



# WSAN-EE 82-102-122-142-162- 182-202-222-242-282

AIR TO WATER HEAT PUMP FOR OUTDOOR INSTALLATION

## Installation and Use Manual

M62P40B5-02

21/09/2007

## UNIT IDENTIFICATION

### SERIAL NUMBER LABEL

The units are identified by the serial number label shown here.

The label lists the type of unit (series and size), serial number, year of manufacture, number of electrical diagram, main technical data, logo and address of the manufacturer.

The label is placed on the unit, generally near the electrical panel and also on the external panelling.

IT MUST NEVER BE REMOVED.

### SERIAL NUMBER

This provides unique identification of the machine. It makes it possible to trace the specific features of the unit and to identify the components installed in it.

Without this number, it is not possible to identify with certainty the spare parts that are specific to that unit.

When requesting assistance, always provide the type of machine and the serial number.

Write them in the space below so that they are readily available when needed.

Type of unit : \_\_\_\_\_

Serial number : \_\_\_\_\_

Wiring diagram : \_\_\_\_\_

Year of manufacture : \_\_\_\_\_

<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px dashed black; padding: 5px; font-weight: bold; font-size: 1.2em;">LOGO</div> <div style="font-size: 2em; font-weight: bold;">CE</div> </div>	
<small>TIPO TYPE/TYP TYPE/TIPO</small>	
<small>NUMERO MATRICOLA SERIAL NUMBER / SERIENNUMMER NUMERO DE SERIE / NUMERO DE SERIE</small>	
<small>ANNO DI FABBRICAZIONE YEAR OF MANUFACTURE / BAUJAHR ANNEE DE FABRICATION / AÑO DE FABRICACIÓN</small>	
<small>REFRIGERANTE REFRIGERANT / KÄLTEMITTEL REFRIGERANT / REFRIGÉRANTE</small>	<small>GRUPPO (PED) GROUP / GRUPE GRUPE / GRUPO</small>
<small>CARICA REFRIGERANTE REFRIG. CHARGE / KÄLTEMITTELFÜLLUNG CHARGE REFRIG / CARGA REFRIG.</small>	<small>Kg</small>
<small>TENSIONE VOLTAGE / SPANNUNG TENSION / TENSION</small>	<small>V/Ph/Hz</small>
<small>F.L.A.</small>	<small>A</small>
<small>F.L.I.</small>	<small>kW</small>
<small>SCHEMA ELETTRICO WIRING DIAGRAM / SCHALTPLAN SCHEMA ELECTRIQUE / ESQUEMA ELÉCTRICO</small>	
<small>PRESSIONE MASSIMA ESERCIZIO MAX OPERATING PRESS. / MAX BETRIEBSDRUCK PRESS. DE SERVICE MAX / PRESIÓN DE EJERCICIO MÁX</small>	
<small>CATEGORIA PED PED CATEGORY / PED KATEGORIE CATEGORIE PED / CATEGORIA PED</small>	<small>PS H/L bar</small>
<small>TEMPERATURA BP TEMPERATURE ON LP SIDE / TEMP. ND-SEITE TEMP. COTE BP / TEMP. PARTE BP</small>	
<small>INDIRIZZO / ADDRESS / ADRESSE / ADRESSE / DIRECCIÓN</small>	

## GENERAL WARNINGS

### MANUAL PURPOSE

This manual has been designed to enable the unit to be installed, started up and maintained correctly.

### MANUAL INSTRUCTIONS

It is essential to observe these instructions.

The manufacturer declines all liability for any damage that may be caused whether directly or indirectly to persons or things if these instructions are not heeded.

### MANUAL STORE

This manual and the unit's wiring diagram should be carefully stored so that they are readily available to the operator when required.

### EXPERT PERSONAL

The unit must be installed, tested and maintained by expert personal who meet the relevant legal requirements (Italian law No. 46 of 5/3/1990).

### LOCAL SAFETY REGULATION INSTALLATION

The installation must be performed observing the local safety regulations.

### POWER SUPPLY

Make sure the power supply conforms to the data on the unit's rating plate, located inside the door of the main electrical panel.

### PACKAGING

The packaging material (plastic bags, polystyrene foam, nails, etc.) is potentially dangerous and should therefore be kept away from children and recycled in compliance with the local regulations in force.

