



**COMEX
GROUP**

TUTTO UN ALTRO CLIMA



Contributing to reducing
the greenhouse effect



HYBRID ECOCLIMA

FACTORY-MADE PRE-ASSEMBLED THERMO-COOLING UNIT

ABOUT US ...technological innovation since 1986



OUR MISSION

Founded in 1986 as a manufacturer of industrial furnaces, **Comex Group** has built its history on a fundamental value: technological innovation.

Many years of experience in the heating and air-conditioning sectors, combined with the continuous acquisition of know-how on new technologies and applications, have enabled the company to apply solutions that are always up-to-date using heat pump systems, solar cooling, heat recovery, thermal power stations and, most recently, air sanitation.

Research and innovation have distinguished the company in the heating and air conditioning sector with important advantages for **Comex Group** customers in the areas of energy saving, safety and environmental protection.

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HYBRID ECOCLIMA

HIGH-POWER HYBRID POWER UNIT

Hybrid Ecoclima is a high-powered pre-assembled factory-made thermo-cooling unit, consisting of a condensing thermal unit and an air-water heat pump complete with inertial storage, designed for winter and summer air-conditioning and domestic hot water production.

Inverter modulating air-water heat pump

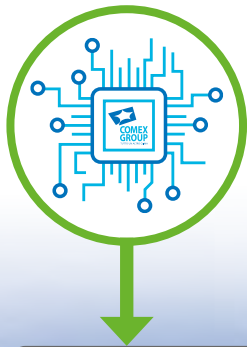


Modulating high-efficiency condensing thermal power unit



Contributing to reducing the greenhouse effect

SMART MANAGEMENT FOR MAXIMUM EFFICIENCY



The high-efficiency **Hybrid Ecoclima** technology makes it possible to optimise the use of primary energy and renewable energy taken from the air, with the advantage of real energy savings and reduced CO₂ emissions into the atmosphere.

The heart of the system is the **Hybrid Software Manager (HSM)**, which intelligently manages through specific logarithms the thermal energy production of the two modules, boiler and heat pump, in parallel or alternating operation according to the external and system flow temperature.

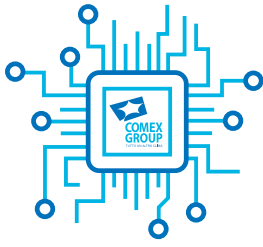


**HYBRID ECOCLIMA:
INTELLIGENT ENERGY
MANAGEMENT FOR ALL
SEASONS**



How **HYBRID ECOCLIMA** works

The production of thermal energy in the **HYBRID ECOCLIMA** power plant takes place through the use of two different modules:

