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Proposed Additional Poultry Units

PLANT NOISE ASSESSMENT

Acoustics Report M2639/R01
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1 Introduction

This acoustic report documents a plant noise assessment for the proposed additional poultry units at Alisons Farm, Great Ponton, Grantham; Figures 1 and 2.

The report is divided into the following sections:

- Section 2: Overview of the Development
- Section 3: Noise Assessment Criteria
- Section 4: Background Noise survey
- Section 5: Plant Noise Assessment
- Section 6: Conclusion
- Appendix A: Survey Data
- Appendix B: Calculations
- Appendix C: Manufacturers noise data

2 Overview of the Development

The proposed scheme is for two additional poultry units (Sheds 7 & 8) at Alisons Farm, Great Ponton, Grantham; Figures 1 and 2. The new sheds will be located to the south of 6 existing poultry buildings.

The plant associated with the proposed additional poultry units will consist of extract fans, namely:

- *Roof fans:* 15 x Fancom 3680 fans per shed, arranged in two rows either side of the ridge
- *Gable end fans:* 4 x Fancom 34130 per shed, located on the west gable ends; Figure 2 Normally the roof extract fans will provide sufficient ventilation on their own; the gable end fans are only required during periods of extreme external temperatures or due to failure of the roof extract fans.

Manufacturers noise data for the fans is provided in Appendix C.

The nearest private dwellings, labelled Receptors A and B in Figure 1, are approximately between 870m and 595m respectively from the proposed additional poultry units.

As a robust approach it has been taken that there will be an unobstructed noise path between the both the roof and gable end extract fans and Receptors A and B for the assessment.

Figure 1. Aerial view (source: www.bing.com) showing proposed additional poultry units, monitor position and assessed receptors

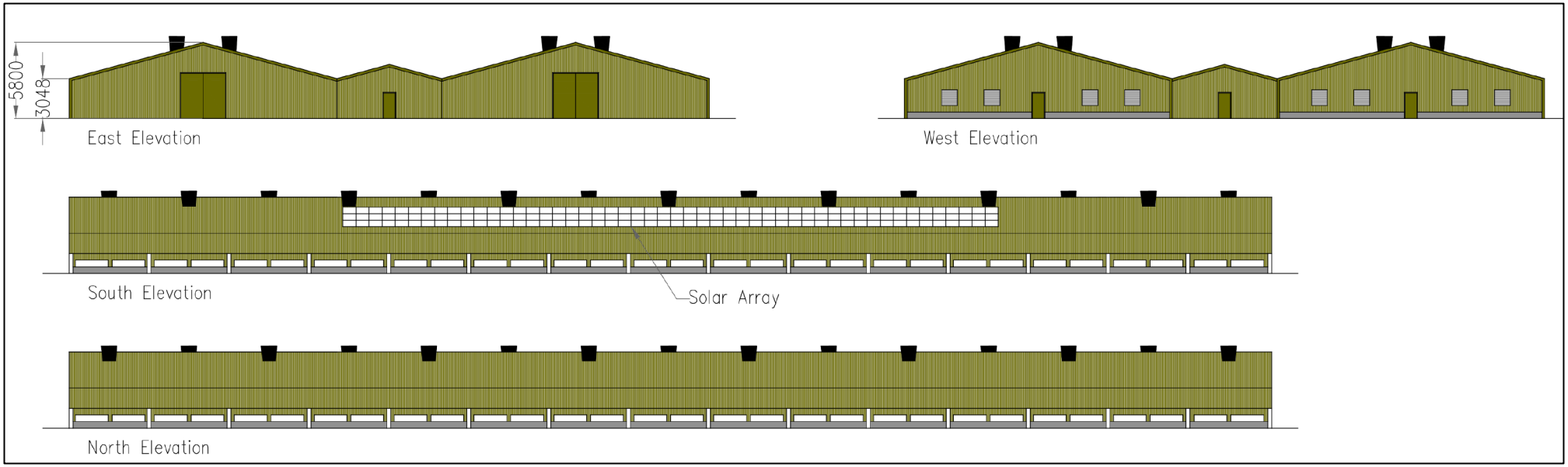


Figure 2. Elevation drawings of proposed poultry units

3 Noise Assessment Criteria

To review the noise impact of the proposed poultry unit's ventilation fans, the following guidance documents have been considered;

3.1 BS4142:2014+A1:2019

BS4142 provides a methodology to assess the impact of industrial and commercial noise affecting dwellings, whereby the 'typical' background noise level is deducted from the industrial noise Rating Level (industrial noise corrected to account for the 'on-time' and noise character of the noise source. The following guidance is given based on the established difference:

- A difference of around +10dB or more is likely to be an indication of significant adverse impact, depending on context
- A difference of +5dB is likely to be an indication of an adverse impact, depending on context
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this
- is an indication of the specific sound source having a low impact, depending on context

Context, as defined in BS4142:2014, includes the consideration of the following factors:

- The absolute level of the noise emissions
- Character and level of the residual sound compared to the character and level of the Specific Level
- Sensitivity of the receptor and any acoustic design measures (e.g., façade sound insulation, use of mechanical ventilation and acoustic screening) incorporated at premises used for residential purposes

To take account of industrial/commercial noise sources that do not operate continually an 'on-time' correction is applied using:

$$- 10 \log (r/r_{ref})$$

Where:

$r_{ref.}$ = reference time (1hr between 07:00 – 23:00hrs and 15 minutes between 23:00 – 07:00hrs)

r = total 'on-time' during the reference period

Note that the shorter reference time interval between 23:00 – 07:00hrs is designed to penalise industrial/commercial noise events that occur during the night.

