ATEQ

ATEQ ERD620
Quick Start Guide

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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

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 ± 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 ERD620, AN UNIVERSAL VALVES TESTER

ATEQ ERD620 is a pressure ramp generator with the options Contact event or Flow event.

ATEQ ERD620 can memorize 128 different test programs.

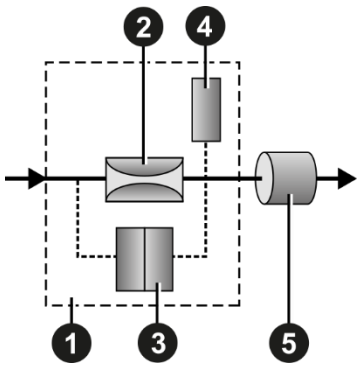
FLOW RATE TEST

The purpose of the instrument is to generate a pressure ramp in a valve and detect a flow event (ex: valve opening). A ramp down can also detect when a valve is closed. The instrument will display the event pressures and compare them to reject levels. As an option the flow event can be replaced by a dry contact event.

The ATEQ ERD620 can do direct or indirect measurements. In both cases, the flow meter can work in vacuum (optional).

Measurement principle

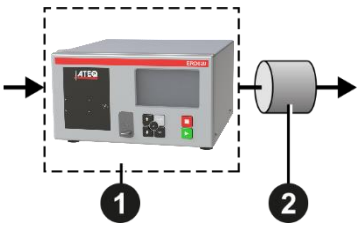
When the fluid (gas) enters the device **1**, it moves through a calibrated flow tube **2** which causes a drop in pressure. The pressure drop is measured by a differential pressure sensor **3**. The pressure of the part under test **5** is measured by the sensor **4**.



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

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**.

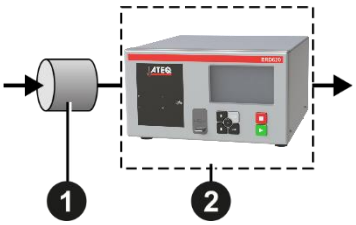


1 Device
2 Part under test

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.

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



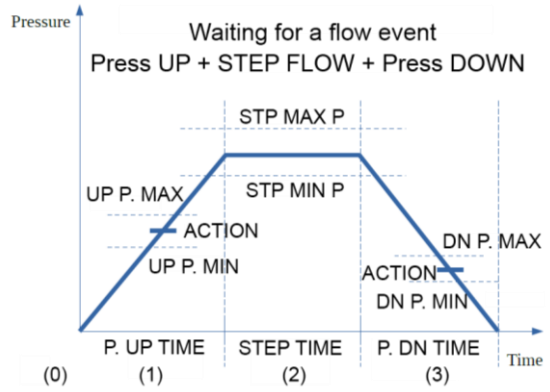
1 Part under test
2 Device

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.

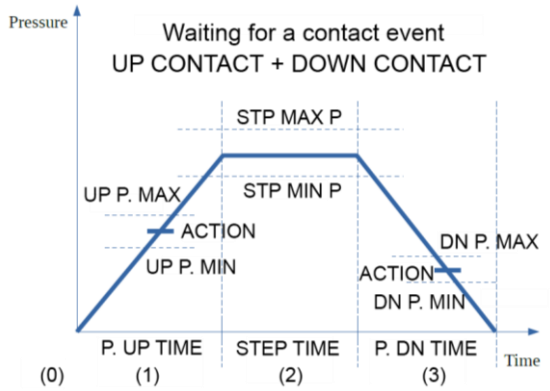
PRINCIPLE OF A CYCLE

The measurement cycle is made of 4 main phases: fill, stabilization, test, dumping.

A Pressure auto zero additional phase **0** can be placed at the start or at the end of a cycle, depending on the requirement of the operator.



0 Pressure auto zero phase (optional)
1 Flow auto zero (0.8s) + Pressure up time
2 Flow auto zero (0.8s) + Step time
3 Pressure down time

