



# CLADE

LEADING THE TRANSFORMATION IN  
GREEN HEATING AND COOLING

Buffer Vessel Volumes

March 2026 //



## INTRODUCTION //

Buffer vessels and thermal stores are a topic that Engineers can discuss for hours!

In this CPD we set out our recommendations for the sizing and design of systems. Every building is different and the way in which the heat pump is used may also need to be different and therefore the buffer size will be different.

There are 3 golden rules:

1. Clade heat pumps do not require a buffer as they use hot gas defrost and will vary output according to demand.
2. We do recommend a buffer volume to smooth the start up and anti-cycling of a heat pump as a precaution, we provide a minimum volume for this.
3. The building and heating system will require a buffer volume to operate as designed, the system designer should size this volume.





## MINIMUM BUFFER SIZING FOR HEAT PUMP OPERATION //

Clade's minimum buffer recommendations are given in the table. These represent the minimum storage requirements necessary to protect the heat pump and allow for a maximum of six starts per hour.

### CO2 heat pumps

A wider TD means a lower volume of buffer required to store the energy at min turn down and during start up.

### R290 heat pumps

Propane modular heat pumps start one module at a time so only require buffer volume for that module.

Where more than one heat pump is used:

- The minimum volume is multiplied by the number of heat pumps.
- Where a Clade Buffer Controller is used, use the single heat pump volume as this allows for a sequenced start up.

Heat Pump Model	Output (kW)	Minimum Buffer Volume (litres)
Acer	65	300
Acer	95	450
Acer	130	600
Maple*	260	600
Maple*	390	600
Maple*	520	600
Maple*	650	600
Birch	85	800
Birch	120	1150
Elm	75	700
Elm	90	980
Rowan*	240	1200
Rowan*	360	1200
Rowan*	480	1200
Rowan*	600	1200
Yew*	210	1100
Yew*	315	1100
Yew*	420	1100
Yew*	525	1100
Rowan 2	130	1200
Birch ULN	120	1100



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## ABOUT THIS INFORMATION //

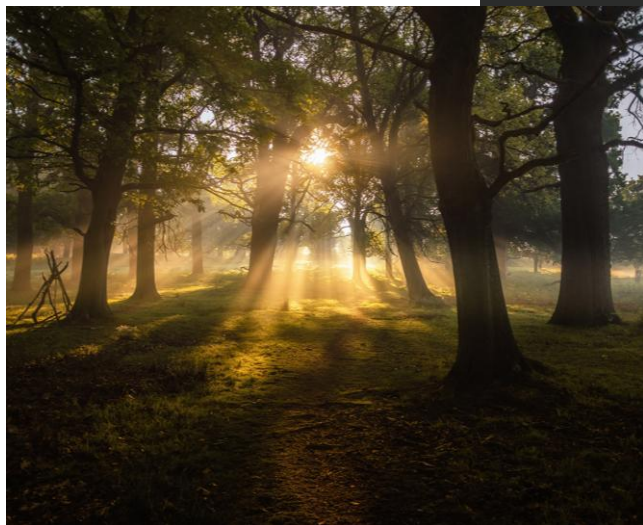
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[www.clade-es.com](http://www.clade-es.com)

[Sales@clade-es.com](mailto:Sales@clade-es.com)

[Aftersales@clade-es.com](mailto: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