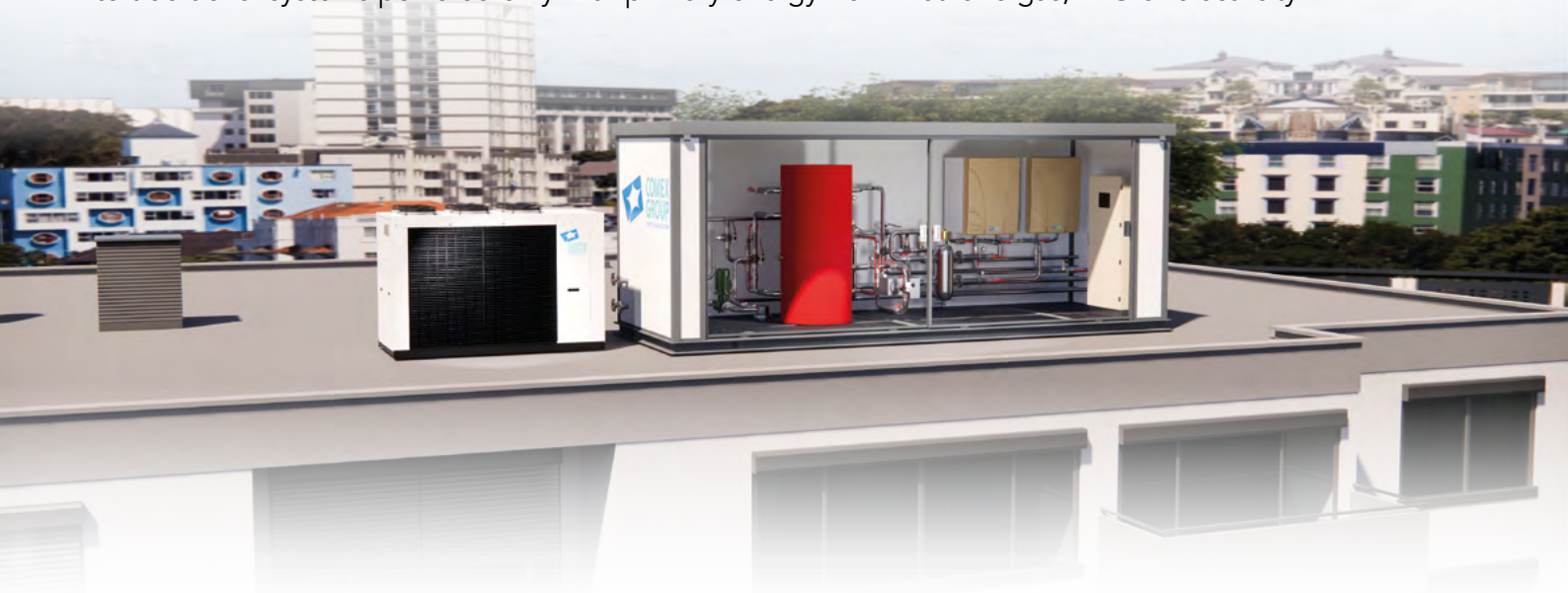


1. **Gas or electrically powered heat pump,**
2. **High-efficiency modulating condensing thermal unit.**

The operation of the hybrid unit is managed by the **Hybrid Software Manager (HSM)**, which allows the efficiency to be maximised in relation to the user's heat requirements, managing both modules simultaneously in correlation with the outside temperature and the system flow temperature.

The thermal power supplied is continuously modulating and produced from a renewable source, thanks to the modulating heat pump, with the possible integration of power and temperature through the gas heating unit.

This technology allows for the production of hybrid thermal energy, always optimising energy savings, thanks to the use of thermal energy from the air, making it possible to significantly reduce costs compared to traditional systems powered only with primary energy from methane gas, LPG or electricity.



The advantages of choosing **HYBRID ECOCLIMA**:

- Energy requalification of buildings
- Integrated winter and summer climate control
- Domestic water production
- Thermal power range available with the Hybrid Ecoclima plant: from 90 to 1,400kW
- Reduction in consumption
- Reduction of greenhouse gas emissions into the atmosphere
- Factory assembled and tested monobloc power station factory made with customised configuration as required by the project
- Exclusive opportunity to choose between an electric or gas heat pump
- Comex Group technical office support for design
- Availability of a technician for site supervision and positioning
- Centralised energy management and remote system management
- Quiet in operation
- Easy and cost-saving commissioning
- A single technician for maintenance service
- Recovery of space occupied by the heating plant and costs of paperwork for bringing the technical room up to standard (for the outdoor package version)

Choose your **HYBRID ECOCLIMA** Factory Made

SOME COMPONENTS OF THE HYBRID FACTORY MADE



THERMAL UNIT



ELECTRIC HEAT PUMP



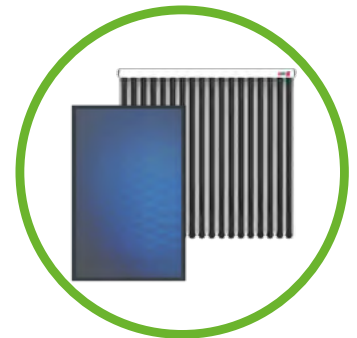
GAS HEAT PUMP



THERMAL FLYWHEEL



HYDRAULIC SYSTEM



SOLAR COLLECTORS

One of the plus points of this range of hybrid power stations is the effective performance of the system, suitably designed with dedicated plant engineering and management electronics to produce thermal energy recovered continuously from the heat pump's aeraulic cycle. Thanks to the hydronic system with exchange valves and dedicated electronics, a significant reduction in gas and electricity consumption is achieved, both for winter air-conditioning and for the production of domestic hot water.

The production of domestic hot water is supplied by the heat pump in combination with the thermal unit, depending on the required temperature, and intelligently managed by the **HSM** system.

The unit is prepared for combination with flat and vacuum solar panels.



