



**CLADE**

**BIRCH**

**LOW NOISE PROPANE HEAT PUMP //  
for HEATING AND HOT WATER**

April 2025/1



# BIRCH //

Our advanced propane heat pumps, designed to seamlessly integrate with existing systems and deliver high temperatures.

Improve sustainability with our eco-conscious natural refrigerant, chosen to minimize carbon footprint.

For noise sensitive environments, our low-noise models offer an aesthetically pleasing design that is not only cost-effective but also the quietest option available.



Model	-5°C capacity	+7°C capacity
Birch 85/50	50KW	85KW
Birch 120/75	75KW	120KW

- Future proof refrigerant which is non-toxic
  - GWP = 0.02
  - ODP = 0
- Low and standard noise models
- Up to 65°C hot water
- Light and dark grey colour options
- Coated coil option
- Can be multiplexed using Clade Multi Controller
- Built in BMS interface
- Leak detection and vent fan included
- Inverter controlled
- Manufactured in the UK
- Full UK based technical support



## R290 - PROPANE

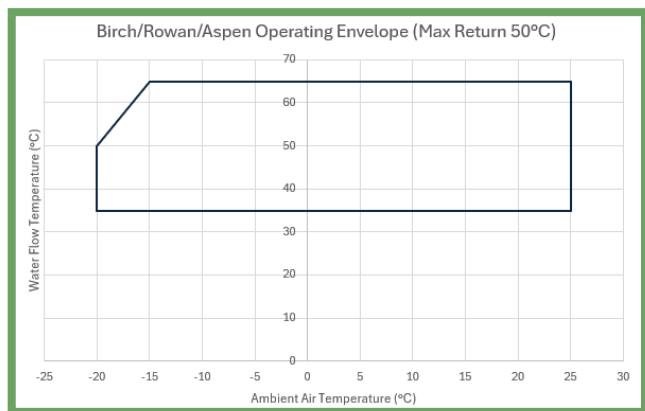
Clade is a leading manufacturer of r290 propane heat pumps being one of the first to bring a large capacity heat pump to market. We continue to innovate with this exciting refrigerant.

R290 propane is an increasingly popular refrigerant for heat pumps due to its excellent thermodynamic properties, environmental benefits, and efficiency.

As a natural hydrocarbon, R290 has an ultra-low Global Warming Potential (GWP) of just 0.02, making it a sustainable alternative to synthetic refrigerants with high GWP values.

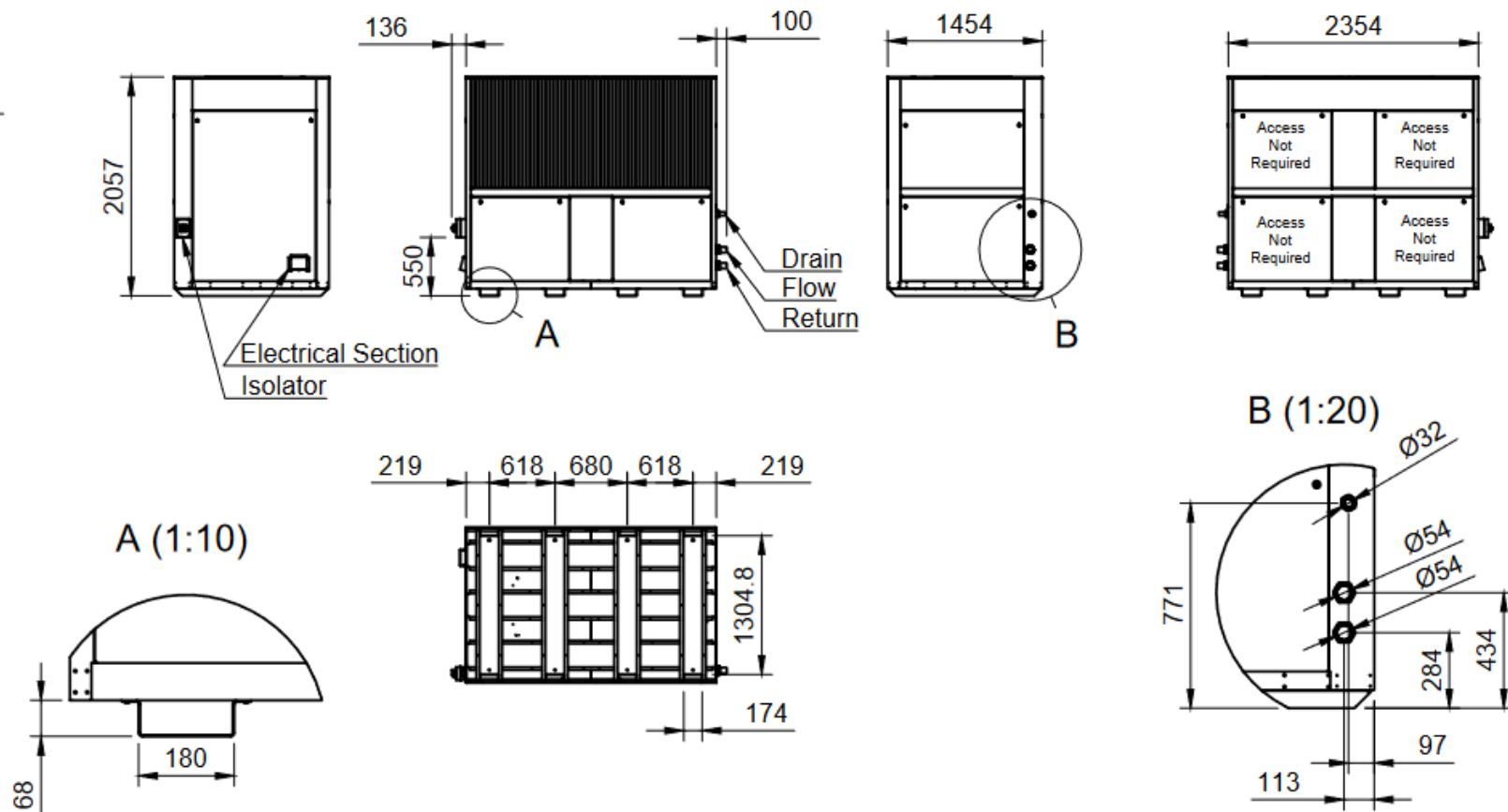
Its high latent heat and superior thermal conductivity enable efficient heat transfer, enhancing the energy efficiency of heat pump systems. R290 operates effectively across a wide range of temperatures, making it suitable for both heating and cooling applications.

