ADVECO

EXPERTLY ENGINEERED WATER HEATING

R32

FPi32 ASHP Range

Adveco FPi32 Air Source Heat Pump Range

The stylish Adveco FPi32 Range consists of 6, 9 & 12 kW inverter driven R-32 air source heat pumps (ASHP). With a compact monobloc arrangement using more environmentally friendly R-32 refrigerant, the FPiR32...

- Reduces environmental impact
- Reduces operational costs
- Provides heating & cooling
- Makes installation easier
- Delivers low maintenance operation

Benefits of FPi32 Heat Pumps

- FPi32 ASHP installations provide the option of both space heating and cooling
- Little construction work required, so can be quickly installed with minimal space requirements
- When installed to the right specifications FPi32 ASHPs can be quick to heat or cool and then sustain the desired temperature
- Able to achieve above average COP, the highly efficient FPi32 heat pumps are one of the lowest cost ways to effectively provide heat to a building
- Only a very small amount of electricity is required to operate the compressor
- Reduced environmental impact with improved efficiency from R-32 refrigerant
- Virtually maintenance free

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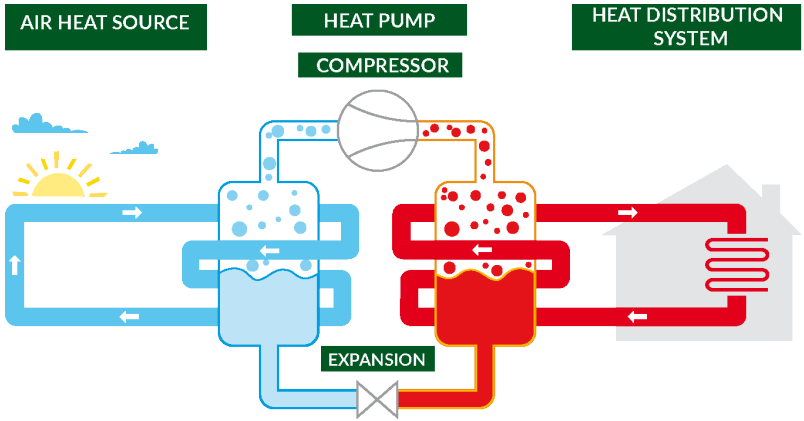
The Principles of Air Source Heat Pumps

55°C
DHW

-7°C
Cools water for fan coils

-25°C
Excellent yields at low external temperatures

Air Source Heat Pumps (ASHP) use ambient air as a heat source for a refrigerant circuit to transfer heat to the building. This is achieved by altering the pressure in the circuit to benefit from the temperature to pressure relationship of fluids.



So long as the outside air temperature is above -25°C heat can be drawn out of the surrounding air to be transferred to a building's heating circuit. The UK's relatively mild winter temperatures help ensure a properly installed ASHP system can achieve excellent levels of efficiency and performance throughout the year.

ASHPs are able to transfer more thermal energy than they consume electrical energy thereby delivering a very efficient form of heating, capable of achieving 5:1 heat output versus electrical input.

Because ASHPs, such as the FPi32, absorb heat from the air, the technology is an excellent method for reducing carbon emissions across a commercial site.

R-32 Refrigerant

A better way to protect the envionment

R-32 (Difluoromethane HFC32), used across the Adveco FPi32 range of heat pumps, is an HFC refrigerant used as the preferred replacement for R410A refrigerant. Not only is the new refrigerant more environmentally friendly, it enables higher performance to save energy.

The advantages of R-32 in terms of energy efficiency, safety and especially the much lower Global Warming Potential (GWP) makes ASHP systems based around R-32 refrigerant highly attractive. They are also more compact with improved operational functionality making the heat pump easy to install, control and maintain.

The use of R-32 provides an immediate way of reducing a building's energy consumption and operational costs. FPi32 ASHPs can therfore help reduce emissions to meet new carbon targets without compromising reliability or performance.

- Much lower Global Warming Potential
- Zero potential for ozone depletion
- Non-toxic
- Better energy efficiency compared to R410A refrigerant
- FPi32 ASHPs require almost a kilo less refrigerant than previoous FPi ASHPs
- Considerably reduces the size of larger ASHPs
- Easier to recycle
- Quieter operation

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Reducing the Global Warming Potential of Heat Pumps

R-32 is a hydrofluorocarbon (HFC) refrigerant developed to replace refrigerant which can deplete and damage the ozone layer.

