



ATEQ D6 Reference Manual





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ATEQ - Measurement Solution, Global Leader.

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-  We continuously work on improving our products. This is why information contained in this manual, the device and the technical specifications may be modified without prior notification.
-  Pictures and figures in this manual are non-contractual.






Safety advisory / Warranty

GOOD PRACTICES AND SAFETY INSTRUCTIONS

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Safety recommendations

-  If the device is supplied with 100 / 240 V AC, it is mandatory to connect it to the ground with a good link to the ground, to protect against electric hazard or electrocution.
-  It is dangerous to change the status of the outputs.
They can control power actuators or other equipment (mechanical, pneumatic, hydraulic, electrical or other) which can cause serious personal injury and damage to surrounding material.
-  For safety and quality measurement reasons, it is important, before powering on the device, to ensure that it is air supplied with a minimum operating pressure (0.6 MPa \pm 15%).

Recommendations for the test environment

Keep the test area as clean as possible.

Recommendations for operators

ATEQ recommends that the operators who use the devices have training and a level of qualification that correspond to the job to perform.

General recommendations

- Read the user manual before using the device.
- All electrical connections to the device must be equipped with safety systems (fuses, circuit breakers, etc.) adapted to the needs and in accordance with the applicable standards and rules.
- To avoid electromagnetic interference, electrical connections to the device must be shorter than 2 meters.
- Power supply plug must be grounded.
- Disconnect the device from the mains before performing any maintenance work.
- Shut off the compressed air supply when working on the pneumatic assembly.
- Do not open a connected device.
- Avoid splashing water on the device.

ATEQ is at your disposal for any information concerning the use of the device under maximum safety conditions.

We draw your attention to the fact that ATEQ cannot be held responsible for any accident related to a misuse of the measuring instrument, the workstation or non-compliance of the installation with safety rules.

In addition, ATEQ declines any responsibility for the calibration or the fitting of their instruments that is not done by ATEQ.




ATEQ also declines any responsibility for any modification (program, mechanical or electrical) of the device done without their written consent.



AIR QUALITY REQUIREMENTS

The air supplied into the device must be clean and dry. Even though the device is provided with a filter, the presence of dust, oil or impurities may cause malfunction.

Air quality requirements according to ISO standard 8573

-  The air must be clean and dry.
-  The presence of impurities, oil or humidity in the air may cause deterioration which will not be covered by the warranty.
-  When the instrument is working in vacuum conditions, impurities must be prevented from being drawn into its internal components.
For this purpose, we strongly recommend that a suitable airtight filter is installed between the part under test and the instrument.

ATEQ recommends the following characteristics for the air supplied into the device.

Air characteristics		ISO standard 8573 class
Grain size and concentration	0.1 μm and 0.1 mg/m^3	Class 1
Dew point under pressure	- 40°C dew	Class 2
Maximum concentration of oil	0.01 mg/m^3	Class 1

Recommended additional equipment

ATEQ recommends the installation of this additional equipment:

- Air dryer to provide dry air at less than - 40°C dew point
- 25 microns and 1/100 microns double filter



Preamble

ATEQ D6 SERIE, A UNIVERSAL FLOW METER

ATEQ D6 serie is a universal flow meter that measures flow rates through parts to test.

D620



D670



ATEQ D6 serie can memorize 128 different test programs.



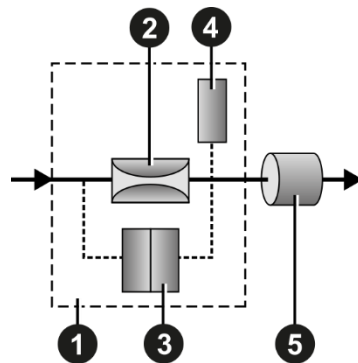
FLOW RATE TEST

The ATEQ D6 series can do direct or indirect measurements. In both cases, the flow meter can also work in vacuum (optional).

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Measurement principle

When the fluid (gas) enters the device **1**, it moves through a calibrated flow tube **2** which causes a drop in pressure. The pressure drop is measured by a differential pressure sensor **3**. The pressure of the part under test **5** is measured by the sensor **4**.

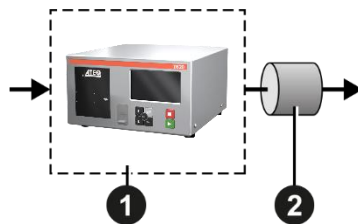


- 1 Device
- 2 Calibrated flow tube
- 3 Differential pressure sensor
- 4 Pressure sensor
- 5 Part under test

i | The flow rate is proportional to the drop in pressure (see: Drop in pressure calculation).

Direct measurement

Once the part is filled, the device measures the flow rate through the part. The test pressure is applied to the device **1** and then to the input of the part under test **2**.



- 1 Device
- 2 Part under test

i | This method allows to test the parts at a higher pressure test (up to 2 MPa).

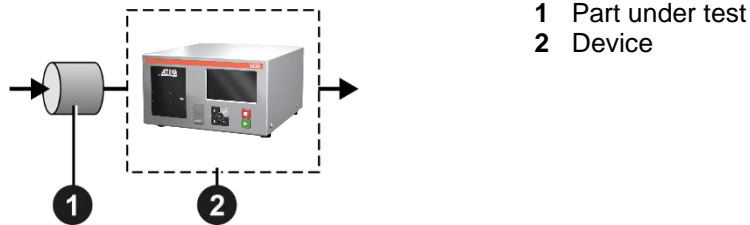


Indirect measurement

The indirect measurement (also called recovery mode or under bell) allows a considerable gain in time as the flow which enters into the device is already stabilized.

The test pressure is first applied to the input of the part under test **1** and then to the device **2**. The output of the device **2** is vented to the atmosphere.

i | This method allows to test the parts at a higher pressure test (up to 2 MPa).



i | Depending on the part type, it may be possible to use a bell (ex: shower head where it is impossible to recover the flow other than through the use of a bell). This method can only be used if the recovery of the flow is easy.

Drop in pressure calculation

When the fluid (gas) moves through a calibrated flow tube, the value of the drop in pressure is proportional to the flow (laminar flow) according to the formula below.

$$\Delta P = \frac{8\mu L Q}{\pi R^4}$$

μ Viscosity of the fluid
 L Length of the calibrated flow tube
 R Radius of the calibrated flow tube Q Flow
 ΔP Drop in pressure in the calibrated flow tube

Viscosity and temperature variation

The viscosity of a gas is directly linked to its temperature. The higher the temperature is, the greater the viscosity. The law of "Poiseuille" shows that when the viscosity increases, the pressure drop increases.

These two parameters, temperature and viscosity have an influence on the accuracy of the measurement. A correction is applied depending on the real temperature of the gas flowing through the system.

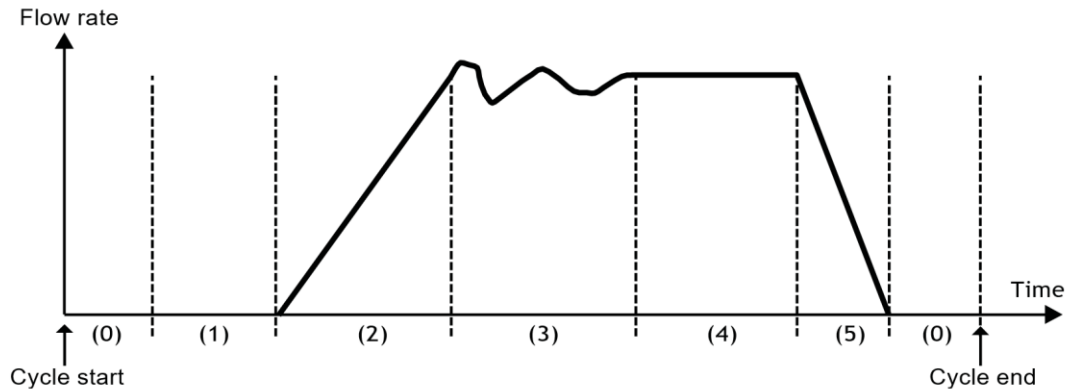


PRINCIPLE OF A CYCLE

Standard measurement (direct or indirect)

The standard measurement cycle is made of 5 main phases: coupling, fill, stabilization, test, dumping.

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Phase	Description
Cycle start	Start of the cycle.
Reset phase (0)	Pressure sensor reset carried out to correct eventual drifts. This phase can be placed at the start of the cycle or at the end of the cycle depending on the requirement of the operator. See: PRESS. AZ .
Coupling phase (1)	Time during which the sealing jig of the parts is put in place before the part is filled. The instrument can be fitted with the automatic connector option (this option adds a valve). This valve which is piloted throughout the cycle time allows a control of the jig setup. See AUTO CONNECT .
Fill phase (2)	Time during which the part is pressurized.
Stabilization phase(3)	Time during which the flow value stabilizes.
Test (4)	Time during which the differential pressure sensor measures the pressure difference on the extremities of the calibrated flow tube. The signal is treated by the electronics which display the result and indicate whether a part is PASS or FAIL .
Dumping (5) (option)	Time during which the instrument is dumping the part under test.
Cycle end	The instrument stops the cycle and sends an END OF CYCLE signal. A new measurement cycle can be carried out.

Operator test

Use this test to carry out operations on the part while under test.

During this test, the operator can carry out operations on the part under test. Once the operation has been carried out:

- if the operator test is good, confirm this operation by pressing **Start** ,
- if the operator test is fail, press **Reset** .



Quick test

Test part conditions which allows supplying the test pressure permanently.
When a start cycle is done, the instrument goes directly in Test phase reading immediately the flow. The Diff auto-zero is done at the end to be ready for the next cycle. There is no pressure auto-zero.



Your ATEQ D6 serie

FRONT PANEL

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The user interface is located on the front panel.



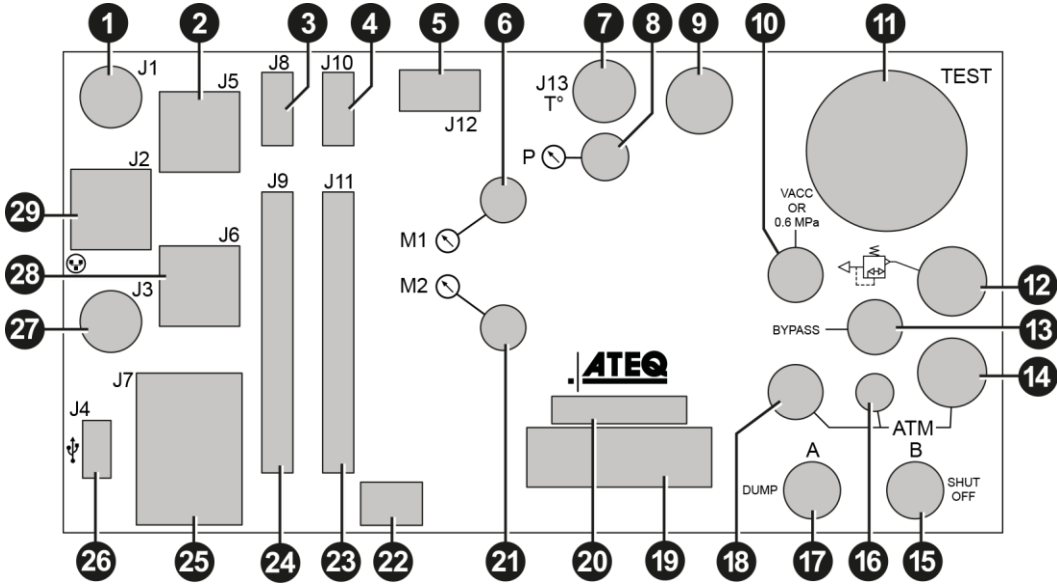
- 1 Display
- 2 Cycle keys
- 3 Navigation keys
- 4 USB connectors

i | For more information, refer to User interface.



CONNECTORS ON THE BACK PANEL (WITH ALL OPTIONS)

D620





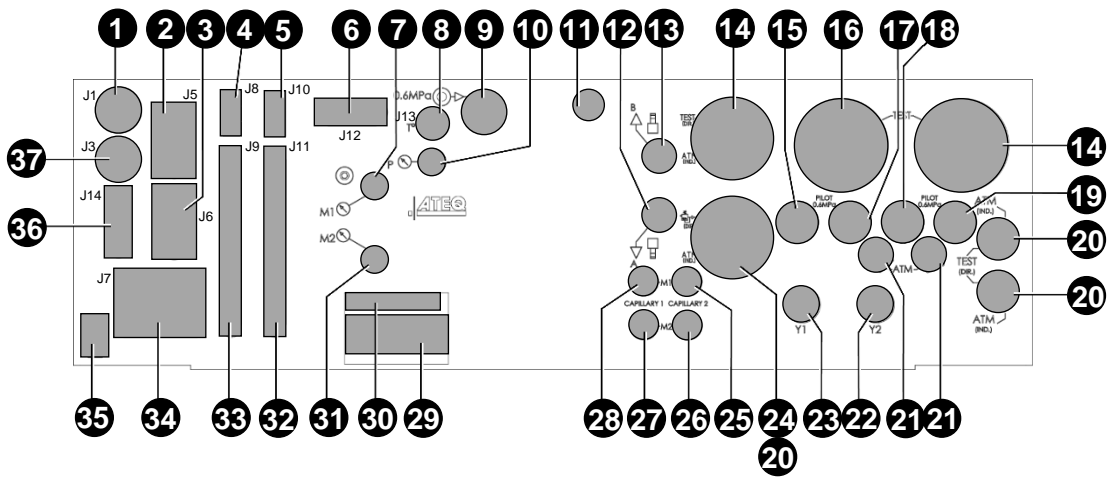
Ref	Name	Description
1	J1	Analog outputs - pressure and flow (option)
2	J5	Fieldbus connector
3	J8*	Extender (not operational)
4	J10	Program selection extension connector (option)
5	J12	Printer RS232 connector / Modbus (option) or Profibus (option)
6	M1	External capillary option
7	J13	Temperature probe connector (option for external capillary)
8	P	External back pressure connector (option)
9	-	Input connector to the air filter (valves or regulator air supply)
10	-	0.6 MPa (87 PSI) valves air supply input (1 MPa (145 PSI) range) or vacuum input
11	TEST	Capillary connector to connect to the part under test
12	-	Regulator output (indirect mode or bypass option or external capillary option)
13	-	Pneumatic output for external bypass option
14	ATM	Output capillary (indirect mode): has to be left to the atmosphere
15	B	Pneumatic output for external shut off option or B automatic connector option
16	ATM	Output to be left to the atmosphere
17	A	Pneumatic output for external dump option or A automatic connector option
18	ATM	Output to be left to the atmosphere
19	-	Air supply energy information
20	ATEQ	Part number / Serial number
21	M2	External capillary connector (option)
22	-	Ground
23	J11	Relay board connector (digital inputs/outputs and 24 V DC - 2 A power supply)
24	J9	Outputs code board connector (digital inputs/outputs)
25	J7	Connector for 24 V DC - 2 A or 100 / 240 V AC power supply (according option provided)
26	J4*	USB (not operational)
27	J3*	Not used
28	J6	Fieldbus connector
29	J2*	Network (not operational)



* These connectors are not operational. They are provided for future development of our devices.



D670 - 3U case

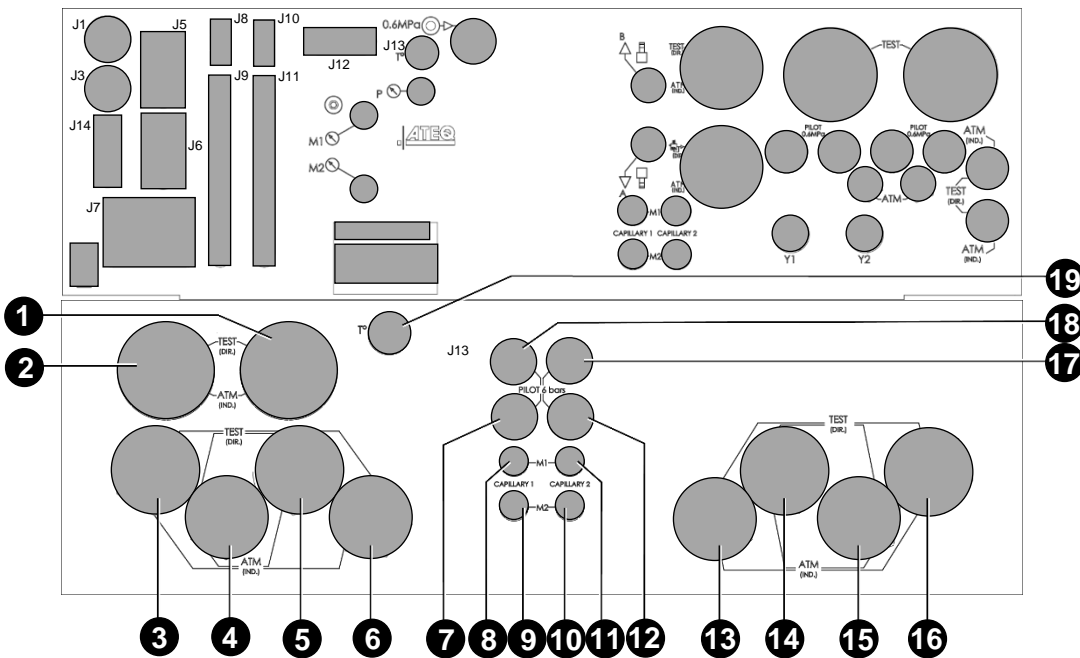




Ref	Name	Description
1	J1	Analog outputs - pressure and flow (option)
2	J5	Fieldbus connector
3	J6	Fieldbus connector
4	J8	Extender (not operational)
5	J10	Program selection extension connector (option)
6	J12	Printer RS232 connector / Modbus (option)
7	M1	External capillary option
8	J13	Temperature probe connector (option for external capillary)
9	-	0.6 MPa valves air supply input (1 MPa range) or vacuum input
10	P	External back pressure connector (option)
11	-	Input connector to the air filter (valves or regulator air supply)
12	A	Pneumatic output for external dump option or A automatic connector option
13	B	Pneumatic output for external shut off option or B automatic connector option
14	TEST	Capillary connector to connect to the part under test
15	-	Pneumatic output for external option
16	TEST	Test capillary output (dual capillary option)
17	-	Pneumatic output for external option
18	-	Pneumatic output for external option
19	-	Pneumatic output for external option
20	ATM	Output capillary (indirect mode): has to be left to the atmosphere
21	ATM	Output to be left to the atmosphere
22	Y2	T1 + T2 tests output option
23	Y1	T1 + T2 tests output option
24	-	Regulator output (indirect mode or bypass option or external capillary option)
25	M1	External Capillary 2 connector M1 (option)
26	M2	External Capillary 2 connector M2 (option)
27	M2	External Capillary 1 connector M2 (option)
28	M1	External Capillary 1 connector M1 (option)
29	ATEQ	Air supply energy information
30	-	Part number / Serial number
31	M2	External capillary connector (option)
32	J11	Relay board connector (digital inputs/outputs) (option)
33	J9	Outputs code board connector (digital inputs/outputs) (option)
34	J7	Connector for 100 / 240 V AC power supply
35	-	Ground
36	J14	Profibus option
37	J3	Not used



D670 - 6U case





Ref	Name	Description
1	TEST	Test outputs (option)
2	TEST	Test outputs (option)
3	TEST	Test outputs (option)
4	TEST	Test outputs (option)
5	TEST	Test outputs (option)
6	TEST	Test outputs (option)
7	-	Pneumatic input for valve piloting option
8	M1	To be connected to M1 – capillary 1 (option)
9	M2	To be connected to M2 – capillary 1 (option)
10	M2	To be connected to M2 – capillary 2 (option)
11	M1	To be connected to M1 – capillary 2 (option)
12	-	Pneumatic input for valve piloting option
13	ATM	Flow inputs before valves switching to be connected to test outputs on the upper case
14	ATM	Flow inputs before valves switching to be connected to test outputs on the upper case
15	ATM	Flow inputs before valves switching to be connected to test outputs on the upper case
16	ATM	Flow inputs before valves switching to be connected to test outputs on the upper case
17	-	Pneumatic input for valve piloting option
18	-	Pneumatic input for valve piloting option
19	J13	Temperature cable input (if capillary placed in the bottom case)



POWER SUPPLY CONNECTORS

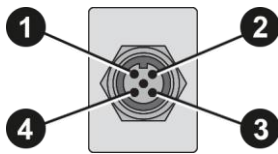
The device can be connected to an external power supply (24 V DC - 2 A) (only the D620) or provided with an internal power supply (100 / 240 V AC) (option).

External supply (only the D620)

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24 V DC connector (J7)

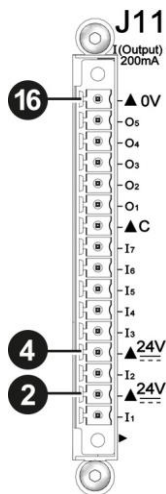
The device can be connected to a 24 V DC - 2 A power supply through a M12 4 pins type connector.



Pin number	Signal
1	Not connected
2	+ 24 V DC
3	Not connected
4	Ground: 0 V

24 V DC on the relay board connector (J11) (option)

The device can also be connected to a 24 V DC - 2 A power supply through J11 connector on the relay board.



Pin number	Signal
2	+ 24 V DC
4	+ 24 V DC
16	Ground: 0 V

i | Apply 24 V DC to the pin 2 or 4.

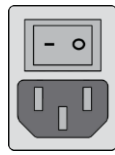
Internal supply only

100 / 240 V AC connector (J7) (option)

The device can be connected to a 100 / 240 V AC power supply (option). This connector has a ON/OFF button.



It is mandatory to connect the device to the ground with a good link to the ground, to protect against electric hazard or electrocution.

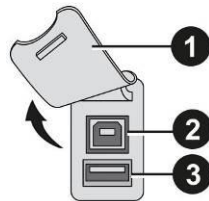


- 1 ON
- 0 OFF

DIGITAL LINKS

PC USB connectors (on front face)

USB connectors can be used for connecting miscellaneous compatible USB devices. The USB connectors are located under the rubber cover **1** (see figure).



- 1 Rubber cover
- 2 USB connector to PC
- 3 USB connector to USB key



Do not connect two USB devices at the same time.



Do not use a cable longer than 2 m.



Push the rubber cover **1** slightly forward for an easy access to USB connectors **2** and **3**.



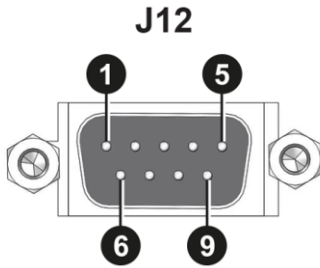
Only use this connection for temporary communication. Connection to a PC cannot be used permanently because the communication can be disconnected by the PC.



Printer RS232 connector / Modbus (option) or Profibus (option) (J12)

RS232 - SubD 9 pins male connector (printer)

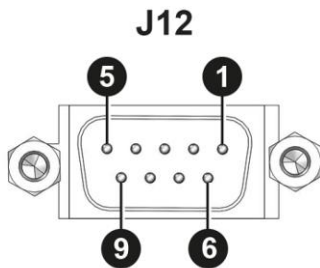
RS232 for printer, barcode reader, PC connection.



Pin number	Signal
1	Not used
2	RXD data input
3	TXD data input
4	Not used
5	Ground
6	Not used
7	RTS request to send
8	CTS clear to send
9	Not used

PROFIBUS - SubD 9 pins female connector option (J14 connector on the D670)

Profibus: SubD 9 pins female connector.



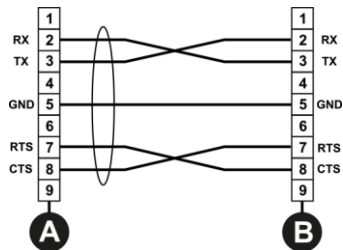
Pin number	Signal
1	PE (ground)
2	Not used
3	Data line A
4	CNTR - A (repeater control signal)
5	DGND (logic ground)
6	VP (supply)
7	Not used
8	Data line B
9	Not used



RS232 cables

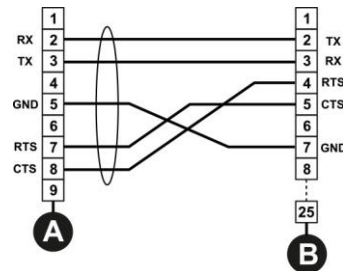
Examples of RS232 cables:

RS232 9 pins SubD - 9 pins SubD cable



- A** 9 pins SubD connector (ATEQside)
- B** 9 pins SubD connector (customer side)

RS232 9 pins SubD - 25 pins SubD cable

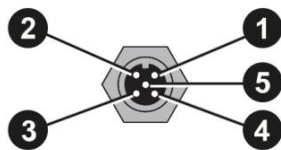


- A** 9 pins SubD connector (ATEQside)
- B** 25 pins SubD connector (customer side)

Devicenet connectors (J5) (J6) (option)

M12 type connector - 5 pins male connector (J5) (Devicenet input)

For connection to others ATEQ devices.

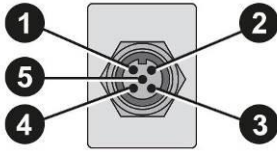


Pin number	Signal
1	Drain
2	V+
3	V-
4	CAN_H
5	CAN_L



M12 type connector - 5 pins female connector (J6) (Devicenet output)

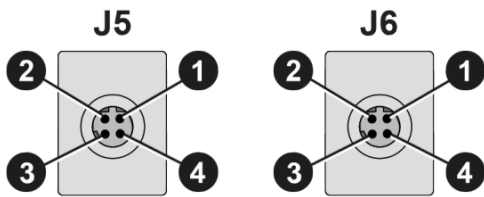
For connection to other ATEQ devices.



Pin number	Signal
1	Drain
2	V+
3	V-
4	CAN_H
5	CAN_L

Profinet connectors (J5 + J6) (option)

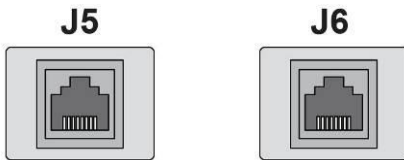
M12 D coded type connector - 4 pins female connector (J5 + J6)



Pin number	Signal
1	Ethernet Tx + (Transmit Data +)
2	Ethernet Rx + (Receive Data +)
3	Ethernet Tx - (Transmit Data -)
4	Ethernet Rx - (Receive Data -)

Ethernet connector (J5 + J6) (option)

Standard connection Ethernet TCP / IP protocol.



One of these network protocols is available:

- Ethernet IP
- Profinet
- Ethercat



DIGITAL INPUTS/OUTPUTS

The 24V DC power supply for the digital inputs can be provided by 2 means:

- The internal power supply of the device (0.3 A max)
- An external power supply provided by the customer

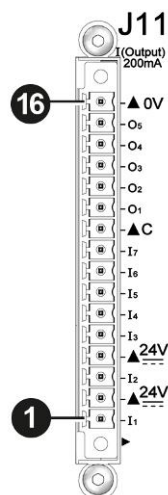
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i Inputs default mode is PNP. NPN mode is available on request.

