SyScroll 20-30 Air EVO NEW

Air Cooled Inverter Driven
Water Heat Pump
Engineering Data Manual

R410A

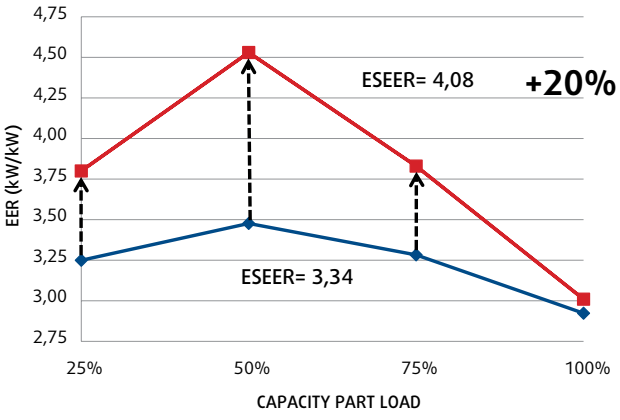
20.0 to 35.0 kW

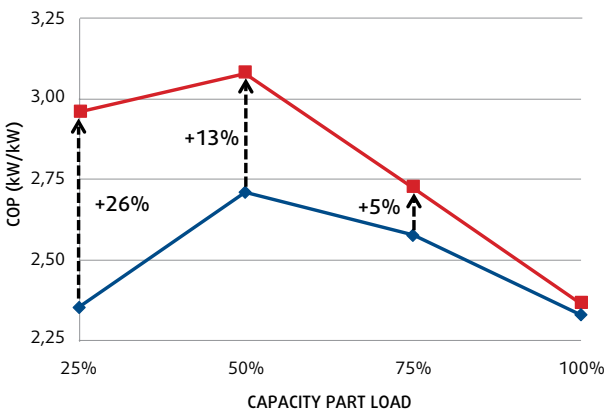
20.0 to 34.0 kW

systemair

Key points

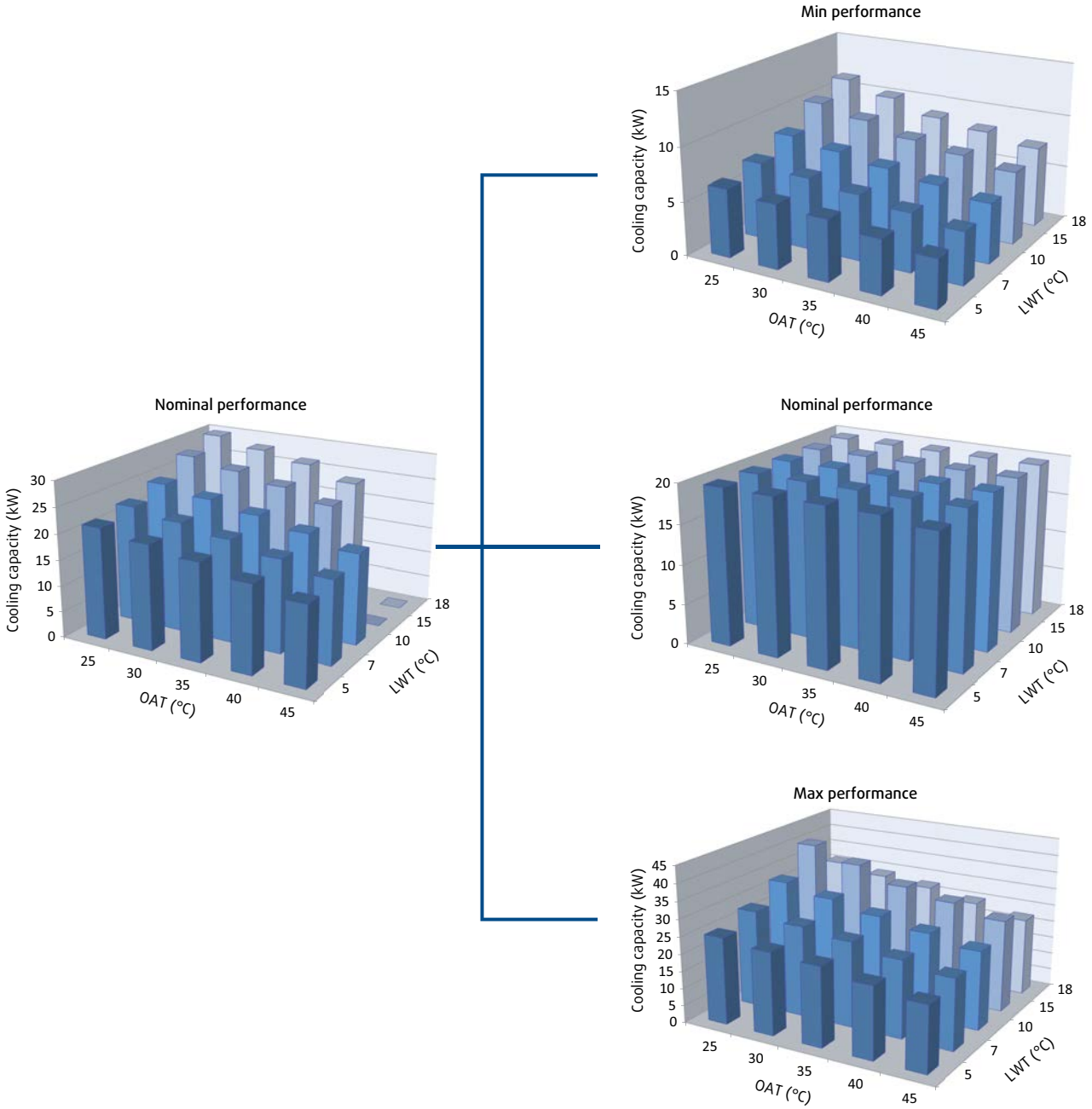
- Wide load variation capability.
  - Cooling operation → down to 30 % and up to 140% of nominal capacity.
  - Heating operation → down to 40% and up to 130% of nominal capacity.
- Great accuracy in maintaining desired set-point.
- Unit optimization for heating operation both for fan coil and floor application.
- Excellent efficiency performances both at full and partial load (EER/COP/SEER/SCOP).
- Wide operating limits in heating mode:
  - Min outdoor ambient temperature → -15 [°C].
  - Max leaving water temperature → 55 [°C].
- Simple refrigerant circuit with easy access to inner components for maintenance purpose.
- Aeraulic independence between refrigerant circuit and condensing side.
- New fan motors (Erp 2015 compliant) with integrated grill, nozzle and condensers.
- Several options / accessories provided with standard delivery:
  - Multistage centrifugal pump → easy hydraulic installation.
- Fan speed control → cooling operation with low OAT / heating operation with high OAT.
- Electronic expansion valve → precision in SH control.
- ModBus interface → supervision ready.
- Phase sequence control algorithm → safe electric installation.
- Stepless capacity control → precision in water set-point control.
- Soft-start function → low inrush current.
- Power factor correction function → low input current distortion.
- Coil blue fin treatment → effective water drainage during defrost.
- Coil guard → protection during transport and installation.
- Double set-point→ different daily profiles.
- Dynamic set-point → water profile in accordance with outdoor air temperature.
- Water filter → protection against impurities.
- Water differential pressure switch → protection against low water flow.
- Rubber pads → basic vibration attenuation.