BS4142 provides four noise character correction categories with associated penalties that must be applied when determining the Rating Level, namely:

- **Tonality:**
  - Not perceptible = 0dB
  - Just perceptible = +2dB
  - Clearly perceptible = +4dB
  - Highly perceptible = +6dB
- **Impulsivity:**
  - Not perceptible = 0dB
  - Just perceptible = +3dB
  - Clearly perceptible = +6dB
  - Highly perceptible = +9dB

- **Intermittency:** +3dB if the intermittency of operation is readily distinctive against the residual noise environment
- **Other:** +3dB applied if the specific sound is neither tonal or impulsive but features noise characteristics that are readily distinctive against the residual noise environment

With regard to noise ingress (noise from outside to inside), BS4142 states that *'The standard is not intended to be applied to the assessment of indoor sound levels'* and the assessment methodology *'... is not intended to be used to assess the extent of the impact at indoor locations'*; in the worked Examples 6 and 8 given in BS4142, comparison with BS8233 noise ingress limits is used to review potential acceptability.

3.2 Noise Ingress (BS8233:2014)

BS8233 provides guidance noise ingress limits for habitable rooms within residential premises, namely;

- Living rooms: $L_{Aeq,16hr}$ 35dB (day)
- Dining room/area: $L_{Aeq,16hr}$ 40dB (day)
- Bedrooms: $L_{Aeq,16hr}$ 35dB (day), $L_{Aeq,8hr}$ 30dB (night)

In order to avoid sleep disturbance, in accordance with guidance given in PRoPG, individual noise events should not exceed 45 dB $L_{Amax,F}$ more than 10 times within bedrooms during the night period.

The above noise limits must be met with windows closed and trickle vents (if applicable) open.

Where the external noise source has a specific character, such as a strong low-frequency content or is irregular enough to attract attention, BS8233 advises lower noise limits might be appropriate.

Though the ventilation fans are not expected to include any adverse noise characteristics, as a conservative approach we consider a noise ingress limit of 5dB below BS8233 noise ingress limits should be designed for.

Purge ventilation, which could be required on occasion to mitigate against overheating, may require open windows. It is generally accepted that there is a compromise between providing rapid ventilation via an open window and the unavoidable higher noise ingress levels (a façade with an open window provides around a 13dB reduction between outside to inside).

For this situation 'Acoustics Ventilation and Overheating - Residential Design Guide: 2020' (AVO) advises that 'reasonable' internal conditions for habitable rooms may be considered to be noise ingress levels up to 5dB above BS8233's noise ingress limits.

In line with AVO's guidance, we therefore consider that 'reasonable' poultry development noise ingress levels via an open window will be 5dB above are suggested noise ingress level with windows closed; this equates to parity with the noise ingress limits given in BS8233.

4 Noise Survey

4.1 Noise Survey

- **Survey dates**: Thursday 7th – Friday 8th May2026
- **Weather;** Table A1, Appendix A:
  - Precipitation: Dry
  - Wind Speed: maximum measured wind speed 3.1m/s, with a median of 1.2m/s
  - Wind direction: The prevailing wind direction was consistently from a south-easterly quadrant throughout the survey, predominantly recorded as SE (80 recordings), ESE (44 recordings), and SSE (32 recordings), with only occasional S readings (4 recordings). This strong clustering within the south-easterly sector, accounting for virtually all observations, indicates stable and consistent meteorological conditions over the survey period.
- **Noise monitor locations:** with the microphone attached to tripod, the noise monitor was located at Position 1 as shown in Figure 1
- **Weather station location:** Weather station, mounted on a tripod, located at Position 1; Figure 1
- **Equipment:**
  - Weather Station: Kestrel type 5500
  - Noise monitors: Brüel & Kjær Type 2238
- **Monitor configuration:**
  - Weather station: Configured to measure the average wind speed and temperature over consecutive 10-minute periods
  - Noise Monitors: configured to measure consecutive 15-minute samples of noise.
- **Calibration:** calibrated before and after the survey using a Brüel & Kjær Type 4231 calibrator with no deviations found

All noise measurements are free-field. Full tabulated results are given in Tables A1 and A2, Appendix A.

The weather conditions will not have adversely affected the noise measurements.

Throughout the survey the existing poultry units were operational.

4.2 Survey observations

During the setting up and collection of the noise monitors it was observed that the noise sources affecting the local area was road traffic on the nearby roads (High Dike and Dallygate Lane), trains pass on the nearby railway line and birdsong.

Activity or plant noise from the existing poultry units was inaudible at Position 1.

4.3 Survey findings

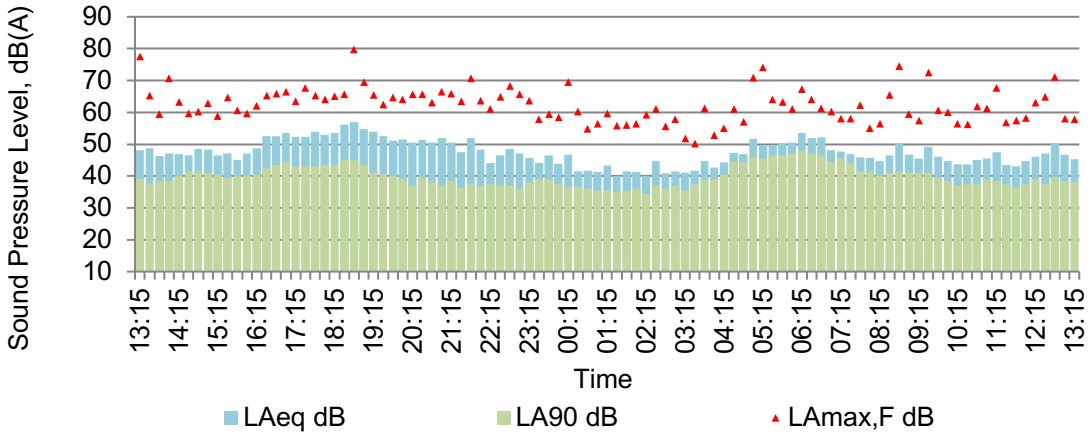
Figure 3 shows the variation in the measured maximum ($L_{Amax,F}$), ambient (L_{Aeq}) and background (L_{A90}) noise levels at Position 1.

Reviewing the survey data, typical background noise levels have been established as:

- Day (07:00 – 20:00hrs): L_{A90} 40dB
- Evening (20:00 – 23:00hrs): L_{A90} 38dB
- Night (23:00 – 07:00hrs): L_{A90} 36dB

The above typical background noise levels are considered to be representative to those that will occur at both Receptors A and B.

