



SINCE 1896

# REPORT

**Intertek** ETL SEMKO

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Order No. 3093818

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## INDOOR AND OUTDOOR SOUND POWER LEVEL TESTS AND SOUND TRANSMISSION LOSS TESTS ON AN APPLIED COMFORT MODEL DMQB12K34S2U40 PACKAGE TERMINAL AIR CONDITIONER

### RENDERED TO

APPLIED COMFORT PRODUCTS, INC.  
1210 BALMORAL ROAD  
CAMBRIDGE, ONTARIO, CAN, N1T 1A5

### INTRODUCTION

This report gives the results of Indoor and Outdoor Sound Power Level tests with Sound Ratings and Sound Transmission Loss tests conducted on an Applied Comfort Products Model DMQB12K34S2U40 Packaged Terminal Air Conditioner. The unit was selected and supplied by the client and was received at the laboratories on May 31, 2006. It appeared to be in new, unused condition.

### AUTHORIZATION

Signed Intertek quotation number 19716599.

### TEST METHOD

The laboratory method used in conducting these tests is in accordance with ARI 300-2000 "Sound Rating and Sound Transmission Loss of Packaged Terminal Equipment". The air conditioner was mounted in the wall of our 16,640 cu. ft. reverberation room. The wall was constructed to minimize any wall vibration effects. Indoor/outdoor tests were conducted in accordance with ARI Standard 350 and 270 respectively. During cooling tests temperature and humidity conditions in the outdoor and indoor rooms were in accordance with the standards and were held steady for one-half hour prior to and during the test.

Note: The results contained herein are for technical evaluation only and are applicable only to the specific specimens referenced herein.

The tests herein reported have not been performed at the request of the Air Conditioning and Refrigeration Institute (ARI), and use of these findings in any advertising or other literature shall state therein that the test is not part of the ARI Certification Program.

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**TEST METHOD – Cont'd.**

The Bruel & Kjaer Type 4204 reference sound source (RSS) was used to obtain the sound power level data. The sound pressure levels were obtained on a Bruel & Kjaer Digital Frequency Analyzer Model 2131 analyzed on a Compaq Prolinea 4/33 Computer and printed using an Epson LQ-850 Printer.

Sound tests for the determination of sound transmission loss were conducted in accordance with ASTM Standards E90 and E1332. The purpose of the E90 Sound Transmission Class (STC) is to provide a single figure rating that can be used for comparing the sound-insulating properties of partition elements used for general building design purposes. The higher the STC rating is, the greater the sound insulating properties of the partition.

The purpose of the Outdoor-Indoor Transmission Class (OITC) is to provide a single number rating that can be used for comparing building facade designs, including exterior walls, doors, windows, air conditioning units and combinations thereof. This rating is designed to correlate with subjective impressions of the ability of building elements to reduce the overall loudness of ground and air transportation noise. It is intended to be used as a rank ordering device.

**DESCRIPTION OF TEST SPECIMEN**

The test specimen consisted of an Applied Comfort Products Model DMQB12K34S2U40 Packaged Terminal Air Conditioner. The unit was installed in a sleeve equipped with a grille provided by Applied Comfort Products, Inc. Operational tests were performed with the unit operating on 208 and 230 volt, 60 hertz power.

**INSTRUMENTATION:**

Reference Sound Source (RSS): Bruel & Kjaer Type 4204, S/N 2036621, Calibrated June 18, 2006 due June 18, 2009.

Data Acquisition System:

Bruel & Kjaer Digital Frequency Analyzer, Type 2131, S/N 945136, Calibrated March 21, 2006; due March 21, 2007.

Bruel & Kjaer Microphone, Type 4166, S/N 1792711, Calibrated April 7, 2006 due April 7, 2007.

Bruel & Kjaer Calibrator, Type 4231, S/N 2130586, Calibrated March 21, 2006 due March 21, 2007.

Additional System Components:

Bruel & Kjaer Rotating Microphone Boom, Type 3923

Bruel & Kjaer Pre-Amplifier, Type 2619

Bruel & Kjaer High Pass Filter, Type WB0153

Bruel & Kjaer Windscreen, Type UA0237

Checked by: *JK*

**RESULTS OF MEASUREMENTS****Model No. DMQB12K34S2U40**

<b><u>1/3 Octave Band Center Frequency Hz</u></b>	<b><u>Sound Transmission Loss in dB</u></b> (Fresh Air Vent Closed)
80	10
100	13
125	8
160	8
200	16
250	17
315	21
400	23
500	24
630	25
800	27
1000	28
1250	31
1600	32
2000	32
2500	34
3150	36
4000	37
5000	34
Sound Transmission Class	27
Outdoor-Indoor Transmission Class	18

**PRECISION**

For any pair of rooms and microphone system, the 95% confidence interval  $\Delta$ TL, for transmission loss must be less than the following.

