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Archbishop Cranmer Church of England Primary Academy, Nottingham

Noise Impact Assessment

For: Archbishop Cranmer C of E Primary Academy

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1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Archbishop Cranmer Church of England School (hereafter referred to as 'the client') to undertake a noise impact assessment for a new fixed plant installation at Archbishop Cranmer Church of England Primary Academy, 1 School Lane, Aslockton, Nottingham, NG13 9AW (hereafter referred to as 'the site').

This report presents:

- The methodology and results of a noise survey conducted at the site
- The assessment of potential impact of noise emission from the plant on nearby noise sensitive receptors

This report has been prepared on behalf of the client for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult the client and ENS as to the extent to which the findings may be appropriate for their use.

A glossary of acoustic terms used in the main body of the text is contained in Appendix A.

1.2 Site Description

The site is located to the south of Main Road, Kirkby-in-Ashfield, in an area of primarily residential land uses, and is bounded on all sides by existing residential dwellings

The site location is presented on Figure 1.1 below, along with the approximate location of the proposed plant.

Figure 1.1: Site Location



2 Noise Criteria

2.1 Assessment Guidance

British Standard 4142: 2014 +A1:2019 "Methods for rating and assessing industrial and commercial sound"

BS 4142¹ presents methods for rating and assessing the potential impact of commercial and industrial sound upon noise sensitive receptors. The Standard is appropriate for the consideration of industrial and manufacturing processes, fixed installations which comprise mechanical and electrical plant and equipment and mobile plant / vehicles that form an intrinsic part of the industrial/commercial including the loading and unloading of goods and materials at the premises.

The noise impact magnitude is derived from the numerical subtraction of the representative² background noise level from the measured or calculated rating level of the specific sound under consideration. Typically, the greater this difference, the greater the magnitude of the impact:

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the 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 the context

The 'rating level' must be determined considering the need for any 'character corrections' to the specific industrial/commercial noise level to account for tonal qualities, impulsive qualities, other sound characteristics and/or intermittency. This can be done using a subjective, objective or reference methods. Where multiple features are present the corrections should be added in a linear fashion to the specific level.

The subjective method is based on the corrections presented in Table 2.1.

Level of Perceptibility	Tonal Correction	Impulsivity Correction	Intermittency Correction	Other
None	0 dB	0 dB		+3 dB
Just Perceptible	+ 2 dB	+ 3 dB	+3 dB	Where neither
Clearly Perceptible	+ 4 dB	+ 6 dB	Where intermittency is	tonal nor impulsive but clearly identifiable against prevailing soundscape
Highly Perceptible	+ 6 dB	+ 9 dB	readily identifiable	

 Table 2.1: BS4142 Subjective Method 'Acoustic Feature' / Rating Corrections

BS 4142 requires separate analysis for day and night time periods, evaluating the Rating level over an appropriate reference time interval (T_r) of:

- 1 hr during the day (between 07:00 23:00 hrs)
- 15 min during the night (between 23:00 07:00 hrs)

¹ British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. British Standards Institution (2019)

² 'Representative' is generally considered to be 'typical' (e.g. formed by analysis of modal / mean average values) rather than the lowest measured

2.2 Noise Sensitive Receptors

The closest residential noise sensitive receptors are dwellings to the south of the Site boundary, indicated on the site location plan included as Appendix B, and described in Table 2.2 below.

NSR	Description	Direction	Approximate minimum distance to plant location (m)
А	Residential dwellings on Walnut Close	South	57
В	Residential dwellings on Main Street	North-east	135

Table 2.2: Noise Sensitive Receptors

3 Noise Survey and Results

3.1 Representative Noise Levels

Noise monitoring was undertaken between Wednesday 13th and Thursday 14th December 2023. Longterm unattended measurements were made at the southern site boundary, where noise conditions are considered representative of the closest identified noise sensitive receptors. Additional short term measurements were made on School Lane to the south of the site entrance, and proximate to Noble Lane to the north-east of the site.

The approximate monitoring locations are presented on the site location plan included as Appendix B and described below:

- Position 1 at the southern boundary, approximately 4m above ground level
- Position 2 on School Lane, approximately 20m south of the school boundary at 4m above ground level
- Position 3 at the north-eastern site boundary adjacent to Noble Lane at 4m above ground level

Observations made whilst installing and collecting the equipment indicate that the noise climate was controlled by a mixture of distant road traffic and noise from the school itself.

Noise measurements were undertaken using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. The meter was connected to a windshield covered microphone positioned at 4 metres height above ground, in 'free-field' conditions (i.e. > 3.5 metres from a vertical reflective surface), at the locations detailed above.

The calibration of each measurement system was verified immediately before and after the survey period using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration levels greater than 0.5 dB was noted. Measurements consisted of A-weighted broadband parameters including L_{Aeq} , L_{A10} and L_{AFmax} together with linear octave band data.

As the survey was unattended, weather conditions were not directly recorded. However, analysis of historic online weather data indicates that conditions throughout the survey were considered appropriate for noise monitoring.

3.2 Summary of Results

Table 3.1 presents a summary of the noise data for the day and night time periods, rounded to the nearest decibel.

Position	Date	Time (hh:mm)	L _{Аеq,7} (dB)	L _{А90,7} (dB)
	13/12/23	13:00-23:00	62	40
1	13/12/23-14/12/23	23:00-07:00	42	35
	14/10/23	07:00-14:00	67	47
2	13/12/23	11:20-12:20	58	40
3	13/12/23	12:26-13:26	51	46

Table 3.1: Summary of Noise Measurement Data

4 Assessment

4.1 Introduction

The proposals are for the installation of 2 no. new air source heat pumps (ASHP) to the north-western façade of the southern teaching block. A datasheet excerpt for the proposed ASHP is presented as Appendix D.

4.2 Fixed Plant Noise Limits

With reference to the BS 4142 guidance set out in Section 2, where the rating noise level from an item or items of fixed plant exceeds the existing background noise level by 5 dB or more, this is an indication that the noise would have an adverse impact at the noise sensitive receptors. On this basis, fixed plant noise should not exceed a rating noise level which is 5 dB above the existing representative background noise level.

