Heat pump systems
IANUS SYSTEM

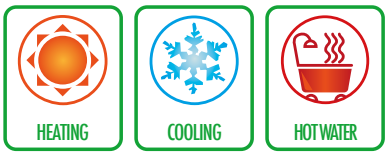


fiorini

Hybrid systems
IANUS system

Ianus: The latest green technology generation

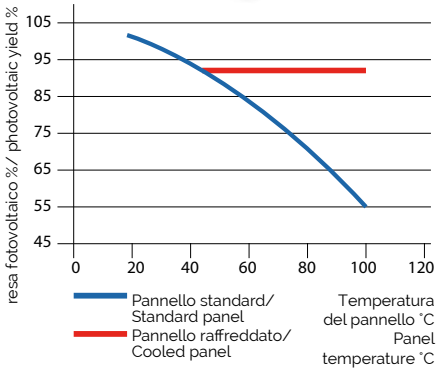
IANUS is an autonomous system combining a geothermal heat pump with hybrid photovoltaic thermal panels. It provides residential heating, cooling and domestic hot water production by using the generated electrical power. The IANUS system transforms free and renewable air and solar energy into the thermal and electric power needed by the housing unit. IANUS makes the most out of available renewable energy with no need for any fossil fuels, and without contributing to greenhouse gas emissions.



Benefits of the IANUS system

- Thermal and electrical energy form the same solar panel
- Improved use of panel absorbing surface area
- Increase photovoltaic performance through cell cooling
- Reduced material and installation costs
- Autonomous electrical power generation
- Use of state incentives feed –in tariff + tax relief
- Use of reduced rate meter for the heat pump, resulting in improved energy consumption balance





What does “hybrid system” mean?

Hybrid photovoltaic collectors transform part of the absorbed solar radiation into electric power and transfer the thermal energy generated by radiation and by the electric power to the heat pump.

Two important benefits are therefore obtained:

- the conditions for the efficient operation of the heat pump are created (high COP), as the pump receives the necessary electric and thermal energy from photovoltaic collectors;
- photovoltaic cell operating temperature is reduced, thus increasing kWh production by up to 30%.

Hydrid systems
IANUS system

The system components' operation is coordinated and improved by the Galileus software, which creates the right conditions for high comfort and user-friendly technology. In case of frost or ice formation on the front side of the photovoltaic panel that would cause an interruption in electricity production, the system automatically removes the ice by shortly reversing the refrigeration cycle and heating the glass surface.

The system ensures the same level of comfort with high performance even in case of snow, ice or frost. It improves power production efficiency by heating the panel surface in the most cost-effective way and making it run in the shortest time possible.

Main components of the IANUS system are:

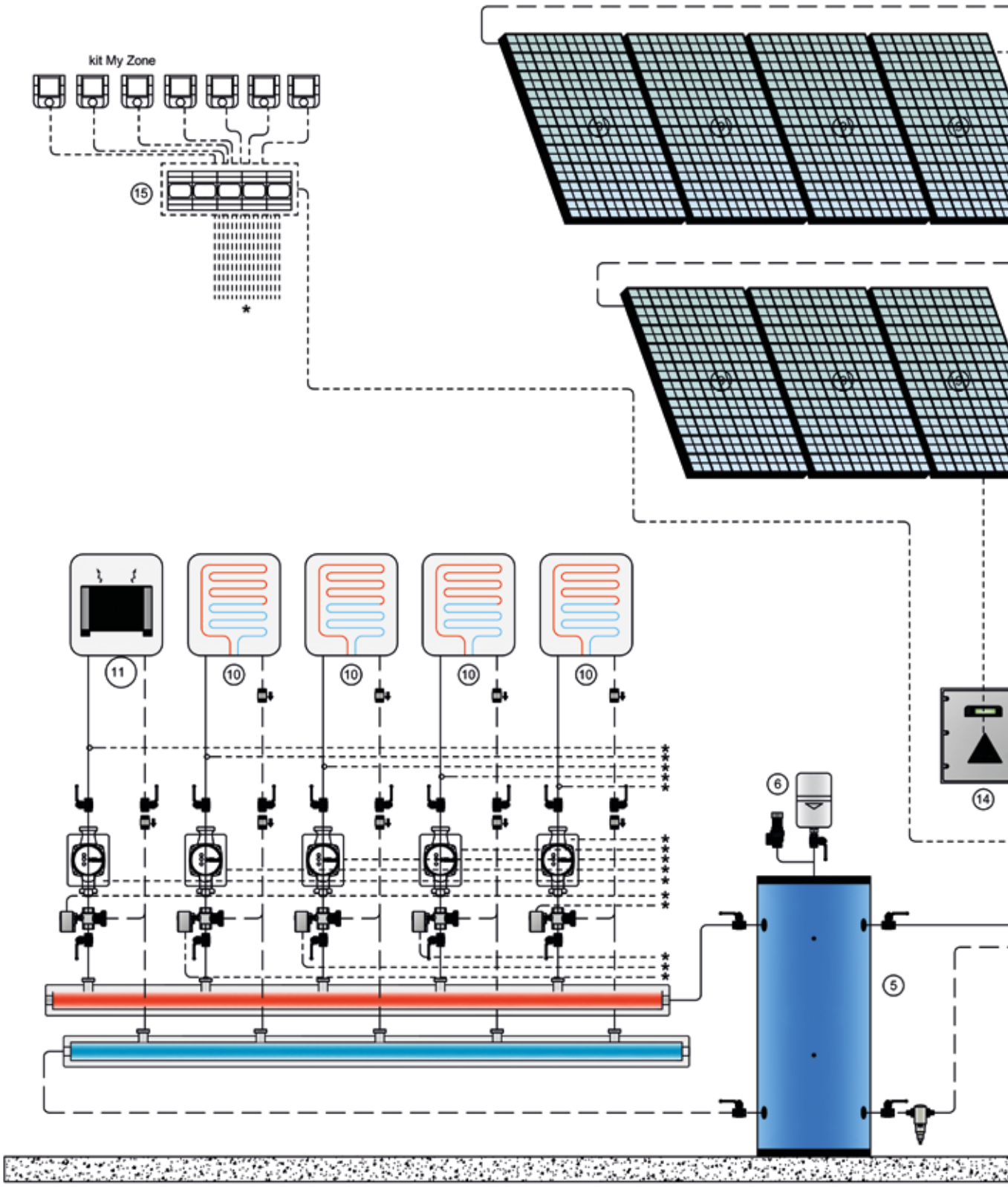
- Heat pump for heating, cooling and DHW productions
- Hybrid photovoltaic panels
- Device's storage tank
- FREE HEATING kit which contains a plate heat exchanger, a 3-way deviation valve and a circulation pump; it heats DHW under sufficient solar radiation conditions without activating the heat pump compressor.



