: 02 LEAK Pr: 03 LEAK ▶Pr: 04 -----                     </pre>                       |
| <p>Select <b>LEAK</b> in the program types.</p>   |   | <pre> PARAM/TYPE ▶LEAK BLOCKAGE DESENSITIZED TEST                     </pre>                            |
| <p>Confirm with a <b>YES</b> the <b>AUTO SETUP</b> function.</p>                                  |   | <pre> PARAM/AUTO SETUP TYPE : LEAK ▶AUTO SETUP   : Yes AUTO CONNECT: Non                     </pre>     |



Next, set the various parameters selected by the instrument. These are:

- ✓ choice of an automatic connector (if the option is installed),
- ✓ choice of the fill regulator (if the double regulator option is present),
- ✓ the coupling time,
- ✓ the pressure unit,
- ✓ the fill instruction,
- ✓ the leak unit, (if the FAIL unit is a flow, it is necessary to edit the volume units of the part),
- ✓ the test FAIL value,
- ✓ the test time (not necessary if a flow unit is chosen).

|  |   |  |
|--|---|--|
| <p>When all the parameters have been entered, press on the <b>CYCLE START</b>. The instrument requests a pressure adjustment on the regulator.</p>   |  | <pre style="border: 1px solid black; padding: 5px; text-align: center;">                 RUN/Pr: 004                 PRESS = 0.875 bar                  REGULATOR ADJUST             </pre>                          |
| <p>When the pressure is reached, the instrument switches to the next cycle.</p>  |   |  |
| <p>The instrument carries out several measurement cycles which enable an adaptation of the different parameters for the part measured.</p>   |   | <pre style="border: 1px solid black; padding: 5px; text-align: center;">                 RUN/Pr: 004                 PRESS = 0.875 bar                  FILL             </pre>                                      |
| <p>At the end of the measurement cycles the instrument must display PASS part.</p> <p>The test parameters are entered in the program, the instrument is ready to carry out measurement cycles.</p> |   | <pre style="border: 1px solid black; padding: 5px; text-align: center;">                 RUN/Pr: 004                 PRESS = 0.875 bar                 LEAK = 016 Pa                 READY (PASS)             </pre> |

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

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

|   |   |   |
|---|---|---|
| <p>Confirm the <b>AUTO SETUP</b> function in the <b>CONFIGURATION</b> menu.</p> |   | <pre style="border: 1px solid black; padding: 5px; text-align: center;">                 MAIN /CONFIGURATION                 EXT. DUMP      : Non                 CHANGE I/O                 ▶AUTO SETUP   : Oui             </pre> |
| <p>Next, enter the test fail percentage</p>                                     |   | <pre style="border: 1px solid black; padding: 5px; text-align: center;">                 IN /CONFI/AUTO SETUP                 ▶% of T FAIL : 20             </pre>  |

**Example:** for a good part and a test FAIL of 10 cm<sup>3</sup>/min, the calculations will be done in such a way as to obtain a result of 2 cm<sup>3</sup>/min (for a test FAIL percentage of 20 %).



### 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 1 adjust:                   | Cycles used to set regulator number 1 (generally on rear panel).   |
| ✓ Regulator 2 adjust:                   | Cycle used to set regulator number 2 (generally on front panel).   |
| ✓ Infinite fill:                        | Cycle used to put test part under pressure for infinite time.  |
| ✓ Piezo auto reset:                     | Cycle used to carry out forced reset of the piezo transducer and the electronic regulator.   |
| ✓ Sealed component learning, good part: | This cycle is used to learn the pressure parameters for a good part if the measurement is of sealed component type. This learning cycle is compulsory. |
| ✓ Sealed component learning, bad part:  | This cycle is used to learn the pressure parameters for a bad part if the measurement is of sealed component type.                                     |
| ✓ Calibration check by volume:          | Cycle started manually by the operator to carry out calibration check by volume with a good part.  |
| ✓ CAL learning:                         | This cycle is used to carry out learning in calibrated Pascal or Pascal/sec mode on a known standard leak.   |
| ✓ CAL check:                            | This cycle is used for auto-diagnostics in calibrated Pascal mode (see previous function) within a tolerance determined by percentage limits.          |
| ✓ CAL check:                            | This cycle is used for auto-diagnostics in calibrated Pascal mode (see previous function) within a tolerance determined by percentage limits.          |



| Special cycle         | Function   |
|-----------------------|--|
| ✓ ATR learning cycle: | 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. |
| ✓ Volume compute:     | Cycle used to calculate the volume of the test circuit.  |

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. AVAILABLE SERVICE SPECIAL CYCLES

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




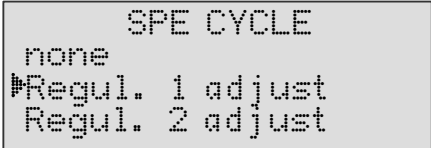



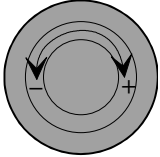
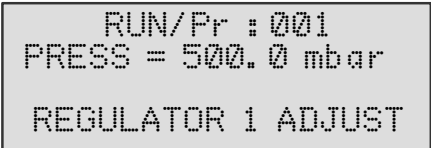


| Special cycle                                      | Function  |
|--|---|
| ✓ Calibration of pressure sensor 1 on regulator 1: | This cycle enables the calibration of piezo sensor 1 with the pressure adjusted on regulator 1. The test output is supplied with air enabling the checking of the pressure with a calibrator. If an electronic regulator is installed the pressure is adjusted with the <b>UP</b>  and <b>DOWN</b>  keys.     |
| ✓ Calibration of pressure sensor 1 on regulator:   | This cycle enables the calibration of piezo sensor 1 with the pressure adjusted on regulator 2. The test output is supplied with air enabling the checking of the pressure with a calibrator. If an electronic regulator is installed the pressure is adjusted with the <b>UP</b>  and <b>DOWN</b>  keys. |
| ✓ Calibration pressure sensor 2:                   | Identical to the previous special cycle with piezo sensor 2 if it is installed in the instrument.   |
| ✓ Differential sensor calibration:                 | This cycle enables the calibration of the differential sensor. It is important to ensure that the test pressure is 0.   |
| ✓ Sensor status :                                  | This cycle enables the display of the measurement points for the sensors installed in the instrument: the differential sensor and the piezo pressure sensors.   |
| ✓ Valve Auto-test:                                 | This special cycle enables the checking of the valve and the detection of a leak defect if there is one.  |

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

### 3.3. STARTING THE SPECIAL CYCLES


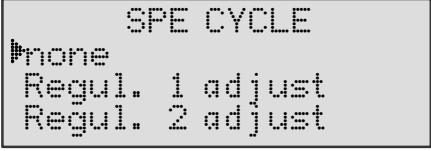

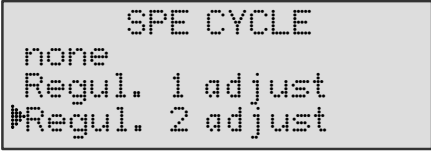


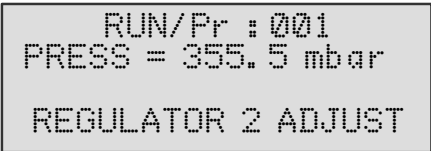
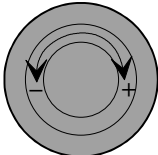
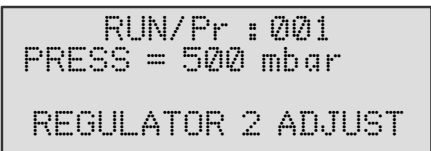


#### 3.3.1. Regulator

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

|   |   |  |
|---|---|--|
| <p>Position the cursor in front of <b>SPE CYCLE</b> and confirm using the <b>ENTER</b> key.</p>       |    |    |
| <p>Next, position the cursor in front of Regulator adjust and confirm using the <b>ENTER</b> key.</p> |    |    |
| <p>The display confirms that the special cycle has been selected.</p>                                 |   |   |
| <p>Press the <b>START</b> key to start the special cycle.</p>   |  |  |
| <p>Adjust the value of the pressure with the regulator.</p>   |  |  |
| <p>Once the pressure is adjusted, press the <b>RESET</b> key to stop the special cycle.</p>           |  |  |

### 3.3.2. Regulator 2

This special cycle enables the pressure of the second (electronic) regulator to be set or displayed. For **REGULATOR 2** to appear in the menu, **FILL MODE** must be selected in the extended menus (refer to § 2.1.1 « activation of additional functions ») then this function must be confirmed in the **FUNCTION** menu of the test program.



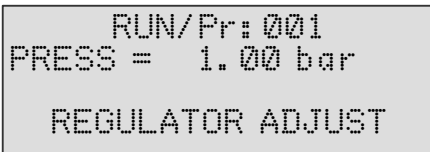
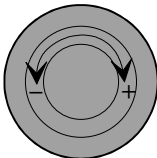


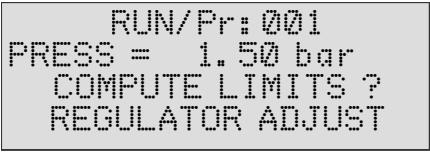

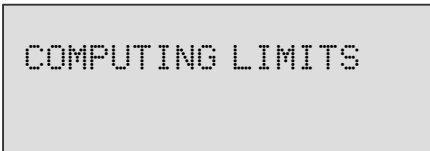



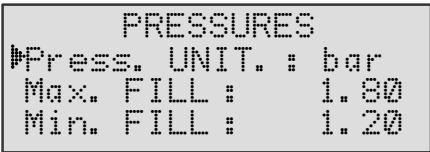
|  |   |  |
|--|---|--|
| <p>Position the cursor in front of <b>SPE CYCLE</b> and confirm using the <b>ENTER</b> key.</p>            |    |    |
| <p>Next, position the cursor in front of <b>Regul.2 adjust</b> and confirm using the <b>ENTER</b> key.</p> |    |    |
| <p>The display confirms that the special cycle has been selected.</p>                                      |   |   |
| <p>Press the <b>START</b> key to start the special cycle.</p>  |  |  |
| <p>Adjust the value of the test pressure with the regulator.</p>   |  |  |
| <p>Once the pressure is adjusted, press the <b>RESET</b> key to stop the special cycle.</p>                |  |  |

### 3.3.3. 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.

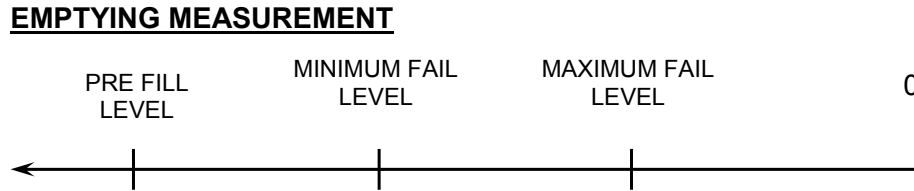
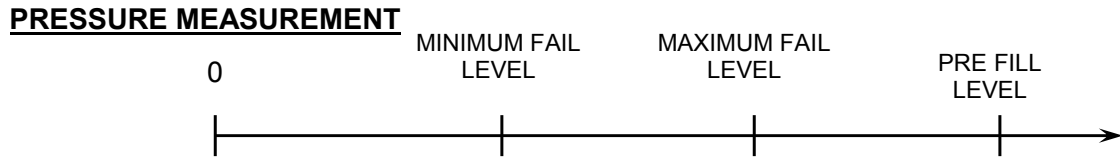
The limit values calculated automatically are plus or minus 20% of the measured value.

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

|  |   |  |
|--|---|--|
| <p>Confirm the special regulator setting cycle.</p>  |   |    |
| <p>Press the <b>START</b> button to run the special cycle.</p>   |    |    |
| <p>If necessary, adjust the test pressure value using the regulator.</p>   |   |   |
| <p>Now, when the switch is turned to <b>ACCESS</b> position, the question: "<b>COMPUTE LIMITS ?</b>" appears on the screen.</p>            |  |  |
| <p>Confirm calculation by pressing <b>ENTER</b>. The instrument calculates the limits and enters them in the cycle program parameters.</p> |  |  |
| <p>When the operation is completed, press the <b>RESET</b> button to stop the special cycle.</p>   |  |  |
| <p>When pressing the <b>ENTER</b> key, the limits computed are displays.</p>   |  |  |

**Notes:**

1) In the case of a vacuum test, the negative pressure limits retain their mathematical "order".




