Heat pump model	**Master Therm**	**BA22IS-1**

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]**	**4.51**	
Seasonal efficiency		**η_s [%]**	**172**	**A++**
Annual electricity consumption		**Q_{HE} [kWh]**	**2128**	
Average 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
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			**Average**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**4.44**	
Seasonal efficiency		**η_s [%]**	**130**	**A++**
Annual electricity consumption		**Q_{HE} [kWh]**	**2759**	
Average 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
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			**Warmer**	
Reference water temperature			**Low, 35°C**	
Full load heating		**Prated [kW]**	**5.32**	
Seasonal efficiency		**η_s [%]**	**239**	
Annual electricity consumption		**Q_{HE} [kWh]**	**1176**	
Warmer 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
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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Heat pump model	**Master Therm**	**BA22IS-1**

Reference heating season			**Warmer**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**5.08**	
Seasonal efficiency		**η_S [%]**	**164**	
Annual electricity consumption		**Q_{HE} [kWh]**	**1626**	
Warmer 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°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			**Colder**	
Reference water temperature			**Low, 35°C**	
Full load heating		**Prated [kW]**	**6.55**	
Seasonal efficiency		**η_S [%]**	**134**	
Annual electricity consumption		**Q_{HE} [kWh]**	**4717**	
Colder 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°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			**Colder**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**6.49**	
Seasonal efficiency		**η_S [%]**	**110**	
Annual electricity consumption		**Q_{HE} [kWh]**	**5643**	
Colder 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°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

Heat pump model	**Master Therm**	**BA22IS-1**

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]	62
Rated airflow	[m^3/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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Heat pump model	**Master Therm**	**BA22IS-1**

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	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	62	

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	%	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

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	%	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

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Heat pump model	**Master Therm**	**BA26IS-1**

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]**	**6.51**	
Seasonal efficiency		**η_S [%]**	**168**	**A++**
Annual electricity consumption		**Q_{HE} [kWh]**	**3139**	
Average 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	5.76	2.59	0.900
B	2	3.72	3.91	0.900
C	7	2.42	6.53	0.900
D	12	2.74	7.21	0.951
TOL (E)	-10	5.88	2.52	0.900
Tbivalent (F)	-7	5.76	2.59	0.900

Reference heating season			**Average**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**6.33**	
Seasonal efficiency		**η_S [%]**	**126**	**A++**
Annual electricity consumption		**Q_{HE} [kWh]**	**4039**	
Average 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	5.60	1.94	0.900
B	2	3.50	3.02	0.900
C	7	2.33	4.69	0.900
D	12	2.78	5.55	0.963
TOL (E)	-10	5.66	1.82	0.900
Tbivalent (F)	-7	5.60	1.94	0.900

Reference heating season			**Warmer**	
Reference water temperature			**Low, 35°C**	
Full load heating		**Prated [kW]**	**7.67**	
Seasonal efficiency		**η_S [%]**	**259**	
Annual electricity consumption		**Q_{HE} [kWh]**	**1567**	
Warmer 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
B	2	7.67	3.41	0.900
C	7	5.10	5.85	0.900
D	12	2.52	8.10	0.944
TOL (E)	2	7.67	3.41	0.900
Tbivalent (F)	2	7.67	3.41	0.900

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Heat pump model	**Master Therm**	**BA26IS-1**

Reference heating season			**Warmer**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**7.40**	
Seasonal efficiency		**η_S [%]**	**177**	
Annual electricity consumption		**Q_{HE} [kWh]**	**2199**	
Warmer 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
B	2	7.40	2.21	0.900
C	7	5.17	3.71	0.900
D	12	2.46	6.09	0.957
TOL (E)	2	7.40	2.21	0.900
Tbivalent (F)	2	7.40	2.21	0.900

Reference heating season			**Colder**	
Reference water temperature			**Low, 35°C**	
Full load heating		**Prated [kW]**	**9.65**	
Seasonal efficiency		**η_S [%]**	**132**	
Annual electricity consumption		**Q_{HE} [kWh]**	**5987**	
Colder 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	5.84	2.70	0.900
B	2	3.54	4.55	0.900
C	7	2.97	6.82	0.960
D	12	3.45	7.50	0.959
TOL (E)	-22	4.16	2.08	0.900
Tbivalent (F)	-7	5.84	2.70	0.900
G	-15	4.81	2.32	0.900