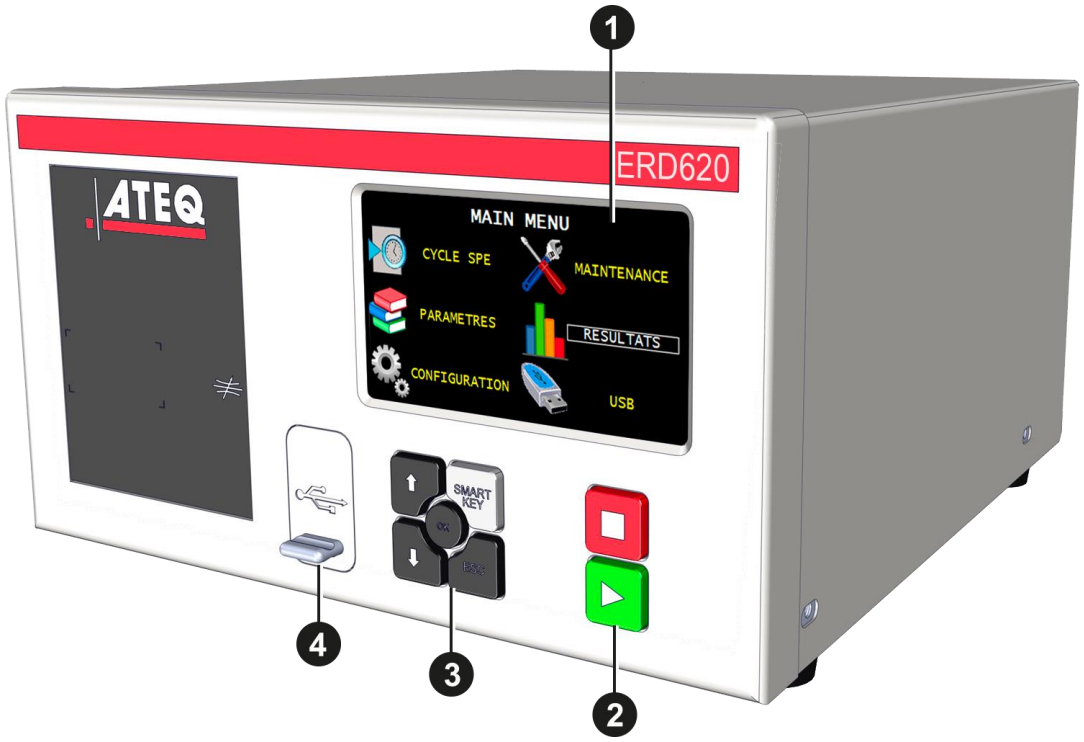


0 Pressure auto zero phase (optional)
1 Pressure up time
2 Step time
3 Pressure down time

Your ATEQ ERD620

FRONT PANEL

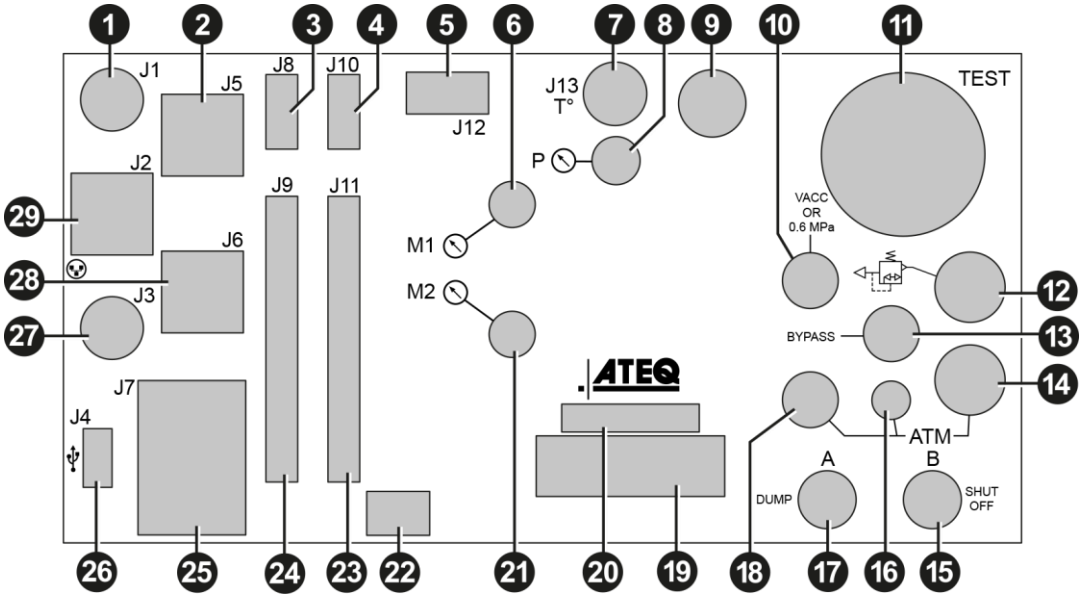
The user interface is located on the front panel.



1 Display
2 Cycle keys
3 Navigation keys
4 USB connectors

For more information, refer to User interface.

CONNECTORS ON THE BACK PANEL (WITH ALL OPTIONS)



Ref	Name	Description
1	J1	Dry contact input from test part (contact event) and 0-10 VDC analog outputs (options)
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 valves air supply input (1 MPa range) or vacuum input
11	TEST	Capillary connector to connect to the part under test
12	-	Regulator output (indirect mode or external capillary option)
13	-	Not used
14	ATM	Output capillary (indirect mode): has to be left to the atmosphere
15	B	B automatic connector option
16	ATM	Output to be left to the atmosphere
17	A	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) (option)
24	J9	Outputs code board connector (digital inputs/outputs) (option)
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.

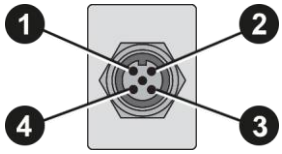
POWER SUPPLY CONNECTORS

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

External supply

24 V DC connector (J7)

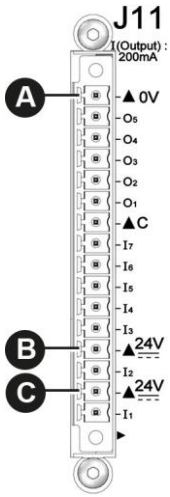
The device can be connected to a 24 V DC - 2 A power supply through a M12 4 pins type connector.



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

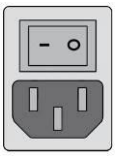
24 V DC to the pin **2** or **4**.

Internal supply only

100 / 240 V AC connector (J7)

The device can be connected to a 100 / 240 V AC power supply.
This connector has an 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.

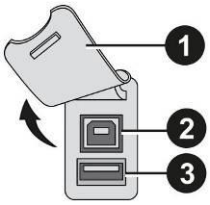


1 ON
0 OFF

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.

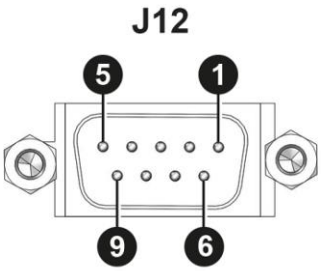
Push the rubber cover **1** slightly forward for an easy access to USB connectors **2** and **3**.

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

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

Profibus SubD 9 pins female connector option

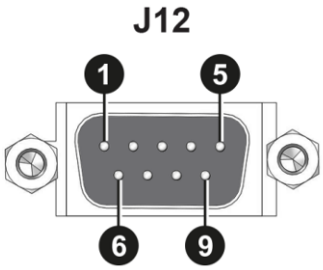
Profibus: SubD 9 pins female connector.



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 - SubD 9 pins male connector (printer)

RS232 for printer, bar code 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

Examples of frames outputs

Pressure up + Step Flow + Pressure Down

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	
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With SHORT CYLE Function

With SHORT CYLE Function

Pressure up + Step Flow

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
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Step Flow + Pressure down

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<	0	1	>	:	D	:	A	L	:	P	R	E	S	S	U	R	E		L	O	W																	
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Pressure down

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
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<	0	1	>	:	0	9	/	0	7	/	2	0	1	9		1	1	:	3	4	:	5	1															
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<	0	1	>	:	D	:	D	>	:	0	.	5	0	1		b	a	r	:		1	0	0	.	0		l	/	h											
<	0	1	>	:	0	9	/	0	7	/	2	0	1	9		1	1	:	4	6	:	0	3															

Pressure up

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
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Step Flow

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
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<	0	1	>	:	A	B	C	D	E	F	G	H	I	J	K	L																								
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<	0	1	>	:	0	9	/	0	7	/	2	0	1	9		1	0	:	4	4	:	1	0																	

Up + down contact

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
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<	0	3	>	:	0	8	/	0	7	/	2	0	1	9		0	9	:	0	1	:	3	0																

Down contact

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
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Up contact