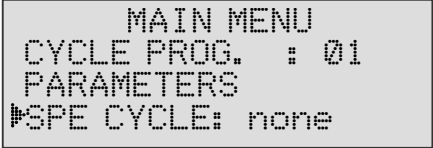

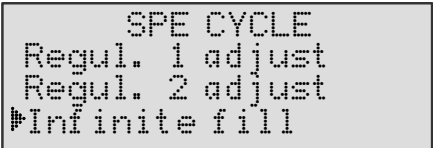
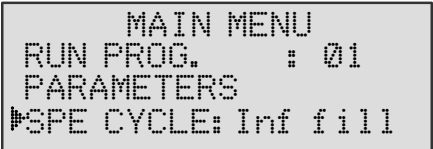


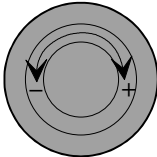



2) In the case of installation of an electronic regulator and pre-fill in the test cycle, the automatic calculation of the maximum pre-fill limit is equal to the maximum fill limit.

It is however possible to adjust this parameter manually to bring it to the most accurate for pressure monitoring.

### 3.3.4. Infinite fill




It is possible to carry out an infinite fill with the instrument, in other words, a permanent flow of air at the test pressure in order to locate leaks (set-up adjustment...).

If the assembly allows it (risk of sudden disconnection of part under pressure) it is preferable, in the case of infinite fill, to have a dump time of zero so as not to draw in liquid if there is a leak (when looking for leaks using a soapy water based product).

|   |   |  |
|---|---|--|
| <p>In the main menu, place the cursor in front of the <b>SPE CYCLE</b> function and confirm using the <b>ENTER</b> key.</p> |    |    |
| <p>Next, place the cursor in front of <b>Infinite fill</b> and confirm using the <b>ENTER</b> key.</p>                      |    |    |
| <p>The display confirms that the special cycle has been selected.</p>   |   |   |
| <p>Press the <b>START</b> key to start a new cycle.</p>   |  |  |
| <p>Adjust the test pressure with the regulator.</p>   |  |  |
| <p>To stop the cycle, press the <b>RESET</b> key.</p>   |  |  |

### 3.3.5. Piezo auto zero (reset)


Used for compulsory reset to zero of the piezo sensor.

|   |   |  |
|---|---|--|
| <p>In the main menu, place the cursor in front of <b>SPE CYCLE</b> and confirm using <b>ENTER</b>.</p>    |  | <pre> MAIN MENU RUN PROG: 001 PARAMETERS SPE CYCLE: none                     </pre>      |
| <p>Next, place the cursor in front of <b>Piezo auto zero</b> function and confirm using <b>ENTER</b>.</p> |  | <pre> SPE CYCLE Regul. 2 adjust Infinite fill Piezo auto zero                     </pre> |
| <p>The display confirms that the special cycle has been selected.</p>                                     |   | <pre> MAIN MENU RUN PROG.   : 01 PARAMETERS Piezo Az                     </pre>          |
| <p>Press the <b>START</b> key to start the reset.</p>   |  | <pre> RUN/Pr : 001 PRESS = 355.5 mbar  RESET                     </pre>                  |
| <p>Once the reset is carried out, the cycle ends automatically.</p>                                       |   | <pre> RUN/Pr : 001 PRESS = 355.5 mbar  READY                     </pre>                  |

**Note:** the auto zero cycle is an automatic cycle carried out at regular intervals of time ( $T_{az}$ ) which initialises the pressure transducers in relation to the atmospheric pressure.

The setting of the parameters for the time interval between two auto zero cycles is explained in paragraph 2.5 of this chapter.

In some circumstances involving automatic processes, it may be necessary to cancel the auto zero cycle.

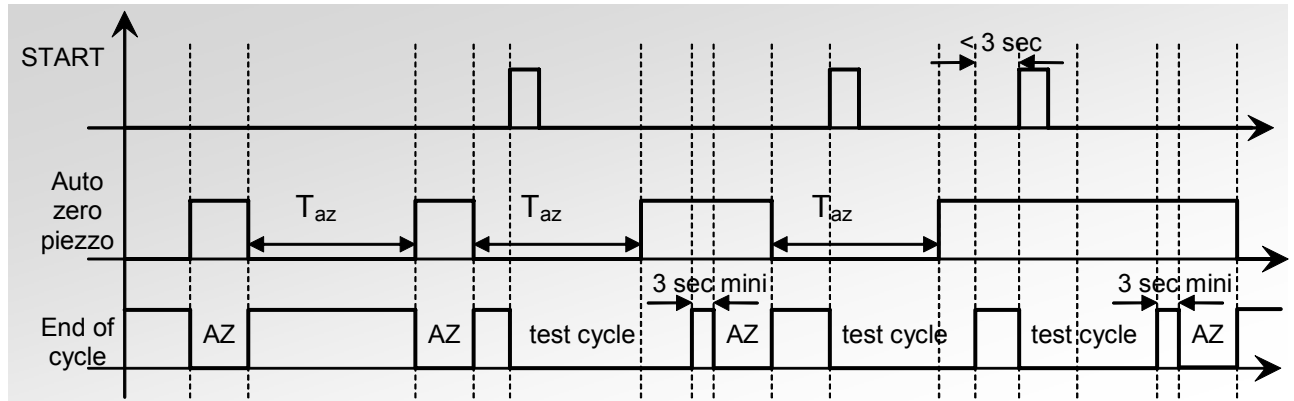
|   |   |  |
|---|---|--|
| <p>To inhibit the automatic zero cycle, go to the <b>CONFIGURATION</b> menu then confirm using <b>No</b>.</p> |  | <pre> CONFIGURATION EXTENDED MENUS Piezo Az                     </pre> |
|---|---|--|

**Warning:** 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 7 on connector J3, programmed for this function, or via a programmed function key on the optional RC5 keypad, if this is installed.

**Note 1:** if an electronic regulator is installed, the auto zero cycle can be used to calculate the three points on the regulator (points at 20 %, 50 % and 80 % of the maximum pressure which can be supplied by the regulator, the value depending on the supply pressure at the input).

**Note 2:** during the auto zero cycle, only the cycle start is saved.

### 3.3.5. 1) Timing chart for auto zero cycle



$T_{az}$  is the time which can be set between two auto zeros and which is dependent of the "AZ PIEZO AUTO" function, please refer to paragraph 2.5 for more information.

### 3.3.6. Volume compute


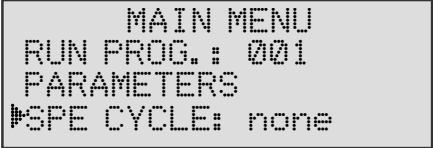



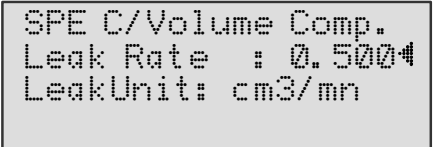

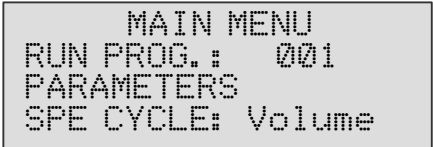

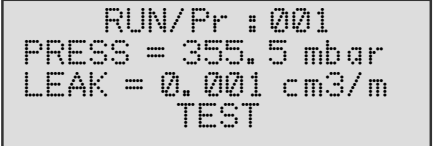
This special cycle is used to calculate the volume of the test circuit.

It is only available if the unit chosen is of the flow type (cm<sup>3</sup>/min, cm<sup>3</sup>/h etc...).

To chose a unit, refer to chapter 3 § 2.3 « Parameter settings ».

#### Preparation of the instrument

- ✓ Connect the instrument to a part with no leak.
- ✓ Connect a known standard leak to the rapid connector on the instrument's measurement circuit.
- ✓ Start a special « Regulator » cycle to set the test pressure for the known standard leak (see § 3.3.1. « Regulator setting »).
- ✓ The instrument now knows the value of the test pressure and can therefore calculate the volume of the part.

|  |   |  |
|--|---|--|
| <p>In the main menu, place the cursor in front of the <b>SPE CYCLE</b> function and confirm using the <b>ENTER</b> key.</p>  |    |    |
| <p>Next, place the cursor in front of the <b>Volume compute</b> function and confirm using the <b>ENTER</b> key.</p>   |  |  |
| <p>The display confirms that the special cycle has been selected.<br/>Enter the value of the leak under <b>Leak Rate</b> (target calibration) using the navigation keys.</p>   |  |  |
| <p>Confirm using the <b>ENTER</b> key.</p>   |  |  |
| <p>Press the <b>START</b> key to start the cycle. At the end of the cycle the value of the volume of the test part calculated by the instrument is sent directly to the <b>VOLUME</b> parameter in the program menu.</p> |  |  |

### 3.3.7. Manual calibration

#### 3.3.7. 1) Custom unit learning

If the 4 units of flow are not appropriate for the application, it is possible to use a custom unit mode (manual). To do this, a learning cycle must be carried out so that a custom unit value will correspond to a pressure drop.





To access this special cycle, select the unit **Cal-Pa** or **Cal-Pa/s** as a FAIL unit when creating a program (for selection of units, see chapter 3 § 2.3 "Parameter settings").



Then the special learning cycle must be carried out, either from the specials cycles menu or from input 7 on connector J3 programmed for this function, or via a programmed function key on the optional RC5 keypad, if this is installed.

The first custom unit learning cycle must be carried out using the specials cycles menu so that a leak rate target which is different to zero can be entered.

On these outputs we have:

- "Pass" and "end of cycle" if the target is lower than or equal to the FAIL reject level,
- "Fail" and "end of cycle" if the target is greater than the test FAIL level.

|   |   |  |
|---|---|--|
| <p>In the main menu, place the cursor in front of the <b>SPE CYCLE</b> function and confirm using the <b>ENTER</b> key.</p> |   | <pre> MAIN MENU RUN PROG. : 001 PARAMETERS SPE CYCLE: none                     </pre>      |
| <p>Next, place the cursor in front of the <b>Custom unit learn</b> function and confirm using the <b>ENTER</b> key.</p>     |  | <pre> SPE CYCLE Infinite fill Piezo auto zero Custom unit learn                     </pre> |
| <p>The display confirms that the special cycle has been selected.</p>   |   | <pre> C/Custom Unit Learn Leak Rate : 0.0004 LeakUnit: Cal-Pa                     </pre>   |
| <p>Set the target calibration <b>Leak Rate</b> which will be used as the base unit using the navigation keys.</p>           |  | <pre> C/Custom Unit Learn Leak Rate : 0.0004 LeakUnit: Cal-Pa                     </pre>   |
| <p>Confirm using the <b>ENTER</b> key.</p>  |  | <pre> MAIN MENU RUN PROG. : 01 PARAMETERS SPE CYCLE: Unit Lrn                     </pre>   |

|  |   |   |
|--|---|---|
| <p>Press the <b>START</b> key to start the learning cycle. At the end of the cycle, the readout displays the test results in the calibration unit.</p> |  | <pre> RUN/Pr : 001 PRESS = 0.505 bar LEAK = 1.5 Cal-Pa READY                     </pre> |
| <p>To stop the cycle, press the <b>RESET</b> key.</p>  |  | <pre> RUN/Pr : 001 PRESS = 355.5 mbar READY                     </pre>                  |




**Note:** The CDF (leak flow calibrator) can be used to calibrate the instrument and to send this value via the infra-red link.

### 3.3.7. 2) Custom unit check

This special cycle is used to verify calibration in custom unit mode (Please refer to the explanation in the previous paragraph for more information). The Custom unit check cycle measures whether the calibration has drifted beyond the limits set as a percentage. If these have been exceeded, an alarm will be triggered and a custom unit learn cycle or an instrument check will be required.