Whilst the plant would typically be expected to operate during school hours only, it is possible that it may also operate during the night time for frost protection, or to begin heating the building prior to students/staff arriving. On this basis, the assessment also considers noise from plant against background noise levels during the night time.

Table 4.1 below presents a summary of the day and night time background noise levels and proposed Rating limits. Representative background noise levels are derived from the average dB $L_{A90,T}$ during the day, and average dB $L_{A90,T}$ during the night time. The noise level presented below should be achieved at 1m from the façade of nearby noise sensitive receptors.

Averaging periods (*T*) are 1 hour for the daytime, and 15 minutes for the night time.

NSR	Period	Representative background noise level (dB LA90,7)	Proposed Rating Noise Limit (dB L _{Ar,Tr})
	Daytime (07:00-23:00)	37	≤ 42
All NORS	Night time (23:00-07:00)	35	≤ 40

Table 4.1: BS4142 Rating Noise Limits

4.3 Plant Noise Assessment

To calculate specific noise levels at the nearest noise sensitive receptors, a three-dimensional Cadna-A noise model has been developed. Noise model geometry is based on Ordnance Survey mapping data and drawings supplied by the client.

A noise contour plot illustrating the propagation of noise from the site is presented as Appendix C.

Propagation of noise has been calculated in octave bands according to ISO 9613: 1996, at a height of 4m above ground level, representative of a first-floor bedroom. All buildings within the model are assumed to be acoustically reflective, and second order reflections have been considered. The noise model assumes mixed hard/soft ground for propagation corrections and all dwellings outside the site boundary have an assumed height of 8m. All plant is assumed to be operating continuously and concurrently throughout the assessment period.

The proposed ASHPs are located a minimum of 60m from the closest habitable façade of the NSRs identified in Section 2.

The noise model includes a noise barrier surrounding the plant area at a height of 2.5m above ground, with the barrier location indicated in blue on the noise contour plot.

The noise model considers the following items of fixed plant:

• 2 no. Mitsubishi EAHV-M1500YCL air source heat pumps

Each of the two ASHPs has been assigned a sound power level of 83 dB L_{wA} , with spectral noise emission derived from the frequency data set out in Section 2 of the product datasheet presented in Appendix D

The following assumptions were used in the model:

- Meteorological conditions: Temp. 10 °C, Relative Humidity 70%
- Reflections: 2nd order reflections considered
- Propagation of noise has been calculated at a height of 4m above ground level

All plant is assumed to be operating continuously and concurrently throughout the assessment period.

4.4 BS 4142 Assessment

The calculated highest specific noise levels have been calculated at 4m above ground level, representing a first-floor window, with the results presented in Table 4.2.

Noise levels during the night time should be assessed over a time period (T) of 15 minutes, whilst daytime noise levels are assessed over a one-hour period, as recommended in BS 4142.

Table 4.2: Calculated Specific Noise Levels at NSRs

Noise Sensitive Receptor	Specific Noise Level [dB $L_{Aeq,T}$] at Receptor
NSR A	≤ 38
NSR B	≤ 33

With regard to potential 'acoustic feature' corrections, the following is considered:

- Air source heat pumps generally do not operate intermittently, and would be expected to operate continuously throughout the assessment periods. The assessment also assumes all plant is operating concurrently, representing worst case noise emission.
- Plant of this type is generally not impulsive, and typically produces a steady noise level when operating.
- Source noise levels used in the assessment are not considered tonal, therefore no correction is required.

Based on the above, no acoustic feature corrections have been applied.

The calculated servicing noise levels have been assessed in accordance with the methodology set out in BS 4142. The results of the assessment are presented in Tables 4.3 and 4.4 for day and night, respectively.

Parameter	NSR A	NSR B		
Typical background sound level (dB LA90,1hour)	37	37		
Specific noise level (dB <i>L</i> _{Aeq,1hr}) (See Table 4.2)	38	33		
Acoustic feature correction (dB)	0	0		
Rating level (dB L _{Ar, Tr})	38	33		
Excess of rating over background sound level (dB)	+1	-4		

Table 4.3: BS4142 Assessment - Day

Table 4.4: BS4142 Assessment - Night

Parameter	NSR A	
Typical background sound level (dB L _{A90,15min})	35	35
Specific noise level (dB <i>L</i> _{Aeq,15min}) (See Table 4.2)	38	34
Acoustic feature correction (dB)	0	0
Rating level (dB <i>L</i> _{Ar,<i>T</i>r})	38	34
Excess of rating over background sound level (dB)	+3	-1

The results presented in Tables 4.3 and 4.4 indicate that noise from the proposed ASHPs will exceed the representative background noise level by ≤ 1 dB during the daytime, and ≤ 3 dB during the night time.

With reference to the BS 4142 guidance set out in Section 2.2, the predicted noise levels are below the level at which adverse impacts are expected.

4.5 BB93 Noise Impact

Noise levels from the proposed plant are predicted to be $\leq 46 \text{ dB } L_{\text{Aeq,30min}}$ at the closest school façade and are therefore suitable for naturally ventilated classrooms according to the guidance set out in Building Bulleting 93: Acoustic design of schools: Performance standards (BB93).

Based on the above, the proposals are considered to satisfy the requirements of BB93 with regards to noise in teaching spaces.

5 Summary and Conclusions

A noise impact assessment has been undertaken for a new fixed plant installation at the existing Archbishop Cranmer Church of England Primary Academy, 1 School Lane, Aslockton, Nottingham, NG13 9AW.

Noise monitoring was undertaken on Wednesday 13th and Thursday 14th December 2023 to assess prevailing background noise levels in the vicinity of nearby noise sensitive receptors.

Rating noise limits have been set for nearby noise sensitive receptors based on the representative background noise levels measured during the day and night time periods at the closest noise sensitive receptors.

Noise emission from the new items of fixed plant has been calculated using a three-dimensional noise model, based on information provided by the client.

Predicted noise levels at the façade of the nearest identified noise sensitive receptors are below the level at which adverse impacts are likely to occur.

Noise levels at the façade of the closest teaching spaces to the proposed plant are also predicted to satisfy the guideline noise levels of BB93.

Appendix A – Abbreviations and Definitions

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 μ Pa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

 $L_{\rm p} = 20 \log_{10}({\rm p}/{\rm p_0})$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p₀ = reference sound pressure (20 μ Pa).