Relay board connector (J11) (option)

Characteristics

- Inputs
 - Activation: + 24 V DC
- Outputs
 - Dry contacts
 - 60 V AC / DC max - 200 mA max



Pin number	Inputs / outputs	Description
1	Input 1	RESET
2	+ 24 V DC	Common
3	Input 2	START
4	+ 24 V DC	Common
5	Input 3	Program selection
6	Input 4	Program selection
7	Input 5	Program selection
8	Input 6	Program selection
9	Input 7	Program selection (programmable input)
10	Output	Common floating output
11	Output	Pass part
12	Output	High flow fail part
13	Output	Low flow fail part
14	Output	Warning
15	Output	End of cycle
16	0 V	Ground

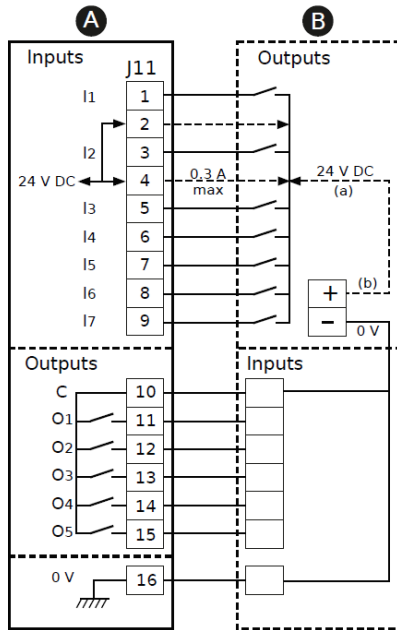
i The device can be energized through the **J11** connector of the relay board (except if internal supply option):

- 0 V to the pin **16**
- 24 V DC to the pin **2** or **4**



Wiring for J11 connector - PLC in NPN connection mode

How to connect a PLC in NPN mode to the instrument.



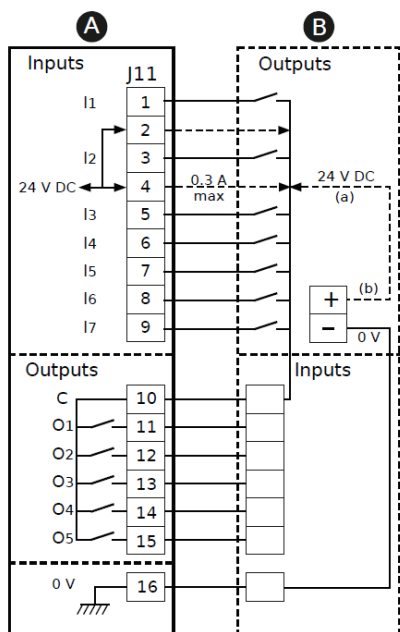
Ref.	Description
A	Relay board (with J11 connector)
B	Customer PLC configuration
I1	Input 1: Reset
I2	Input 2: Start
I3 to I6	Inputs 3 to 6: Test program selection (refer to Program selection (J11 and J10) section)
I7	Input 7: Program selection (programmable input)
C	Common floating output
O1	Output 1: Pass part
O2	Output 2: High flow fail part
O3	Output 3: Low flow fail part
O4	Output 4: Alarm
O5	Output 5: End of cycle

- i** The 24 V DC **(a)** power supply must be provided by the internal power supply of the ATEQ instrument (with a maximum current of 0.3 A) or by the external power supply of the customer **(b)**.
- i** When the external power supply of the customer is used, the ATEQ instrument (only the D620) can be supplied by the 24 V DC **(b)** on the pins **2** or **4** of the J11 connector.



Wiring for J11 connector - PLC in PNP connection mode

How to connect a PLC in PNP mode to the instrument.



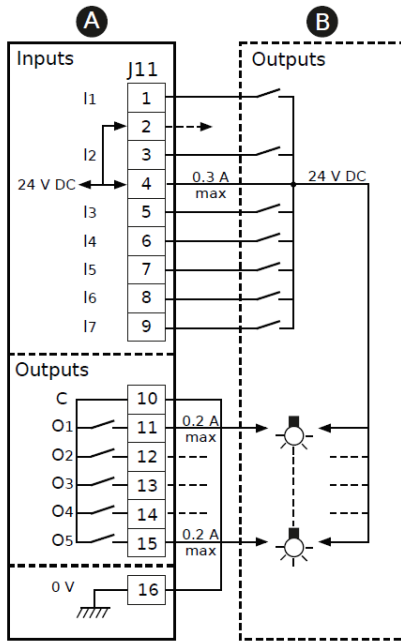
Ref.	Description
A	Relay board (with J11 connector)
B	Customer PLC configuration
I1	Input 1: Reset
I2	Input 2: Start
I3 to I6	Inputs 3 to 6: Test program selection (refer to Program selection (J11 and J10) section)
I7	Input 7: Program selection (programmable input)
C	Common floating output
O1	Output 1: Pass part
O2	Output 2: High flow fail part
O3	Output 3: Low flow fail part
O4	Output 4: Alarm
O5	Output 5: End of cycle

- i** The 24 V DC **(a)** power supply must be provided by the internal power supply of the ATEQ instrument (with a maximum current of 0.3 A) or by the external power supply of the customer **(b)**.
- i** When the external power supply of the customer is used, the ATEQ instrument (only the D620) can be supplied by the 24 V DC **(b)** on the pins **2** or **4** of the J11 connector.



Wiring for J11 connector - Lights connection

How to connect external lights to the instrument.



Ref.	Description
A	Relay board (with J11 connector)
B	Customer PLC configuration
I1	Input 1: Reset
I2	Input 2: Start
I3 to I6	Inputs 3 to 6: Test program selection (refer to Program selection (J11 and J10) section)
I7	Input 7: Program selection (programmable input)
C	Common floating output
O1	Output 1: Pass part
O2	Output 2: High flow fail part
O3	Output 3: Low flow fail part
O4	Output 4: Alarm
O5	Output 5: End of cycle



When the power supply is provided by the ATEQ instrument, the current provided to the lights is limited to 0.3 A.



The 24 V DC power supply must be provided by the internal power supply of the ATEQ instrument (with a maximum current of 0.3 A) or by the external power supply of the customer.

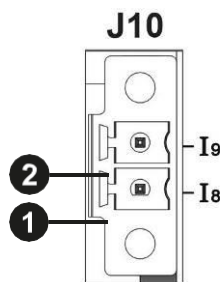
Program selection extension connector (J10) (option)

The J10 connector is an extension of the J11 connector that enables the selection of 128 programs.

Characteristics

— Inputs

- Activation: + 24 V DC



Pin number	Inputs/outputs	Description
1	Input 8	Program selection from 33 to 64 (programmable input)
2	Input 9	Program selection from 65 to 128 (programmable input)



Program selection (J11 and J10)

The connectors J11 and J10 (option) enable you to select a program from digital inputs. Combinations of connector pins to activate for program selection.


The active program (**Pr**) is the one selected before starting up. It remains active even if the program inputs on the connector are no longer activated.

The active program can only be modified during the inter-cycle period by pressing any of the command inputs.

To return to the program number 1 when a cycle is not in progress, select any program (50ms minimum) and return to no program selection.

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Program number	J11					J10	
	Pin 5 (input 3)	Pin 6 (input 4)	Pin 7 (input 5)	Pin 8 (input 6)	Pin 9 (input 7)	Pin 1 (input 8)	Pin 2 (input 9)
1	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0
3	0	1	0	0	0	0	0
4	1	1	0	0	0	0	0
5	0	0	1	0	0	0	0
6	1	0	1	0	0	0	0
7	0	1	1	0	0	0	0
8	1	1	1	0	0	0	0
9	0	0	0	1	0	0	0
10	1	0	0	1	0	0	0
11	0	1	0	1	0	0	0
12	1	1	0	1	0	0	0
13	0	0	1	1	0	0	0
14	1	0	1	1	0	0	0
15	0	1	1	1	0	0	0
16	1	1	1	1	0	0	0
17 to 32	X*	X	X	X	1	X	X
33 to 64	X	X	X	X	X	1	X
65 to 128	X	X	X	X	X	X	1

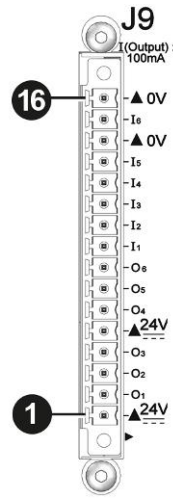
 * X is equal to 0 or 1 in function of the program number.



Valve codes outputs board connector (J9) (option)

Characteristics

- Outputs:
 - 24 V DC - 100 mA max per output
- Inputs:
 - Activation: + 24 V DC

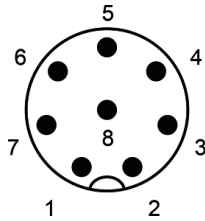


Pin number	Inputs / outputs	Description
1	+ 24 V DC	Common (outputs 1, 2,3)
2	Output 1	Open collector
3	Output 2	Open collector
4	Output 3	Open collector
5	+ 24 V DC	Common (outputs 4, 5, 6)
6	Output 4	Open collector
7	Output 5	Open collector
8	Output 6	Open collector
9	Input 1	Programmable input
10	Input 2	Programmable input
11	Input 3	Programmable input
12	Input 4	Programmable input
13	Input 5	Programmable input
14	0 V	Ground
15	Input 6	Programmable input
16	0 V	Ground



ANALOG OUTPUTS

M12 type connector – 8 pins female connector (J1) (option)



Pin number	Description
1	Pressure analog output (ground)
2	Pressure analog output (0-10Vdc)
3	Flow analog output (ground)
4	Flow analog output (0-10Vdc)
5	Not connected
6	Not connected
7	Not connected
8	Not connected

PNEUMATIC CONNECTORS

Pneumatic connectors used to connect the part under test are located on the back panel of the device.

Pneumatic supply



The pneumatic supply has to meet specific requirements recommended by ATEQ. Refer to Good practices and safety instructions section.
A specific filter may be necessary.

The air is supplied via the filter located on the back panel of the device.

Metal air filter



The metal filter is used for 1MPa range.
The maximum pressure admissible is 1.2 MPa.



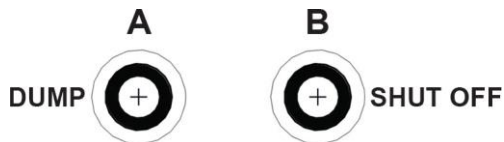
Plastic air filter



The plastic filter is used for 0.5 MPa range (direct and indirect modes) or 2MPa range (indirect mode only).

The maximum pressure admissible is 690 kPa.

Pneumatic outputs 0.6 MPa (option)

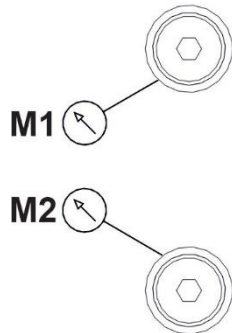


DUMP: pneumatic output to connect to an external valve for dump option.

SHUT OFF: pneumatic output to connect to an external valve for shut off option.

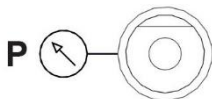
A and B: automatic connectors option. These connectors are used to drive pneumatic caps on the part under test.

External capillary connectors (option)



M1 and M2 connectors are pneumatic inputs used for external capillary connection (option).

External pressure monitoring connector (option)



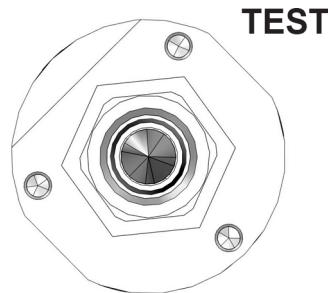
The P connector is a pneumatic input used for external pressure monitoring connection (option).



Test connector

The test connector is used to connect the device to the part to test for both direct and indirect modes. The TEST output connector place depends on the internal mounting and options.

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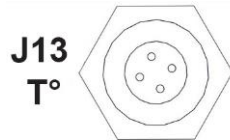


Metallic fitting diameter options (in mm):

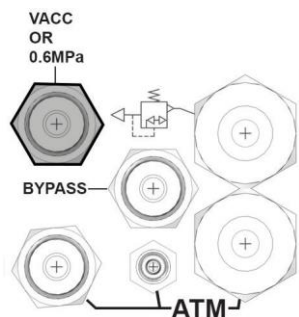
- 4/6
- 6/8
- 8/10
- 15
- 20
- 25

Temperature probe connector (option)

The J13 connector is used for tests with external capillary option.



Air supply input for options

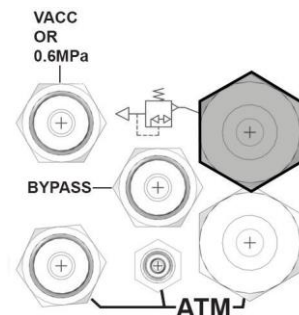


Instant fitting: 6 mm diameter

- 0.6 MPa air supply input for internal valves for 1 MPa range
- Vacuum input for vacuum range. Metallic fitting: 4/6 mm diameter
- Regulator air supply for 1.1 to 2 MPa range indirect mode.

Regulator output connector (option)

This connector can be used as regulator output in indirect mode, for bypass option or external capillary option.



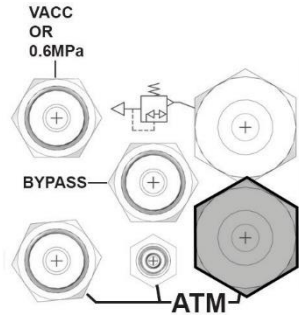
Instant fitting: 8, 10 or 12 mm diameter for 1 MPa range maximum.

Metallic fitting: 4/6 mm or 6/8 mm diameter for 2 MPa range (indirect mode).



Capillary output connector (option)

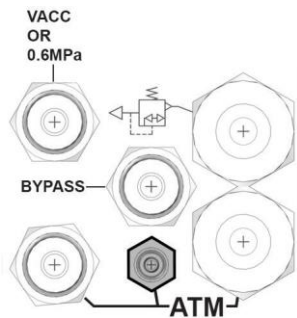
This connector needs to be open to atmosphere for indirect mode. This output connector place depends on the internal mounting options.



Instant fitting: 8, 10 or 12 mm diameter.

ATM 4 mm connector (option)

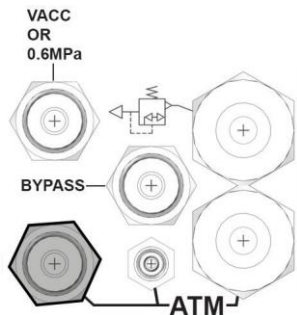
This connector needs to be open to atmosphere.



Instant fitting: 4 mm diameter.

ATM 6 mm connector (option)

This connector needs to be open to atmosphere. The place depends on the internal mounting options.



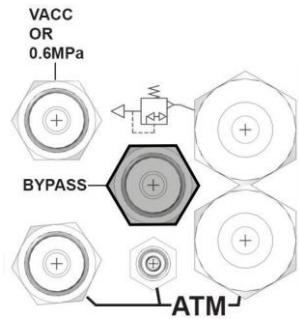
Instant fitting: 6 mm diameter.



Pneumatic output for bypass option

This connector is used to connect the device to an external valve for bypass option. The place depends on the internal mounting options.

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Instant fitting: 6 mm diameter.



PNEUMATIC CONFIGURATION

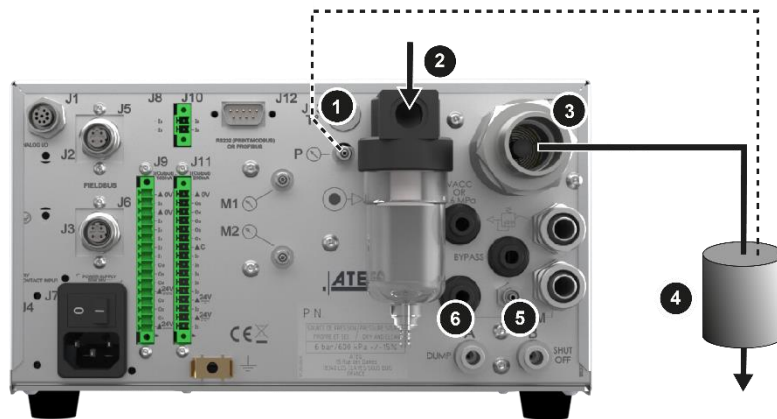
According to the part under test and the pressure range, different configurations can be used.

- i** M1 and M2 connectors are always fitted with caps except for external capillary option.

Direct mode - Internal back pressure - until 0.5 MPa

This configuration is used for direct mode at medium pressure range.

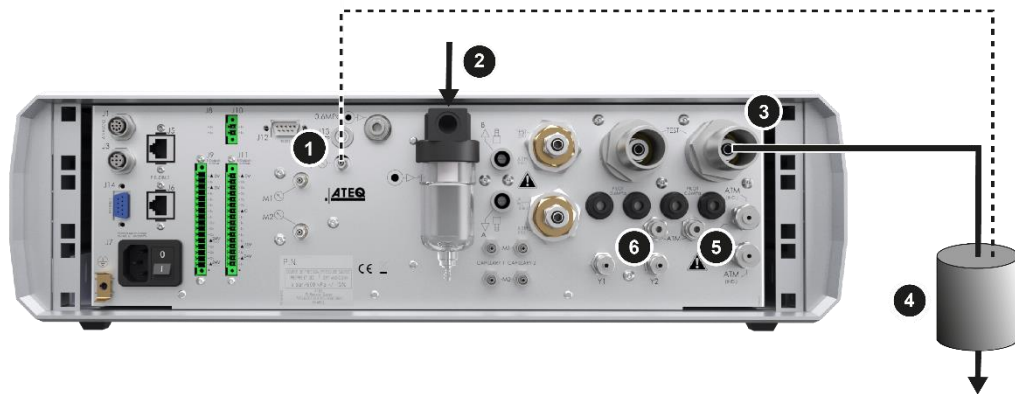
D620 case



Connection	Option / description
Air supply to 2	Connection of the air supply to the filter input (0.6 MPa)
3 to 4	Connection of the test output to the part under test (direct mode option)
4 to ATM	Connection of the part under test to the atmosphere
4 to 1	Connection of the part to test to P connector (external back pressure option)
5 to ATM	Connector left free to the atmosphere
6 to ATM	Connector left free to the atmosphere



D670 3U case



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Connection	Option / description
Air supply to 2	Connection of the air supply to the filter input (0.6 MPa)
3 to 4	Connection of the test output to the part under test (direct mode option)
4 to ATM	Connection of the part under test to the atmosphere
4 to 1	Connection of the part to test to P connector (external back pressure option)
5 to ATM	Connector left free to the atmosphere
6 to ATM	Connector left free to the atmosphere

Direct mode - 1 MPa

This configuration is used for direct mode at high pressure range.

D620 case



Connection	Option / description
Air supply to 1	Connection of the regulator air supply to the filter input (1.2 MPa)
Air supply to 4	Connection of the air supply to the valve pilot input (0.6 MPa)
2 to 3	Connection of the test output to the part under test (direct mode option)
3 to ATM	Connection of the part under test to the atmosphere



D670 3U case

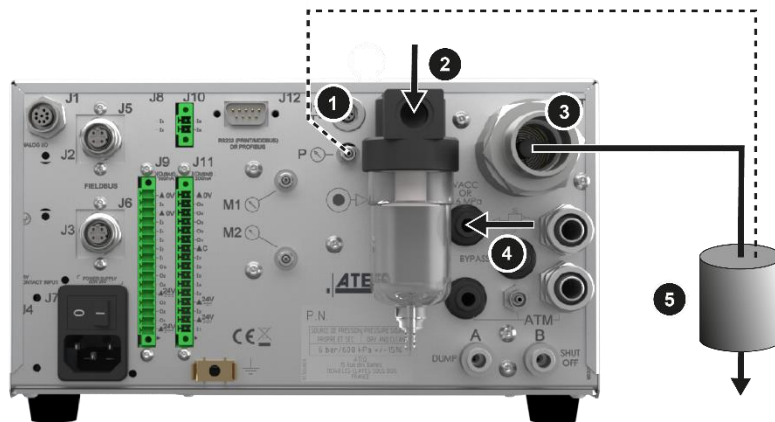


Connection	Option / description
Air supply to 1	Connection of the regulator air supply to the filter input (1.2 MPa)
Air supply to 4	Connection of the air supply to the valve pilot input (0.6 MPa)
2 to 3	Connection of the test output to the part under test (direct mode option)
3 to ATM	Connection of the part under test to the atmosphere

Direct mode - Vacuum test option

This configuration can be used for test with vacuum application.

D620 case



Connection	Option / description
Air supply to 2	Connection of the air supply to the filter input
3 to 5	Connection of the test output to the part under test (direct mode option)
5 to ATM	Connection of the part under test to the atmosphere
5 to 1	Connection of the part to test to P connector (external back pressure option)
Vacuum to 4	Connection of the vacuum input to the regulator output

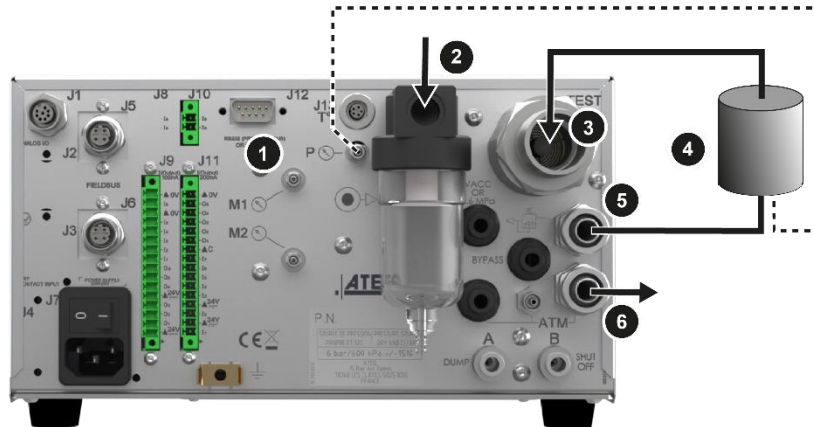


Indirect mode - Internal pressure reading on regulator output - until 0.5 Mpa

Use this configuration for indirect mode at medium pressure range.

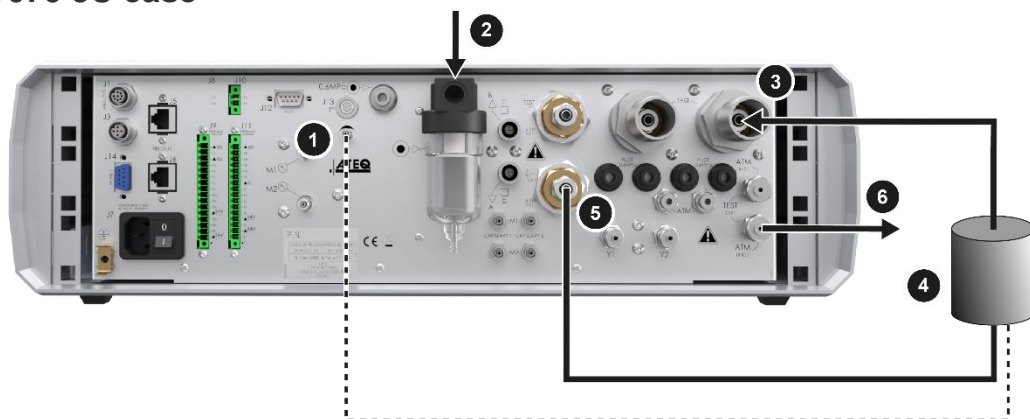
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D620 case



Connection	Option / description
Air supply to 2	Connection of the air supply to the filter input (0.6 MPa)
5 to 4	Connection of the regulator output to the part under test
4 to 3	Connection of the part to the test input (indirect mode option)
4 to 1	Connection of the part to test (regulator side) to P connector (external back pressure option)
6 to ATM	Connector left free to the atmosphere

D670 3U case



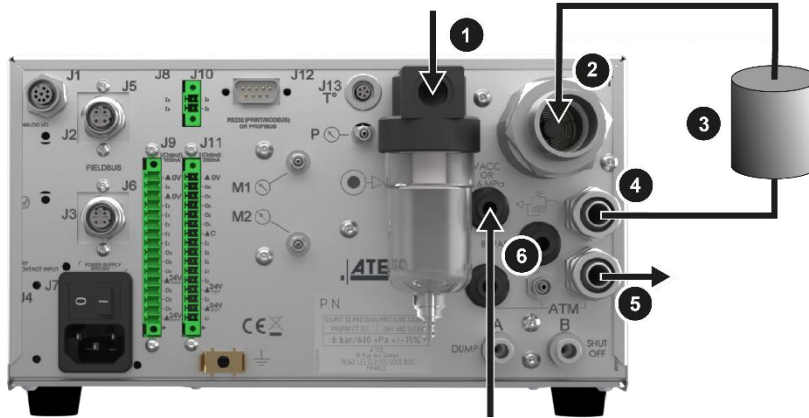
Connection	Option / description
Air supply to 2	Connection of the air supply to the filter input (0.6 MPa)
5 to 4	Connection of the regulator output to the part under test
4 to 3	Connection of the part to the test input (indirect mode option)
4 to 1	Connection of the part to test (regulator side) to P connector (external back pressure option)
6 to ATM	Connector left free to the atmosphere



Indirect mode- 1 MPa range

This configuration is used for indirect mode at high pressure range.

D620 case



Connection	Option / description
Air supply to 1	Connection of the regulator air supply to the filter input (1.2 MPa)
4 to 3	Connection of the regulator output to the part under test
3 to 2	Connection of the part to the test input (indirect mode option)
5 to ATM	Connector left free to the atmosphere
Air supply to 6	Connection of the air supply to the valves pilot input (0.6 MPa)

D670 3U case



Connection	Option / description
Air supply to 1	Connection of the regulator air supply to the filter input (1.2 MPa)
4 to 3	Connection of the regulator output to the part under test
3 to 2	Connection of the part to the test input (indirect mode option)
5 to ATM	Connector left free to the atmosphere
Air supply to 6	Connection of the air supply to the valves pilot input (0.6 MPa)





Indirect mode- 2 MPa range

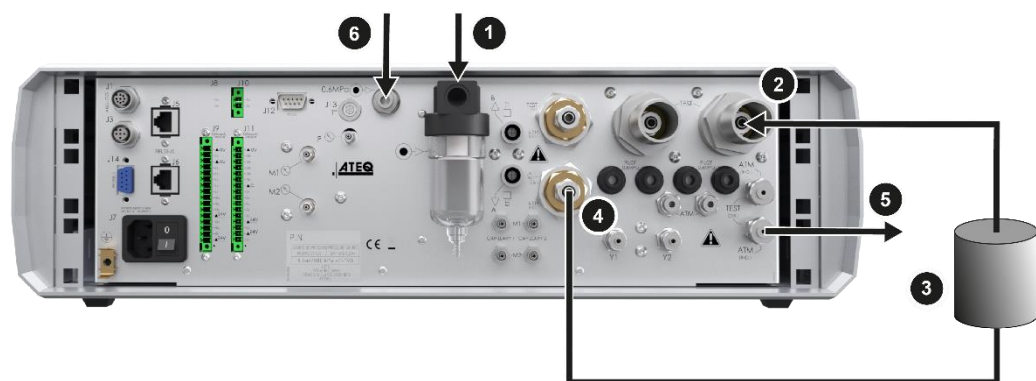
This configuration is used for indirect mode at high pressure range.