While its flammability requires safety consideration, modern system designs and proper handling mitigate these risks. Overall, R290 propane represents a future-proof choice for heat pumps, balancing performance, cost-effectiveness, and sustainability in decarbonizing heating solutions.



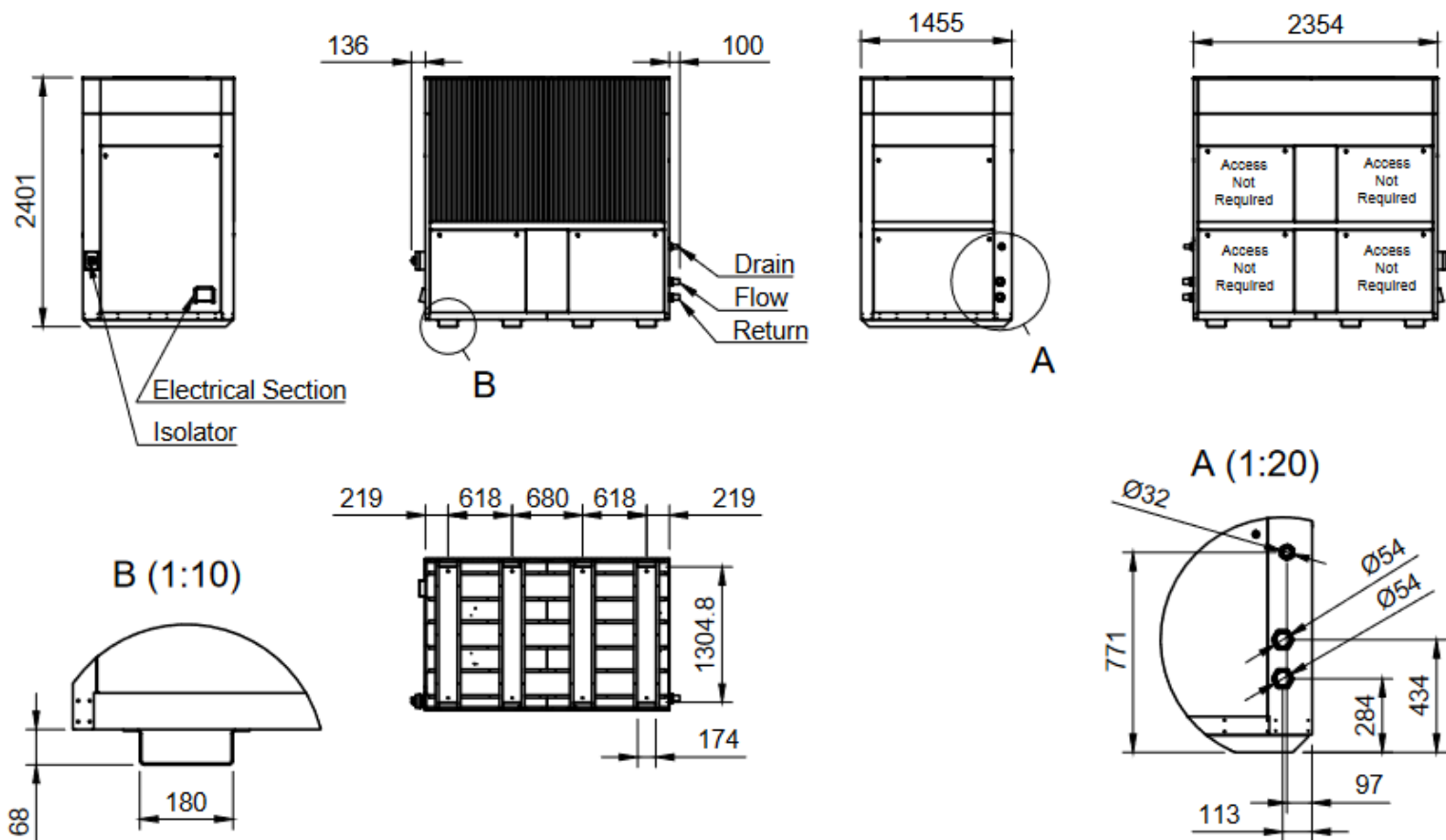


# BIRCH 85/50 SN DIMENSIONS //



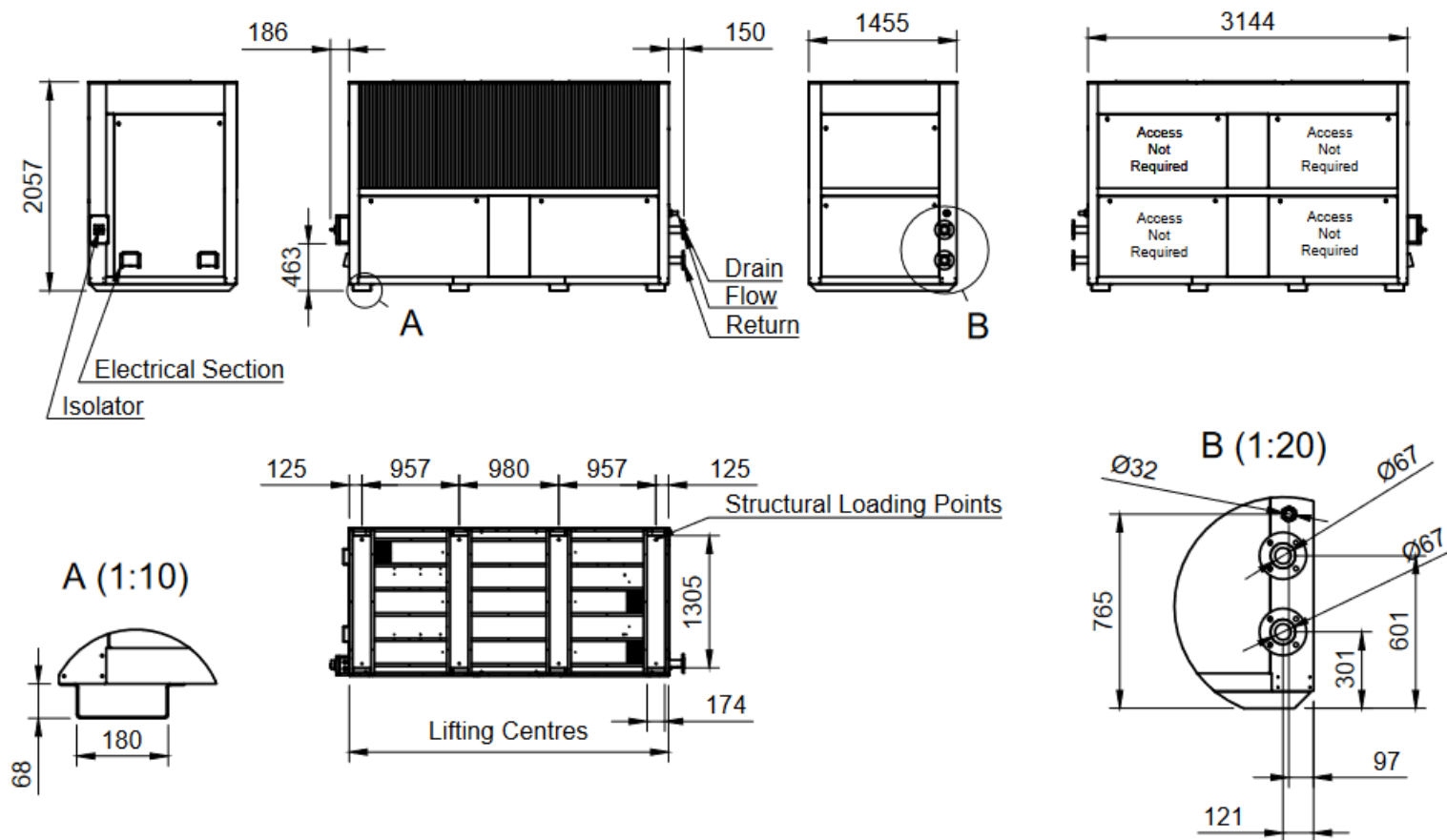


BIRCH 85/50 LN DIMENSIONS //





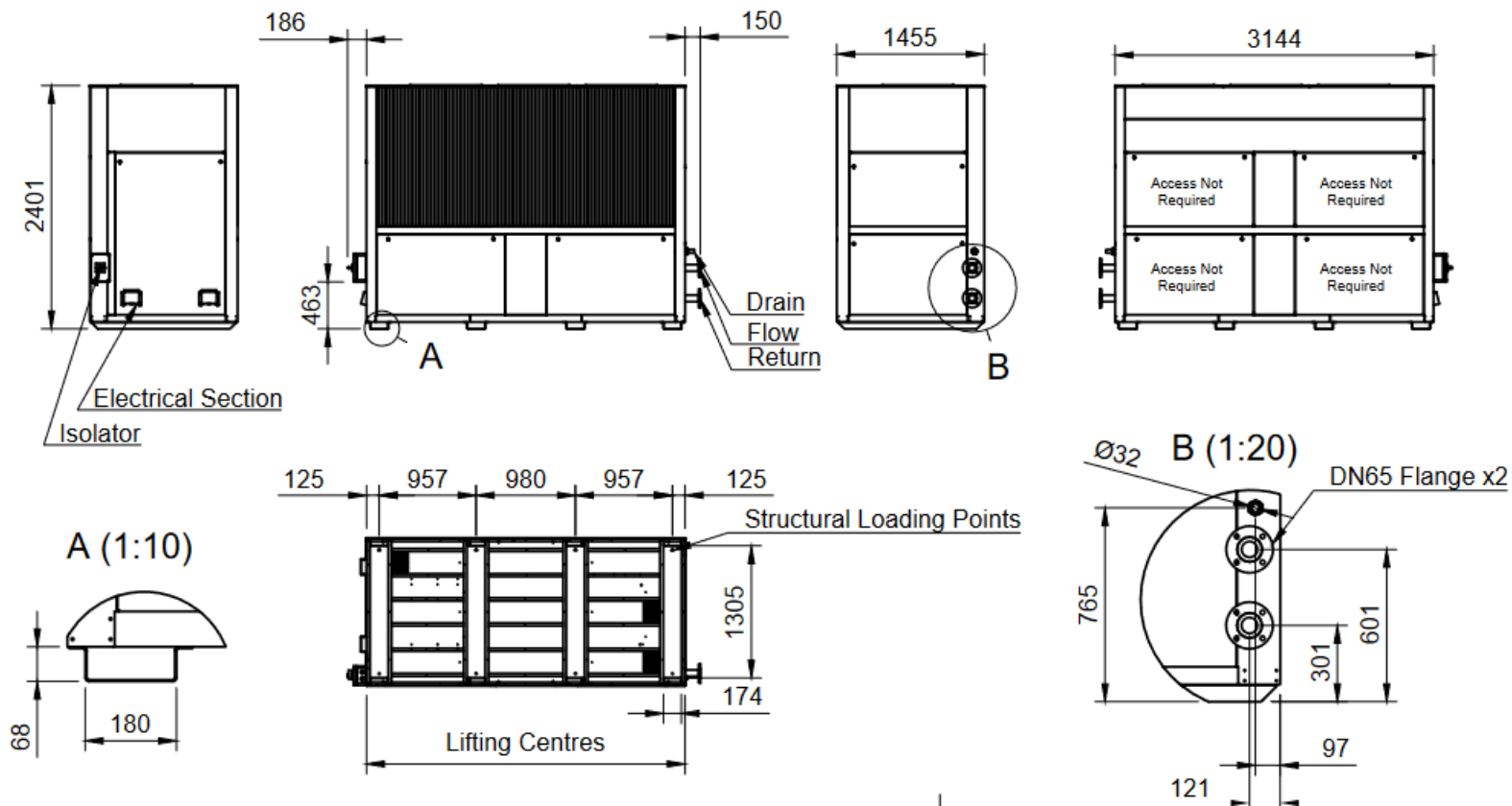
BIRCH 120/75 SN DIMENSIONS //





# BIRCH 120/75 LN DIMENSIONS //

BIRCH //

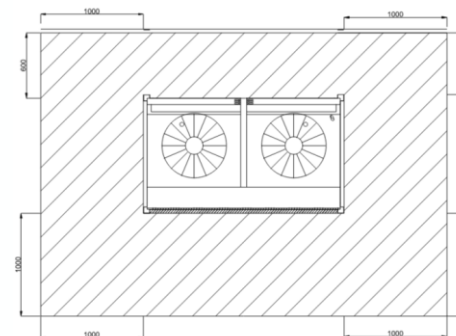




# TECHNICAL SPECIFICATION //

Birch Range	Birch 85/50kW	Birch 120/75kW
<b>REFRIGERATION SIDE</b>		
Compressor Type	-	Reciprocating
Compressor Qty	Pc s.	1
Refrigerant	-	Propane (R290)
Refrigerant Circuits	Pc s.	1
Variable speed drive (VSD)	Pc s.	1
Refrigerant charge (CO2)	kg	4
No. evaporators	Pc s.	1
Evaporators Type	-	Flat bed
