EN

19.03 – 6228091_01
Translation from original

HMI

Technical manual

50Hz | R32 | INVERTER | INVERTER | 2

AIR-WATER HEAT PUMP

Cooling capacity 3 - 13 kW

Heating capacity 4 - 15.5 kW

AERMEC

www.aermec.com

Dear customer,
Thank you for choosing an AERMEC product. It is the fruit of many years of experience and special design studies and has been made of the highest grade materials and with cutting edge technology.
In addition, all our products bear the EC mark indicating that they meet the requirements of the European Machine Directive regarding safety. The quality level is being constantly monitored, so AERMEC products are synonymous with Safety, Quality and Reliability.

The data may undergo modifications considered necessary for the improvement of the product, at any time and without the obligation for any notice thereof.

Thank you once again.
AERMEC S.p.A

This marking indicates that this product should not be disposed with other household wastes throughout the EU.
To prevent possible harm to the environment or human health from uncontrolled disposal of Waste Electrical and Electronic Equipment (WEEE), please return the device using appropriate collection systems, or contact the retailer where the product was purchased. Please contact your local authority for further details.
Illegal dumping of the product by the user entails the application of administrative sanctions provided by law.

INDEX

CERTIFICATIONS

COMPANY CERTIFICATIONS

PERFORMANCE CERTIFICATIONS

Aermec participates in the EUROVENT program: LCP
The products involved can be found on the website
www.eurovent-certification.com

SAFETY CERTIFICATIONS

CHARACTERISTICS OF THE RANGE

Reversible air/water heat pump Inverter for air conditioning systems with chilled water production for cooling rooms and hot water for heating and/or domestic hot water services, suitable for connection with small or medium users. Special attention was paid to the winter mode, improving the working range compared with standard heat pumps so as to guarantee production of hot water up to 60°C and extending operation down to an outside air temperature of -25°C. The unit is equipped with a twin rotary DC inverter compressor, axial flow fans and a plate heat exchanger. Ready for immediate installation, it can be combined not only with low-temperature emission systems such as floor heating or fan coils, but also the most traditional radiators.

Operating limits

Works at full load down to -25°C (outside air temperature in winter), and up to 48°C in summer. Maximum processed water temperature in heating mode - 60°C.

Brushless DC axial flow fans

Designed for aerodynamic optimisation, they reduce the noise level but at the same time increase the efficiency and air flow rate.

Heat exchanger, source side

Heat exchanger coils with Golden Fin anti-corrosion protection. The aluminium-manganese (Al-Mn) coil fins are coated with a special layer of epoxy resin, which gives them a characteristic golden colour, and then a hydrophilic layer.

Base electric heater

To avoid the formation of ice in heating mode.

Emergency operation (a supplementary heat source may be activated)

Quick domestic hot water heating function (Quick Hot Water)
Weather Dependent Mode (climatic adjustment)
Quiet function for reduced noise operation (programmable with a timer)
Condensation Control
When the anti-legionella cycle is activated (it's easily set via the control panel), the whole tank is heated once a week to a temperature (max. 70°C) that weakens the bacteria responsible for the infection.

Coastal marine environments

Coastal or marine environments are characterized by the abundance of sodium chloride (salt) which is carried by sea spray, mist, or fog. Most importantly, this salt water can be carried more than several miles by ocean breezes and tidal currents. It's not uncommon to experience salt-water contamination as far as 10km from the coast. For this reason, it may be necessary to protect the equipment from electrolytes of marine origin.

Industrial environments

Industrial applications are associated with a host of diverse conditions with the potential to produce various atmospheric emissions.
Sulphur and nitrogen oxide contaminants are usually linked to high-density urban environments. The combustion of coal oil and fuel oils releases sulphur oxides (SO_2, SO_3) and nitrogen oxides (NO_x) into the atmosphere. These gases accumulate in the atmosphere and return to the ground in the form of acid rain or low pH dew.
Not only are industrial emissions potentially corrosive, but many industrial dust particles can be laden with harmful elements like metal oxides, chlorides, sulphates, sulphuric acid, carbon, and carbon compounds.
These particles, in the presence of oxygen, water, or high humidity environments can be highly corrosive and may lead to many forms of corrosion including general corrosion and localized corrosion such as pitting and formicary corrosion.

Combination of marine and industrial environments

Salt-laden seawater mist, combined with the harmful emissions of an industrial environment, poses a severe threat.
The combined effects of salt mist and industrial emissions will speed up corrosion.
Internally in manufacturing plants, corrosive gases may be the result of process chemicals or the typical industrial processes employed in manufacturing activities.
Open sewage systems, vents, diesel exhaust, emissions from dense traffic, landfills, aircraft and ocean vessel exhaust, industrial manufacturing, chemical treatment facilities (cooling towers nearby) and fossil fuel power stations are all potential contributors that must be taken into consideration.

Urban environments

Highly populated areas generally have high levels of automobile emissions and an increased use of fuels for heating the buildings.
Both these conditions raise the concentration of sulphur oxide (SO_x) and nitrogen oxide (NOx). Inside a building, gases can be produced by cleaning substances, cigarette smoke, process operations and data center printers.
In some indoor environments such as swimming pool areas and water treatment facilities can also produce corrosive atmospheres.
Corrosion severity in this environment is a function of the pollution levels, which in turn depend on several factors including population density in the area.
Any equipment installed immediately adjacent to diesel exhaust, incinerator discharge stacks, fuel-burning boiler stacks, or areas exposed to fossil fuel combustion emissions, should be considered an industrial application.

Rural environments

Rural environments may contain high levels of ammonia and nitrogen contamination from animal excrement, fertilizers, and high concentrations of diesel exhaust. These environments should be handled much like industrial applications.
The local weather conditions play a major role in concentrating or dispersing external gaseous contaminants.
Temperature inversions can trap pollutants, producing a serious air pollution problem.

Additional precautions

Although each of the corrosive environments listed above can be detrimental to the life of a heat exchanger, many other factors should also be considered before making a final design selection.
The local climate around the application site may be subject to:
— wind
— dust
— road salts
— swimming pools
— diesel exhaust / traffic
— localised fog
— household cleaning agents
— sewer vents
— and many other individual contaminants
Even being within 3-5km of these special local climates may reclassify a normally moderate environment as one requiring corrosion prevention measures. When these factors are a direct part of the immediate environment, their influence is further exacerbated.

CONFIGURATOR

Field	Description
1,2,3	**HMI**
4,5,6	**Size** 040-060-080-100-120-140-160
8	**Power supply**
	220-240V/1/50Hz
T	380-415V/3N/50Hz [1]

[1] Only for sizes HMI 120-140-160

DESCRIPTION OF THE COMPONENTS OF THE STANDARD UNIT

COOLING CIRCUIT

Twin rotary DC inverter compressor

2-stage twin rotary DC inverter compressor. All the compressors are fitted with a heater casing and internal electronic thermal protection.

Heat exchanger, service side

Braze welded plate heat exchanger in steel. Coated with an anti-condensation material in closed cell neoprene.
When the unit is not functioning, it's protected against the formation of ice by an electric heater.

Heat exchanger, source side

Heat exchanger coils with Golden Fin anti-corrosion protection. The aluminium-manganese (Al-Mn) coil fins are coated with a special layer of epoxy resin, which gives them a characteristic golden colour, and then a hydrophilic layer.

Cycle inversion valve

4-way cycle inversion valve. Reverses the refrigerant fluid flow.

Economiser

Economiser circuit with plate heat exchanger; allows to increase the performance, especially with the high compression ratios, for example in case of low external temperatures during winter operation.

Fluid separator

Positioned on the intake line to protect the compressor from any possible liquid return.

Cooling circuit filter

Mechanically sealed type made of hygroscopic material, to trap impurities and any traces of humidity in the cooling circuit.

Solenoid valves

The valves close when the compressor is switched off, preventing the refrigerant gas from flowing towards the evaporator - recovery and coil.

Electronic thermostatic valve

Compared with a mechanical thermostatic valve, the electronic one offers better overheating control so the evaporator is used more efficiently in all conditions, thereby boosting machine output.
Its use in comfort dedicated applications allows to make substantial benefits especially in the presence of varying loads, because it allows you to maintain the maximum efficiency with any external air temperature.
In industrial applications, where there is often a need to make temperature changes in a wide range of environmental conditions, the use of the electronic valve is ideal because it avoids the need for continuous calibration, adapting the system to different load conditions and hence making it independent.

HYDRAULIC COMPONENTS

Water filter

Fitted with steel filtering mesh to prevent the heat exchangers (service side) from getting clogged up by impurities in the circuit.

■ *Water filter supplied as standard (must be fitted, otherwise the warranty will be invalidated).*

Flow switch

Checks that water is circulating in the heat exchanger, and stops the unit if this is not the case.

Air drain valve

Works automatically to release any air pockets that may be present in the hydraulic circuit.

Expansion tank

Membrane type with nitrogen pre-loading.

Inverter pump

Provides the system with a useful head net of the unit pressure drops.

Safety valve

Calibrated at 3 bar and with conveyed discharge, it bleeds off the excess pressure in the event of an anomalous pressure value.

CHARACTERISTICS OF THE WATER

Impianto: Chiller con scambiatore a piastre	
PH	7,5-9
Conduttività elettrica	10-500µS/cm
Durezza totale	4,5-8,5°dH
Temperatura	< 65°C
Contenuto di ossigeno	< 0,1 ppm
Quantità max. glicole	50%
Fosfati (PO4)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Ferro (Fe)	< 0,3 ppm
Alcalinità (HCO3)	70 - 300 ppm
Ioni cloro (Cl-)	< 50 ppm
Ioni solfato (SO4)	< 50 ppm
Ione solfuro (S)	nessuno
Ioni ammonio (NH4)	nessuno
Silice (SiO2)	< 30ppm

STRUCTURE

RAL 9002
Load-bearing structure for outdoor installation, in hot galvanised sheet steel painted with polyester powders and designed to ensure maximum accessibility for service and maintenance.
Equipped with an electric heater in the base to avoid the formation of ice in heating mode.

BRUSHLESS DC AXIAL FLOW FANS

Fitted with accident prevention protection and consisting of axial flow fans and a motor with a protection rating of IP44. In addition, the motor has internal thermal protection with automatic reset.
Condensation control via a device that continuously adjusts the fan speed.
Fan speed is electronically controlled, so it is automatically increased to ensure constant good unit operation in the event of critical ambient conditions.

CONTROL AND SAFETY COMPONENTS

LOW pressure switch

With fixed calibration and located on the low pressure side of the refrigerant circuit, it stops compressor operation in the event of anomalous work pressure values.

HIGH pressure switch

With fixed calibration, placed on the high pressure side of the refrigerant circuit, it shuts down compressor operation in the case of abnormal operating pressure.

High pressure transducer

Placed on the high pressure side of the refrigerant circuit, it communicates to the control card the operating pressure, sending a pre-alarm in case of abnormal pressure.

MICROPROCESSOR CONTROL

Pioneering electronic adjustment.
Via the touch screen control panel, in three languages (Italian, English and Spanish).
Management of a 3-way diverting valve (not supplied) for the production of domestic hot water.
Management of a 2-way valve (not supplied) for shutting off part of the system.
Weekly programming, in time bands.
Auto-Restart.

