


	Use and maintenance instruction test device code 94-1160-0069	5000070620
		Revision -- Date 10/06/24


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1. General safety instructions


Please follow the safety recommendations given in this document. These recommendations are classified to identify the hazards and the possible associated risk.

	NOTICE	The error could lead to a wrong test result
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- Some hazards become active only after the product has been installed. It is the responsibility of the end user to identify these hazards and reduce the risks associated with them.
- Read the information contained in this document before using the product.
- Keep this document in a safe place for the whole life cycle of the product.
- Transfer this document to any subsequent owner or user of the product.
- Mounting and operation must only be carried out by qualified and authorized personnel, in accordance with the following instructions.
- Use appropriate protection to minimize any risk of injury.
- Do not make any unauthorized changes to the product. If unauthorized changes are made any subsequent damage to equipment, people or animals is the users responsibility.
- It is recommended that every safety rule associated with the product is strictly adhered to.
- Do not interfere with the machine or appliance without first checking that the working conditions are safe.

2. General characteristics and conditions of use

General characteristics and conditions of use	
Pneumatic connections	Tube Ø8
Air specifications	Filtered air class 5.5.4 according to ISO 8573.1
Working pressure	6 bar
Temperature	0 ÷ 50 °C
Storage Temperature	-10 ÷ 50 °C
Power supply Voltage	24 Vdc
Power supply to AC/DC adapter	115 ÷ 230 Vac
Protection class (EN 60529)	IP40
Laptop	Windows 10 min

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3. Transport and storage of the product.

Take all possible precautions to avoid accidentally damaging of the product during transport, if available use the original packaging.

