Unical

HEAT PUMPS

Unical® AG S.p.A.

In 1972, on the initiative of the young engineer Giovanni Jahier, Unical was born, to design and produce civil and industrial thermal groups for heating, has, subsequently, expanded its operating field, including air conditioning systems, thermal solar systems, integrated and hybrid systems, heat pumps, radiant panels, etc., coming to have one of the most complete catalogs in the entire sector.
The company, which still belongs to the Jahier family, has always had, and continues to have, among its priorities, a real attention to the “quality of life”, i.e. more comfort, greater safety, lower energy consumption, high respect for the environment and people.

Made In Italy is the focus of Unical.

4 the locations distributed on the national territory, between production and logistics, strategically connected and highly advanced for automation and robotization of the construction phases.

Wall and floor-standing boilers are built in the Caorso plant, both traditional and condensing (up to 1,500 kW); whilst in the Borgocarbonara’s plant biomass boilers and steel units for fan assisted burners (up to 7,000 kW), as well as the industrial line, known for high-efficiency special boilers by virtue of special patented heat exchange pipes, which includes hot / superheated water boilers, up to 22,000 kW and generators up to 25,000 kg/h of steam.

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HEAT PUMPS

JAN. 2021 n° 01

Unical

PROFESSIONAL

INDUSTRIAL

DOMESTIC

BIOMASS

SOLAR

INTEGRATED SYSTEMS

HEAT PUMPS

AIR CONDITIONING

RADIANT SYSTEMS

CONTENTS

HEAT PUMPS

CONTENTS

HEAT PUMPS

CONTENTS

HEAT PUMPS

HP_OWER ONE R

ULTRA COMPACT, NOISELESS, HIGH EFFICIENCY AIR-WATER HEAT PUMP FOR HEATING/COOLING AND EXTERNAL D.H.W. PRODUCTION FULL INVERTER – PRE-ASSEMBLED HYDRONIC KIT						
OUTPUT RANGE	7 to 18 kW / in cascade up to 126 kW (18 kW x 7)					
ENERGY CLASS	COP up to 4,85 according EN14511 EER up to 5,40 according EN14511					
REFRIGERANT	R32					
FLOW TEMPERATURE	up to 60°C					
OPERATION	up to -20°C					
MODELS HP_OWER ONE R	70R-70RK	90R-90RK	120R-120RK	140R-140RK	160RT-160RTK	180R -180RK
FAN MOTORS n°	1 DC Inverter Brushless	1 DC Inverter Brushless	1 DC Inverter Brushless	2 DC Inverter Brushless	2 DC Inverter Brushless	2 DC Inverter Brushless
ELECTRICAL SUPPLY	Single-phase	Single-phase	Single-phase	Single-phase	Three-phase	Three-phase
COMPRESSOR	Low absorption and noise DC Inverter Twin Rotary					
INTEGRAL PUMP	Inverter with high efficiency brushless motor					

FEATURES

Ultra-compact, ENBLOC, silent, high efficiency Air-Water heat pump for installations of heating/cooling and domestic hot water production for residential and commercial applications.

FULL INVERTER 5D" technology: HP_OWER ONE is designed with DC INVERTER TWIN ROTARY compressor, DC Brushless variable speed fan motors, electronic expansion valve with modulating actuator, integrated hydronic kit with high efficiency circulator. In modulation mode, this "FULL INVERTER" system allows optimized delivery of the necessary thermal power, obtaining significant reductions in energy consumption, increased seasonal efficiency and greater comfort when compared to common inverter systems.

- **DC INVERTER TWIN ROTARY compressor**
  Low absorption, double compression chamber and double balanced rotor, guarantee of limited vibrations and noise emissions, continuous progressive DC Inverter modulation, HP Super Silence insulation (dBa reduction - 5%), mounted on rubber shock-absorbers, complete with thermal protection and electric crankcase heater
- **Fan Motors DC INVERTER Brushless**
  High efficiency, continuous progressive air flow modulation DC Inverter for a greater precision in the delivery of temperature to the exchanger and a reduction in defrosting cycles, equipped with integrated thermal protection and rubber anti-vibration joints
- **Air / refrigerant exchanger in copper pipes with aluminium fins**
  Exclusive profile to reduce air side pressure drops and allow reduced ventilation speeds, GOLD FIN anti-corrosion treatment to achieve a high degree of protection against acidic rains, salt spray and the conferment of hydrophilic properties
- **Thermo-assisted and modulating Electronic valve for refrigerant regulation**
  Continuous control of overheating to increase product performance
- **Microprocessor control logic**
  with wide "Full Inverter" modulation.
  Simultaneous adjustment of compressor, circulator and fan timings to increase the performance and efficiency of the condensing unit.
- **Simple and quick maintenance** via USB peripheral Unit for updating the firmware of the electronic control board and configuration parameters to and from the heat pump. Made in Italy technology
- **Water / refrigerant plate heat exchanger**
  In high-efficiency stainless steel, patented, for the heat exchange water / R32 refrigerant, equipped with an anti-freeze protection probe that can activate the circulator even when the machine is off
- **High efficiency INVERTER circulator with Brushless motor**
  Programmable operating mode: continuous, on request from thermoregulator, from thermoregulator with periodic activation, from auxiliary integration source; configurable antifreeze pump function
- **PREASSEMBLED Hydronic Kit**
  consisting of: INVERTER circulator, 6 bar safety valve, air vent valve, protection flow switch, pressure gauge, sockets
- **Integrated digital regulator**
  User interface for monitoring, control, real-time maintenance of the Heat Pump parameters and complete system configuration, accessible through a transparent polycarbonate door with IP 67 protection degree
- **Standard RS-485 serial interface** for communication with control and supervision devices via Modbus-RTU communication protocol
- **"Maximum Hz" function**, to increase the cooling and heating capacity by 10%
- **D.H.W. Production** via storage tank / dedicated external storage tank
- **Automatic management of additional electric heater** for DHW storage tank
- **Management of auxiliary integration source** with integrated climate control
- **Double Set Point**
  Regulation of two different temperatures for both heating and cooling, and optimization of consumption
- **Thermoregulation supplied as Standard,** with modulating flow temperature management, dynamic set point with settable climatic curve and work with system modulating flow temperature (pre-assembled external air temperature probe)
- **Management with 0 ÷ 10 Volt** external control unit (optional)
- **Management with external ON / OFF chrono-thermostat** (optional)
- **Automatic defrost function**
- **System deaeration function**, with forcing of the circulator at maximum speed to facilitate maintenance operations
- **Autorestart**
- **Self-diagnosis**
  Presence of protection and control devices for the hydraulic circuit, refrigeration circuit, condensing unit, electric unit on the machine with centralized management of the diagnostic logic and signalling of any operating anomalies, phase controller (for units with three-phase power supply)
- **Version K: pre-assembled anti-freeze kit**, for heat exchangers, low absorption heating cables on the crankcase of the air / refrigerant exchanger, with automatic management and pre-wired electrical connection.
  Electric heating elements anti-freeze in PET, applied to the plates of the water / refrigerant exchanger

ADJUSTMENT ACCESSORIES (OPTIONAL)

- **TOUCH SCREEN_N remote control**
  Remote management of the heat pump, the network of heat pumps in cascade and the system with integrated functions
- **KTsmart chrono-thermostat**
  Hot / cold, touch screen, Wi-Fi, summer / winter switch, voice assistance, geolocation

OTHER ACCESSORIES (OPTIONAL)

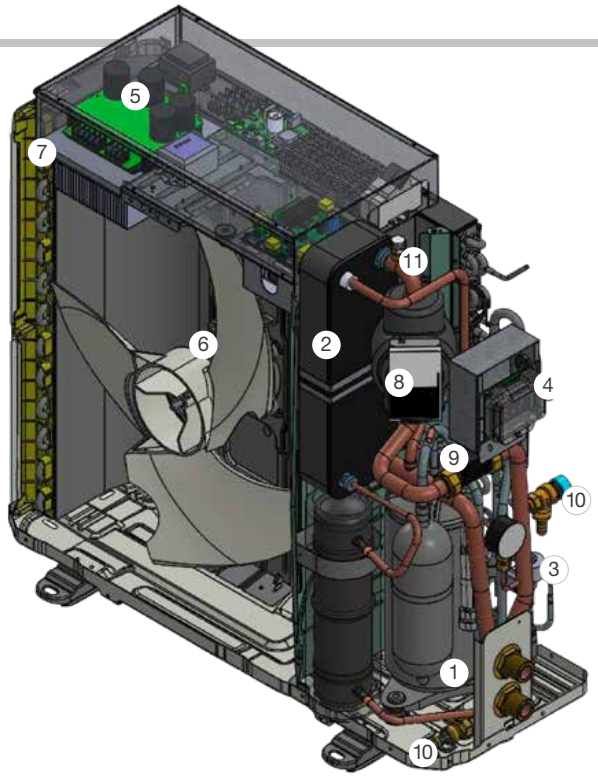
- **D.H.W. storage preparation Kit**
  NTC probe, motorized 3-way valve with 1" connections for (HP_OWER ONE 70R / RK-90R / RK) and 1" 1/4 connections for (HP_OWER ONE 120R / RK-140R / RK-160RT / RTK-180R / RK)
- **Antivibration kit**
  4 rubber anti-vibration shock absorber that can be inserted at the base of the unit to dampen any vibrations
- **Antifreeze and pure anti-corrosive fluid**

MAIN COMPONENTS

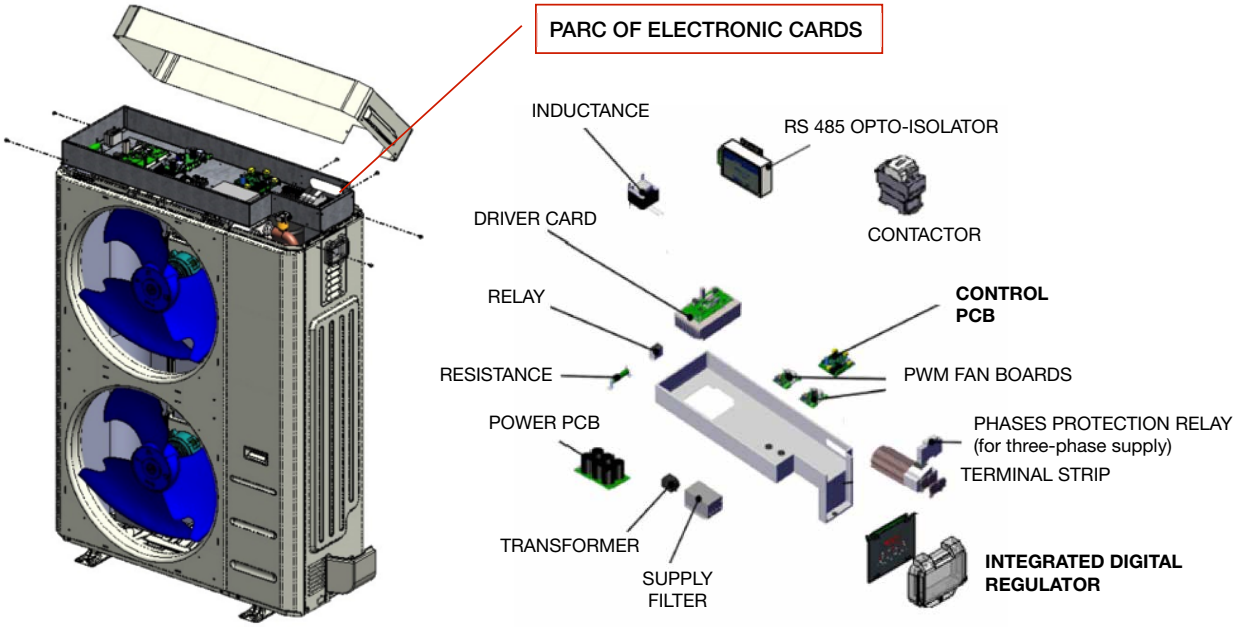
1. DC INVERTER TWIN ROTARY compressor
2. Stainless steel plate heat exchanger water / refrigerant
3. Electronic refrigerant regulation valve
4. Integrated digital controller and system configurator
5. Parc of electronic cards
6. DC INVERTER Brushless Fan Motor
7. Air / refrigerant heat exchanger

PREASSEMBLED Hydronic Kit consisting of:

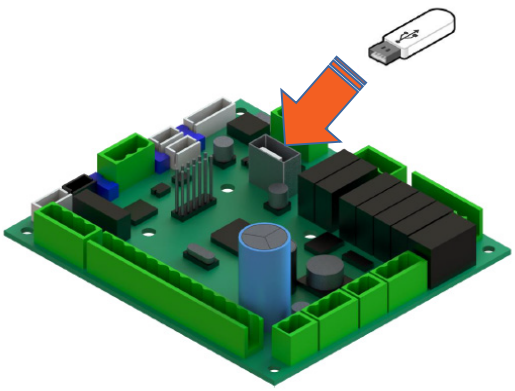
8. INVERTER circulator with high efficiency brushless motor
9. Protection flow switch
10. Group of 6 bar safety valve, pressure gauge and service tap and sockets
11. Air vent valve



ELECTRIC PANEL BOARD: EASY ACCESS



CONTROL PCB



PROGRAMMABLE

FAST UPDATINGS VIA USB PERIPHERAL UNIT:

- **firmware** updating
- transfer of system **configuration parameters from and to heating pump**
- implementation of **new logics** in relation to specific requests / installation areas

PERFORMANCE DATA

HP_OWER ONE			70R-70RK	90R-90RK	120R-120RK	140R-140RK	160RT-160RTK	180R-180RK
Cooling	Cooling power min/nom/max (1)	kW	4,82 / 6,18 / 6,80*	4,91 / 7,72 / 8,49*	6,41 / 11,60 / 12,76*	9,17 / 14,00 / 14,70*	9,20 / 15,80 / 16,59*	9,09 / 17,10 / 17,96*
	Absorbed power (1)	kW	1,28	1,76	2,79	2,59	3,15	3,59
	E.E.R. (1)	W/W	4,82	4,38	4,16	5,40	5,02	4,76
	Cooling power min/nom/max (2)	kW	3,20 / 5,02 / 5,52*	3,80 / 6,08 / 6,69*	4,55 / 8,51 / 9,36*	6,87 / 11,48 / 12,05*	5,99 / 13,80 / 14,49*	6,86 / 15,04 / 15,79*
	Absorbed power (2)	kW	1,60	1,99	2,79	3,53	4,38	4,88
	E.E.R. (2)	W/W	3,14	3,05	3,05	3,25	3,15	3,08
	SEER (5)	W/W	4,12	4,25	4,25	4,62	4,80	4,91
Heating	Heating power min/nom/max (3)	kW	3,95 / 6,08 / 6,99*	3,95 / 7,81 / 8,98*	5,33 / 11,80 / 13,57*	7,54 / 14,10 / 15,23*	7,36 / 16,30 / 17,60*	7,30 / 17,90 / 19,33*
	Absorbed power (3)	kW	1,35	1,78	2,73	2,91	3,49	4,07
	C.O.P. (3)	W/W	4,51	4,38	4,32	4,85	4,67	4,40
	Heating power min/nom/max (4)	kW	3,82 / 5,88 / 6,76*	3,80 / 7,58 / 8,72*	5,13 / 11,47 / 13,19*	7,23 / 13,56 / 14,64*	7,06 / 15,77 / 17,03*	7,02 / 17,32 / 18,71*
	Absorbed power (min/nom/max 4)	kW	1,66	2,17	3,33	3,55	4,24	4,92
	C.O.P. (4)	W/W	3,54	3,50	3,44	3,82	3,72	3,52
	SCOP (6)	W/W	4,46	4,46	4,47	4,48	4,49	4,46
	Energy efficiency water 35°C / 55°C	Class	A+++/A++	A+++/A++	A+++/A++	A+++/A++	A+++/A++	A+++/A++

Performance referring to the following conditions:

(1) Cooling: external air temperature 35°C; water temperature in / out 23/18°C
(2) Cooling: external air temperature 35°C; water temperature in / out 12/7°C
(3) Heating: external air temperature 7°C d.b. 6°C w.b.; water temp. in / out 30/35°C
(4) Heating: external air temperature 7°C d.b. 6°C w.b.; water temp. in / out 40/45°C
(5) Cooling: in / out water temperature 12/7°C
(6) Heating: average climatic conditions; Tbiv = -7°C; water temp. in / out 30/35°C
(*) by activating the “Maximum Hz” function

N.B. The yields declared in points (1), (2), (3) and (4) are to be understood as referring to the instantaneous power according to EN 14511.
The data declared in points (5) and (6) is determined according to EN 14825.

CORRECTIVE FACTORS

WATER / REFRIGERANT PLATE EXCHANGER DIRT

Fouling factor [m² °C / kW]	Correction factor for power output	Correction factor for power consumption
0,44 x 10-1	1,00	1,00
0,88 x 10-1	0,99	1,00
1,76 x 10-1	0,98	1,00

ALTITUDE

The performance correction factors, as a function of altitude, are calculated for cooling under conditions (2) and for heating under conditions (3) of the previous technical data tables.

Altitude [m]	500	1000	1500	2000
Correction factor Thermal output	0,9964	0,9941	0,9888	0,9869
Corrective factor Power absorbed in heating	0,9931	0,9841	0,9853	0,9755
Corrective factor Cooling output	0,9888	0,9762	0,9618	0,9466
Correction factor Power absorbed in cooling	1,0106	1,0235	1,0386	1,0560

PERFORMANCE DATA

HEATING EFFICIENCY TABLES

The tables show the values of heating power, absorbed power and COP at various external air temperature conditions referred to instantaneous power according to EN 14511.

Model	Outside air T [°C]	Tout [°C]																				
		25			30			35			40			45			50			55		
		Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Thermal power [kW]	COP [W/W]
70R 70RK	-15	5,88	1,95	3,02	5,82	2,13	2,74	5,85	2,33	2,51	5,84	2,56	2,28	5,91	2,72	2,17	-	-	-	-	-	-
	-10	5,95	1,77	3,35	5,87	1,94	3,02	5,82	2,11	2,76	5,82	2,35	2,48	5,83	2,50	2,33	5,83	2,76	2,11	5,84	2,90	2,01
	-7	5,96	1,67	3,57	5,92	1,84	3,22	6,00	2,10	2,86	5,86	2,19	2,67	5,85	2,39	2,44	5,89	2,62	2,25	5,84	2,87	2,03
	-2	5,95	1,45	4,10	5,89	1,64	3,60	5,92	1,84	3,22	5,77	1,97	2,93	5,86	2,20	2,67	5,78	2,36	2,45	5,76	2,65	2,17
	2	5,92	1,23	4,79	5,93	1,39	4,26	6,07	1,59	3,82	5,85	1,75	3,34	5,77	1,88	3,06	6,00	2,17	2,76	5,99	2,32	2,58
	7	6,21	1,05	5,93	6,13	1,19	5,14	6,08	1,35	4,51	6,04	1,53	3,93	5,88	1,66	3,54	6,07	1,93	3,15	6,03	2,14	2,82
	12	6,68	0,91	7,37	6,65	1,07	6,22	6,57	1,25	5,25	6,55	1,41	4,64	6,53	1,63	4,02	6,38	1,79	3,56	6,31	1,98	3,19
90R 90RK	-15	6,50	2,18	2,98	6,49	2,39	2,72	6,48	2,60	2,49	6,48	2,79	2,32	6,44	2,94	2,19	-	-	-	-	-	-
	-10	6,63	2,02	3,29	6,60	2,19	3,01	6,59	2,44	2,70	6,52	2,63	2,48	6,48	2,79	2,32	6,52	3,02	2,16	6,53	3,34	1,96
	-7	6,64	1,90	3,50	6,64	2,09	3,17	6,60	2,29	2,88	6,49	2,42	2,68	6,57	2,71	2,42	6,51	2,88	2,26	6,54	3,13	2,09
	-2	6,70	1,69	3,97	6,66	1,86	3,59	6,56	2,07	3,17	6,53	2,29	2,86	6,55	2,46	2,67	6,52	2,69	2,42	6,49	2,99	2,17
	2	6,70	1,42	4,73	6,74	1,62	4,17	6,61	1,77	3,72	6,59	1,96	3,37	6,58	2,13	3,08	6,60	2,35	2,81	6,67	2,63	2,53
	7	7,74	1,32	5,86	7,78	1,54	5,05	7,81	1,78	4,38	7,70	1,97	3,91	7,58	2,17	3,50	7,55	2,40	3,15	7,55	2,65	2,85
	12	8,27	1,17	7,10	8,27	1,37	6,04	8,16	1,56	5,22	8,09	1,78	4,55	7,98	1,97	4,05	7,87	2,20	3,57	7,79	2,45	3,18
120R 120RK	-15	8,983	3,063	2,93	9,012	3,362	2,68	8,937	3,625	2,47	8,974	3,915	2,29	9,025	4,254	2,12	-	-	-	-	-	-
	-10	8,95	2,76	3,25	8,93	3,07	2,91	8,86	3,29	2,70	8,92	3,65	2,44	8,83	3,88	2,27	8,71	4,12	2,11	8,85	4,52	1,96
	-7	9,01	2,59	3,47	8,93	2,83	3,15	8,90	3,12	2,85	8,85	3,39	2,61	8,91	3,73	2,39	8,75	3,96	2,21	8,85	4,34	2,04
	-2	9,54	2,43	3,92	9,50	2,73	3,48	9,40	2,98	3,16	9,45	3,41	2,77	9,25	3,55	2,61	9,19	3,90	2,36	9,15	4,18	2,19
	2	10,24	2,20	4,66	10,16	2,44	4,17	10,30	2,78	3,71	10,38	3,12	3,33	10,39	3,45	3,02	10,05	3,65	2,75	10,19	4,09	2,49
	7	12,01	2,13	5,63	11,89	2,40	4,95	11,80	2,73	4,32	11,71	3,03	3,87	11,47	3,33	3,44	11,46	3,69	3,11	11,37	4,10	2,78
	12	12,49	1,75	7,12	12,39	2,07	5,99	12,28	2,38	5,15	12,11	2,70	4,48	11,97	3,04	3,94	11,84	3,40	3,48	11,67	3,72	3,14
140R 140RK	-15	10,87	3,72	2,92	10,80	4,05	2,66	10,81	4,37	2,47	10,77	4,78	2,25	10,82	5,29	2,05	-	-	-	-	-	-
	-10	10,70	3,23	3,31	10,65	3,55	3,00	10,64	3,90	2,73	10,65	4,27	2,49	10,50	4,55	2,31	10,48	4,93	2,13	10,28	5,12	2,01
	-7	10,90	3,01	3,62	10,78	3,31	3,26	10,70	3,63	2,95	10,72	4,00	2,68	10,65	4,36	2,44	10,68	4,83	2,21	10,58	5,05	2,09
	-2	11,24	2,65	4,25	11,47	3,08	3,72	11,38	3,41	3,34	11,25	3,73	3,02	11,17	4,08	2,74	11,11	4,43	2,51	10,98	4,72	2,33
	2	12,43	2,41	5,16	12,54	2,81	4,46	13,02	3,24	4,02	12,50	3,46	3,62	12,69	3,92	3,24	12,40	4,21	2,95	12,40	4,57	2,71
	7	14,26	2,24	6,36	14,09	2,56	5,51	14,10	2,91	4,85	13,87	3,23	4,30	13,56	3,55	3,82	13,62	4,00	3,41	13,44	4,35	3,09
	12	15,00	1,83	8,20	14,88	2,18	6,83	14,74	2,48	5,94	14,58	2,83	5,15	14,43	3,19	4,52	14,14	3,53	4,00	13,96	3,92	3,56
160RT 160RTK	-15	10,28	3,62	2,84	10,22	4,00	2,56	10,22	4,33	2,36	10,19	4,62	2,20	10,78	5,32	2,03	-	-	-	-	-	-
	-10	11,85	3,71	3,20	11,84	4,07	2,91	11,79	4,42	2,67	11,75	4,82	2,44	11,61	5,15	2,25	11,64	5,56	2,09	11,30	5,88	1,92
	-7	12,30	3,56	3,45	12,19	3,90	3,13	12,00	4,20	2,86	11,99	4,61	2,60	11,86	4,86	2,44	11,80	5,33	2,21	11,79	5,75	2,05
	-2	12,68	3,18	3,99	12,88	3,57	3,61	12,81	3,97	3,23	12,65	4,30	2,94	12,56	4,68	2,68	12,45	5,07	2,45	12,39	5,51	2,25
	2	14,03	2,90	4,83	14,17	3,29	4,30	14,05	3,62	3,88	14,04	4,02	3,49	14,36	4,59	3,13	14,10	4,91	2,87	14,15	5,44	2,60
	7	16,58	2,74	6,05	16,39	3,09	5,30	16,30	3,49	4,67	16,13	3,90	4,13	15,77	4,24	3,72	15,84	4,77	3,32	15,63	5,18	3,02
	12	16,42	2,08	7,91	16,29	2,45	6,65	16,13	2,79	5,77	15,95	3,18	5,02	15,79	3,57	4,43	15,47	3,94	3,93	15,27	4,35	3,51
180R 180RK	-15	11,71	4,045	2,89	11,79	4,486	2,63	11,79	4,901	2,41	11,84	5,262	2,25	12,06	5,79	2,08	-	-	-	-	-	-
	-10	12,20	3,82	3,19	12,19	4,18	2,91	12,27	4,62	2,66	11,81	4,79	2,47	12,03	5,31	2,26	12,08	5,76	2,10	11,40	6,05	1,88
	-7	12,93	3,77	3,43	12,53	4,03	3,11	12,61	4,46	2,83	12,41	4,77	2,60	12,46	5,26	2,37	12,29	5,58	2,20	12,30	6,04	2,04
	-2	13,78	3,58	3,85	13,50	3,86	3,49	13,59	4,32	3,15	13,44	4,68	2,87	13,35	5,09	2,62	13,27	5,57	2,38	13,14	5,96	2,21
	2	14,94	3,21	4,66	14,73	3,53	4,17	15,12	3,97	3,81	14,99	4,45	3,37	14,90	4,89	3,05	14,62	5,31	2,76	14,73	5,60	2,63
	7	18,13	3,23	5,62	18,03	3,65	4,94	17,90	4,07	4,40	17,64	4,52	3,91	17,32	4,92	3,52	17,32	5,45	3,18	17,25	5,99	2,88
	12	18,66	2,62	7,13	18,48	3,03	6,10	18,26	3,45	5,29	18,11	3,89	4,65	17,69	4,27	4,14	17,57	4,76	3,69	17,33	5,24	3,31

PERFORMANCE DATA

COOLING EFFICIENCY TABLES

The tables show the values of cooling power, absorbed power and EER at various external air temperature conditions, referred to instantaneous power according to EN 14511.

Model	Outside air T [°C]	Tout [°C]																	
		5			7			10			12			15			18		
		Cooling power [kW]	Absorbed power [kW]	EER [W/W]	Cooling power [kW]	Absorbed power [kW]	EER [W/W]	Cooling power [kW]	Absorbed power [kW]	EER [W/W]	Cooling power [kW]	Absorbed power [kW]	EER [W/W]	Cooling power [kW]	Absorbed power [kW]	EER [W/W]	Cooling power [kW]	Absorbed power [kW]	EER [W/W]
70R 70RK	20	4,91	1,00	4,90	5,26	1,02	5,13	5,80	1,00	5,80	5,91	0,89	6,61	6,08	0,74	8,26	6,50	0,72	8,98
	25	4,92	1,20	4,10	5,26	1,20	4,40	5,82	1,23	4,75	5,88	1,09	5,39	5,98	0,89	6,70	6,38	0,88	7,22
	30	4,86	1,39	3,49	5,19	1,41	3,69	5,75	1,43	4,03	5,81	1,29	4,51	5,90	1,08	5,47	6,32	1,09	5,81
	35	4,70	1,58	2,98	5,02	1,60	3,14	5,55	1,63	3,40	5,64	1,49	3,79	5,78	1,28	4,54	6,18	1,28	4,82
	40	4,42	1,72	2,57	4,72	1,76	2,69	5,23	1,79	2,92	5,32	1,65	3,23	5,46	1,43	3,82	5,83	1,44	4,05
	45	4,14	1,86	2,22	4,42	1,90	2,32	4,90	1,96	2,51	4,99	1,80	2,77	5,13	1,57	3,27	5,48	1,59	3,45
90R 90RK	20	6,16	1,34	4,62	6,58	1,34	4,91	7,26	1,34	5,43	7,43	1,22	6,09	7,68	1,05	7,34	8,24	1,04	7,90
	25	6,17	1,56	3,96	6,59	1,59	4,15	7,28	1,60	4,55	7,42	1,47	5,06	7,62	1,27	6,02	8,19	1,30	6,33
	30	6,02	1,78	3,39	6,43	1,81	3,55	7,08	1,85	3,82	7,24	1,71	4,23	7,49	1,51	4,97	8,00	1,53	5,24
	35	5,61	1,97	2,86	6,08	1,99	3,05	6,71	2,04	3,28	6,92	1,92	3,60	7,25	1,74	4,17	7,72	1,76	4,38
	40	5,33	2,14	2,50	5,71	2,18	2,62	6,26	2,24	2,80	6,49	2,11	3,07	6,84	1,93	3,54	7,29	1,95	3,73
	45	5,03	2,30	2,19	5,36	2,35	2,28	5,91	2,42	2,44	6,12	2,30	2,66	6,42	2,11	3,05	6,85	2,14	3,20
120R 120RK	20	8,60	1,89	4,54	9,17	1,85	4,96	10,06	1,84	5,48	10,26	1,71	5,99	10,55	1,53	6,91	11,64	1,54	7,56
	25	8,35	2,09	3,99	8,97	2,14	4,20	10,04	2,16	4,65	10,29	2,05	5,01	10,66	1,89	5,64	11,71	1,89	6,20
	30	8,30	2,43	3,42	8,80	2,41	3,66	9,79	2,49	3,94	10,08	2,37	4,26	10,51	2,19	4,80	11,47	2,21	5,19
	35	7,78	2,74	2,84	8,51	2,79	3,05	9,60	2,86	3,36	10,06	2,82	3,57	10,74	2,75	3,90	11,60	2,79	4,16
	40	7,62	3,02	2,52	8,17	3,07	2,66	8,99	3,15	2,85	9,45	3,11	3,03	10,14	3,06	3,32	10,88	3,10	3,51
	45	7,21	3,29	2,19	7,52	3,33	2,26	8,34	3,42	2,44	8,79	3,39	2,59	9,46	3,35	2,82	10,27	3,41	3,01
140R 140RK	20	10,39	2,02	5,14	11,33	2,05	5,53	12,30	2,02	6,08	13,14	1,87	7,04	14,40	1,64	8,81	15,60	1,61	9,71
	25	10,78	2,51	4,30	11,61	2,51	4,62	12,74	2,55	5,01	13,25	2,30	5,76	14,02	1,93	7,26	15,05	1,89	7,98
	30	11,19	3,07	3,65	12,04	3,19	3,77	13,10	3,23	4,05	13,34	2,85	4,69	13,71	2,27	6,05	14,76	2,26	6,53
	35	10,88	3,48	3,13	11,48	3,53	3,25	12,77	3,59	3,56	12,89	3,19	4,04	13,07	2,58	5,06	14,00	2,59	5,40
	40	10,25	3,80	2,70	10,94	3,88	2,82	11,93	3,96	3,02	12,10	3,53	3,43	12,35	2,89	4,28	13,25	2,91	4,55
	45	9,58	4,12	2,32	10,18	4,20	2,43	11,21	4,30	2,61	11,33	3,86	2,94	11,52	3,19	3,61	12,44	3,23	3,86
160RT 160RTK	20	12,14	2,42	5,02	12,85	2,38	5,39	14,08	2,34	6,03	14,48	2,12	6,83	15,08	1,80	8,40	16,23	1,75	9,26
	25	12,14	2,86	4,24	12,91	2,83	4,56	14,30	2,90	4,93	14,54	2,61	5,58	14,89	2,17	6,87	16,00	2,12	7,54
	30	12,80	3,60	3,55	13,59	3,62	3,75	15,00	3,65	4,11	14,89	3,23	4,62	14,73	2,59	5,69	16,02	2,60	6,16
	35	12,86	4,32	2,98	13,80	4,38	3,15	15,05	4,49	3,35	14,94	3,94	3,79	14,77	3,11	4,75	15,80	3,15	5,02
	40	12,17	4,70	2,59	13,10	4,80	2,73	14,21	4,91	2,90	14,11	4,33	3,26	13,95	3,47	4,02	14,96	3,50	4,28
	45	11,43	5,07	2,26	12,23	5,17	2,37	13,55	5,34	2,54	13,33	4,72	2,82	13,01	3,80	3,42	14,04	3,86	3,64
180R 180RK	20	13,37	2,68	5,00	14,24	2,72	5,23	15,63	2,72	5,75	15,78	2,42	6,51	16,01	1,98	8,09	17,39	1,99	8,73
	25	13,70	3,30	4,15	14,82	3,41	4,35	16,19	3,38	4,80	16,18	3,03	5,34	16,17	2,52	6,42	17,51	2,49	7,04
	30	14,06	4,00	3,52	15,01	4,11	3,65	16,29	4,00	4,07	16,17	3,58	4,51	16,00	2,95	5,42	17,33	2,99	5,80
	35	14,26	4,81	2,96	15,04	4,88	3,08	16,67	5,01	3,33	16,34	4,43	3,69	15,85	3,56	4,46	17,10	3,59	4,76
	40	13,39	5,21	2,57	14,33	5,32	2,69	15,77	5,47	2,88	15,37	4,86	3,16	14,78	3,94	3,76	16,17	4,00	4,05
	45	12,63	5,63	2,25	13,36	5,73	2,33	14,82	5,92	2,50	14,51	5,28	2,75	14,04	4,33	3,25	15,18	4,40	3,45

PERFORMANCE DATA

DATA FOR THE ENERGY CERTIFICATION OF BUILDINGS ACCORDING TO UNI / TS 11300-4

Key:

T_{design}	Project temperature (for the A - average climate, defined by UNI EN 14825 equal to -10 ° C)
A, B, C, D	Reference operating conditions for performance evaluation according to UNI EN 14825
T_{air}	Reference external air temperature
T_{water}	Water Heating water flow temperature
PLR	Partial Load Ratio - climatic load factor
DC	Declared Capacity - power of the heat pump in operating conditions A, B, C, D
COP_{DC}	COP of the heat pump referred to in nominal DC conditions
COP_{PL}	COP of the heat pump in the partialization conditions defined by the UNI EN 14825 standard

HP_OWER ONE 70R-70RK

Operating limits

COLD SOURCE	EXTERNAL AIR	
Operating temperature (cut-off)	min	-20°C
	max	30°C

HOT SOURCE	WATER	
Operating temperature (cut-off)	min	25°C
	max	60°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat output [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	6,0	5,85	5,84
2	6,07	5,77	5,99
7	6,08	5,88	6,03
12	6,57	6,53	6,31

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	2,86	2,44	2,03
2	3,82	3,06	2,58
7	4,51	3,54	2,82
12	5,25	4,02	3,19

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	6,12	6,07	3,68	3,16	3,69
COP_{PL}		2,73	2,96	4,36	5,56	7,88
COP_{DC}		2,76	2,86	3,82	4,51	5,25

Performances

35°C		
SCOP	ηS	Energy Class
4,46	175%	A+++

PERFORMANCE DATA

HP_OWER ONE 90R-90RK

Operating limits

COLD SOURCE	EXTERNAL AIR	
Operating temperature (cut-off)	min	-20°C
	max	30°C

HOT SOURCE	WATER	
Operating temperature (cut-off)	min	25°C
	max	60°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat output [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	6,6	6,57	6,54
2	6,61	6,58	6,67
7	7,81	7,58	7,55
12	8,16	7,98	7,79

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	2,88	2,42	2,09
2	3,72	3,08	2,53
7	4,38	3,50	2,85
12	5,22	4,05	3,18

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	6,52	6,52	3,97	3,14	3,67
COP_{PL}		2,70	2,95	4,37	5,55	7,86
COP_{DC}		2,70	2,88	3,72	4,38	5,22

Performances

35°C		
SCOP	ηS	Energy Class
4,46	176%	A+++

PERFORMANCE DATA

HP_OWER ONE 120R-120RK

Operating limits

COLD SOURCE	EXTERNAL AIR	
Operating temperature (cut-off)	min	-20°C
	max	30°C

HOT SOURCE	WATER	
Operating temperature (cut-off)	min	25°C
	max	60°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat output [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	8,9	8,91	8,85
2	10,3	10,39	10,19
7	11,8	11,47	11,37
12	12,28	11,97	11,67

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	2,85	2,39	2,04
2	3,71	3,02	2,49
7	4,32	3,44	2,78
12	5,15	3,94	3,14

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	8,82	8,86	5,39	4,27	4,86
COP_{PL}		2,64	2,88	4,31	5,82	7,81
COP_{DC}		2,70	2,85	3,71	4,32	5,15

Performances

35°C		
SCOP	ηS	Energy Class
4,47	176%	A+++

PERFORMANCE DATA

HP_OWER ONE 140R-140RK

Operating limits

COLD SOURCE	EXTERNAL AIR	
Operating temperature (cut-off)	min	-20°C
	max	30°C

HOT SOURCE	WATER	
Operating temperature (cut-off)	min	25°C
	max	60°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat output [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	10,7	10,65	10,58
2	13,02	12,69	12,40
7	14,1	13,56	13,44
12	14,74	14,43	13,96

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	2,95	2,44	2,09
2	4,02	3,24	2,71
7	4,85	3,82	3,09
12	5,94	4,52	3,56

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	10,52	10,71	6,52	5,78	6,68
COP_{PL}		2,69	2,98	4,20	5,98	8,16
COP_{DC}		2,73	2,95	4,02	4,85	5,94

Performances

35°C		
SCOP	ηS	Energy Class
4,48	176%	A+++

PERFORMANCE DATA

HP_OWER ONE 160RT-160RTK

Operating limits

COLD SOURCE	EXTERNAL AIR	
Operating temperature (cut-off)	min	-20°C
	max	30°C

HOT SOURCE	WATER	
Operating temperature (cut-off)	min	25°C
	max	60°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat output [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	12,0	11,86	11,79
2	14,05	14,36	14,15
7	16,3	15,77	15,63
12	16,13	15,79	15,27

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	2,86	2,44	2,05
2	3,88	3,13	2,60
7	4,67	3,72	3,02
12	5,77	4,43	3,51

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	11,69	11,95	7,27	5,70	6,67
COP_{PL}		2,60	2,88	4,33	5,83	8,12
COP_{DC}		2,67	2,86	3,88	4,67	5,77

Performances

35°C		
SCOP	ηS	Energy Class
4,49	177%	A+++

PERFORMANCE DATA

HP_OWER ONE 180R-180RK

Operating limits

COLD SOURCE	EXTERNAL AIR	
Operating temperature (cut-off)	min	-20°C
	max	30°C

HOT SOURCE	WATER	
Operating temperature (cut-off)	min	25°C
	max	60°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat output [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	12,61	12,46	12,30
2	15,12	14,90	14,73
7	17,9	17,32	17,25
12	18,26	17,69	17,33

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	2,83	2,37	2,04
2	3,81	3,05	2,63
7	4,40	3,52	2,88
12	5,29	4,14	3,31

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	12,75	12,83	7,81	5,75	6,66
COP_{PL}		2,59	2,83	4,34	5,67	7,94
COP_{DC}		2,66	2,83	3,81	4,40	5,29

Performances

35°C		
SCOP	ηS	Energy Class
4,46	175%	A+++

PERFORMANCE DATA

COOLING OUTPUT TABLES AT PARTIAL LOADS ACCORDING TO UNI / TS 11300-3

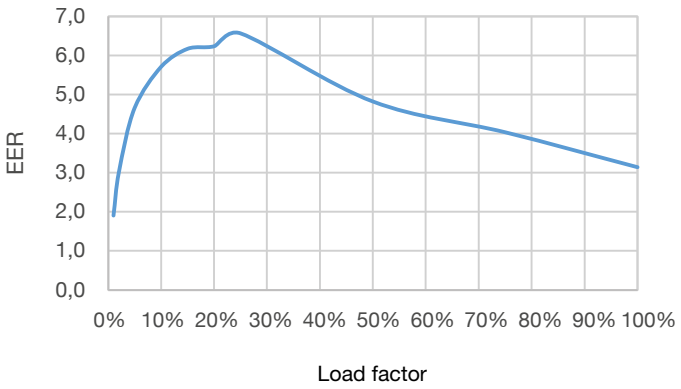
The EER values are reported at various partial load percentages in the reference conditions according to UNI / TS 11300-3

Test	Load factor	Dry bulb outdoor air temperature	Chilled water temperature in/out of fan coils
1	100%	35	12/7
2	75%	30	(*)/7
3	50%	25	(*)/7
4	25%	20	(*)/7

(*) temperature determined by the water flow at full load EERs are also provided for load factors below 25%

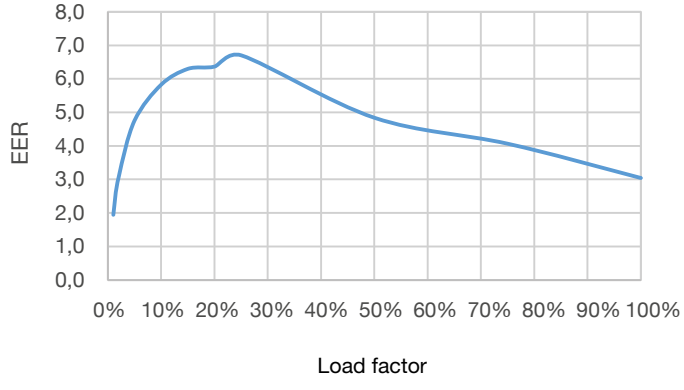
HP_OWER ONE 70R-70RK		
Dry bulb outdoor air temperature [°C]	Load factor	EER
35	100%	3,14
30	75%	4,03
25	50%	4,82
20	25%	6,57
C	Load factor	EER @20°C x C
0,95	20%	6,24
0,94	15%	6,17
0,87	10%	5,71
0,71	5%	4,66
0,46	2%	3,02
0,29	1%	1,90

EER at partial load HP_OWER ONE 70R - 70RK



HP_OWER ONE 90R-90RK		
Dry bulb outdoor air temperature [°C]	Load factor	EER
35	100%	3,05
30	75%	4,07
25	50%	4,84
20	25%	6,70
C	Load factor	EER @20°C x C
0,95	20%	6,37
0,94	15%	6,30
0,87	10%	5,83
0,71	5%	4,76
0,46	2%	3,08
0,29	1%	1,94

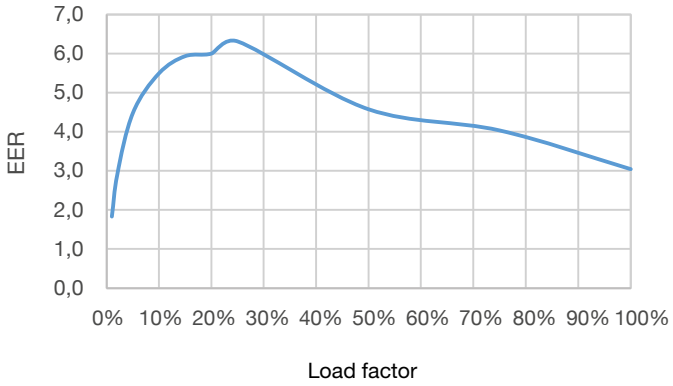
EER at partial load HP_OWER ONE 90R - 90RK



PERFORMANCE DATA

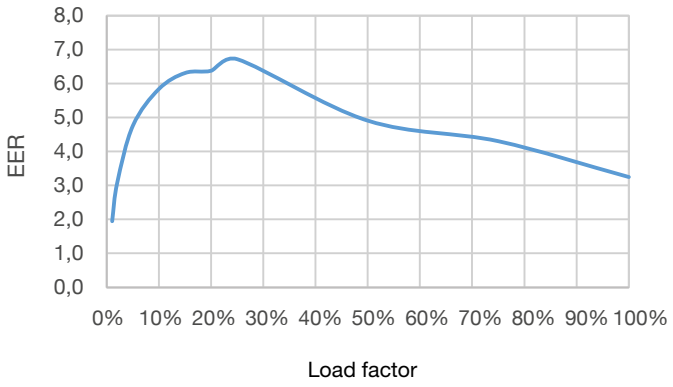
HP_OWER ONE 120R-120RK		
Dry bulb outdoor air temperature [°C]	Load factor	EER
35	100%	3,05
30	75%	4,03
25	50%	4,58
20	25%	6,32
C	Load factor	EER @20°C x C
0,95	20%	6,00
0,94	15%	5,94
0,87	10%	5,50
0,71	5%	4,49
0,46	2%	2,91
0,29	1%	1,83

EER at partial load HP_OWER ONE 120R - 120RK



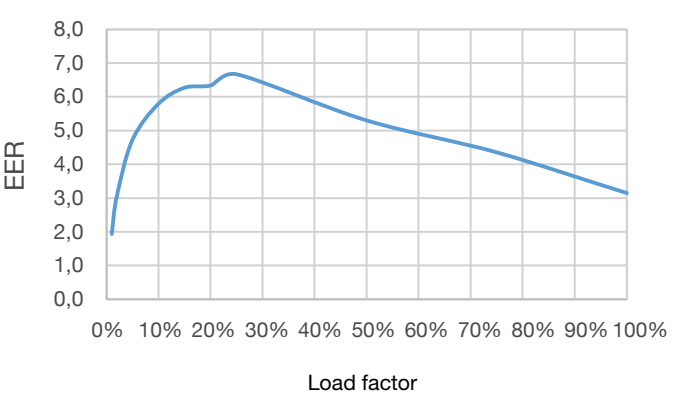
HP_OWER ONE 140R-140RK		
Dry bulb outdoor air temperature [°C]	Load factor	EER
35	100%	3,25
30	75%	4,31
25	50%	4,91
20	25%	6,72
C	Load factor	EER @20°C x C
0,95	20%	6,38
0,94	15%	6,31
0,87	10%	5,84
0,71	5%	4,77
0,46	2%	3,09
0,29	1%	1,95

EER at partial load HP_OWER ONE 140R - 140RK



HP_OWER ONE 160RT-160RTK		
Dry bulb outdoor air temperature [°C]	Load factor	EER
35	100%	3,15
30	75%	4,36
25	50%	5,30
20	25%	6,67
C	Load factor	EER @20°C x C
0,95	20%	6,34
0,94	15%	6,27
0,87	10%	5,80
0,71	5%	4,73
0,46	2%	3,07
0,29	1%	1,93

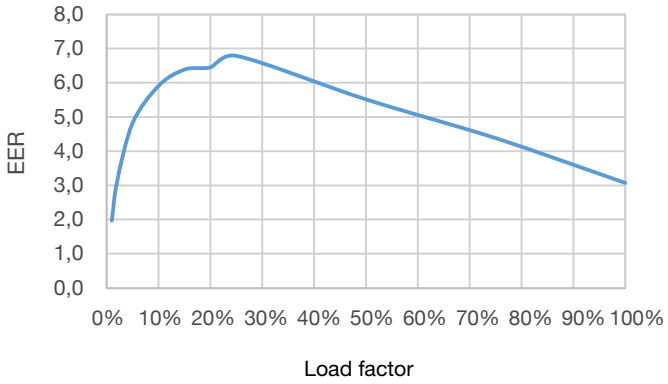
EER at partial load HP_OWER ONE 160RT - 160RTK



PERFORMANCE DATA

HP_OWER ONE 180R-180RK		
Dry bulb outdoor air temperature [°C]	Load factor	EER
35	100%	3,08
30	75%	4,38
25	50%	5,52
20	25%	6,80
C	Load factor	EER @20°C x C
0,95	20%	6,46
0,94	15%	6,39
0,87	10%	5,91
0,71	5%	4,83
0,46	2%	3,13
0,29	1%	1,97

EER at partial load HP_OWER ONE 180R - 180RK



YIELD TABLES IN DOMESTIC HOT WATER PRODUCTION MODE DURING THE SUMMER SEASON

The tables show the values of Thermal power, Absorbed power and COP at various external air temperature conditions during the summer season for technical water at 45/50/55 °C for the purpose of producing domestic hot water. The data shown are indicative and may be subject to change. They always refer to the instantaneous power according to EN 14511.

HEATING										
Model	Outside air temperature ° C	Tout [°C]								
		45			50			55		
		Heating output kW	Absorbed power kW	COP W/W	Heating output kW	Absorbed power kW	COP W/W	Heating output kW	Absorbed power kW	COP W/W
70R 70RK	20	6,13	1,33	4,61	6,04	1,49	4,04	5,95	1,66	3,59
	25	6,19	1,20	5,16	6,11	1,36	4,48	6,01	1,52	3,94
	30	6,39	1,12	5,70	6,34	1,29	4,90	6,23	1,47	4,25
	35	6,58	1,05	6,27	6,45	1,21	5,34	-	-	-
90R 90RK	20	7,66	1,71	4,47	7,58	1,94	3,91	7,50	2,15	3,49
	25	7,76	1,55	4,99	7,73	1,76	4,40	7,60	2,02	3,76
	30	8,17	1,50	5,46	8,10	1,72	4,71	8,03	1,94	4,14
	35	8,55	1,44	5,93	8,43	1,65	5,12	-	-	-
120R 120RK	20	10,55	2,35	4,50	10,43	2,62	3,97	10,27	2,92	3,52
	25	10,30	2,03	5,08	10,15	2,27	4,46	9,99	2,58	3,87
	30	10,73	1,93	5,56	10,49	2,18	4,82	10,38	2,46	4,22
	35	11,25	1,82	6,17	11,08	2,11	5,25	-	-	-
140R 140RK	20	14,22	2,61	5,46	14,06	2,93	4,80	13,87	3,25	4,27
	25	14,47	2,27	6,37	14,27	2,57	5,55	14,01	2,86	4,90
	30	15,45	2,06	7,51	15,08	2,38	6,33	14,84	2,69	5,52
	35	16,19	1,90	8,51	15,90	2,21	7,19	-	-	-
160RT 160RTK	20	14,94	2,79	5,35	14,77	3,13	4,72	14,57	3,48	4,19
	25	14,74	2,31	6,39	14,54	2,64	5,50	14,28	2,94	4,86
	30	15,77	2,18	7,23	15,39	2,46	6,27	15,15	2,76	5,50
	35	16,56	1,98	8,35	16,26	2,25	7,23	-	-	-
180R 180RK	20	16,99	3,53	4,82	16,59	3,89	4,26	16,45	4,32	3,81
	25	16,92	3,06	5,54	16,62	3,42	4,86	16,32	3,81	4,28
	30	17,89	2,88	6,20	17,58	3,26	5,39	17,29	3,63	4,76
	35	18,83	2,72	6,93	18,63	3,14	5,94	-	-	-

Attention: The production of A.C.S. must take place in a suitable boiler with heat exchanger or in a rapid producer.