Reference heating season			**Colder**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**9.31**	
Seasonal efficiency		**η_S [%]**	**107**	
Annual electricity consumption		**Q_{HE} [kWh]**	**7116**	
Colder 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	5.63	2.17	0.900
B	2	3.69	3.58	0.900
C	7	2.86	5.58	0.966
D	12	3.33	6.22	0.965
TOL (E)	-22	3.53	1.42	0.900
Tbivalent (F)	-7	5.63	2.17	0.900
G	-15	4.34	1.71	0.900

Heat pump model	**Master Therm**	**BA26IS-1**

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]	62
Rated airflow	[m^3/h]	max. 3500

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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Heat pump model	**Master Therm**	**BA26IS-1**

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	7	6
Space heating seasonal efficiency, Average climate	%	168	126
Space heating annual electricity consumption, Average cl.	kWh	3139	4039
Nominal heating capacity Pdesign, Colder climate	kW	10	9
Space heating seasonal efficiency, Colder climate	%	132	107
Space heating annual electricity consumption, Colder cl.	kWh	5987	7116
Nominal heating capacity Pdesign, Warmer climate	kW	8	7
Space heating seasonal efficiency, Warmer climate	%	259	177
Space heating annual electricity consumption, Warmer cl.	kWh	1567	2199
Sound power level Lwa Outdoor	dBA	62	

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	%	170	128
Set Space heating energy efficiency class, Average climate	-	A++	A++
Set Space heating seasonal efficiency, Colder climate	%	134	109
Set Space heating seasonal efficiency, Warmer climate	%	261	179

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	%	172	130
Set Space heating energy efficiency class, Average climate	-	A++	A++
Set Space heating seasonal efficiency, Colder climate	%	136	111
Set Space heating seasonal efficiency, Warmer climate	%	263	181

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Heat pump model	**Master Therm**	**BA37IS-1**

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]**	**10.93**	
Seasonal efficiency		**η_S [%]**	**176**	**A+++**
Annual electricity consumption		**Q_{HE} [kWh]**	**5035**	
Average 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	9.67	2.64	0.900
B	2	6.10	4.38	0.900
C	7	4.06	6.19	0.900
D	12	4.75	7.62	0.961
TOL (E)	-10	9.04	2.48	0.900
Tbivalent (F)	-7	9.67	2.64	0.900

Reference heating season			**Average**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**10.02**	
Seasonal efficiency		**η_S [%]**	**137**	**A++**
Annual electricity consumption		**Q_{HE} [kWh]**	**5910**	
Average 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	8.86	2.00	0.900
B	2	5.45	3.41	0.900
C	7	3.48	4.94	0.900
D	12	4.08	6.01	0.965
TOL (E)	-10	8.22	1.85	0.900
Tbivalent (F)	-7	8.86	2.00	0.900

Reference heating season			**Warmer**	
Reference water temperature			**Low, 35°C**	
Full load heating		**Prated [kW]**	**12.45**	
Seasonal efficiency		**η_S [%]**	**249**	
Annual electricity consumption		**Q_{HE} [kWh]**	**2645**	
Warmer 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
B	2	12.45	3.33	0.900
C	7	8.12	5.54	0.900
D	12	3.58	7.87	0.900
TOL (E)	-10	12.45	3.33	0.900
Tbivalent (F)	-7	12.45	3.33	0.900

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Heat pump model	**Master Therm**	**BA37IS-1**

Reference heating season			**Warmer**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**11.14**	
Seasonal efficiency		**η_S [%]**	**175**	
Annual electricity consumption		**Q_{HE} [kWh]**	**3348**	
Warmer 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
B	2	11.14	2.28	0.900
C	7	7.21	3.79	0.900
D	12	4.51	5.84	0.969
TOL (E)	-10	11.14	2.28	0.900
Tbivalent (F)	-7	11.14	2.28	0.900