If the opposite is the case the "Pass" and "end of cycle" or "Fail" and "end of cycle" Fail level.

The Custom unit check request may be made from input 7 on connector J3 programmed for this function, or from a programmed function key on the optional RC5 keypad, if this is installed.

|   |   |  |
|---|---|--|
| <p>In the main menu, position the cursor beside <b>SPE CYCLE</b> and confirm using <b>ENTER</b>.</p>  |  | <pre> MAIN MENU RUN PROG.   : 01 PARAMETERS SPE CYCLE: none                     </pre>         |
| <p>Then place the cursor beside <b>Custom unit check</b> and confirm by pressing <b>ENTER</b>.</p>    |  | <pre> SPE CYCLE Piezo auto zero Custom Unit Learn Custom Unit Check                     </pre> |
| <p>Press the <b>START</b> button to run the check cycle. The check cycle will stop automatically.</p> |  | <pre> MAIN MENU RUN PROG.   : 01 PARAMETERS SPE CYCLE: Unit chk                     </pre>     |
| <p>At the end of the cycle, the display gives the test result in the unit of calibration.</p>         |   | <pre> RUN/Pr: 001 PRESS = 2.00 bar LEAK = 2 Cal-Pa READY (OK)                     </pre>       |

### 3.3.7. 3) Custom unit Check + Custom unit learn

This special cycle enables the checking of learning in the custom unit mode (Please refer to the previous paragraphs for more information). The checking cycle measures the drift in relation to the imposed percentage limits. If the limits are not exceeded, a Custom Unit learn cycle will be carried out automatically to refresh the value learnt.



If the percentage limit is exceeded, the instrument will display a Custom Unit drift error.

The custom unit check + Custom unit learn cycle request can be carried out on input 7 of the J3 which has been programmed for this function or on a pre programmed key on the optional RC5 consol if it is installed.

### 3.3.7. 4) Personalisation of the custom unit

The names of the **Cal-Pa** or **Cal-Pa/s** units may be changed in each program. This allows the individual recognition of each unit chosen.

```
RUN/Pr: 001
PRESS = 0.875 bar
LEAK = 30.00 g/s
READY (OK)
```




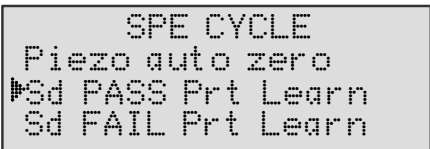
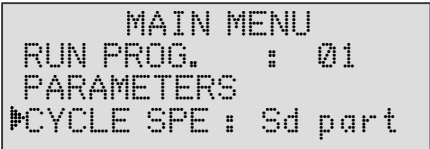

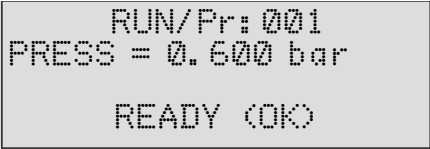

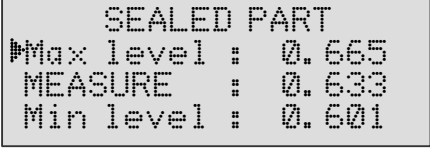
|  |   |  |
|--|---|--|
| <p>The personalisation is carried out in the <b>PARAMETERS/FUNCTIONS/UNITS</b> menu.</p>                                     |   | <pre>AM/Pr001/FUNCT/UNITS LeakUnit: g/s Drift Unit : 020 % NAME : g/s</pre>  |
| <p>The Custom name can be deleted in the <b>PARAMETERS/TEST TYPE</b> menu and select the <b>Delete Custom name</b> line.</p> |   | <pre>ARAM/Pr001/TEST TYPE Delete name Reset program Delete Custom Name</pre> |

### 3.3.8. Calibration check by volume

This cycle is used to check calibration of the instrument using a known volume. Please refer to the explanation in paragraph 2.1.3.6.

### 3.3.9. Sealed component learning





For sealed components, learning cycles for Pass and Fail must be done so that the instrument knows the parameters. These learning cycles are located as shortcuts in the specials cycles menu, on input 7 of connector J3 which is programmed for this function or on a programmed function key on the optional RC5 keypad, if it is installed.

|  |   |  |
|--|---|--|
| <p>Position the cursor beside <b>SPE CYCLE</b> and confirm by pressing <b>ENTER</b>.</p>   |    |  <pre> MAIN MENU RUN PROG.   : 01 PARAMETERS #CYCLE SPE : none                     </pre>                |
| <p>The place the cursor beside <b>Sealed PASS Part Learn</b> and confirm using <b>ENTER</b>.</p>   |    |  <pre> SPE CYCLE Piezo auto zero #Sd PASS Prt Learn Sd FAIL Prt Learn                     </pre>         |
| <p>The display confirms that the special cycle has been selected.</p>  |   |  <pre> MAIN MENU RUN PROG.   : 01 PARAMETERS #CYCLE SPE : Sd part                     </pre>           |
| <p>Then press the <b>START</b> button to start the learning cycle. At the end of the cycle, the display gives the test result for the good part.</p> |  |  <pre> RUN/Pr: 001 PRESS = 0.600 bar  READY (OK)                     </pre>                            |
| <p>At the end of the learning cycle, press <b>ENTER</b> (or any key) and the instrument will display the sealed component parameters.</p>            |  |  <pre> SEALED PART #Max level : 0.665 MEASURE    : 0.633 Min level  : 0.601                     </pre> |
| <p>Proceed in the same way for the bad part parameters.</p>  |   |  |

For further information about sealed components, see paragraph 2.1.3.16) in this chapter.

### 3.3.10. 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 specials cycles menu, on input 7 of connector J3 if programmed for this function or on a programmed function key on the optional RC5 keypad, if this is installed.

|  |   |  |
|--|---|--|
| <p>If no transient learning has been carried out, the message <b>ATR ERROR</b> will appear.</p>  |   | <pre> RUN/Pr: 001 PRESS = 1.50 bar LEAK = ATR ERROR READY (NO OK)                     </pre>       |
| <p>To carry out the learning, select the <b>SPE CYCLE</b> menu.</p>  |    | <pre> MAIN MENU RUN PROG. : 01 PARAMETERS ▶CYCLE SPE : none                     </pre>             |
| <p>Then select the <b>ATR Learning cycle</b> function.</p>   |    | <pre> SPE CYCLE Custom unit check Check+custom unit ▶ATR Learning cycle                     </pre> |
| <p>The display confirms that the special cycle has been selected.</p>  |   | <pre> MAIN MENU RUN PROG. : 01 PARAMETERS ▶SPE CYCLE : ATR                     </pre>              |
| <p>Press the <b>START</b> button to start the learning cycle. At the end of the cycle, the display gives the test result for the good part.</p>                                  |  | <pre> RUN/Pr: 001 PRESS = 1.50 bar LEAK = 002 Pa READY (OK)                     </pre>             |
| <p>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.</p> |   | <pre> RUN/Pr: 001 PRESS = 1.50 bar LEAK = 002 Pa ATR Learn.                     </pre>             |
| <p>To view the transient values, press <b>ENTER</b>.<br/><b>Note:</b> these values can be modified manually.</p>   |  | <pre> ATR2 ▶Start : -000 Transient : -003 DRIFT : 020 %                     </pre>                 |

### 3.4. STARTING THE SERVICE SPECIAL CYCLES

The service special cycles enable the carrying out of checks on various parts of the instrument (pressure sensors and valves). "


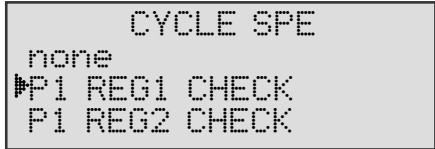

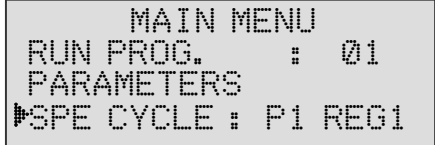
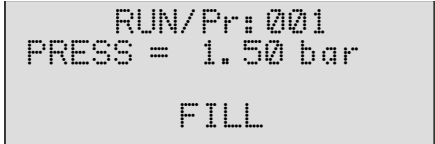


To display these cycles in the special cycles menu the function must be confirmed in the **SERVICE** menu. Please refer to paragraph 4.2 "Service special cycles".

#### 3.4.1. Sensor calibration

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

##### 3.4.1. 1) Piezo sensors




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

|   |   |  |
|---|---|--|
| <p>To carry out the calibration, select the <b>SPE CYCLE</b> menu. Next, select the required calibration cycle. Then confirm.</p> |    |   |
| <p>When the cycle is selected, press on the <b>CYCLE START</b> key to start the calibration cycle.</p>                            |  |  |
| <p>The instrument switches to infinite fill and displays the pressure measured. A calibration of the sensor is know possible.</p> |   |  |
| <p>Stop the special cycle by pressing on the <b>END OF CYCLE</b> key.</p>   |  |  |

**Note:** in an electronic regulator is used, the adjustment of the instruction can be modified with the up and down arrows.

### 3.4.1. 2) Differential (Leak) sensor



This procedure concerns the calibration of the differential sensor. Before carrying out this operation the pressure should be set to 0 on the mechanical regulator.

|   |   |   |
|---|---|---|
| <p>Select the <b>SPE CYCLE</b> menu.<br/>Then select the <b>LEAK SENSOR CHECK</b> cycle.</p>  |    | <pre>SPE CYCLE P1 REG2 CHECK P2 SENSOR CHECK ▶LEAK SENSOR CHECK</pre> |
| <p>When the cycle is selected, press on the <b>CYCLE START</b> key to launch the calibration cycle.</p>   |    | <pre>MAIN MENU RUN PROG.    : 01 PARAMETERS ▶CYCLE SPE : LEAK</pre>   |
| <p>The instrument carries out a dump, checks that the pressure is not zero then switches to test and displays the pressure measured. A sensor calibration is then possible.</p> |   | <pre>RUN/Pr: 001 LEAK =- 8.4 Pa TEST</pre>                            |
| <p>Stop the special cycle by pressing on the <b>END OF CYCLE</b> key.</p>   |  | <pre>RUN/Pr: 001 PRESS = 1.50 bar READY</pre>                         |

### 3.4.2. Valve auto-test

The cycle **VALVE AUTO-TEST** must only be carried out with plugs on the test and reference outputs.




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

|  |   |  |
|--|---|--|
| <p>To carry out an Auto-test cycle, select the <b>SPE CYCLE</b> function in the main menu, then the <b>AUTO TEST</b> function and confirm.</p> |  | <pre>CYCLE SPE ▶AUTO TEST SENSOR STATUS Regul. 1 adjust</pre>        |
| <p>When the cycle is selected, press on <b>CYCLE START</b> to launch the calibration cycle.</p>  |  | <pre>MAIN MENU RUN PROG.    : 01 PARAMETERS ▶SPE CYCLE : VALVE</pre> |
| <p>During the Auto-test, the instrument displays the pressure measured.</p>  |   | <pre>RUN/Pr: 001 PRESS = 1.50 bar AUTO-TEST FILL</pre>               |

|   |  |  |
|---|--|--|
| <p>The cycle stops automatically if the valve has no defect, the instrument displays <b>PART PASS</b></p> |  | <pre> RUN/Pr: 001 PRESS = 1.50 bar AUTO-TEST READY (PB)                     </pre> |
|---|--|--|

### 3.4.3. Sensor status

This menu enables the display the values in points measured by the sensors.

|   |   |   |
|---|---|---|
| <p>Select the <b>SPE CYCLE</b> menu. Then select the <b>SENSOR POINTS</b> function.</p>                 |    | <pre> SPE CYCLE LEAK SENSOR CHECK AUTO TEST SENSOR STATUS                     </pre>    |
| <p>When the cycle is selected, press on the <b>CYCLE START</b> key to launch the calibration cycle.</p> |    | <pre> MAIN MENU RUN PROG. : 01 PARAMETERS SPE CYCLE : SENSOR                     </pre> |
| <p>The instrument carries out a dump and displays the values in points of the various sensors.</p>      |   | <pre> RUN/Pr: 001 DIFF PIEZ1 PIEZ2 00068 -0167 00001                     </pre>         |
| <p>Stop the special cycle by pressing on the <b>END OF CYCLE</b> key.</p>                               |  | <pre> RUN/Pr: 001 PRESS = 1.50 bar  READY                     </pre>                    |

## 4. SERVICE MENU










### 4.1. PARAMETERS SERVICE

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

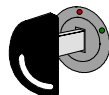
- ✓ **Save** service parameters menu: used to save the configuration of the parameters in the current test.
- ✓ **Restore** service parameters menu: used to restore a previously saved configuration.
- ✓ **Reset** service parameters menu: used to delete the current configuration.