Figure 3. Position 1 noise monitor data (free-field)



5 Plant Noise Assessment

5.1 Calculation of Ventilation Fan Noise Emissions at Receptors A and B

The full calculations of the noise emissions from the proposed poultry unit's extract fans are provided in Tables B1 and B2, Appendix B

5.2 Source Noise Data

- Roof fans:
  - Type: Fancom 3680
  - Total number of fans: 15 per shed, split into two rows either side of the ridge; Figure 2
  - Sound pressure level: 70dB(A) at 2m, 45° lateral; see Appendix C for manufacturers data sheet
- Gable End Fans:
  - Type: Fancom 34130
  - Total number of fans: 4 per shed, located on the west gable ends; Figure 2
  - Sound pressure level: 75dB(A) at 2m, 45° lateral; see Appendix C for manufacturers data sheet

5.3 Ventilation fan operation

The temperature within the sheds is determined by a combination of the heat generated by the birds themselves, the external temperature and the ventilation provided by the extract fans.

To provide sufficient ventilation of the bird generated heat, as required to maintain the ideal internal operating temperature of around 20°C, up to 25% of the roof extract fans will be required to operate (either intermittently or on variable speed).

With the influence of the external temperature additional extract fans may be required in order to maintain the ideal operating internal temperature. Here the fans are operated in Stages, triggered with each 1°C rise above the ideal internal temperature. The highest Stage will typically only be triggered when the internal temperature rises above 23°.

Normally the roof extract fans will provide sufficient extraction on their own; the gable end fans are only required during periods of extreme external temperatures or due to failure of the roof extract fans.

The operation of 100% of the roof extract fans, and additionally the gable end fans if required, are only expected to occur during the day period when the external temperatures have the potential to be higher.

During the evening and night, when the external temperature will fall, there will be a corresponding decrease in the number of roof extract fans needed above those for bird generated heat alone; the expected percentage of ridge extract fans required to maintain the set temperature are 50% and 25% for the evening and night periods respectively.

For a robust assessment however, the calculations have reviewed the following scenarios:

- Day (07:00 – 20:00hrs): 100% roof and gable end extract fans operating (this is the worst-case scenario; typically the gable end fans will not be required to operate)
- Evening (20:00 – 23:00hrs): 50% roof extract fans operating
- Night (23:00 – 07:00hrs): 25% roof extract fans operating

5.4 Derivation of Ventilation Fan Noise Emissions

The individual noise level of each extract fan (roof and gable end) has been calculated at Receptors A and B; Figure 1. The following corrections have been applied to the source noise data:

- ***Directivity correction:***
  - Roof fans: correction to convert the fan noise data from the manufacturers stated level at 45° lateral to 90° lateral (the propagation angle for the assessed dwellings), determined using the corrections given in Duct Directivity Index Applications (Day H. Hansen C & Bennett B, Acoustics Australia 96 Vol. 37 December (2009) No. 3). For the calculation a typical axial frequency spectra has been used
  - Gable end fans: correction to convert the fan noise data from the manufacturers stated level at 45° from the termination to the propagation angle for the assessed dwellings, determined using the corrections given in Figure 11.2, p322, Noise Control in Building Services, SRL Ltd. For the calculation a typical frequency spectra has been used
- ***Reflections:*** 3dB added to account for reflections off the poultry shed roof
- ***Distance correction:*** 20 x log (d_1/d_0), where d_1 = distance between receptor and the noise source and d_0 = reference distance.
- ***Shielding attenuation:*** Where the line of sight between the noise source and dwelling is fully blocked by a solid barrier (e.g., by local topography or the sheds themselves) 10dB shielding correction has been applied in accordance with BS5228-1 2009
- ***Ground absorption correction:*** ISO 9613-2: Attenuation of sound during propagation outdoors, Formula 10:

  $$A_{gr} = 4.8 – (2h_m/d)[17 + (300/d)]$$

  Where,

  h_m = mean height of the propagation path above ground
  d = distance from source to receptor

  In accordance with ISO 9613-2 the ground absorption correction is assumed to be zero when the line of sight of the noise source is partially or fully blocked by a solid body (i.e., when a shielding correction is applicable).
- ***Atmospheric attenuation:*** ISO 9613-2: Attenuation of sound during propagation outdoors, Formula 8: $A_{atm} = \alpha d/100$ Where, α = is the atmosphere attenuation coefficient for a temperature of 10°C and 70% relative humidity and d = distance from source to receptor

The attenuation at 500Hz has been used.

- **On-time correction:** it has been assumed that the fans are operating continuously and consequently no 'on-time' correction has been applied

Tables B1 and B2, Appendix B provide the full calculations.

5.5 Rating Levels

To establish the Rating Levels the following BS4142 character corrections have been applied to the established Specific Levels.

- *Tonality:* 0dB; inhouse measurements of operating Fancom fans at other poultry developments confirm that they are not tonal according to BS4142's 'objective' assessment methodology.
- *Impulsivity:* 0dB; the proposed extract fans will not contain an impulsive noise element such as bangs or a very sudden jump in sound output due to quick start-up/change in fan speed.
- *Intermittency:* 0dB; the starting/stopping of individual fans will not be readily distinctive against the residual noise environment and consequently an intermittency penalty is not applicable
- *Other:* 0dB; no 'other' noise characteristics of the fans are expected

Table 1 provides the resultant Rating Levels at Receptors A and B.

5.6 Assessment Level

We define Assessment Level = RL – min L_{A90} dB, where:

RL = Rating Level, dB(A)

L_{A90} dB = the typical background noise level, L_{A90}, derived from the noise survey data

Table 1 provides the resultant Assessment Levels at Receptors A and B.

