

HH_Form_M_01 - Mechanical Services Equipment Schedules

Project Name GMFRS Carbon 4 Bury
Project No. 312991
Status Stage 4
Revision P01

**HARLEY
HADDOW**

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General Notes; (Applies to all schedules)

- 1 The manufacturer and model noted on these schedules has been used in the detailed design process. Refer to Mechanical Specification 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.

System	Part System	Max. Working Pressure (Bar)	Material Description	BS Ref.	Flanges	Notes
LTHW Heating & Chilled Water	Flow and return pipework	5	Black MS	BS1387 Medium Grade	BS4504 PN6	
	LTHW & CHW Cold Feed	5	Galvanised MS	BS1387 Medium Grade	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	
	Cold water mains underground	10	MDPE (Blue)	BS6752		For non-contaminated ground conditions
	Cold water mains (entry to building from underground)	10	Copper	BS2871 Table Y	BS4505 PN15	
Drainage	WC cisterns, tanks & condense drains		UPVC	BS3505		
	WC cisterns, tanks & condense drains		Copper up to 28mm	BS2871 Table X		
Notes	1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet					
Revisions	- - - - - -					

Insulation Schedule

System	Part System	Thickness (mm)	Insulation Material Description	Vapour Barrier	Protection	Electric Trace Heating Required	Notes
LTHW Heating	Pipework in Plant Rooms	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	Aluminium clad	-	
	Pipework within the building, hidden from view (ceiling voids etc)	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	None	-	
	Pipework exposed to view in non occupied & 'Back of house' rooms (stores, workshops etc)	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	None	-	
	External Pipework	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	Proclad cover with sealed joints	-	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.
	External Pipework	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	Proclad 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
Drainage	Above Ground Vertical Soil & Waste Drainage Stack within the building	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	None	-	Required where indicated on the drawings or specification
	Rainwater Down Pipes within the building	Refer to Specification	Rigid mineral fibre sections	Aluminium foil	None	-	Required where indicated on the drawings or specification
Notes	1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet						
Revisions							
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Valve Schedule

System	Valve Type	Max. Working Pressure (Bar)	Size Range (mm N.B.)	Material Description	Manufacturer & Reference	Pipe Connections	Notes
LTHW, MTHW & Chilled Water Valves	Thermostatic Radiator Valves - Integral sensing head	5	8 - 22	Angled or straight pattern nickel plated valve body with adjustable thermostatic head - To be used on standard radiator installations	Oventrop	Screwed BSP /Compression to suit pipe	Use angled pattern for side connections and straight pattern for top/bottom connections to radiator
	Thermostatic Radiator Valves - Remote sensor	5	8 - 22	Angled or straight pattern nickel plated valve body with adjustable thermostatic head and remote sensor - To be used where indicated on the drawing	Oventrop	Screwed BSP /Compression to suit pipe	Use angled pattern for side connections and straight pattern for top/bottom connections to radiator
	Thermostatic Radiator Valves - Remote adjustment & sensor	5	8 - 22	Angled or straight pattern nickel plated valve body with remote adjustable thermostatic head and sensor -	Oventrop	Screwed BSP /Compression to suit pipe	Use angled pattern for side connections and straight pattern for top/bottom connections to radiator
	Isolating Gate Valves	5	15 - 50	Bronze body gate valve - Hand wheel control (104 10's) max temp 120°C @ PN16	Oventrop	Screwed BSP BS5154	
		5	65 - 150	Cast Iron gate valve - Hand wheel control (104 52's) max temp 120°C	Oventrop	Flanged BS5150 PN16	
	Isolating Ball Valves	5	15 - 50	DZR Brass body with Chrome plated DZR ball and EPDM Rubber seals - Lever action (107 90's) max temp 120°C @ PN16	Oventrop	Screwed BSP	
	Isolating Butterfly Valves	5	65 - 150	Cast Iron body with stainless steel Disc. EPDM Liner (104 82's) max temp 110°C	Oventrop	Flanged BS5155 PN16	
	Non Return Valves (Check Valves)	5	15 - 50	Bronze Swing Check Valve (107 50's) max temp 120°C @ PN10 or 80°C @ PN16	Oventrop	Screwed BSP	
		5	65 - 150	Cast Iron Swing Check Valves (107 30's) max temp 120°C	Oventrop	Flanged BS5153 PN16	
LTHW, MTHW & Chilled Water Valves	Double Regulating Valves	5	15 - 50	"Hydrocontrol R" (106 01's) Bronze body and bonnet. max temp 150°C @ PN16	Oventrop	Screwed BSP BS7350	
		5	65 - 150	"Hydrocontrol F" (106 26's) Cast Iron body & Bronze bonnet. Max temp 150°C @ PN16	Oventrop	Flanged BS5152 PN16	
	Commissioning Sets	5	15 - 50	"Hydroset R" (106 09 or 08's) Bronze body and bonnet. Max temp 150°C @ PN16	Oventrop	Screwed BSP BS 7350	
		5	65 - 150	"Hydroset F" (106 28's) Cast Iron body, bronze bonnet & Nickel Plated Steel Metering Station. Max temp 150°C @ PN16	Oventrop	Flanged BS5152 PN16	
	Self regulating Commissioning valves	5	15 - 50			Screwed BSP	
		5	65 - 150			Flanged BS4505 PN10	
	Drain valves (within plantrooms & hidden from view)	5	15 - 20	"Optiflex" Lever Operated Drain Valve. Brass body with self sealing male thread. Max temp 120°C	Oventrop	Screwed BSP	
	Drain valves (at heat emitters)	5	15		N/A	Screwed BSP	
	Manual Air vent valves	5	8 - 15	Vent Plug (110 16). Nickel Plated Brass max temp 120°C @ PN10	Oventrop	Screwed BSP	
	Automatic air vent valves	5	8 - 15	Std Pattern with Auto Shut off. (108 83's) Brass Body and PTFE Seals. Max temp 110°C @ PN10	Oventrop	Screwed BSP	
	Strainers	5	15 - 50	"Y" type. (112 00's) Bronze body with Stainlees Steel basket. mesh 600 micron. Max temp 150°C @ PN16	Oventrop	Screwed BSP	
		5	65 - 150	"Y" type. (112 20's) Cast Iron body with Stainlees Steel basket. mesh 1500 micron. Max temp 120°C	Oventrop	Flanged PN16	

