



Measurement Report

Grana Ltd

Acoustical measurements
of basin faucet 10302

3.1.2017

Project 2895.67



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1. General information

1.1. Customer

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1.2. Measurements and report

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1.3. Date

Measurements: 27.12.2016
Report: 3.1.2017

1.4. Assignment and laboratory accreditation

The assignment was to measure acoustical parameters (appliance sound pressure level L_{ap} and the corresponding acoustic class if applicable at flow pressures of 3,0 bar and 5,0 bar) of the basin faucet 10302.

All measurements in this measurement report are included in Engineering Office W. Zenner Ltd. laboratory accreditation (accreditation according to SFS-EN ISO/IEC 17025 [1], FINAS T276).

1.5. Water supply appliance under test

Water supply appliances under test were basin faucets (3 pcs, product number 10302), which were obtained from the Grana Ltd. storage. The body of the faucet is manufactured from chromed brass. The mixing valve is ceramic.

The faucet consists of the body and the spout outlet. Water connection hoses are manufactured from PE-X-plastic tubes covered with metal twine. The faucet is connected to the water supply network with pressing coupling. Regulation of the faucet's water flow rate and temperature is performed with a single lever control. The measured faucet type is presented in figure 1. A technical drawing of the tested faucet type is shown in annex A.



Figure 1. Measured basin faucet 10302.

1.6. Used instrumentation

Measurement room ~ 52 m³

Reverberation time of the measurement room (T20):

125 Hz	250 Hz	500 Hz	100 Hz	2000 Hz	4000 Hz
3,06 s	2,96 s	2,51 s	1,98 s	1,58 s	1,23 s

Water supply appliance test pipe (according to ISO 3822)

INS-noise sources, 4 pcs. (according to ISO 3822)

Test wall (light concrete) 9 m², ca. 150 kg/m²

Grant SQ2020-2FR – 16/8-channel datalogger

Sinus Apollo – multichannel real time analyser (4-channel)

Gras46AE – measurement microphones, 4 pcs.

Brüel & Kjær type 4231 – sound level calibrator (IEC class 1)

Valmet MT2.5A – water flow meter

Aplisens APC-2000ALW – pressure difference transmitter

Laboratory mercury thermometers

Laboratory mercury barometer

2. Measurement procedure

Acoustical measurements (determination of acoustic class)

Appliance sound pressure levels of the faucets were measured in different temperature positions while the faucet was in the "fully open" position. With this procedure the faucet's maximum sound pressure level could be determined.

Appliance sound pressure levels were measured in five different flow pressures / rates. In each flow pressure situation, faucet's temperature control device was set in middle / full hot / full cold positions. Measurements were performed according to standards SFS-EN ISO 3822-1 [2], SFS-EN ISO 3822-2 [3], and ISO 3822-4 [4]. Appliance sound pressure level L_{ap} was calculated from measured values at flow pressures of 3,0 bar and 5,0 bar. The acoustic class of the faucet was determined from L_{ap} according to standard SFS-EN 817 [5]. Limits of the acoustic classes are presented in table 1.

Table 1. Acoustic classification according to standard SFS-EN 817 [5].

Flow pressure	Appliance sound pressure level	Acoustic class
3,0 bar	$L_{ap} \leq 20$ dB	Class 1: I
	$20 \text{ dB} < L_{ap} \leq 30$ dB	Class 2: II
	$L_{ap} > 30$ dB	Not classified: U

Measurement principle and instrumentation in acoustic measurements are presented in figure 2.