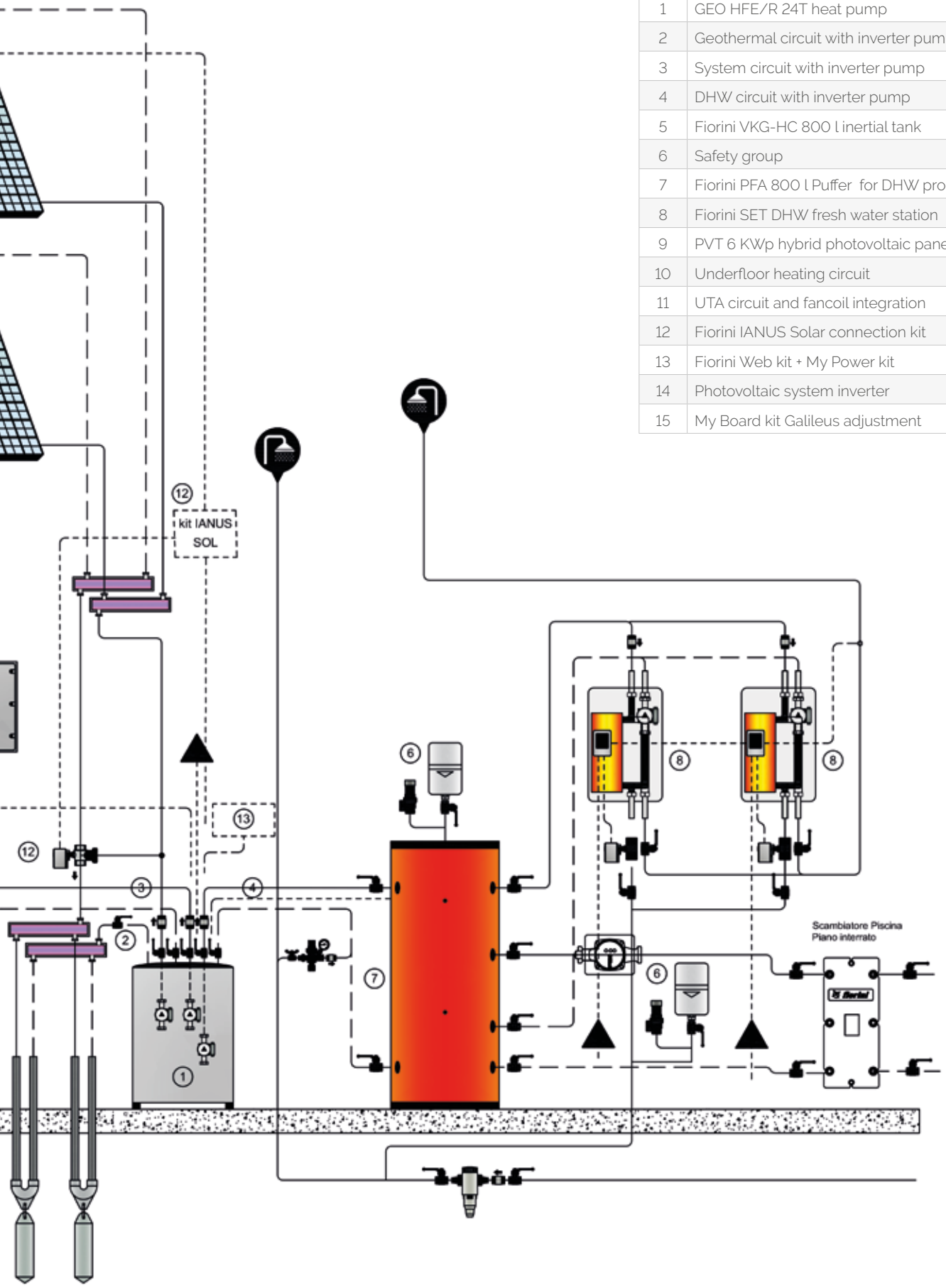
Typical combinations for housing units from 6 to 10 kW
(Some components are available only on request)

