SYSTEMA

HEATING COOLING GREEN ENERGY

SHP

Reversible electric heat pumps from 33 to 186 kW in heating mode and from 29 to 164 kW in cooling mode

GAS R290 GWP 3

PLUG & PLAY

GREENHOUSE GAS REDUCTION -CO_2

R290

ECOFRIENDLY SOLUTION

FAST AND EASY INSTALLATION

REVERSIBLE

RECIPROCATING COMPRESSORS

AXIAL VENTILATION

LOW NOISE IMPACT

OUR ECO-SUSTAINABLE CONTRIBUTION

Global warming and the progressive need to reduce CO_2 and HFC emissions are forcing us to make conscious choices with an eye to the future.

Our vision and commitment to sustainability have led us to greater ecological responsibility, proposing new products that use natural and low-GWP refrigerants such as R290 propane, a refrigerant gas that becomes fundamental in the econenergy development project and integrated in our SHP heat pumps.

Our mission has therefore become the implementation and use of natural and/or ultra-low GWP high-efficiency gases in new eco-friendly air-conditioning products.

R290 propane gas is flammable, but natural and non-toxic. Its excellent thermodynamic properties are very similar to those of R-22, even surpassing it in certain parameters, and in many laboratory tests it even surpasses 404A in energy efficiency.

R290 is a long-term solution in fact it has a very low GWP (GWP R290 = 3) and is suitable for use until 2030 without restrictions related to the F-Gas Regulation.

OUR GOALS

- ***COST REDUCTION,***
- ***REDUCING CLIMATE-CHANGING GAS EMISSIONS,***
- ***DECARBONISATION,***
- ***ECOSUSTAINABILITY,***

consistent with international goals and agreements to make a more sustainable future possible.

GENERAL FEATURES

SHP heat pumps are designed for outdoor installation, the external panels are painted with polyester powders to guarantee total resistance to atmospheric agents, while the base and frame are in galvanised sheet steel. Silenced versions are also available thanks to sandwich panels insulated with rock wool.

The compressor is managed by a semi-hermetic reciprocating INVERTER, the inverter allows the compressor capacity to be adapted to the heating or cooling demand, as well as being mechanically optimised for use with hydrocarbons.

The compressor is also fixed on an anti-vibration system and complete with an integrated lubrication system. Inside the SHP we also find, the oil crankcase heater, integral electronic protection, suction and discharge taps with anti-vibration systems installed on the channels themselves.

The fans of the SHP heat pumps are premium-axial EC type with bionic blades, the motors are high-efficiency brushless EC type electronically commutated, with thermal class THCL 155, efficiency class in accordance with IE4 and electrical protection class IP54.

The heat exchanger is air heat exchanger with a finned coil offering a high exchange surface area, the coil is composed of copper tubes inserted with an alternating arrangement inside a hydrophilic-treated aluminium fin pack.

While the water heat exchanger is composed of brazed AISI 316 stainless steel plates thermally insulated with anti-condensation material (closed-cell neoprene), the manual air vent valve is included while the overheating limiter is optional.

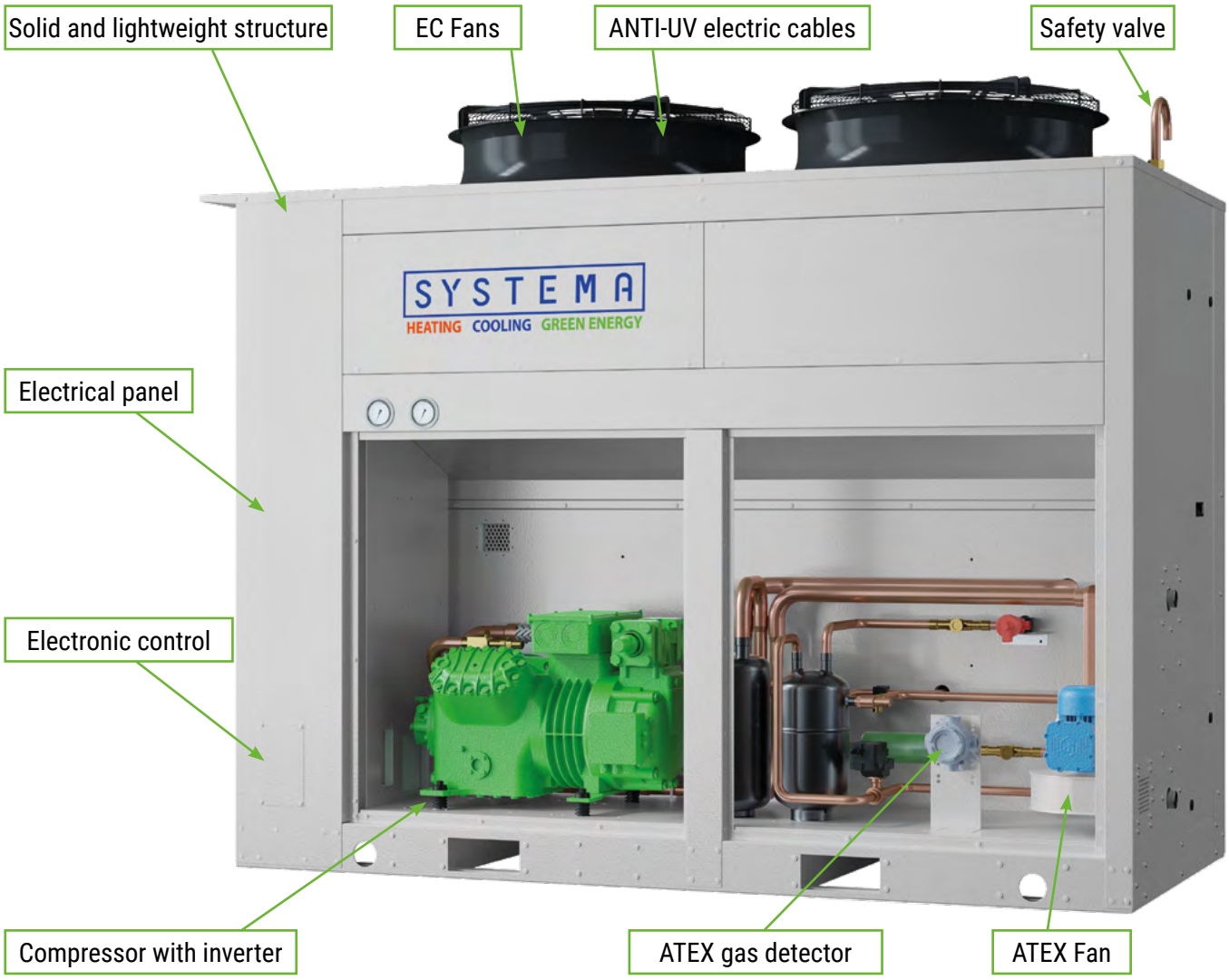
The electrical panel is made in accordance with IEC 204-1/EN60204-1 standards and is complete with: main disconnector, door lock safety device, contactor and compressor protection, the minimum electrical protection rating is IP54 and to guarantee further safety, it is separated from the rest of the machine and positioned on the external side of the unit, furthermore the propane gas sensor (R290) is equipped with a dedicated external power supply for constant monitoring of any leaks.