Table 1. Typical background and calculated Rating and Assessment Levels at Receptors A and B

Receptor	Day: 07:00 - 20:00hrs			Evening : 20:00 - 23:00hrs			Night : 23:00 - 07:00hrs		
	Typical L_{A90} dB	Rating Level, dB	Assessment Level, dB	Typical L_{A90} dB	Rating Level, dB	Assessment Level, dB	Typical L_{A90} dB	Rating Level, dB	Assessment Level, dB
	100% roof & gable end extract fans operating			*50% roof fans operating*			*25% roof fans operating*		
A	40	30	-10	38	17	-21	36	14	-22
B	40	32	-8	38	21	-17	36	18	-18

Where the Rating Level is at parity with the typical background noise level (Assessment Level = 0 dB) BS4142 states that the Specific Level will have a low impact; an adverse impact is indicated where the Rating Level is ≥ 5dB and <10dB above the typical background noise level.

As can be seen in Table 1, during the day and evening periods the highest aggregate ventilation fan Assessment Levels are:

- *Day (07:00 – 20:00hrs):* -8dB; indicates a BS4142 very low noise impact
- *Evening (20:00 – 23:00hrs):* -17B; indicates a BS4142 negligible noise impact

During the night period (23:00 – 07:00hrs) we consider the context that occupiers of the nearest dwellings are expected to be within their houses is relevant, and consequently it will be noise ingress that will inform on the noise impact. Based on a room with an open window providing 13dB sound reduction from outside to inside, the highest aggregate ventilation fan noise ingress would be $L_{Aeq,15min}$ 5dB

The resultant ambient noise level is extremely low, being significantly below the measured existing background noise levels and our suggested noise ingress limit (5dB below the noise ingress limits given in BS8233). We therefore conclude that during the night the extract fan noise emissions will result in a negligible noise impact.

5.7 Assessment uncertainty

With all calculations there is a level of uncertainty, which in this case we do not expect to be greater than +/-3dB (3dB is a just perceptible change in noise level). This small level of uncertainty is not considered to have any significance to the outcome of the assessment i.e., it would not result in an adverse noise impact being identified.

The difference between halving or doubling the number of fans operating (e.g., 50% to 100%) is 3dB. With smaller changes in the number of fans operating, for example, 50% to 70%, the change in aggregate noise emissions will be less than 2dB; this represents an imperceptible change in noise.

We therefore consider the used percentage of fans as suitably robust for the purpose of the assessment; it reflects the percentage of fans used in poultry units as advised by both operators and experts and would not result in a perceptible change in noise emissions with a 20 – 25% increase/decrease in the number of fans operating.

6 Conclusion

A plant noise assessment has been undertaken with regard to the ventilation fans on the proposed additional poultry units at Alisons Farm, Great Ponton, Grantham; Figures 1 and 2.

The assessment included:

- A noise survey to establish representative background noise levels at the nearest dwellings; Appendix A and Figure 1
- Calculations of the noise emissions and corresponding BS4142 Rating Levels generated by the ventilation fans; Table 1 and Tables B1 and B2, Appendix B

The findings of the assessment established that the ventilation fans will result in:

- *Day & evening:* very low noise impact during day (includes the emergency gable end fans) and negligible impact during the evening
- *Night:* ambient noise ingress levels via an open window significantly below the existing background noise levels and our suggested noise ingress limit (5dB below the noise ingress limits given in BS8233). We therefore conclude that during the night, when occupiers are expected to be indoors, the noise impact will be negligible.

On the basis that the operation of the ventilation fans on the proposed additional poultry units will not result in an adverse noise impact at the nearest dwellings, we conclude that on noise grounds they are acceptable.

Table A1. Noise monitor data (free-field)							
Start Time	$L_{Amax,F}$ dB	L_{Aeq} dB	L_{A90} dB	Start Time	$L_{Amax,F}$ dB	L_{Aeq} dB	L_{A90} dB
13:15	77.4	48.2	39.0	02:45	55.5	40.8	36.0
13:30	65.2	48.7	37.5	03:00	57.7	41.5	37.0
13:45	59.3	46.3	38.5	03:15	51.7	41.0	35.5
14:00	70.6	47.2	38.5	03:30	50.2	41.7	37.5
14:15	63.2	46.8	40.0	03:45	61.1	44.6	39.0
14:30	59.6	46.4	41.5	04:00	52.8	42.6	39.0
14:45	60.1	48.6	41.5	04:15	54.9	44.3	40.5
15:00	62.7	48.3	41.0	04:30	60.9	47.4	44.5
15:15	58.7	46.5	40.5	04:45	57.0	46.9	44.5
15:30	64.5	47.2	39.5	05:00	70.8	51.8	46.0
15:45	60.6	45.0	40.0	05:15	74.0	49.8	45.5
16:00	59.5	47.1	40.0	05:30	64.0	49.7	46.5
16:15	62.0	48.8	40.5	05:45	63.2	50.4	46.5
16:30	65.2	52.5	42.5	06:00	61.0	50.6	47.0
16:45	65.8	52.6	43.5	06:15	67.1	53.5	48.0
17:00	66.3	53.5	44.5	06:30	63.9	51.9	47.0
17:15	63.3	52.4	43.0	06:45	61.2	52.1	46.5
17:30	67.7	52.4	43.0	07:00	60.2	48.2	44.5
17:45	65.2	54.0	43.0	07:15	57.9	47.7	45.5
18:00	64.0	52.9	43.5	07:30	57.9	46.9	44.0
18:15	65.0	53.6	43.5	07:45	62.1	45.9	41.5
18:30	65.5	56.1	45.0	08:00	55.0	45.6	41.5
18:45	79.6	56.9	45.0	08:15	56.3	44.7	40.0
19:00	69.4	54.8	43.5	08:30	65.3	46.4	41.0
19:15	65.3	54.0	41.0	08:45	74.4	50.3	41.5
19:30	62.4	52.6	40.5	09:00	59.4	46.6	41.0
19:45	64.6	51.1	40.0	09:15	57.3	45.5	41.0
20:00	64.0	51.5	39.0	09:30	72.5	49.2	41.0
20:15	65.5	50.6	37.0	09:45	60.5	46.1	39.5
20:30	65.5	51.3	39.5	10:00	60.0	44.6	38.5
20:45	62.9	50.6	38.0	10:15	56.4	43.6	37.0
21:00	66.4	51.9	37.0	10:30	56.1	43.6	37.5
21:15	65.8	50.5	38.5	10:45	61.7	45.0	37.5
21:30	63.4	47.5	36.5	11:00	61.1	45.4	39.0
21:45	70.7	51.9	37.5	11:15	67.6	47.5	38.5
22:00	63.6	48.4	37.0	11:30	56.7	43.5	37.5
22:15	60.9	44.0	37.5	11:45	57.3	43.1	36.5
22:30	64.8	46.5	37.0	12:00	58.2	44.6	37.5
22:45	68.2	48.6	37.0	12:15	62.9	46.1	39.0
23:00	65.5	47.1	36.0	12:30	64.8	47.2	37.5
23:15	63.5	45.7	38.0	12:45	71.0	50.3	39.5
23:30	57.8	44.1	39.0	13:00	57.9	46.6	38.5
23:45	59.3	46.5	39.0	13:15	57.8	45.2	38.0
00:00	58.3	43.9	37.5	13:30	55.4	43.5	38.0
00:15	69.5	46.7	36.5	13:45	60.0	49.8	39.0
00:30	60.1	41.4	36.5	14:00	61.1	47.0	37.5
00:45	54.7	41.7	36.0	14:15	63.7	49.4	40.5
01:00	56.3	41.2	35.5	14:30	58.5	45.6	37.0
01:15	59.5	43.2	35.5	14:45	60.7	48.2	39.5
01:30	55.8	40.0	35.0	15:00	57.7	45.9	38.0
01:45	55.9	41.5	35.5	15:15	59.8	47.4	38.0
02:00	56.3	41.2	36.0	15:30	67.0	47.8	38.5
02:15	59.2	40.1	34.5	15:45	66.6	49.8	39.0