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

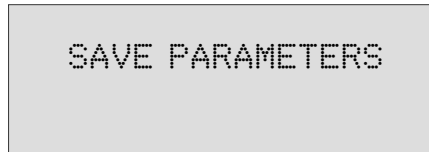


|   |  |  |
|---|--|--|
| <p>In the main menu, place the cursor in front of <b>SERVICE</b> and confirm using <b>ENTER</b>.</p>  |    | <pre> MAIN MENU SPE CYCLE: none CONFIGURATION SERVICE                     </pre>   |
| <p>Then place the cursor in front of <b>PARAMETERS</b> and confirm using <b>ENTER</b>.</p>  |    | <pre> MAIN/SERVICE PARAMETERS                     </pre>   |
| <p>Then place the cursor in front of the action required :</p> <p><b>SAVE</b>: save current parameters,</p> <p><b>RESTORE</b>: load from memory to current parameters,</p> <p><b>RESET</b>: delete current parameters,</p> <p>and confirm using <b>ENTER</b>.</p> |    | <pre> MAIN/SERVI/PARAMETE SAVE                : No RESTORE             : No RESET               : No                     </pre>  |
| <p>To activate an operation, confirm using <b>ENTER</b>. Then choose <b>YES</b> using the arrows then confirm again using <b>ENTER</b>.</p>   | <br>  | <pre> MAIN/SERVI/PARAMETE SAVE                : Yes RESTORE             : No RESET               : No                     </pre> |

Turn the switch to the **LOCKED** 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.



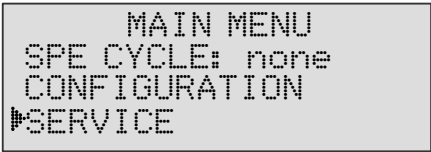


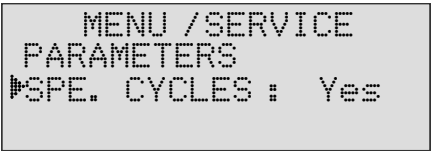


This message does not block the instrument and disappears after a few seconds. It informs that a parameters saving could be necessary. In this case three solutions arise:

- 1) **Restore** the saved parameters (current parameters will be lost).
- 2) **Save** the current parameters in the memory (the parameters already in the memory will be lost).
- 3) **Do nothing** and work with the current parameters.

#### 4.2. SERVICE SPECIAL CYCLES

This menu enables the display of the checking cycles in the special cycles menu.

|  |   |  |
|--|---|--|
| <p>In the main menu, place the cursor in front of the <b>SERVICE</b> function and confirm with the <b>ENTER</b> key.</p> |   |   |
| <p>Next, place the cursor in front of <b>SPE CYCLES</b> and confirm with <b>Yes</b>.</p>                                 |   |  |

## 5. RESULTS MENU

This function is used for the:

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

## 6. LANGUAGE MENU

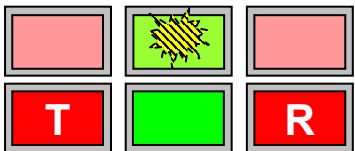

This function is used to select the language displayed by the instrument. Several languages are available. Two languages can be stored in the instrument when it is manufactured, English by default and one other optional language.


## 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:















- 1) Either through the standby menu,
- 2) Or by pressing the **RESET**  key for more than three seconds.

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

 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.

|   |   |   |
|---|---|---|
| <p>In the main menu, position the cursor beside <b>STAND-BY</b> and confirm by pressing <b>ENTER</b>.</p>   |       | <pre> MAIN MENU RESULTS LANGUAGE : English STAND-BY                     </pre>                            |
| <p>To program automatic standby at a given time, position the cursor beside <b>STOP TIME</b>.</p>   |       | <pre> STAND-BY Now           : No Start time    : No STOP TIME    : No                     </pre>         |
| <p>Confirm the <b>STOP TIME</b> parameter using <b>YES</b></p>  |       | <pre> STAND-BY Now           : No Start time    : No STOP TIME    : Yes                     </pre>        |
| <p>Then set parameters for the time (hours and minutes) when the standby must take effect. <b>TIME DELAY</b> is the delay (in minutes) between the programmed time and actual standby</p> |   | <pre> STAND/Stop time HOUR          : 00 MINUTE        : 00 Delay         : 00                     </pre> |
| <p>To program the start-up time for the instrument, position the cursor beside <b>START TIME</b></p>  |   | <pre> STAND-BY Now           : No START TIME   : Yes STOP TIME    : Yes                     </pre>        |
| <p>Confirm the <b>START TIME</b> parameter using <b>YES</b></p>   |   | <pre> STAND-BY Now           : No START TIME   : Yes STOP TIME    : Yes                     </pre>        |
| <p>Then set parameters for the instrument start time (in hours and minutes).</p>  |   | <pre> STAND/Start time HOUR          : 00 MINUTE        : 00                     </pre>                   |

## Chapter 5

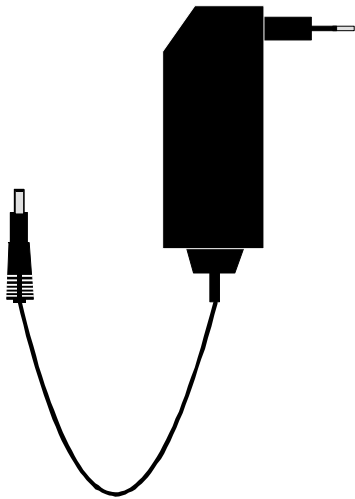
---

# ACCESSORIES

---

### 1. ACCESSORIES SUPPLIED WITH THE INSTRUMENT

#### 1.1. POWER SUPPLY



The power supply of the **F510**, **F520** converts a network voltage (120 to 240 V AC) into a 24 V DC low voltage supply. It has no power switch and works as soon as it is plugged in. It is protected against surges and short circuits via a thermal fuse (Do not use any other type of fuse).


## 2. OPTIONAL ACCESSORIES

### 2.1. CALIBRATED MASTER 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 |
| <b>2 kPa</b><br>(20 mbar)   |                  |     | 1,5  | 3,12 | 6,6  | 18  | 31,2 | 1,24 | 2,05 | 4,2  | 53   |
| <b>5 kPa</b><br>(50 mbar)   |                  | 2,3 | 4    | 7,4  | 17,5 | 42  | 1,3  | 2,6  | 5,25 | 11,3 | 132  |
| <b>15 kPa</b><br>(150 mbar) | 2,82             | 6,7 | 12   | 23   | 55   | 2,2 | 4    | 8,2  | 17   | 35,5 | 338  |
| <b>30 kPa</b><br>(300 mbar) | 4,8              | 12  | 24   | 46,8 | 2,12 | 3,6 | 7,6  | 22,4 | 40   | 74,5 | 700  |
| <b>50 kPa</b><br>(500 mbar) | 10               | 25  | 48   | 1,4  | 3,5  | 8   | 15,5 | 31   | 63   | 150  | 1142 |
| <b>100 kPa</b><br>(1 bar)   | 23               | 56  | 1,8  | 3,3  | 8    | 19  | 37   | 74   | 149  | 360  | 2230 |
| <b>200 kPa</b><br>(2 bar)   | 55               | 2,3 | 4,6  | 8,5  | 21   | 47  | 89   | 194  | 380  | 830  | 4343 |
| <b>400 kPa</b><br>(4 bar)   | 2,5              | 6,6 | 12,1 | 23,3 | 56   | 125 | 220  | 540  | 1030 | 1500 | 8750 |
| <b>1 MPa</b><br>(10 bar)    | 11,5             | 29  | 50   | 95   | 198  | 420 | 705  | 2310 | 3700 | 4450 |      |

 **kPa.cm<sup>3</sup>/h**  
(bar.cm<sup>3</sup>/h)

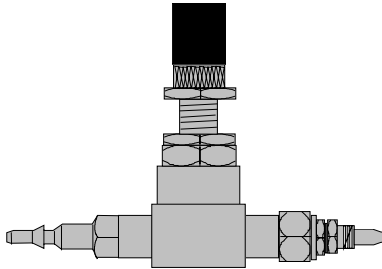
 **kPa.cm<sup>3</sup>/min**  
(bar.cm<sup>3</sup>/min)

**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<sup>3</sup>/min (10 bar.cm<sup>3</sup>/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 service.
- ✓ 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. Only with pressure regulation and not vacuum.

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

### 2.2.1. Needle valve

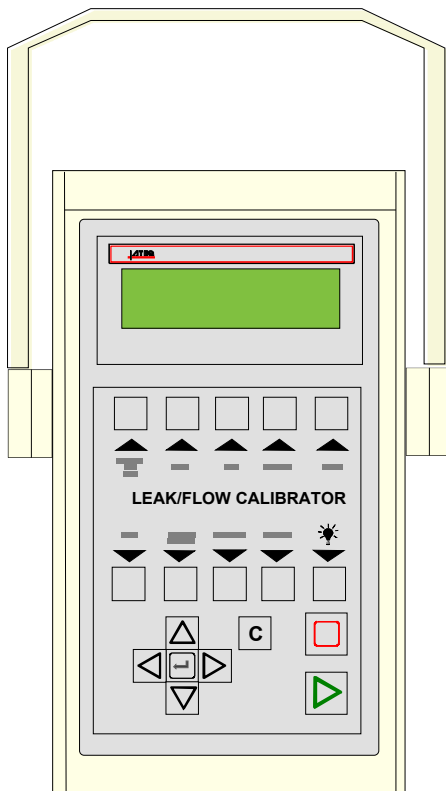


Needle valves are used to calibrate the leakage limits. These valves have an adjustable leak and depending on the model allow adjustments of between a few cm<sup>3</sup>/h to several l/min.

These valves can be easily disturbed and therefore require the frequent use of some means of checking the setting (eg : SAGA 4000).

**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", 1 1/4", 1 1/2", 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.

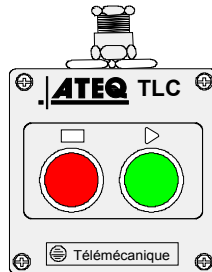
The filtration kit is connected to the air input on the rear panel of the instrument.

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. SIMPLES REMOTE CONTROLS

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

### 2.5.1. Reset/Start remote



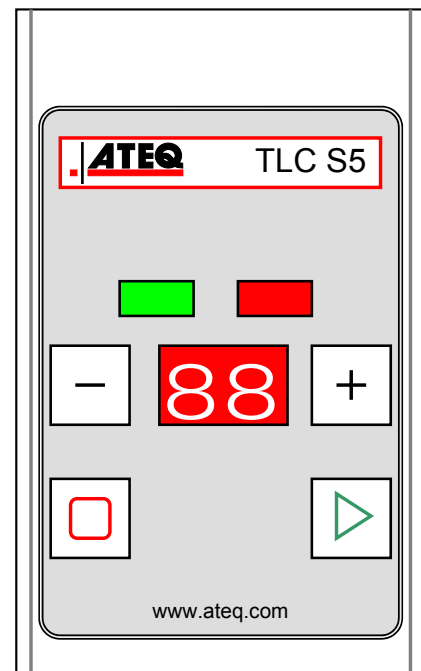
### 2.5.2. S5 four-function remote control

This remote control has four functions which can be used to control a series 5 instrument remotely. (F580 or C540 single head only).