SCHEMATIC HYDRAULIC DIAGRAMS

INTERNAL AND EXTERNAL HMI HYDRAULIC CIRCUIT

COMPONENTS SUPPLIED AS STANDARD

1. Plate heat exchanger
2. Water filter (supplied)
3. Flow switch
4. Air drain valve
5. Water temperature probes (IN/OUT)
9. Expansion tank
12. Pump
21. Safety valve

RECOMMENDED HYDRAULIC COMPONENTS EXTERNAL TO THE UNIT (THE RESPONSIBILITY OF THE INSTALLER)

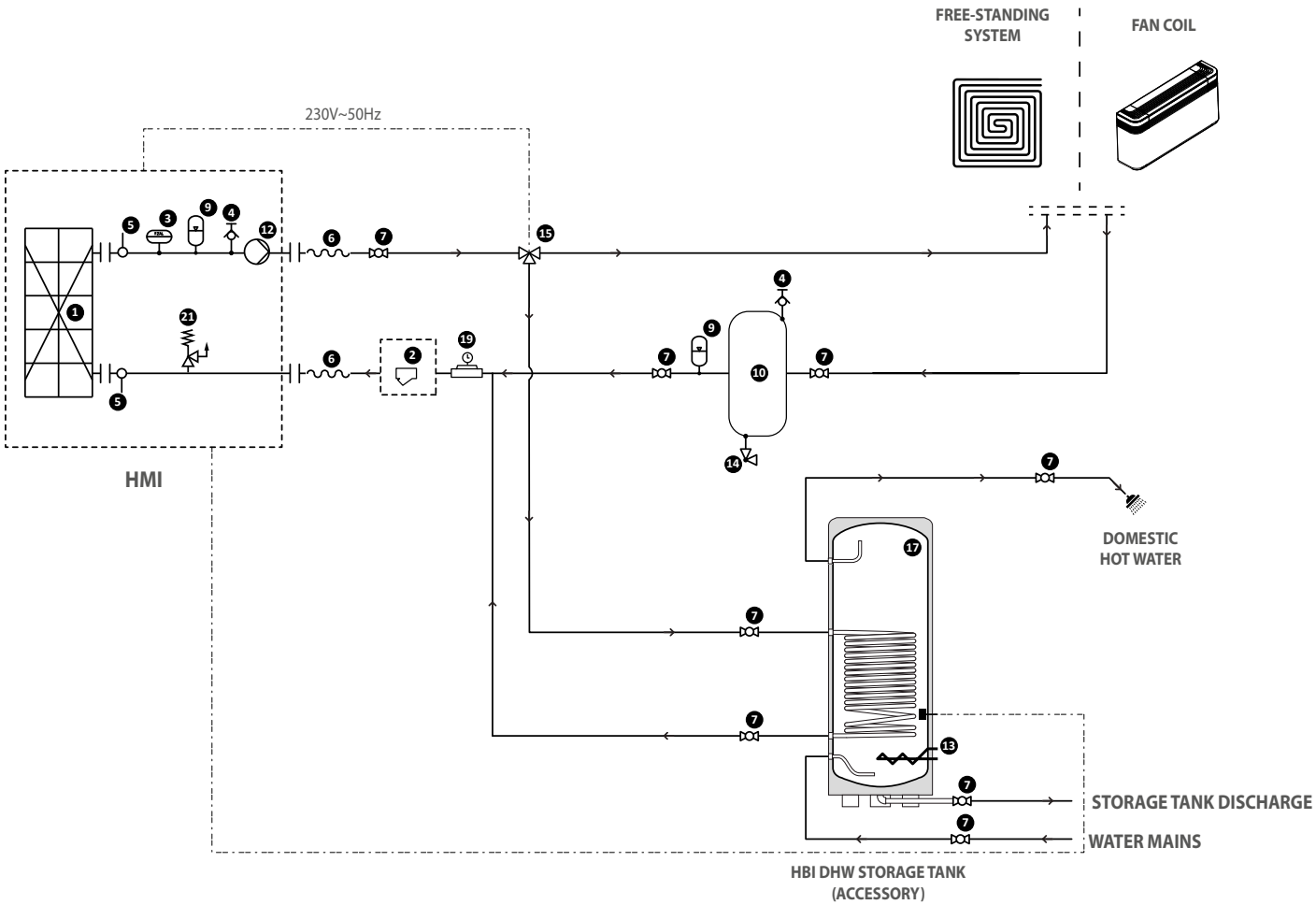
4. Air drain valve
6. Anti-vibration joints
7. Interception taps
9. Expansion tank
10. System storage tank (installation recommended if the system water content is lower than the value indicated in the technical manual).
13. Electric heater
14. Discharge tap
15. 3-way valve
16. 2-way valve
17. Domestic hot water storage tank (DHW) - *ACCESSORY NOT SUPPLIED (HBI)*
19. Charging unit

CHARACTERISTICS OF THE WATER

Impianto: Chiller con scambiatore a piastre	
PH	7,5-9
Conduttività elettrica	10-500µS/cm
Durezza totale	4,5-8,5°dH
Temperatura	< 65°C
Contenuto di ossigeno	< 0,1 ppm
Quantità max. glicole	50%
Fosfati (PO4)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Ferro (Fe)	< 0,3 ppm
Alcalinità (HCO3)	70 - 300 ppm
Ioni cloro (Cl-)	< 50 ppm
Ioni solfato (SO4)	< 50 ppm
Ione solfuro (S)	nessuno
Ioni ammonio (NH4)	nessuno
Silice (SiO2)	< 30ppm

CONFIGURATION EXAMPLE: FREE-STANDING SYSTEM + DHW

Recommended components



INTERNAL AND EXTERNAL HMI HYDRAULIC CIRCUIT

COMPONENTS SUPPLIED AS STANDARD

1. Plate heat exchanger
2. Water filter (supplied)
3. Flow switch
4. Air drain valve
5. Water temperature probes (IN/OUT)
9. Expansion tank
12. Pump
21. Safety valve

RECOMMENDED HYDRAULIC COMPONENTS EXTERNAL TO THE UNIT (THE RESPONSIBILITY OF THE INSTALLER)

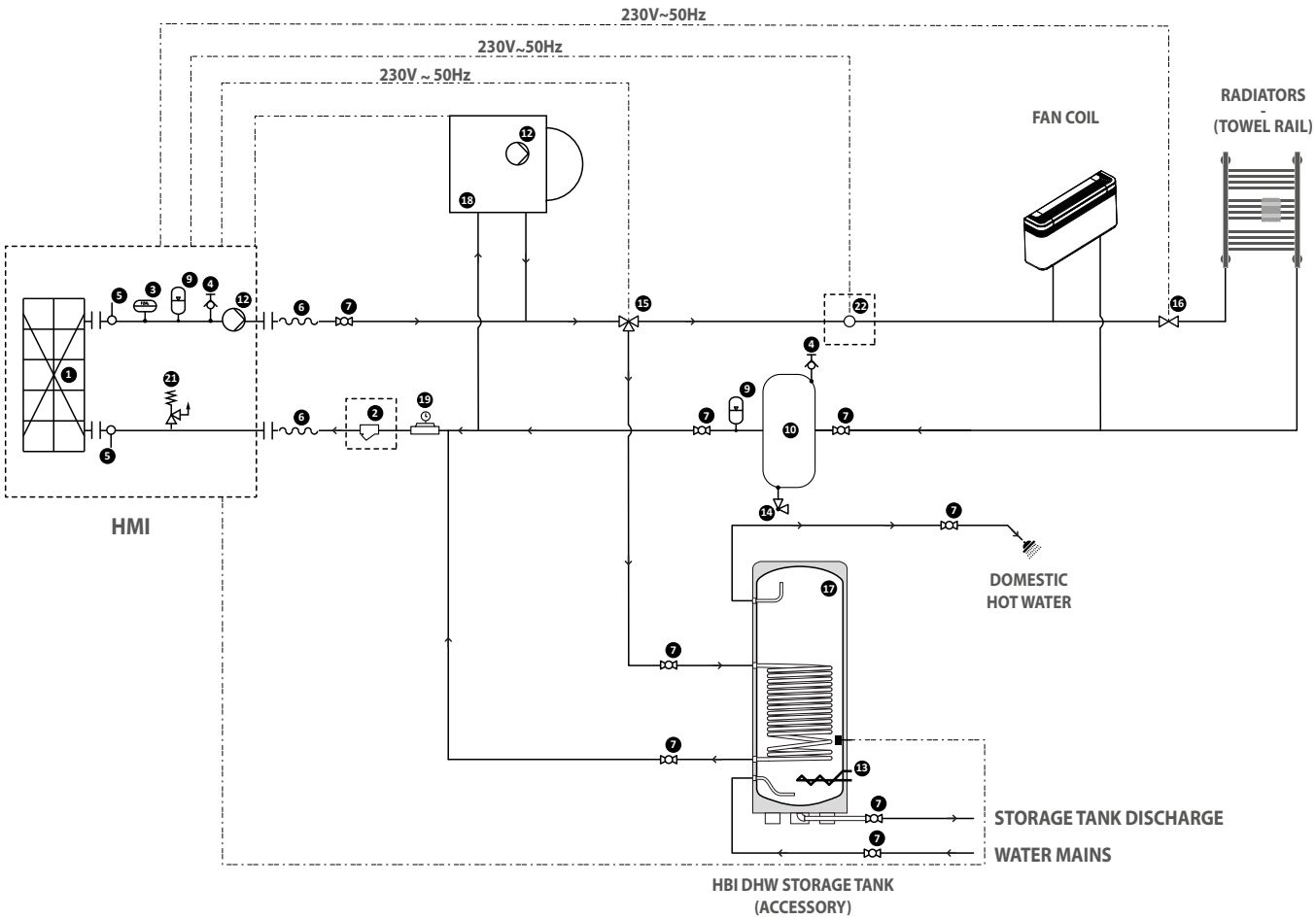
4. Air drain valve
6. Anti-vibration joints
7. Interception taps
9. Expansion tank
10. System storage tank (installation recommended if the system water content is lower than the value indicated in the technical manual).
13. Electric heater
14. Discharge tap
15. 3-way valve
16. 2-way valve
17. Domestic hot water storage tank (DHW) - *ACCESSORY NOT SUPPLIED (HBI)*
18. Additional heat source
19. Charging unit
22. Water temperature probe - SUPPLIED (optional)