Table A2. Weather Station Data

Start Time	Temp, °C	Wind Speed, m/s	Wind Direction	Start Time	Temp, °C	Wind Speed, m/s	Wind Direction	Start Time	Temp, °C	Wind Speed, m/s	Wind Direction
13:10	14.4	2.2	ESE	22:00	9.7	1.7	SSE	07:00	8.2	1.0	SE
13:20	13.7	1.3	SE	22:10	9.4	1.3	SSE	07:10	8.4	0.3	SE
13:30	13.2	2.6	SE	22:20	9.2	1.0	SE	07:20	8.4	0.9	SE
13:40	12.9	1.5	ESE	22:30	9.4	1.6	ESE	07:30	8.7	0.8	SE
13:50	13.2	0.8	ESE	22:40	9.6	1.6	SSE	07:40	9.2	0.9	SE
14:00	13.3	1.1	ESE	22:50	9.7	1.6	S	07:50	9.3	0.8	SE
14:10	13.4	1.3	SE	23:00	9.3	1.3	SSE	08:00	9.7	1.1	S
14:20	13.2	1.2	ESE	23:10	9.2	1.3	ESE	08:10	11.1	1.0	SSE
14:30	12.9	1.7	S	23:20	8.9	1.5	SE	08:20	10.8	0.9	SSE
14:40	13.0	1.5	SSE	23:30	8.9	1.3	SSE	08:30	11.5	0.5	SSE
14:50	13.1	0.9	SSE	23:40	9.3	1.5	SE	08:40	11.2	0.8	SE
15:00	13.1	1.0	SE	23:50	9.3	2.5	ESE	08:50	12.0	0.6	SSE
15:10	12.8	1.6	SE	00:10	8.9	2.1	SE	09:00	12.8	0.9	SE
15:20	13.3	1.3	SSE	00:20	8.9	1.6	SE	09:10	11.9	1.0	SE
15:30	13.3	1.7	SE	00:30	8.8	2.5	SE	09:20	12.1	1.2	SE
15:40	13.4	1.3	ESE	00:40	8.7	1.4	SSE	09:30	13.7	0.8	SSE
15:50	13.5	2.0	ESE	00:50	8.8	1.5	SSE	09:40	13.7	0.8	SE
16:00	14.7	1.8	ESE	01:00	8.8	1.8	SE	09:50	13.0	1.3	ESE
16:10	15.2	1.6	SE	01:10	8.8	1.3	SSE	10:00	13.3	1.4	ESE
16:20	14.4	1.1	S	01:20	8.8	1.4	SSE	10:10	13.4	1.1	SE
16:30	14.9	1.0	SSE	01:30	8.6	1.3	SE	10:20	14.4	1.1	SE
16:40	15.7	0.7	SSE	01:40	8.3	1.2	SE	10:30	14.2	1.3	ESE
16:50	13.4	1.7	SSE	01:50	8.1	0.9	SE	10:40	15.8	1.3	ESE
17:00	13.2	1.5	SE	02:00	8.3	1.5	SE	10:50	16.6	1.1	ESE
17:10	13.2	2.4	SE	02:10	8.2	1.4	SSE	11:00	15.4	1.2	SSE
17:20	13.4	1.9	SE	02:20	8.2	1.2	SE	11:10	17.1	1.1	SSE
17:30	13.2	2.0	SE	02:30	8.1	1.2	SE	11:20	15.3	1.4	SE
17:40	13.8	1.2	SE	02:40	8.0	0.8	SE	11:30	15.9	1.7	SE
17:50	13.8	1.5	ESE	02:50	8.0	0.8	SE	11:40	17.2	1.3	SE
18:00	13.4	3.0	ESE	03:00	8.0	0.7	SE	11:50	16.9	1.5	ESE
18:10	13.2	1.8	ESE	03:10	7.9	1.0	SE	12:00	18.9	1.1	ESE
18:20	14.0	1.3	SE	03:20	7.9	0.6	SSE	12:10	16.8	2.1	ESE
18:30	13.4	1.6	SE	03:30	7.9	1.2	SE	12:20	17.6	1.7	SE
18:40	12.8	1.3	SSE	03:40	7.8	0.9	SSE	12:30	17.6	1.7	SSE
18:50	12.3	1.6	ESE	03:50	7.9	0.9	SSE	12:40	19.1	1.6	ESE
19:00	12.9	1.6	ESE	04:00	7.9	0.7	SE	12:50	17.5	1.4	ESE
19:10	12.8	1.4	SSE	04:10	7.9	0.7	SE	13:00	18.4	0.9	ESE
19:20	12.6	2.2	SE	04:20	7.9	1.0	SE	13:10	16.9	1.8	ESE
19:30	12.5	2.1	ESE	04:30	7.8	0.8	SSE	13:20	16.6	3.1	SE
19:40	11.7	1.6	SE	04:40	7.8	0.9	SSE	13:30	16.9	0.8	SE
19:50	11.2	1.2	SE	04:50	7.8	1.1	SE	13:40	18.2	1.3	SE
20:00	11.1	0.8	SE	05:00	7.7	1.1	SE	13:50	20.7	1.3	ESE
20:10	11.3	1.1	SE	05:10	7.8	0.8	SE	14:00	18.3	1.7	ESE
20:20	10.8	1.1	SE	05:20	7.7	0.9	SE	14:10	18.4	0.9	ESE
20:30	10.8	0.8	SE	05:30	7.8	0.8	SE	14:20	18.2	1.1	ESE
20:40	10.7	1.1	SE	05:40	7.7	1.0	SE	14:30	19.7	1.5	ESE
20:50	10.5	1.1	SE	05:50	7.8	1.0	SSE	14:40	18.7	1.5	SE
21:00	10.3	0.9	SE	06:00	8.0	0.9	SSE	14:50	17.6	2.5	SE
21:10	9.9	0.8	SE	06:10	8.0	0.7	SE	15:00	17.6	2.1	ESE
21:20	9.5	0.9	SE	06:20	8.0	1.2	SE	15:10	17.5	1.7	SE
21:30	9.3	1.2	SE	06:30	7.9	0.7	SE	15:20	18.3	2.1	ESE
21:40	8.9	1.1	SE	06:40	8.0	0.7	ESE	15:30	18.8	0.9	ESE
21:50	8.9	1.2	ESE	06:50	8.1	0.8	ESE	15:40	18.2	1.3	SE