A-weighting

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, LAeq, T

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, *T*, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

*L*A10, *T*

The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

LA90, T

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

LAF max

The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

Single Event Level / Sound Exposure Level (SEL or L_{AE})

The energy produced by a discrete noise event averaged over one second, regardless of the event duration. This allows for comparison between different noise events which occur over different lengths of time.

Weighted Sound Reduction Index (R_W)

Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).

Appendix B –Site Location Plan and Monitoring Positions



Appendix C –Noise Contour Plot (dB *L*_{Aeq,T}) at 4m AGL



Appendix D –Datasheet

1. Product Specifications

1-1. Specifications

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Product Outlet Marce 32-26.97 Outloor (Cooling) +C Outlet water 25-25.77 Outdoor (Cooling) +C -1-25.87 Outdoor (Cooling) +C -1-25.87 Outdoor (Cooling) +C -1-25.87 Outdoor (Preating) *C -2-20-43 Tread-ange water volume range m ² /m -4-109.47 Cread-ange water volume range m ² /m -4-109.47 Sound preserve level (measured in anechoic room) 11 dB (A) -65 Sound preserve level (measured in anechoic room) 11 dB (A) -65 Demeter of water pipe Inite mn (n) -65.42 (12B) housing type joint (finade-ange pipe) Ioitet mn (n) -65.42 (12B) housing type joint (finade-ange pipe) Ioitet mn (n) 150.4 (8B) housing type joint (finade-anger pipe) Ioitet mn (n) 150.4 (8B) housing type joint (finade-anger pipe) Ioitet mn (n) 150.4 (8B) housing type joint External final dinemion 14. W × D m (n) 150.4 (8B) housing type joint Imade heade	remp range	Cooling	0	Outlet water 4~50 *7	
Heating 1C Outlet water 77-55 77 Outdoor (Cooling) 1C 15-52 77 Outdoor (Cooling) 1C 15-52 77 Outdoor (Healing) 1C 15-52 77 Circulating watter volume range m ² h 12-53 77 Sound pressure level (measured in anchoic room) at Im 11 dB (A) 85 Sound pressure level (measured in anchoic room) at Im 11 dB (A) 83 Dameter of water pipe Initet mn (n) 65A (2.128) housing type joint Dameter of water pipe Initet mn (n) 65A (2.128) housing type joint Dameter of water pipe Initet mn (n) 150A (8B) housing type joint Dameter of water pipe Initet mn (n) 150A (8B) housing type joint Calendar dimetsion H - W + D mn (n) 150A (8B) housing type joint 16 Descipe pressure M2A M2A 10 1 Heat exchanger M2A M2A 10 1 Heat exchanger M2A M2A 30A 4 1 Compreasor Type Initet <td></td> <td></td> <td>*F</td> <td>Outlet water 39.2~86 *7</td> <td></td>			*F	Outlet water 39.2~86 *7	
Image: state of the second		Heating	°C	Outlet water 25~55 *7	
Dubbor (Cooling) *C			°F	Outlet water 77~131 *7	
Outdoor (commy) -r 6-125.6 r7 Quidoor (Heating) 'F -20-43 r7 Circulating water volume range m ² /h 12-43.0 Sound pore server level (measured in an exchoir coron) at 1 m *1 dB (A) 65 Sound pore server level (measured in an exchoir coron) at 1 m *1 dB (A) 65 Diameter of water pipe Inlet mm (in) 65.4 (27.8) housing type joint Diameter of water pipe Inlet mm (in) 150.4 (8) housing type joint Circulating water volume and the set pipe Inlet mm (in) 150.4 (8) housing type joint Diameter of water pipe Inlet mm (in) 150.4 (8) housing type joint 150.4 (8) housing type joint External dimension H × W × D mm (in) 150.4 (8) housing type joint 150.2 (28.1) External dimension H × W × D mm (in) 1280 (28.2) 150.2 (28.1) Design pressure R52. MPa 4.15 Compressor Type Stantines set pipe in stantimetic compressor Mater wide Mater wide Mater set and exchanger Vater side Stantine set and exchanger <td></td> <td>Outdoor (Cooling)</td> <td>°C</td> <td>15~52 *7</td> <td></td>		Outdoor (Cooling)	°C	15~52 *7	
Outdoor (Heating) 1 C 20-13-0 Circulating wather volume range F 4-19-14-07 Circulating wather volume range F 7 Sound pressure level (inseaurofi a nearcholic room) at 1m of 1 dB (A) 6.5 Sound pressure for the inseaurofic room) '1 dB (A) 6.5 Dameter of water pice Date mm (n) 6.54.6 12(2B) housing type piont Classical piping) Outlet mm (n) 1.50.4 (B) housing type piont Classical piping) Outlet mm (n) 1.50.4 (B) housing type piont Classical piping) Outlet mm (n) 1.50.4 (B) housing type piont Classical piping) Outlet mm (n) 1.50.4 (B) housing type piont External finative Polymeter power contage atee piping totage type pint External finative MPa 4.15 Heat exchanger Water MPa 1.0 Design pressure Kater ateide Saterest ateide at		outdoor (cooning)	*E	E-10 02 1	
Outdoor (Heating) -C			-F	5~125.6 */	
circulating water volume range m ² /h 12.9-43.0 Sound pressure level (measured in anechoic room) at tm *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1 dB (A) 65 Sound pressure level (measured in anechoic room) *1		Outdoor (Heating)	°C	-20~43 */	
Circulating water volume range m ² h 12.9-43.0 Sound pressure level (measured in anechoic croop) 11 dB (A) 65 Sound pressure level (measured in anechoic croop) 14 dB (A) 65 Sound pressure level (measured in anechoic croop) 14 dB (A) 65 Sound pressure level (measured in anechoic croop) 14 dB (A) 65 Sound pressure level (measured in anechoic croop) 14 dB (A) 65 Sound pressure level (measured in anechoic croop) 14 mm (in) 150.4(B) housing type joint Cinculating (measure) Context mm (in) 150.4(B) housing type joint Cinculating (measure) Value (masure) 160.0(B) 1200.0(B) External finants Poysette provide coating selecitate 10 External finants Value Satisfies atten proper fanzing 10 Feat exchanger Mare ade Satisfies atten pressor Mare ade Compressor Type Inverter scoll hermetic compressor Mare ade Satisfies method Inverter scoll hermetic compressor Mare ade 10 Satisfies method Inverter scoll hermetic compressor			°F	-4~109.4 *7	