The controls are managed by a microprocessor that adapts the compression capacity according to the required power while simultaneously managing alarms and with the possibility of connection to BMS.

The high level of safety is also guaranteed by an ATEX-certified flammable gas detector calibrated to 10% of the lower flammable limit (LFL).

The safety system's communication with the outside world is via a Modbus interface, for safe monitoring and to activate emergency devices that guarantee the highest level of safety. The refrigeration circuit is equipped with: molecular sieve filter, liquid sight glass, 4-way reversing valve, liquid receiver, liquid separator, shut-off valve on the liquid line, electronic expansion valve, high-pressure safety pressure switch, high and low pressure gauges, and is manufactured in accordance with the PED directive (2014/68/EU), and some components are also ATEX certified.

TECHNICAL FEATURES



ANTI UV electric cables: these are placed outside and are made of a special sheath that protects them from ultraviolet rays but at the same time also at low temperatures.

EC Fans: with high efficiency they are variable speed, which reduces energy consumption.

Electrical panel: has an electrical protection rating of IP54 and is built in accordance with IEC 204-1 / EN60204-1 standards, and is complete with a main switch disconnector and door lock safety device.

Electronic control: is built with the most advanced technology available on the market and is equipped with proprietary software, designed and optimised specifically for SHP heat pumps.

Safety valve: is on the outside of the unit and a special kit is supplied for the end of the discharge pipe.

ATEX certified gas detector: installed inside the compressor compartment, it guarantees the activation of appropriate safety measures in the event of a leak of R290 gas.

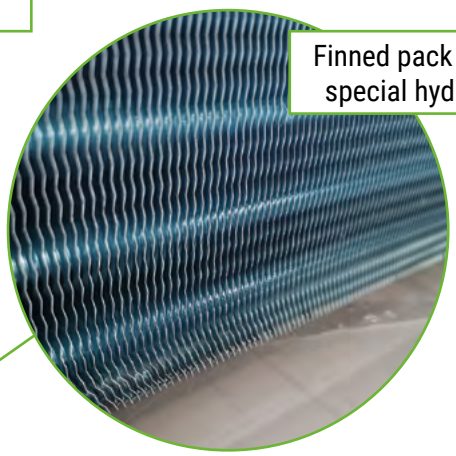
ATEX centrifugal fan: ensures emergency ventilation inside the compressor compartment in the event of a R290 gas leak.

Solid and lightweight structure: designed and manufactured to guarantee total resistance to atmospheric agents and corrosion with special openings that facilitate handling of the unit and allow simple and rapid installation.

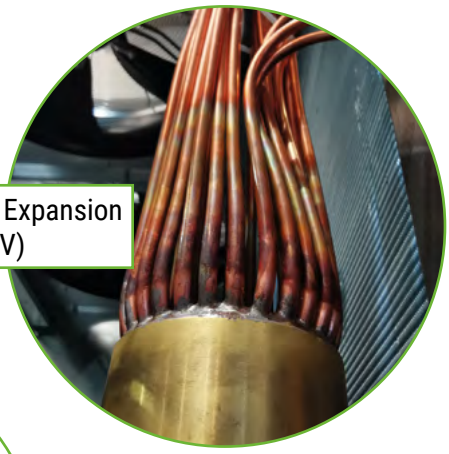
RELIABILITY OF OPERATION UP TO -20°C

The **inclined exchange coil** is positioned vertically with a special inclination to optimise condensate flow during defrosting and air distribution.

Special attention was paid to the design of the obliquely positioned condensate drain pan, as well as to the sizing of the drain fittings with generous diameters to allow optimum condensate drainage flow during defrosting.

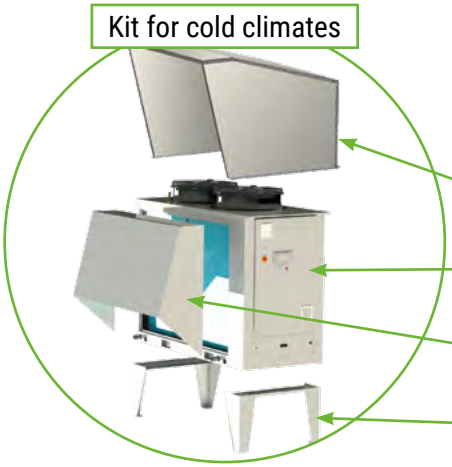


The finned pack of the coil is coated with a special hydrophilic layer that ensures rapid removal of condensate from the fins while increasing the efficiency of the heat exchanger.



Circuito evaporatore con scambio termico in controcorrente, grazie alla **doppia valvola di espansione elettronica (EEV)** durante la modalità di riscaldamento, lo scambio termico in controcorrente permette la miglior efficienza per il suo elevato coefficiente di scambio.

To prevent condensate from freezing during cold periods, SHP heat pumps are also equipped with a heating cable positioned in the condensate collection tank and near the drain; the process is self-regulating and the cable temperature automatically adapts to compensate for temperature variations and prevent freezing.



Fan guard channels designed to prevent snow and ice from depositing on the fan grilles.

Heating resistor with thermostat that prevents condensation and maintains a suitable temperature inside the cabinet.

Protection of finned heat exchanger from intense winds and heavy snowfall and violent weather phenomena.

Raised support frame in case of particularly heavy installations with heavy snowfall.

CONTROL-S5 CASCADE UNIT MANAGEMENT

CONTROL-S5: management system for up to 5 SHP units in cascade, consists of a small **c.pCO** controller that communicates with the slave units using an **Ethernet UDP** connection with **ModBus** protocol.

The input/output probes of the collectors being connected to the system allow the type of regulation to be selected, on the flow or return, through a specific parameter.

CONTROL-S5 sends the switch-on command via the network to the base unit based on the user's request, according to these parameters:

- When the temperature remains in the increase zone beyond a preset time, the number of units will be increased by one.
- Conversely, if the temperature remains in the decrement zone for a set time, the number of units required is decreased.
- If the temperature returns to the neutral zone while the timer was active, it will be reset.

AUTOMATIC REGULATION

The controller ensures that the amount of operating hours of the networked units is kept balanced.

Once activated, the demand calculated by a PID algorithm on **CONTROL-S5** is sent to the units to allow the system to manage the real load demand of the user.

