

## NRGI 151H-602H

## Reversible air/water heat pump

Cooling capacity 28.9 ÷ 123.7 kW  
Heating capacity 31.6 ÷ 133.9 kW

- High efficiency also at partial loads
- High modulation capacity
- Continuous modulation of the cooling capacity
- Compressors and fans with Inverter
- Reduced amount of refrigerant
- Stable temperature control of the outlet water



### DESCRIPTION

Reversible outdoor heat pumps for the production of chilled/heated water designed to satisfy the needs of residential and commercial buildings, or for industrial applications.

**These are outdoor units with streamlined scroll compressors used with R32 gas.**

Condensing coil with copper pipes and aluminium louvers, plate heat exchanger and **standard electronic expansion valve.**

The base the structure and the panels are made of steel treated with polyester paint RAL 9003.

### VERSIONS

- A High efficiency
- E Silenced high efficiency

### FEATURES

#### Operating field

Working at full load up to -15 °C outside air temperature in winter, and up to 49 °C in summer. Hot water production up to 60 °C

For more information refer to the selection program and to the dedicated documentation.

#### High efficiency

These are flexible and reliable units which adapt to the most diverse load conditions thanks to the precise design and **the use of steady speed compressors together with inverter-controlled variable speed compressors** guaranteeing a high energy efficiency level both at full and partial load.

#### Inverter compressor + On-Off

They can be configured with a single variable speed compressor or two in tandem configuration, one steady and one variable speed. This pair guarantees high efficiency both with partial and full loads.

**Sizes 151-281 have a single variable speed compressor. Sizes 302-602 have two compressors in tandem configuration.**

This solution gets the best value out of the particularities and advantages of each compressor, enhancing the efficiency of each load condition and allowing for

- High seasonal efficiency
- steady and precise modulation of the chilling demand
- The stability of the outlet water temperature.

#### Refrigerant HFC R32

The environmental impact of the units is reduced considerably owing to the last generation R32 refrigerant.

Combining a reduced refrigerant load with a low global warming potential (GWP), these units boast low equivalent CO<sub>2</sub> values.

■ *The leak detector is supplied as per standard.*

#### New condensing Coils

**The whole range uses copper - aluminium condensation coils with reduced diameter rows,** allowing a lower quantity of gas to be used compared to traditional coils.

#### Electronic expansion valve

**Single-compressor units have a standard electronic expansion valve, while units with tandem compressors have two.**

The possibility to use electronic expansion valve, offers significant benefits, especially when the chiller is working with partial loads, increasing the energy seasonal efficiency of the unit.

#### Inverter fans

All of the units are equipped as per standard with high-efficiency inverter-controlled axial fans which provide:

- Steady air flow rate adjustment
- Low consumption and reduced sound level at partial loads
- Operation with low outdoor air temperatures
- Precise condensation control for an extended operating range.

#### Option integrated hydronic kit

An optional, integrated hydronic kit containing the main hydraulic components, to obtain a solution that allows you to save money and to facilitate installation.

**It is available in different configurations with storage tank or with fixed or variable pumps also inverter.**

■ **VARIABLE FLOW RATE:** Correctly adjust the speed of the inverter-controlled pumps according to the load demand of the system, in order to reduce power consumption.

### CONTROL PCO<sup>5</sup>

Microprocessor adjustment, with keyboard and LCD display, for easy access on the unit is a menu available in several languages.

- The presence of a programmable timer allows functioning time periods and a possible second set-point to be set.
- The temperature control takes place with the integral proportional logic, based on the water output temperature.
- **Swing HP and LP controls:** available for all models. By continuously modulating the fans, they streamline operation of the unit at any work point both in cooling and heating mode. This results in enhanced energy efficiency of the unit at partial loads.
- **Night Mode:** it is possible to set a silenced operation profile. Perfect for night operation since it guarantees greater acoustic comfort in the evenings, and a high efficiency in the time of greater load.