CHARACTERISTICS OF THE WATER

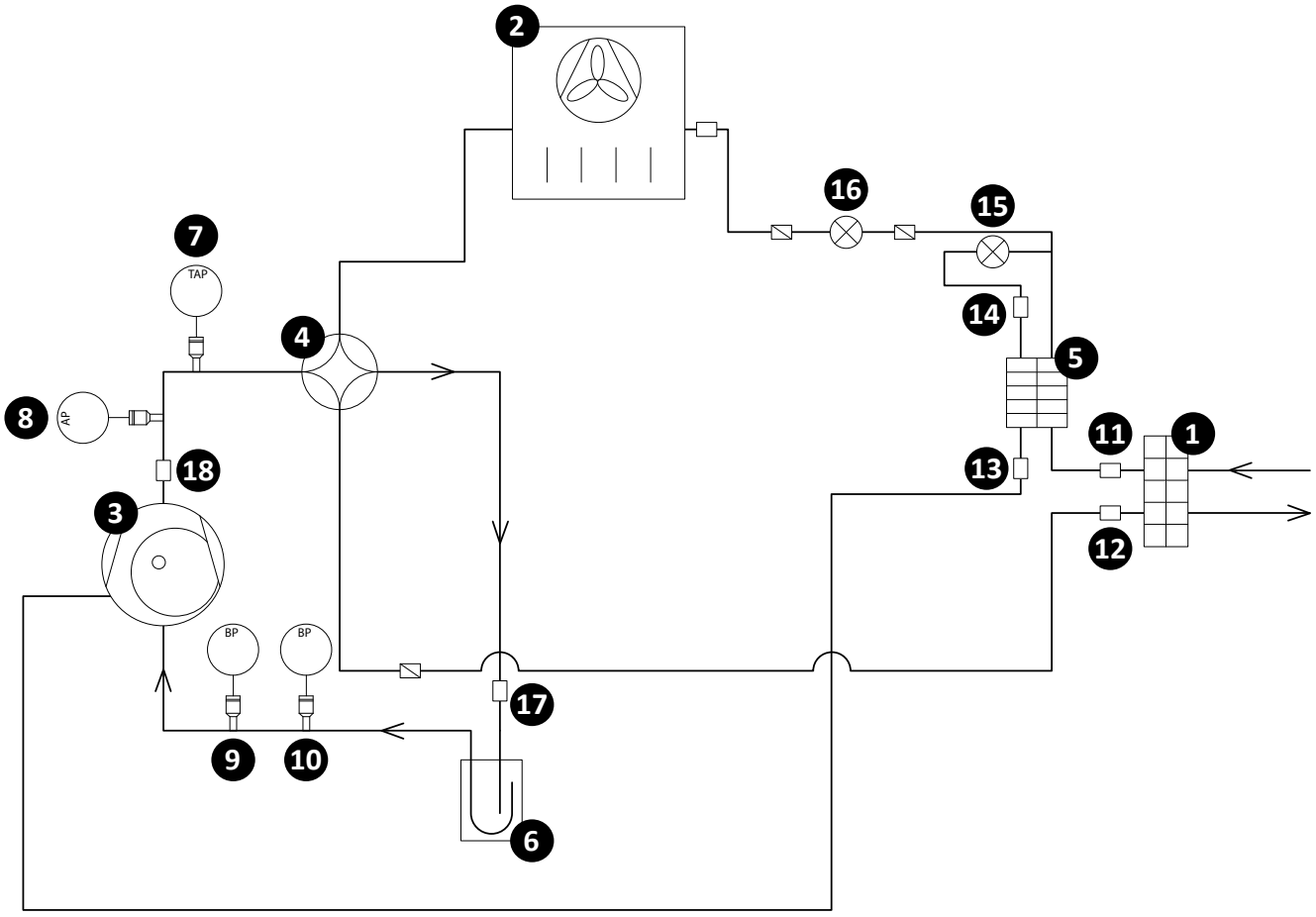
Impianto: Chiller con scambiatore a piastre	
PH	7,5-9
Conduttività elettrica	10-500µS/cm
Durezza totale	4,5-8,5°dH
Temperatura	< 65°C
Contenuto di ossigeno	< 0,1 ppm
Quantità max. glicole	50%
Fosfati (PO4)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Ferro (Fe)	< 0,3 ppm
Alcalinità (HCO3)	70 - 300 ppm
Ioni cloro (Cl-)	< 50 ppm
Ioni solfato (SO4)	< 50 ppm
Ione solfuro (S)	nessuno
Ioni ammonio (NH4)	nessuno
Silice (SiO2)	< 30ppm

CONFIGURATION EXAMPLE: FANCOIL + TOWEL RAIL RADIATOR + DHW + ADDITIONAL HEAT SOURCE

Recommended components



COOLING DIAGRAMS



COMPONENTS SUPPLIED AS STANDARD

1. Heat exchanger, service side
2. Heat exchanger, source side
3. Twin rotary DC inverter compressor
4. 4-way cycle inversion valve
5. Economiser
6. Fluid separator
7. High pressure transducer
8. High pressure switch
9. Low pressure switch (cooling)
10. Low pressure switch (heating)
11. Liquid temperature probe
12. Gas temperature probe
13. Economiser outlet temperature probe
14. Economiser inlet temperature probe
15. Electronic economiser expansion valve
16. Electronic expansion valve
17. Compressor intake temperature probe
18. Compressor delivery temperature probe

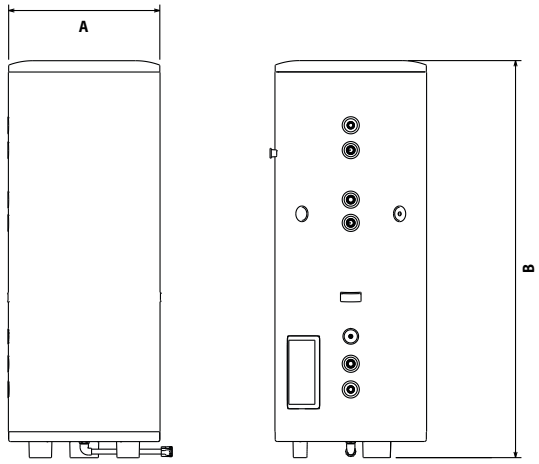
ACCESSORIES

HBI_WT (220-240V ~ 50Hz)
HBI_WTT (380-415V ~3 50Hz)
Domestic hot water storage tank of 200, 300 litres with main coil and 3kW back-up electric heater:
- magnesium sacrificial anode
- stainless steel tank and coil
- painted sheet metal outer casing and insulation material, thickness 50mm
- internal installation

HBI_WTS (220-240V~50Hz)
HBI_WTST (380-415V ~3 50Hz)
Domestic hot water storage tank of 200, 300 litres with main coil, supplementary coil and 3kW back-up electric heater:
- magnesium sacrificial anode
-Stainless steel tank and coil
-Painted sheet metal outer casing and insulation material, thickness 50mm
-Internal installation

HMI		040	060	080	100	120	140	160
HBI200	WT	•	•	•	•	•	•	•
	WTS	•	•	•	•	•	•	•
	WTT	•	•	•	•	•	•	•
	WTST	•	•	•	•	•	•	•
HBI300	WT	•	•	•	•	•	•	•
	WTS	•	•	•	•	•	•	•
	WTT	•	•	•	•	•	•	•
	WTST	•	•	•	•	•	•	•

HBI (ACCESSORIES)



	A (mm)	B (mm)
HBI200WT	540	1595
HBI200WTS	540	1595
HBI300WT	620	1620
HBI300WTS	620	1620
HBI200WTT	540	1595
HBI200WTST	540	1595
HBI300WTT	620	1620
HBI300WTST	620	1620

PERFORMANCE TECHNICAL DATA

HMI (DATA 12/7 - 40/45°C)

HMI		040	060	080	100	120	140	160	100T	120T	140T	160T
Performance in cooling mode 12°C / 7°C [1]												
Cooling capacity	kW	3,00	4.00	5,00	7.80	9.50	12.00	13.00	7.80	9.50	12.00	13.00
Input power	kW	0,94	1,29	1.61	2,48	3,20	4.14	4.96	2,64	3.11	4.38	4,91
EER	W/W	3.19	3,10	3.11	3.15	2,97	2.90	2,62	2,95	3.05	2,74	2.65
Water flow rate (services)	l/h	516	672	860	1320	1650	2080	2270	1270	1665	2065	2231
Useful head	kPa	75	74	74	71	65	51	45	71	64	51	46
Performance in heating mode 40°C / 45°C [2]												
Heating capacity	kW	4.00	6,00	7.50	10.00	12.00	14,00	15.50	10.00	12.00	14,00	15.50
Input power	kW	1,00	1,58	2.00	2,70	3.48	4,18	4.70	2,70	3.48	4,18	4.70
COP	W/W	4.00	3,80	3,75	3,70	3.45	3.35	3,30	3,70	3.45	3.35	3,30
Water flow rate (services)	l/h	690	977	1240	1700	2050	2500	2700	1710	2040	2474	2734
Useful head	kPa	74	73	72	63	52	37	30	63	52	38	29

1 Data 14511:2013; Heat exchanger water (services side) 12°C / 7°C; External air 35°C

HMI (DATA 23/18 - 30/35°C)

HMI		040	060	080	100	120	140	160	100T	120T	140T	160T
Performance in cooling mode 23°C / 18°C [3]												
Cooling capacity	kW	3,80	5.80	6.80	8.80	11,00	12.50	14.50	8.80	11,00	12.50	14.50
Input power	kW	0,82	1,32	1.55	1.96	2.56	3.05	3.82	1.96	2.56	3.05	3.82
EER	W/W	4.63	4,39	4,39	4.49	4,30	4.10	3,80	4.49	4,30	4.10	3,80
Water flow rate (services)	l/h	660	981	1220	1510	1926	2238	2640	1500	1900	2200	2570
Useful head	kPa	74	73	72	69	56	46	32	69	57	47	34
Performance in heating mode 30°C / 35°C [4]												
Heating capacity	kW	4.00	6,00	7.50	10.00	12.00	14,00	15.50	10.00	12.00	14,00	15.50
Input power	kW	0,79	1.20	1.63	2.17	2,64	3.22	3.60	2.17	2,64	3.22	3.60
COP	W/W	5.10	5,00	4.60	4,61	4.55	4.35	4,31	4,61	4.55	4.35	4,31
Water flow rate (services)	l/h	690	1030	1247	1736	2137	2524	2703	1720	2100	2400	2626
Useful head	kPa	74	73	72	62	49	36	30	62	50	40	32

3 Data 14511:2013; Heat exchanger water (services side) 23°C / 18°C; External air 35°C

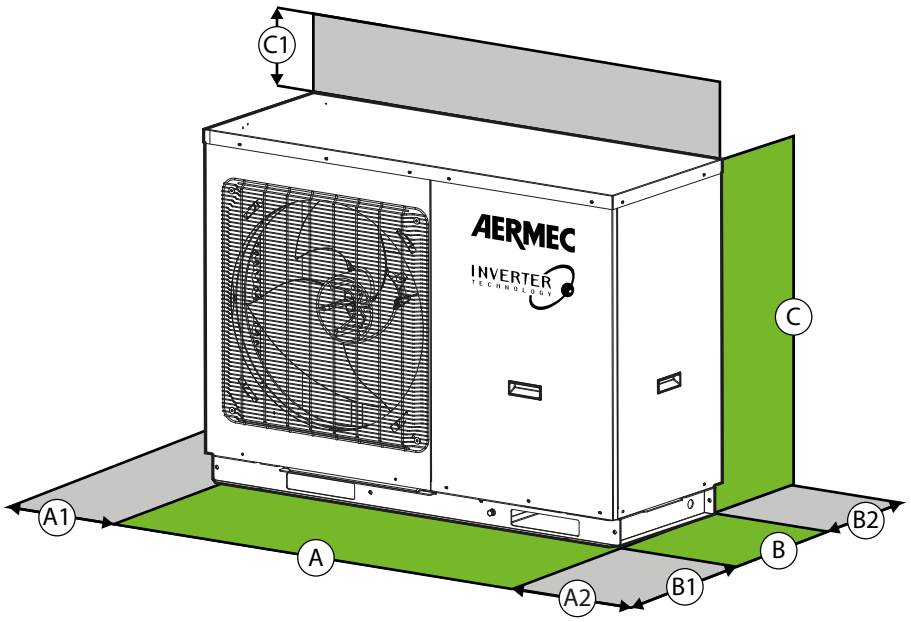
HMI		040	060	080	100	120	140	160	100T	120T	140T	160T
PERFORMANCE IN AVERAGE AMBIENT CONDITIONS (AVERAGE 35°C) - UE NO.811/2013 PDESIGNH ≤ 70KW												
Pdesignh		5	5	6	9	11	11	13	9	11	11	13
ηs	%	185	185	183	176	175	168	164	176	175	168	164
Energy efficiency class		A+++	A+++	A+++	A+++	A+++	A++	A++	A+++	A+++	A++	A++
Performance in average ambient conditions (Average 55°C) - UE no.811/2013 Pdesignh ≤ 70kW												
Pdesignh		6	6	7	8	10	11	13	8	10	11	13
ηs	%	126	126	127	128	126	125	125	128	126	125	125
Energy efficiency class		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++