Fin Material	-	AL/MG
Defrost Type	-	Cool Gas
Defrost medium	-	R290
Defrost design/condition	-	> +8°C ambient Off Cycle / < +8°C ambient Cool Gas
Electrical supply	-	3~ 400V 50 HZ
<b>DIMENSIONS &amp; NOISE</b>		
Birch Low Noise		
Colour	-	RAL7016 Anthracite
Unit Weight (empty)	kg	1840
Unit Weight (operational)	kg	1850
Sound Power Level $L_{W(A)}$ (dB)	dB	73
Birch Standard Noise		
Colour	-	RAL7016 Anthracite
Unit Weight (empty)	kg	1235
Unit Weight (operational)	kg	1243
Sound Power Level $L_{W(A)}$ (dB)	dB	85

<b>WATER SIDE</b>			
Type of internal exchanger		Stainless steel plate heat exchanger	
Exchanger Water content	l	13.5	13.5
Connections waterside Flow/Return	DN	54mm Copper	67mm Copper
Connections waterside Pressure Rating	PN	6	
Waterside Burst Disk (supplied by installer)	PN	6	
Control Methodology		PICV	
<b>Water flow rates</b>			
Nominal dT 20 K	l/s	0.91	1.39
Nominal dT 15 K	l/s	1.19	1.82
Nominal dT 10 K	l/s	1.82	2.78
