HOARE LEA

Design Note.

To:	Kilburn Building Project Team
Cc:	-
From:	Sam Garne, Principal Acoustics Engineer
Date:	08 October 2026
Project:	UoM Kilburn Building
File ref:	1016181-HLE-RP-AC-Planning Condition 4a Discharge Report-rev01.docx

Planning Condition 4a Discharge Report - Noise.

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
00	24/09/2026	For issue.	SG	PM	PM
01	08/10/2026	Updated following discussion with Environmental Health.	SG	PM	PM

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1. Introduction.

Hoare Lea has been appointed to act as acoustic consultant in relation to the proposed refurbishment works at the Kilburn Building associated with the University of Manchester.

This note provides a noise assessment of the external plant equipment in order to discharge the noise elements of Planning Condition 4a.

Hoare Lea LLP is a limited liability partnership and is registered in England and Wales with registered number OC407254.
Our registered office is at 155 Aztec West Almondsbury Bristol BS32 4UB.

2. Planning Condition 4.

The wording of Planning Condition 4 is provided below:

4. *a) Prior to any works to install plant equipment in the compound shown on the drawing 'Proposed Compound Setting Out Plan 7799-FA-KB-ZZ-DR-A-08010 P01' received by the City Council as Local Planning Authority on 02 April 2026, either a scheme that demonstrates that any plant equipment will achieve a rating level of 5dB (LAeq) below the typical background (LA90) level in each octave band at the nearest noise sensitive location, or a scheme showing a method to acoustically treat/insulate any plant equipment so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level in each octave band at the nearest noise sensitive location, shall be submitted to and approved in writing by the Local Planning Authority. The development shall then be carried out in accordance with the approved details.*

   b) Prior to the first use any of the plant in the compound shown on the drawing 'Proposed Compound Setting Out Plan 7799-FA-KB-ZZ-DR-A-08010 P01' received by the City Council as Local Planning Authority on 02 April 2026, a verification report, which will include post-completion testing, shall be submitted to and approved in writing by the Local Planning Authority to validate that the plant equipment achieves a rating level of 5dB (LAeq) below the typical background (LA90) level in each octave band at the nearest noise sensitive location.

   c) In the event of non-conformity with a rating level of 5dB (LAeq) below the typical background (LA90) level in each octave band, then any measures/changes required to achieve conformity shall be carried out. Any required measures/changes and verification shall continue until conformity has been achieved and agreed in writing by the Local Planning Authority, before the use can commence.

   Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around the site. Pursuant to policies SP1 and DM1 of the Core Strategy and saved policy DC26 of the UDP.

Following discussions with Lisa Jones, Environmental Protection, the following has been confirmed (via email received 01/10/2026):

The plant assessment for overall noise levels will be sufficient, the octave band wording is from our old condition and it should be as follows:

> *<u>NSE6 (External plant/equipment/servicing)</u>*
>
> *a) Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location. Prior to commencement of the use hereby approved the scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.*
>
> *b) Prior to the operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of non-conformity with the recommendations in the verification report shall be detailed along with any measures required to be undertaken prior to operation of the scheme to ensure compliance with the agreed noise criteria.*

Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around the site.

On the basis of the above, the new wording provided is considered to supersede the wording on the decision notice.

In addition, a relaxed requirement for the back-up generator has been sought. The following has been confirmed by Lisa Jones (via email received 01/10/2026):

With regard to the emergency plant, the 10dB above background limit is applicable. A schedule for testing the emergency equipment must also be submitted.

3. Noise criteria.

As detailed above, the requirement is to achieve a maximum rating level of 5 dB below the existing background sound level at the nearest noise-sensitive receptors for normal operating plant.

The closest noise-sensitive receptor has been identified as the George Kenyon Halls of Residence to the southeast. A noise survey has been conducted at a position considered representative of these residences to establish the existing background sound level. Full details of the survey are presented in the submitted environmental noise report (reference *1016181-HLE-RP-AC-Environmental noise report-rev01*).

For equipment which is only to be used in an emergency and during infrequent daytime testing, a relaxed limit of 10 dB above the existing background sound level applies at the nearest noise-sensitive receptors, as agreed with the Local Authority.

The noise limits to comply with planning condition 4 are therefore presented below:

Time of day	Representative background sound level measured during noise survey, dB $L_{A90,Tr,}$	Maximum rating level at 1 m from the nearest noise-sensitive receptors, dB $L_{Ar,Tr,}$
Outside George Kenyon Halls of Residence		
07:00 to 23:00 hours	50	45
23:00 to 07:00 hours	48	43
Emergency operation – testing	50	60

Table 1: Maximum permissible sound pressure levels at 1 m from the nearest noise sensitive premise.