R-32, which offers zero potential for ozone depletion and is non-toxic, has a much lower Global Warming Potential (GWP) than R-410A, typically used as the refrigerant of choice in ASHPs.

GWP is a means for measuring the impact on the atmosphere of one kilo of released HFC compared to a single kilo of carbon.

A kilo of released R410A would do 2,090 times the damage of a kilo of carbon. With a GWP of 675, R-32 is considerably more environmentally friendly. With less refrigerant required when using R-32, Adveco FPi32 ASHP's reduce the GWP of prior FPi models by as much as 80%.

The FPi32 reduces GWP by as much as

80%

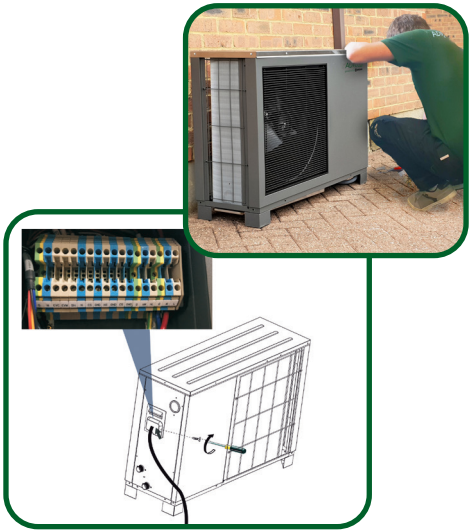
Compared to R-410A FPi models

R-32

Easy Installation and Set Up

Monobloc design

The built in circulation pump and plate heat exchanger are incorporated within a single, easy to access unit to simplify installation. All refrigerant pipework is completed in factory and precharged. Flow/Return pipework requires just a strainer, expansion vessel and pressure relief valve. When utilising the supplied frost protection which is available even if the heat pump is off, water can be employed as the heat transfer medium.



Easy access electrical terminal board connections

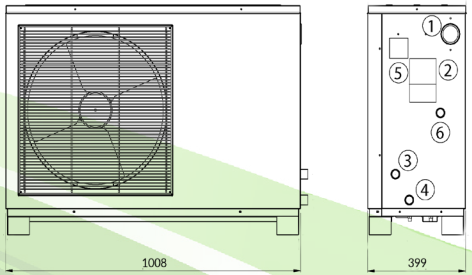
No need to remove the heat pump casing to access electrical connections.

System Control

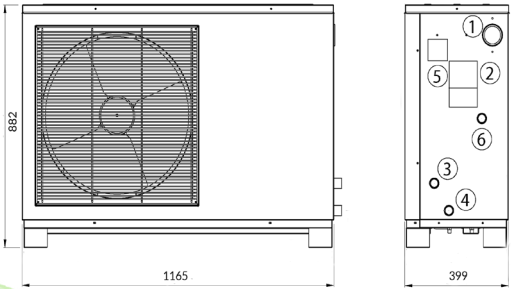
FPi32 is supplied as standard with a simple to operate thermostat and 4-wire remote timer control. Easy to install and intuitive to use, it manages on and off switching and regulates the heating/cooling, DHW temperature and alerts.

1 - Pressure gauge
2 - Terminal block
3 - Flow
4 - Return
5 - Electronic control
6 - Air vent valve