D620 case



Connection	Option / description
Air supply to 1	Connection of the air supply to the filter input (0.6 MPa)
4 to 3	Connection of the regulator output to the part under test
3 to 2	Connection of the part to the test input (indirect mode option)
5 to ATM	Connector left free to the atmosphere
Air supply to 6	Connection of the air supply to the regulator input (instrument pressure range + 0.1 to 0.2 MPa)

D670 3U case



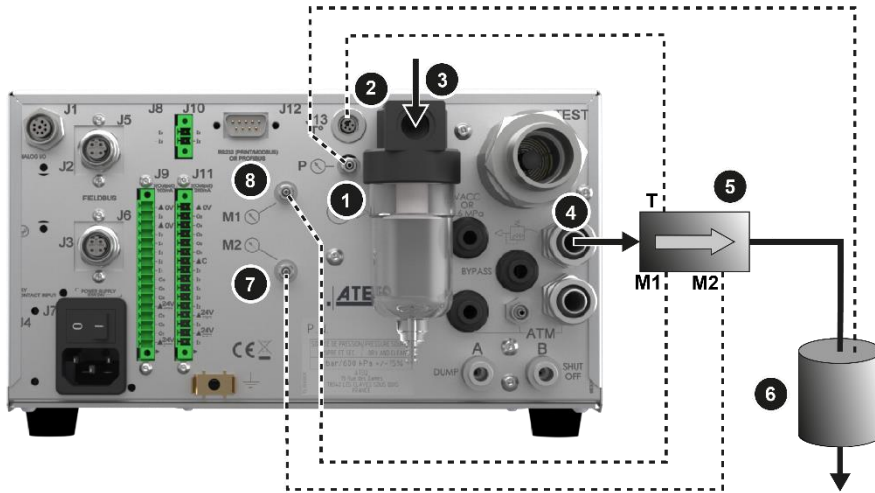
Connection	Option / description
Air supply to 1	Connection of the air supply to the filter input (0.6 MPa)
4 to 3	Connection of the regulator output to the part under test
3 to 2	Connection of the part to the test input (indirect mode option)
5 to ATM	Connector left free to the atmosphere
Air supply to 6	Connection of the air supply to the regulator input (instrument pressure range + 0.1 to 0.2 MPa)



Direct mode - External capillary option

This configuration can be used for test with external capillary application.

D620 case



Connection	Option /description
Air supply to 3	Connection of the air supply to the filter input
4 to 5	Connection of the regulator output to the external capillary main input
5 to 6	Connection of the external capillary main output to the part under test
6 to ATM	Connection of the part under test to the atmosphere
6 to 1	Connection of the part to test to P connector (external back pressure option)
5 to 8	Connection of the M1 output of the external capillary to the M1 connector
5 to 7	Connection of the M2 output of the external capillary to the M2 connector
5 to 2	Connection of the T output of the external capillary to the J13 (T) connector



Direct mode - Flow quick connector in spare part (option)

This configuration can be used to connect a master jet to check the calibration.

Range

From 1 to 150 l/h maximum at 2.0 kPa.

D620 case



Connection	Option /description
Air supply to 1	Connection of the air supply to the filter input
2 to 3 and 4	Connection of the test output through a T connector to a quick connector and to the part under test (direct mode option)
4 to ATM	Connection of the part under test to the atmosphere
3	Quick connector to connect a master jet
5 to ATM	Connector left free to the atmosphere
6 to ATM	Connector left free to the atmosphere



Direct mode - External shut off + dump options (low range)

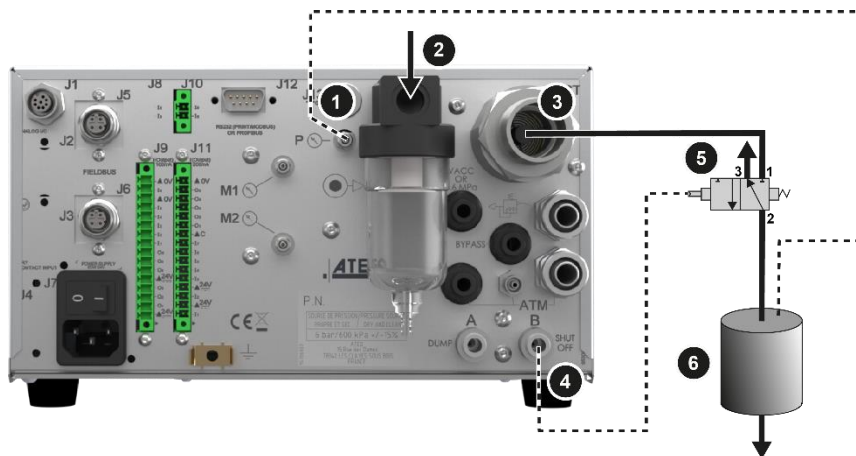
This configuration can be used for external shut off of the flow into the part under test and to dump the flow using one single external valve.

Ranges

- From 1 to 150 l/h maximum with pressure < 0.4 MPa
- From 1 to 1500 l/h maximum with pressure > 0.4 MPa

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D620 case

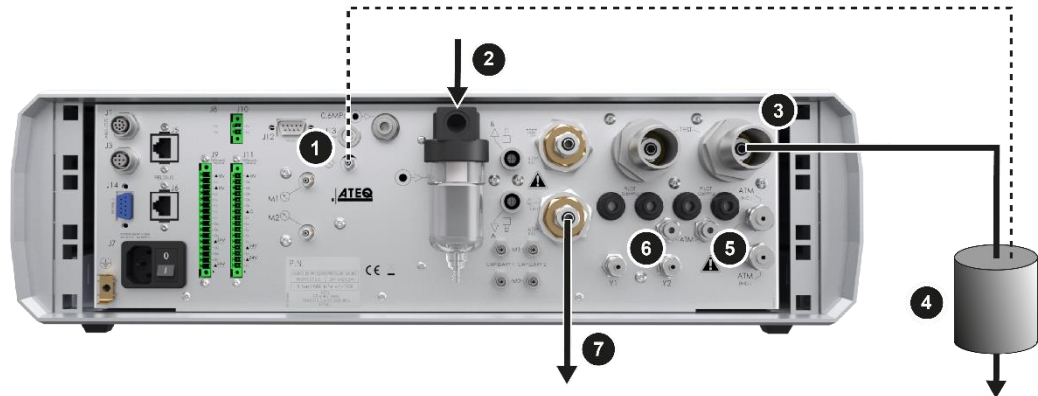


Connection	Option / description
Air supply to 2	Connection of the air supply to the filter input
3 to 5	Connection of the test output to the shut off valve (direct mode option)
4 to 5	Connection of the shut off output to the shut off valve (external shut off option)
5 to 6	Connection of the shut off valve to the part under test (external shut off option)
5 to ATM	Controlled connection of the shut valve to the atmosphere (exhaust the part after the test)
6 to ATM	Connection of the part under test to the atmosphere
6 to 1	Connection of the part to test to P connector (external back pressure option)



D670 3U case

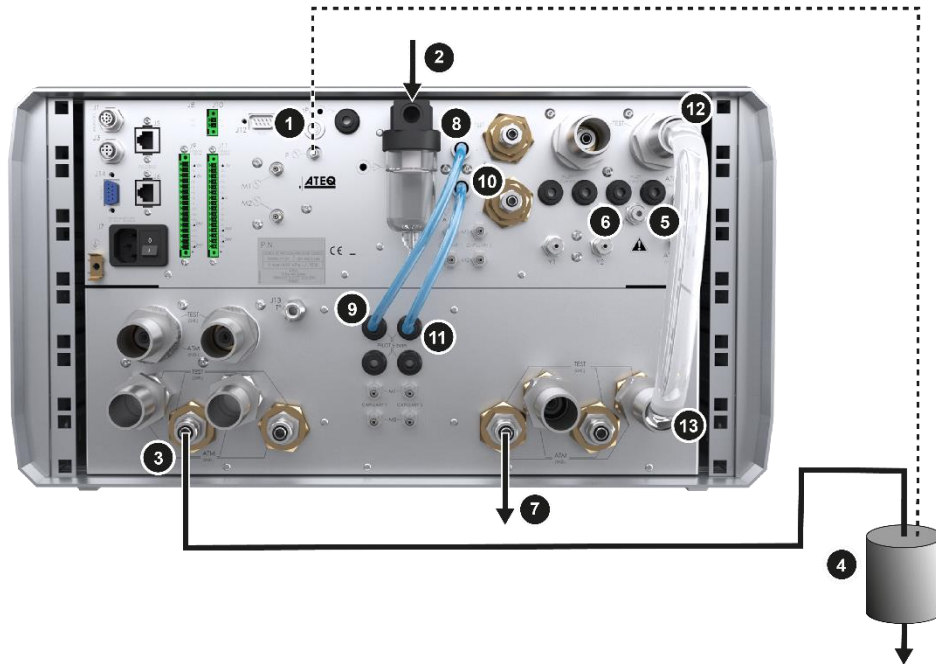
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Connection	Option / description
Air supply to 2	Connection of the air supply to the filter input (0.6 MPa)
3 to 4	Connection of the test output to the part under test (direct mode option)
4 to ATM	Connection of the part under test to the atmosphere
4 to 1	Connection of the part to test to P connector (external back pressure option)
5 to ATM	Connector left free to the atmosphere
6 to ATM	Connector left free to the atmosphere
7 to ATM	Exhaust of the part under test, connector left free to atmosphere



D670 6U case



Connection	Option / description
Air supply to 2	Connection of the air supply to the filter input (0.6 MPa)
3 to 4	Connection of the test output to the part under test (direct mode option)
4 to ATM	Connection of the part under test to the atmosphere
4 to 1	Connection of the part to test to P connector (external back pressure option)
5 to ATM	Connector left free to the atmosphere
6 to ATM	Connector left free to the atmosphere
7 to ATM	Exhaust of the part under test, connector left free to atmosphere
8 to 9	Shut Off pilot
10 to 11	Dump pilot
12 to 13	Output capillary to internal shut off valve



Direct mode - External shut off + dump options (high range)

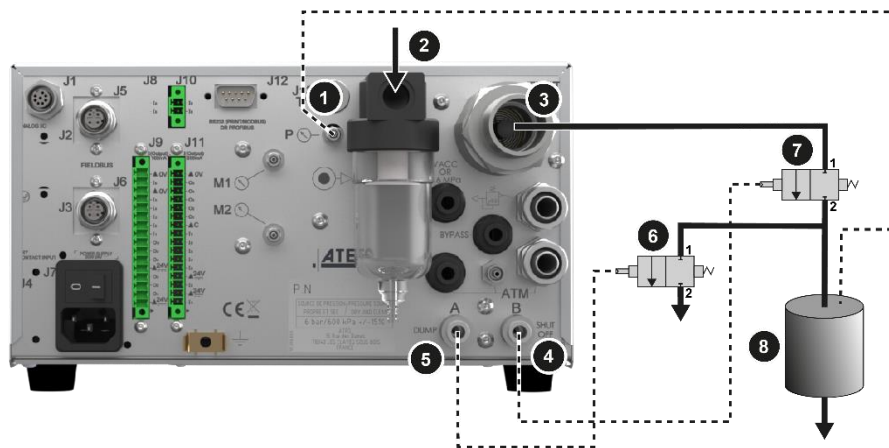
This configuration can be used for external shut off of the flow into the part to test and to dump the output flow of the device.

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Ranges

- From 500 to 1500 l/h maximum with pressure < 0.4 MPa
- From 4000 to 10000 l/h maximum for all pressures

D620 case



Connection	Option /description
Air supply to 2	Connection of the air supply to the filter input
3 to 7	Connection of the test output to the shut off valve (direct mode option)
4 to 7	Connection of the shut off output to the shut off valve (external shut off option)
7 to 6 and 8	Connection of the shut off valve to the dump valve and to the part under test
5 to 6	Connection of the dump output to the dump valve (dump option)
6 to ATM	Controlled connection of the dump valve to the atmosphere
7 to 8	Connection of the shut off valve to the part under test (external shut off option)
8 to ATM	Connection of the part under test to the atmosphere
8 to 1	Connection of the part to test to P connector (external back pressure option)



Direct mode - External shut off option without dump

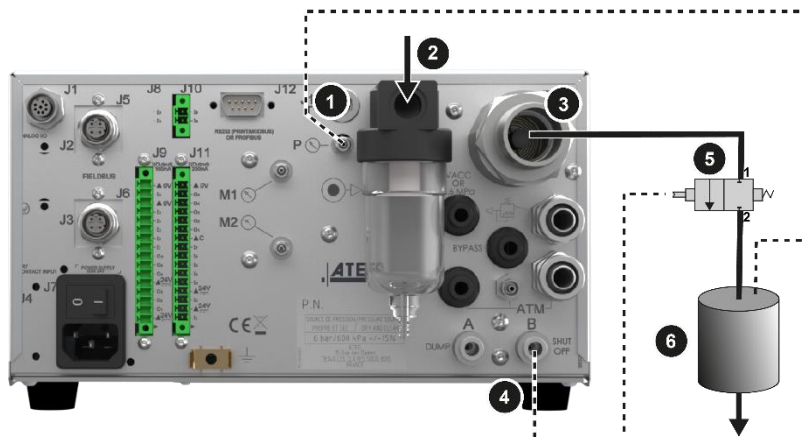
This configuration can be used for external shut off of the flow into the part to test for high flow range.

Ranges

- From 500 to 1500 l/h maximum with pressure < 0.4 MPa
- From 4000 to 10000 l/h maximum for all pressures

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D620 case



Connection	Option / description
Air supply to 2	Connection of the air supply to the filter input
3 to 5	Connection of the test output to the shut off valve (direct mode option)
4 to 5	Connection of the shut off output to the shut off valve (external shut off option)
5 to 6	Connection of the shut off valve to the part under test (external shut off option)
6 to ATM	Connection of the part under test to the atmosphere
6 to 1	Connection of the part to test to P connector (external back pressure option)



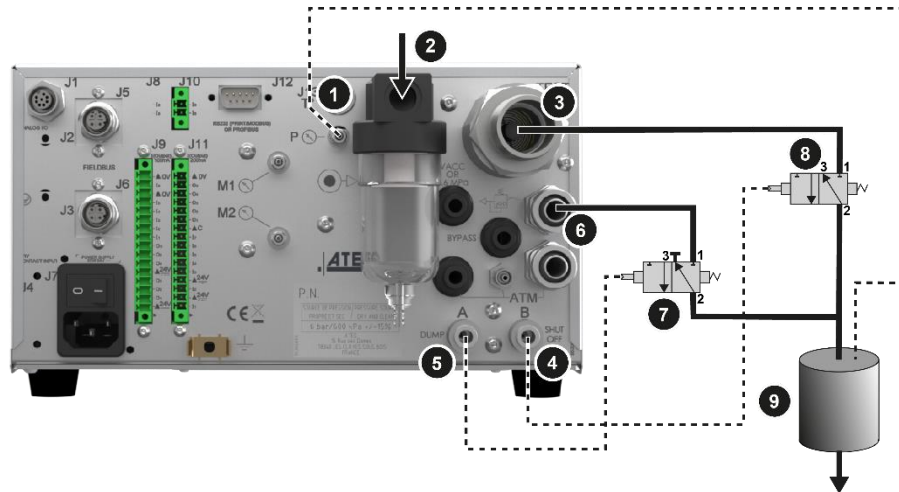
Direct mode - External bypass + shut off option - low range

This configuration can be used for external shut off of the flow into the part to test and to bypass the device to fill the part under test.

Ranges

- From 1 to 150 l/h maximum with pressure < 0.4 MPa
- From 1 to 1500 l/h maximum with pressure > 0.4 MPa

D620 case



Connection	Option /description
Air supply to 2	Connection of the air supply to the filter input
3 to 8	Connection of the test output to the shut off valve (direct mode option)
4 to 8	Connection of the shut off output to the shut off valve (external shut off option)
8 to 9	Connection of the shut off valve to the part under test (external shut off option)
6 to 7	Connection of the regulator output to the bypass valve (external bypass option)
5 to 7	Connection of the bypass output to the bypass valve (external bypass option)
7* to 9	Connection of the bypass valve to the part under test (external bypass option)
9 to ATM	Connection of the part under test to the atmosphere
9 to 1	Connection of the part to test to P connector (external back pressure option)

i | *A cap is installed on the valve for its not-operated position.



Direct mode - External bypass + shut off option - high range

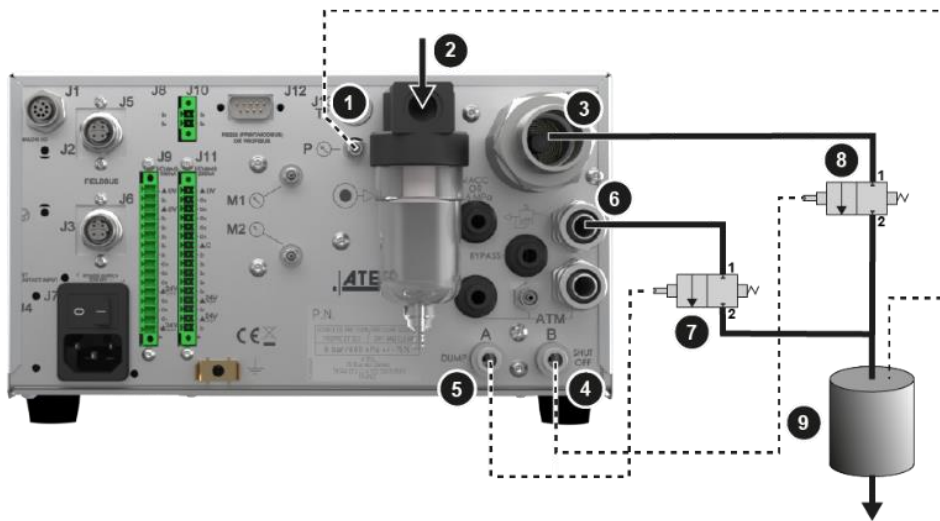
This configuration can be used for external shut off of the flow into the part to test and to bypass the device to fill the part under test.

Ranges

- From 500 to 1500 l/h maximum with pressure < 0.4 MPa
- From 4000 to 10000 l/h maximum for all pressures

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D620 case



Connection	Option /description
Air supply to 2	Connection of the air supply to the filter input
3 to 8	Connection of the test output to the shut off valve (direct mode option)
4 to 8	Connection of the shut off output to the shut off valve (external shut off option)
8 to 9	Connection of the shut off valve to the part under test (external shut off option)
6 to 7	Connection of the regulator output to the bypass valve (external bypass option)
5 to 7	Connection of the bypass output to the bypass valve (external bypass option)
7 to 9	Connection of the bypass valve to the part under test (external bypass option)
9 to ATM	Connection of the part under test to the atmosphere
9 to 1	Connection of the part to test to P connector (external back pressure option)



Direct mode - Two parts test option (T1 - T2) - Low range (dump after end of cycle, so no time)

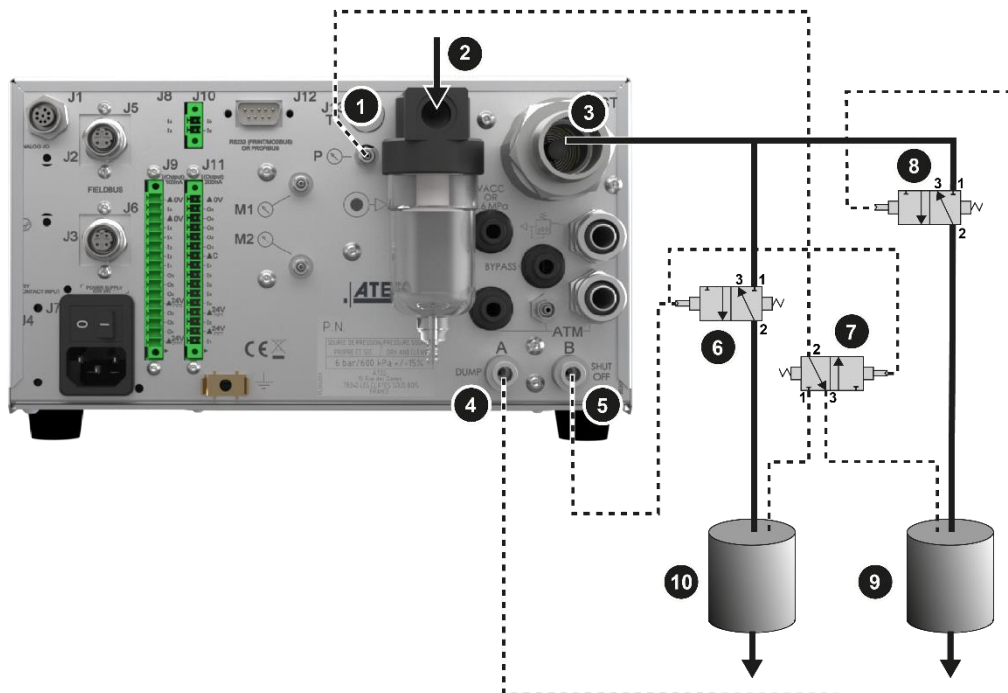
This configuration can be used to test two parts.

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Ranges

- From 1 to 150 l/h with pressure < 0.4 MPa
- From 1 to 1500 l/h with pressure > 0.4 MPa

D620 case



Connection	Option /description
Air supply to 2	Connection of the air supply to the filter input
3 to 8	Connection of the test output to the supply valve 1 (direct mode option)
8 to 9	Connection of the supply valve 1 to the part 1 to test
4 to 8	Connection of the auxiliary 1 output to the supply valve 1
3 to 6	Connection of the test output to the supply valve 2 (direct mode option)
6 to 10	Connection of the supply valve 2 to the part 2 to test
5 to 6	Connection of the auxiliary 2 output to the supply valve 2
9 to ATM	Connection of the part 1 to the atmosphere (ATM)
10 to ATM	Connection of the part 2 to the atmosphere (ATM)
5 to 7	Connection of the auxiliary 2 output to the return valve (external back pressure option)
9 to 7	Connection of the part 1 to the return valve (external back pressure option)
10 to 7	Connection of the part 2 to the return valve (external back pressure option)
7 to 1	Connection of the return valve to P connector (external back pressure option)





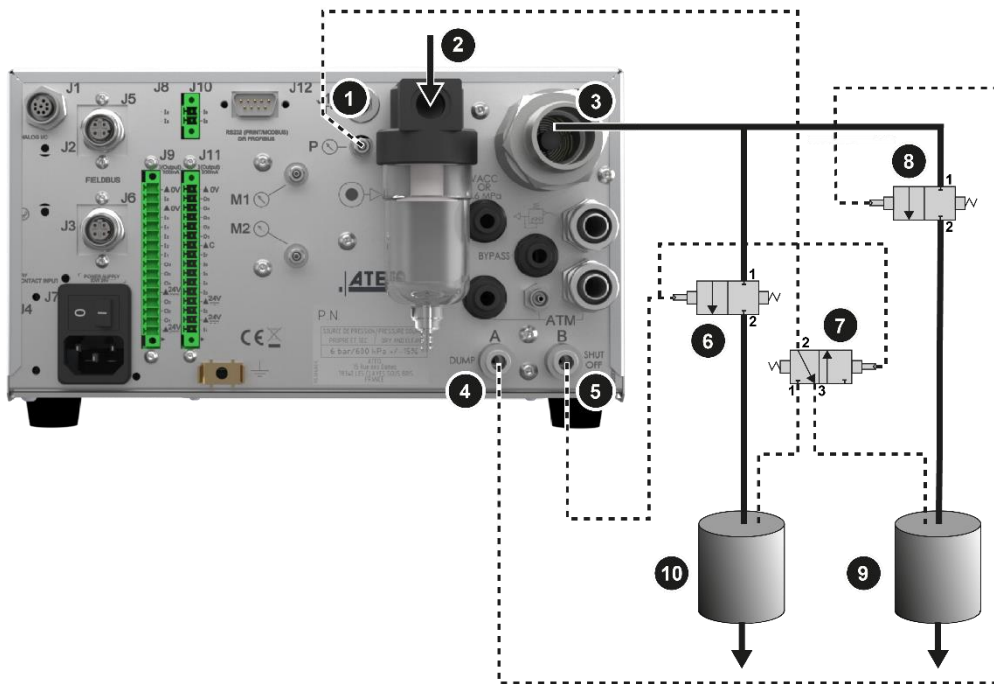
Direct mode - Two parts test option (T1 - T2) - High range (no dump)

This configuration can be used to test two parts.

Ranges

- From 500 to 1500 l/h with pressure < 0.4 MPa
- From 4000 to 10000 l/h maximum for all pressures

D620 case



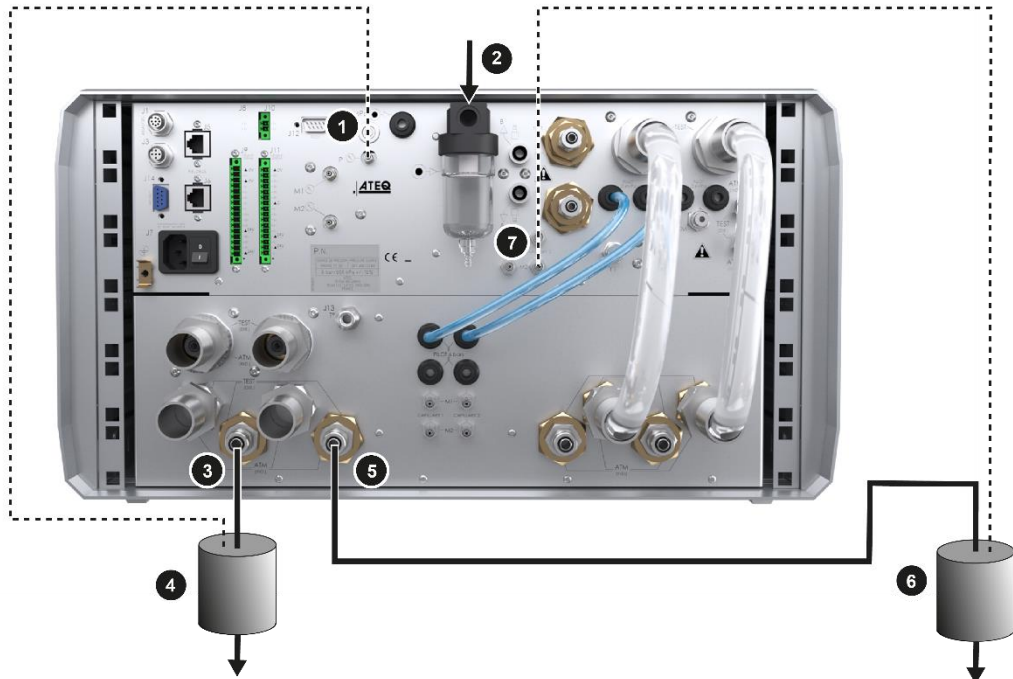
Connection	Option /description
Air supply to 2	Connection of the air supply to the filter input
3 to 8	Connection of the test output to the supply valve 1 (direct mode option)
8 to 9	Connection of the supply valve 1 to the part 1 to test
4 to 8	Connection of the auxiliary 1 output to the supply valve 1
3 to 6	Connection of the test output to the supply valve 2 (direct mode option)
6 to 10	Connection of the supply valve 2 to the part 2 to test
5 to 6	Connection of the auxiliary 2 output to the supply valve 2
9 to ATM	Connection of the part 1 to the atmosphere (ATM)
10 to ATM	Connection of the part 2 to the atmosphere (ATM)
5 to 7	Connection of the auxiliary 2 output to the return valve (external back pressure option)
9 to 7	Connection of the part 1 to the return valve (external back pressure option)
10 to 7	Connection of the part 2 to the return valve (external back pressure option)
7 to 1	Connection of the return valve to P connector (external back pressure option)



Direct mode - Option Dual Capillary with Shut Off - until 0.5 MPa

This configuration is used for direct mode at medium pressure range.