Minimum Water Flow Rate	l/s	0.46	0.70
Minimum water volume in heating	l	1586	2239
Total internal water volume	l	23.3	29.1
<b>Clearances</b>			







# PERFORMANCE BIRCH 85/50 POWER MODE //

Heating Capacity (Power Mode)																							
Model name	Water Temp (°C)	SCOP	-10°C External			-5°C External			0°C External			5°C External			7°C External			10°C External			15°C External		
			QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP
BIRCH SN 85/50	65/50	2.6	48.9	22.4	2.2	55.8	24.1	2.3	63.2	25.7	2.5	71.3	27.3	2.6	74.8	27.9	2.7	74.8	25.6	2.9	74.8	24.2	3.1
	65/45	2.6	48.9	22.4	2.2	55.8	24.1	2.3	63.2	25.8	2.5	71.3	27.3	2.6	74.8	28.0	2.7	74.8	25.7	2.9	74.8	24.2	3.1
	60/50	2.8	49.7	21.1	2.4	56.6	22.7	2.5	64.2	24.2	2.7	72.6	25.7	2.8	76.2	26.3	2.9	76.2	24.2	3.1	76.2	22.8	3.3
	60/45	2.8	49.7	21.1	2.4	56.5	22.7	2.5	64.1	24.2	2.7	72.5	25.6	2.8	76.1	26.2	2.9	76.1	24.2	3.2	76.1	22.7	3.4