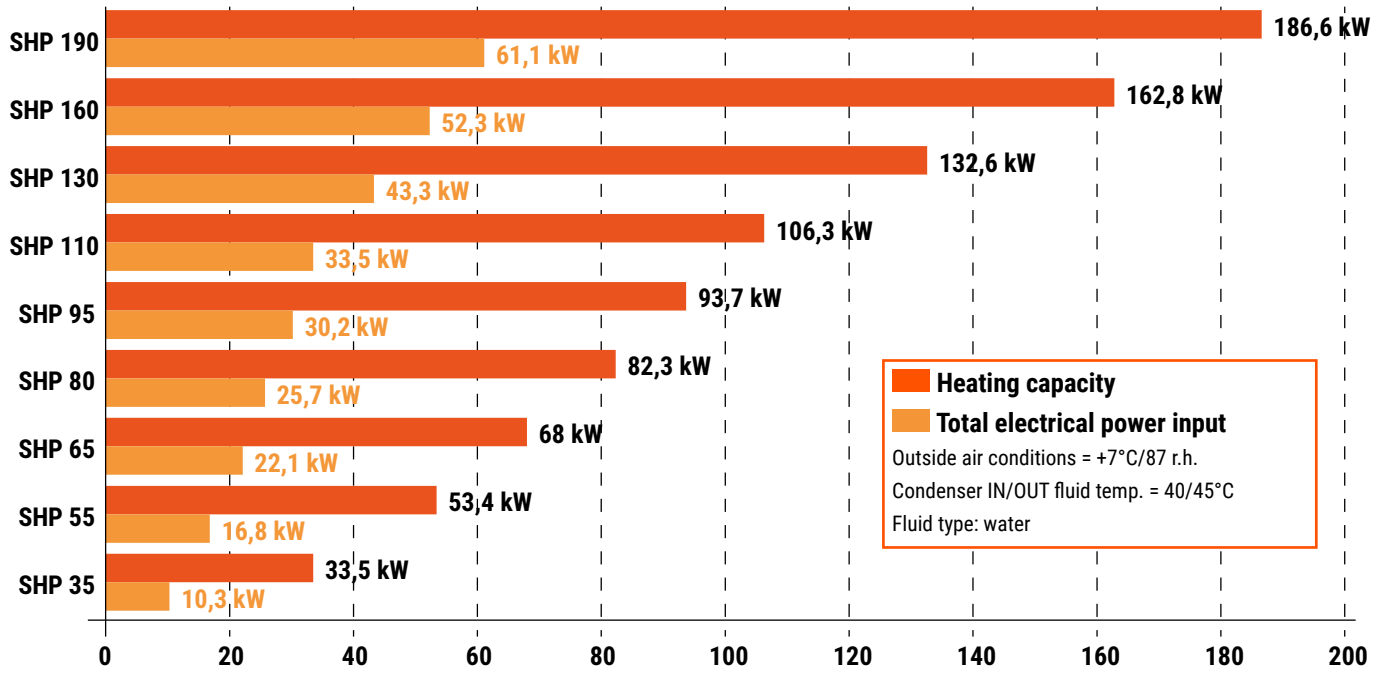
3 OPERATING MODES

The operating modes can be managed via a parameter in the Service menu:

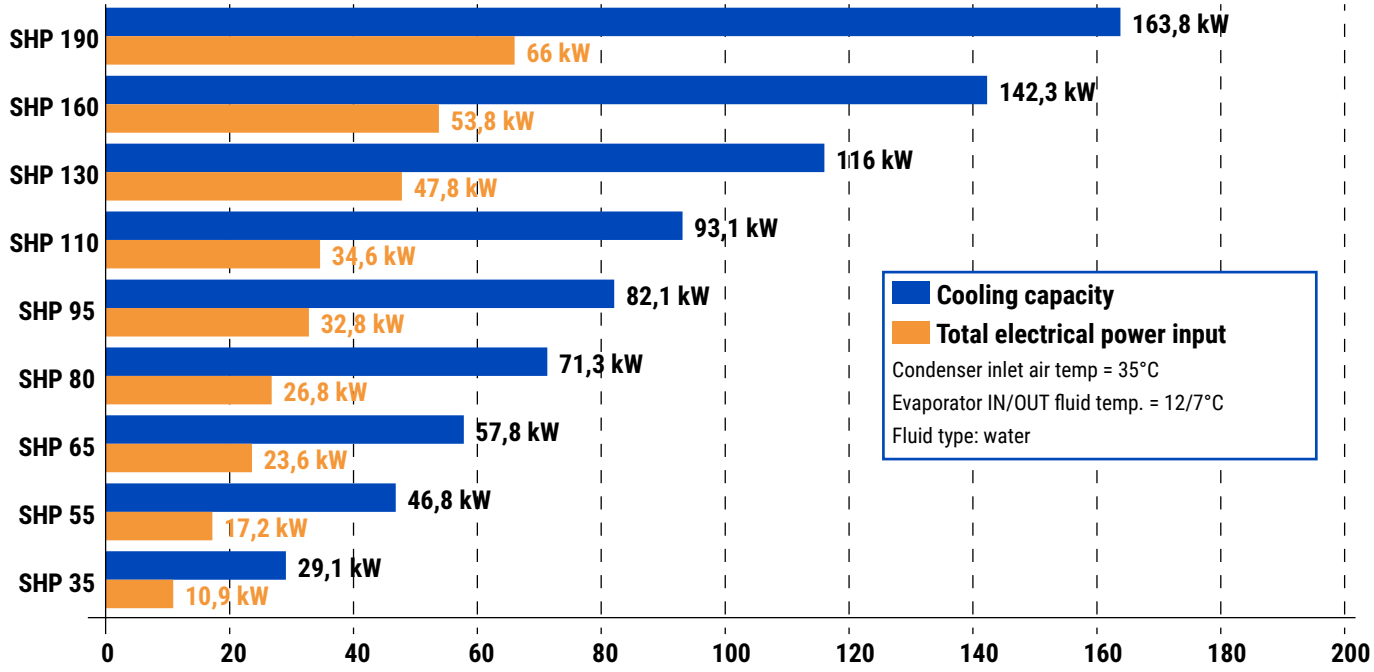
1. **From digital input;**
2. **From keypad;**
3. **Automatically**, Heating/Cooling (and vice versa) switching is carried out by sensing the outside air temperature.

SHP RANGE

HEATING CAPACITY AND POWER USED



COOLING CAPACITY AND POWER USED



CONSTRUCTION SPECIFICATIONS

Model	N^{er} gas circuits	N^{er} compressors	N^{er} fans
SHP 35	1	1	1
SHP 55 - 65	1	1	2
SHP 80 - 95	1	1	3
SHP 110 - 130	2	2	4
SHP 160 - 190	2	2	5

