

# **BP-RUMORE**

## **HYDRAULIC BENCH FOR ACOUSTIC TESTS - 2023**

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## **1 - INTRODUCTION**

This test bench is used for R&D of sanitary taps, valves and hydraulic components or to compare different products. The test rig is designed in compliance with EN ISO 3822 standard, the noise is measured by using a specific microphone inserted into the pipe, so it is possible to carry out the measurement of the noise produced by taps and hydraulic appliances used in water distribution plants.

This method is in compliance with EN ISO 3822 standards and avoids the construction of an anechoic room. It is possible to operate in laboratory because the ambient background noise does not influence the measure.

The bench can not be used for official measures.

### **ADDITIONAL EQUIPMENTS AND ACCESSORIES:**

- 2FIBP-INS-STD                      working reference noise generator.
- KIT-RESISTENZE                    kit of hydraulic resistances.
- SERV.KIT-RUMORE                service kit of accessories for acoustic test bench.

## 2 - CONFIGURATION OF THE BENCH

### 2.1 - BP-RUMORE

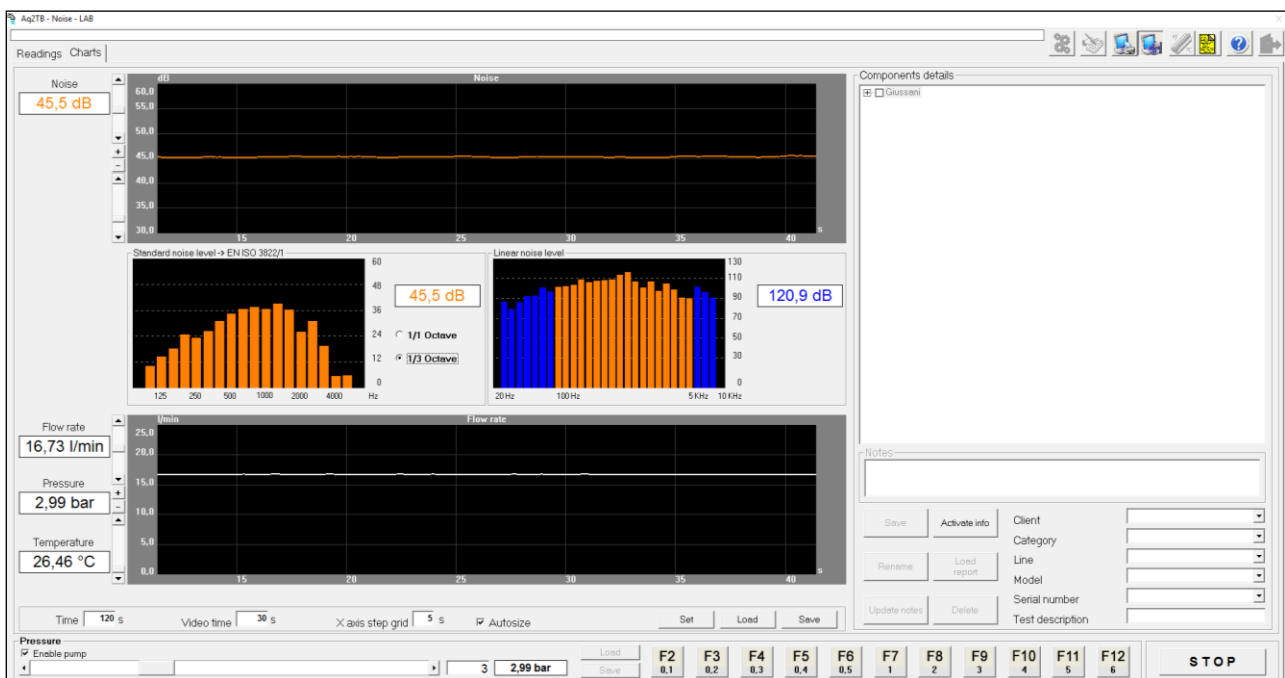
- Flow rate: 0-47 L/min.
- Pressure range: 0,1-8 bar.
- Max pressure at 50 L/min 6 bar (free outlet).
- Water temperature: Ambient.
- Noise: 0-117 dB.

#### 2.1.1 - Applications:

Measurement of the noise produced by taps and hydraulic appliances used in water distribution plants.