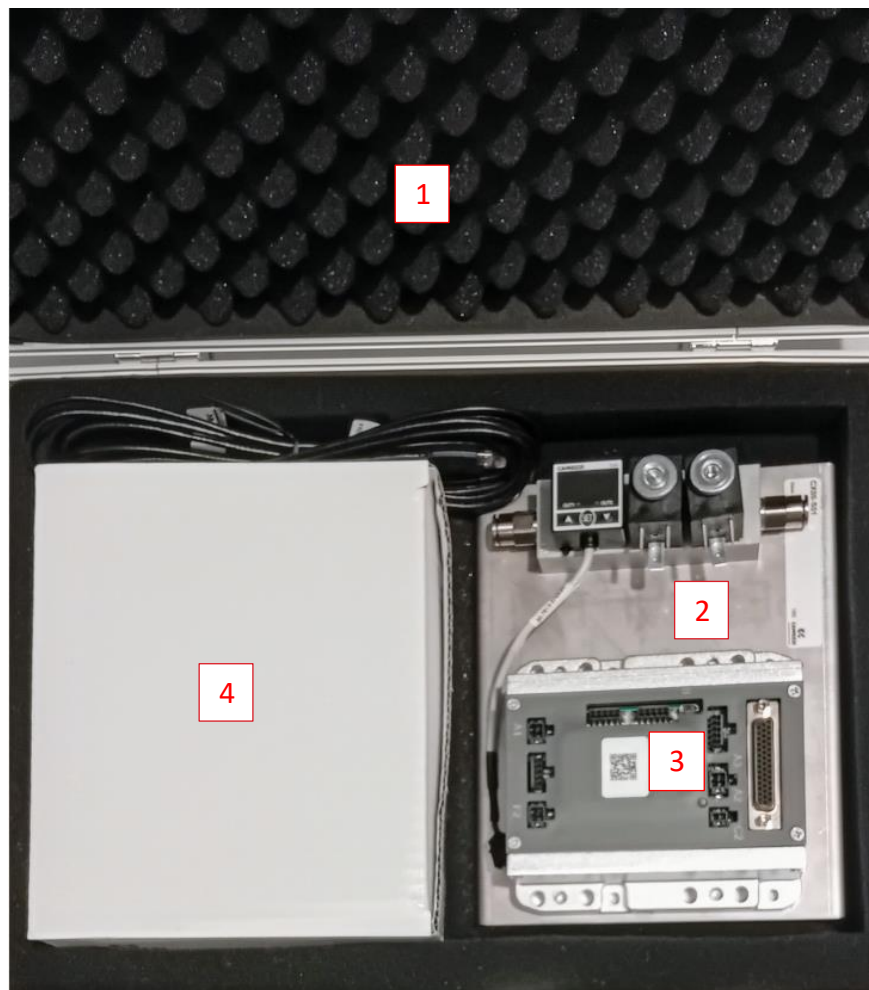
4. Installation and commissioning

- When unpacking the product be careful to don't damage it.
- Check the product for any damage which could have been caused during its transportation or storage.
- Separate any packaging materials so that they can be recovered and disposed of in compliance with national regulations.
- Avoid any sudden pressure changes in the circuit where you install the component.
- During installation check that the component does not create a hazard due to any potential mechanical movement.
- Put the component in an area where the phases of set-up and maintenance can be easily performed to check that it is not hazardous to the operator.
- Install condensate filtering and draining modules to prevent rust forming in the internal parts of components.
- When the component has been installed ensure that all pipes are properly connected.
- Use ESD protections

5. Use

- Before to use the equipment check that all operating conditions are within the permissible values.
- The equipment should only be put into service when all the operating conditions are within the permissible values; if one of the operating conditions exceeds the limits, the product can only be put into service after receiving official authorization from Camozzi.
- The product must be supplied with compressed air quality 5.5.4 in accordance with ISO 8573-1.
- The use of the product with liquids or gases is not permitted.

5.1 CX00-S01 description

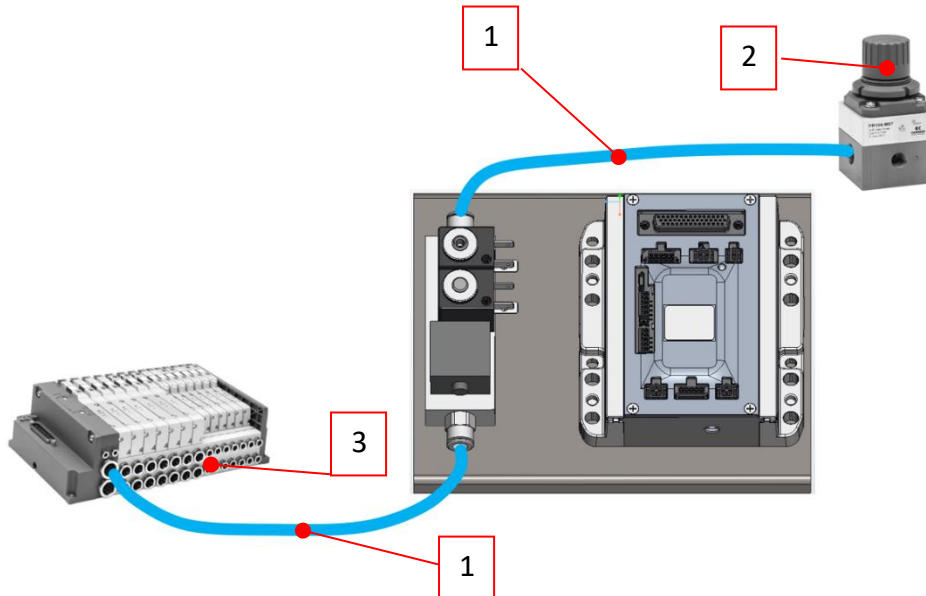


- 1) Case
- 2) Test device.
- 3) 05H2500-054101 - CX00-S01 control panel.
- 4) Cables:
 - 4.1) G25X1-G44W-1 Connector
 - 4.2) G44X1-G44W-1 Connector
 - 4.3) CX4 \$ Connector
 - 4.4) S.A \$ Connector
 - 4.5) G11W-G12W-2
 - 4.6) EC-140222-A0200

5.2 Cables	INCLUDED
	To connect the control panel to the pneumatic unit, use the plug cable: S.A \$
	To connect the control panel to the valve island multipole version, use the plug cable: G25X1-G44W-1 (25 pin) G44X1-G44W-1 (44 pin)
	To connect the control panel to the valve island fieldbus version, use the plug cable: CX4 \$
	To connect the control panel to the laptop and to the fieldbus head, use USB cable (2 pcs): G11W-G12W-2
	To connect the control panel to a DC power supply, use the cable: EC-140222-A0200
5.3 power supply	NOT INCLUDED
  <p> ID 2.5 x OD 5.5 Outside ⊖ ⊕ ⊕ Inside -V not connected to AC FG </p>	To connect the control panel to an AC power socket, use the AC/DC adapter code: 70-1307-0010 Or a similar one with the following characteristics: 24 V - 90W