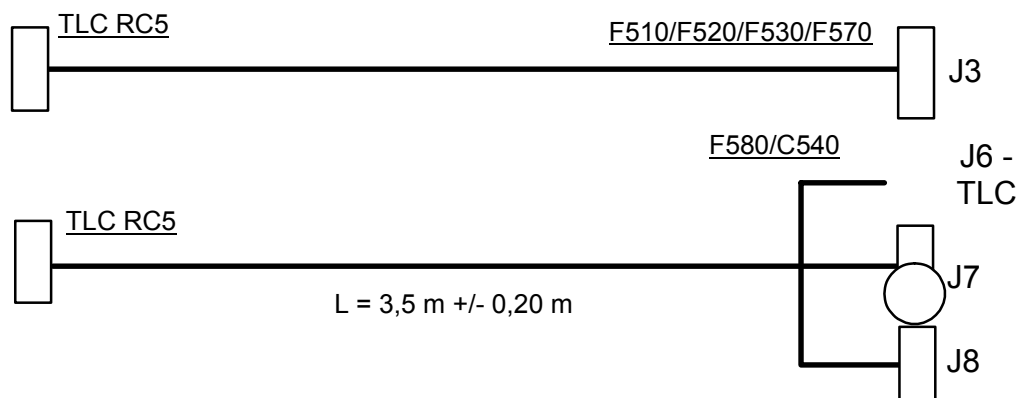
The four functions on this remote control are as follows:

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



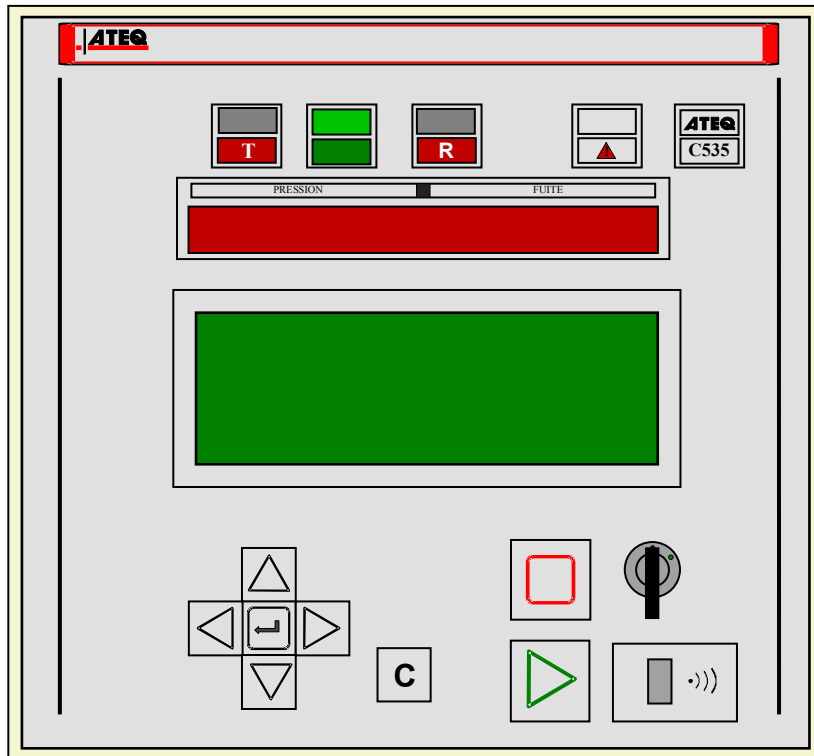
#### 2.5.2. 1) Connection diagram



## 2.6. RC5 REMOTE FRONT PANEL

### 2.6.1. Appearance

This option is used where the control station is in a different place from that of the test instrument. It means that tests can be controlled and results read remotely, which is useful if measurement instruments are installed in accessible places, such as, for example, inside a machine so that the pipes between the part to be measured and the instrument are as short as possible.



This front panel behaves exactly as if the operator were in front of the instrument itself. For the interface, please refer to the overall operation of the instrument.

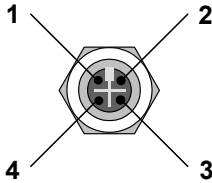
This remote control is optional. It is connected to the LUMBERG type socket reserved for remote controls. It is "plug and play" type so it is automatically detected by the instrument and the "REMOTE CONTROL" menu appears if the RC5 remote control is connected.

When the remote control is installed, its keypad takes priority and the keypad on the test instrument becomes inactive.

## 2.6.2. Installation

### 2.6.2. 1) Connector on measurement instrument

#### a) Connector J5 RS485 (remote control)

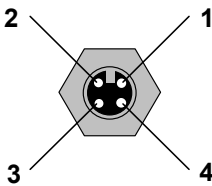


Used for connection of an intelligent remote control. (Lumberg female connector).

|       |                    |
|-------|--------------------|
| PIN 1 | Network            |
| PIN 2 | + 24V Power supply |
| PIN 3 | Network            |
| PIN 4 | 0V Earth           |

### 2.6.2. 2) Connector on the RC5

#### a) RS485 connector (Input)



Used for the connection of the option to the remote control input of the **ATEQ** instrument (Lumberg male connector).

|       |                    |
|-------|--------------------|
| PIN 1 | Network            |
| PIN 2 | + 24V Power supply |
| PIN 3 | Network            |
| PIN 4 | 0V Earth           |

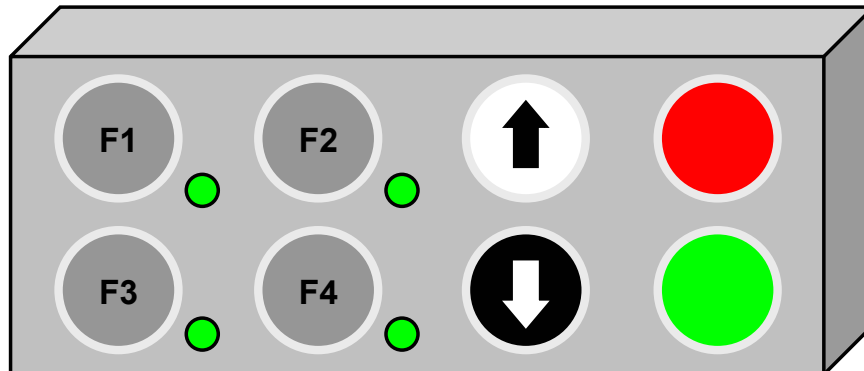
## 2.6.3. Start-up

Before making connections between instruments, switch off the power supply to them. When the network is installed and the instrument is started up, it automatically detects the presence of the RC5 remote front panel.

If the remote front panel is fitted with the multi-function (8 key) keypad, please refer to the paragraph relating to this accessory.

## 2.7. INTELLIGENT REMOTE CONTROL

### 2.7.1. Appearance of the remote control



The remote control is used for remote control and selection of the various functions in the **ATEQ** instruments range.

This keypad can only be installed with an RC5 type remote front panel with the keypad interface option.

### 2.7.2. Programmable keys

This remote control is fitted with four function keys (F1, F2, F3 and F4) which can be programmed according to the user's requirements (four buttons located on the left-hand side). When a special cycle is used on a function key, it no longer appears in the menus for the other function keys.

The programmable functions are all the special cycles and start cycle (the start cycle function is used to simulate a bi-manual control).

**Note:** synchronisation between the two keys is of the order of 300 ms. The bi-manual function does not have a safety rating and the ATEQ company would not be in any way liable if an accident were to happen to personnel due to improper use of it.

### 2.7.3. Programmable cycles

The programmable special cycles on the function keys F1 to F4 are as follows:

None.

Regulator 1 adjust.

Regulator 2 adjust.

Infinite fill.

Piezo auto zero.

PASS part sealed component learn.

FAIL part sealed component learn.

Sensor status.

Custom unit learn.

Custom unit check.

ATR learn.

Volume compute.

Start.

### 2.7.4. Indicator lights

The three-colour LED's located close to keys F1 to F4 show the status of the special cycle requested:

- **green**, good cycle (PASS),
- **red**, bad cycle (FAIL),
- **orange** cycle in progress.

### 2.7.5. Fixed function keys

The four other push buttons (located on the right-hand side) have the following functions:

- up through program selection (white),
- down through program selection (black),
- start cycle button (green),
- stop cycle button (red).

*Note: these are fixed function buttons and the functions can not be modified.*

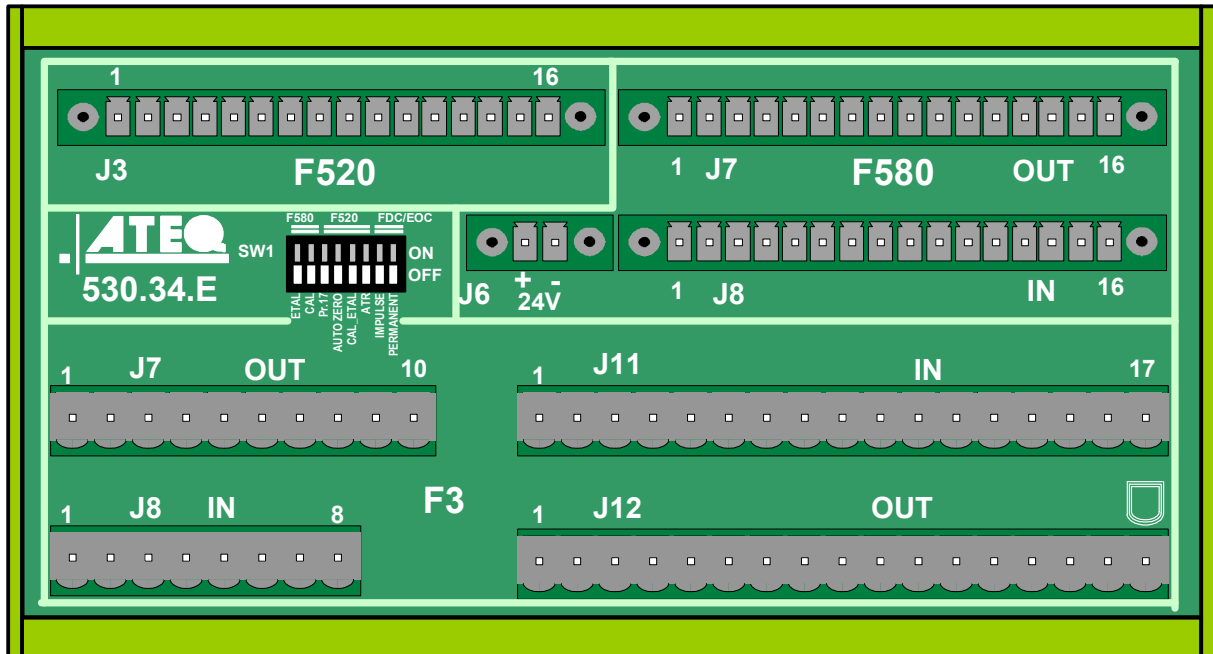
### 2.7.6. Installation of keypad on the RC5

| Pins | J2 Connector (Outputs) |        | J3 Connector (Inputs) |           |
|------|------------------------|--------|-----------------------|-----------|
|      | Outputs<br>24 V 10 mA  | L.E.D. | Inputs                | Functions |
| 1    | Green anode            | F1     | Input 1               | F1        |
| 2    | Cathode (0 V)          |        | 24 V                  |           |
| 3    | Red anode              |        | Input 2               | F2        |
| 4    | 0 V                    |        | 24 V                  |           |
| 5    | Green anode            | F2     | Input 3               | F3        |
| 6    | Cathode (0 V)          |        | 24 V                  |           |
| 7    | Red anode              |        | Input 4               | F4        |
| 8    | 0 V                    |        | 24 V                  |           |
| 9    | Green anode            | F3     | Input 5               | UP        |
| 10   | Cathode (0 V)          |        | 24 V                  |           |
| 11   | Red anode              |        | Input 6               | DOWN      |
| 12   | 0 V                    |        | 24 V                  |           |
| 13   | Green anode            | F4     | Input 7               | RESET     |
| 14   | Cathode (0 V)          |        | 24 V                  |           |
| 15   | Red anode              |        | Input 8               | START     |
| 16   | 0 V                    |        | 24 V                  |           |

## 2.8. INSTALLATION OF THE INTERFACE BOARD F5 TO F3

### 2.8.1. Presentation

The interface relay board F5 to F3 is presented as follows:



The interface relay board allows the replacement of a 3 series instrument by a 5 series one without modify all the existing wiring. The compatibility only concerns some basic functions, which are described in the following pages.