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
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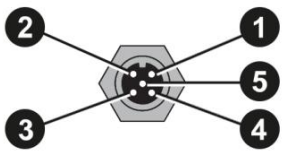
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
NAME	PR.	PR.	State	UP Result	UPPress =	PressUnit	UP Flow	Flow Unit	UPALARM	STEP RESULT	STEP Press	STEP Flow	STEPALARM	PR.	State	Down Result	Down Press	Down Flow	DownALARM	DATE	HOUR	NUM. BAR CODE	Temp.	Temp. Unit	P atm	Patm Unit
UP CONTACT																										
ABCDEFGHIJKL	<03>	<03>	U	GP	0.256	bar	ACTION							<03>	D					08/07/2019	15:17:35		25.5	C	1005	HPa
ABCDEFGHIJKL	<03>	<03>	U	U>	CONTACT DEF.		ACTION							<03>	D					08/07/2019	15:30:39		25.6	C	1005	HPa
ABCDEFGHIJKL	<03>	<03>	U	U>	0.379	bar	ACTION							<03>	D					08/07/2019	15:35:54		25.5	C	1005	HPa
ABCDEFGHIJKL	<03>	<03>	U	U<	0.075	bar	ACTION							<03>	D					08/07/2019	15:42:50		25.5	C	1005	HPa
ABCDEFGHIJKL	<03>	<03>	U	AL					PRESSURE LOW	AL			PRESSURE LOW	<03>	D	AL			PRESSURE LOW	08/07/2019	15:54:18		25.5	C	1005	HPa
DOWN CONTACT																										
ABCDEFGHIJKL	<03>	<03>	U			bar		l/h						<03>	D	GP	0.236	ACTION		08/07/2019	16:11:54		25.4	C	1005	HPa
ABCDEFGHIJKL	<03>	<03>	U			bar		l/h						<03>	D	D>	0.450	ACTION		08/07/2019	16:22:39		25.4	C	1005	HPa
ABCDEFGHIJKL	<03>	<03>	U			bar		l/h						<03>	D	D<	0.072	ACTION		08/07/2019	16:50:20		25.1	C	1004	HPa
UP + DOWNCONTACT																										
ABCDEFGHIJKL	<03>	<03>	U	GP	0.151	bar	ACTION							<03>	D	GP	0.239	ACTION		08/07/2019	16:58:15		25.1	C	1005	HPa
ABCDEFGHIJKL	<03>	<03>	U	U>	CONTACT DEF.		ACTION							<03>	D	D>	0.501	ACTION		08/07/2019	17:18:11		25.0	C	1004	HPa
ABCDEFGHIJKL	<03>	<03>	U	AL					PRESSURE LOW	AL			PRESSURE LOW	<03>	D	AL			PRESSURE LOW	08/07/2019	17:23:32		24.9	C	1004	HPa
ABCDEFGHIJKL	<03>	<03>	U	AL					PRESSURE HIGH	AL			PRESSURE HIGH	<03>	D	AL			PRESSURE HIGH	09/07/2019	09:04:58		24.7	C	1007	HPa
SHORT CYCLE																										
ABCDEFGHIJKL	<03>	<03>	U	U>	0.329	bar	ACTION							<03>	D	D<	0.000	ACTION	FAULT	09/07/2019	09:24:28		24.7	C	1007	HPa
STEP FLOW																										
ABCDEFGHIJKL	<01>	<01>	U			bar		l/h		GP	0.501	109.4		<01>	D					09/07/2019	10:30:29		24.0	C	1007	HPa
ABCDEFGHIJKL	<01>	<01>	U			bar		l/h		S<	0.500	90.6		<01>	D					09/07/2019	10:39:47		24.0	C	1007	HPa
ABCDEFGHIJKL	<01>	<01>	U	AL					PRESSURE LOW	AL			PRESSURE LOW	<01>	D	AL			PRESSURE LOW	09/07/2019	10:46:19		23.9	C	1007	HPa
PRESSURE UP																										
ABCDEFGHIJKL	<01>	<01>	U	GP	0.202	bar	100.1	l/h						<01>	D					09/07/2019	10:55:27		23.9	C	1007	HPa
ABCDEFGHIJKL	<01>	<01>	U	U>	0.452	bar	100.8	l/h						<01>	D					09/07/2019	10:58:58		23.9	C	1007	HPa
SHORT CYCLE																										
ABCDEFGHIJKL	<01>	<01>	U	U>	0.368	bar	100.7	l/h						<01>	D					09/07/2019	11:14:52		24.0	C	1007	HPa
PRESSURE DOWN																										
ABCDEFGHIJKL	<01>	<01>	U			bar		l/h						<01>	D	GP	0.247	99.7		09/07/2019	11:39:13		24.4	C	1007	HPa
ABCDEFGHIJKL	<01>	<01>	U			bar		l/h						<01>	D	D>	0.501	100.0		09/07/2019	11:44:06		24.5	C	1007	HPa