D670 6Ucase



Connection	Option / description
Air supply to 2	Connection of the air supply to the filter input (0.6 MPa)
3 to 4	Connection of the test output to the part under test (direct mode option)
4 to ATM	Connection of the part under test to the atmosphere
4 to 1	Connection of the part to test to P connector (external back pressure option)
5 to 6	Connection of the test flow 2 output to the part under test
6 to ATM	Connection of the part under test to atmosphere
6 to 7	Connection of the part to test flow 2 to P2 connector (external back pressure option)



User interface

OVERVIEW

The user interface comprises a display and user keys located on the front panel.

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- 1 Display
- 2 Cycle keys
- 3 Navigation keys

KEYS

Cycle keys

The cycle keys are used to start and to stop a measurement cycle.

Key	Name	Function
	Start	On the Program screen, starts a measurement cycle and opens the Measurement cycle screen.
	Reset	Stops the measurement cycle in progress and returns to the Program screen.



Navigation keys

The navigation keys are used to select menus/options and change parameter values.

Key	Name	Function
	Up key	Scrolls up or increases numerical values.
	Down key	Scrolls down or decreases numerical values.
	OK	Returns to the MAIN MENU screen or opens menus and options, validates parameters.
	Esc	Returns to previous screen (until the Program screen), escapes without modifying parameters.

Smart key

Smart key is a programmable key that provides direct access to a function selected by the user.

Key	Name	Function
	Smart key	Starts a measurement cycle (default, programmable).

This key is programmable through the **MAIN MENU** screen:

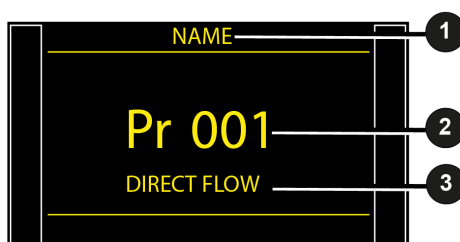
MAIN MENU > CONFIGURATION > MISCELLANEOUS > SMART KEY

DISPLAY

The device uses 4 main screens.

The Program screen

Use the **Program** screen to select a test program.



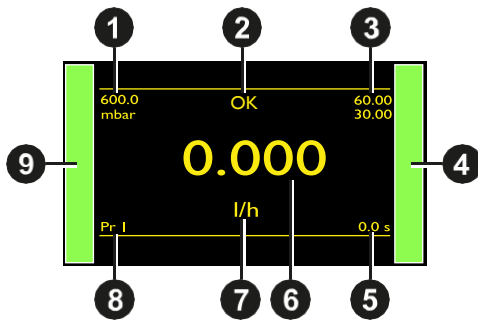
- 1 Current program name (here **NAME**)
- 2 Current program number (here **001**)
- 3 Test type (here **DIRECT FLOW**)

Access at startup of the device or by pressing several times **Esc**



The Measurement cycle screen

The **Measurement cycle** screen displays the different values of the current test (or last one).



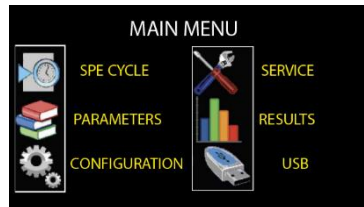
- 1 Test pressure measurement
- 2 Test result or step phase
- 3 Test reject value
- 4 Vertical line test result
- 5 Remaining time of the current phase or ready status
- 6 Flow measurement
- 7 Measurement unit
- 8 Current program
- 9 Vertical line test result

i A star (*) can be displayed after the measurement unit 7 when the standard conditions function is validated.
See: **STD CONDITIONS**.

The MAIN MENU screen

The **MAIN MENU** screen gives access to different sections for managing the device and the test parameters.

i Access: from the **Program** screen, press **OK**.



Option	Description
SPE CYCLE	Specific procedures necessary to ensure the proper operation of measurement cycles (for example, adjustment of a pressure regulator).
PARAMETERS	Parameters of the test programs.
CONFIGURATION	General configuration of the device.
SERVICE	Maintenance of the device.
RESULTS	Test results, backup and display options.
USB	USB connection functions (backup, restore).



User adjustments




PROGRAM MANAGEMENT

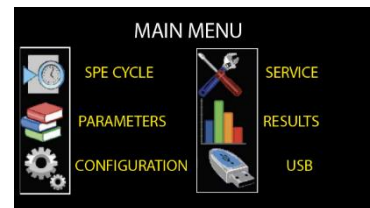
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Preparing a program

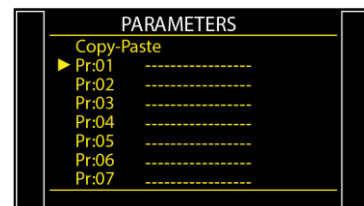
Use this procedure to configure a new test program.
On the **MAIN MENU** screen:

ACCESSING THE PARAMETERS


1. Select **PARAMETERS** using the up/down   keys and press .



The program list is displayed.

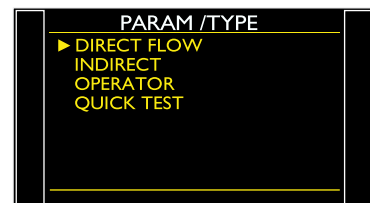


SELECTING A PROGRAM NUMBER


2. Select the program to configure and press .

A list of the available measurement types is displayed:

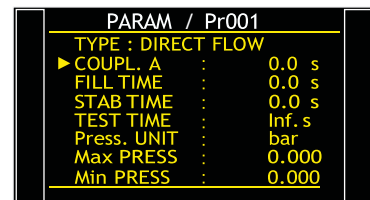
- **DIRECT FLOW** type
- **INDIRECT** type
- **OPERATOR** type
- **QUICK TEST** type



CONFIGURING THE ASSOCIATED MEASUREMENTS

3. Select the program to configure and press .
The parameters of the selected measurement type are displayed.


4. Define the measurement cycle parameters.
See: Modifying a parameter.








Modifying a parameter

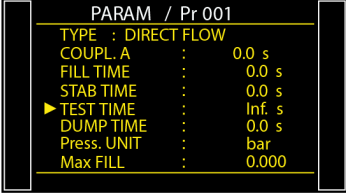
Use this procedure to complete the test program setup.

- i** The protection of the parameters is configurable. If the icon  is displayed at the bottom of the screen, you must insert the USB unlocking device or enter a password before modifying a parameter.
See: Activation of safety.


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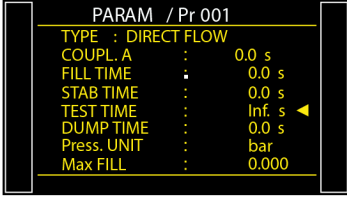
On the **PARAMETERS** screen of the program (see: Preparing a program):

1. Press **up/down**   to select the parameter to modify, and press .




PARAM / Pr 001	
TYPE	: DIRECT FLOW
COUPL. A	: 0.0 s
FILL TIME	: 0.0 s
STAB TIME	: 0.0 s
▶ TEST TIME	: Inf. s
DUMP TIME	: 0.0 s
Press. UNIT	: bar
Max FILL	: 0.000

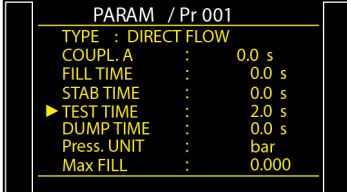
An arrow  is displayed on the right of the parameter being modified.




PARAM / Pr 001	
TYPE	: DIRECT FLOW
COUPL. A	: 0.0 s
FILL TIME	: 0.0 s
STAB TIME	: 0.0 s
TEST TIME	: Inf. s ◀
DUMP TIME	: 0.0 s
Press. UNIT	: bar
Max FILL	: 0.000

2. Use the **up/down**   keys to modify the parameter value, and press  to validate.

The arrow  returns to the left of the modified parameter.



PARAM / Pr 001	
TYPE	: DIRECT FLOW
COUPL. A	: 0.0 s
FILL TIME	: 0.0 s
STAB TIME	: 0.0 s
▶ TEST TIME	: 2.0 s
DUMP TIME	: 0.0 s
Press. UNIT	: bar
Max FILL	: 0.000

3. Repeat these steps until all parameters are set.
4. To return to the **MAIN MENU** screen, press Esc  as many times as necessary.




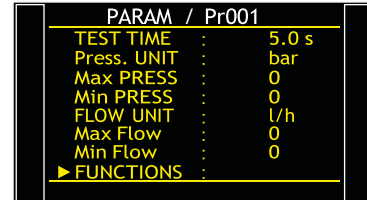
Access to additional functions

Use this procedure to enable additional functions.

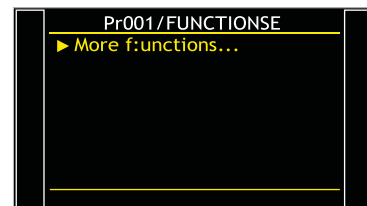
On the **PARAMETERS** screen of the program (see: Preparing a program):

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1. Press **down**  as many times as necessary in order that **FUNCTIONS** is displayed, then press **OK**.

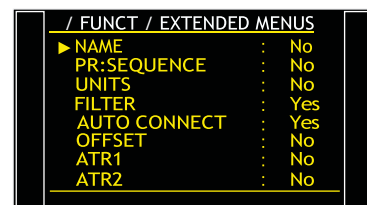




More functions... is displayed.

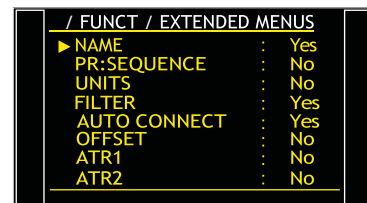


2. Press **OK**.
The list of all the additional functions available is displayed.

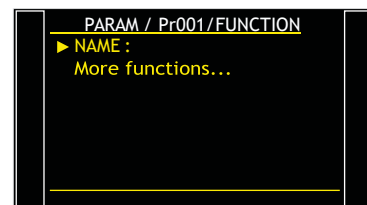
 The functions already enabled are identified by **Yes**.



3. Press **up/down**   to select the function to enable, and press **OK** and replace the value No by Yes.



You can now use this function as any other parameter.

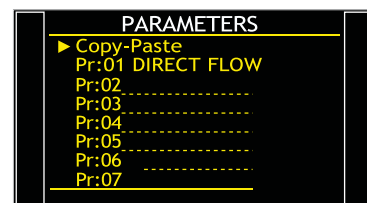


Duplicating a program

Use this procedure to duplicate a test program.

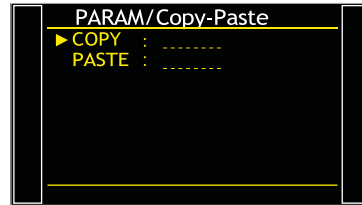
Access: **MAIN MENU** > **PARAMETERS**.

1. Select **Copy-Paste** and press **OK**.

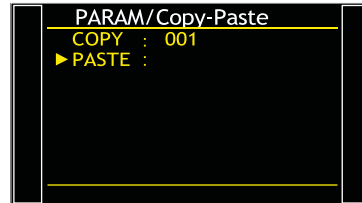




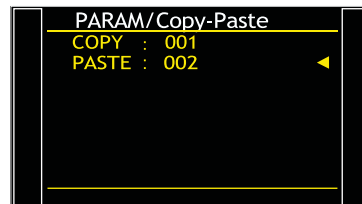
2. Select **COPY** and press **OK**.



3. Use the **up/down** keys to select the number of the program to duplicate and press **OK**.

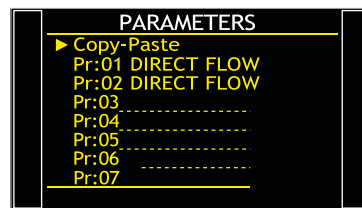


4. Select **PASTE**, press **OK** and with the **up/down** keys select the number of the new program.



If the new program already exists, it will be erased and replaced by the source program without prior notice.

5. Press **OK** to paste the source program to the destination program.



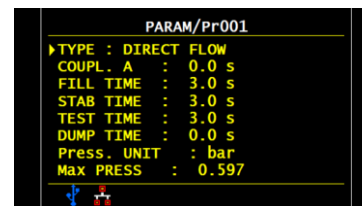
In this example, the program number 2 has been created and is an exact copy of the program number 1, with all its parameters.

Deleting a program

Use this procedure to delete a test program or to delete its name.

Access: **MAIN MENU > PARAMETERS.**

1. Select the **TYPE** parameter and press **OK**.

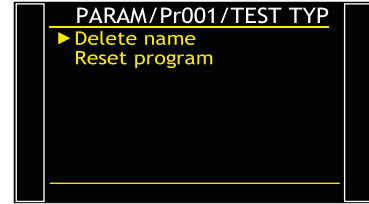


DELETING THE NAME OF A PROGRAM

This function will be carried on without prior notice.



- To delete the name of the program, select **Delete name** and press **OK**.



DELETING A COMPLETE PROGRAM



The program deletion is instantaneous without prior notice.
Make sure you have saved it if necessary.

- To delete a test program, select **Reset program** and press **OK**.

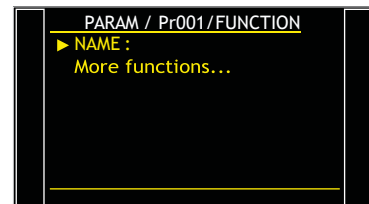
Naming a program



Use this procedure to name a test program.
Access: **MAIN MENU > PARAMETERS > FUNCTIONS**.

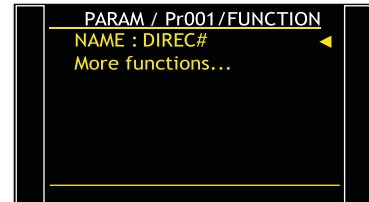


If this function is not available, you must enable it (see: Additional functions).

- Select the function **NAME** and press **OK**.



- Use the **up/down**   keys to select each character of the name and press **OK** to enter the following character.
- Repeat these steps until the complete name is entered.
- Then select the Enter symbol and press **OK**.



The maximum length of the name is 12 characters.



MEASUREMENT PARAMETERS

Parameters of the DIRECT FLOW measurement type

Label	Parameter	Description
RANGE : 1>	Flow range selection	If options Pressure / Vacuum or Double Capillary, several choices can be available: - 1P>: flow range 1 with pressure calibration - 1V>: flow range 1 with vacuum calibration - 2P>: flow range 2 with pressure calibration - 2V>: flow range 2 with vacuum calibration
COUPL. A or COUPL. B	Coupling time	In the event of an instrument with automatic connector, the coupling time A allows the activation of a first connector as soon as the cycle starts and to delay the pressurization of the test part. The coupling time B allows the activation of a second automatic connector.
FILL TIME	Fill time	This is the time taken to pressurize and initialize the flow in the test part.
FLOW UNIT	Reject unit	Flow rate unit displayed: SI System: ml/h, l/h, ml/s, ml/min, sccm, l/min, m3/h, pts US System: in3/h, ft3/h, in3/min, in3/s, sccm, pts. You may also use a customized measurement unit (see UNITS function).
Max Flow	Maximum reject	This parameter allows the definition of the upper limit of the authorized flow range in the test part, above this limit the part is considered as fail.
Max PRESS	Maximum fill pressure	This function is used to set a maximum limit for the fill pressure. A warning is triggered if this limit is exceeded.
Min Flow	Minimum reject	This parameter allows the definition of the lower limit of the authorized flow range in the test part, under this limit the part is considered as fail.
Min PRESS	Minimum fill pressure	This function allows the setting of a minimum fill pressure threshold which sets of an alarm if the pressure is not reached.
Press. UNIT	Pressure units	The different units are: bar, mbar, PSI, Pa, kPa, MPa.
STAB TIME	Stabilization time	This time allows the stabilization of the flow in the part. If the stabilization time is too short, parasite flow variations can cause inaccurate readings. It is therefore recommended to start with a long stabilization time and to progressively reduce it until a stable reading of flow can be made.
TEST TIME	Test time	The test time can be a set value or infinite. During all this time the instrument indicates if the flow in the part measured is between the minimum and maximum reject values.

Parameters of the INDIRECT measurement type

See **DIRECT FLOW** parameters.



Parameters of the OPERATOR measurement type

Label	Parameter	Description
COUPL. A or COUPL. B	Coupling time	In the event of an instrument with automatic connector, the coupling time A allows the activation of a first connector as soon as the cycle starts and to delay the pressurization of the test part. The coupling time B allows the activation of a second automatic connector.
INTER-CYCLE	Inter cycle time	This function is used to set the time between each cycle.
TEST TIME	Test time	During this test, the operator can carry out operations on the part under test. Once the operation has been carried out: <ul style="list-style-type: none">— if the operator test is good, confirm this operation by pressing Start,— if the operator test is fail, press Reset

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Parameters of the QUICK TEST measurement type

Label	Parameter	Description
COUPL. A or COUPL. B	Coupling time	In the event of an instrument with automatic connector, the coupling time A allows the activation of a first connector as soon as the cycle starts and to delay the pressurization of the test part. The coupling time B allows the activation of a second automatic connector.
DUMP TIME	Dump time	Dump time.
FLOW UNIT	Reject unit	Flow rate unit displayed: SI System: ml/h, l/h, ml/s, ml/min, sccm, l/min, m ³ /h, pts US System: in ³ /h, ft ³ /h, in ³ /min, in ³ /s, sccm, pts. You may also use a customized measurement unit (see UNITS function).
Max Flow	Maximum reject	This parameter allows the definition of the upper limit of the authorized flow range in the test part, above this limit the part is considered as fail.
Max PRESS	Maximum fill pressure	This function is used to set a maximum limit for the fill pressure. A warning is triggered if this limit is exceeded.
Min Flow	Minimum reject	This parameter allows the definition of the lower limit of the authorized flow range in the test part, under this limit the part is considered as fail.
Min PRESS	Minimum fill pressure	This function allows the setting of a minimum fill pressure threshold which sets of an alarm if the pressure is not reached.
Press. UNIT	Pressure units	The different units are: bar, mbar, PSI, Pa, kPa, MPa.
TEST TIME	Test time	The test time can be a set value or infinite. During all this time the instrument indicates if the flow in the part measured is between the minimum and maximum reject values.



If there is an electronic regulator option, activate in the configuration **MENU > PNEUMATIC > READY STATUS = YES > ELEC REG = Instruction.**



ADDITIONAL FUNCTIONS

Measurement functions

Label	Function	Description
ATR1 / ATR2	ATR 1 - 2	Specific filters on flow measurement
DISPLAY MODE	Display Mode	Flow measurement resolution
FILTER	Filtering	Stabilize the measurement values
NO NEGATIVE	No Negative	Replace negative value per 0
OFFSET	Offset	Flow offset
PEAK HOLD MAX	Peak hold	Give as result, the highest flow during the test time
PRESS. CORR.	Pressure correction	Calculate flow measurement at a specific pressure value, whatever the real test pressure is different
SIGN	Sign	Return opposite result
STD CONDITIONS	Standard conditions	Calculate measured flow in other ATM pressure and temperature condition (displays the unit with an *)

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Cycle functions

Label	Function	Description
FILL MODE	Fill types	Special filling methods (only available with mechanical regulator)
MINI-VALVE	Mini valve	Access to highest time resolution (fast test) and auto zero time
NAME	Name	Program customization
PR:SEQUENCE	Sequencing	Allowed program automatic sequencing
PRE-FILL	Pre-fill types	Special filling methods
PRESS. AZ	Pressure auto zero	Define if Pressure auto zero is done before, after the cycle or on demand (not done automatically)
REG. MODE	Regulator mode	Define the method to control the electronic pressure / flow regulator
REWORK LIMIT	Rework limits	Additional levels for specific reworkable parts
UNITS	Units	Access to International System or American or Custom Units



Automation functions

Label	Function	Description
24V OUTPUTS	Auxiliaries output 24 V	Available outputs for external automatism
ANALOG OUTPUT	Analog output	Duplicate the flow and pressure measurements on the analogues outputs
AUTO CONNECT	Automatic connector	Function to manage automatic jigs
AUTO MODE	Automatic mode	Starts automatically when pressure reach min pressure level (only available with mechanical regulator)
BUZZER	Buzzer	Buzzer activation configuration
CODE READER	Bar code reader	Bar code configuration
END OF CYCLE	End of cycle	Several automatism case depending on fail part management
STAMPING	Stamp	Pneumatic or electric output to identify the part
VALVE CODES	Valve codes	Available outputs for external automatism

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MEASUREMENT FUNCTIONS

ATR1 / ATR2

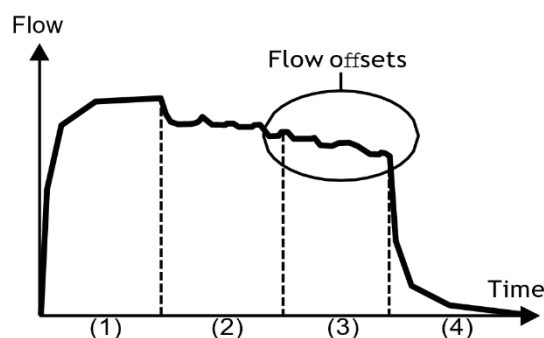
ATR – principle

Use the ATR (Attenuated Transient Reduction) functions to reduce the stabilization time.

Problem: is the flow offset occurring during the test time due to a transient effect?

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

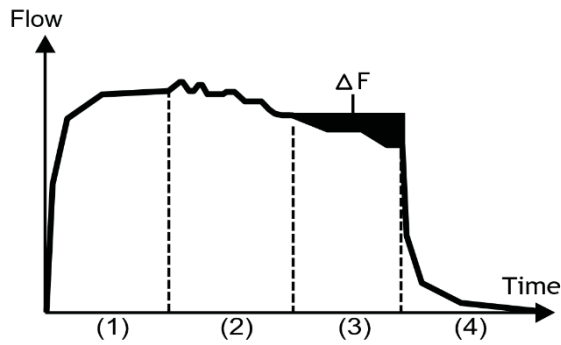
To avoid any interference, it is possible to increase the stabilization time to obtain the ideal measurement conditions during the test phase. However, increasing the stabilization time for each test may not be acceptable for optimal production speed.



- 1 Fill phase
- 2 Stabilization phase
- 3 Test phase
- 4 Dumping phase

Operational principle

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



- ΔF Transient
- 1 Fill phase
 - 2 Stabilization phase
 - 3 Test phase
 - 4 Dumping phase

i The use of the ATR function enables you to test parts with a short stabilization time without being influenced by the transient effects.

! The ATR (Attenuated Transient Reduction) function can only be used on parts that have similar transients (i.e. parts that have a very similar behavior during the test).

! 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 could have changed.

Two ATR (Attenuated Transient Reduction) functions are available:

- ATR1
- ATR2

ATR1

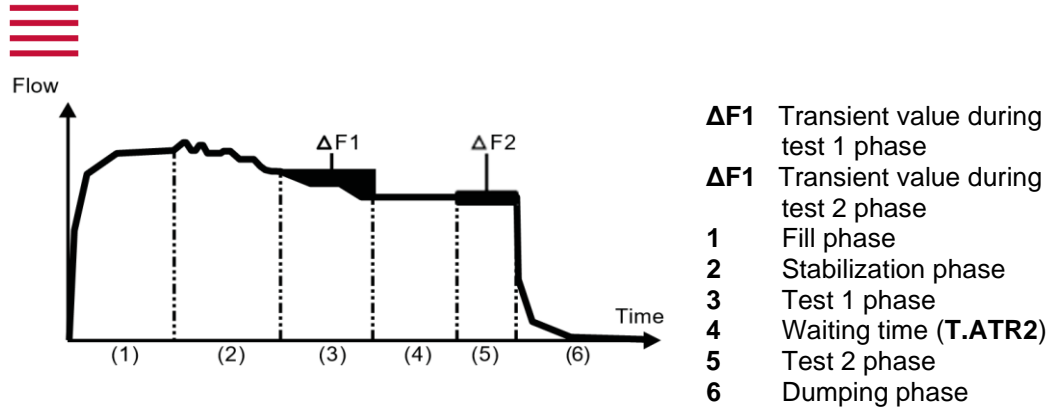
The value of the transient is unknown. A special learning cycle must be carried out. For this function, the learning cycle must be carried out on a known good part.

As the part tested is a good part, the flow variation ΔF measured at the end of the cycle is then the transient. This value is saved and subtracted from the final result of subsequent tests. Its value is recalculated at each measurement cycle.

ATR2

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

For this function, the learning cycle must be carried out on any part (see figure below).



Test 1 phase (3)

At the end of test 1 phase (3), the flow variation **ΔF1** is equal to the transient value **T** and the flow value **F** if there is one.

$$\Delta F1 = F + T$$

F Flow value
T Transient value

Test 2 phase (5)

At the end of the waiting time (4), the transient phenomena is assumed to have been disappeared.

At the end of test 2 phase (5), the pressure variation **ΔP2** is equal to the flow value **F**.

$$\Delta F2 = F$$

Result

By taking these two flow variations, the transient **T** can be calculated:

$$\Delta F1 - \Delta F2 = (F + T) - F = T$$

- i** | This transient **T** will be subtracted from the flow measurement of the following cycles.
- i** | Due to the evolution of the test conditions (temperature variations...), the value of the transient can vary through time. Therefore, the transient drift is corrected by the instrument (see: below / Transient drift).
- i** | The Transient drift is recalculated periodically.
 Due to the evolution of the test conditions (temperature variations...), the value of the transient can vary through time.
 To avoid having to carry out learning cycles too often, the instrument saves the last ten values of parts considered as very good (result close to 0) and recalculates the transient using an average value:

$$T = \frac{\sum_{i=1}^{10} t_i}{10}$$

T Transient calculated
t_i Transient value of the last 10 very good parts



ATR - parameters setup

Use this procedure to setup the ATR parameters before carrying out an ATR special cycle. Select one of the ATR function (**ATR1** or **ATR2**) and adjust the following ATR parameters:

Start	initial value of the transient.
Transient	last calculated transient value.
% Drift	percent of the reject level (the measurements used for the transient calculation are less than this value).
DRIFT	drift tolerance on acquisition of the transient, as a % of the reject level. Transient Monitoring feature, this parameter helps to define the Maximum acceptable Transient. If the calculated transient becomes over Drift*Reject level. It will display an Alarm.

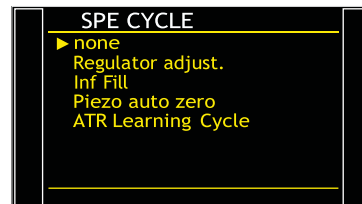
i | The **Transient** parameter is not modifiable. It is the current value of the transient.

