



**CLADE**

**OAK 200kW HEAT PUMP //**

Sept 22 //



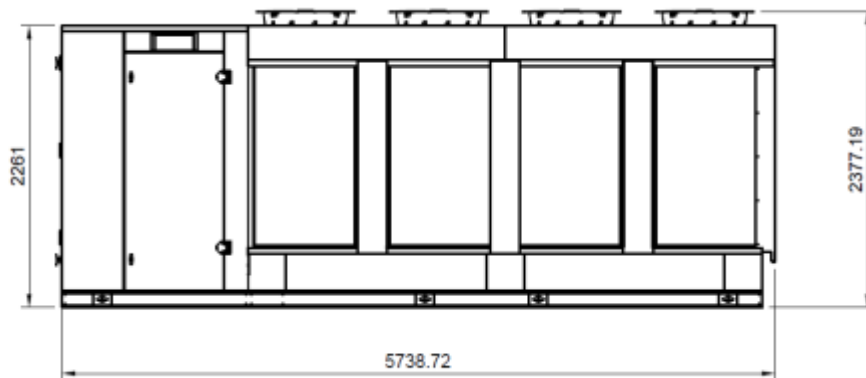
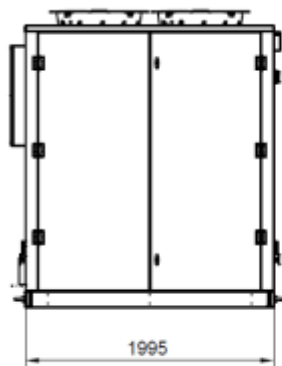
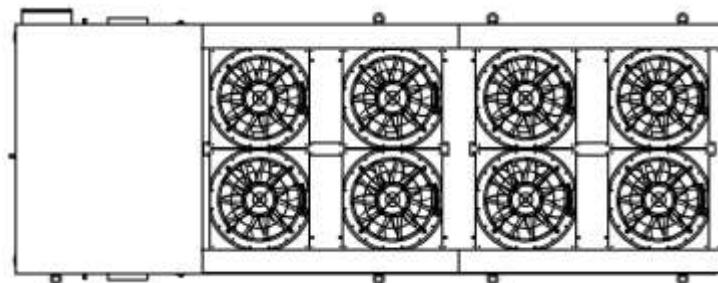
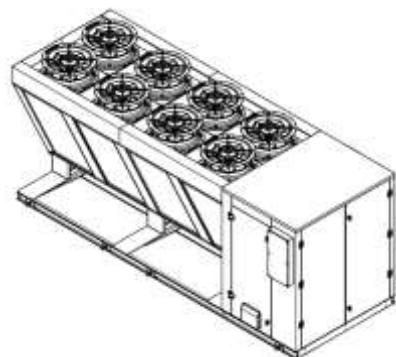
## THE CLADE OAK 200kW //

Single unit combining; compressor station, controls, gas cooler and water side pump, evaporator section





## DIMENSIONAL INFORMATION //







## TECHNICAL INFORMATION //

Clade Oak ASHP		Oak -200Kw ASHP
Nominal conditions: Water side		flow 45c to 85c Return temperature <35°C
Nominal conditions: CO <sub>2</sub> side		Ambient air temperature +3°C (85% RH) and -9°C evaporation
Compressor Manufacturer		Dorin
Compressor Heating Qty	Pcs.	2
Compressor Paralell Qty	Pcs.	1
Compressor Power @ Design total	kW	75.3
Evaporator fans Power at design	kW	5.4
Total	kW	84
Heat Pump Design Run Amps DRA	A	151
Ancillary Controls Amps	A	4
Total Amps		155
Variable speed drive (VSD)	Pcs.	3
Refrigerant charge (CO <sub>2</sub> )	kg	150
Electrical supply	-	3~ 400V 50 HZ
Housing Weight (empty)	kg	2,071
Housing Weight (operational)	kg	2,146
Load Cell A Weight (empty)	kg	997
Load Cell A Weight (operational)	kg	1,072
Load Cell B Weight (empty)	kg	N/A
Load Cell B Weight (operational)	kg	N/A
Sound Power	dB(A)	61.5
Connections waterside flow	DN	42mm Copper
Connections waterside Return	DN	42mm Copper
Connections waterside Pressure Rating	PN	10
Waterside Burst Disk	PN	10
Communication protocol	-	MODBUS/BACNET
IP-Class	-	IP54
Evaporators Type		V Block
No. evaporators	Pcs.	24
Fin Material	-	AL/MG
Defrost Type	-	Cool Gas CO <sub>2</sub>
Defrost medium	-	CO <sub>2</sub>
Defrost design/condition	-	> +6c ambient Off Cycle / < +6c ambient Cool Gas
Fan regulation	-	0-10v
Colour	-	BS48-000A05 Textured Grey