PRODUCT DATA SHEETS ACCORDING TO EU REGULATION 811/2013

Product data sheet for low temperature application (Twater = 35°C)

HP_OWER ONE		70R 70RK	90R 90RK	120R 120RK	140R 140RK	160RT 160RTK	180R 180RK
Seasonal Energy Efficiency Class in space heating mode		A+++	A+++	A+++	A+++	A+++	A+++
Nominal output	average climatic conditions	7 kW	7 kW	10 kW	12 kW	14 kW	15 kW
	colder climatic conditions	9 kW	9 kW	12 kW	15 kW	16 kW	18 kW
	warmer climatic conditions	6 kW	7 kW	10 kW	13 kW	14 kW	15 kW
Seasonal Energy Efficiency In space heating mode	average climatic conditions	175 %	176 %	176 %	176 %	177 %	175 %
	colder climatic conditions	130 %	130 %	130 %	135 %	133 %	130 %
	warmer climatic conditions	210 %	207 %	210 %	233 %	233 %	220 %
Annual energy consumption	average climatic conditions	3179 kWh	3413 kWh	4631 kWh	5584 kWh	6210 kWh	6722 kWh
	colder climatic conditions	6497 kWh	6797 kWh	9145 kWh	10931 kWh	11885 kWh	13000 kWh
	warmer climatic conditions	1523 kWh	1684 kWh	2588 kWh	2944 kWh	3188 kWh	3624 kWh
Annual energy consumption in terms of final energy	average climatic conditions	8085 kWh	8652 kWh	11776 kWh	14198 kWh	15789 kWh	17092 kWh
	colder climatic conditions	16616 kWh	17384 kWh	23387 kWh	27936 kWh	30382 kWh	33251 kWh
	warmer climatic conditions	3863 kWh	4270 kWh	6562 kWh	7456 kWh	8073 kWh	9183 kWh
S.C.O.P.	average climatic conditions	4,46	4,46	4,47	4,48	4,49	4,46
	colder climatic conditions	3,33	3,33	3,34	3,44	3,40	3,32
	warmer climatic conditions	5,32	5,25	5,32	5,91	5,89	5,57
Indoor unit sound power level L_{WA}		-	-	-	-	-	-
Outdoor unit sound power level L_{WA}		64 dB(A)	64 dB(A)	65 dB(A)	68 dB(A)	68 dB(A)	68 dB(A)

PRODUCT DATA SHEETS ACCORDING TO EU REGULATION 811/2013

Product data sheet for low temperature application (Twater = 55°C)

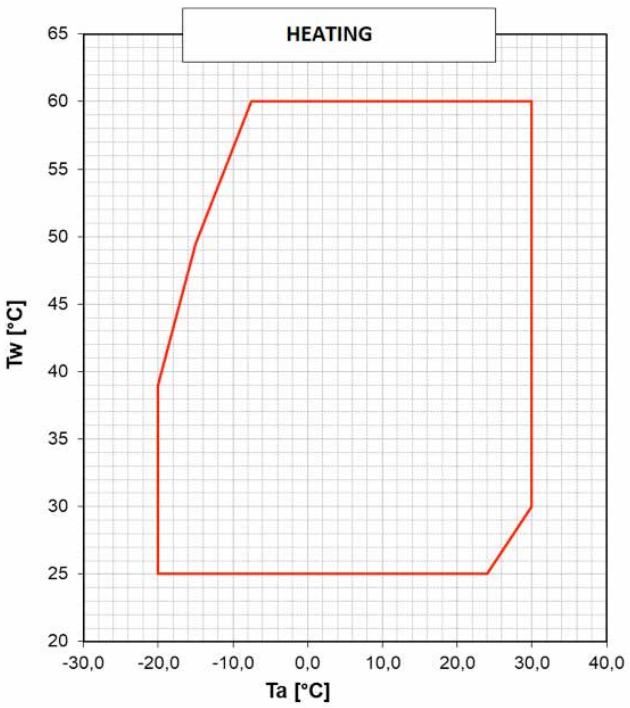
HP_OWER ONE		70R 70RK	90R 90RK	120R 120RK	140R 140RK	160RT 160RTK	180R 180RK
Seasonal Energy Efficiency Class in space heating mode		A++	A++	A++	A++	A++	A++
Nominal output	average climatic conditions	7 kW	7 kW	10 kW	12 kW	13 kW	14 kW
	colder climatic conditions	8 kW	9 kW	12 kW	15 kW	16 kW	17 kW
	warmer climatic conditions	6 kW	7 kW	10 kW	12 kW	14 kW	15 kW
Seasonal Energy Efficiency In space heating mode	average climatic conditions	126 %	128 %	131 %	130 %	126 %	131 %
	colder climatic conditions	92 %	108 %	108 %	107 %	110 %	108 %
	warmer climatic conditions	153 %	155 %	156 %	173 %	172 %	163 %
Annual energy consumption	average climatic conditions	4191 kWh	4496 kWh	5942 kWh	7260 kWh	8359 kWh	8660 kWh
	colder climatic conditions	8785 kWh	7861 kWh	10688 kWh	13132 kWh	13817 kWh	14996 kWh
	warmer climatic conditions	2155 kWh	2247 kWh	3434 kWh	3774 kWh	4193 kWh	4689 kWh
Annual energy consumption in terms of final energy	average climatic conditions	10728 kWh	11503 kWh	15195 kWh	18570 kWh	21395 kWh	22145 kWh
	colder climatic conditions	22677 kWh	20196 kWh	27463 kWh	33748 kWh	35481 kWh	38531 kWh
	warmer climatic conditions	5492 kWh	5726 kWh	8750 kWh	9598 kWh	10664 kWh	11938 kWh
S.C.O.P.	average climatic conditions	3,21	3,27	3,36	3,31	3,22	3,36
	colder climatic conditions	2,38	2,78	2,78	2,76	2,84	2,78
	warmer climatic conditions	3,91	3,94	3,98	4,40	4,38	4,16
Indoor unit sound power level L_{WA}		-	-	-	-	-	-
Outdoor unit sound power level L_{WA}		64 dB(A)	64 dB(A)	65 dB(A)	68 dB(A)	68 dB(A)	68 dB(A)

OPERATING TEMPERATURES

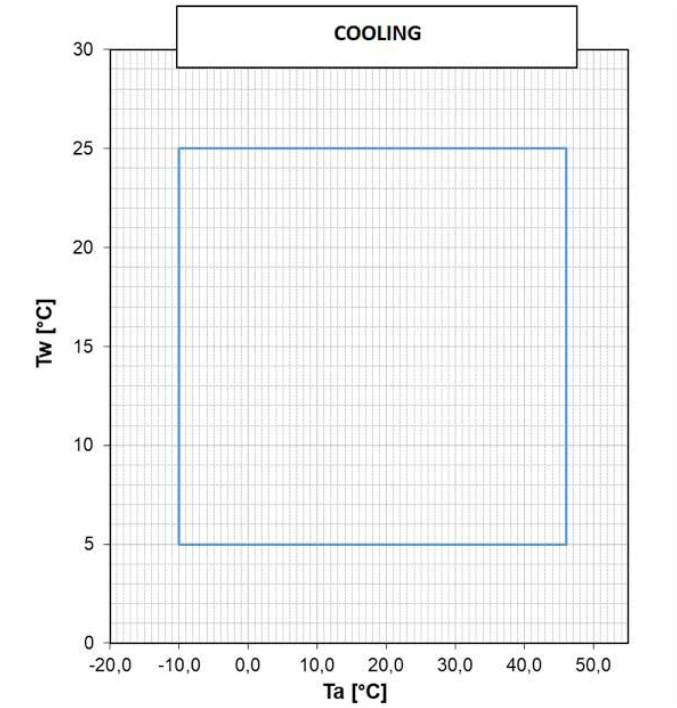
The Heat Pumps are designed in the following external air temperature conditions:

- in heating and DHW production mode, with external air temperature from -20 °C to + 40 °C
- in cooling mode, with condensation control, with an external air temperature between -10 °C and + 46°C

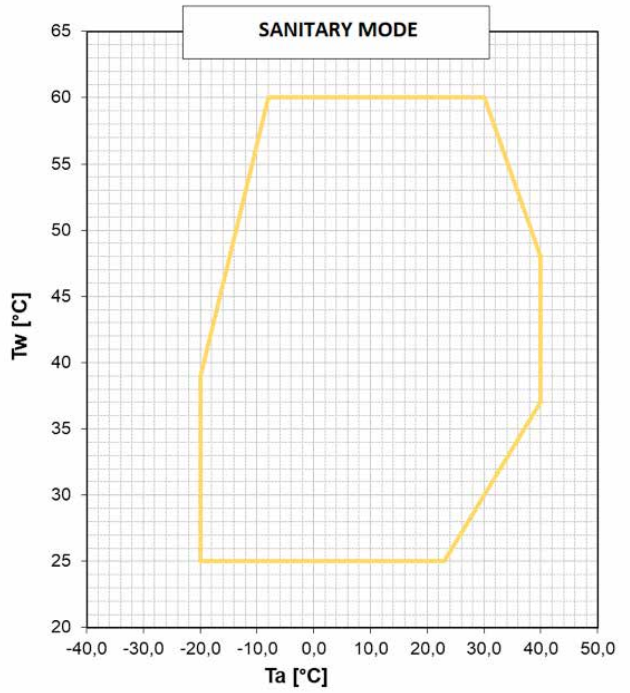
HEATING MODE



COOLING MODE



D.H.W. PRODUCTION MODE



COOLING Mode	
Outdoor air temperature	Minimum -10°C Maximum +46°C
Outlet water temperature	Minimum +5°C Maximum +25°C
HEATING Mode	
Outdoor air temperature	Minimum -20°C Maximum +30°C
Outlet water temperature	Minimum +25°C Maximum +60°C
D.H.W. HEATING Mode	
Outdoor air temperature with water at 39°C maximum	Minimum -20°C Maximum +40°C
Outdoor air temperature with water at 55°C maximum	Minimum -10°C Maximum +35°C
Outlet water temperature	Minimum +25°C Maximum +60°C

REFRIGERANT CIRCUIT

HP_OWER ONE			70R-70RK	90R-90RK	120R-120RK	140R-140RK	160RT-160TTK	180R-180RK
Compressor	Type		Twin Rotary DC Inverter	Twin Rotary DC Inverter	Twin Rotary DC Inverter	Twin Rotary DC Inverter	Twin Rotary DC Inverter	Twin Rotary DC Inverter
	Refrigerant oil (type)		ESTEL OIL RB74AF	ESTEL OIL RB74AF	ESTEL OIL VG74	ESTEL OIL VG74	ESTEL OIL VG74	ESTEL OIL VG74
	Number of compressors		1	1	1	1	1	1
	Oil charge (Q.ty)	l	0,67	0,67	1	1,4	1,4	1,4
	Refrigerant circuits		1	1	1	1	1	1
Refrigerant R32	Type		R32	R32	R32	R32	R32	R32
	Refrigerant charge (7)	kg	1,5	1,5	2,5	3,6	4	4
	Refrigerant quantity in tons of equivalent CO_2 (7)	ton	1,0	1,0	1,7	2,4	2,7	2,7
	Design pressure (high / low) in Heating mode	bar	42,8/1,3	42,8/1,3	42,8/1,3	42,8/1,3	42,8/1,3	42,8/1,3
	Design pressure (high / low) in Cooling mode	bar	42,8/3,5	42,8/3,5	42,8/3,5	42,8/3,5	42,8/3,5	42,8/3,5
Fan motor	Type		DC Brushless Motor	DC Brushless Motor	DC Brushless Motor	DC Brushless Motor	DC Brushless Motor	DC Brushless Motor
	Q.ty		1	1	1	2	2	2
Noise	Sound power Lw (8)	dB(A)	64	64	65	68	68	68
	Sound pressure at 1 meter distance dB(A) Lp1 (9)	dB(A)	49,8	49,8	50,4	52,7	52,7	52,7
	Sound pressure at 10 meter distance Lp10 (9)	dB(A)	32,8	32,8	33,7	36,6	36,6	36,6

Performances referred to the following conditions:

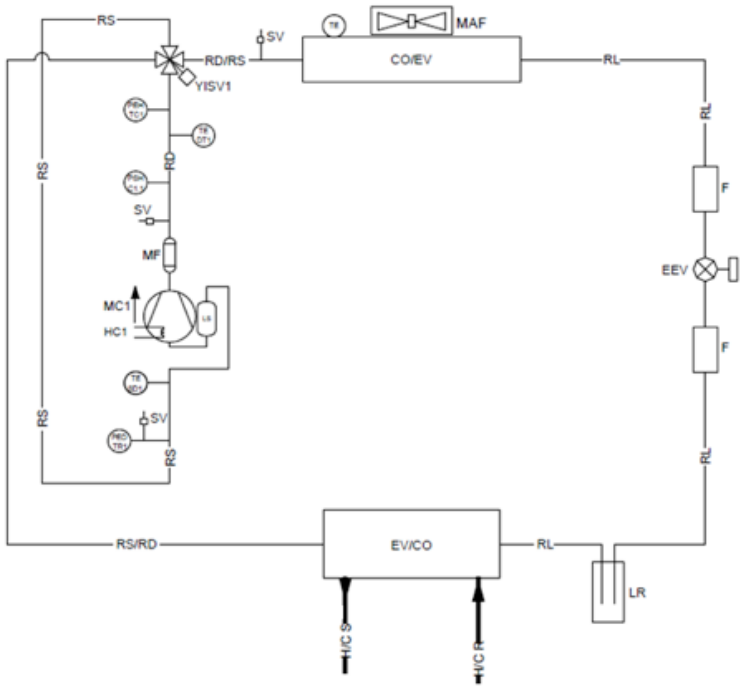
(1) Indicative data and subject to change. For the correct data, always refer to the technical label on the unit

(2) Sound power: unit at full load in heating mode according to the provisions of EU Regulation 813/2013 for medium and low temperature applications. Value determined on the basis of measurements carried out in accordance with the EN 12102-1: 2017 standard, used in conjunction with EN ISO 9614-2 which describes the test with intensity method. The tolerance on the value of the total sound power level is 2 dB (A).

(3) Sound pressure: value calculated from the sound power level using ISO 3744: 2010, considering the units in open field.

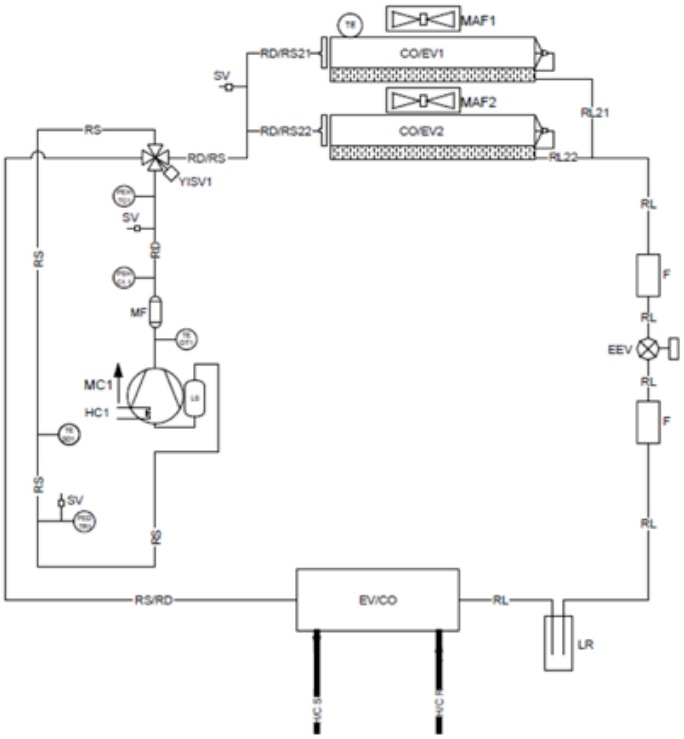
REFRIGERANT CIRCUIT

REFRIGERANT SCHEME FOR HP_OWER ONE 70R/70RK-90R/90RK-120R/120RK



MC	compressor
CO/EV	condenser (in chiller function)
EV/CO	evaporator ((in chiller function)
EEV	electronic expansion valve
YISV	4-way reverse cycle valve
LR	liquid receiver
F	filter
SV	charge connection
HC	crankcase resistance
MAF	axial fan
MF	muffler
LS	liquid separator
RS	suction line
RD	flow line
RL	liquid line
RD/RS	flow/suction line
RS/RD	suction/flow line
H/CR	user water outlet
H/CR	user water inlet
PEH TC	high pressure transducer
PED TR	low pressure transducer
TE	external air temperature probe
TE SD	suction line temperature probe
TE DT	compressor discharge temperature probe
PSH C	high pressure switch automatic reset

REFRIGERANT SCHEME FOR HP_OWER ONE 140R/140RK-160RT/160RTK-180R/180RK



MC	compressor
CO/EV	condenser (in chiller function)
EV/CO	evaporator (in chiller function)
EEV	electronic expansion valve
YISV	4-way reverse cycle valve
LR	liquid receiver
F	filter
SV	charge attack
HC	crankcase resistance
MAF	axial fan
MF	muffler
LS	liquid separator
RS	suction line
RD	delivery line
RL	liquid line
RD/RS	delivery / suction line
RS/RD	suction / delivery line
H/CR	user water outlet
H/CR	user water inlet
PEH TC	high pressure transducer
PED TR	low pressure transducer
TE	external air temperature probe
TE SD	suction line temperature probe
TE DT	compressor discharge temperature probe
PSH C	high pressure switch automatic reset

HYDRAULIC CIRCUIT

HP_OWER ONE			70R-70RK	90R-90RK	120R-120RK	140R-140RK	160RT-160RTK	180R-180RK
Cooling	Water flow rate (2)	l/s	0,24	0,28	0,41	0,55	0,66	0,71
	Exchanger pressure drops user side (2)	kPa	2,0	2,8	8,8	12,9	17,5	20,6
	Nominal useful head (2)	kPa	78,8	76,0	63,4	75,0	62,3	55,6
Heating	Water flow rate (4)	l/s	0,28	0,37	0,55	0,65	0,76	0,83
	Exchanger pressure drops user side (4)	kPa	2,1	3,3	13,1	13,0	17,6	21,0
	Nominal useful head (4)	kPa	75,8	66,3	43,4	63,6	48,5	37,3
Internal exchanger	Type of internal exchanger		A piastre	A piastre	A piastre	A piastre	A piastre	A piastre
	Q.ty of internal exchangers		1	1	1	1	1	1
	Water content	l	0,9	0,9	1,2	1,7	1,7	1,7
Hydraulic circuit	Water content of the hydronic circuit	l	1,4	1,4	1,8	3,0	3,0	3,0
	Maximum working pressure of the hydronic kit (calibration of safety valve)	bar	6	6	6	6	6	6
	Hydraulic connections	inch	1"M	1"M	1"M	1"M	1"M	1"M
	Minimum water volume	l	40	40	60	60	70	70
	Pump nominal power	kW	0,075	0,075	0,075	0,14	0,14	0,14
	Pump maximum power	kW	0,075	0,075	0,075	0,14	0,14	0,14
	Pump maximum absorbed current	A	0,38	0,38	0,38	1,10	1,10	1,10
	Pump Energy Efficiency Index (EEI)		≤ 0,21	≤ 0,21	≤ 0,21	≤ 0,23	≤ 0,23	≤ 0,23

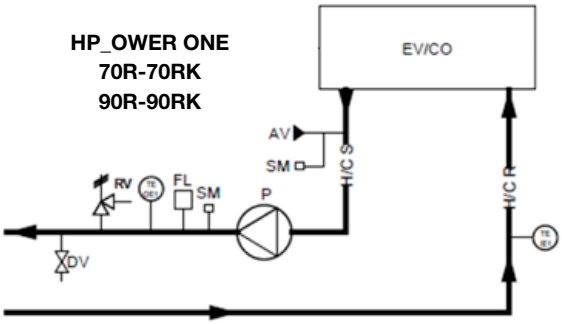
Performances referred to the following conditions:

(2) Cooling: external air temperature 35 °C; water temperature in / out 12/7 °C
(4) Heating: external air temperature 7 °C d.b. 6 °C w.b.; water temp. in / out 40/45 °C

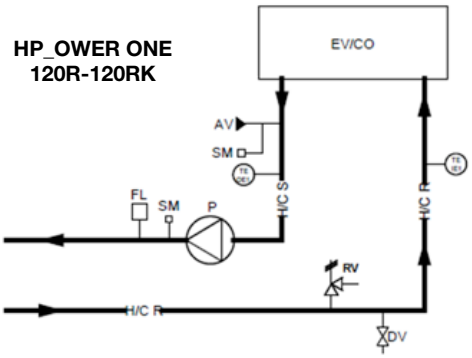
HYDRAULIC CIRCUIT

HYDRAULIC SCHEME

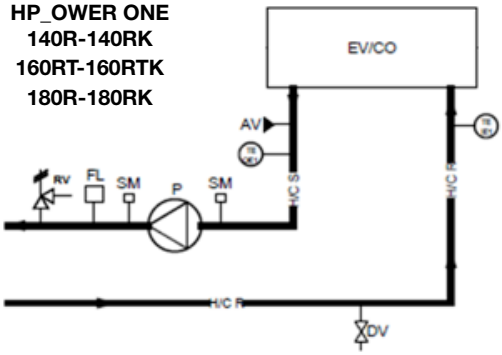
HP_OWER ONE
70R-70RK
90R-90RK



HP_OWER ONE
120R-120RK



HP_OWER ONE
140R-140RK
160RT-160RTK
180R-180RK



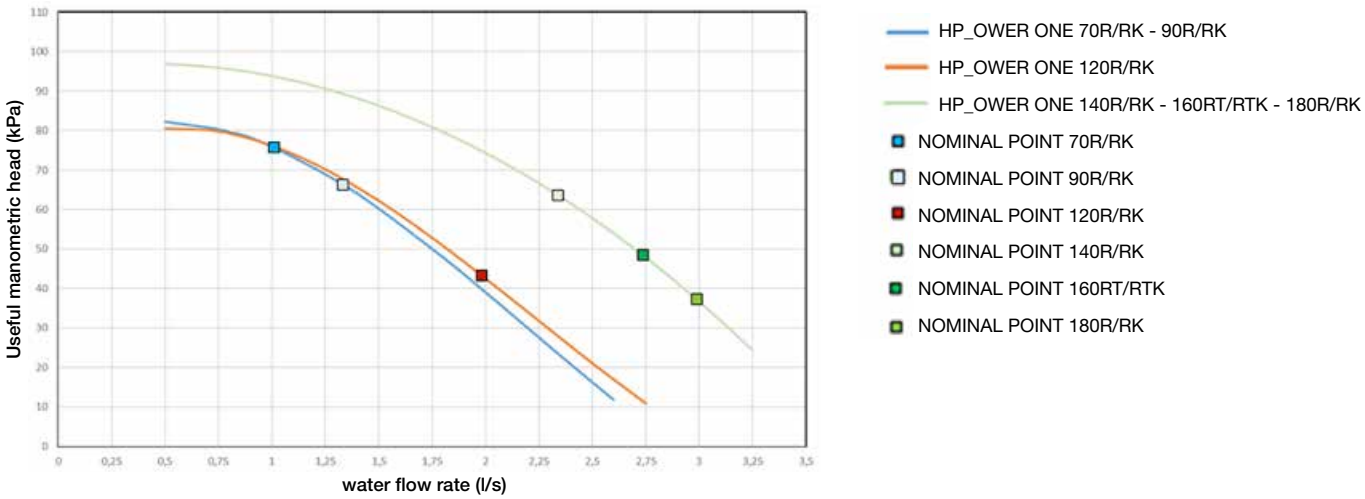
TE IE	User inlet temperature probe
TE OE	User outlet temperature probe
DV	Drain cock
RV	Safety valve
FL	Flowswitch
P	Pump
AV	Automatic air vent valve
SM	Service sleeve

CALIBRATION OF PROTECTION AND CONTROL DEVICES

Descrizione	Valore
Pressostato di alta pressione	42,8 bar
Allarme di alta pressione	41,5 bar
Allarme di bassa pressione	Dipende dall'unità
Numero massimo di ripartenze dopo allarme di alta/bassa pressione (reset manuale)	3
Protezione antigelo	Emissione allarme: 4 °C Rientro allarme: +7°C
Valvola di sicurezza del circuito idronico	6 bar

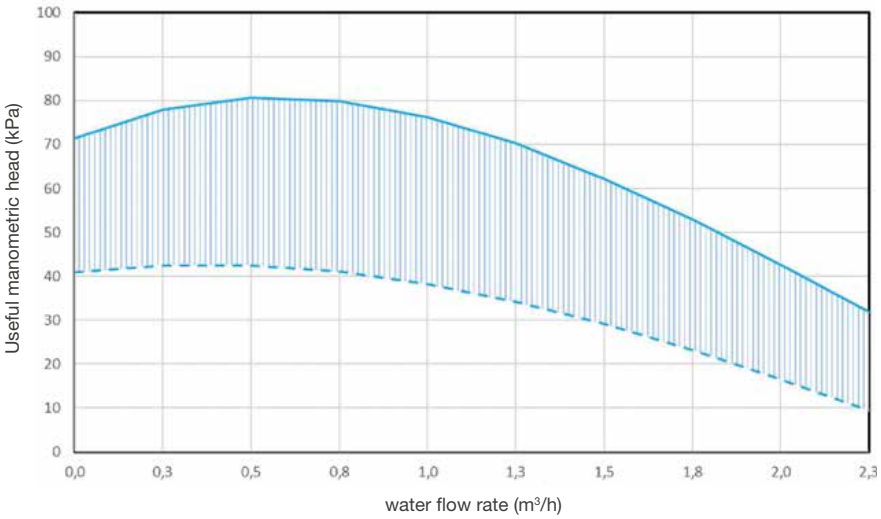
CALIBRATION OF PROTECTION AND CONTROL DEVICES

The system must be designed in such a way as to ensure the nominal flow rate related to the work points listed below (in the conditions specified in point (4) of the technical data table).

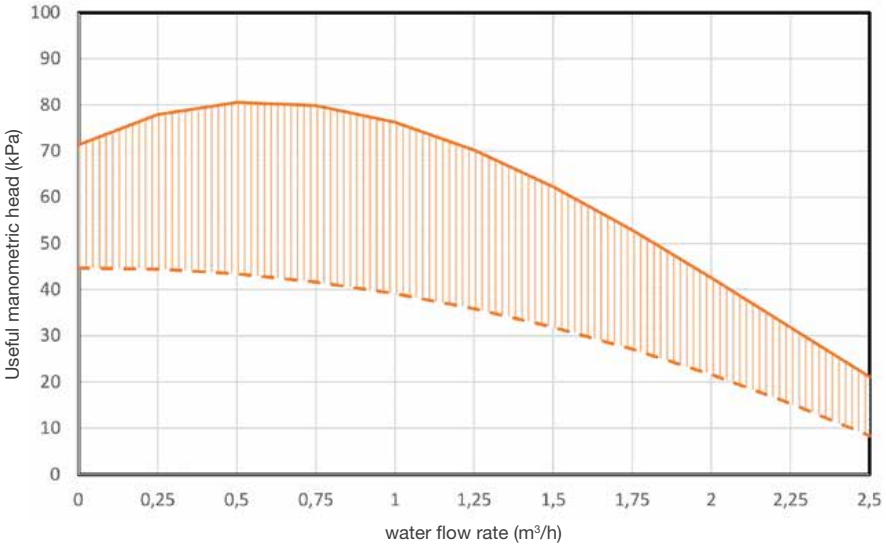


HYDRAULIC CIRCUIT

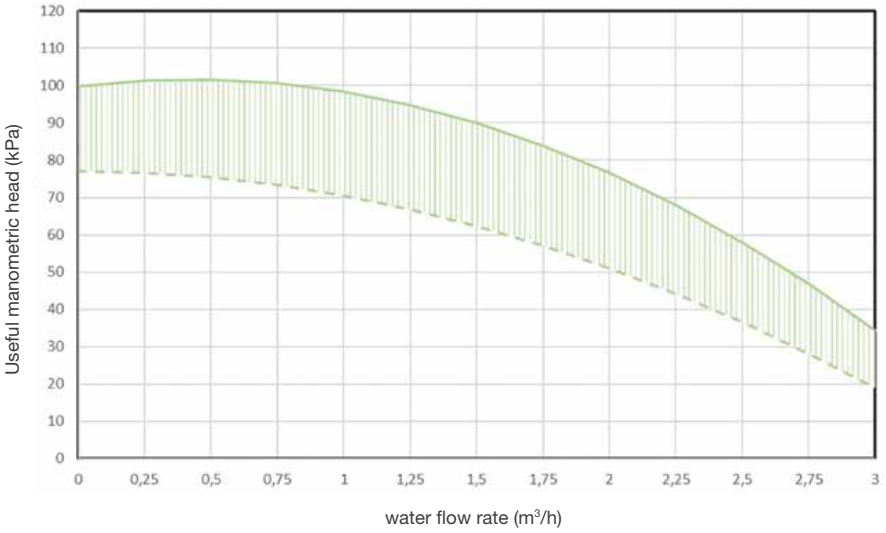
The range of useful heads guaranteed by the machine during pump modulation is as follows:



HP_OWER ONE 70R-70RK-90R-90RK
Operational area of the pump



HP_OWER ONE 120R-120RK
Operational area of the pump



HP_OWER ONE 140R-140RK
160RT-160RTK-180R-180RK
Operational area of the pump

HYDRAULIC CIRCUIT

NOMINAL FLOW RATE

The nominal water flow rate refers to a temperature difference between the evaporator inlet and outlet of 5 °C. The maximum admitted flow rate corresponds to a temperature difference of 3 °C. Higher values can cause excessively high pressure drops.

The minimum admitted water flow rate is relative to a typical temperature difference of 8 °C at the nominal conditions reported in the technical data.

Insufficient water flow rates can cause evaporation temperatures that are too low with subsequent intervention by the safety devices and stopping the unit. In some extreme cases, ice may form in the evaporator with consequent anomalies in the refrigeration circuit.

The minimum flow rates to be ensured to the plate heat exchanger to guarantee correct operation are the following

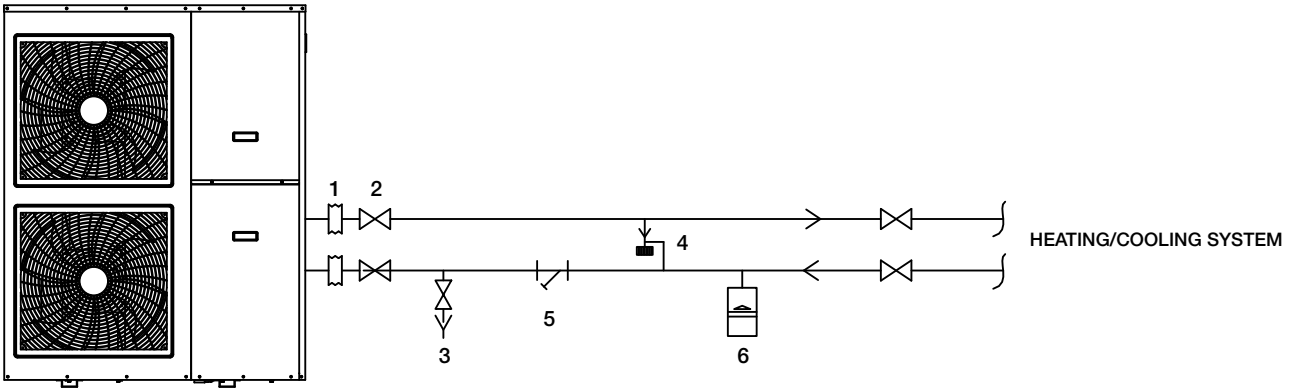
HP_OWER ONE		70R-70RK	90R-90RK	120R-120RK	140R-140RK	160RT-160RTK	180R-180RK
Minimum water flow rate to be guaranteed (2)	l/s	0,15	0,17	0,25	0,34	0,34	0,41
Maximum water flow rate to be guaranteed (2)	l/s	0,40	0,46	0,68	0,92	0,92	1,10
Flow switch intervention flow by decreasing flow (*)	l/s	0,117	0,117	0,153	0,153	0,262	0,262
Flow switch intervention flow by increasing (*)	l/s	0,132	0,132	0,175	0,175	0,293	0,293

Performance referred to the following conditions:

(2) Cooling: external air temperature 35 °C; water temperature in / out 12/7 °C

(*) The intervention of the water flow switch occurs if the flow rate falls below the indicated limit value (decreasing flow): the alarm signaled can only be reset when the flow switch intervention flow rate is reached - increasing flow

HYDRAULIC CONNECTION



1 Anti-vibration coupling
2 Shut-off valve
3 Filling / drain valve
4 Differential by-pass
5 Filter
6 System expansion vessel

HYDRAULIC CIRCUIT

SYSTEM WATER CHARACTERISTICS

To ensure proper operation of the unit, the water must be adequately filtered and the quantity of dissolved substances must be minimal.

MAXIMUM CHEMICAL-PHYSICAL CHARACTERISTICS ALLOWED FOR THE SYSTEM WATER	
PH	7,5 - 9
Electrical conductivity	100 - 500 µS/cm
Total hardness	4,5 – 8,5 dH
Temperature	< 65°C
Oxygen content	< 0,1 ppm
Max quantity of glycol	40 %
Phosphates (PO4)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,3 ppm
Alkalinity (HCO3)	70 – 300 ppm
Chlorine ions (Cl-)	< 50 ppm
Sulphate ions (SO4)	< 50 ppm
Sulphide ion (S)	None
Ammonium ions (NH4)	None
Silica (SiO2)	< 30 ppm

USE OF GLYCOL

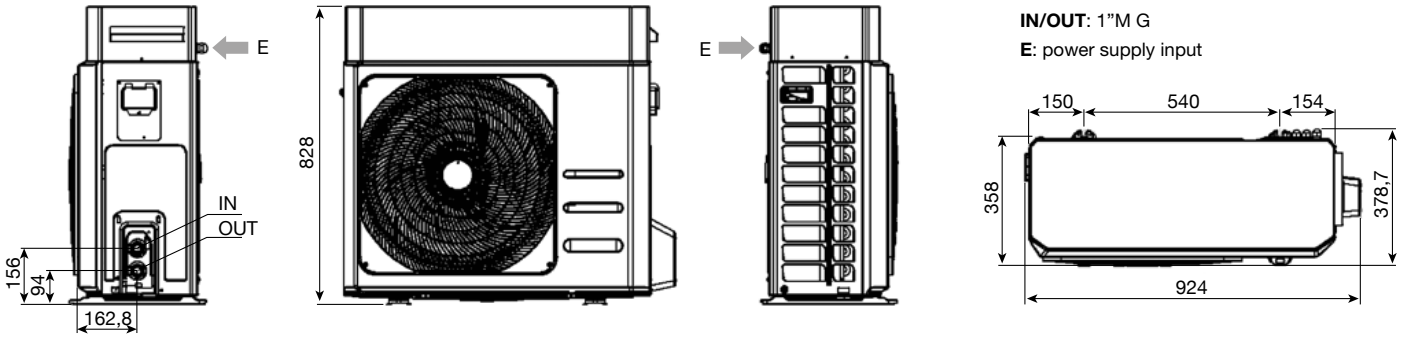
Glycol Percentage	Freezing point (°C)	CCF	IPCF	WFCF	PDCF
10%	-3,2	0,985	1	1,02	1,08
20%	-7,8	0,98	0,99	1,05	1,12
30%	-14,1	0,97	0,98	1,10	1,22
40%	-22,3	0,965	0,97	1,14	1,25
50%	-33,8	0,955	0,965	1,2	1,33

CCF: Efficiency Correction Factor
IPCF: Absolute Power Correction Factor
WFCF: Water Flow rate Correction Factor
PDCF: Pressure Drop Correction Factor

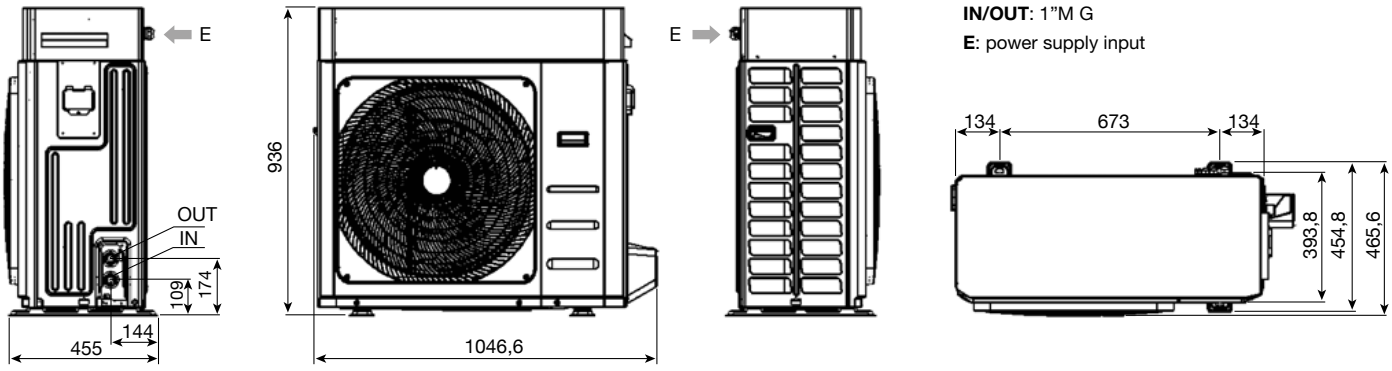
DIMENSIONS AND CLEARANCES

HP_OWER ONE			70R-70RK	90R-90RK	120R-120RK	140R-140RK	160RT-160RTK	180R-180RK
Dimensions and weights	Length	mm	924	924	1047	1044	1044	1044
	Depth	mm	377	377	455	448	448	448
	Height	mm	828	828	936	1409	1409	1409
	Shipping weight	kg	84	84	110	134	154	154
	Weight in exercise	kg	72	72	96	121	141	141
Package dimensions	Length	mm	970	970	1080	1100	1100	1100
	Depth	mm	395	395	510	490	490	490
	Height	mm	985	985	1130	1605	1605	1605

HP_OWER ONE 70R/RK-90R/RK

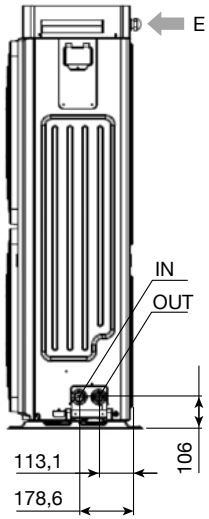


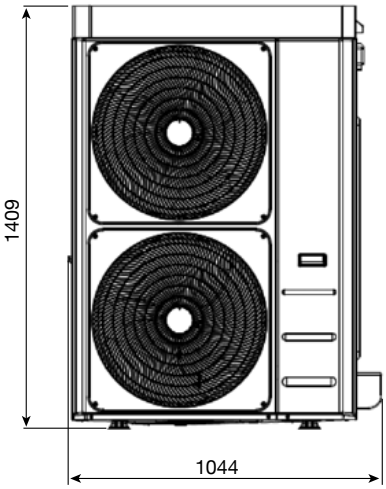
HP_OWER ONE 120R/RK

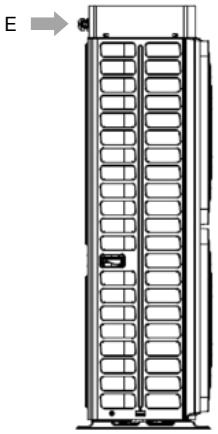


DIMENSIONS AND CLEARANCES

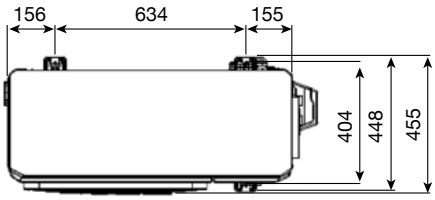
HP_OWER ONE 140R/RK-160RT/RTK-180R/RK







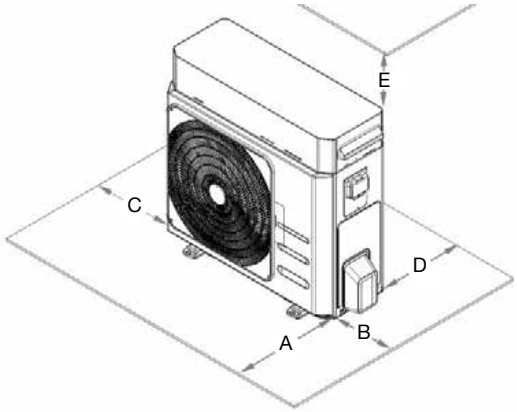
IN/OUT: 1”M G
E: power supply input

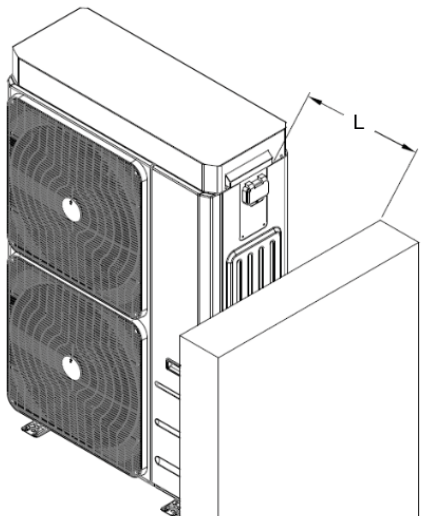


TECHNICAL CLEARANCES

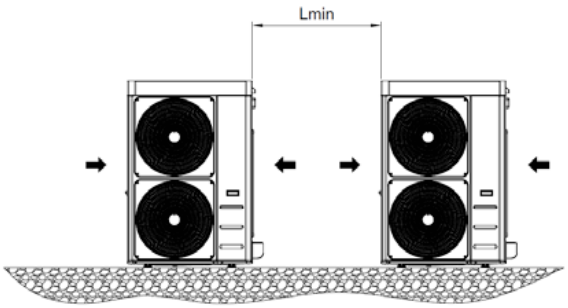
HP_OWER ONE	A	B	C	D	E	L
70R-70RK	1500	500	400	400	500	500
90R-90RK	1500	500	400	400	500	500
120R-120RK	1500	500	400	400	500	500
140R-140RK	1500	500	400	400	500	500
160RT-160RTK	1500	500	400	400	500	500
180R-180RK	1500	500	400	400	500	500

- Avoid the installation in the vicinity of loopholes or wells in which gases can accumulate and generate an explosive atmosphere: distance of 5 m.
- Avoid obstruction of ventilation openings located on the top cover.
- Install the unit on a stable and adequate base to support its weight. Suspended installation is not recommended.

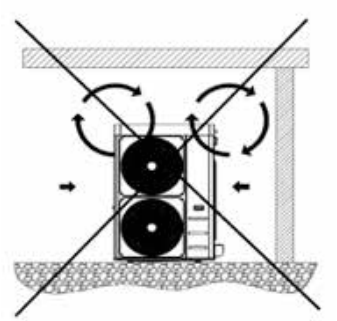




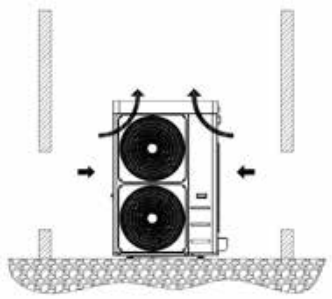
DIMENSIONS AND CLEARANCES



In the case of units side by side, the minimum distance Lmin to be respected between them is 1 m.



Covering with a canopy or positioning near plants or walls should be avoided in order to avoid air recirculation



In the case of winds with speeds higher than 2.2 m/s, the use of windbreak barriers is recommended.

ELECTRICAL CONNECTIONS

HP_OWER ONE			70R-70RK	90R-90RK	120R-120RK	140R-140RK	160RT-160RTK	180R-180RK
Electrical data	Supply		230V/1/50Hz				400V/3P+N+T/50Hz	
	Maxumum absorbed power	kW	3,5	3,9	5,1	6,6	7,0	8,3
	Maximum absorbed current	A	15,1	17,0	22,1	28,6	10,1	12,0
	Maximum absiorbed current (K version)	kW	3,6	4,0	5,2	6,7	7,1	8,5
	Maximum absorbed current (K version)	A	15,6	17,6	22,7	29,2	10,3	12,2
	Touch Screen supply		12V/1/50Hz					
	Fans supply		230V/1/50Hz					

SUPPLY CABLES

HP_OWER ONE	Supply	Recommended cable section (maximum length 30 m	Recommended tightening torque
70R-70RK	230V / 1ph	3 x 4 mm^2	L/N: 3,4 Nm – PE: 1 Nm
90R-90RK	230V / 1ph	3 x 4 mm^2	L/N: 3,4 Nm – PE: 1 Nm
120R-120RK	230V / 1ph	3 x 4 mm^2	L/N: 3,4 Nm – PE: 1 Nm
140R-140RK	230V / 1ph	3 x 6 mm^2	L/N: 3,4 Nm – PE: 1 Nm
160RT-160RTK	400V / 3ph	5 x 2,5mm^2	L1/L2/L3: 3,4 Nm – N/PE: 1 Nm
180R-180RK	400V / 3ph	5 x 4 mm^2	L1/L2/L3: 3,4 Nm – N/PE: 1 Nm

The following table shows the recommended cable sections for a maximum length of 30 m. In any case, depending on the type of installation, the physical location and the length of the cables (whether less than or greater than 30m), the designer of the electrical system will make an appropriate choice.

ELECTRICAL CONNECTIONS

TERMINAL	CONNECTION	TYPE
X-1	Connect the ground wire	Supply input 1-Ph/N/PE, 230Vac, 50Hz
N	Connect the neutral wire from the mains	
L	Connect the phase wire from the mains	
PE	Connect the ground wire	Supply input 3-Ph/N/PE, 400 Vac, 50Hz (only for HP_OWER ONE 160RT-160RTK and 180R-180RK)
N	Connect the neutral wire from the mains	
L1	Connect the phase wire L1 from the mains	
L2	Connect the phase wire L2 from the mains	
L3	Connect the phase wire L3 from the mains	
X-12.1	Touch screen supply (12V-)	Output for supply 12Vac, 50Hz, 500mA
X-12.2	Touch screen supply (12V+)	
X-4.1	Riferimento massa Modbus RTU per touch screen (GNDR)	Modbus communication
X-5.1	Signal Modbus RTU – for touch screen (R-)	
X-5.2	Signal Modbus RTU+ for touch screen (R+)	
X-16.1/X16.2	Input of Summer / Winter mode exchange from remote	Digital input (tension free contact)
X-15.1/X15.2	Input of On/Off from remote (closed contact = machine On / open contact = machine Off)	Digital input (tension free contact)
X-17.1/X-17.2	D.H.W. temperature probe / Input of digital D.H.W. thermostat	Analog input (probe NTC-10KΩ @ 25°C β 34-35) or digital
X-19.1/X-19.2	System temperature probe from remote / Input of digital room thermostat	Analog input (probe NTC-10KΩ @ 25°C β 34-35) or digital
X-20.1/X-20.2	Double set point / Digital input for D.H.W. request	Digital input (tension free contact)
X-22.1	Input signal 0-10Vdc (-) for set point modification	Analog input (ST10) in tension 0÷10Vdc
X-22.2	Input signal 0-10Vdc (+) for set point modification	
X-6.1/X-6.2	System heater	Output in single phase tension 230Vac, 50Hz, 2A (resistive)
X-9.1/X-9.2	Plate heat exchanger heater (K version) / Configurable output	
X-10.1/X-10.2	Crankcase heater (K version) / Configurable output	
X-11.1/X-11.2	Output for D.H.W. valve	
X-14.1/X-14.2	Output for double set point valve	

ELECTRICAL CONNECTIONS

5 OUTPUTS IN TENSION CONFIGURABLE:

- Motorized three-way valve with two-point supply for D.H.W.
- Motorized three-way valve with two-point power supply for radiant panels (Double Set Point)
- Motorized three-way valve with two-point power supply for differentiated Hot / Cold system
- Enabling emergency boiler
- Enable auxiliary integration source in Heating
- Enable auxiliary integration source for D.H.W. production
- Active pump signal replication
- Booster pump external to the Heat Pump, on the secondary loop
- Defrost in progress signal
- System season signal (switching of the three-way valve on the hot/cold side)
- Momentary anomaly and Heat Pump locked out (alarm with manual reset)

3 DIGITAL INPUTS + 2 DIGITAL / ANALOG CONFIGURABLE INPUTS (IN EXCLUSIVE MANNER)

Digital inputs (voltage free contacts)

- ON / OFF from Remote
- Summer / Winter operating mode
- Call from room thermostat
- Call from humidistat (Double Set Point)
- Call from D.H.W. thermostat

Analog Inputs (Probes NTC 10KΩ a 25°C β 34-35)

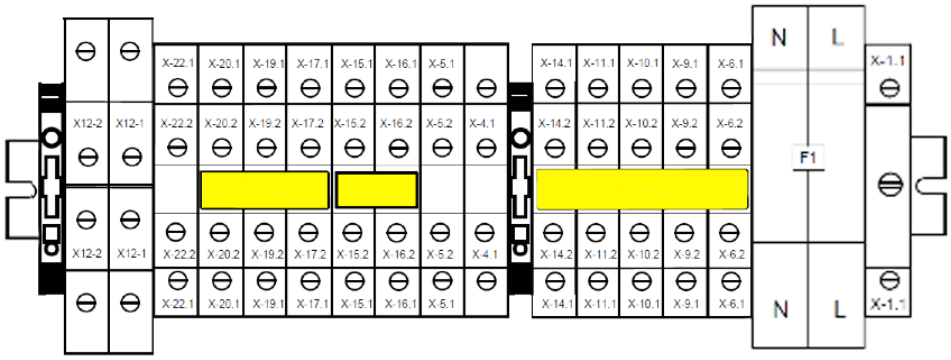
- D.H.W. temperature probe
- System side remote temperature probe

1 ANALOG INPUT IN TENSIONE 0÷10Vdc

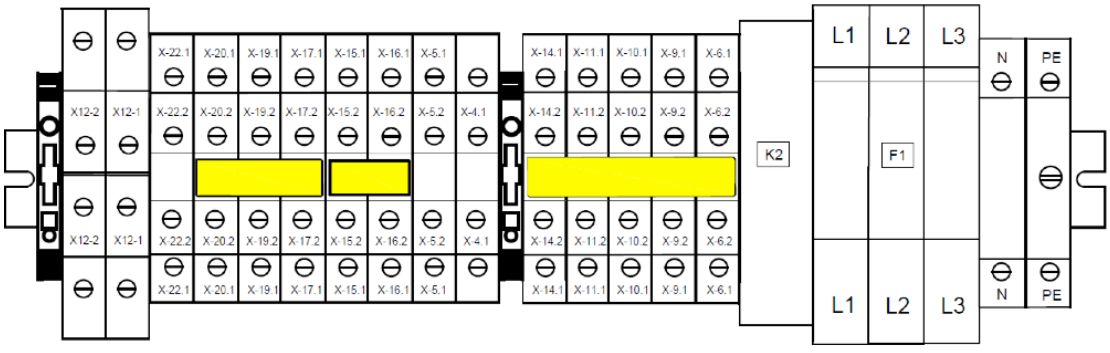
- Interfacing with external thermoregulator in both, Heating and Cooling mode

USER TERMINAL STRIP

HP_OWER ONE 70R/70RK-90R/90RK-120R/120RK-140R/140RK



HP_OWER ONE 160RT/160RTK-180R/180RK



AVAILABLE I/O RESOURCES:

- 3 DIGITAL INPUTS (VOLTAGE FREE CONTACTS)
- 2 DIGITAL / ANALOG INPUTS (CONFIGURABLE in EXCLUSIVE way)
- 1 ANALOG INPUT 0÷10Vdc
- 5 SINGLE PHASE VOLTAGE OUTPUTS (230Vac, 50Hz)
- TOUCH SCREEN POWER SUPPLY 12Vac
- MODBUS TOUCH SCREEN SIGNAL

CONTROLLER - TYPICAL CONFIGURATIONS

INTEGRATED DIGITAL CONTROLLER

The on-board user interface allows the **control** of the heat pump and the programming of the **system configurations** in which it operates.

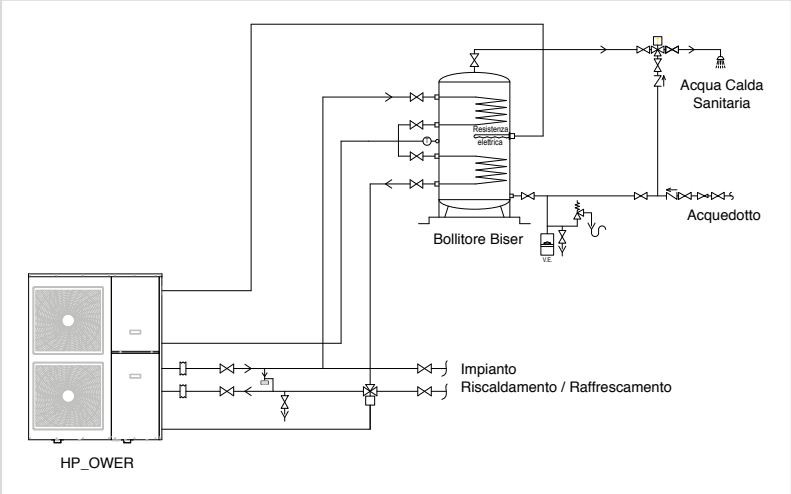
- Operating mode signaling (summer, winter, domestic hot water production, defrost, alarms) and current status of the main components (compressor, pump)
- Display of hydraulic and refrigerant circuits temperatures
- Display of refrigerant working pressures
- Operating hours of compressor and pump

DIAGNOSTICS

- Real-time display of any operating anomalies
- Reset with manual reset

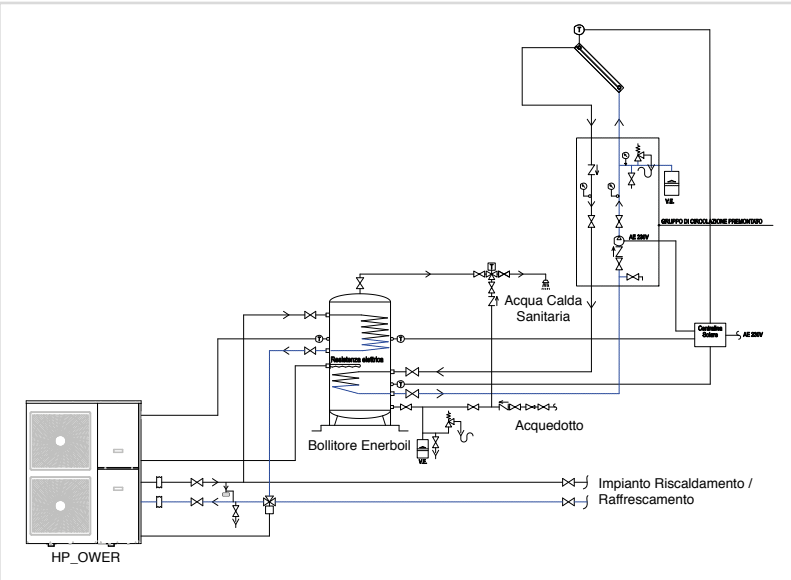
BASIC PROGRAMMING AND CONFIGURATIONS

DOMESTIC HOT WATER PRODUCTION



The diagrams shown illustrate, by way of example, two possible system configurations for the production of DHW in heat pump:

- via BISER tank with double coil in series
- via ENERBOIL tank with double oversized exchanger for the combined connection of the Heat Pump and Thermal Solar



Health priority management:

The heat pump will always work in D.H.W. priority with respect to heating or cooling mode.

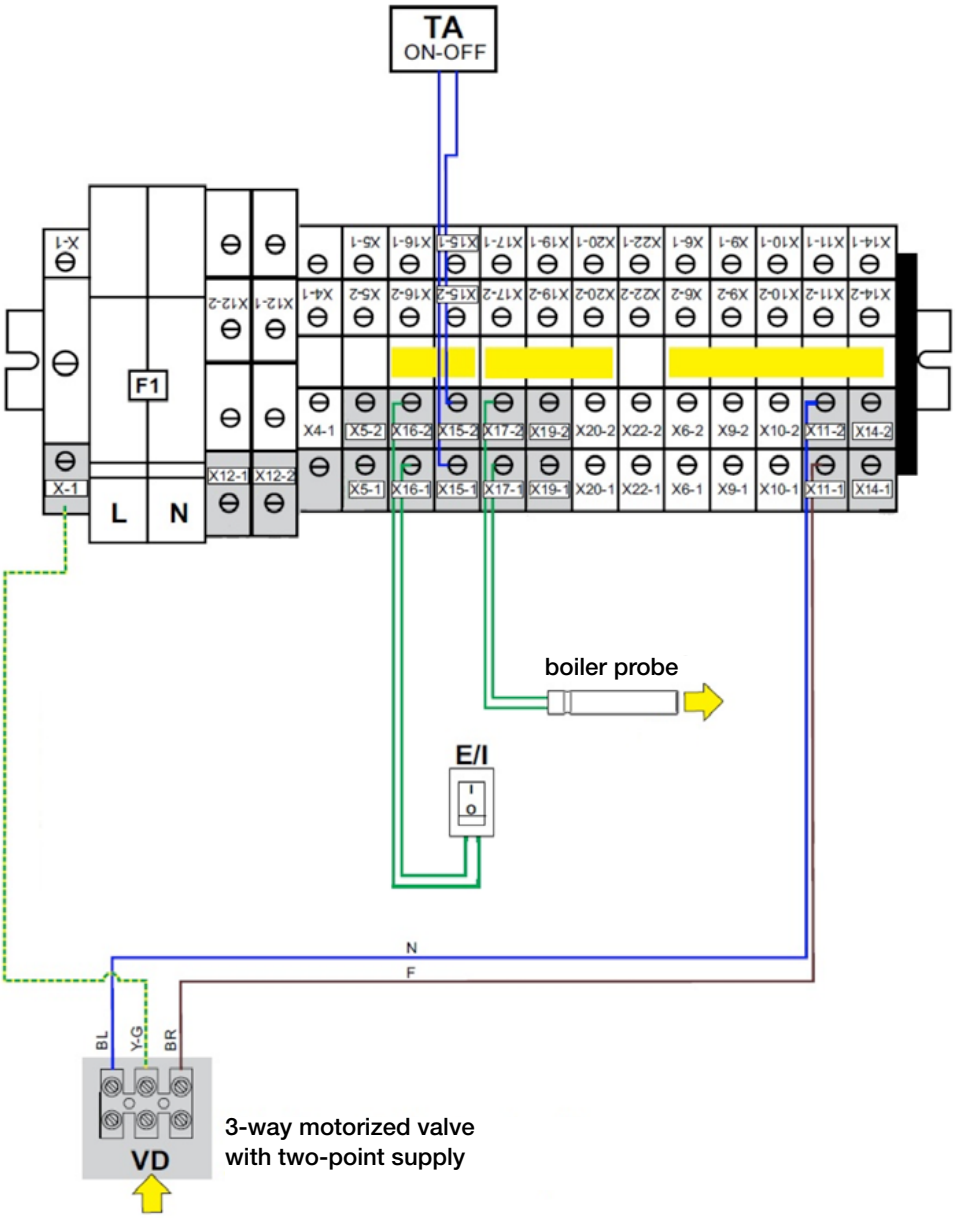
Preparation Domestic Hot Water tank (both in Summer and Winter):

Through the DHW cylinder sensor, the temperature of the tank is controlled and the HP_OWER ONE is started in D.H.W. priority: the Heat Pump controls the automatic deviation of the heat carrier fluid through the appropriate switching of a motorized 3-way valve.