Sourd pore revel (measured in anechoic room) *1 dB (A) 65 Sourd pore revel (measured in anechoic room) *1 dB (A) 63 Dameter of water pipe Intel: mm (in) 65A (212B) housing type pint Dameter of water pipe Intel: mm (in) 65A (212B) housing type pint Dameter of water pipe Intel: mm (in) 150A (6B) housing type pint Dameter of water pipe Intel: mm (in) 150A (6B) housing type pint Clinack header piping) Outet mm (in) 150A (6B) housing type pint External dimensioned H × W × D mm 2380 × 1300 × 1300 1280 (2822) External dimensioned H × W × D mm 2380 × 1300 × 1300 10 Net weight Stander piping Kg (0b) 1307 (2831) 10 Heat exchanger Water aide Stating method Inverter Stating method Inverter Compressor Type Inverter MG 20 × 4 10 15 × 4 Lubricent Water aide MT 300 × 1000 Inverter MG 20 × 4 10 15 × 4	Circulating water volume r	ulating water volume range		12.9~43.0	
Source Average function in the second seco	Sound pressure level (me	asured in anechoic room) at 1m *1	dB (A)	65	
Solution Dowler level interaction of the difference of the di	Cound procedie level (me	used in an achair an and the	dD (/1)	00	
Dameter of water pipe Intel Intel Imm (in) Imm (Sound power level (measi	ured in anechoic room) *1	db (A)	63	
(Standard piping) Outlet mm (m) 65A (2 1/28) housing type joint (Inside header piping) Outlet mm (m) 15DA (8B) housing type joint (Inside header piping) Outlet mm (m) 15DA (8B) housing type joint External finant Polysets prowder casting stel plate External finant (m) 15DA (8B) housing type joint External dimension H × W × D mm 2350 × 3400 × 1080 N External dimension H × W × D mm 2350 × 3400 × 1080 N Design pressure R32 MPa 1.37 (2831) Design pressure R32 MPa 1.0 Heat exchanger Water MPa 1.0 Compressor Type Inverter scole hermetic cooper trazing Maker MITSUBISH ELECTRIC CORPORATION Maker MITSUBISH ELECTRIC CORPORATION Maker Mitor output W 1.15 × 4 Unificiant meret isotang travel isota	Diameter of water pipe	Inlet	mm (in)	65A (2 1/2B) housing type joint	
Diameter of water pipe [india (haide header pipin] Citedren all mension 1 × W × D Ret weight Bindia header piping Ret weight Bindia header piping Ret weight Bindia header piping Ret weight Ret weight	(Standard piping)	Outlet	mm (in)	65A (2 1/2B) housing type joint	
Inside header piping) Outlet mm (n) 150A (6B) housing type joint External finite Polyeater prowder coaling steep joint External finite header piping kg (Bs) 1280 (2822) Net weight Standard piping kg (Bs) 1280 (2822)	Diameter of water pipe	Inlet	mm (in)	150A (6B) housing type joint	
External finish Construction Polyester power conting steel plate External dimension H × W × D Imm 2359 3.8400 x 1080 No Design pressure R52 MPa 4.15 Design pressure R52 MPa 4.15 Compressor Water ride MPa 1.0 Compressor Type Inverter acroll hermedic compressor MMFa Compressor Type Inverter acroll hermedic compressor Inverter Maker Marce Mater and comper brazing Ar side Statiness stee plate and copper brazing Compressor Type Inverter Inverter Maker Mater acroll hermedic compressor Mater Mater Stating method Inverter Inverter Inverter Quantity 4 4 Motor output KW Effect Mater and pressor Protection Inverter Inverter Viata and the state press Pa 20 Inverter Inverter Viata and thot coupt KW 0.92 x	(Inside header piping)	Outlet	mm (in)	150A (6B) housing type joint	
Label mass Imp Contract Control Control External dimension H × W × D Standard piping kg (bs) 1280 x 3400 × 1080 Net weight Standard piping kg (bs) 1280 x 3400 × 1080 Design pressure R32 MPa 4.15 Water MPa 4.15 Water MPa 5.31mless steel plate and copper brazing Ar raide Sattresstant cross fin & A staminium tube Compressor Type Sattresstant cross fin & A staminium tube Compressor Maker MitSuBISH LECTRIC CORPORATION Starting method Inverter MitSuBISH LECTRIC CORPORATION Quantity 4 Motor output W Lubricant WW 11.5 x 4 1.0 Type, Quantity W 0.92 x 4 1.0 Starting method It/25 1.0 1.0 Type, Quantity W 0.92 x 4 1.0 Control Inder output WW 0.92 x 4 1.0 Voor - heat protection High pres.Sensor & High pres.Switch at 4.1	External finish		1	Polyester powder costing steel plate	
External admension In X w D Imm 2.35 X 3400 X 1000 External admension In X w D Inside header piping kg (lbs) 1307 (281) Design pressure R32 MPa 4.15 Design pressure Water MPa 1.0 Heat exchanger Water side Statinless steel pilet and copper brazing Air side Satiring nethod Inverter scroll hemotic compressor Type Inverter scroll hemotic compressor Maker Guantity 4 4 Motion ubut kW 11.5 x 4 Lubricent m ² /min 270 x 4 Lubricent Mit flow rate 10 Type, Quantity 4 4 Value 4 4 Lubricent m ² /min 270 x 4 Type, Quantity V 0.92 x 4 External static presso Pa 20 Protection High pres Sarok 14 J.0Pare (601 pgi) Inverter crout Over heat protection Inverter crout Over heat protection Inverter crout <td>External dimensional Unit</td> <td>1 D</td> <td></td> <td>Polycalci powder coalling aleer plate</td> <td></td>	External dimensional Unit	1 D		Polycalci powder coalling aleer plate	
Net weight Standard pping Kg (tis) 1280 (2522) Inside header pping Kg (tis) 1307 (2881)	External dimension H × W	× D	mm	2350 × 3400 × 1080	