ATR learning cycle

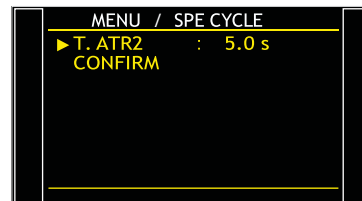
Carry out a learning cycle to calculate the ATR transient values.

Access: **MAIN MENU > SPECIAL CYCLE MENU.**

1. Select ATR Learning Cycle.

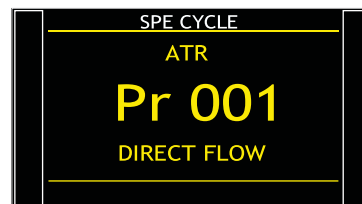


2. Set the T. ATR2 parameter with the duration of the delay before Test 2 phase.




3. Select **CONFIRM**.

The cycle screen is displayed.



! | The program deletion is instantaneous without prior notice.
Make sure you have saved it if necessary.

4. Press **Start**  to start the cycle.
The cycle screen is displayed.

i | During the ATR test cycle, **ATR MODE** is displayed to inform that the ATR calculation is in progress.

At the end of the special cycle, the result must be pass (**OK**).



5. Press **OK** just after the special cycle end to check the parameters recorded by the special cycle.

i | It is then possible to modify these parameters.

ATR2	
▶ Start	: -0.9
Transient	: 16.5
% Drift	: 20 %
DRIFT	: 10 %

DISPLAY MODE

Use this function to adjust the number of decimal displayed by the instrument. Select the **DISPLAY MODE** function.

Select one of the following items:

- **STANDARD**
- **XXXX**
- **XXX.X**
- **XX.XX**
- **X.XXX**
- **X.XXXX**

i | For the **STANDARD** mode, the result is displayed with the default resolution of the current unit.

i | Of course, the selected mode cannot be better than the standard mode.

FILTER

Use this function to make the values displayed more readable when the measurement values change quickly.

Select the **FILTER** function.

Set one of the following parameters:

- **FLOW**
- **PRESSURE**

i | This function enables the slowing down of the sampling speed, by performing an average over the measurement time set.

! | With an electronic regulator option, the **PRESSURE** parameter must be about 0.1s or 0.2s.
If not, the pressure regulation will not work properly.

NO NEGATIVE

Use this function to replace negative values by zero. Select the **NO NEGATIVE** function.

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

OFFSET

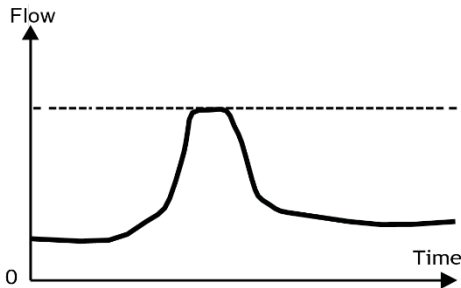
Use this function to subtract an offset value to the current value measured by the instrument. Select the **OFFSET** function.



PEAK HOLD MAX

Use this function to display the highest value of the flow rate during the test time.

Principle



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Select the **PEAK HOLD MAX** function.

- i** | The **PEAK HOLD MAX** mode excludes any use of the ATR mode.
- i** | When the instrument is used with the flow regulation function, the maximum value of the pressure measurement is memorized instead of the flow rate.

PRESS. CORR.

When the function is activated, the instrument recalculates the flow results depending on the instruction pressure.

Select the **PRESS. CORR.** function.

Select the correction mode according to the flow type (**TYPE** parameter):

- **TURBULENT**
- **LAMINAR**
- **LINEAR** + a Coef. Correction must be set

Adjust the **INSTRUCT.** parameter.

- i** | Some flow tests can be done at different pressures on the test part so as to select the best corresponding correction.

SIGN

Use this function to change the sign (positive or negative) of the measurement result.

- i** | This function is useful in case of a vacuum application or indirect measurements as it allows the display of a positive measurement result.

Select the **SIGN** function.



STD CONDITIONS

Use this function to correct the measurements as if the test was carried out in atmospheric standard conditions.

- i** | The measurements depend on the ambient temperature and atmospheric pressure. When this function is activated, the instrument recalculates the flow results according to the atmospheric conditions set. So, the results of the measurements are not depending on the ambient variations.
- i** | This function is validated by default on each program.

Select the **STD CONDITIONS** function. Adjust the following parameters:

Parameter	Description
ATM PRESS.	Value of the standard atmospheric pressure from 600 to 1100 hPa
TEMP.	Value of the standard ambient temperature from 0 to 100 °C

- i** | The default values of these parameters are 1013 hPa and 20.0 °C.

When the measurements results are displayed in **STD CONDITIONS** mode, a star (*) is displayed after the unit.





CYCLE FUNCTIONS

FILL MODE (only available with mechanical regulator)

Use this function to choose different type of fill.

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Standard (by default)

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

If the test pressure is over Max PRESS, the cycle is stopped with an alarm **Pressure High**.

Ballistic

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

However, once the test sequence enters the stabilization phase, the test pressure must be within the limits defined by **Max Fill**. and **Min Fill**.

Associated parameters to be set: Select the **FILL MODE** function.

MINI-VALVE

Use this function for small parts applications.

- i** This function is useful for parts with a volume below 10 cm³. The base time is equal to 0.01s instead of 0.1s.
The parameter to be set differently than for the other applications is **Diff A-Z** (differential Auto-Zero).
This time can be reduced only if the measurement values stays stable and repeatable.

Select the **MINI-VALVE** function.

Adjust the value of the **Diff A-Z** parameter.

Set the **AzDiff2** parameter. If yes, the flow measurement can be a little more repeatable (**Diff A-Z** done twice).

- i** For flow rate measurement applications, a value of 800ms is proven stable.

NAME

Use this procedure to name a test program.

Select the **NAME** function.

Enter the alphanumerical characters of the name (see Naming a program).

- i** The maximum length of the name is 12 characters.



PRESS. AZ

Use this function to position the **Reset phase** in the test cycle.

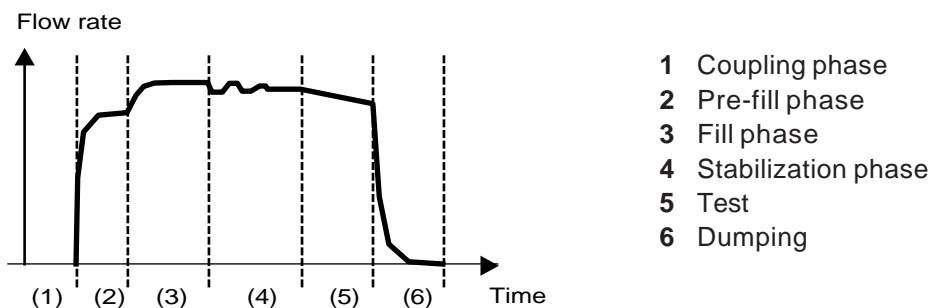
i | The Reset phase in the instrument is carried out for each test cycle.

Select the **PRESS. AZ** function.
Select one of the following parameters:

Parameter	Description
Before	Just after the cycle start order and before the test cycle
After	Just after the test time
Without	No Reset phase

PreFILL (only available with mechanical regulator) (Option)

Use this function to add a pre-fill phase before the fill phase of a test cycle.



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.
- Test on parts requiring an initial stretch so that their volume remains stable for the duration of the test.
- Part proof tests, where the pre-fill pressure exerts an elevated pressure on the test part to ensure the part will continue to operate successfully at its working pressure.

Adjustment of the parameters

Select the **PreFILL** function.
Adjust the following parameter:

Parameter	Description
PreFILL	Time for the Pre-fill phase
Max PreFILL	When the pressure is over that limit, a pressure alarm is triggered



REG. MODE (only available with electronic regulator)

Use this function to select the mode to fill the parts.

Select the **REG. MODE** function.

Select the regulation mode and adjust the parameters associated.


Regulation mode	/ Parameter
NONE Raw instruction and no software correction In this mode the test pressure can be a little different of the instruction depending on the flow.	INSTRUCT. A percentage of electronic regulator full scale is applied without software correction. UNIT: pressure unit OVERSHOOT If No , gives a pressure alarm if pressure is above max level. If Yes , allows the pressure above the max level on the filling time but must be between the two levels at stabilization time.
P(Auto) Pressure regulation with software correction to reach the instruction value during the filling time.	START INST. Automatic % value of pressure full scale corresponding to the instruction value and cannot be changed and is the start value at the beginning of filling time and will be corrected by the software. CONTINUOUS If No , the software correction is done only on the filling time. If Yes , the software will do the correction permanently on filling, stabilization, test times. INSTRUCT.: pressure instruction UNIT: pressure unit GAIN 100 per default. If the pressure correction is unstable, decrease the value close to zero to get it more stable but it will be longer to reach the instruction pressure. It can be increased until 1000 to reach the instruction faster if the correction is kept stable. OVERSHOOT If No , gives a pressure alarm if pressure is above max level. If Yes , allows the pressure above the max level on the filling time but must be between the two levels at stabilization time.
P(Manu) Pressure regulation with software correction to reach the instruction value during the filling time. Start Inst. % value can be changed if big flows to start at the good pressure on a good part. It's to win time on the filling the test part.	START INST. Automatic % value of pressure full scale corresponding to the instruction value and can be changed and is the start value at the beginning of filling time and will be corrected by the software. CONTINUOUS: see P(Auto) mode INSTRUCT.: pressure instruction UNIT: pressure unit GAIN: see P(Auto) mode OVERSHOOT: see P(Auto) mode



Regulation mode	/ Parameter
<p>FLOW Flow regulation with software correction to reach the instruction flow during the stabilization time</p>	<p>START INST. A special cycle Regulator adjust. can be done with a good part to set automatically the parameters START INST. and INSTRUCT.. They can be changed manually by varying the percentage of start value on the filling time.</p> <p>CONTINUOUS If No, the software correction is done only on the stabilization time. If Yes, the software will do the correction permanently on stabilization, test times.</p> <p>INSTRUCT.: flow instruction UNIT: flow unit</p> <p>GAIN 100 per default. If the flow correction is unstable, decrease the value close to zero to get it more stable but it will be longer to reach the instruction flow. It can be increased until 1000 to reach the instruction faster if the correction keep stable.</p> <p>OVERSHOOT If No, gives a pressure alarm if pressure is above max level. If Yes, allows the pressure above the max level on the filling time but must be between the two levels at stabilization time.</p>

Regulator adjust.

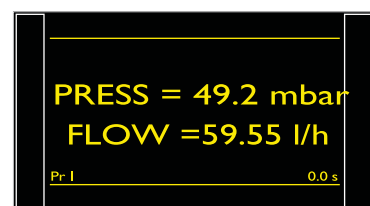
Access: **MAIN MENU > SPE CYCLE >**


1. Connect a pass part to the device.
2. Select Regulator adjust.
The **Regul.** cycle screen is displayed.
3. Press **Start**  to start the cycle.



The current pressure and flow are displayed.

4. Use the **up/down**   keys to adjust the flow until the flow value is reached.

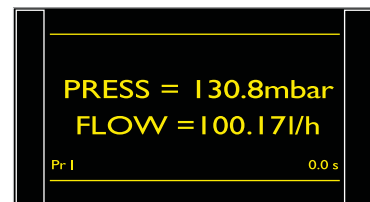


5. Then press **OK** .

For the **FLOW** mode (see **REG. FLOW**), the device calculates then the **START INST.** and **INSTRUCT.** parameters, the maximum and minimum flow thresholds (Max Flow and Min Flow) at $\pm 10\%$ of the flow value reached.

For the **NONE**, **P(Auto)** and **P(Manu)** modes (see **REG. FLOW**), the device calculates then the **START INST.** and **INSTRUCT.** parameters, the maximum and minimum flow thresholds (**Max Flow** and **Min Flow**) at $\pm 20\%$ of the value reached.

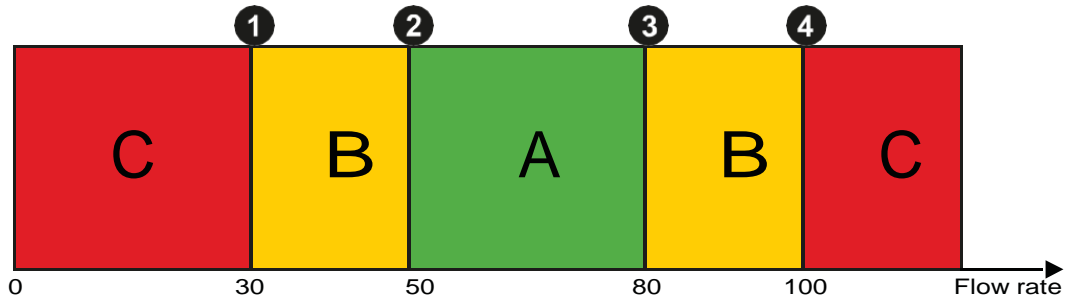
The device confirms the settings.





REWORK LIMIT

Use this function to define additional reject levels. This function enables to select fail parts which can be reworked.



- A Pass parts
- B Reworkable parts
- C Fail parts

When this option is validated, you can define the following thresholds:

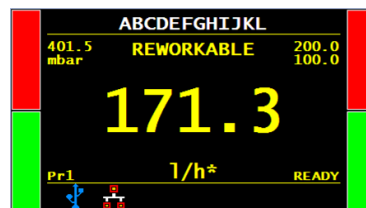
Parameter	Description
Min Flow (1)	below this value, the part will be considered as definitely fail (standard parameter)
Min Rework* (2)	below this value and above Min Flow (1) , the part will be considered as reworkable
Max Rework* (3)	above this value and below Max Flow (4) , the part will be considered as reworkable
Max Flow (4)	above this value, the part will be considered as definitely fail (standard parameter)

i | This function enables to define two additional reject levels (2 and 3).

Procedure

Select the **REWORK LIMIT** function.

When a part under test is reworkable, **REWORKABLE** is displayed on the measurement screen.





UNITS

Use this function to select the flow rate system units or a customized measurement unit. Select the **UNITS** function.

Select one of the following parameters:

Parameter	Description
SI	SI system (available units depending on the flow range: ml/min; sccm; ml/s; l/h; l/min; m ³ /h)
SAE	US system (available units depending on the flow range: sccm; cu in/h; cu in/min; cu in/s; cu ft/h)
CUSTOM	Customized measurement unit (to be calibrated by the next procedures)

Customized unit configuration

Use this function to define the calibration parameters of the customized unit.

Access: **MAIN MENU > PARAMETERS > FUNCTIONS > UNITS > CUSTOM.**

Set the following parameters:

Parameter	Description
Drift Unit	Tolerance limit for the calibration drift used during the calibration check
NAME	Name of the customized unit
SINGLE CAL	— Yes : the calibrated unit will only be assigned to the current program — No : the calibrated unit will be assigned to the all programs using a calibration unit
Delete Unit Name	Deletion of the customized unit name

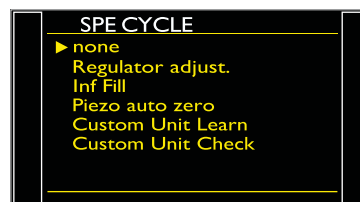
Customized unit learn

Use this function to calibrate the customized measurement unit.

i | The customized unit corresponds to the flow. So, you have to calibrate the instrument using a master jet and to carry out a special cycle.

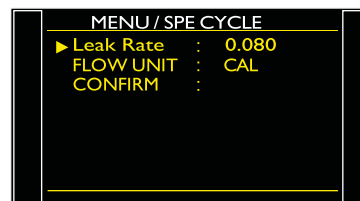
Access: **MAIN MENU > SPECIAL CYCLE MENU.**

1. Select Custom Unit Learn.



2. Select Leak Rate and enter a value for the calibration.

3. Select **CONFIRM**.





The cycle screen is displayed.

4. Press **Start**  to start the cycle.



At the end of the special cycle, the result must be pass (OK).



Customized unit check

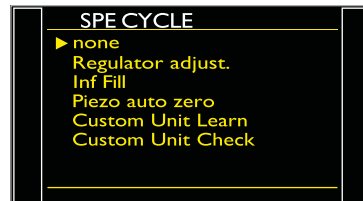
Use this function to verify the calibration of a customized measurement unit.



This cycle measures whether the calibration has drifted beyond the limits set as a percentage (see: Customized unit configuration, **Drift Unit** parameter). If these have been exceeded, an alarm is triggered and a Customized unit learn cycle or an instrument check is required.

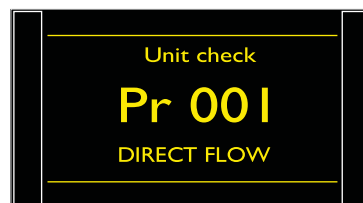
Access: **MAIN MENU > SPECIAL CYCLE MENU.**

1. Select Custom Unit Check.



The cycle screen is displayed.

2. Press **Start**  to start the cycle.



At the end of the special cycle, the result must be pass (OK).





AUTOMATION FUNCTIONS

24V OUTPUTS (Option)

Internal 24V outputs are available to pilot internal electrovalves and can be used to select Test 1 or Test 2 output when T1+T2 option. They will be automatically activated on all the test cycle. If there is a function name (dump, stamping...) instead of AUX 1, it will not be available and reserved for that function.

The activation can work in several different ways: see the Configuration Menu / Automatism / Outputs Config.

Use this procedure to activate the auxiliary programmable outputs of the relay board. Select the **24V OUTPUTS** function.

- Select the output to activate (**AUX 1** to **AUX 4**) **NO** = disabled or **YES** = enabled
- Repeat this procedure for each output

ANALOG OUTPUT (Option)

An output voltage 0-10VDC is generated for the test pressure and the flow.

Access: MAIN MENU > PARAMETERS > FUNCTIONS > ANALOG OUTPUT

PRESSURE / NONE / F.S. (pressure Full Scale of the Ateq instrument)

FLOW : NONE / F.S. (flow Full Scale of the Ateq instrument) / WINDOW (window mode is to drive a motor system with a target flow) > TARGET / EXTENDED

Window mode:

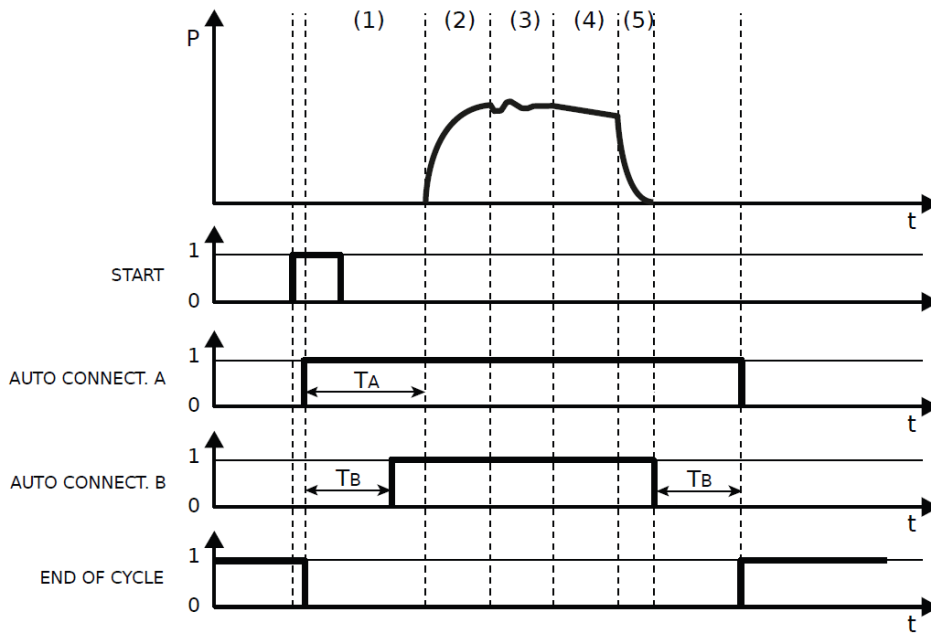
- Target flow value = 5 VDC
- Max = target flow + extended flow = 10 VDC
- Min = target flow – extended flow = 0 VDC
- Output Voltage = $((\text{Flow} - \text{Min}) * 10) / (\text{Max} - \text{Min})$

AUTO CONNECT (Option)

A pneumatic control drives external device (valve, pneumatic device, pneumatic caps...) using pneumatic connectors A and B (see: Pneumatic outputs 0.6 MPa (87 PSI) (option)). The pneumatic control **AUTO CONNECT. A** is activated at the start of the coupling phase (1) and is released at the end of the cycle (see: figure below).

A second control **AUTO CONNECT. B** is activated after the time delay **TB** and is released before the same time delay before the release of the **AUTO CONNECT. A**.

The test cycle begins at the end of the time delay **TA** and finishes at the end of the same time delay after the dump phase (5).



- P** Pressure
- t** time
- (1)** Coupling phase
- (2)** Fill phase
- (3)** Stabilization phase
- (4)** Test
- (5)** Dumping phase (option)
- TA** **COUPL. A** time
- TB** **COUPL. B** time

Procedure

Select the **AUTO CONNECT** function.
Select each parameter and enter a value of the time delay:


Parameter	Description
COUPL. A	Time delay TA
COUPL. B	Time delay TB





AUTO MODE

Use this function to launch automatically a test cycle when the part to be tested is connected to the measurement circuit.

When this function is validated, the cycle starts automatically without pressing the **Start**  key when both following conditions are completed:

- The part is connected to the measurement circuit.
- The test pressure is between the minimum and the maximum levels (**Min PRESS** and **Max PRESS** parameters).

Procedure

Select the **AUTO MODE** function and the ready status becomes a waiting mode.



BUZZER

Use this function to manage the use of the buzzer of the instrument.

Select the **BUZZER** function.

Adjust the following parameters:


Parameter	Description
PASS	4 short beeps (at each good part - OK)
FAIL	1 long beep (at each fail parts)
ALA	1 long beep (when an alarm is triggered - ALARM)
EOC	4 short beeps (each time the instrument ends a cycle - END OF CYCLE)

CODE READER (Option)

This option enables you to use a barcode reader to select and to launch a test program.

Access: MAIN MENU < PARAMETERS < FUNCTIONS < CODE READER.

Adjust the following parameters:

Parameter	Description
NUM. BAR CODE	Contents the barcode read once it has been learned (see Learning of barcodes).
AUTO START	Yes: The program will start after the barcode is read. No: The program will not start after the barcode is read. Nevertheless, it is selected and you can start it by pressing Start  .

See Configuration of the barcode reader in Configuration of the Device > Automatism > Code Reader to select if RS232 or USB barcode reader and other configurations.



Barcode structure

The total length (number of characters) of the barcodes used for this function must be lower or equal to 40.

The "useful" portion of the barcode is defined by two parameters:

- the position of the first character to take into account: **First Char.**
- the character number or the "useful" portion of the barcode: **Char. Number**

i | The sum of both parameters (**First Char. + Char. Number**) must be lower or equal to 39.

Example:

- Barcode = " **1234567890123456789012** "
- **First Char.** = " **8** "
- **Char. Number** = " **5** "
- Useful portion of the barcode = " **89012** "

i | To use this function, we recommend you to use the following barcode reader: DATALOGIC USB Gryphon 4130 (1D) or USB Gryphon 4400 (2D).

To use this function, you need to carry out the following procedures:

- Initialization of the barcode reader (see Initialization of the barcode reader)
- Configuration of the barcode reader (see Configuration of the barcode reader)
- Learning of barcode (see Learning of barcodes)

i | For further information on the use of the barcode reader, see its Product Reference Guide.

Initialization of the barcode reader

You have to configure the USB Barcode reader interface in a virtual RS232 (usb-cdc) mode.

! | Your Barcode Reader must be connected to a device supporting the classical USB connection (like your PC) in order to execute this step. Connecting your Barcode Reader to your ATEQ device won't work if the interface is not configured in USB-CDC mode.

You have to configure the Barcode Reader suffix to the value 13 (0x0D in hexadecimal) corresponding to the "carriage return" character in the ASCII table.

Learning of barcodes

This function enables you to learn barcodes and to affect them to test programs.

Access: **MAIN MENU > SPE CYCLE > CODE READER > RUN PROG.**

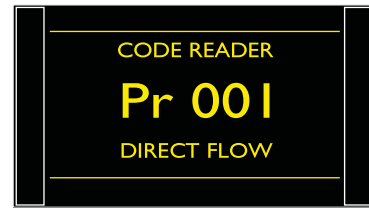
i | If the special cycle **CODE READER** is not available, you must first configure the barcode reader option (see: Configuration of the barcode reader).



1. Select the program number for which you will learn the bar code and press **OK**.

The cycle screen **CODE READER** is displayed.

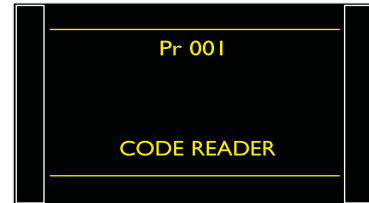
- i** The current program number is displayed too. Nevertheless, it can be different than the one that was selected for the barcode learning.



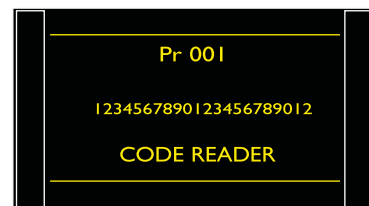
2. Press **Start**  to start the cycle.

The instrument is waiting for the barcode scanning.

3. Scan the barcode with the barcode reader.



4. The completed captured characters of the barcode are displayed a short time.



Check of the captured barcode

If you return to the code reader function (see Assignment of a barcode to a program), the **NUM. BAR CODE** parameter contents only the first 14 characters.


The complete barcode can be check after doing a complete test in the menu **RESULTS > LAST RESULTS**.

Selecting a program with a barcode reader

Use this function to initialize the barcode reader.

- i** Make sure that the barcode reader is connected to the RS232 (or USB) connector of your instrument.
- i** Make sure that the barcode to read is associated to the right program (see Learning of barcodes).
- i** Make sure that the **AUTO START** parameter is **No** (see Assignment of a barcode to a program).

1. Scan the barcode with the barcode reader.
The program is selected.

- i** To launch the program selected, press **Start** .

- i** If the barcode is unknown or too large, this message is displayed.





If the barcode is smaller than First character + character number, this message is displayed.



Starting a program with a barcode reader

Use this function to start a program with a barcode reader.

- i** Make sure that the barcode reader is connected to the RS232 (or USB) connector of your instrument.
- i** Make sure that the barcode to read is associated to the right program (see Learning of barcodes).
- i** Make sure that the **AUTO START** parameter is **Yes** (see Assignment of a barcode to a program).

1. Scan the barcode with the barcode reader.
The program is launched.

- i** If the barcode is unknown or too large, this message is displayed.



If the barcode is smaller than First character + character number, this message is displayed.



END OF CYCLE

Use this function to configure the end of cycle corresponding to the configuration of your instrument (connection to a PLC...).

Select the **END OF CYCLE** function.

Select the type of **END OF CYCLE**:

END OF CYCLE type	Description
No	When this function is not activated, the AUTO RESETEEND OF CYCLE is used (see below).
AUTO RESET	The AUTO RESETEEND OF CYCLE is used (see below).
DUMP + RESET	The DUMP + RESETEEND OF CYCLE is used (see below).
FILL TIME	The FILL TIMEEND OF CYCLE is used (see below).