### INTEGRATED SOLUTION

The "integrated solution" concept has been implemented in the system architecture, consisting in an integrated and streamlined control of compressors and electronic valves.

This solution allowed a variety of new features to be introduced, such as:

- **Low Superheat Control:** Progressive superheating reduction in conditions of stability. This allows to increase energy performance: both in modulation and in full load conditions;
- **DLT control:** Control of electronic valves at discharge temperature in certain operating conditions. This is demonstrated in an enhanced reliability of the control and a considerable expansion of the machine's operating range, especially in heating mode.

### ACCESSORIES

**AER485P1:** RS-485 interface for supervision systems with MODBUS protocol.

**AERNET:** The device allows the control, the management and the remote monitoring of a Chiller with a PC, smartphone or tablet using Cloud connection. AERNET works as Master while every unit connected is configured as Slave (max. 6 unit); also, with a simple click is possible to save a log file with all the connected unit datas in the personal terminal for post analysis.

**MULTICHILLER\_EVO:** Control, switch-on and switch-off system of the single chillers where multiple units are installed in parallel, always ensuring constant flow rate to the evaporators.

**PGD1:** Allows you to control the unit at a distance.

**GP:** Anti-intrusion grid.

**VT:** Anti-vibration supports.

### FACTORY FITTED ACCESSORIES

**DRE:** Electronic device for peak current reduction.

### ACCESSORIES COMPATIBILITY

Model	Ver	151	201	281	302	332	352	382	502	552	602
AER485P1	A,E	*	*	*	*	*	*	*	*	*	*
AERNET	A,E	*	*	*	*	*	*	*	*	*	*
MULTICHILLER_EVO	A,E	*	*	*	*	*	*	*	*	*	*
PGD1	A,E	*	*	*	*	*	*	*	*	*	*

#### Antivibration

Ver	151	201	281	302	332	352	382	502	552	602
<b>Integrated hydronic kit: 00</b>										
A,E	VT17	VT13	VT13	VT13	VT13	VT13	VT11	VT11	VT11	VT22
<b>Integrated hydronic kit: 01, 02, 03, 04, 05, 06, 07, 08, 09</b>										
A,E	VT13	VT13	VT13	VT13	VT13	VT13	VT11	VT11	VT11	VT22
<b>Integrated hydronic kit: I1, I2, I3, I4</b>										
A,E	VT17	VT13	VT13	VT13	VT13	VT13	VT11	VT11	VT11	VT22
<b>Integrated hydronic kit: K1, K2, K3, K4</b>										
A,E	VT13	VT13	VT13	VT13	VT13	VT13	VT11	VT11	VT11	VT22
<b>Integrated hydronic kit: P1, P2, P3, P4</b>										
A,E	VT17	VT13	VT13	VT13	VT13	VT13	VT11	VT11	VT11	VT22
<b>Integrated hydronic kit: W1, W2, W3, W4</b>										
A,E	VT13	VT13	VT13	VT13	VT13	VT13	VT11	VT11	VT11	VT22

#### Anti-intrusion grid

Ver	151	201	281	302	332	352	382	502	552	602
A,E	GP3	GP4	GP4	GP4	GP4	GP4	GP2 x 2 (1)	GP2 x 2 (1)	GP2 x 2 (1)	GP2 x 3 (1)

(1) x \_ indicates the quantity to buy

#### Device for peak current reduction

Ver	151	201	281	302	332	352	382	502	552	602
A,E	-	-	-	DRENRGI302	DRENRGI332	DRENRGI352	DRENRGI382	DRENRGI502	DRENRGI552	DRENRGI602

The accessory cannot be fitted on the configurations indicated with -  
A grey background indicates the accessory must be assembled in the factory

