



Chillers – Technical Submittal (TSM)

Project: Manchester Metropolitan University – Institute of Sports
Project No: MC1136
TSM No: 1918-AME-XX-XX-TS-M-0011
Revision: -

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CARBONCONSULTANTS



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Building Services Engineering

CUSTOMER INFORMATION

Company
Contact
Telephone Number
Email Address
Project Name
Quotation Reference Number
Sales Engineer (Internal)
Sales Engineer (External)



CHILLER SELECTION INFORMATION

DCC032DR-06KLR0

Cooling Capacity Required	[kW]	308.0
Fluid Inlet Temperature	[°C]	12.0
Fluid Outlet Temperature	[°C]	6.0
Design Ambient Temperature	[°C]	35.0
Fluid Type		Water
Glycol Concentration	[%]	N/A
Solution Freezing Point	[°C]	0.0
Sound Level Variant		Regular Quiet
Sound Pressure (Distance to Listener)	[m]	10

PERFORMANCE RELATED OPTIONS

Condenser Fan Type	EC
Extended Plenum	x
Fan Diffusers	x
Coil Protection Type	Standard
Compressor Enclosure	Standard Insulation
Compressor Acoustic Jackets	x
Water Filter	x
Bypass	x
Pumps	x
Pump Configuration	N/A
Pump Type	N/A
Pump Size	N/A

PREDICTED PERFORMANCE DATA

Notes

Cooling Capacity (Gross)		[kW]	315.7
Cooling Capacity (Nett)		[kW]	315.4
Total Input Power (Gross)	(1)	[kW]	103.2
Total Input Power (Nett)	(1)	[kW]	103.8
Total EER (Gross)			3.06
Total EER (Nett)			3.04
ESEER (Gross)	(2)		4.70
ESEER (Nett)	(2)		4.54
SEER Office (Gross)			4.70
SEER Office (Nett)			4.54
IPLV (COP _R - EER - kW/ton _R)	(3)		5.29 - 18.06 - 0.66
Fluid Flow Rate		[l/s]	12.5
Chilled Pressure Drop		[kPa]	21.3
Capacity Steps (of maximum duty)		[%]	25-45-65-85-100

ECODESIGN PERFORMANCE DATA

Notes

Application	(4)	COMFORT APPLICATION SSCEE 184.3% = Tier 2 (2021)
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NOTES

- 1) All values inclusive of compressors and fans
- 2) All part load ratios in line with RS 6/C/003-2016
- 3) IPLV calculated according to AHRI Standard 550/590 2018
- 4) SSCEE calculated using EN14825-1 Table 4 including external pump rerates as per EN14511. Compliance based on capacity at Ecodesign rating conditions (Gross) = Excluding absorbed pump power as per EN14511, (Nett) = Including absorbed pump power as per EN14511
All performance data is supplied in accordance with BS EN14511-1 (external pump) and subject to the tolerances laid out in table 7, section VII of Eurovent 6/C/003-2016. Cooling Capacity; -5%, EER Full Load; -5%, (PL 75%; -6%, PL 50%; -8%, PL 25%; -14%, ESEER; -9%). For free-cooling chillers, the resultant free-cooling performance figures obtained from test will be proven to not differ from the claimed figures by more than the allowable deviations specified in section VII of Eurovent RS 7/C/008 – 2017 (cooling capacity; -8%, power input; +10%).