	60/40	2.8	49.7	21.1	2.4	56.5	22.7	2.5	64.1	24.2	2.7	72.5	25.6	2.8	76.1	26.2	2.9	76.1	24.2	3.2	76.1	22.7	3.4
	55/45	3.0	50.5	20.0	2.5	57.4	21.4	2.7	65.2	22.7	2.9	73.8	24.1	3.1	77.5	24.6	3.2	77.5	22.8	3.4	77.5	21.3	3.6
	55/40	3.0	50.5	19.9	2.5	57.3	21.3	2.7	65.1	22.7	2.9	73.7	24.0	3.1	77.4	24.5	3.2	77.4	22.7	3.4	77.4	21.2	3.7
	55/35	3.0	50.5	20.0	2.5	57.3	21.3	2.7	65.1	22.7	2.9	73.7	24.0	3.1	77.4	24.5	3.2	77.4	22.7	3.4	77.4	21.2	3.7
	50/40	3.2	51.4	18.9	2.7	58.2	20.2	2.9	66.2	21.4	3.1	75.0	22.6	3.3	78.8	23.0	3.4	78.8	21.4	3.7	78.8	19.9	4.0
	50/35	3.2	51.3	18.9	2.7	58.2	20.1	2.9	66.1	21.4	3.1	75.0	22.5	3.3	78.8	23.0	3.4	78.8	21.3	3.7	78.8	19.8	4.0
	50/30	3.2	51.3	18.9	2.7	58.2	20.1	2.9	66.1	21.4	3.1	75.0	22.5	3.3	78.8	23.0	3.4	78.8	21.3	3.7	78.8	19.8	4.0
	45/30	3.5	52.2	17.9	2.9	59.1	19.0	3.1	67.2	20.1	3.4	76.2	21.1	3.6	80.1	21.5	3.7	80.1	20.0	4.0	80.1	18.5	4.3
	35/20	4.1	54.1	16.1	3.4	60.9	16.9	3.6	69.4	17.8	3.9	78.8	18.6	4.3	82.9	18.8	4.4	82.9	17.4	4.8	82.9	15.8	5.2