5.4 Test procedure

5.4.1 – PNEUMATIC CONNECTIONS



NOTES: use the following tubes for indicated valve island version:

- Codes DMC*A-*: tube Ø8/6 L=800mm
- Codes DMC*B-*: tube Ø8/6 L=370mm (2 pcs.) + tube Ø4/2 L= 400mm + "TEE" fitting + reducer

For the pneumatic connection of intermediate subbases with diaphragm use, following the version, tubes Ø8/6 for channels 1 and tubes Ø4/2 for channels 12/14 with a minimum length for to allow the pneumatic connection using necessary "TEE" fittings and reductions.

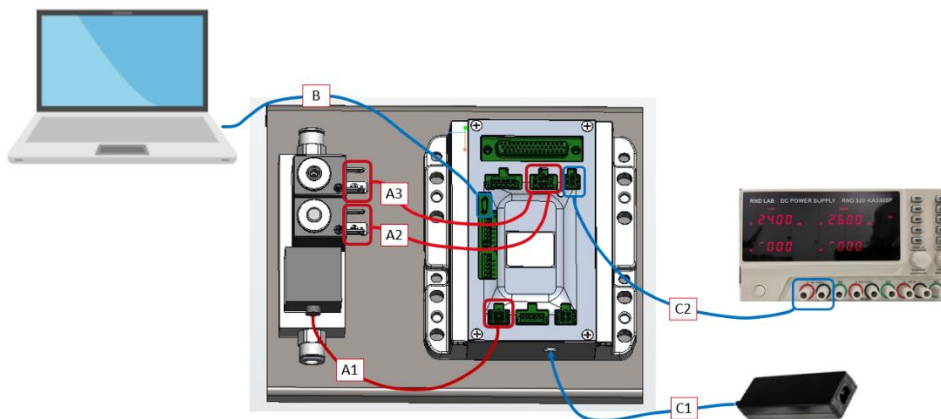
For intermediate subbases with additional flow, it is necessary to close channels 1 and 12/14 with plastic plugs.

- 1 – Tube Ø8/6
(not included - L from test device to the valve island **MUST** be of a length as indicated in NOTES box in the image aside – a different length changes the volume under test and therefore the result of the test)
- 2 – Precision Pressure Regulator (not included)
- 3 – Plastic male plugs (not included)

i The tubes will be damaged with multiple use. Remember to change them periodically; to detect the damage it's recommended to plug the tube and start "test mode: Leakage" program.

i The plastic plugs will be damaged with multiple use. Remember to change them periodically.

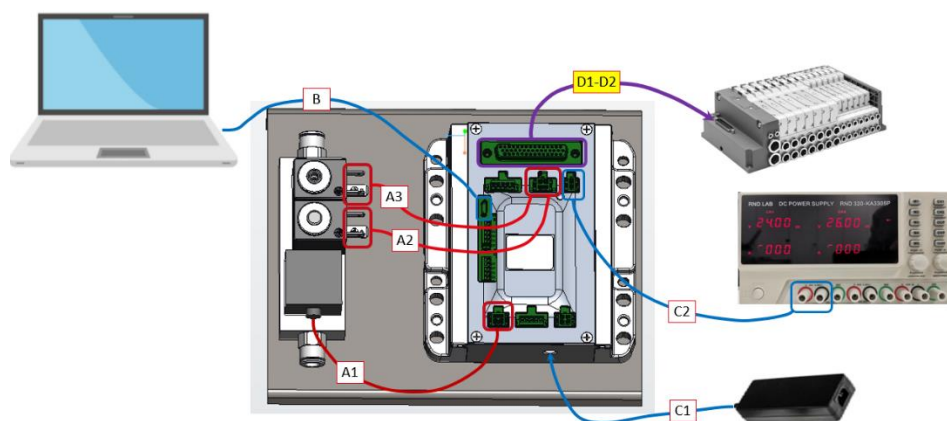
5.4.2 – ELECTRICAL CONNECTIONS – CONTROL PANEL



