

<b>Heat pump model</b>	<b>Master Therm</b>	<b>BA22IS-1</b>
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Heat pump type	Air/Water
Supplementary heater	Yes
Heat pump combination heater	No

Reference heating season		<b>Average</b>		
Reference water temperature		<b>LOW, 35°C</b>		
Full load heating		<b>Prated [kW]</b>	<b>4.51</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>172</b>	<b>A++</b>
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>2128</b>	
<b>Average 35°C</b>	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	$T_j$ [°C]	$P_{dh}$ [kW]	$COP_d$ (-)	$C_{dh}$ (-)
A	-7	3.99	2.74	0.900
B	2	2.58	4.16	0.900
C	7	1.64	6.22	0.900
D	12	2.08	7.50	0.938
TOL (E)	-10	3.64	2.61	0.900
Tbivalent (F)	-7	3.99	2.74	0.900

Reference heating season		<b>Average</b>		
Reference water temperature		<b>High, 55°C</b>		
Full load heating		<b>Prated [kW]</b>	<b>4.44</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>130</b>	<b>A++</b>
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>2759</b>	
<b>Average 55°C</b>	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	$T_j$ [°C]	$P_{dh}$ [kW]	$COP_d$ (-)	$C_{dh}$ (-)
A	-7	3.93	2.03	0.900
B	2	2.45	3.15	0.900
C	7	1.69	4.74	0.900
D	12	1.96	5.73	0.950
TOL (E)	-10	3.68	1.90	0.900
Tbivalent (F)	-7	3.93	2.03	0.900

Reference heating season		<b>Warmer</b>		
Reference water temperature		<b>Low, 35°C</b>		
Full load heating		<b>Prated [kW]</b>	<b>5.32</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>239</b>	
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>1176</b>	
<b>Warmer 35°C</b>	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	$T_j$ [°C]	$P_{dh}$ [kW]	$COP_d$ (-)	$C_{dh}$ (-)
B	2	5.32	3.34	0.900
C	7	3.78	5.20	0.976
D	12	1.58	7.76	0.900
TOL (E)	2	5.32	3.34	0.900
Tbivalent (F)	2	5.32	3.34	0.900

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Reference heating season		<b>Warmer</b>		
Reference water temperature		<b>High, 55°C</b>		
Full load heating		<b>Prated [kW]</b>	<b>5.08</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>164</b>	
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>1626</b>	
<b>Warmer 55°C</b>	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	$T_j$ [°C]			
		Pdh [kW]	COPd (-)	Cdh (-)
B	2	5.08	2.25	0.900
C	7	3.54	3.52	0.900
D	12	1.95	5.56	0.951
TOL (E)	2	5.08	2.25	0.900
Tbivalent (F)	2	5.08	2.25	0.900

Reference heating season		<b>Colder</b>		
Reference water temperature		<b>Low, 35°C</b>		
Full load heating		<b>Prated [kW]</b>	<b>6.55</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>134</b>	
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>4717</b>	
<b>Colder 35°C</b>	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	$T_j$ [°C]			
		Pdh [kW]	COPd (-)	Cdh (-)
A	-7	3.97	2.91	0.900
B	2	2.61	4.47	0.900
C	7	1.56	6.42	0.900
D	12	2.08	7.50	0.938
TOL (E)	-22	2.64	2.34	0.900
Tbivalent (F)	-7	3.97	2.91	0.900
G	-15	3.15	2.56	0.900

Reference heating season		<b>Colder</b>		
Reference water temperature		<b>High, 55°C</b>		
Full load heating		<b>Prated [kW]</b>	<b>6.49</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>110</b>	
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>5643</b>	
<b>Colder 55°C</b>	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	$T_j$ [°C]			
		Pdh [kW]	COPd (-)	Cdh (-)
A	-7	3.93	2.33	0.900
B	2	2.50	3.53	0.900
C	7	1.73	5.18	0.948
D	12	1.99	6.12	0.947
TOL (E)	-22	2.84	1.88	0.900
Tbivalent (F)	-7	3.93	2.33	0.900
G	-15	3.26	2.05	0.900

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Power consumption in modes other than "active mode"		
Off mode	$P_{OFF}$ [kW]	0.018
Thermostat off mode	$P_{TO}$ [kW]	0.017
Standby mode	$P_{SB}$ [kW]	0.018
Crankcaseheater mode	$P_{CK}$ [kW]	-

Supplementary heater capacity	$P_{sup}$ [kW]	4,5+(4,5)
Supplementary heater type	[-]	electricity

Capacity control		Variable
Sound power level Indoor	$L_{WA}$ [dBA]	48
Sound power level Outdoor	$L_{WA}$ [dBA]	55
Rated airflow	[m <sup>3</sup> /h]	max. 3000

Temperature controller		
Type	Carel pCO5/pCO5+/uPC, Master Therm custom SW	
Class	II	
Contribution	%	2.0

Temperature controller + Room Terminal		
Type	Carel pCO5/pCO5+/uPC + pAD, Master Therm custom SW	
Class	VI	
Contribution	%	4.0

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<b>Information sheet</b>			
Temperature application		<b>Low, 35°C</b>	<b>High, 55°C</b>
Space heating energy efficiency class, Average climate	-	A++	A++
Nominal heating capacity Pdesign, Average climate	kW	5	4
Space heating seasonal efficiency, Average climate	%	172	130
Space heating annual electricity consumption, Average cl.	kWh	2128	2759
Nominal heating capacity Pdesign, Colder climate	kW	7	6
Space heating seasonal efficiency, Colder climate	%	134	110
Space heating annual electricity consumption, Colder cl.	kWh	4717	5643
Nominal heating capacity Pdesign, Warmer climate	kW	5	5
Space heating seasonal efficiency, Warmer climate	%	239	164
Space heating annual electricity consumption, Warmer cl.	kWh	1176	1626
Sound power level Lwa Outdoor	dBA	55	

<b>Information sheet for energy efficiency Set with Temperature controller</b>			
Temperature application		<b>Low, 35°C</b>	<b>High, 55°C</b>
Controller Carel pCO5/pCO5+/uPC, Class	-	II	II
Controller Carel pCO5/pCO5+/uPC, Contribution	%	2.0	2.0
Set Space heating seasonal efficiency, Average climate	%	174	132
Set Space heating energy efficiency class, Average climate	-	A++	A++
Set Space heating seasonal efficiency, Colder climate	%	136	112
Set Space heating seasonal efficiency, Warmer climate	%	241	166

<b>Information sheet for energy efficiency Set with Temperature controller + Room Terminal</b>			
Temperature application		<b>Low, 35°C</b>	<b>High, 55°C</b>
Controller Carel pCO5/pCO5+/uPC + pAD, Class	-	VI	VI
Controller Carel pCO5/pCO5+/uPC, +pAD, Contribution	%	4.0	4.0
Set Space heating seasonal efficiency, Average climate	%	176	134
Set Space heating energy efficiency class, Average climate	-	A+++	A++
Set Space heating seasonal efficiency, Colder climate	%	138	114
Set Space heating seasonal efficiency, Warmer climate	%	243	168