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
NAME	PR.	PR.	State	UP Result	UPPress =	PressUnit	UP Flow	Flow Unit	UPALARM	STEP RESULT	STEP Press	STEP Flow	STEPALARM	PR.	State	Down Result	Down Press	Down Flow	DownALARM	DATE	HOUR	NUM. BAR CODE	Temp.	Temp. Unit	P atm	Patm Unit
STEP FLOW +PRESSURE DOWN																										
ABCDEFGHIJKL	<01>	<01>	U			bar		l/h		GP	0.501	186.9		<01>	D	GP	0.269	100.0		09/07/2019	15:27:08		25.7	C	1005	hPa
ABCDEFGHIJKL	<01>	<01>	U			bar		l/h		S>	0.501	187.2		<01>	D	GP	0.186	100.0		09/07/2019	16:22:14		24.7	C	1005	hPa
ABCDEFGHIJKL	<01>	<01>	U			bar		l/h		S<	0.501	187.0		<01>	D	GP	0.188	100.0		09/07/2019	16:37:25		24.5	C	1005	hPa
ABCDEFGHIJKL	<01>	<01>	U			bar		l/h		GP	0.500	187.2		<01>	D	D>	0.188	100.0		09/07/2019	16:51:56		24.3	C	1005	hPa
ABCDEFGHIJKL	<01>	<01>	U			bar		l/h		GP	0.500	187.2		<01>	D	D<	0.187	100.0		09/07/2019	17:02:23		24.2	C	1005	hPa
ABCDEFGHIJKL	<01>	<01>	U	AL					PRESSURE LOW	AL			PRESSURE LOW	<01>	D	AL			PRESSURE LOW	10/07/2019	09:02:32		25.5	C	1006	hPa
PRESSURE UP +STEP FLOW																										
ABCDEFGHIJKL	<01>	<01>	U	GP	0.124	bar	100.2	l/h		GP	0.501	189.1		<01>	D					10/07/2019	09:38:06		26.1	C	1006	hPa
ABCDEFGHIJKL	<01>	<01>	U	U<	0.049	bar	100.9	l/h		GP	0.501	189.0		<01>	D					10/07/2019	10:26:19		26.4	C	1006	hPa
ABCDEFGHIJKL	<01>	<01>	U	U>	0.108	bar	100.0	l/h		GP	0.501	187.3		<01>	D					10/07/2019	10:37:23		26.6	C	1006	hPa
ABCDEFGHIJKL	<01>	<01>	U	U>	0.113	bar	100.0	l/h		S<	0.501	189.0		<01>	D					10/07/2019	14:15:01		26.2	C	1005	hPa
SHORT CYCLE																										
ABCDEFGHIJKL	<01>	<01>	U	U>	0.102	bar	100.2	l/h		GP	0.103	100.9		<01>	D					10/07/2019	10:52:06		26.5	C	1006	hPa
	<06>	<06>	U	U<	59.9	mbar	101.8	l/h		GP	61.2	103.3		<06>	D					13/08/2020	13:07:47		25.1	C	999.1	hPa
	<06>	<06>	U	U<	59.9	mbar	101.1	l/h		S<	61.1	103.1		<06>	D					13/08/2020	13:11:44		25.4	C	998.9	hPa
PRESSURE UP +STEP FLOW +PRESSURE DOWN																										
ABCDEFGHIJKL	<01>	<01>	U	GP	0.172	bar	150.1	l/h		GP	0.501	190.4		<01>	D	GP	0.267	99.6		10/07/2019	16:19:51		27.2	C	1004	hPa
ABCDEFGHIJKL	<01>	<01>	U	U<	0.179	bar	150.4	l/h		S>	0.501	189.8		<01>	D	GP	0.273	99.4		10/07/2019	16:06:13		27.0	C	1004	hPa
ABCDEFGHIJKL	<01>	<01>	U	AL					PRESSURE LOW	AL			PRESSURE LOW	<01>	D	AL			PRESSURE LOW	11/07/2019	14:31:24		26.0	C	999.0	hPa
ABCDEFGHIJKL	<01>	<01>	U	AL					FLOW OVER FS	AL			FLOW OVER FS	<01>	D	AL			FLOW OVER FS	12/07/2019	15:50:10		26.0	C	1001	hPa
ABCDEFGHIJKL	<06>	<06>	U	GP	59.7	mbar	101.4	l/h		GP	401.1	323.0		<06>	D	D<	64.5	99.5		12/08/2020	14:56:53		26.7	C	997.3	hPa
ABCDEFGHIJKL	<06>	<06>	U	U<	59.7	mbar	101.4	l/h		GP	401.0	324.5		<06>	D	GP	65.1	99.9		12/08/2020	15:10:20		26.7	C	997.0	hPa
ABCDEFGHIJKL	<06>	<06>	U	U>		mbar		l/h	FAULT	S<	401.8	6.2		<06>	D	D>	401.7	9.6		13/08/2020	09:12:07		26.8	C	998.6	hPa
SHORT CYCLE																										
ABCDEFGHIJKL	<06>	<06>	U	GP	59.7	mbar	101.2	l/h		GP	401.2	322.9		<06>	D	D<	64.4	99.5		12/08/2020	14:59:44		26.7	C	997.2	hPa
ABCDEFGHIJKL	<06>	<06>	U	U>		mbar		l/h	FAULT	S<	396.6	22.3		<06>	D	D<			FAULT	13/08/2020	08:24:24		26.8	C	998.4	hPa
ERD6 Frames WORKING IN FLOW D6 MODE (Different of D620)																										
ABCDEFGHIJKL	<05>	<05>		(OK)	0.452	bar	177.9	l/h												11/07/2019	14:46:16		25.9	C	999.1	hPa
ABCDEFGHIJKL	<05>	<05>		(F+)	0.493	bar	185.1	l/h												11/07/2019	15:25:06		26.1	C	999.0	hPa

Devicenet connectors (J5) (J6) (option)

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

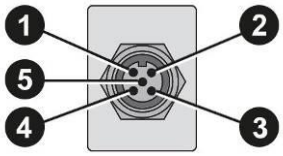
For connection to others ATEQ devices.



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)

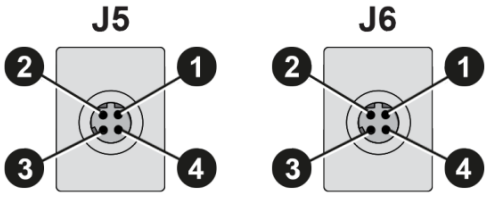
For connection to other ATEQ devices.



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

Profinet connectors (J5 + J6) (option)

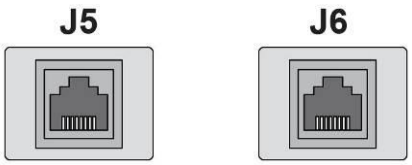
M12 D coded type connector - 4 pins female connector (J5 + J6)



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

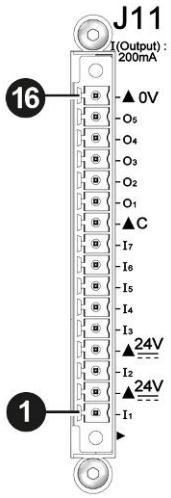
The 24V DC power supply for the digital inputs can be provided by 2 means:
— The internal power supply of the device (0.3 A max)
— An external power supply provided by the customer.

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	Fail Part Up
13	Output	Fail Part Down
14	Output	Warning
15	Output	End of cycle
16	0 V	Ground

When outputs Fail Part Up + Fail Part Down are activated at the same time, it means a Fail Part Step. Only the first part fail is declared on the display and on the relay outputs when there are several fails in the same cycle test. All the details results are available in the last results menu or output frame.

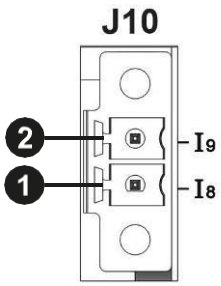
The device can be energized through the J11 connector of the relay board (except if internal supply option):
— 0 V to the pin 16
— 24 V DC to the pin 2 or 4.