Table B1. Calculation of proposed additional poultry units extract fan Rating Levels at Receptor A

		Octave Band Centre Frequency, Hz							
		63	125	250	500	1k	2k	4k	dB(A)
Roof Fans: Fancom 3680	[A] Lp at 2m, 45° lateral:	72	68	66	63	65	63	63	70
	[B] directivity correction (45° to 90°):	0	1.5	3	4.5	9	11	18	
	[C] Reflection off poultry shed roof:	3	3	3	3	3	3	3	
	[A] - [B] + [C] L_p at 2m, 90° lateral:	75	70	66	62	59	55	48	64.5
Gable End Fans: Fancom 34130	[D] Lp at 2m, 45° lateral:	84	78	74	74	68	66	62	75
	[E] directivity correction (45° to 5°):	-1	-1	-1.5	-1.5	-1.5	-1.5	-1.5	
	[F] Reflection off poultry shed roof:	3	3	3	3	3	3	3	
	[D] - [E] + [F] L_p at 2m, 5° lateral:	88	82	79	79	73	71	67	79.4

		Shed 7			*Shed 8*				*Shed 7*			*Shed 8*				*Shed 7*			*Shed 8*		
Fan		Roof Fans		Gable End	Roof Fans		Gable End		Roof Fans		Gable End	Roof Fans		Gable End		Roof Fans		Gable End	Roof Fans		Gable End
		North Row	South Row		North Row	South Row			North Row	South Row		North Row	South Row			North Row	South Row		North Row	South Row	
1	Direct distance, m	953.1	959.1	870.8	958.0	951.9	869.4	Distance correction, dB	53.6	53.6	52.8	53.6	53.6	52.8	Shielding attenuation, dB	0	0	0	0	0	0
2		940.9	946.9	870.7	945.8	939.7	869.4		53.5	53.5	52.8	53.5	53.4	52.8		0	0	0	0	0	0
3		928.7	934.7	870.5	933.6	927.5	869.5		53.3	53.4	52.8	53.4	53.3	52.8		0	0	0	0	0	0
4		916.5	922.5	870.5	921.4	915.3	869.6		53.2	53.3	52.8	53.3	53.2	52.8		0	0	0	0	0	0
5		904.3	910.3		909.2	903.1			53.1	53.2		53.2	53.1			0	0		0	0	
6		892.1	898.1		897.0	890.9			53.0	53.0		53.0	53.0			0	0		0	0	
7		879.9	885.9		884.8	878.7			52.9	52.9		52.9	52.9			0	0		0	0	
8			873.7			869.5				52.8			52.8				0			0	
1	Ground absorption, dB	4.6	4.6	4.6	4.6	4.6	4.6	Atmospheric attenuation, dB	1.8	1.8	1.7	1.8	1.8	1.7	Sound pressure level at dwelling, dB	4.5	4.5	20.4	4.5	4.5	20.4
2		4.6	4.6	4.6	4.6	4.6	4.6		1.8	1.8	1.7	1.8	1.8	1.7		4.7	4.6	20.4	4.6	4.7	20.4
3		4.6	4.6	4.6	4.6	4.6	4.6		1.8	1.8	1.7	1.8	1.8	1.7		4.8	4.7	20.4	4.7	4.8	20.4
4		4.6	4.6	4.6	4.6	4.6	4.6		1.7	1.8	1.7	1.8	1.7	1.7		4.9	4.9	20.4	4.9	5.0	20.4
5		4.6	4.6		4.6	4.6			1.7	1.7		1.7	1.7			5.1	5.0		5.0	5.1	
6		4.6	4.6		4.6	4.6			1.7	1.7		1.7	1.7			5.2	5.2		5.2	5.2	
7		4.6	4.6		4.6	4.6			1.7	1.7		1.7	1.7			5.4	5.3		5.3	5.4	
8			4.6			4.6				1.7			1.7				5.5			5.5	

	BS4142 character correction	0
Day (07:00 - 20:00hrs): 100% roof & gable end extract fans operating	Specific Level, dB	30
	Rating Level, dB	30
Evening (20:00 - 23:00hrs): 50% roof extract fans operating (assumed odd no. fans operating)	Specific Level, dB	17
	Rating Level, dB	17
Night (23:00 - 07:00hrs): 25% extract roof fans operating (assumed no. 2 & 7 fans operating)	Specific Level, dB	14
	Rating Level, dB	14