Valve Schedule

System	Valve Type	Max. Working Pressure (Bar)	Size Range (mm N.B.)	Material Description	Manufacturer & Reference	Pipe Connections	Notes
Domestic Water Services Valves	Isolating Gate Valves		15 - 50	Bronze body gate valve (104 30's) - Hand wheel control	Oventrop	Scewed BSP	WRC approved for potable water applications
			65 - 150	Bronze body gate valve - Hand wheel control	N/A		WRC approved for potable water applications
	Isolating Ball Valves		15 - 50	DZR Brass body with Chrome plated DZR ball and EPDM Rubber seals - Lever action (107 90's Screwed & 107 95 Compression) max temp 120°C @ PN16	Oventrop	Screwed BSP or compression	WRC approved for potable water applications
	Isolating Butterfly Valves		65 - 150	Nodular Cast Iron body with stainless steel Disc. EPDM Liner. (104 84's)	Oventrop	Flanged BS5155 PN16	WRC approved for potable water applications
	Isolating Stopcock for Mains Water		15 - 50	Bronze body valve - Hand wheel control	N/A	Compression	WRC approved for potable water applications
			65 - 150	Bronze body valve - Hand wheel control	N/A	Flanged BS4505 PN10	WRC approved for potable water applications
	Non Return Valves (Standard)			DZR Brass Body with NBR seals. Acetyl copolymer check cartridge. (440 11's Screwed & 440 10's compression)	Oventrop	Screwed BSP or compression	WRC approved for potable water applications
	Non Return Valves (Wafer Pattern)				N/A	Compression	WRC approved for potable water applications
	Double Check Valves for Mains Water Installations		15 - 50	DZR Brass Body with NBR seals. Acetyl copolymer check cartridge. (440 01's Screwed & 440 00's compression)	Oventrop	Screwed BSP or compression	WRC approved for potable water applications
			65 - 150		N/A	Flanged BS4505 PN10	WRC approved for potable water applications
	Strainer		15 - 50	"Y" type. (112 00's) Bronze body with Stainless Steel basket. mesh 600 micron. Max temp 150°C @ PN16	Oventrop	Screwed BSP	WRC approved for potable water applications
			65 - 150		N/A	Flanged BS4505 PN10	WRC approved for potable water applications
	Hot Water Return Commissioning Valve		15 - 50	"Aquastron T Plus" Valve. Thermal regulation valve with built in automatic disinfection mode. (420 55's)	Oventrop	Screwed BSP	WRC approved for potable water applications
	Thermostatic Mixing Valve (Standard)		15 - 25	"Brawa-mix" Blending Valve. TMV 3. Control range 35 - 50°C. (130 03's) complete with the manufacturers recommended check valves, strainers and isolation valves on hot & cold inlet.	Oventrop	Compression	WRC approved for potable water applications
	Thermostatic Mixing Valve (Health Projects)		15 - 25	"Brawa-mix" Blending Valve. TMV 3. Control range 35 - 50°C. (130 03's) complete with the manufacturers recommended check valves, strainers and isolation valves on hot & cold inlet.	Oventrop	Compression	WRC approved for potable water applications
Notes	1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet						
Revisions							
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GMFRS Carbon 4 Bury
Pumps Schedule