## CONFIGURATOR

Field	Description
<b>1,2,3,4</b>	<b>NRGI</b>
<b>5,6,7</b>	<b>Size</b> 151, 201, 281, 302, 332, 352, 382, 502, 552, 602
<b>8</b>	<b>Operating field</b>
X	Electronic thermostatic expansion valve (1)
<b>9</b>	<b>Model</b>
H	Heat pump
<b>10</b>	<b>Heat recovery</b>
°	Without heat recovery
D	With desuperheater (2)
<b>11</b>	<b>Version</b>
A	High efficiency
E	Silenced high efficiency
<b>12</b>	<b>Coils</b>
°	Copper-aluminium
R	Copper-copper
S	Copper-Tinned copper
V	Copper-painted aluminium
<b>13</b>	<b>Fans</b>
J	Inverter
<b>14</b>	<b>Power supply</b>
°	400V ~ 3N 50Hz with magnet circuit breakers
<b>15,16</b>	<b>Integrated hydronic kit</b>
	<b>Without hydronic kit</b>
00	Without hydronic kit
	<b>Kit with storage tank and pump/s</b>
01	Storage tank with low head pump
02	Storage tank with low head pump + stand-by pump
03	Storage tank with high head pump
04	Storage tank with high head pump + stand-by pump
	<b>Kit with pump/s and storage tank with holes for heaters (3)</b>

Field	Description
05	Storage tank with holes for heaters and single low head pump
06	Storage tank with holes for heaters and pump low head + stand-by pump
07	Storage tank with holes for heaters and single high head pump
08	Storage tank with holes for heaters and pump high head + stand-by pump
	<b>Double loop</b>
09	Double loop
	<b>Kit with pump/s</b>
P1	Single pump low head
P2	Pump low head + stand-by pump
P3	Single pump high head
P4	Pump high head + stand-by pump
	<b>Kit with inverter pump/s to fixed speed</b>
I1	Single low head pump + fixed speed inverter
I2	Single low head pump with fixed speed inverter + stand-by pump
I3	Single high head pump + fixed speed inverter
I4	Single high head pump with fixed speed inverter + stand-by pump
	<b>Kit with storage tank and inverter pump/s to fixed speed</b>
K1	Single low head pump + storage tank + fixed speed inverter
K2	Storage tank and low head pump with fixed speed inverter + stand-by pump
K3	Single high head pump + storage tank + fixed speed inverter
K4	Storage tank and low head pump with fixed speed inverter + stand-by pump
	<b>Kit with storage tank and variable speed inverter pump/s</b>
W1	Single low head pump + Storage tank + variable speed inverter
W2	Double low head pump + Storage tank + variable speed inverter
W3	Single high head pump + Storage tank + variable speed inverter
W4	Double high head pump + Storage tank + variable speed inverter

(1) Water produced from -10 °C ÷ 20 °C. Double electronic thermostatic valve from size 302 to 602.

(2) The desuperheater must be intercepted in heating mode. In cooling mode, a water temperature no lower than 35°C must always be guaranteed on the heat exchanger inlet.

(3) Storage tanks with holes for supplementary heaters (not provided) are sent from the factory with plastic protection caps. Before loading the system, if the installation of one or all resistances is not expected, all plastic caps must be replaced with the special caps, commonly commercially available.

## PERFORMANCE SPECIFICATIONS

### NRGI - HA

Size		151	201	281	302	332	352	382	502	552	602
<b>Cooling performance 12 °C / 7 °C</b>											
Cooling capacity	kW	36,5	48,9	54,2	64,1	72,1	77,3	87,0	95,7	106,0	123,7
Input power	kW	12,1	15,6	18,1	21,5	23,9	26,3	28,4	32,3	36,1	39,1
Cooling total input current	A	18,0	24,0	27,0	38,0	42,0	47,0	44,0	51,0	55,0	60,0
EER	W/W	3,00	3,13	3,00	2,98	3,02	2,94	3,06	2,96	2,93	3,16
Water flow rate system side	l/h	6280	8416	9328	11028	12414	13315	14969	16471	18246	21290
Pressure drop system side	kPa	15	28	34	28	35	41	19	18	23	25
<b>Heating performance 40 °C / 45 °C</b>											
Heating capacity	kW	39,6	53,4	59,0	69,9	78,1	84,1	94,7	104,8	115,7	133,9
Input power	kW	11,6	15,4	17,3	20,3	23,0	24,9	29,4	32,2	34,6	40,6
Heating total input current	A	18,0	24,0	27,0	38,0	42,0	46,0	46,0	52,0	54,0	64,0
COP	W/W	3,42	3,46	3,42	3,45	3,40	3,37	3,22	3,25	3,34	3,30
Water flow rate system side	l/h	6869	9260	10228	12113	13544	14563	16431	18188	20074	23220
Pressure drop system side	kPa	18	33	40	34	42	49	23	22	27	29