GEO HFE	Thermal photovoltaic panel		Kit Freeheating	Kit Drycooler	Diverter kit
					
Size	**n°**	**kWp**	**n°**	**Size**	**n°**
6	19	4,5	1	Dry 6-8	1
8	26	6	1	Dry 6-8	1
10	34	8	1	Dry 10-12	1

IANUS hybrid system solutions



1	GEO HFE/R 24T heat pump
2	Geothermal circuit with inverter pump
3	System circuit with inverter pump
4	DHW circuit with inverter pump
5	Fiorini VKG-HC 800 l inertial tank
6	Safety group
7	Fiorini PFA 800 l Puffer for DHW production
8	Fiorini SET DHW fresh water station
9	PVT 6 KWp hybrid photovoltaic panels
10	Underfloor heating circuit
11	UTA circuit and fancoil integration
12	Fiorini IANUS Solar connection kit
13	Fiorini Web kit + My Power kit
14	Photovoltaic system inverter
15	My Board kit Galileus adjustment

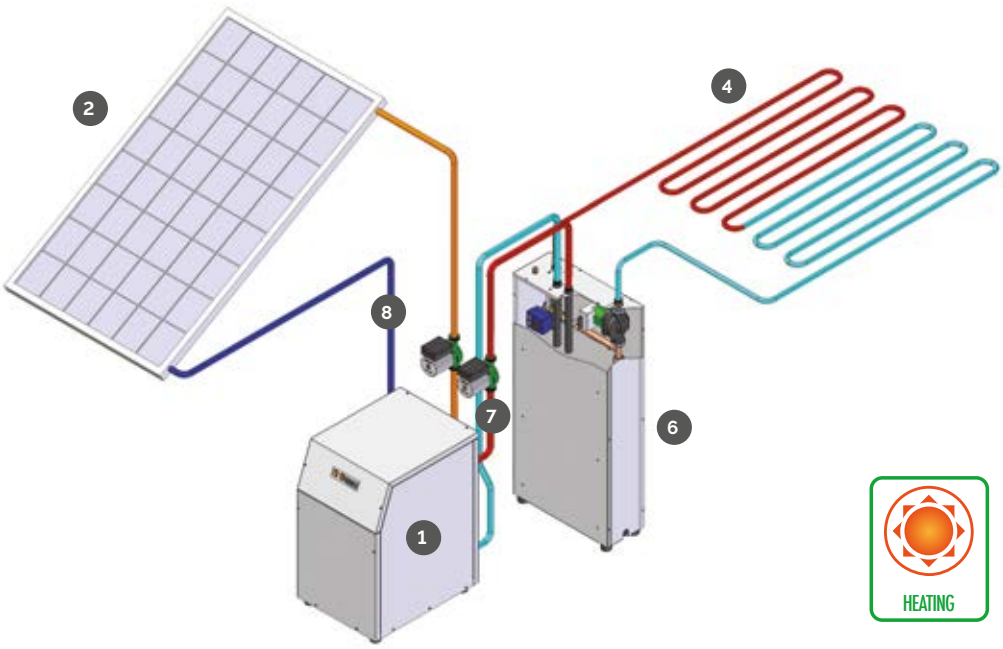


IANUS hybrid system solutions

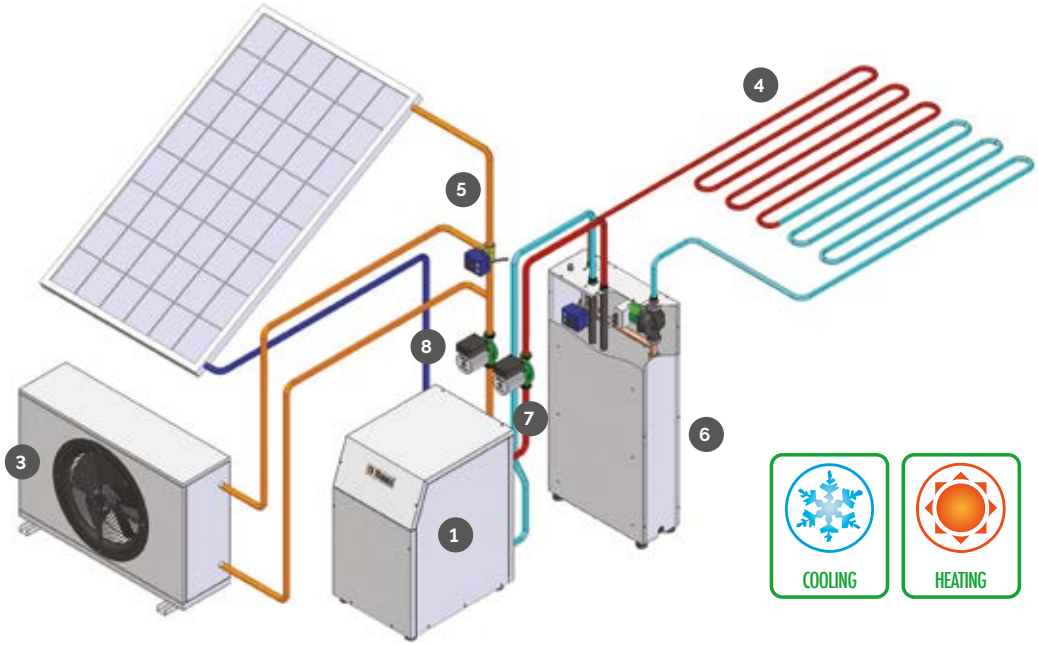
1	GEO EASY-E HT heat pump
2	thermal photovoltaic panel
3	dry cooler
4	floor heating
5	IANUS deviation valve kit
6	compact storage tank for the installation
7	device's circulation kit
8	geothermal circulation kit

Device's solutions with Ianus system are proposed below according to the energy demand of the housing unit.