HYBRID ECOCLIMA
INTELLIGENT ENERGY MANAGEMENT FOR ALL SEASONS

Wall-hung condensing thermic units from 93 kW to 438 kW



BOILER MODEL	THERMAL POWER			PERFORMANCE AT LCV			WEIGHT
	80 - 60 °C		50 - 30 °C	100%	100%	30% / 30°C return	
	Max	Min	Max	80 - 60 °C	50 - 30 °C	30 °C	
	kW	kW	kW	%	%	%	kg
CLIMAIR 100	92.9	11.2	101.2	97.8	106.5	108.7	97
CLIMAIR 115	112	11.8	121	97.4	103.2	108.3	97
CLIMAIR 150	146.1	19.2	154.5	97.2	103	108.3	107
CLIMAIR 180	185.8	11.2	222.2	97.8	106.5	108.7	194
CLIMAIR 200	204.9	11.2	242	97.6	104.8	108.5	194
CLIMAIR 220	224	11.8	242	97.4	103.2	108.2	194
CLIMAIR 240	239	11.8	255.7	97.5	104.7	108.5	204
CLIMAIR 260	258.1	19.2	275.5	97.3	103.1	108.3	204
CLIMAIR 290	292.2	19.2	309	97.2	103	108.3	214
CLIMAIR 340	336	11.8	303.6	97.4	106.5	108.3	291
CLIMAIR 440	438.3	19.2	463.5	97.2	103	108.3	321

For application details Hybrid Eoclina Factory made contact Comex Group Technical Department

Condensing thermal power units from 450 kW to 1.4 MW



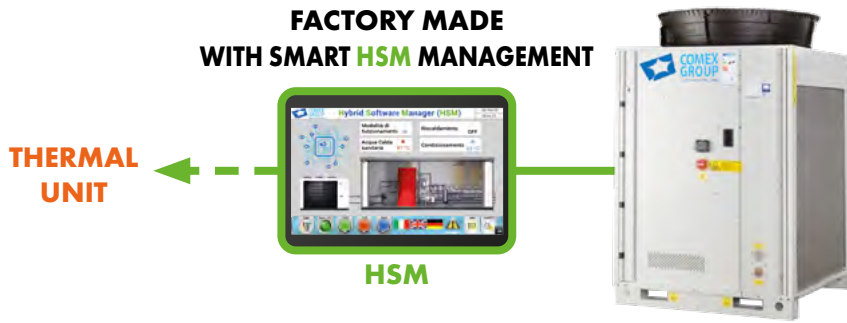
For condensing thermal units from 450 kW to 1.4 MW please contact Comex Group Technical Department

The size and weight of the hybrid power plant are dependent on the type of plant configuration, the accessories appropriately designed by the technical office, the type of application, the space available on site, and the thermal, sanitary and cooling production requirements.

Comex Group has been structured internally for years for the flexible production of heating and cooling plants, with lithium bromide absorbers and powers up to 1.6 MW.

Comex Group's Technical Department remains available to support professionals and customers in the provision of customised solutions.

ELECTRIC HEAT PUMPS



MODEL	COOLING CAPACITY ⁽¹⁾	THERMAL POWER ⁽²⁾	COP ⁽²⁾	ENERGY CLASS	
	kW	kW		at 35°C	at 55°C
MP 30	27,4	24,6	4,13	A++	A+
MP 40	38,3	32,8	4,18	A++	A+
MP 50	48	40,1	3,87	A++	A+
PLE70	68,1	61,2	4,1	A++	A+
PLE 75	74	68,8	4,09	A++	A+
PLE 85	84,0	70,0	4,12	A++	A+
PLE 95	94,4	88,9	4,12	A++	A+
PLE 115	113,1	104,3	4,09	A++	A+
PLE125	123,8	116,5	4,05	A++	A+
PLE 140	142,8	131,2	4,06	A++	A+
PLE 160	161,3	145,3	4,06	A++	A+
PLE175	176,3	164,4	4,09	A++	A+
PLE190	189,6	180,8	4,03	A++	A+
PLE210	209	168,5	3,62	A++	A+

The nominal cooling capacity data refer in room cooling to:

(1) Chilled water inlet/outlet 23/18°C: outside air temperature 35°C

(2) Inlet/outlet heated water 30/35°C: outdoor air temperature 7°C

NOTE: Heated water inlet/outlet possible. 40/45°C

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GEHP HEAT PUMPS WITH ENDOTHERMIC GAS ENGINE

Heating from 37 to 700 kW

Cooling from 46 to 820 kW

Save electricity with
Hybrid Ecoclima G



FACTORY MADE
WITH SMART HSM MANAGEMENT



HSM

THERMAL
UNIT

For hybrid systems the main sources of primary energy supply are gas and a considerable amount of electricity, which is especially necessary for the use of the electric heat pump.

