

Equipment Schedules

Project: Horniman Aquarium Chillers
HH Job Ref. 302807



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General Notes; (Apply to all schedules)

- 1 The manufacturer and model noted on these schedules has been used in the detailed design process. Refer to Mechanical Specification section ES(M)1 for requirements relating to alternative manufacturers.
- 2 Manufacturers model references used within the contents of these equipment schedules are for guidance only. The contractor is responsible for checking that the model references are correct at the time of pricing and the equipment being priced or supplied meets the performance and material requirements detailed in the specification, drawings and equipment schedules.

Pipework Schedule

Horniman Aquarium Chillers

Revision T1

System	Part System	Max. Working Pressure (Bar)	Material Description	BS Ref.	Flanges	Notes
Chilled Water	Flow and return pipework	5	ABS Plastic	BSEN150 2580-2:2003		
	CHW Cold Feed	5	Copper or Stainless Steel	BS2871 Table X	BS4504 PN6	
	External Distribution Pipework Buried in Ground	5	Up to DN100mm - Flexalen 600 pre-insulated Polybutene pipe with water tight PB outer casing	BS EN-ISO 15876		Installed in accordance with the manufacturers instructions. Twin pipe system used up to DN50mm
Domestic Water Services	DHWS flow and return	5	Copper	BS2871 Table X	BD4505 PN10	
	Cold water service (tank)	5	Copper	BS2871 Table X	BS4505 PN10	
	Cold water mains within building	10	Copper	BS2871 Table X	BS4504 PN15	
	Hot & Cold & mains water Flow & Return Pipework (Alternative)	10	Stainless Steel grade 316 Mappress System or Equivalent	Refer to Specification	Refer to Specification	
	Cold water mains underground	10	MDPE (Blue)	BS6752		For non-contaminated ground conditions
	Cold water mains underground	10	Ductile Iron	Refer to Specification	BS4505 PN15	For contaminated ground conditions
	Cold water mains (entry to building from underground)	10	Copper	BS2871 Table Y	BS4505 PN15	

Notes 1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet

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Thermal Insulation Schedule

Horniman Aquarium Chillers

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System	Part System	Thickness (mm)	Insulation Material Description	Vapour Barrier	Protection	Electric Trace Heating Required	Notes
Chilled Water Pipework	Pipework in Plant Rooms	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	Aluminium clad	-	Insulation carried over support brackets and through sleeves.
	Pipework within the building, hidden from view (ceiling voids etc)	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	None	-	Insulation carried over support brackets and through sleeves.
	Pipework within the building, exposed to view (ceiling voids etc)	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	None	-	Insulation carried over support brackets and through sleeves.
	External Pipework	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	Ventureclad Plus cover with sealed joints	Yes	Insulation carried over support brackets and through sleeves.
Domestic Hot & Cold Water Services	Pipework in Plant Rooms	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	Aluminium clad	-	Insulation carried over support brackets and through sleeves.
	Pipework within the building, hidden from view (ceiling voids, below sanitary appliances etc.)	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	None	-	Insulation carried over support brackets and through sleeves.
	Pipework exposed to view in non occupied & 'Back of house' rooms (stores, workshops etc)	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	None	-	Insulation carried over support brackets and through sleeves.
	Distribution Pipework Buried in screed	9mm	Armaflex or similar	Denso wrapped	Denso wrapped	-	Insulation carried over support brackets and through sleeves.
	Pipework exposed to view in occupied rooms (toilets etc)	None	None	None	None	-	Unless stated on the drawings or specification
	External Pipework	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	Ventureclad Plus cover with sealed joints	-	Insulation carried over support brackets and through sleeves.
	Cold water mains (entry to building from underground)	Refer to Specification	Mineral fibre	Denso wrapped	Denso wrapped	-	Insulated pipe within pipe sleeve

Thermal Insulation Schedule

Horniman Aquarium Chillers

Revision T1

System	Part System	Thickness (mm)	Insulation Material Description	Vapour Barrier	Protection	Electric Trace Heating Required	Notes
Ventilation Ductwork (Thermal Insulation)	Supply, Extract & Fresh Air ductwork within plantrooms	Refer to Specification	Mineral fibre wool or rigid sections	Aluminium foil	Aluminium clad	-	
	Supply Air ductwork within the building	Refer to Specification	Mineral fibre wool or rigid sections	Aluminium foil	None	-	
	Extract Air ductwork for heat recovery or recirculation within the building	Refer to Specification	Mineral fibre wool or rigid sections	Aluminium foil	None	-	
	Individual extract systems (no heat recovery)	None	None	None	None	-	Unless stated on the drawings or specification
	External Fresh Air & Exhaust Louvre Plenums	Refer to Specification	Mineral fibre wool or rigid sections	Aluminium foil	None	-	Aluminium clad protection if plenum is within the plantroom
	External Supply & Extract Ductwork	Refer to Specification	Mineral fibre wool or rigid sections	Aluminium foil	Ventureclad Plus cover with sealed joints	-	Insulation carried over support brackets.