Heating with EASY-E HT

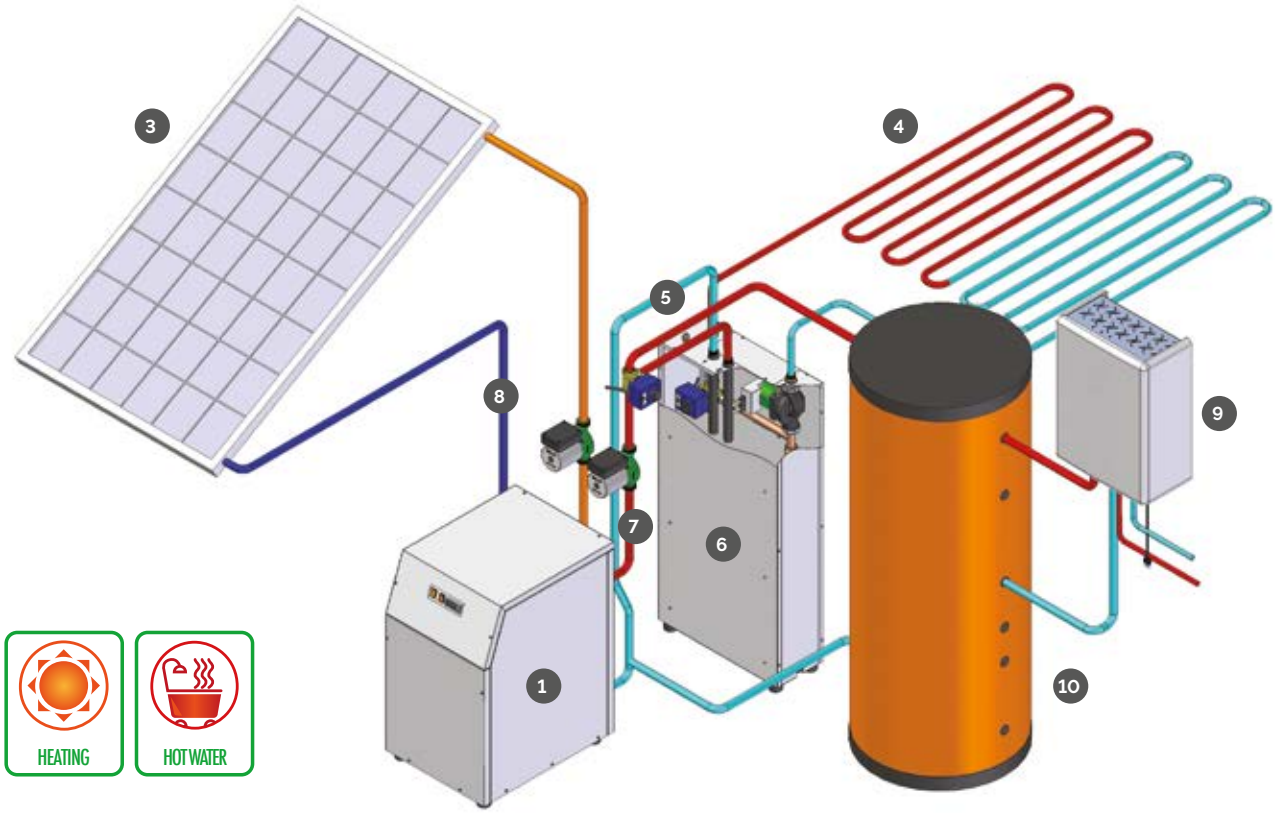


Heating and cooling with EASY-E HTR