Reference heating season			**Colder**	
Reference water temperature			**Low, 35°C**	
Full load heating		**Prated [kW]**	**16.31**	
Seasonal efficiency		**η_S [%]**	**135**	
Annual electricity consumption		**Q_{HE} [kWh]**	**11678**	
Colder 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	9.87	2.78	0.900
B	2	6.18	4.67	0.900
C	7	4.09	6.35	0.900
D	12	4.75	7.62	0.961
TOL (E)	-22	7.55	2.00	0.900
Tbivalent (F)	-7	9.87	2.78	0.900
G	-15	8.44	2.30	0.900

Reference heating season			**Colder**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**15.21**	
Seasonal efficiency		**η_S [%]**	**112**	
Annual electricity consumption		**Q_{HE} [kWh]**	**12984**	
Colder 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	9.20	2.27	0.900
B	2	5.89	3.78	0.900
C	7	3.93	5.32	0.900
D	12	4.59	6.36	0.967
TOL (E)	-22	6.95	1.64	0.900
Tbivalent (F)	-7	9.20	2.27	0.900
G	-15	7.82	1.89	0.900

Heat pump model	**Master Therm**	**BA37IS-1**

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.6000

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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Heat pump model	**Master Therm**	**BA37IS-1**

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	11	10
Space heating seasonal efficiency, Average climate	%	176	137
Space heating annual electricity consumption, Average cl.	kWh	5035	5910
Nominal heating capacity Pdesign, Colder climate	kW	16	15
Space heating seasonal efficiency, Colder climate	%	135	112
Space heating annual electricity consumption, Colder cl.	kWh	11678	12984
Nominal heating capacity Pdesign, Warmer climate	kW	12	11
Space heating seasonal efficiency, Warmer climate	%	249	175
Space heating annual electricity consumption, Warmer cl.	kWh	2645	3348
Sound power level Lwa Outdoor	dBA	62	

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	%	178	139
Set Space heating energy efficiency class, Average climate	-	A+++	A++
Set Space heating seasonal efficiency, Colder climate	%	137	114
Set Space heating seasonal efficiency, Warmer climate	%	251	177

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	%	180	141
Set Space heating energy efficiency class, Average climate	-	A+++	A++
Set Space heating seasonal efficiency, Colder climate	%	139	116
Set Space heating seasonal efficiency, Warmer climate	%	253	179

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Heat pump model	**Master Therm**	**BA45IS-1**

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			
	Tj [°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			
	Tj [°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			
	Tj [°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

Master Therm tepelná čerpadla s.r.o.
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Heat pump model	**Master Therm**	**BA45IS-1**

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			
	Tj [°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			
	Tj [°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			
	Tj [°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

Heat pump model	**Master Therm**	**BA45IS-1**

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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Heat pump model	**Master Therm**	**BA45IS-1**

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	

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

Master Therm tepelná čerpadla s.r.o.
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Heat pump model	**Master Therm**	**BA60IS-1**

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

Reference heating season			**Average**	
Reference water temperature			**LOW, 35°C**	
Full load heating		**Prated [kW]**	**22.57**	
Seasonal efficiency		**η_S [%]**	**177**	**A+++**
Annual electricity consumption		**Q_{HE} [kWh]**	**10351**	
Average 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	20.64	2.64	0.900
B	2	12.68	4.21	0.900
C	7	8.04	6.61	0.900
D	12	9.26	8.02	0.977
TOL (E)	-10	22.57	2.35	0.900
Tbivalent (F)	-10	22.57	2.35	0.900

Reference heating season			**Average**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**24.94**	
Seasonal efficiency		**η_S [%]**	**135**	**A++**
Annual electricity consumption		**Q_{HE} [kWh]**	**14980**	
Average 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	21.44	2.05	0.900
B	2	12.27	3.22	0.900
C	7	7.80	5.06	0.900
D	12	9.00	6.13	0.982
TOL (E)	-10	22.06	1.55	0.900
Tbivalent (F)	-7	22.06	1.55	0.900