As an alternative to using a DHW tank probe, the DHW function can be activated by acquiring the status of a voltage-free contact (digital consent to the Heat Pump for the DHW production.

CONTROLLER - TYPICAL CONFIGURATIONS

ELECTRICAL WIRING DIAGRAM

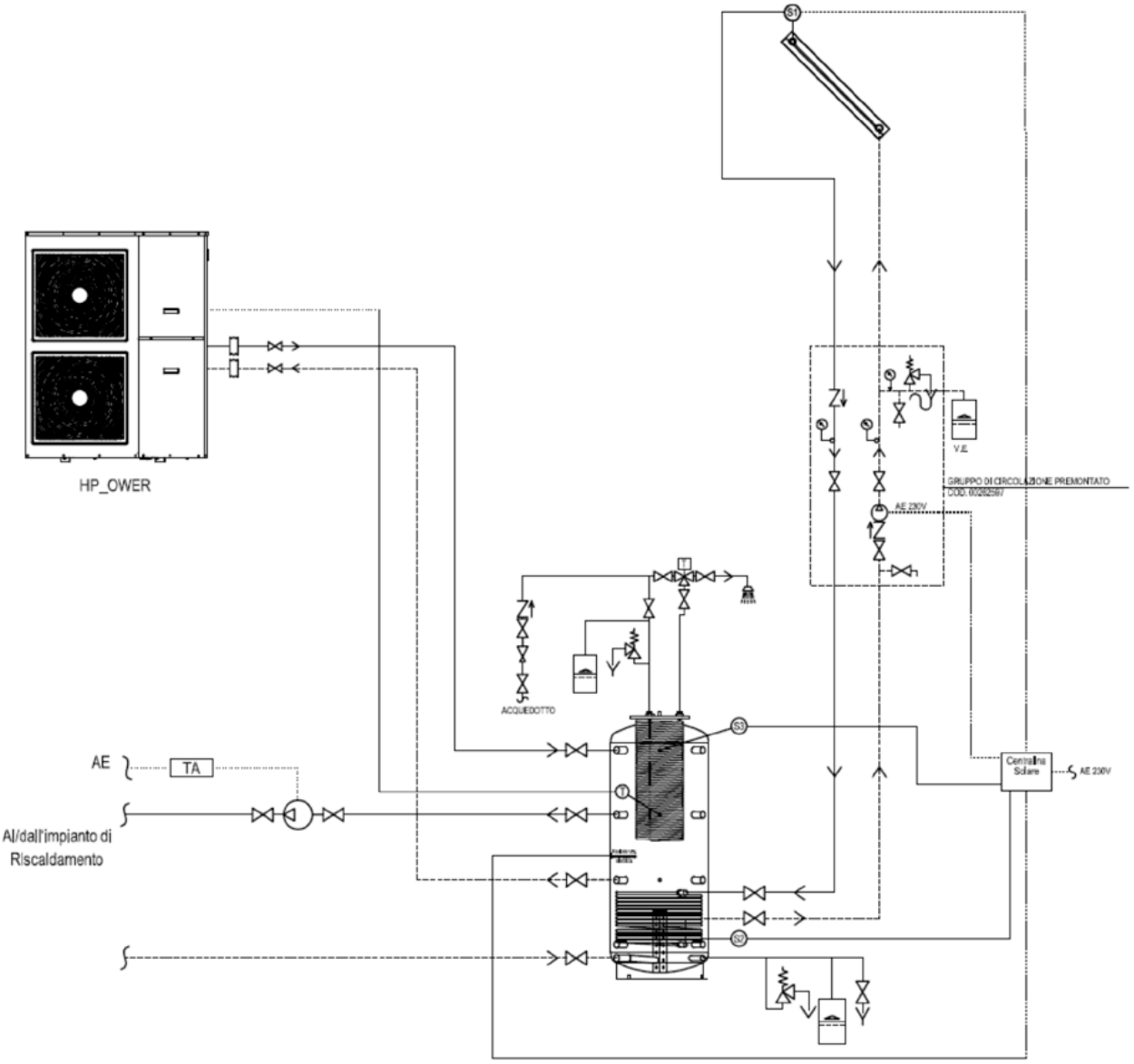


The diagram, also, illustrates the following functions:

- **ON/OFF**
  enabling on / off by acquiring the status of a voltage-free physical contact (DHW function can also be enabled in OFF status), coming, for example, from a room thermostat.
- **Summer/Winter**
  Summer / Winter switching by acquiring the status of a voltage-free physical contact (in the default configuration the open contact controls the Heat Pump in Cooling mode and, the closed contact, the Heat Pump in Heating mode).

CONTROLLER - TYPICAL CONFIGURATIONS

COMBINED DHW TANK FUNCTION (Heating + DHW)



The diagram illustrates a configuration in which both, heating and DHW production, in Heat Pump are made using the same MULTIPOWER storage (tank of technical water with 316L stainless steel exchanger for the production of DHW and lower coil for solar thermal circuit).

DHW priority management:
The Heat Pump will always work in Domestic Hot Water priority over the Cooling mode.

Preparation of DHW storage tank (both in Summer and Winter):

Through the sensor of the storage tank is controlled the temperature of the DHW tank and the HP_OWER ONE is started in DHW priority mode: the heat pump controls the automatic deviation of the heat carrier fluid through the appropriate switching of a three-way motorized valve only in in the event of room cooling or during the defrost cycle.

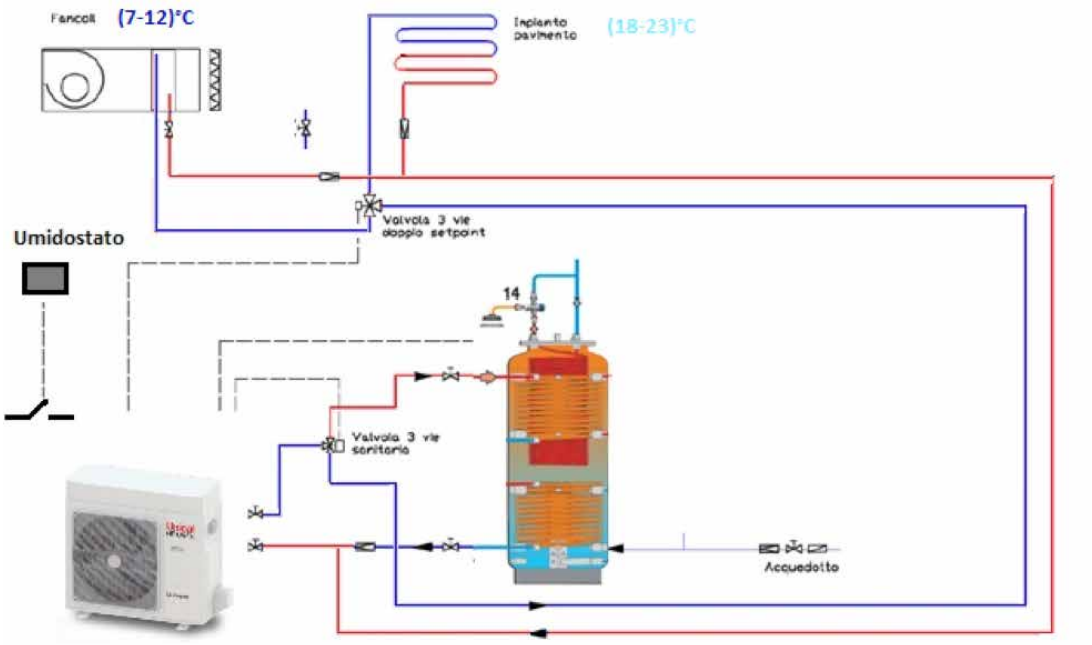
For the wiring diagram, refer to what is illustrated for the “DHW preparation” function.

CONTROLLER - TYPICAL CONFIGURATIONS

DOUBLE SET POINT FUNCTION

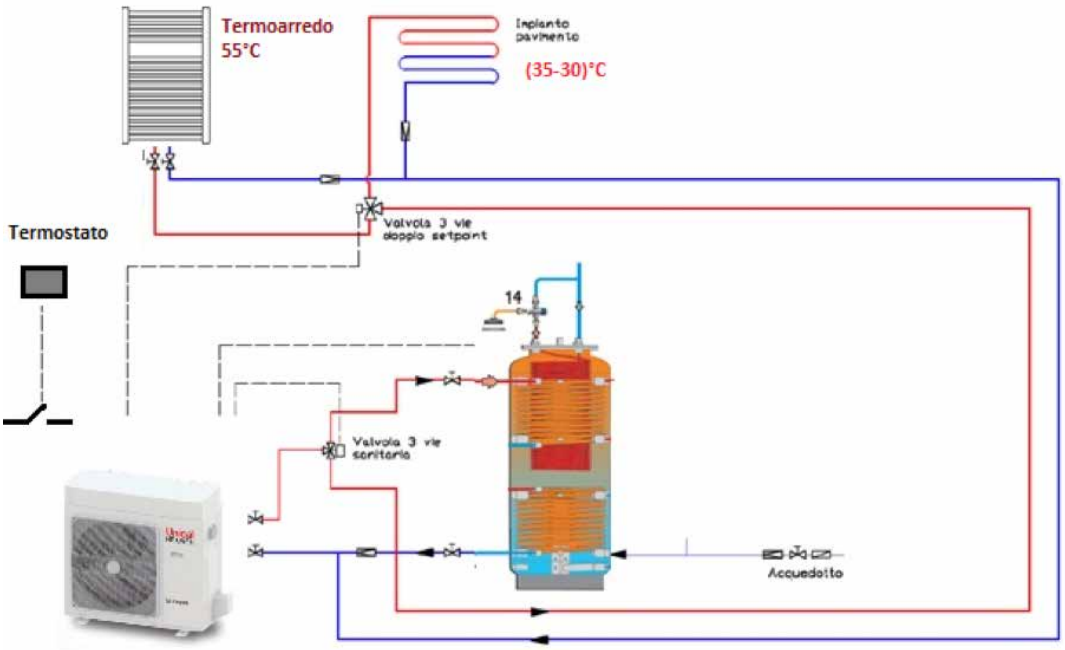
It allows you to manage two zones with different temperatures in both, Heating and Cooling mode, optimizing the COP and EER of the Heat Pump.

COOLING MODE



The Humidistat gives consent to the Heat Pump for the passage from the Mixed Zone set point (Radiant system in cooling) to the Direct Zone set point (Fan Coil in dehumidification).

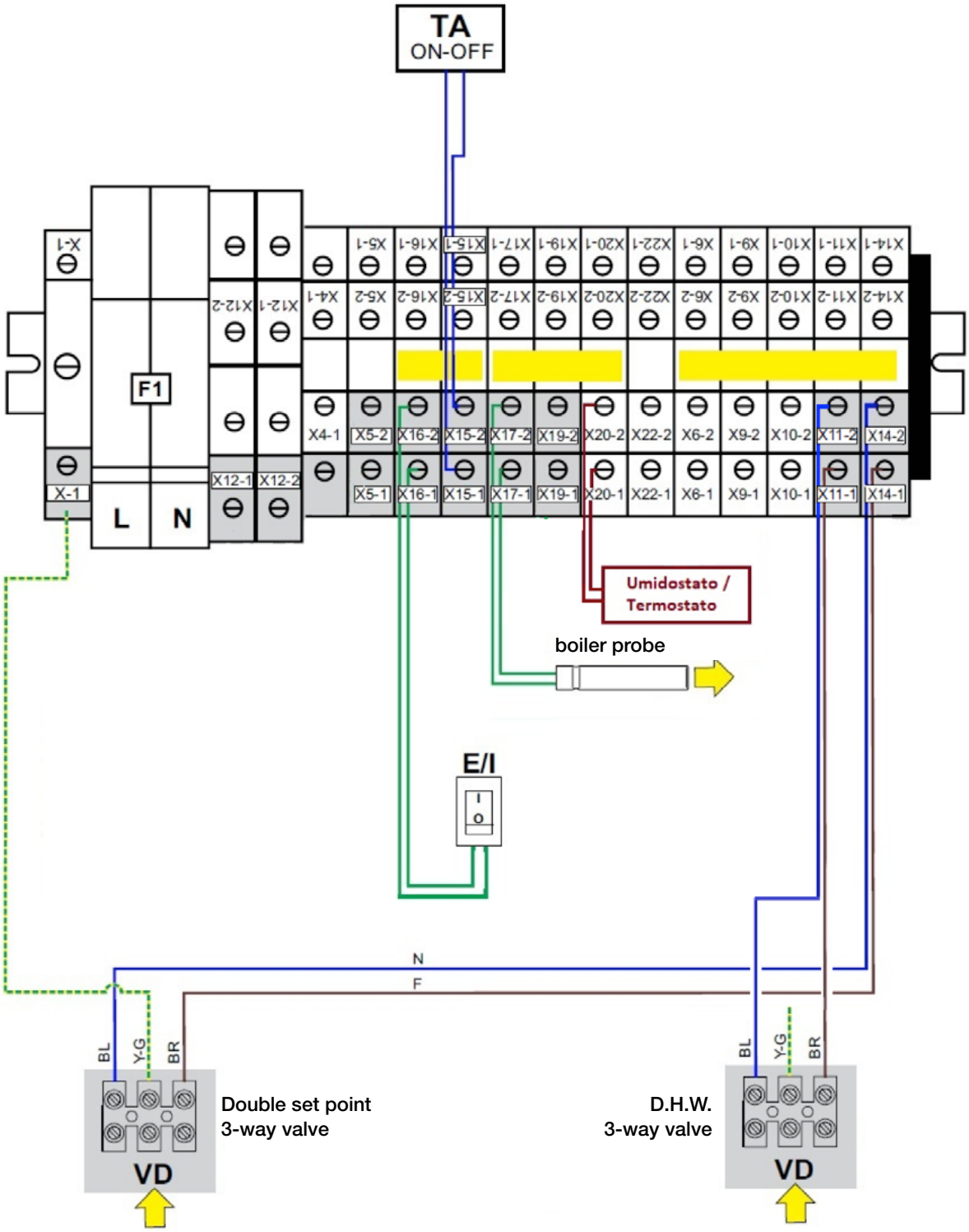
HEATING MODE



The Thermostat gives consent to the Heat Pump for the passage from the Mixed Zone set point (Radiant system in heating) to the Direct Zone set point (Radiator – Heated towel rails).

CONTROLLER - TYPICAL CONFIGURATIONS

ELECTRICAL WIRING DIAGRAM



CONTROLLER - TYPICAL CONFIGURATIONS

MANAGEMENT OF THE INTEGRATION SOURCE

It is possible to enable the integration of an auxiliary emergency source in the production of domestic hot water or for space heating. The programming logic provides for the definition of the timing of the integration intervention.

Backup Generator Configuration:

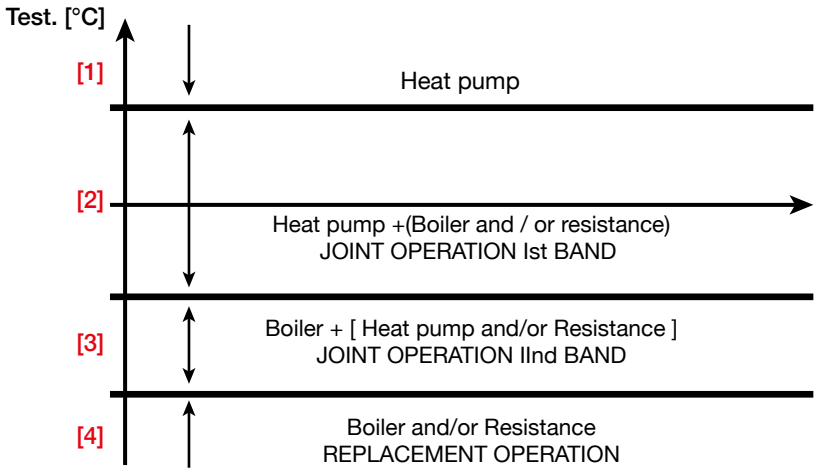
- Immersion Electric Heater
- Boiler
- Other auxiliary generator

Priority Setting of Emergency Generators and their Intervention Methods

Related to:

- Production of DHW or Heating o Combined DHW storage + Heating
- External thermoregulations or by heat pump

Stand-alone working temperature or in joint bands



Depending on the outside air temperature, it is possible to manage four possible operating bands.

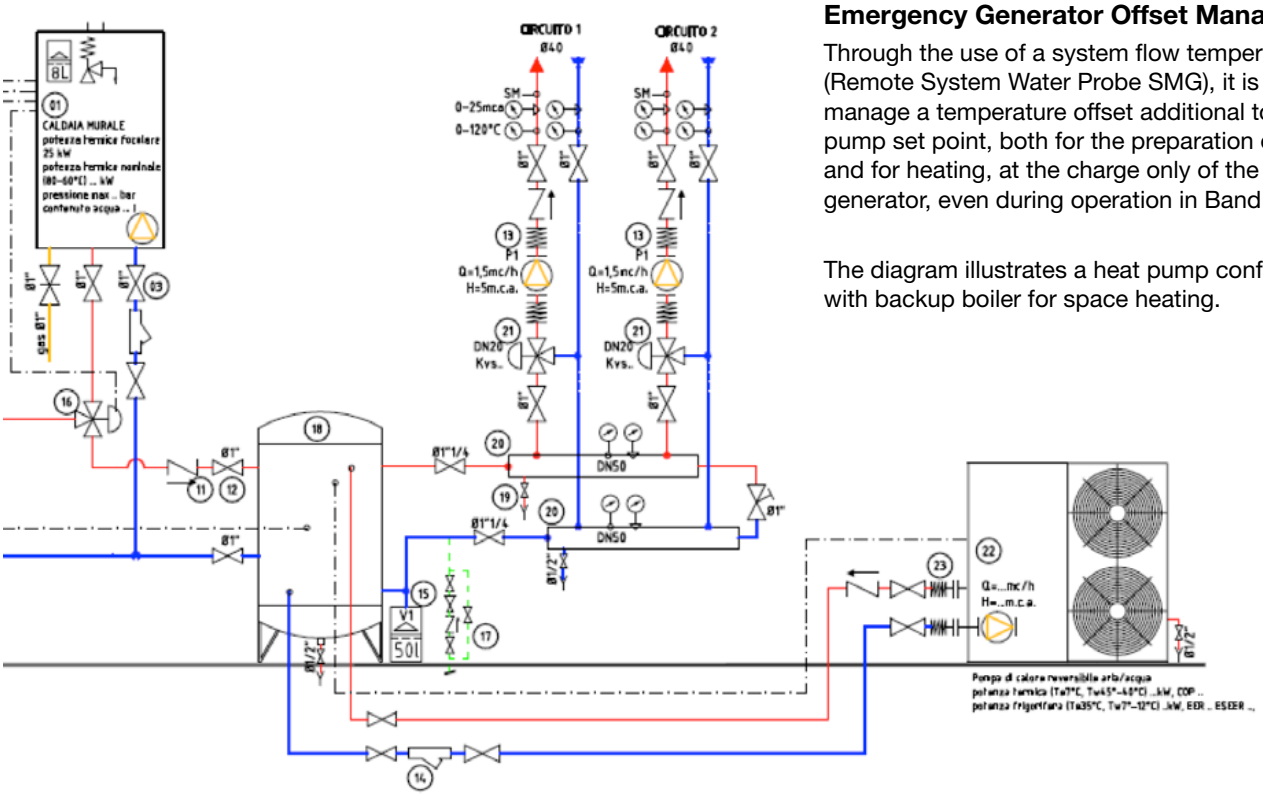
[1] HEAT PUMP OPERATION
L'intervento del Generatore Ausiliario è previsto unicamente in caso di Pompa di Calore in blocco allarme e di Set Point non soddisfatto entro le tempistiche programmate

[2] FUNZIONAMENTO CONGIUNTO (I FASCIA)
La Pompa di Calore è il generatore prioritario.
In base alle priorità impostate in integrazione, è previsto l'intervento dei diversi Generatori di Soccorso in funzionamento congiunto alla Pompa di Calore nel caso di Set Point non soddisfatto entro le tempistiche programmate

[3] FUNZIONAMENTO CONGIUNTO (II FASCIA)
La Caldaia è il generatore prioritario.
In base alle priorità impostate in integrazione, è previsto l'intervento dei diversi Generatori di Soccorso in funzionamento congiunto alla Caldaia nel caso di Set Point non soddisfatto entro le tempistiche programmate

[4] FUNZIONAMENTO IN SOSTITUZIONE
Sono attivi i soli Generatori di Soccorso secondo le priorità e le tempistiche impostate.

CONTROLLER - TYPICAL CONFIGURATIONS

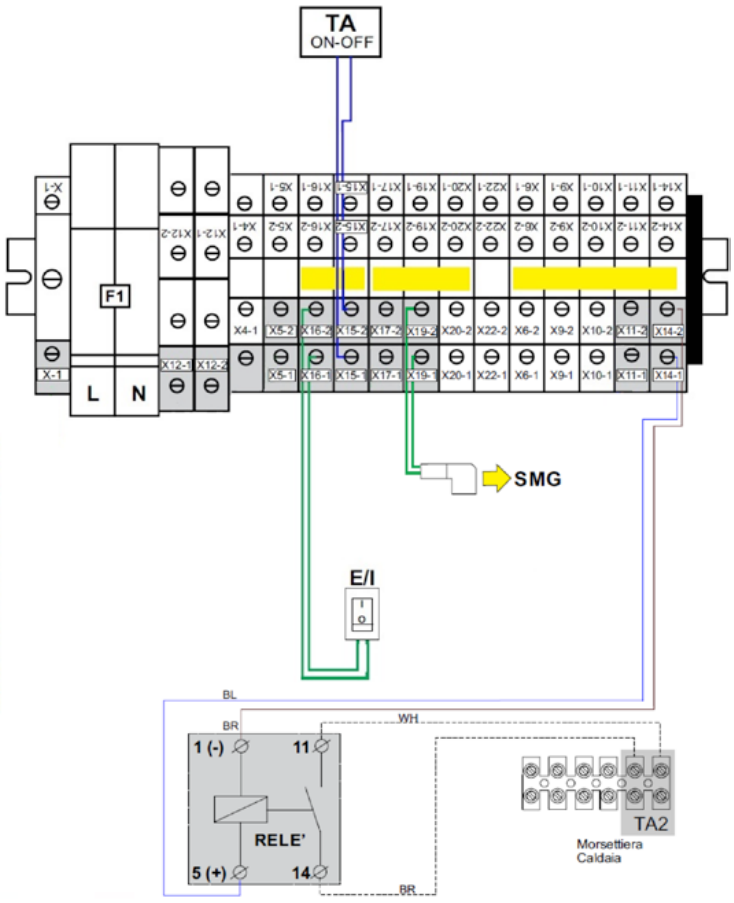


Emergency Generator Offset Management:

Through the use of a system flow temperature probe (Remote System Water Probe SMG), it is possible to manage a temperature offset additional to the heat pump set point, both for the preparation of DHW and for heating, at the charge only of the emergency generator, even during operation in Band [1].

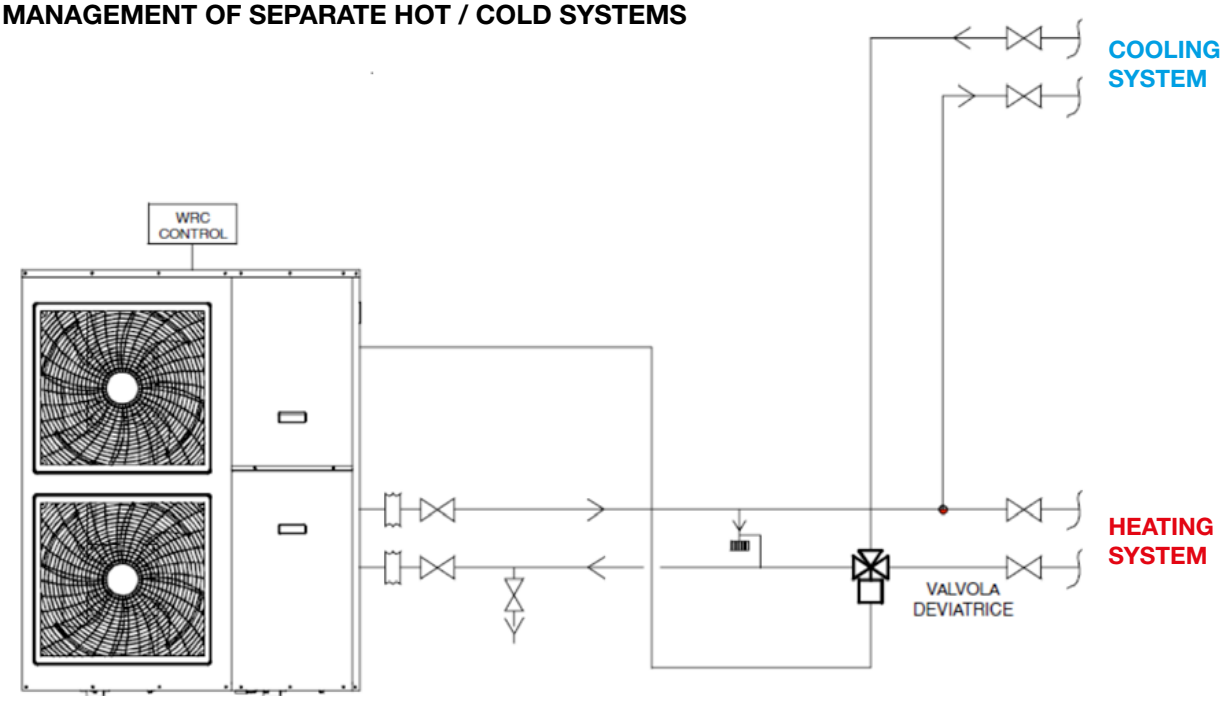
The diagram illustrates a heat pump configuration with backup boiler for space heating.

ELECTRICAL WIRING DIAGRAM

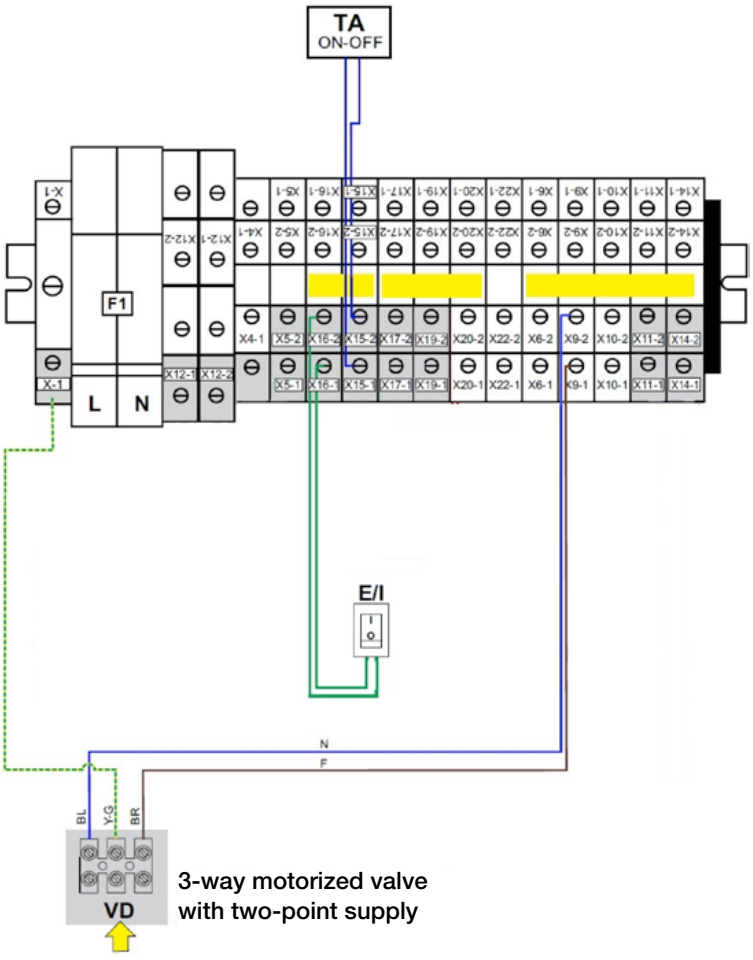


CONTROLLER - TYPICAL CONFIGURATIONS

MANAGEMENT OF SEPARATE HOT / COLD SYSTEMS



ELECTRICAL WIRING DIAGRAM



HP_OWER TWO

ULTRA COMPACT, NOISELESS, HIGH EFFICIENCY AIR-WATER HEAT PUMP FOR HEATING/COOLING AND EXTERNAL D.H.W. PRODUCTION **FULL INVERTER – PRE-ASSEMBLED HYDRONIC KIT**		
OUTPUT RANGE	from 9 to 12 kW / in cascade up to 84 kW (12 kW x 7)	
ENERGY CLASS	COP up to 4.37 according EN 14511 EER up to 4.49 according EN 14511	
REFRIGERANT	R410A	
FLOW TEMPERATURE	up to 58°C	
OPERATION	up to -20°C	
MODELS HP_OWER TWO	90	120
INTERNAL UNIT	WALL (also BUILT-IN)	WALL (also BUILT-IN)
EXTERNAL UNIT	FLOOR / HANGING	FLOOR / HANGING
FAN MOTORS	DC Inverter Brushless	DC Inverter Brushless
ELECTRICAL SUPPLY	Single-phase	Single-phase
COMPRESSOR	Low absorption and noise DC Inverter Twin Rotary	
INTEGRAL PUMP	Inverter with high efficiency brushless motor	

FEATURES

Silent, high efficiency, SPLIT air-water heat pump for heating, cooling and domestic hot water production systems for residential or commercial applications. Indoor unit installed on the wall (also recessed).

FULL INVERTER 5D technology: HP_OWER TWO is designed with DC INVERTER TWIN ROTARY compressor, DC Brushless variable speed fan motors, electronic expansion valve with modulating actuator, integrated hydronic kit with high efficiency circulator. In modulation mode, this "FULL INVERTER" system allows optimized delivery of the necessary thermal power, obtaining significant reductions in energy consumption, increased seasonal efficiency and greater comfort when compared to common inverter systems.

- **DC INVERTER TWIN ROTARY compressor**
  Low absorption, double compression chamber and double balanced rotor, guarantee of limited vibrations and noise emissions, continuous progressive DC Inverter modulation, HP Super Silence insulation (dBa reduction - 5%), mounted on rubber shock-absorbers, complete with thermal protection and electric crankcase heater
- **Fan Motors DC INVERTER Brushless**
  High efficiency, continuous progressive air flow modulation DC Inverter for a greater precision in the delivery of temperature to the exchanger and a reduction in defrosting cycles, equipped with integrated thermal protection and rubber anti-vibration joints
- **Air / refrigerant exchanger in copper pipes with aluminium fins with anti-mold treatment**
  Exclusive profile to reduce air side pressure drops and allow reduced ventilation speeds
- **Thermo-assisted and modulating Electronic valve for refrigerant regulation**
  Continuous control of overheating to increase product performance
- **Microprocessor control logic**
  with wide "Full Inverter" modulation.
  Simultaneous adjustment of compressor, circulator and fan timings to increase the performance and efficiency of the condensing unit.
- **Water / refrigerant plate heat exchanger in Internal Unit**
  In high-efficiency stainless steel, patented, for the heat exchange water / R410A refrigerant, equipped with an anti-freeze protection probe that can activate the circulator even when the machine is off
- **High efficiency INVERTER circulator with Brushless motor in Internal Unit**
  Programmable operating mode: continuous, on request from thermoregulator, from thermoregulator with periodic activation, from auxiliary integration source; configurable antifreeze pump function
- **Integrated Hydronic Kit in Internal Unit**
  consisting of: INVERTER circulator, 3 bar safety valve, air vent valve, protection flow switch, expansion vessel 8 l, Y filter, installation template
- **Integrated digital regulator**
  User interface Master on Internar Unit for monitoring, control, real-time maintenance of the Heat Pump parameters and complete system configuration
- **"Maximum Hz" function**, to increase the cooling and heating capacity by 10%
- **D.H.W. Production** via storage tank / dedicated external storage tank
- **Automatic management of additional electric heater** for DHW storage tank
- **Management of auxiliary integration source** with integrated climate control
- **Double Set Point**
  Regulation of two different temperatures for both heating and cooling, and optimization of consumption
- **Thermoregulation supplied as Standard,** with modulating flow temperature management, dynamic set point with settable climatic curve and work with system modulating flow temperature
- **Management with 0 ÷ 10 Volt** external control unit (optional)
- **Management with external ON / OFF chrono-thermostat** (optional)
- **Automatic defrost function**
- **System deaeration function**, with forcing of the circulator at maximum speed to facilitate maintenance operations
- **Autorestart**
- **Self-diagnosis**
  Presence of protection and control devices for the hydraulic circuit, refrigeration circuit, condensing unit, electric unit on the machine with centralized management of the diagnostic logic and signalling of any operating anomalies

ADJUSTMENT ACCESSORIES (OPTIONAL)

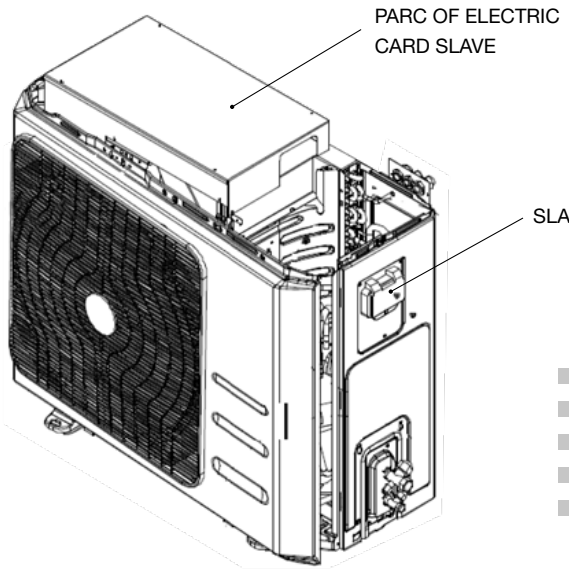
- **TOUCH SCREEN_N remote control**
  Remote management of the heat pump, the network of heat pumps in cascade and the system with integrated functions
- **KTsmart chrono-thermostat**
  Hot / cold, touch screen, Wi-Fi, summer / winter switch, voice assistance, geolocation

OTHER ACCESSORIES (OPTIONAL)

- **D.H.W. storage preparation Kit**
  NTC probe, motorized 3-way valve with 1" connections for (HP_OWER TWO 90) and 1" 1/4 connections for (HP_OWER TWO 120)
- **Antivibration kit**
  4 rubber anti-vibration shock absorber that can be inserted at the base of the unit to dampen any vibrations
- **Antifreeze and pure anti-corrosive fluid**

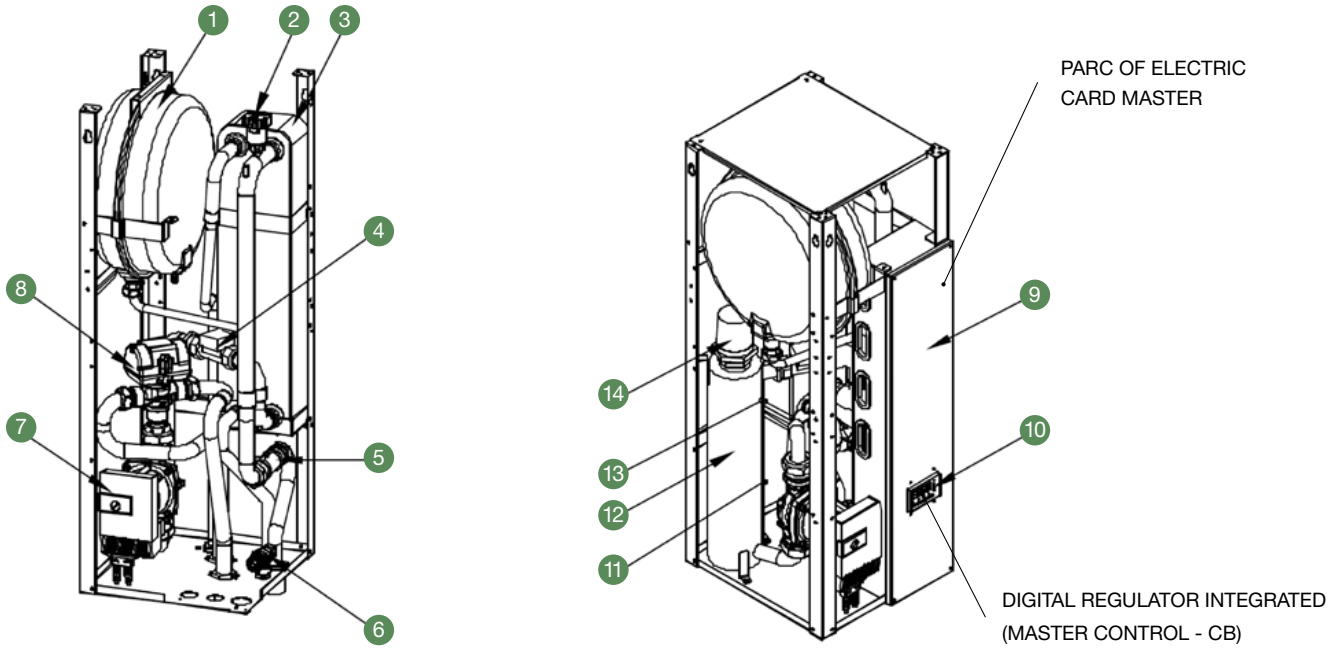
MAIN COMPONENTS

INTERNAL UNIT



- DC INVERTER TWIN ROTARY compressor
- Fan Motors DC INVERTER Brushless
- Electronic valve for refrigerant regulation
- Parc of electronic card
- Air / refrigerant exchanger

EXTERNAL UNIT



1. Expansion vessel
2. Automatic air vent valve
3. Plate heat exchanger
4. Safety flow switch
5. Y filter
6. 3 bar relief valve
7. Circulator
8. Plant/technical side DHW diverting valve (optional kit)
9. Electric box
10. User interface
11. Safety-thermostat with automatic reset (T80°C)
12. Collector (only with optional electric heater)
13. Safety-thermostat with manual reset (T100°C)
14. Electric heater (optional)

PERFORMANCE DATA

HP_OWER TWO			90	120
Cooling	Cooling power min/nom/max (1)	kW	4,65 / 8,52 / 9,12*	5,4 / 11,9 / 13,1*
	Absorbed power (1)	kW	2,18	2,65
	E.E.R. (1)	W/W	3,91	4,49
	Cooling power min/nom/max (2)	kW	2,95 / 6,12 / 6,73*	3,27 / 8,49 / 9,6*
	Absorbed power (2)	kW	2,11	2,74
	E.E.R. (2)	W/W	2,90	3,10
	SEER (5)	W/W	3,61	4,73
Heating	Heating power min/nom/max (3)	kW	3,56 / 8,09 / 8,90*	4,69 / 12,1 / 12,7*
	Absorbed power (3)	kW	1,85	2,89
	C.O.P. (3)	W/W	4,37	4,19
	Heating power min/nom/max (4)	kW	2,88 / 8,00 / 8,80*	3,9 / 11,3 / 12,1*
	Absorbed power (min/nom/max 4)	kW	2,40	3,32
	C.O.P. (4)	W/W	3,33	3,41
	SCOP (6)	W/W	3,91	4,31
	Energy efficiency water 35°C / 55°C	Classe	A++ / A+	A++ / A+

Performance referring to the following conditions:

(1) Cooling: external air temperature 35°C; water temperature in / out 23/18°C

(2) Cooling: external air temperature 35°C; water temperature in / out 12/7°C

(3) Heating: external air temperature 7°C d.b. 6°C w.b.; water temp. in / out 30/35°C

(4) Heating: external air temperature 7°C d.b. 6°C w.b.; water temp. in / out 40/45°C

(5) Cooling: in / out water temperature 12/7°C

(6) Heating: average climatic conditions; Tbiv = -7°C; water temp. in / out 30/35°C

(*) by activating the “Maximum Hz” function

N.B. The yields declared in points (1), (2), (3) and (4) are to be understood as referring to the instantaneous power according to EN 14511.
The data declared in points (5) and (6) is determined according to EN 14825.

PERFORMANCE DATA

HEATING EFFICIENCY TABLES

The tables show the values of heating power, absorbed power and COP at various external air temperature conditions referred to instantaneous power according to EN 14511.

Model	Outside air T [°C]	Tout [°C]																				
		25			30			35			40			45			50			55		
		Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]
90	-20	4,40	1,98	2,22	4,34	2,13	2,04	4,31	2,35	1,83	4,24	2,62	1,62									
	-15	5,17	1,95	2,65	5,09	2,11	2,42	5,05	2,32	2,18	5,00	2,58	1,93	4,87	2,88	1,69						
	-10	5,89	1,88	3,14	5,81	2,04	2,85	5,76	2,25	2,56	5,70	2,51	2,27	5,58	2,81	1,99	5,35	3,13	1,71	4,96	3,47	1,43
	-7	6,50	1,77	3,67	6,40	1,96	3,27	6,35	2,18	2,91	6,29	2,44	2,57	6,18	2,74	2,25	5,95	3,06	1,94	5,55	3,40	1,63
	-2	7,02	1,66	4,22	6,88	1,86	3,70	6,87	2,10	3,28	6,87	2,37	2,90	6,77	2,67	2,53	6,46	2,99	2,16	5,82	3,33	1,75
	2	7,37	1,59	4,63	7,21	1,79	4,02	7,21	2,04	3,54	7,24	2,32	3,12	7,15	2,63	2,72	6,81	2,95	2,31	6,07	3,28	1,85
	7	8,21	1,39	5,91	8,08	1,61	5,02	8,09	1,85	4,37	8,11	2,11	3,84	8,00	2,40	3,33	7,64	2,73	2,80	6,89	3,09	2,23
	12	8,96	1,20	7,46	8,87	1,41	6,27	8,88	1,65	5,38	8,88	1,91	4,65	8,75	2,19	4,00	8,36	2,49	3,36	7,60	2,81	2,71
120	-20	5,96	1,73	3,44	5,77	2,38	2,43	5,63	2,81	2,00	5,52	3,10	1,78									
	-15	6,85	1,46	4,69	6,48	2,33	2,79	6,33	2,80	2,26	6,27	3,05	2,05	6,17	3,23	1,91						
	-10	7,36	1,57	4,69	6,97	2,44	2,86	6,81	2,91	2,34	6,75	3,16	2,13	6,65	3,34	1,99	6,41	3,63	1,77	5,90	4,17	1,42
	-7	9,74	1,93	5,05	9,12	2,47	3,69	8,86	2,82	3,14	8,78	3,07	2,86	8,72	3,30	2,64	8,49	3,62	2,35	7,93	4,10	1,94
	-2	10,85	1,56	6,94	10,19	2,42	4,20	9,82	2,90	3,39	9,61	3,14	3,06	9,41	3,30	2,85	9,06	3,52	2,57	8,41	3,97	2,12
	2	11,59	1,59	7,28	10,90	2,45	4,45	10,47	2,92	3,58	10,17	3,16	3,22	9,87	3,30	2,99	9,43	3,49	2,70	8,73	3,87	2,26
	7	13,20	2,00	6,60	12,55	2,54	4,94	12,10	2,89	4,19	11,73	3,13	3,75	11,30	3,32	3,41	10,68	3,54	3,02	9,74	3,86	2,52
	12	14,34	2,26	6,34	13,66	2,64	5,17	13,23	2,91	4,54	12,90	3,13	4,13	12,53	3,32	3,77	11,96	3,56	3,36	11,05	3,87	2,86

PERFORMANCE DATA

COOLING EFFICIENCY TABLES

The tables show the values of cooling power, absorbed power and EER at various external air temperature conditions, referred to instantaneous power according to EN 14511.

HP_OWER TWO	Outside air T [°C]	Tout [°C]																	
		5			7			10			12			15			18		
		Cooling power [kW]	Absorbed power [kW]	COP [W/W]	Cooling power [kW]	Absorbed power [kW]	COP [W/W]	Cooling power [kW]	Absorbed power [kW]	COP [W/W]	Cooling power [kW]	Absorbed power [kW]	COP [W/W]	Cooling power [kW]	Absorbed power [kW]	COP [W/W]	Cooling power [kW]	Absorbed power [kW]	COP [W/W]
90	20	4,84	1,25	3,88	5,21	1,22	4,28	5,77	1,18	4,90	6,14	1,15	5,33	6,70	1,11	6,03	7,26	1,07	6,78
	25	5,23	1,47	3,55	5,63	1,45	3,87	6,23	1,43	4,37	6,63	1,41	4,70	7,24	1,38	5,23	7,84	1,36	5,77
	30	5,85	1,88	3,12	6,30	1,88	3,36	6,98	1,88	3,72	7,43	1,88	3,96	8,10	1,88	4,32	8,78	1,87	4,68
	35	5,68	2,10	2,71	6,12	2,11	2,90	6,77	2,13	3,18	7,21	2,14	3,37	7,87	2,16	3,64	8,52	2,18	3,91
	40	5,43	2,26	2,40	5,84	2,28	2,56	6,47	2,31	2,80	6,89	2,33	2,95	7,51	2,37	3,18	8,14	2,40	3,39
	45	4,94	2,55	1,94	5,32	2,56	2,08	5,89	2,58	2,29	6,27	2,59	2,43	6,84	2,60	2,63	7,41	2,62	2,83
120	20	6,45	1,64	3,95	6,96	1,58	4,40	7,72	1,51	5,13	8,23	1,46	5,66	9,00	1,38	6,53	9,76	1,30	7,50
	25	7,18	1,93	3,72	7,74	1,89	4,10	8,59	1,82	4,71	9,16	1,78	5,14	10,00	1,72	5,83	10,85	1,65	6,57
	30	8,22	2,47	3,33	8,86	2,44	3,63	9,83	2,40	4,11	10,48	2,37	4,43	11,45	2,32	4,93	12,42	2,28	5,45
	35	7,87	2,76	2,86	8,49	2,74	3,10	9,42	2,72	3,47	10,04	2,70	3,72	10,97	2,67	4,10	11,90	2,65	4,49
	40	7,40	2,97	2,49	7,98	2,96	2,70	8,85	2,95	3,00	9,44	2,94	3,21	10,31	2,93	3,52	11,19	2,92	3,84
	45	6,84	3,35	2,04	7,38	3,33	2,22	8,19	3,29	2,49	8,72	3,26	2,68	9,53	3,22	2,96	10,34	3,18	3,25

PERFORMANCE DATA

REFRESHING YIELD TABLE, AT PARTIAL LOADS

The tables show the values of cooling capacity and EER at various percentages of required load for leaving water temperature of 7/18 ° C. The data shown are indicative and may be subject to change. They always refer to the instantaneous power according to EN 14511.

PARTIAL LOADS - TECHNICAL WATER at 7 °C

HP_OWER TWO 90				
Water temperature [°C]	7			
Outside air temperature [°C]	35	30	25	20
Load required [%]	100	75	50	25
Load required [kW]	6,120	4,590	3,060	1,530
Cooling capacity declared [kW]	6,120	4,592	3,110	2,880
EER at the required load	2,899	3,557	4,404	4,547

HP_OWER TWO 120				
Water temperature [°C]	7			
Outside air temperature [°C]	35	30	25	20
Load required [%]	100	75	50	25
Load required [kW]	8,490	6,368	4,245	2,123
Cooling capacity declared [kW]	8,490	6,457	4,277	4,190
EER at the required load	3,098	3,795	4,479	4,363

PARTIAL LOADS - TECHNICAL WATER at 18 °C

HP_OWER TWO 90				
Water temperature [°C]	18			
Outside air temperature [°C]	35	30	25	20
Load required [%]	100	75	50	25
Load required [kW]	8,520	6,390	4,260	2,130
Cooling capacity declared [kW]	8,520	6,393	4,408	4,369
EER at the required load	3,907	4,960	6,853	7,063

HP_OWER TWO 120				
Water temperature [°C]	18			
Outside air temperature [°C]	35	30	25	20
Load required [%]	100	75	50	25
Load required [kW]	11,900	8,925	5,950	2,975
Cooling capacity declared [kW]	11,900	9,051	6,318	6,352
EER at the required load	4,490	5,699	7,135	7,311

PERFORMANCE DATA

YIELD TABLES IN DOMESTIC HOT WATER PRODUCTION MODE DURING THE SUMMER SEASON

The tables show the values of Thermal power, Absorbed power and COP at various external air temperature conditions during the summer season for technical water at 45/50/55 °C for the purpose of producing domestic hot water. The data shown are indicative and may be subject to change. They always refer to the instantaneous power according to EN 14511.

RISCALDAMENTO										
HP_OWER TWO	Outside air T [°C]	Tout [°C]								
		45			50			55		
		Heating power [kW]	Absorbed power [kW]	COP [W/W]	Heating power [kW]	Absorbed power [kW]	COP [W/W]	Heating power [kW]	Absorbed power [kW]	COP [W/W]
90	20	7,94	1,67	4,76	7,60	2,00	3,80	6,91	2,36	2,92
	25	7,79	1,65	4,73	7,46	1,98	3,76	6,76	2,34	2,88
	30	7,92	1,55	5,12	7,59	1,88	4,03	6,89	2,24	3,07
	35	7,36	1,52	4,86	7,03	1,85	3,80	6,33	2,21	2,86
120	20	11,32	2,40	4,71	10,70	2,56	4,19	9,76	2,98	3,28
	25	11,12	2,38	4,67	10,50	2,53	4,15	9,56	2,95	3,24
	40	11,30	2,25	5,02	10,68	2,40	4,44	9,74	2,82	3,45
	45	10,51	2,21	4,75	9,89	2,36	4,18	8,94	2,78	3,21

DATA FOR THE ENERGY CERTIFICATION OF BUILDINGS ACCORDING TO UNI / TS 11300-4

Key:

T_{design} Project temperature (for the A - average climate, defined by UNI EN 14825 equal to -10 ° C)

A, B, C, D Reference operating conditions for performance evaluation according to UNI EN 14825

T_{air} Reference external air temperature

T_{water} Water Heating water flow temperature

PLR Partial Load Ratio - climatic load factor

DC Declared Capacity - power of the heat pump in operating conditions A, B, C, D

COP_{DC} COP of the heat pump referred to in nominal DC conditions

COP_{PL} COP of the heat pump in the partialization conditions defined by the UNI EN 14825 standard

PERFORMANCE DATA

DATA FOR THE ENERGY CERTIFICATION OF BUILDINGS ACCORDING TO UNI / TS 11300-4

HP_OWER TWO 90

Operating limits

COLD SOURCE	EXTERNAL AIR	
Temperatura di funzionamento (cut-off)	min	-20°C
	max	30°C

HOT SOURCE	WATER	
Temperatura di funzionamento (cut-off)	min	25°C
	max	58°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat outpututile [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	6,35	6,18	5,55
2	7,21	7,15	6,07
7	8,09	8,00	6,89
12	8,88	8,75	7,60

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	2,91	2,25	1,63
2	3,54	2,72	1,85
7	4,37	3,33	2,23
12	5,38	4,00	2,71

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	5,67	6,11	3,72	3,56	3,68
COP_{PL_NET}		2,42	2,45	4,10	4,17	5,16
COP_{PL_GROSS}		2,42	2,45	4,10	4,20	5,40

Performances

35°C		
SCOP	ηS	Energy Class
3,82	150%	A++

PERFORMANCE DATA

DATA FOR THE ENERGY CERTIFICATION OF BUILDINGS ACCORDING TO UNI / TS 11300-4

HP_OWER TWO 90

Operating limits

COLD SOURCE	EXTERNAL AIR	
Temperatura di funzionamento (cut-off)	min	-20°C
	max	30°C

HOT SOURCE	WATER	
Temperatura di funzionamento (cut-off)	min	25°C
	max	58°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat outpututile [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	8,86	8,72	7,93
2	10,47	9,87	8,73
7	12,10	11,30	9,74
12	13,23	12,53	11,05

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	3,14	2,64	1,94
2	3,58	2,99	2,26
7	4,19	3,41	2,52
12	4,54	3,77	2,86

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	8,60	8,08	5,66	3,99	4,71
COP_{PL_NET}		2,26	2,72	4,34	5,16	6,82
COP_{PL_GROSS}		2,26	2,72	4,35	5,18	7,14

Performances

35°C		
SCOP	ηS	Energy Class
4,31	169%	A++

PERFORMANCE DATA

TABLES OF ENERGY EFFICIENCY IN WATER HEATING MODE FOR HP_OWER TWO SYSTEM AND MULTIPOWER / MULTIPOWER PLUS TECHNICAL TANK WITH COIL FOR DHW PRODUCTION

The tables below are indicative and may be subject to change. They refer to measurements and calculations according to EN 16147, where applicable, for the system consisting of an HP_OWER TWO heat pump, combined with the technical tank model MULTIPOWER / MULKTIPOWER PLUS 300/500/800 with removable coil for DHW production kit.