### MAINTENANCE

Before performing any service operations, cut off the power. Perform the operations in conformity with the local regulations in force.

### PERIODICAL INSPECTIONS

Perform periodical inspections to locate possible loosened or broken parts. If the repairs are not performed, there will be a higher risk for things and peoples to become damaged and injured.

### FAULT – POOR OPERATION

Switch off the unit in the event of faults or poor operation.

### REPAIR

Only have repairs carried out by a service centre authorised by the manufacturer, and insist on the use of original spare parts only.

Failure to comply with the above may compromise the safety of the unit.

### MODIFICATIONS

The manufacturer will not accept any responsibility, and the warranty will lapse, in the event of electric and/or mechanical modifications. Any modification which is not formally authorized, and which does not respect the

instructions given in this manual, will cause the warranty to lapse.

### INTENDED USE

The unit must only be used for the specific purpose it was designed :

**The unit is designed to cool/heat water or a water and glycol mix for air-conditioning, within the limits defined in the technical bulletin and this manual.**

Any use other than that specified does not imply any commitment or constraint by the manufacturer in any way whatsoever.

### ADDITIONAL SAFETY PRECAUTIONS

This unit has been especially designed and manufactured so to prevent any risk to persons and health hazard.

For this reason, design solutions fit to eliminate (where possible) any cause of risk and sensibly reduce the probability of danger have been adopted.

Please refer to the "Residual Risks" section of this manual and strictly observe the behaviour prescriptions listed there in order to prevent any possible risk that hasn't been possible to avoid in the design stage.

### DATA UPDATING

The manufacturer may be able to modify the data without prior notice as a consequence of constant improvements.

## REGULATIONS AND CERTIFICATIONS

### UNI EN ISO 9001 CERTIFICATION

Clivet S.p.A., in order to guarantee customer satisfaction, has chosen the ISO 9001 Quality System as the reference for all its business activities. This is demonstrated by the company's commitment to ongoing improvements in the quality and reliability of its products; its sales, design, purchasing, production and after-sales service activities are the means used to reach such purpose.

### CE MARK



Clivet products bear the CE mark, in compliance with the requirements of the following EC directives, including the latest amendments, and with the corresponding national approximated legislation:

- - 98/37/CE
- - 89/336/CEE as modified by the directives 92/31/CEE and 93/68/CEE
- - 73/23/CEE as modified by the directive 93/68/CEE
- - 97/23/CE

### EUROVENT CERTIFICATION



Clivet is participating in the EUROVENT Certification Programme "Liquid Chilling Packages". Products are listed in the EUROVENT Directory of Certified Products and in the site [www.eurovent-certification.com](http://www.eurovent-certification.com). Eurovent Chillers Certification Programme covers air cooled packaged chillers up to 600 kW and water cooled packaged chillers up to 1500 kW.

# ELECTRICAL CONNECTION

## GENERAL

The characteristics of the electrical lines and relevant components must be determined by **SPECIALIZED PERSONNEL ABLE TO DESIGN ELECTRICAL INSTALLATIONS**; moreover, the lines must be in conformity with professional procedures and the regulations in force.

All electrical operations should be performed by trained **PERSONNEL HAVING THE NECESSARY REQUISITES UNDER LAW** and being informed about the risks relevant to these activities.

Before performing any operation on the electrical system, make sure that the unit supply line is **SELECTED AT START**.

The earth connection must be made prior to other electrical connections.

For all electrical type operations, **REFER TO THE ELECTRICAL DIAGRAM ATTACHED TO THE UNIT**; the number of the diagram is shown on the registration plate positioned on the electrical board or next to it.

The electrical diagram should be carefully kept together with this manual and should be **AVAILABLE FOR FUTURE INTERVENTION ON THE UNIT**.

### LINE OF UNIT POWER SUPPLY

The **ELECTRICAL DATA OF THE UNIT** are shown in the technical chart of this manual and on the unit registration plate. The presence of accessories can vary according to the unit; the electrical data shown in the technical chart

refer to standard units. In the event of differences between the data of the registration plate and the data shown in this manual, as well as in the technical chart, please refer to the **DATA SHOWN IN THE REGISTRATION PLATE**.

The protection device of the unit power supply line should break off the short circuit power whose value should be determined according to the plant features.

