

The most visionary CO₂ heat pump systems in the world

H-RANGE

AIR-TO-WATER &
WATER-TO-WATER

Natural
Refrigerants
ONLY

APPLICATIONS

District heating · Heat networks
Industrial processes · Green houses
Food industry · Data centres
Logistics centres · HVAC in general
Offices and hospitals

FENAGY[®]
FUTURE ENERGY SOLUTIONS

H-RANGE - heat pumps

The Fenagy H-range heat pumps reach capacities from 500 kW to 3,000 kW heat per rack. All the heat pumps are designed to deliver optimal performance in accordance with customer-specific operation needs. The entire range is available as both water-sourced and air-sourced heat pumps.

The H-range uses the natural refrigerant CO₂, which is ideal for applications with heat-sink return temperatures below 45°C and supply temperatures up to 85°C. The heat pumps are typically used for applications such as district heating or heating of larger buildings, but they are also suitable for industrial processes, the food industry, green houses, data centres, logistics centres, offices, hospitals and HVAC in general.

H-600



CAPACITY: 600 kW PU

DIMENSIONS: 2.5/4.8/1.3m

H-1200



CAPACITY: 1,200 kW PU

DIMENSIONS: 2.5/8.0/1.3m

H-1800



CAPACITY: 1,800 kW PU

DIMENSIONS: 2.5/10.0/1.3m

H-2600



CAPACITY: 3,000 kW PU

DIMENSIONS: 2.8/12.0/1.3m

Easy installation with enclosure

All the heat pumps in the H-range can be delivered in an industrial walk-in enclosure, which is a fully approved machine room with lighting, ventilation, CO₂ alarm and sound dampening panels. The enclosure is available in any colour and with extra space for installation of an electrical supply panel, pumps, valves on the water circuit, etc.

Enclosures are usually delivered with a self-supporting concrete foundation, so only a levelled sand pad is needed on site for the installation.





Control systems

The complete range uses a standard Siemens PLC controller, and Fenagy has developed its own PLC algorithms for the most essential functions to ensure optimal control and monitoring. Our PLC solutions can communicate with most of the platforms the customer will need to communicate with. The onboard HMI panel offers direct monitoring of the system and its operating conditions. Furthermore, our PLC solutions support several communication protocols and can integrate with the overall SCADA system.

For an air-sourced heat pump, it is essential to have an efficient and robust defrost system that can secure heat production, regardless of weather conditions. Furthermore, unique features have been developed enabling the heat pump to restart automatically after an emergency stop and even after heavy snowfall.

For all systems, Fenagy aspires to minimise start-up and shutdown times, enabling the system to help balance the electrical grid in a future with an increasing demand for such functions. Last, but not least, the system can deliver high supply temperatures, and Fenagy is continuously pushing the boundaries with new functions and features in the PLC development.

REMOTE ACCESS CLIENT



Technical personnel direct access to PLC, HMI and cloud data



Customer login for data and performance review

DATA SERVER HOSTED BY SECOMEA



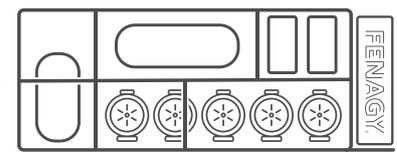
Secomea gate manager and DCC cloud data server

SITE MANAGER ROUTER BETWEEN PLC/HMI/INTERNET

Optional 3/4G network



Uplink 1 (Dhcp Internet)



Technical specifications

H-RANGE		H-600	H-1200	H-1800	H-2600
Compressors	qty.	3-4	4-8	6	8
Capacity control	-	VSD	VSD/cyl. unloader	Cyl. unloader	Cyl. unloader
Receiver size	L	500	750	1,000	1,800
Refrigerant charge	kg	350	500	700	1,260
Electrical supply	-	3~400V 50 Hz		3~400V 50 Hz/3~690V 50 Hz	
Heating capacity range	kW	600	1,200	1,800	3,000
COP heat range	-	3.0 - 3.5			
Dimensions (H/L/W)	m	2.4/5.0/1.4	2.4/8.0/1.4	2.4/11.0/1.4	2.4/12.0/1.6
Weight	kg	4,500	7,500	12,000	16,000
Est. sound power level (LpA)	dB(A)	98	101	102	105
Connection, waterside	mm	DN50	DN80	DN100	DN200
Connection, refrigerant	mm	DN50/DN65	DN80/DN80	DN80/DN100	DN100/DN125
Design pressure HP/LP	bar	130/80			
Controller type	-	Siemens PLC			
Communication protocol	-	MODBUS / PROFINET			
EVAPORATORS FOR AIR-TO-WATER HEAT PUMPS					
Evaporators	qty.	4	4	6	8
Fan consumption	kW	5	8	12	16
Fin material	-	Epoxy-coated aluminum fins			
Casing material	-	Corrosion class C4			
Defrost method	-	Gas	Glycol	Glycol	Glycol
Type	-	Flatbed / Up flow			
Fan regulation	-	EC fans			
Sound pressure level (pr. evap.)	dB(A)	40 in 10 m			
Footprint	m ²	60	100	150	200
EVAPORATORS FOR WATER-TO-WATER HEAT PUMPS					
Type	-	Plate heat exchanger (80 bar)			

Key features

- Patented ejector technology for optimisation of capacity and COP
- Fast start and stop for balancing the electrical grid
- Efficient and robust defrosting of air-sourced heat pumps
- Internal heat exchangers and receiver, designed for heat pump operation
- Industrial design with stainless steel piping
- Available as water-to-water and air-to-water
- Water pump, energy meter and various valves can be integrated on the rack
- PLC control of the entire heat pump, including optimised air-source evaporators