GENERAL TECHNICAL DATA

HMI		040	060	080	100	120	140	160	100T	120T	140T	160T
Compressors												
Driver							Inverter					
Type							Twin-stage DC rotary inverter					
No. compressors	no.	1	1	1	1	1	1	1	1	1	1	1
No. circuits	no.	1	1	1	1	1	1	1	1	1	1	1
Refrigerant:												
Type							R32/ 675 kgCO_2eq					
Refrigerant load	kg	0.9	0.9	0.9	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2
Oil												
Oil type							FW68DA					
Oil charge	l	0,5	0,5	0,5	1,1	1,1	1,1	1,1	1,1	1,1	1,1	1,1
Heat exchanger, service side												
Type							Plates					
Quantity	no.						1					
Connection type							Female gas					
Connections (in/out)	ø						G1					
Fans												
Type							Brushless DC axial flow fans					
Quantity	no.	2	2	2	1	1	1	1	1	1	1	1
Air flow rate	m^3/h	2600	2600	2600	4500	4500	4500	4500	4500	4500	4500	4500
Useful static pressure	Pa											
Sound data (in cooling mode)												
Sound pressure 1m	dB(A)	51	52	53	56	56	57	59	56	56	57	59
Sound data (in heating mode)												
Sound power:	dB(A)	64	64	65	69	69	70	72	69	69	70	72
Sound pressure 1m	dB(A)	50	50	51	54	54	55	57	54	54	55	57

DIMENSIONS - WEIGHTS - MINIMUM TECHNICAL CLEARANCES

HMI		040	060	080	100	120	140	160	100T	120T	140T	160T
Dimensions												
A	mm	1150	1150	1150	1200	1200	1200	1200	1200	1200	1200	1200
B	mm	345	345	345	460	460	460	460	460	460	460	460
C	mm	758	758	758	878	878	878	878	878	878	878	878
Dimensions with packaging												
A	mm	1260	1260	1260	1295	1295	1295	1295	1295	1295	1295	1295
B	mm	490	490	490	595	595	595	595	595	595	595	595
C	mm	900	900	900	1020	1020	1020	1020	1020	1020	1020	1020
Minimum technical clearances												
A1	mm	500	500	500	500	500	500	500	500	500	500	500
A2	mm	500	500	500	500	500	500	500	500	500	500	500
B1	mm	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
B2	mm	500	500	500	500	500	500	500	500	500	500	500
C1	mm	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Weights												
Net weight	kg	96	96	96	151	151	151	151	151	151	151	151
Gross weight	kg	109	109	109	166	166	166	166	166	166	166	166

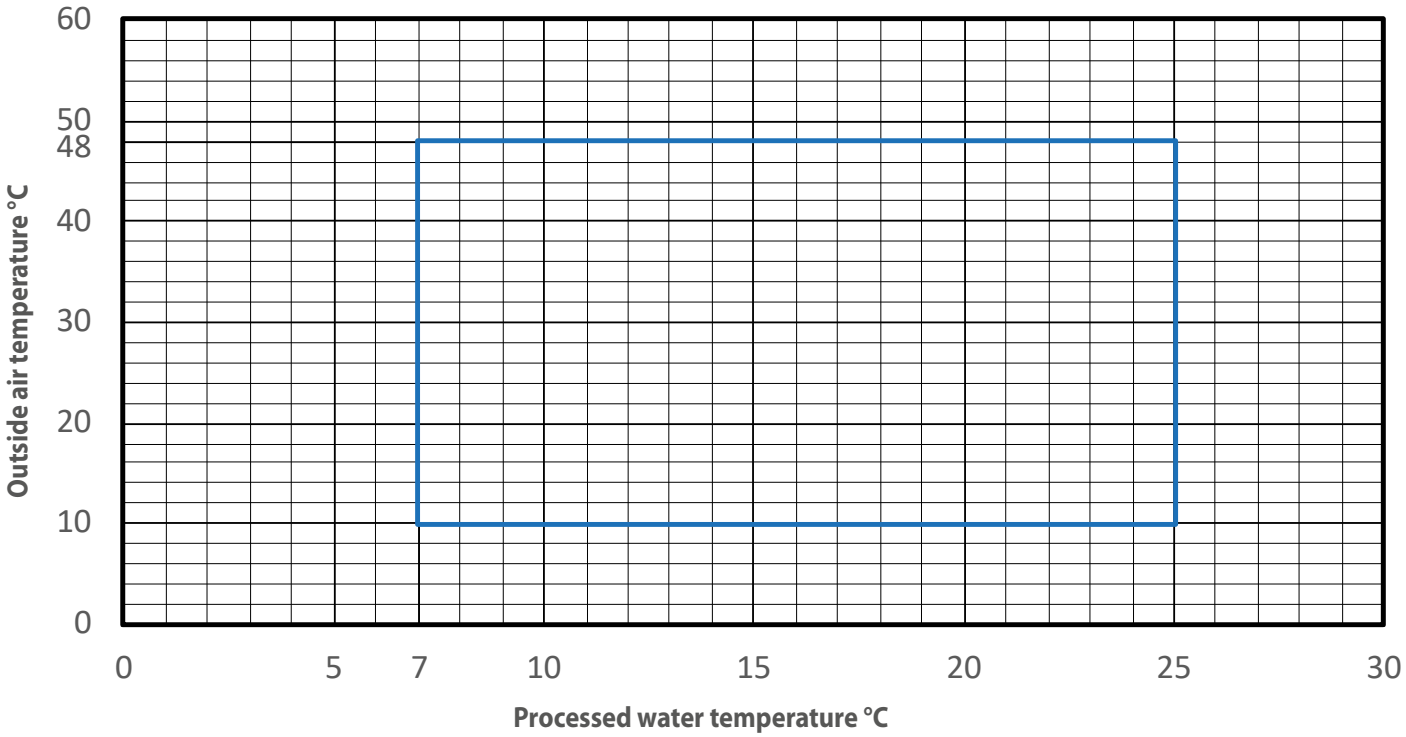


OPERATING LIMITS

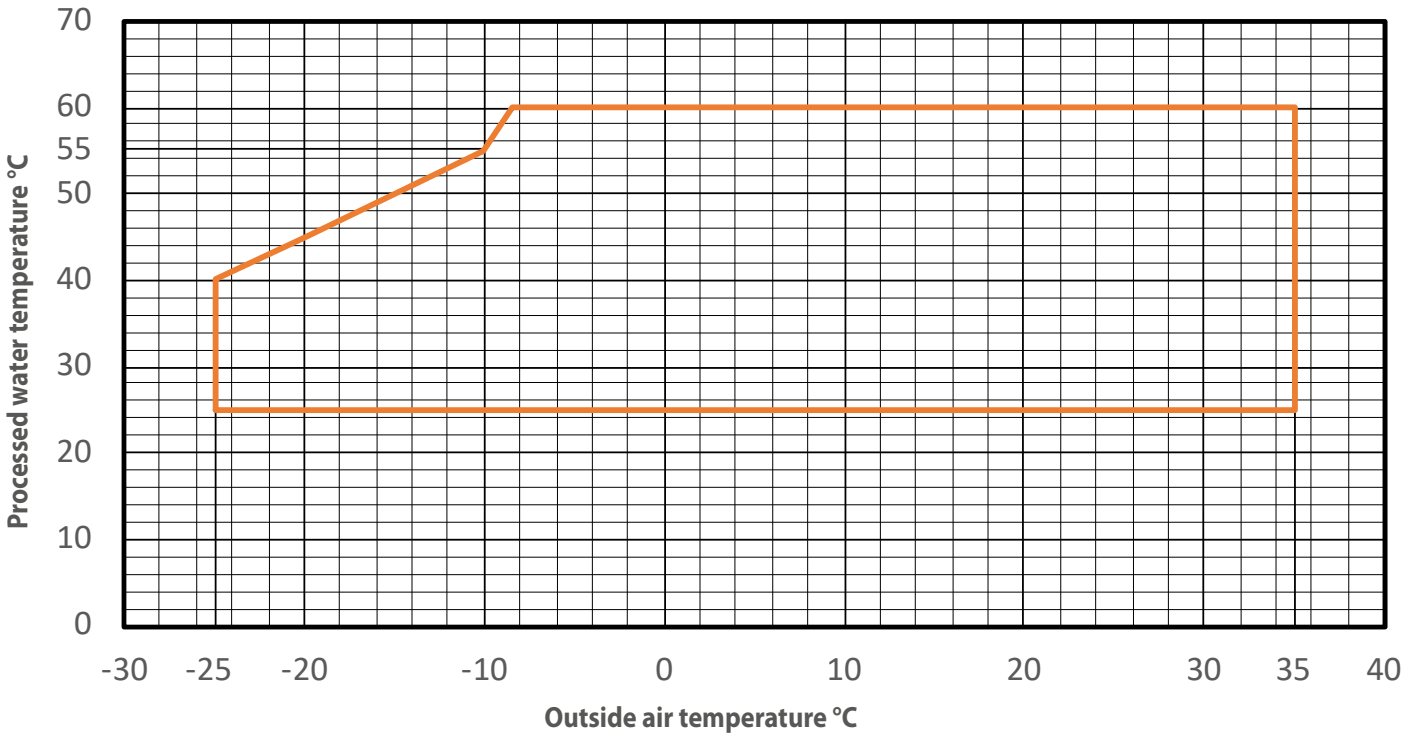
In their standard configuration, the units are not suitable for installation in salty environments.
The values shown in the table relate to the min. and max. unit temperature limits. For more information, refer to the tables of output and intake values other than nominal, valid for ΔT = 5°C.

Contact our technical sales department if the unit needs to be used outside the operating limits.
NB: wind breaks should be used if the unit is installed in particularly windy areas, to prevent malfunctioning. Installation of windbreaks is recommended if wind speeds exceed 2.5 m / s.