Compressor type: semi-hermetic with pistons

Fan type: axial

Exchanger type: brazed plate heat exchanger

SHP 35/95 TECHNICAL DATA

Model		SHP 35	SHP 55	SHP 65	SHP 80	SHP 95
Heating capacity (1)	kW	33,5	53,4	68	82,3	93,7
Total power input (1)	kW	10,3	16,8	22,1	25,7	30,2
COP	-	3,25	3,17	3,08	3,2	3,1
Water flow rate (1)	m³/h	5,8	9,2	11,8	14,3	16,2
Water-side pressure loss (1) - Basic solution	kPa	35	53	67	33	34
Min/Max flow rate user exchanger	m³/h	5,48 / 6,92	8,73 / 11,03	11,10 / 14,02	13,44 / 16,98	15,31 / 19,34
Performance indices in average climatic conditions, according to EU Regulation No. 813/2013 - Pdesignh ≤ 400kW (low temperature)						
SCOP	W/W	3,457	3,426	3,466	3,556	3,436
ηsh	%	135,3	134	135,7	139,3	134,4
Performance indices in average climate conditions, according to EU Regulation No. 813/2013 - Pdesignh ≤ 400kW (medium temperature)						
SCOP	W/W	2,858	2,848	2,936	2,936	2,834
ηsh	%	111,3	110,9	114,4	114,4	110,3
Efficiency class according to EU Regulation no.811/2013 - heat pump room heating appliances ≤ 70kW						
Environmental heating seasonal energy efficiency class		A+	A+	A+	#	#
Cooling capacity (2)	kW	29,1	46,8	57,8	71,3	82,1
Total power input (2)	kW	10,9	17,2	23,6	26,8	32,8
EER	-	2,67	2,72	2,45	2,66	2,5
Water flow rate (2)	m³/h	5	8,1	10	12,3	14,1
Water-side pressure losses (2) - Basic Solution	kPa	26	35	42	27	28
Min/Max flow rate user exchanger	m³/h	4,00 / 6,00	6,43 / 9,65	7,95 / 11,93	9,81 / 14,71	11,29 / 16,94
Refrigerant / GWP	-			R290 / 3		
Refrigerant charge	kg	**3**	**4,5**	**4,7**	**6,4**	**6,8**
Number of refrigerant circuits	N°			1		
Compressor type / quantity	-/N°			Semihermetic reciprocating with INVERTER / 1		
Expansion valve type	-			Electronics		
Fan type / quantity	-/N°	EC Axial / 1	EC Axial / 2	EC Axial / 2	EC Axial / 3	EC Axial / 3
Fan power input (1) (total)	kW	0,84	1,75	1,75	2,65	2,65
Total air flow rate	m³/h	14.000	26.500	26.500	39.300	39.300
Electrical data						
Power supply (main - sensor R290)	-			400/3+N/50 - 230/1/50		
Maximum power consumption	kW	13,2	21,3	27,3	31,5	38,5
Inrush current - LRA	A			< 10		
Maximum current consumption (full load)	A	21,8	37	47,8	56,9	67,8
INTEGRATED solution - with hydronic kit						
Inertial storage tank capacity	L			300		
Pump type	-			Centrifugal		
Standard pump (1,5 bar)						
Motor efficiency	-			IE3		
Pump motor power input (nominal)	kW	0,55	1,1	1,1	1,5	1,5
Current drawn by pump motor (nominal)	A	1,85	3,3	3,3	3,8	3,8
Oversized pump (3.0 bar)						
Motor efficiency	-			IE3		
Pump motor power input (nominal)	kW	1,5	2,2	2,2	3	3
Current drawn by pump motor (nominal)	A	4,1	4,7	4,7	6,4	6,4
Hydraulic connections						
Dimension (nominal outside diameter)	inch	1"	1" ¼	1" ¼	2"	2"
Noise levels (3)						
Total noise Power (Standard - Optional)	db(A)	78 - 76	85,5 - 82	85,5 - 82	87,1 - 83,6	88 - 85,1
Total noise pressure at 1 m (Standard - Optional)	db(A)	70 - 68	77,5 - 74	77,5 - 74	79,1 - 75,6	80 - 77,1
Total noise pressure at 10 m (Standard - Optional)	db(A)	50 - 48	57,5 - 54	57,5 - 54	59,1 - 55,6	60 - 57,1
Dimensions and weights						
Length	mm	1.750	2.400	2.400	3.200	3.200
Depth	mm	1.050	1.050	1.050	1.050	1.050
Height	mm	1.900	1.900	1.900	1.900	1.900
Shipping weight	kg	490	600	660	820	820
Hydronic Kit Dimensions						
Length	mm	1050	1050	1050	1050	1050
Depth	mm	900	900	900	900	900
Height	mm	1670	1670	1670	1670	1670

Reference conditions:

1. Outside air conditions = +7°C / 87% r.h. - Condenser IN/OUT fluid temperature = 40/45°C - Fluid: water
2. Condenser inlet air temperature = 35°C - Condenser IN/OUT fluid temperature = 12/7°C - Fluid: water
3. The cooling capacity is declared gross of the power used by the pump motor (where applicable).
4. The sound pressure level (average value) is calculated considering the unit as a point source with hemispherical emission with the presence of the support surface with the assumption of complete reflectivity (non-binding value obtained from the sound power level).

Eco-Design Compliance: The units comply with European Directive 2009/125/EU, Regulations (EU) no. 811/2013, Commission Regulation (EU) no. 813/2011 and the harmonised directives. The relevant information for each model (eg: SCOP, Room Heating Seasonal Energy Efficiency Class, Annual Electricity Consumption, ...) is given in our manual.

SHP 110/190 TECHNICAL DATA

Model		SHP 110	SHP 130	SHP 160	SHP 190
Heating capacity (1)	kW	106,3	132,6	162,8	186,6
Total power input (1)	kW	33,5	43,3	52,3	61,1
COP	-	3,17	3,06	3,11	3,05
Water flow rate (1)	m³/h	18,4	23	28,2	32,3
Water-side pressure loss (1) - Basic solution	kPa	41	42	49	51
Min/Max flow rate user exchanger	m³/h	17,37 / 21,94	21,67 / 27,37	26,60 / 33,60	30,49 / 38,51
Performance indices in average climatic conditions, according to EU Regulation No. 813/2013 - Pdesignh ≤ 400kW (low temperature)					
SCOP	W/W	3,457	3,538	3,507	3,519
ηsh	%	135,3	138,5	137,3	137,8
Performance indices in average climate conditions, according to EU Regulation No. 813/2013 - Pdesignh ≤ 400kW (medium temperature)					
SCOP	W/W	2,929	3,012	2,989	3,018
ηsh	%	114,2	117,5	116,6	117,7
Efficiency class according to EU Regulation no.811/2013 - heat pump room heating appliances ≤ 70kW					
Environmental heating seasonal energy efficiency class		#	#	#	#
Cooling capacity (2)	kW	93,1	116	142,3	163,8
Total power input (2)	kW	34,6	47,8	53,8	66
EER	-	2,69	2,43	2,64	2,48
Water flow rate (2)	m³/h	16	20	24,5	28,2
Water-side pressure losses (2) - Basic Solution	kPa	33	36	40	42
Min/Max flow rate user exchanger	m³/h	12,81 / 19,21	15,96 / 23,94	19,58 / 29,37	22,54 / 33,81
Refrigerant / GWP	-	R290 / 3			
Refrigerant charge	kg	**4,5 x 2**	**4,7 x 2**	**6,4 x 2**	**6,8 x 2**
Number of refrigerant circuits	N°	2			
Compressor type / quantity	-/N°	Semihermetic reciprocating with INVERTER / 2			
Expansion valve type	-	Electronics			
Fan type / quantity	-/N°	EC Axial / 4	EC Axial / 4	EC Axial / 6	EC Axial / 6
Fan power input (1) (total)	kW	3,58	3,58	5,34	5,34
Total air flow rate	m³/h	52.100	52.100	78.600	78.600
Electrical data					
Power supply (main - sensor R290)	-	400/3+N/50 - 230/1/50			
Maximum power consumption	kW	42,6	54,6	62,9	76,9
Inrush current - LRA	A	< 10			
Maximum current consumption (full load)	A	74	95,6	113,8	135,6
INTEGRATED solution - with hydronic kit					
Inertial storage tank capacity	L	290			
Pump type	-	Centrifugal			
Standard pump (1,5 bar)					
Motor efficiency	-	IE3			
Pump motor power input (nominal)	kW	1,5	1,5	2,2	2,2
Current drawn by pump motor (nominal)	A	3,8	3,8	4,7	4,7
Oversized pump (3.0 bar)					
Motor efficiency	-	IE3			
Pump motor power input (nominal)	kW	4	4	4	4
Current drawn by pump motor (nominal)	A	8,7	8,7	8,7	8,7
Hydraulic connections					
Dimension (nominal outside diameter)	inch	2"	2"	2" ½	2" ½
Noise levels (3)					
Total noise Power (Standard - Optional)	db(A)	87,7 - 84,7	87,7 - 84,7	90,1 - 86,6	90,2 - 86,7
Total noise pressure at 1 m (Standard - Optional)	db(A)	79,7 - 76,7	79,7 - 76,7	82,1 - 78,6	82,2 - 78,7
Total noise pressure at 10 m (Standard - Optional)	db(A)	59,7 - 56,7	59,7 - 56,7	62,1 - 58,6	62,2 - 58,7
Dimensions and weights					
Length	mm	3.190	3.190	4.090	4.090
Depth	mm	2.100	2.100	2.100	2.100
Height	mm	1.900	1.900	1.900	1.900
Shipping weight - standard version	kg	1.300	1.420	1.650	1.650
Shipping weight - optional version	kg	1.370	1.480	1.720	1.720