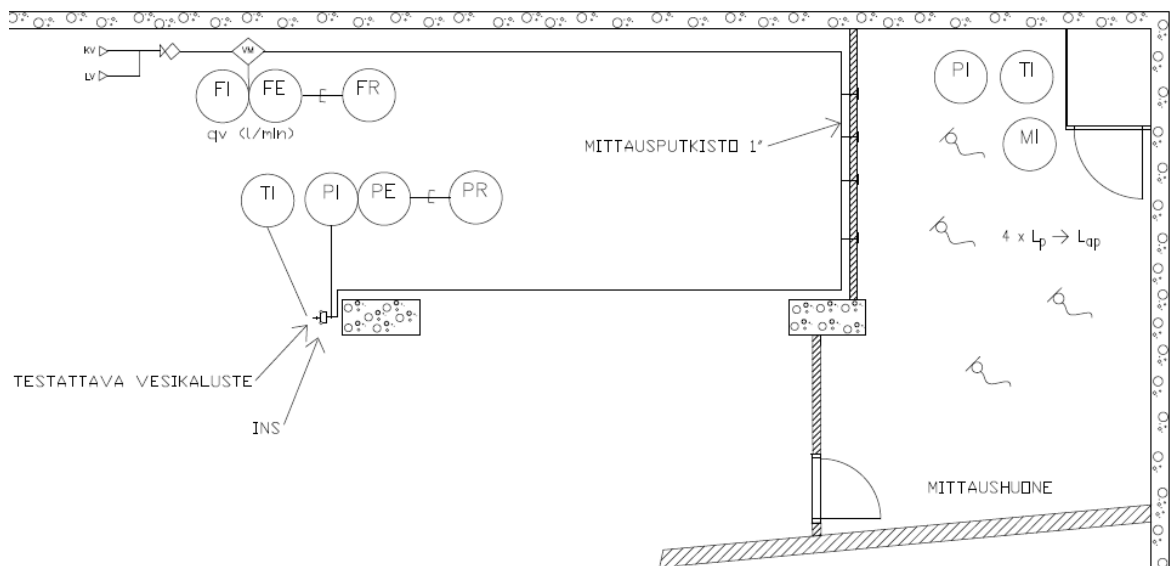


Figure 2. Measurement principle in acoustic tests of water supply appliances.

3. Results

Appliance sound pressure levels L_{ap} , flow rates, and corresponding acoustic class (for 3,0 bar measurement) in flow pressures of 3,0 bar and 5,0 bar of the measured faucets are presented in tables 2 and 3 respectively.

Results are valid only for the measured appliances. The estimated accuracy of the flow rate and pressure measurements is $\pm 2\%$ and the estimated accuracy of the appliance sound pressure levels L_{ap} are $\pm 1,5$ dB.

Table 2. Appliance sound pressure levels, flow rates and acoustic class of basin faucet 10302 in the flow pressure of 3,0 bar.

Engineering office W. Zenner Oy identifier no.	Temperature control position	Measured L_{ap} [dB]	q_v [l/min]	Acoustic class
2895.67.1	Middle position	18	14,6	I
	Cold	17	12,8	
	Hot	13	13,3	
2895.67.2	Middle position	17	14,5	
	Cold	15	12,9	
	Hot	15	13,1	
2895.67.3	Middle position	18	14,0	
	Cold	16	12,6	
	Hot	14	12,9	
Average of maximum levels		18	14,4	
I	Class 1, $L_{ap} \leq 20$ dB			
II	Class 2, $20 \text{ dB} < L_{ap} \leq 30$ dB			
U	Unclassified, $L_{ap} > 30$ dB			

According to the performed measurements, the measured water supply appliance type belongs to acoustic class 1.

Table 3. Appliance sound pressure levels and flow rates of basin faucet 10302 in the flow pressure of 5,0 bar.

Engineering office W. Zenner Oy identifier no.	Temperature control position	Measured L_{ap} [dB]	q_v [l/min]
2895.67.1	Middle position	22	18,8
	Cold	21	16,5
	Hot	18	17,2
2895.67.2	Middle position	21	18,8
	Cold	19	16,8
	Hot	20	17,0
2895.67.3	Middle position	23	18,2
	Cold	20	16,4
	Hot	19	16,7
Average of maximum levels		22	18,6

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References

- [1] SFS-EN ISO/IEC 17025. *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005).*
- [2] SFS-EN ISO 3822-1:1999. *Acoustics. Laboratory tests on noise emission from appliances and equipment used in water supply installations. Part 1: Method of measurement.*
- [3] SFS-EN ISO 3822-2:1995. *Acoustics. Laboratory tests on noise emission from appliances and equipment used in water supply installations. Part 2: Mounting and operating conditions for draw-off taps and mixing valves.*
- [4] SFS-EN ISO 3822-4:1997. *Acoustics. Laboratory tests on noise emission from appliances and equipment used in water supply installations. Part 4: Mounting and operating conditions for special appliances.*
- [5] SFS-EN 817:2008. *Sanitary tapware. Mechanical mixing valves (PN10). General technical specifications.*

Annexes

Annex A Technical drawing of the measured faucet type.