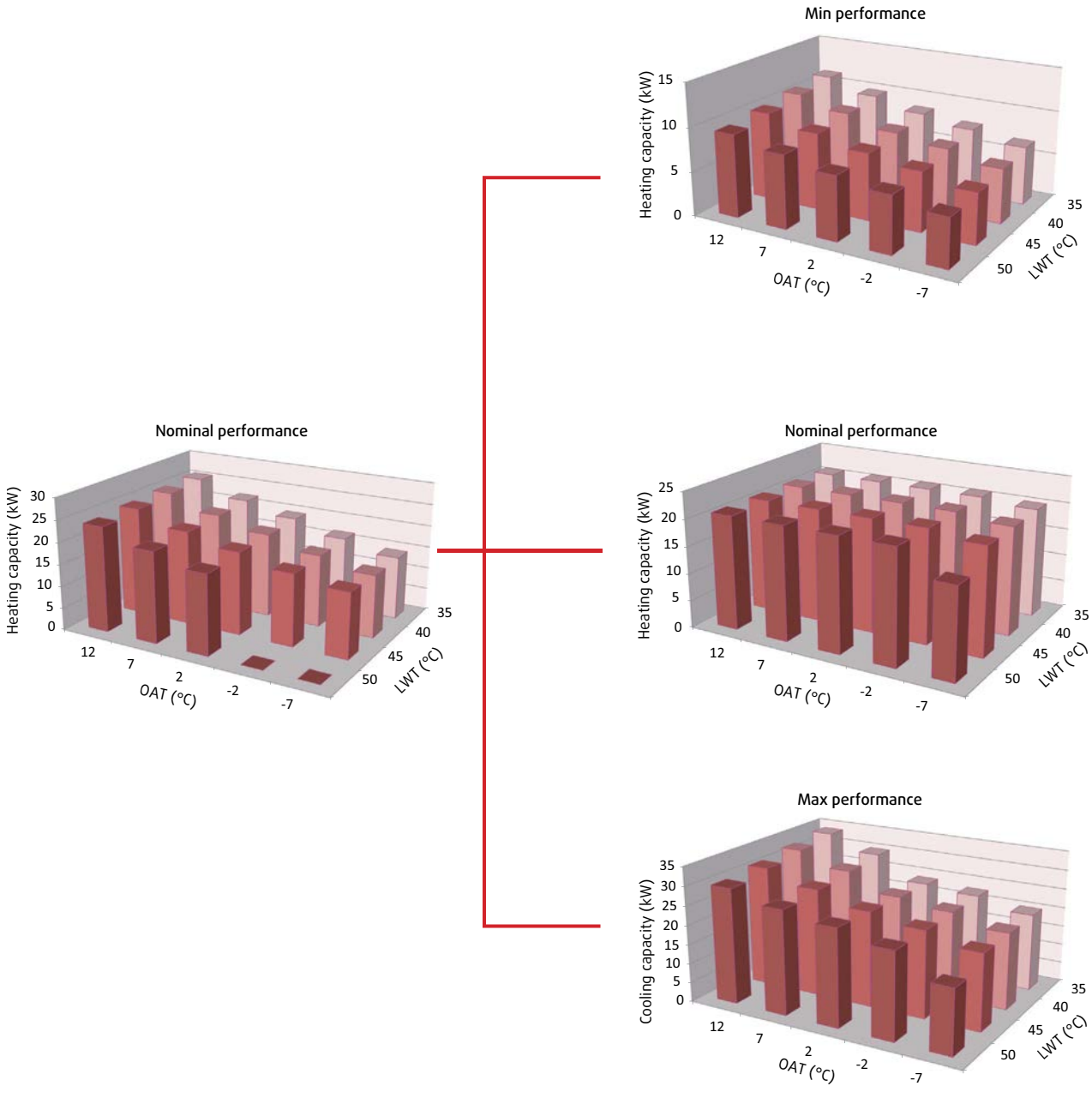


FIXED SPEED VARIABLE SPEED

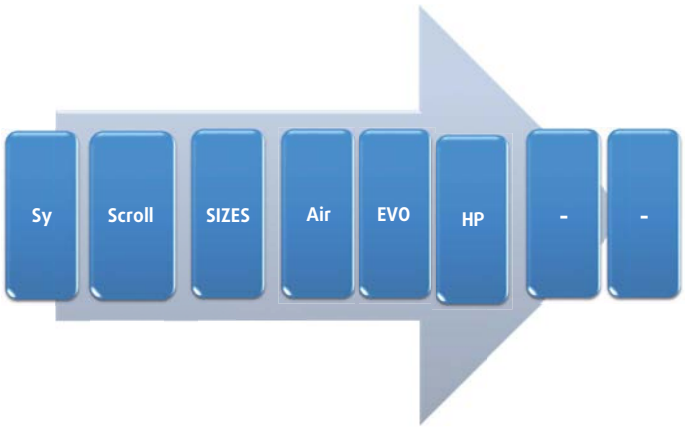
Comparison between fixed speed and variable speed technology - Cooling operation



Comparison between fixed speed and variable speed technology - Heating operation



Specifications



HP = Heat Pump; Version - = BLN.

General

The new SyScroll Air EVO air cooled water heat pumps have been designed and optimized to operate with R410A refrigerant and inverter driven scroll compressors.