As the board is an external component, it has to be bought separately from the ATEQ instruments. The board has to be fixed on a DIN support and its measurements are: L = 160 mm x H = 90 mm x D = 50 mm.

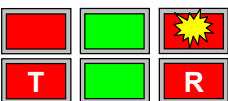
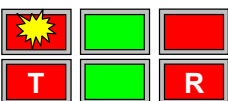
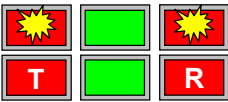



### 2.8.2. Installation of the interface

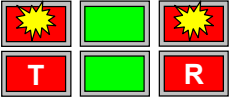

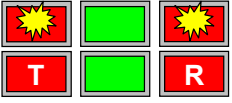
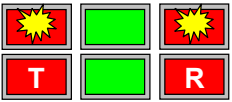

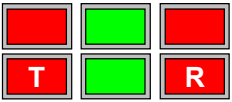
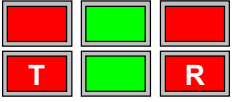
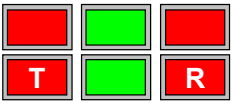
For information on the installation and compatible functions, please refer the interface's manual or brochure.

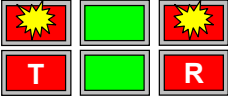
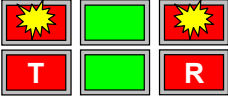

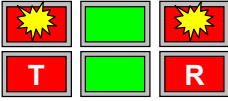
## Chapter 6

## ERROR MESSAGES

The **ATEQ F510** and **F520** can display error messages if there are operational problems.

| PROBLEM  | LIT INDICATORS  | MESSAGE DISPLAYED   |
|--|---|---|
| Reference error. Leak in excess of the full scale.<br><b>Action:</b> check the reference circuit.  |    | <pre>RUN/Pr001 PRESS=0.942 bar LEAK=&gt;&gt;F. S REF. READY (NO OK)</pre> |
| Test error. Leak in excess of the full scale.<br><b>Action:</b> check the test circuit.  |    | <pre>RUN/Pr001 PRESS=0.942 bar LEAK=&gt;&gt;F. S TEST READY (NO OK)</pre> |
| Pressure in excess of the full scale.<br><b>Action:</b> decrease the pressure using the mechanical regulator knob or the target if an electronic regulator is used.                              |  | <pre>RUN/Pr001 PRESS=&gt; FULL SCALE READY (NO OK)</pre>                  |
| Differential transducer error.<br><b>Action:</b> contact ATEQ after sales service for repair (probably water or oil in the instrument's test circuit).   |  | <pre>RUN/Pr001 PRESS=0.942 bar LEAK= SENSOR ERR. READY (NO OK)</pre>      |
| Pressure in excess of the max. threshold.<br><b>Action:</b> check regulator settings, pressure limits, check whether the right regulator has been selected if there are two.                     |  | <pre>RUN/Pr001 PRESS=1.02 bar P&gt; READY (NO OK)</pre>                   |
| Pressure below the min. threshold.<br><b>Action:</b> check the network pressure and regulator settings, the pressure limits, and whether the right regulator has been selected if there are two. |  | <pre>RUN/Pr001 PRESS=0.000 bar P&lt; READY (NO OK)</pre>                  |

| PROBLEM   | LIT INDICATORS   | MESSAGE DISPLAYED   |
|---|--|---|
| <p>ATR error.<br/><b>Action:</b> run another ATR learning cycle or check the ATR parameters. ATR fault.</p>   |   | <pre>RUN/Pr001 PRESS=0.942 bar LEAK=ATR DEFAULT READY (NO OK)</pre>   |
| <p>Custom unit learning error.<br/><b>Action:</b> carry out another learning cycle.</p>   |   | <pre>RUN/Pr001 PRESS=0.942 bar LEAK=Custom unit ERR READY (NO OK)</pre>   |
| <p>Custom unit drift following a custom unit check request.<br/><b>Action:</b> check the programmed percentage of drift, the master leak, the test pressure.</p>  |   | <pre>RUN/Pr001 PRESS=0.942 bar LEAK=Custom Unit ERR READY (NO OK)</pre>   |
| <p>Commutation fault in the equalising valve.<br/><b>Action:</b> check network pressure, contact ATEQ after sales service for repair.</p>   |   | <pre>RUN/Pr001 PRESS=0.942 bar LEAK=VALVE ERR. READY (NO OK)</pre>  |
| <p>1) The electronic regulator has been unable to initialise correctly.<br/>2) The input pressure on the regulator must be at least 10 % of regulator full scale + 100kPa (+ 1 bar).<br/><b>Action:</b> check supply network pressure or pressure at the regulator input.</p> | <br> | <p>The indicator lights come on briefly after the following message is displayed :</p> <pre>REGULATOR ERROR</pre> |
| <p>PROG error: the I/O's have selected a program with no parameters.<br/><b>Action:</b> enter program parameters.</p>   |   | <pre>RUN/Pr. : 009 ERROR</pre>  |
| <p>Inappropriate size for the selected unit of pressure.<br/><b>Action:</b> change unit or modify the minimum and maximum pressure limits if these and the test pressure can be used with this unit.</p>  |   | <pre>PARAM/Pr001 &gt;Press. Unity: mbar MAX Fill : PPPP MIN Fill : 0.0</pre>                                      |

| PROBLEM   | LIT INDICATORS  | MESSAGE DISPLAYED   |
|---|---|---|
| <p>Sealed component learning fault.<br/> <b>Action:</b> carry out a sealed component learning cycle.</p>  |    | <pre> RUN/Pr001 PRESS=0.942 bar LEARNING ERROR READY (NO OK)                     </pre>     |
| <p>Sealed component fault.<br/> Insufficient pressure drop, so volume abnormally small.<br/> <b>Action:</b> check the pneumatic test circuit (e.g. pipe twisted, blocked or other cause).</p>   |    | <pre> CYCLE/Pr001 PRESS = 0.000 bar VOLUME &lt; READY (NO OK)                     </pre>    |
| <p>Sealed component large leak fault.<br/> <b>Action:</b> check in the pneumatic test circuit that there is no leak between the ATEQ measurement instrument and the test part (e.g. pipe cut, torn or other cause) and also check that the belljar is airtight.</p> |    | <pre> CYCLE/Pr001 PRESS = 0.000 bar VOLUME &gt; READY (NO OK)                     </pre>    |
| <p>Auto test error. The valve auto test cycle result is bad.<br/> <b>Action:</b> check that plugs have been placed on the test and reference outputs, if the problem persists, the valve is leaking it should be serviced or replaced.</p>                          |  | <pre> CYCLE/Pr001 PRESS = 1.00 bar AUTO TEST ERROR READY (NO OK)                     </pre> |



## 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 limits to +/- 20 % of the test pressure,
  - ⇒ coupling times A and B 0 seconds,
  - ⇒ the fill time 4 seconds,
  - ⇒ the stabilisation time 10 seconds,
  - ⇒ the test time 10 seconds,
  - ⇒ the dump time 1 second,
  - ⇒ the FAIL 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

---

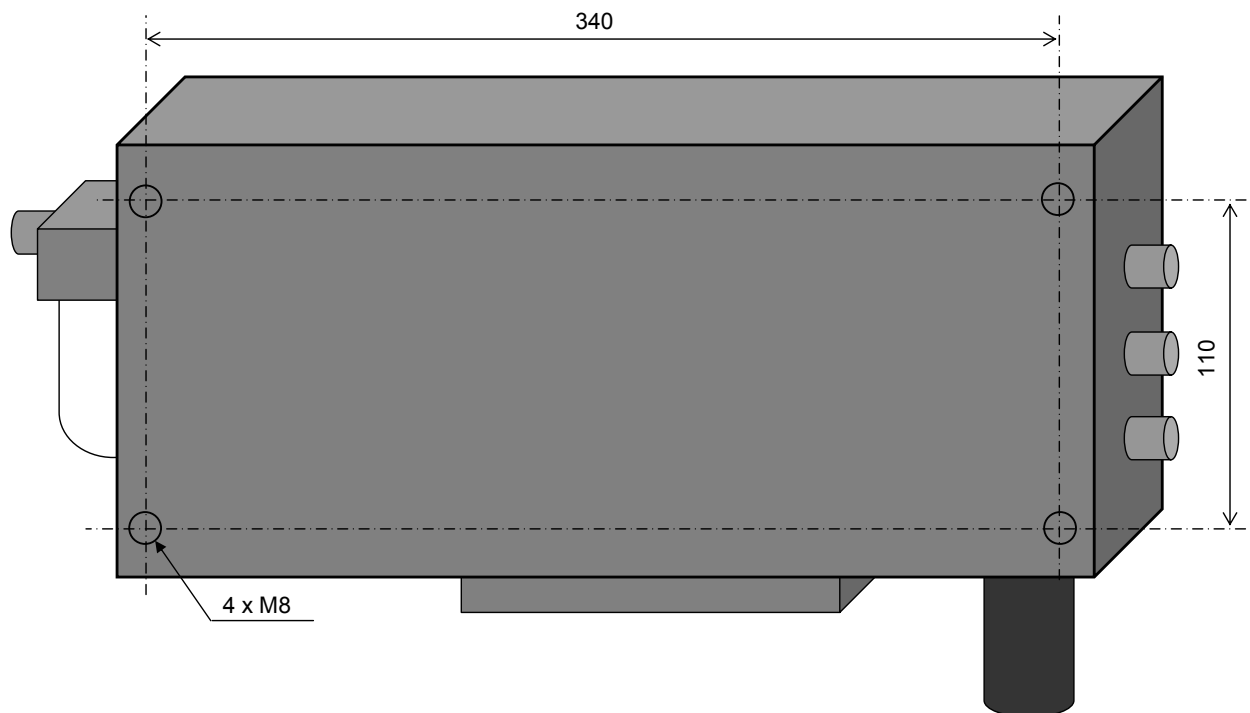
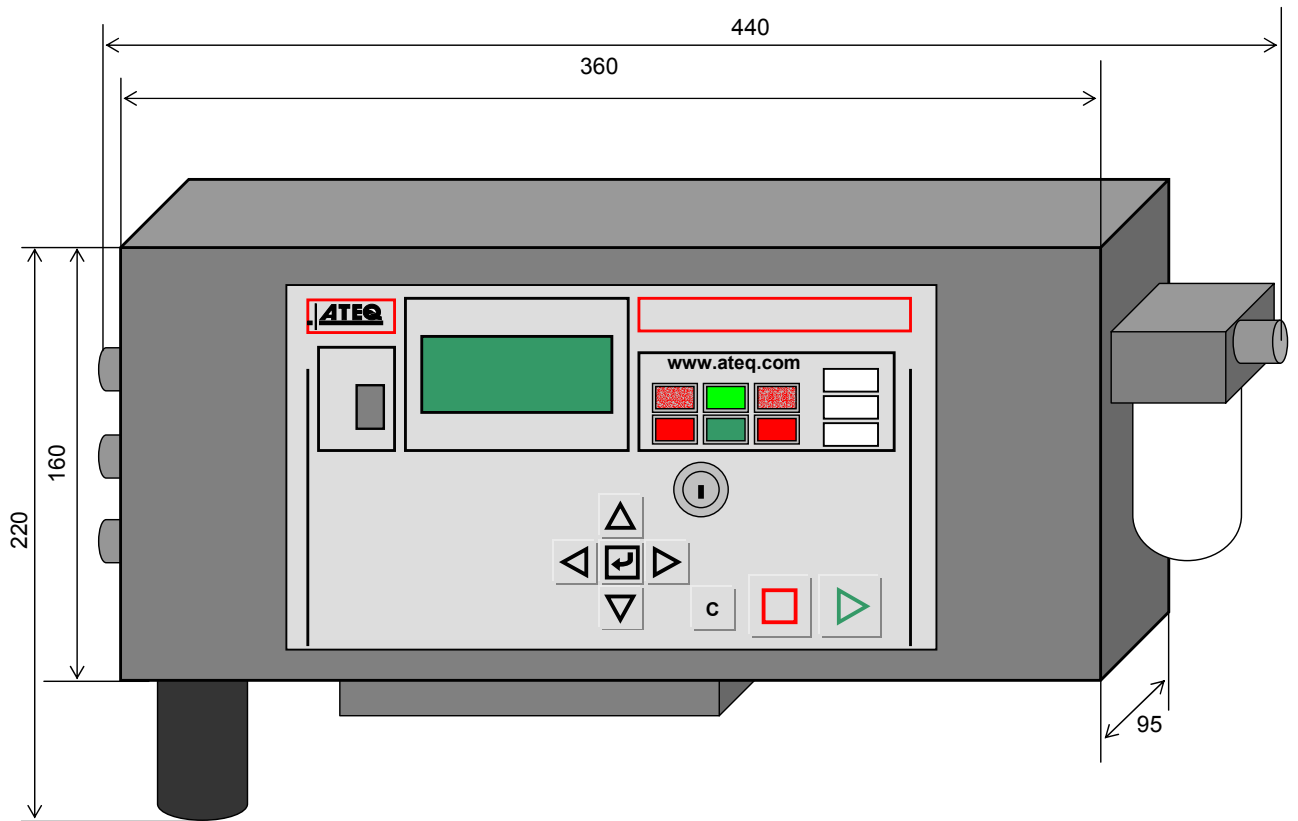
### ATEQ F510 / F520