The unique innovation in the **Comex Group's Hybrid Ecoclima G** range is the use of a gas heat pump with an endothermic engine as an alternative to the electric heat pump usually in use.

One of the advantages of using the **factory made Hybrid Ecoclima G** is the minimal use of electricity as a result of using the 'all-gas' hybrid system to power both the boiler and the heat pump.

This innovative solution offers considerable advantages and is ideal for users such as residential condominiums, tertiary buildings, shopping centres or process cycles.

MODEL	COOLING CAPACITY ⁽¹⁾	P.E.R. COOLING ⁽³⁾	HEATING POWER ⁽²⁾	P.E.R. HEATING ⁽³⁾	ELECTRICAL ABSORPTION	ENERGY CLASS	
	kW		kW	-	kW	35°C	55°C
13HP	33.5	1.71	37.5	1.47	930	A+	A+
16HP	42.5	2.07	50	1.7	830	A++	A+
20HP	53	1.78	62.5	1.61	1,100	A++	A+
25HP	63.5	1.68	77	1.54	1,400	A++	A+
30HP	74.5	1.68	87.5	1.48	1,680	A++	A+

The nominal cooling capacity data refer in room cooling to:

(1) Chilled water inlet/outlet 23/18°C: outside air temperature 35°C

(2) Inlet/outlet heated water 30/35°C: outdoor air temperature 7°C

(3) Primary energy ratio (including optional engine heat recovery kit)

NOTE: Heated water inlet/outlet possible. 40/45°C

For higher powers up to 250 kW please contact the Comex Group technical department

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ADVANTAGES OF GEHP GAS HEAT PUMPS



OVER 200% ENERGY EFFICIENCY

The direct use of gas in hybrid power plants, configured with a **GEHP** gas boiler and heat pumps with an endothermic engine, avoids the losses associated with the centralised production and transport of electricity. All primary energy used in **GEHPs** is transformed into thermal/cooling energy, thanks to the recovery of thermal energy from the motor for the free production of domestic hot water, in cooling mode, which is one third of the kW output. Another advantage is the reduction of winter defrosting cycles in heating mode, **allowing efficiencies of over 200%**.



RENEWABLE ENERGY

AISIN GEHPs draw **up to 65% renewable energy** from the air during normal operation; therefore, the thermal energy supplied is significantly environmentally neutral. The advantage of using an endothermic engine with condensing exhaust gas recovery ensures additional free thermal energy production.



AN INNOVATIVE HEAT PUMP

Each GEHP maintains its nominal performance even at very low outside temperatures (+43°C / -20°C), thanks to an exchanger designed to recover thermal energy from the engine's exhaust gases, reducing and even eliminating defrost cycles. Consequently, compared to common electric heat pumps, there is no need to install integration systems, or overestimate power requirements with increased electricity consumption.



SUSTAINABILITY

The direct use of clean gas energy (Methane / LPG / Biomethane) for air-conditioning has the advantage of a significantly reduced electrical commitment of 90% compared to EHP electrical systems of the same power. As a result, the electrical commitment to an economical single-phase user is almost eliminated, avoiding the investment and bureaucracy of installing a costly dedicated electrical substation if necessary. The control of exhaust gases and the zeroing of PM10 emissions make these heat pumps one of the most effective and sustainable systems for heating and cooling with an environmental impact reduced by 40% compared to a traditional hybrid system, boiler + electric chiller of equal power. In one year of use, these units, which have been installed in Europe to date, total a saving of approximately 70,000 tonnes of CO₂.



POSSIBILITY OF INCENTIVES

The replacement of existing winter air-conditioning systems with a gas heat pump is incentivised through tax deductions according to the laws and regulations of the country of installation, with the possibility of also benefiting from gas tariff concessions, thus reducing the pay-back on the investment.



REDEVELOPMENT AND EFFICIENCY

The possibility of realising both hydronic and direct expansion (V.R.F.) systems, makes this technology extremely versatile, consequently this gas heat pump is ideal for use in hybrid plants and in newly installed systems such as energy requalification, of residential, tertiary and industrial buildings. The electronics on board the machine are designed to connect to the main communication protocols available today in home automation (ModBus RTU, ModBus IP), guaranteeing maximum versatility in the choice for plant management.



ENERGY EFFICIENCY CLASS A++

The high average seasonal efficiency of GEHP modulating heat pumps in heating (hot SPER) is such that they are recognised as energy class A++. In fact, GEHPs also perform excellently in cooling (cold SPER), allowing a significant leap forward in the calculation of seasonal and annual efficiency.