Range of One-Third Octave <u>Bands- Hertz</u>	Transmission Loss Uncertainty, dB	
	<u>Required</u>	<u>Actual</u>
125 and 160	3.0	<1.5
200 and 250	2.0	<1.5
315 – 4000	1.0	<1.0

Checked by: *JK*

**RESULTS OF MEASUREMENTS: Cont'd****Model No. DMQB12K34S2U40****INDOOR SOUND****Generated Sound Power Level dB re 10<sup>-12</sup> Watt**

1/3 Octave Band Center Frequency  (Hz)	230 V	230 V	230 V	230 V	230 V	230 V	208 V	208 V
	<b>High Cool</b>	<b>Med Cool</b>	<b>Low Cool</b>	<b>High Fan</b>	<b>Med Fan</b>	<b>Low Fan</b>	<b>Low Cool</b>	<b>Low Fan</b>
100	67.0	62.0	61.0	60.0	59.5	56.5	58.5	54.0
125	74.5	69.5	69.5	65.0	63.0	60.0	70.0	57.5
160	64.0	63.0	62.0	61.5	60.0	58.0	60.5	55.5
200	61.5	60.0	59.0	59.0	58.0	56.0	56.0	53.5
250	58.5	57.0	55.5	57.5	56.5	54.5	53.0	51.5
315	57.0	56.0	54.0	57.0	55.5	53.5	51.5	50.5
400	54.0	52.5	51.0	53.0	52.0	50.0	48.5	47.0
500	51.0	50.5	49.5	50.0	49.0	47.5	47.5	44.5
630	51.0	50.5	49.0	48.5	47.0	44.5	48.0	42.0
800	48.5	47.5	46.5	46.5	45.0	43.0	46.0	39.5
1000	47.5	46.5	45.5	46.0	44.5	43.0	44.0	39.5
1250	43.5	43.0	41.5	43.0	41.5	40.0	41.0	36.5
1600	41.5	40.5	39.5	41.0	39.5	38.5	38.5	35.0
2000	41.0	40.5	39.5	40.5	39.0	37.5	38.0	34.0
2500	39.5	39.5	39.0	39.0	37.5	36.0	38.0	32.0
3150	38.0	38.0	37.5	37.0	35.0	34.0	36.5	29.0
4000	36.5	36.5	36.0	35.0	33.0	32.0	35.0	27.0
5000	36.0	36.0	35.5	34.0	32.0	30.5	35.5	26.0
6300	33.5	34.0	34.0	30.5	28.5	26.5	33.5	23.5
8000	33.0	34.5	34.5	27.0	26.5	25.0	34.0	24.0
10000	35.0	35.0	35.0	27.0	25.0	25.0	36.0	26.0
Tone Adjusted A-Weighted Sound Power Level (dB)	62	60	59	59	57	55	57	52

Checked by: *gkc*

**RESULTS OF MEASUREMENTS: Cont'd****Model No. DMQB12K34S2U40****OUTDOOR SOUND COOLING****Generated Sound Power Level dB re 10<sup>-12</sup> Watt**

1/3 Octave Band Center Frequency  (Hz)	230 V	230 V	230 V	208 V
	<u>High Cool</u>	<u>Med Cool</u>	<u>Low Cool</u>	<u>Low Cool</u>
100	65.5	67.5	68.5	58.0
125	71.0	70.0	69.5	67.0
160	71.5	70.0	68.0	70.0
200	75.0	72.0	69.5	65.5
250	70.0	67.0	66.5	63.5
315	70.0	66.0	65.0	62.0
400	68.5	65.0	64.5	61.5
500	68.5	65.0	64.5	61.0
630	67.5	64.0	63.5	60.0
800	65.0	61.5	61.0	58.0
1000	61.5	58.5	58.0	55.0
1250	59.0	56.5	56.0	54.0
1600	58.5	55.5	57.0	54.5
2000	57.5	55.5	57.0	55.5
2500	57.0	55.5	57.5	56.5
3150	57.5	55.5	57.5	56.0
4000	56.5	55.0	57.5	56.0
5000	55.0	54.0	56.5	55.0
6300	51.5	52.5	55.5	54.0
8000	50.0	52.5	56.0	54.5
10000	49.0	52.5	55.5	54.5
Tone Adjusted A-Weighted Sound Power Level (dB)	74	71	71	69

Checked by: qic

**RESULTS OF MEASUREMENTS: Cont'd****Model No. DMQB12K34S2U40****INDOOR SOUND****Generated Sound Power Level dB re 10<sup>-12</sup> Watt**

1/1 Octave Band Center Frequency  (Hz)	230V	230V	230V	230V	230V	230V	208V	208V
	High Cool	Med Cool	Low Cool	High Fan	Med Fan	Low Fan	Low Cool	Low Fan
125	75.5	71.0	70.5	67.5	66.0	63.0	70.5	60.5
250	64.0	63.0	61.5	62.5	61.5	59.5	58.5	57.0
500	57.0	56.0	54.5	55.5	54.5	52.5	53.0	49.5
1000	51.5	51.0	49.5	50.0	48.5	47.0	49.0	43.5
2000	45.5	45.0	44.0	45.0	43.5	42.0	43.0	38.5
4000	41.5	41.5	41.0	40.5	38.5	37.0	40.5	32.5
8000	38.8	39.5	39.5	33.5	31.5	30.5	39.5	29.5

**OUTDOOR SOUND COOLING****Generated Sound Power Level dB re 10<sup>-12</sup> Watt**

1/1 Octave Band Center Frequency  (Hz)	230V	230V	230V	208V
	High Cool	Med Cool	Low Cool	Low Cool
125	75.0	74.0	73.5	72.0
250	77.0	74.0	72.0	68.5
500	73.0	69.5	69.0	65.5
1000	67.5	64.0	63.5	61.0
2000	62.5	60.5	62.0	60.5
4000	61.0	59.5	62.0	60.5
8000	55.0	57.5	60.5	59.0

Checked by: *Q/C*

**CONCLUSION**

The test method employed for these tests has no pass-fail criteria; therefore, the evaluation of the test results is left to the discretion of the client.

**DATES OF TESTING**

July 28 and 31, 2006

Report Approved by:



James H. Nickelsen  
Senior Project Engineer  
Acoustical Testing

Report Reviewed By:



James R. Kline  
Engineer/Quality Supervisor  
Acoustical Testing

Attachments: None

Checked by: