



Jack Burgess &lt;jack.burgess@ocado.com&gt;

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## Noise issues

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**Scott Jones** <s.jones@riello-ups.co.uk>  
To: Jack Burgess <jack.burgess@ocado.com>

7 August 2017 at 14:41

Hi Jack,

Please see response below. Basically the maximum noise level at 1 meter from the container is 80dBA and this would be at the middle of the back wall (length) of the UPS container only.

### UPS HOUSING

UPS unit as stated: **72dB(A) x 4-off UPS = 78dB(A) housed within our Housing** this level will increase due to reverberation, but the wall construction of the housing gives a minimum **-30dB(A)** of attenuation to this.

NB. As quoted – the UPS housing is lined with perforated sheet steel specifically allow the thermal insulation to also act as acoustic absorption and to reduce the increase in noise level due to reverberation within the housing.

As the inlet ventilation louvres offer minimal attenuation, the inlets will be the dominant Noise source with a typical noise level at 1m from them of **80dB(A)@1m**.

**Fortunately the UPS noise is made up of predominantly high frequency noise so does dissipate quickly with distance.**

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### **Other noise sources external to the UPS housing:**

Are the UPS ventilation fans, which are permanently running at both ends of the unit:

Combined noise for 2 fans running = **76dB(A)@3m** and also contains a tonal low frequency component, which means it doesn't dissipate quickly with distance, but equally doesn't like turning corners either.

Therefore with recent changes and the addition of the external turning cowls (Segregating inlet and discharge airpaths).

This fan noise is now directed vertically – which will significantly improve attenuation with horizontal distance.

**It is reasonable to state 65-70 dB(A)@1m from the end walls of the UPS housing.**

### BATTERY HOUSING

WALL CONSTRUCTION IS AS ABOVE – BUT INTERNAL NOISE LEVELS OF EQUIPMENT ARE LOWER.

So the only meaningful noise source is the HVAC at one end of the unit.

Typical external condenser noise levels **50dB(A)@1m**.

**Therefore the Battery housing will have minimal additive effect on the dominant UPS housing noise levels.**

**NOTES:**

Please note that in order to measure the above noise levels – the background level requires to be not less than 10 dB(A) Lower than the noise emitted from the housing.

At figures less than 10 dB(A) lower an additive effect will be recorded and at zero difference between background and equipment levels the addition will equate to +3dB(A).

As a comparison value: 65dB(A) is considered the level of normal conversational speech.

NB. All comments above assume Free Field Conditions.

Regards,

Scott Jones CDCDP, Prince 2® Practitioner 07935 504 161

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**From:** Jack Burgess [mailto:[jack.burgess@ocado.com](mailto:jack.burgess@ocado.com)]  
**Sent:** 07 August 2017 13:32

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