

Project Name

Equipment Schedules

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BDP.

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Equipment Schedules

INDEX

Number	Schedule Name	Revision	Date of Revision
1	Chiller Schedule	T03	26/06/2026
2	Pump Schedule	T02	26/06/2026
3	Dirt Air Separator Schedule	T02	07/06/2026
4	Pressurisation Unit Schedule	T01	07/06/2026

Equipment Schedules Suppliers/Manufacturers

Explanation of Status:

If the supplier status is listed for an item of equipment it has the following meaning:

1: Suggested Manufacturer: The names are provided to assist the contractor in identifying suppliers that may supply compliant equipment. This does not preclude the use of alternatives that comply fully with the requirements detailed in the schedules. The equipment supplied must comply fully with the requirements listed in the schedule irrespective of the manufacture/supplier used.

2. Required Quality: The supplier/manufacturer listed provides an indication of the quality of equipment that must be provided. Equivalent alternatives will be considered but all alternatives offered must comply fully with the requirements of the schedules and must be fully technically and visually equivalent to that provided by the supplier/manufacturer listed.

3. Required Product: This item of equipment must be purchased from the supplier/manufacturer listed. Any difficulties in obtaining an accurate quotation must be raised during the tender period. Post tender, a deviation from the listed manufactures will only be considered if (in the view of the consultant engineer) the cost is considerably outside the industry norm or the supplier is shown to be unreliable or inappropriate.

[illegible]

Equipment Schedules : General Notes Applicable To All Schedules

Equipment must be supplied from companies that meet the following Minimum Requirements:

A distributor must have hand an office in the same country as the project, for at least five years.

The supplier must be able to provide on request ten positive references from previous installations of the proposed equipment.

The supplier or distributor must have a minimum of 5 No. support staff in the same country as the project.

Fit for Purpose:

All equipment must be fit for the intended purpose and suitable for the weather conditions found at the site. All equipment must comply with all statutory regulations and requirements.

Technical Support:

All suppliers proposed must be able to provide a technically competent representative who is capable of fully understanding the equipment provided and advising on commissioning and operational information.

Warrantees:

Provide warranties / extended warranties for all equipment for a period of at least 12 months beyond the date of at which the equipment is accepted as handed over to the client, snag free. If equipment is not accepted, the contractor shall provide, at their cost, extended warrantees as required to meet this clause.

Two year warranties shall be provided for any item of equipment that contains moving parts.

Warrantees shall cover full replacement cost including parts and labour in the event of an equipment failure For any other purpose other than direct damage by the client.

Oversizing:

Equipment supplied shall not be significantly oversized. If equipment is oversized by more than 20% of the specified duty, and the Employer's Representative determines that this is causing a difficulty with the control, efficiency, noise, or physical dimensions of the unit then the item shall be replaced at no cost to the contract.

Certification

All plant shall contain the CE mark All plant and equipment shall comply with the Building Regulations. References above to equipment shall also refer to plant and components.

Equipment shall only be proposed, for which the manufacturer can supply environmental performance declarations in accordance with ISO 14025 and EN 15804+A2

Chiller Schedule

Equipment Property	Units								
Reference:		CH02							
Cooling Duty	kW	97.8							
Free cooling		Yes							
Refrigerant GWP		R454B							
To be treated for marine environments		No							
Compressors per unit		2							
Compressor type		Scroll							
Refrigeration Circuits per unit		2							
Width	mm	1288							
Length	mm	2090							
Height	mm	2359							
Weight	kg	2,359							
Must Support Static Pressure of	Bar	6							

Cooling									
Entering Temperature	°C	12							
Leaving Temperature	°C	6							
Design Ambient	°C	30							
Glycol content	%	20%							
Specific heat capacity	kJ/kgK	3.8							
Water Flow Rate	kg/s	4.3							
EER at Cooling Condition Above		3.28							

Property Relevant to all Instances

Compliance	CE marked
Compressor Type	Inverter driven, variable speed with a turndown ratio of no larger than 20%
Max water side pressure drop	kPa 15
Pump Control	To be suitable for variable speed primary pumping.
Pump control	Primary pumps to run at minimum speed in frost conditions

Electrics:	
Include	Soft start to be provided
Note	Unit must be capable of operating with grid voltage tolerances (+/-10%)
Include:	The unit shall be capable of restarting within 30 seconds on loss of power
Include:	They shall continue to control with previous set points on restoration of power

Accessories:	
Include	Anti-Vibration mounts
Include	Sump heater and any other components required to safely operate in glycol free mode
Include	Crank case heater
Include	Flow switches

Sound Levels:			
Maximum sound power	dB(A)	85	Acoustic unit to be selected
Maximum sound pressure at 1m	dB(A)	63.7m	