## PERFORMANCE BIRCH 85/50 EFFICIENCY MODE //

Heating Capacity (Efficiency Mode)																							
Model name	Water Temp (°C)	SCOP	-10°C External			-5°C External			0°C External			5°C External			7°C External			10°C External			15°C External		
			QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP
BIRCH SN 85/50	65/50	2.6	48.9	22.3	2.2	55.8	24.1	2.3	55.8	21.8	2.6	55.8	20.7	2.7	55.8	20.3	2.7	55.8	19.6	2.8	55.8	18.4	3.0
	65/45	2.6	48.9	22.4	2.2	55.8	24.1	2.3	55.8	21.8	2.6	55.8	20.8	2.7	55.8	20.3	2.7	55.8	19.6	2.8	55.8	18.4	3.0
	60/50	2.8	49.7	21.1	2.4	56.6	22.7	2.5	56.6	20.7	2.7	56.6	19.6	2.9	56.6	19.1	3.0	56.6	18.4	3.1	56.6	17.2	3.3
	60/45	2.8	49.7	21.1	2.4	56.5	22.7	2.5	56.5	20.7	2.7	56.5	19.6	2.9	56.5	19.1	3.0	56.5	18.4	3.1	56.5	17.2	3.3
	60/40	2.8	49.7	21.1	2.4	56.5	22.7	2.5	56.5	20.7	2.7	56.5	19.6	2.9	56.5	19.1	3.0	56.5	18.4	3.1	56.5	17.2	3.3
	55/45	3.0	50.5	20.0	2.5	57.4	21.4	2.7	57.4	19.6	2.9	57.4	18.4	3.1	57.4	17.9	3.2	57.4	17.2	3.3	57.4	16.0	3.6
	55/40	3.0	50.5	19.9	2.5	57.3	21.3	2.7	57.3	19.6	2.9	57.3	18.4	3.1	57.3	17.9	3.2	57.3	17.2	3.3	57.3	16.0	3.6
	55/35	3.0	50.5	19.9	2.5	57.3	21.3	2.7	57.3	19.6	2.9	57.3	18.4	3.1	57.3	17.9	3.2	57.3	17.2	3.3	57.3	16.0	3.6
	50/40	3.2	51.4	18.9	2.7	58.2	20.1	2.9	58.2	18.6	3.1	58.2	17.3	3.4	58.2	16.8	3.5	58.2	16.1	3.6	58.2	14.9	3.9
	50/35	3.3	51.3	18.9	2.7	58.2	20.1	2.9	58.2	18.5	3.1	58.2	17.3	3.4	58.2	16.8	3.5	58.2	16.1	3.6	58.2	14.8	3.9
	50/30	3.3	51.3	18.9	2.7	58.2	20.1	2.9	58.2	18.5	3.1	58.2	17.3	3.4	58.2	16.8	3.5	58.2	16.1	3.6	58.2	14.8	3.9
	45/30	3.5	52.2	17.9	2.9	59.1	19.0	3.1	59.1	17.5	3.4	59.1	16.2	3.6	59.1	15.7	3.8	59.1	15.0	3.9	59.1	13.7	4.3
	35/20	4.1	54.0	16.1	3.4	60.9	16.9	3.6	60.9	15.6	3.9	60.9	14.2	4.3	60.9	13.7	4.5	60.9	12.9	4.7	60.9	11.7	5.2