Revision P01

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			
P/01	Plantroom	LTHW Primary	1.91	21	LTHW up to 85C	230/1/50	138	2113	Grundfos Magna3D 50-40 F	In-line Inverter controlled pump selected to operate on a constant system pressure basis.
P/02	Plantroom	LTHW Primary	1.91	21	LTHW up to 85C	230/1/50	138	2113	Grundfos Magna3D 50-40 F	In-line Inverter controlled pump selected to operate on a constant system pressure basis.
P/03	Plantroom	LTHW Primary	2.63	64	LTHW up to 85C	230/1/50	510	3186	Grundfos Magna3D 50-120 F	In-line Inverter controlled pump selected to operate on a constant system pressure basis.
P/04	Container	LTHW Primary	1.72	50	LTHW up to 85C	230/1/50	320	3125	Grundfos Magna3 50-80 F	In-line Inverter controlled pump selected to operate on a constant system pressure basis.
Notes	1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet									
	2 Manual speed control pumps shall be selected on mid speed setting.									
Revisions	3 Inverter controlled pumps shall be sized at 85% motor speed.									
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GMFRS Carbon 4 Bury
Pressurisation Unit Schedule

Revision P01

Ref. No.	Location	System	System Static Pressure (Bar)	System Operating Pressure		System Temperature (degC)	System Water Content (litres)	Electrical Supply		Manufacturer & Type	Expansion Vessel Size	Description & Accessories
				Min (Bar)	Max (Bar)			V/Ph/Hz	W			
PU/01	Container	Heating	0.5	0.5	3	LTHW up to 85C	1200	230/1/50	28	Grundfos PHT A N230	Manufacturer to advise	Packaged unit with remote fault indication to the BMS system
Notes	1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet											
	2 The LTHW and CHW expansion vessels shall be supplied loose for installation into the relevant cold feed pipe connection.											
Revisions												
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Heat Pump Unit Schedule

HH Reference	ASHP/01	Location:	External
Manufacturer:	Mitsubishi Electric		
Model	CAHV-R450YA		
Type:	Packaged air cooled Heat Pump		
No. of Compressors	1	Compressor type	Scroll
Refrigerant Type	R454C		
Required Duty:	Heating Capacity	33.3	kW
	Cooling Capacity (If applicable)	N/A	kW
	External Summer Design Temperature (Air cooled unit)	N/A	deg.C
	External Winter Design Temperature (Air cooled unit)	-5	deg.C
	Heating Water Flow Temperature	45	deg.C
	Heating Water Return Temperature	40	deg.C
	Heating Water Flow Rate	1.9	kg/s
	Maximum Heating Water pressure drop	10	kPa
	CHW Flow Temperature	N/A	deg.C
	CHW Return Temperature	N/A	deg.C
	CHW Flow Rate	N/A	kg/s
	Maximum CHW pressure drop	N/A	kPa
	Ground Loop Flow Rate (if applicable)	N/A	kg/s
	Ground Loop Medium (if applicable)		
	Electrical Supply	400/3/50	(V/ph/Hz)
	Electrical Load	14.6	kW
	Running Current	-	Amps
	Starting Current	40.3	Amps
	Capacity Control Stages	100/63/37/0%	
	Minimum COP at design heating load conditions	2.3	
Ancillary Items	Microprocessor control with interface with the BMS system : BMS shall provide start/stop control, and fault indication. Anti-vibration mountings & Flexible Connections		

Shipping Weight:		359 kg						
Nominal Size:	Length	740 mm						
	Width	1,750 mm						
	Height	1,710 mm						
Frequency (Hz)	63	125	250	500	1K	2K	4K	8K
Breakout Noise (SWL)	64	66	67	60	54	52	52	47
Sound level at 5m distance		- dBA						
Notes:								
		1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet						
		2						
Revisions								
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Heat Pump Unit Schedule