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 (I8)	Input 8	Program selection from 33 to 64 (programmable input)
2 (I9)	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.

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

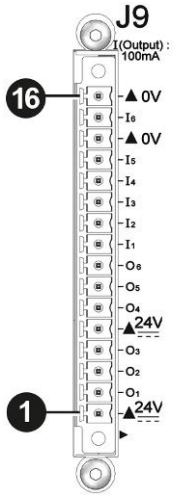
***** X is equal to 0 or 1 in function of the program number.

Valve codes and auxiliary outputs board connector (J9) (option)

Characteristics

— Outputs:
- 24 V DC - 100 mA max per output

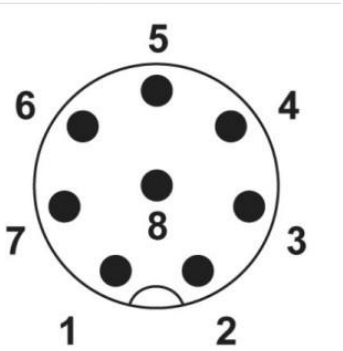
— Inputs:
- Activation: + 24 V DC.



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 connector (J1) (option)

M12 – 8 pin Female connector



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	Dry contact input (signal side)
6	Dry contact input (ground side)
7	Not connected
8	Not connected

For the contact event option, a dry contact (no voltage) must be used to the pin 5 and pin 6 inputs.

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.

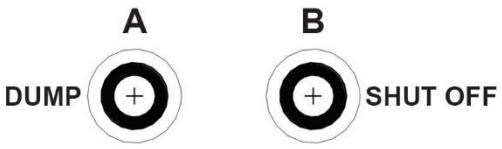
Metal air filter

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

Plastic air filter

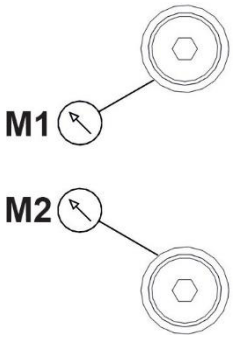
The plastic filter is used for 0.5 MPa range (direct and indirect modes) or 2MPa range (indirect mode only).
The maximum pressure admissible is 690 kPa.

Pneumatic outputs 0.6 MPa



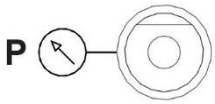
A and B: automatic connectors option. These connectors are used to drive pneumatic caps on the part under test.

External capillary connectors



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

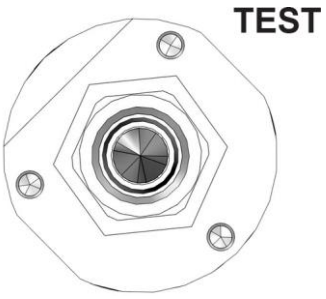
External pressure monitoring connector



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

Test connector

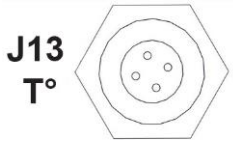
The test connector is used to connect the device to the part to test for both direct and indirect modes.



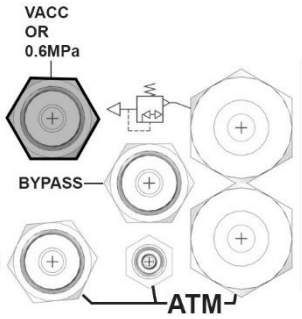
Metallic fitting diameter options (in mm):
— 4/6
— 6/8
— 8/10
— 15
— 20
— 25

Temperature probe connector

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



Air supply input for options



Instant fitting: 6 mm diameter

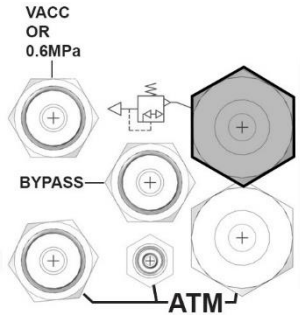
- 0.6 MPa air supply input for internal valves for 1 MPa range
- Vacuum input for vacuum range

Metallic fitting: 4/6 mm diameter

- Regulator air supply for 1.1 to 2MPa range indirect mode

Regulator output connector

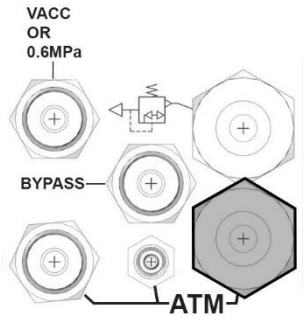
This connector can be used as regulator output in indirect mode, for bypass option or external capillary option.



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

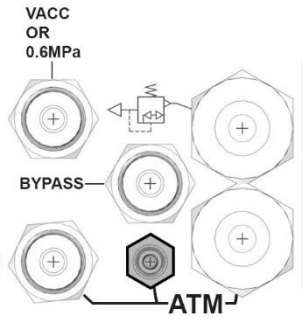
This connector needs to be open to atmosphere for indirect mode.



Instant fitting: 8, 10 or 12 mm diameter.

ATM 4 mm connector

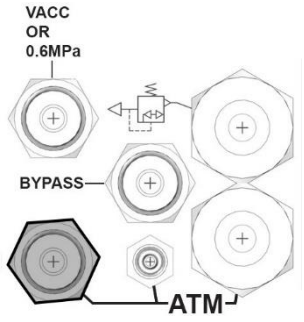
This connector needs to be open to atmosphere.



Instant fitting: 4 mm diameter.

ATM 6 mm connector

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



Instant fitting: 6 mm diameter.

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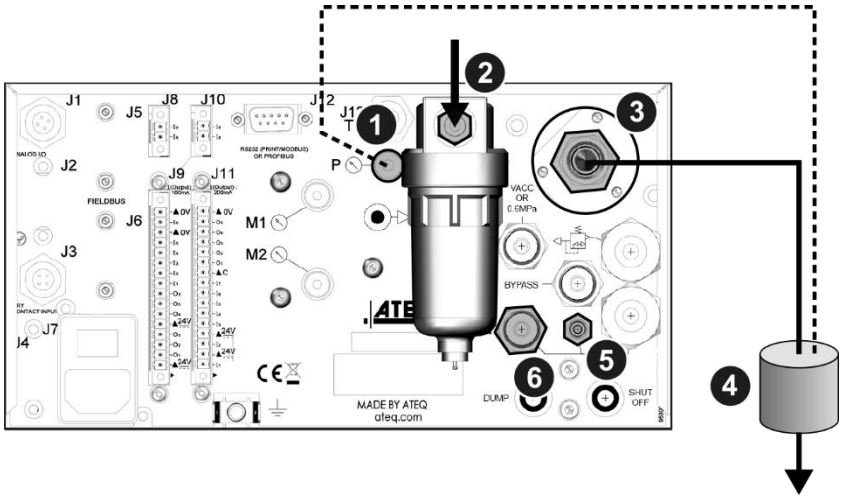
PNEUMATICS CONFIGURATION