Table B2. Calculation of proposed additional poultry units extract fan Rating Levels at Receptor B

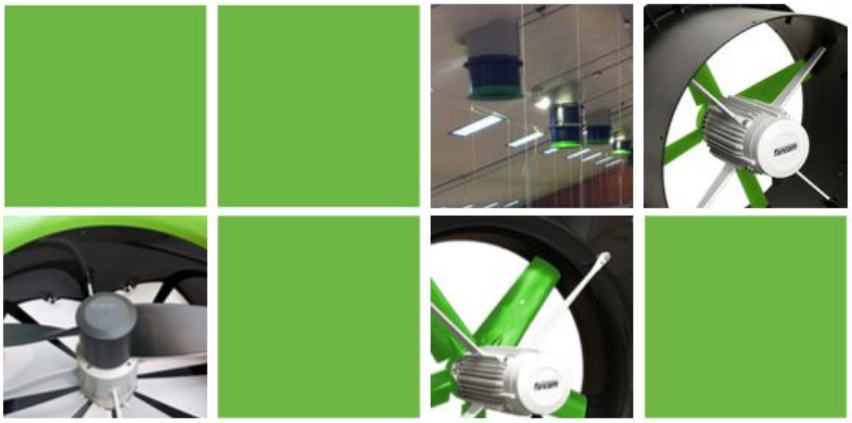
		Octave Band Centre Frequency, Hz							
		63	125	250	500	1k	2k	4k	dB(A)
Roof Fans: Fancom 3680	[A] Lp at 2m, 45° lateral:	72	68	66	63	65	63	63	70
	[B] directivity correction (45° to 90°):	0	1.5	3	4.5	9	11	18	
	[C] Reflection off poultry shed roof:	3	3	3	3	3	3	3	
	[A] - [B] + [C] L_p at 2m, 90° lateral:	75	70	66	62	59	55	48	64.5
Gable End Fans: Fancom 34130	[D] Lp at 2m, 45° lateral:	84	78	74	74	68	66	62	75
	[E] directivity correction (45° to 30°):	0	0	0	0	0	0	0	
	[F] Reflection off poultry shed roof:	3	3	3	3	3	3	3	
	[D] - [E] + [F] L_p at 2m, 30° lateral:	87	81	77	77	71	69	65	77.9

		Shed 7			*Shed 8*				*Shed 7*			*Shed 8*				*Shed 7*			*Shed 8*		
Fan		Roof Fans		Gable End	Roof Fans		Gable End		Roof Fans		Gable End	Roof Fans		Gable End		Roof Fans		Gable End	Roof Fans		Gable End
		North Row	South Row		North Row	South Row			North Row	South Row		North Row	South Row			North Row	South Row		North Row	South Row	
1	Direct distance, m	687.0	690.9	615.4	680.1	673.0	601.3	Distance correction, dB	50.7	50.8	49.8	50.6	50.5	49.6	Shielding attenuation, dB	0	0	0	0	0	0
2		675.9	679.8	614.0	668.8	661.7	600.0		50.6	50.6	49.7	50.5	50.4	49.5		0	0	0	0	0	0
3		664.9	668.7	610.3	657.6	650.4	596.6		50.4	50.5	49.7	50.3	50.2	49.5		0	0	0	0	0	0
4		653.9	657.7	608.9	646.4	639.2	595.3		50.3	50.3	49.7	50.2	50.1	49.5		0	0	0	0	0	0
5		643.0	646.7		635.2	628.0			50.1	50.2		50.0	49.9			0	0		0	0	
6		632.1	635.7		624.1	616.9			50.0	50.0		49.9	49.8			0	0		0	0	
7		621.2	624.8		613.0	605.8			49.8	49.9		49.7	49.6			0	0		0	0	
8			614.0			597.4				49.7			49.5				0			0	
1	Ground absorption, dB	4.5	4.5	4.5	4.5	4.5	4.5	Atmospheric attenuation, dB	1.3	1.3	1.2	1.3	1.3	1.1	Sound pressure level at dwelling, dB	8.0	7.9	22.5	8.1	8.2	22.7
2		4.5	4.5	4.5	4.5	4.5	4.5		1.3	1.3	1.2	1.3	1.3	1.1		8.1	8.1	22.5	8.2	8.3	22.7
3		4.5	4.5	4.5	4.5	4.5	4.5		1.3	1.3	1.2	1.2	1.2	1.1		8.3	8.2	22.6	8.4	8.5	22.8
4		4.5	4.5	4.5	4.5	4.5	4.5		1.2	1.2	1.2	1.2	1.2	1.1		8.5	8.4	22.6	8.6	8.7	22.8
5		4.5	4.5		4.5	4.5			1.2	1.2		1.2	1.2			8.6	8.6		8.8	8.9	
6		4.5	4.5		4.5	4.5			1.2	1.2		1.2	1.2			8.8	8.7		8.9	9.1	
7		4.5	4.5		4.5	4.5			1.2	1.2		1.2	1.2			9.0	8.9		9.1	9.2	
8			4.5			4.5				1.2			1.1				9.1			9.4	

	BS4142 character correction	0
Day (07:00 - 20:00hrs): 100% roof & gable end extract fans operating	Specific Level, dB	32
	Rating Level, dB	32
Evening (20:00 - 23:00hrs): 50% roof extract fans operating (assumed odd no. fans operating)	Specific Level, dB	21
	Rating Level, dB	21
Night (23:00 - 07:00hrs): 25% extract roof fans operating (assumed no. 2 & 7 fans operating)	Specific Level, dB	18
	Rating Level, dB	18

AGRICULTURAL FANS

Fancom fans are specially developped for the use in livestock buildings and they have an IP66 classification. Fancom fans have an aluminium motor housing, synthetic or coated steel housing and synthetic fan blades. The fans combine high air flow capacity with low energy consumption and noise levels. The low energy consumption and superb controllability mean that the motors run at a lower temperature - which also benefits the durability.