HH Reference	ASHP/02	Location:	External
Manufacturer:	Mitsubishi Electric		
Model	CAHV-R450YA		
Type:	Packaged air cooled Heat Pump		
No. of Compressors	1	Compressor type	Scroll
Refrigerant Type	R454C		
Required Duty:	Heating Capacity	33.3	kW
	Cooling Capacity (If applicable)	N/A	kW
	External Summer Design Temperature (Air cooled unit)	N/A	deg.C
	External Winter Design Temperature (Air cooled unit)	-5	deg.C
	Heating Water Flow Temperature	45	deg.C
	Heating Water Return Temperature	40	deg.C
	Heating Water Flow Rate	1.9	kg/s
	Maximum Heating Water pressure drop	10	kPa
	CHW Flow Temperature	N/A	deg.C
	CHW Return Temperature	N/A	deg.C
	CHW Flow Rate	N/A	kg/s
	Maximum CHW pressure drop	N/A	kPa
	Ground Loop Flow Rate (if applicable)	N/A	kg/s
	Ground Loop Medium (if applicable)		
	Electrical Supply	400/3/50	(V/ph/Hz)
	Electrical Load	14.6	kW
	Running Current	-	Amps
	Starting Current	40.3	Amps
	Capacity Control Stages	100/63/37/0%	
	Minimum COP at design heating load conditions	2.3	
Ancillary Items	Microprocessor control with interface with the BMS system : BMS shall provide start/stop control, and Anti-vibration mountings & Flexible Connections		

Shipping Weight:

359 kg

Nominal Size:

Length

740 mm

Width

1,750 mm

Height

1,710 mm

Frequency (Hz)

63

125

250

500

1K

2K

4K

8K

Breakout Noise (SWL)

64

66

67

60

54

52

52

47

Sound level at 5m distance

-

dBA

Notes:

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

2

Revisions

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Heat Pump Unit Schedule

HH Reference	WSHP/01	Location:	Container
Manufacturer:	Climaveneta (Mitsubishi Electric)		
Model	EW-HT		
Type:	Packaged water cooled Heat Pump		
No. of Compressors	2	Compressor type	Scroll
Refrigerant Type			
Required Duty:	Heating Capacity	70.4	kW
	Cooling Capacity (If applicable)	N/A	kW
	External Summer Design Temperature (Air cooled unit)	N/A	deg.C
	External Winter Design Temperature (Air cooled unit)	N/A	deg.C
	Heating Water Flow Temperature	78	deg.C
	Heating Water Return Temperature	68	deg.C
	Heating Water Flow Rate	1.718	kg/s
	Maximum Heating Water pressure drop	15.3	kPa
	CHW Flow Temperature	N/A	deg.C
	CHW Return Temperature	N/A	deg.C
	CHW Flow Rate	N/A	kg/s
	Maximum CHW pressure drop	N/A	kPa
	Ground Loop Flow Rate (if applicable)	N/A	kg/s
	Ground Loop Medium (if applicable)		
	Electrical Supply	400/3/50	(V/ph/Hz)
	Electrical Load	17.3	kW
	Running Current	35	Amps
	Starting Current	112	Amps
Capacity Control Stages	100/63/37/0%		
Minimum COP at design heating load conditions	4.07		
Ancillary Items	Microprocessor control with interface with the BMS system : BMS shall provide start/stop control, and Anti-vibration mountings & Flexible Connections		

Shipping Weight:

365 kg

Nominal Size:

Length

1,223 mm

Width

877 mm

Height

1,496 mm

Frequency (Hz)

63

125

250

500

1K

2K

4K

8K

Breakout Noise (SWL)

75

73

70

71

71

64

60

54

Sound level at 5m distance

74 dBA

Notes:

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

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Revisions

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GMFRS Carbon 4 Bury
Buffer Vessel Schedule

Revision P01

Ref. No.	Location	Storage Capacity (litres)	System Working Pressure (Bar)	System Operating Temperature		Test Pressure (Bar)	Material	Manufacturer & Type	BS Ref.
				Flow (oC)	Return (oC)				
BV/01	Container	1000	3	45	40			As Supplied by Kooltech Ltd or equal and approved	
BV/02	Container	250	3	78	58			As Supplied by Kooltech Ltd or equal and approved	

Notes	3								
	1 Refer to notes 1 & 2 on Equipment Schedule Front Cover and Contents Sheet 2 The vessel shall be supplied with anti-vac valve, thermometer, automatic air vent, drain valve, safety valve, metal clad insulation (mineral wool with vapour barrier) and 300mm dia manhole.								
Revisions									