As all plant is assumed to operate at full design duty during daytime and night-time periods, the more onerous night-time limit has been used as the basis of the assessment.

4. Proposed equipment.

There are several items of plant equipment proposed, including three chiller units, two CRAC units, and one generator. Other equipment proposed is not understood to generate significant levels of external noise so have not been considered. The equipment details are presented in Table 2.

Unit reference	Unit type	Model	Unit location
CH-01 CH-02 CH-03	Chiller	Aermec NRG0754XFDEVJ°K3	External plant compound
EC-01 EC-02	CRAC unit	Aermec TMC 19 (EC) H	
Generator	Generator	Model: DTG900SM/B Engine Type: Baudouin 12M26G900/5 (E) Alternator Type: Stamford S6L1D-D	

Table 2: Details of proposed external equipment.

The locations of the different items of plant are presented in Figure 1.

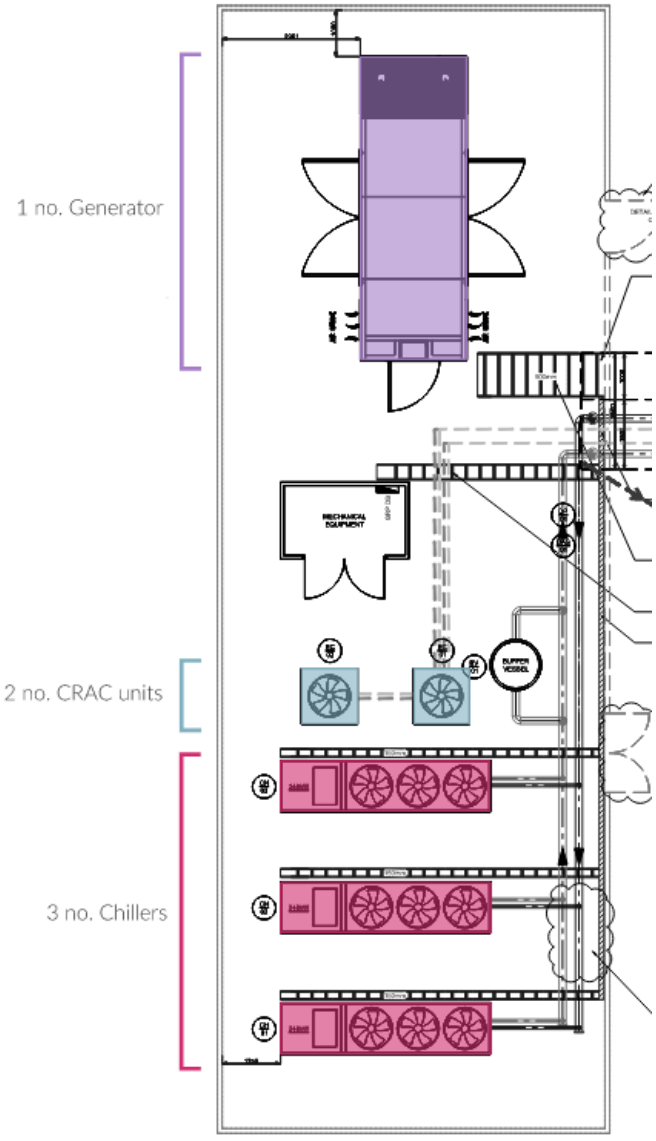


Figure 1: Plan of external plant compound showing location of the items of noise-generating plant.

The chillers and CRAC units are proposed to operate during normal conditions, so all units are assumed to be operating simultaneously at maximum design duty within the assessment. The generator is only understood to run in the case of a power outage to the site, and for infrequent weekday, daytime testing.

5. Sound level data.

The datasheets have been provided by the equipment manufacturers presenting sound data at design duty. The sound power levels in octave band resolution have been presented in Table 3 below. The relevant sections of the manufacturers' datasheets are provided in Appendix A.

Unit reference	Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	dBA
CH-01 CH-02 CH-03	83 [1]	83	75	76	74	65	58	50	78
EC-01 [2] EC-02 [2]	77	69	66	70	73	64	57	50	75
Notes: [1] No data available at 63 Hz, so this has been approximated based on the 125 Hz octave band. [2] The data provided is for a single fan operating per unit. The proposal is for twin fan units, so +3 dB has been applied to the manufacturer's data. This is as confirmed with the MEP designer.									