Thanks to inverter technology it is possible to cover with only 2 sizes a very wide capacity range both in cooling (from 20 to 35 kW) and heating (from 20 to 34 kW) operation.

All units are equipped with a single inverter driven 3-phase scroll compressor.

The general operation status of the unit is steadily managed by a microprocessor implementing a dedicated developed software, allowing operation with a very low water content (2,5 l/kW) and ensuring a total protection of compressor inside its operating envelope.

An external buffer tank can be supplied as accessory for field installation; it is mainly recommended to provide compensation to water temperature decrease occurring during defrost operation.

All units are equipped with a multistage centrifugal pump as standard.

A fan speed controller is included in the standard equipment allowing the unit operating in cooling mode at low ambient temperature and in heating mode at high ambient temperature.

Conformity with standards

The units are in conformity with the following standards:

- Machine Directive: 2006/42/EC
- Low Voltage Directive: 2006/95/EC
- Electromagnetic Compatibility Directive: 2004/108/EC
- Pressure Equipment Directive: 97/23/EC

Cabinet

The cabinet is made of heavy gauge galvanized steel.

All galvanized steel components are individually painted by a special painting process before the assembly of the unit. This painting system performs a homogeneous protection to the corrosion.

The painting is a polyester powder based type, coloured in RAL 7040. The units are suitable for outdoor installation, directly on the building roof or at the ground level.

Compressors

Compressors are hermetic scroll equipped with brushless direct current motor (BLDC) type.

Motor is cooled down by refrigerant gas itself; a discharge gas thermostat and a discharge temperature sensor protect motor against over-temperature operation.

A 40 W belt electric heater is switched ON during compressor OFF time in order to protect against flooded starts.

Compressors are assembled on rubber shock absorbers to limit vibrations trasmission.

Evaporator

Indoor heat exchangers are brazed stainless steel plate type. They are insulated with a 10 mm thick closed cell polyethylene foam material and provided with male gas threaded connections.

They are protected by a 35 W antifreeze electric heater to ensure a good protection against freezing at low ambient temperature when the unit is switched off.

Maximum working pressure is 10 bar at water side and 45 bar at refrigerant side.

Air cooled condenser coil

Outdoor heat exchangers are finned tubes coils. Coils are built with internally grooved copper tubes expanded into corrugated aluminium fins. Fin pitch and blue fin hydrophilic treatment are intended to optimize coil behavior during heating and defrost operations.

Condenser fans
Units are equipped with two 500mm diameter axial fans with profiled, sickle shaped blades designed with bionical know how, optimized full bellmouth with static blades (motor suspension) and short diffusor.
They are placed directly in front of the coil in order to increase the air flow and the heat transfer between air and refrigerant.
Fan motors have IP54 protection grade, and thermostat protection placed in the bearings. Both fans are equipped with a safety grill.

Refrigerant circuit
Refrigerant circuit is equipped with one hermetic scroll compressor, 4-way reversing valve, bi-flow filter drier, sight glass, bi-flow electonic expansion valve, liquid receiver and suction accumulator.

Hydraulic circuit
All units are equipped with multi-stage centrifugal pump providing outdoor available static pressure. Pump impeller is insulated with anti-condensation shell. Water filter is supplied as standard. Safety valve and expansion tank are placed on suction side of the pump. Water connections are 1" 1/4 male GAS threaded type.

Control panel

A new optimized control with a simple user keyboard, manage unit operation under different load and temperature condition and protect compressor against operation out of its envelope.
In addition to standard features - as water temperature control - the control can also manage following functions:
- Dynamic set point with OAT compensation,
- Double set point,
- Advanced pump management,
- Counting of pump / compressors operating hours,
- Display of discharge and suction pressure values,
- Display of temperature sensors,
- History of stored alarms.

Safety and control devices
Each unit is complete with the following safety and control devices.

Safety
- Fan motor overload protection,
- Compressor motor overload protection,
- Phase sequence control,
- Pump motor overload protection,
- High pressure switch,
- Low pressure switch,
- Discharge gas thermostat,
- Evaporator antifreeze electric heater,
- Crankcase oil electric heater.

Control
- Return water temperature sensor,
- Leaving water temperature sensor,
- Coil temperature sensor,
- Suction and discharge temperature sensors,
- Air temperature sensor,
- Suction and discharge pressure transducers.