## HEAT PUMP PERFORMANCE //

Noise Performance Characteristics					
Model name	Nameplate output (kW)	Output Temp (°C)	Noise Data db(A)		
			Sound Power	Sound Pressure @ 1m	Sound Pressure @ 10m
Oak 200Kw	200	65	87	61	49
		70	87	61	49
		75	88	62	50
		80	88	62	50

Clade Heat Pump Performance Characteristics																													
Model name	Nameplate output (kW)	Output Temp (°C)	Return Temp (°C)	SCOP	SPF	-10°C External			-5°C External			0°C External			5°C External			10°C External			15°C External			20°C External			25°C External		
						QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)
Oak 200kW	200	55	35	2.8	2.9	160	78	2.06	200	87	2.29	220	86	2.57	240	84	2.86	240	77	3.13	240	71	3.39	240	66	3.63	240	61	3.95
		60	35	2.8	2.9	160	78	2.06	200	87	2.29	220	86	2.57	240	84	2.86	240	77	3.13	240	71	3.39	240	66	3.63	240	61	3.95
		65	35	2.8	2.9	160	78	2.06	200	87	2.29	220	86	2.57	240	84	2.86	240	77	3.13	240	71	3.39	240	66	3.63	240	61	3.95
		70	35	2.8	2.9	160	80	2.01	200	91	2.2	220	88	2.5	240	86	2.8	240	79	3.05	240	73	3.3	240	68	3.55	240	62	3.9
		75	35	2.8	2.9	160	80	2	200	91	2.2	220	88	2.5	240	86	2.8	240	79	3.05	240	73	3.3	240	68	3.55	240	62	3.9
		80	35	2.8	2.9	160	80	2	200	91	2.2	220	88	2.5	240	86	2.8	240	79	3.05	240	73	3.3	240	68	3.55	240	62	3.9

Clade Heat Pump Performance Characteristics																													
Model name	Nameplate output (kW)	Output Temp (°C)	Return Temp (°C)	SCOP	SPF	-10°C External			-5°C External			0°C External			5°C External			10°C External			15°C External			20°C External			25°C External		
						QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)	QH (kW)	PI (kW)	COPH (-)
Oak 200kW	200	55	30	3	3.1	160	72	2.22	200	81	2.48	220	79	2.78	240	78	3.09	240	71	3.39	240	66	3.66	240	61	3.93	240	56	4.27
		60	30	3	3.1	160	72	2.22	200	81	2.48	220	79	2.78	240	78	3.09	240	71	3.39	240	66	3.66	240	61	3.93	240	56	4.27
		65	30	3	3.1	160	72	2.22	200	81	2.48	220	79	2.78	240	78	3.09	240	71	3.39	240	66	3.66	240	61	3.93	240	56	4.27
		70	30	3	3.1	160	74	2.15	200	83	2.4	220	81	2.7	240	80	3	240	73	3.3	240	67	3.6	240	62	3.85	240	57	4.2
		75	30	3	3.1	160	74	2.15	200	83	2.4	220	81	2.7	240	80	3	240	73	3.3	240	67	3.6	240	62	3.85	240	57	4.2
		80	30	3	3.1	160	74	2.15	200	83	2.4	220	81	2.7	240	80	3	240	73	3.3	240	67	3.6	240	62	3.85	240	57	4.2



## BUILDING CONNECTIONS //

### POWER

3 phase.