Models		HP_OWER TWO 90	HP_OWER TWO 120
Declared load profile		L	L
Classe di efficienza energetica di riscaldamento dell'acqua		A+	A+
Water heating energy efficiency class	warmer climatic conditions (+ 14 ° C)	142%	135%
	average climatic conditions (+ 7 ° C)	119%	122%
	colder climatic conditions (+ 2 ° C)	98%	108%
Daily consumption of electrical energy Q_{elec}	warmer climatic conditions (+ 14 °C)	3,344 kWh	3,509 kWh
	average climatic conditions (+ 7 °C)	3,975 kWh	3,891 kWh
	colder climatic conditions (+ 2 °C)	4,816 kWh	4,401 kWh
Annual energy consumption in terms of final energy	warmer climatic conditions (+ 14 °C)	736 kWh	772 kWh
	average climatic conditions (+ 7 °C)	874 kWh	856 kWh
	colder climatic conditions (+ 2 °C)	1060 kWh	968 kWh
Thermostat temperature setting		45 °C	45 °C

PRODUCT DATA SHEETS ACCORDING TO EU REGULATION 811/2013

Product data sheet for low temperature application (Twater = 35°C)

HP_OWER TWO		90	120
Seasonal Energy Efficiency Class in space heating mode		A++	A++
Nominal output	average climatic conditions	7 kW	9 kW
	colder climatic conditions	6 kW	7 kW
	warmer climatic conditions	6 kW	9 kW
Seasonal Energy Efficiency In space heating mode	average climatic conditions	150 %	169 %
	colder climatic conditions	136 %	161 %
	warmer climatic conditions	244 %	220 %
Annual energy consumption	average climatic conditions	3733 kWh	4882 kWh
	colder climatic conditions	3916 kWh	4197 kWh
	warmer climatic conditions	1398 kWh	2253 kWh
Annual energy consumption in terms of final energy	average climatic conditions	9520 kWh	11150 kWh
	colder climatic conditions	10004 kWh	10687 kWh
	warmer climatic conditions	3537 kWh	5709 kWh
Indoor unit sound power level L_{WA}		-	-
Outdoor unit sound power level L_{WA}		62,5 dB(A)	63,5 dB(A)

Scheda prodotto per applicazioni a media temperatura (Twater = 55°C)

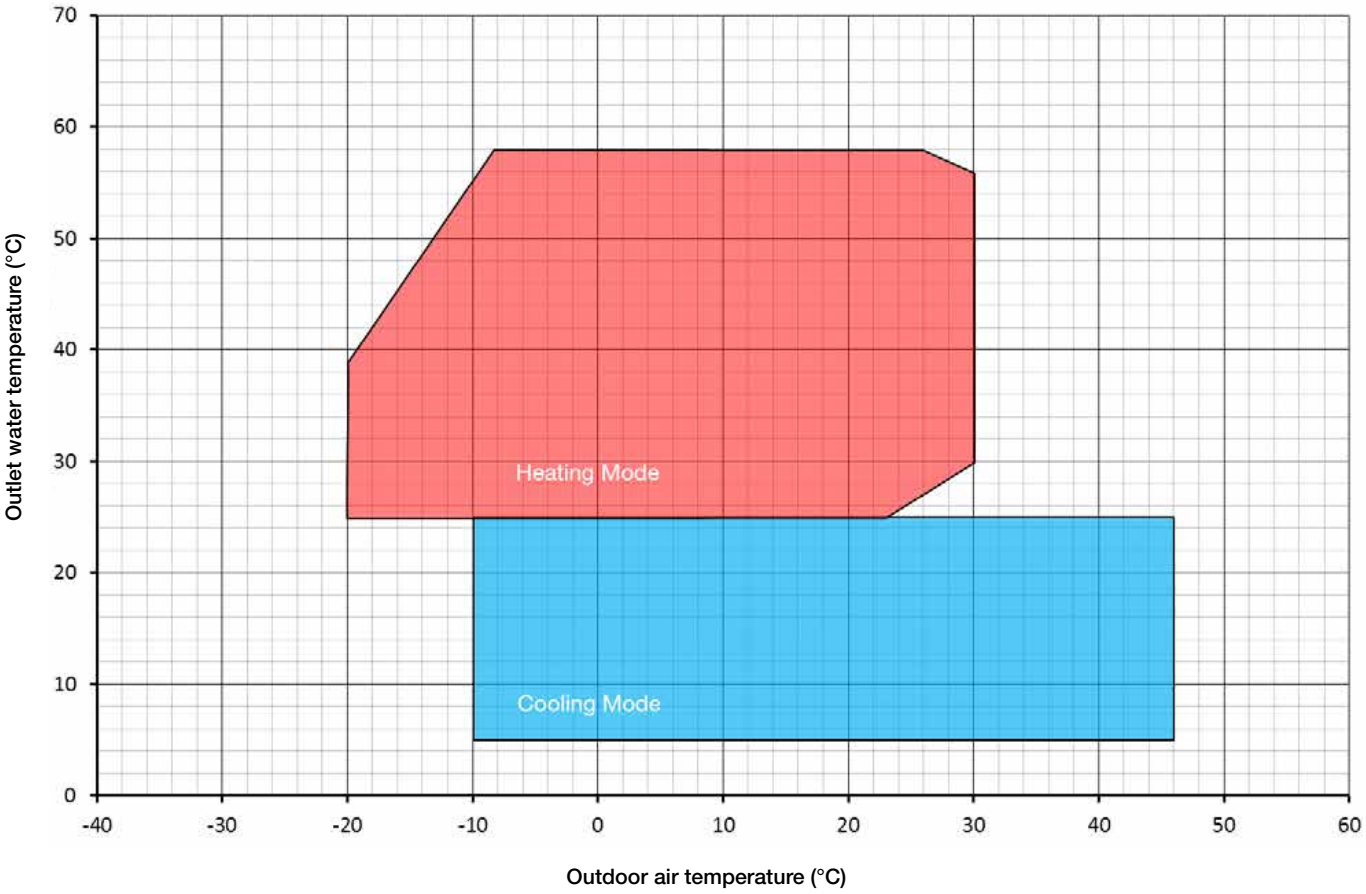
HP_OWER TWO		90	120
Seasonal Energy Efficiency Class in space heating mode		A++	A++
Nominal output	average climatic conditions	6 kW	8 kW
	colder climatic conditions	9 kW	13 kW
	warmer climatic conditions	5 kW	8 kW
Seasonal Energy Efficiency In space heating mode	average climatic conditions	123 %	124 %
	colder climatic conditions	101 %	106 %
	warmer climatic conditions	166 %	156 %
Annual energy consumption	average climatic conditions	3794 kWh	5186 kWh
	colder climatic conditions	8610 kWh	11583 kWh
	warmer climatic conditions	1732 kWh	2648 kWh
Annual energy consumption in terms of final energy	average climatic conditions	9716 kWh	13278 kWh
	colder climatic conditions	22164 kWh	29776 kWh
	warmer climatic conditions	4407 kWh	6748 kWh
Indoor unit sound power level L_{WA}		32 dB(A)	38 dB(A)
Outdoor unit sound power level L_{WA}		62,5 dB(A)	63,5 dB(A)

OPERATING TEMPERATURES

The Heat Pumps are designed in the following external air temperature conditions:

- in heating and DHW production mode, with external air temperature from -20 °C to + 40 °C
- in cooling mode, with condensation control, with an external air temperature between -10 °C and + 46°C

HEATING / COOLING MODE

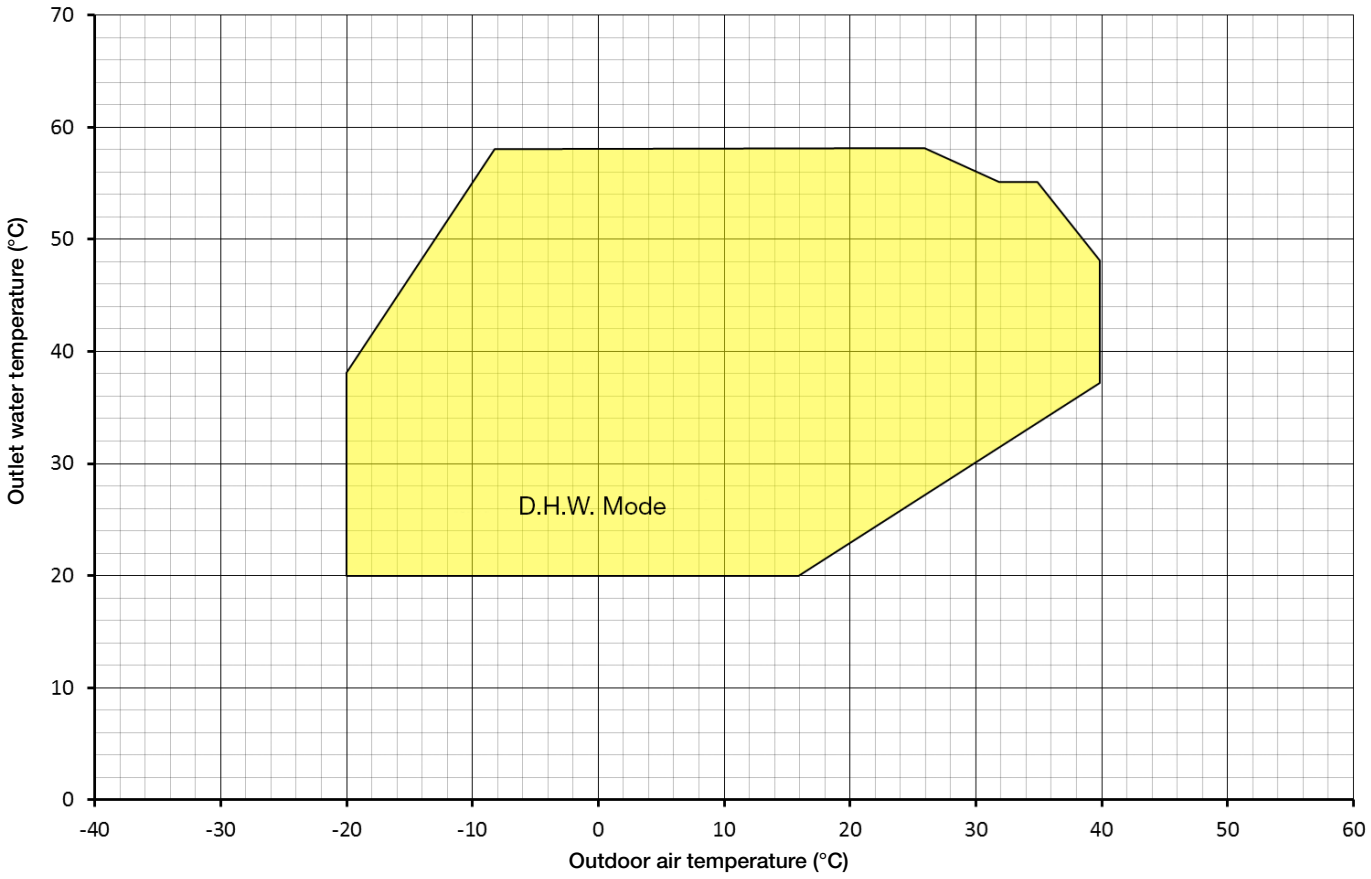


COOLING Mode	
Outdoor air temperature	Minimum -10°C Maximum +46°C
Outlet water temperature	Minimum +5°C Maximum +25°C
HEATING Mode	
Outdoor air temperature	Minimum -20°C Maximum +30°C
Outlet water temperature	Minimum +25°C Maximum +58°C/+63°C*
D.H.W. HEATING Mode	
Outdoor air temperature with water at 38°C maximum	Minimum -20°C Maximum +40°C
Outdoor air temperature with water at 55°C maximum	Minimum -10°C Maximum +35°C
Outlet water temperature	Minimum +20°C Maximum +58°C/+63°C*

(*) with additional electric heater

OPERATING TEMPERATURES

D.H.W. PRODUCTION MODE



COOLING Mode	
Outdoor air temperature	Minimum -10°C Maximum +46°C
Outlet water temperature	Minimum +5°C Maximum +25°C
HEATING Mode	
Outdoor air temperature	Minimum -20°C Maximum +30°C
Outlet water temperature	Minimum +25°C Maximum +58°C/+63°C*
D.H.W. HEATING Mode	
Outdoor air temperature with water at 38°C maximum	Minimum -20°C Maximum +40°C
Outdoor air temperature with water at 55°C maximum	Minimum -10°C Maximum +35°C
Outlet water temperature	Minimum +20°C Maximum +58°C/+63°C*

(*) with additional electric heater

REFRIGERANT CIRCUIT

EXTERNAL UNIT

HP_OWER TWO			70	90
Compressor	Type		Twin Rotary DC Inverter	Twin Rotary DC Inverter
	Number of compressors		1	1
	Oil charge (type, q.ty)	ml	ESTER OIL VG74, 670	ESTER OIL VG74, 1000
Fan motor	Type		DC Brushless Motor	DC Brushless Motor
	Q.ty		1	1
Refrigerant R410A	Refrigerant charge (7)	kg	2,03	3,9
	Refrigerant quantity in tons of equivalent CO_2	ton	4,2	8,1
	Design pressure (high / low)	MPa	4,2 / 2,7	4,2 / 2,7
Refrigerant circuit	Liquid - gas side connection	inch SAE	3/8" - 5/8"	3/8" - 5/8"
	Minimum length to guarantee	m	3	3
	Maximum length	m	30	30
	Length for nominal capacity	m	5	5
	Maximum length without refill	m	7	7
	Additional amount of R410A refrigerant (10)	g/m	20	20
	Maximum height difference (9)	m	15/20	15/20
Noise	Sound power Lw (8)	dB(A)	62,5	63,5
	Sound pressure at 1 meter distance L_{p1} (11)	dB(A)	49,9	50,4
	Sound pressure at 10 meter distance L_{p10} (11)	dB(A)	32,8	33,7

INTERNAL UNIT

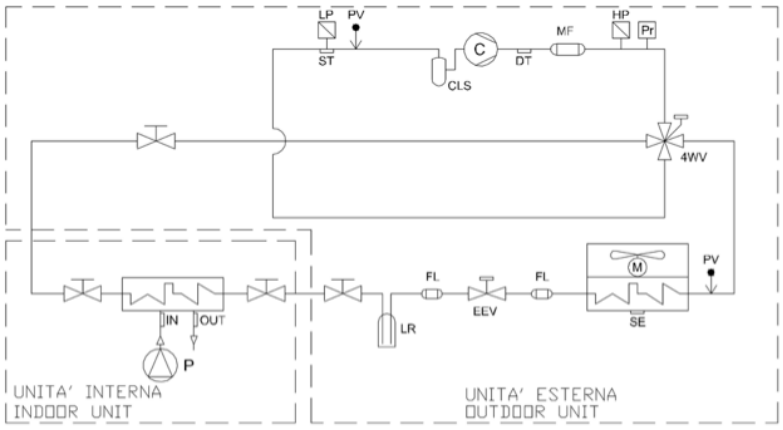
HP_OWER TWO			70	90
Refrigerant circuit	Liquid - gas side connection	inch SAE	3/8" - 5/8"	3/8" - 5/8"
Noise	Sound power Lw (8)	dB(A)	32	38
	Sound pressure at 1 meter distance L_{p1} (11)	dB(A)	18,4	24,4
	Sound pressure at 10 meter distance L_{p10} (11)	dB(A)	0,9	6,9

Operating conditions:

(7) Refrigerant charge valid until 5m of distance between indoor and outdoor units.
(8) Sound power level: Heating mode condition (3) measured value made according to UNI EN ISO 9614-2, as required for Eurovent certification.
(9) Data for: Indoor unit is up and Outdoor unit is down / Indoor unit is down and Outdoor unit is up (in this case a siphon must be created each 5m of the piping length).
(10) Additional refrigerant for pipe dimensions coherent with the intended attacks
(11) Sound pressure level obtained with internal measurements made in accordance with ISO 3744.

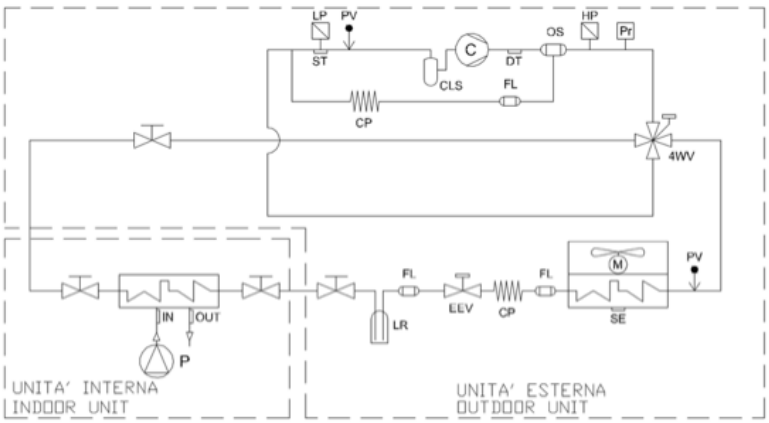
REFRIGERANT CIRCUIT

REFRIGERANT SCHEME HP_OWER TWO 90



C	Compressor
CLS	Compressor liquid separator
ST	Compressor inlet temperature
DT	Compressor outlet temperature
HP	High pressure transducer
Pr	High pressure flow switch
LP	Low pressure transducer
LS	Liquid separator (only for the model 09)
4WV	Valve fo inverting cycle
LR	Liquid receiver
EEV	Electronic expansion valve
FL	Filter
M	Axial fan
MF	Muffler silencer
SE	Outdoor air temperature sensor
P	Circulator on board unit
IN	Water inlet temperature
OUT	Water outlet temperature

REFRIGERANT SCHEME HP_OWER TWO 120



C	Compressor
CLS	Compressor liquid separator
OS	Oil separator
ST	Compressor inlet temperature
DT	Compressor outlet temperature
HP	High pressure transducer
Pr	High pressure flow switch
LP	Low pressure transducer
4WV	Valve for inverting cycle
LR	Liquid receiver
EEV	Electronic expansion valve
FL	Filter
M	Axial fan
SE	Outdoor air temperature
P	Circulator on board unit
IN	Water inlet temperature
OUT	Water outlet temperature
CP	Capillary

HYDRAULIC CIRCUIT

EXTERNAL UNIT

HP_OWER TWO			70	90
Hydraulic circuit	Expansion vessel of technical plant side	l	8	8
	Hydraulic plant flow/return connections	inch	1" M	1" M
	Minimum additional water volume (12)	l	31	46
Circulator	Water flow (3)	m^3/h	1,39	2,08
	Available head pressure (3)	kPa	55,5	35,7
	Nominal input power (3)	kW	0,075	0,09
	Max. input power	kW	0,075	0,09
	Max. input current	A	0,60	0,7
	Energy Efficiency Index (EEI)		≤ 0,21	≤ 0,23

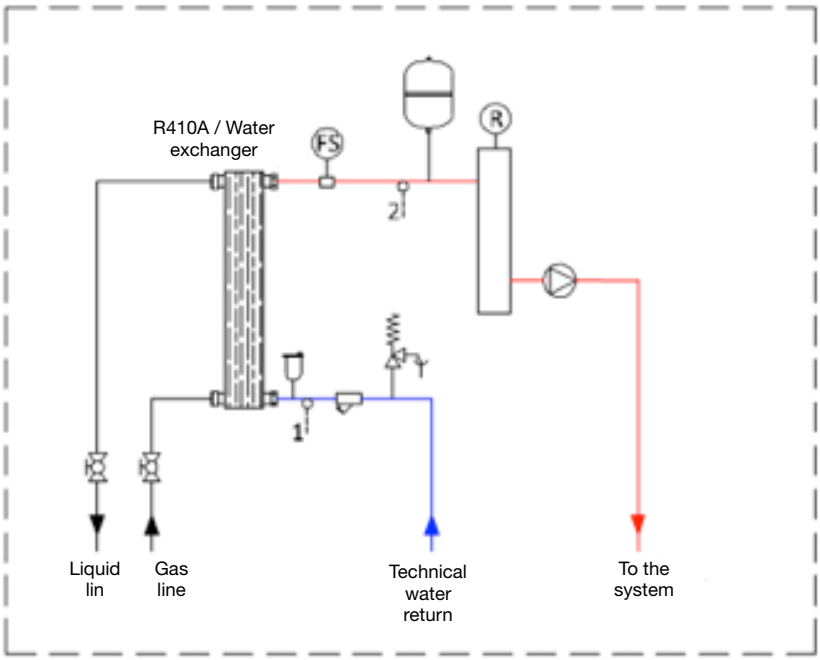
Operating conditions:

(3) Heating: Outdoor air temperature 7°C DB 6°C WB; inlet/outlet temperature 30/35°C.

(12) Calculated for a decrease of the plant water temperature with 10°C and including defrosting cycle maintained for 6 minutes.

HYDRAULIC DIAGRAM

HYDRONIC CIRCUIT OF INTERNAL UNIT

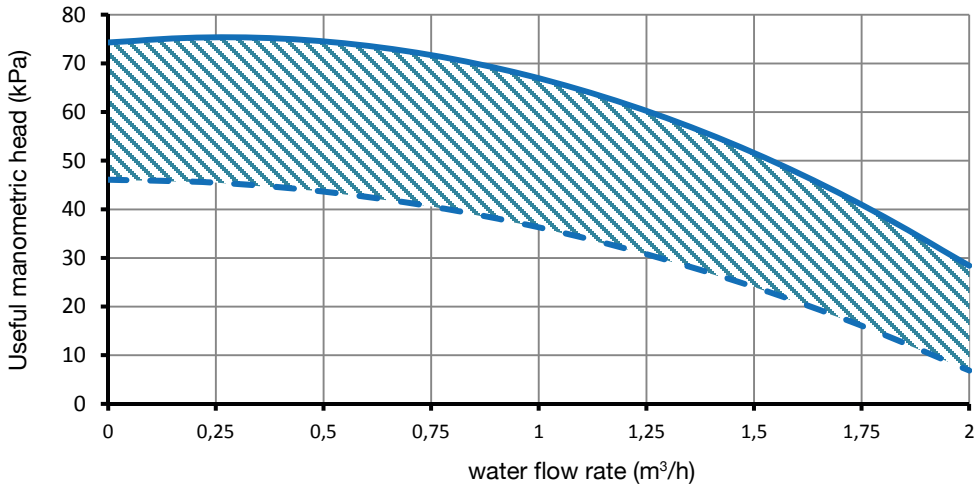


KEY	
	Pump
FS	Flow switch
FM	Flow meter
	Safety valve at 3 bar
	Expansion tank 8 litres
	Air vent valve
	Y filter with 1000 µm wire mesh
	Temperature probe
R	Optional integrative resistance with double protection therm

HYDRAULIC CIRCUIT

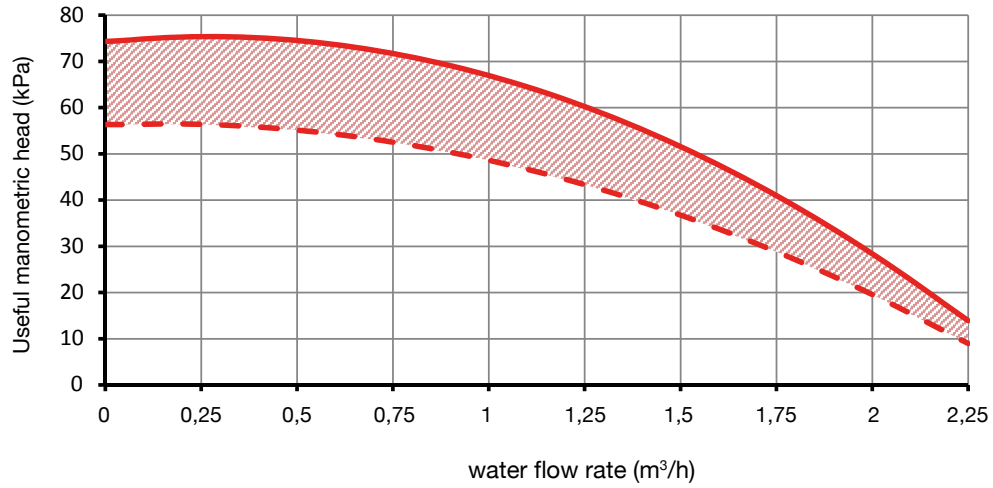
USEFUL HEADS OF HYDRAULIC CIRCUIT

The range of useful heads guaranteed by the machine during pump modulation is as follows:



HP_OWER TWO 90

Operational area of the pump



HP_OWER TWO 120

Operational area of the pump

NOMINAL FLOW RATE

The nominal water flow rate refers to a temperature difference between the evaporator inlet and outlet of 5 °C. The maximum admitted flow rate corresponds to a temperature difference of 3 °C. Higher values can cause excessively high pressure drops. The minimum admitted water flow rate is relative to a typical temperature difference of 8 °C (except for the HP_OWER TWO 90 model where is admitted a maximum temperature difference of 7.5°C).

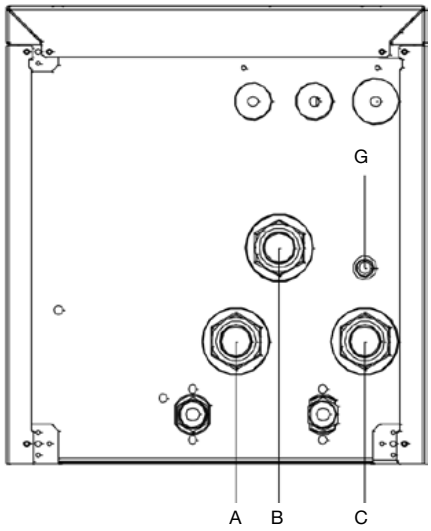
Insufficient water flow rates can cause evaporation temperatures that are too low with subsequent intervention by the safety devices and stopping the unit. In some extreme cases, ice may form in the evaporator with consequent anomalies in the refrigeration circuit.

Modelli		HP_OWER TWO 90	HP_OWER TWO 120
Minimum water flow rate to be guaranteed	m³/h	0,86	1,30
Maximum water flow rate to be guaranteed	m³/h	2,30	3,47

HYDRAULIC CIRCUIT

CONNECTIONS POSITIONS INTERNAL UNIT

view from below



A To the plant (1"M)
B To the DHW puffer (1"M)
C Technic water return (1"M)
G Condensate outlet (joint Ø 14 mm)

SYSTEM WATER CHARACTERISTICS

To ensure proper operation of the unit, the water must be adequately filtered and the quantity of dissolved substances must be minimal.

MAXIMUM CHEMICAL-PHYSICAL CHARACTERISTICS ALLOWED FOR THE SYSTEM WATER	
PH	7,5 - 9
Electrical conductivity	100 - 500 µS/cm
Total hardness	4,5 – 8,5 dH
Temperature	< 65°C
Oxygen content	< 0,1 ppm
Max quantity of glycol	50 %
Phosphates (PO4)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,3 ppm
Alkalinity (HCO3)	70 – 300 ppm
Chlorine ions (Cl-)	< 50 ppm
Sulphate ions (SO4)	< 50 ppm
Sulphide ion (S)	Nessuno
Ammonium ions (NH4)	Nessuno
Silica (SiO2)	< 30 ppm

USE OF GLYCOL

Glycol Percentage	Freezing point (°C)	CCF	IPCF	WFCF	PDCF
10%	-3,2	0,985	1	1,02	1,08
20%	-7,8	0,98	0,99	1,05	1,12
30%	-14,1	0,97	0,98	1,10	1,22
40%	-22,3	0,965	0,97	1,14	1,25
50%	-33,8	0,955	0,965	1,2	1,33

CCF: Efficiency Correction Factor
IPCF: Absolute Power Correction Factor
WFCF: Water Flow rate Correction Factor
PDCF: Pressure Drop Correction Factor

DIMENSIONS AND CLEARANCES

EXTERNAL UNIT

HP_OWER TWO			90	120
Dimensions and weights	Length	mm	924,3	1046,7
	Depth	mm	356,9	464,9
	Height	mm	784,4	912,5
	Package dimensions (LxAxP) (*)	mm	995 x 944 x 415	1120 x 1080 x 520
	Weight in exercise	kg	70 / 62	90 / 83,5

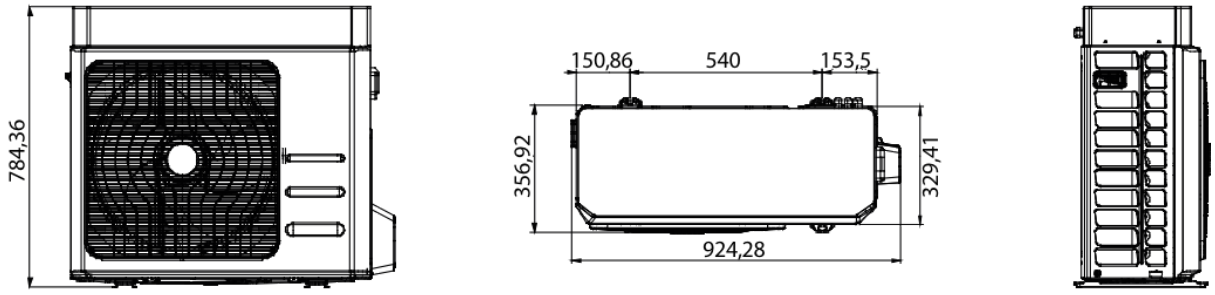
(*) Package height including pallet

INTERNAL UNIT

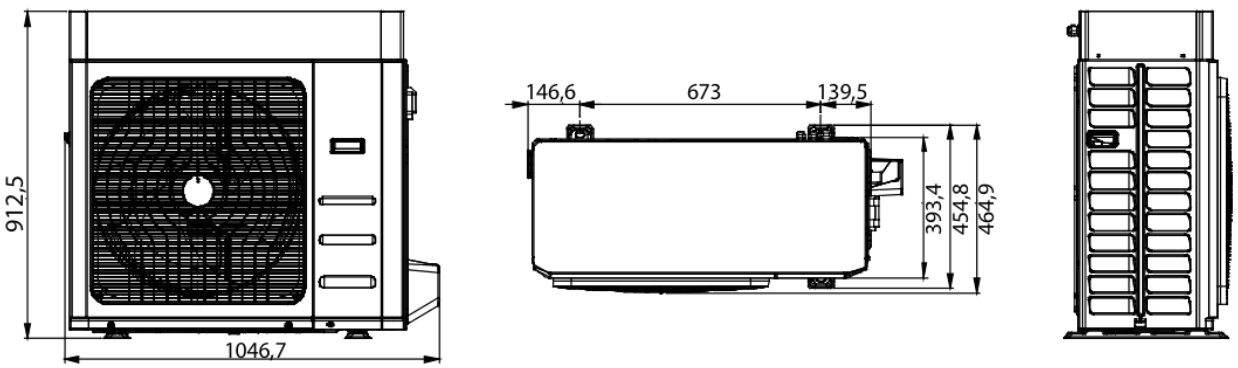
HP_OWER TWO			90	120
Dimensions and weights	Length	mm	314	314
	Depth	mm	343	343
	Height	mm	893	893
	Package dimensions (LxAxP) (*)	mm	560 x 1000 x 600	560 x 1000 x 600
	Weight in exercise	kg	44 / 36	44 / 36

(*) Package height including pallet

DIMENSIONS HP_OWER TWO 90

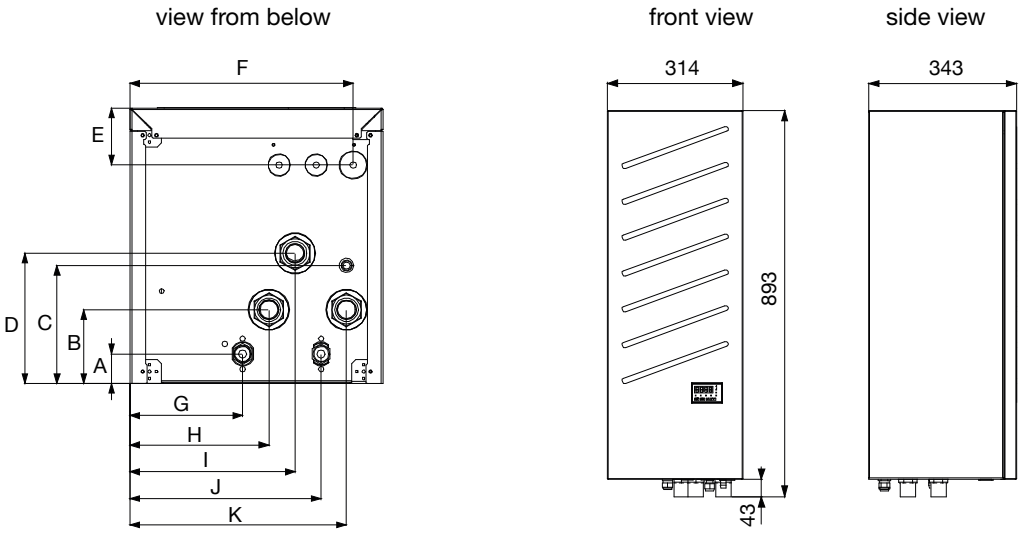


DIMENSIONS HP_OWER TWO 120



DIMENSIONS AND CLEARANCES

INTERNAL UNIT

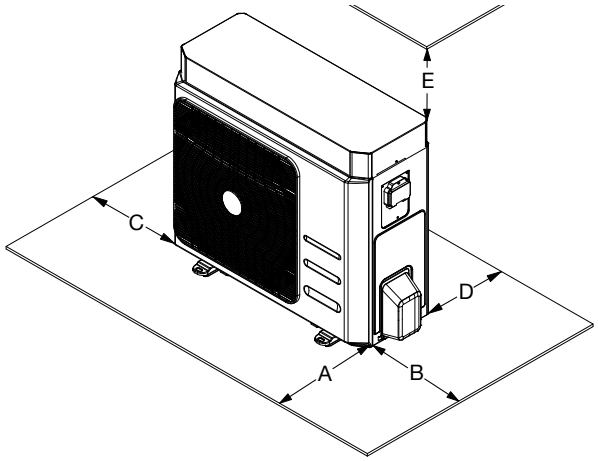


DIMENSIONS	A	B	C	D	E	F	G	H	I	J	K
mm	37	92	147	162	71	277	140	172	205	237	269

TECHNICAL CLEARANCES

EXTERNAR UNIT

All the outdoor units series are designed for outdoor installation. Re-circulation of discharge air has to be avoided. For these reasons it is necessary to respect the following clearances (expressed in mm).

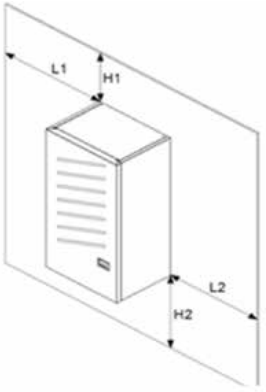


MODELS	A	B	C	D	E
HP_OWER TWO 90	1500	500	400	400	500
HP_OWER TWO 120	1500	500	400	400	500

INTERNAL UNIT:

WALL POSITIONING (also BUILT-IN)

The installation must allow authorized personnel to operate in the event of maintenance, in an easy manner respecting both the safety distances between the units and other apparatus that the technical spaces (expressed in mm) indicated in the table:



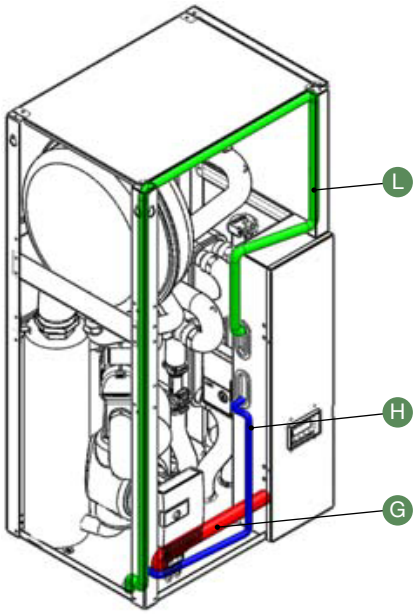
L1*	L2*	H1	H2
1500	500	400	400

(*) Recommended distances for lateral inspection in case of concealed installation. In case concealed installation, the inspection side is not required and you can keep up to 10 mm on each side.

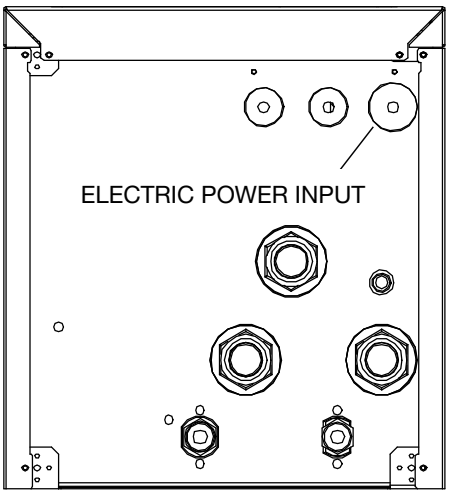
ELECTRICAL CONNECTIONS

HP_OWER TWO			90	120
Electrical data	Supply	V/~/Hz	230/1/50	230/1/50
	Maxumum absorbed power	kW	4,7	6,0
	Maximum absorbed current	A	20,4	26,1
	Internal Unit control supply (Master)	V/~/Hz	12/1/50	12/1/50
	External Unit control supply (Slave)	V/~/Hz	12/1/50	12/1/50
	Touch Screen supply	V/~/Hz	12/1/50	12/1/50
	Fans supply	V/~/Hz	230/1/50	230/1/50
	Circulator supply	V/~/Hz	230/1/50	230/1/50

INTERNAL UNIT CABLE PASSAGE



view from below



G Power supply cables
H Power cables exits (if presents)
L Exit of the communication cable between indoor and outdoor units

POWER TERMINAL BOARD

Single phase system 1-Ph_230Vac + N +PE		
Terminal block	Terminal	Description
M1	PE	Grounding conductor
	L	Phase conductor
	N	Neutral conductor

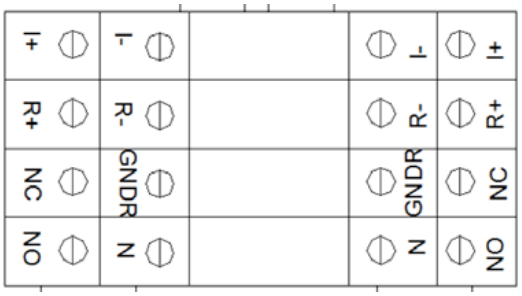
ELECTRICAL CONNECTIONS

INDOOR UNIT TERMINAL BLOCK

Terminal block	Terminals	Description
M2	L1-1	Phase conductor (230Vac)
	L1-2	Phase conductor (230Vac)
	L1-3	Phase conductor for auxiliary systems (230Vac)
	N-1	Neutral conductor
	N-2	Neutral conductor for double setpoint valve
	N-R1	Neutral conductor for electric heater
	PE	Grounding conductor
M3	12V-	Power supply 12Vac
	12V+	Power supply 12Vac
	E-	Modbus per collegamento con unità esterna
	E+	
	R-	Modbus per comunicazioni con Touch Screen
	R+	
	I-	Modbus for connection with outdoor unit
	I+	
	GNDR	GND reference signals and for connection with outdoor unit
	ACS	Sensor for Domestic hot water
	SW	Double set-point digital input
	ON / OFF	Digital input for remote on/off
	IMP	Plant remote temperature sensor
	D01	Phase conductor for DHW the circulator of recirculation
	D01N	Neutral conductor for DHW circulator of circulation
	D02	Phase conductor for DHW valve (230Vac)
	D02N	Neutral conductor for DHW valve
	D03	Phase conductor for auxiliary plant system electric heater (230Vac)
	DO3N	Neutral conductor for plant system auxiliary electric heater
	DO4	Phase conductor for auxiliary DHW electric heater (230Vac)
	DO4N	Neutral conductor for auxiliary DHW electric heater
	DO5	Phase conductor for boiler enablement (230Vac)
	DO5N	Neutral conductor for boiler enablement
	NO2	Normally open changeover contact for double set-point valve (Phase 230Vac)
	NC2	Normally closed changeover contact for double set-point valve (Phase 230Vac)

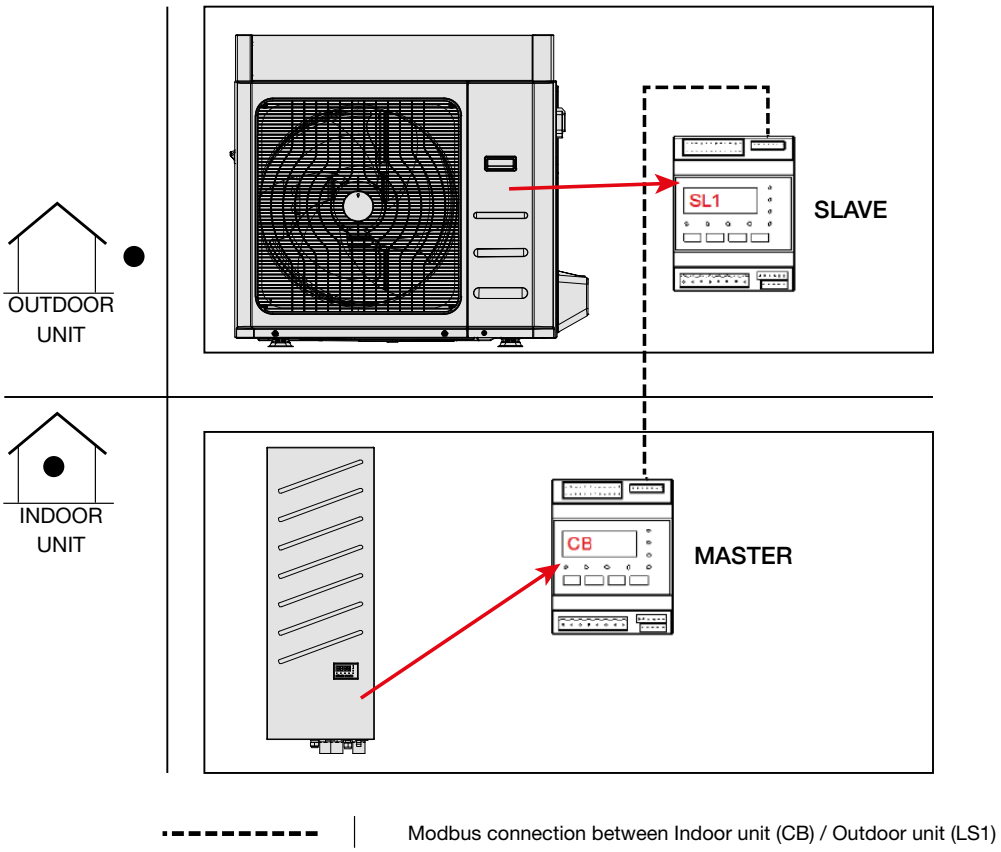
OUTDOOR UNIT TERMINAL BLOCK

Terminals	Description
GND	Grounding
N1	Neutral
L1	Phase 1
L2	Phase 2 (only for three-phase systems)
L3	Phase 3 (only for three-phase systems)
NO	Power supply (230V AC) general alarm (closed if the alarms is on)
N	Neutral
NC	Power supply (230V AC) general alarm (closed if the alarm is off)
I+ / I-	Modbus Slave Wiring with indoor unit
R+ / R-	Modbus Master Wiring with indoor unit
GNDR	GND reference signals (Modbus reference mass for connection with indoor unit)



ELECTRICAL CONNECTIONS

CONNECTION BETWEEN INDOOR - OUTDOOR UNITS



Modbus connection between Indoor unit (CB) / Outdoor unit (LS1)

The Indoor Unit must be connected to the Outdoor Unit respecting the following connection:

INTERNAL UNIT TERMINAL BLOCK	EXTERNAL UNIT TERMINAL BLOCK
I+	I+
I-	I-
E+	R+
E-	R-
GNDR	GNDR

AVAILABLE I / O RESOURCES

- 2 DIGITAL INPUTS (VOLTAGE FREE CONTACTS)
- 2 DIGITAL / ANALOG INPUTS (CONFIGURABLE in EXCLUSIVE manner)
- 1 ANALOGUE INPUT 0-10Vdc
- 2 EXCHANGE CONTACT OUTPUTS (12A - 230Vac)
- 5 SINGLE PHASE OUTPUTS (230V - 50 Hz)
- TOUCH SCREEN POWER SUPPLY (12Vdc)
- MODBUS TOUCH SCREEN SIGNAL

ELECTRICAL CONNECTIONS

5 OUTPUTS IN TENSION CONFIGURABLE

- Motorized three-way valve with two-point supply for D.H.W.
- Motorized three-way valve with two-point power supply for radiant panels (Double Set Point)
- Motorized three-way valve with two-point power supply for differentiated Hot / Cold system
- Enabling emergency boiler
- Enable auxiliary integration source in Heating
- Enable auxiliary integration source for D.H.W. production
- Booster pump external to the Heat Pump, on the secondary loop
- Defrost in progress signal
- System season signal (switching of the three-way valve on the hot/cold side)
- Momentary anomaly and Heat Pump locked out (alarm with manual reset)

2 DIGITAL INPUTS + 2 DIGITAL / ANALOG CONFIGURABLE INPUTS (IN EXCLUSIVE MANNER)

Digital inputs (voltage free contacts)

- ON / OFF from Remote
- Summer / Winter operating mode
- Call from room thermostat
- Call from humidistat (Double Set Point)
- Call from D.H.W. thermostat

Analog Inputs (Probes NTC 10KΩ a 25°C β 34-35)

- D.H.W. temperature probe
- System side remote temperature probe

1 ANALOG INPUT IN TENSIONE 0÷10Vdc

- Interfacing with external thermoregulator in both, Heating and Cooling mode

CONTROLLER - TYPICAL CONFIGURATIONS

INTEGRATED DIGITAL CONTROLLER

The on-board user interface allows the **control** of the heat pump and the programming of the **system configurations** in which it operates.

- Operating mode signaling (summer, winter, domestic hot water production, defrost, alarms) and current status of the main components (compressor, pump)
- Display of hydraulic and refrigerant circuits temperatures
- Display of refrigerant working pressures
- Operating hours of compressor and pump

DIAGNOSTICS

- Real-time display of any operating anomalies
- Reset with manual reset

,

For a detailed description of typical programming and basic configurations

- **DOMESTIC HOT WATER PRODUCTION**
- **COMBINED DHW TANK FUNCTION (Heating + DHW)**
- **DOUBLE SET POINT FUNCTION**
- **MANAGEMENT OF THE INTEGRATION SOURCE**
- **MANAGEMENT OF SEPARATE HOT / COLD SYSTEMS**

refer to what is described for the HP_OWER ONE R, with the appropriate adjustments of the electrical connections in the terminal board.

HP_OWER N

NOISELESS, HIGH EFFICIENCY AIR-WATER HEAT PUMP FOR HEATING/COOLING AND EXTERNAL D.H.W. PRODUCTION **FULL INVERTER – MADE IN ITALY**			
OUTPUT RANGE	From 25 to 50 kW. In cascade up to 350 kW (50 kW x 7)		
ENERGY CLASS	COP up to 4.49 according to EN 14511 EER up to4.63 according to EN 14511		
REFRIGERANT	R410A		
FLOW TEMPERATURE	up to 58°C		
OPERATION	up to – 15°C		
MODELS HP_OWER	250N	350N	500N
FAN MOTOR	DC Inverter Brushless	DC Inverter Brushless	DC Inverter Brushless
ELECTRICAL SUPPLY	three-phase	three-phase	three-phase
COMPRESSOR n°	1 DC Inverter Scroll	1 DC Inverter Scroll	2 DC Inverter Scroll
INTEGRAL PUMP	High head Brushless Inverter (on request)		
EXPANSION MODULE	Control of additional I/O (Input/Output) resources for managing auxiliary sources		
ANTIFREEZE KIT	Low absorption heating cables with automatic management		
KIT SLN “SUPER LOW NOISE”	Thermo-acoustic insulation for compressor + fan diffuser		

FEATURES

FULL INVERTER air-water heat pump, quiet, high efficiency for heating, cooling and domestic hot water production systems, for residential and commercial applications and outdoor installations.

FULL INVERTER 5D" technology: HP_OWER N is designed with DC INVERTER SCROLL compressor, DC Brushless variable speed fan motors, electronic expansion valve with modulating actuator, integrated hydronic kit with high efficiency circulator. In modulation mode, this "FULL INVERTER" system allows optimized delivery of the necessary thermal power, obtaining significant reductions in energy consumption, increased seasonal efficiency and greater comfort when compared to common inverter systems.

- **DC INVERTER SCROLL compressor**
  Low absorption, low noise emissions, continuous progressive DC Inverter modulation, mounted on rubber shock-absorbers, complete with thermal protection and electric crankcase heater
- **Fan Motors DC INVERTER Brushless**
  High efficiency, continuous progressive air flow modulation DC Inverter for a greater precision in the delivery of temperature to the exchanger and a reduction in defrosting cycles, EC thrust regulation at a reduced number of revolutions compared to traditional ones tecnologie, equipped with integrated thermal protection, centrifugal fan
- **Air / refrigerant exchanger in copper pipes with aluminium fins with anti-mold treatment**
  Exclusive profile to reduce air side pressure drops and allow reduced ventilation speeds
- **Thermo-assisted and modulating Electronic valve for refrigerant regulation**
  Continuous control of overheating to increase product performance
- **Microprocessor control logic**
  with wide "Full Inverter" modulation.
  Simultaneous adjustment of compressor, circulator and fan timings to increase the performance and efficiency of the condensing unit
- **Simple and quick maintenance** via USB peripheral Unit for updating the firmware of the electronic control board and configuration parameters to and from the heat pump.
  Made in Italy technology
- **Water / refrigerant plate heat exchanger**
  In high-efficiency stainless steel, patented, for the heat exchange water / R410A refrigerant, equipped with an anti-freeze protection probe that can activate the circulator even when the machine is off
- **Hydronic Kit**
  consisting of: INVERTER circulator, 6 bar safety valve, air vent valve, protection flow switch, pressure gauge, sockets
- **Integrated digital regulator**
  User interface for monitoring, control, real-time maintenance of the Heat Pump parameters and complete system configuration
- **"Maximum Hz" function**, to increase the cooling and heating capacity by 10%
- **D.H.W. Production** via storage tank / dedicated external storage tank
- **Automatic management of additional electric heater** for DHW storage tank
- **Management of auxiliary integration source** with integrated climate control
- **Double Set Point**
  Regulation of two different temperatures for both heating and cooling, and optimization of consumption
- **Thermoregulation supplied as Standard,** with modulating flow temperature management, dynamic set point with settable climatic curve and work with system modulating flow temperature
- **Management with 0 ÷ 10 Volt** external control unit (optional)
- **Management with external ON / OFF chrono-thermostat** (optional)
- **Automatic defrost function**
- **System deaeration function**, with forcing of the circulator at maximum speed to facilitate maintenance operations
- **Autorestart**
- **Self-diagnosis**
  Presence of protection and control devices for the hydraulic circuit, refrigeration circuit, condensing unit, electric unit on the machine with centralized management of the diagnostic logic and signalling of any operating anomalies
- **Double front opening**
  Quick access to the electrical panel and to the border terminal board. Hydraulic circuit and refrigerant circuit can be inspected in complete safety even with moving parts.