#### 2.1.2 - Basic software installed:

- A) **AQ2TB-BASEMOD** “SWG” service software with multichannel acquisition engine, management of users, calibration, change of language, messages, water and air temperature regulation (if available on the bench).
- B) **AQ2TB-NOISE** Noise analysis is carried out by the computer using a dedicated software: the monitor displays the values of pressure, temperature and flow-rate related to the noise level, showing the total spectrum in octaves and elaborating the data to calculate the global noise level (in dB). The overall noise produced by the component under test is represented by the histogram on the right; the total value is indicated at the side and expressed in dB. Only values within the range 100 to 5000 Hz, measured in third octave, contribute to determine the noise level searched (orange bars). The values are corrected by the A-weighting according to EN 60651 Standards and by the calibration matrix, calculated during the calibration of the bench, by means of the noise sample.



- |                          |                                                                   |
|--------------------------|-------------------------------------------------------------------|
| C) <b>WINDOWS 10</b>     | OEM Multilanguage.                                                |
| D) <b>MACRIUM BACKUP</b> | software for automatic back up of test data and operative system. |
| E) <b>TEAM VIEWER</b>    | internet remote control.                                          |

*Basic software included is in Italian language + second language English or German. Others language only by request with extra cost.*

### **2.1.3 - Ethernet connection:**

The test bench is provided with Ethernet plug in order to allow the connection to Internet and enable the remote assistance functionalities through TEAMVIEWER software (installed by default on the PC).

The Ethernet plug also allows the integration of the bench inside the customer's network (intranet). In this way is possible to export data and reports and remotely check the functioning of the bench. It allows, in conjunction with AQ2TB-MANSYS software, the incoming (from corporate server to test bench) and outgoing data exchange (from bench to server).

### **2.1.4 - Main components:**

- **Multi-stage vertical pump** with speed control, inverter and feedback pressure transducers. Pressure adjustable from 0,1 up to 8 bar, maximum flow-rate 47 L/min, the pressure is kept constant independently of the supply flow-rate.
- **Electromagnetic flow meter** with range 0,2 ÷47 L/min with pipe line according to the Standard.
- **Temperature probe** for measuring the supply water temperature at high-speed response.
- **Moving carriage** with test rig and transducers.
- Test plant with pipes with sections and dimensions in compliance with **EN ISO 3822** Standards.
- Measurement tube mounted on sliding supports that can be shifted in height.
- Stainless steel test sockets, standard construction with plugs for pressure transducer and microphone specifically designed to be used for noise measurements in fluids.
- **Analogical acoustic noise meter**, with A weighting, selector for slow & fast functions, field 0÷117 dB, max error ±1 dB.
- **Acquisition card** and dedicated software.

### **2.1.5 - PC and software:**

#### **Installed WORKSTATION consisting of:**

- **Intel processor** – the configuration changes according the last components in the market: acquisition card National Instruments, network cards, two hard disks, DVD burner.
- **Keyboard and mouse wireless.**
- **A4 colour laser printer and support trolley – Code: KIT-LASERPRINTER.**
- **23” LCD monitor** 16:9, assembled on adjustable holder.
  - Available on request **Touchscreen monitor - Code: 4MONITOR23-TS.**
- **UPS power supply 500 W.**
- **Back-up external unit – USB HDD.**
- **Instruction manuals and Help on-line.**

#### **Operative system and acquisition software SWG:**

- Operative system: **Windows 10 Enterprise LTSC.**
- **Dedicated software: SWG 2023** to perform hydraulic tests.

The new multilanguage software SWG allows to work with different units of measure, it allows to acquire the parameters for the functioning of the bench and to provide documentation for the tests through the following screens:

  - ◇ Direct access to the various installed applications.
  - ◇ Main screen showing the virtual synoptically panel, with all the measures acquired in real time.
  - ◇ Specific screen showing the flow-rate and total noise as a function of time in a graphic format with adjustable video size, possibility to perform enlargements of the working area, final summary data with the minimum and maximum values at the end of the acquisition. The system show also the spectrum of the noise in real time and, at the end of the acquisition, it is possible to analyse the spectrum of the maximum noise level measured.
  - ◇ Final report with all the test data and a significant video screen. It is possible to generate each report in different languages.
  - ◇ It is possible to control the pump by clicking with the mouse on the graphic symbol representing each components in the synoptic panel.
  - ◇ All the existing screens may be printed with customer’s notes and logo.
  - ◇ Help On-line support, with all the main operational instructions.