FPi32-6



FPi32-9 / FPi32-12



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Efficient Operation

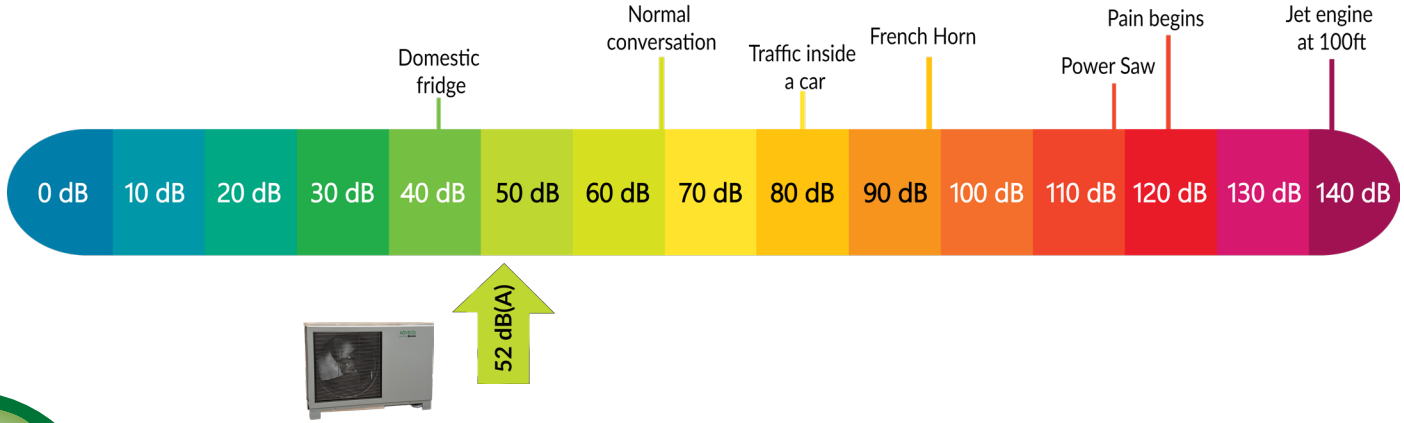
Advanced Vector Control Technology

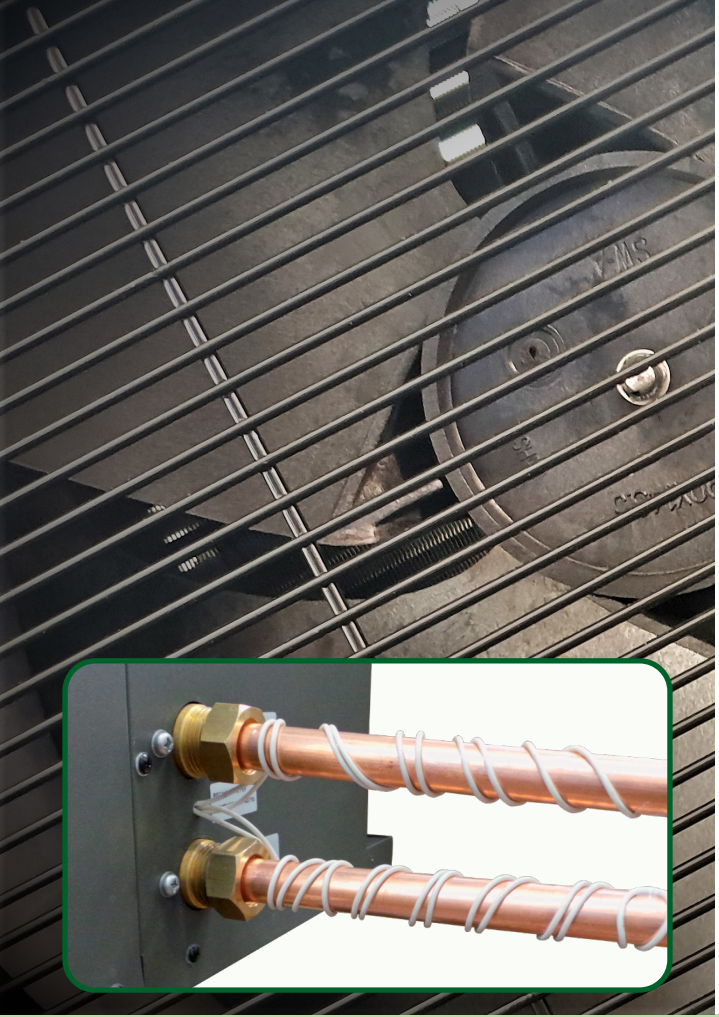
FPi32 is equipped with a high-efficiency twin rotary inverter compressor providing an accurate response to the demands of variable operational cycles.

At high speed, the RISC operational microchip calculates and optimises the current for vector control, reducing losses due to friction. The magnetic action generated by rotation is used to improve motor efficiency. That, and optimisation of flow channels, delivers more effective compression.

Low Noise

At 52 dB(A), FPi32 heat pumps are extremely quiet, helping to address concerns over noise pollution and improving the comfort of the working environment. FPi32 also features quiet time operation to reduce noise pollution at night.