COOLING MODE



HEATING MODE



OUTPUTS AND INPUTS DIFFERENT FROM THE RATED VALUES

COOLING MODE

HMI040					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	1230	7.19	2,45	2,93
10	12	1420	8.30	2,74	3.03
10	18	1650	9,61	4,17	2,30
10	25	1610	9.40	3.60	2.61
20	25	1770	10,29	4.90	2.10
20	18	1710	9.95	4.72	2,11
20	12	1660	9,68	4.58	2,11
20	7	1530	8.94	4,26	2.10
30	7	1290	7,55	3.03	2,49
30	12	1550	9.03	3.48	2,59
30	18	1710	9.95	3.85	2,58
30	25	1790	10.46	4.05	2,58
40	7	840	4,92	2.07	2.38
40	12	1160	6.77	2.77	2,44
40	25	1870	10.89	4.33	2,52
40	18	1520	8,89	3.56	2,50
48	25	1400	8.14	3.36	2.42
48	18	930	5.42	2.29	2,37
48	12	650	3.77	1.42	2.65
48	7	650	2.77	0,89	3,12

HMI060					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	1310	7,62	2.43	3,14
10	12	1510	8.80	2.72	3,24
10	18	1750	10.18	4.14	2,46
10	25	1710	9,96	3.57	2.79
20	25	1870	10.90	4,86	2.24
20	18	1810	10.54	4,68	2,25
20	12	1760	10,25	4.54	2.26
20	7	1620	9.47	4,23	2.24
30	7	1410	8.24	3,00	2.75
30	12	1690	9,86	3.45	2,86
30	18	1870	10,87	3,81	2.85
30	25	1960	11.42	4.00	2,86
40	7	880	5.15	2.06	2,50
40	12	1210	7.08	2.75	2.57
40	25	1950	11,37	4,30	2,64
40	18	1590	9,28	3.53	2.63
48	25	1420	8.31	3.35	2,48
48	18	950	5.53	2,28	2.43
48	12	650	3.77	1.42	2.65
48	7	650	2.77	0,89	3,12

HMI080					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	1340	7.83	2.42	3,24
10	12	1550	9.05	2,71	3.34
10	18	1800	10.46	4,12	2.54
10	25	1760	10.24	3.56	2,88
20	25	1920	11,21	4,84	2.32
20	18	1860	10,84	4,67	2.32
20	12	1810	10.54	4.53	2.33
20	7	1670	9.73	4,22	2.31
30	7	1450	8.47	2,99	2.83
30	12	1745	10.14	3.43	2.96
30	18	1920	11,17	3,80	2.94
30	25	2021	11.74	3,99	2.94
40	7	880	5.15	2.06	2,50
40	12	1210	7.08	2.75	2.57
40	25	1950	11,37	4,30	2,64
40	18	1590	9,28	3.53	2.63
48	25	1420	8.31	3.35	2,48
48	18	950	5.53	2,28	2.43
48	12	650	3.77	1.42	2.65
48	7	650	2.77	0,89	3,12

HMI100					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	1960	11.41	2,27	5,03
10	12	2270	13.18	2.54	5.19
10	18	2620	15.25	3,86	3.95
10	25	2570	14.92	3,33	4,48
20	25	2810	16.33	4.54	3.60
20	18	2720	15.79	4,37	3.61
20	12	2640	15.36	4.24	3.62
20	7	2440	14.18	3.95	3.59
30	7	2120	12.34	2,81	4,39
30	12	2540	14.77	3,21	4.60
30	18	2800	16,28	3.56	4.57
30	25	2940	17,10	3,74	4.57
40	7	1110	6,43	1.96	3.28
40	12	1520	8.84	2.63	3.36
40	25	2450	14.22	4.10	3.47
40	18	2000	11.61	3.37	3.45
48	25	1740	10.13	3,20	3,17
48	18	1160	6.74	2.18	3.09
48	12	650	3,80	1.35	2,81
48	7	650	2.79	0,88	3,17

HMI120					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	2060	11.95	2,25	5.31
10	12	2370	13.81	2,52	5.48
10	18	2750	15.97	3,83	4,17
10	25	2690	15,63	3,30	4,74
20	25	2940	17,10	4.50	3,80
20	18	2840	16,54	4.33	3.82
20	12	2770	16.09	4.20	3,83
20	7	2560	14.85	3,91	3,80
30	7	2220	12.93	2,78	4,65
30	12	2660	15,48	3,18	4,87
30	18	2930	17.05	3.52	4,84
30	25	3080	17.92	3,70	4,84
40	7	1160	6.72	1.94	3.46
40	12	1590	9.23	2.60	3.55
40	25	2550	14,83	4,06	3.65
40	18	2080	12.11	3,33	3.64
48	25	1740	10.13	3,20	3,17
48	18	1160	6.74	2.18	3.09
48	12	650	3,80	1.35	2,81
48	7	650	2.79	0,88	3,17

HMI140					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	2240	13,04	2.21	5.90
10	12	2590	15.07	2,47	6.10
10	18	3000	17.43	3,75	4,65
10	25	2930	17.05	3,24	5,26
20	25	3210	18.67	4.41	4,23
20	18	3100	18.04	4,25	4.24
20	12	3020	17,56	4,12	4,26
20	7	2790	16.21	3.84	4,22
30	7	2430	14.11	2.72	5.19
30	12	2900	16.88	3,12	5.41
30	18	3200	18.61	3.45	5.39
30	25	3360	19.54	3,63	5.38
40	7	1160	6.72	1.94	3.46
40	12	1590	9.23	2.60	3.55
40	25	2550	14,83	4,06	3.65
40	18	2080	12.11	3,33	3.64
48	25	1800	10,47	3,18	3.29
48	18	1200	6.97	2.17	3,21
48	12	720	4.20	1,34	3,13
48	7	650	2.79	0,88	3,17

Data 14511:2013

TA D.B. Outside air temperature - dry bulb (°C)
TWu Processed water temperature - services side (°C)
Pc Cooling capacity (kW)
Pe Input power (kW)
Qu Water flow rate - services side (l/h)
Flow rates to the heat exchanger calculated with ΔT 5°C

HMI160					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	2340	13,59	2.19	6.21
10	12	2700	15.69	2,45	6.40
10	18	3120	18.15	3.72	4.88
10	25	3060	17,76	3,21	5.53
20	25	3340	19.44	4,37	4.45
20	18	3230	18.80	4.21	4.47
20	12	3150	18.29	4,08	4,48
20	7	2900	16.89	3,80	4.44
30	7	2530	14.70	2,70	5,44
30	12	3030	18.59	3,10	6,00
30	18	3330	19.38	3.43	5.65
30	25	3500	20.36	3.60	5.66
40	7	1200	7,00	1,93	3,63
40	12	1650	9.62	2,58	3.73
40	25	2660	15.46	4,03	3.84
40	18	2170	12,62	3.31	3,81
48	25	1860	10,82	3,16	3.42
48	18	1240	7.20	2.15	3.35
48	12	750	4,34	1,34	3,24
48	7	680	2.79	0,88	3,17

HMI100T					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	1940	11,31	2,28	4.96
10	12	2240	13.07	2.55	5.13
10	18	2600	15.12	3,88	3.90
10	25	2540	14.79	3.35	4.41
20	25	2780	16.19	4.56	3.55
20	18	2690	15.66	4,39	3.57
20	12	2610	15.23	4,26	3.58
20	7	2410	14.06	3,97	3.54
30	7	2100	12.24	2,82	4,34
30	12	2520	14.65	3.23	4.54
30	18	2770	16.14	3.58	4.51
30	25	2910	16.96	3.76	4.51
40	7	1090	6.38	1.97	3,24
40	12	1500	8,77	2,64	3,32
40	25	2420	14,10	4,12	3.42
40	18	1980	11.51	3.39	3.40
48	25	1720	10,04	3.22	3,12
48	18	1140	6.68	2.19	3.05
48	12	650	3.77	1,36	2.77
48	7	650	2.77	0,89	3,12

HMI120T					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	2030	11,85	2.26	5.24
10	12	2350	13,69	2,53	5.41
10	18	2720	15.84	3.85	4.11
10	25	2660	15.50	3,32	4,67
20	25	2910	16.96	4.52	3,75
20	18	2820	16.40	4.35	3.77
20	12	2740	15.95	4,22	3,78
20	7	2530	14,73	3,93	3,75
30	7	2200	12.82	2.79	4.59
30	12	2600	15.35	3,20	4.80
30	18	2900	16,91	3.54	4,78
30	25	3050	17,77	3.72	4,78
40	7	1140	6.66	1.95	3.42
40	12	1570	9.15	2.61	3.51
40	25	2530	14.71	4,08	3.61
40	18	2060	12,01	3.35	3.59
48	25	1720	10,04	3.22	3,12
48	18	1140	6.68	2.19	3.05
48	12	650	3.77	1,36	2.77
48	7	650	2.77	0,89	3,12

HMI140T					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	2220	12.93	2,22	5.82
10	12	2560	14.94	2,48	6.02
10	18	2970	17.28	3.77	4.58
10	25	2910	16,91	3.26	5.19
20	25	3180	18.51	4,43	4,18
20	18	3070	17.89	4,27	4.19
20	12	2990	17.41	4.14	4.21
20	7	2760	16.07	3,86	4.16
30	7	2410	13.99	2.73	5.12
30	12	2880	16.74	3,14	5.33
30	18	3170	18.45	3.47	5.32
30	25	3330	19.38	3.65	5.31
40	7	1140	6.66	1.95	3.42
40	12	1570	9.15	2.61	3.51
40	25	2530	14.71	4,08	3.61
40	18	2060	12,01	3.35	3.59
48	25	1780	10,38	3,20	3,24
48	18	1180	6,91	2.18	3,17
48	12	710	4.16	1.35	3.08
48	7	650	2.77	0,89	3,12

HMI160T					
TA D.B.	TWu	Qu	Pc	EER	pe
10	7	2336	13.47	2.20	6.13
10	12	2717	15.56	2,46	6.33
10	18	3167	18	3,74	4.81
10	25	3120	17.62	3.23	5.46
20	7	2851	16.74	3.82	4.38
20	12	3045	18.13	4.10	4,42
20	18	3263	18,65	4,23	4.41
20	25	3321	19.28	4,39	4,39
30	7	2437	14.58	2,71	5.38
30	12	2947	17.45	3.11	5.60
30	18	3239	19.22	3,44	5.58
30	25	3445	20,19	3.62	5.58
40	7	1514	6.94	1.94	3.58
40	12	1687	9.54	2,59	3.68
40	18	2198	12.51	3,33	3.76
40	25	2718	15.33	4.05	3,79
48	7	683	2.77	0,89	3,12
48	12	754	4,30	1.35	3,20
48	18	1213	7.14	2,16	3,30
48	25	1992	10.73	3,18	3.38

Data 14511:2013

TA D.B. Outside air temperature - dry bulb (°C)
TWu Processed water temperature - services side (°C)
Pc Cooling capacity (kW)
Pe Input power (kW)
Qu Water flow rate - services side (l/h)
Flow rates to the heat exchanger calculated with ΔT 5°C