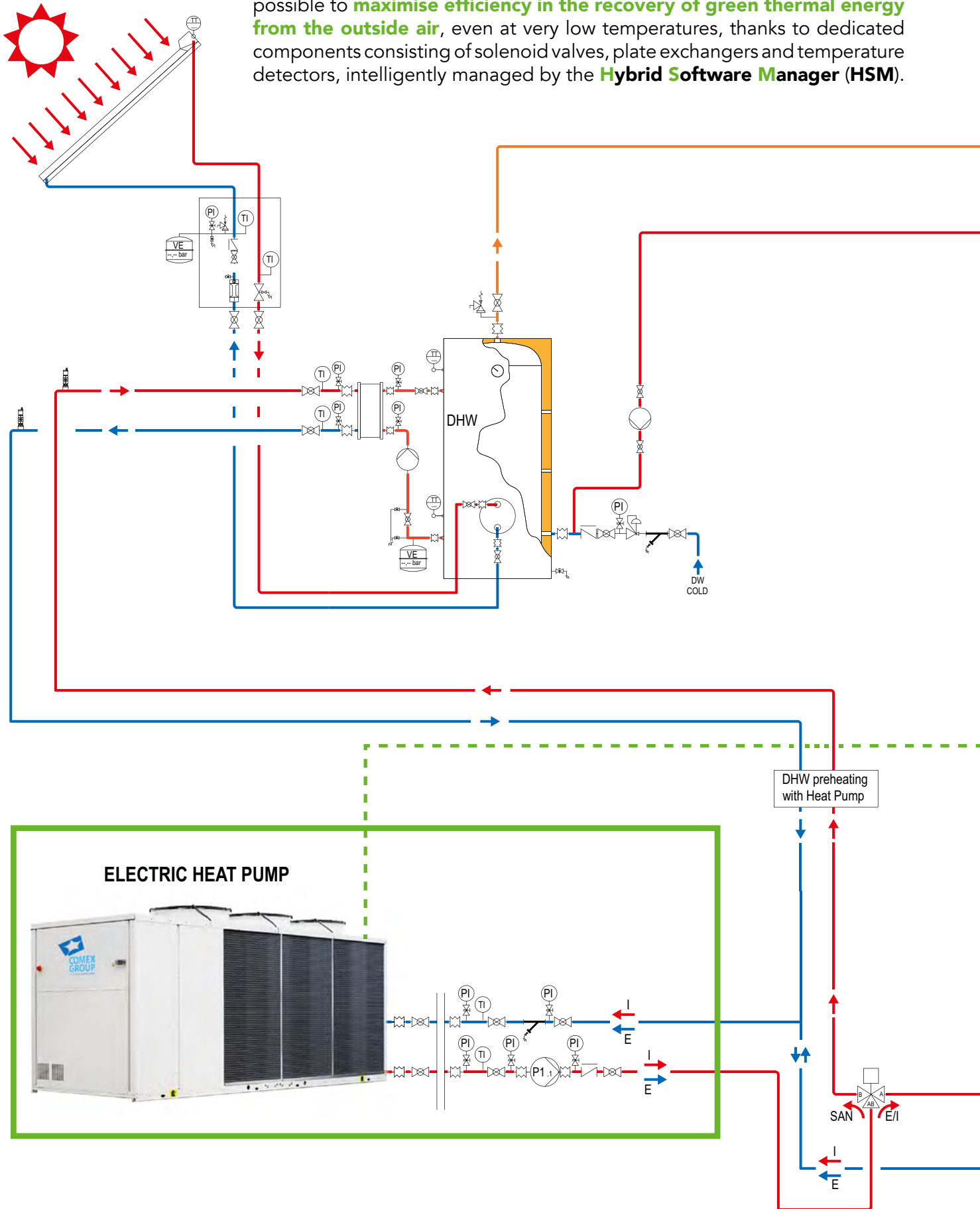
TOYOTA® RELIABILITY

Aisin GEHPs can count on endothermic engines specifically made for use in air conditioning. These are therefore not automotive units adapted for the purpose, but real engines that TOYOTA's Research and Development Centre has designed and refined over time to maximise operating efficiency. A further advantage is the significant reduction in maintenance costs with a check-up after 10,000 hours and an oil change after as many as 30,000 hours.