### **2.1.6 - Structural characteristic of the bench:**

- Supporting structural frame made of aluminium and laminated panels.
- Slide guide for holder, anticorodal made for fixing the samples under test.
- Assembly on rotating wheels provided with parking brakes.
- Working tank in stainless steel (1,5 mm) with drain.
- Internal hydraulic plant for the supply water, made with stainless steel piping, adequate to supply at the maximum nominal flow-rate.
- Internal separation between hydraulic plant and the area with PC and electrical cabling.

### 2.1.7 - Transducers installed:

TEMPERATURE:	accuracy $\pm 0,3$ °C, resolution 0,01 °C. Pt100 low-inertia, 3-wires probes.
PRESSURE:	operative range 0-10 bar. accuracy $\pm 0,05\%$ of the full-scale value. resolution 0,01 bar, pressure probes with high dynamic response.
FLOW-RATE:	accuracy $\pm 0,25\%$ of reading value (from 5 to 47 L/min). resolution 0,01 L/min with precision electromagnetic flow meter with output connected to microprocessor converter.
NOISE:	accuracy $\pm 1$ dB, resolution 0,1 dB. analogical noise meter.

**The measuring equipment assembled on the bench is equipped with an inspection report relative to the operational fields and performed according to the ISO 9001 standards, with reference to the ACCREDIA (Italian Calibration Service) primary samples.**

**The test bench is provided with a final test report of electrical safety according to standard CEI EN 60204-1 and CE declaration of conformity.**

### 2.1.8 - Technical data:

WEIGHT AND DIMENSION	
- LENGTH	1500 mm
- DEPTH	1500 mm
- HEIGHT	1800 mm
- WEIGHT (APPROX.)	350 kg
SUPPLY CHARACTERISTICS	
- ELECTRICAL SUPPLY	400 V 3 phases + N + GND 50 Hz
- POWER	2,0 kW
- HYDRAULIC SUPPLY	From internal tank
- HYDRAULIC PUMP MAXIMUM FLOW RATE	47 L/min
- WATER DRAIN FLOW	80 L/min
- WATER TEMPERATURE	10÷35 °C

## 2.2 - EXAMPLE



## 2.3 - Service functionalities

- AQ2TB-OPZ-MLG** Possibility to generate and print in five different languages (Italian, English, German, French and Spanish) all the test reports. The language of the report is independent from the language of the software. Each report can be generated more than one time in different languages.
- AQ2TB-DATA-EXP** Possibility to export in a TXT format file all the samples acquired during a test. It is possible to activate this function for all the software; this function is independent by the graphs shown in each software. For laboratory tests, it is possible to export the data of the entire test. For endurance tests, it is possible to export data of a single cycle, the number of saved cycle can be chosen by the operator. The maximum acquisition frequency is about 10 Hz (sample per second) for each channel.
- AQ2TB-DATA-INFO** Additional option for the personalization of the test information in all the active languages. The standard menu, composed in English by the entries “*Client*”, “*Category*”, “*Line*”, “*Model*”, “*Serial number*” and “*Test description*” can be modified in order to adapt the management of the tests on bench (including the reports) to the modality adopted by the company internally.



## 2.4 - AQ2TB-MANSYS

This optional software, installable on one or more PCs with suitable characteristics and integrated into the company network, can be used for remote management activities on the test bench.