HEATING MODE

HMI040					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	1240	7.25	6.63	1.09
35	30	1280	7.49	6,26	1.20
35	35	1310	7.65	5.35	1,43
35	40	1320	7.70	4,78	1.61
35	45	1320	7.73	4.38	1.76
35	50	1240	7.26	4.24	1,71
35	55	1160	6.79	4.11	1,65
35	60	940	5.49	3,94	1,39
15	25	1240	7.21	4.80	1,50
15	30	1250	7.28	4,27	1,70
15	35	1270	7.42	3.56	2.08
15	40	1280	7.44	3.53	2,11
15	45	1280	7.44	3.40	2.19
15	55	1060	6.17	3.39	1,82
15	60	750	4,37	3,18	1.37
7	60	800	4.69	2,59	1.81
7	40	1050	6.11	3.39	1.80
7	30	1070	6,26	3.77	1.66
7	25	1070	6.27	3.95	1,59
7	35	680	4.00	5.10	0.78
7	45	680	4.00	4.10	0,98
7	55	510	4,73	3,01	1.57
2	25	950	5.52	4,65	1,19
2	30	870	5.10	4.44	1.15
2	40	860	5.01	3.56	1.41
2	60	650	3,80	1.66	2.29
2	35	680	2.63	3.58	0.73
2	45	680	2,62	2,45	1,07
2	55	640	5.80	2,30	2,52
-7	40	730	4,30	2,67	1.61
-7	30	750	4,37	3.41	1,28
-7	25	700	4.11	3.46	1,19
-7	60	650	3.77	1.64	2,30
-7	35	680	2,40	2.38	1,01
-7	45	680	2.20	2,48	0,89
-7	55	510	2.10	2.09	1,00
-25	25	650	3.77	1.73	2.18
-25	30	650	3.77	1,46	2,58
-25	35	650	3.77	1.25	3,02
-25	45	650	3.77	0.78	4,83

HMI060					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	1330	7.73	6,60	1.17
35	30	1370	7.98	6.23	1,28
35	35	1400	8.16	5.33	1.53
35	40	1410	8.22	4.75	1.73
35	45	1410	8.24	4.36	1.89
35	50	1330	7.74	4.21	1.84
35	55	1240	7.24	4.09	1.77
35	60	1000	5.85	3.92	1,49
15	25	1320	7.69	4.77	1.61
15	30	1330	7.76	4.24	1.83
15	35	1360	7.92	3.54	2.24
15	40	1360	7.93	3.51	2.26
15	45	1360	7.93	3.38	2.35
15	55	1130	6.58	3.37	1.95
15	60	800	4.66	3,16	1,47
7	60	860	5,00	2,58	1.94
7	40	1120	6.51	3.38	1,93
7	30	1140	6.67	3,75	1.78
7	25	1150	6.68	3,93	1,70
7	35	1030	6,00	5,00	1.20
7	45	1030	6,00	3.85	1,56
7	55	680	6.39	3,25	1.97
2	25	950	5.52	4,65	1,19
2	30	870	5.10	4.44	1.15
2	40	860	5.01	3.56	1.41
2	60	650	3,80	1.66	2.29
2	35	1030	3.38	2.79	1.21
2	45	1030	3.66	2,46	1,49
2	55	710	6.80	2,30	2.96
-7	40	730	4,30	2,67	1.61
-7	30	750	4,37	3.41	1,28
-7	25	700	4.11	3.46	1,19
-7	60	650	3.77	1.64	2,30
-7	35	1030	3,10	2.35	1,32
-7	45	1030	3,00	2,47	1.21
-7	55	680	2.60	2.07	1,26
-25	25	650	3.77	1.73	2.18
-25	30	650	3.77	1,46	2,58
-25	35	650	3.77	1.25	3,02
-25	45	650	3.77	0.78	4,83

HMI080					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	1570	9.18	6,50	1.41
35	30	1630	9.48	6.13	1.55
35	35	1660	9,69	5.25	1,85
35	40	1670	9.76	4,68	2.09
35	45	1680	9,79	4,29	2,28
35	50	1580	9.19	4,15	2.21
35	55	1470	8.60	4,03	2,13
35	60	1190	6.95	3,86	1.80
15	25	1570	9.13	4.70	1.94
15	30	1580	9,22	4,18	2.21
15	35	1610	9.40	3.49	2.69
15	40	1620	9.42	3.46	2.72
15	45	1620	9.42	3,33	2.83
15	55	1340	7.81	3,32	2.35
15	60	950	5.53	3,12	1.77
7	60	1020	5.94	2.54	2.34
7	40	1330	7.74	3,33	2.32
7	30	1360	7.93	3.69	2.15
7	25	1360	7.94	3.87	2,05
7	35	1290	7.50	4.60	1.63
7	45	1290	7.50	3,75	2.00
7	55	770	7.22	3,18	2,27
2	25	1120	6.56	4.58	1,43
2	30	1040	6.06	4,37	1,39
2	40	1020	5.95	3.51	1,70
2	60	770	4.52	1.63	2.77
2	35	1290	3,97	2.65	1,50
2	45	1290	4.32	2.24	1,93
2	55	850	7.80	2,30	3.39
-7	40	870	5.10	2.63	1.94
-7	30	890	5,20	3.36	1.55
-7	25	840	4.88	3.41	1,43
-7	60	610	3.56	1.62	2.20
-7	35	1290	3,80	2.32	1.64
-7	45	1290	3,50	2,45	1,43
-7	55	770	3,20	2,05	1,56
-25	25	610	3.56	1,71	2.08
-25	30	610	3.56	1.44	2,47
-25	35	610	3.56	1.23	2,89
-25	45	610	3.56	0.77	4,62

HMI100					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	2560	14.85	5.94	2,50
35	30	2640	15.35	5.60	2,74
35	35	2700	15.67	4.80	3.26
35	40	2720	15.79	4.28	3.69
35	45	2730	15.84	3.92	4,04
35	50	2560	14.87	3,79	3.92
35	55	2390	13.91	3.68	3,78
35	60	1930	11,24	3.53	3,18
15	25	2110	12.25	4.41	2,78
15	30	2130	12,36	3.92	3.15
15	35	2170	12,62	3.27	3,86
15	40	2180	12,65	3,25	3.89
15	45	2180	12,65	3,12	4.05
15	55	1800	10.48	3.11	3.37
15	60	1280	7.42	2,93	2,53
7	60	1370	7.98	2.38	3.35
7	40	1780	10,38	3,12	3,33
7	30	1830	10.64	3.46	3.08
7	25	1830	10,65	3,63	2,93
7	35	1720	10,08	4.58	2.20
7	45	1700	10,08	3.68	2,74
7	55	1070	10,11	2.96	3.42
2	25	1830	10.62	4,18	2.54
2	30	1690	9.81	4.00	2,45
2	40	1660	9.63	3,21	3,00
2	60	1260	7.31	1,49	4,91
2	35	1720	6.86	3,32	2.07
2	45	1700	6.07	2,59	2.34
2	55	840	7.87	2.24	3.51
-7	40	1420	8.26	2,40	3,44
-7	30	1450	8.41	3,07	2,74
-7	25	1360	7.91	3.11	2.54
-7	60	990	5.76	1.48	3.89
-7	35	1720	4.85	2,28	2,13
-7	45	1700	6.19	2,40	2,58
-7	55	1070	8.19	1.99	4,12
-25	25	760	4,43	1,56	2,84
-25	30	640	3,74	1,31	2.85
-25	35	640	3,74	1,12	3.34
-25	45	640	3,74	0,70	5.34

Data 14511:2013

TA D.B. Outside air temperature - dry bulb (°C)
TWu Processed water temperature - services side (°C)
Ph Heating capacity (kW)
Pe Input power (kW)
Qu Water flow rate - services side (l/h)
Flow rates to the heat exchanger calculated with ΔT 5°C

HMI120					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	2870	16.67	5.86	2,84
35	30	2960	17.21	5.53	3.11
35	35	3030	17.59	4,73	3.72
35	40	3050	17,72	4,22	4.20
35	45	3060	17,77	3.87	4.59
35	50	2870	16,69	3,74	4.46
35	55	2690	15,61	3,63	4,30
35	60	2170	12,62	3.48	3,63
15	25	2400	13.96	4.35	3,21
15	30	2420	14,09	3.87	3.64
15	35	2470	14.37	3.22	4.46
15	40	2480	14.40	3,20	4.50
15	45	2480	14.40	3.08	4,68
15	55	2050	11.94	3,07	3.89
15	60	1450	8.45	2,89	2.92
7	60	1560	9,08	2.35	3,86
7	40	2030	11.83	3,07	3.85
7	30	2080	12.11	3.41	3.55
7	25	2090	12.13	3.58	3.39
7	35	2050	12.10	4,42	2,74
7	45	2050	12.10	3.41	3.55
7	55	1290	12.14	2,89	4.20
2	25	2050	11.91	4.13	2,88
2	30	1890	11,00	3,94	2.79
2	40	1860	10.81	3,16	3.42
2	60	1410	8.20	1,47	5.58
2	35	2050	8.65	3.28	2,64
2	45	2050	8.28	2,50	3.31
2	55	840	7.87	2.24	3.51
-7	40	1590	9.27	2,37	3,91
-7	30	1620	9.44	3,02	3,13
-7	25	1520	8.86	3,07	2,89
-7	60	1110	6.46	1,46	4,42
-7	35	2050	6.89	2,62	2.63
-7	45	2050	7,48	2.34	3,20
-7	55	1290	9.15	2.01	4.55
-25	25	860	4.97	1.54	3.23
-25	30	720	4.21	1,29	3.26
-25	35	630	3.64	1.11	3.28
-25	45	630	3.64	0,70	5,20

HMI140					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	3490	20.29	5.70	3.56
35	30	3610	20.97	5.37	3,91
35	35	3680	21,41	4.60	4,65
35	40	3710	21.57	4.10	5,26
35	45	3720	21,64	3.76	5.76
35	50	3500	20,32	3.64	5.58
35	55	3270	19,01	3.53	5.39
35	60	2640	15.37	3.38	4.55
15	25	2990	17,37	4,23	4.11
15	30	3010	17.53	3.76	4.66
15	35	3080	17.88	3,13	5.71
15	40	3080	17.91	3.11	5.76
15	45	3080	17.92	2,99	5.99
15	55	2560	14.85	2,99	4.97
15	60	1810	10.52	2,81	3,74
7	60	1940	11,29	2,28	4,95
7	40	2530	14.71	2,99	4,92
7	30	2590	15.07	3,32	4.54
7	25	2600	15.10	3.48	4,34
7	35	2400	14.12	4.20	3.36
7	45	2400	14.12	3.53	4.00
7	55	1500	14.20	2,93	4.85
2	25	2490	14.50	4.01	3.62
2	30	2310	13.40	3,83	3,50
2	40	2260	13.16	3,07	4,29
2	60	1720	9.98	1,43	6.98
2	35	2400	10.17	3.35	3,04
2	45	2400	9,39	2.39	3,93
2	55	840	7.87	2.24	3.51
-7	40	1940	11.28	2.31	4.88
-7	30	1980	11,49	2,95	3.89
-7	25	1860	10.80	2,99	3.61
-7	60	1350	7.87	1.42	5.54
-7	35	2400	8.61	2,78	3,10
-7	45	2400	8,90	2.35	3,79
-7	55	1500	9.53	1.73	5.51
-25	25	1040	6.05	1,49	4,06
-25	30	880	5.11	1,26	4,06
-25	35	760	4,43	1,08	4.10
-25	45	600	3.51	0,68	5.16