Standard equipment
- Multistage centrifugal pump.
- Fan speed control.
- Electronic expansion valve.
- ModBus protocol kit for BMS.
- Phase sequence control function.
- Stepless capacity control.
- Soft start function.
- Power factor correction function.
- Coil blue fin treatment.
- Coil guard.
- Double set-point.
- Dynamic set-point.
- Water filter.
- Water differential pressure switch.
- Pressure and temperature sensors value display.
- Compressor/pump hour meter.
- Compressor box.
- Evaporator antifreeze electric heater.
- Compressor belt electric heater.

Field-installed accessories
- Water buffer tank (112 l),
- Water flow switch,
- Water pressure switch,
- In/out valve kit,
- No pump kit,
- Remote ON/OFF control,
- Sequencer for up to 4 chillers installation.

Accessories & Options

SyScroll Air	Delivery	Abbreviation	Description & Befenit
Sequence phases control	Std	PHC	It allows to check the correct sense R-S-T of electric supply phases for 400/3/50 units.
Main switch	Std		Front operated switch-disconnector with direct mounted handle to cut the power Supply Line according CE standards.
Differential pressure switch	Std		Prevents the operation of the unit if the circulating chilled fluid is insufficient. Checking water differential pressure.
Antifreeze electric heater kit	Std	EEH	Electrical Heater protects the plate exchanger.
Low ambient kit (pressostatic stepless fan speed control)	Std	FSC	Electronic speed controllers are designed to control the speed of fan motors in Air Cooled Chiller and Heatpump. Fan Speed controlled by Condensing Pressure in cool mode or by Air Temp in heat mode. Using variable fan speed controllers offers following benefits in commercial refrigeration or air-conditioning applications High Efficiency, Low Noise level, Low air temperature in cool mode and High air temperature in heat mode.
Double set point	Std	DSP	Can manage two different applications (set point) selected by remote dry contact.
Electronic expansion valves	Std	EEV	It is the device able to control the refrigerant flow on suction line trough a stepper motor in order to keep the superheat as constant as possible.
Modbus protocol kit for BMS	Std	MBS	It permits the integration of the unit with BMS with Modbus protocol trough RS485 port.
Softstarter for compressor	Std	SS	An electronic device that automatically starts up the compressors gradually. The starting current can be reduced by up to 40% of the direct on line value.
Power factor corrector capacitors	Std	PFC	The purpose of the power factor corrector capacitor is to minimize the input current distortion and make the current in phase with the voltage. Target is to keep Power Factor about 0.90 in any running condition.
Coil Guards	Std	CG	Grilles to protect the coils.
Water filter	Std		Filter to remove impurities from the water supply.
Remote On/Off control	Accessory		It enables the operator to power on the unit when it is in standby mode, to display alarms and switch over cooling–heat pump. Maximum lenght: 50mt.
Sequencer for up to 4 chillers installation	Accessory	SEQ	It can easily pilot up to 4 units, chiller or heat pumps, belonging to the same family, fitted in parallel, 50 metres apart maximum.
Flow switch	Accessory	FS	Prevents the operation of the unit if the circulating chilled fluid is insufficient. It is recommended to install a flow switch to ensure the correct operation of the unit.
Water pressure switch	Accessory		Mechanical water pressure switch to be mounted on the field installation on installation water piping to prevent very low Water Pressure.
Valve in out	Accessory		Ball valves makes it possible to insulate unit hydraulic circuit from the rest of the installation.

Accessories are loosed and to install in the field. Options are mounted in factory.

EN 14511-2011

Starting 2012 Campaign Eurovent Certification Company took decision to start certify only performances declared in according severe European Standard EN14511.

BEFORE 2012: GROSS PERFORMANCES

Before this date all capacity performances are declared, measured and certified by Eurovent, as GROSS performances.
COOLING or HEATING CAPACITY was rated without taking in account the negative contribution of the heat exchanger Pressure Drop or the positive contribution of the Head Available prevalence in example.
POWER INPUT was rated as pure sum of all power input contribution from all motors fitted on the unit. Without taking in account the correction due to power spent to win the exchanger Pressure Drop in example.