TECHNICAL DATA**Construction**

Material		Panels: Galvanised Sheet Steel, Epoxy Baked Powder Paint Panels: Galvanised Sheet Steel, Epoxy Baked Powder Paint
Colour		Light Grey (RAL7035)

Dimensions / Mass

Dimensions (Height x Width x Length)	[mm]	2620 x 2200 x 3690
Machine Mass	[kg]	2659
Operating Mass	[kg]	2739

Compressor

Type		Tandem + Trio
Quantity		5
Capacity Control		Staged
Oil Charge Volume	[l]	2 x 6.1 + 3 x 6.1
Oil Type		Polyol Ester

Condenser

Type		Epoxy Coated Aluminium Microchannel & Aluminium Fins
Face Area (Total)	[m²]	14.3
Maximum Airflow	[m³/s]	38.8

Fan

Type		Sickle Bladed Fan
Quantity		6
Diameter	[mm]	800
Maximum Speed	[rpm]	1026
Fan Speed Control		Microprocessor Controlled EC (Electronically Commutated) Fans

Refrigeration

Configuration		Dual Circuit
Refrigerant Type		R32
Refrigerant Control		Electronic Expansion Valve (EEV) 1 x ETS 25C / 1 x ETS 25C
Refrigerant Charge (Total)	[kg]	26 + 27

Evaporator

Type		Brazed Plate
Insulation		Class 1
Water Volume	[l]	33.3
Design Flow Control		Constant Flow
		Unit to be commissioned and fixed at design water flow rate

Connections

Type		Grooved Terminations
Unit Water Inlet and Outlet Size		DN100
Water Drain / Bleed		1/2

Water System

Min. System Water Volume	[l]	1185
Max. System Operating Pressure	[Barg]	10
Unit Water Volume	[l]	80

Pumps

Additional External Static	[kPa]	N/A
Pump Operating Speed	[%]	N/A
Pump Input Power	[kW]	N/A
Total External Static Available	[kPa]	N/A

Strainer

Fitted or Supplied Loose		N/A
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TECHNICAL DATA - ELECTRICAL**Unit Data**

Mains Supply	[VAC]	400 V 3 PH 50 Hz
Nominal Run Amps*	[A]	204.3
Unit Maximum Start Amps*	[A]	395.4
Recommended Mains Fuse Size*	[A]	250
Maximum Mains Incoming Cable Size		Direct to Bus Bar

* Inclusive of pump if specified



CAUTION - A separately fused, locally isolated, permanent single phase and neutral supply is required for the compressor sump heater, evaporator trace heating and control circuits.

Permanent Supply	[VAC]	230 V 1 PH 50 Hz
Max. Permanent Incoming Cable Size	[mm ²]	4 mm ²
Recommended Permanent Main Fuse Size	[A]	16
Control Circuit	[VAC]	24V (±10%) / 230V

External Trace Heating

Available (Fitted by Others)	[W]	500
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Condenser Fan - Per Fan

Quantity		6
Full Load Amps	[A]	3.9
Locked Rotor Amps	[A]	N/A
Motor Rating	[kW]	2.6

Compressor - Per Compressor

Quantity		5
Nominal Run Amps	[A]	39.9 / 32.9
Motor Rating	[kW]	23.8 / 19.8
Sump Heater Rating	[W]	56 / 56
Start Amps	[A]	231 / 191
Type of Start		Direct on line

Evaporator Immersion Heater

Power per Heater (1 per Unit)	[W]	100
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OPTIONAL EXTRAS**Power Factor Correction**

Nominal Run Amps	[A]	188
Maximum Start Amps	[A]	383
Compressor Nominal Run Amps - Per Compressor	[A]	36.1 / 30.1
Recommended Mains Fuse	[A]	250

Electronic Soft Start

Nominal Run Amps	[A]	204
Maximum Start Amps	[A]	286
Recommended Mains Fuse	[A]	250

Pump

Configuration		N/A
Full Load Amps	[A]	N/A
Locked Rotor Amps	[A]	N/A
Motor Rating	[kW]	N/A
Type of Start		N/A

SOUND DATA

Measurement of Sound

All sound data quoted has been measured in the third-octave band limited values, using a Real Time Analyser calibrated sound intensity meter in accordance with BS EN ISO9614 : 2009.

All Sound Power Levels quoted are calculated from measured sound intensity according to BS EN ISO9614 : 2009.

Sound Pressure Levels are calculated from sound power using the expanded parallelepiped method according to BS EN ISO11203 : 2009.