Annex A

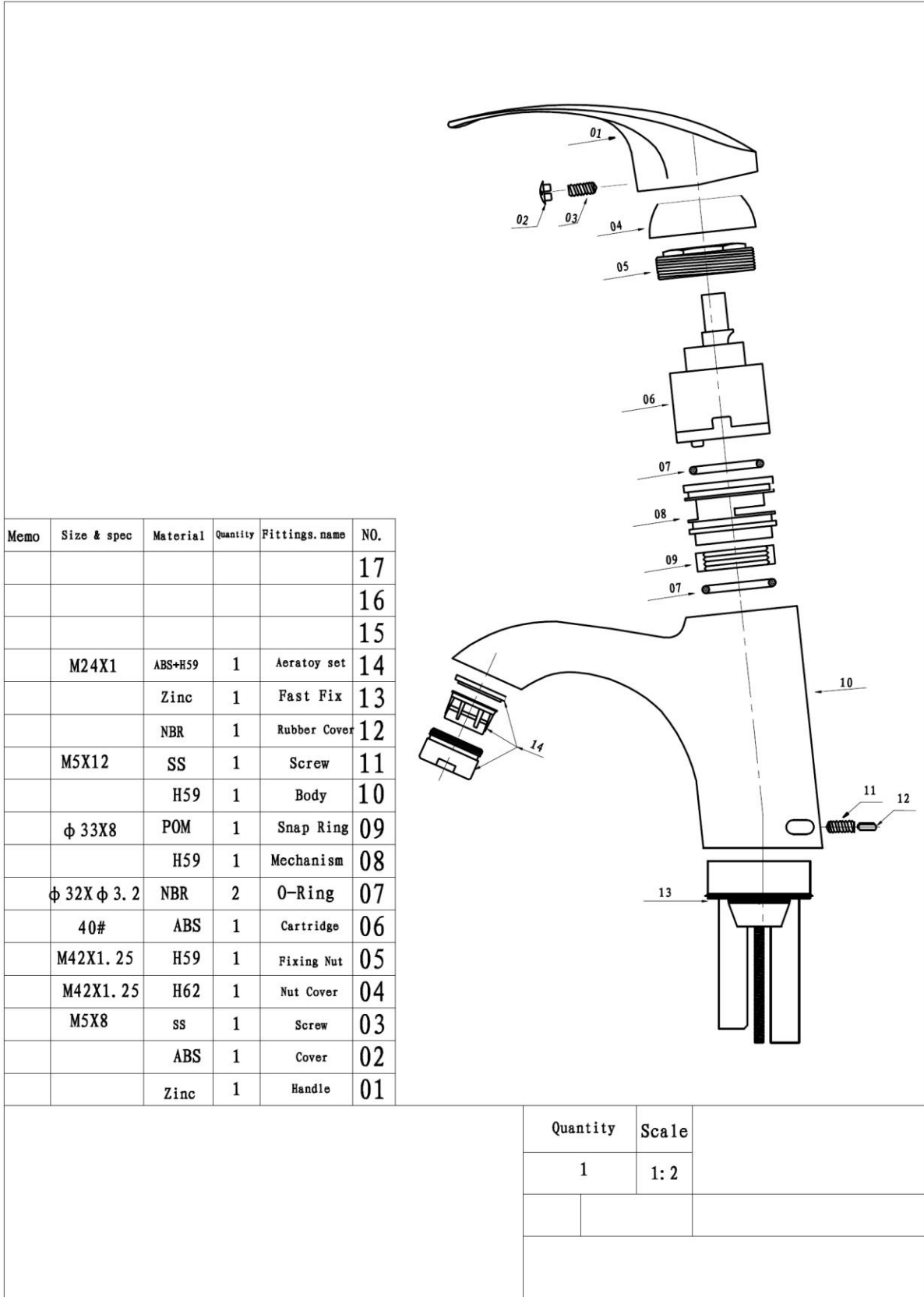


Figure A-1. Technical drawing of the measured faucet type (not in scale).