- 1 - Connect the valves and the digital pressure gauge to the electronic board (A1-A2-A3).
- 2 - Connect the laptop (B).
- 3 - To provide power to the control panel use one of the following options:

- C.1 – by using an AC/DC adapter
- C.2 – by using a DC power supply and cable **EC-140222-A0200**

5.4.3 – ELECTRICAL CONNECTIONS – MULTIPOLE VALVE ISLAND

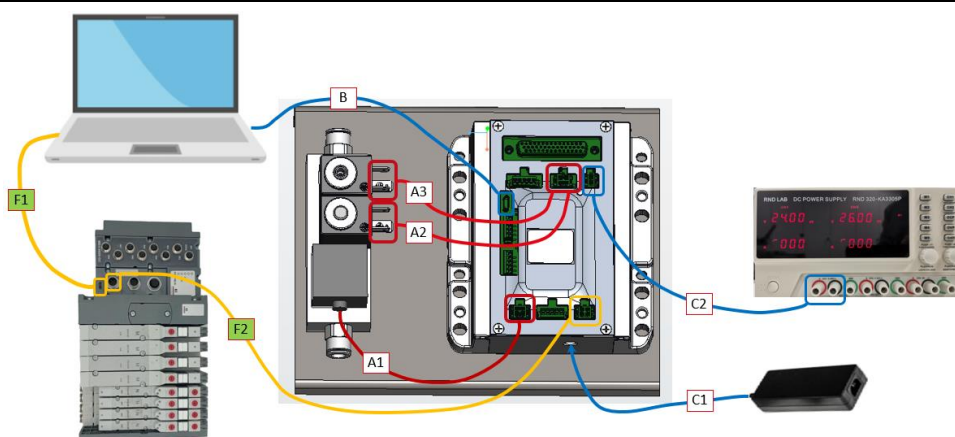


1 - Connect the valve island to the control panel by using the cable D1 or D2



use ESD protections.

5.4.4 – ELECTRICAL CONNECTIONS – FIELDBUS VALVE ISLAND



1 - Connect the valve island to the control panel by using the cable F2 and to the laptop by using the cable F1



use ESD protections.

NOTE: it is possible to connect only ONE module with separation of the electrical supply with the provided cable CX4 \$ - in the case of presence of two or more modules it is necessary to use M8 "TEE" connectors or external power supply.

5.4.5 – SOFTWARE OVERVIEW – SETUP TAB

Username:

To perform a test the operator must insert a personal username (free input). The username will be written in test report file.

Edit setup:

The operator must select the type of electrical connection (multipole or fieldbus) and the size of the valve island (D1, D2, D5 or D4)

i If the selected system type is not correct appears a message with red background. (e.g. selected type: Serial - Valve island under test: Multipolar)

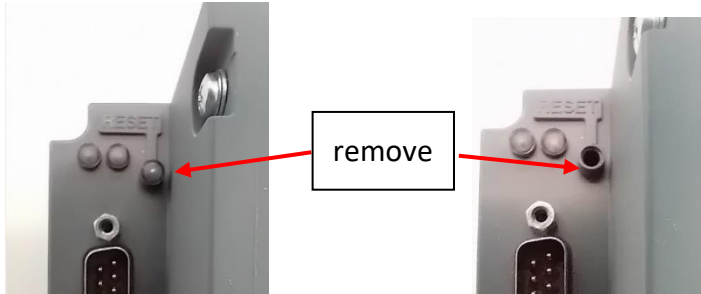
5.4.6 – SOFTWARE OVERVIEW – SETUP TAB

Select setup:

The operator must select the number of valves. Automatically will be selected the max allowed pressure drop. In case of **fieldbus** valve island select **series D tab**. In case of **multipolar** valve island select **Enumeration tab** before to perform the test

i The program doesn't verify the correspondence between the selected number of sub-bases and real number of sub-bases in the valve island therefore it's recommended to visually doublecheck and confirm before to start the test the exact number of valve positions selected. A not correct number of valve position selected will affect the test's result.