### Software specification:

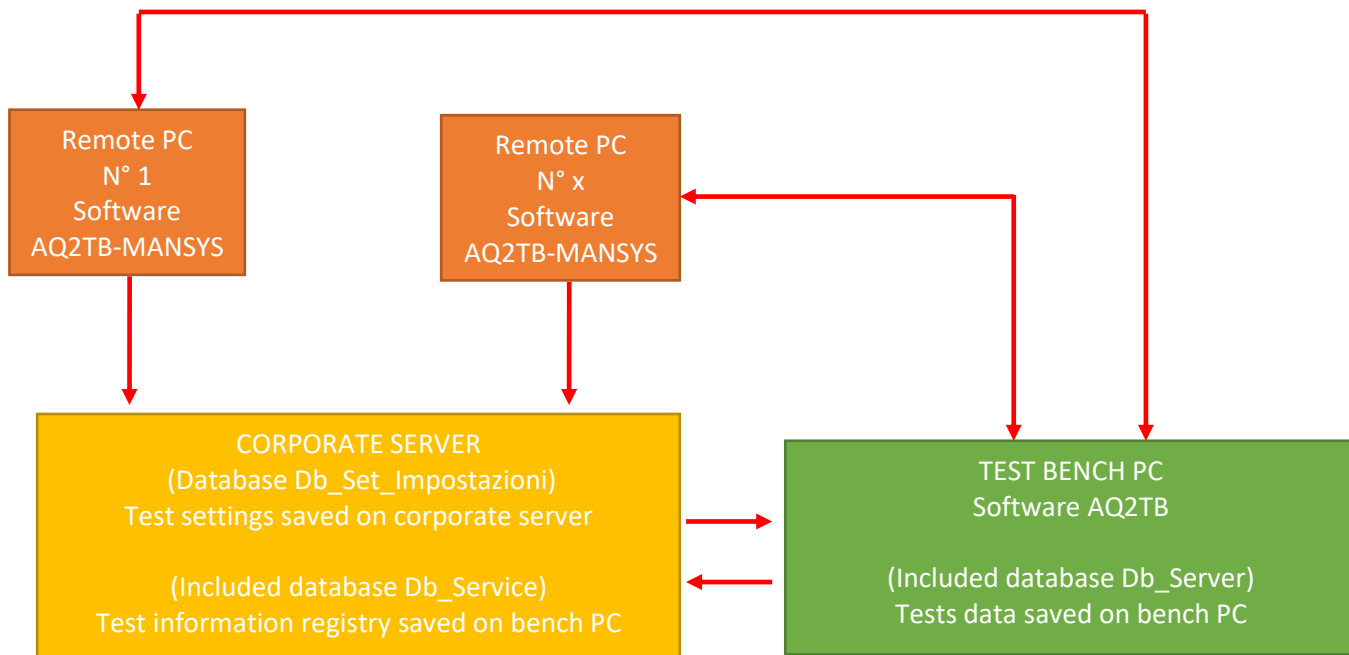
- The software allows the remote creation, modification and cancellation of the tests execution parameters for each test. (\*)
- The software allows the access to the test data and, consequently, to their analysis and exportation; it allows the creation of the test report independently from the activity carried out on the bench in that moment. (\*\*)
- It allows the visualisation of the bench status (normal functioning or in alarm) and the kind of test in execution in real time. (\*\*)
- It allows the creation of test information registry usable on the bench during the saving procedure. (\*)

\* The bench will not have access to data in case of absence of network connection.

\*\* Features active only in case of available network connection.

### Notes:

- In case of absence of network connection, the normal functioning of the bench is always guarantee.
- The effective functioning of the software depends on the corporate server features, and cannot be guaranteed before the start-up of the bench.



### 3 - Accessories

#### 3.1 - Installation noise standard

Master noise generator (INS) 45 dB for the calibration of the bench with ISO 17025 calibration report.

Including connection bend, fittings and carrying case.

Code: **2FIBP-INS-STD**

As an alternative: installation noise standard with reference report to the INS master.

Code: **2FIBP-INS-WORK**

#### 3.2 - HYDRAULIC RESISTANCES KIT

Code: **KIT-RESISTENZE**

Kit of hydraulic resistances for noise test (N° 5 pcs) according the standards EN-ISO 3822-4

TYPE	Flow rate at 3 bar (L/s)	Flow rate at 3 bar (L/min)
Class Z	0,15	9,0
R25 class A	0,25	15,0
R33 class S	0,33	19,8
R42 class B	0,42	25,2
R50 class C	0,50	30,0
R63 class D	0,63	37,8

Adaptors to connect the resistances to the taps under test:

- Type A1 male
  - ◇ N°1 mod. M22x1
  - ◇ N°1 mod. M24x1
  - ◇ N°1 mod. ½" G.
  - ◇ N°1 mod. ¾" G.
- Type A2 female
  - ◇ N°1 mod. M22x1
  - ◇ N°1 mod. M24x1
  - ◇ N°1 mod. ½" G.
  - ◇ N°1 mod. ¾" G.

N°1 special adaptor type A1.0 M16x1 / M28x1.

Flow rate and noise level test report at 3 bar.



### **3.3 - Service kit for BP-RUMORE**

The service kit includes reductions, nipples, bends, hoses, gaskets, accessories and spare parts for the connection of the taps on the test station of the test bench.

**Code: SERV.KIT-RUMORE**

## **4 - PACKAGING**

### **4.1 - BP-RUMORE packaging**

Wooden box with anti-vibrating damper.

Exp. model with sealed plastic bag and ISPM treatment.

Code: 8CASSABPR160EXP