IANUS hybrid system solutions

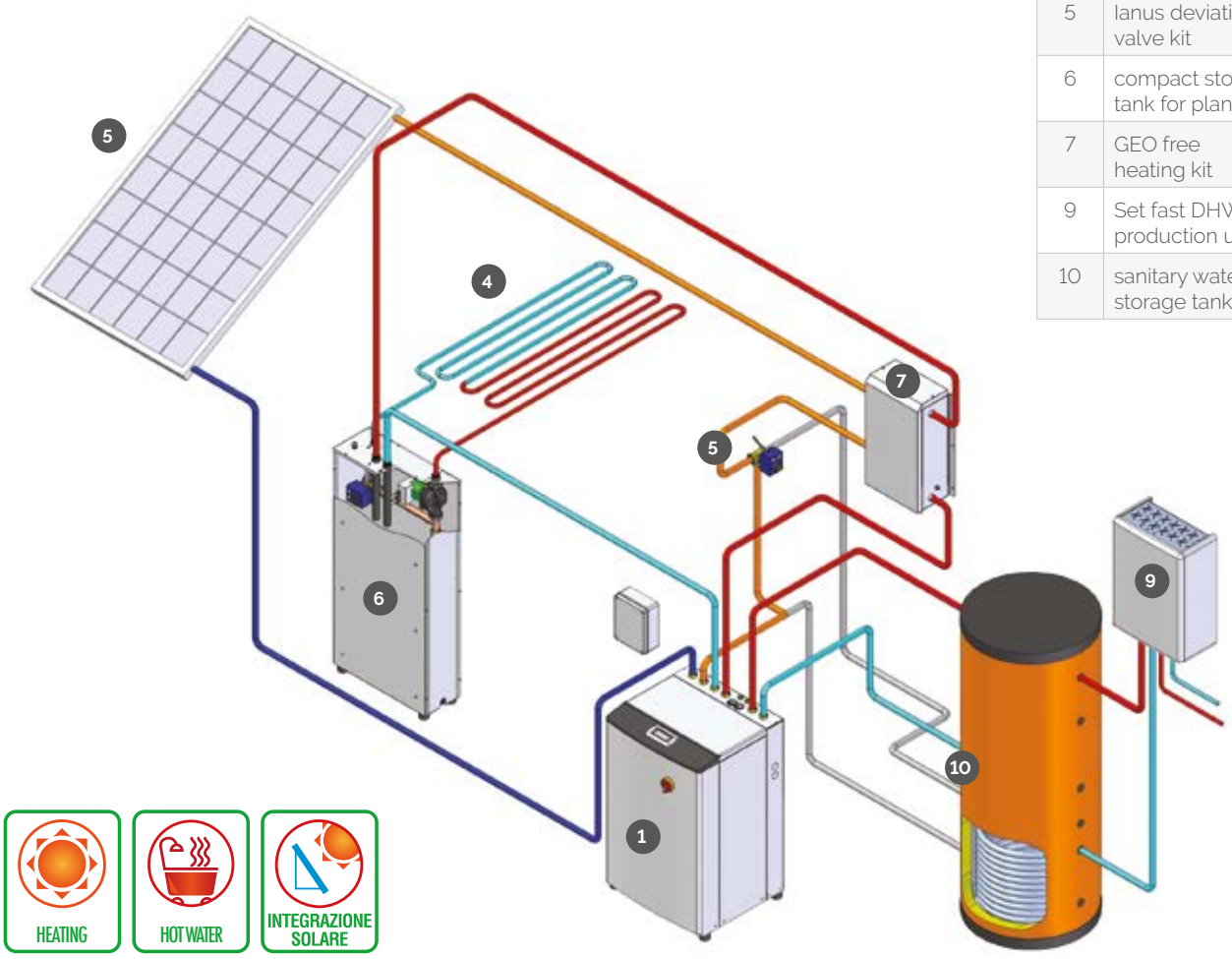
Heating and DHW production with EASY-E HT + DHW kit