Inside header pipingkg (lbs)1307 (281)Design pressureR32MPa4.15Bet exchangerWaterMPa1.0Heat exchangerAir sideStaltness steel jale and copper brazingAir sideSalt-resistant cross fin & aluminium tubeCompressorTypeInverter scrol hemelic compressorMakerMitsuBisHi ELECTRIC CORPORATIONStating methodInverterQuantity4AuritionMitsuBisHi ELECTRIC CORPORATIONStating methodInverterQuantity4Holor outputkWLubricentMitsuBisHi ELECTRIC CORPORATIONFanAir flow rateType, Quantity4Type, QuantityYesType, QuantityPropelier fan x 4Stating methodInverterMotor outputkWMotor outputKWNew External static pressorProtectionHigh pres. Sanzer Airbing pressInverter circuitOver-heat protectionControlControlVider corral cooling conditions at outdoor temp 35*CDB/24*CWB (55*FDB / 75.2*FWB) outlet water temp 7*C (44.6*F)init water temp 12*C (53.6*F). Pump input is not included in cooling capacity and power input.10 Unde	Net weight	Standard piping	kg (lbs)	1280 (2822)	
Design pressure R32 MPa 4.15 Water MPa 10 Heat exchanger Water side Salit-resistant cross file & aluminium tube Compressor Type Inverter scol hermetic congressor Maker MITSUBJKH ELECTRIC CORPORATION Salit-no method Inverter scol hermetic congressor Maker MITSUBJKH ELECTRIC CORPORATION Salit-no method Inverter Quantity 4 Moto output KW Fan Air flow rate Moto output KW Lubricant MEL46EH Type, Quantity Propeller fan x 4 Stating method Inverter Moto output KW 0.92 x 4 Type, Quantity Propeller fan x 4 Stating method Inverter Moto output KW 0.92 x 4 External static press. Pa 20 Protection High press.Sensor & High press.Switch at 4.15MPa (601pa) Inverter incuit Over-heat protection. Compressor Over-hea		Inside header piping	kg (lbs)	1307 (2881)	
Water MPa 1.0 Heat exchanger Water side Stainless steel plate and copper brazing Air side Stainless steel plate and copper brazing Compressor Type Inverter scroll hermetic compressor Maker MITSUBISHIELECTRIC CORPORATION Inverter Quantity 4 4 Motor output kW 1.1.5 x.4 Lis 4.4 Motor output 4 Motor output KW 1.5.2 x.4 1.6.2 x.4 Lis 4.500 x.4 1.6.2 x.4 1.6.2 x.4 Type, Quantity Propeller fan x.4 1.6.2 x.4 1.6.2 x.4 Starting method Inverter 1.0.2 x.4 1.0.2 x.4 Lis 4.500 x.4 1.0.2 x.4 1.0.2 x.4 Compressor Propeller fan x.4 1.0.2 x.4 1.0.2 x.4 Starting method Inverter 0.92 x.4 1.0.2 x.4 External static press. Pa 2.0 2.0 Protection High pressure protection Ourer-heat protection.0.2 x.4 1.0.2 x.4 x.4 x.8 <td>Design pressure</td> <td>R32</td> <td>MPa</td> <td>4.15</td> <td></td>	Design pressure	R32	MPa	4.15	
Heat exchanger Water side Intervert Air side Salt-resistant cross fin & aluminium tube Compressor Type Inverter scroll hermetic compressor Maker MITSUBISHIELECTRIC CORPORATION Starting method Inverter scroll hermetic compressor Quantity 4 Motor output kW Lubricant m ³ min 270 x 4	5.	Water	MPa	10	
Air side Statutes size pare and copies watch Compressor Type Inverter scroll hermetic compressor Maker MiTSUBSHI ELECTRIC CORPORATION Stating method Inverter scroll hermetic compressor Maker MITSUBSHI ELECTRIC CORPORATION Stating method Inverter Quanthy 4 Motor output KW Lubricant MEL66EH Type, Quanity 4 Inverter 5534 x 4 Type, Quanity Propeller fan x 4 Stating method Inverter Motor output KW Or output KW Motor output KW Motor output KW Or output KW Motor output KW Motor output KW Over-heat protection High pressure protection Inverter circuit Over-heat protection Compressor Over-heat protection Control LEV Vider normal cooling conditions at outdoor temp 35*CDB/24*CWB (95*FDB / 75.2*FWB) outlet water temp 7*C (44.6*F) Intere sterrouit Over-heat protection <	Heat exchanger	Water eide	init G	Staiplage steel plate and separar brazin	2
Air side Saft-resistant cross fin & aluminium tybe Compressor Inverter accol hermetic coord hermetic compressor Maker MITSUBISHI ELECTRIC CORPORATION Stating method Inverter Quantity 4 Motor output kW Lubricant MEL46EH Fan Air flow rate Lubricant m ² /min Z00 x 4	Heat exchanger	water side		Stainless steel plate and copper plazin	ig
Compressor Type Inverter Inverter Inverter Starting method MITSUBISH: IELECTRIC CORPORATION Inverter Inverter <td< td=""><td></td><td>Air side</td><td></td><td>Salt-resistant cross fin & aluminium tub</td><td>e</td></td<>		Air side		Salt-resistant cross fin & aluminium tub	e
Maker MITSUBISHI ELECTRIC CORPORATION Starting method Inverter Quanity 4 Motor output kW Motor output kW Motor output kW Motor output kW Motor output ME(46EH Fan Air flow rate Motor output kW Starting method Inverter Motor output kW Air flow rate m?min Type, Quantity Propeller fan x 4 Type, Quantity V Type, Quantity Refragerant Type, Quantity KW Motor output kW Motor output KW Motor output KW Refragerant Compressor Compressor Over-heat protection, Over current protection Inverter circuit Over-heat protection Intert or erange Refragerant Type x charge RS12 × 11.5 (kg) x 4 *5 Control LEV Vunder normal cooling conditions at outdoor temp 35	Compressor	Туре		Inverter scroll hermetic compressor	
Starting method Inverter Quantity 4 Motor output kW Lubricant MEL46EH Fan Air flow rate m ³ min L/s 4500 × 4 L/s 4500 × 4 Common and the starting method Inverter Motor output kW 0.92 × 4 Starting method Inverter Inverter Motor output kW 0.92 × 4 External static press. Pa 20 Protection High pres.Sensor & High pres.Switch at 4.15MPa (601psi) Inverter circuit Over-heat protection Over-heat protection Inverter circuit Over-heat protection EV Control LEV Voer-heat protection 1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (85°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) BTU/h intel water temp 12°C (53.6°F). Pump input is not included in cooling capacity and power input. LEV Notes: 'Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (85°FDB/75.2°FWB) outlet water temp 7°C (44.6°F) BTU/h intel water temp 12°C (53.6°F). Pump input		Maker		MITSUBISHI ELECTRIC CORPORATIO	ON