## NRGI - HE

Size		151	201	281	302	332	352	382	502	552	602
<b>Cooling performance 12 °C / 7 °C (1)</b>											
Cooling capacity	kW	28,9	37,0	42,6	56,7	64,9	70,1	78,8	84,0	94,0	111,3
Input power	kW	9,1	11,4	13,5	18,4	20,8	23,2	25,3	27,6	31,6	34,1
Cooling total input current	A	13,0	17,0	20,0	33,0	36,0	41,0	39,0	44,0	49,0	53,0
EER	W/W	3,17	3,25	3,15	3,07	3,12	3,03	3,12	3,04	2,97	3,26
Water flow rate system side	l/h	4974	6363	7326	9764	11165	12069	13554	14451	16179	19152
Pressure drop system side	kPa	10	16	21	22	29	33	16	14	18	20
<b>Heating performance 40 °C / 45 °C (2)</b>											
Heating capacity	kW	31,6	41,2	47,5	62,3	70,4	76,5	87,0	93,3	104,4	122,0
Input power	kW	9,1	11,8	13,6	18,0	20,3	22,2	27,0	28,5	31,2	36,8
Heating total input current	A	15,0	20,0	22,0	35,0	38,0	43,0	43,0	47,0	50,0	59,0
COP	W/W	3,49	3,49	3,49	3,47	3,47	3,44	3,23	3,27	3,35	3,32
Water flow rate system side	l/h	5484	7151	8247	10814	12215	13253	15103	16186	18126	21177
Pressure drop system side	kPa	12	20	26	27	34	40	20	18	22	24

(1) Data 14511:2018; System side water heat exchanger 12 °C/7 °C; External air 35 °C

(2) Data 14511:2018; System side water heat exchanger 40 °C/ 45 °C; Outside air 7 °C d.b. / 6 °C w.b.

## ENERGY DATA

Size		151	201	281	302	332	352	382	502	552	602	
<b>Cooling capacity with low leaving water temp (UE n° 2016/2281)</b>												
η <sub>sc</sub>	A	%	184%	195%	192%	182%	187%	184%	189%	191%	193%	201%
	E	%	185%	197%	194%	183%	188%	186%	190%	192%	194%	202%
SEER	A	W/W	4,67	4,96	4,89	4,62	4,74	4,68	4,79	4,84	4,90	5,09
	E	W/W	4,71	5,00	4,93	4,66	4,78	4,72	4,83	4,88	4,94	5,13
<b>Performance in average ambient conditions (average) - 35 °C (1)</b>												
Efficiency energy class	A <sub>1</sub> E		A++	A++	A++	A++	A++	-	-	-	-	-
P <sub>designh</sub>	A	kW	34	46	51	61	67	72	81	90	100	115
	E	kW	27	35	41	54	61	66	75	80	90	105
SCOP	A		4,24	4,32	4,25	4,40	4,28	4,35	4,27	4,25	4,13	4,02
	E		4,27	4,35	4,29	4,44	4,31	4,38	4,30	4,29	4,17	4,05
η <sub>sh</sub>	A	%	167%	170%	167%	173%	168%	171%	168%	167%	162%	158%
	E	%	168%	171%	168%	174%	170%	172%	169%	169%	164%	159%
<b>Performance in average ambient conditions (average) - 55 °C (2)</b>												
Efficiency energy class	A <sub>1</sub> E		A++	A++	A++	A++	A++	-	-	-	-	-
P <sub>designh</sub>	A	kW	35	48	53	62	69	73	83	92	102	117
	E	kW	28	37	43	55	62	67	76	82	92	106
SCOP	A		3,31	3,40	3,38	3,37	3,41	3,49	3,28	3,35	3,35	3,27
	E		3,32	3,39	3,37	3,38	3,41	3,48	3,39	3,37	3,36	3,28
η <sub>sh</sub>	A	%	129%	133%	132%	132%	134%	137%	128%	131%	131%	128%
	E	%	130%	133%	132%	132%	133%	136%	132%	132%	131%	128%