Reference conditions:

1. Outside air conditions = +7°C / 87% r.h. - Condenser IN/OUT fluid temperature = 40/45°C - Fluid: water
2. Condenser inlet air temperature = 35°C - Condenser IN/OUT fluid temperature = 12/7°C - Fluid: water
3. The cooling capacity is declared gross of the power used by the pump motor (where applicable).
4. The sound pressure level (average value) is calculated considering the unit as a point source with hemispherical emission with the presence of the support surface with the assumption of complete reflectivity (non-binding value obtained from the sound power level).

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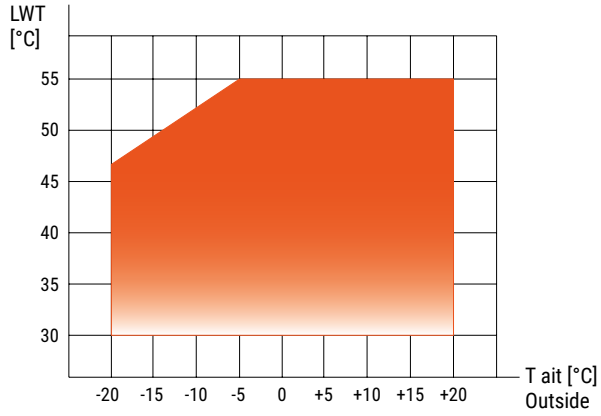
OPERATING LIMITS

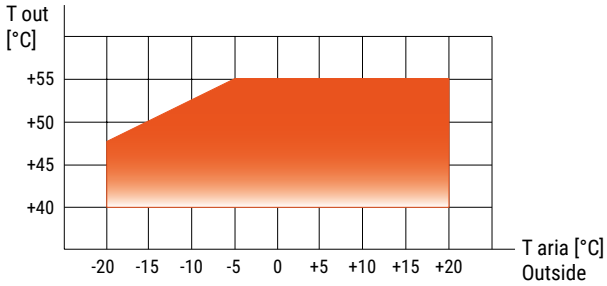
OPERATING LIMITS - HEATING



Standard operating range
(ΔT condenser - water side: min. 3 / max. 7K)

T air: Outside air temperature (°C) (BS)
LWT: Condenser outlet temperature (°C)

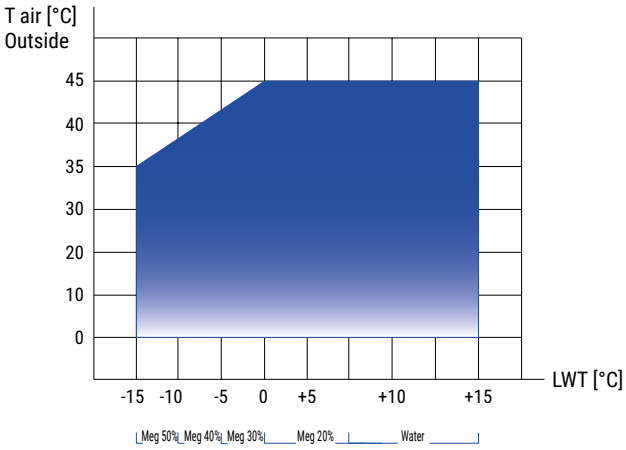
DESUPERHEATER OPERATING LIMITS
Heating



Operating area with Desuperheater
(ΔT condenser - water side: min. 3 / max. 7K)

T out: Desuperheater water outlet temperature (°C)
T air: Outside air temperature (°C)
T desuperheater inlet > 35°C

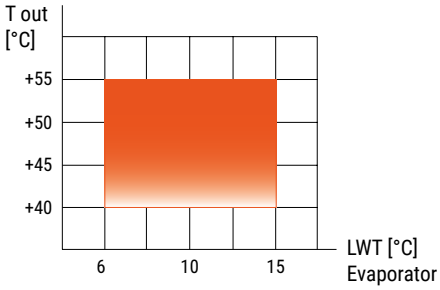
OPERATING LIMITS - COOLING



Standard operating range
(ΔT condenser - water side: min. 3 / max. 7K)

T air: Outside air temperature (°C) (BS)
LWT: Condenser outlet temperature (°C)

DESUPERHEATER OPERATING LIMITS
Cooling



Operating area with Desuperheater
(ΔT condenser - water side: min. 3 / max. 7K)

T out: Desuperheater water outlet temperature (°C)
T air: Outside air temperature (°C)
T desuperheater inlet > 35°C

PERFORMANCE TABLES

HEATING PERFORMANCE TABLES

Model		SHP 35						SHP 55						SHP 65					
Environment temperature	[°C]	-5	-1	3	7	11	15	-5	-1	3	7	11	15	-5	-1	3	7	11	15
Environment relative humidity	[%]	91,5	87,5	84,3	80,3	76,9	73,4	91,5	87,5	84,3	80,3	76,9	73,4	91,5	87,5	84,3	80,3	76,9	73,4
Charge	[kW]	43,9	41,7	39,5	37,3	33	30,8	69	65,6	62,2	58,6	51,9	48,5	87,6	83,2	78,9	74,5	65,8	61,5
Capacity	[kW]	25,3	28,4	31,7	35,2	33	30,8	40,2	45	50	55,3	51,9	48,5	51,6	57,4	63,7	70,2	65,8	61,5
COP	[-]	3,12	3,34	3,64	3,91	4,4	4,89	3,02	3,26	3,52	3,79	4,33	4,9	3,02	3,24	3,46	3,71	4,3	4,92
EWT	[°C]	31,4	31	30,5	**30**	30,3	30,6	31,4	30,9	30,5	**30**	30,3	30,6	31,3	30,9	30,5	**30**	30,3	30,6
LWT	[°C]	35	35	35	**35**	35	35	35	35	35	**35**	35	35	35	35	35	**35**	35	35

