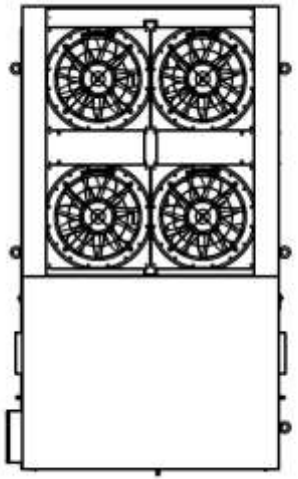
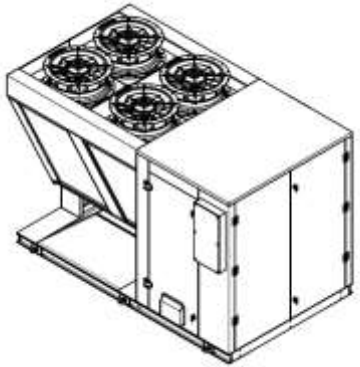

# OAK 100kW HEAT PUMP //

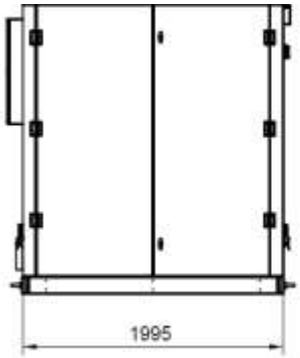
Sept 22 //

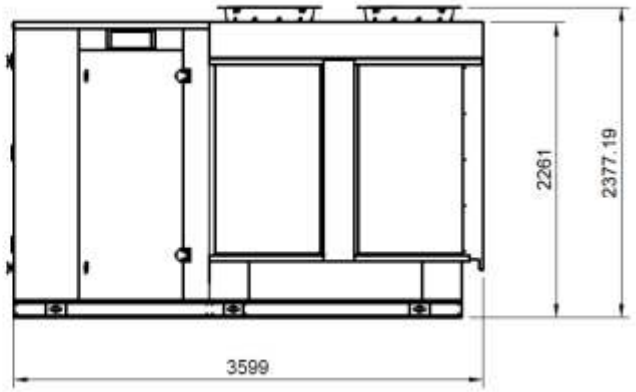
CLADE

## DIMENSIONAL INFORMATION //







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# TECHNICAL INFORMATION //

| Clade Oak ASHP | | Oak -100Kw ASHP |
|---|---|---|
| Nominal conditions: Water side | | flow 45c to 85c Return temperature <35°C |
| Nominal conditions: $CO_2$ side | | Ambient air temperature +3°C (85% RH) and -9°C evaporation |
| Compressor Manufacturer | | Dorin |
| Compressor Heating Qty | Pcs. | 1 |
| Compressor Paralell Qty | Pcs. | 2 |
| Compressor Power @ Design total | kW | 40.4 |
| Evaporator fans Power at design | kW | 3.6 |
| Total | kW | 44 |
| Heat Pump Design Run Amps DRA | A | 80 |
| Ancillery Controls Amps | A | 4 |
| Total Amps | | 84 |
| Variable speed drive (VSD) | Pcs. | 1 |
| Refrigerant charge ($CO_2$) | kg | 90 |
| Electrical supply | - | 3~ 400V 50 HZ |
| Housing Weight (empty) | kg | 1,270 |
| Housing Weight (operational) | kg | 1,315 |
| Load Cell A Weight (empty) | kg | 657 |
| Load Cell A Weight (operational) | kg | 702 |
| Load Cell B Weight (empty) | kg | N/A |
| Load Cell B Weight (operational) | kg | N/A |
| Sound Power compressor only | dB(A) | 59 |
| 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. | 4 |
| Fin Material | - | AL/MG |
| Defrost Type | - | Cool Gas $CO_2$ |
| Defrost medium | - | $CO_2$ |
| Defrost design/condition | - | > +6c ambient Off Cycle / < +6c ambient Cool Gas |
| Fan regulation | - | 0-10v |
| Colour | - | BS48 – 000A05 TEXTURED GREY |

