

<b>Heat pump model</b>	<b>Master Therm</b>	<b>AQ45I-1, AQ45I-0</b>
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Heat pump type	Water/Water
Supplementary heater	No
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>21</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>196</b>	<b>A+++</b>
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>8658</b>	
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	18,53	4,23	0,900
B	2	11,28	5,21	0,900
C	7	7,46	5,45	0,900
D	12	3,62	5,47	0,971
TOL (E)	-10	21,37	3,99	0,900
Tbivalent (F)	-10	21,37	3,99	0,900

Reference heating season		<b>Average</b>		
Reference water temperature		<b>High, 55°C</b>		
Full load heating		<b>Prated [kW]</b>	<b>19,40</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>151</b>	<b>A+++</b>
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>10112</b>	
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	16,68	2,95	0,900
B	2	10,79	4,11	0,900
C	7	6,96	4,36	0,900
D	12	3,26	4,47	0,900
TOL (E)	-10	19,40	2,71	0,900
Tbivalent (F)	-10	19,40	2,71	0,900

Reference heating season		<b>Warmer</b>		
Reference water temperature		<b>Low, 35°C</b>		
Full load heating		<b>Prated [kW]</b>	<b>21,37</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>194</b>	
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>5652</b>	
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	21,37	3,99	0,900
C	7	13,68	4,66	0,900
D	12	6,05	5,61	0,900
TOL (E)	2	21,37	3,99	0,900
Tbivalent (F)	2	21,37	3,99	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>19,40</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>141</b>	
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>6955</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	19,40	2,71	0,900
C	7	12,63	3,29	0,900
D	12	5,80	4,36	0,900
TOL (E)	2	19,40	2,71	0,900
Tbivalent (F)	2	19,40	2,71	0,900

Reference heating season		<b>Colder</b>		
Reference water temperature		<b>Low, 35°C</b>		
Full load heating		<b>Prated [kW]</b>	<b>21,37</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>201</b>	
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>10069</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	12,86	4,79	0,900
B	2	7,90	5,40	0,900
C	7	5,33	5,61	0,900
D	12	4,82	5,47	0,979
TOL (E)	-22	21,37	3,99	0,900
Tbivalent (F)	-22	21,37	3,99	0,900
G	-15	17,65	5,89	0,900

Reference heating season		<b>Colder</b>		
Reference water temperature		<b>High, 55°C</b>		
Full load heating		<b>Prated [kW]</b>	<b>19,40</b>	
Seasonal efficiency		<b><math>\eta_s</math> [%]</b>	<b>151</b>	
Annual electricity consumption		<b><math>Q_{HE}</math> [kWh]</b>	<b>12018</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	12,02	3,51	0,900
B	2	7,35	4,23	0,900
C	7	4,70	4,70	0,900
D	12	4,70	4,70	0,981
TOL (E)	-22	19,40	2,71	0,900
Tbivalent (F)	-22	19,40	2,71	0,900
G	-15	15,82	3,82	0,900

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Power consumption in modes other than "active mode"		
Off mode	P <sub>OFF</sub> [kW]	0,000
Thermostat off mode	P <sub>TO</sub> [kW]	0,019
Standby mode	P <sub>SB</sub> [kW]	0,019
Crankcaseheater mode	P <sub>CK</sub> [kW]	-
Supplementary heater capacity		
Supplementary heater capacity	P <sub>sup</sub> [kW]	-
Supplementary heater type	[-]	electricity
Capacity control		
Capacity control		Variable
Sound power level Indoor	L <sub>WA</sub> [dBA]	48
Sound power level Outdoor	L <sub>WA</sub> [dBA]	-
Rated water flow	[m <sup>3</sup> /h]	7,08
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	21	19
Space heating seasonal efficiency, Average climate	%	196	151
Space heating annual electricity consumption, Average cl.	kWh	8658	10112
Nominal heating capacity Pdesign, Colder climate	kW	21	19
Space heating seasonal efficiency, Colder climate	%	201	151
Space heating annual electricity consumption, Colder cl.	kWh	10069	12018
Nominal heating capacity Pdesign, Warmer climate	kW	21	19
Space heating seasonal efficiency, Warmer climate	%	194	141
Space heating annual electricity consumption, Warmer cl.	kWh	5652	6955
Sound power level Lwa	dBA	48	

<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	%	198	153
Set Space heating energy efficiency class, Average climate	-	A+++	A+++
Set Space heating seasonal efficiency, Colder climate	%	203	153
Set Space heating seasonal efficiency, Warmer climate	%	196	143

<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	%	200	155
Set Space heating energy efficiency class, Average climate	-	A+++	A+++
Set Space heating seasonal efficiency, Colder climate	%	205	155
Set Space heating seasonal efficiency, Warmer climate	%	198	145