We only work with natural refrigerants

R744 - CO₂

APPLICATIONS

District heating, heat networks, industrial processes, food industry, green houses, data centres, logistics centres, offices, hospitals and HVAC in general

- Natural refrigerant with a wide temperature range
- Non-toxic and non-flammable
- Excellent choice for air-sourced heat pumps for direct use in the energy collectors and with high delta T on the heat sink side
- Optimal for medium-temperature water-sourced heat pumps, chillers and combined heating and cooling applications
- Medium-high temperature level on heat sink (up to 85°C supply temp) with high delta T on the heat sink (dT: 30-40K)

R600a - Isobutane

APPLICATIONS

Heat networks, biogas, PtX, geothermal, carbon capture, CO₂ heat pump sub-cooler, industrial processes and the food industry

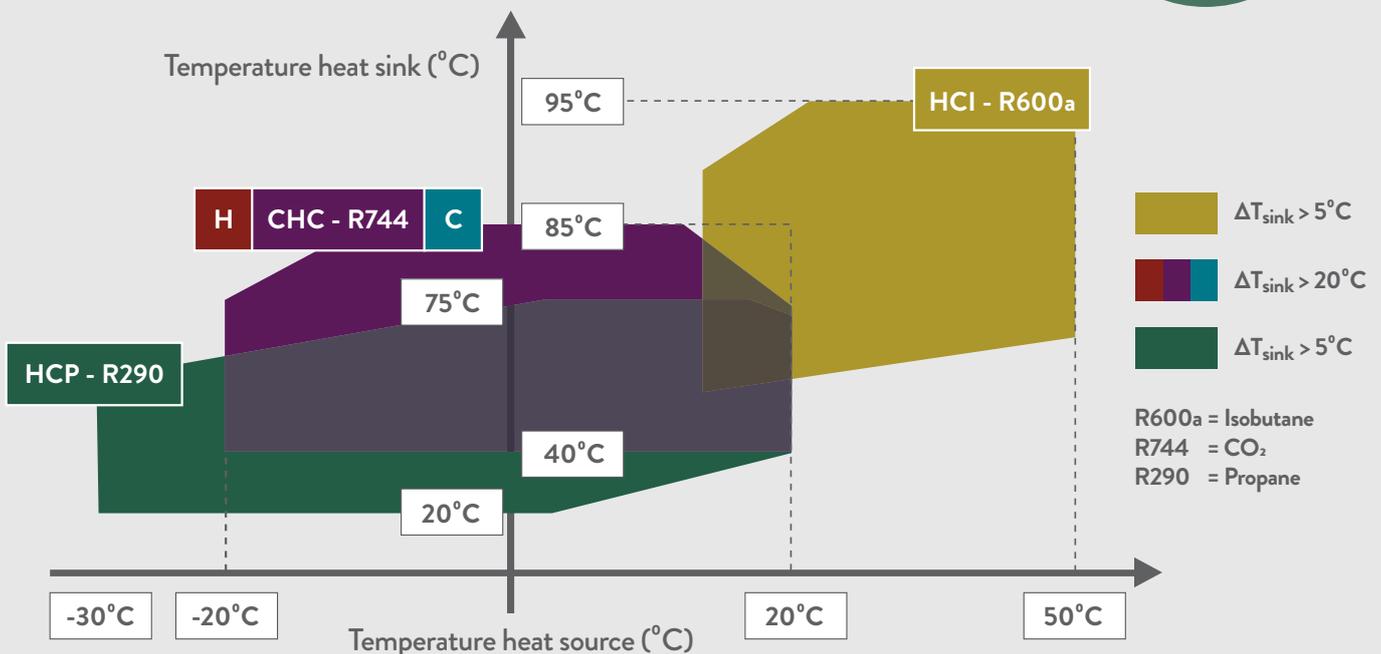
- High-temperature natural refrigerant
- Suitable for water-sourced heat pumps and chillers
- Can be used in a wide temperature range on both the heat source and heat sink sides
- Robust operation under various operating conditions
- Use of efficient screw compressors and high COP of the cycle
- High temperature level on heat source (up to 40°C evap. temp)
- High temperature level on heat sink (up to 95°C supply temp) and ideal with low delta T on heat sink - serial coupling on water side at higher delta T

R290 - Propane

APPLICATIONS

Heat networks, industrial processes, food industry, data centres, offices, hospitals and HVAC in general

- Low-temperature natural refrigerant
- Suitable for lower temperature water-sourced heat pumps and chillers
- Low temperature level on heat source (down to -30°C evap. temp)
- Medium temperature level on heat sink (up to 75°C supply temp)
- Ideal with low delta T on sink and heat source
- High refrigeration capacity ensures compact solutions with small footprint
- Can be combined with isobutane in serial hydraulic couplings



Developing and manufacturing future energy solutions



Fenagy develops and manufactures refrigeration and heat pump systems based on the natural refrigerants CO₂ and hydrocarbons. We always use natural refrigerants because they are efficient and have no harmful effects on the environment and climate - unlike all alternative synthetic refrigerants. Natural refrigerants are the refrigerants of the future, not just in Denmark.

We are constantly developing new solutions and services that play an active role in future energy systems, based on power from renewable energy sources, such as solar and wind. This puts great demands on the power grid and thus also on electricity-consuming devices, which must be able to react fast - and this is exactly what Fenagy machines can.

We are also looking into a future where it will be legally required or a social norm not to release valuable waste heat into the environment if it can be utilised. But what about waste cooling? At Fenagy, we aim to utilise both the cooling and heating capabilities of our solutions, either separately or in combination.

Fenagy is an OEM, but also a project-oriented company that secures professional and close cooperation with our partners, from quotation to final handover of our systems to the customers.