Warranty	Include two year manufacturers warranty covering all parts and labour
Fan type	Fans shall be variable speed with ECDC motors
Pump duty	Refer to the pump schedule
Integration	If integrated into chiller, ensure BMS can control pumps for frost control and sequencing requirements

Controls:								
BMS Interface	BACnet							
Inputs	Enable	Flow temperature	Frost mode	Mode (H/C)				
Outputs	Fault	% Output						
Outputs For Evaporator and Condenser	Flow temperature	Return temperature						
Sequencing	Integrated sequencer to sequence for most efficient operation and to ensure defrost of one unit at a time							
Soft Start	Ensure soft start and ensure no more than one unit starts at a time							
Frost conditions	Ensure primary pumps only run at minimum speed on idle units in frost conditions							

Unit based off Liebert HPC-S Freecooling Chiller Model FS5 013

Pump Schedule

Equipment Property	Units		
Plant Reference Number		P01	
Quantity		2	
Flow rate	kg/s	4.27	
External Pressure Drop	kPa	150	
Temperature	°C	12	
System Temperature Difference	K	6	
Glycol Content	%	20	
Integrated Variable Speed Drive		No	
Variable Speed Control		N/A	
Pump Housing Material		Cast Iron	
Pump Impeller Material		Plastic	
Electrical Phases		1	
Provide Control Interface		BACnet	
Integrated Energy Meter		N/A	
Pump Heads		1	
Pump Mounting		Wall	
Include Flexible Connections		No	

Property Relevant to all Instances				
Pump Efficiency Must be at least	EEI < 0.23 , with rating clearly displayed on the pump			
Conformity, Must be	CE marked, ErP Compliant			
Provide Control Input Per head	Enable			
Provide Control Outputs Per head	Fault	Active flowrate	Energy Consumed	
All Pumps shall have active displays showing	Pressure	Flow rate	Active control mode	
Pumps to be rated for a static head of	10 Bar			
Include	All brackets and supports required			
Include	Anti vibration mounts on all pumps with a flow rate over 8g/s			
Selection	Select pumps at the centre of the pump curve			
Handover	Demonstrate correct commissioning of the VSD's			
Handover	Pumps to be commissioned within 10% of design conditions			

For information only (for the designer)		P01								
Approx energy transfer	kW	93.28930818								
Approx Pump Electrical Power	kW	1.0								

Dirt Air Separator Schedule

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Equipment Property	Units					
Reference		AD01				
Flow rate	kg/s	4.27				
Maximum temperature	°C	110				
Pipe connections	mm	100 flanged				
Test Pressure	Bar	10				
Max pressure drop acceptable at flow above	kPa	3.7				

Property Relevant to all Instances	
Location in system	Adhere to manufacturers advices
Efficiency	Separator to be capable of separating out particles with a size of 5 µm and larger
Materials	Stainless steel
Insulation	To same standard as containing pipe
Accessories	Include air vent and drain
Include Magnetic filter integrated into unit	Yes

Pressurisation Unit Schedule

Equipment Property	Units								
Plant Reference Number		PU H1							
System		Heating							
Fluid		Water							
Fluid Temp	°C	5degC - 20degC							
Energy Input	kW	800							
Minimum Expansion Vessel Size	L	709							
Maximum Fill Pressure	bar (g)	6							
System Height	m	40							
Tank Size	L	4							
Fill Rate	L/m	12							
No. of Pumps (with auto changeover if multiple)	per unit	2							

Property Relevant to all Instances	
Maximum Ambient	°C 20
Pump Casing Material	Gun Metal
Pump Shaft Material	Stainless Steel
High Pressure Cut Out	Yes
Low Pressure Cut Out	Yes
High pressure cut out	Yes
Low pressure cut out	Yes
BMS BACnet connection	Yes
BMS outputs for fault and high and low pressure	Yes
BMS outputs for pump run indication	Yes
Feed tank low level protection	Yes
Frost protection (only to be activated in frost conditions)	Yes
Include controls with "pump kick" feature to prevent seizing	Yes
Conformity, Must be	CE marked, ErP Compliant, IEE rating to be marked on pumps, BS 7074, EN ISO 4126
Conformity, Must be	Regional wiring regulations
Include :	All brackets and supports required
Include :	Isolating valve on the inlet and lock shield valve on the outlet
Include :	Non return valve (with expansion vessel on system side)
Include :	Strainers on all pumps
Include :	Pressure gauge to indicate system pressure
Include :	Air relief valve and pressure relief valve
Note	Type "AA" air gap shall be included within the system
Note	Noise produced shall be less than 60 dB(A) at 1m
Commissioning	The contractor shall measure the actual system content and confirm pressure vessel size is appropriate with the manufacturer prior to order