Duranity A Motor output kW 11.5 x 4 Motor output kW 11.5 x 4 Lubricant MEL46EH 11.5 x 4 Fan Air flow rate m ³ min 270 x 4 L/s 4500 x 4 4500 x 4 cfm 9534 x 4 11.5 x 4 Type, Quantity Propeller fan x 4 11.5 x 4 Starting method Inverter 11.6 x 4 Motor output kW 0.92 x 4 External static press. Pa 20 Protection High pressure protection High press.Sensor & High pres.Sensor & High pres.Sensor & Cover-heat protection. Compressor Over-heat protection, Over current protection 11.5 (kg) x 4 *5 Control LEV LV Kal/h = KW x 88 VI Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) Inite water temp 10°C (104°F). Pump input is not included in cooling capacity and power input. LUV VI Under normal leading conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) BTU/h = KW x 38 inlet water temp 10°C (104°F). Pump in		Starting method		Inverter	
Judantity 4 Juda construct kW 11.5 x 4 Lubricant MEL46EH Fan Åir flow rate m ³ min 270 x 4 L/s 4500 x 4 4 Type, Quantity Propeller fan x 4 534 x 4 Starting method Inverter 1 Motor output kW 0.92 x 4 External static press. Pa 20 Protection High pressure protection High pressure protection 0.92 x 4 Inverter circuit Over-heat protection Over cover current protection Refrigerant Type x charge R32 x 11.5 (kq) x4 45 Control LEV Ver -heat protection 1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) Interver intel water temp 12°C (53.6°F). Pump input is included in cooling capacity and power input. Unit conver 2 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) Ibs = kg0.45 in let water temp 12°C (53.6°F). Pump input is included in cooling capacity and power input. Unit co		Quantity		A	
Index output INV 11.5 × 4 Fan MEL46EH MEL46EH Fan Air flow rate m ³ min 270 × 4 L/s 4500 × 4 4500 × 4 Cm 9534 × 4 9534 × 4 Type, Quantity Propeller fan × 4 1 Starting method Inverter Inverter Motor output kW 0.92 × 4 External static press. Pa 20 Protection High press.protection. Finde press.protection. Compressor Inverter circuit Over-heat protection. Over-heat protection. Kcally × 4*5 Compressor Over-heat protection. LEV Kcally × 4*5 Voldroin at outdoor temp 35°CDB/24*CWB (95°FDB / 75.2*FWB) outlet water temp 7°C (44.6*F) Kcally = \$W × 88 inlet water temp 10°C (104*F). Pump input is included in cooling capacity and power input. Unit conver Kcally = \$W × 88 10 Under normal leading conditions at outdoor temp 35°CDB/24*CWB (95°FDB / 75.2*FWB) outlet water temp 7°C (44.6*F) BTU/h = \$W × 88 10 Hear normal leading conditions at outdoor temp 7°CB/64*CB/B4/2.8*FWB) outlet water temp 7°C (44.6*F) BTU/h = \$W × 88		seathing		4	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$		Motor output	kW	11.5 × 4	
FanAir flow rate m^2min 270×4 L/s4500 $\times 4$ 4500 $\times 4$ 4500 $\times 4$ L/s4500 $\times 4$ 9534 $\times 4$ 9534 $\times 4$ Type, QuantityPropeller fan $\times 4$ InverterInverterMotor outputkW0.92 $\times 4$ 1External static press.Pa20ProtectionHigh pressure protectionWWInverter circuitOver-heat protection, Over current protectionInverter circuitOver-heat protection, Over current protectionCompressorOver-heat protection, Over current protectionRefrigerantType \times chargeRefrigerantType \times chargeVorteEXPONDER/24*CWB (95*FDB / 75.2*FWB) outlet water temp 7*C (44.6*F)inlet water temp 12*C (53.6*F). Pump input is not included in cooling capacity and power input.20Unit converY Under normal leating conditions at outdoor temp 35*CDB/24*CWB (95*FDB / 75.2*FWB) outlet water temp 7*C (44.6*F)inlet water temp 12*C (53.6*F). Pump input is included in cooling capacity and power input.2 Under normal leating conditions at outdoor temp 32*CDB/24*CWB (95*FDB / 75.2*FWB) outlet water temp 7*C (44.6*F)inlet water temp 10*C (104*F). Pump input is included in cooling capacity and power input.3 Under normal leating conditions at outdoor temp 7*CDB/24*CWB (95*FDB / 75.2*FWB) outlet water temp 7*C (44.6*F)inlet water temp 10*C (104*F). Pump input is not included in cooling capacity and power input.4 Under normal leating conditions at outdoor temp 7*CDB/24*CWB (95*FDB / 75.2*FWB) outlet water temp 7*C (44.6*F)inlet water temp 10*C (104*		Lubricant		MEL46EH	
L/s 4500 × 4 cfm 9534 × 4 fm 9534 × 4 Starting method Inverter Motor output kW 0.92 × 4 External static press. Pa 20 Protection High press_resport of the protection, Over current protection Over-heat protection, Over current protection Inverter circuit Over-heat protection, Over current protection Over-heat protection, Over current protection Refrigerant Type < charge	Fan	Air flow rate	m ³ /min	270 × 4	
Intervent Intervent Image: Construct on the second s			L/s	4500 × 4	
Image: Type, Quantity 93:54 x 4 Type, Quantity Propeller fan x 4 Starting method Inverter Motor output kW 0.92 x 4 External static press. Pa 20 Protection High press_temp crotection. Over-heat protection. Over current protection. Inverter circuit Over-heat protection. Over-heat protection. Compressor Over-heat protection. Ver-main static press. Control Inverter circuit. Over-heat protection. Notes: Control LEV *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) Ka/h inlet water temp 12°C (53.6°F). Pump input is included in cooling capacity and power input. Unit conver *2 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (45°FDB/2.5°FWB) outlet water temp 7°C (44.6°F) BTU/h in let water temp 12°C (53.6°F). Pump input is included in cooling capacity and power input. Unit conver *1 Under normal heating contions at outdoor temp 35°CDB/24°CWB (45°FDB/2.4°FWB) outlet water temp 7°C (44.6°F) BTU/h in let water temp 12°C (53.6°F). Pump input is included in cooling capacity and power input. BTU/h <td></td> <td></td> <td>ofm</td> <td>0694 - 4</td> <td></td>			ofm	0694 - 4	