Easy To Maintain

As a monobloc unit the FPi32 range simply requires regular cleaning of the coil and water filter. Internal parts are easy to access for ease of maintenance.

Circuit Pressure Check

Positioned to display through the external cover, a refrigerant circuit high pressure gauge is connected to the circuit for easy pressure check to confirm or rule out whether a leak has occurred.

Non Return Valves on Sensors and Switches

Allows replacement without costly and time consuming evacuation of the refrigerant circuit.

Frost Protection

FPi32 is equipped with a standard 1.5 meter trace heating cable to protect pipework between the heat pump and the building from frost. Trace heating via mechanical thermostat is available any time the heat pump has power, regardless of whether the heat pump is on, ensuring frost protection whenever necessary.

Coefficient Of Performance (COP)

A commercial property's energy consumption is a key factor to consider when choosing system equipment.

For an ASHP the "efficiency" is calculated as the ratio between the electricity invested in order to run the ASHP and heat transferred from the evaporator to the condenser. This is known as the coefficient of performance (COP).

The FPi32 range offers an above average system COP of as much as 5.23 for the 6kW, 5.16 for the 9kW, and 4.94 for the 12kW variant.

This COP can also be influenced by other factors including the energy needs and energy efficiency of a property, as well as the quality of hot water and heating system installation and set up.

Due to instantaneous ASHP performance varying with external temperature and heating flow temperature, seasonal COP provides a better overall gauge of an ASHP's efficiency. The seasonal COP of the FPi32 is above average and ranges from 4.71 (12kW) to 4.74 (6kW).

FPi Power & COP

	FPi32-6		FPi32-9		FPi32-12	
Ta	Q	COP	Q	COP	Q	COP
Water In/ Out 30/35°C						
-7	4.74	3.04	5.71	2.97	7.64	3.10
2	6.13	3.80	7.87	3.87	10.17	3.69
7	7.45	4.51	9.21	4.48	11.67	4.35
12	7.27	5.23	8.85	5.16	11.09	4.94
Water In/ Out 40/45°C						
-7	4.44	2.38	5.29	2.28	7.12	2.39
2	5.87	3.07	7.40	2.98	9.80	3.07
7	6.80	3.44	8.68	3.46	11.25	3.45
12	6.76	3.91	8.63	4.00	10.69	3.82
Water In/ Out 50/55°C						
-7	3.69	1.77	4.88	1.73	6.51	1.74
2	4.72	2.22	6.85	2.28	8.62	2.28
7	5.69	2.60	7.91	2.56	9.86	2.63
12	6.32	2.98	7.96	3.03	9.67	2.80

Q = heat energy in joules (j)
Ta= Ambient Temperature °C

A Hybrid Approach

A hybrid approach, where an ASHP is packaged in combination with a gas boiler/water heater and control system, presents an attractive option for commercial projects by retaining an element of gas boiler technology that customers are comfortable with.

The hybrid approach offers better compatibility with existing heating distribution systems and thermal demands of higher heat loss buildings, meaning less adaptation is required.

Where bespoke system design is required to meet the particular needs of a commercial project, the availability of two heat sources to meet the heating demand of a property is extremely advantageous. It enables a DHW or heating system to operate at a higher temperature grade, as well as remaining effective at very low temperatures. Using a gas boiler to meet peak demands on the coldest of days also means the heat pump can be reduced in size, such as the compact FPi32, when compared to the required capacity of a standalone electric heat pump system.