The section of supply cables and protection cable must be seized according to the characteristics of the protections used.

### SIGNALS / DATA LINES

Do not overpass the maximum power allowed, which varies, according to the type of signal.

Lay the cables far from power cables or cables having a different tension and that are able to emit electromagnetic disturbances.

Do not lay the cable near devices which can generate electromagnetic interferences.

Do not lay the cables parallel to other cables; cable crossings are possible, only if laid at 90°.

Connect the screen to the ground, only if there are no disturbances

Assure the continuity of the screen during the entire extension of the cable.

Observe, if any, the requirements about impedance, capacity, attenuation

## STANDARD UNIT ELECTRICAL DATA

### Voltage: 400/3/50+N

SIZE		82	102	122	142	162	182	202	222	242	282
<b>F.L.A. FULL LOAD CURRENT AT MAX ADMISSIBLE CONDITIONS</b>											
F.L.A. - Pump	A	1.58	1.58	1.58	3.49	3.49	3.49	3.49	3.49	3.49	3.68
F.L.A. - Total	A	21.6	26	29.7	33.8	38.8	40.8	46.3	51.1	54.4	62.1
<b>F.L.I. FULL LOAD POWER INPUT AT MAX ADMISSIBLE CONDITIONS</b>											
F.L.I. - Pump	kW	0.79	0.79	0.79	1.95	1.95	1.95	1.95	1.95	1.95	1.95
F.L.I. - Total	kW	11.6	13.9	16	19	21.7	22.8	25.8	29.2	31.6	35.7
<b>M.I.C. MAXIMUM INRUSH CURRENT</b>											
M.I.C. - Value	A	77.9	112.9	116.6	138.8	143.7	147.7	189	220	223.3	231

power supply 400/3/50 (+ NEUTRAL) +/- 6%  
for non standard voltage please contact Clivet technical office

Maximum Phase Unbalance: 2%

## CONNECTION TO THE MAINS

1. Make sure that the sectioning device at the beginning of the unit's power line is opened, locked and equipped with a signal.
2. Open the general line disconnecting switch (if present)
3. Verify that the net is in conformity with the data shown in the registration plate placed on the electrical board.
4. Check the dimensional drawing for the input of the electrical lines
5. Take away the closing plate placed on the electric board (**ONLY IF PRESENT**) and drill a hole through it to pass the cables through)
6. Protect the cables, using the fairlead of an adequate size.
7. Using the layout of the electrical diagram, single out the connecting terminals of the electrical supply cables, of the neutral (if foreseen) and the PE protection cable
8. Connect the cables to the relevant terminal boards
9. Before supplying power to the unit, make sure that all the safety devices that were removed during electrical connections are positioned again.