1	GEO EASY-E HT heat pump
3	thermal photovoltaic panel
4	floor heating
5	IANUS deviation valve kit
6	Compact inertial storage tank
7	device circulator kit
8	geothermal probe circulator kit
9	SET fast DHW production unit
10	sanitary water storage tank

IANUS hybrid system solutions

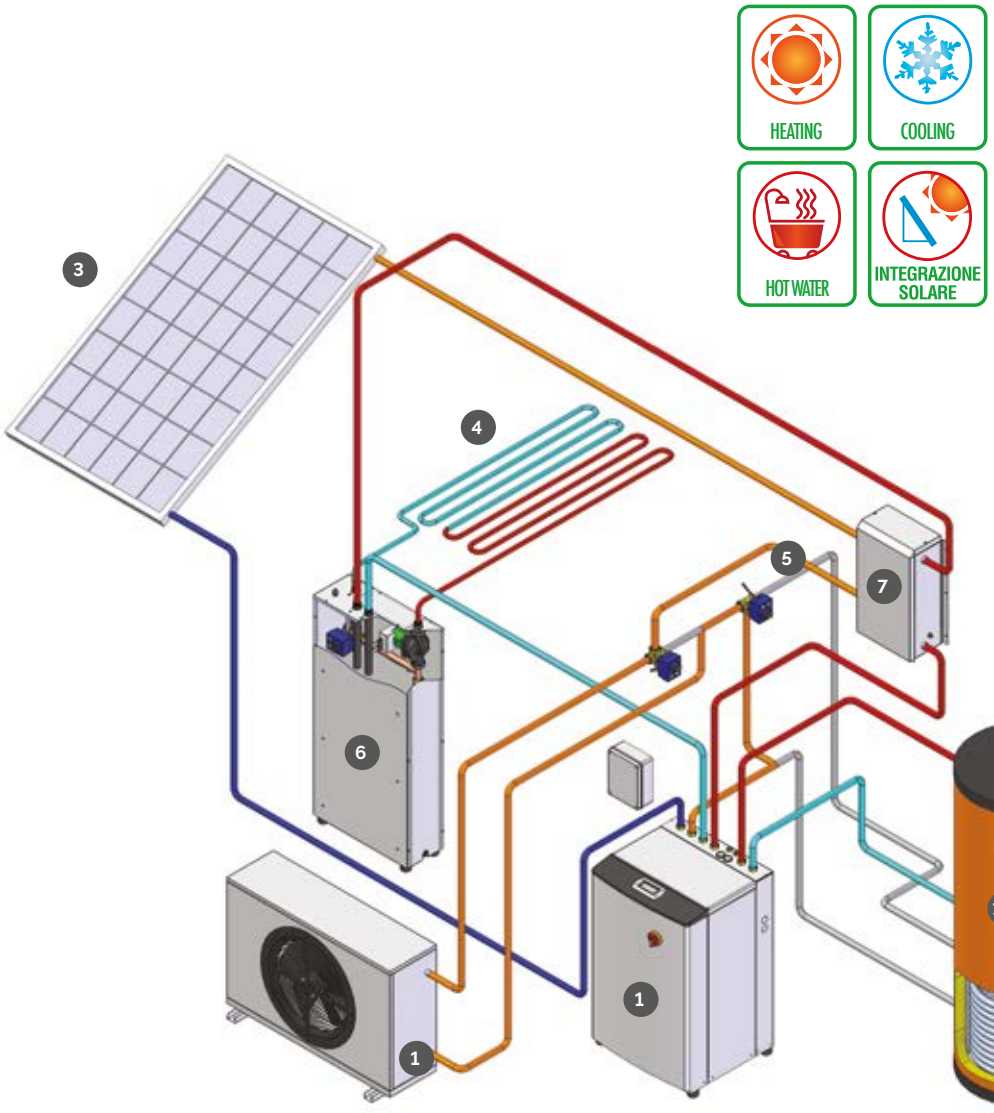
Heating + DHW + solar thermal
With GEO HFE + HFREE kit free heating



1	GEO HFE heat pump
3	thermal photovoltaic panel
4	floor heating
5	Ianus deviation valve kit
6	compact storage tank for plant
7	GEO free heating kit
9	Set fast DHW production unit
10	sanitary water storage tank