Reference heating season			**Warmer**	
Reference water temperature			**Low, 35°C**	
Full load heating		**Prated [kW]**	**30.53**	
Seasonal efficiency		**η_S [%]**	**248**	
Annual electricity consumption		**Q_{HE} [kWh]**	**6503**	
Warmer 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
B	2	30.53	3.18	0.900
C	7	20.32	5.22	0.900
D	12	9.29	8.30	0.900
TOL (E)	2	30.53	3.18	0.900
Tbivalent (F)	2	30.53	3.18	0.900

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Heat pump model	**Master Therm**	**BA60IS-1**

Reference heating season			**Warmer**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**30.47**	
Seasonal efficiency		**η_S [%]**	**173**	
Annual electricity consumption		**Q_{HE} [kWh]**	**9259**	
Warmer 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
B	2	30.47	2.27	0.900
C	7	20.53	3.57	0.900
D	12	8.97	5.93	0.900
TOL (E)	2	30.47	2.27	0.900
Tbivalent (F)	2	30.47	2.27	0.900

Reference heating season			**Colder**	
Reference water temperature			**Low, 35°C**	
Full load heating		**Prated [kW]**	**32.27**	
Seasonal efficiency		**η_S [%]**	**141**	
Annual electricity consumption		**Q_{HE} [kWh]**	**22051**	
Colder 35°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	19.53	2.79	0.900
B	2	12.78	4.49	0.900
C	7	8.07	6.82	0.900
D	12	9.26	8.02	0.977
TOL (E)	-22	20.47	2.24	0.900
Tbivalent (F)	-7	19.53	2.79	0.900
G	-15	22.66	2.41	0.900

Reference heating season			**Colder**	
Reference water temperature			**High, 55°C**	
Full load heating		**Prated [kW]**	**31.21**	
Seasonal efficiency		**η_S [%]**	**116**	
Annual electricity consumption		**Q_{HE} [kWh]**	**25783**	
Colder 55°C	Outdoor heat exchanger	Declared capacity	COP at part load	Degradation Coefficient
	Outdoor air			
	Tj [°C]	Pdh [kW]	COPd (-)	Cdh (-)
A	-7	18.89	2.28	0.900
B	2	12.43	3.60	0.900
C	7	7.89	5.52	0.900
D	12	9.07	6.54	0.981
TOL (E)	-22	21.78	1.86	0.900
Tbivalent (F)	-7	18.89	2.28	0.900
G	-15	22.84	1.98	0.900

Heat pump model	**Master Therm**	**BA60IS-1**

Power consumption in modes other than "active mode"		
Off mode	P_{OFF} [kW]	0.028
Thermostat off mode	P_{TO} [kW]	0.027
Standby mode	P_{SB} [kW]	0.028
Crankcaseheater mode	P_{CK} [kW]	-

Supplementary heater capacity	P_{sup} [kW]	-
Supplementary heater type	[-]	electricity

Capacity control		Variable
Sound power level Indoor	L_{WA} [dBA]	53
Sound power level Outdoor	L_{WA} [dBA]	58
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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Heat pump model	**Master Therm**	**BA60IS-1**

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	23	25
Space heating seasonal efficiency, Average climate	%	177	135
Space heating annual electricity consumption, Average cl.	kWh	10351	14980
Nominal heating capacity Pdesign, Colder climate	kW	32	31
Space heating seasonal efficiency, Colder climate	%	141	116
Space heating annual electricity consumption, Colder cl.	kWh	22051	25783
Nominal heating capacity Pdesign, Warmer climate	kW	31	30
Space heating seasonal efficiency, Warmer climate	%	248	173
Space heating annual electricity consumption, Warmer cl.	kWh	6503	9259
Sound power level Lwa Outdoor	dBA	58	

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	%	179	137
Set Space heating energy efficiency class, Average climate	-	A+++	A++
Set Space heating seasonal efficiency, Colder climate	%	143	118
Set Space heating seasonal efficiency, Warmer climate	%	250	175

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	%	181	139
Set Space heating energy efficiency class, Average climate	-	A+++	A++
Set Space heating seasonal efficiency, Colder climate	%	145	120
Set Space heating seasonal efficiency, Warmer climate	%	252	177

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