## TECHNICAL DATA

SIZE		82	102	122	142	162	182	202	222	242	282
<b>COOLING</b>											
Cooling capacity	1 kW	22,2	25,6	29	34	38,2	41,4	48,2	54,9	58,2	68
Compressor power input	1 kW	7,7	9,3	10,9	12,5	14,8	16,7	18,1	21,2	23,2	26,2
Total power input	2 kW	8,4	10	11,5	13,9	16,1	17,9	19,5	22,5	24,5	28,8
EER	3	2,64	2,56	2,52	2,44	2,37	2,31	2,47	2,44	2,37	2,36
EER	4	4,96	5,02	5,01	4,22	4,61	4,6	4,5	4,69	4,75	4,3
EER	5	3,95	3,85	4,01	3,44	3,55	3,7	3,66	3,66	3,6	3,6
<b>HEATING</b>											
Heat output	6 kW	26	30,4	34,7	40,3	45,4	49	57,7	65,5	69,7	80
Compressor power input	kW	7,7	9	10,4	12,2	14	15,3	18,3	20,9	22,5	26,1
Total power input	2 kW	8,4	9,6	11	13,6	15,3	16,6	19,7	22,2	23,9	28,8
COP		3,1	3,16	3,15	2,96	2,96	2,95	2,92	2,95	2,91	2,77
<b>COMPRESSOR</b>											
Type of compressors		SCROLL									
No. of Compressors	Nr	2									
Std Capacity control steps	Nr	3									
Refrigerant charge	Nr	1									
Refrigerant circuits (C1)	7 kg	12	12	12	15	15	15	20	20	20	22
<b>INTERNAL EXCHANGER</b>											
Type of internal exchanger	8	PHE									
No. of internal exchangers	Nr	1									
Water flow rate	l/s	1,1	1,2	1,4	1,6	1,8	2	2,3	2,6	2,8	3,3
Useful pump discharge head	kPa	148	140	135	190	187	185	175	169	160	103
Water content	7 l	1,7	2	2,4	2,6	3,1	3,4	3,8	4,4	4,4	5,5
<b>EXTERNAL EXCHANGER</b>											
Quantity	Nr	2									
<b>EXTERNAL SECTION FANS</b>											
Type of fans	9	AX									
Number of fans	Nr	2	2	2	4	4	4	6	6	6	6
Standard air flow	l/s	3056	3056	3056	4125	4125	4125	6120	6120	6120	7800
Installed unit power	kW	0,22	0,22	0,22	0,15	0,15	0,15	0,15	0,15	0,15	0,19
<b>HYDRAULIC CIRCUIT</b>											
Max water side pressure	kPa	550									
Safety valve calibration	kPa	600									
<b>EXPANSION VESSEL</b>											
Expansion vessel capacity	l	5									
No. of expansion vessels	Nr	1									
<b>DIMENSIONS</b>											
Length	mm	1560	1560	1560	1595	1595	1595	2130	2130	2130	2160
Depth	mm	678	678	678	1107	1107	1107	1107	1107	1107	1107
Height	mm	1367	1367	1367	1570	1570	1570	1570	1570	1570	1570
<b>STANDARD UNIT WEIGHTS</b>											
Shipping weight	kg	310	315	320	440	470	490	560	580	600	660
Operating weight	kg	330	335	340	460	490	510	580	600	620	670

(1) data referred to the following conditions :

internal exchanger water = 12/7°C  
ambient temperature = 35°C

(2) The total input is given by the compressor input + fans power input + pump power input - proportional part of the water pump to supply the available head to installation input

(3) 100% EER  
internal exchanger water supply temperature = 7°C  
outside air temperature 35°C

(4) 66% EER

internal exchanger water supply temperature = 10°C  
ambient temperature = 28°C

(5) 33% EER  
internal exchanger water supply temperature = 13°C  
ambient temperature = 25°C

(6) data referred to the following conditions :  
ambient temperature = 7°C (RH = 85%)  
external exchanger water supply temperature 45°C

(7) approximate values

(8) PHE = plates

(9) AX = axial-flow fan

### CUT-OUT AND CONTROL SETTINGS

		Opens	Closes		
High pressure switch	(kPa)	2750	2000		
Low pressure switch	(kPa)	230	360	Max compressor starts/hour	(n°) 10
Antifreeze protection	(°C)	4	5,5	Safety discharge thermostat	(°C) 120

**Note:** The safety "high pressure switch" and "safety discharge thermostat" must be reset manually from the control unit. The "low pressure switch" resets automatically. In some units the safety discharge thermostat is internal to the compressor.

### OPERATING LIMITS (COOLING)

SIZE			82	102	122	142	162	182	202	222	242	282
<b>EXTERNAL EXCHANGER</b>												
Max air intake temperature	1	°C	48	46.5	44.5	46.5	45	43.5	46	45	43.5	44.5
Max air intake temperature	2	°C	53	51	50	50.5	49.5	48	51	49	48	49.5
Min. air intake temperature	3	°C						-10				
<b>INTERNAL EXCHANGER</b>												
Max water return temperature	4	°C						24				
Min. water supply temperature	5	°C						4				

### OPERATING LIMITS (HEATING)

SIZE			82	102	122	142	162	182	202	222	242	282
<b>EXTERNAL EXCHANGER</b>												
Max air temperature return (WB)	6	°C						18				
Min air return temperature (W.B.)	7	°C						-7				
<b>INTERNAL EXCHANGER</b>												
Min. water supply temperature		°C						28				
Max water supply temperature	8	°C						53				