Model		SHP 80						SHP 95						SHP 110					
Environment temperature	[°C]	-5	-1	3	7	11	15	-5	-1	3	7	11	15	-5	-1	3	7	11	15
Environment relative humidity	[%]	91,5	87,5	84,3	80,3	76,9	73,4	91,5	87,5	84,3	80,3	76,9	73,4	91,5	87,5	84,3	80,3	76,9	73,4
Charge	[kW]	105,6	100,4	95,1	89,9	79,4	74,1	121,1	115,1	109,1	103,1	91	85	138,2	131,3	124,4	117,6	103,8	97
Capacity	[kW]	61,9	69,3	76,8	84,6	79,4	74,1	70,9	79,1	88,1	97,1	91	85	80,4	89,8	100,2	110,7	103,9	97
COP	[-]	3,02	3,27	3,52	3,79	4,44	5,08	3	3,22	3,47	3,73	4,27	4,8	3,03	3,25	3,53	3,8	4,24	4,73
EWT	[°C]	31,3	30,9	30,5	**30**	30,3	30,6	31,3	30,9	30,5	**30**	30,3	30,6	31,4	31	30,5	**30**	30,3	30,6
LWT	[°C]	35	35	35	**35**	35	35	35	35	35	**35**	35	35	35	35	35	**35**	35	35

Model		SHP 130						SHP 160						SHP 190					
Environment temperature	[°C]	-5	-1	3	7	11	15	-5	-1	3	7	11	15	-5	-1	3	7	11	15
Environment relative humidity	[%]	91,5	87,5	84,3	80,3	76,9	73,4	91,5	87,5	84,3	80,3	76,9	73,4	91,5	87,5	84,3	80,3	76,9	73,4
Charge	[kW]	170,9	162,4	153,9	145,4	128,5	120	210,5	200,1	189,6	179,2	158,2	147,8	241,6	229,6	217,6	205,6	181,6	169,6
Capacity	[kW]	100,6	112,1	124,3	136,9	128,5	120	123,4	138,1	153	168,7	158,2	147,8	141,4	158	175,8	193,6	181,6	169,6
COP	[-]	2,97	3,18	3,41	3,66	4,19	4,76	3	3,23	3,48	3,75	4,26	4,77	2,97	3,19	3,43	3,68	4,19	4,74
EWT	[°C]	31,3	30,9	30,5	**30**	30,3	30,6	31,3	30,9	30,5	**30**	30,3	30,6	31,3	30,9	30,5	**30**	30,3	30,6
LWT	[°C]	35	35	35	**35**	35	35	35	35	35	**35**	35	35	35	35	35	**35**	35	35

Reference meteorological data location: Strasbourg (FR). - Design ambient temperature: 7 °C. - Load profile: Process.
EWT: Evaporator water inlet temperature - LWT: Evaporator water outlet temperature

COOLING PERFORMANCE TABLES

Model		SHP 35						SHP 55						SHP 65					
Environment temperature	[°C]	35	33	31	29	27	15	35	33	31	29	27	15	35	33	31	29	27	25
Environment relative humidity	[%]	49,3	45,1	47,4	49	52,9	73,4	49,3	45,1	47,4	49	52,9	73,4	49,3	45,1	47,4	49	52,9	56,5
Charge	[kW]	29,1	28,1	27	25,9	24,9	30,8	46,9	45,2	43,4	41,8	40,1	48,5	58	55,9	53,7	51,7	49,6	38,3
Capacity	[kW]	29,1	28,1	27	25,9	24,9	30,8	46,9	45,2	43,4	41,8	40,1	48,5	58	55,9	53,7	51,7	49,6	38,3
EER	[-]	2,69	2,96	3,18	3,41	3,72	4,89	2,76	2,94	3,17	3,43	3,71	4,9	2,49	2,75	3,05	3,27	3,57	3,99
EWT	[°C]	**12**	11,8	11,6	11,4	11,3	30,6	**12**	11,8	11,6	11,4	11,3	30,6	**12**	11,8	11,6	11,4	11,3	11,1
LWT	[°C]	**7**	7	7	7	7	35	**7**	7	7	7	7	35	**7**	7	7	7	7	7

Model		SHP 80						SHP 95						SHP 110					
Environment temperature	[°C]	35	33	31	29	27	25	35	33	31	29	27	25	35	33	31	29	27	25
Environment relative humidity	[%]	49,3	45,1	47,4	49	52,9	56,5	49,3	45,1	47,4	49	52,9	56,5	49,3	45,1	47,4	49	52,9	56,5
Charge	[kW]	71,4	68,8	66,2	63,9	61	58,4	82,2	79,2	76,2	73,2	70,3	67,2	93,3	89,9	86,5	83,1	79,8	76,3
Capacity	[kW]	71,4	68,8	66,2	63,9	61	58,4	82,2	79,2	76,2	73,2	70,3	67,2	93,3	89,9	86,5	83,1	79,8	76,3
EER	[-]	2,68	2,93	3,2	3,49	3,74	4,11	2,52	2,79	3,07	3,33	3,66	3,95	2,73	2,95	3,2	3,39	3,73	4,04
EWT	[°C]	**12**	11,8	11,6	11,4	11,3	11,1	**12**	11,8	11,6	11,4	11,3	11,1	**12**	11,8	11,6	11,4	11,3	11,1
LWT	[°C]	**7**	7	7	7	7	7	**7**	7	7	7	7	7	**7**	7	7	7	7	7

Model		SHP 130						SHP 160						SHP 190					
Environment temperature	[°C]	35	33	31	29	27	25	35	33	31	29	27	25	35	33	31	29	27	25
Environment relative humidity	[%]	49,3	45,1	47,4	49	52,9	56,5	49,3	45,1	47,4	49	52,9	56,5	49,3	45,1	47,4	49	52,9	56,5
Charge	[kW]	116,3	112,1	107,8	103,6	99,4	95,1	142,7	137,5	132,2	127,1	122	116,7	164,1	158,2	152,1	146,2	140,3	134,2
Capacity	[kW]	116,3	112,1	107,8	103,6	99,4	95,1	142,7	137,5	132,2	127,1	122	116,7	164,1	158,2	152,1	146,2	140,3	134,2
EER	[-]	2,46	2,72	3	3,25	3,55	3,83	2,68	2,93	3,19	3,45	3,82	4,09	2,52	2,81	3,08	3,34	3,63	3,97
EWT	[°C]	**12**	11,8	11,6	11,4	11,3	11,1	**12**	11,8	11,6	11,4	11,3	11,1	**12**	11,8	11,6	11,4	11,3	11,1
LWT	[°C]	**7**	7	7	7	7	7	**7**	7	7	7	7	7	**7**	7	7	7	7	7

Reference meteorological data location: Strasbourg (FR). - Design ambient temperature: 7 °C. - Load profile: Process.
EWT: Evaporator water inlet temperature - LWT: Evaporator water outlet temperature