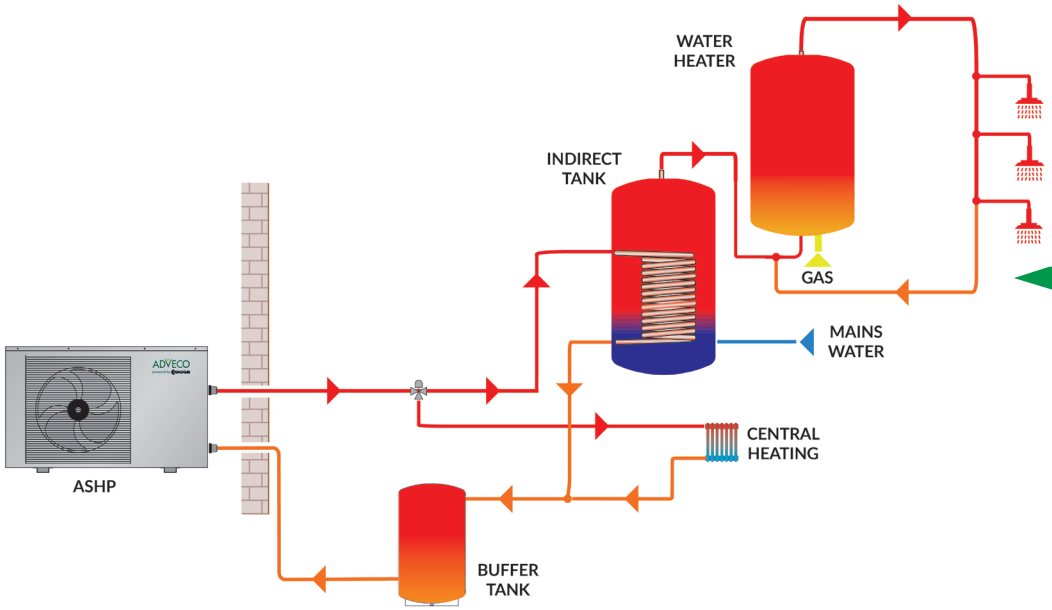
A hybrid system also gives a property the versatility of switching to the gas boiler/water heater at time of network peak, helping reduce operational costs while maintaining higher water temperatures demanded by commercial operations.

Although the heat pump does not completely replace an existing heating or DHW system, these hybrid systems keep running costs low while helping businesses meet their carbon targets in the coming decades and helping bridge the gap to forthcoming zero carbon technologies such as hydrogen.