Table 3: Sound power levels for proposed external equipment.

Noise data for the generator has not been provided in octave band resolution, but an overall sound pressure level of 75 dBA at 1 m has been provided by the project MEP designer. For a conservative assessment, the sound has been assumed to be low frequency dominated, with all of the sound power in the 63 Hz octave band and calibrated to the overall sound level at 1 m within the model. This sound level is assumed to apply to all associated noise sources including casing radiated, air intake, air discharge, and exhaust flue, which are to be acoustically attenuated to comply with the overall sound level presented.

6. Assessment.

6.1 Modelling.

A noise model has been developed using the CadnaA proprietary noise modelling software. This uses the principles of ISO 9613-2 to calculate the sound levels, including for the effects of distance attenuation, screening, and reflections from nearby buildings. The model includes the following assumptions:

- Source heights are taken from the datasheets provided.
- A full building evaluation of the nearby noise-sensitive receptor has been used to determine the loudest section of the building for use in the assessment.
- The ground and building façades have been modelled as acoustically reflective.
- The building locations and heights have been taken from OS open data and LIDAR data.
- There is a screen around the plant compound, but this has been assumed to be acoustically transparent.

An image of the model is presented in Figure 2.

No corrections for tonality, impulsivity, intermittency or other distinctive acoustic characteristics have been applied. The plant is expected to operate continuously during normal operation, and the available manufacturer information does not identify any distinctive acoustic features requiring a correction.