AFTER 2012: NET PERFORMANCES

After this date all data are certified according EN14511. Mainly consequences in example on Water chiller or heatpump are:
COOLING or HEATING CAPACITY is now rated taking in account the negative contribution of the heat exchanger Pressure Drop or the positive contribution of the Head Available prevalence in example. In case of Water to Water unit, in example, both exchanger Pressure Drop values are taken in account in the formula.
POWER INPUT is now rated as all power input contribution from all motors fitted on the unit taking in account also the correction due to power spent to win the exchanger Pressure Drop in example.
As an important consequence of these new rules setted by Eurovent is that EER, COP and ESEER are also affected by these correction. All efficiency index are now calculated, measured and certified according new rules setted by Eurovent according EN14511.

Air to water unit (non ducted outdoor):

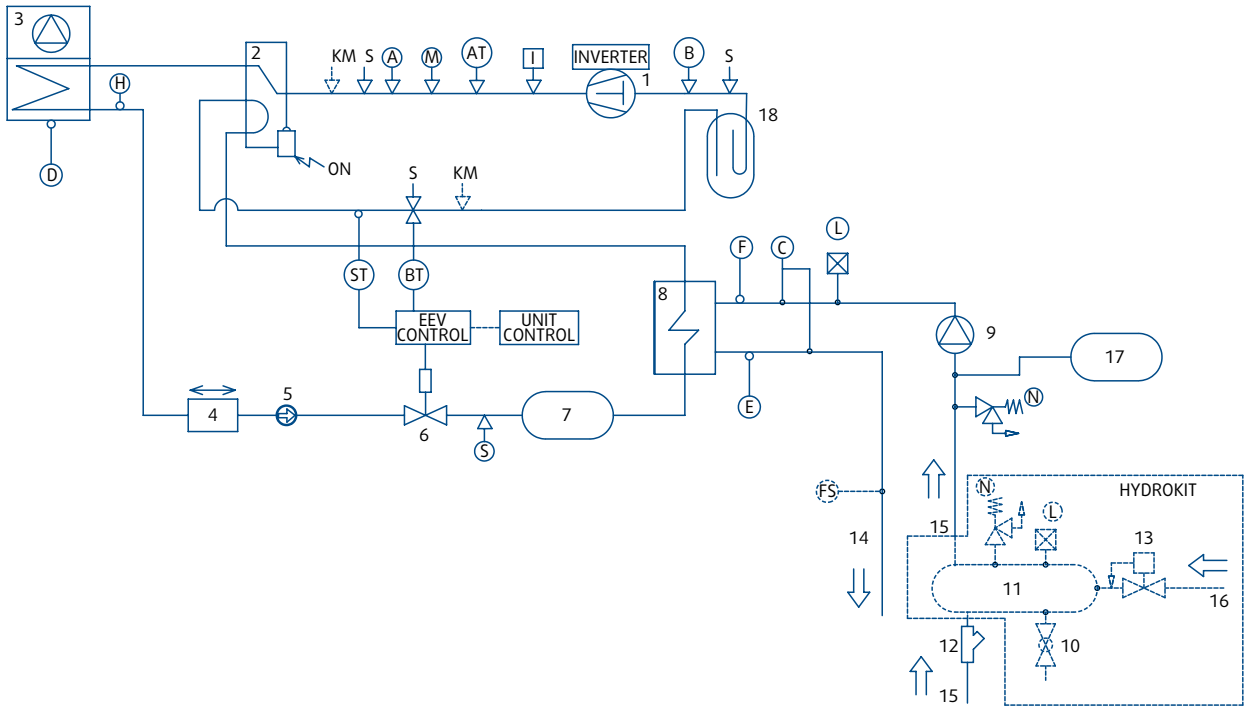
	Indoor pump is an integral part		Indoor pump is not an integral part	
	ECC 2011 (gross)	EN14511:2011	ECC 2011 (gross)	EN14511:2011
Ph	Ph_m (1)	$Ph_m - \frac{q_{wi}\Delta p_{e,wi}}{\eta_{pi}}$	Ph_m	$Ph_m + \frac{q_{wi}(-\Delta p_{i,wi})}{\eta_{pi}}$
Pc	Pc_m (1)	$Pc_m + \frac{q_{wi}\Delta p_{e,wi}}{\eta_{pi}}$	Pc_m	$Pc_m - \frac{q_{wi}(-\Delta p_{i,wi})}{\eta_{pi}}$
Pe	Pe_m (1)	$Pe_m - \frac{q_{wi}\Delta p_{e,wi}}{\eta_{pi}}$	Pe_m	$Pe_m + \frac{q_{wi}(-\Delta p_{i,wi})}{\eta_{pi}}$

(1) Measured with the indoor pump not running.