IANUS hybrid system solutions

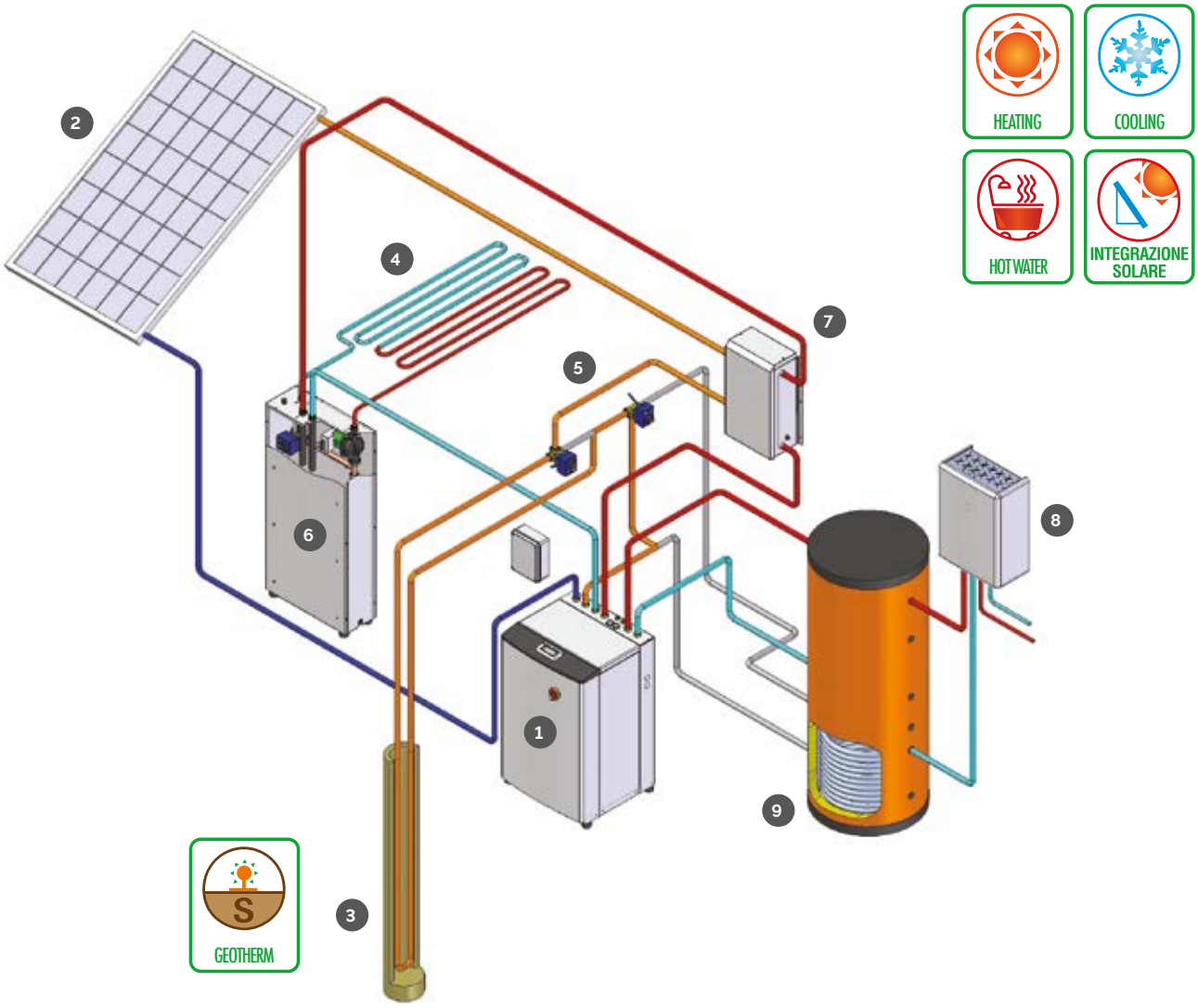
heating + cooling + DHW + solar thermal with GEO HFE



1	GEO HFE heat pump
3	thermal photovoltaic panel
4	floor heating
5	Ianus deviation valve kit
6	compact storage tank for plant
7	GEO free heating kit
9	Set fast DHW production unit
10	sanitary water storage tank

IANUS hybrid system solutions

COMBINED SYSTEM WITH PHOTOVOLTAIC PANEL AND GEOTHERMAL PROBE
HEATING + COOLING + DHW + SOLAR THERMAL con GEO HF / with GEO HFE



1	GEO HFE heat pump
2	thermal photovoltaic panel
3	geothermal probe
4	floor heating
5	IANUS deviation valve kit
6	compact inertial tank for the installation
7	GEO free heating kit
8	SET fast DHW production unit
9	sanitary water storage tank

By combining the heat pump with a double source (geothermal probe + PV/T panel), the heat pump receives the power needed to ensure the proper operation for winter heating and summer cooling. It also makes it possible to improve energy source management, by reducing the area of the photovoltaic field and the depth and number of probes. During cooling, the heat dissipated by the heat pump and the panel – which, in the meantime, is cooled down – is exchanged in the geothermal probe to obtain a useful soil regeneration effect, working as thermal storage for the following heating phase.

Accessories for geothermal devices MFREE

The Freecooling module contains a brazed plate heat exchanger and a diverter valve. In summer mode, the heat pump manages the diverting valve so as to subtract heat from the system circuit transferring it to the geothermal one, obtaining a passive cooling effect (without the use of the compressor, if the conditions allow it).