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

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

Direct mode - Internal back pressure - until 0.5 MPa

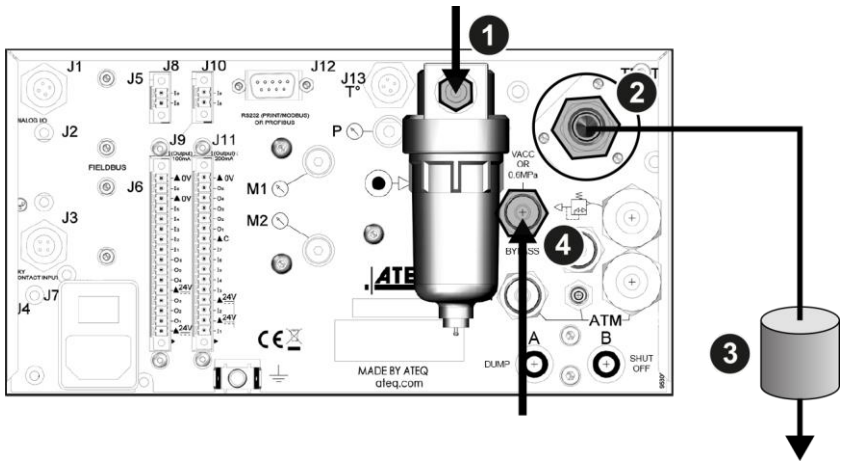
This configuration is used for direct mode at medium pressure range.



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 range

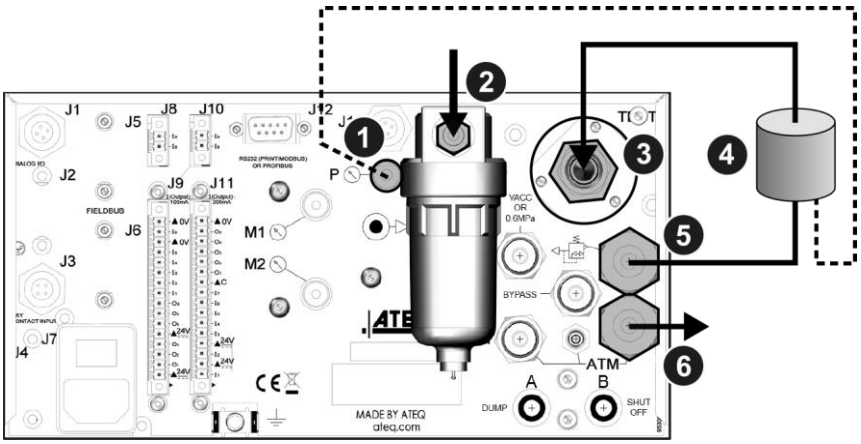
This configuration is used for direct mode at high pressure range.



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

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

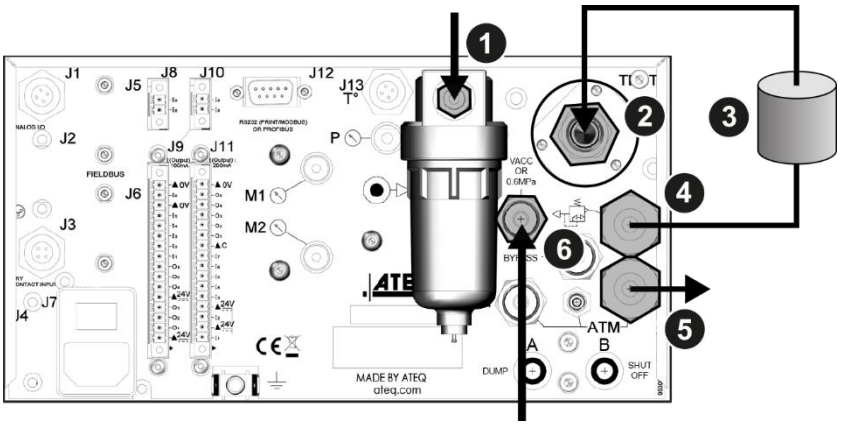
Use this configuration for indirect mode at medium pressure range.



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.



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)

User interface

OVERVIEW

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

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	**OK**	Returns to the **MAIN MENU** screen or opens menus and options, validates parameters.
ESC	**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	**Smart key**	Starts a measurement cycle (default, programmable).

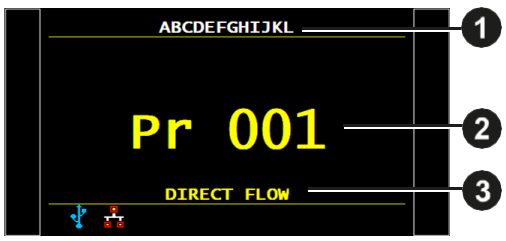
This key is programmable through the **MAIN MENU** screen:
MAIN MENU > **CONFIGURATION** > **MISCELLANEOUS** > **SMART KEY**

DISPLAY

The device uses 4 main screens.

The Program screen

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

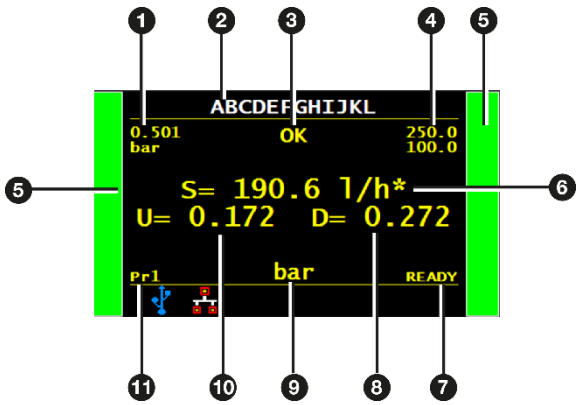


1 Current program name (here **NAME**)
2 Current program number (here **001**)
3 Test type (here **DIRECT FLOW**)

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

The Measurement cycle screen

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



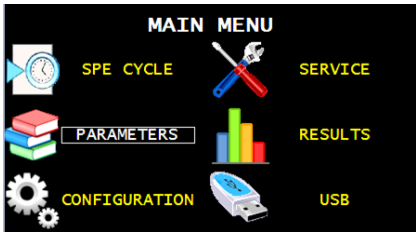
1. Test pressure measurement
2. Program name
3. Test result or step phase
4. Flow reject value
5. Vertical line test result*
6. Step flow measurement (when the function Step flow is selected)
7. Remaining time of the current phase or ready status
8. Down pressure event (when the function Pressure Down is selected)
9. Event pressure unit
10. Up pressure event (when the function Pressure Up is selected)
11. Current program

* Indicates the result: both green = Pass, red on the left = Fail Up, red on the right = Fail Down, both red bottom = step flow low, both red up = step flow high, both red = pressure alarm

The MAIN MENU screen

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

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).