Reduce running costs

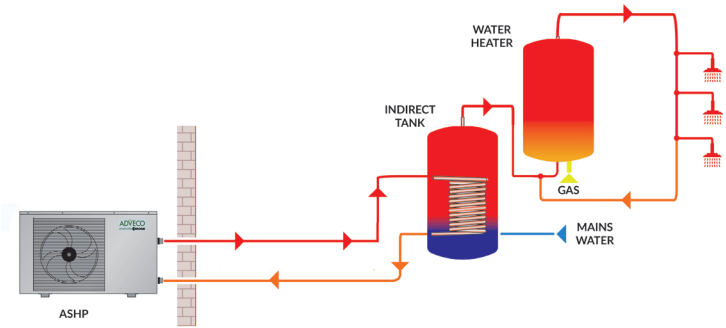
Improve environmental performance

Hybrid System Schematics

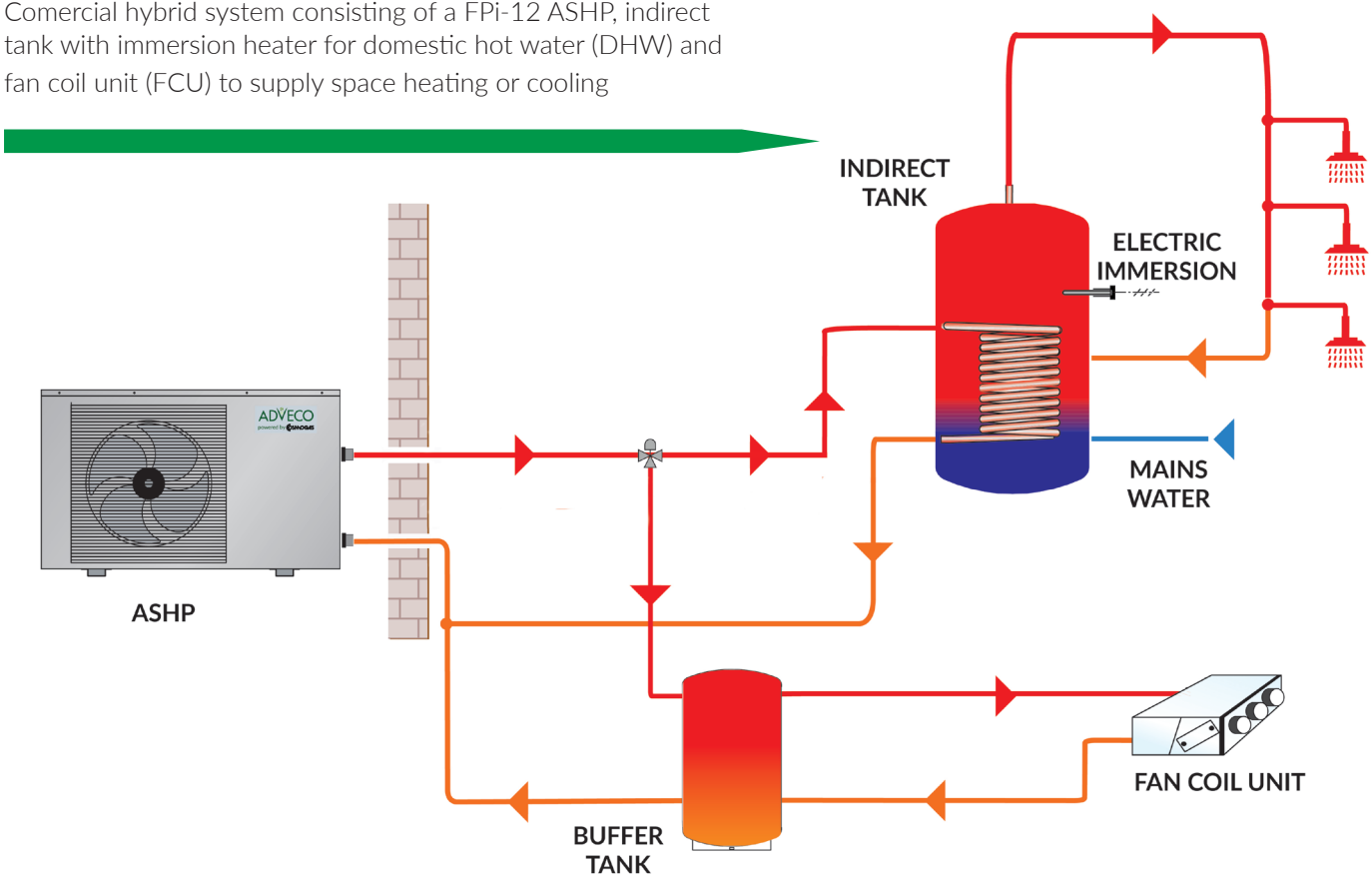


Commercial hybrid system consisting of a FPi-12 ASHP and condensing gas water heater to supply heating and domestic hot water (DHW)

Commercial hybrid system consisting of a FPi-12 ASHP and condensing gas water heater to supply domestic hot water (DHW) only



Comercial hybrid system consisting of a FPi-12 ASHP, indirect tank with immersion heater for domestic hot water (DHW) and fan coil unit (FCU) to supply space heating or cooling



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FPi32 Technical Features

Refrigerant circuit

Twin rotary inverter compressor
High efficiency evaporator
High- and low-pressure switches
High- and low-pressure sensors
Suction temperature sensor
Compressor discharge temperature sensor
Electronic expansion valve
Dehydrator filter

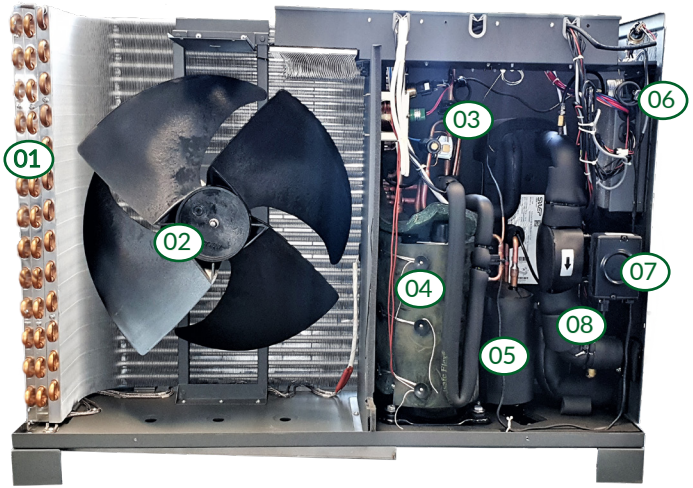
Electrical circuit

Inverter fan(s) with silenced profile blades
Operating range with external temperatures from -25°C to +55°C
Maximum heating delivery temperature 55°C or higher in hybrid systems