ACCESSORIES PREASSEMBLED IN FACTORY (OPTIONAL):

- High head **INVERTER pump** with high efficiency Brushless motor.
  Electronically managed by the integrated digital regulator.
  Programmable operating mode: continuous, on request from controller, from controller with periodic activation, from auxiliary integration source; configurable antifreeze pump function
- **Antifreeze kit for heat exchangers**
  Low absorption heating cables on the base of the air / refrigerant exchanger, with automatic management and pre-wired electrical connection.
  Antifreeze electric resistances applied to the plates of the water / refrigerant heat exchanger
- **SLN "Super Low Noise" Kit**
  Thermal and acoustic insulation of the compressor, for a reduction in noise emissions up to 10% and a heat losses reduction up to 2% compared to standard insulation.
  Specific fan diffuser that, favouring the expulsion of air, allows the reduction of the impeller speed, limited sound pressures, reduced energy consumption, increased efficiency.
- **Expansion Module for System Management**
  Management of additional I/O resources for the control of an integration or emergency source, such as heat generator or electrical resistance in relation to the external working temperature in order to optimize system consumption (choice of the most convenient energy source)

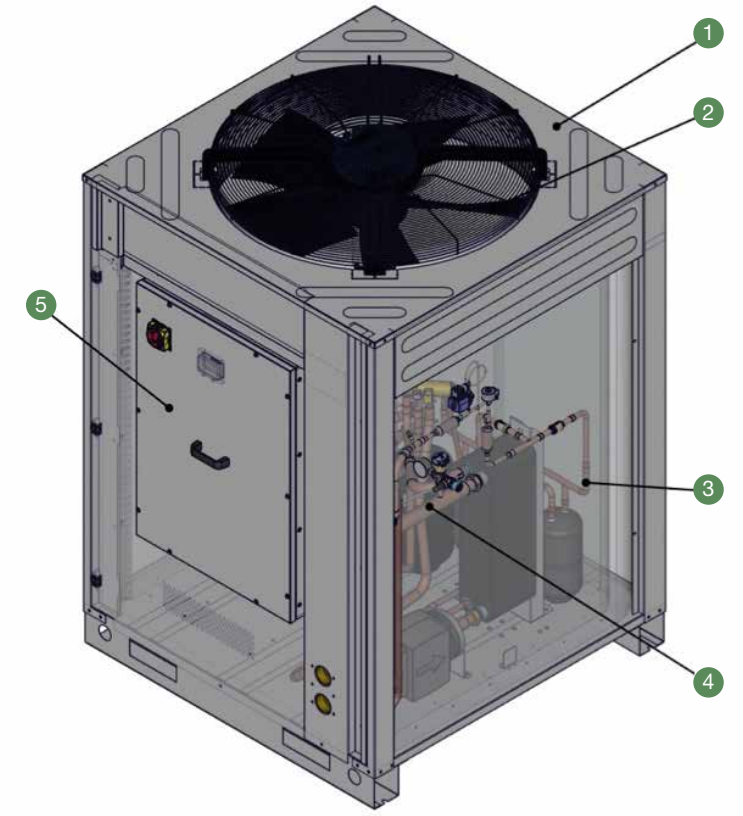
ADJUSTMENT ACCESSORIES (OPTIONAL)

- **TOUCH SCREEN_N remote control**
  Remote management of the heat pump, the network of heat pumps in cascade and the system with integrated functions
- **KTsmart chrono-thermostat**
  Hot / cold, touch screen, Wi-Fi, summer / winter switch, voice assistance, geolocation

OTHER ACCESSORIES (OPTIONAL)

- **LN Kit "Low Noise"**
  Thermal and acoustic insulation of the compressor, allows a reduction in noise emissions of up to 10% and the recovery of over 2% of thermal energy compared to standard insulation
- **Antivibration kit**
  4 rubber anti-vibration shock absorber that can be inserted at the base of the unit to dampen any vibrations
- **Antifreeze and pure anti-corrosive fluid**

MAIN COMPONENTS

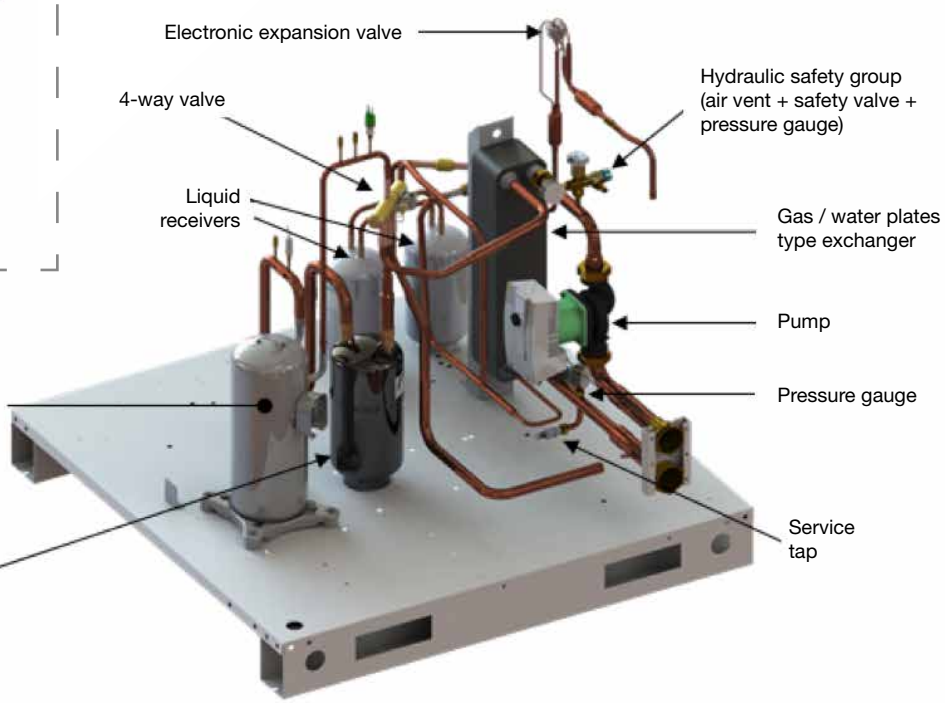


1. Carpentry
2. Axial Fan
3. Refrigerant circuit
4. Hydraulic circuit
5. Electrical panel

HYDRAULIC CIRCUIT - REFRIGERANT CIRCUIT

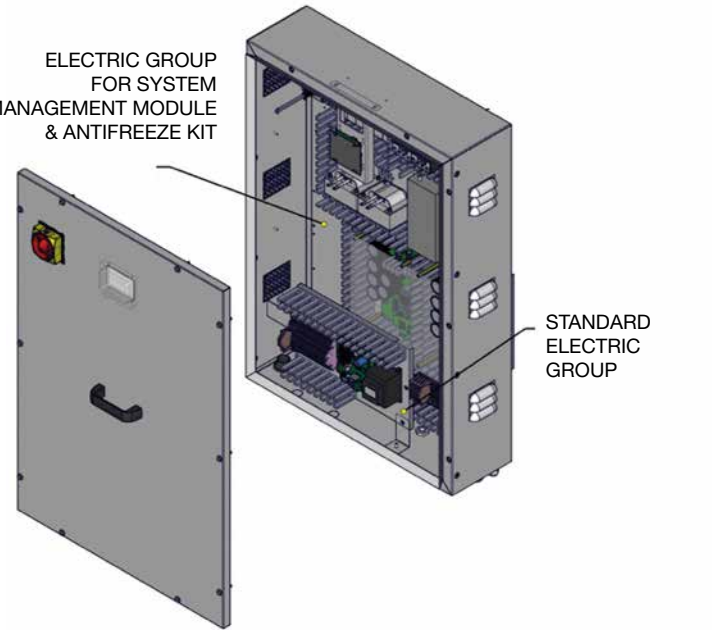
HP_OWER 500N
BI COMPRESSOR

HP_OWER 250N-350N
SINGLE COMPRESSOR

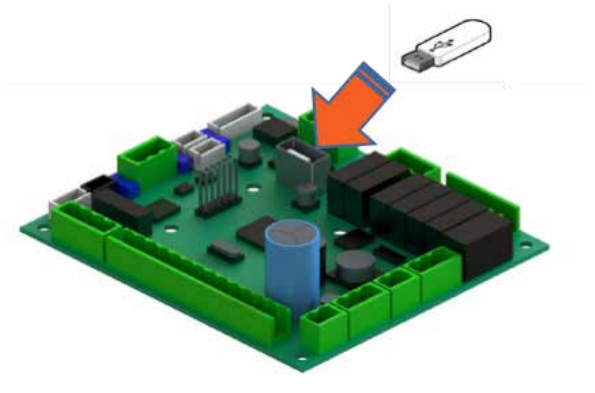


MAIN COMPONENTS

ELECTRICAL CABINET



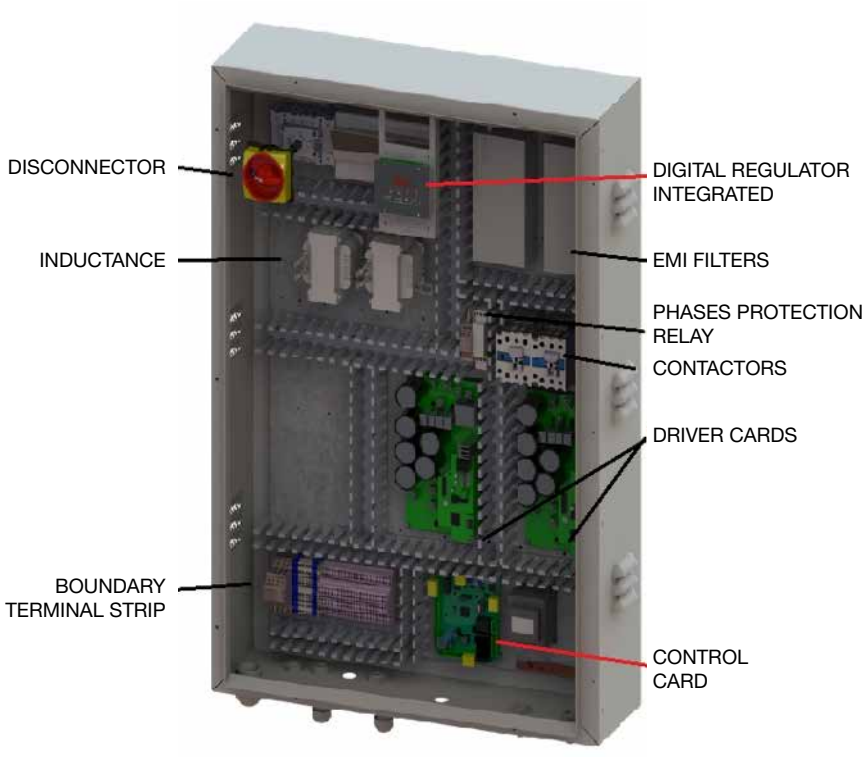
CONTROL BOARD

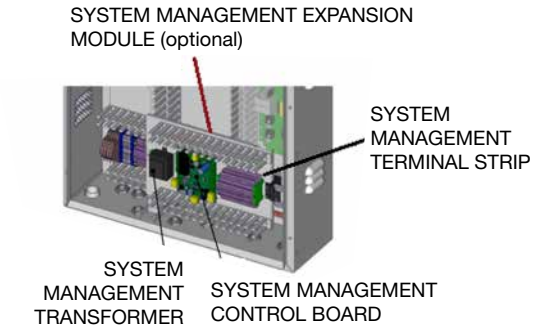


PROGRAMMABLE

QUICK UPDATES VIA USB PERIPHERAL:

- **firmware** update
- transfer of the system **configuration parameters** to and from the heat pump
- implementation of **new logics** in relation to specific requests / installation areas





PERFORMANCE DATA

HP_OWER			250N Integrated circulator	350N Integrated circulator	500N Integrated circulator
Cooling	Cooling capacity (1)	kW	30,65 (33,50*)	36,37 (39,30*)	49,32 (51,80*)
	Power input (1)	kW	6,62	8,91	12,06
	EER (1)	W/W	4,63	4,08	4,09
	Cooling capacity (2)	kW	21,15 (23,10*)	27,04 (29,10*)	36,36 (38,30*)
	Power input (2)	kW	6,35	8,96	12,45
	EER. (2)	W/W	3,33	3,02	2,92
	SEER (5)	W/W	3,98	4,00	4,03
Heating	Heating capacity (3)	kW	24,57 (27,20*)	32,65 (35,30*)	48,25 (51,60*)
	Power input (3)	kW	5,47	7,89	11,42
	COP (3)	W/W	4,49	4,14	4,22
	Heating capacity (4)	kW	22,05 (24,40*)	32,33 (35,10*)	41,07 (43,50*)
	Power input (4)	kW	6,33	9,80	12,07
	COP (4)	W/W	3,49	3,30	3,40
	SCOP (6)	W/W	3,83	3,82	3,82
	Energetic class water temp. 35°C / 55°C	Class	A++ / A+	A++ / A+	A++ / A+

Operating conditions:

(1) Cooling: outdoor air temperature 35°C; inlet/outlet temperature 23/18°C.
(2) Cooling: outdoor air temperature 35°C; inlet/outlet temperature 12/7°C.
(3) Heating: outdoor air temperature 7°C DB 6°C WB; inlet/outlet temperature 30/35°C.
(4) Heating: Outdoor air temperature 7°C DB 6°C WB; inlet/outlet temperature 40/45°C.
(5) Cooling: water temperature inlet/outlet 12/7°C.
(6) Heating: normal climatic condition; Tbiv=-7°C; eater temperature inlet/outlet 30/35°C.
(*) With “Hz max” operation

N.B. The performance data are indicative and could be subject to change. In addition, the performances declared in apex (1), (2), (3) and (4) refer to the instantaneous power according to EN 14511. The declared data stated in the apex (5) and (6) is determined according to the UNI EN 14825.

PERFORMANCE DATA

HEATING EFFICIENCY TABLES

The tables show the values of heating power, absorbed power and COP at various external air temperature conditions referred to instantaneous power according to EN 14511.

Model	Outside air T [°C]	Tout [°C]																				
		25			30			35			40			45			50			55		
		Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]	Thermal power [kW]	Absorbed power [kW]	COP [W/W]
250N	-15	17,39	7,55	2,30	16,65	7,78	2,14	15,82	8,02	1,97	14,91	8,29	1,80	13,91	8,59	1,62	12,83	8,91	1,44			
	-10	18,47	6,89	2,68	17,70	7,15	2,48	16,80	7,42	2,26	15,78	7,72	2,04	14,64	8,04	1,82	13,39	8,39	1,60	12,03	8,77	1,37
	-7	19,62	6,53	3,01	18,84	6,80	2,77	17,91	7,09	2,53	16,84	7,40	2,28	15,64	7,74	2,02	14,30	8,10	1,77	12,83	8,49	1,51
	-2	21,93	5,94	3,69	21,16	6,25	3,39	20,21	6,56	3,08	19,08	6,90	2,76	17,78	7,26	2,45	16,31	7,64	2,14	14,68	8,05	1,82
	2	23,76	5,48	4,33	23,02	5,81	3,96	22,06	6,15	3,59	20,91	6,50	3,21	19,55	6,88	2,84	18,00	7,27	2,48	16,26	7,70	2,11
	7	25,49	4,89	5,21	25,24	5,31	4,76	24,57	5,47	4,49	23,56	6,08	3,87	22,05	6,33	3,49	20,54	6,89	2,98	18,68	7,36	2,54
	12	25,99	4,25	6,12	25,40	4,63	5,49	24,52	5,02	4,89	23,38	5,41	4,32	21,97	5,83	3,77	20,30	6,26	3,24	18,36	6,71	2,74
350N	-15	21,14	7,59	2,78	20,86	8,48	2,46	20,53	9,47	2,17	20,16	10,52	1,92	19,74	11,56	1,71	19,26	12,54	1,54			
	-10	23,53	7,05	3,34	23,25	7,85	2,96	22,96	8,79	2,61	22,64	9,79	2,31	22,30	10,81	2,06	21,94	11,78	1,86	21,54	12,64	1,70
	-7	25,40	6,92	3,67	25,12	7,68	3,27	24,84	8,57	2,90	24,55	9,55	2,57	24,26	10,55	2,30	23,94	11,52	2,08	23,62	12,38	1,91
	-2	28,71	6,86	4,18	28,42	7,54	3,77	28,15	8,37	3,36	27,90	9,31	3,00	27,66	10,28	2,69	27,43	11,24	2,44	27,21	12,11	2,25
	2	31,09	6,80	4,57	30,78	7,41	4,15	30,51	8,20	3,72	30,27	9,10	3,33	30,08	10,05	2,99	29,91	11,00	2,72	29,76	11,88	2,51
	7	33,42	6,55	5,10	33,00	7,12	4,63	32,65	7,89	4,14	32,46	8,80	3,69	32,33	9,80	3,30	32,14	10,71	3,00	32,00	11,58	2,92
	12	33,28	5,66	5,88	32,88	6,12	5,38	32,57	6,78	4,80	32,35	7,60	4,26	32,20	8,50	3,79	32,14	9,43	3,41	32,15	10,32	3,11
500N	-15	32,66	15,22	2,15	31,57	15,37	2,05	30,45	15,70	1,94	29,40	16,26	1,81	28,54	17,13	1,67	27,96	18,37	1,52			
	-10	35,37	14,56	2,43	33,71	14,63	2,30	31,94	14,82	2,16	30,18	15,19	1,99	28,53	15,82	1,80	27,09	16,77	1,62	25,97	18,10	1,44
	-7	38,35	14,12	2,72	36,38	14,16	2,57	34,28	14,29	2,40	32,14	14,58	2,20	30,06	15,09	1,99	28,16	15,89	1,77	26,53	17,04	1,56
	-2	44,30	13,27	3,34	41,91	13,31	3,15	39,32	13,39	2,94	36,62	13,58	2,70	33,92	13,94	2,43	31,31	14,53	2,15	28,91	15,43	1,87
	2	48,90	12,45	3,93	46,25	12,53	3,69	43,34	12,61	3,44	40,26	12,76	3,16	37,12	13,04	2,85	34,02	13,51	2,52	31,07	14,24	2,18
	7	52,92	11,23	4,71	51,04	11,65	4,38	48,25	11,42	4,22	45,12	12,17	3,71	41,07	12,07	3,40	37,55	12,70	2,96	33,80	13,20	2,56
	12	53,32	9,73	5,48	50,29	10,06	5,00	46,84	10,29	4,55	43,09	10,48	4,11	39,14	10,70	3,66	35,09	11,01	3,19	31,05	11,48	2,70

PERFORMANCE DATA

COOLING EFFICIENCY TABLES

The tables show the values of heating power, absorbed power and COP at various external air temperature conditions referred to instantaneous power according to EN 14511.

Model	Outside air T [°C]	Tout [°C]																	
		5			7			10			12			15			18		
		Cooling power [kW]	Absorbed power [kW]	COP [W/W]	Cooling power [kW]	Absorbed power [kW]	COP [W/W]	Cooling power [kW]	Absorbed power [kW]	COP [W/W]	Cooling power [kW]	Absorbed power [kW]	COP [W/W]	Cooling power [kW]	Absorbed power [kW]	COP [W/W]	Cooling power [kW]	Absorbed power [kW]	COP [W/W]
250N	20	17,76	4,94	3,60	19,27	4,93	3,91	21,56	4,97	4,33	23,03	5,01	4,59	25,10	5,06	4,96	26,89	5,06	5,31
	25	18,25	5,36	3,40	19,89	5,37	3,70	22,36	5,43	4,12	23,97	5,48	4,37	26,23	5,55	4,73	28,22	5,56	5,07
	30	18,85	5,88	3,21	20,56	5,90	3,49	23,14	5,97	3,87	24,82	6,03	4,11	27,20	6,12	4,45	29,32	6,15	4,77
	35	19,24	6,40	3,01	21,15	6,35	3,33	23,77	6,55	3,63	25,56	6,64	3,85	28,13	6,76	4,16	30,65	6,62	4,63
	40	18,66	7,16	2,61	20,36	7,20	2,83	22,93	7,31	3,14	24,61	7,40	3,33	27,00	7,51	3,59	29,13	7,58	3,84
	45	17,02	7,91	2,15	18,64	7,97	2,34	21,09	8,09	2,61	22,69	8,19	2,77	24,97	8,32	3,00	26,99	8,41	3,21
350N	20	25,07	6,89	3,64	27,14	6,92	3,92	30,18	7,00	4,31	32,11	7,07	4,54	34,80	7,17	4,86	37,16	7,23	5,14
	25	26,20	7,43	3,53	28,31	7,44	3,80	31,36	7,50	4,18	33,28	7,54	4,41	35,91	7,60	4,72	38,17	7,63	5,00
	30	26,28	8,04	3,27	28,38	8,05	3,53	31,40	8,09	3,88	33,27	8,13	4,09	35,79	8,17	4,38	37,90	8,17	4,64
	35	25,78	8,65	2,98	27,04	8,96	3,02	30,63	8,77	3,49	32,35	8,82	3,67	34,60	8,89	3,89	36,37	8,91	4,08
	40	24,36	9,58	2,54	26,36	9,62	2,74	29,14	9,70	3,00	30,81	9,76	3,16	32,97	9,82	3,36	34,63	9,83	3,52
	45	22,90	10,58	2,16	24,80	10,66	2,33	27,39	10,79	2,54	28,92	10,87	2,66	30,82	10,97	2,81	32,17	11,02	2,92
500N	20	30,71	8,41	3,65	33,32	8,41	3,96	36,99	8,54	4,33	39,44	8,61	4,58	42,50	8,69	4,89	45,56	8,76	5,20
	25	31,64	9,51	3,33	34,33	9,51	3,61	38,00	9,62	3,95	40,44	9,69	4,18	43,50	9,76	4,46	46,55	9,82	4,74
	30	32,33	10,63	3,04	35,08	10,63	3,30	38,81	10,85	3,58	41,30	10,98	3,76	44,40	11,13	3,99	47,51	11,26	4,22
	35	33,27	12,41	2,68	36,36	12,45	2,92	39,93	12,45	3,21	42,48	12,48	3,41	45,67	12,50	3,65	49,32	12,06	4,09
	40	31,42	13,83	2,27	34,10	13,88	2,46	37,71	13,88	2,72	40,12	13,91	2,89	43,13	13,94	3,10	46,15	13,96	3,30
	45	29,58	15,25	1,94	32,09	15,31	2,10	35,49	15,30	2,32	37,76	15,33	2,46	40,60	15,37	2,64	43,43	15,40	2,82

PERFORMANCE DATA

YIELD TABLES IN DOMESTIC HOT WATER PRODUCTION MODE DURING THE SUMMER SEASON

The tables show the values of Thermal power, Absorbed power and COP at various external air temperature conditions during the summer season for technical water at 45/50/55 °C for the purpose of producing domestic hot water. The data shown are indicative and may be subject to change. They always refer to the instantaneous power according to EN 14511.

HEATING										
Model	Outside air temperature ° C	Tout [°C]								
		45			50			55		
		Heating output kW	Absorbed power kW	COP W/W	Heating output kW	Absorbed power kW	COP W/W	Heating output kW	Absorbed power kW	COP W/W
250N	15	21,40	5,29	4,04	17,25	5,24	3,29	16,82	5,79	2,91
	20	22,78	5,00	4,56	18,31	4,96	3,69	17,88	5,50	3,25
	25	22,83	4,38	5,21	18,34	4,37	4,20	17,87	4,86	3,68
	≥ 30	24,59	4,31	5,71	19,56	4,31	4,54	-	-	-
350N	15	27,97	6,97	4,02	29,83	7,87	3,79	28,93	8,71	3,32
	20	29,35	6,58	4,46	31,40	7,46	4,21	30,56	8,28	3,69
	25	27,71	5,35	5,18	29,58	6,11	4,84	28,69	6,83	4,20
	≥ 30	30,06	5,29	5,68	32,08	6,07	5,29	-	-	-
500N	15	39,16	10,17	3,85	27,92	8,60	3,25	27,17	9,43	2,88
	20	40,55	9,28	4,37	28,90	7,87	3,67	28,21	8,65	3,26
	25	35,24	6,67	5,28	25,03	5,71	4,39	24,32	6,33	3,84
	≥ 30	38,06	6,46	5,90	26,78	5,56	4,81	-	-	-

Attention: the production of A.C.S. must take place in a suitable boiler with heat exchanger or in a rapid producer

PERFORMANCE DATA

DATA FOR THE ENERGY CERTIFICATION OF BUILDINGS ACCORDING TO UNI / TS 11300-4

Key::

T_{design}	Project temperature (for the A - average climate, defined by UNI EN 14825 equal to -10 ° C)
A, B, C, D	Reference operating conditions for performance evaluation according to UNI EN 14825
T_{air}	Reference external air temperature
T_{water}	Water Heating water flow temperature
PLR	Partial Load Ratio - climatic load factor
DC	Declared Capacity - power of the heat pump in operating conditions A, B, C, D
COP_{DC}	COP of the heat pump referred to in nominal DC conditions
COP_{PL}	COP of the heat pump in the partialization conditions defined by the UNI EN 14825 standard
EER_{FL}	EER of the heat pump at full load
EER_{PL}	EER of the heat pump at partial load

HEATING

HP_OWER 250N

Operating limits

COLD SOURCE	EXTERNAL AIR	
Operating temperature (cut-off)	min	-15°C
	max	30°C

HOT SOURCE	WATER	
Operating temperature (cut-off)	min	25°C
	max	60°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat output [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	17,91	15,64	12,83
2	22,06	19,55	16,26
7	24,57	22,05	18,68
12	24,52	21,97	18,36

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	2,60	2,07	1,55
2	3,52	2,79	2,07
7	4,40	3,44	2,54
12	4,84	3,74	2,72

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	14,97	16,36	9,96	10,89	13,38
COP_{PL}		2,04	2,36	3,69	5,24	5,94
COP_{DC}		2,04	2,36	3,69	5,26	6,04

Performances

35°C		
SCOP	ηS	Energy Class
3,83	150%	A++

PERFORMANCE DATA

HEATING

HP_OWER 350N

Operating limits

COLD SOURCE	EXTERNAL AIR	
Operating temperature (cut-off)	min	-15°C
	max	30°C

HOT SOURCE	WATER	
Operating temperature (cut-off)	min	25°C
	max	60°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat output [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	24,84	24,26	23,62
2	30,51	30,08	29,76
7	32,65	32,33	32,00
12	32,57	32,20	32,15

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	2,67	2,16	1,72
2	3,41	2,78	2,15
7	4,07	3,26	2,58
12	4,61	3,77	2,96

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	19,21	20,53	12,50	8,03	8,20
COP_{PL}		2,01	2,12	4,09	4,80	5,89
COP_{DC}		2,01	2,12	4,09	4,80	5,95

Performances

35°C		
SCOP	ηS	Energy Class
3,88	152%	A++

PERFORMANCE DATA

HEATING

HP_OWER 500N

Operating limits

COLD SOURCE	EXTERNAL AIR	
Operating temperature (cut-off)	min	-15°C
	max	30°C

HOT SOURCE	WATER	
Operating temperature (cut-off)	min	25°C
	max	60°C

Useful heat output / COP in nominal conditions with defrost contribution

Useful heat output [kW]			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	34,28	30,06	26,53
2	43,34	37,12	31,07
7	48,25	41,07	33,80
12	46,84	39,14	31,05

COP_{DC}			
Air temp. (cold source)	T_{water} (hot souce)		
	35	45	55
-7	2,45	2,05	1,60
2	3,40	2,79	2,14
7	4,10	3,34	2,56
12	4,51	3,62	2,72

Performance data measured in partial load conditions, according to UNI EN 14825

Operating conditions		F	A (E)	B	C	D
T_{air}	°C	-10	-7	2	7	12
PLR	%	100	88	54	35	15
Power DC (Declared Capacity)	kW	28,77	31,38	22,75	21,46	22,21
COP_{PL}		1,95	2,23	3,77	5,26	5,76
COP_{DC}		1,95	2,23	3,77	5,27	5,81

Performances

35°C		
SCOP	ηS	Energy Class
3,82	150%	A++

PERFORMANCE DATA

COOLING

HP_OWER 250N

Wg		0	0,3	0,4	0,2	T_{acqua} (°C)
T_{air}	°C	35	30	25	20	**7**
PLR	%	100	75	50	25	**7**
Power DC_{PL}	kW	21,15	15,93	10,54	8,90	**7**
EER_{PL}		3,33	3,62	4,11	4,12	**7**
Power DC_{FL}	kW	21,15	20,52	19,80	19,25	**7**
EER_{FL}		3,33	3,48	3,68	3,91	**7**

Wg		0	0,3	0,4	0,2	T_{acqua} (°C)
T_{air}	°C	35	30	25	20	**18**
PLR	%	100	75	50	25	**18**
Power DC_{PL}	kW	30,65	22,86	15,47	12,52	**18**
EER_{PL}		4,63	4,93	5,56	5,64	**18**
Power DC_{FL}	kW	30,65	29,08	28,00	27,08	**18**
EER_{FL}		4,63	4,75	5,01	5,34	**18**

HP_OWER 350N

Wg		0	0,3	0,4	0,2	T_{acqua} (°C)
T_{air}	°C	35	30	25	20	**7**
PLR	%	100	75	50	25	**7**
Power DC_{PL}	kW	27,04	20,36	13,63	6,75	**7**
EER_{PL}		3,02	3,69	4,24	4,38	**7**
Power DC_{FL}	kW	27,04	29,10	28,40	28,06	**7**
EER_{FL}		3,02	3,50	3,86	4,14	**7**

Wg		0	0,3	0,4	0,2	T_{acqua} (°C)
T_{air}	°C	35	30	25	20	**18**
PLR	%	100	75	50	25	**18**
Power DC_{PL}	kW	36,37	27,52	18,59	14,07	**18**
EER_{PL}		4,08	5,01	5,75	5,83	**18**
Power DC_{FL}	kW	36,37	38,80	37,56	36,96	**18**
EER_{FL}		4,08	4,76	5,20	5,56	**18**

PERFORMANCE DATA

COOLING

HP_OWER 500N

Wg		0	0,3	0,4	0,2	T_{acqua} (°C)
T_{air}	°C	35	30	25	20	**7**
PLR	%	100	75	50	25	**7**
Power DC_{PL}	kW	36,36	27,24	18,28	9,93	**7**
EER_{PL}		2,92	3,18	3,86	4,03	**7**
Power DC_{FL}	kW	36,36	35,08	34,33	33,32	**7**
EER_{FL}		2,92	3,05	3,41	3,66	**7**

Wg		0	0,3	0,4	0,2	T_{acqua} (°C)
T_{air}	°C	35	30	25	20	**18**
PLR	%	100	75	50	25	**18**
Power DC_{PL}	kW	49,32	36,89	24,79	14,53	**18**
EER_{PL}		4,09	4,41	5,37	5,72	**18**
Power DC_{FL}	kW	49,32	47,51	46,55	45,56	**18**
EER_{FL}		4,09	4,22	4,74	5,20	**18**

PRODUCT DATA SHEETS ACCORDING TO EU REGULATION 811/2013

Product data sheet for low temperature application (Twater = 35°C)

Model		HP_OWER 250N	HP_OWER 350N	HP_OWER 500N
Seasonal Energy Efficiency Class in space heating mode		A++	A++	A++
Nominal output	average climatic conditions	18 kW	23 kW	35 kW
	colder climatic conditions	17 kW	22 kW	33 kW
	warmer climatic conditions	19 kW	23 kW	38 kW
Seasonal Energy Efficiency In space heating mode	average climatic conditions	150 %	152 %	150 %
	colder climatic conditions	113 %	104 %	107 %
	warmer climatic conditions	193 %	177 %	180 %
Annual energy consumption	average climatic conditions	9984 kWh	12357 kWh	19182 kWh
	colder climatic conditions	14400 kWh	19952 kWh	29309 kWh
	warmer climatic conditions	5266 kWh	6752 kWh	11162 kWh
Annual energy consumption in terms of final energy	average climatic conditions	25459 kWh	31501 kWh	48916 kWh
	colder climatic conditions	36960 kWh	51315 kWh	75334 kWh
	warmer climatic conditions	13369 kWh	17165 kWh	28370 kWh
Indoor unit sound power level L_{WA}		-	-	-
Outdoor unit sound power level L_{WA}		70 dB(A)	74 dB(A)	77 dB(A)

Product data sheet for low temperature application (Twater = 55°C)

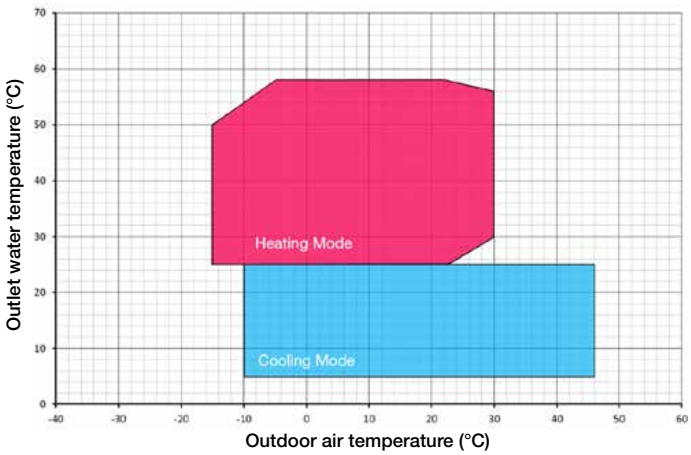
Model		HP_OWER 250N	HP_OWER 350N	HP_OWER 500N
Seasonal Energy Efficiency Class in space heating mode		A+	A+	A+
Nominal output	average climatic conditions	13 kW	23 kW	26 kW
	colder climatic conditions	12 kW	22 kW	24 kW
	warmer climatic conditions	14 kW	22 kW	27 kW
Seasonal Energy Efficiency In space heating mode	average climatic conditions	100 %	100 %	100 %
	colder climatic conditions	81 %	83 %	74 %
	warmer climatic conditions	130 %	113 %	110 %
Annual energy consumption	average climatic conditions	10662 kWh	18817 kWh	20948 kWh
	colder climatic conditions	14082 kWh	24867 kWh	30795 kWh
	warmer climatic conditions	5746 kWh	9999 kWh	12677 kWh
Annual energy consumption in terms of final energy	average climatic conditions	27271 kWh	48434 kWh	53947 kWh
	colder climatic conditions	36506 kWh	64425 kWh	80112 kWh
	warmer climatic conditions	14696 kWh	25661 kWh	32558 kWh
Indoor unit sound power level L_{WA}		-	-	-
Outdoor unit sound power level L_{WA}		70 dB(A)	74 dB(A)	77 dB(A)

OPERATING TEMPERATURES

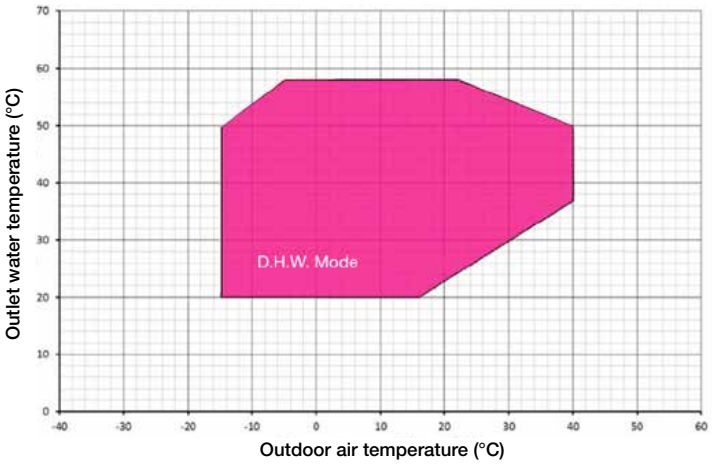
The Heat Pumps are designed in the following external air temperature conditions:

- in heating and DHW production mode, with external air temperature from -15 °C to + 40 °C
- in cooling mode, with condensation control, with an external air temperature between -10 °C and + 46°C

COOLING/HEATING MODE



D.H.W. PRODUCTION MODE



COOLING Mode	
Outdoor air temperature	Minimum -10°C Maximum +46°C
Outlet water temperature	Minimum +5°C Maximum +25°C
HEATING Mode	
Outdoor air temperature	Minimum -15°C Maximum +30°C
Outlet water temperature	Minimum +25°C Maximum +58°C
D.H.W. HEATING Mode	
Outdoor air temperature with water at 50°C maximum	Minimum -15°C Maximum +40°C
Outdoor air temperature with water at 55°C maximum	Minimum -9/-10°C Maximum +28°C
Outlet water temperature	Minimum +20°C Maximum +58°C/+65°C (*)

(*) with additional electric heater

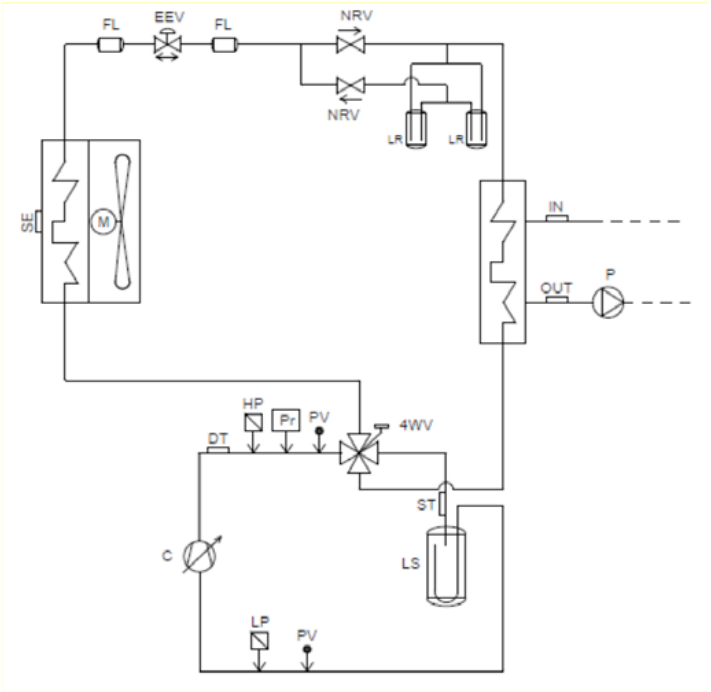
REFRIGERANT CIRCUIT

HP_OWER			250N	250N Integrated circulator	350N	350N Integrated circulator	500N	500N Integrated circulator
Compressor	Brand		Mitsubishi		Mitsubishi		Mitsubishi	
	Type		Scroll DC Inverter		Scroll DC Inverter		Scroll DC Inverter	
	Number		1		1		2	
	Refrigerant oil (type, quantity)	ml	FVC68D, 2300 total		FVC68D, 2300 total		FVC68D, 4600 total	
Fan motor	Type		DC Brushless motor		DC Brushless motor		DC Brushless motor	
	Number		1		1		1	
	Rated power input (2)	kW	0,60		0,72		1,10	
	Max power input	kW	0,72		0,84		1,78	
	Max current input	A	1,22		1,42		2,57	
	Speed	r/min	540		580		670	
	Rated air flow	m^3/s	3,90		4,10		6,90	
Refrigerant	Type		R410A		R410A		R410A	
	Refrigerant quantity (11)	kg	9,5		10		15,5	
	Equivalent amount of CO_2 (11)	ton	19,84		20,88		32,36	
	Design pressure (high/low)	MPa	4,15/2,7		4,15/2,7		4,15/2,7	
Noise level	Sound power (8)	dB(A)	70,1 / LN 68,3 / SLN 67,4		73,6 / LN 71,8 / SLN 70,9		76,5 / LN 74,5 / SLN 73,6	
	Sound pressure at 1 meter distance L_{p1} (9)	dB(A)	54,4 / LN 52,4 / SLN 50,7		56,5 / LN 54,7 / SLN 53,0		59,7 / LN 58,7 / SLN 56,5	
	Sound pressure at 10 meter distance L_{p10} (9)	dB(A)	40,9 / LN 39,1 / SLN 39,1		43,9 / LN 42,1 / SLN 41,2		46,4 / LN 44,6 / SLN 43,7	

Operating conditions:

(8) Sound power: the value is determined on the basis of measurements taken in accordance with the UNI EN ISO 9614-2, in compliance with the requirements of Eurovent certification.
(9) Sound pressure level measured at 1m from the unit in free field, at 10m in free field from the unit according to ISO 3744.
Also the values with installed LN or SLN accessories are reported.
(11) Indicative data subject to variation. For the correct data, always refer to the technical label on the unit.

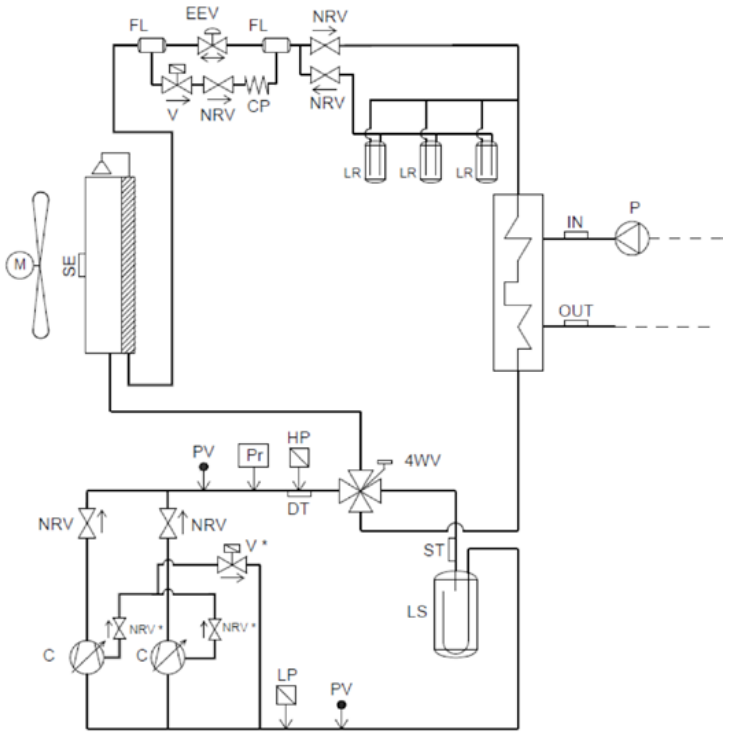
REFRIGERANT SCHEME HP_OWER 250N-350N



C	Inverter compressor
ST	Compressor inlet temperature
DT	Compressor outlet temperature
HP	High pressure transducer
Pr	High pressure flow switch
LP	Low pressure transducer
LS	Liquid separator
4WV	Cycle reversing valve
LR	Liquid receiver
EEV	Liquid receiver
FL	Filter
M	Axial fan
SE	Outdoor air temperature sensor
P	Circulator on board unit
IN	Water inlet temperature
OUT	Water outlet temperature
NRV	No return valve
PV	Pressure check valve

REFRIGERANT CIRCUIT

REFRIGERANT SCHEME HP_OWER 500N



C	Inverter compressor
ST	Compressor inlet temperature
DT	Compressor outlet temperature
HP	High pressure transducer
Pr	High pressure flow switch
LP	Low pressure transducer
LS	Liquid separator
4WV	Cycle reversing valve
LR	Liquid receiver
EEV	Electronic expansion valve
FL	Filter
M	Axial fan
SE	Outdoor air temperature sensor
P	Circulator on board unit
IN	Water inlet temperature
OUT	Water outlet temperature
V	On-off solenoid valve
CP	Capillary
NRV	No return valve
PV	Pressure check valve

A-WEIGHTED SOUND POWER

	Total L_w dB(A)		Octave bands L_w dB(A)							
Size	**Fitting out**	**L_w(A)**	**63 Hz**	**125 Hz**	**250 Hz**	**500 Hz**	**1.000 Hz**	**2.000 Hz**	**4.000 Hz**	**8.000 Hz**
250N	standard	**70,1**	46,8	56,5	60,9	64,0	64,5	62,8	56,9	58,1
	LN	**68,3**	44,9	54,3	59,9	62,0	62,3	59,7	58,9	57,5
	SLN	**67,4**	44,0	55,2	58,5	60,9	61,2	58,1	58,2	57,4
350N	standard	**73,6**	48,2	57,8	65,0	67,4	67,6	66,7	63,1	59,3
	LN	**71,8**	47,4	57,0	64,0	66,4	66,0	63,5	59,3	58,0
	SLN	**70,9**	45,9	56,8	63,5	65,3	64,9	62,6	58,4	57,9
500N	standard	**76,5**	56,3	60,1	68,1	69,8	70,0	69,8	68,1	60,5
	LN	**74,5**	56,0	59,7	67,1	68,5	68,3	66,7	64,2	59,2
	SLN	**73,6**	54,2	59,5	66,3	67,5	67,3	65,4	63,4	59,1

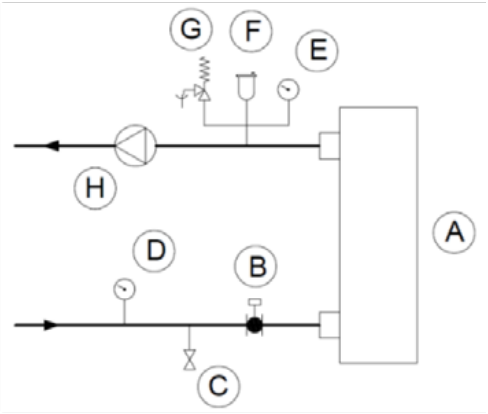
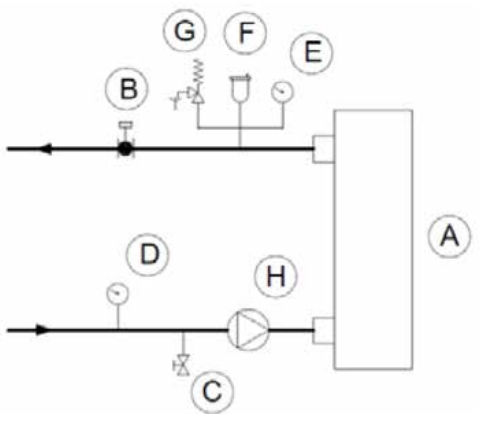
Sound power heating mode; value determined on the basis of measurements taken in accordance with the UNI EN ISO 9614-2.

HYDRAULIC CIRCUIT

HP_OWER			250N	250N Integrated circulator	350N	350N Integrated circulator	500N	500N Integrated circulator
Hydraulic circuit	Water flow rate (2)	l/s	1,00	1,01	1,28	1,29	1,73	1,72
	Available head pressure (2)	kPa	-	88	-	81	-	70
	Internal head loss (2)	kPa	30		34		48	
	Pump rated power input (2)	kW	-	0,27	-	0,31	-	0,44
	Pump max power input	kW	-	0,31	-	0,31	-	0,55
	Pump max current input	A	-	1,37	-	1,37	-	2,05
	Hydraulic connections	inch	2”F		2”F		2”F	
	Minimum volume of water (7)	l	84		108		150	
	Energy Efficiency Index (EEI)		-	≤ 0,23	-	≤ 0,23	-	≤ 0,23

Operating conditions:
(2) Cooling: Outdoor air temperature 35°C; inlet/outlet temperature 12/7°C.
(7) Calculated in the case of the plant water temperature decreased by 15°C for 6 minutes of defrosting.

HYDRAULIC SCHEME

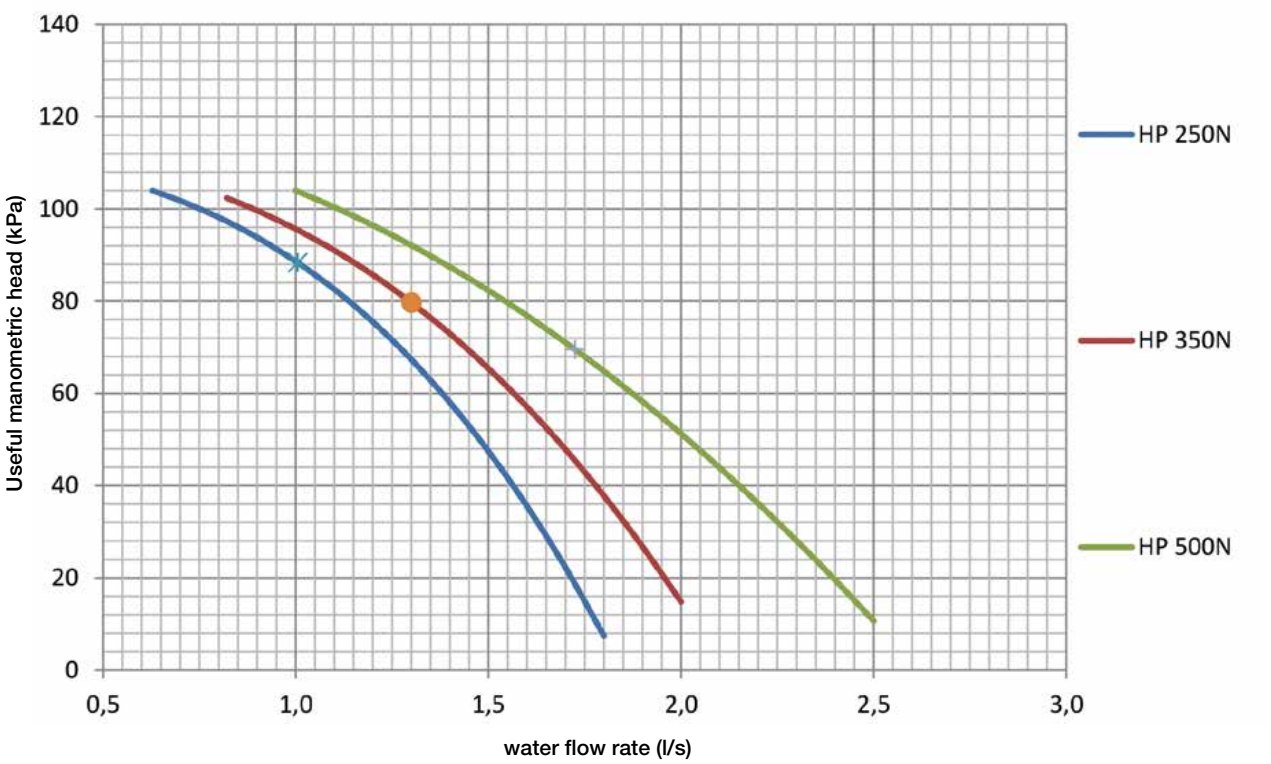
HP_OWER 250N-350N	HP_OWER 500N
	

KEY			
A	Plate heat exchanger	**E**	Outlet pressure gauge
B	Water flow switch	**F**	Air vent valve
C	Service valve	**G**	Safety valve
D	Inlet pressure gauge	**H**	Circulating pump

HYDRAULIC CIRCUIT

CALIBRATION OF PROTECTION AND CONTROL DEVICES

The system must be designed in such a way as to ensure the nominal flow rate related to the work points listed below.

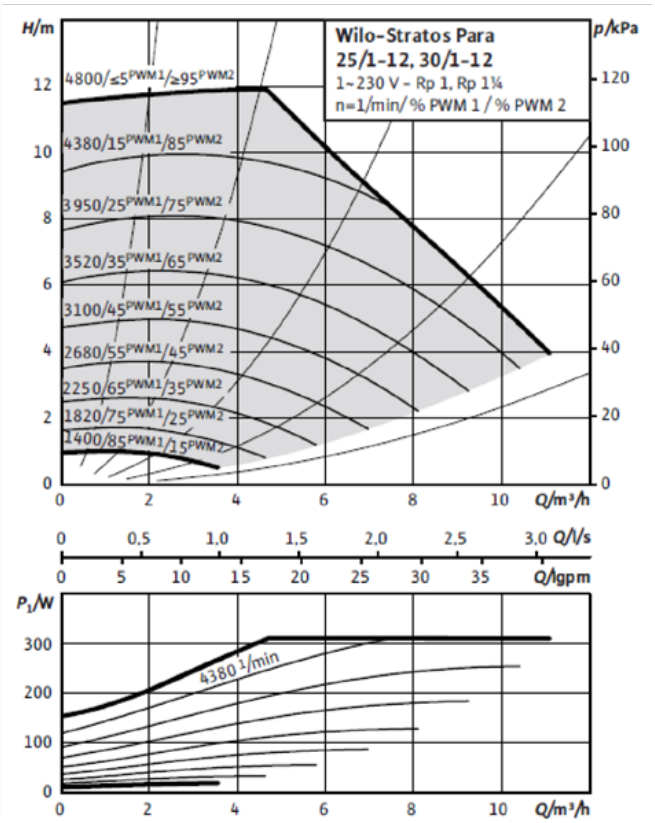


HYDRAULIC CIRCUIT

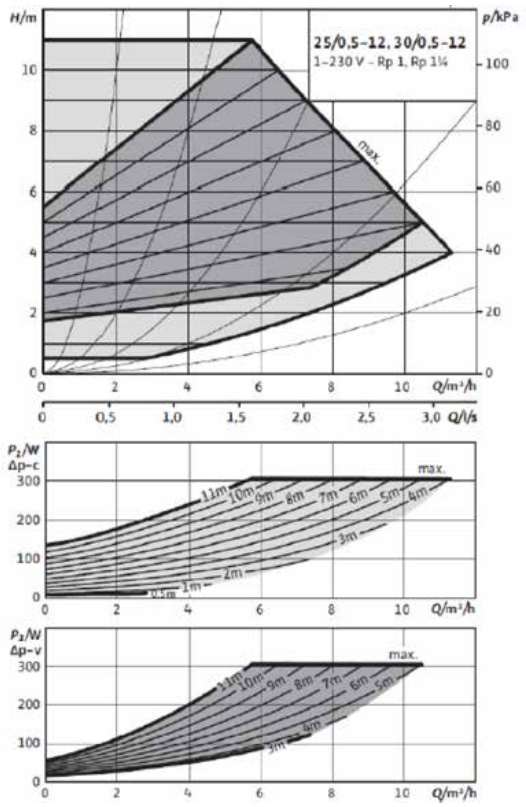
CIRCULATOR'S CURVES

HP_OWER 250N-350N

- Configuration with integrated circulator, control via PWM1 signal

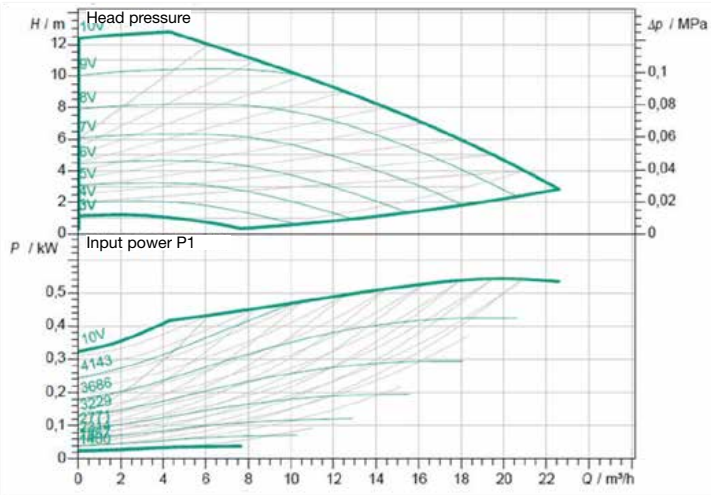


- Configuration with auto-adaptive circulator (with the possibility of choice between constant ΔP and variable ΔP)

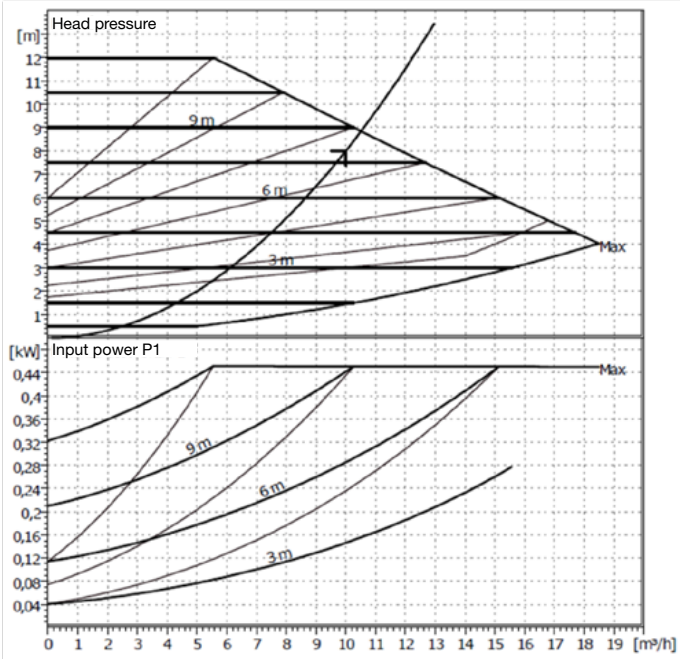


HP_OWER 500N

- Configuration with integrated circulator, control via 0-10 volt analogic signal



- Configuration with auto-adaptive circulator (with the possibility of choosing between constant ΔP and variable ΔP)



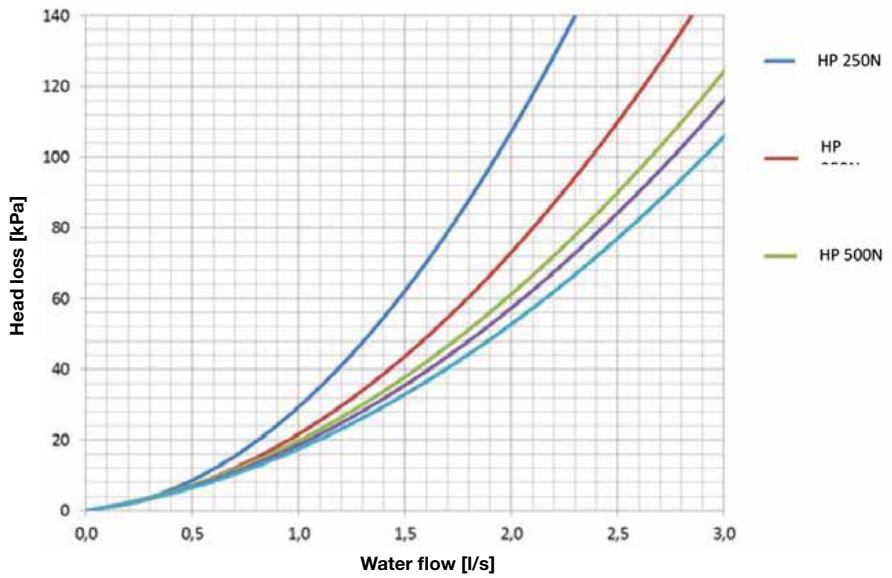
HYDRAULIC CIRCUIT

Model:	HP_OWER 250N - 350N		HP_OWER 500N	
Configuration:	**Integrated**	**Auto adaptive**	**Integrated**	**Auto adaptive**
Max. absorbed power [kW]	310	305	550	450
Max. absorbed current [A]	1,37	1,33	2,05	2
EEI (energy efficiency index))	≤ 0,23	≤ 0,23	≤ 0,23	≤ 0,23

HP_OWER		**250N**	**350N**	**500N**
CIRCULATOR MODEL	Wilo Stratos Para 30/1-12 T10	✓	✓	
	Wilo Stratos Para 40/1-12			✓

HEAD LOSS CURVES OF THE HYDRONIC CIRCUIT

We obtain the pressure head of the circulating pump from the addition of the head losses of the hydronic circuit and the available head pressure. For example: for the model HP_OWER 250N with nominal water flow 1,01 l/s we obtain: 30 kPa (head loss) + 88 kPa (available head pressure)=118 kPa (circulator head pressure).

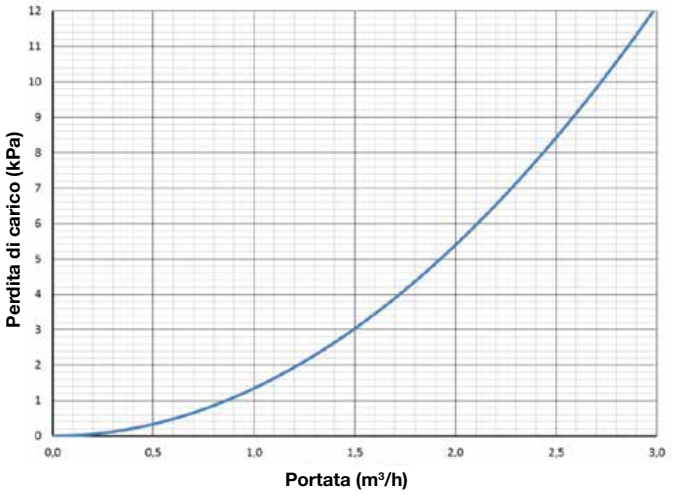


HYDRAULIC CIRCUIT

CHARACTERISTIC CURVE OF THE CONTROL VALVE FOR UNIT IN PARALLEL

CONFIGURAZIONE CON CIRCOLATORE ESTERNO CON GESTIONE IN PARALLELO

The pressure drops of the motorized ON / OFF valve are to be added to the pressure drops of the hydraulic circuit.