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# 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 100Kw | 100 | 65 | 87 | 59 | 47 |
| | | 70 | 87 | 59 | 47 |
| | | 75 | 88 | 60 | 48 |
| | | 80 | 88 | 60 | 48 |

**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 100kW | 100 | 55 | 35 | 2.8 | 2.9 | 80 | 39 | 2.06 | 100 | 44 | 2.29 | 110 | 43 | 2.57 | 120 | 42 | 2.86 | 120 | 38 | 3.13 | 120 | 35 | 3.39 | 120 | 33 | 3.63 | 120 | 30 | 3.95 |
| | | 60 | 35 | 2.8 | 2.9 | 80 | 39 | 2.06 | 100 | 44 | 2.29 | 110 | 43 | 2.57 | 120 | 42 | 2.86 | 120 | 38 | 3.13 | 120 | 35 | 3.39 | 120 | 33 | 3.63 | 120 | 30 | 3.95 |
| | | 65 | 35 | 2.8 | 2.9 | 80 | 39 | 2.06 | 100 | 44 | 2.29 | 110 | 43 | 2.57 | 120 | 42 | 2.86 | 120 | 38 | 3.13 | 120 | 35 | 3.39 | 120 | 33 | 3.63 | 120 | 30 | 3.95 |
| | | 70 | 35 | 2.8 | 2.9 | 80 | 40 | 2.01 | 100 | 45 | 2.2 | 110 | 44 | 2.5 | 120 | 43 | 2.8 | 120 | 39 | 3.05 | 120 | 36 | 3.3 | 120 | 34 | 3.55 | 120 | 31 | 3.9 |
| | | 75 | 35 | 2.8 | 2.9 | 80 | 40 | 2 | 100 | 45 | 2.2 | 110 | 44 | 2.5 | 120 | 43 | 2.8 | 120 | 39 | 3.05 | 120 | 36 | 3.3 | 120 | 34 | 3.55 | 120 | 31 | 3.9 |
| | | 80 | 35 | 2.8 | 2.9 | 80 | 40 | 2 | 100 | 45 | 2.2 | 110 | 44 | 2.5 | 120 | 43 | 2.8 | 120 | 39 | 3.05 | 120 | 36 | 3.3 | 120 | 34 | 3.55 | 120 | 31 | 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 100kW | 100 | 55 | 30 | 3 | 3.1 | 80 | 36 | 2.22 | 100 | 40 | 2.48 | 110 | 40 | 2.78 | 120 | 39 | 3.09 | 120 | 35 | 3.39 | 120 | 33 | 3.66 | 120 | 31 | 3.93 | 120 | 28 | 4.27 |
| | | 60 | 30 | 3 | 3.1 | 80 | 36 | 2.22 | 100 | 40 | 2.48 | 110 | 40 | 2.78 | 120 | 39 | 3.09 | 120 | 35 | 3.39 | 120 | 33 | 3.66 | 120 | 31 | 3.93 | 120 | 28 | 4.27 |
| | | 65 | 30 | 3 | 3.1 | 80 | 36 | 2.22 | 100 | 40 | 2.48 | 110 | 40 | 2.78 | 120 | 39 | 3.09 | 120 | 35 | 3.39 | 120 | 33 | 3.66 | 120 | 31 | 3.93 | 120 | 28 | 4.27 |
| | | 70 | 30 | 3 | 3.1 | 80 | 37 | 2.15 | 100 | 42 | 2.4 | 110 | 41 | 2.7 | 120 | 40 | 3 | 120 | 36 | 3.3 | 120 | 33 | 3.6 | 120 | 31 | 3.85 | 120 | 29 | 4.2 |
| | | 75 | 30 | 3 | 3.1 | 80 | 37 | 2.15 | 100 | 42 | 2.4 | 110 | 41 | 2.7 | 120 | 40 | 3 | 120 | 36 | 3.3 | 120 | 33 | 3.6 | 120 | 31 | 3.85 | 120 | 29 | 4.2 |
| | | 80 | 30 | 3 | 3.1 | 80 | 37 | 2.15 | 100 | 42 | 2.4 | 110 | 41 | 2.7 | 120 | 40 | 3 | 120 | 36 | 3.3 | 120 | 33 | 3.6 | 120 | 31 | 3.85 | 120 | 29 | 4.2 |

# BUILDING CONNECTIONS //

## POWER

3 phase.