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

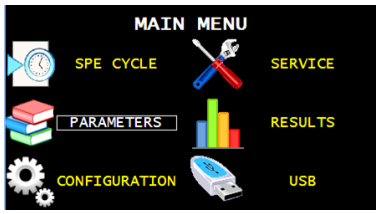
When power-up is completed, the **Program** screen is displayed, with last program used on screen.

PREPARING A PROGRAM

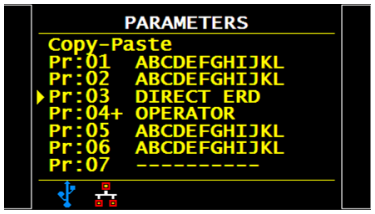
Use this procedure to configure a new test program.
On the **MAIN MENU** screen:

ACCESSING THE PARAMETERS

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



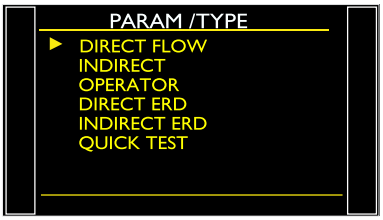
The program list is displayed.



SELECTING A PROGRAM NUMBER

2. Select the program to configure and press **OK**.

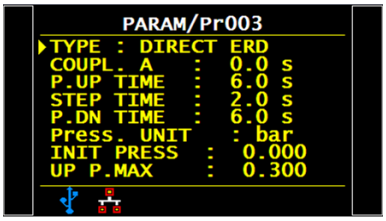
A list of the available measurement types is displayed:



- **DIRECT ERD** type
- **INDIRECT ERD** type
- **OPERATOR** type (Option)
- **DIRECT FLOW** type (Special option)
- **INDIRECT** type(Special option)
- **QUICK TEST** type. (Special option)

CONFIGURING THE ASSOCIATED MEASUREMENTS

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



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

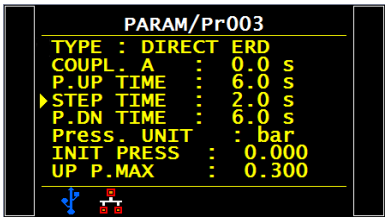
MODIFYING A PARAMETER

Use this procedure to complete the test program setup.

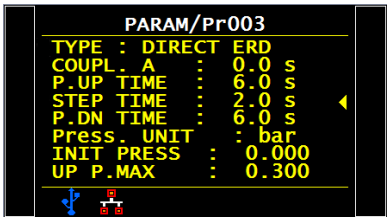
The protection of the parameters is configurable. If the icon is displayed at the bottom of the screen, you must insert the USB unlocking device or enter a password before modifying a parameter.

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

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

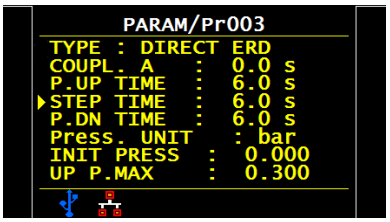


An arrow is displayed on the right of the parameter being modified.



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

The arrow returns to the left of the modified parameter.



3. Repeat these steps until all parameters are set.

4. To return to the **MAIN MENU** screen, press **Esc** ESC as many times as necessary.

SELECTING A PROGRAM OR A SEQUENCE

If necessary, you can select another program or another sequence if sequence mode is activated in the configuration.

1. Press **up/down** .

STARTING AND STOPPING CURRENT CYCLE

Use the front panel keys to start/stop a measurement cycle.
With the desired program displayed on the **Program** screen:

STARTING A MEASUREMENT CYCLE

1. Press **Start** .

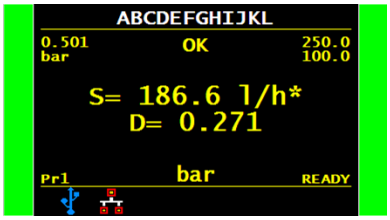
The cycle phases of the program are successively displayed:

WAITING

PRESS. UP

STEP

PRESS. DOWN



At the end of the cycle, the results are displayed and **READY** appears at the bottom right of the screen.

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

STOPPING A CYCLE

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

User adjustments

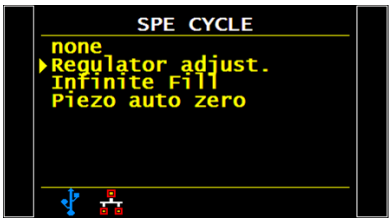
OPTIONS OF THE MENUS

Different menus are accessible on the **MAIN MENU** screen.

For more information, refer to the Reference Manual.

SPECIAL CYCLE MENU menu

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



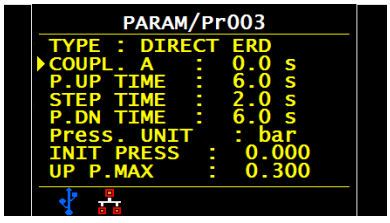
Label	Special cycle	Description of the cycle
none	None	No special cycle selected
Regulator adjust.	Regulator adjustment	Adjustment of regulator in front panel (Only for Direct or Indirect Flow Test and do not use with ERD)
Inf Fill	Infinite fill	Pressurize the part with an infinite fill time (Only for Direct or Indirect Flow Test and do not use with ERD)
Piezo auto zero	Piezo auto zero	Auto zero cycle on the piezo sensor

TO START SPECIAL CYCLES...

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

PARAMETERS menu

Use this menu to configure the measurement cycle associated to each test program.