Notes 1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet

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Package Chiller Schedule

Horniman Aquarium Chiller

Revision T1

HH Reference: CH01 Location: External Enclosure

Manufacturer: ICS Cool Energy
 Model: iC410
 Type: Packaged air cooled chiller

No. of Compressors: 1 Compressor type: Reciprocating
 Refrigerant Type: Manufacturer's

Required Duty:	Cooling Capacity	29.3	kW
	External Design Temperature	30	deg.C
	CHW Flow Temperature	6	deg.C
	CHW Return Temperature	12	deg.C
	CHW Flow Rate		kg/s
	Air Flow Rate	8150	m ³ /hr
	Maximum CHW pressure drop		kPa
	Electrical Supply (v/ph/Hz)	400/3/50	
	Electrical Load	8.39	kW
	Cooling Capacity Control Stages	0-100%	

Ancillary Items: Hydronics package incorporating CHW pumps, internal buffer vessel, fill unit and controls linked to the BMS.
 Chilled water flow switch and refrigerant pressure gauges
 Flexible pipe connections
 Low noise package
 Microprocessor control with interface with the BMS system : BMS shall provide start/stop control,

Shipping Weight: 464 kg

Nominal Size:
 Length: 1,862 mm
 Width: 761 mm
 Height: 1,462 mm

	Hz	63	125	250	500	1K	2K	4K	8K
Breakout Noise (SWL)		50.9	69.8	70.2	73.2	78.9	75.5	69.4	59

Sound level at 10m distance: 54.1 dBA

Notes:
 1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet

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Chilled Water Buffer Vessel Schedule

Horniman Aquarium Chillers

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Ref. No.	Location	Description	Storage Capacity (litres)	System Working Pressure (Bar)	System Operating Temperature		Test Pressure (Bar)	Manufacturer & Type	Ancillaries	Comments
					Flow (oC)	Return (oC)				
BV01	External Chiller Enclosure	Steel buffer vessel	500	2	6	12	7	McCallum Water Heating ZSA	150mm Dial temperature & pressure gauge. DN20 relief valve. 1" anti vacuum valve. BMS temperature sensor pockets (4No) bottom (lower connection level), 1/3 from bottom, 2/3 from bottom, top (high level connection level) of vessel. 2No. 50Ø, 2No. 40Ø, 2No 32Ø & 2No 25Ø pipe connections each pair at high & low level. 25mm drain with valve	Vessel to be supplied with 75mm mineral wool insulation with vapour proof wrap, suitable low legs to suit drain and height of enclosure and shall be painted with 2No coats of micacious iron paint in balck to prevent corrosion.

Notes
 1 The vessel shall be supplied with anti-vac valve, thermometer, pressure guage, automatic air vent, anti vacuum valve drain valve, safety valve, metal clad insulation (mineral wool with vapour
 2 Refer to McCallum Water Heating quote Ref. Tel.0141 881 1051

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Pump Schedule

Horniman Aquarium Chillers

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Ref. No.	Location	System	Pump Duty		Fluid	Electrical Supply		Pump Speed RPM (max)	Manufacturer & Type	Description/Accessories
			Flow (kg/s)	Pressure (KPa)		V/Ph/Hz	W			
P01	Chiller Enclosure	Aquarium Chilled Water	1.8	120	80% CHW 20% Glycol	230/1/50	560	2900	Wilo DP-E 32/105-0, 75/2 PN 10	Twin duty/standby variable speed pump

Notes

- 1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet
- 2 Pump heads to be supplied with separate Bacnet control cards to allow Duty/Standby operation.
- 3 Inverter controlled pumps shall be sized at 85% motor speed.
- 4 Refer to Wilo UK quote Ref. PRO_0096341 Tel. 01283 523000

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Pressurisation Unit Automatic Dosing Schedule

Horniman Aquarium Chillers

Ref. No.	Location	System	System Static Pressure (Bar)	System Operating		System Temperature (degC)	System Water Content (litres)	Electrical Supply		Manufacturer & Type
				Min (Bar)	Max (Bar)			V/Ph/Hz	Amp	
DU01	Chiller Enclosure	Aquarium Chilled Water	2	0.6	1.5	CHW at 4C 80% CHW 25% Glycol	400	230/1/50	2	Grundfos Dosing System (parts below)
										40 litre Tank Pt No 96688081 Dosing Pump DDA 7.5ltr/hr Pt No 97721940 Hose 3m Pt No 91835076 Suction Lance RSL with level switch Pt No 98071074 Multifunction Valve Pt No 9570459 Injection Unit 95730908