Lype, cuanny Propelier tan × 4 Inverter Inverter Motor output WW 0.92 × 4 External static press. Pa 20 Protection High pres.Sum protection. High pres.Sum of & High Pres.High Pres.High Pres.High Pres.High Pres.High Pres.High		Tuno Quantitu	i enti	3004 × 4	
Starting method Inverter External static press. Pa 20 Protection High press_rest at 1.5MP a (601ps) 20 Protection High press_ensor & High pres_Switch 41.15MP a (601ps) 20 Inverter circuit Over-heat protection, Over current protection 0ver-heat protection, Over current protection Compressor Over-heat protection, Over current protection 0ver-heat protection, Over current protection Refrigerant Type x charge R32 x 11.5 (kg) x 4 *5 0ver-heat protection, Over current protection Notes: Control LEV 0ver-heat protection, Over current protection, Over current protection, Over-heat protectin, Over-heat protection, Over-heat pr		Type, quantity		Propeller tan × 4	
Motor output kW 0.92 × 4 External static press. Pa 20 Protection High pressure protection High press.Sensor & High press.Sensor & High press.Sensor & Kigh press.Sensor		Starting method		Inverter	
External static press. Pa 20 Protection High press.Switch at 4.15MPa (601psi) High press.Switch at 4.15MPa (601psi) High press.Switch at 4.15MPa (601psi) High press.Switch at 4.15MPa (601psi) Numeric circuit Over-heat protection, Over current protection Compressor Over-heat protection, Over current protection Refrigerant Type x charge R32 x 11.5 (kg) x 4 *5 Control LEV		Motor output	kW	0.92 × 4	
Protection High pressure protection High press.Sensor & High press.Switch at 4.15MPa (60 tpsi) Inverter circuit Over-heat protection, Over current protection Compressor Over-heat protection, Over current protection Refrigerant Type x charge R32 x 11.5 (kg) x 4 *5 Control LEV		External static press.	Pa	20	
Inter Proceeding Proceeding Inter Proceeding Proceeding Inter Proceeding Proceeding Compression Compression Over - heat protection Refrigerant Type x charge Inter Proceeding R32 x 11.5 (kg) x 4 *5 Control LEV Notes: Inter Proceeding Control *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (85°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) LEV *2 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (85°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) BTU/n *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (85°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) BTU/n *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (85°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) BTU/n *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (85°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) BTU/n *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (46°FDB / 28°FWB) outlet water temp 7°C (44.6°F) BTU/n *1 Under normal heating conditions at outdoor temp 35°CDB/24°CWB (46°FDB / 28°FWB) outlet water temp 45°C (113°F) Bs = kg/0.45 *1 Under normal heating conditions at outdoor temp 3°CDB/24°CWB (46°FDB / 28°FWB) outlet water temp 45°C (113°F) Bs = kg/0.45 *1 Under normal heating conditions at outdoor temp 3°CDB/2	Protection	High pressure protection		High pres Sensor & High pres Switch at 4 15MD	Pa (601psi)
Interior of outsite Over-instal protection Compressor Over-instal protection Refrigerant Type x charge R32 x 11.5 (kq) x 4 *5 Control LEV		Inverter circuit		Over heat protection. Over extract crotection	tion
Compressor Over-heat protection Refrigerant Type x charge R32 x 11.5 (kg) x 4 *5 Control LEV		Compressor		Over-near protection, over current protect	2001
Refrigerant Type x charge R32 x 11.5 (kg) x 4 *5 Control LEV Notes: 1 LEV '1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) Kcal/h = KW × 88 '2 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) Kcal/h = KW × 88 '2 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 52.7°FWB) outlet water temp 7°C (44.6°F) Ibs = Kg/0.45 '1 Under normal heating conditions at outdoor temp 35°CDB/24°CWB (94.6°FDB/24.5°FWB) outlet water temp 7°C (44.6°F) Ibs = Kg/0.45 '1 Under normal heating conditions at outdoor temp 7°CDB/24°CWB (94.6°FDB/24.5°FWB) outlet water temp 45°C (113°F) Ibs = kg/0.45 '1 Under normal heating conditions at outdoor temp 7°CDB/24°CWB (94.6°FDB/24.5°FWB) outlet water temp 45°C (113°F) Ibs = kg/0.45 '1 Under normal heating conditions at outdoor temp 7°CDB/52.5°WB/94.0°WB (44.6°FDB/24.3°FWB) outlet water temp 45°C (113°F) Ibs = kg/0.45 '6 IPLV is calculated in second temp 75°CDB/24°WB (44.6°FDB/24.3°FWB) outlet water temp 45°C (113°F) Ibs = kg/0.45 '6 IPLV is calculated in scond mater water pringer and at the field. '6 IPLV is calculated in scond mater water pring. 'Pleas		Compressor		Over-heat protection	
Control LEV Notes: Unit convert *1 Under normal cooling conditions at outdoor temp 35°CDB/24*CWB (95°FDB /7 5.2°FWB) outlet water temp 7°C (44.6°F) Kcal/n = KW × 3, inlet water temp 12°C (53.6°F). Pump input is not included in cooling capacity and power input. BTU/h = KW × 3, '2 Under normal cooling conditions at outdoor temp 35°CDB/24*CWB (95°FDB /7 5.2°FWB) outlet water temp 7°C (44.6°F) BTU/h = KW × 3, '3 Under normal cooling conditions at outdoor temp 35°CDB/24*CWB (45°FDB /75.2°FWB) outlet water temp 45°C (113°F) BtU/h = Ky/0.45 '3 Under normal cooling conditions at outdoor temp 7°CDB/6*CWB (44.6°FDB/42.8°FWB) outlet water temp 45°C (113°F) Ibs = kg/0.45 cfm = m ⁹ /min '4 Under normal heating conditions at outdoor temp 7°CDB/6*CWB (44.6°FDB/42.8°FWB) outlet water temp 45°C (113°F) Ibs = kg/0.45 cfm = m ⁹ /min '5 Under normal heating conditions at outdoor temp 7°CDB/6*CWB (44.6°FDB/42.8°FWB) outlet water temp 45°C (113°F) Ibs = kg/0.45 cfm = m ⁹ /min '6 Under normal heating conditions at outdoor temp 7°CDB/6*CWB (44.6°FDB/42.8°FWB) outlet water temp 45°C (113°F) Ibs = kg/0.45 cfm = m ⁹ /min '6 H2/V is calculated in accordance with AHRI 550-590. "Please don tuse groundwater or well water in direct. "Please don tuse groundwater or we	Refrigerant	Type × charge		R32 × 11.5 (kg) × 4 *5	