Hydraulic circuit

High inverter pump
Stainless steel plate heat exchanger
DHW Function (external 3-way valve on request)

FPi32



01 - Condensor
02 - Fan
03 - Four-way valve
04 - Compressor
05 - Separator
06 - Service Panel
07 - Plate Heat Exchanger
08 - Water Pump

Technical Specifications		Units	FPi32-6	FPi32-9	FPi32-12
Dimensions HxWxD		mm	734x1008x399	882x1165x399	
Power supply		V/Hz/Ph	230 / 50 / 1ph		
Starting current		A	Soft Start		
Run current		A	8	12	15
Refrigerant (R-32)		kg	0.9	1.4	1.8
Heating capacity min./max. (1)		kW	3.50/7.45	4.30/9.21	5.50/11.67
Heating capacity min./max. (2)		kW	3.15/6.80	3.90/8.68	4.90/11.25
Heating Power Input min./max. (1)		kW	7.58/14.10	92.7/20.97	11.07/26.83
Heating Power Input min./max. (2)		kW	9.43/17.32	11.62/25.50	14.01/32.63
COP (1)			4.51	4.48	4.35
COP (2)			3.44	3.46	3.45
Seasonal COP (SCOP)			4.74	4.73	4.71
Circuit maximum pressure		bar	42	42	42
Rated power water pump		W	87		
Noise level (outdoor)		dB(A)	52	53	52
Ambient operational temperature range	Heating	°C	-25 ~ 43	-25 ~ 43	-25 ~ 43
	Cooling	°C	20 ~ 55	20 ~ 55	20 ~ 55

(1) Heating condition: Water in/out temperature 30°C/35°C. Ambient temperature DB/WB 7/6°C.
(2) Heating condition: Water in/out temperature 40°C/45°C. Ambient temperature DB/WB 7/6°C.

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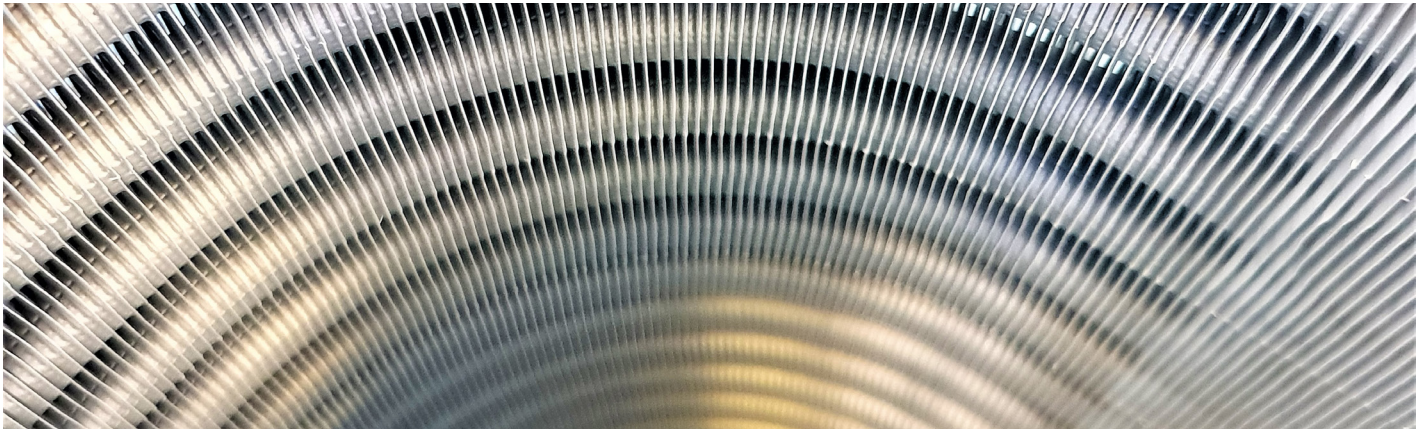
Technical Specifications		Units	FPi32-6	FPi32-9	FPi32-12
Compressor	Type			Twin Rotary Inverter	
	Quantity / System			1	
	Oil			FV68S	
Fan	Airflow	m^3/h	2700	3150	3150
	Rated Power	W	60	60	60
Water side plate heat exchanger	Material			Stainless Steel - Copper	
	Pipe connections	Inch	G1”	G1”	G1”
Minimum water flow		L/s	0.35	0.44	0.55
Available pump head		kPa	75	73	60
Dry Mass		kg	65	78	85
Refrigerant	Type		R-32	R.32	R-32
	Mass	kg	0.9	1.4	1.8
Water Volume		kg	3.0	3.5	4.0