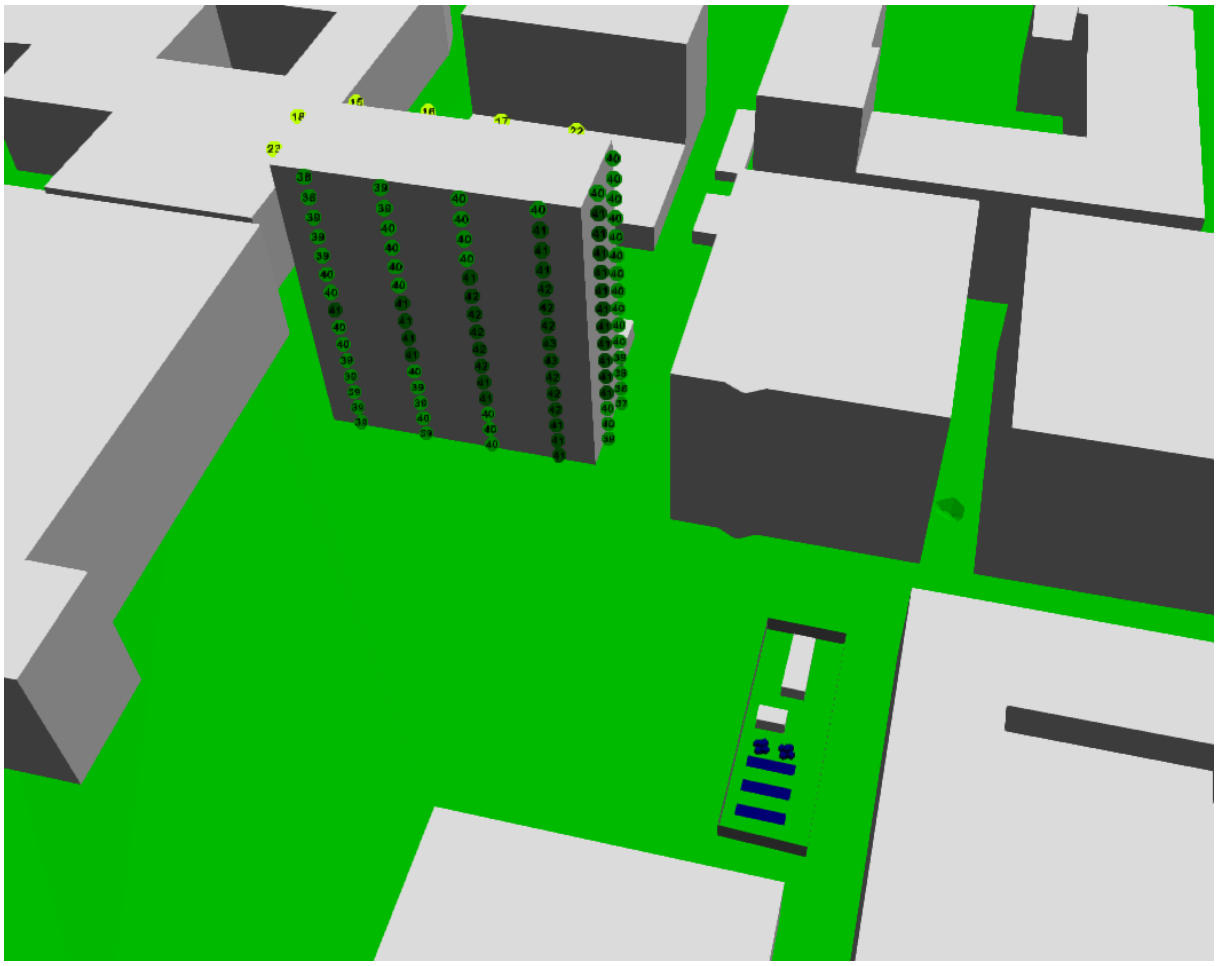


Figure 2: Image of CadnaA noise model used to calculate sound levels at the nearby noise-sensitive receptors.

6.2 Normal operation.

Based on the source locations and the data provided, calculations have been undertaken to determine the sound pressure levels acting on the closest noise-sensitive receptor.

A summary of the results is presented in Table 4.

Unit reference	Rating level at 1 m from the nearest noise-sensitive receptor, dB $L_{Ar,Tr}$
CH-01	37
CH-02	37
CH-03	37
EC-01	35
EC-02	35
Total	43

Table 4: Summary of calculated sound pressure levels at the receptor location from each noise source, during normal operation.

As presented, the assessment shows that noise from the proposed plant equipment is calculated to comply with the noise limits during both daytime and night-time periods.

6.3 Emergency operation.

As well as the chillers and CRAC units, there is an emergency generator proposed. This is proposed to operate in the case of a power outage at the site and during routine testing. Testing is proposed during weekday, daytime hours only.

The results of the modelling are presented below:

Unit reference	Rating level at 1 m from the nearest noise-sensitive receptor, dB $L_{Ar,Tr}$
Normal plant operation	43
Generator	50
Total	51

Table 5: Summary of calculated sound pressure levels at the receptor location from each noise source, during generator operation.

On the basis of the emergency-operation criterion adopted for this assessment, the calculated level complies with the relaxed limit.

7. Summary.

Hoare Lea has conducted a noise assessment of the plant equipment to discharge part a of Planning Condition 4.

The assessment shows that the proposed equipment is anticipated to comply with the noise limit at the closest noise-sensitive receptors whilst all equipment is running at full design duty.

A relaxed limit applies for the operation of the back-up generator. The assessment shows that the relaxed limit is calculated to be achieved with the proposed generator.

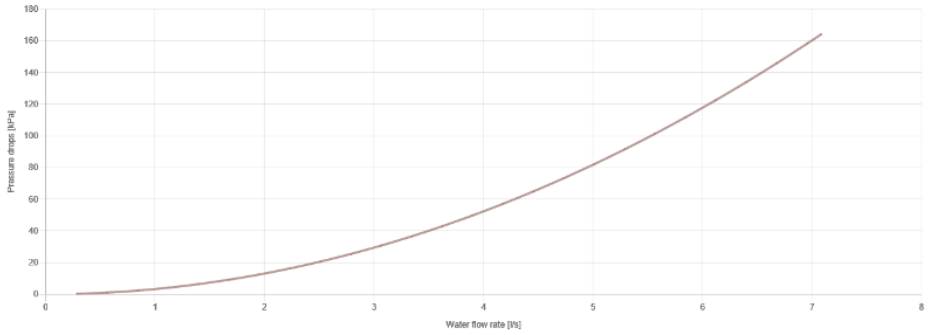
This report is suitable for submission for the discharge of planning condition 4a.

Appendix A: Manufacturer's datasheets.

The following pages present the relevant pages of the manufacturer's datasheets provided.

