

Heat pump model	Master Therm	BA45IS-1
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Heat pump type	Air/Water
Supplementary heater	Yes
Heat pump combination heater	No

Reference heating season		Average		
Reference water temperature		LOW, 35°C		
Full load heating		Prated [kW]	13.37	
Seasonal efficiency		η_s [%]	175	A+++
Annual electricity consumption		Q_{HE} [kWh]	6195	
Average 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	T_j [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	11.83	2.77	0.900
B	2	7.91	4.17	0.900
C	7	4.88	6.44	0.900
D	12	5.73	7.93	0.967
TOL (E)	-10	10.96	2.32	0.900
Tbivalent (F)	-7	11.83	2.77	0.900

Reference heating season		Average		
Reference water temperature		High, 55°C		
Full load heating		Prated [kW]	12.05	
Seasonal efficiency		η_s [%]	136	A++
Annual electricity consumption		Q_{HE} [kWh]	7166	
Average 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	T_j [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	10.66	2.10	0.900
B	2	6.82	3.28	0.900
C	7	4.38	5.00	0.900
D	12	4.83	6.13	0.970
TOL (E)	-10	9.57	1.77	0.900
Tbivalent (F)	-7	10.66	2.10	0.900

Reference heating season		Warmer		
Reference water temperature		Low, 35°C		
Full load heating		Prated [kW]	15.78	
Seasonal efficiency		η_s [%]	251	
Annual electricity consumption		Q_{HE} [kWh]	3326	
Warmer 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	T_j [°C]	Pdh [kW]	COPd (-)	Cdh (-)
B	2	15.78	3.03	0.900
C	7	9.77	5.50	0.900
D	12	5.09	8.20	0.961
TOL (E)	2	15.78	3.03	0.900
Tbivalent (F)	2	15.78	3.03	0.900

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Reference heating season			Warmer		
Reference water temperature			High, 55°C		
Full load heating		Prated [kW]		13.11	
Seasonal efficiency		η_s [%]		172	
Annual electricity consumption		Q_{HE} [kWh]		3992	
Warmer 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient	
	Outdoor air				
	T_j [°C]	Pdh [kW]	COPd (-)	Cdh (-)	
B	2	13.11	2.14	0.900	
C	7	8.70	3.66	0.900	
D	12	6.40	5.94	0.978	
TOL (E)	2	13.11	2.14	0.900	
Tbivalent (F)	2	13.11	2.14	0.900	
Reference heating season			Colder		
Reference water temperature			Low, 35°C		
Full load heating		Prated [kW]		19.79	
Seasonal efficiency		η_s [%]		130	
Annual electricity consumption		Q_{HE} [kWh]		14639	
Colder 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient	
	Outdoor air				
	T_j [°C]	Pdh [kW]	COPd (-)	Cdh (-)	
A	-7	11.98	2.61	0.900	
B	2	7.22	4.62	0.900	
C	7	5.76	6.63	0.972	
D	12	6.74	7.93	0.972	
TOL (E)	-22	8.20	1.97	0.900	
Tbivalent (F)	-7	11.98	2.61	0.900	
G	-15	9.47	2.18	0.900	
Reference heating season			Colder		
Reference water temperature			High, 55°C		
Full load heating		Prated [kW]		19.18	
Seasonal efficiency		η_s [%]		108	
Annual electricity consumption		Q_{HE} [kWh]		17082	
Colder 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient	
	Outdoor air				
	T_j [°C]	Pdh [kW]	COPd (-)	Cdh (-)	
A	-7	11.61	2.09	0.900	
B	2	6.66	3.72	0.900	
C	7	5.56	5.43	0.977	
D	12	6.52	6.52	0.976	
TOL (E)	-22	7.65	1.68	0.900	
Tbivalent (F)	-7	11.61	2.09	0.900	
G	-15	8.95	1.77	0.900	

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Power consumption in modes other than "active mode"		
Off mode	P_{OFF} [kW]	0.026
Thermostat off mode	P_{TO} [kW]	0.024
Standby mode	P_{SB} [kW]	0.026
Crankcaseheater mode	P_{CK} [kW]	-

Supplementary heater capacity	P_{SUP} [kW]	7.5(+7.5)
Supplementary heater type	[-]	electricity

Capacity control		Variable
Sound power level Indoor	L_{WA} [dBA]	48
Sound power level Outdoor	L_{WA} [dBA]	62
Rated airflow	[m ³ /h]	max.8000

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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Information sheet			
Temperature application		Low, 35°C	High, 55°C
Space heating energy efficiency class, Average climate	-	A+++	A++
Nominal heating capacity Pdesign, Average climate	kW	13	12
Space heating seasonal efficiency, Average climate	%	175	136
Space heating annual electricity consumption, Average cl.	kWh	6195	7166

Nominal heating capacity Pdesign, Colder climate	kW	20	19
Space heating seasonal efficiency, Colder climate	%	130	108
Space heating annual electricity consumption, Colder cl.	kWh	14639	17082

Nominal heating capacity Pdesign, Warmer climate	kW	16	13
Space heating seasonal efficiency, Warmer climate	%	251	172
Space heating annual electricity consumption, Warmer cl.	kWh	3326	3992

Sound power level Lwa Outdoor	dBA	62	
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Information sheet for energy efficiency Set with Temperature controller			
Temperature application		Low, 35°C	High, 55°C
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	%	177	138
Set Space heating energy efficiency class, Average climate	-	A+++	A++
Set Space heating seasonal efficiency, Colder climate	%	132	110
Set Space heating seasonal efficiency, Warmer climate	%	253	174

Information sheet for energy efficiency Set with Temperature controller + Room Terminal			
Temperature application		Low, 35°C	High, 55°C
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	%	179	140
Set Space heating energy efficiency class, Average climate	-	A+++	A++
Set Space heating seasonal efficiency, Colder climate	%	134	112
Set Space heating seasonal efficiency, Warmer climate	%	255	176