---

#### 1. TECHNICAL CHARACTERISTICS F510 AND F520

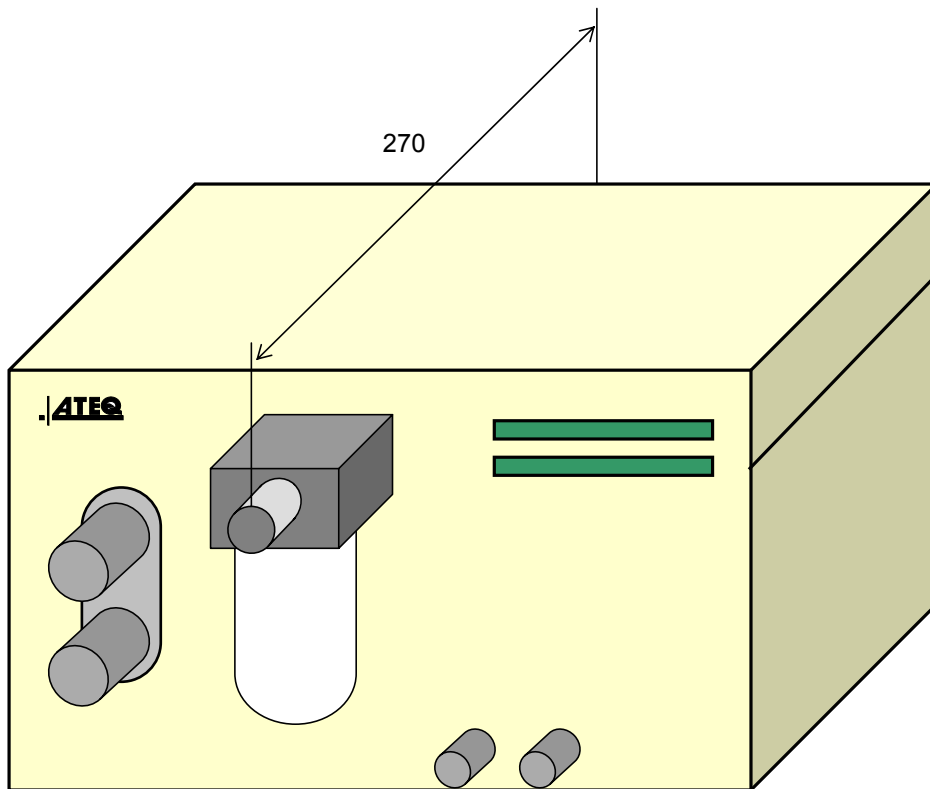
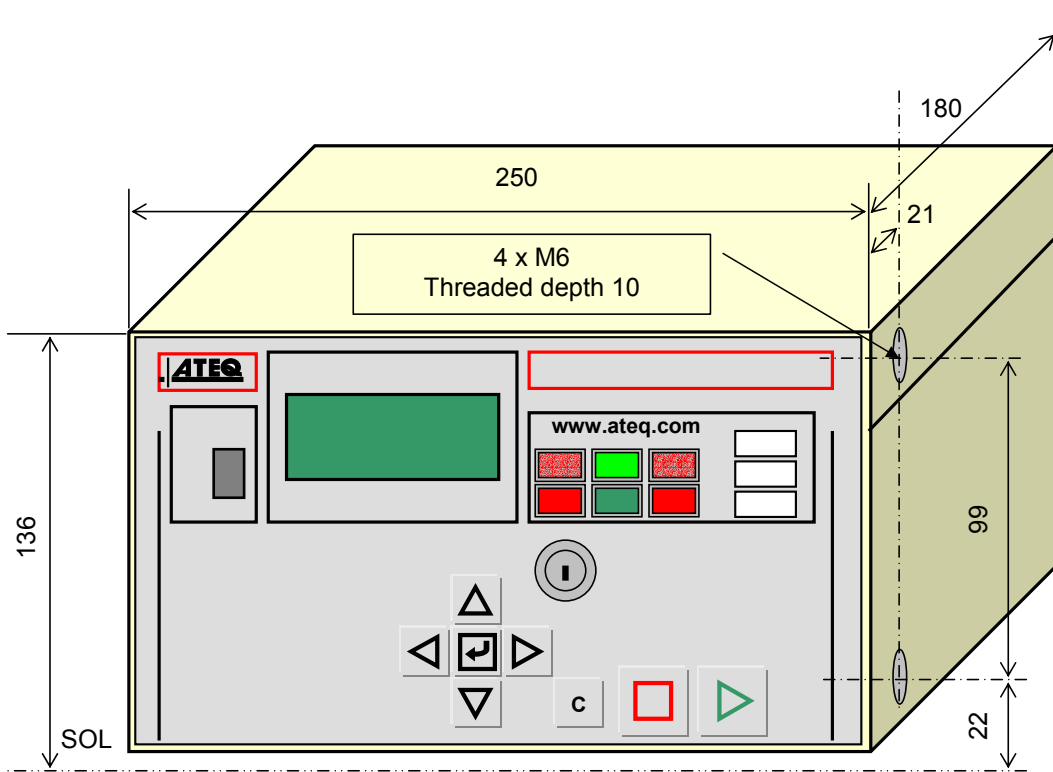
|   | F510                                  | F520  |
|---|---------------------------------------|---|
| <b>Dimensions</b><br>H x L x D (mm):                  | 214 x 415 x 109                       | Short: 136 x 250 x 180<br>Long: 136 x 250 x 255 |
| <b>Dimensions with air filter and regulator</b> (mm): |                                       | Short: 136 x 250 x 270<br>Long: 136 x 250 x 370 |
| <b>Power supply:</b>                                  | 24 VDC / 2 A<br>Min 23,5 V ; Max 28 V | 24 VDC / 2 A<br>Min 23,5 V ; Max 28 V           |
| <b>Pneumatic connections:</b>                         | 3/5, 4/6 or 6/8                       | 3/5, 4/6 or 6/8                                 |
| <b>Weight (kg):</b>                                   | about 5,7                             | about 4   |
| <b>Format:</b>  | -                                     | ½ 19 inches                                     |
| <b>Temperatures:</b>                                  |                                       |   |
| Operational:  | +10°C to +45°C                        | +10°C to +45°C                                  |
| Storage:  | 0°C to +60 °C                         | 0°C to +60 °C                                   |

## 2. F510 CASING DIAGRAMS

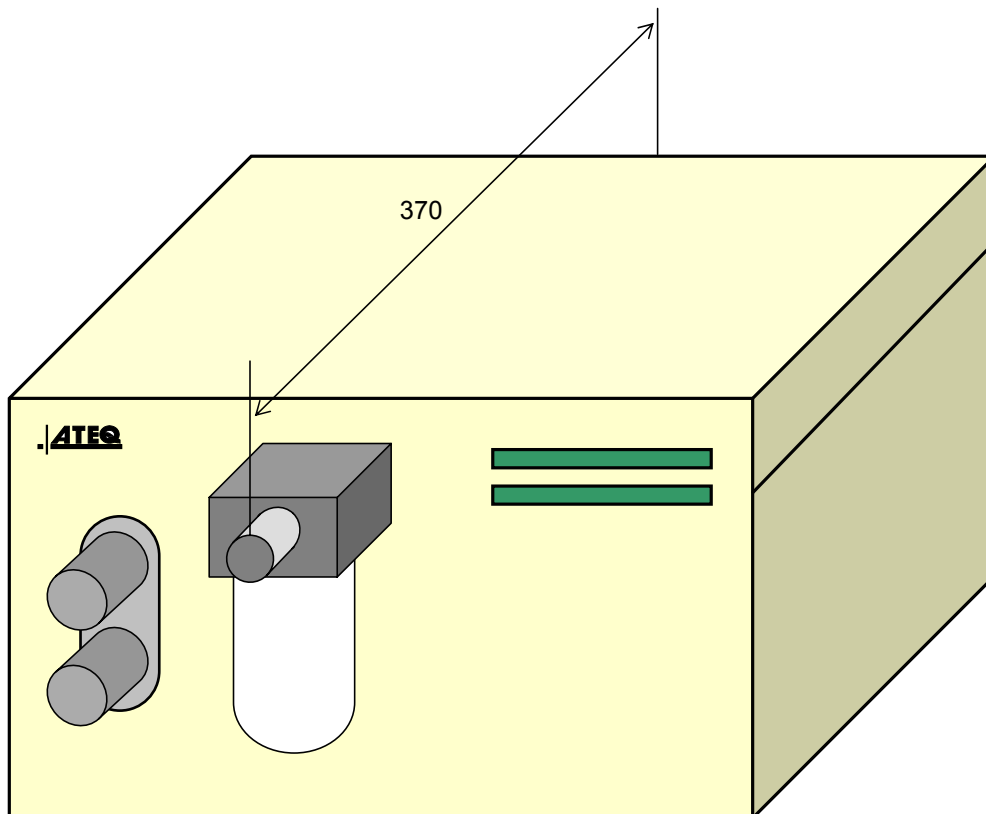
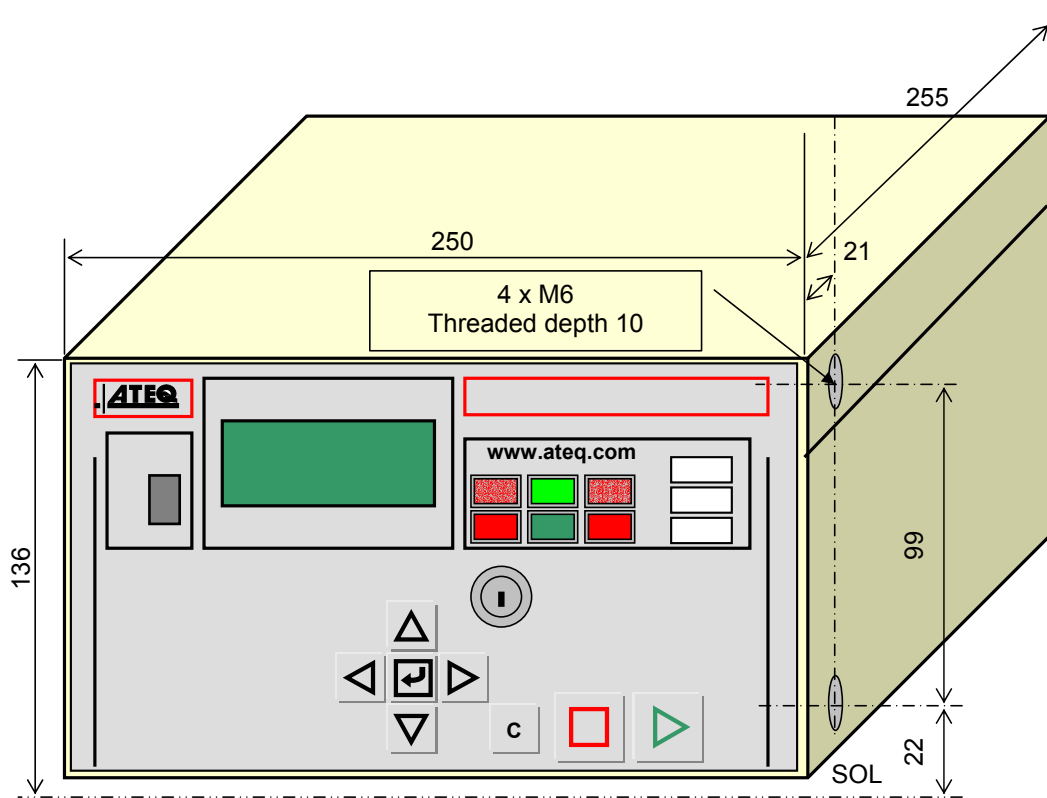