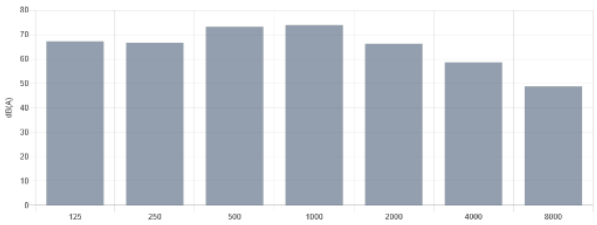
Chiller: Aermec NRG0754XFDEVJ°K3

Water circuit data (recovery side)			
Exchanger type			Plate
Number of exchangers		n.	2
Water content		l	3.66
Connections type			Grooved joints
Water connections	inlet	Ø	1 1/2 "
	outlet	Ø	1 1/2 "



Sound data (nominal cooling data)		
Sound power - Lw	dB(A)	77.5
Sound pressure at 10 m	dB(A)	45.4

Hz	Lw [dB]	Lw [dB(A)]
125	83.3	67.2
250	75.2	66.6
500	76.4	73.2
1000	73.9	73.9
2000	65.1	66.3
4000	57.6	58.6
8000	49.9	48.8



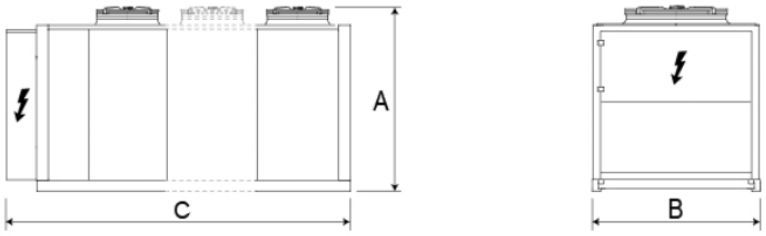
The sound levels are given at full load, without pumps (if available) and at nominal conditions (air temperature: 35.0 °C, water temperature (in/out): 12.0/7.0 °C).
Sound power: calculated on the basis of measurements carried out in accordance with the UNI EN ISO 9614-2 regulation, in compliance with the requirements of the Eurovent certification. Sound pressure calculated according to correlation in accordance with UNI EN ISO 3744.

Electric data		
Full Load Amps (FLA)	A	154.5
Locked Rotor Amps (LRA)	A	364.3
Power supply		400V/3N/50Hz with circuit breakers

Dimensions and weights		
A - Height	m	1.9
B - Width	m	1.1
C - Length	m	4.47

The dimensions and weight refer to the unit without packaging. For these data, consult the installation manual.

Dimensions and weights during transport		
A - Height	m	2.03
B - Width	m	1.17
C - Length	m	4.47



CRAC Unit: Aermec TMC 19 (EC) H

OFFER N.: OF 263098 FP rev. 0 date : 24/08/2026 - **D**	**CUSTOMER:** AERMEC UK LIMITED
UNIT ACC CONDENSER WITH MAIN SWITCH ONLY	TMC 19 (EC) H

Ver. 3.3.0.279 - 30/06/2026

Air inlet temp.	[°C]	35,0
Condensing temp.	[°C]	51,4
Temperature of the hot gas	[°C]	86,4
Subcooling	**[K]**	**0**
Refrigerant		R410A
Sea level	[m]	0
Version		Horizontal

Power supply: 230V-1PH-50Hz

Capacity	**[kW]**	**21,9**
Air quantity	[m3/h]	5.190
Energetic efficiency class		D
Power consumpt.	[W]	310
Power consumpt.	[A]	1,5
Max fans absorption	[A]	2,7
Fans speed	[1/min]	1.475
S.P.L. (distance 10 [m])	[dB(A)]	44
Sound Power Level	[dB(A)]	75

Fans:	[mm]	2 x 350	Weight	[kg]	44
Pole :	[n]	**EC FANS**	Inlet connect.	[n] x [mm]	1 x 16
Fin spacing:	[mm]	1,8	Outlet	[n] x [mm]	1 x 16
Volume	[dm3]	2,00	Circuit	[n]	12 x 1
Surface	[m2]	25,1	Overall dimens.	[mm]	1.571 x 548 x 811

Frame material	Galvanized steel powder coated RAL 9003	Fins material	Al
Header material	Cu	Tube material	Cu