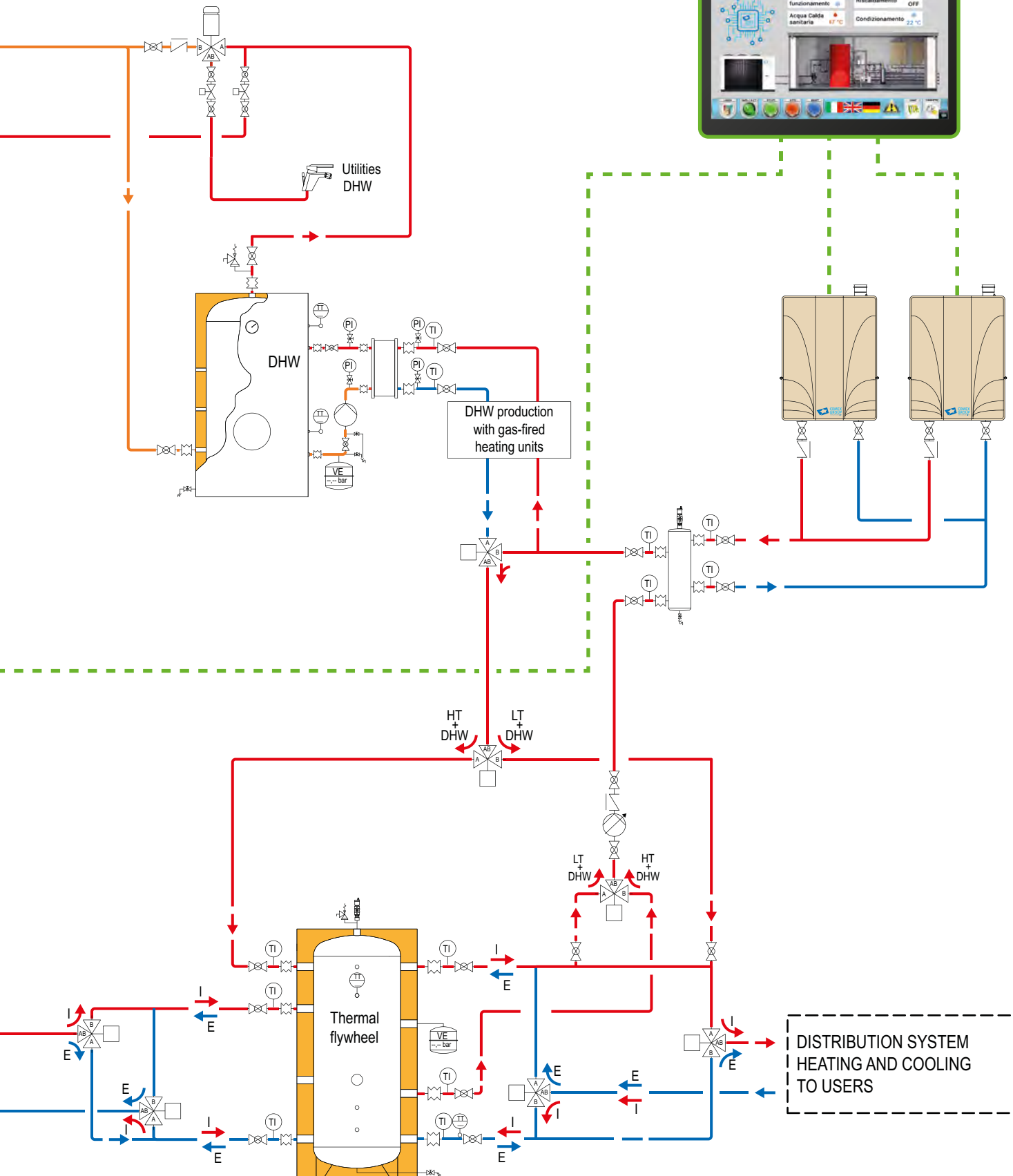
HYBRID ECOCLIMA ELITE WITH ELECTRIC HEAT PUMP

EXAMPLE PLANT

The evolution of the standard **Hybrid Ecoclima COMFORT (HY-CE)** central unit, is represented by the **Hybrid Ecoclima ELITE (HY-EE)**, model, the special "**all-air version**", where design choices have made it possible to **maximise efficiency in the recovery of green thermal energy from the outside air**, even at very low temperatures, thanks to dedicated components consisting of solenoid valves, plate exchangers and temperature detectors, intelligently managed by the **Hybrid Software Manager (HSM)**.



