

Heat pump model **Master Therm** **BA45IP-0, BA45IP-1**

Heat pump type	Air/Water
Supplementary heater	Yes
Heat pump combination heater	No

Reference heating season	Average		SCOP	
Reference water temperature	LOW, 35°C		4,74	
Full load heating	Prated [kW]	14,96		
Seasonal efficiency	η_s [%]	187	A+++	
Annual electricity consumption	Q_{HE} [kWh]	6515		
Average 35°C	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	13,61	3,16	0,900
B	2	8,18	4,56	0,900
C	7	5,33	6,37	0,900
D	12	4,84	7,28	0,971
TOL (E)	-10	14,96	2,88	0,900
Tbivalent (F)	-10	14,96	2,88	0,900

Reference heating season	Average		SCOP	
Reference water temperature	High, 55°C		3,61	
Full load heating	Prated [kW]	13,62		
Seasonal efficiency	η_s [%]	141	A++	
Annual electricity consumption	Q_{HE} [kWh]	7799		
Average 55°C	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	12,24	2,41	0,900
B	2	7,88	3,46	0,900
C	7	4,91	4,83	0,900
D	12	4,73	5,53	0,978
TOL (E)	-10	13,62	2,12	0,900
Tbivalent (F)	-10	13,62	2,12	0,900

Reference heating season	Warmer			
Reference water temperature	Low, 35°C			
Full load heating	Prated [kW]	16,46		
Seasonal efficiency	η_s [%]	236		
Annual electricity consumption	Q_{HE} [kWh]	3681		
Warmer 35°C	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	16,46	3,88	0,900
C	7	10,82	5,45	0,900
D	12	4,84	7,28	0,900
TOL (E)	2	16,46	3,88	0,900
Tbivalent (F)	2	16,46	3,88	0,900

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Reference heating season		Warmer		
Reference water temperature		High, 55°C		
Full load heating		Prated [kW]	15,40	
Seasonal efficiency		η_s [%]	168	
Annual electricity consumption		Q_{HE} [kWh]	4818	
Warmer 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
B	2	15,40	2,70	0,900
C	7	10,24	3,74	0,900
D	12	4,72	5,36	0,900
TOL (E)	2	15,40	2,70	0,900
Tbivalent (F)	2	15,40	2,70	0,900

Reference heating season		Colder		
Reference water temperature		Low, 35°C		
Full load heating		Prated [kW]	17,17	
Seasonal efficiency		η_s [%]	160	
Annual electricity consumption		Q_{HE} [kWh]	10356	
Colder 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	10,80	3,45	0,900
B	2	6,58	5,01	0,900
C	7	4,46	6,85	0,900
D	12	4,84	7,28	0,971
TOL (E)	-20	11,98	2,59	0,900
Tbivalent (F)	-10	11,75	3,12	0,900
G	-15	11,86	2,86	0,900

Reference heating season		Colder		
Reference water temperature		High, 55°C		
Full load heating		Prated [kW]	16,93	
Seasonal efficiency		η_s [%]	127	
Annual electricity consumption		Q_{HE} [kWh]	12849	
Colder 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	10,40	2,78	0,900
B	2	6,42	3,87	0,900
C	7	4,39	5,42	0,900
D	12	4,76	5,89	0,977
TOL (E)	-20	10,68	2,00	0,900
Tbivalent (F)	-10	11,59	2,50	0,900
G	-15	11,13	2,25	0,900

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Power consumption in modes other than "active mode"		
Off mode	P_{OFF} [kW]	0,019
Thermostat off mode	P_{TO} [kW]	0,019
Standby mode	P_{SB} [kW]	0,019
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]	-
Sound power level Outdoor	L_{WA} [dBA]	60
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	15	14
Space heating seasonal efficiency, Average climate	%	187	141
Space heating annual electricity consumption, Average cl.	kWh	6515	7799

Nominal heating capacity Pdesign, Colder climate	kW	17	17
Space heating seasonal efficiency, Colder climate	%	160	127
Space heating annual electricity consumption, Colder cl.	kWh	10356	12849

Nominal heating capacity Pdesign, Warmer climate	kW	16	15
Space heating seasonal efficiency, Warmer climate	%	236	168
Space heating annual electricity consumption, Warmer cl.	kWh	3681	4818

Sound power level Lwa Outdoor	dBA	60
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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	%	189	143
Set Space heating energy efficiency class, Average climate	-	A+++	A++
Set Space heating seasonal efficiency, Colder climate	%	162	129
Set Space heating seasonal efficiency, Warmer climate	%	238	170

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	%	191	145
Set Space heating energy efficiency class, Average climate	-	A+++	A++
Set Space heating seasonal efficiency, Colder climate	%	164	131
Set Space heating seasonal efficiency, Warmer climate	%	240	172