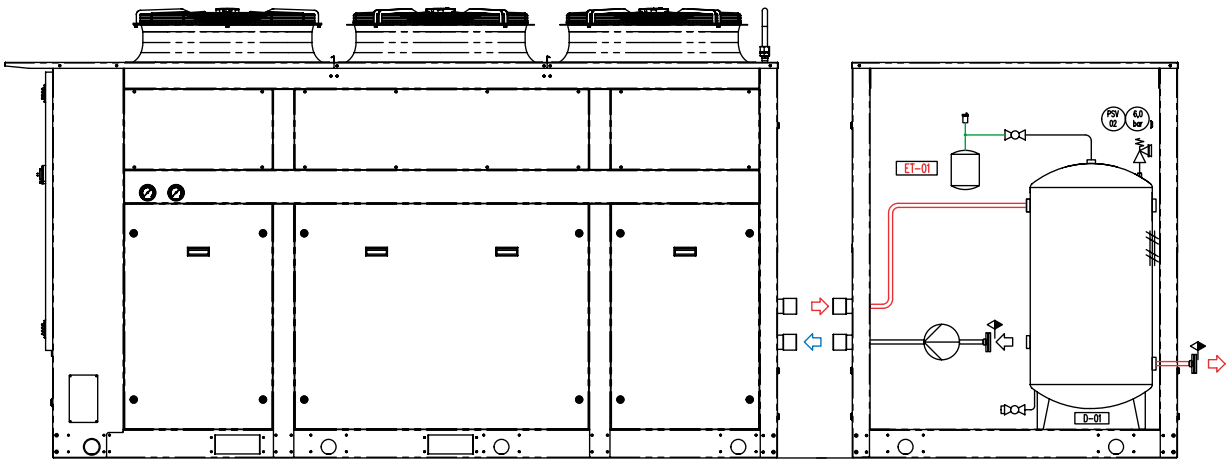
PLUG & PLAY HYDRONIC KIT

The **PLUG & PLAY HYDRONIC KIT is available for single-circuit units from SHP 35 to SHP 95** and consists of a pumping station with storage tank, all within a pre-assembled module that is very easily connected.

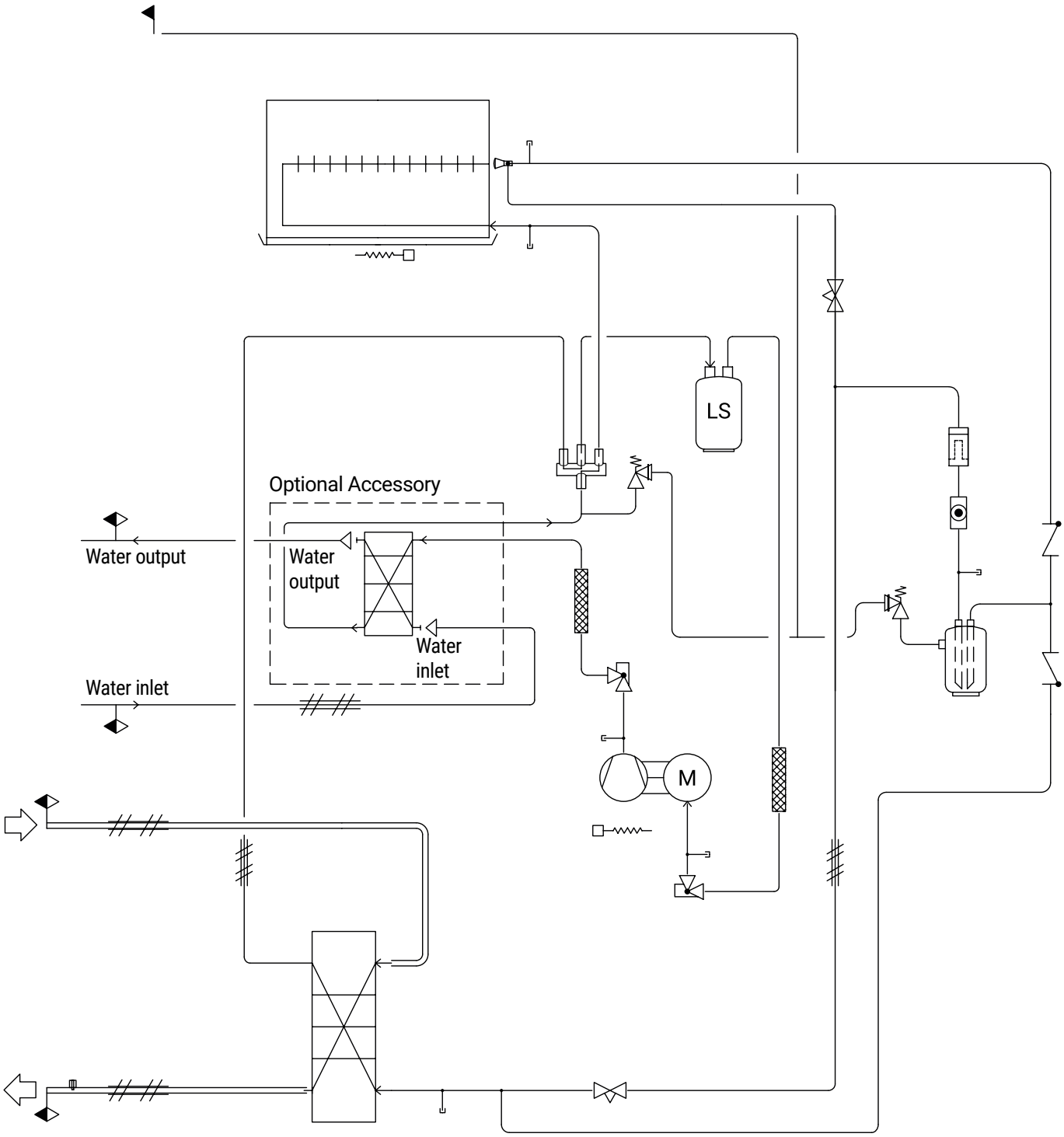
For the double circuit units from SHP 110 to SHP 190, the components of the hydronic kit are instead housed directly on board the machine, thus obtaining a single unit with more compact dimensions.

The design choices of the kits have been studied for both the optimisation of the air-conditioning system and the best hydronic distribution. SHP units are built for outdoor installation and can be customised as required.

- Single or double centrifugal pump depending on model, with shut-off valves
- Power supply panel with relevant protections, thermal switches, free contacts for pump status, IP55 degree of protection. In the 2-pump versions, there is an automatic system that alternates pump operation at each start-up, prolonging the life of the pumps themselves and thus always having a reserve pump ready to start in the event of a failure.
- Base and panels made of galvanised sheet metal and painted steel, suitable for outdoor installation.
- Closed carbon steel tank and pipes insulated with anti-condensation elastomer.
- Closed expansion tank
- Safety valve
- Breather valve
- Pressure gauge
- Flow switch
- Inlet / outlet valves



P&I DIAGRAM COOLING CIRCUIT



ACCESSORIES

Hydraulic circuit differential pressure switch, differential pressure meter for monitoring the lack or reduced flow of secondary fluid.

Overpressure safety valve set at 4.5 bar that automatically activates in the event of overpressure in the hydraulic circuit.

Manual air vent valve, which allows the air in the hydraulic circuit to be expelled manually.

Automatic air vent valve, which allows the air contained in the hydraulic circuit to be automatically expelled.

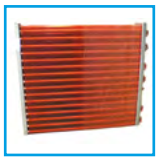
Automatic hydraulic circuit overpressure and by-pass valve, which controls the pressure at the delivery of the electric pump to avoid dangerous overpressures in the hydraulic circuit at the utilities, if installed on board the unit, it allows the secondary fluid to be recirculated to the tank or evaporator, automatically reducing the delivery pressure according to the characteristic curve of the pump installed. Useful with hydraulic systems that can work with considerable variations in flow rate.

Expansion tank with automatic filling valve and pressure reducer, , for containing volume variations of the fluid contained in the hydraulic circuit. The fluid is in contact with a membrane that separates it from a chamber containing gas. Filling takes place via an automatic filling valve and is complete with pressure reducer.