Notes: Unit conve *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) kcal/h = KW × 88 inlet water temp 12°C (53.6°F). Pump input is not included in cooling capacity and power input. BTU/h = KW × 88 2 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB/7.52°FWB) outlet water temp 7°C (44.6°F) BTU/h = KW × 88 2 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB/72.5°WB) outlet water temp 7°C (44.6°F) BTU/h = KW × 88 3 Under normal heating conditions at outdoor temp 3°CDB/24°CWB (95°FDB/72.5°WB) outlet water temp 7°C (44.6°F) Ibs = Kg/0.45 1 Under normal heating conditions at outdoor temp 3°CDB/24°CWB (94.6°FDB/24.5°FWB) outlet water temp 45°C (113°F) Ibs = kg/0.45 in Under normal heating conditions at outdoor temp 3°CDB/52.0°WB (44.6°FDB/24.3°FWB) outlet water temp 45°C (113°F) Ibs = kg/0.45 in Under attemp 40°C (104°F). Pump input is included in heating capacity and power input based on EN14511. 's Amount of factory-charged refrigerant is 3 (kg) × 4. Please add the refrigerant at the field. '6 IPLV is calculated in accordance with AHRI 550-590. *Please advs make water circulate, or pull the circulation water out completely when not in use. 'Please advs make water circulate, or pull the circulation water out completely when not in use. *		Control		LEV	
Notes: Unit conve *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) kcal/h = kW × 30 *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) kcal/h = kW × 30 *2 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB / 75.2°FWB) outlet water temp 7°C (44.6°F) kDU/h = kW × 30 inlet water temp 12°C (53.6°F.) Poump input is included in cooling capacity and power input based on EN14511. lbs = ky0.45 *3 Under normal heating conditions at outdoor temp 7°CDB/6°CWB (44.6°FDB/42.8°FWB) outlet water temp 45°C (113°F) lbs = ky0.45 *1 Under normal heating conditions at outdoor temp 7°CDB/6°CWB (44.6°FDB/42.8°FWB) outlet water temp 45°C (113°F) inlet water temp 40°C (104°F). Pump input is included in heating capacity and power input. ksp0.45 *4 Under normal heating conditions at outdoor temp 7°CDB/6°CWB (44.6°FDB/42.8°FWB) outlet water temp 45°C (113°F) inlet water temp 40°C (104°F). Pump input is included in heating capacity and power input. sm0.66 *5 Amount of factory-charged refrigerant it 3 (kg) × 4. Please add the refrigerant at be field. (kd.6°FDB/42.8°FWB) sm0.66 *6 IPU.V is calculated in accordance with AHRI 550-590. *Please don to use groundwater or well water in direct. *Please don to use groundwater or well water in di					1
"o IrLV is calculated in accordance with ArRI 50-590. "Please advises that the attential for the water piping. "Please always make water circulate, or pull the circulation water out completely when not in use. "Please always make water circulate, or pull the circulation water out completely when not in use. "Please always make water circulater or well water in direct. "The water circuit must be closed circuit. "Due to continuous improvement, the above specifications may be subject to change without notice. "This model doesn't equip with a pump.	Notes: ¹ Under normal cooling c inlet water temp 12°C (² Under normal cooling c inlet water temp 10°C (³ Under normal heating c inlet water temp 40°C (⁴ Under normal heating c inlet water temp 40°C (⁵ Amount of factory-chan ⁹ Dividio temp 40°C (⁵ Amount of factory-chan)	onditions at outdoor temp 35°CDB/24°CW (53.6°F). Pump input is not included in coor anditions at outdoor temp 35°CDB/24°CW (53.6°F). Pump input is included in cooling anditions at outdoor temp 7°CDB/6°CWB (104°F). Pump input is not included in heating and the provided in heating (104°F). Pump input is included in heating ged refrigerant is 3 (kg) × 4. Please add th	VB (95°FDB / 75.2° pling capacity and VB (95°FDB/75.2°F g capacity and pow (44.6°FDB/42.8°F (44.6°FDB/42.8°F capacity and pow he refrigerant at the	*FWB) outlet water temp 7*C (44.6*F) power input. *WB) outlet water temp 7*C (44.6*F) er input based on EN14511. *WB) outlet water temp 45°C (113°F) sower input WB) outlet water temp 45°C (113°F) er input based on EN14511. e field.	kcal/h = kW × 860 BTU/h = kW × 3,412 lbs = kg/0.4536 cfm = m ³ /min × 33
*Due to continuous improvement, the above specifications may be subject to change without notice. *This model doesn't equip with a pump.	*6 IPLV is calculated in ac *Please don't use the stee *Please always make wat *Please do not use ground *The water circuit must be	cordance with AHRI 550-590. I material for the water piping. er circulate, or pull the circulation water ou dwater or well water in direct. e closed circuit.	ut completely when	n not in use.	
*7 Please refer to 2-1-6. Operation temperature range.	*Due to continuous improv *This model doesn't equip *7 Please refer to 2-1-6. C	vement, the above specifications may be s with a pump. Operation temperature range.	subject to change v	without notice.	

2. Product Data







MEES20K012

MITSUBISHI ELECTRIC CORPORATION