Water thermal head (min / max) are indicated in the section INTERNAL EXCHANGER  
**PRESSURE DROP**  
 Warning: the still air condition is meant as absence of air flow to the unit. Any wind condition can let air pass through the condenser coil thus worsening the operating limits of the unit (see limits with air speed at 0,5 m/s & 1 m/s).  
 internal exchanger water = 12/7°C  
**ATTENTION: IN CASE OF PREDOMINANT WINDS, WINDBREAK BARRIERS ARE NECESSARY.**

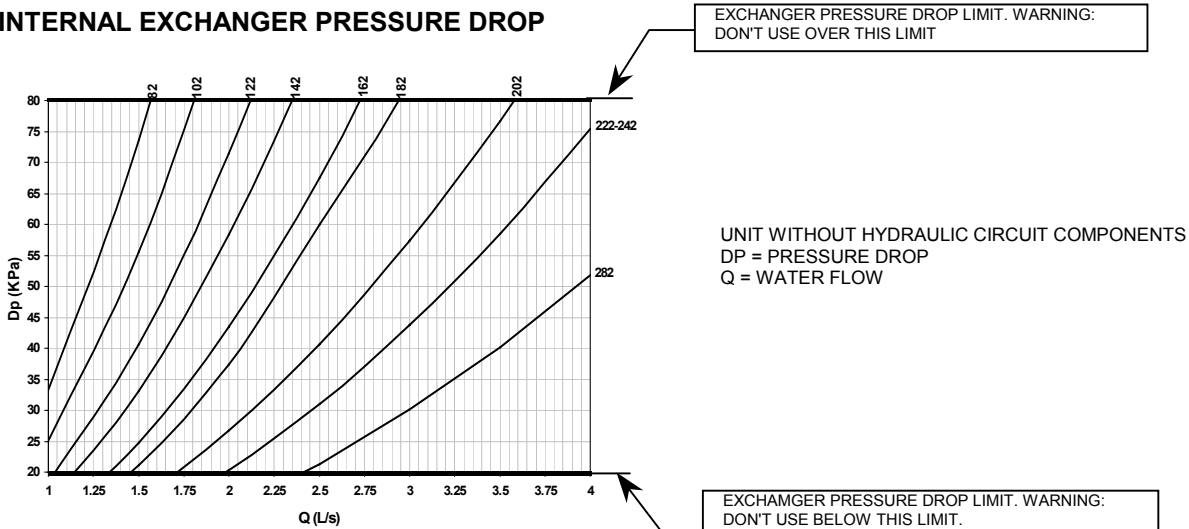
- (1) unit at full load: internal exchanger water 12/7°C
- (2) internal exchanger water = 12/7°C capacity-controlled unit (automatic capacity control)
- (3) internal exchanger water = 12/7°C external exchanger air in quiet
- (4) this limit can be exceeded for brief and transitory periods with automatic capacity control of the unit: the maximum limit is 30°C.
- (5) antifreeze set-point
- (6) unit at full load supply water internal exchanger 45°C
- (7) supply water internal exchanger 45°C
- (8) ambient temperature = 7°C (RH = 85%)

### SOUND LEVELS

Size	Sound Power Level (dB)								Sound pressure level dB(A)	Sound power level dB(A)
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000		
82	84	87	75	71	68	65	62	46	60	75
102	80	84	75	73	69	63	60	42	59	75
122	80	76	73	73	71	65	62	43	59	75
142	87	80	74	73	71	69	62	63	60	77
162	87	81	76	73	70	69	62	62	60	77
182	84	78	78	74	69	70	62	55	60	77
202	86	79	78	77	72	67	62	54	61	78
222	86	81	80	76	70	71	62	62	61	78
242	86	82	81	75	70	73	63	65	62	79
282	86	82	81	75	70	73	63	65	64	81

**Nota:**  
 Measures according to ISO 3744 regulations, with respect to the EUROVENT 8/1 certification.  
 the sound levels refer to the unit at full load, in the rated test conditions.  
 The sound pressure level refers to a distance of 1m from the external surface of the units operating in an open field.  
 data referred to the following conditions :  
 internal exchanger water = 12/7°C

### INTERNAL EXCHANGER PRESSURE DROP



SIZE		23	26	30	35	39	41	50	56	60	70
Minimum flow	l/s	0,7	0,8	1,05	1,2	1,3	1,45	1,75	2	2	2,8
Maximum flow	l/s	1,45	1,75	2,05	2,30	2,75	2,90	3,55	4	4	4