Default parameters of the **FLOW** type tests

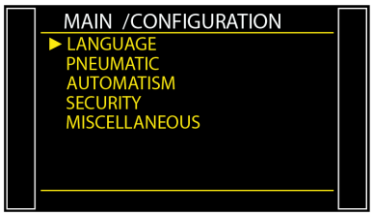
Label	Parameter	Description
COUPL. A or **COUPL. B**	Coupling time	Required times when instrument manage automatic jigs (COUPL. A can be used as a waiting time before generating pressure)
P. UP TIME	Pressure up time	Time for the rising ramp
STEP TIME	Step time	Time of step phase
P. DN TIME	Pressure down time	Time for the dropping ramp
Press. UNIT	Pressure units	Pressure unit (bar, mbar, PSI, Pa, kPa, MPa, Pts)
INIT PRESS	Initial pressure	Initial pressure at the start of the cycle
UP P. MAX	Maximum up pressure	Maximum level of pressure during rising pressure phase: the flow event must be below this level
UP P. MIN	Minimum up pressure	Minimum level of pressure during rising pressure phase: the flow event must be over this level
CONTACT	Contact	Select Closed or Opened and the contact event must happen between UP P. MAX and UP P. MIN
STP MAX P	Maximum step pressure	Maximum level of pressure during step phase
STP MIN P	Minimum step pressure	Minimum level of pressure during step phase
STEP PRESS	Step pressure	Instruction pressure maintained during the step
DN P. MAX	Maximum down pressure	Maximum level of pressure during dropping pressure phase : the flow event must be below this level
DN P. MIN	Minimum down pressure	Minimum level of pressure during dropping pressure phase : the flow event must be over this level
CONTACT	Contact	Select Closed or Opened and the contact event must happen between DN P. MAX and DN P. MIN.
END PRESS	End pressure	Pressure at the end of cycle
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.
UP MIN FLOW	Pressure up minimum flow	Minimum flow value during the rise: it is the flow event value.
S. MAX FLOW	Step maximum flow	Maximum flow value during the step phase
S. MIN FLOW	Step minimum flow	Minimum flow value during the step phase
DN. MAX FLOW	Down maximum flow	Maximum flow during dropping phase: it is the flow event value.
VALVE TYPE	Valve type	State of the valve (opened or closed)
FUNCTIONS	Functions	Access to additional functions

Additional 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 (Window mode is only for Direct or Indirect Flow Test and do not use with ERD)
AUTO CONNECT	Automatic connector	Function to manage automatic jigs
BUZZER	Buzzer	Buzzer activation configuration
CODE READER	Code reader	Bar code reader configuration
DISPLAY MODE	Display Mode	Flow measurement resolution
DN CONTACT	Down contact	Contact type parameter between the inferior and superior pressure limits during the drop, open or close. It is the same pressure levels as for flow event.
END OF CYCLE	End of cycle	Several automatism case depending on fail part management (Only for Direct or Indirect Flow Test and do not use with ERD)
FILTER	Filtering	Stabilize the measurement values
MEAS. DELAY	Measurement delay	During this time reject levels are not controlled (perturbations at starting ramp)
MINI-VALVE	Mini valve	Access to highest time resolution (fast test) and auto zero time
NAME	Name	Program customization
OFFSET	Offset	3 Flow offset: Offset Up, Offset Step, Offset Down
PR:SEQUENCE	Sequencing	Allowed program automatic sequencing
PRESS. AZ	Pressure auto zero	Define if Pressure auto zero is done before, after the cycle or on demand (not done automatically)
PRESS. CORR.	Pressure correction	Calculate flow measurement at a specific pressure value, whatever the real test pressure is
PRESS. DOWN	Pressure down	Inferior and superior pressure limits and maximal flow value during the dropping phase (flow event)
PRESS. UP	Pressure up	Inferior and superior pressure limits, minimal flow value during the rising phase (flow event)
SHORT CYCLE	Cycle shortened	When fail is detected, the test is stopped and does the dropping ramp
SIGN	Sign	The flow sign is inverted
STAMPING	Stamp	Pneumatic or electric output to identify the part
START PRESS	Start pressure	No flow measure taken as long as the parameterized pressure not reached
STD CONDITIONS	Standard conditions	Calculate measured flow in other ATM pressure and temperature condition (displays the unit with an *)
STEP FLOW	Step flow	Minimal and maximal flow value during the step
UNITS	Units	Access to International System or American or Custom Units
UP CONTACT	Up contact	Contact type parameter between the inferior and superior pressure limits during the rising, open or close. It is the same pressure levels as for flow event.
VALVE CODES	Valve codes	Available outputs for external automatism

CONFIGURATION menu

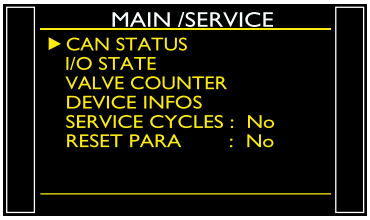
Use this menu to configure your ATEQ device.



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 (Only for Direct or Indirect Flow Test and do not use with ERD)
> **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**		Lock/Unlock 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.
MISCELLANEOUS	Miscellaneous	
> **SMART KEY**	-	Configuration of the assigned function to the Smart key SMART KEY
> **BARGRAPH**	-	Bargraph display configuration (Only for Direct or Indirect Flow Test and do not use with ERD)

SERVICE menu

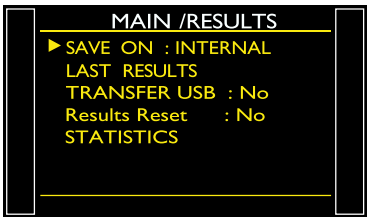
Use this menu to do the maintenance of your device (status check, internal tests...).



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

RESULTS menu

In this section, manage measurements results.

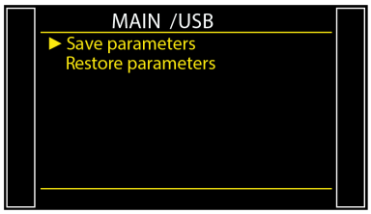


Label	Function	Description
SAVE ON	-	Define memory location (internal or external USB stick)
LAST RESULTS	Results display	Last 1500 results carried out by the device
TRANSFER USB	Results transfer	Transfer all results to USB stick on CSV file
Results Reset	Results erasing	The results are lost after the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

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).

USB menu

This section describes save and restore parameters on an external USB stick (format Fat32).



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

Specifications

CHARACTERISTICS

Technical characteristics of the device.
Main characteristics:

Characteristics	Values
Case dimensions: Height x Width x Depth	150 x 250 x 270 mm
Overall dimensions	150 x 250 x 360 mm
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
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)