Technical Specifications	Units	FPi32-6	FPi32-6	FPi32-12
Cooling capacity min./max.(3)	kW	6.22/7.41	6.70/9.48	7.20/9.84
Cooling capacity min./max.(4)	kW	3.50/4.25	4.90/6.95	4.90/6.56
Cooling power input min./max. (3)	W	1400/1863	1679/2242	1791/2510
Cooling power input min./max. (4)	W	1330/1680	1451/2366	1358/2444
Energy Efficiency Ratio (EER) / max. (3)		4.10/4.53	4.31/4.56	3.92/4.51
Energy Efficiency Ratio (EER) / max. (4)		2.52/3.56	2.99/3.75	2.68/3.67
Seasonal Energy Efficiency Ratio (SEER)		4.10	4.07	3.93

(3) Cooling condition: Water in/out temperature 23°C / 18°C. Ambient temperature 35°C.
(4) Cooling condition: Water in/out temperature 12°C / 7°C. Ambient temperature 35°C.



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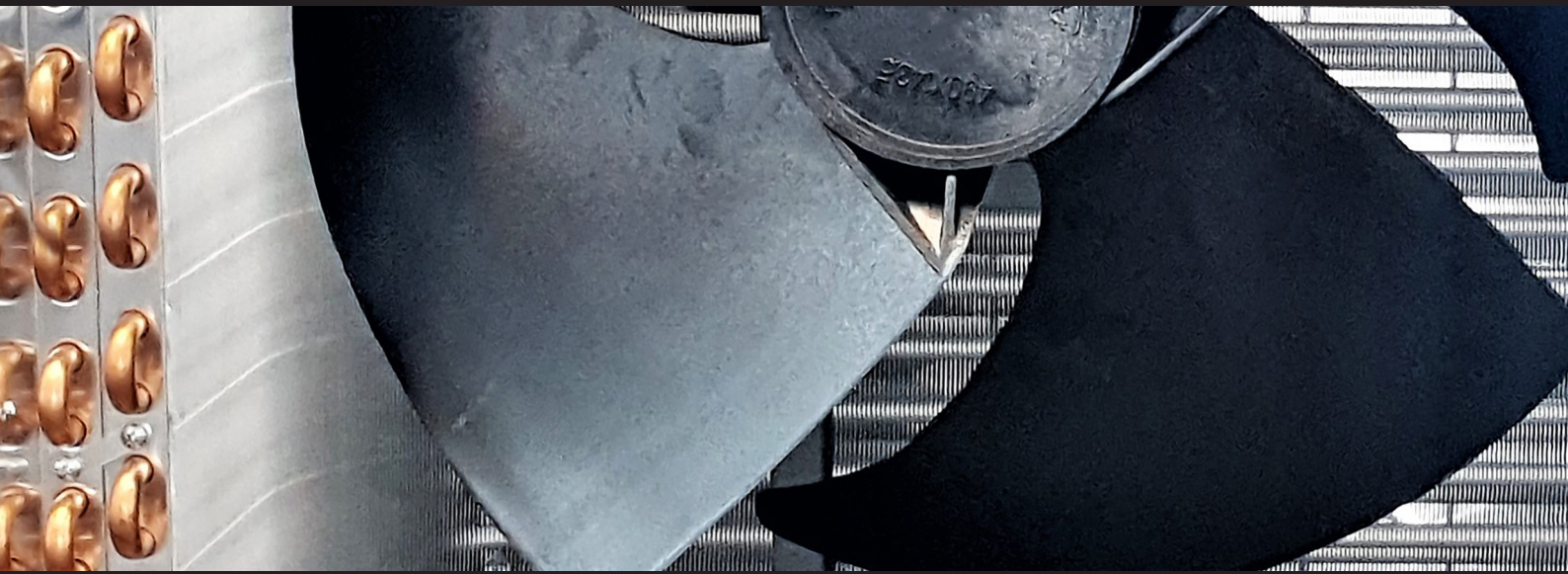

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