5.4.7 – SOFTWARE OVERVIEW – ENUMERATION (ONLY FOR MULTIPOLAR)



Setup
SeriesD
Enumeration
Periodic Test
Info

System type: Multipol25

- Press the button on head
- Click Enumerate button
- Wait while island is turned OFF and then ON
- Wait for LEDs on all valves to turn ON and OFF
- Release the button

As soon as the valve island is connected the red LED lights on. In some cases, a green LED can light on (e.g. modify or adding positions on an already enumerated valve island).

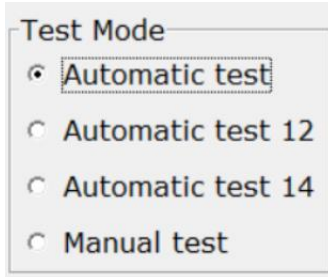
To carry out the enumeration follow the procedure that you see on the software tab:

- remove the reset cap.
- press the reset button
- click “Enumerate” button keeping reset button pressed
- keep the reset button pressed until the LEDs of all the valves are switched on and off
- release the button

Now the valve island is correctly enumerated and a green LED will blink.

5.4.8 – TEST MODES

Four types of tests can be performed:



Automatic test: to use to test valve island.

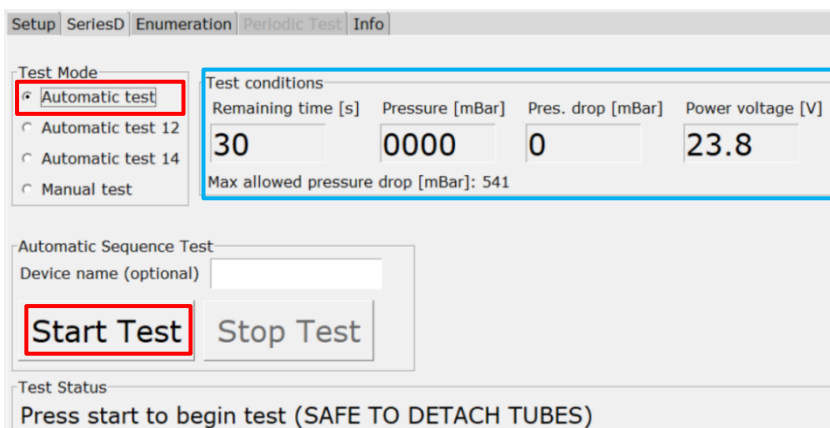
Automatic test 12: to use in case of leakage found when all the valves are activated by pilot side 12 to detect the failed valve position.

Automatic test 14: to use in case of leakage found when all the valves are activated by pilot side 14 to detect the failed valve position.

Manual test: to use if it's not clearly detected the failed valve position or in any other cases.

5.4.9 – AUTOMATIC TEST

i Set the inlet pressure at 6 bars – It's mandatory to use a precision pressure regulator to have a reliable output of the test.



Push "Start test" button:

1 - check that the input pressure has been set within the correct range (5700mba to 6300 mbar).

2 - All the valves are then activated through the pilot valves 14 and the pressure drop is verified. If the pressure drop exceeds the threshold level the test ends.

3 - All the valves are then activated through the pilot valves 12 and the pressure drop is verified (rest position for monostable valves). If the pressure drop exceeds the threshold level the test ends.

Test conditions: Picture of the status of the test.

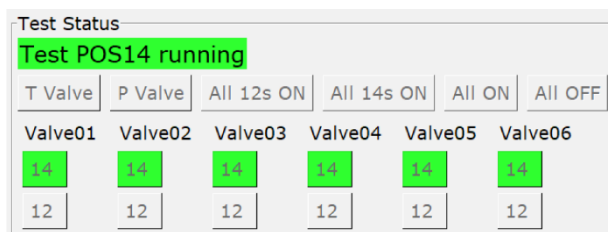
Remaining time: time left until the end of the test.

Pressure: value instantly measured by digital pressure gauge (the displayed value on the software may vary in $\pm 2.5\%$ from the indication the pressure gauge display; this will not affect the test's result).

Pres. drop: this value is compared with the threshold value to define the result of the test

Power voltage: value instantly measured by the interface board.

Test status: Picture of the status of the test.