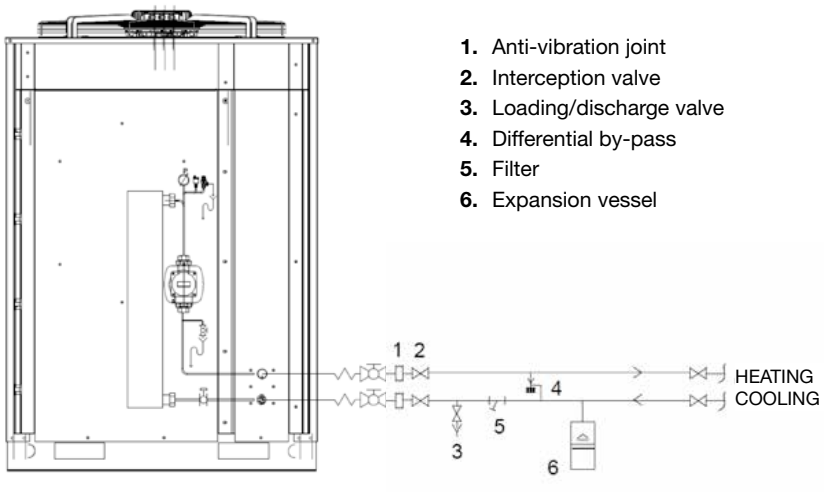
For example: for the model HP_OWER 250N with nominal water flow 1,01L/s, we obtaine 1,4kPa (valve head loss) + 30kPa (hydronic circuit head loss)=34,9 kPa (total internal head loss).

EVAPORATOR WATER FLOW RATE

The nominal water flow rate is referred to a ΔT equal to 5°C, between the evaporator's inlet and outlet temperatures. The allowed maximum flow rate is corresponding to ΔT=3°C. Higher values may produce too high pressure drops. The allowed minimum water flow rate is corresponding to ΔT=8°C. Insufficient values of water flow may produce too low evaporating temperatures according to the operating status with the intervention of safety devices which would stop the unit and, in some particular cases, the water can freeze in the evaporator coil which can breakdown the refrigeration circuit or causes the increasing of the condensing pressure with the shutdown risk of the appliance and the compressor could be damaged.
Le portate minime da assicurare allo scambiatore a piastre per garantirne il corretto funzionamento sono le seguenti:

HP_OWER	250N	350N	500N
Cooling capacity for reference [kW]	21,02	26,90	36,21
Minimum water flow rate that to ensure [l/s]	0,63	0,80	1,08

HYDRAULIC CONNECTIONS



1. Anti-vibration joint
2. Interception valve
3. Loading/discharge valve
4. Differential by-pass
5. Filter
6. Expansion vessel

HYDRAULIC CIRCUIT

CHARACTERISTICS OF WATER OF THE PLANT CIRCUIT

To ensure the correct operation of the unit, the water should be adequately filtred and that the amounts of dissolved substances should minimal.

MAXIMUM PHYSICAL AND CHEMICAL CHARACTERISTICS ALLOWED BY THE WATER OF THE PLANT CIRCUIT	
PH	7,5 - 9
Electrical conductivity	100 - 500 µS/cm
Total hardness	4,5 – 8,5 dH
Temperature	< 65°C
Oxygen content	< 0,1 ppm
Maximum glycol content	50 %
Phosphates (PO4)	< 2ppm
Manganese (Mn)	< 0,05 ppm
Iron (Fe)	< 0,3 ppm
Alkalinity (HCO3)	70 – 300 ppm
Chloride ions (Cl-)	< 50 ppm
Sulfate ions (SO4)	< 50 ppm
Sulfide ions (S)	Nessuno
Ammonium ions (NH4)	Nessuno
Silica (SiO2)	< 30 ppm

USE OF GLYCOL

Glycol Percentage	Freezing point (°C)	CCF	IPCF	WFCF	PDCF
10%	-3,2	0,985	1	1,02	1,08
20%	-7,8	0,98	0,99	1,05	1,12
30%	-14,1	0,97	0,98	1,10	1,22
40%	-22,3	0,965	0,97	1,14	1,25
50%	-33,8	0,955	0,965	1,2	1,33

CCF: Efficiency Correction Factor

IPCF: Absolute Power Correction Factor

WFCF: Water Flow rate Correction Factor

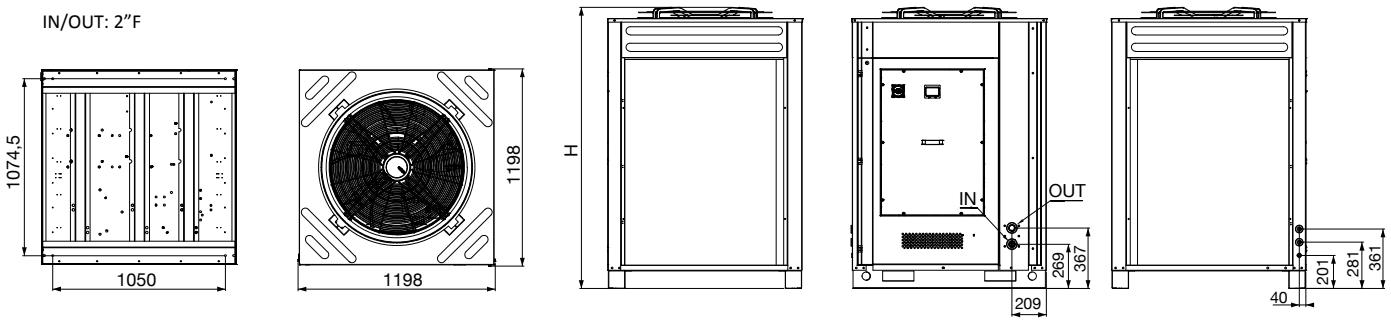
PDCF: Pressure Drop Correction Factor

DIMENSIONS AND CLEARANCES

HP_OWER			250N	250N Integrated circulator	350N	350N Integrated circulator	500N	500N Integrated circulator
Dimensions and weight	Dimensions (L×H×W)	mm	1198x1673x1198		1198x1673x1198		1198x1745x1198	
	Dimensions SLN version (L×H×W)	mm	1198x1915x1198		1198x1915x1198		1198x1920x1198	
	Packing dimensions (L×H×W) (10)	mm	1200x1785x1200		1200x1785x1200		1200x1890x1200	
	Packing dimensions SLN version (LxHxW) (10)	mm	1200x2045x1200		1200x2045x1200		1200x2055x1200	
	Operating weight	kg	357	363	384	391	422	436
	Net/Gross weight	kg	349/369	355/375	376/396	382/401	414/434	428/448

(10) Packing height including the pallet.

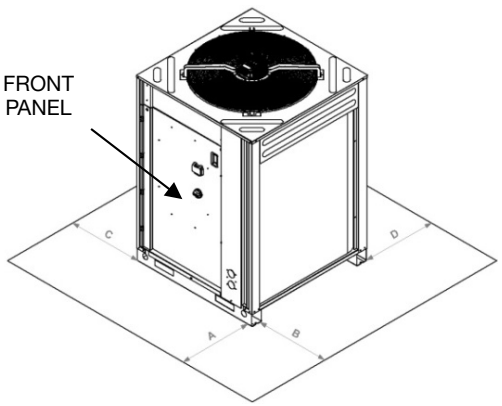
DIMENSIONS



Model	Height H mm	Height H with AXITOP (SLN version) mm	Altezza max imballo (*) mm	Altezza max imballo con AXITOP (Versioni SLN) mm
HP_OWER 250N – 350N	1673	1915	1785	2045
HP_OWER 500N	1745	1920	1890	2055

(*) Some units could be shipped with another type of packaging, only in case of no accessory AXITOP. The maximum height should be increased by 95mm.

TECHNICAL CLEARANCES

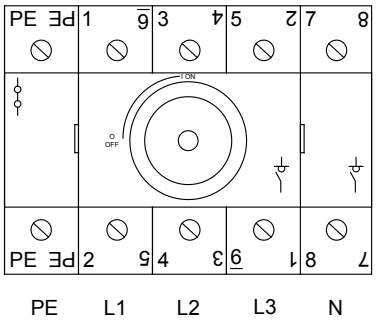


MODELS	A	B	C	D
HP_OWER 250N	1500	1000	1000	1000
HP_OWER 350N	1500	1000	1000	1000
HP_OWER 500N	1500	1000	1000	1000

ELECTRICAL CONNECTIONS

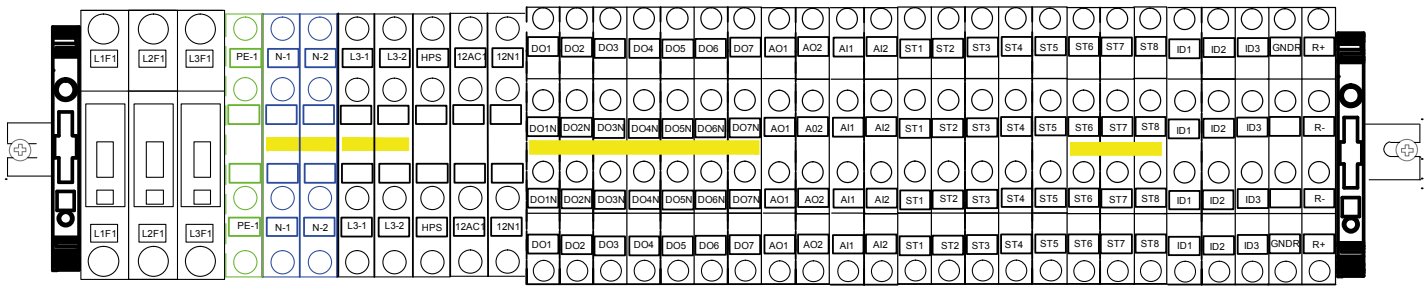
HP_OWER			250N	250N Integrated circulator	350N	350N Integrated circulator	500N	500N Integrated circulator
Electric data	Power supply		400V/3P+N+T/50Hz		400V/3P+N+T/50Hz		400V/3P+N+T/50Hz	
	Maximum power input	kW	14,83	15,14	19,16	19,47	28,62	29,09
	Maximum current input	A	21,4	21,9	27,7	28,1	41,4	42,1
	Touch Screen supply		12V/1/50Hz					
	Fans supply		230V/1/50Hz					

POWER SUPPLY (3-Ph/N/PE 400Vac, 50Hz):



Terminal	Description
PE	Connect the ground wirev
N	Connect the neutral wire from the mains
L1	Connect the phase wire L1 from the mains
L2	Connect the phase wire L2 from the mains
L3	Connect the phase wire L3 from the mains

USER TERMINAL STRIP (STANDARD configuration)



AVAILABLE I/O RESOURCES:

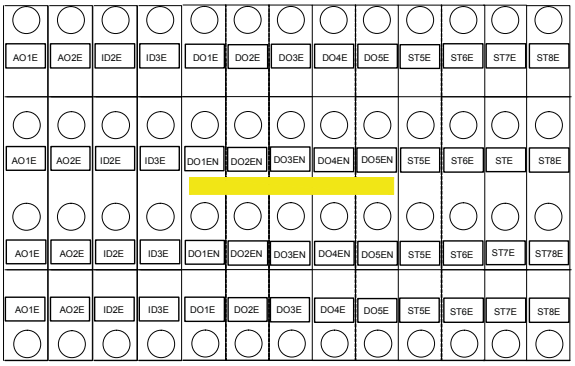
- 3 DIGITAL INPUTS (VOLTAGE FREE CONTACTS)
- 2 DIGITAL / ANALOG INPUTS (CONFIGURABLE in EXCLUSIVE way)
- 1 ANALOG INPUT 0÷10Vdc **
- 3 SINGLE PHASE VOLTAGE OUTPUTS (230Vac, 50Hz) *
- TOUCH SCREEN POWER SUPPLY 12Vac
- MODBUS TOUCH SCREEN SIGNAL

* 2 VOLTAGE OUTPUT if the Antifreeze kit is present (DO4-DO4N output not available)
** Input available on the CN7 connector of the Control Board

ELECTRICAL CONNECTIONS

TERMINAL	CONNECTION	TYPE
12N1	Power Supply for touch screen (12V-)	Power supply 12Vac, 50Hz, 500mA
12AC1	Power Supply for touch screen (12V+)	
GNDR	Modbus ground reference connection terminal for remote supervision	Modbus communication
R-	Modbus - signal connection terminal for touch screen (12V-)	
R+	Modbus + signal connection terminal for touch screen (12V+)	
ID2/ID2	Summer/Winter mode changeover	Digital input (voltage free contact)
ID3/ID3	Remote switch on/off input (if closed=unit is ON / if open = unit is off)	Digital input (voltage free contact)
ST8/ST8	Ambient thermostat	Digital input (voltage free contact)
ST6/ST6	Domestic hot water temperature sensor (if enabled)	NTC sensor NTC-10KΩ a 25°C β 34-35) or digital input
ST7/ST7	Plant water temperature sensor (if enabled)	NTC sensor NTC-10KΩ a 25°C β 34-35) or digital input
DO4 (fase) / DO4N (neutro)	Antifreeze kit heating element (Output not available if Antifreeze kit is present)	Under-voltage output 230Vac, 50Hz, 2A resistive
DO5 (fase) / DO5N (neutro)	Domestic (sanitary) hot water valve	Under-voltage output 230Vac, 50Hz, 2A resistive
DO6 (fase) / DO6N (neutro)	External circulator of plant primary circuit	Under-voltage output 230Vac, 50Hz, 2A resistive

TERMINAL STRIP EXPANSION MODULE GI



AVAILABLE I/O RESOURCES IN GI TERMINAL STRIP:

- 2 DIGITAL INPUTS (VOLTAGE FREE CONTACTS)
- 5 SINGLE PHASE VOLTAGE OUTPUTS (230Vac, 50Hz)

TERMINAL	CONNECTION	TYPE
ID2E/ID2E	Ambient thermostat	Digital input (voltage free contacts)
ID3E/ID3E	Double setpoint	Digital input (voltage free contacts)
DO1E (fase) / DO1EN (neutro)	Plant auxiliary heating element	Under-voltage output 230V ac, 50Hz, 2A resistive
DO2E (fase) / DO2EN (neutro)	Domestic hot water auxiliary electric heater	Under-voltage output 230V ac, 50Hz, 2A resistive
DO3E (fase) / DO3EN (neutro)	Alarm warning	Under-voltage output 230V ac, 50Hz, 2A resistive
DO4E (fase) / DO4EN (neutro)	Plant season warning	Under-voltage output 230V ac, 50Hz, 2A resistive
DO5E (fase) / DO5EN (neutro)	Double setpoint valve	Under-voltage output 230V ac, 50Hz, 2A resistive

Where the plant management kit (optional) is present, a third controller is located inside the electric panel, which acts as I/O resource expansion module. With this controller, it is therefore possible to increase the number of logics handled by the main controller; in particular these logics are used to manage the plant system and are reported below. The functions described below can be activated by the on-board unit controller that is located on the unit's front panel.
For the configuration of the functionalities, please check the control manual supplied with the unit.

ELECTRICAL CONNECTIONS

OUTPUTS IN TENSION CONFIGURABLE

- Motorized three-way valve with two-point supply for D.H.W.
- Motorized three-way valve with two-point power supply for radiant panels (Double Set Point)
- Motorized three-way valve with two-point power supply for differentiated Hot / Cold system
- Enabling emergency boiler
- Enable auxiliary integration source in Heating
- Enable auxiliary integration source for D.H.W. production
- Active pump signal replication
- Booster pump external to the Heat Pump, on the secondary loop
- Defrost in progress signal
- System season signal (switching of the three-way valve on the hot/cold side))
- Momentary anomaly and Heat Pump locked out (alarm with manual reset)

DIGITAL INPUTS + 2 DIGITAL / ANALOG CONFIGURABLE INPUTS (IN EXCLUSIVE MANNER)

Digital inputs (voltage free contacts)

- ON / OFF from Remote
- Summer / Winter operating mode
- Call from room thermostat
- Call from humidistat (Double Set Point)
- Call from D.H.W. thermostat

Analog Inputs (Probes NTC 10KΩ a 25°C β 34-35)

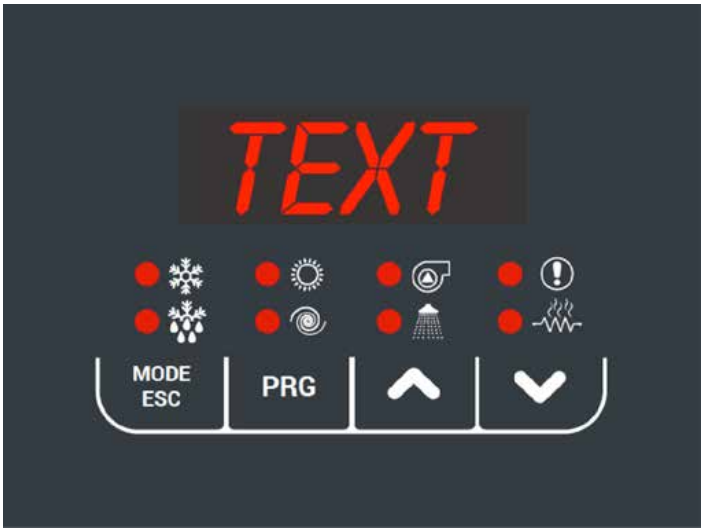
- D.H.W. temperature probe
- System side remote temperature probe

1 ANALOG INPUT IN TENSIONE 0÷10Vdc

- Interfacing with external thermoregulator in both, Heating and Cooling mode

CONTROLLER - TYPICAL CONFIGURATIONS

INTEGRATED DIGITAL CONTROLLER



The on-board user interface allows the **control** of the heat pump and the programming of the **system configurations** in which it operates.

- Operating mode signaling (summer, winter, domestic hot water production, defrost, alarms) and current status of the main components (compressor, pump)
- Display of hydraulic and refrigerant circuits temperatures
- Display of refrigerant working pressures
- Operating hours of compressor and pump

DIAGNOSTICS

- Real-time display of any operating anomalies
- Reset with manual reset

BASIC PROGRAMMING AND CONFIGURATIONS

For a detailed description of typical programming and basic configurations

- DOMESTIC HOT WATER PRODUCTION
- COMBINED DHW TANK FUNCTION (Heating + DHW)
- DOUBLE SET POINT FUNCTION
- MANAGEMENT OF THE INTEGRATION SOURCE
- MANAGEMENT OF SEPARATE HOT / COLD SYSTEMS

refer to what is described for the HP_OWER ONE R, with the appropriate adjustments of the electrical connections in the terminal board.

HP 300S

AIR-WATER HEAT PUMP FOR DHW PRODUCTION AND DEHUMIDIFICATION OF ENVIRONMENTS “FULL INVERTER” - HIGH EFFICIENCY	
STORAGE TANK CAPACITY	278 litres (double-layer glass lining with anti-corrosion magnesium anode)
ENERGY CLASSIFICATION	COP_{DHW} = 2.85 according to EN 16147, profile XL, Tamb = 7 ° C / 6 ° C COP_{DHW} = 3.03 according to EN 16147, profile XL, Tamb = 14 ° C / 12 ° C
REFRIGERANT	R134a
D.H.W. TEMPERATURE	up to 65 ° C (without electrical resistance)
OPERATION	up to -10 °C
DIAMETER OF CHANNELS	160 mm
ELECTRIC RESISTANCE	1,2 kW
ELECTRIC POWER SUPPLY	Single-phase
INTEGRATED COIL SOLAR / AUXILIARY SOURCE	Surface 1.2 m^2 / Flow rate 1,2 m^3/h / Power exchanged 30 kW

FEATURES

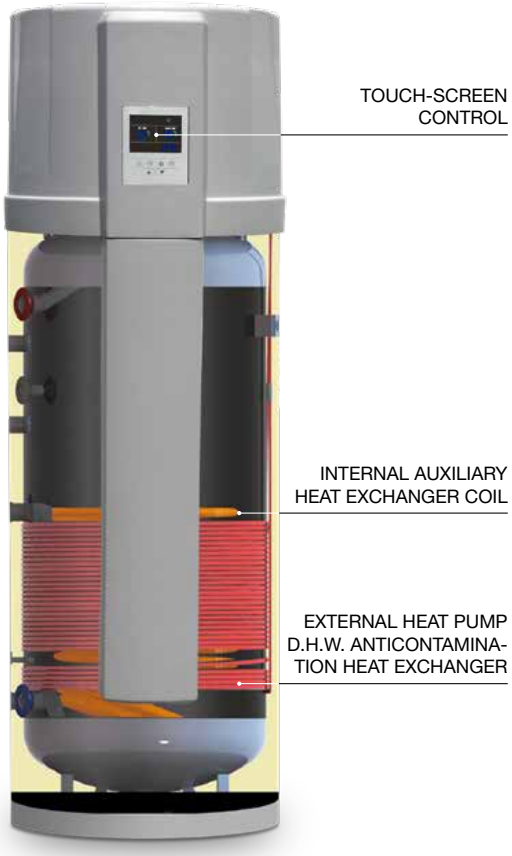
Water heater in air-water heat pump, MONOBLOCK, FULL INVERTER, silent, high efficiency, for domestic hot water production. Optimal solution for indoor installation in laundries or in rooms used for foodstuffs store, as it dehumidifies and cools the rooms.

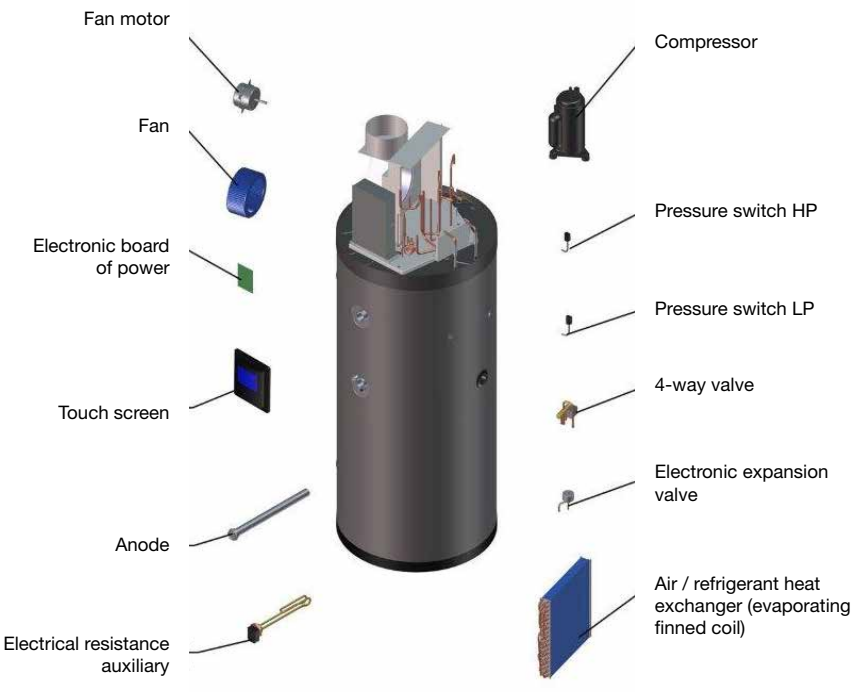
- **A.C.S. Production** up to 65 °C (without resistance)
- **278-liter storage tank** with double anti-corrosion glass lining "Made in Italy"
- Magnesium Anode
- **High thickness** polyurethane foam thermal insulation (50 mm)
- **Operating ambient temperature**: -10 °C to + 43 °C
- **Water / refrigerant heat exchanger in aluminium,** outside the storage tank
- High efficiency **rotary compressor**
- **Refrigerant R134a** (GWP=1300)
- **Electronic expansion valve**
- **Air / refrigerant heat exchanger** in aluminium finned copper pipes, with anti-mold treatment
- **Integrated coil for solar / auxiliary source** with a wide 1.2 m² exchange surface (flow rate 1.2 m³/h, exchanged power 30 kW)
- **Integrated Touch Screen Controller** integrato with functions:
  - User interface for monitoring, for in real-time control of the Heat Pump parameters and complete system configuration
  - Timer
  - Auto-restart
  - Self-diagnosis
- **Acoustically insulated upper cover**
- **Auxiliary electric heater 1.2 kW** (with integrated thermostat with safety at 90 °C)
- Automatic management of integrative electrical resistance
- **Safety devices** for high / low pressure and high temperature (thermostat with safety at 85 °C)
- Integrated programmable **anti-legionella function**
- **On / off contact for starting from external control,** dedicated for photovoltaic energy optimization with automatic raising of the DHW production temperature
- **Management of pump for DHW and water of solar system recirculation**
- **Automatic defrost function**
- Facilitated maintenance with interception of the refrigerant circuit independent of the water circuit

ACCESSORIES (OPTIONAL):

- **Solar collector sensor / DHW recirculation**

MAIN COMPONENTS





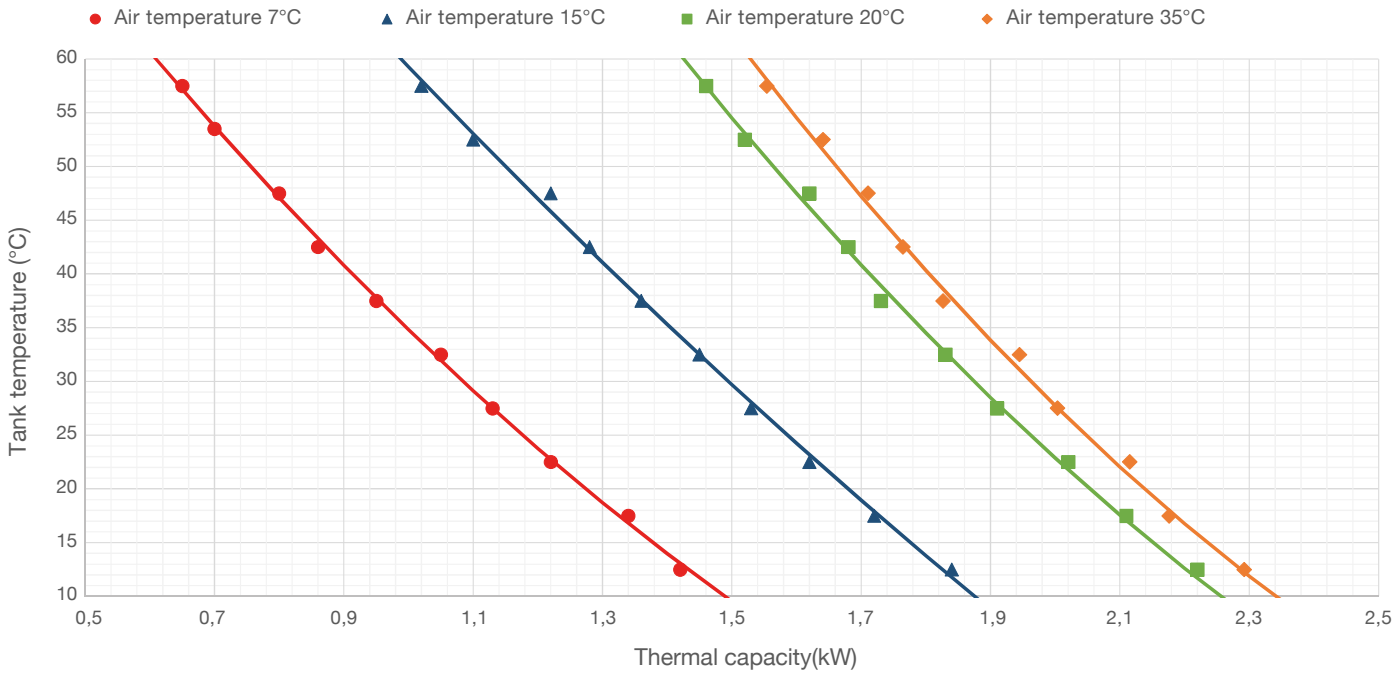
PERFORMANCE DATA

TECHNICAL DATA		HP 300S
Water tank real capacity	l	278
Heating capacity	W	2060* (+1200**)
Rated power input	W	700* (+1200**)
Nominal	A	2,21* (+5,2**)
COP_{DHW} (1)	W/W	2.85
COP_{DHW} (2)	W/W	3.03
Max power input	W	765 (+1200**)
Max current	A	3,2 (+5,2**)
Power supply	V/~/Hz	230/1/50

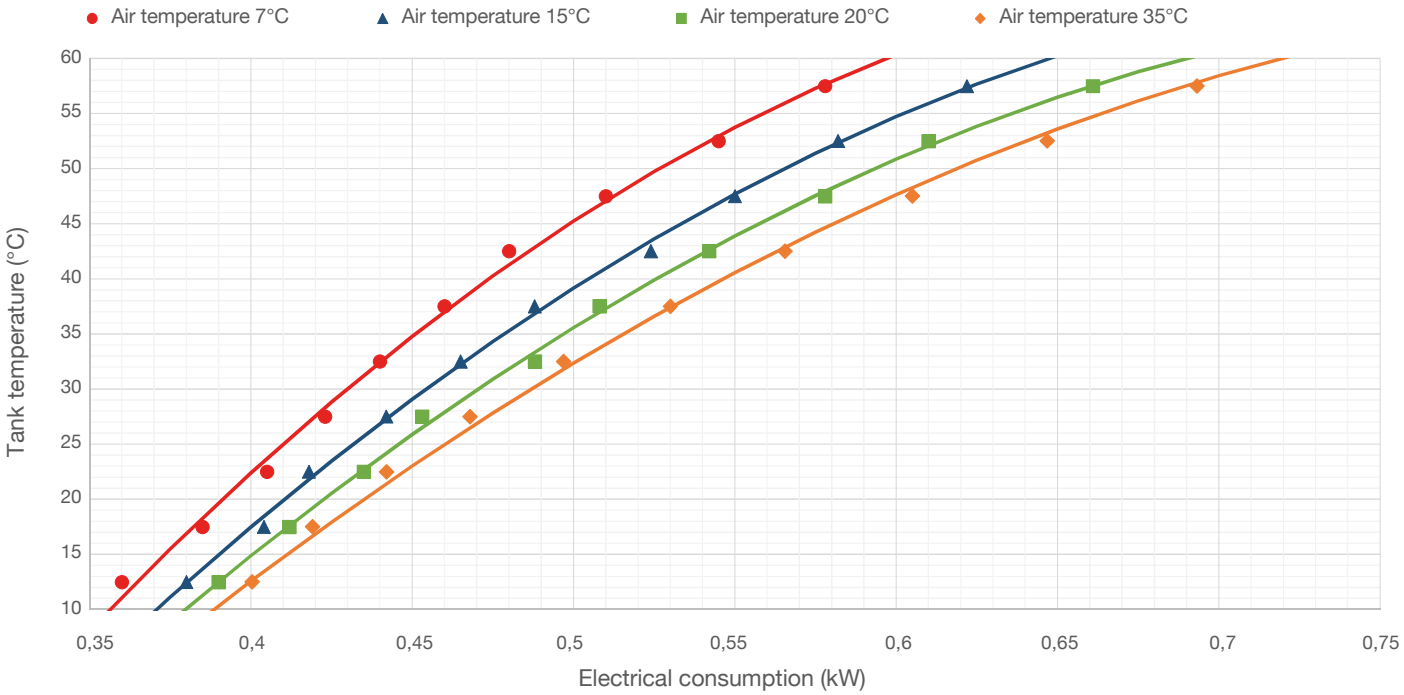
NOTES:

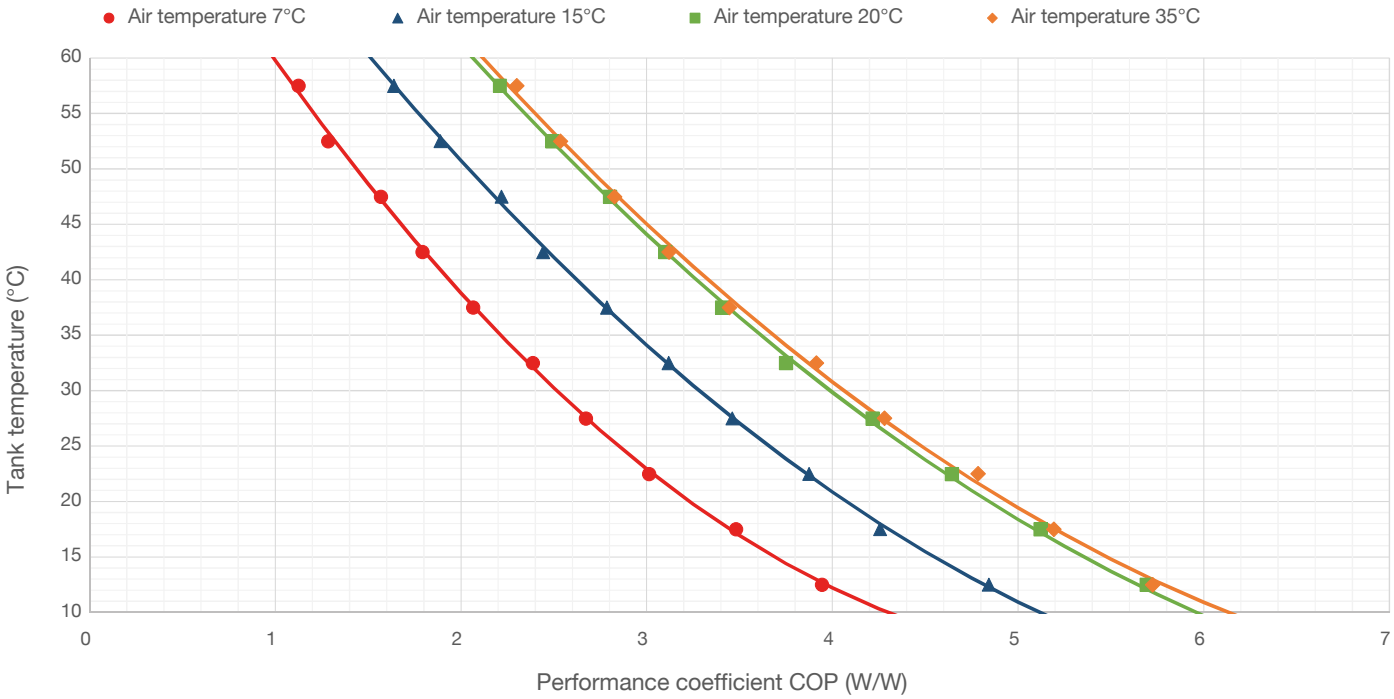
* Capacity and power input based on the following conditions:
ambient temperature 20°C, water temperature from 15°C to 55°C (these data are obtained by internal laboratory tests based on the uniform reintegration of the tank temperature).
**Related to the supplementary e-heater. During disinfection, the water temp could be up to 70°C by electrical heater
(1) Energy efficiency of water heating based on ERP regulations (EN 16147), profile XL, room temperature 7°C / 6°C, water temperature from 10°C to 55°C
(2) Energy efficiency of water heating based on ERP regulations (EN 16147), profile XL, room temperature 14°C / 12°C, water temperature from 10°C to 55°C

The data are obtained from internal laboratory tests on a uniform replenishment of the tank temperature.
The COP is calculated as the ratio between thermal capacity and electricity consumption measured in the corresponding temperature range.



PERFORMANCE DATA





PERFORMANCE DATA

FICHE ACCORDING TO REGULATION (EU) No 812/2013

Models		HP 300S
Declared load profile		XL
Water heating energy efficiency class		A
Water heating energy efficiency	Indoor air +20°C	135 %
	under warmer climate condition (+14°C)	125 %
	under average climate conditions (+7°C)	117 %
	under colder climate conditions (+2°C)	105 %
Annual energy consumption in terms of final energy	Indoor air +20°C	1241 kWh
	under warmer climate condition (+14°C)	1340 kWh
	under average climate conditions (+7°C)	1426 kWh
	under colder climate conditions (+2°C)	1546 kWh
Thermostat temperature settings		55°C
Sound power level, indoor L_{WA}		58 dB(A)
Precautions for installation and maintenance		Read precautions for installation and maintenance at specific chapters on user's and installation's manual.

TECHNICAL PARAMETERS ACCORDING TO REGULATION (EU) No 814/2013

Models		HP 300S
Daily electricity consumption Q_{elec}	Indoor air +20°C	5,829 kWh
	under warmer climate condition (+14°C)	6,298 kWh
	under average climate conditions (+7°C)	6,670 kWh
	under colder climate conditions (+2°C)	7,265 kWh
Declared load profile		XL
Sound power level, indoor L_{WA}		58 dB(A)
Mixed water at 40°C V40		390 l
Water heating energy efficiency	Indoor air +20°C	135 %
	under warmer climate condition (+14°C)	125 %
	under average climate conditions (+7°C)	117 %
	under colder climate conditions (+2°C)	105 %

REINTEGRATION TIMES

The replenishment times shown below are indicative and may be subject to change. The data are obtained from internal laboratory tests on a uniform replenishment of the tank temperature according to the EN 16147 standard.

		HP 300S	
			con Resistenza attivata
		Water 10 -> 55°C EN 16147	
Air 20°C	[h:min]	5:50	3:10
Air 15°C	[h:min]	6:20	3:25
Air 7°C	[h:min]	8:10	3:50
		Water 10 -> 60°C EN 16147	
Air 20°C	[h:min]	6:45	3:35
Air 15°C	[h:min]	7:25	3:55
Air 7°C	[h:min]	9:30	4:25

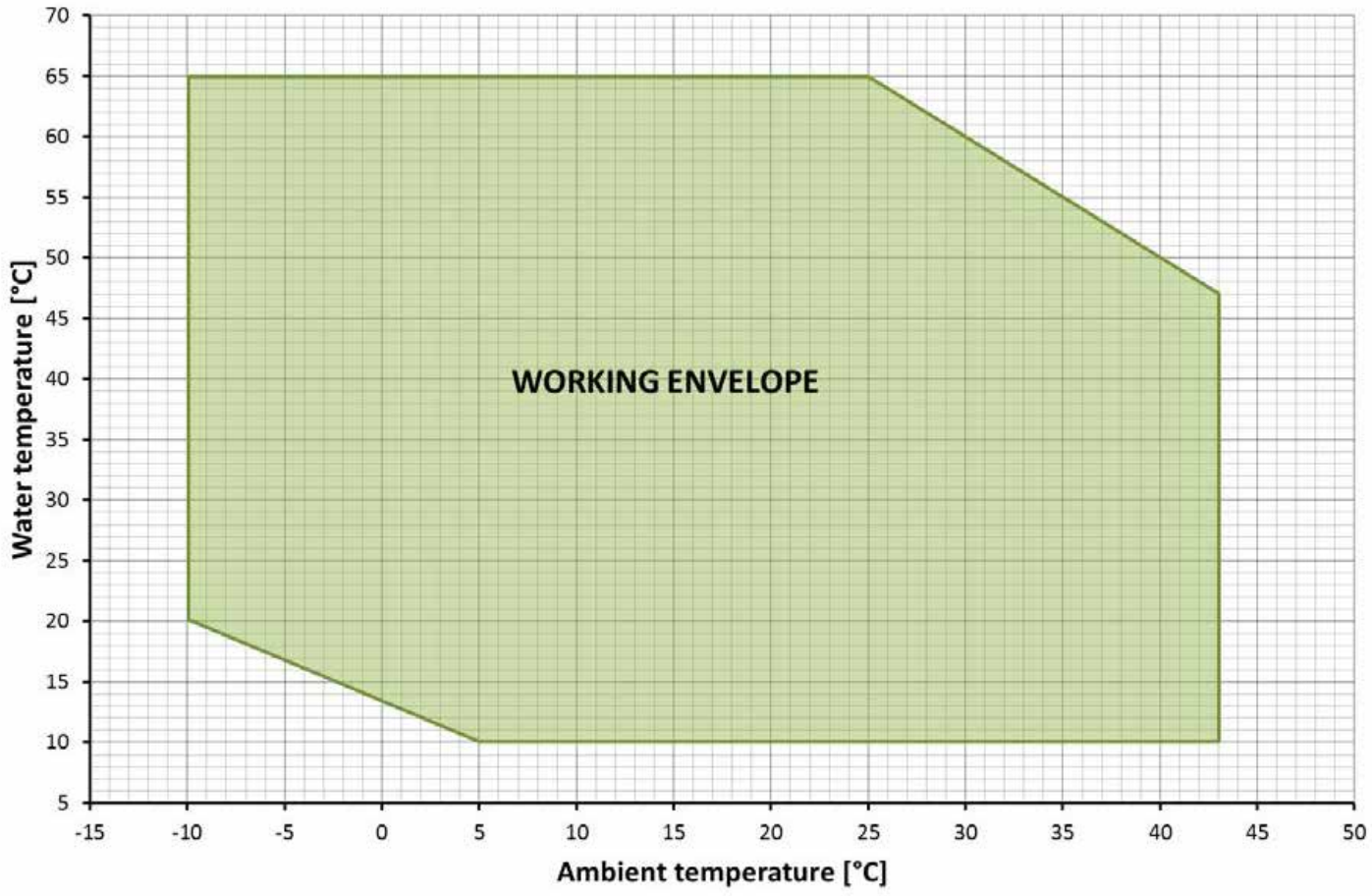
OPERATING TEMPERATURES

HP 300S is designed to operate with external air temperatures from -10 ° C to + 43 ° C.
However, the heat pump automatically adapts its set to the limits highlighted in the following diagram.

TECHNICAL DATA		HP 300S
Max. outlet water temperature (without using E-heater)	°C	65
Max. water temperature	°C	75**
Min. water start temperature	°C	10
Ambient working temperature	°C	-10 ~ +43

NOTES:

**Related to the supplementary e-heater. During disinfection, the water temp could be up to 70°C by electrical heater.

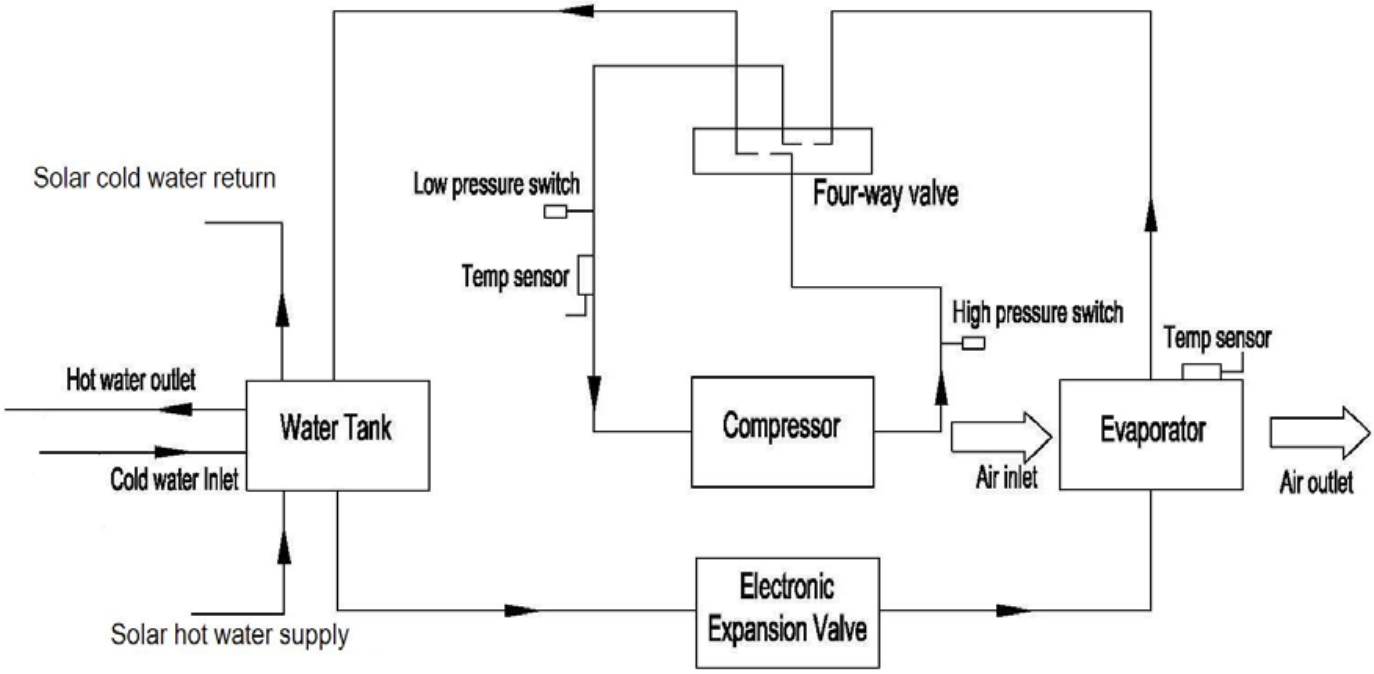


REFRIGERANT CIRCUIT

DATI TECNICI		HP 300S
Refrigerant max. discharge pressure	bar	25
Max allowed pressure of tank	bar	10
Refrigerant type		R134a
Refrigerant charge	g	1000
Compressor	Type	Rotary
	oil	ESTER OIL VG74, 400 ml
Fan motor	Type	Asynchronous motor
	W	80
	RPM	1250
Air flow without air static pressur	m^3/h	450
Air flow with 60 Pa of air static pressur	m^3/h	350
Duct diameter	mm	160
Electronic expansion valve		Yes
Heat pump heat exchanger material (condenser)		Aluminium alloy
Sound Power****	dB(A)	58,2
Sound Pressure*****	dB(A)	42,8

NOTE:
**** measured according to the EN 12102 standard under the conditions of the EN 16147 standard.
***** calculated according to ISO 3744: 2010 algorithm at 1 m from the unit.

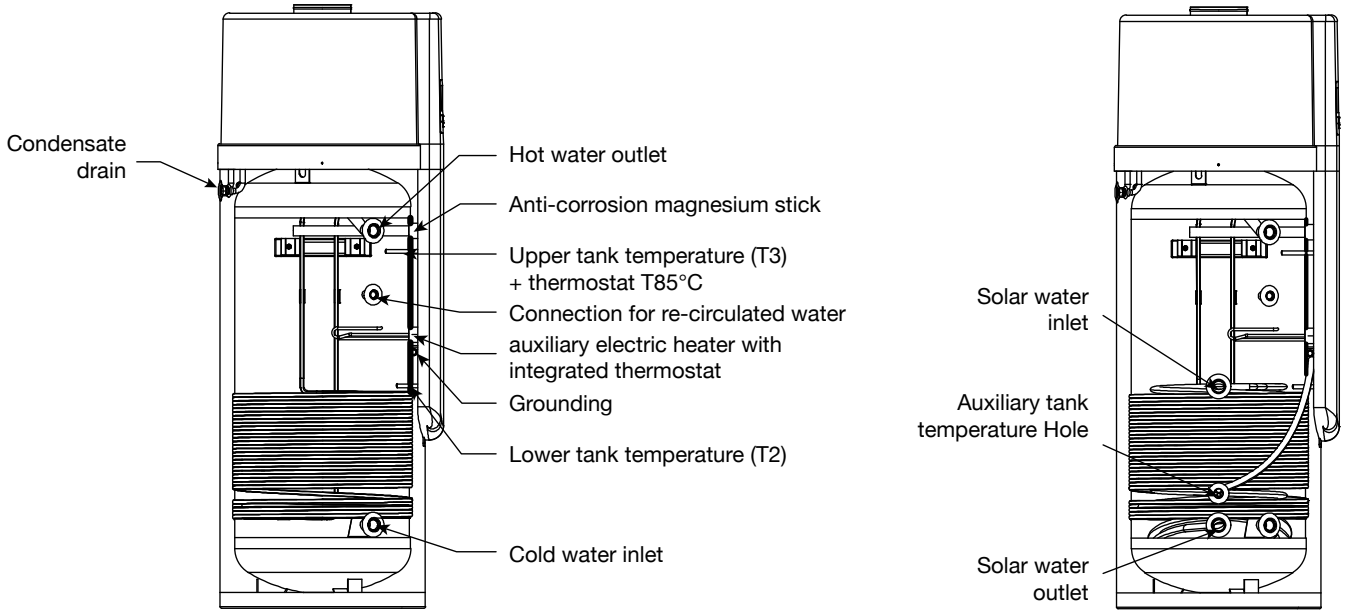
SCHEMATIC OVERVIEW OF THE WATER AND GAS CIRCUIT



HYDRAULIC CIRCUIT

TECHNICAL DATA		HP 300S
Max allowed pressure of tank	bar	10
Inside body material of tank		S235JR with double layer vetrification
Auxiliary electrical heater	kW	1,2
Magnesium stick		Si
Solar/Auxiliary exchanger coil surface	m^2	1,2
Solar/Auxiliary exchanger coil flow rate ***	m^3/h	1,2
Solar/Auxiliary exchanger Exchanged Power ***	kW	30
Exchanger coil max. pressure	bar	6
Exchanger coil mat		Pickled S235JR
Cold water inlet	inch	G 1"female
Hot water outlet	inch	G 1"female
Heat source inlet/outlet	inch	G 1"female
Condensed water outlet		0,3 mt. Ø22 mm plastic flexible pipe
Drainage	inch	To be installed externally

NOTE:
*** values referring to integration with boiler in accordance with DIN 4708 norms (80/60°C on primary circuit, 10/45°C on secondary circuit)



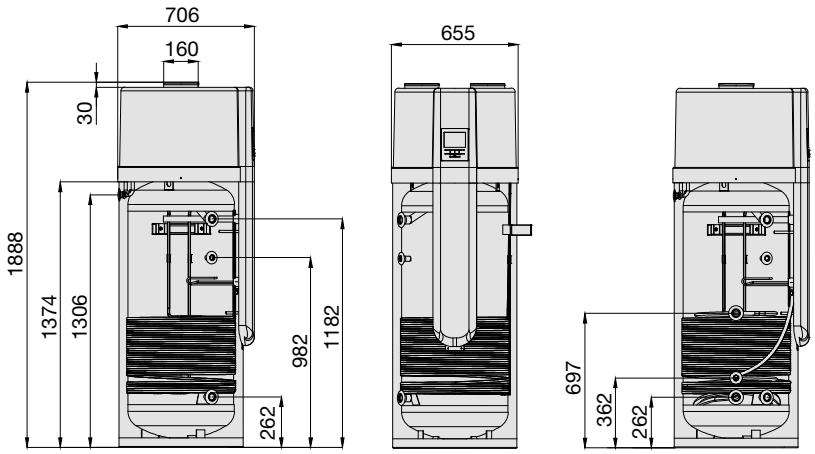
if an external pump is installed and connected to the system (for hot sanitary water circuitation or solar water circuitation) it is recommended to install and connect also a flow switch before the pump

SYSTEM WATER CHARACTERISTICS

Check the water hardness, which should not be below 12°f. With particularly hard water, it's recommended the use of a water softener so that the residual hardness is no more than 20°f and no less than 12°f.

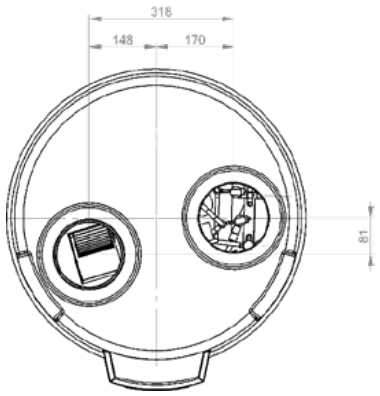
DIMENSIONS AND CLEARANCES

TECHNICAL DATA		HP 300S
IP protection class		IPX1
Net Dimensions	mm	Ø655x1888
Packing Dimensions	mm	700x700x2010
Net Weight	Kg	121.5
Weight with full water	Kg	399.5
Gross Weight	Kg	136.5

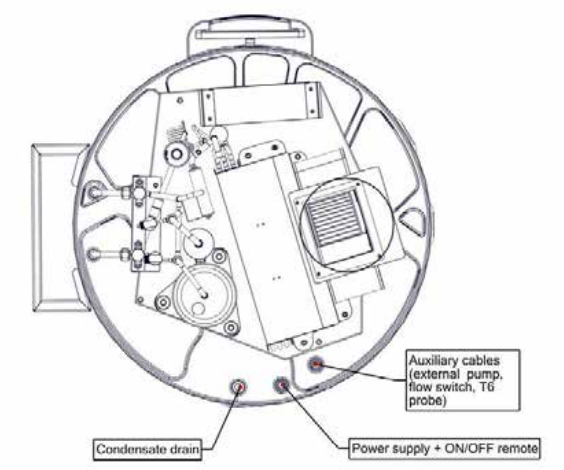


AIR CONNECTIONS

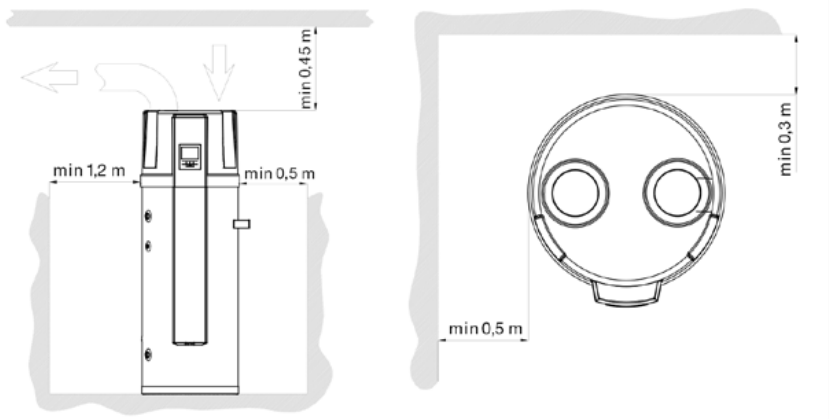
Wheelbase air connections: 318 mm



HOLES FOR CABLES



REQUIRED SERVICE SPACE



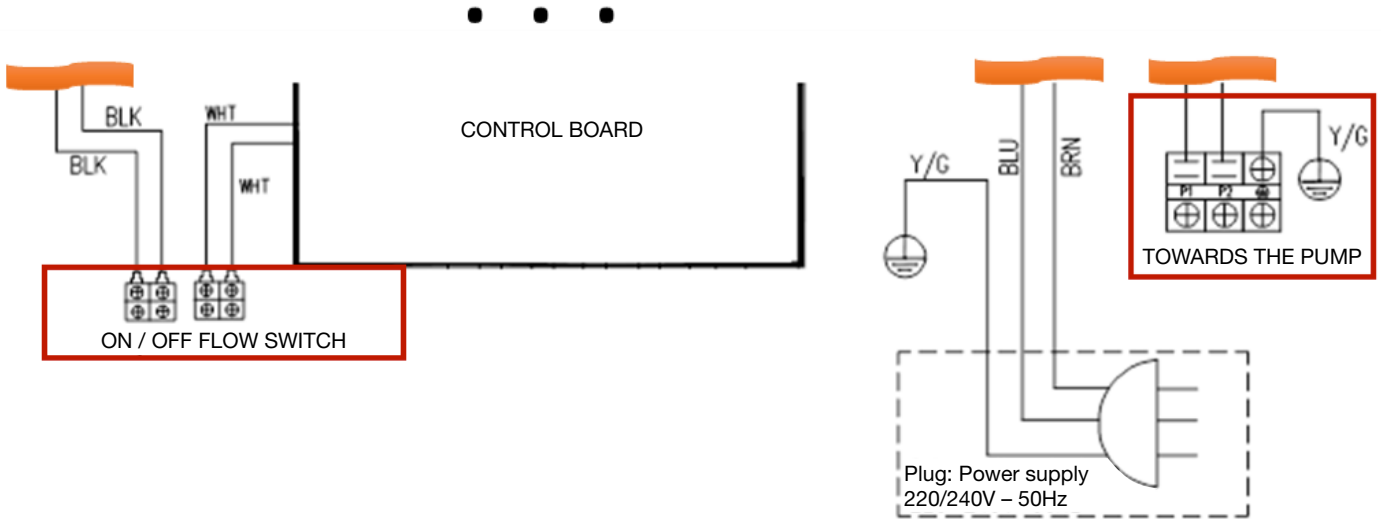
If air inlet and/or outlet pipes are connected, portion airflow and capacity in heat pump unit will lose. If the unit connects with air ducts it should be DN 160 mm for pipes or 160 mm internal diameter flexible hose. Total length of the ducts should not be longer than 8 m or the maximum static pressure should not exceed than 60 Pa. If the air ducts are bended, the pressure loss will be larger. So if there are 2 bending pipes, the total length of the ducts should not be longer than 4m. Please note that the performance of the unit are reduced in the case the air inlet is connected to a duct which takes air from outside, because of the low winter temperatures and high summer temperatures. The optimal working ambient temperature is 20°C.