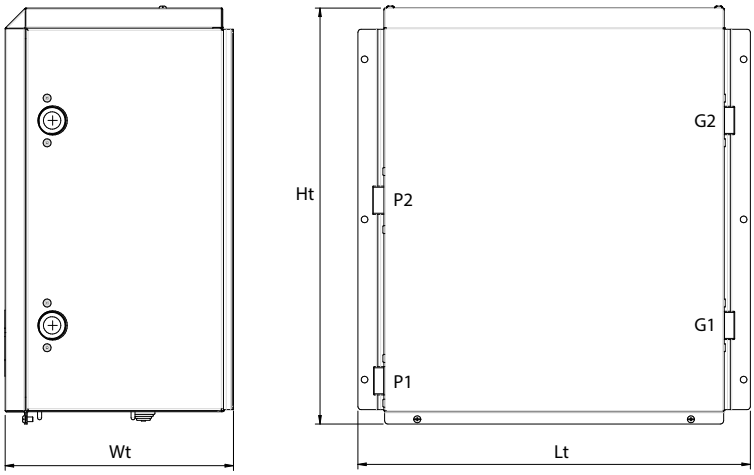




Model	HFE compatibility	Code	Price
MFREE small	for sizes 6-8-12	421120013	
MFREE medium	for sizes 16-20-24	421120014	
MFREE large	for sizes 33-42	421120015	

Technical data

				System		Source	
HFE size	Compatible MFREE	Exchanger model	Cooling power kW	Flow m³/h	Load loss kPa	Flow m³/h	Load loss kPa
6	SMALL	P7-30	9,46	1,63	7,1	1,63	6,1
8			12,45	2,14	11,7	2,14	10
12			16,55	2,85	19,7	2,85	16,9
16	MEDIUM	P7-70	20,9	3,59	6,5	3,59	6
20			27,5	4,73	10,6	4,73	9,9
24			32,7	5,64	14,6	5,64	13,6
33	LARGE	P15-70	41,6	7,16	5,4	7,16	5,5
42			49,75	8,56	7,6	8,56	7,6



Size and couplings chart

Model	Ht mm	Lt mm	Wt mm	P1 inch	P2 inch	G1 inch	G2 inch
SMALL	623	588	342	1"1/4	1"1/4	1"1/4	1"1/4
MEDIUM	623	588	342	1"1/4	1"1/4	1"1/4	1"1/4
LARGE	623	600	441	1"1/4	1"1/4	1"1/4	1"1/4

Couplings legend

P1	To energy source
P2	From energy source
G1	From plant
G2	To plant

For other connection solutions see installation manual.

Accessories



SOLAR KIT	
Model	**Description**
GEOSOL	Solar kit for GEO HFE heat pumps is a control unit supplied with a solar circulator management board and a temperature sensor contact board(2), which have to be placed on collectors and the storage tank. The Galileus software manages the integration of the collectors and their correct operation.
IANUS SOL	The solar system control module for the IANUS System, manages the PVT thermal-photovoltaic panel as a thermal collector. Controlled and managed by the Galileus software (only for GEO HFE).
EOS PLUS SOLAR KIT	It consists of a control card to adjust solar collectors. Fitted inside the EOS PLUS unit, it makes it possible to transfer the heat supplied by thermal solar collectors to the water heater through an internal heat exchanger.



WEB KIT
Description
Network board for the connection and complete management of the heat pump via Internet, does not require the installation of software. It requires a permanent Internet connection with fixed IP.



AREA KIT
Description
Temperature/humidity control kit for up to 30 room areas. It consists of the following elements: 1. Kit My-Zone: room temperature and humidity thermostat. There are as many kits as room areas to control. 2. My-Board kit: RS485 expansion board with connectors. It is used to control: - 2 dehumidifiers - 2 area valves / area pumps - 1 mixer valve. Here are its main features: - Standard power supply (115-230 Vac) - Measurement of temperature and relative humidity - Internal Clock - Compatible with IT, DE, CN and US - Time-based programs: for 5+2 days, for 7 days or for individual days (up to 6 time slots a day). - Communication with the RS485 control board with the "master Modbus protocol". - Connection of up to 30 My-Zone room thermostats on the same network. - Operating limits: -10 / 50°C. 3. Kit RS485 field-bus: RS485 board that can provide communication between Galileus 5 (on the machine), My-Zone and My-Board. Fixed component.



DIVERTER KIT
Description
Diverter valve with electric actuator at 24V governed by the Galileus system for the transfer and recovery of the free thermal energy and distributing it inside the domestic storage or the device's storage (with electric control kit for GEO EASY-E).



MIXING KIT
Description
Servo-motor modulating mixing valve for controlling the temperature of the flow to the radiant floor.



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