5.4.10 – AUTOMATIC TEST 12 (OR 14)

Test Mode
☒ Automatic sequence on positions
☐ Automatic sequence on 12 valves
☐ Automatic sequence on 14 valves
☐ Manual

Test conditions
 Remaining time [s] Pressure [mBar] Pres. drop [mBar] Power voltage [V]
 0 2131 1745 23.7
 Max allowed pressure drop [mBar]: 450

Serial SeriesD1

Automatic Sequence Test
 Device name (optional)

Start Test Stop Test Pressure drop = 1745mBar. Threshold = 450mBar

TEST POS 14 PASSED!
TEST POS 12 FAILED!



Automatic Sequence Test
 Device name (optional)

Start Test Stop Test Pressure drop = 633mBar. Threshold = 450mBar
SINGLE VALVES TEST ON POSITION 12 FAILED!

Test Status
 Press start to begin single valves test on position 12

T Valve P Valve All 12s ON All 14s ON All ON All OFF

Valve01	Valve02	Valve03	Valve04	Valve05	Valve06
14	14	14	14	14	14
12	12	12	12	12	12

This picture shows the result of an automatic test: in that case it has been found leakage when pilot valves 12 are activated.

To find the failed valve **Automatic test 12** must be performed.

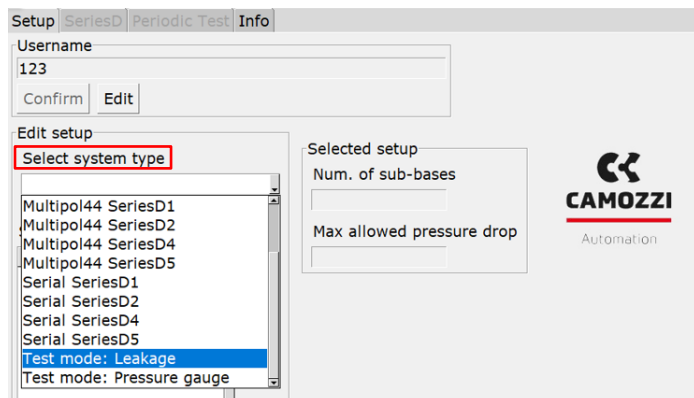
After having start the test 12 (or 14) pilot valves are activated one by one: in particular, when 14 channel is activated on a valve, 12 channels are activated on the other valves. At this point, application waits for countdown, to find which valve position is leaking.

This image shows the result of semi-automatic test on 12 channels with Valve position 2 leaking.

5.4.11 – MANUAL TEST

This test mode allows the operator to manually control all the valves and perform specific tests without being forced to follow pre-programmed sequences and timers.

5.4.12 – PERIODICAL CHECK



Edit setup:


At the bottom of the list “Select system type” select one of the two options:

Test mode: Leakage.

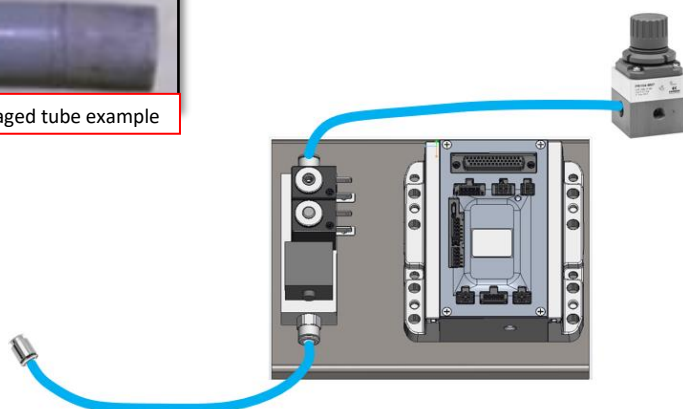
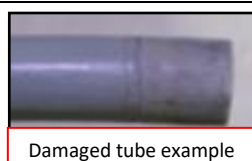
This program must be used to detect potential leakages in the pneumatic circuit.

Test mode: Pressure gauge.

This program must be used to verify the precision of the digital pressure gauge.

 In the case of failure of periodical check, it is necessary to change the 800mm tube. After that, if test fails again, contact Camozzi Technical Assistance.