(1) Efficiencies for low temperature applications (35 °C)

(2) Efficiencies for average temperature applications (55 °C)

## ELECTRIC DATA

Size		151	201	281	302	332	352	382	502	552	602	
<b>Electric data</b>												
Maximum current (FLA)	A <sub>1</sub> E	A	23,8	31,6	34,9	47,6	52,8	58,1	60,1	68,8	74,4	87,5
Peak current (LRA)	A	A	30,3	43,0	43,0	142,8	167,1	201,1	174,4	211,8	278,6	329,2
	E	A	30,3	43,0	43,0	136,2	160,5	194,5	166,6	204,0	270,8	317,5

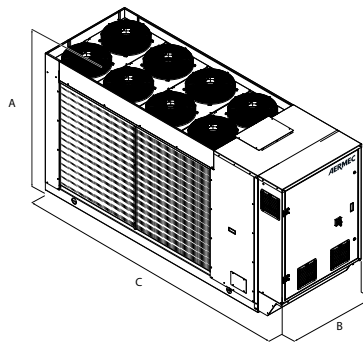
Data calculated without hydronic kit and accessories.

## GENERAL TECHNICAL DATA

Size			151	201	281	302	332	352	382	502	552	602
<b>Compressor</b>												
Type	A,E	type	Scroll									
Compressor regulation	A,E	Type	Inverter	Inverter	Inverter	Inverter+On/Off	Inverter+On/Off	Inverter+On/Off	Inverter+On/Off	Inverter+On/Off	Inverter+On/Off	Inverter+On/Off
Number	A,E	no.	1	1	1	2	2	2	2	2	2	2
Circuits	A,E	no.	1	1	1	1	1	1	1	1	1	1
Refrigerant	A,E	type	R32									
<b>System side heat exchanger</b>												
Type	A,E	type	Braze plate									
Number	A,E	no.	1	1	1	1	1	1	1	1	1	1
<b>Inverter fan</b>												
Type	A,E	type	Axial									
Number	A,E	no.	4	6	6	8	8	8	2	2	2	3
Air flow rate	A	m <sup>3</sup> /h	16896	24887	24891	31613	29660	29659	36859	36859	36859	55733
	E	m <sup>3</sup> /h	14667	21591	21591	27379	25774	25774	27308	27308	27307	41430
<b>Sound data calculated in cooling mode (1)</b>												
Sound power level	A	dB(A)	81,8	84,6	86,0	82,2	85,0	85,1	85,4	86,5	87,8	88,1
	E	dB(A)	79,3	82,8	83,3	80,9	81,3	81,7	82,8	83,0	85,4	85,6

(1) Sound power calculated on the basis of measurements made in accordance with UNI EN ISO 9614-2, as required for Eurovent certification. Sound pressure (cold functioning) measured in free field, 10m away from the unit external surface (in compliance with UNI EN ISO 3744).

## DIMENSIONS



Size			151	201	281	302	332	352	382	502	552	602
<b>Dimensions and weights</b>												
A	A,E	mm	1652	1652	1652	1652	1652	1652	1907	1907	1907	1900
B	A,E	mm	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
C	A,E	mm	2873	3372	3372	3372	3372	3372	3623	3623	3623	4373

Aermec reserves the right to make any modifications deemed necessary. All data is subject to change without notice. Aermec does not assume responsibility or liability for errors or omissions.

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