Resultant performance figures obtained from test will be proven to not differ from the claimed figures by more than the allowable deviations specified in table 7 of section VII of Eurovent RS 6/C/003-2016 (A-weighted sound power; +3dBA).

Directivity Indicator

The sound measurements quoted in the Global Chiller Sound Level Values table do not incorporate any directivity or denote any sound level heard at any given position surrounding the chiller, rather they represent the total sound levels radiating from the chiller in all directions in the horizontal plane from source.

Please Note: pump sound levels are not included.

Global Chiller Sound Level Values

Frequency	[Hz]	63	125	250	500	1k	2k	4k	8k
Sound Power Level	[dB]	82.0	88.3	86.1	83.9	86.0	76.5	72.8	63.9
Sound Pressure @ 10m	[dB]	59.8	56.0	53.8	51.7	53.8	44.2	40.5	31.7
Sound Pressure @ 10m	[dB]								
Total Sound Data									
Sound Power Level	[dB(A)]	88.3							
Sound Pressure @ 10m	[dB(A)]	56.1							
Sound Pressure @ 10m	[dB(A)]	56.1							

Note:

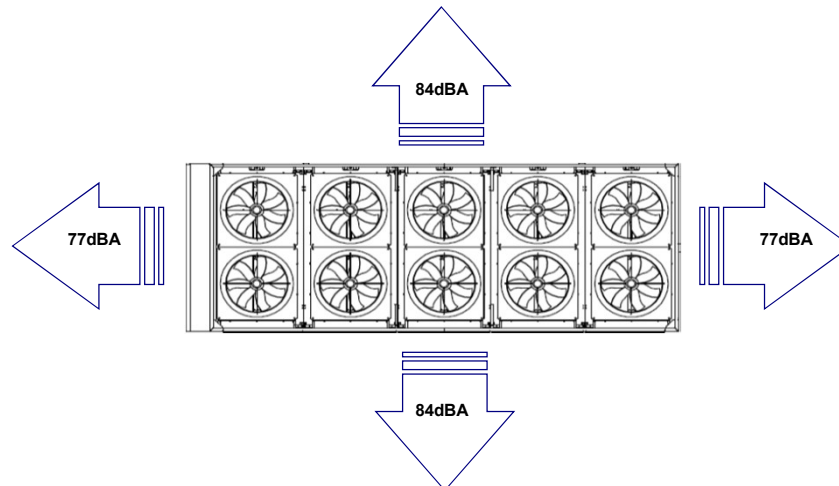
Sound Power Levels calculated from measured sound intensity according to BS EN ISO9614 : 2009.

Sound Pressure Levels calculated from sound power using the expanded parallelepiped method according to BS EN ISO11203 :2009.

dBA is the overall noise level measured on the A scale.

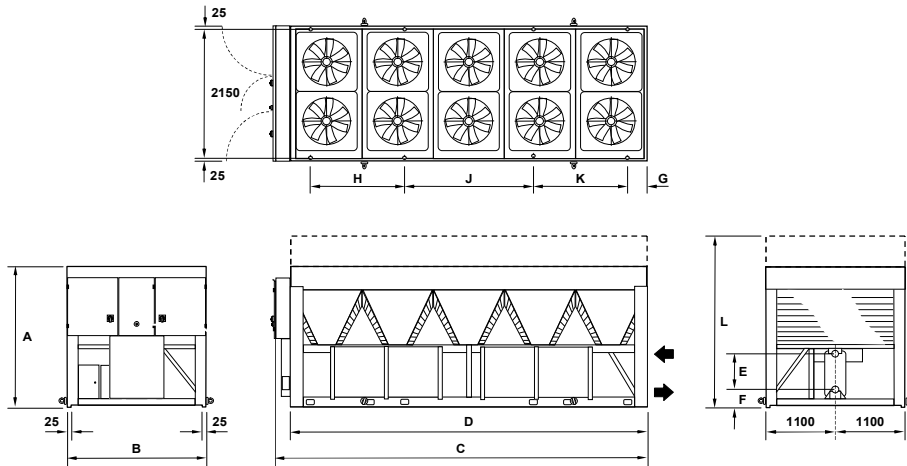
The Sound Pressure data quoted is only valid in free field conditions, where the unit is installed on a reflective base. If the equipment is placed adjacent to a reflective wall, values may vary from those stated, typically increasing by 3dB for each side added. All data excludes the sound emitted by the pump if selected.