- i** An **END OF CYCLE** can be carried out by any **Reset** action (**Reset** key, relay board, network command...).






Timing charts

The following timing charts give details on the sequencing of:

- commands entered on the front panel (**Start**  and **Reset** ) or through the J11 connector (**START, RESET**)
- pneumatic outputs from the automatic connectors (**AUTO CONNECT. A, AUTO CONNECT. B**)
- electrical outputs from relay board on the **J11** connector (**PASS, FAIL, END OF CYCLE**).

 The timing given on the following diagrams does not respect the true values (scale, time).

 There is a delay time of 50ms before the instrument accepts an input from the front panel or the relay board.

END OF CYCLE with AUTO RESET

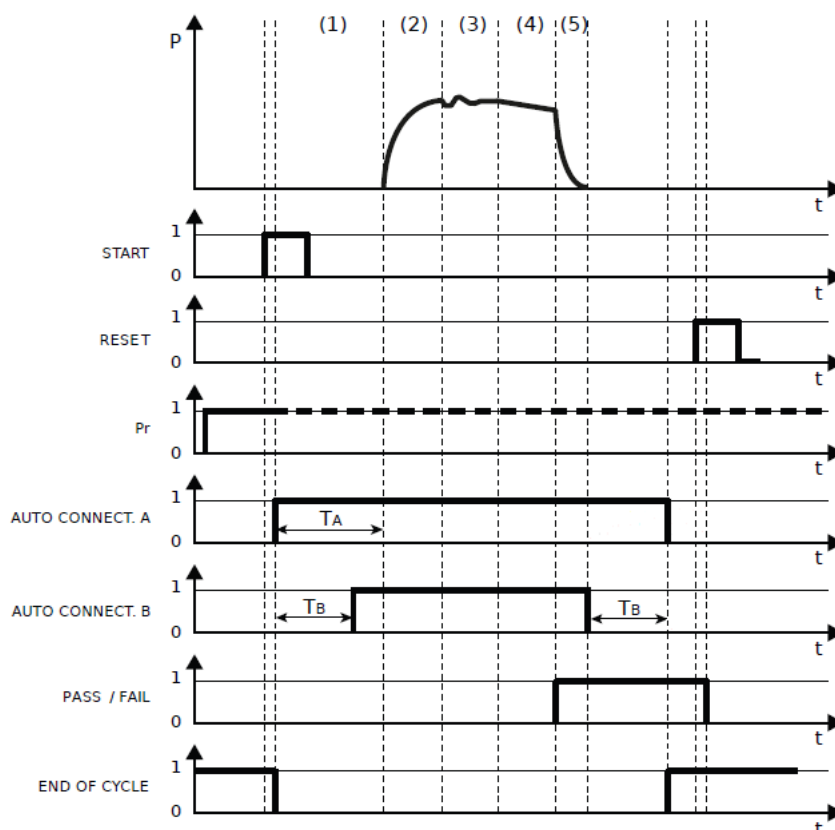
 This end of cycle is also used when the **END OF CYCLE** function is **No**.

At the end of the test phase (4), if the part is OK, the output **PASS** is activated until the start of the next cycle.

- After the dump phase (5) or (after the coupling time **T_B** if the **AUTO CONNECT** function is activated), the output **END OF CYCLE** is activated.

At the end of the test phase (4), if the part is fail, the output **FAIL** is activated.

- The output **END OF CYCLE** is activated.
- A new cycle can then be launched.

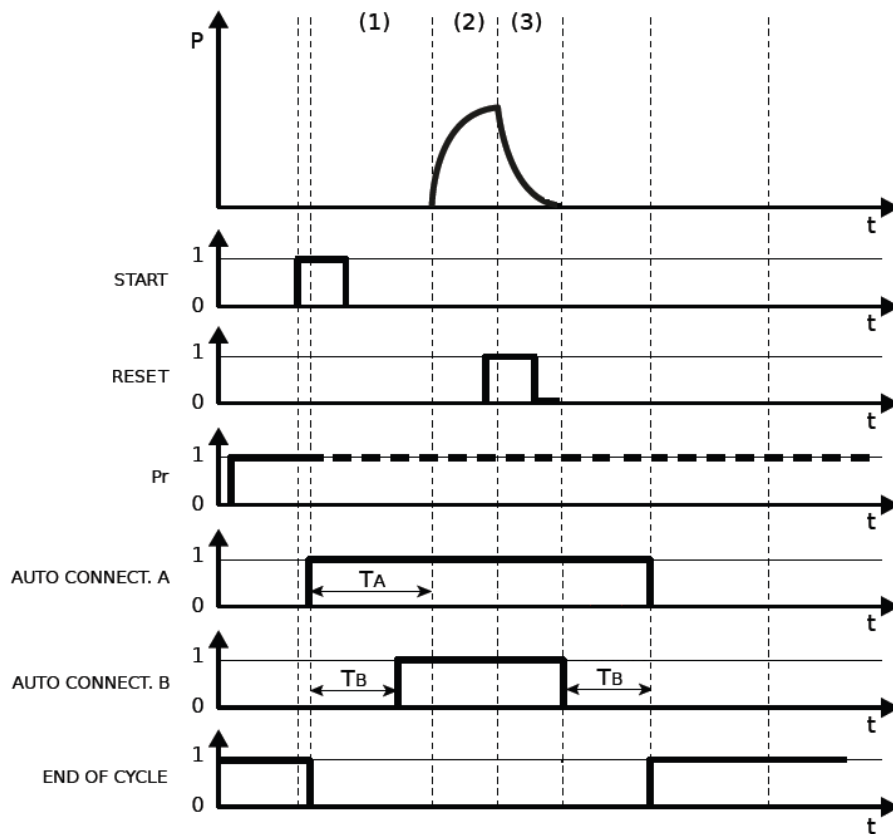




END OF CYCLE with RESET action

This function enables to stop the cycle being carried out with a **Reset** action.

- i** An **END OF CYCLE** can be carried out by any **Reset** action (**Reset** key, relay board, network command...).






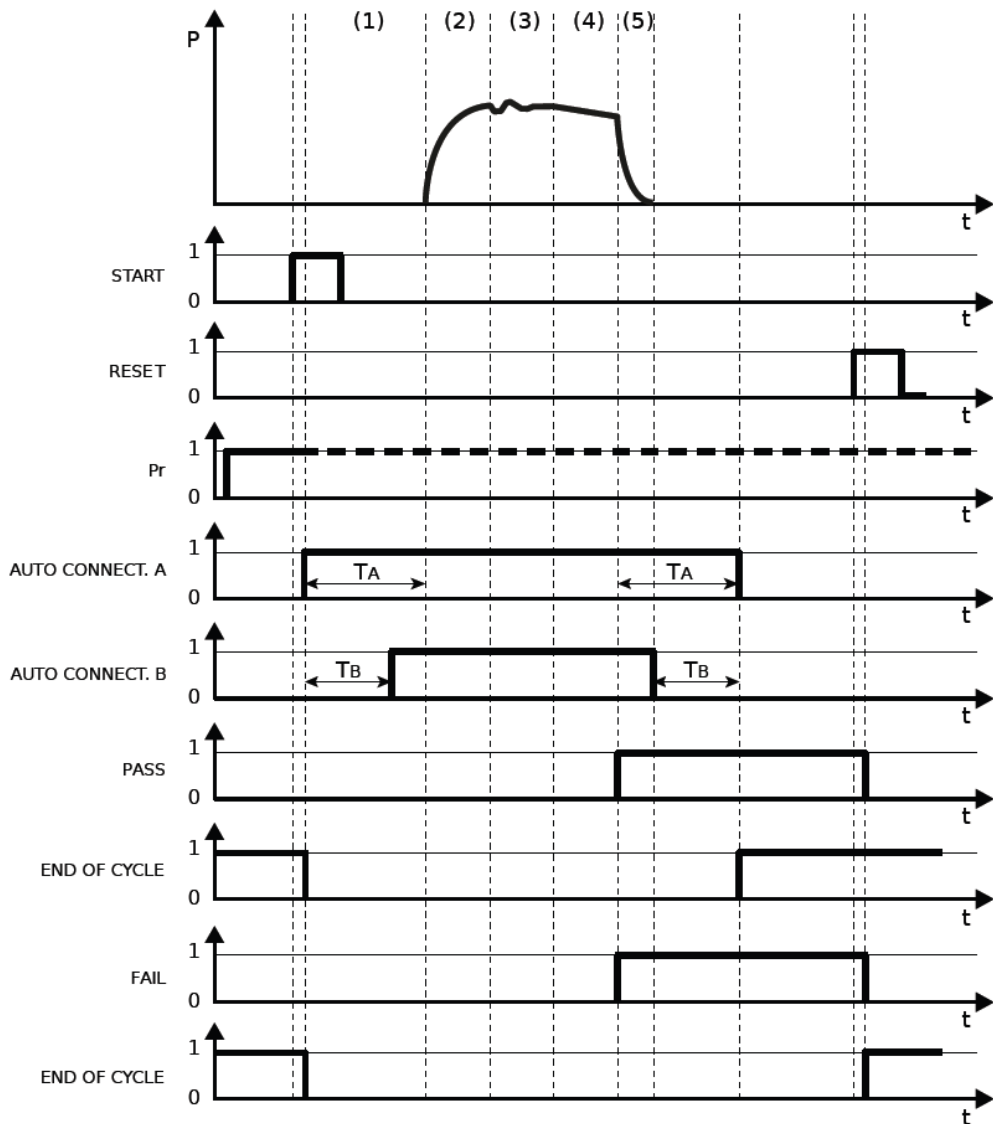
END OF CYCLE with DUMP + RESET

At the end of the test phase (4), if the part is OK, the output **PASS** is activated until the start of the next cycle.

- After the dump phase (5) or (after the coupling time **T_B** if the **AUTO CONNECT** function is activated), the output **END OF CYCLE** is activated.

At the end of the test phase (4), if the part is fail, the output **FAIL** is activated.

- The dump phase (5) is carried out.
- The output **END OF CYCLE** is only activated by pressing the **Reset**  key or by activating the **RESET** input.
- A new cycle can then be launched.





END OF CYCLE with FILL TIME


i This function is useful to look for the leaks (with soap or another way) on the test part.

At the end of the test phase (4), if the part is OK, the output **PASS** is activated until the start of the next cycle.

— After the dump phase (5) or (after the coupling time **TB** if the **AUTO CONNECT** function is activated), the output **END OF CYCLE** is activated.

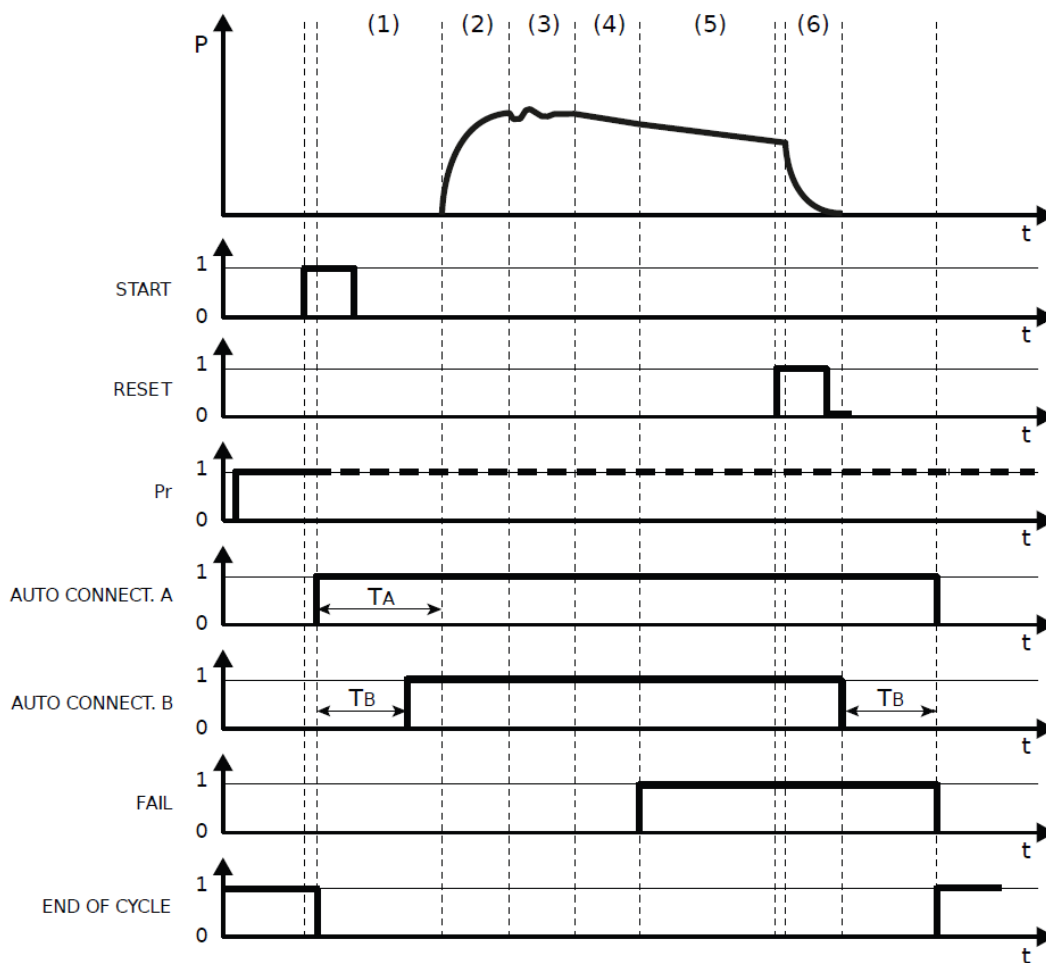
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At the end of the test phase (4), if the part is fail, the output **FAIL** is activated and the test part is kept with filling pressure.

— The dump phase (6) is only carried out by pressing on the **Reset**  key or by activating the **RESET** input.

— The output **END OF CYCLE** is then activated.

— A new cycle can then be launched.





STAMPING (option)

Use this function to activate a pneumatic output to mark the parts tested.

This function is available using one of the following outputs:

- an external electric output (see Valve code board connector (J9) (option))
- one of the pneumatic outputs on the automatic connectors (see Pneumatic outputs 0.6MPa (87 PSI) (option)).

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

i This function enables you to define the duration of the stamping and the condition which will trig the stamping.

Select the **STAMPING** function.

Set up the following parameters:

Parameter	Description
DURATION	Holding time
ALL RESULTS	Systematic stamping
PASS	Stamping on a pass part
MAX FLOW	Stamping on fail part if above maximum flow
MIN FLOW	Stamping on fail part if lower minimum flow
ALARM	Stamping if an alarm is triggered
PRESSURE OUT	Stamping if the pressure is out of the pressure limits

VALVE CODES (Option)

2 internal or 6 external 24V outputs are available to pilot electrovalves and can be used to select Test 1 or Test 2 output when T1+T2 option or another option. They will be automatically activated on all the test cycle. If there is a function name (dump, stamping...) instead of Ext. 1, it will not be available and reserved for that function.

The activation can work in several different ways: see the Configuration Menu / Automatism / Outputs Config.

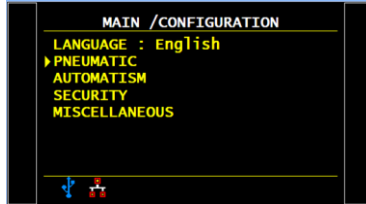
Use this procedure to activate the programmable outputs of the valve code board. Select the **VALVE CODES** function.

- Select the output to activate (**EXT 1** to **EXT 6** or **INT 1** to **INT 2**).
- Repeat this procedure for each output.





CONFIGURATION OF THE DEVICE

Use this menu to configure your ATEQ device.



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Label	Function	Description
LANGUAGE	Language	Selection of the language displayed on the screen.
PNEUMATIC	Pneumatics	Configuration of the pneumatics functions of the device.
> READY STATUS	-	Out of cycle electronic regulator instruction choice.
> Press. UNIT	-	Pressure unit by default for the new programs.
AUTOMATISM	Automatism	Configuration of the different communications between the device and its environment.
> RS232	-	Configuration of the communication type on the RS232 port.
> USB	-	Sending result frames to a PC.
> Date & Time	-	Setup of the built-in clock.
> SEQUENCE	-	If activated YES, the instrument will work in sequence mode (32 sequences with 16 programs possible by sequence) and the relay board inputs will select the sequences.
> OUTPUTS CONFIG.	-	Configuration of the programmable outputs.
> INPUTS CONFIG.	-	Configuration of the programmable inputs.
> CODE READER	-	Bar code reader configuration.
SECURITY	Security	Security functions.
> ACCESS	-	Parameters access mode (key or password).
> EXT. ACCESS	-	Activation or deactivation of the external access to the parameters by Fieldbus.
> START OFF	-	Deactivation of the Start  on the instrument front panel. Programs can only be started from the instrument relay board or by Fieldbus.
MISCELLANEOUS	Miscellaneous	
> SMART KEY	-	Configuration of the assigned function to the Smart key 
> BARGRAPH	-	Bargraph display configuration.



LANGUAGE

Use this function to select the language displayed by the instrument. Several languages are available.

Two languages can be stored in the instrument's internal memory:

- English : default language
- Another optional language

Access: **MAIN MENU > CONFIGURATION > LANGUAGE.**

Select one of the languages available.

PNEUMATIC

READY STATUS

Use this function to enable/disable the device blowing outside a test cycle (Electronic regulator end of cycle status).

Access: **MAIN MENU > CONFIGURATION > PNEUMATIC > READY STATUS > ELEC REG.**

Select one of the following parameters:

Parameter	Description
Instruc.	The device will keep blowing at the pressure instruction of the last test cycle (Instruc.) outside the test cycle
Zero	The device won't blow outside the test cycle.

Press. UNIT

Use this parameter to set the default pressure unit for the new programs and for the pneumatic configuration functions.

Access: **MAIN MENU > CONFIGURATION > PNEUMATIC > Press. UNIT.**

Select the pressure unit in the following list:

- **bar**
- **mbar**
- **PSI**
- **Pa**
- **kPa**
- **MPa**

AUTOMATISM



CODE READER

Configuration of the barcode reader

To use a barcode reader, you need to configure your instrument and select if RS232 or USB barcode reader and other configurations.

- i** If RS232 barcode reader, make sure that the RS232 port is configured with **Speed: 9600 Bds** and **1St/ 7 bits/ even** (see RS232 protocol configuration).
These parameters are default communication parameters of the ATEQ instruments.

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > CODE READER.**

Set up the following parameters:

Parameter	Description
PORT COM.	Selection of communication port: — RS232 — USB
PR. SELECT	Selection of the barcode format: — First Char.: position of the first character of the barcode to take into account. — Char. Number: length of the character chain to take into account in the barcode.
RESET EOC	Selection of the memorization of the scanning: — Yes: you will have to scan again a barcode before each start cycle. — No: the last barcode scanned is saved in memory for all the following tests, until a new barcode is read on the corresponding program.
KEYBOARD SUFFIX	Make sure that this parameter is equal to 13 or enter this value. This parameter corresponds to the "Carriage Return" in decimal. It is used to notify to the instrument that the frame sent by the barcode reader is ended.

Date & Time

Use this function to adjust the date and time of the instrument.

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > Date & Time.**

Set the following date and time parameters:

- **YEAR**
- **MONTH**
- **HOUR**
- **DAY**
- **MINUTE**
- **SECOND**





INPUTS CONFIG.

Configuration of the digital inputs (relay board)

Use this function to assign specific functions to inputs of relay board.

This function is available for the three last inputs of the relay board:

- Input 7 - connector J11 pin 9 (IN7)
- Input 8 - connector J10 pin 1 (IN8)
- Input 9 - connector J10 pin 2 (IN9)

i | See Relay board connector (**J10 – J11**) (option).

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > INPUTS CONFIG. > I/O.**

- Select the input to configure (**IN7 to IN9**)
- Select the function to assign to the input:
 - **PR. SELECT**: not available for the inputs of the valve code board
 - **Regulator adjust.**
 - **Infinite Fill**
 - **Piezo auto zero**
 - **PRINT RESULTS.**
 - **Custom Unit Learn**
 - **Custom Unit Check**
 - **ATR Learning Cycle**
- Repeat this procedure for each input

Configuration of the digital inputs (valve code board)

Use this function to assign specific functions to inputs of the valve code board. This function is available for all the digital input of the valve code board:

- Input 1 - connector J9 pin **9 (IN1)**
- Input 2 - connector J9 pin **10 (IN2)**
- Input 3 - connector J9 pin **11 (IN3)**
- Input 4 - connector J9 pin **12 (IN4)**
- Input 5 - connector J9 pin **13 (IN5)**
- Input 6 - connector J9 pin **15 (IN6)**

i | See Valve board connector (**J9**) (option)

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > INPUTS CONFIG. > VALVE C.**

- Select the input to configure (**IN1 to IN6**)
- Select the function to assign to the input:
 - **Regulator adjust.**
 - **Infinite Fill**
 - **Piezo auto zero**
 - **PRINT RESULTS.**
 - **Custom Unit Learn**
 - **Custom Unit Check**
 - **ATR Learning Cycle**
- Repeat this procedure for each input



OUTPUTS CONFIG.

Programmable digital outputs

The instrument is provided with programmable outputs to enable automation functions.

- On the relay board (see: Relay board connector (**J11**) (option)):
 - 4 internal digital outputs programmable (**AUX 1** to **AUX 4** in the 24V OUTPUTS function).
- On the valve code board (see: Valve code board connector (**J9**) (option)):
 - 6 external programmable digital outputs (**EXT 1** to **EXT 6**) available on the **J9** connector in the **VALVE CODE** function.
 - 2 internal programmable digital outputs (**INT 1** to **INT 2**) only available for factory configuration.

- i** | According to the configuration of the instrument, they can be assigned to predefined function or available for factory configuration.
- i** | The internal digital outputs can only be configured at the factory.
- i** | To be used, the digital outputs must first be activated, then configured.

Digital outputs configuration (relay board)

Use this procedure to configure the auxiliary programmable outputs of the relay board.

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > OUTPUTS CONFIG. > I/O**

- Select the output to configure (**AUX 1** to **AUX 4**)
- Select the operating mode:

Operating mode	Description
CYCLING	The output is activated during the test cycle
CONTINUOUS	The output is continuously activated
PROGRAMMED	The output is activated during a programmed time: DELAY AUX1 : delay before the output activation after the start of the test cycle TIME AUX1 : activation time of the output

- Repeat this procedure for each output (**AUX 1** to **AUX 4**)

Digital outputs configuration (valve code board)

Use this procedure to configure the programmable outputs of the valve code board.

Access: **MAIN MENU>CONFIGURATION>AUTOMATISM>OUTPUTS CONFIG.>VALVE CODES**

- Select the output to configure (**EXT 1** to **EXT 6** or **INT 1** to **INT 2**)
- Select the operatingmode:

Operating mode	Description
CYCLING	The output is activated during the test cycle.
CONTINUOUS	The output is continuously activated.
PROGRAMMED	The output is activated during a programmed time: DELAY EXT1 : delay before the output activation after the start of the test cycle. TIME EXT1 : activation time of the output.

- Repeat this procedure for each output.





SEQUENCE

If activated by **YES**, the instrument will work in sequence mode (32 sequences with 16 programs steps possible by sequence with data base of the 128 programs) and the relay board inputs will select the sequences.

RS232

Use this menu to select the operating mode of the RS232 port.

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > RS232.**

Select the operating modes of the RS232 port:

Mode	Description
SUPERVISION	In this mode, when you connect to the RS232 port a PC running a program control such as Winateq software, the device switches automatically in supervision mode.
PRINTER	This mode enables you to use configure the RS232 protocol to send the program parameters and the test results to a printer or any another device (see RS232 protocol configuration). When this option is activated, the RS232 port broadcast the test results after each cycle.
MODBUS	This mode is only available for the RS232 port. It enables you to use configure the RS232 protocol for the MODBUS option (see Modbus protocol configuration).
CODE READER	Configures the barcode reader link (see Configuration of the barcode reader).
AUTO	Switches automatically from PRINTER to SUPERVISION when requested by Winateq software.
NONE	No RS232 link.

i | If one USB or RS232 port is configured in AUTO mode, the other port will be automatically configured in NONE mode to avoid conflicts with the connected device (PC for example).

RS232 protocol configuration

Use this menu to configure the RS232 protocol.

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > RS232 > PRINTER > RS Parameter.**

Adjust the transmission parameters:

Parameter	Available values
Speed (in Bds)	— 4800 — 9600 — 19200 — 28800 — 38400 — 57600
Stop bit, number of bits and parity parameters	— 1St/ 7 bits/ 0 — 1St/ 7 bits/ 1 — 1St/ 7 bits/ even — 1St/ 7 bits/ odd — 1St/ 7 bits/ none — 1St/ 8 bits/ 0 — 1St/ 8 bits/ 1 — 1St/ 8 bits/ even — 1St/ 8 bits/ odd

i | These parameters must be the same as the receiver device.



Modbus protocol configuration

Use this menu to configure the Modbus option.

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > RS232 > MODBUS > RS Parameter.**

Adjust the transmission parameters to configure the link between the ATEQ device (slave) and a PC or a PLC (master):

Parameter	Available values
ADDRESS	Address of the ATEQ in the network (0 to 255). If several devices are installed in the network, they must have different addresses. An external rs232 to rs485 converter can be used to do a network.
Speed(in Bds)	— 4800 — 9600 — 19200 — 28800 — 38400 — 57600
Stop bit, number of bits and parity parameters	— 1St/ 7 bits/ 0 — 1St/ 7 bits/ 1 — 1St/ 7 bits/ even — 1St/ 7 bits/ odd — 1St/ 7 bits/ none — 1St/ 8 bits/ 0 — 1St/ 8 bits/ 1 — 1St/ 8 bits/ even — 1St/ 8 bits/ odd

i | These parameters must be the same as the receiver device.

Printer mode

Use this function to configure the data sent from the RS232 port.

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > RS232 > PRINTER > Print Frame.**

Set the result printout parameters:

Parameter	Description
Print Frame	This function enables you to configure the result printout. You may set the following parameters: — Pressure: Display testpressure — Prog. Name: Display program name (when set) — Date & Time: Printing date and time — Lines Before: Number of lines before result — Lines After: Number of lines after result — Inter Line: Space between each line — Form feed: Newpage
Sending Cond.	This function enables you to choose which data are to be printed on the results sheet: — ALL RESULTS: All test results — PASS: Number of pass parts — MAX FLOW: Fail maximum flow parts — MIN FLOW: Fail minimum flow parts — ALARM: Alarm triggered — PRESSURE OUT: Pressure error — REWORKABLE: Recoverable parts





Parameter	Description
Export	This function enables you to export results to a PC with a software like Microsoft Excel. The frames sent are made of ASCII codes.
Frame type	Select D5 or D6 frames. If D5, the frames will be like D5 instruments and use the function DISPLAY MODE to set the same digits as D5.
Print parameters	This function enables you to send immediately to the printer or the PC the parameters of the test programs of your device.