Complete fan

The complete fan from Fancom is extremely easy to mount either in or on a wall. The fans in the 35 to 56cm diameter series are supplied in a robust synthetic housing. Fans with diameters of 63, 71 and 80 cm are solidly housed in steel . The coated housing prevents corrosion.

Modular fan

To mount fans underneath a chimney module Fancom's fans are supplied in a robust, shape retaining synthetic module with the Fancom quick mounting system. Fancom measuring and damping units complete the ventilation system. The control valve and air flow transmitter have been built into the same module which can be directly connected to the fan module.

Central exhaust systems

Fancom has specially developed the 3480P and 3480D fans for central air exhaust systems and other installations which operate with high counter pressures. The maximum counter pressures are 270Pa, resp. 320Pa. This fan is notable for it large air displacement capacity. Noise production and energy consumption are, however, kept to a minimum.

	Diameter	Voltage (+/- 10%)	Revolutions	Motor current (50Pa - Inorm)	Power (50Pa)	Axis power (50Pa)	Noise level (0Pa - berekend)		Control	Airflow in m3/h Pressure in Pa (Pascal)								
TYPE	cm	V	RPM	A	W	W	dBA|2m	dBA|7m		0	30	50	100	150	200	250	300	Débit max/pression max
1435	35	200-240	1404	0.96	211	111	61	50	T, E	3940	3580	3250						2660 / 78
1440	40	200-240	1347	1.19	273	165	64	53	T, E	5040	4630	4250						3300 / 92
1445	45	200-240	1326	1.6	372	235	65	54	T, E	6690	6140	5760	4400					4310 / 102
1450	50	200-240	1317	2.08	474	314	66	55	T, E	8550	7800	7300	5780					5710 / 102
1450P	50	200-240	1381	2.99	720	566	69	58	T, E	9720	9250	8970	7950					6900 / 128
1456	56	200-240	1366	3.16	741	569	70	59	T, E	12060	11260	10830	9250					8520 / 113
1656	56	200-240	954	2.23	486	378	66	55	T, E	10360	9250	8340						6920 / 67
1463	63	200-240	1381	3.1	721	586	68	57	T, E	14600	13200	12380	9070					8980 / 101
1671	71	200-240	901	4.19	924	635	68	57	T, E	18030	16410	15320						11620 / 92
1680	80	200-240	903	4.64	1091	756	69	58	T, E	20750	19050	17820	14160					13020 / 113
1692	92	200-240	905	4.54	1058	778	68	57	T, E	24400	21840	19940	13767					13340 / 103
3435	35	Y400 Δ230	1426	Y0.34 Δ0.59	157	116	61	50	F	3710	3400	3140						2520 / 86
3440	40	Y400 Δ230	1376	Y0.42 Δ0.73	227	175	64	53	F	5120	4750	4370						3430 / 96
3445	45	Y400 Δ230	1297	Y0.55 Δ0.95	312	220	65	54	F	6540	5910	5470						4020 / 99
3450	50	Y400 Δ230	1304	Y0.72 Δ1.25	414	305	66	55	F	8240	7530	7010	5440					5240 / 105
3456	56	Y400 Δ230	1364	Y1.17 Δ2.03	657	567	70	59	F	11830	10920	10260	8490					7700 / 120
3656	56	Y400 Δ230	936	Y1.05 Δ1.82	384	322	65	54	F	10190	9080	8020						6690 / 65
3463P	63	Y400 Δ230	1439	Y2.75 Δ4.76	1351	1224	74	63	F	17530	16740	16270	15150	13930	12370	10240		10240 / 250
3663	63	Y400 Δ230	931	Y1.38 Δ2.58	687	512	67	56	F	14180	12920	12060						9000 / 97
3671	71	Y400 Δ230	949	Y1.89 Δ3.27	884	741	69	58	F	17970	16500	15450	12190					11320 / 110
3680	80	Y400 Δ230	941	Y2.03 Δ3.52	1047	850	70	59	F	22220	20555	19380	15910					14070 / 122
3480P	80	Y400 Δ230	1429	Y4.58 Δ7.93	2268	2150	77	66	F	28650	27582	26870	25290	23580	21225	18655		17440 / 268
3480D	80	Y400 Δ230	1436	Y4.26 Δ7.38	1981	1520	69	58	F	21610	21130	20810	19990	19050	17920	16495	14770	11050 / 380
3692	92	Y400 Δ230	936	Y2.16 Δ3.74	1033	859	68	57	F	24870	22570	20840	15470					14110 / 110
3692P	92	Y400 Δ230	929	Y3.64 Δ6.3	1850	1324	71	60	F	28080	26600	25560	22810	17820				15200 / 167

FANS **GB** **FAN 34130 (400V 50HZ)**

Fan 34130 BOX 400V 50Hz	**4305110**
Fan 34130 BOX KIT 400V 50Hz	**4305140**

Images

KIT

4305110 **4305140**

Technical data

Voltage:	**400**	[⏦V ac] +/-10%
Phase:	**3**	
Frequency:	**50**	[Hz]
Max. current:	**3,08**	[A]
Current (at 50 Pa and 400V):	**3,08**	[A]
Input power (at 50 Pa and 400V):	**1695**	[W]
Max. input power:	**1716**	[W]
Max. air volume:	**44650**	[m^3/h]
Max. pressure:	**70**	[pa]
Max. rotations:	**570**	[RPM]
Poles:	**4**	
Cos phi:	**0,81**	
Controllable:	**On / Off**	
Insulation class:	**F**	
Protection class:	**IP 55**	
Sound production (calculated):	**75 (64)**	[dB(A)]
Impeller:	**10 / 3 / N**	Type / n / system
Weight 4305110 (excl. pack.):	**65,3 / 144**	[Kg] / [lbs]

- Air density 1,2 kg/m3, 1 Pa (Pascal) = 1N/m2 ~ 0,102 mm wk. (20°C).
- Sound production is measured according to "free field method" at a distance of 2 meter. (The value between brackets is the sound production at a distance of 7 meter).
- The above data is from a fully assembled fan with safety grid and shutter..
- According to AMCA 210 / ISO 5801.
- Images may differ slightly from reality.