### 3. F520 CASING DIAGRAMS

#### 3.1. SHORT CASE



3.2. LONG CASE



4. CONVERSION TABLE

|      |       | TO                    |                         |                         |                         |         |                         |                         |                         |                        |                        |
|------|-------|-----------------------|-------------------------|-------------------------|-------------------------|---------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|
|      |       | Pa                    | kPa                     | bar                     | mbar                    | mmH2O   | atm                     | Torr                    | psi                     | inH2O                  | inHg                   |
| FROM | Pa    | 1                     | 10 <sup>-3</sup>        | 10 <sup>-5</sup>        | 10 <sup>-2</sup>        | 0.10197 | 9.8692 10 <sup>-6</sup> | 7.5 10 <sup>-3</sup>    | 1.45 10 <sup>-4</sup>   | 4.01 10 <sup>-3</sup>  | 2.95 10 <sup>-4</sup>  |
|      | kPa   | 10 <sup>3</sup>       | 1                       | 10 <sup>-2</sup>        | 10                      | 101.97  | 9.8692 10 <sup>-3</sup> | 7.5                     | 0.145                   | 4.01                   | 0.295                  |
|      | bar   | 10 <sup>5</sup>       | 10 <sup>2</sup>         | 1                       | 10 <sup>3</sup>         | 10197   | 0.98692                 | 750                     | 14.5                    | 401.46                 | 29.53                  |
|      | mbar  | 10 <sup>2</sup>       | 10 <sup>-1</sup>        | 10 <sup>-3</sup>        | 1                       | 10.197  | 9.8692 10 <sup>-4</sup> | 0.75                    | 1.45 10 <sup>-2</sup>   | 0.401                  | 2.95 10 <sup>-2</sup>  |
|      | mmH2O | 9.806                 | 9.8067 10 <sup>-3</sup> | 9.8067 10 <sup>-5</sup> | 9.8067 10 <sup>-2</sup> | 1       | 9.6784 10 <sup>-5</sup> | 7.3556 10 <sup>-2</sup> | 1.4223 10 <sup>3</sup>  | 3.937 10 <sup>-2</sup> | 2.895 10 <sup>-3</sup> |
|      | atm   | 1.013 10 <sup>5</sup> | 101.33                  | 1.0133                  | 1013.3                  | 10332   | 1                       | 760                     | 14.695                  | 406.78                 | 29.921                 |
|      | Torr  | 133.32                | 0.13332                 | 1.3332 10 <sup>-3</sup> | 1.3332                  | 13.595  | 1.3158 10 <sup>-3</sup> | 1                       | 1.9337 10 <sup>-2</sup> | 0.535                  | 3.937 10 <sup>-2</sup> |
|      | psi   | 6897.8                | 6.8948                  | 6.8948 10 <sup>-2</sup> | 68.948                  | 703.07  | 6.8045 10 <sup>-2</sup> | 51.71                   | 1                       | 27.68                  | 2.036                  |
|      | inH2O | 249.09                | 0.2491                  | 2.4909 10 <sup>-3</sup> | 2.4909                  | 25.400  | 2.4583 10 <sup>-3</sup> | 1.8683                  | 3.61 10 <sup>-2</sup>   | 1                      | 7.35 10 <sup>-2</sup>  |
|      | inHg  | 3386.4                | 3.3864                  | 3.3864 10 <sup>-2</sup> | 33.864                  | 345.32  | 3.3421 10 <sup>-2</sup> | 25.4                    | 0.491                   | 13.595                 | 1                      |



**6. VALVES CODES USED IN YOUR APPLICATION**

PROGRAMME GROUP:

| <b>PROGRAM</b> | <b>VALVE CODE</b> | <b>FUNCTION</b> |
|----------------|-------------------|-----------------|
| <b>01</b>      |                   |                 |
| <b>02</b>      |                   |                 |
| <b>03</b>      |                   |                 |
| <b>04</b>      |                   |                 |
| <b>05</b>      |                   |                 |
| <b>06</b>      |                   |                 |
| <b>07</b>      |                   |                 |
| <b>08</b>      |                   |                 |
| <b>09</b>      |                   |                 |
| <b>10</b>      |                   |                 |
| <b>11</b>      |                   |                 |
| <b>12</b>      |                   |                 |
| <b>13</b>      |                   |                 |
| <b>14</b>      |                   |                 |
| <b>15</b>      |                   |                 |
| <b>16</b>      |                   |                 |



## Index

|  |         |
|--|---------|
| <b>A</b>                                   |         |
| Access position of the key .....           | 26      |
| Additional functions .....                 | 57      |
| Adjust the main regulator pressure .....   | 97      |
| Adjust the second regulator pressure ..... | 98      |
| ATR .....                                  | 61      |
| ATR cycle .....                            | 60      |
| ATR error .....                            | 128     |
| ATR explained .....                        | 61      |
| ATR fault .....                            | 128     |
| ATR learning .....                         | 109     |
| Auto setup .....                           | 92      |
| Auto-diagnostics check .....               | 108     |
| Auto-diagnostics check test .....          | 60      |
| Automatic calculation of limits .....      | 99      |
| Automatic connectors .....                 | 59, 120 |
| Automatic save .....                       | 82      |
| Auto-zero frequency .....                  | 83      |
| Auxiliary outputs .....                    | 66      |
| <b>B</b>                                   |         |
| Blockage mode .....                        | 32      |
| Blow mode .....                            | 65      |
| <b>C</b>                                   |         |
| C540 / F580 .....                          | 84      |
| CAL check .....                            | 106     |
| Calibration leaks .....                    | 118     |
| Clock .....                                | 83      |
| Configuration E/S .....                    | 90      |
| Conversion table .....                     | 137     |
| Create a new program .....                 | 30      |
| Custom unit check + learn .....            | 107     |
| Custom unit personalisation .....          | 107     |
| <b>D</b>                                   |         |
| Definition .....                           | 5       |
| Delete a program .....                     | 40      |
| Desensitized Mode .....                    | 32      |
| Detailed display of the test results ..... | 115     |
| Determine the fill time .....              | 34      |
| Determine the stabilisation time .....     | 35      |
| Dimensions .....                           | 134     |
| Dump time .....                            | 35      |
| Duplicate a program .....                  | 38      |
| <b>E</b>                                   |         |
| Electronic regulator .....                 | 43, 82  |
| End of Cycle .....                         | 67      |
| Export results under MS Excel .....        | 86      |
| Extended menus .....                       | 57      |
| External dump .....                        | 89      |
| <b>F</b>                                   |         |
| FAIL units .....                           | 36      |
| Fill time/mode .....                       | 64      |
| Filling instruction .....                  | 44      |
| Filter .....                               | 59      |
| Filtration kit .....                       | 120     |
| Frame formats .....                        | 85      |
| Functions menu .....                       | 54      |
| <b>I</b>                                   |         |
| Infinite fill .....                        | 101     |
| Intelligent remote control .....           | 124     |
| International units .....                  | 59      |
| <b>L</b>                                   |         |
| Language .....                             | 115     |
| Leak/Flow calibrator .....                 | 119     |
| Lighting the screen .....                  | 88      |
| Locked position of the key .....           | 26      |
| <b>M</b>                                   |         |
| Main types of measurements .....           | 7       |
| Measurement cycle .....                    | 9       |
| Measurements characteristics .....         | 6       |
| Mini valve .....                           | 73      |
| Modbus .....                               | 87      |
| <b>N</b>                                   |         |
| Navigation keys .....                      | 25      |
| Needle valves .....                        | 119     |
| Number of Auto zero cycles .....           | 83      |
| <b>O</b>                                   |         |
| Operator mode .....                        | 32      |
| <b>P</b>                                   |         |
| Part PASS indicator .....                  | 28      |
| Part reference FAIL indicator .....        | 28      |
| Part test FAIL indicator .....             | 28      |
| Part volume calculation .....              | 78      |
| Peak hold .....                            | 77      |
| Pneumatics connectors .....                | 20      |
| Power supply .....                         | 117     |
| Pressure in excess max threshold .....     | 127     |
| Pressure inferior min threshold .....      | 127     |
| Pressure too high .....                    | 127     |
| Pressurisation output .....                | 20      |
| Print frame .....                          | 84      |
| Print parameters .....                     | 84      |
| Print the results .....                    | 84      |
| Printer .....                              | 19, 84  |
| Printing the results .....                 | 115     |
| Programmable input .....                   | 16      |
| <b>R</b>                                   |         |
| Rapid connectors .....                     | 27      |
| Recovery mode measurement .....            | 80      |
| Reference error .....                      | 127     |
| Reference pneumatic output .....           | 20      |
| Reference volume .....                     | 78      |
| Regulator adjustment .....                 | 42      |

|                                    |              |                                     |     |
|------------------------------------|--------------|-------------------------------------|-----|
| Remote control .....               | 18, 121, 123 | Stand by .....                      | 115 |
| Remote control (RC5).....          | 91           | Stop the measurement .....          | 46  |
| Remote front panel .....           | 122          | Symbols.....                        | 10  |
| Reset the results memory.....      | 115          | <b>T</b>                            |     |
| Rework limits .....                | 73           | Technical characteristics .....     | 133 |
| Re-workable .....                  | 28           | Temperature correction .....        | 79  |
| RS232 .....                        | 19           | Test error .....                    | 127 |
| RS485 .....                        | 87           | Test in calibrated Pa/s or Pa.....  | 105 |
| <b>S</b>                           |              | Test pneumatic output .....         | 20  |
| Sealed component learning .....    | 108          | Test time .....                     | 35  |
| Sealed components.....             | 74           | Transient drift.....                | 62  |
| Sealed components learn.....       | 108          | Transient effects attenuation ..... | 60  |
| Sensor check.....                  | 110          | Type of test.....                   | 8   |
| Sensor service.....                | 110          | <b>V</b>                            |     |
| Sensor status.....                 | 112          | Valve codes .....                   | 65  |
| Sequence several test cycles ..... | 58           | <b>W</b>                            |     |
| Service special cycles .....       | 110          | Wait times A and B .....            | 34  |
| Sign .....                         | 82           | Warning .....                       | 28  |
| Special cycles.....                | 42           | Work in calibrated Pa/s or Pa ..... | 105 |
| Stamping .....                     | 79           |                                     |     |