# PERFORMANCE BIRCH 120/75 POWER MODE //

Heating Capacity (Power Mode)																							
Model name	Water Temp (°C)	SCOP	-10°C External			-5°C External			0°C External			5°C External			7°C External			10°C External			15°C External		
			QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP	QH (kW)	PI (kW)	COP
BIRCH SN 75/120	65/50	2.5	74.7	34.0	2.2	84.7	36.6	2.3	96.0	39.2	2.4	108.6	41.9	2.6	114.1	42.9	2.7	114.1	39.5	2.9	114.1	37.6	3.0
	65/45	2.5	74.7	34.0	2.2	84.7	36.6	2.3	96.0	39.2	2.4	108.6	41.9	2.6	114.1	42.9	2.7	114.1	39.5	2.9	114.1	37.6	3.0
	60/50	2.7	75.9	32.3	2.4	85.9	34.6	2.5	97.6	37.2	2.6	110.7	39.7	2.8	116.5	40.7	2.9	116.5	37.8	3.1	116.5	35.8	3.3
	60/45	2.7	75.8	32.2	2.4	85.8	34.6	2.5	97.5	37.1	2.6	110.6	39.6	2.8	116.4	40.6	2.9	116.4	37.7	3.1	116.4	35.7	3.3
	60/40	2.7	75.8	32.2	2.4	85.8	34.6	2.5	97.5	37.1	2.6	110.6	39.6	2.8	116.4	40.6	2.9	116.4	37.7	3.1	116.4	35.7	3.3
	55/45	2.9	77.0	30.6	2.5	87.0	32.8	2.7	99.1	35.2	2.8	112.8	37.6	3.0	118.7	38.5	3.1	118.7	36.1	3.3	118.7	34.0	3.5
	55/40	2.9	77.0	30.6	2.5	87.0	32.7	2.7	99.0	35.1	2.8	112.7	37.5	3.0	118.6	38.4	3.1	118.6	36.0	3.3	118.6	33.9	3.5
	55/35	2.9	77.0	30.6	2.5	87.0	32.8	2.7	99.0	35.1	2.8	112.7	37.5	3.0	118.6	38.4	3.1	118.6	36.0	3.3	118.6	33.9	3.5
	50/40	3.1	78.3	29.2	2.7	88.3	31.2	2.8	100.7	33.4	3.0	114.8	35.6	3.2	121.0	36.5	3.3	121.0	34.4	3.5	121.0	32.2	3.8
	50/35	3.1	78.2	29.1	2.7	88.2	31.1	2.8	100.6	33.3	3.0	114.7	35.6	3.2	120.9	36.4	3.3	120.9	34.3	3.5	120.9	32.1	3.8
	50/30	3.1	78.2	29.1	2.7	88.2	31.1	2.8	100.6	33.3	3.0	114.7	35.5	3.2	120.8	36.4	3.3	120.8	34.3	3.5	120.8	32.1	3.8
	45/30	3.4	79.5	27.8	2.9	89.5	29.6	3.0	102.2	31.7	3.2	116.7	33.7	3.5	123.1	34.5	3.6	123.1	32.6	3.8	123.1	30.3	4.1
	35/20	3.8	82.1	25.5	3.2	92.0	26.9	3.4	105.3	28.7	3.7	120.6	30.3	4.0	127.3	30.9	4.1	127.3	29.2	4.4	127.3	26.6	4.8