Example of export mode outputs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	NAME	PR.	Result	Flow=	Flow Unit	Press=	Press Unit	ALARM	NUM. BAR CODE	DATE	HOUR	Temp.	Temp. Unit	P atm	Patm Unit
(1)	ABCDEFGHIJKL	02	(OK)	166.5	l/h	0.400	bar			11/07/2019	16:59:46	24.9	C	998.8	hPa
(2)	ABCDEFGHIJKL	02	(F+)	171.4	l/h	0.400	bar			12/07/2019	08:21:15	24.5	C	1001	hPa
(3)	ABCDEFGHIJKL	02	(F-)	170.6	l/h	0.401	bar			12/07/2019	08:32:15	24.7	C	1001	hPa
(4)	ABCDEFGHIJKL	02	(AL)			0.400	bar	PRESSURE LOW		12/07/2019	08:47:21	24.9	C	1001	hPa
(5)	ABCDEFGHIJKL	02	(AL)			0.389	bar	PRESSURE HIGH		12/07/2019	08:56:07	24.9	C	1001	hPa
(6)	ABCDEFGHIJKL	02	(AL)			0.377	bar	FLOW OVER FS		12/07/2019	09:46:08	25.7	C	1001	hPa
(7)	ABCDEFGHIJKL	02	(AL)			0.500	bar	FLOW UNDER FS		12/07/2019	09:54:38	25.7	C	1002	hPa
REWORK															
(8)	ABCDEFGHIJKL	01	(R+)	174.1	l/h	401.1	mbar			02/08/2019	08:11:57	24.1	C	1004	hPa
(9)	ABCDEFGHIJKL	01	(R-)	174.0	l/h	401.0	mbar			02/08/2019	08:14:46	24.1	C	1003	hPa

- (1) (OK) : PASS PART
- (2) (F+): Flow over the maximum flow level
- (3) (F-): Flow under the minimum flow level
- (4) (AL) PRESSURE LOW: pressure under the minimum pressure level
- (5) (AL) PRESSURE HIGH: pressure over the maximum pressure level
- (6) (AL) FLOW OVER FS: flow over the instrument full scale
- (7) (AL) FLOW UNDER FS: Flow sensor points under internal alarm system level
- (8) (R+): Flow is between the Max. flow and Max Reworkable
- (9) (R-): Flow is between the Min. flow and Min Reworkable

Examples of frames outputs

Test Operator:

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	3	>	:																																					
<	0	3	>	:	2	2	/	0	7	/	2	0	1	9	1	5	:	5	6	:	3	6																			
<	0	3	>	:	(O	K)																																	
<	0	3	>	:																																					
<	0	3	>	:	2	2	/	0	7	/	2	0	1	9	1	5	:	5	6	:	5	6																			
<	0	3	>	:	(F	+)																																	

- (1) (OK): TEST = PASS
- (2) (F+): TEST = FAIL





Direct – indirect flow – Quick test:

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 2 > : A B C D E F G H I J K L																																							
< 0 2 > : 1 1 / 0 7 / 2 0 1 9 1 7 : 0 0 : 3 7																																							
< 0 2 > : 0 . 4 0 0 b a r : (O K) : 1 6 6 . 5 l / h																																							
< 0 2 > : A B C D E F G H I J K L																																							
< 0 2 > : 1 2 / 0 7 / 2 0 1 9 0 8 : 1 7 : 5 8																																							
< 0 2 > : 0 . 4 0 0 b a r : (F +) : 1 6 9 . 3 l / h																																							
< 0 2 > : A B C D E F G H I J K L																																							
< 0 2 > : 1 2 / 0 7 / 2 0 1 9 0 8 : 2 9 : 0 8																																							
< 0 2 > : 0 . 4 0 1 b a r : (F -) : 1 7 0 . 6 l / h																																							
< 0 2 > : A B C D E F G H I J K L																																							
< 0 2 > : 1 2 / 0 7 / 2 0 1 9 0 8 : 4 4 : 1 3																																							
< 0 2 > : 0 . 4 0 0 b a r : (A L) : P R E S S U R E L O W																																							
< 0 2 > : A B C D E F G H I J K L																																							
< 0 2 > : 1 2 / 0 7 / 2 0 1 9 0 8 : 5 3 : 0 9																																							
< 0 2 > : 0 . 3 7 7 b a r : (A L) : P R E S S U R E H I G H																																							
< 0 2 > : A B C D E F G H I J K L																																							
< 0 2 > : 1 2 / 0 7 / 2 0 1 9 0 9 : 4 6 : 2 0																																							
< 0 2 > : 0 . 3 7 7 b a r : (A L) : F L O W O V E R F S																																							
< 0 2 > : A B C D E F G H I J K L																																							
< 0 2 > : 1 2 / 0 7 / 2 0 1 9 0 9 : 5 2 : 0 2																																							
< 0 2 > : 0 . 5 0 0 b a r : (A L) : F L O W U N D E R F S																																							
< 0 1 > : A B C D E F G H I J K L																																							
< 0 1 > : 0 2 / 0 8 / 2 0 1 9 0 8 : 0 4 : 5 5																																							
< 0 1 > : 4 0 1 . 5 m b a r : (R +) : 1 7 1 . 3 l / h																																							
< 0 1 > : A B C D E F G H I J K L																																							
< 0 1 > : 0 2 / 0 8 / 2 0 1 9 0 8 : 1 5 : 4 7																																							
< 0 1 > : 4 0 1 . 2 m b a r : (R -) : 1 7 2 . 6 l / h																																							





- (1) (OK) : PASS PART
- (2) (F+): Flow over the maximum flow level
- (3) (F-): Flow under the minimum flow level
- (4) (AL) PRESSURE LOW: pressure under the minimum pressure level
- (5) (AL) PRESSURE HIGH: pressure over the maximum pressure level
- (6) (AL) FLOW OVER FS: flow over the instrument full scale
- (7) (AL) FLOW UNDER FS: Flow sensor points under internal alarm system level
- (8) (R+): Flow is between the Max. flow and Max Reworkable
- (9) (R-): Flow is between the Min. flow and Min Reworkable

Example of sequence mode frames:

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	4	>	:	S	e	q	0	2																																
<	0	4	>	:	0	7	/	0	2	/	2	0	2	0	0	9	:	1	3	:	1	2																			
<	0	4	>	:	0	.	2	0	9		b	a	r	:	(O	K)	:	0	.	7		l	/	h															
<	0	4	>	:	A	0	1	B	0	2	C	0	3	D	0	4	E	0	5	F	0	6	G	0	7	H	0	8	I	0	9	J	1	0	K	1	1	L	1		
<	0	2	>	:	S	e	q	0	1																																
<	0	2	>	:	0	7	/	0	2	/	2	0	2	0	0	9	:	1	6	:	3	0																			
<	0	2	>	:	0	.	2	0	9		b	a	r	:	(O	K)	:	4	.	3		l	/	h															
<	0	2	>	:	A	1	B	2	C	3	D	4	E	5	F	6	G	7	H	8	I	9	J	1	K	2	L	3	M	4	N	5	O	6	P	7	Q	8	R		

Example of sequence export with Barcode reader:

AA	02	(OK)	2.5	l/h	0.202	bar		A1B2C3D4E5F6G7H8I9J1K2L3M4N5O6P7Q8R9S1T2	07/02/2020	09:37:59	18.9	C	1007	hPa	S1
BB	03	(OK)	0.5	l/h	0.212	bar		A1B2C3D4E5F6G7H8I9J1K2L3M4N5O6P7Q8R9S1T2	07/02/2020	09:38:14	18.9	C	1008	hPa	S1
CC	04	(OK)	0.0	l/h	0.212	bar		A1B2C3D4E5F6G7H8I9J1K2L3M4N5O6P7Q8R9S1T2	07/02/2020	09:38:24	18.9	C	1008	hPa	S1
CC	04	(OK)	3.6	l/h	0.201	bar		A01B02C03D04E05F06G07H08I09J10K11L12M13N	07/02/2020	09:39:24	18.9	C	1008	hPa	S2
BB	03	(OK)	1.0	l/h	0.209	bar		A01B02C03D04E05F06G07H08I09J10K11L12M13N	07/02/2020	09:39:43	19.0	C	1008	hPa	S2
AA	02	(OK)	0.7	l/h	0.209	bar		A01B02C03D04E05F06G07H08I09J10K11L12M13N	07/02/2020	09:39:55	19.0	C	1007	hPa	S2

Example of print parameters on RS232 or USB ports

```

Version1.025
22/06/2020 15:00:57
Version1.025
22/06/2020 15:01:12

Pr 01 ABCD
TYPE : DIRECT FLOW
COUPL. A : 0.60 s
FILL TIME : 2.00 s
STAB TIME : 2.00 s
TEST TIME : 2.00 s
Diff A-Z : 0.80 s
Press. UNIT : bar
Max PRESS : 0.460
Min PRESS : 0.100
INSTRUCT. : 0.200
FLOW UNIT : l/h
Max Flow : 549
Min Flow : 186
Max Rework : 300
Min Rework : 186

Pr 02
TYPE : OPERATOR
COUPL. A : 1.2 s
TEST TIME : 4.0 s

Pr 03
TYPE : QUICK TEST
COUPL. A : 0.3 s
TEST TIME : 3.0 s
Press. UNIT : bar
Max PRESS : 0.155
Min PRESS : 0.075
INSTRUCT. : 0.100
FLOW UNIT : l/h
Max Flow : 791
Min Flow : 150
  
```





USB

Use this menu to configure the USB port.

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > USB >**

Mode	Available values
SUPERVISION	In this mode, when you connect on the USB port a PC running a program control such as Winateq software, the device switches automatically in supervision mode.
PRINTER	This mode enables you to use configure the USB protocol to send the program parameters as well as test results to a printer or any another device (see Configuration of the USB port). When this option is activated, the USB port broadcast the test results after each cycle.
CODEREADER	The USB port has been selected in the barcode reader configuration, so the other choices are not available anymore.
AUTO	Switches automatically from PRINTER to SUPERVISION when requested by Winateq software.
NONE	No USB link.

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Printer mode

Use this function to configure the data sent from the USB port.

Access: **MAIN MENU > CONFIGURATION > AUTOMATISM > USB > PRINTER > Print Frame.**

Set the result printout parameters:

Parameter	Description
Print Frame	This function enables you to configure the result printout. You may set the following parameters: <ul style="list-style-type: none">– Pressure: Display testpressure– Prog. Name: Display program name (when set)– Date & Time: Printing date and time– Lines Before: Number of lines before result– Lines After: Number of lines after result– Inter Line: Space between each line– Form feed: Newpage
Sending Cond.	This function enables you to choose which data are to be printed on the results sheet: <ul style="list-style-type: none">– ALL RESULTS: All test results– PASS: Number of pass parts– MAX FLOW: Fail maximum flow parts– MIN FLOW: Fail minimum flow parts– ALARM: Alarm triggered– PRESSURE OUT: Pressure error– REWORKABLE: Recoverable parts
Export	This function enables you to export results to a PC with a software like Microsoft Excel. The frames sent are made of ASCII codes.
Frame type	Select D5 or D6 frames. If D5, the frames will be like D5 instruments and use the function DISPLAY MODE to set the same digits as D5.
Print parameters	This function enables you to send immediately to the printer or the PC the parameters of the test programs of your device.

Example of frame and export mode outputs: see examples at RS232 chapter.



SECURITY

ACCESS

Use this function to lock/unlock the modification of the instrument parameters.

Access: **MAIN MENU > CONFIGURATION > SECURITY > ACCESS.**

Validate your choice between the following options:

Parameter	Description
NONE	The program parameters can be modified.
USB	You will have to insert an USB stick with the rights to modify the program parameters.
PASSWORD	You will have to enter a password to modify the program parameters or to insert an USB stick.

Lock/unlock of the program parameters with a USB stick

A key.bin file available on the CDROM must place on the USB stick > ATEQ > UNLOCK > key.bin.

When the USB stick is connected to the instrument, it makes turn off the icon key on the display and the parameters can be modified.

Lock/unlock of the program parameters with a password

Use this function to lock/unlock the modification of the instrument parameters with a password or to change the password.

Access: **MAIN MENU > CONFIGURATION > SECURITY > ACCESS > PASSWORD.**

Validate your choice between the following options:


Parameter	Description
UNLOCK	Enter the password to unlock the modification of the parameters.
LOCK	Lock the modification of the parameters.
ERASE	Erase the current password to set a new password.

i | The default ATEQ password is **2837**.

START OFF



Use this function to activate/deactivate the **Start**  key and to lock/unlock the modification of the instrument parameters.

Activation/deactivation of the **Start**  key.

Use this function to activate/deactivate the **Start**  key.

Access: **MAIN MENU > CONFIGURATION > SECURITY > START OFF.**

Validate your choice between both options:

Parameter	Description
No	The Start  is activated. It operates normally.
Yes	The Start  key is deactivated. Programs can then only be started from the instrument relay board (see: Digital inputs/outputs) or from the fieldbus.



EXT. ACCESS

Use this function to lock/unlock the modification of the instrument parameters from an external device.

Select one choice:

- NO ACCESS
- READ ONLY
- READ/WRITE

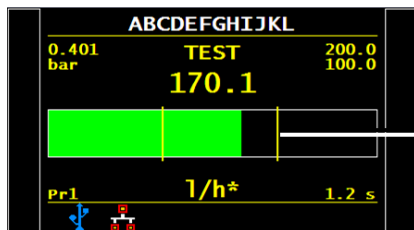
MISCELLANEOUS

BARGRAPH

Use this function to display a flow bargraph.

Access: **MAIN MENU > CONFIGURATION > MISCELLANEOUS > BARGRAPH.**

The max flow reject level can be displayed at 30, 50 or 70 % on the bargraph. Select your preference.



Here, Max flow is at 70% on the bargraph

SMART KEY

Use this function to configure the **Smart key** 

Access: **MAIN MENU > CONFIGURATION > MISCELLANEOUS > SMART KEY.**

Select the function to assign to the **Smart key**:

Parameter	Description
SPECIAL CYCLE MENU	Access to the SPE CYCLE menu.
SPE CYCLE	Run a specific special cycle.
PARAMETERS	Access to the PARAMETERS menu.
PROG. DEFINED	Access to the parameters of a specific program.
RUN PROG.	Run a specific program.
LAST RESULTS	Access to the RESULTS menu.
PASSWORD	Access to the PASSWORD login.





Use of your device

STARTING UP

Power up

1. Make sure that all the necessary connections are in place.

Electrical: such as power supply, inputs/outputs Pneumatic: including line pressure supply.

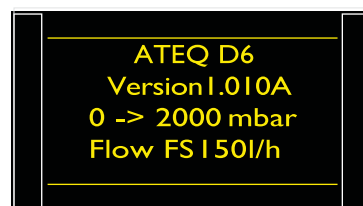
2. Power up your device.

During the initializing of your device, information is displayed: **Updating in progress**.

When the initialization is finished, information about your device is displayed:

- Instrument type
- Software version
- Pressure full scale
- Flow rate full scale

Then the **Program** screen is displayed with last program used on screen.



Selecting a program

If necessary, you can select another program.

1. Press up/down  .





Starting and stopping current cycle

Use the front panel keys to start/stop a measurement cycle.

Adjustment of test pressure

When the instrument is fitted with a mechanic regulator, adjust the test pressure by running the special cycle **REGULATOR ADJUST** (see: **SPE CYCLE** menu).

When instrument is fitted with an electronic regulator, the test pressure value is fill target configured in the program. No special cycle is required.



The regulator input pressure depends on the pneumatic air supply range (see: Characteristics).

With the desired program displayed on the **Program** screen:

STARTING A MEASUREMENT CYCLE

1. Press **Start**

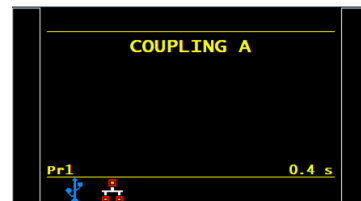


During the measurement cycle, you may press **OK** to access the **MAIN MENU** screen and set parameters for a next measurement cycle.

The cycle phases of the program are successively displayed:

Cycle phases:

1. Coupling A time.



2. Pressure sensor auto zero (if before test function) standard time = 0.5.



3. Fill time.



4. Flow differential sensor auto zero, standard time = 0.8s.

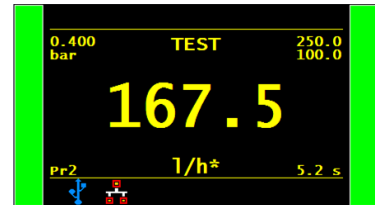




5. Stabilization time.



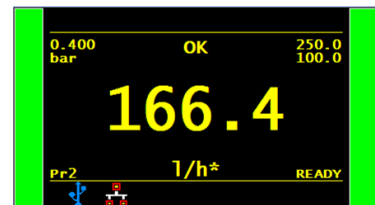
6. Test time.




7. Dump time (option).




8. Ready status with test results.




STOPPING A CYCLE

2. Press **Reset**  to immediately stop the current measurement cycle and return to the **Program** screen.

Use of Smart key

Use the **Smart key**  when you have to repeat the same task frequently (running a specific program, a specific special cycle...).

 | To set up the **Smart key**, see: Configuration of the Smart key.



DISPLAY AT THE END OF CYCLE

At the end of a cycle, the results of the test are displayed with status indication (part pass, fail, reworkable...).

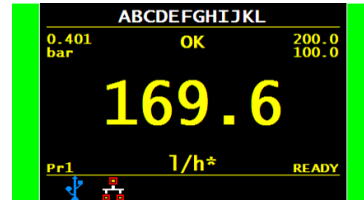
PASS part

Display:

- Green light
- **OK**

Flow between the thresholds.

The part under test is good.



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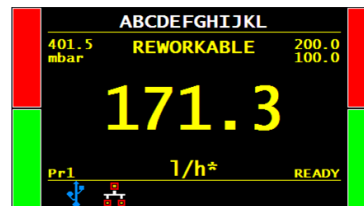
MAXIMUM REWORKABLE part

Display:

- Green and red lights
- **REWORKABLE**

Flow between the maximum flow thresholds and the maximum reworkable thresholds (see: **REWORK LIMIT**).

The part under test is not good but it can be reworked so that it could become good.



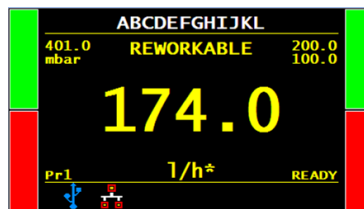
MINIMUM REWORKABLE part

Display:

- Green and red lights
- **REWORKABLE**

Flow between the minimum flow thresholds and the minimum reworkable thresholds (see: **REWORK LIMIT**).

The part under test is not good but it can be reworked so that it could become good.



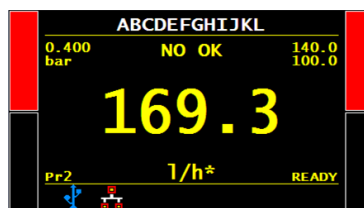
FAIL part

Display:

- Red light upper side
- **NO OK**

Flow over the maximum thresholds.

The part under test is bad. It cannot be reworked.



FAIL part

Display:

- Red light lower side
- **NO OK**

Flow below minimum thresholds.

The part under test is bad. It cannot be reworked.





ALARM

Display:

- Red flashing light
- Alarm message (pressure, learning function, ...)

An alarm has occurred. See: Error messages.

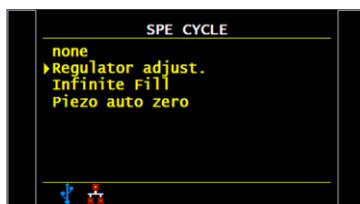
The instrument has detected not good test conditions to proceed.



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SPECIAL CYCLES

Use this menu to carry out specific procedures necessary to ensure the proper operation of specific measurement cycles (for example, adjustment of pressure regulator).





Label	Special cycle	Description of the cycle
none	None	No special cycle selected.
Regulator adjust.	Regulator adjustment	Adjustment of regulator in front panel (see Regulator adjust.).
Inf Fill	Infinite fill	Pressurize the part with an infinite fill time.
Piezo auto zero	Piezo auto zero	Auto zero cycle on the piezo sensor.

i | Some parameters are displayed when specific functions are activated.

Some cycles are available when specific functions are used:

- **ATM PRESSURE CHECK**: see Service special cycles.
- **ATR Learning Cycle**: see ATR learning cycle.
- **CAPIL. TEMP. CHECK**: see Service special cycles.
- **CODE READER**: see Learning of barcodes.
- **Custom Unit Check**: see Customized unit check.
- **Custom Unit Learn**: see Customized unit learn.
- **FLOW CHECK**: see Service special cycles.

TO START SPECIAL CYCLES...

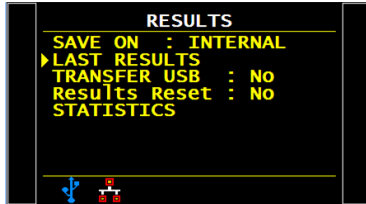
1. On the **SPECIAL CYCLE MENU** screen, select a cycle, and press **OK** to validate.
2. Press **Start**  to start the cycle.
3. To stop the current cycle press **Reset** .



RESULTS MENU

RESULTS menu

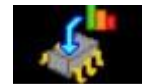
In this section, manage measurements results.



Label	Function	Description
SAVE ON	-	Define memory location (internal or external USB stick).
LAST RESULTS	Results display	Last 1500 results carried out by the device.
TRANSFER USB	Results transfer	Transfer all results to USB stick on CSV file.
Results Reset	Results erasing	The results are lost after the reset!
STATISTICS	Results statistics	Statistics for each program.

SAVE ON (None, Internal or USB)

- None: test results are not saved.
- Internal: The results will be saved on an internal memory with about 1500 results and variable number in regard of the frame content. Only the last results on that memory can be displayed.
An extended memory option is available this memory allows to record up to 400 000 of standard results frames. When this memory is installed, this icon appears on the screen. The two memories record the same data simultaneously. The results of that memory option can only be transferred to a memory stick and not read on the display.
When the memories are full, the older result is deleted and replaced by the last result (FIFO).
- USB: the results will be saved at the same time on the internal memory and on the USB stick (format Fat32) > ATEQ > RESULTS > Serial Number > csv file by date (YYYYMMDD.csv).



Last results

Use this function to display the last results of all programs.

Last results display

Access: **MAIN MENU > RESULTS > LAST RESULTS.**

All the last results are displayed. For each result, the following information is displayed:

- The result number
- The result status: for example **(OK)**
- The result value with the measurement unit or the alarm message



Detailed results display

Select a result and press **OK** to display detailed information:

- Program number and name
- Result status and value
- Test pressure
- Alarm message (if any) with 2 lines
- Bar code number (if any) with 2 lines
- Date and hour
- Capillary temperature
- Atmospheric pressure

Transfer USB

Select and press **OK** to transfer the results to a USB stick (Fat 32) > **ATEQ > TRANSFER > Serial Number > csv file by date** (YYYYMMDD.csv).

- i** | Make sure that the USB stick memory is installed on the instrument.

Results reset

Select and press **OK** and the internal memories will be deleted immediately.

Statistics

Statistics display of the selected program

Access: **MAIN MENU > RESULTS > STATISTICS**.

Statistics of the selected program are displayed:

- **PROG.:** Program number
- **TOTAL:** Number of test
- **PASS:** percentage of pass parts
- **MAX FLOW:** percentage of fail parts (above high threshold)
- **MIN FLOW:** percentage of fail parts (below low threshold)
- **REWORK:** percentage of reworkable parts
- **ALARM:** percentage of alarms triggered.
- **PRINT ALL STATS:** output all statistics on the RS232 port only
- **RESET ALL STATS:** reset all statistics

Statistics print

Access: **MAIN MENU > RESULTS > STATISTICS > PRINT ALL STATS**.

The statistics of all the programs are sent under a frame format on the communication port.

- i** | This function is available if the print conditions are activated. See Configuration of the RS232 port.

Statistics reset

Access: **MAIN MENU > RESULTS > STATISTICS > RESET ALL STATS**.

The statistics of all the programs are deleted.



USB SAVE RESTORE PARAMETERS

USB menu

This section describes save and restore parameters on an external USB device.

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Label	Description
Save parameters	Save parameters on an external USB memory device for restoring later
Restore parameters	Restore parameters from an external USB memory device

USB save and restore

Use this function to save or restore data of the device using an USB memory stick.

This function enables you to make security saves and to clone the data to another device. The data are saved in two files (**PARA.BIN** and **PARA.TXT**) which are located in the memory stick in the folder **ATEQ\DATASAVE**.

- ⚠ | Do not connect two USB devices at the same time.
- ⚠ | Only one device can be saved on an USB stick. The previous files are deleted at each save.
- ⚠ | Before doing this task, make sure you have plugged a suitable USB stick memory to the device
- ℹ | The USB stick memory plugged to the device must have the following characteristics:
 - Formatted in FAT32
 - Almost empty before use (only few others files)
 - Speed connection: USB2 only

USB restore

- ⚠ | The previous parameters of the device will be deleted.

Access: **MAIN MENU > USB > Restore parameters.**

The device confirms the restore of the parameters. It can take several seconds.

USB save

- ⚠ | The previous parameters of the device saved on the key will be deleted.

Access: **MAIN MENU > USB > Save parameters.**

The device confirms the saving. It can take several seconds.



Example of saved parameters:

SN : 388-0116
Pr 01 ABCD
TYPE : DIRECT FLOW
COUPL. A : 0.60 s
FILL TIME : 2.00 s
STAB TIME : 2.00 s
TEST TIME : 2.00 s
INTER-CYCLE: 0.00 s
Press. UNIT : bar
Max PRESS : 0.460
Min PRESS : 0.100
INSTRUCT. : 0.200
FLOW UNIT : l/h
Max Flow : 549
Min Flow : 186
Max Rework : 300
Min Rework : 186
NAME: ABCD
PR:SEQUENCE : Yes
NEXT PROG. : 02+
INTER-CYCLE: 0.00 s
ALL RESULTS : No
PASS : Yes
MAX FLOW : No
MIN FLOW : No
ALARM : No
PRESSURE OUT : No
REWORKABLE : No
AUTO MODE : No
UNITS : SI
FLOW UNIT : l/h
FILTER : Yes
FLOW : 1.50 s
PRESSURE : 0.10 s
STD CONDITIONS: Yes
ATM PRESS.: 1013 hPa
TEMP. : 20.0 C
PRESS. CORR. : Yes
INSTRUCT. : 0.240
TYPE : TURBULENT
PRESS. AZ : Yes
PRESS. AZ : Before
AZ PIEZO : 0.50 s
OFFSET : Yes
OFFSET : 2
ATR1 : Yes
Start : 0
Transient : 0
% Drift : 20 %
DRIFT : 00 %
ATR2 : No
REG. MODE : P(Auto)
START INST: 40.0 %
CONTINUOUS : No
INSTRUCT. : 0.200
GAIN : 100
OVERSHOOT : No
24V OUTPUTS : Yes
AUX 1 : Yes
AUX 2 : No
AUX 3 : No
AUX 4 : No
END OF CYCLE : Yes
AUTO RESET : Yes
DUMP + RESET : No
FILL TIME : No
MINI-VALVE : Yes
Diff A-Z : 0.80 s

AzDiff2 : No
REWORK LIMIT : Yes
Max Rework : 300
Min Rework : 186
PEAK HOLD MAX : No
SIGN : No
NO NEGATIVE : No
DISPLAY MODE: X.XXXX
BUZZER : No
ANALOG OUTPUT : No

Pr 02
TYPE : OPERATOR
COUPL. A : 1.2 s
TEST TIME : 4.0 s
NAME:
PR:SEQUENCE : No
START INST: 0.0 %
CONTINUOUS : No
GAIN : 100
OVERSHOOT : No
24V OUTPUTS : No
BUZZER : No

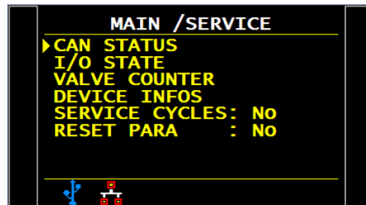
Pr 03
TYPE : QUICK TEST
COUPL. A : 0.3 s
TEST TIME : 3.0 s
Press. UNIT : bar
Max PRESS : 0.155
Min PRESS : 0.075
INSTRUCT. : 0.100
FLOW UNIT : l/h
Max Flow : 791
Min Flow : 150
NAME:
PR:SEQUENCE : No
AUTO MODE : No
UNITS : SI
FLOW UNIT : l/h
FILTER : Yes
FLOW : 1.5 s
PRESSURE : 0.1 s
STD CONDITIONS: Yes
ATM PRESS.: 1013 hPa
TEMP. : 20.0 C
PRESS. CORR. : No
OFFSET : No
REG. MODE : P(Auto)
START INST: 20.0 %
INSTRUCT. : 0.100
GAIN : 100
OVERSHOOT : No
24V OUTPUTS : No
END OF CYCLE : No
MINI-VALVE : No
REWORK LIMIT : No
PEAK HOLD MAX : No
SIGN : No
NO NEGATIVE : No
DISPLAY MODE: X.XXXX
BUZZER : No
ANALOG OUTPUT : No



Service

SERVICE MENU

Use this menu to do the maintenance of your device (status check, internal tests...).