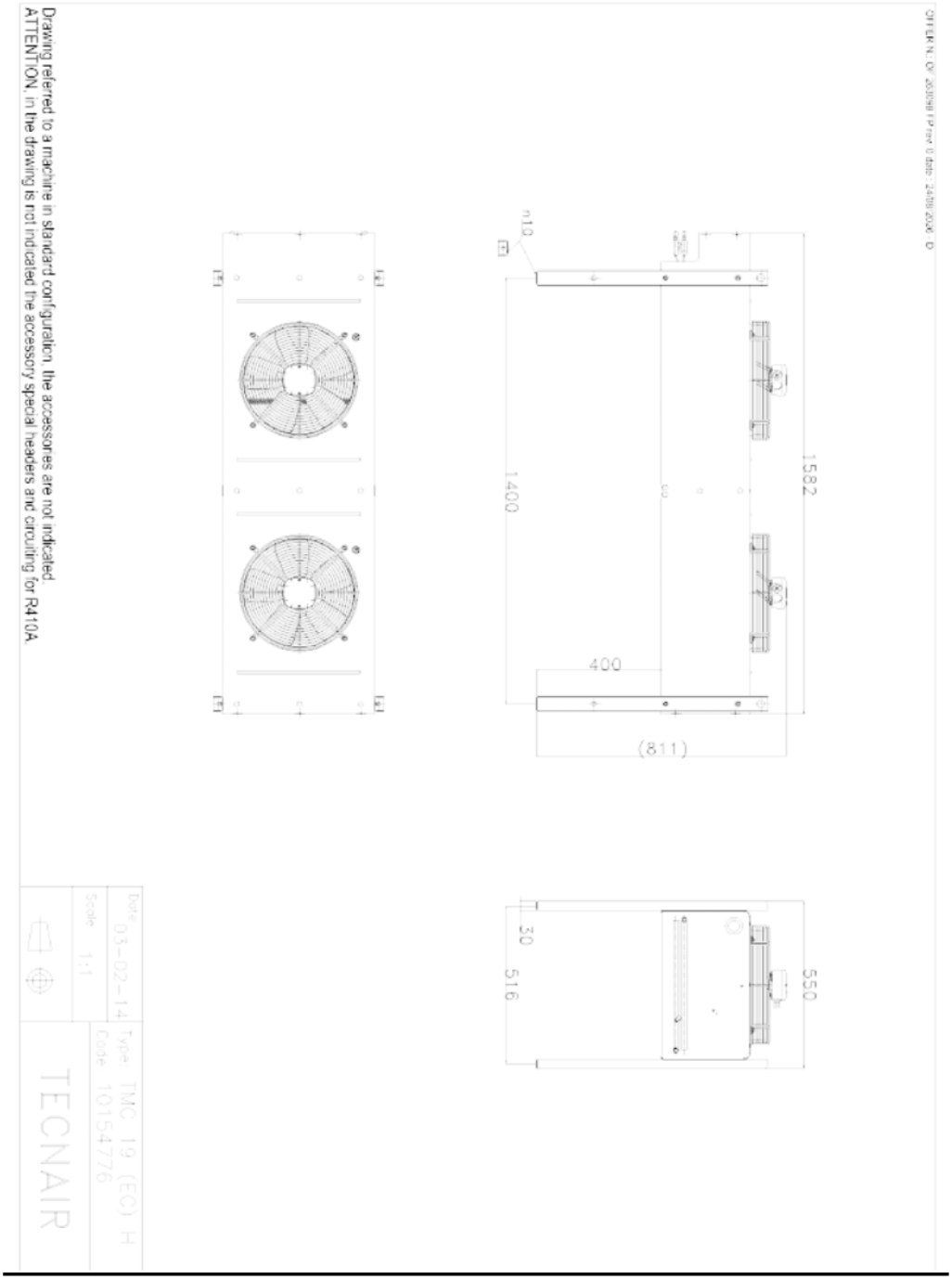
* Refer to TECNAIR catalogues for details, way of data declaration and standards. Noise level according to EN 13487. The weight and the dimensions are not valid for all the possible configurations. All fans are ErP-compliant (Directive 2009/125/EC Energy-related products) ATTENTION: contact always TECNAIR before matching a regulation not supplyed by TECNAIR.

New electronic EC fan, allowing important energy saving. Self protected, suitable for regulation by signal 0-10 VdC or BUS RS485.

SOUND POWER LEVEL

	Tot.	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
230V-1PH-50Hz [dB(A)]	72	48	50	54	64	70	62	55	46

Data refers to one fan. IMPORTANT: data tolerance in the sound spectrum is higher (± 5 dBA) than the combined pressure and power spectrum, with greater variation at low frequencies.


Drawing referred to a machine in standard configuration. The accessories are not indicated.
ATTENTION: in the drawing is not indicated the accessory special heaters and circuiting for R410A.
n10
1582
1400
400
(811)
30
516
550
TECNAIR
Type TMC 19 (EC) H
Code 10154776
Scale 1:1
Date 03-02-14