5.4.13 – PERIODICAL CHECK – TEST MODE: LEAKAGE

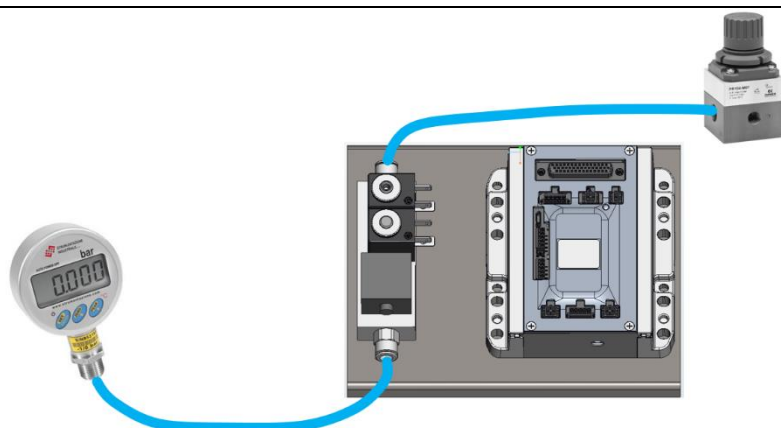


Close the circuit at the end of the 800mm tube which connect the equipment to the valve island and start “Test mode: Leakage” program.

The frequency of this test depends on the number of valve islands tested. A visual check of the end of the tube can help to define it. Anyhow it's recommended to test it at least once in a year.


The maximum leakage admitted for this test is 0,5 bar in 120 seconds (6 cc/min).

5.4.14 – PERIODICAL CHECK – TEST MODE: PRESSURE GAUGE



To perform this validation, connect a digital pressure gauge with precision of $\pm 1\text{mbar}$ at the end of the 800mm tube which connect the equipment to the valve island and start “Test mode: Pressure gauge” program.

The difference between the two values must be lower than $\pm 0.2\text{bar}$

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6. Test report.

The application generates test report files in CSV textual format: one report file is created per single day; if the application is launched more than once during the same day, new lines are added to the file which has previously been created. The file name is:

TestReport.csv. YYYY-MM-DD

Where YYYY-MM-DD is the date of creation. The file is organized in sections: each section reports details and results of a fully automatic test run. Only fully automatic tests are reported: semi-automatic and manual trials are not recorded.

For each run, the following records are added:

Windows Client Version - Application version.

Username

Device name - Nickname of the island to be tested.

Interface Board Firmware Version - Firmware Version of the multipolar interface board.

Valves Series

Head Type

Selected Number of Valves - Number of valves in the island.

Max Allowed Pressure Drop - Maximum pressure drop allowed at the end of test.

Power Supply Voltage [V] - Voltage supply value when test starts.

Measured Pressure [mBar] - Pressure value when test starts.

Min Allowed Pressure [mBar] - Lower limit for the initial pressure range.


Max Allowed Pressure [mBar] - Upper limit for the initial pressure range.

14 Positions Measured Pressure Drop [mBar] - Pressure drop measured on 14 positions.

14 Positions Test Result - Can be: PASSED, FAILED or ABORTED.

12 Positions Measured Pressure Drop [mBar] - Pressure drop measured on 12 positions.

12 Positions Test Result - Can be: PASSED, FAILED (leakage over the admitted limit) or ABORTED (STOP button clicked).

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Here below, an example of a report file:

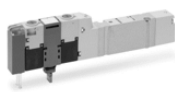


```


10-06-23;10:24:03; *****,*****
10-06-23;10:24:03; Windows Client Version;1.0
10-06-23;10:24:03; Username; dsdsd
10-06-23;10:24:03; Device Name;
10-06-23;10:24:03; Interface Board Firmware Version;.
10-06-23;10:24:03; Valves Series;SeriesD1
10-06-23;10:24:03; Head Type;Multipol44
10-06-23;10:24:03; Selected Number of Valves;4
10-06-23;10:24:03; Max Allowed Pressure Drop;390
10-06-23;10:24:06; Power Supply Voltage [V];23.6
10-06-23;10:24:06; Measured Pressure [mBar];3275
10-06-23;10:24:06; Min Allowed Pressure [mBar];2900
10-06-23;10:24:06; Max Allowed Pressure [mBar];6200
10-06-23;10:24:16; 14 Positions Measured Pressure Drop [mBar];0
10-06-23;10:24:16; 14 Positions Test Result;PASSED
10-06-23;10:24:31; 12 Positions Measured Pressure Drop [mBar];70
10-06-23;10:24:31; 12 Positions Test Result;PASSED
10-06-23;10:27:40; *****,*****
10-06-23;10:27:40; Windows Client Version;1.0
10-06-23;10:27:40; User Name;dsds
10-06-23;10:27:40; Device Name;
10-06-23;10:27:40; Interface Board Firmware Version;.
10-06-23;10:27:40; Valves Series;SeriesD1
10-06-23;10:27:40; Head Type;Multipol44
10-06-23;10:27:40; Selected Number of Valves;4
10-06-23;10:27:40; Max Allowed Pressure Drop;390
10-06-23;10:27:43; Power Supply Voltage [V];23.6
10-06-23;10:27:43; Measured Pressure [mBar];3364
10-06-23;10:27:43; Min Allowed Pressure [mBar];2900
10-06-23;10:27:43; Max Allowed Pressure [mBar];6200
10-06-23;10:27:45; Test Result;ABORTED (Stop button)

```

7. Troubleshooting

CYCLE PHASE	PHASE NAME	FIELD BUS	MULTIPOLE	FAIL	PARTS INVOLVED	ROOT CAUSE	HOW TO REPAIR	NOTES
-	Visual verify of valve island code	X	X	Valve island code does not uniform with the assembled valves'sequence		Mistakes on valves'assembly sequence or subbases'assembly sequence	Visual verify of valve island code vs. assembled valves codes, change valves'sequence on the assembly	
	Enumeration			Error on enumeration		fail of connector	Replace connector	check LED light working (steady on) on subbases - replace connector on first LED light not working position
						Valve position does not work (LED light not working on valve's position)	replace subbase	
						Electric interface does not work	replace electric interface	
						Valve position does not work (LED light not working on FIRST valve's position)	replace subbase	

CYCLE PHASE	PHASE NAME	FIELD BUS	MULTIPOLE	FAIL	PARTS INVOLVED	ROOT CAUSE	HOW TO REPAIR	NOTES
-	Pneumatic seal activated 14 then 12	X	X	Air leakage		Test machine's tube not inserted correctly in "1" collet - external air leakage from hose	Verify pneumatic connections, control with bubbles - cut the terminal part of the tube on the position where bubbles are found	Cut the tube when it appears with collet marks on, see image below 
						External leakage from male plug on channels "2" and "4"	Replace the male plug on the position indicated by the test machine	
						Connection cartridges'OR seals broken	replace connection cartridge on the position indicated by the test machine	
						Pneumatic leakage from valve	replace the valve on the position indicated by the test machine	
						Pneumatic leakage from subbases'seals - seals are not present or broken	Replace the subbase on the position indicated by the test machine	As first step, check valve'seal before to replace the subbase - if seal is ok, replace the complete subbase

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8. Use limitations.

1. Do not exceed the operating conditions illustrated within either the "General Characteristics" section of this document.
2. Do not install the product in zones where the air can cause hazards.
3. Do not use the product in environments where there may be direct contact with corrosive gases, chemicals, salt water, steam, or water.

9. Maintenance

1. Maintenance procedures which are not carried out correctly can compromise the product functionality.
2. Always remove the condensate from any filters present in the line.
3. Check if it is possible to return the product to an authorised service centre.
4. Do not disassemble when pressure is applied.
5. Use safety equipment in accordance with national laws and authorities' specifications.
6. The replacement of worn pieces with spare parts, when permitted, must only be carried out by specialized and authorized personnel.

10. Ecological information

1. At the end of the life of the product, it is recommended that the materials are separated so that they can be recycled where possible.
2. Dispose of the product and the packaging material according to the current environmental standards of your country.

11. Contacts

Camozzi Automation S.p.A.

Via Eritrea, 20/I 25126 Brescia - Italy

Tel. +39 030 37921

www.camozzi.com

Technical Assistance

Tel. +39 030 3792790

service.camozzi@camozzi.com