# PERFORMANCE BIRCH 120/75 EFFICIENCY MODE //

Heating Capacity (Efficiency Mode)																								
Model name	Water Temp (°C)	SCO P	-10°C External			-5°C External			0°C External			5°C External			7°C External			10°C External			15°C External			
			QH (kW)	PI (kW)	CO P	QH (kW)	PI (kW)	CO P	QH (kW)	PI (kW)	CO P	QH (kW)	PI (kW)	CO P	QH (kW)	PI (kW)	CO P	QH (kW)	PI (kW)	CO P	QH (kW)	PI (kW)	CO P	
BIRCH SN 75/120	65/50	2.6	74.7	34.0	2.2	84.7	36.6	2.3	84.7	33.3	2.5	84.7	31.9	2.7	84.7	31.2	2.7	84.7	30.3	2.8	84.7	28.6	3.0	
	65/45	2.6	74.7	34.0	2.2	84.7	36.6	2.3	84.7	33.3	2.5	84.7	31.9	2.7	84.7	31.2	2.7	84.7	30.3	2.8	84.7	28.7	3.0	
	60/50	2.7	75.9	32.3	2.4	85.9	34.6	2.5	85.9	31.9	2.7	85.9	30.4	2.8	85.9	29.8	2.9	85.9	28.8	3.0	85.9	27.1	3.2	
	60/45	2.8	75.8	32.2	2.4	85.8	34.6	2.5	85.8	31.9	2.7	85.8	30.4	2.8	85.8	29.7	2.9	85.8	28.7	3.0	85.8	27.0	3.2	
	60/40	2.8	75.8	32.2	2.4	85.8	34.6	2.5	85.8	31.9	2.7	85.8	30.4	2.8	85.8	29.7	2.9	85.8	28.7	3.0	85.8	27.0	3.2	
	55/45	2.9	77.0	30.6	2.5	87.0	32.8	2.7	87.0	30.6	2.8	87.0	29.0	3.0	87.0	28.3	3.1	87.0	27.2	3.2	87.0	25.5	3.4	
	55/40	2.9	77.0	30.6	2.5	87.0	32.7	2.7	87.0	30.5	2.8	87.0	28.9	3.0	87.0	28.2	3.1	87.0	27.2	3.2	87.0	25.4	3.4	
	55/35	2.9	77.0	30.6	2.5	87.0	32.8	2.7	87.0	30.6	2.8	87.0	28.9	3.0	87.0	28.2	3.1	87.0	27.2	3.2	87.0	25.4	3.4	
	50/40	3.1	78.3	29.2	2.7	88.3	31.2	2.8	88.3	29.4	3.0	88.3	27.6	3.2	88.3	26.9	3.3	88.3	25.8	3.4	88.3	24.0	3.7	
	50/35	3.1	78.2	29.1	2.7	88.2	31.1	2.8	88.2	29.3	3.0	88.2	27.6	3.2	88.2	26.8	3.3	88.2	25.7	3.4	88.2	23.9	3.7	
	50/30	3.1	78.2	29.1	2.7	88.2	31.1	2.8	88.2	29.3	3.0	88.2	27.6	3.2	88.2	26.8	3.3	88.2	25.7	3.4	88.2	23.9	3.7	
	45/30	3.3	79.5	27.8	2.9	89.5	29.6	3.0	89.5	28.1	3.2	89.5	26.2	3.4	89.5	25.5	3.5	89.5	24.3	3.7	89.5	22.4	4.0	
	35/20	3.8	82.1	25.5	3.2	92.0	26.9	3.4	92.0	25.6	3.6	92.0	23.5	3.9	92.0	22.7	4.1	92.0	21.4	4.3	92.0	19.4	4.7	



## CONTROL OPTIONS //

### Capped Capacity Control

There are two options for output capacity available from the Clade controls.

1. Efficiency mode: Capped at  $-5^{\circ}\text{C}$  – the unit will only deliver heat up to the  $-5^{\circ}\text{C}$  ambient rated output.
2. Power mode: Capped at  $+7^{\circ}\text{C}$  – the unit will deliver heat up to the maximum rating at  $+7^{\circ}\text{C}$  ambient temperature.

See capacity tables for details

### Low noise models

Clade use proprietary technology to reduce noise levels to market leading levels.

We have had our heat pumps tested and certified in real environments by industry recognised experts which means you can be 100% confident in meeting your planning requirements.

Data is given in accordance with BS EN ISO 4871: 2009 and Measured in Accordance with BS EN ISO 9614 - Part 1: 2009

### Pressure Independent flow control for an External pump

The heat pump is provided without a pump. This gives the designer freedom to select the correct pump for the system temperature differential, pressure drop and capacity. The heat pump will enable the pump and control the output as required.

Birch Range	Birch 85 / 50		Birch 120 / 75	
	Standard	Low Noise	Standard	Low Noise
Sound Power Level, $L_{W(A)}$ (dB)	85	75	85	75
Sound Pressure Level at 10m (dB)	53	43	53	43
Uncertainty (dB)	4	4	4	4



## ABOUT THIS INFORMATION //

Performance may vary based on climate conditions, installation quality, and specific usage patterns. Actual energy savings may differ from estimates.

Professional installation is required to ensure optimal performance and compliance with local building codes. Improper installation will void the warranty.

Regular maintenance is necessary to maintain efficiency and performance. Failure to perform recommended maintenance may reduce system lifespan and efficiency.

Efficiency ratings (COP) are based on standard testing conditions and control patterns. Actual efficiency may vary depending on operational conditions and geographic location. COP are instantaneous figures not averaged over any period of time which may include defrost and other system variables.

Heat pumps are designed for specific use. Using the product for unintended purposes may result in suboptimal performance or damage.

Noise levels produced by the heat pump may vary based on the installation environment and operating conditions. Sound pressure figures are for free field without the specifics of the site application.

Please refer to the user manual and installation guide for detailed information on operation, maintenance, and safety instructions.

Clade continually innovates to improve our products, the information in this document is valid (excepting typographic errors) at the time of publication. Availability, specification and performance are subject to change from time to time and without warning.

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Any technical advice provided is for informational purposes only, unless specifically covered by a purchase order, and is based on our current understanding and available information. While we strive to ensure the accuracy and reliability of the information provided, it is not intended to be a substitute for professional advice or services tailored to specific circumstances.

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