HMI160					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	3080	22.11	5.62	3,93
35	30	3930	22,84	5.30	4,31
35	35	4010	23.33	4.54	5,14
35	40	4040	23,51	4.05	5.80
35	45	4060	23,58	3.71	6.36
35	50	3910	22,15	3.59	6.17
35	55	3560	20,71	3.48	5.95
35	60	2880	16.74	3.34	5.01
15	25	3570	20,78	4,12	5.04
15	30	3610	20.97	3.66	5.73
15	35	3680	21,39	3.05	7.01
15	40	3690	21,44	3.03	7.08
15	45	3690	21,44	2.92	7.34
15	55	3060	17,77	2,91	6.11
15	60	2160	12.59	2.73	4,61
7	60	2330	13.52	2,22	6.09
7	40	3030	17.60	2.92	6.03
7	30	3100	18.03	3.23	5.58
7	25	3110	18.06	3.39	5.33
7	35	2670	15.50	4.05	3,83
7	45	2670	15.50	3.38	4.59
7	55	1720	16,00	2,58	6.20
2	25	2720	15.81	3,96	3,99
2	30	2510	14.60	3,78	3,86
2	40	2470	14.34	3,04	4.72
2	60	1870	10,88	1.42	7.66
2	35	2670	10.74	3,14	3.42
2	45	2670	10.93	2,52	4,34
2	55	930	8.87	2.15	4.13
-7	40	2110	12.29	2,28	5.39
-7	30	2150	12.52	2,91	4,30
-7	25	2020	1.77	2,95	0,60
-7	60	1480	8,58	1.40	6.13
-7	35	2670	10.34	2,62	3.95
-7	45	2670	10,09	2.29	4.41
-7	55	1720	9.75	1,68	5.80
-25	25	1130	6,60	1.48	4.46
-25	30	960	5.58	1.25	4.46
-25	35	830	4,83	1,07	4.51
-25	45	630	3.66	0,67	5.46

HMI100T					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	2530	14,73	5.97	2,47
35	30	2610	15.22	5.63	2,70
35	35	2670	15.54	4.82	3.22
35	40	2690	15.66	4,30	3.64
35	45	2700	15.71	3,94	3,99
35	50	2530	14.75	3,81	3.87
35	55	2370	13,79	3,70	3.73
35	60	1920	11.15	3.55	3,14
15	25	2090	12.15	4,43	2,74
15	30	2110	12.26	3,94	3.11
15	35	2150	12.51	3.29	3,80
15	40	2150	12.54	3.27	3,83
15	45	2150	12.54	3,14	3,99
15	55	1780	10.39	3,13	3,32
15	60	1260	7.36	2.94	2,50
7	60	1360	7.91	2.39	3.31
7	40	1770	10,29	3,14	3.28
7	30	1810	10.55	3.48	3.03
7	25	1810	10.56	3.65	2,89
7	35	1720	10.00	4.60	2.17
7	45	1720	10.00	3,70	2,70
7	55	1070	10.03	2,97	3.38
2	25	1810	10.53	4.20	2.51
2	30	1670	9.73	4,02	2.42
2	40	1640	9,55	3.23	2.96
2	60	1240	7.25	1,50	4,83
2	35	1720	6.80	3.34	2.04
2	45	1720	6.02	2.60	2.32
2	55	850	7.80	2,25	3.47
-7	40	1400	8.19	2.41	3.40
-7	30	1430	8.34	3.09	2,70
-7	25	1340	7.84	3,13	2,50
-7	60	980	5.71	1,49	3,83
-7	35	1720	4.81	2.29	2.10
-7	45	1720	6.14	2.41	2.55
-7	55	1070	8,12	2.00	4,06
-25	25	750	4,39	1.57	2,80
-25	30	630	3.71	1,32	2,81
-25	35	630	3.71	1,13	3.28
-25	45	630	3.71	0,70	5.30

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TA D.B. Outside air temperature - dry bulb (°C)
TWu Processed water temperature - services side (°C)
Ph Heating capacity (kW)
Pe Input power (kW)
Qu Water flow rate - services side (l/h)
Flow rates to the heat exchanger calculated with ΔT 5°C

HMI120T					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	2840	16.53	5.89	2,81
35	30	2930	17.07	5.56	3,07
35	35	3000	17,44	4.75	3.67
35	40	3020	17.57	4.24	4.14
35	45	3030	17.62	3.89	4.53
35	50	2840	16.55	3.76	4.40
35	55	2660	15,48	3.65	4.24
35	60	2150	12.51	3,50	3.57
15	25	2380	13,84	4,37	3,17
15	30	2400	13,97	3.89	3.59
15	35	2450	14.25	3,24	4.40
15	40	2450	14.28	3.22	4,43
15	45	2450	14.28	3,10	4,61
15	55	2030	11.84	3.09	3,83
15	60	1440	8.38	2.90	2,89
7	60	1540	9.00	2,36	3,81
7	40	2010	11.73	3.09	3,80
7	30	2060	12,01	3.43	3,50
7	25	2070	12.03	3.60	3.34
7	35	2060	12.00	4.55	2,64
7	45	2060	12.00	3.60	3,33
7	55	1290	12.04	2.90	4,15
2	25	2030	11.81	4,15	2.85
2	30	1870	10.91	3,96	2.76
2	40	1840	10.72	3,18	3.37
2	60	1390	8.13	1.48	5.49
2	35	2060	8,58	3,30	2.60
2	45	2060	8.21	2.51	3.27
2	55	850	7.80	2,25	3.47
-7	40	1580	9.19	2.39	3.85
-7	30	1610	9.36	3,04	3.08
-7	25	1510	8.79	3.09	2,84
-7	60	1100	6.41	1,47	4.36
-7	35	2060	6.83	2.63	2.60
-7	45	2060	7.42	2.35	3,16
-7	55	1290	9,07	2,02	4.49
-25	25	840	4.93	1.55	3,18
-25	30	710	4,17	1.30	3,21
-25	35	620	3.61	1,12	3.22
-25	45	620	3.61	0,70	5.16

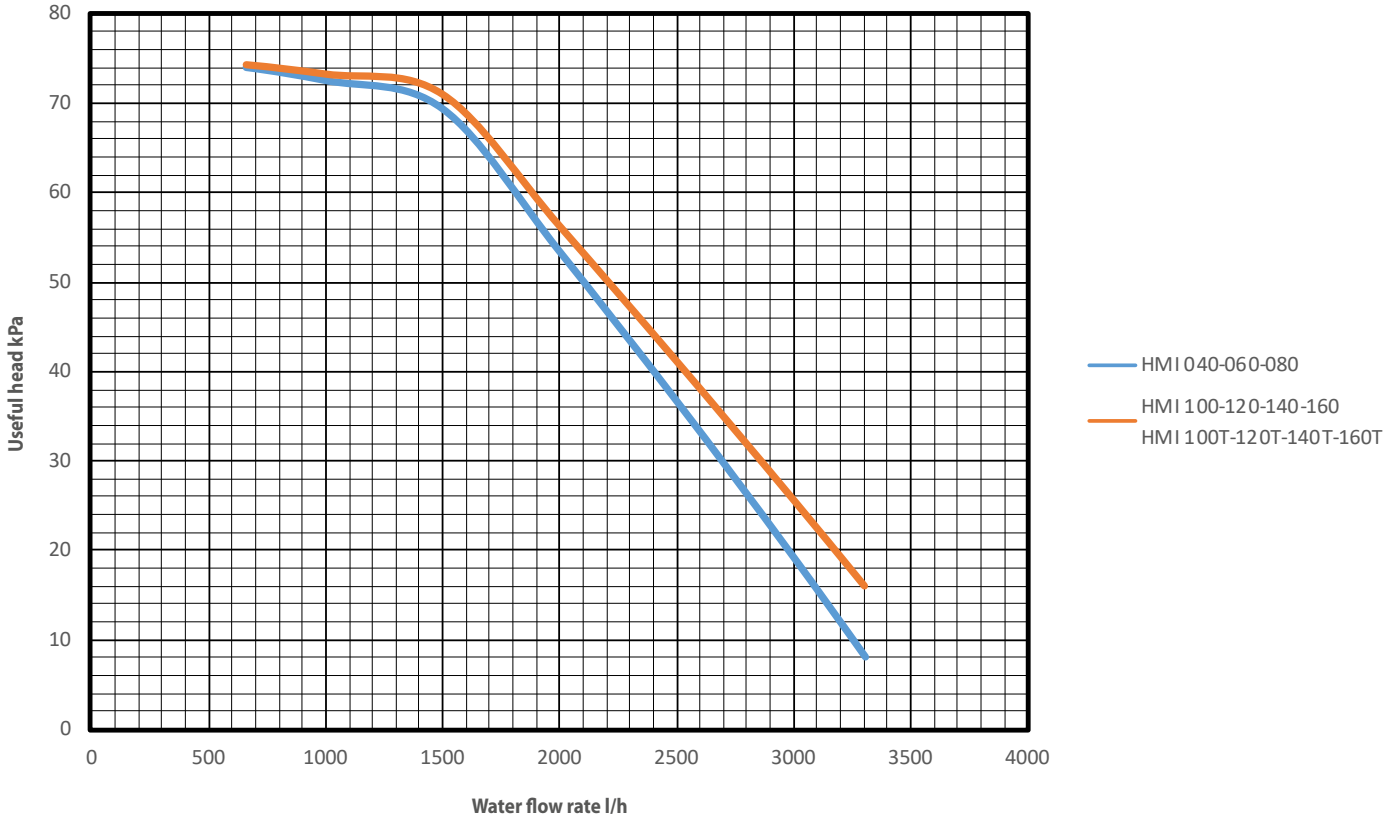
HMI140T					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	3460	20,12	5.73	3.51
35	30	3570	20.79	5.40	3.85
35	35	3650	21,23	4,62	4.60
35	40	3680	21,39	4,12	5.19
35	45	3690	21.46	3,78	5.68
35	50	3460	20.15	3.66	5.51
35	55	3240	18.85	3.55	5.31
35	60	2620	15.24	3.40	4,48
15	25	2960	17.22	4,25	4.05
15	30	2990	17,38	3,78	4.60
15	35	3040	17.73	3.15	5.63
15	40	3050	17,76	3,13	5.67
15	45	3050	17,77	3,01	5.90
15	55	2530	14,73	3,01	4.89
15	60	1790	10,43	2,82	3,70
7	60	1920	11.20	2.29	4.89
7	40	2510	14.59	3,01	4.85
7	30	2570	14.94	3.34	4.47
7	25	2570	14.97	3,50	4.28
7	35	2400	14,00	4.35	3.22
7	45	2400	14,00	3.55	3,94
7	55	1510	14.08	2.94	4,79
2	25	2470	14.38	4,03	3.57
2	30	2280	13,29	3.85	3.45
2	40	2240	13.05	3.09	4,22
2	60	1700	9.90	1.44	6.88
2	35	2400	10,08	3.37	2,99
2	45	2400	9.31	2,40	3,88
2	55	850	7.80	2,25	3.47
-7	40	1920	11.19	2.32	4.82
-7	30	1960	11.39	2.96	3.85
-7	25	1840	10.71	3,01	3.56
-7	60	1340	7.80	1,43	5.45
-7	35	2400	8.54	2.79	3.06
-7	45	2400	8.83	2,36	3,74
-7	55	1510	9.45	1,74	5,43
-25	25	1030	6,00	1,50	4.00
-25	30	870	5.07	1,27	3,99
-25	35	750	4,39	1.09	4,03
-25	45	600	3.48	0,68	5.12