Max lenght of air piping (in+out)		d = 160 mm
Without curves		4,3 m
90° curves no.	1	3,2 m
	2	2,2 m
	3	-
	4	-

ELECTRICAL CONNECTIONS

TECHNICAL DATA		HP 300S
Power supply	V/Ph/Hz	220-240/1/50

INTERFACE TERMINAL STRIPS



CONTROLLER - TYPICAL CONFIGURATIONS

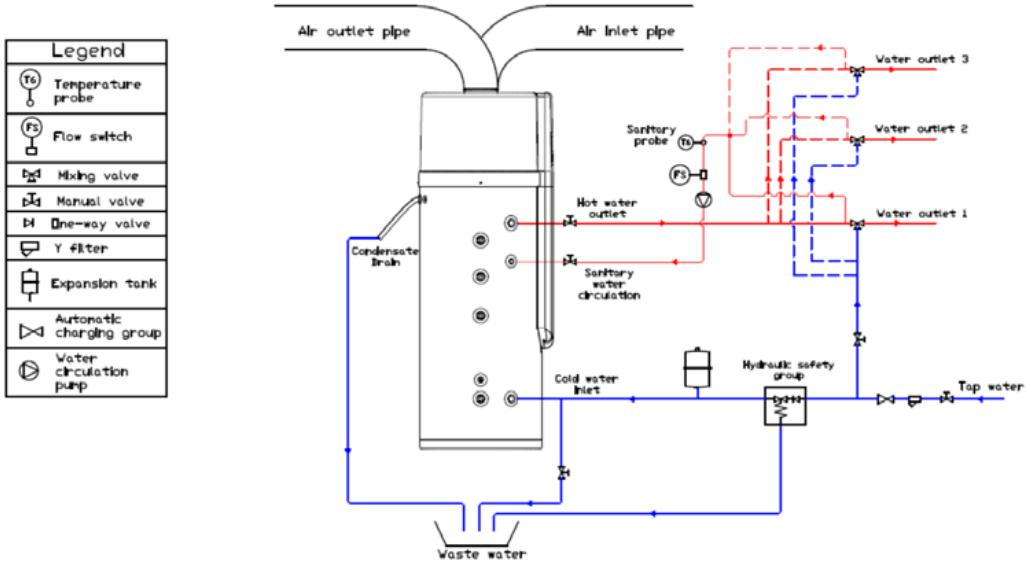
Il Regolatore Touch Screen permette il monitoraggio, il controllo real-time dei parametri della Pompa di Calore e la configurazione completa del sistema.

Funzioni:

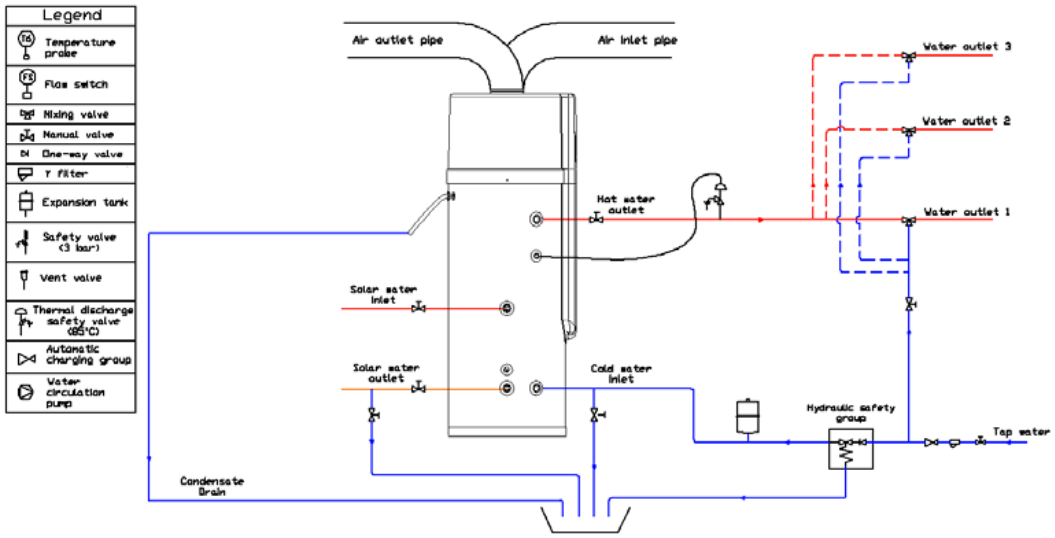
- Timer
- Automatic management of integrative electric resistance
- Integrated anti-legionella function
- D.H.W. recirculation management pump
- Solar integration management
- Automatic defrost function
- Autorestart
- Self-diagnosis

BASIC CONFIGURATIONS

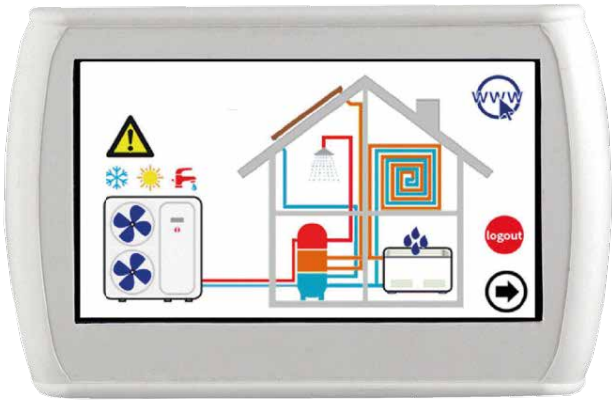
D.H.W. CIRCULATION



SOLAR INTEGRATION



REMOTE CONTROL TOUCH SCREEN_N



The remote control has an LCD touch screen interface and allows **the system configuration** and **centralized management** of a network of Heat Pumps in cascade.
The Touch Screen control is used for wall mounting, according to the DIN 503 standard.

- Operating mode indication (summer, winter, domestic hot water production, alarms) and current status of the main components (compressor, pump)
- Display of hydraulic circuit - refrigerant circuit temperatures
- Display of refrigerant working pressures
- Display of operating hours of compressor and pump

Functions:

- **CHRONOTHERMOSTAT**
- **HUMIDOSTAT**
- **SYSTEM SUPERVISION**
- **CLIMATIC COMPENSATION**
- **CASCADE MANAGEMENT**
- **DOUBLE SET-POINT**
- **DHW**
- **Management of 9 AIR CONDITIONING ZONES**
- **ANTILEGIONELLA**
- **MAT**
- **BOOST AND ECO**
- **Display of the DIAGNOSTICS of the Heat Pump (error codes)**
- **FIRMWARE update (via USB device)**

ELECTRICAL CONNECTIONS

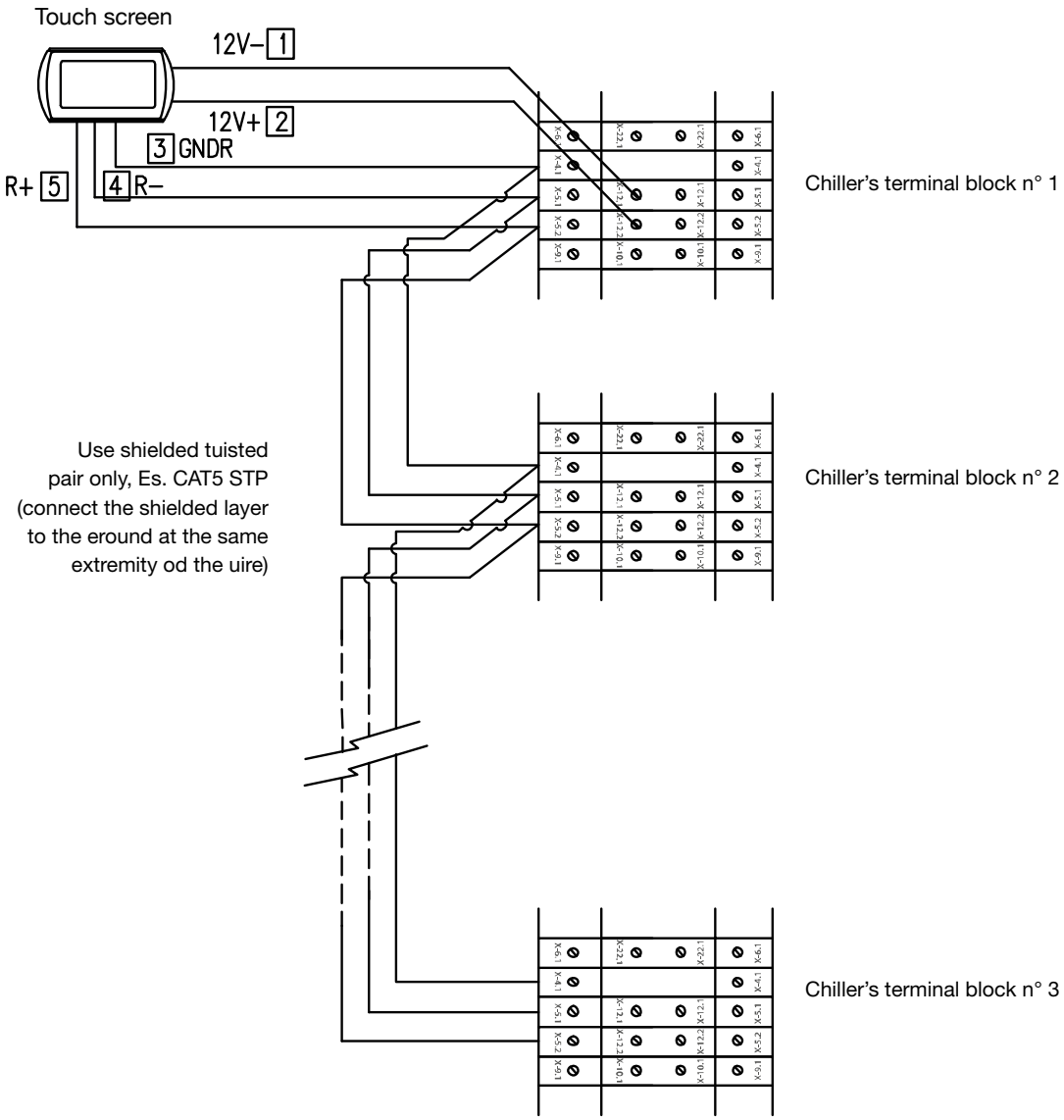
ELECTRICAL CONNECTIONS TOUCH SCREEN - HEAT PUMP

HEAT PUMP TERMINAL			TOUCH SCREEN_N TERMINAL (*)	TYPE
HP_OWER ONE	HP_OWER N	HP_OWER TWO - U.I.		
X-12.1	12N1	12V-	Touch screen power supply (12V-)	Power supply 12Vac, 50Hz, 500mA
X-12.2	12AC1	12V+	Touch screen power supply (12V +)	
X-4.1	GNDR	GNDR	Modbus RTU ground reference for touch screen (GNDR)	Modbus Communication
X-5.1	R-	R-	Modbus RTU - signal for touch screen (R-)	
X-5.2	R+	R+	Modbus RTU + signal for touch screen (R+)	

(*) The HP_OWER TWO heat pumps require the TOUCH SCREEN remote control
The HP_OWER ONE and HP_OWER_N Heat Pumps require the TOUCH SCREEN_N remote control

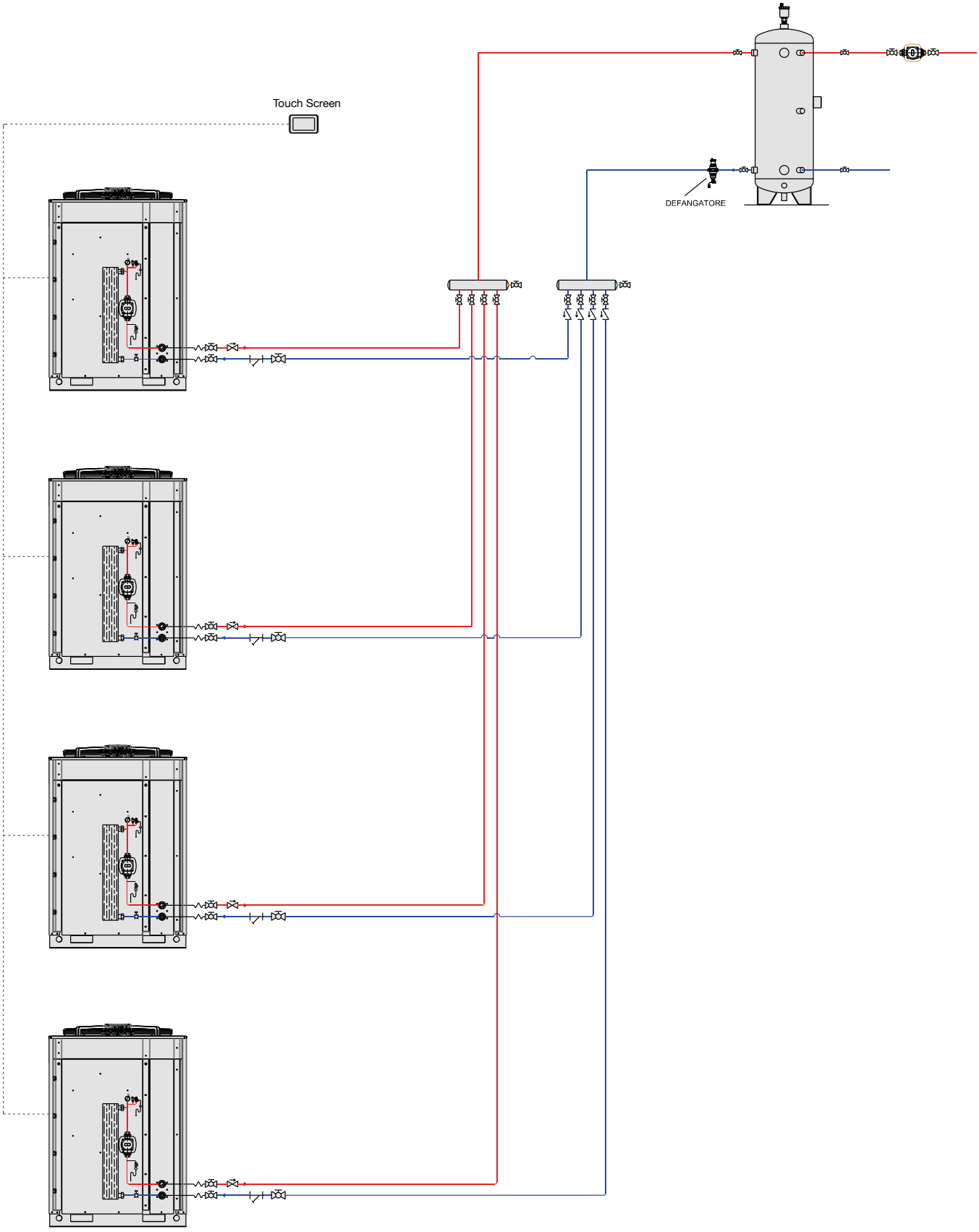
Management of CASCADE OF HEAT PUMPS

A network managed by the remote control Touch Screen can be composed of a maximum of 7 chiller/heat pumps. In the figure, by way of example, the connection between HP_OWER ONE heat pumps is shown.

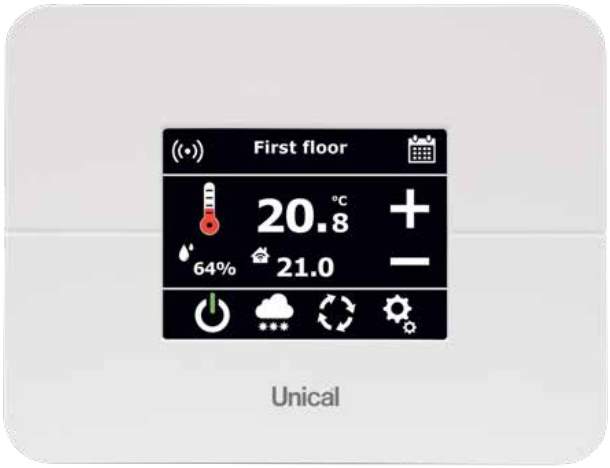


ELECTRICAL CONNECTIONS

HYDRAULIC DIAGRAM FOR CONNECTION OF 4 HP_OWER N IN CASCADE



CHRONOTHERMOSTAT WIFI KTsmart



Functions:

- **HOT / COLD CHRONOTHERMOSTAT**: up to 6 customizable programs
- **FOR EVERY PROGRAM**, up to 8 **INDEPENDENT time slots for EVERY DAY** of the week with DIFFERENT selectable TEMPERATURES
- **TEMPERTURE / HUMIDITY indicator** (integrated sensors)
- **SUMMER / WINTER SWITCH - DEHUMIDIFIER ignition CONSENT**
- **2.8“ colour TOUCH SCREEN DISPLAY**
- **GEOLOCALIZATION**
- **VOICE ASSISTANCE** (integration into systems with compatible Google Home and Amazon Alexa devices)
- **REMOTE MANAGEMENT WI-FI INTEGRATED** via APP
- 2 configurable relay outputs:
  - ON-OFF contact for heat pump / zone valve actuator
  - season contact / dew point comparison / relative humidity comparison / ON-OFF duplication
- **INTERFACE BUS towards HOME AUTOMATION MODULES FOR LIGHTING AND AUTOMATION CONTROL**

Technical features:

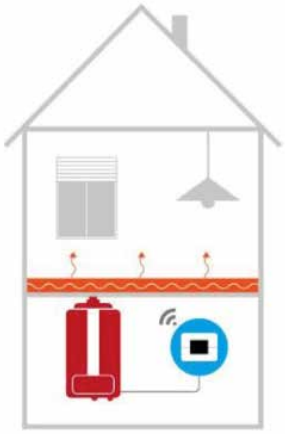
- **SUPPLY VOLTAGE:**
  100÷290 Vac / 47÷63 Hz
- **ABSORPTION:**
  65mA max 120 mA
- **OPTIMAL INSTALLATION**
  Horizontal wall installation or on 3-module socket box
- **OPERATING TEMPERATURE:**
  from +5 to +50°C
- **TEMPERATURE SENSOR:**
  5-50°C | ±5%
- **RELATIVE HUMIDITY SENSOR:**
  20-80% | ±5%
- **PROTECTION CLASS:**
  IP10
- **DIMENSIONS:**
  94x60x121 mm (HxPxL)
- **WEIGHT:**
  187 gr

Wireless device compliant with standard 802.11 b/g/n, frequency2.4-2.4835 GHz.

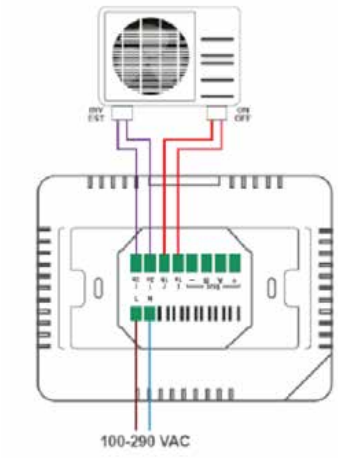
Transmission power <20dBm. WPA/WPA2 safety protocol.

FEATURES

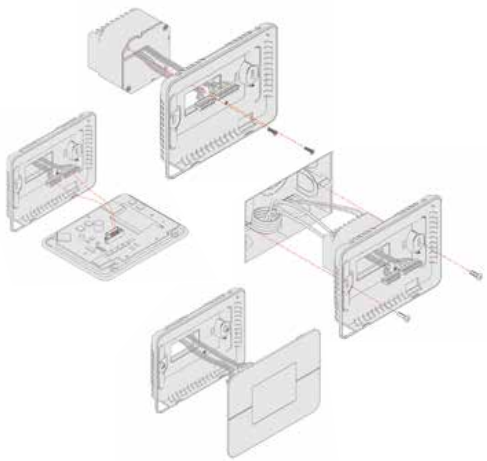
REMOTE THERMOREGULATION



ELECTRICAL CONNECTIONS KTsmart - Heat Pomp

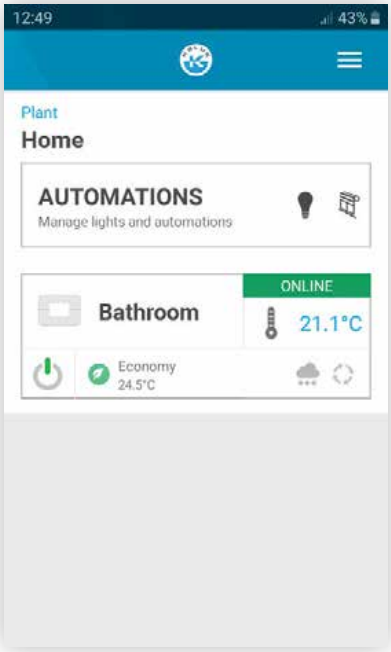


Recessed installation in Electrical boxes R 503

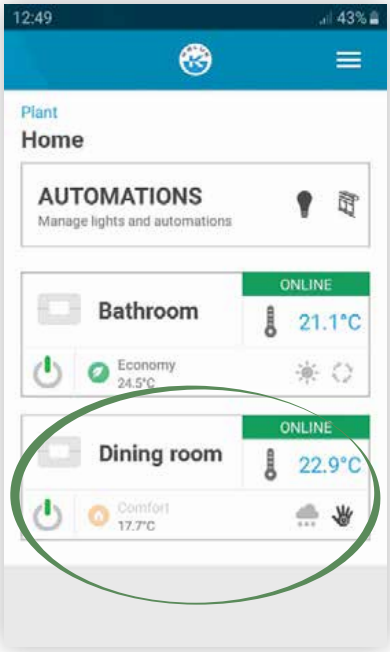


Wi-Fi and APP

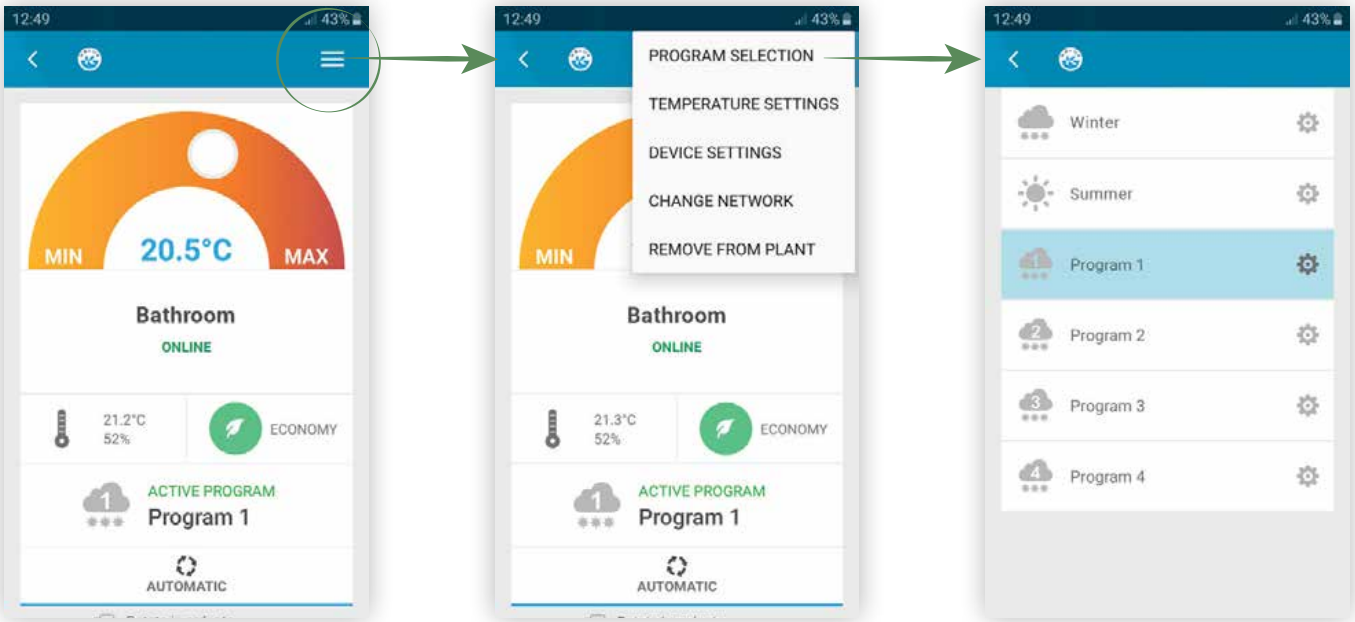
Home menu with single KTsmart

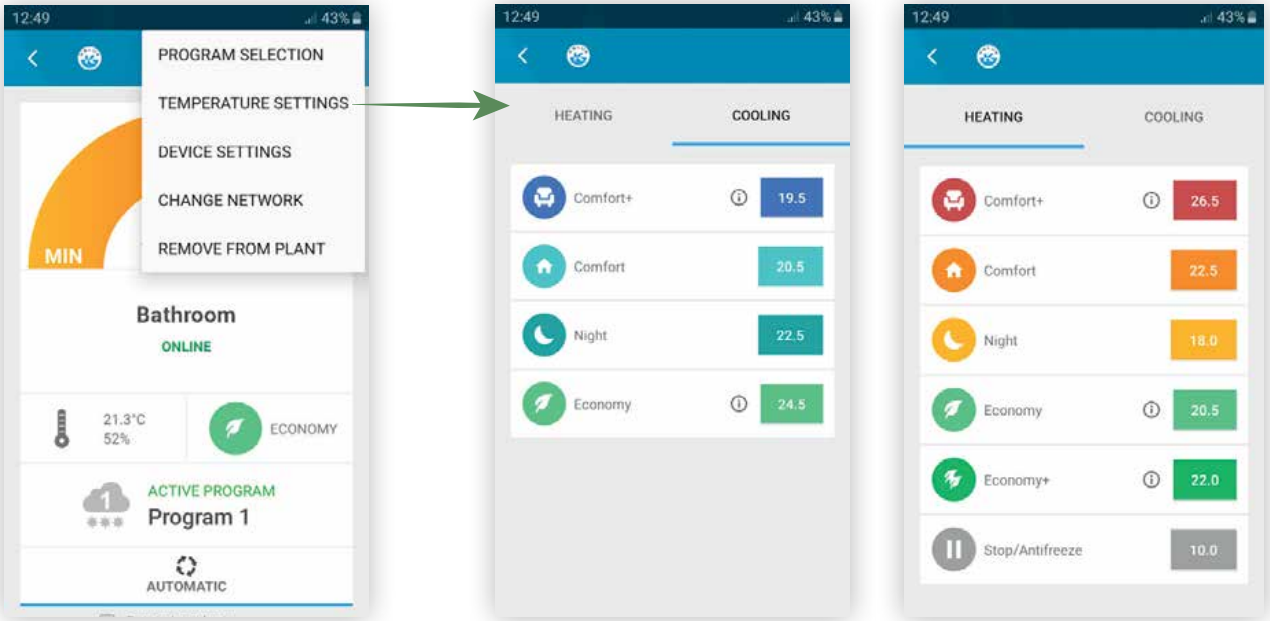


Home menu with several KTsmart



Wi-Fi and APP

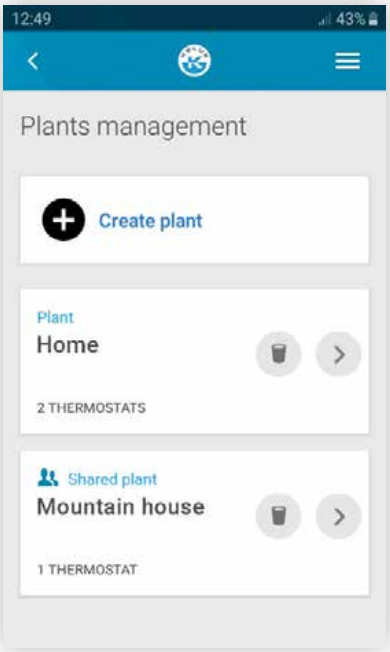




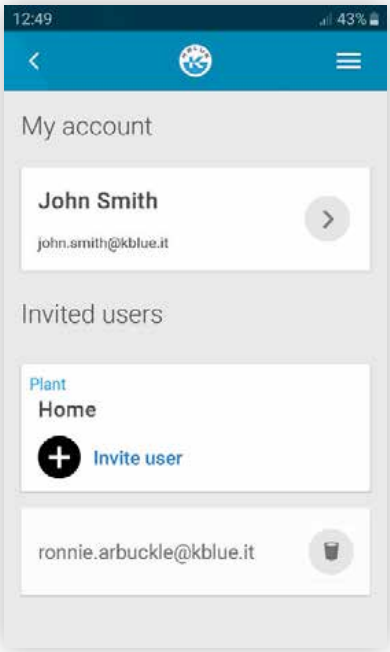
SCREEN ROTATION: TIME SCHEDULE SCREEN

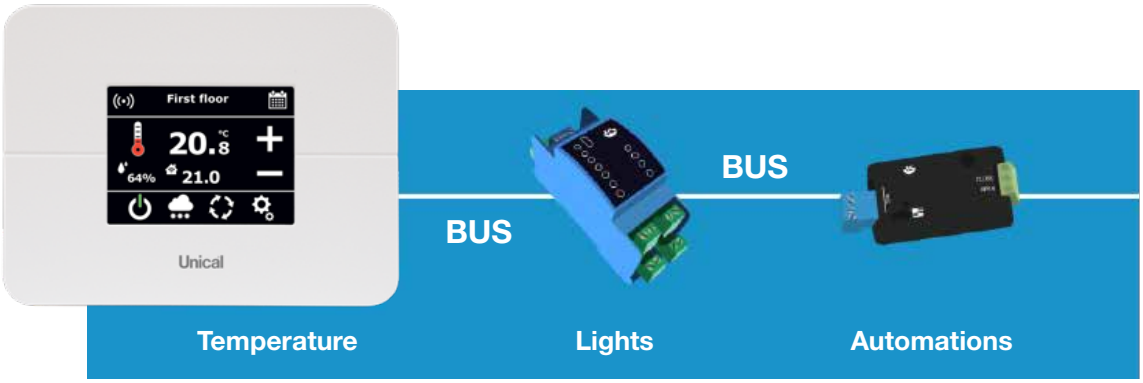
Wi-Fi and APP

MANAGEMENT OF MORE PLANTS

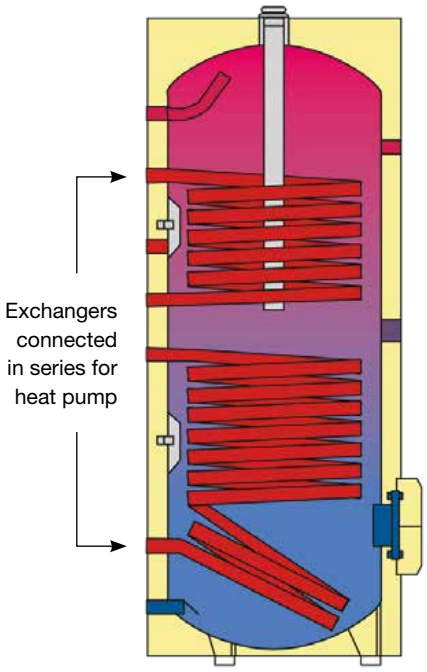


CONTROL BY MULTIPLE USERS





BISER

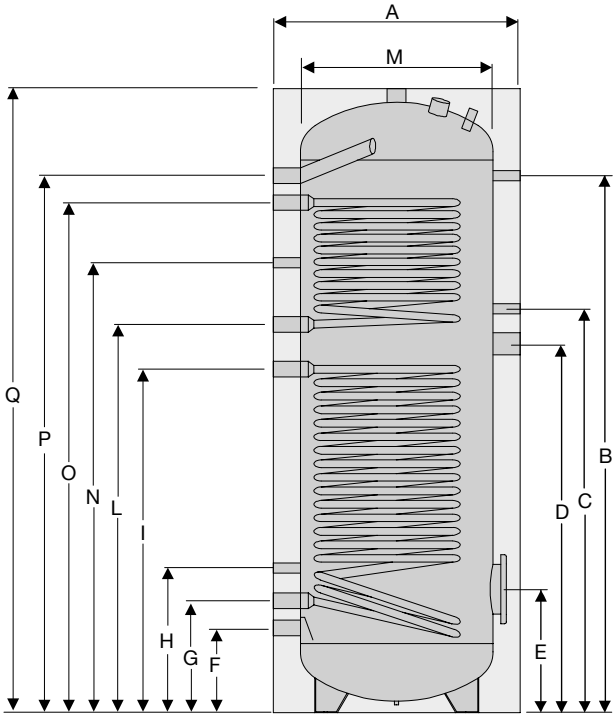


- Double coil for both, solar panel andauxiliary boiler
- Double internal glass lining at 860 °C for models from 200 ÷ 1000 litres (DIN 4753-3 & UNI 10025 standards)
- Smalver treatment (for 1500, 2000 models)
- Anti-corrosion magnesium anode (double for 800, 1000, 1500, 2000 tanks)
- Inspection flange ø 180 mm (Ø 290 mm for 1500-2000 litre versions)
- Total insulation in polyurethane 50 mm for models 200-300-500; in polyester fibre 100 mm for models 800-1000-1500-2000
- Three bulb holders for thermostat/ thermometer
- Electrical heater connection

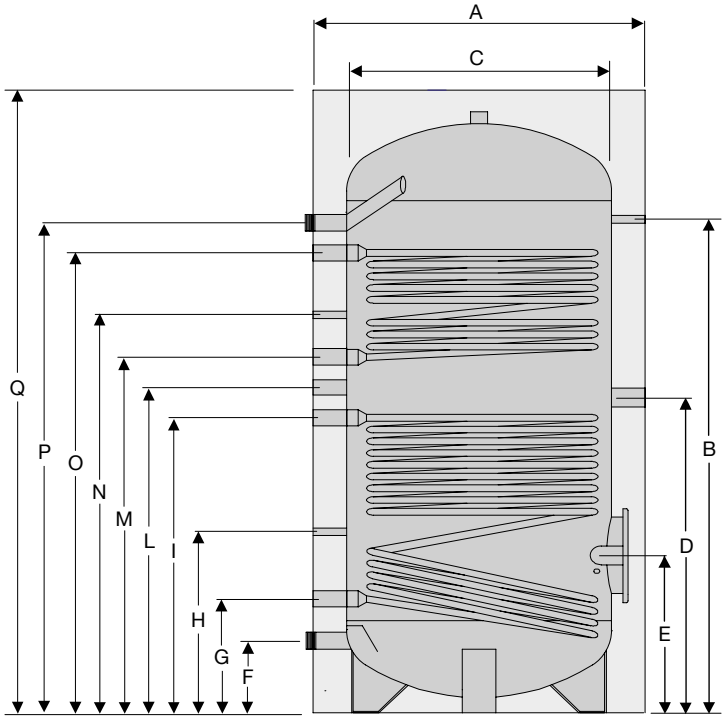
SOLAR TANK FOR DOMESTIC HOT WATER PRODUCTION							
RANGE	from 196 to 1950 titres						
THERMAL INSULATION	total insulation in polyurethane / polyester fibre						
WORKING TEMPERATURE	max. working temperature 95°C / 70°C						
MODELS	200	300	500	800	1000	1500	2000

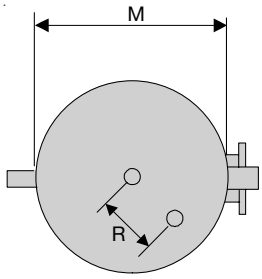
DIMENSIONS

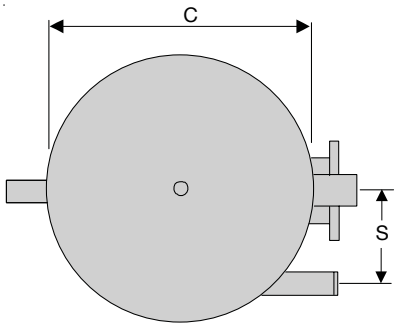
BISER 200-300-500



BISER 800÷2000





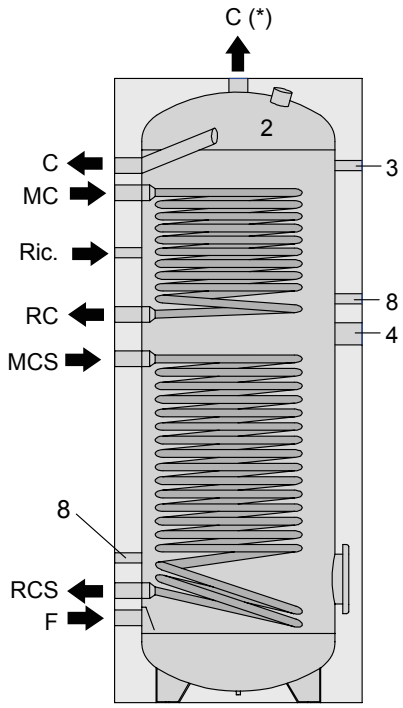


BISER		A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R	S
200	mm	600	1000	885	810	320	220	290	375	750	835	500	905	975	1070	1215	150	-
300	mm	600	1390	1045	955	320	220	290	375	890	1005	500	1165	1320	1390	1615	150	-
500	mm	750	1425	1060	960	365	265	345	440	880	1015	650	1170	1330	1415	1690	150	-
800	mm	990	1500	790	980	470	240	365	565	905	995	1086	1235	1400	1500	1810	-	200
1000	mm	990	1830	790	1220	470	240	380	600	1120	1235	1345	1495	1660	1830	2140	-	200
1500	mm	1200	1775	1000	1230	515	280	415	525	1125	1225	1325	1420	1730	1890	2120	-	230
2000	mm	1300	2000	1100	1340	550	250	400	662	1205	1315	1425	1487	1870	1990	2405	-	230

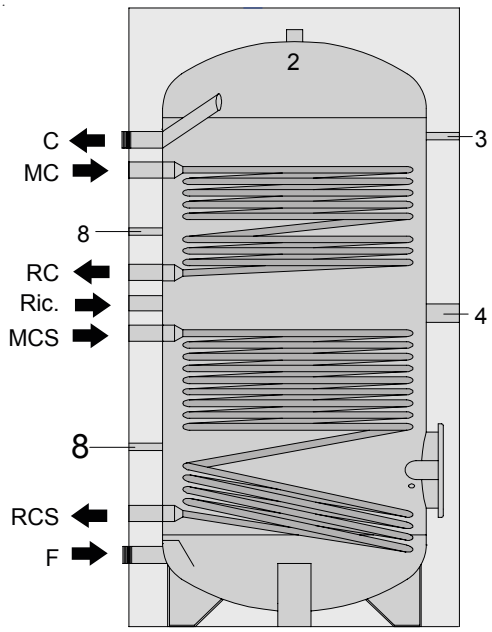
Attention: BISER tanks 200 & 300 without feet

HYDRAULIC CONNECTIONS

BISER 200-300-500



BISER 800÷2000



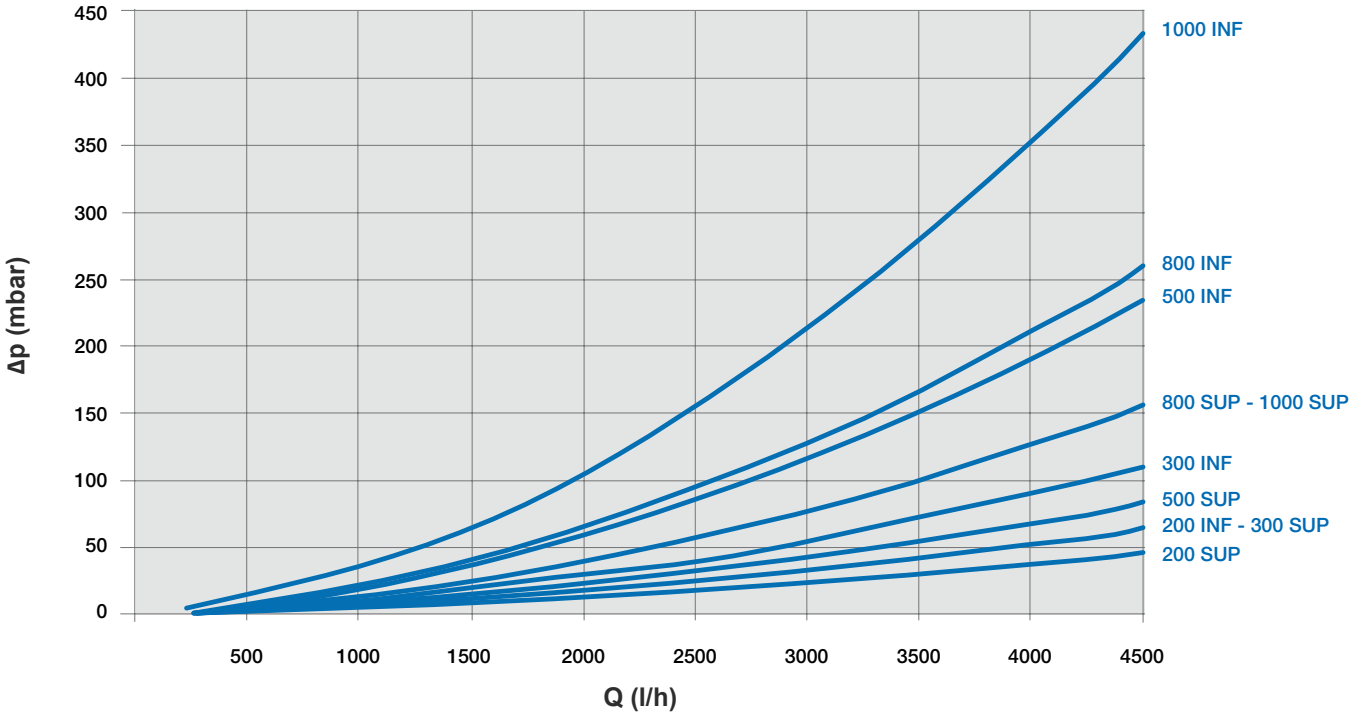
BISER		200	300	500	800	1000	1500	2000
C	Domestic Hot Water Outlet	1”	1”	1”	1” 1/4	1” 1/4	1” 1/2	1” 1/2
C(*)	Domestic Hot Water Outlet	1” 1/4	1” 1/4	1” 1/4	-	-	-	-
MC	From the boiler flow	1”	1”	1”	1” 1/4	1” 1/4	1” 1/4	1” 1/4
RC	To the boiler return	1”	1”	1”	1” 1/4	1” 1/4	1” 1/4	1” 1/4
Ric.	DHW recirculation	1/2”	1/2”	1/2”	1”	1”	1”	1”
MCS	From solar collectors flow	1”	1”	1”	1” 1/4	1” 1/4	1” 1/4	1” 1/4
RCS	To the solar collectors return	1”	1”	1”	1” 1/4	1” 1/4	1” 1/4	1” 1/4
F	Cold Water Inlet	1”	1”	1”	1” 1/4	1” 1/4	1” 1/2	1” 1/2
2	Anode	1” 1/4	1” 1/4	1” 1/4	1” 1/2	1” 1/2	1” 1/2	1” 1/2
3	Thermometer/Temperature probe bulb holder	1/2”	1/2”	1/2”	1/2”	1/2”	1/2”	1/2”
4	Electrical heater	1” 1/2	1” 1/2	1” 1/2	1” 1/2	1” 1/2	1” 1/2	1” 1/2
8	Thermostat/Temperature probe bulb holder	1/2”	1/2”	1/2”	1/2”	1/2”	1/2”	1/2”

TECHNICAL DATA

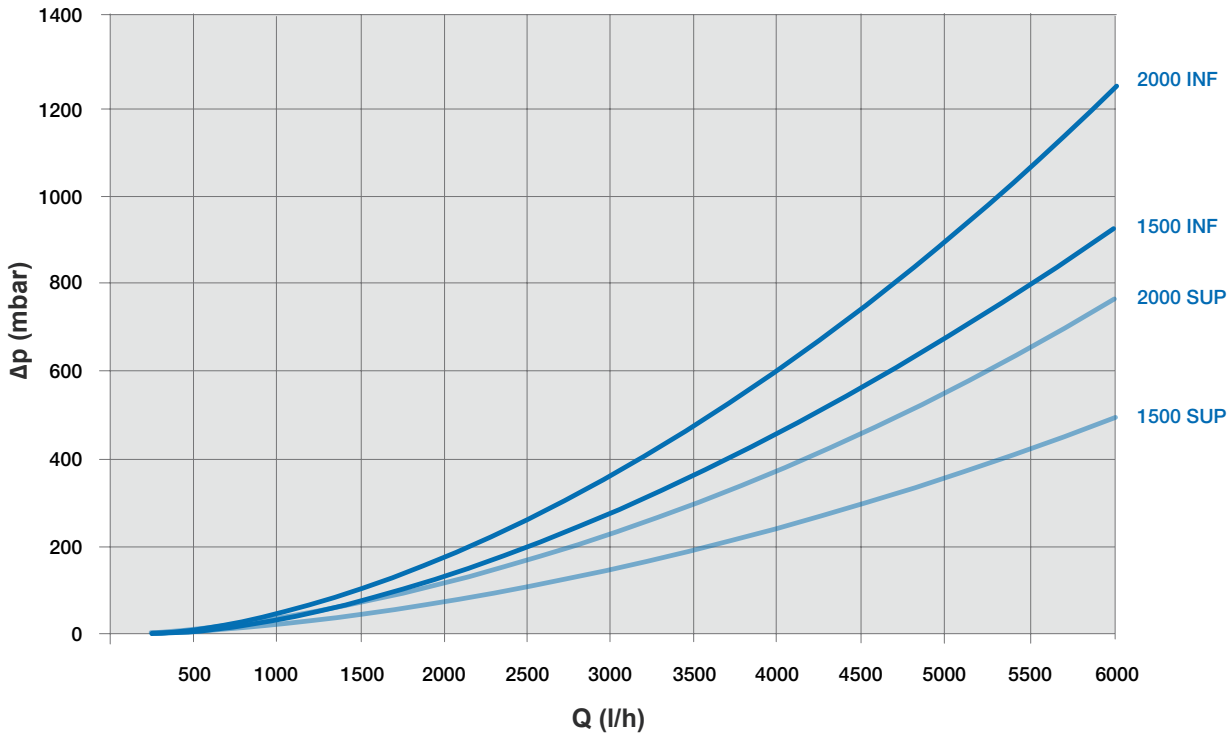
BISER		200	300	500	800	1000	1500	2000
Total capacity	l	196	273	475	738	930	1390	1950
Rigid PU insulation	mm	50	50	50	-	-	-	-
Polyester fibre insulation	mm	-	-	-	100	100	100	100
Tank diameter with insulation	mm	600	600	750	990	990	1200	1300
Total height with insulation	mm	1215	1615	1705	1875	2205	2185	2470
Upper coil surface	m^2	0,5	0,8	0,9	1,2	1,2	1,8	2,8
Lower coil surface	m^2	0,7	1,2	1,8	2,0	2,4	3,4	4,6
Water content od upper coil	l	2,6	4,1	5,6	7,0	7,0	10,4	16,9
Water content od lower coil	l	5,6	7,9	11,4	12,6	15,1	19,5	28,1
Upper coil exchanged power	kW	12	20	23	30	30	47	73
Lower coil exchanged power	kW	19	29	43	50	60	88	120
Necessary flow rate for upper coil	m^3/h	0,5	0,8	1,0	1,3	1,3	2,0	3,1
Necessary flow rate for lower coil.	m^3/h	0,8	1,2	1,8	2,2	2,6	3,8	5,2
Domestic hot water production of upper coil 80°C / 60°C - 10°C / 45°C (DIN 4708)	m^3/h	0,3	0,5	0,6	0,7	0,7	1,2	1,8
Domestic hot water production of lower coil 80°C / 60°C - 10°C / 45°C (DIN 4708)	m^3/h	0,5	0,7	1,1	1,2	1,5	2,2	2,9
Pressure losses of upper coil	mbar	6	10	14	60	60	80	233
Pressure losses of lower coil	mbar	14	32	105	190	480	499	1019
Performance factor NL (DIN 4708)		4,5	7	15	20	27	45	60
Flange	Ømm	180/120	180/120	180/120	180/120	180/120	290/220	290/220
Dry weight	kg	83	112	151	210	235	334	442
Max. working pressure of the cylinder	bar	10	10	10	10	10	6	6
Max. working pressure of the coil	bar	10	10	10	10	10	10	10
Max. working temperature of the cylinder	C°	95	95	95	95	95	70	70
Energy rating		C	C	C	C	C	C	C

PRESSURE LOSSES DIAGRAMS FOR THE COILS

COILS OF BISER 200 - 300 - 500 - 800 - 1000



COILS OF BISER 1500 - 2000



ENERBOIL - ENERBOIL PLUS

The ENERBOIL cylinders are equipped with:

- Double internal glass lining at 860 °C (DIN 4753-3 UNI 10025 standards) and anti-corrosion magnesium anode
- Oversized coils with double helix structure for the combined connection of heat pump and thermal solar
- Inspection flange Ø 180 mm (Ø 290 mm for model 1500), with predisposition for electrical heater
- Total insulation in rigid polyurethane 50 mm thick (for models 300-500), in polyester fibre 100 mm thick (for models 1000-1500), in rigid polyurethane 70 mm thick (for models PLUS).
- Integrated 80 liter accumulator (for the PLUS model) with predisposition for electrical heater
- 3 bulb holders for thermostat / thermometer (4 in the PLUS model)

The ENERBOIL double helix exchangers allow to:

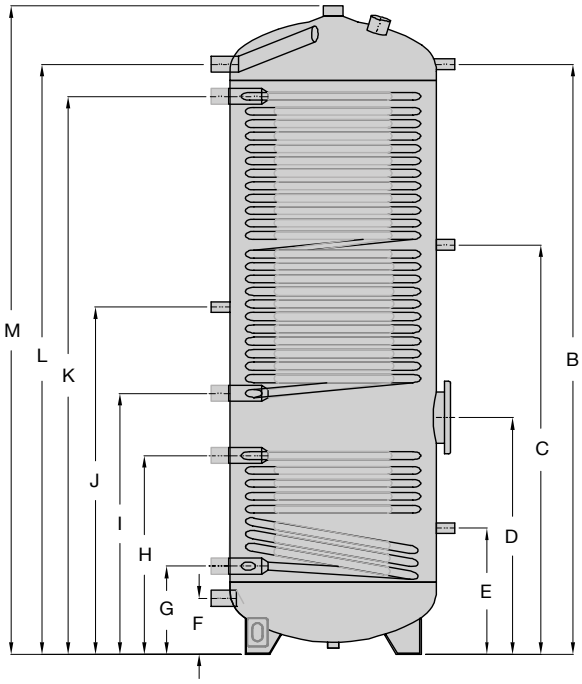
- Connect even in small volumes of water, heat pumps and thermal solar systems
- Double the exchange surfaces of the coils, improving their efficiency
- Reduce the dimensions of the exchangers with the same exchange surface
- Decrease the ON and OFF of the heat pump in the preparation of domestic hot water
- Also prepare the cylinder with an electrical heater connection.