Label	Function	Description
CAN STATUS	Internal network state	State of the internal network of the device.
I/O STATE	Inputs/outputs state	State of the inputs/outputs.
VALVE COUNTER	Valves wear function	Approximate state of the valves wear.
DEVICE INFOS	Device information	Information about the device, program version, built in components etc.
SERVICE CYCLES	Special service cycles	Allows to display more special cycles to carry out device internal tests.
RESET PARA	Parameters reset	Reset to factory configuration.

CAN Status

Use this function to check the communication between the various built in components through the CAN network (Controller Area Network).

- i** If one or several boards are not detected in the network, a communication error message is triggered (e.g. **Com. Error SENSOR BOARD**. See Error messages).

Access: **MAIN MENU > SERVICE > CAN STATUS**.

Each component of the device is displayed with the following information:

Label	Description
OK	The component is installed in the device.
NO OK	The component installed in the device has an issue.
-----	The component is not installed in the device.
SENSOR ERROR	Number of communication error occurrences since last power on of the device.
I/O ERROR	Number of communication error occurrences since last power on of the device.
VALVE C. ERROR	Number of communication error occurrences since last power on of the device.

- i** If the network has a defect or if a component is **NO OK**, restart the device.

- i** If the issue persists, contact ATEQ.





I/O State

Use this function to check the communication between the various built in components through the CAN network (Controller Area Network).



It is dangerous to change the status of the outputs. They can control power actuators or other equipment (mechanical, pneumatic, hydraulic, electrical or other) which can cause serious personal injury and damage to surrounding material.



The state of an activated input or output equals 1.
The state of an input or output not activated equals 0.

You can change the status of each input / output by pressing .

Adjust the outputs of the sensor board

Access: **MAIN MENU > SERVICE > I/O STATE > SENSOR BOARD.**

Inputs/outputs	Description	State
OUT1: STD 1	24 V command internal valve	0 / 1
OUT2: STD 2	24 V command internal valve	0 / 1
OUT3: STD 3	24 V command internal valve	0 / 1
OUT4: STD 4	24 V command internal valve	0 / 1
DAC 1	Instruction sent to the electronic regulators (0-10 VDC)	0 % to 100 %
DAC 1	Instruction sent to the electronic regulators (0-10 VDC)	0 % to 100 %
DAC 1	Pressure analog signal output 0-10 VDC	0 % to 100 %
DAC 1	Flow analog signal output 0-10 VDC	0 % to 100 %

Check or adjust the inputs / outputs of the relay board

Access: **MAIN MENU > SERVICE > I/O STATE > I/O**

Inputs/outputs	Description	State
IN1: RESET	RESET	0 / 1
IN2: START	START	0 / 1
IN3: PROG 1	Program 1	0 / 1
IN4: PROG 2	Program 2	0 / 1
IN5: PROG 3	Program 3	0 / 1
IN6: PROG 4	Program 4	0 / 1
IN7: Pr. Select.	Program selection	0 / 1
IN8: Pr. Select.	Program selection	0 / 1
OUT1: OK	Part pass	0 / 1
OUT2: (F+)	High flow fail part	0 / 1
OUT3: (F-)	Low flow fail part	0 / 1
OUT4: ALA	Warning	0 / 1
OUT5: END CYCLE	End of cycle	0 / 1
OUT6: AUX 1	Auxiliary programmable output	0 / 1
OUT7: AUX 2	Auxiliary programmable output	0 / 1
OUT8: AUX 3	Auxiliary programmable output	0 / 1
OUT9: AUX 4	Auxiliary programmable output	0 / 1



Check or adjust the inputs / outputs of the valve code board

Access: **MAIN MENU > SERVICE > I/O STATE > VALVE C.**

Inputs/outputs	Description	State
OUT1: EXT 1	External output	0 / 1
OUT2: EXT 2	External output	0 / 1
OUT3: EXT 3	External output	0 / 1
OUT4: EXT 4	External output	0 / 1
OUT5: EXT 5	External output	0 / 1
OUT6: EXT 6	External output	0 / 1
OUT7: INT 1	Internal output	0 / 1
OUT8: INT 2	Internal output	0 / 1
IN1: none	Programmable input (none or special cycle)	0 / 1
IN2: none	Programmable input (none or special cycle)	0 / 1
IN3: none	Programmable input (none or special cycle)	0 / 1
IN4: none	Programmable input (none or special cycle)	0 / 1
IN5: none	Programmable input (none or special cycle)	0 / 1
IN6: none	Programmable input (none or special cycle)	0 / 1

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Valves counter

Use this function to have an approximate state of the internal valves with the counters indications.

Access: **MAIN MENU > SERVICE > VALVE COUNTER.**

Label	Description
Partial	Number of cycles the valve has performed since the last counter reset.
TOTAL	Total number of cycles the valve has performed. This counter is managed by ATEQ. It is reset once a complete service is carried out on the valves.
Partial Reset	Select this item to reset the partial counter.



Device infos

Use this function to have an approximate state of the internal valves with the counters indications.

Access: **MAIN MENU > SERVICE > DEVICE INFOS**

Menu option	Description
S/N	Serial number of the device
TEXT	Database version of the device texts
SOFT INFOS	This option enables you to display the software versions installed in the following components: <ul style="list-style-type: none">– MAIN BOARD: mainboard– USB: USBboard– SENSOR BOARD: sensorboard– I/O: relay board– VALVE C.: valve code board– FIELDBUS: fieldbus board– MEMORY BOARD: internal memory board
BOOT INFOS	This option enables you to display the version of the boot software of the following components: <ul style="list-style-type: none">– SENSOR BOARD: sensorboard– I/O: relay board– VALVE C.: valve code board– FIELDBUS: fieldbus board– MEMORY BOARD: internal memory board
BOARD INFOS	<ul style="list-style-type: none">– SENSOR BOARD: 541.15N– I/O: 45D– VALVE C.: 46G
SETTINGS INFO	This option enables to display the settings info of the following sensors built in the device (only for ATEQ servicing): <ul style="list-style-type: none">– FLOW 1 PRESS. SET– FLOW 1 VAC. SET– FLOW 2 PRESS SET– FLOW 2 VAC. SET– PRESSURE– ATM PRESS.– TEMP. CAP. The characteristics of each sensor may then be displayed: <ul style="list-style-type: none">– Calibration type used– Calibration coefficients– Date of the last calibration– Name of the person who has carried out this calibration





Service special cycles

The service special cycles enable running predefined cycles to diagnose different systems of the device.

Activation of the service special cycle

Access: **MAIN MENU > SERVICE > SERVICE CYCLES.**

Label	Service special cycle	Description
CAPIL. TEMP. CHECK	Capillary temperature check	Check of the calibration of the temperature sensor in the capillary. During this special cycle, the current temperature measured is displayed.
ATM PRESSURE CHECK	Atmospheric pressure check	Check of the calibration of the atmospheric pressure sensor. During this special cycle, the current atmospheric pressure measured is displayed.
FLOW CHECK	Flow check	Check the calibration of the flow range corresponding to the running program range. It can be: – 1P>: flow range 1 with pressure calibration – 1V>: flow range 1 with vacuum calibration – 2P>: flow range 2 with pressure calibration – 2V>: flow range 2 with vacuum calibration

1. Select a service special cycle and press **Start**  to run the cycle.
 2. To stop the current cycle press **Reset** .
- For some cycles, the stop is automatic.

Parameters reset

Use this function to delete the parameters of all the test programs and to return to the factory configuration of the device.

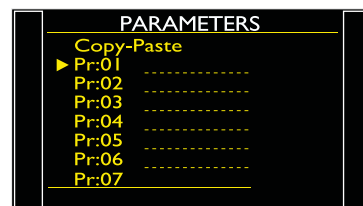
Access: **MAIN MENU > SERVICE > RESET PARA.**

 This function will be carried on without prior notice.

The device confirms the deletion of all the parameters of the programs.



The programs are empty.





ERROR MESSAGES

Error messages are displayed if there are operational problems.

Communication errors

Communication error messages are displayed if there are communication errors between the various built components of the device.

Communication error messages

Message displayed	Diagnostic
Com. Error FIELDBUS	Detection error of the Fieldbus board
Com. Error I/O	Detection error of the relay board
Com. Error SENSOR BOARD	Detection error of the sensor board
Com. Error VALVE C.	Detection error of the valve codes board

In case of communication error, restart the device and make sure the measurement head is turning on pneumatic valves sounds.

If the communication with the sensor board is lost after starting the device, the device will freeze on the run program number and won't carry on any test cycle.

- i** | An error with the sensor board is instantly detected.
An error with the relay board and valve codes board needs 30 to 60 seconds to be detected.

- i** | If the issue persists, contact ATEQ.

Measurement errors

Error messages are displayed if there are operational problems.

Error message displayed	DEF. BAR CODE
Description	Barcode error
Effect	The program selection and the program launch do not work.
Possible cause	The barcode scanned is unknown
Remedy	Start a new learning cycle (see: Learning of barcodes)

Error message displayed	Do Learning Cycle ATR - (ALARM)
Description	-
Effect	The Alarm and End of Cycle outputs are activated.
Possible cause	<ul style="list-style-type: none"> — A parameter has been modified but no learning cycle has started. — The measured value is greater than the reject level.
Remedy	<ul style="list-style-type: none"> — Start a new ATR learning cycle (see: ATR learning cycle). — Check the ATR parameters.

Error message displayed	Do Learning Cycle Custom Unit Learn - (ALARM)
Description	-
Effect	The Alarm and End of Cycle outputs are activated.
Possible cause	Customer Unit Learning error (CAL)
Remedy	Carry out another learning cycle (see Customized unit configuration)



Error message displayed	DRIFT ATR - (ALARM)
Description	Transient drift alarm.
Effect	The Alarm and End of Cycle outputs are activated.
Possible cause	The transient drift is over the set value Drift level, test conditions area have changed or parameters have changed.
Remedy	Check the percentage parameter of ATR drift (see ATR – parameter setup) or do a new ATR learning cycle.

Error message displayed	DRIFT CUSTOM UNITS - (ALARM)
Description	Custom unit drift following a custom unit check request (CAL).
Effect	The Alarm and End of Cycle outputs are activated.
Possible cause	Parameters or test conditions have changed.
Remedy	Check the programmed percentage of drift, the master jet, the test pressure (see Customized unit configuration).

Error message displayed	ERROR
Description	-
Effect	Test cycle cannot be started.
Possible cause	An empty program has been selected through the relay board.
Remedy	<ul style="list-style-type: none">— Enter program parameters.— Select another program.

Error message displayed	PPPP
Description	Too many digits to display with the selected unit of pressure.
Effect	Displays PPPP instead of the test pressure.
Possible cause	Pressure value higher than the format unit selected.
Remedy	Change the pressure unit.

Error message displayed	FLOW (-) Over Full Scale - (NO OK)
Description	-
Effect	The Fail and End of Cycle outputs are activated.
Possible cause	Test error. FLOW (-) over of the full scale.
Remedy	Check the test circuit, part or fixture.

Error message displayed	FLOW (+) Over Full Scale - (NO OK)
Description	-
Effect	The Fail and End of Cycle outputs are activated.
Possible cause	Test error. FLOW (+) over of the full scale.
Remedy	Check the test circuit, part or fixture.

Error message displayed	Pressure High - (ALARM)
Description	-
Effect	The Alarm and End of Cycle outputs are activated.
Possible cause	Pressure over the maximum threshold.
Remedy	Check: <ul style="list-style-type: none">— Regulator settings— Pressure limits— Selection of the right regulator, if the device has two regulators



Error message displayed	Pressure Low - (ALARM)
Description	-
Effect	The Alarm and End of Cycle outputs are activated.
Possible cause	Pressure below the minimum threshold.
Remedy	Check: <ul style="list-style-type: none">— Supply pressure— Regulator settings— Pressure limits— Selection of the right regulator, if the device has two regulators— Check the test circuit, part or fixture

Error message displayed	Pressure Over Full Scale - (ALARM)
Description	-
Effect	The Alarm and End of Cycle outputs are activated.
Possible cause	Pressure in excess of the full scale.
Remedy	<ul style="list-style-type: none">— Decrease the pressure using the mechanical regulator knob or the target if an electronic regulator is used— Start a special cycle Piezo auto zero



Accessories

STANDARD

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Power supply cable

For 100 / 240 V AC connector (**J7**) (option for D620), the instrument is provided with a power supply cable.



The power supply cable may only be replaced by a cable with the following characteristics:
2 poles + ground
250 VAC / 16 A



Power supply adaptor for the D620.
A power supply adaptor (100 – 240VDC
M12 connector) is supplied.

OPTIONS

Flow master jets

Use flow master jets to check the calibration of flow measurement instruments.
Flows master jets are delivered in a case, attached to a connector which depends on the value of the flow.
They are delivered with a calibration certificate.



The masters jets:
Must be used with clean and dry air
Must be stored in there boxes when not in use
Must be checked periodically, to guarantee their accuracy (our metrology laboratory can carry out this service).



Pressure	Nozzle type/flow in dm ³ /h (air between 15°C to 35°C and 1013 mbar)						
	10	20	35	59	80	112	160
2 kPa (20 mbar)	0.98	5	17	51	93	180	405
10 kPa (100 mbar)	2.64	13	40	117	221	387	922
25 kPa (250 mbar)	4.36	21	64	185	354	607	1473
50 kPa (500 mbar)	6.54	29	90	262	482	890	1947
100 kPa (1 bar)	9.6	43	129	372	676	1262	-
150 kPa (1.5 bar)	12.4	54	162	468	850	1599	-
200 kPa (2 bar)	15.0	65	194	545	1010	1909	-
250 kPa (2.5 bar)	17.7	76	227	638	1185	-	-
300 kPa (3 bar)	20.4	88	260	729	1357	-	-
350 kPa (3.5 bar)	23.4	100	293	819	1524	-	-
400 kPa (4 bar)	25.2	110	325	910	1694	-	-



The values displayed in the table above are given for information purposes, as the value of the standard leaks can vary by $\pm 15\%$.

The real flow rate of each master leak is accurately measured and given with an accuracy of $\pm 1.5\%$.

Filtration kit

Use the filtration kit to get clean dry air for a better reliability of the device.

The filtration kit consists of a dust filtering cartridge ($5\mu\text{m}$) and a second cartridge ($0.01\mu\text{m}$) filtering residual oil pollution down to 0.01 ppm.

1. Connect the filtration kit to the air input located at the rear of the device.





Leak/flow calibrators

CDF60 (low flow calibrator)

Use the ATEQ CDF60 Leak/Flow Calibrator to check the calibration of leak and flow measuring devices as well as calibrated leaks and jets.



This light, portable, compact and user-friendly calibrator is essential for field or laboratory checks, when accuracy and repeatability cannot be compromised and large instruments are too bulky or too expensive.

It lets you adjust very accurately your leak or flow rate with a real time cc/min reading on the display.

You can adjust any leak or flow rate within your measuring range, store test results and export them to an Excel spreadsheet.

The CDF60 is fully traceable to international standards and every unit has been calibrated in ATEQ's state of the art calibration facility and is delivered with a calibration certificate.

CDF (leak / flow calibrator)

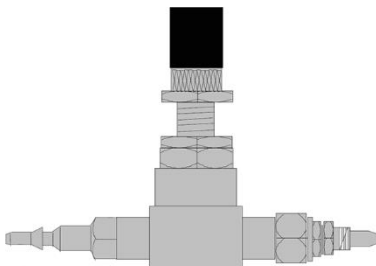
Use the ATEQ Leak/Flow Calibrator to check leak testing equipment and particularly ATEQ instruments.



The ATEQ leak/Flow calibrator is a multiple range flow meter.

Needle valves

Use needle valves to verify the leakage limits.



These valves have an adjustable leak and depending on the model, allow adjustments of between a few cm³/h to several l/min.

These valves can easily be misadjusted and therefore require the frequent use of some means of checking the setting as ATEQ CDF (leak/flow calibrator).



It is strongly recommended that you do NOT leave a needle valve permanently connected on a leak detection instrument with automatic calibration every "n cycles".



Valves

Characteristics of main valves

Valve model	Input pressure range	Flow rate range
3/2 Airtac valve 1/4G	0 to 0.4 MPa	0 to 150 l/h
2/2 Burkert valve	0 to 0.4 MPa	500 to 1500 l/h
3/2 Ateq Y valve	0.4 to 1 MPa	0 to 1500 l/h
2/2 Legris or Senga Valve	0 to 1 MPa	4000 to 10000 l/h

i | For more information, see below.

3/2 ATEQ valve (Y-valve)



The ATEQ valve and mini valve are 2 positions, 3 ways spring returned, pressurized and leak-tight valves. The valve comes with either a pneumatic or electric pilot.

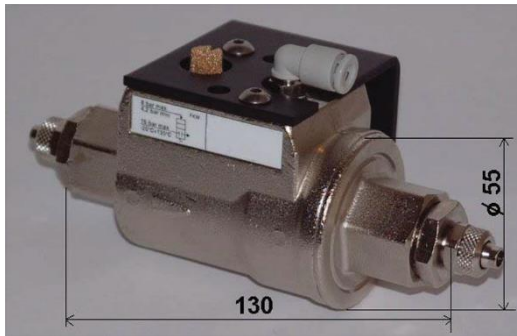
i | The choice of a leak tight valve is extremely important when installed in the leak test circuit.

2/2 Burkert valve





2/2 Legris or Senga valve



This valve is proposed in option with the instrument, it allows stopping the gas or air flow out of cycle. The driving of this valve is pneumatic, by the ATEQ D6 series devices.

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External capillary

To use this option, see Direct mode - External capillary option.



Quick connectors with expandable joints



ATEQ quick connectors are designed to be used manually or integrated into the leak tester's fixture. They connect the leak tester to your part reliably and assure leak tightness. Several connectors may be connected to the same manifold, driven by an ATEQ, a PLC or manually.

They easily adapt to a large number of fittings and opening of varied dimensions.

Their use ensures that non-machined walls can be guaranteed airtight.

There are 4 basic versions of the ATEQ quick connectors:

- SA for external connections,
- SI for internal connections,
- SAG and SIG for internal and external threads.

They come black anodized with engraved markings. Different types of seals are available depending on the requirements.



Operation

The connector is positioned manually, automatically or using cylinder. Compressed air goes through the pilot port via a three way valve. The pressure pushes the piston which compresses the seal. The air tightness is therefore ensured.

Standard dimensions

SAG and SIG have been designed for internal and external threads. For the time being, they are available in the following sizes: 1/2", 3/4", 1", 1 1/4", 1 1/2", 2", BSP.

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

Barcode reader

Barcode reader option (RS232 or USB)



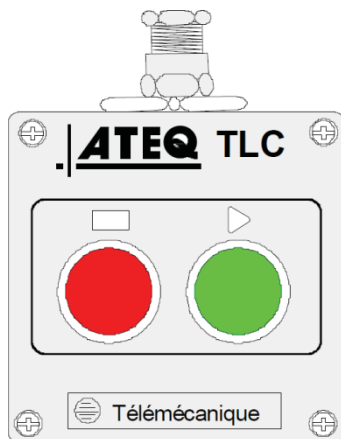
General Purpose Corded Handheld Linear Imager Bar Code Reader.
Model: Gryphon™ I GD4100
Manufacturer: Datalogic Scanning, Inc.
USB Gryphon 4130 (1D) or USB Gryphon 4400 (2D).

Remote controls

Use remote control for remote control and selection of various settings for ATEQ instruments.

1. Connect the remote control to the instrument's relay board.

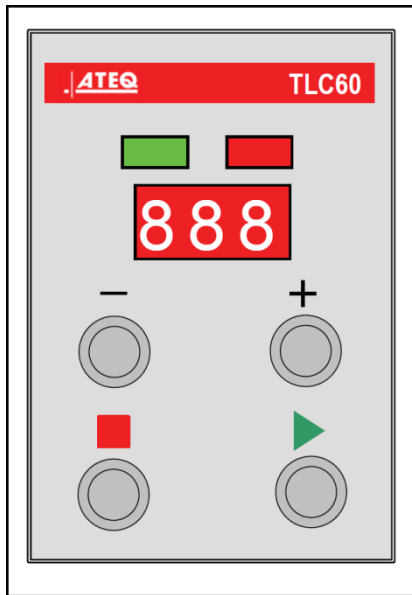
Rest/start remote





TLC60

Four-function 128 programs remote control.



This remote control has four functions which can be used to control an instrument remotely:

- Reset and start cycle.
- Increase or decrease program numbers.
- Display the selected program number.
- Display the test result, green indicator light for Pass, red indicator light for Fail or alarm.

- i** | A program number can only be changed (increase or decrease) when no test cycle is running.
- i** | At the device powering up, as the END OF CYCLE information is not on, the TLC60 remote control displays alternatively its firmware version and the lights test.



Specifications

CHARACTERISTICS

Technical characteristics of the device.

D620 main characteristics:

Characteristics	Values
Case dimensions: Height x Width x Depth	150 x 250 x 270 mm (5.91 x 9.84 x 10.63")
Overall dimensions	150 x 250 x 360 mm (5.91 x 9.84 x 14.17")
Format	Half 19-inch rack
Mass	About 8 kg (17.6 lbs)
Electrical power supply	— 100 / 240 V AC - 50 W - 50/60 Hz — 24 V DC - 2 A.
Overvoltage category	II
Protection	Device protection level IP2
Pneumatic connections: (inside / outside diameters)	4/6 to 26 mm
Operation temperature	+5 °C to + 45 °C (+ 41 °F to 113 °F)
Storage temperature	0 °C to +60 °C (32 °F to 140 °F)
Operation altitude	Up to 2000 m (6500 ft)
Relative humidity	80 % at 31 °C (87 °F) and 50 % at 40 °C (104 °F)

D670 main characteristics:

Characteristics	Values
Case dimensions: Height x Width x Depth	157 x 537 x 305 mm
Overall dimensions	157 x 537 x 380 mm
Format	19-inch rack
Mass	About 8 kg (17.6 lbs)
Electrical power supply	— 100 / 240 V AC - 50 W - 50/60 Hz
Overvoltage category	II
Pneumatic air supply (0 to 0.5 MPa range)	Air supply: 0.6 MPa ± 15%
Pneumatic air supply (0.6 to 1 MPa range)	— Regulator input: 1.2 MPa ± 10% — Valves supply: 0.6 MPa ± 15%
Pneumatic air supply (1.1 to 2 MPa range)	— Regulator input: instrument pressure range + 0.1 to 0.2 MPa — Valves supply: 0.6 MPa ± 15%
Protection	Device protection level IP2
Pneumatic connections: (inside / outside diameters)	4/6 to 26 mm
Operation temperature	+5 °C to + 45 °C (+ 41 °F to 113 °F)
Storage temperature	0 °C to +60 °C (32 °F to 140 °F)
Operation altitude	Up to 2000 m (6500 ft)
Relative humidity	80 % at 31 °C (87 °F) and 50 % at 40 °C (104 °F)



METROLOGY

Technical characteristics of the device.

Flow measurement :

Range (l/h)	Global Accuracy*	Resolution (l/h)
1	+/- (2,5 % Rdg + 0,001 l/h)	0,0001
5	+/- (2,5 % Rdg + 0,005 l/h)	0,0001
30	+/- (2,5 % Rdg + 0,03 l/h)	0,001
80	+/- (2,5 % Rdg + 0,08 l/h)	0,001
150	+/- (2,5 % Rdg + 0,15 l/h)	0,01
500	+/- (2,5 % Rdg + 0,5 l/h)	0,01
1 500	+/- (2,5 % Rdg + 1,5 l/h)	0,1
4 000	+/- (2,5 % Rdg + 4 l/h)	0,1
10 000	+/- (2,5 % Rdg + 10 l/h)	1

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Pressure measurement :

Range (kPa)	Global Accuracy*	Resol. (kPa)	Resolution (MPa)
20	+/- 1% FS	0,01 => 99,99 100,1 => 999,9	0,001 => 0,999
50			
500			
1 000			
2 000			0,001 => 0,999 1,00 => 9,99

ATM Pressure measurement :

Range (hPa)	Global Accuracy*	Resolution (hPa)
750 – 1 050	+/- 2 mbar	1

Temperature measurement :

Range (°C)	Global Accuracy*	Resolution (°C)
5 – 45	+/- 0,5 °C	0,1



Rdg : Reading Value

FS : Full Scale

*Includes Linearity + Repeatability + Hysteresis + Long term Drift + Temperature Drift (5 to 45°C).



Annexes

INSTRUMENT MEMORY

The results of the test are saved within frames.

The frame length can vary in regard with the functions, units and others used in the program. A standard frame contains about 60 characters.

One character in the frame has a one byte size.

Technical characteristics of the device.


Internal memory


The device in its basic version is built in internal memory which can record:

- up to 1500 results since the board reference 550.16K.


Extended internal memory

An extended memory option is available.


This memory allows to record up to 400 000 of standard results frames. When this memory is installed, this icon  appears on the screen.


-  | The two memories record the same data simultaneously.

USB stick memory

If a USB stick memory is plugged, it comes in parallel with the others memories. When connected, this icon  is displayed on the screen.

For 1 GigaBytes (Gb) it may be store up to 1 500 000 (1.5 million) of standard results frames.

-  | All the memories record the same data simultaneously.

-  | The USB stick memory plugged to the device must have the following characteristics:
 - Formatted in FAT32
 - Almost empty before use (only few others files)
 - Speed connection: USB2 only