HMI160T					
TA D.B.	TWu	Qu	PH	COP	pe
35	25	3659	21,93	5.65	3,88
35	30	3778	22,65	5.33	4,25
35	35	3880	23,14	4.56	5.07
35	40	3968	23,31	4.07	5.73
35	45	4204	23,38	3.73	6.27
35	50	3940	21,96	3.61	6.08
35	55	3666	20.53	3,50	5.87
35	60	3057	16,60	3.36	4.94
15	25	3527	20,61	4.14	4.98
15	30	3550	20,80	3.68	5.65
15	35	3577	21.21	3,07	6,91
15	40	3594	21,26	3.05	6.97
15	45	3603	21,26	2,93	7.25
15	55	3100	17.62	2,93	6.02
15	60	2586	12.48	2.75	4.55
7	60	2587	13.41	2.24	6,00
7	40	2941	17,46	2,93	5.96
7	30	3028	17.88	3,25	5,50
7	25	2991	17.91	3.41	5,26
7	35	2670	15.50	4,30	3.60
7	45	2670	15.50	3.40	4.56
7	55	1720	16,00	2,59	6.17
2	25	2678	15.67	3.98	3,94
2	30	2556	14,48	3,80	3,81
2	40	2663	14.22	3.05	4.66
2	60	2587	10.79	1.42	7.58
2	35	2670	10.72	3,14	3.41
2	45	2670	10.93	2,53	4.32
2	55	930	8.80	2,16	4.07
-7	40	2161	12.19	2.29	5.33
-7	30	2174	12.42	2.92	4,25
-7	25	2059	11.67	2,97	3,93
-7	60	1631	8,50	1.41	6.03
-7	35	2670	10,25	2.63	3.90
-7	45	2670	10.01	2,30	4.35
-7	55	1720	9.67	1,69	5.72
-25	25	1175	6.54	1,49	4.40
-25	30	972	5.53	1.25	4.41
-25	35	890	4,79	1,08	4.45
-25	45	626	3,63	0,67	5.41

Data 14511:2013

TA D.B. Outside air temperature - dry bulb (°C)
TWu Processed water temperature - services side (°C)
Ph Heating capacity (kW)
Pe Input power (kW)
Qu Water flow rate - services side (l/h)
Flow rates to the heat exchanger calculated with ΔT 5°C

USEFUL HEAD VALUES

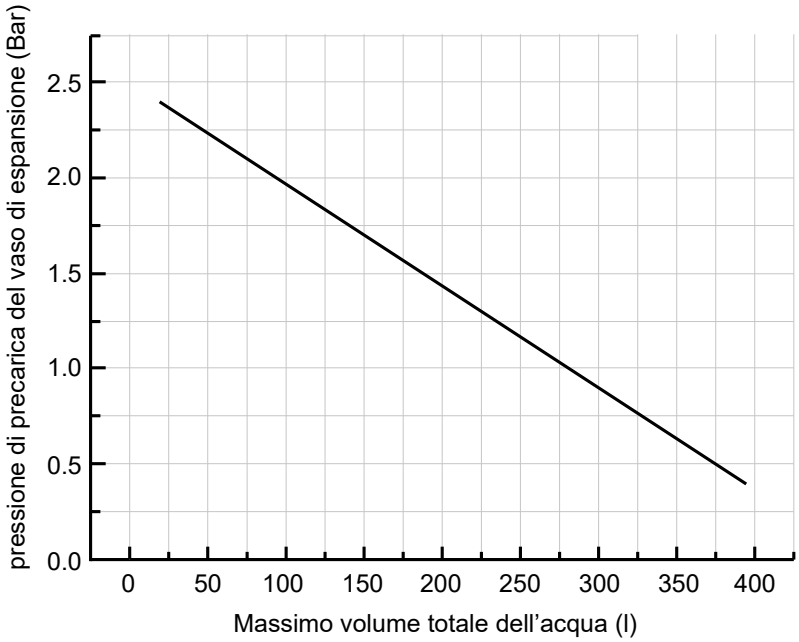


NB:

- **the unit automatically controls the circulator via signals of the PWM type, according to the operating conditions; this means that no settings are needed at the time of installation**

- **the unit must be sized on the basis of the nominal design conditions and, in those conditions, must guarantee that the pressure drops (system side) are less than - or equal to - the useful head available.**

SYSTEM WATER CONTENT



CORRECTION FACTORS

Corrective factors for average water temperatures other than nominal															
System side heat exchanger		Cooling mode							Heating or recovery mode						
Average water temperatures	(°C)	5	10	15	20	30	40	50	23	28	33	38	43	48	53	58
Correction factor		1.02	**1**	0.98	0.97	0.95	0.93	0.91	1.04	1.03	1.02	1.01	**1**	0.99	0.98	0.97

FOULING

Corrective factors for SCALING [K*M²]/[kW]			
	0,00005	0,0001	0,0002
Cooling capacity correction factors	**1**	0,98	0,94
Input power correction factors	**1**	0,98	0,95

GLYCOL

KÜHLBETRIEB

KORREKTURFAKTOREN MIT ETHYLENGLYKOL-LÖSUNGEN - KÜHLBETRIEB											
Gefrierpunkt	°C	0	-3,63	-6,10	-8,93	-12,11	-15,74	-19,94	-24,79	-30,44	-37,10
Ethylenglykol-Anteil	%	0	10	15	20	25	30	35	40	45	50
Qwc	-	1,000	1,033	1,040	1,049	1,060	1,072	1,086	1,102	1,120	1,141
Pc	-	1,000	0,990	0,985	0,980	0,975	0,970	0,965	0,960	0,955	0,950
Pa	-	1,000	0,996	0,994	0,992	0,990	0,988	0,986	0,984	0,982	0,980
Dp	-	1,000	1,109	1,157	1,209	1,268	1,336	1,414	1,505	1,609	1,728

Durchschnittliche Wassertemperatur = 9,5 °C

HEIZUNG

KORREKTURFAKTOREN MIT ETHYLENGLYKOL-LÖSUNGEN - HEIZUNG											
Gefrierpunkt	°C	0	-3,63	-6,10	-8,93	-12,11	-15,74	-19,94	-24,79	-30,44	-37,10
Ethylenglykol-Anteil	%	0	10	15	20	25	30	35	40	45	50
Qwh	-	1,000	1,027	1,038	1,050	1,063	1,078	1,095	1,114	1,135	1,158
Ph	-	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Pa	-	1,000	1,002	1,003	1,004	1,005	1,007	1,008	1,010	1,012	1,015
Dp	-	1,000	1,087	1,128	1,175	1,227	1,286	1,353	1,428	1,514	1,610

Durchschnittliche Wassertemperatur = 42,5 °C

Qwc: Korrekturfaktor Wasserdurchfluss (durchsch. Wassertemperatur 9,5 °C)
Qwh: Korrekturfaktor Wasserdurchfluss (durchsch. Wassertemperatur 42,5°C)
Pc: Korrekturfaktor Kühlleistung
Ph: Corrective factor of heating capacity
Pa: Korrekturfaktor Leistungsaufnahme
Dp: Druckverluste

PROPYLENGLYKOL-LÖSUNGEN

KÜHLBETRIEB

KORREKTURFAKTOREN MIT PROPYLENGLYKOL-LÖSUNGEN - KÜHLBETRIEB											
Gefrierpunkt	°C	0	-3,43	-5,30	-7,44	-9,98	-13,08	-16,86	-21,47	-27,04	-33,72
Propylenglykol-anteil	%	0	10	15	20	25	30	35	40	45	50
Qwc	-	1,000	1,007	1,006	1,007	1,010	1,015	1,022	1,032	1,044	1,058
Pc	-	1,000	0,985	0,978	0,970	0,963	0,955	0,947	0,939	0,932	0,924
Pa	-	1,000	0,996	0,994	0,992	0,990	0,988	0,986	0,984	0,982	0,980
Dp	-	1,000	1,082	1,102	1,143	1,201	1,271	1,351	1,435	1,520	1,602

Durchschnittliche Wassertemperatur = 9,5 °C

HEIZUNG

KORREKTURFAKTOREN MIT PROPYLENGLYKOL-LÖSUNGEN - HEIZUNG											
Gefrierpunkt	°C	0	-3,43	-5,30	-7,44	-9,98	-13,08	-16,86	-21,47	-27,04	-33,72
Propylenglykol-anteil	%	0	10	15	20	25	30	35	40	45	50
Qwh	-	1,000	1,008	1,014	1,021	1,030	1,042	1,055	1,071	1,090	1,112
Ph	-	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Pa	-	1,000	1,003	1,004	1,005	1,007	1,009	1,011	1,014	1,018	1,023
Dp	-	1,000	1,050	1,077	1,111	1,153	1,202	1,258	1,321	1,390	1,467

Durchschnittliche Wassertemperatur = 42,5 °C

Qwc: Korrekturfaktor Wasserdurchfluss (durchsch. Wassertemperatur 9,5 °C)
Qwh: Korrekturfaktor Wasserdurchfluss (durchsch. Wassertemperatur 42,5°C)
Pc: Korrekturfaktor Kühlleistung
Ph: Corrective factor of heating capacity
Pa: Korrekturfaktor Leistungsaufnahme
Dp: Druckverluste

Es ist zu vermeiden Glykol in den Wasserkreislauf auf der Saugseite der Pumpe zuzugeben. Eine hohe Konzentration an Glykol und Additiven (über die zulässigen Grenzwerte hinaus) kann die Pumpe beschädigen. Bitte die Pumpe nicht als Mischvorrichtung benutzen.

SOUND DATA

Sound power based on measurements taken in compliance with ISO 3744:1994 in a semi-anechoic chamber.
This certification refers specifically to sound power in dB(A), so this is the only sound value which should be considered binding.

Unit	Notes	Total sound levels		Octave band (Hz)							
		Pow.	Pres. 1m	63	125	250	500	1000	2000	4000	8000
		dB(A)	dB(A)	Sound power by central band frequency [dB] (A)							
040		64	50	45,1	46,2	54.1	59.1	59,9	53,9	49.6	44,1
060		64	50	45,6	46.7	54.1	59.1	59,9	53,9	49.6	44,1
080		65	51	44.6	47,1	53,9	56,1	61.2	59.7	52,1	44,3
100		69	54	48,7	57,0	60,0	64,3	63,8	59,9	51.2	53.4
120		69	54	48.5	56,2	58,6	63,5	65,1	59,4	52,7	53,8
140		70	55	51.5	55,9	60,1	65,4	65,5	59.1	53,9	55,7
160		72	57	54.1	57,6	61,8	66,9	68,0	61,7	55,8	56.7
100T		69	54	48,7	57,0	60,0	64,3	63,8	59,9	51.2	53.4
120T		69	54	48.5	56,2	58,6	63,5	65,1	59,4	52,7	53,8
140T		70	55	51.5	55,9	60,1	65,4	65,5	59.1	53,9	55,7
160T		72	57	54.1	57,6	61,8	66,9	68,0	61,7	55,8	56.7

Working conditions - heating mode
Processed water temperature 55°C;
Outside air temperature 7°C.

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AERMEC S.p.A.
Via Roma, 996 - 37040 Bevilacqua (VR) - Italia
Tel. +39 0442 633111 - Fax +39 0442 93577
marketing@aermec.com - www.aermec.com

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