CYLINDER FOR THE PRODUCTION OF DHW WITH INCREASED COILS AND INTEGRATED BUFFER (PLUS VERSION) COMBINED CONNECTION FOR HEAT PUMPS AND THERMAL SOLAR

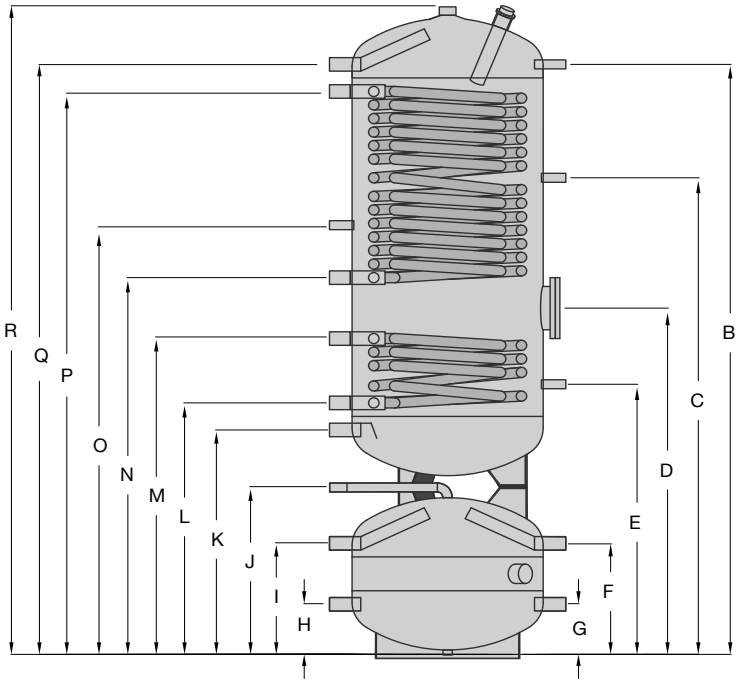
RANGE	from 260 to 1390 litres					
WORKING TEMPERATURE	max. working temperature 95°C max. working pressure 10 bar					
MODELS	300	500	1000	1500	PLUS 300	PLUS 500

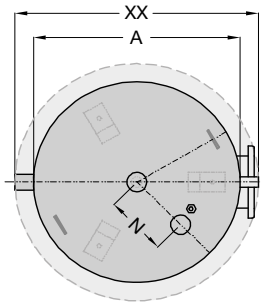
DIMENSIONS

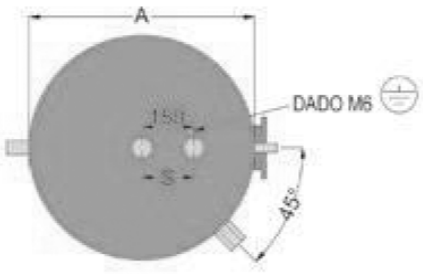
ENERBOIL



ENERBOIL PLUS



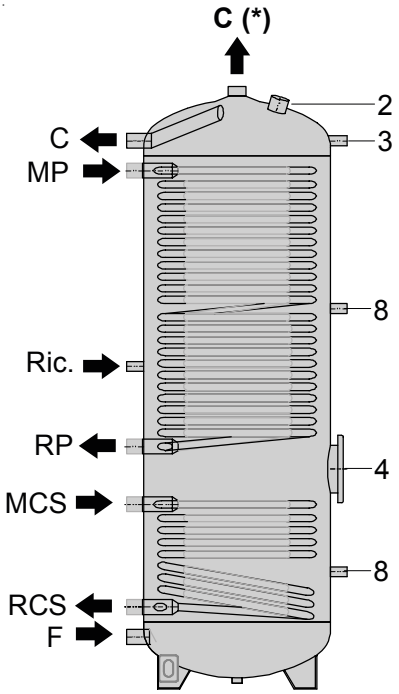




ENERBOIL		A	B	C	D	E	F	G	H	I	J	K	L	M	N
300	mm	500	1470	1035	590	315	140	220	495	650	865	1390	1470	1615	150
500	mm	650	1500	1045	625	320	185	275	252	700	950	1395	1500	1705	150
1000	mm	790	1940	1270	1005	540	240	350	905	1095	1295	1830	1940	2140	200
1500	mm	1000	1820	1235	930	540	280	395	805	1090	1285	1725	1860	2120	230

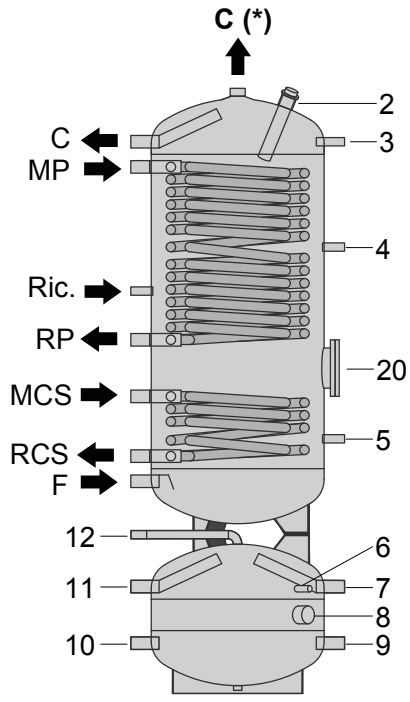
ENERBOIL PLUS		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
300	mm	550	1755	1420	1035	810	340	160	160	340	505	675	755	945	1125	1280	1675	1755	1925	150
500	mm	650	1850	1415	995	690	235	135	135	235	375	565	645	895	1070	1320	1765	1850	2040	150

HYDRAULIC CONNECTIONS



Schema esemplificativo per i modelli 300-500

ENERBOIL		300-500	1000	1500
C	Domestic hot water outlet	1”	1” ¼	1” ½
C(*)	Domestic hot water outlet	1” ¼	1” ¼	1” ½
MP	From the heat pump flow	1”	1” ¼	1” ¼
RP	To the heat pump return	1”	1” ¼	1” ¼
Ric.	Domestic hot water recirculation	1/2”	1”	1”
MCS	From solar collector flow	1”	1” ¼	1” ¼
RCS	To solar collector return	1”	1” ¼	1” ¼
F	Domestic Cold Water Inlet	1”	1” ¼	1” ½
2	Anode	1” ¼	1” ½	1” ½
3	Thermometer/Temperature probe sheat connection	1/2”	1/2”	1/2”
4	Electrical heater connection	1” ½	1” ½	1” ½
8	Thermostat/Temperature probe sheat connection	1/2”	1/2”	1/2”

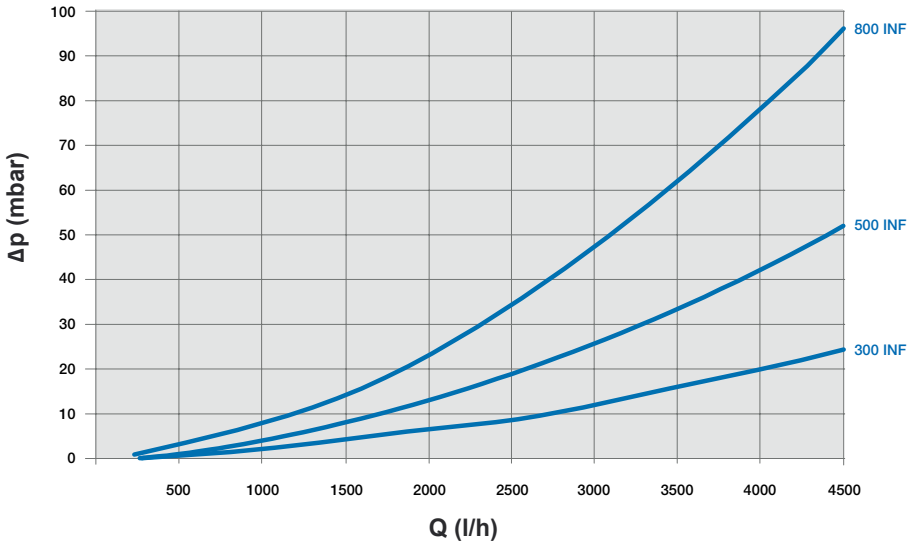


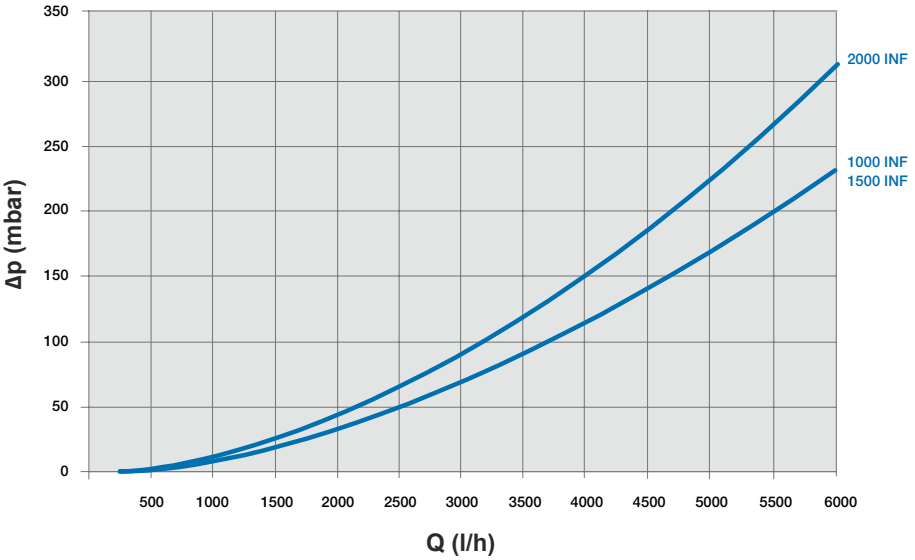
ENERBOIL PLUS		300-500
C	Domestic hot water outlet	1”
C(*)	Domestic hot water outlet	1” ¼
MP	From the heat pump flow	1”
RP	To the heat pump return	1”
Ric.	Domestic hot water recirculation	1/2”
MCS	From solar collector flow	1”
RCS	To solar collector return	1”
F	Domestic Cold Water Inlet	1”
2	Anode	1” ¼
3	Thermometer/Temperature probe sheat connection	1/2”
4	Thermostat/Temperature probe sheat connection	1/2”
20	Electric heater connection for D.H.W.	1” ½
5	Thermostat/Temperature probe sheat connection	1/2”
6	Buffer tank Thermostat/Temperature probe	1/2”
7	From the boiler flow	1”
8	Buffer tank electric heater	1”
9	To the boiler return	1” ½
11	From the flow of an auxiliary source	1”
10	To the Return of an auxiliary source	1”
12	Vent of buffer tank	1/2”

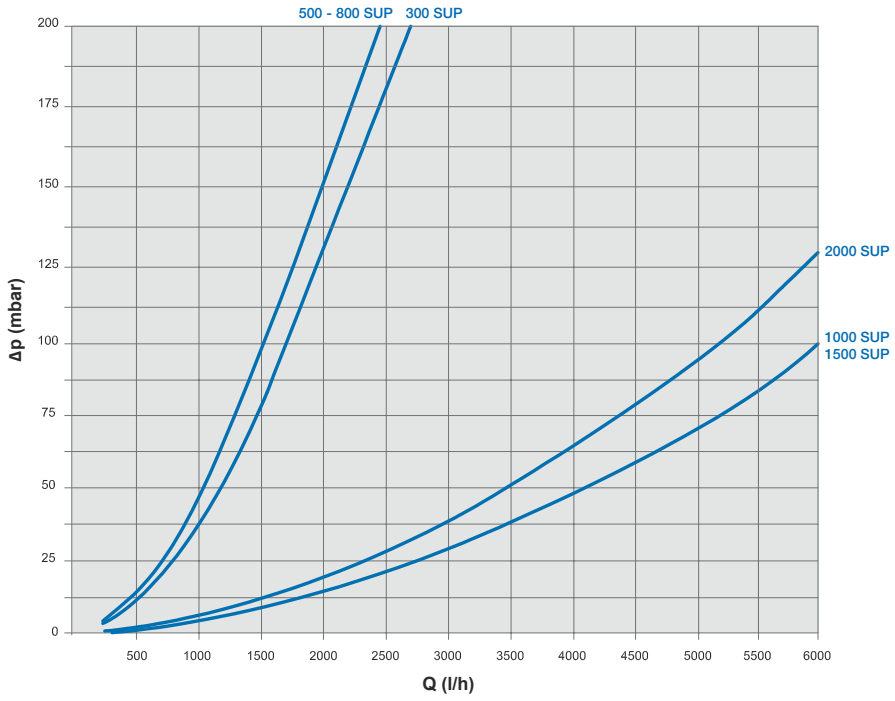
TECHNICAL DATA

ENERBOIL		300	500	1000	1500	PLUS 300	PLUS 500
Total water content	l	260	455	900	1390	270	460
Rigid PU insulation	mm	50	50	-	-	70	70
Polyester Fibre Insulation	mm	-	-	100	100	-	-
Storage tank diameter with insulation	mm	600	740	990	1200	690	790
Total height with insulation	mm	1615	1705	2205	2185	1925	2040
Upper exchanger surface	m^2	3,7	5,2	6,0	6,0	2,8	4,4
Lower exchanger surface	m^2	1,2	1,8	3,7	3,7	0,9	1,5
Water content of the upper coil	l	18	31	35	35	17	26,6
Water content of the lower coil	l	8	10	23	23	5,3	9,4
Upper coil exchanged power (60°C / 50°C)	kW	18,5	27,5	35,0	35,0	14	23
Lower coil exchanged power (80°C / 60°C)	kW	29	44	88	88	22	37
Necessary flow rate to the upper coil	m^3/h	1,59	2,37	3,01	3,01	1,2	2
Necessary flow rate to the lower coil	m^3/h	1,25	1,9	3,8	3,8	0,9	1,6
Upper coil DHW production 60°C / 50°C 10°C / 45°C (DIN 4708)	m^3/h	0,45	0,68	0,86	0,86	0,34	0,57
Lower coil DHW production 60°C / 50°C 10°C / 45°C (DIN 4708)	m^3/h	0,71	1,08	2,21	2,21	0,54	0,91
Upper coil pressure losses	mbar	31	37	45	45	13	22
Lower coil pressure losses	mbar	17	21	215	215	7	13
Flange	Ømm	180/120	180/120	180/120	290/220	180/120	180/120
Dry weight	Kg	131	182	294	395	170	220
Max. working pressure for the cylinder (DHW)	bar	10	10	10	8	10	10
Max. working pressure of the exchanger	bar	10	10	10	10	10	10
Max. working temperature of the cylinder	°C	95	95	95	95	95	95
Max working temperature of the exchanger	°C	110	110	110	110	110	110
Energy rating		C	C	C	C	B	B
Coils in series							
Total area	m^2	4,9	7,0	9,7	9,7	3,7	5,9
Total water content	l	26	41	58	58	22,3	36
Exchanged power (60 °C / 50 °C)	kW	27	38	53	53	20	32
Flow rate needed	m^3/h	2,32	3,27	4,56	4,56	1,7	2,8
D.H.W. production 60 °C / 50 °C 10 °C / 45 °C (DIN 4708)	m^3/h	0,66	0,93	1,01	1,30	0,49	0,79
Pressure losses	mbar	63	67	195	195	26	42
BUFFER TANK for Heat Pump							
Actual capacity	l	-	-	-	-	80	74
Max. working pressure	bar	-	-	-	-	6	6
Max. working temperature	°C	-	-	-	-	95	95

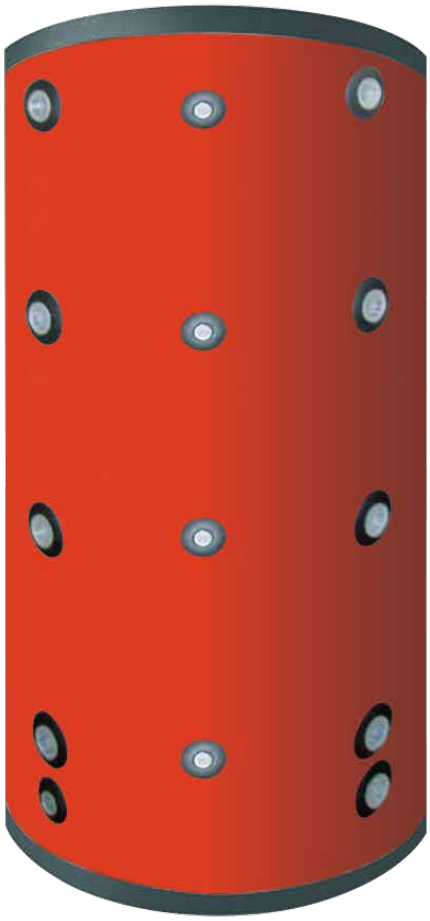
COILS PRESSURE LOSSES DIAGRAMS







MULTIPOWER - MULTIPOWER PLUS

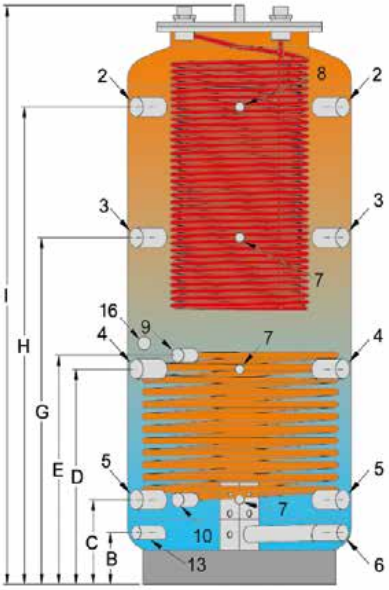


- Exchange coil in Stainless steel AISI 316 Lfor D.H.W. production (finned copper for models 300 ÷ 500)
- Coil for thermal solar circuit
- Coil for additional integration source (version Plus)
- Stratifyer for exploitation optimization of the solar energy
- Total insulation in polyester fibre 100 mm thick
- Outer lining in PVC
- 5 thermostat / thermometer bulb holders
- Electrical resistance connection

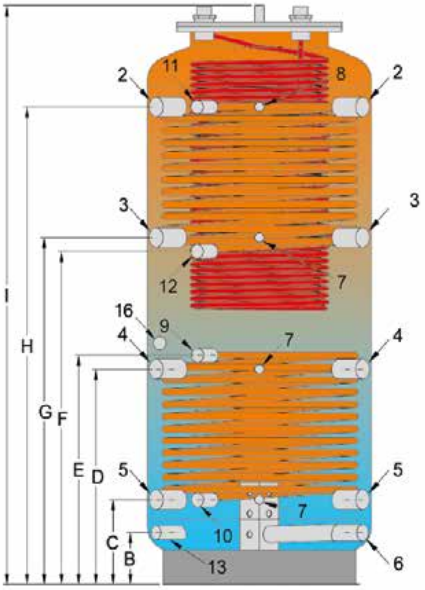
SOLAR STORAGE TANK FOR FORCED CIRCULATION SUITABLE FOR D.H.W. AND HEATING INTEGRATION WITH EXTRACTABLE STAINLESS STEEL HEAT EXCHANGER, FOR DIFFERENT ENERGY SOURCES				
RANGE	from 270 to 2346 litres			
THERMAL INSULATION	total insulation in polyester fiber			
WORKING TEMPERATURE	maximum working temperature 95°C			
MODELS	300	500 PLUS 500	800 PLUS 800	1000 PLUS 1000
	1200 PLUS 1200	1500 PLUS 1500	2000 PLUS 2000	2500 PLUS 2500

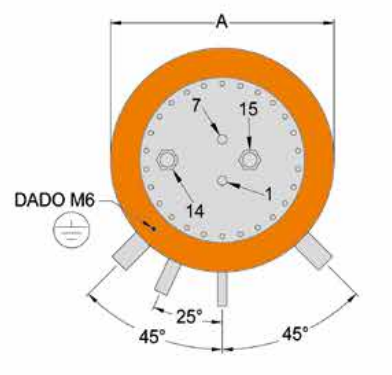
DIMENSIONS

MULTIPOWER



MULTIPOWER PLUS





MULTIPOWER		A	B	C	D	E	F	G	H	I
300	mm	500	-	230	600	830	-	970	1340	1625
500 / PLUS 500	mm	650	150	245	625	665	965	1005	1385	1680
800 / PLUS 800	mm	790	170	280	660	640	1000	1035	1410	1780
1000 / PLUS 1000	mm	790	170	280	805	700	1395	1335	1860	2180
1200 / PLUS 1200	mm	900	195	305	765	675	1265	1225	1685	2035
1500 / PLUS 1500	mm	1000	235	345	805	735	1175	1265	1725	2110
2000 / PLUS 2000	mm	1100	240	360	920	840	1470	1480	2040	2450
2500 / PLUS 2500	mm	1250	275	395	855	875	1295	1315	1775	2220

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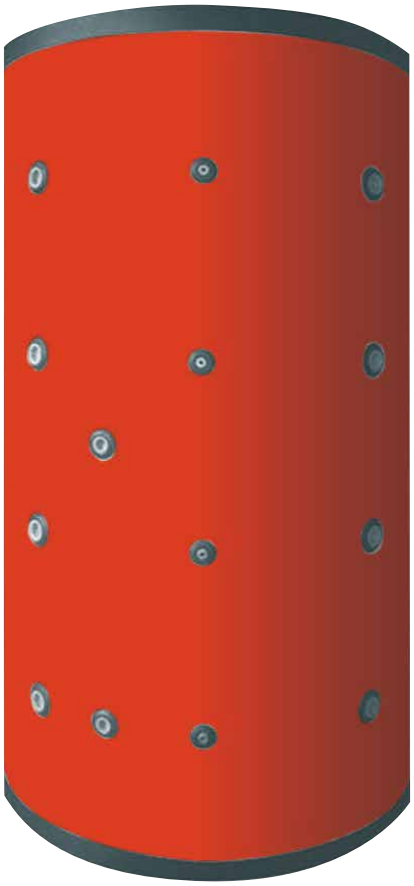
MULTIPOWER		300	500 PLUS 500	800÷2500 PLUS 800÷2500
1	Vent	1/2”	1/2”	1/2”
2	From Boiler flow	1” ½	1” ½	1” ½
3	From the flow of an auxiliary source	1” ½	1” ½	1” ½
4	To the boiler C.H. Return at 50 °C	1” ½	1” ½	1” ½
5	To the boiler C.H. Return	1” ½	1” ½	1” ½
6	Water return at 30 °C	-	1” ¼	1” ½
7	Temperature probe	1/2”	1/2”	1/2”
8	Thermometer	1/2”	1/2”	1/2”
9	From the Solar system flow	1”	1”	1”
10	To the Solar system return	1”	1”	1”
11	From the Auxiliary source flow	-	1”	1”
12	To the Auxiliary source return	-	1”	1”
13	Cylinder drain	-	1”	1”
14	Domestic hot water outlet	3/4”	1” ¼	1” ¼
15	Domestic cold water inlet	3/4”	1” ¼	1” ¼
16	Connection for electric heater	1” ½	1” ½	1” ½

TECHNICAL DATA

MULTIPOWER		300	500 PLUS 500	800 PLUS 800	1000 PLUS 1000	1200 PLUS 1200	1500 PLUS 1500	2000 PLUS 2000	2500 PLUS 2500
TOTAL WATER CONTENT	l	270	450	700	905	1077	1385	1980	2346
POLYESTER FIBER INSULATION	mm	100	100	100	100	100	100	100	100
CYLINDER DIAMETER WITH INSULATION	mm	700	850	990	990	1100	1200	1300	1450
TOTAL HEIGHT WITH INSULATION	mm	1625	1690	1725	2175	2030	2110	2445	2215
UPPER EXCHANGER SURFACE	m^2	-	2,0	2,0	2,0	2,5	3,0	3,0	4,0
LOWER EXCHANGER SURFACE	m^2	1,9	2,0	2,5	3,0	3,0	3,5	4,0	4,0
WATER CONTENT OF UPPER EXCHANGER	l	-	11,4	11,8	11,8	14	19	17,7	22,7
WATER CONTENT OF LOWER EXCHANGER	l	11,4	11,4	14,2	16,6	16,8	20,5	22,7	22,7
POWER OF UPPER EXCHANGER	kW	-	34	42	42	55	66	66	104
POWER OF LOWER EXCHANGER	kW	45	48	63	75	78	91	104	104
FLOW RATE REQUIRED BY THE UPPER COIL	m^3/h	-	1,5	1,8	1,8	2,4	2,8	2,8	4,5
FLOW RATE REQUIRED BY THE LOWER COIL	m^3/h	1,9	2,1	2,7	3,2	3,4	3,9	4,5	4,5
PRESSURE LOSSES OF UPPER COIL	mbar	-	63	72	72	144	276	258	808
PRESSURE LOSSES OF LOWER COIL	mbar	67	91	191	313	343	565	808	808
D.H.W. EXCHANGE SURFACE	m^2	3,00	3,38	3,38	4,27	4,27	4,87	4,87	4,87
WATER CONTENT OF D.H.W. EXCHANGER	l	2,00	14,90	14,90	18,83	18,83	21,49	21,49	21,49
POWER OF D.H.W. EXCHANGER	kW	60	59	59	74	74	85	85	85
D.H.W. PRODUCTION WITH Delta T 20K (80 °C / 60 °C) DIN 4708	m^3/h	1,5	1,5	1,5	1,8	1,8	2,1	2,1	2,1
PRESSURE LOSSES OF D.H.W. COIL	mbar	295	280	280	550	550	820	820	820
EFFICIENCY COEFFICIENT NL (DIN 4708)		15,0	10,3	13,1	14,6	16,6	19,6	21,2	26,2
FLANGE DIA.	Ømm	290/220	480/400	480/400	480/400	480/400	480/400	480/400	480/400
MULTIPOWER DRY WEIGHT	kg	130	160	220	235	285	305	395	380
MULTIPOWER PLUS DRY WEIGHT	kg	-	200	250	295	330	365	440	425
EXCHANGER MAX.WORKING PRESSURE	bar	10	10	10	10	10	10	10	10
CYLINDER MAX WORKING PRESSURE (D.H.W.)	bar	3	3	3	3	3	3	3	3
CYLINDER MAX WORKING TEMPERATURE	°C	95	95	95	95	95	95	95	95
ERP EFFICIENCY CLASS		C	C	C	C	C	C	C	-

PUFFER PSR

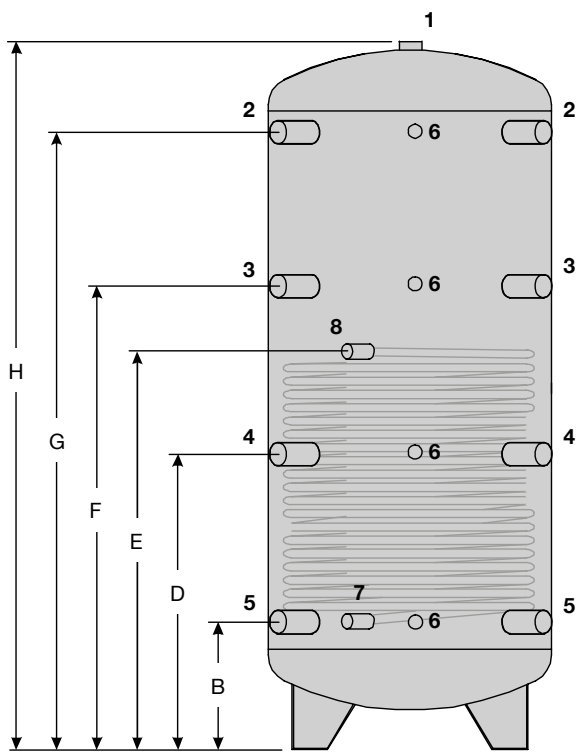


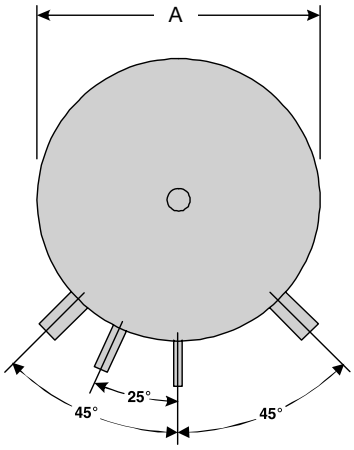
The tanks PSR are accumulators of thermal energy for the production of water not destined to the human use. They are made of an internal coil exchanger with a wide exchange surface and there fore they are optimal to the contemporary connection of different sources of energy, such as gas, oil and solid fuel boilers, hydronic cookers, solar panel installations and heat pumps.

- Steel tank
- Coil type internal heat exchanger
- Total insulation in polyester fibre 100 mm thick
- 4 thermostat / thermometer bulb holders
- External covering in PVC.

SOLAR STORAGE TANKS FOR HEATING WATER, WITH INTERNAL COIL					
RANGE	from 476 to 2959 litres				
THERMAL INSULATION	Total insulation in polyester fibre				
WORKING TEMPERATURE	maximum working temperature 95°C				
MODELS	500	1000	1500	2000	3000

DIMENSIONS AND TECHICAL DATA





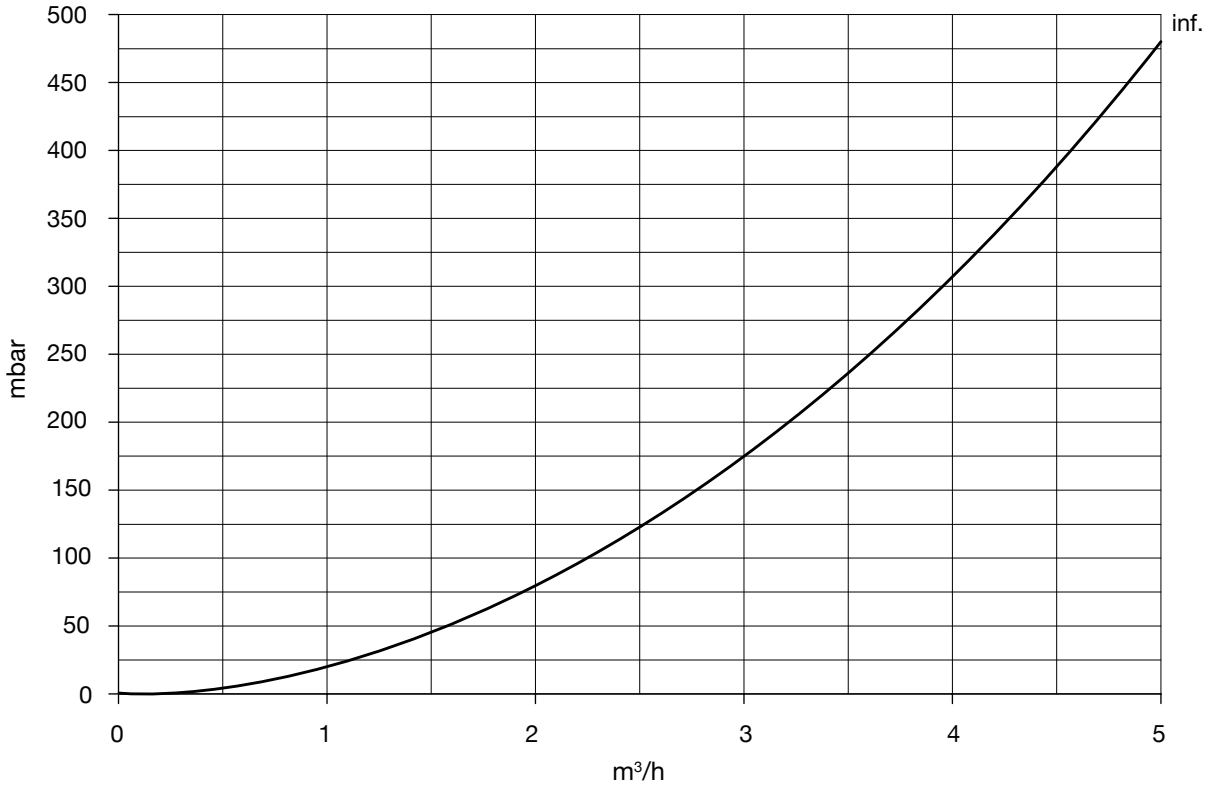
1	Vent	1” 1/4
2	From Boiler flow	1” 1/2
3	From an auxiliary energy source flow	1” 1/2
4	To the Boiler return at middle temperature (50 °C)	1” 1/2
5	To the Boiler return at low temperature (30 °C)	1” 1/2
6	Temperature probe	1/2”
7	Coil return	1”
8	Coil flow	1”

PUFFER PSR		A	B	C	D	E	F	G	H
500	mm	650	330	520	710	930	1090	1470	1700
1000	mm	790	280	545	810	990	1335	1860	2115
1500	mm	1000	390	620	850	1290	1310	1770	2090
2000	mm	1100	390	670	950	1290	1510	2070	2405
3000	mm	1250	390	705	1020	1170	1650	2280	2645

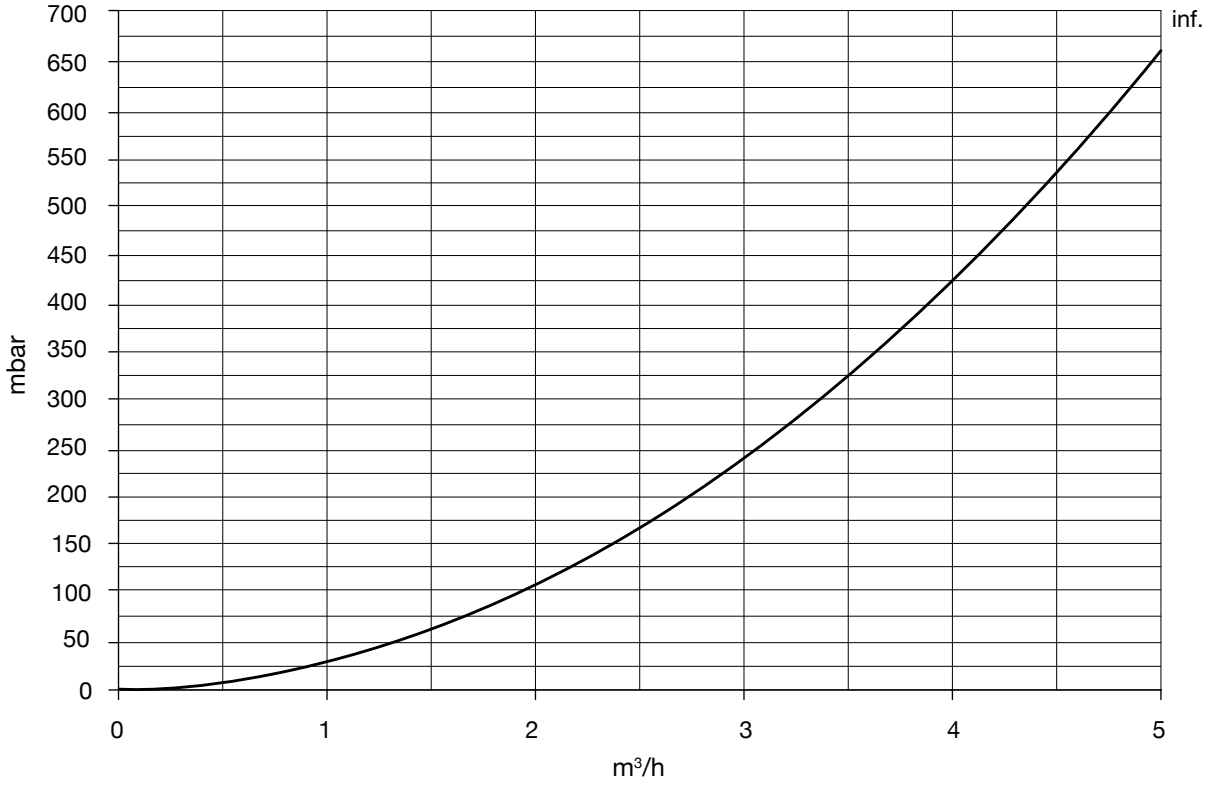
PUFFER PSR		500	1000	1500	2000	3000
TOTAL WATER CONTENT	l	476	920	1410	2010	2959
POLYESTER FIBRE INSULATION	mm	100	100	100	100	100
DIAMETER WITH INSULATION	mm	850	990	1200	1300	1450
TOTAL HEIGHT WITH INSULATION	mm	1775	2190	2165	2480	2720
SURFACE OF LOWER SOLAR COIL	m^2	1,8	2,6	3,8	3,8	5,0
WATER CONTENT OF LOWER COIL	l	10,4	14,6	21,6	21,6	28,2
POWER OF LOWER COIL	kW	45	68	99	103	130
FLOW RATE REQUESTED BY THE LOWER COIL	m^3/h	1,9	2,9	4,2	4,4	5,6
HEATING WATER PRODUCTION 80 °C / 60 °C (DIN 4708)	m^3/h	1,1	1,7	2,4	2,5	3,2
LOWER COIL PRESSURE LOSSES	mbar	73	228	700	759	1556
FLANGE DIAMETER	Ømm	290/220	290/220	290/220	290/220	290/220
DRY WEIGHT	kg	140	196	266	372	421
EXCHANGER MAX. WORKING PRESSURE	bar	10	10	10	10	10
BUFFER TANK MAX. WORKING PRESSURE	bar	3	3	3	3	3
BUFFER TANK MAX. WORKING TEMPERATURE	°C	95	95	95	95	95
ENERGY RATING		C	C	C	C	-

COILS PRESSURE LOSSES DIAGRAMS

PSR 500

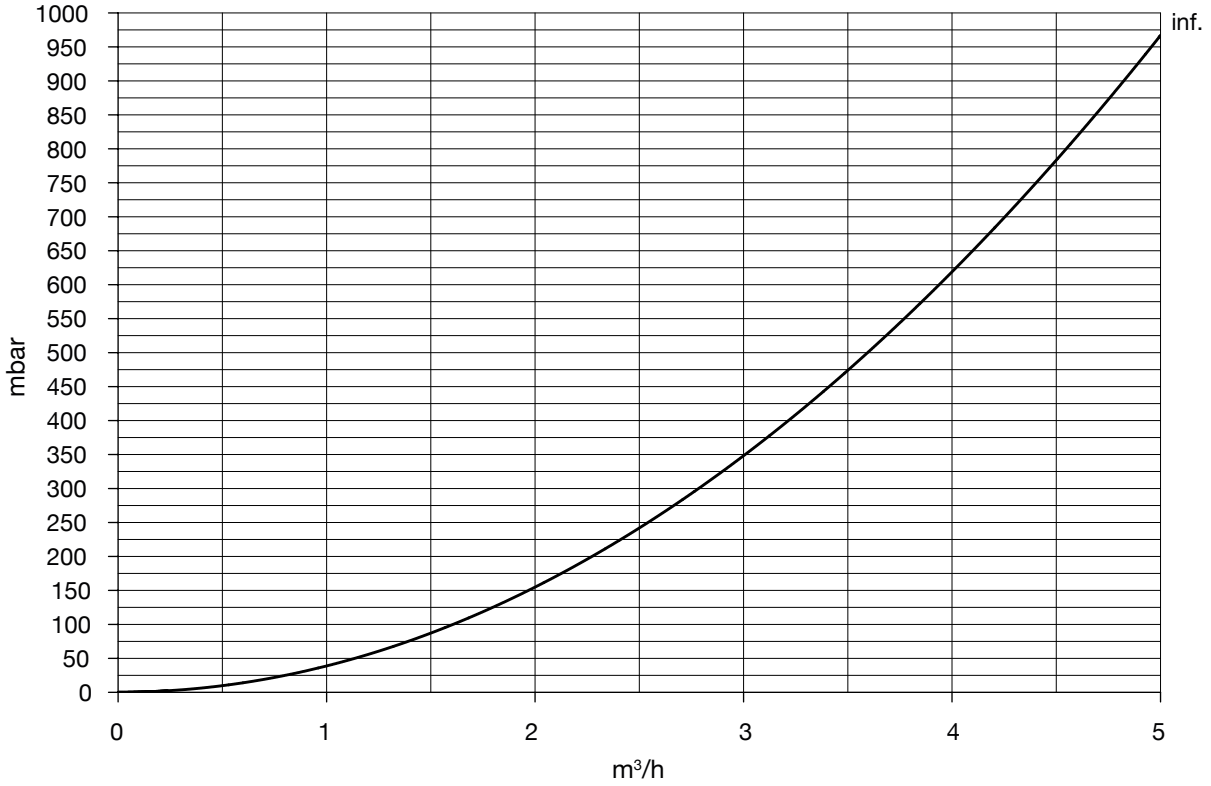


PSR 1000

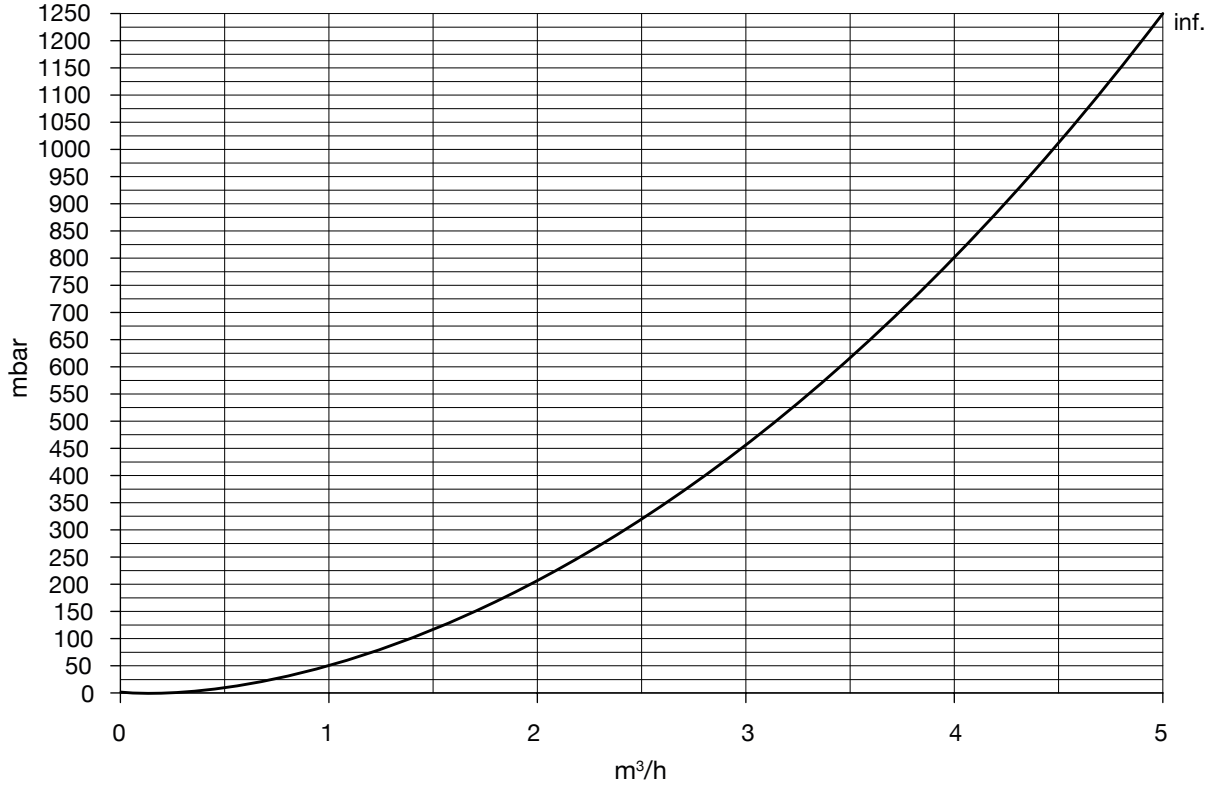


COILS PRESSURE LOSSES DIAGRAMS

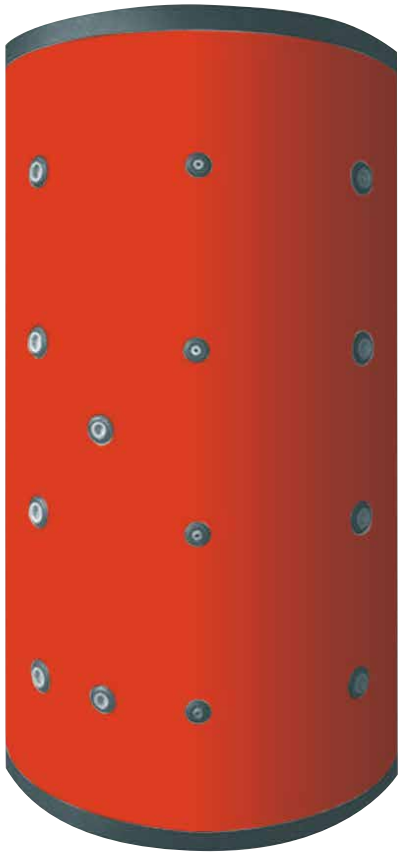
PSR 1500 / PSR 2000 / PSR 2500



PSR 3000



PUFFER PSS

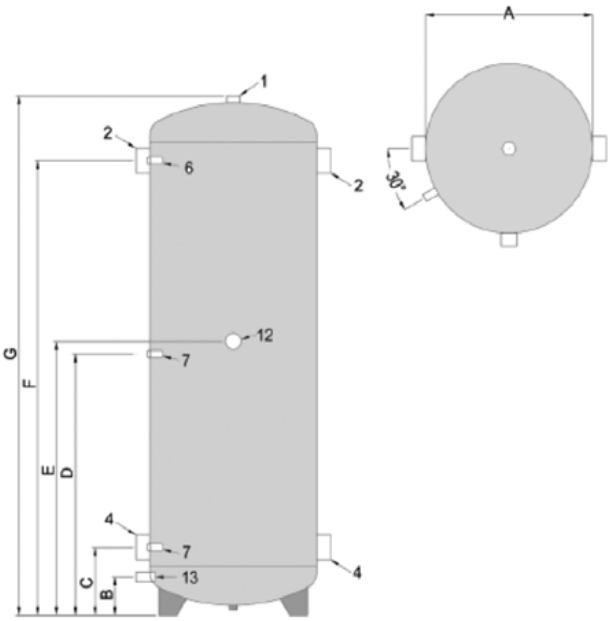


- Steel tank
- Total insulation in rigid polyurethane
  Th. 50 mm for models 50 ÷ 500 and in PEXL for models 800 ÷ 2000
- 3 thermostat / thermometer bulb holders
- PVC coating
- Electric heater connection

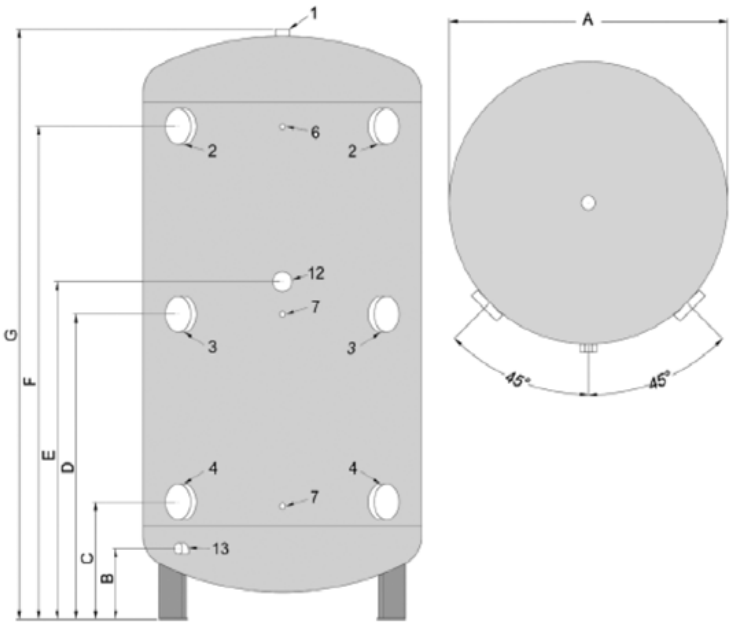
STORAGE TANKS FOR REFRIGERATED/HOT WATER					
RANGE	from 57 to 2013 litres				
THERMAL INSULATION	Total insulation in rigid polyurethane / PEXL				
WORKING TEMPERATURE	maximum working temperature 95°C				
MODELS	50	100	200	300	400
	500	800	1000	1500	2000

DIMENSIONS AND TECHICAL DATA

PUFFER PSS 50÷500



PUFFER PSS 800÷2000

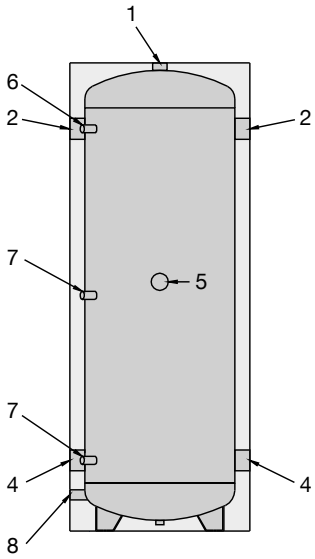


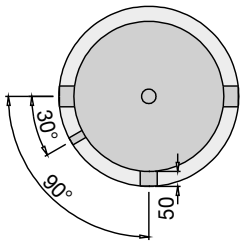
PUFFER PSS		A	B	C	D	E	F	G
50	mm	300	100	180	485	530	785	935
100	mm	400	100	185	560	605	935	1095
200	mm	450	105	215	705	750	1200	1395
300	mm	500	120	235	785	830	1340	1560
400	mm	600	135	240	775	820	1310	1555
500	mm	600	135	240	925	970	1610	1855
800	mm	790	220	355	905	990	1455	1725
1000	mm	790	220	355	1030	1130	1705	1975
1500	mm	1000	250	415	1080	1180	1745	2090
2000	mm	1100	250	415	1230	1330	2045	2405

PUFFER PSS		50	100	200	300	400	500	800	1000	1500	2000
TOTAL WATER CONTENT	l	57	123	203	277	390	473	732	855	1420	2013
RIGID POLYURETHANE INSULATION	mm	50	50	50	50	50	50	-	-	-	-
PEXL INSULATION	mm	-	-	-	-	-	-	30	30	30	30
DIAMETER WITH INSULATION	mm	400	500	550	600	700	700	850	850	1060	1160
TOTAL HEIGHT WITH INSULATION	mm	935	1095	1395	1560	1555	1855	1725	1975	2090	2405
DRY WEIGHT	Kg	25	35	45	55	95	100	170	190	240	330
CYLINDER MAX. WORKING PRESSURE	bar	6	6	6	6	6	6	6	6	6	6
CYLINDER MAX. WORKING TEMPERATURE	°C	95	95	95	95	95	95	95	95	95	95
ENERGY RATING		B	B	C	C	C	C				

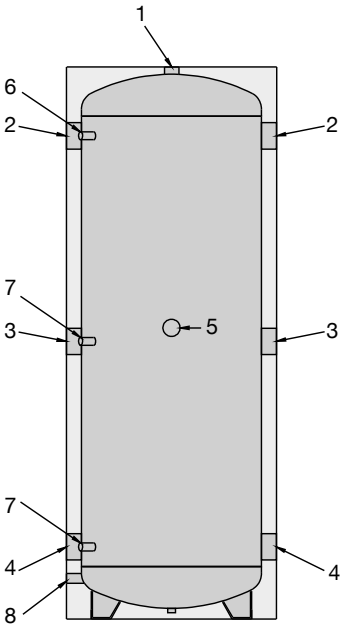
HYDRAULIC CONNECTIONS

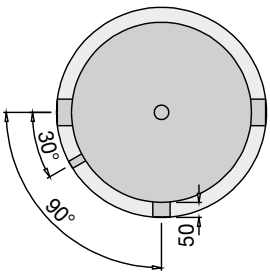
PUFFER PSS 50÷400



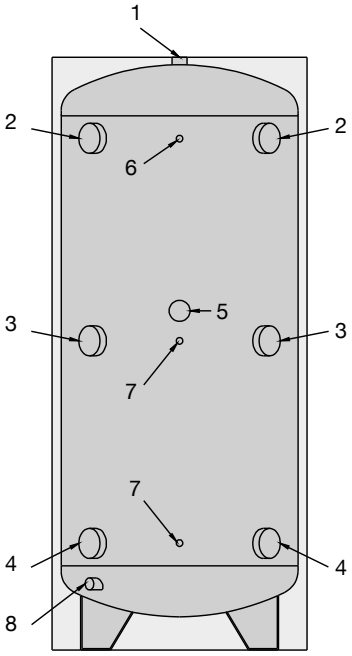


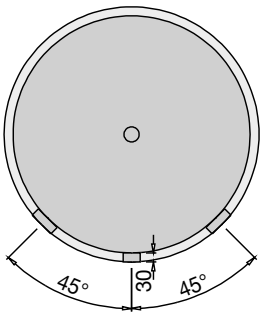
PUFFER PSS 500





PUFFER PSS 800÷2000





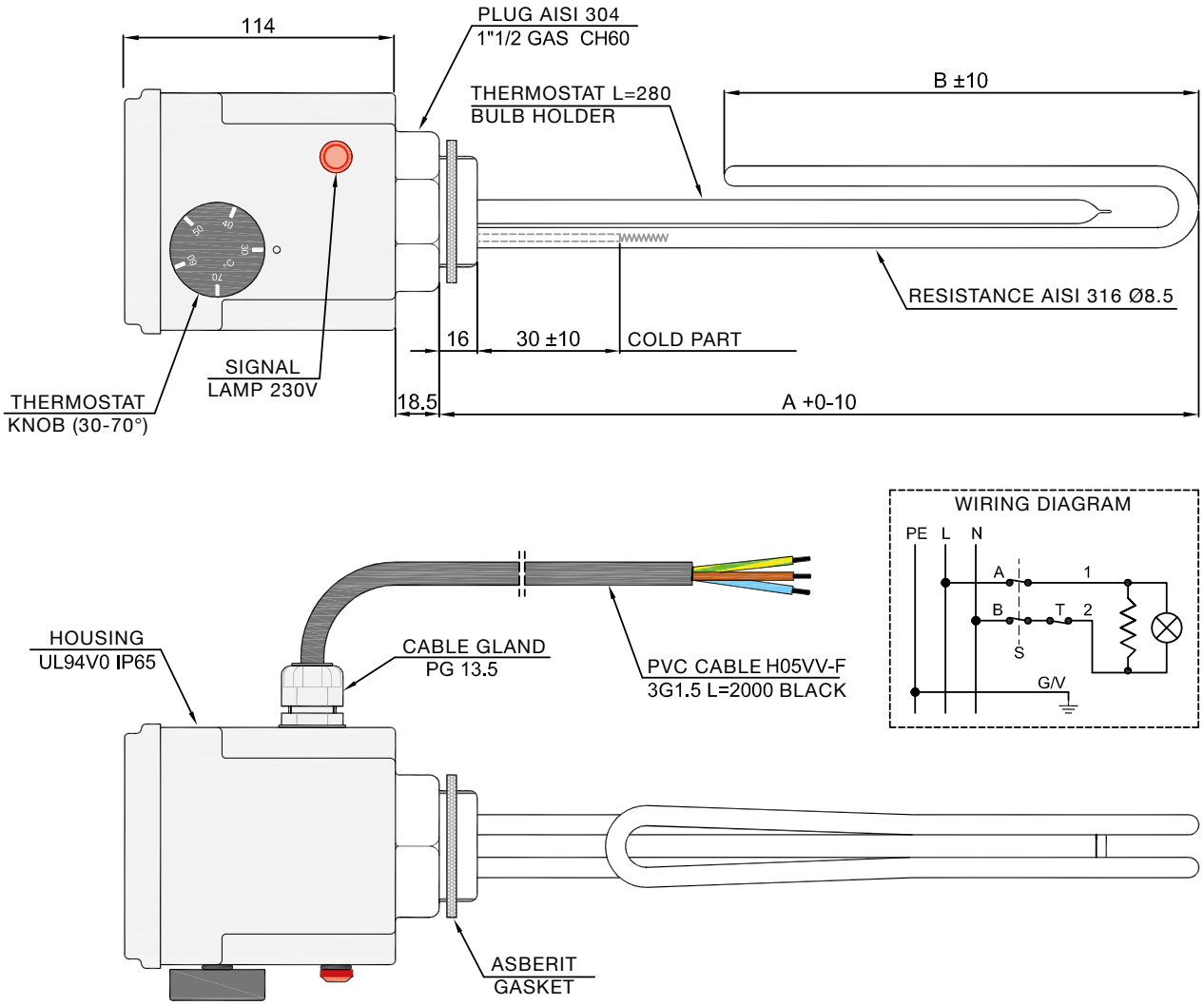
PUFFER PSS		50 - 100	200 - 300	400	500	800 - 1000	1500 - 2000
1	Vent	1”	1“ 1/4	1“ 1/4	1“ 1/4	1“ 1/4	1“ 1/4
2	From the Boiler flow	1“ 1/4	1“ 1/2 - 2”	2” 1/2	2” 1/2	3”	4”
3	From an auxiliary heat source	-	-	-	2” 1/2	3”	4”
4	To the return of the boiler or auxiliary heat source	1” 1/4	1” 1/2 - 2”	2” 1/2	2” 1/2	3”	4”
5	Electrical resistance	1” 1/2	1” 1/2	1” 1/2	1” 1/2	1” 1/2	1” 1/2
6	Thermometer	1/2”	1/2”	1/2”	1/2”	1/2”	1/2”
7	Temperature robe	1/2”	1/2”	1/2”	1/2”	1/2”	1/2”
8	Drain	1/2”	1/2” - 3/4”	3/4”	3/4”	1”	1”

ELECTRICAL HEATER

- Immersion type in stainless steel AISI 316L
- External thermostat
- Integrated safety temperature limiter (maximum operating temperature: 100 °C)
- Set Point: 30-70 °C

MODEL	Absorbed power	Power supply voltage	Length	Connection
Electrical heater 2 kW	2000 W	230 V	320 mm	1”1/2
Electrical heater 2,5 kW	2500 W	230 V	320 mm	1”1/2
Electrical heater 3 kW	3000 W	400 V	300 mm	1”1/2
Electrical heater 4,5 kW	4500 W	400 V	450 mm	1”1/2
Electrical heater 6 kW	6000 W	400 V	600 mm	1”1/2
Electrical heater 7,5 kW	7500 W	400 V	700 mm	1”1/2
Electrical heater 9 kW	9000 W	400 V	700 mm	1”1/2

SINGLE-PHASE ELECTRIC HEATER (illustrative example)



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