Connection box mounted in position shown.

Isolation at control panel only.

Installer to provide local isolator external to heat pump.

### HEATING

Supplied with primary pump with 14m spare head.

Flow and return located in position shown.

PN 10 Flanged steel connections with butterfly valve.

### CONDENSATE

Condensate from the evaporator will drain centrally from the base of the unit.

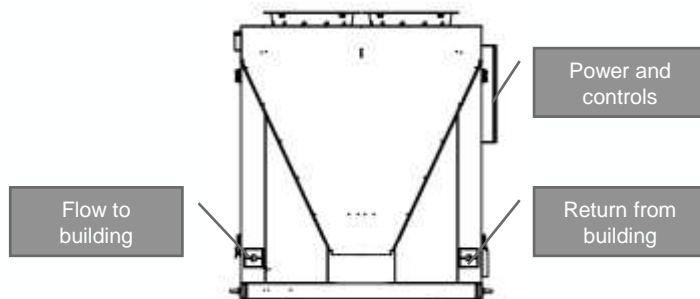
It is recommended that a gully be installed below the heat pump and lead to a soak away.

### CONTROLS

The heat pump has self contained controls that manage its operation and the primary pump.

#### Alarms

- ❖ Hardwired shut down signal for fire alarm
- ❖ CO<sub>2</sub> detection
- ❖ Other fault
- ❖ High return water temperature.



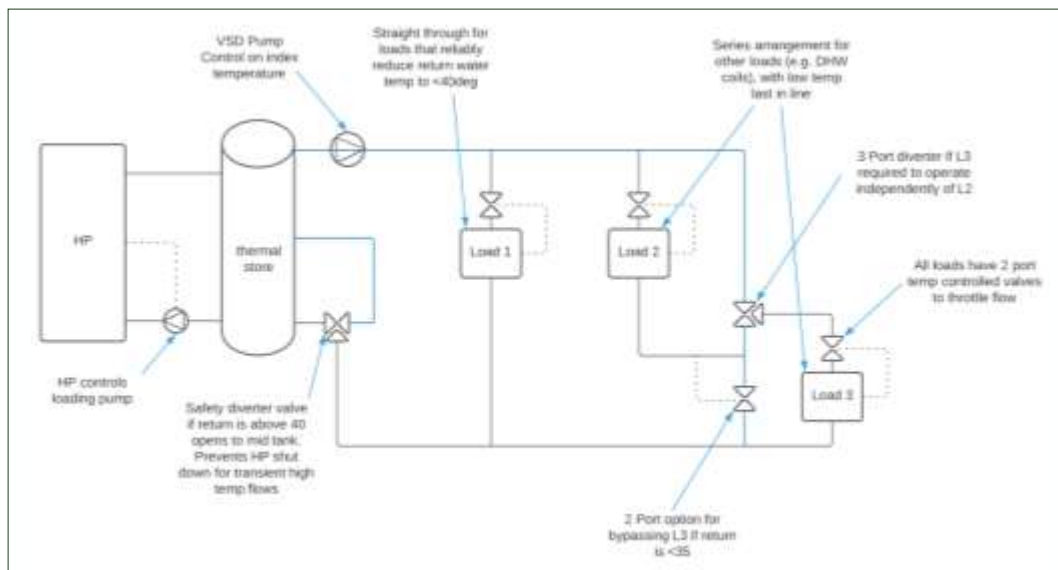
## SYSTEM DESIGN

Here are our recommendations for good system design, however each building and application is different and so the system should be designed to meet the specific needs of the building.

The designer should aim to minimise the return water temperature to the heat pump in order to generate the highest COP possible.

Clade offers engineering support if required.

- ❖ Series arrangement of heat load by temperature with the lowest last
- ❖ Proper sizing of terminal units for high DT
- ❖ High quality two port control on terminal units to prevent high temperature bypass
- ❖ VSD pumping controlled on temperature at the index point
- ❖ Zero bypass on the system
- ❖ Proper commissioning of systems
- ❖ Data and analytics for continuous improvement
- ❖ Primary control on the return water temperature
- ❖ Thermal store to even out temperature variations





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