High pressure water pump with increased head, for hydronic kit see page 12

Double water pump (stand-by) and standard head, for hydronic kit see page 12

Modbus remote user terminal, for controlling and displaying all readings and remotely in a more accessible location.



Copper/Copper finned pack heat exchanger, consisting of copper tubes and fins. This solution increases the heat exchange efficiency and performance of the machine.

GSM or Ethernet centralised remote management module, with functions for reading and writing variables in real time, history, alarm management, e-mail notification, reports and graphs for up to 300 variables, live-trends, software update of programmable controllers, access to all system information from PC, Ta blet or Smartphone, thanks to a VPN access is secure, fast and protected by SSL encryption.

Electromechanical type flow switch hydraulic circuit - Evaporator (supplied separately), with the function of controlling the lack or reduced flow of secondary fluid to the evaporator. The component is supplied with the machine and it will be the installer's responsibility to carry out the correct mechanical assembly and connection to the unit's electrical panel.

Electronic type flow switch Evaporator hydraulic circuit (supplied separately), with the function of controlling the lack or reduced flow of secondary fluid to the evaporator. The component is supplied with the machine and it will be the installer's responsibility to carry out its correct mechanical assembly and connection to the unit's electrical panel.

HWAC APPLICATIONS

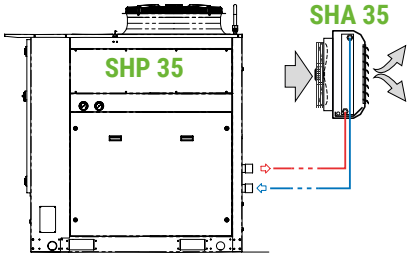
SHA 35

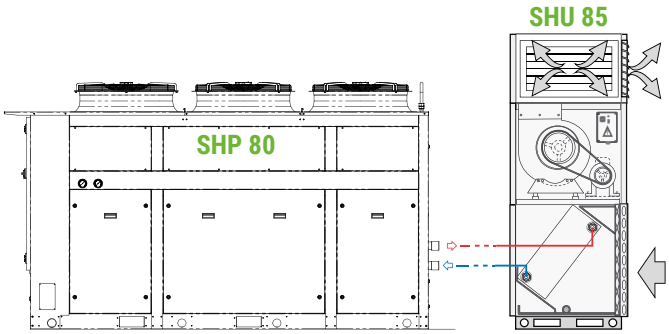
SHU 85

Systema also offers immediate and complete ready-made HWAC solutions, the combinations to the two ready-made configurations are:

- **Reversible heat pump SHP 35 + Aerotherm SHA 35**
- **Reversible heat pump SHP 80 + AHU SHU 85**

These complete plug & play solutions make it easy to choose and facilitate system design, it is also possible to request solutions with different combinations and customisation of accessories to complete the system for the SHU 85 AHU





Model		SHP 35 Heat pump	SHA 35 Aerotherm
Heating performance			
Heat output	kW	33,5	36,3
Fluid temp. out /in	°C	40 / 45	40 /45
Fluid flow rate	m³/h	5,8	6,48
Total input power	kW	10,3	0,33
COP	-	3,5	-
Cooling performance			
Cooling capacity	kW	29,8	32,9
Fluid temp. out /in	°C	12 / 7	12 / 7
Fluid flow rate	m³/h	5,8	5,8
Total input power	kW	10,9	0,33
EER	-	2,67	-
General features			
Noise pressure 10m	dB(A)	50	-
Air flow rate	m³/h	-	8.875
Fluid type	-	10% Glycol	10% Glycol
Dimensions and weights			
Length	mm	1.750	1320
Depth	mm	1.050	670
Height	mm	1.900	350
Shipping weight	kg	490	49
Hydronic Kit Dimensions			
Length	mm	1050	-
Depth	mm	900	-
Height	mm	1670	-

Model		SHP 80 Heat pump	SHU 85 AHU
Heating performance			
Heat output	kW	82,3	86
Fluid temp. out /in	°C	40 / 45	40 /45
Fluid flow rate	m³/h	14,3	17,4
Total input power	kW	25,6	5,5
COP	-	3,35	-
Cooling performance			
Cooling capacity	kW	71,3	90,7
Fluid temp. out /in	°C	12 / 7	12 / 7
Fluid flow rate	m³/h	14,3	16,2
Total input power	kW	26,8	5,5
EER	-	2,66	-
General features			
Noise pressure 10m	dB(A)	59,1	-
Air flow rate	m³/h	-	12.000
Fluid type	-	10% Glycol	10% Glycol
Dimensions and weights			
Length	mm	3.200	1200
Depth	mm	1.050	1100
Height	mm	1.900	2420
Shipping weight	kg	820	400
Hydronic Kit Dimensions			
Length	mm	1050	-
Depth	mm	900	-
Height	mm	1670	-

Since 1986, Systema S.p.A. is one of the leader companies in Italy and Europe in designing, developing and producing devices for the heating and conditioning in industrial and commercial buildings.
There has been always in Systema's Research and Development department where high investments have been made, since the beginning, for the creation of an internal laboratory who could design and offer highly innovative products that can satisfy and anticipate all the requests coming from the market. In this field Systema works together with important Italian, European and extra-European laboratories and university departments. A cooperation which leads to the concept of innovative and visionary products and solutions and to the obtaining of several international patents.
Systema S.p.A. differs from competitors because can offer a complete range of products that goes from commercial and industrial heating with radiant and hot air solutions, to conditioning with absorption chillers, electric heat pumps and evaporative adiabatic coolers and with a specific focus on the agricultural and breeding farms products for heating (both heaters and radiant systems) and conditioning with adiabatic coolers. This range has been conceived looking for environmental-friendly products with the lowest energy consumption.
Managing such a large range of products is not easy but, also in this field, Systema S.p.A. has been always different with an internal and external organization that guarantees high quality services through an extensive commercial network made of highly qualified technical salesmen, an internal organization of customer service with experience in designing and consultancies well aware of all the required standards and rules and a massive after sales structure both internal and external that Systema keeps regularly update in order to have technicians who are always very well prepared.
The work of these structures is greatly facilitated by Systema S.p.A.'s production facilities, which are made up of the highest quality standards and production processes that are technologically advanced and constantly modernised. The united work of those responsible for production, procurement and quality allows Systema S.p.A. to make available to its commercial structure products and systems that are of high quality, reliable and made in full compliance with the most advanced standards.
Systema S.p.A. is able to supply its sales organisation with products and systems of high quality and reliability and manufactured in full compliance with the most advanced standards.
Systema S.p.A. has thus managed, over the years, to gain a strong international presence which sees it active in markets all over the world, carrying forward the flag of top quality Made in Italy and achieving leadership positions in many countries. A strategic decision was taken by Systema S.p.A. to create Systema Polska, which is able to provide a highly qualified, high quality production force and a commercial structure, in synergy with that of Systema S.p.A., which is able to present and improve the commercial penetration of Systema products in markets such as Poland and neighbouring countries.
The synergies put in place have greatly facilitated the growth of the services offered to the market, services made up of a very high level of attention to the customer, who in Systema finds not only a business partner but also a highly qualified technical consultancy service that goes hand in hand with reliable after-sales services that are always ready to quickly resolve any problems reported by the customers themselves.

Systema: focus on the future
by interpreting the present...

SYSTEMA
HEATING COOLING GREEN ENERGY

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