Weighted Sound Power Level with Directivity



PHYSICAL DATA

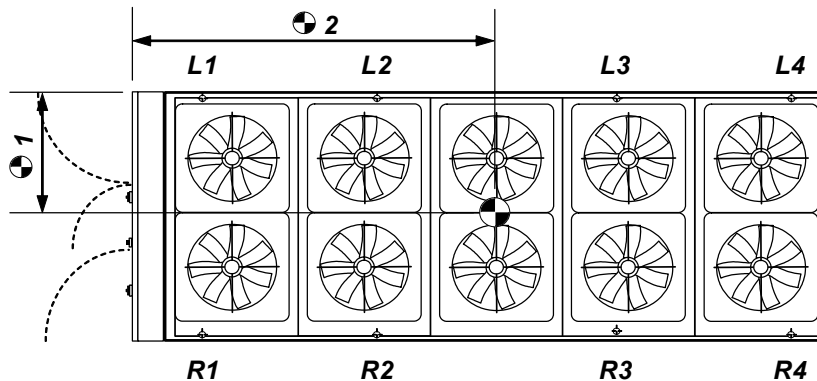
DIMENSIONS



Dimensions

[mm]	A	B	C	D	E	F	G	H
	2620	2200	3690	3407	549	206	712	1982
[mm]	J	K	L					
	N/A	N/A	2915					

POINT LOADS



L1 =	605	[kg]	R1 =	885	[kg]
L2 =	440	[kg]	R2 =	645	[kg]
L3 =	-	[kg]	R3 =	-	[kg]
L4 =	-	[kg]	R4 =	-	[kg]
L5 =	-	[kg]	R5 =	-	[kg]
L6 =	-	[kg]	R6 =	-	[kg]
L7 =	-	[kg]	R7 =	-	[kg]

CENTRE OF GRAVITY

C of G 1 = 1300 [mm]

C of G 2 = 1550 [mm]

NOTES

Calculation based on standard unit, for units fitted with enclosure, pump, tank and expansion vessel options, please contact Airedale.

ECODESIGN - PERFORMANCE BREAKDOWN

SSCEE

Model:		DCC032DR-06KLR0
Outdoor Heat Exchanger:		Air
Indoor Heat Exchanger:		Water
Type:		Compressor driven vapour compression
Driver of Compressor:		Electric Motor
Rated Cooling Capacity:	[kW]	322.1
SSCEE:	[%]	184.3 %

Performance Data		Ambient	
Declared Cooling	35°C	[kW]	321.8
Declared EER			3.07
Declared Cooling	30°C	[kW]	294.7 / 228.9
Declared EER			3.89 / 3.98
Declared Cooling	25°C	[kW]	167.6 / 89.1
Declared EER			5.29 / 4.97
Declared Cooling	20°C	[kW]	97.3 / 0.0
Declared EER			6.10 / 0

Power Consumption in other modes other than 'Active Mode'

P _{OFF}	[kW]	0.078
P _{TO}	[kW]	1.267
P _{CK}	[kW]	0.112
P _{SB}	[kW]	0.116

Supporting Information

Degradation Coefficient:		0.9
Capacity Control:		Staged
Sound Power Level:	[dB(A)]	88.4
Air Flow Rate:	[m³/h]	139779
Emissions of nitrogen oxides:		N/A
GWP of Refrigerant:		675
Standard Rating Conditions:		Low temperature application

Contact Details:

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