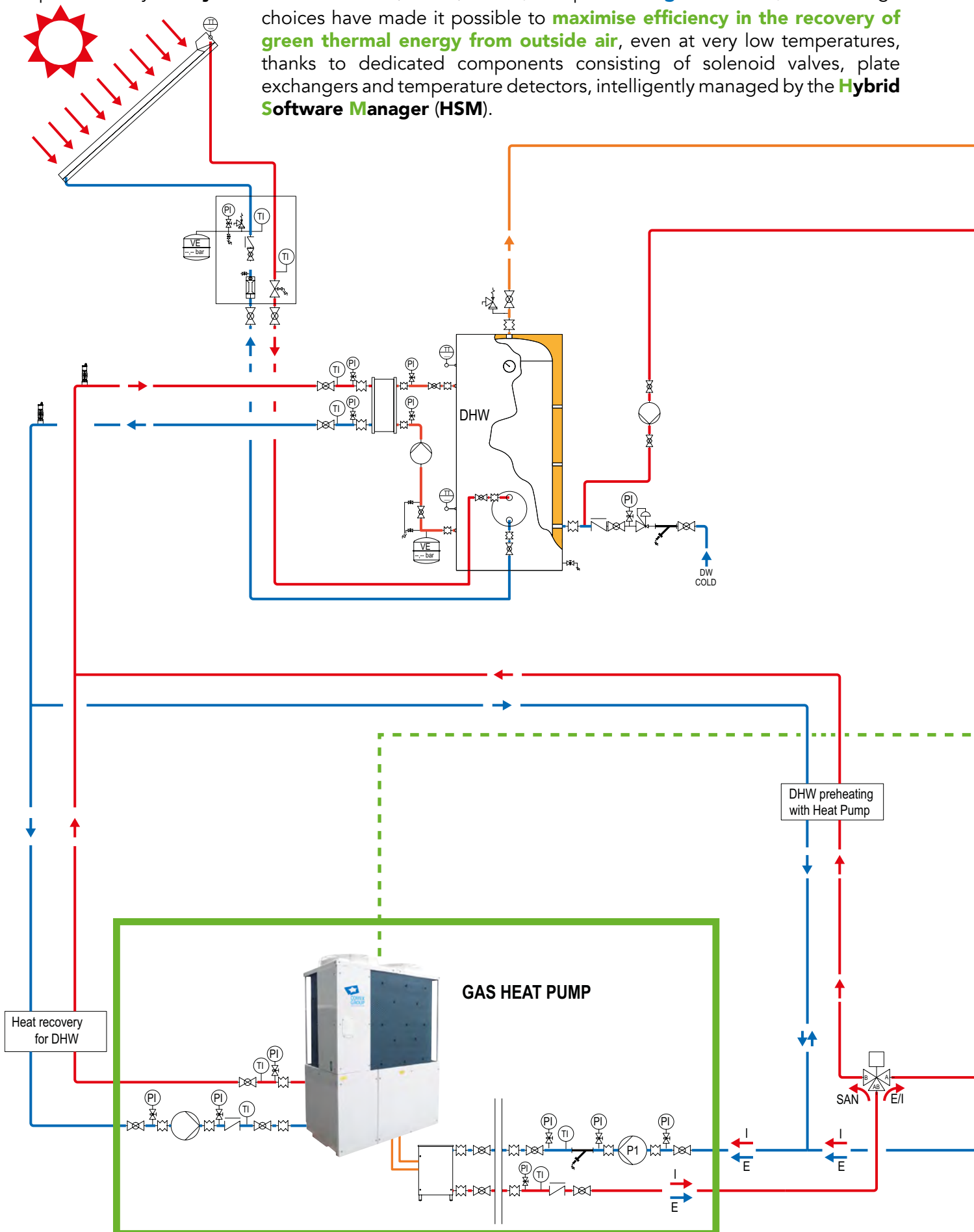
**FACTORY MADE
SMART HSM MANAGEMENT**



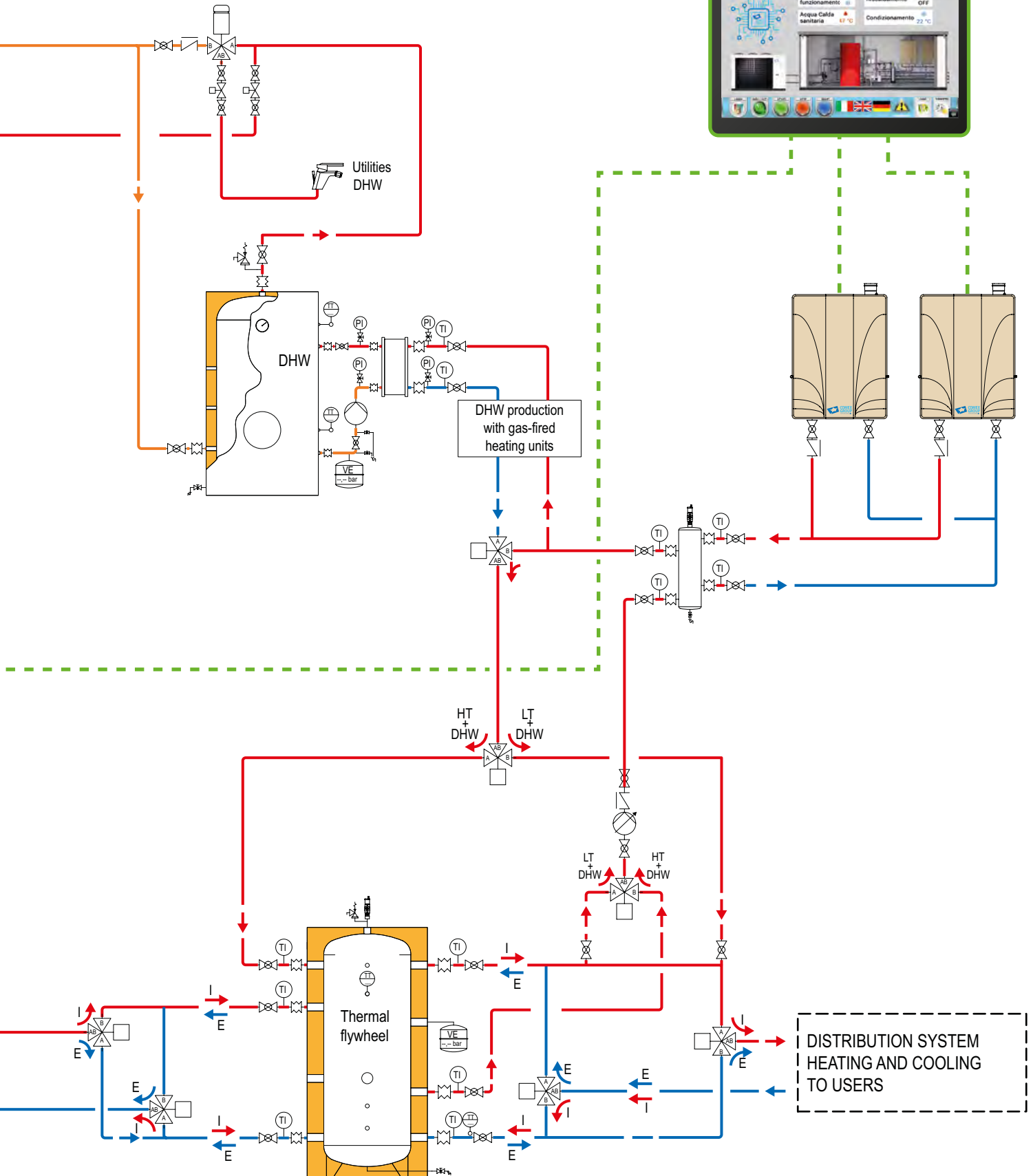
HYBRID ECOCLIMA ELITE WITH GAS HEAT PUMP

EXAMPLE PLANT

Even for the standard **Hybrid Ecoclima COMFORT (HY-CG)** central unit with gas heat pump, the evolution is represented by the **Hybrid Ecoclima ELITE (HY-CE)** model, the special "**all-gas version**", where design choices have made it possible to **maximise efficiency in the recovery of green thermal energy from outside air**, even at very low temperatures, thanks to dedicated components consisting of solenoid valves, plate exchangers and temperature detectors, intelligently managed by the **Hybrid Software Manager (HSM)**.



**FACTORY MADE
SMART HSM MANAGEMENT**





HYBRID ECOCLIMA

THE HIGH-POWER HYBRID POWER UNIT

THAT HELPS REDUCE THE GREENHOUSE EFFECT AND CO₂ EMISSIONS



HYBRID ECOCLIMA - Some applications

RESIDENTIAL SECTOR



COMMERCIAL SECTOR



INDUSTRIAL SECTOR



HEAT RECOVERY UNITS



LITHIUM BROMIDE ABSORBERS



INDUSTRIAL OVENS



SPLIT SYSTEMS



ADIABATIC COOLERS



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