Connection box mounted in position shown.

Isolation at control panel only.

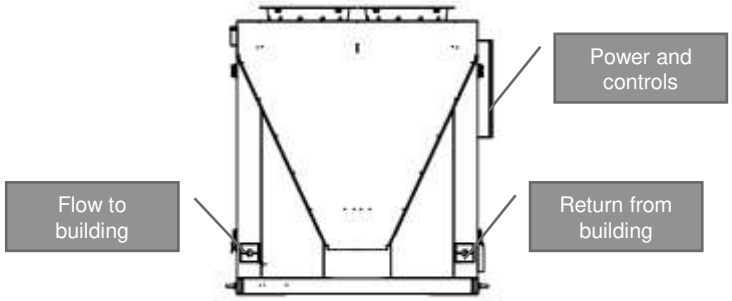
Installer to provide local isolator external to heat pump.

## 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
- $CO_2$ detection
- Other fault
- High return water temperature.

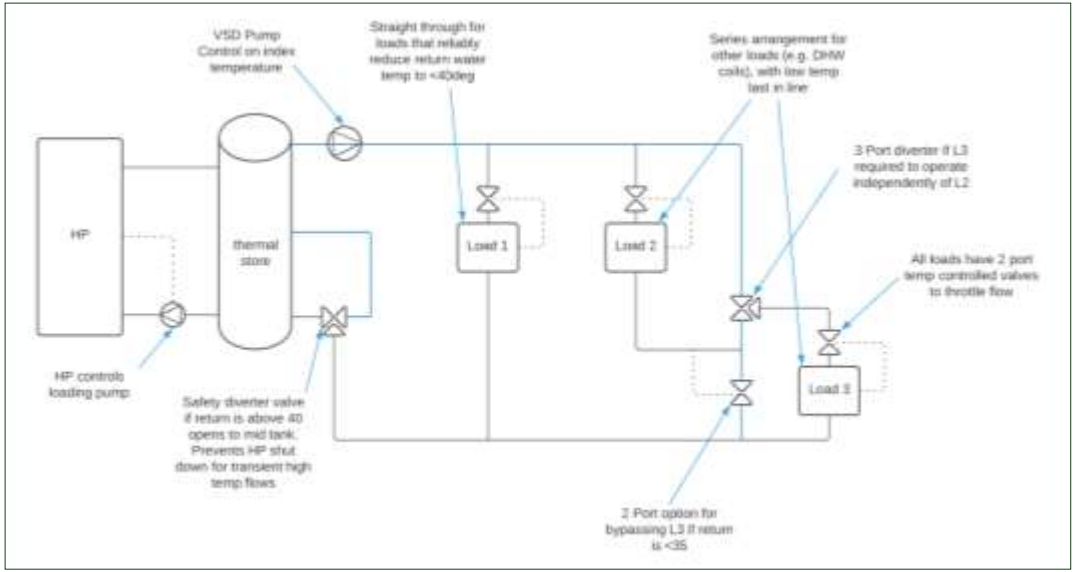
# SYSTEM DESIGN

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



# LEEDS MANUFACTURING CENTRE //


- UK based
- 35 years of engineering experience
- Leeds manufacturing division
- Committed to sustainable business and sustainable products
- Investing in people, diversity & inclusion
- Non leveraged, owner operated

**ACCREDITATIONS**

ISO 9001: 2015

ISO14001: 2015

OHSAS ISO 18001: 2007

**CERTIFICATIONS**

Altius Assured Vendor Award

Altius CDM Vendor Award

CHAS

Sales Contractor

## THANK YOU //

**www.clade-es.com**

**Sales@clade-es.com**
**Aftersales@clade-es.com**

Head Office & Registered Office //
Bristol & Bath Science Park,
Dirac Crescent, Emersons Green,
BRISTOL  BS16 7FR

The Technology Centre //
Unit R3 Gildersome Spur Industrial Estate,
Stone Pits Lane, Morley,
LEEDS  LS27 7JZ