Notes

- 1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet
- 2 The dosing unit parts are supplied loose and require to be assembled (bolts etc required). The dosing system shall be set up by the contractor
- 3 Dosing unit to be supplied by Grundfos Dosing 01942 263628 (ask for Bob)

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Pressurisation Unit Automatic Dosing Schedule

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Description & Accessories
Packaged unit with automatic chemical dosing and low level alarm

Installation engineer

Pressurisation Unit Automatic Dosing Schedule

Horniman Aquarium Chillers

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Ref. No.	Location	System	System Static Pressure (Bar)	System Operating		System Temperature (degC)	System Water Content (litres)	Electrical Supply		Manufacturer & Type	Expansion Vessel Size	Description & Accessories
				Min (Bar)	Max (Bar)			V/Ph/Hz	Amp			
PU01	Chiller Enclosure	Aquarium Chilled Water	2	0.6	1.5	CHW at 4C 80% CHW 20% Glycol	400	230/1/50	2	Aquatech Pressmain Micropack 2ETM40-E	Confirmed & supplied by manufacturer	Packaged unit pressurisation unit with remote fault indication to the BMS system (bacnet card)

Notes

- 1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet
- 2 The CHW expansion vessels shall be supplied loose for installation into the relevant cold feed pipe connection.
- 3 Refer to Aquatech Pressmain quote Ref. 35-18511/0 Tel. 01206 215121

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Pressurisation Unit Automatic Dosing Schedule

Horniman Aquarium Chillers

Revision

Ref. No.	Location	System	System Static Pressure (Bar)	System Operating		System Temperature (degC)	System Water Content (litres)	Electrical Supply		Manufacturer & Type	Expansion Vessel Size
				Min (Bar)	Max (Bar)			V/Ph/Hz	Amp		
DA01	Chiller Enclosure	Aquarium Chilled Water	2	0.6	1.5	CHW at 4C 80% CHW 25% Glycol	400			Flamco Flamcovent Clean Spearator 50S Smart	n/a

- Notes
- 1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet
 - 2 The dirt air separator shall be supplied with an insulated cover and shall be suitably vapour sealed.
 - 3 Unit to be supplied by Flamco Ltd

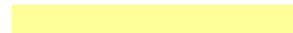
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Pressurisation Unit Automatic Dosing Schedule

T1

Description & Accessories
Dirt Air separator supplied with Flacovent Clean Isoplus insulated cover with vapour seal.



Silencer Schedule

Horniman Aquarium Chillers

Revision T1

Silencer Ref	System	QTY	Air Volume (m ³ /s)	P.D. (Pa)	Manufacturer/ Type	Length (mm)	Duct Size width x height (or diameter)		Attenuation (dB)								Accessories/Notes
							(mm)		63	125	250	500	1K	2K	4K	8K	
ATT01	Chiller Exhaust	1	2.26	15	Allaway Acoustics PL/GX	900	630ø		50.9	69.8	70.2	73.2	78.9	75.5	69.4	59.0	Exhaust from new chiller c/w connections and discharge piece
ATT02	Chiller Exhaust	1	1.7	15	Allaway Acoustics PL/GX	600	500ø		52.1	73.5	74.4	70.7	76.6	72.2	65.2	57.4	Exhaust from new chiller c/w connections and discharge piece

Notes 1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet
 2 Attenuators to be supplied and manufactured by Allaway Acoustics Ltd 01992 550825

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External Louvre Schedule

Horniman Aquarium Chillers

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Louvre Ref	Floor Level	Air Volume (l/s)	QTY	Manufacturer / Type	Size Length x Height (or diameter)		Duct Size (mm)	Plenum Box	Accessories/Notes
EL/01	Ground	150	1	CBS 50DB	2525	1970	N/A	None	Double Bank, aluminium, 50mm pitch, fixed blade louvre providing chiller make up air. Powder coated to RAL colour to match Equitone Panels (Pebble LT20)
EL/02	Ground	0.0144m ² F.A. (min)	1	CBS 50 DB	1100	2075	N/A	None	Double Bank, aluminium, 50mm pitch, fixed blade louvre providing chiller make up air. Powder coated to RAL colour to match Equitone Panels (Pebble LT20)

- Notes
- 1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet
 - 2 The above louvres shall be supplied with a powder coated paint colour approved by the CA.
 - 3 All louvres shall be supplied with a 5mm stainless steel bird screen, drip cills and concealed internal fixings
 - 4 Louvres to be supplied by CBS 07715 198949

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