Where:
Ph = NET heating capacity.
Pc = NET cooling capacity.
Pe = electrical power input.
Ph_m = is the gross heat capacity, expressed in Watts.
Pc_m = is the gross cool capacity, expressed in Watts.
q_{wi} = is the nominal liquid flow rate.
$\Delta_{pe,wi}$ = is the measured available external static pressure.
$\Delta_{pi,wi}$ = is the measured internal static pressure difference.
η_{pi} = is the efficiency of the pump.

Reference: Guidelines for the declaration of performances according to EN14511:2011 (available a copy upon request for Syste mair customer).

Refrigerant Flow Diagram



COMPONENTS

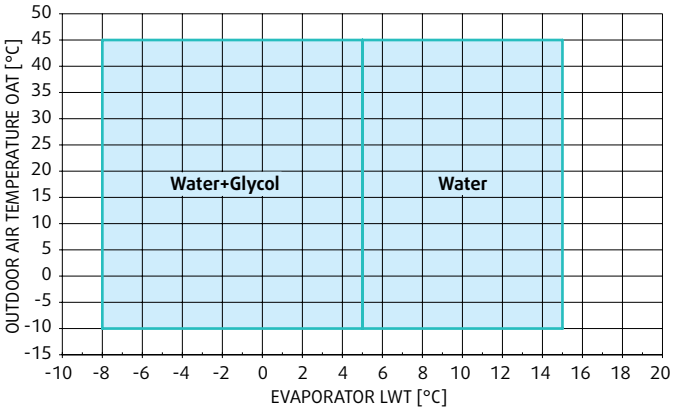
1	Inverter driven Scroll compressor
2	4-way valve
3	Air cooled condenser
4	Biflow filter drier
5	Sight glass
6	Expansion valve
7	Liquid receiver
8	Plate heat exchanger
9	Pump
10	Drain valve
11	Water buffer tank
12	Water filter (loose)
13	Automatic water charging valve
14	Water outlet
15	Water inlet
16	Water charging line
17	Expansion vessel (lt 5)
18	Suction accumulator

SAFETY/CONTROL DEVICES

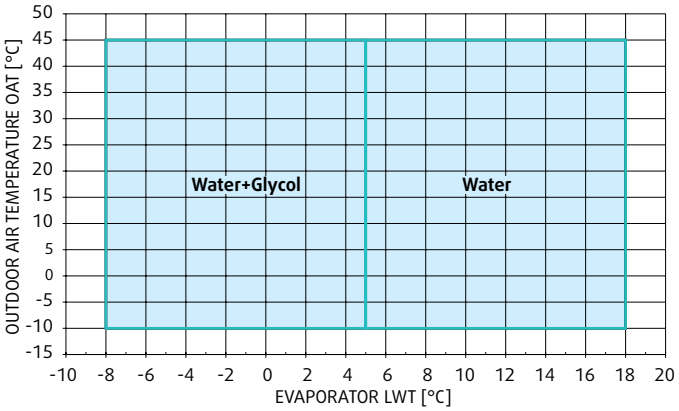
A	High pressure switch (40,5 bar)
AT	High pressure transducer
B	Low pressure switch (1,5 bar)
BT	Low pressure transducer
C	Water differential pressure switch (105 mbar)
D	Air temperature sensor
E	Outlet water temperature sensor
F	Inlet water temperature sensor
FS	Flow switch
H	Defrost temperature sensor
I	Discharge gas temperature thermostat-DGT
L	Vent valve
M	Discharge temperature sensor
N	Water safety valve (3 bar)
S	Shrader valve (Service/Charging point)
ST	Suction temperature probe
KM	Manometer (Optional)
↓	Pipe connection with Shrader valve 1/4" SAE
----	Optional components
∘	Probes

Operating Limits - SyScroll 20 Air EVO HP

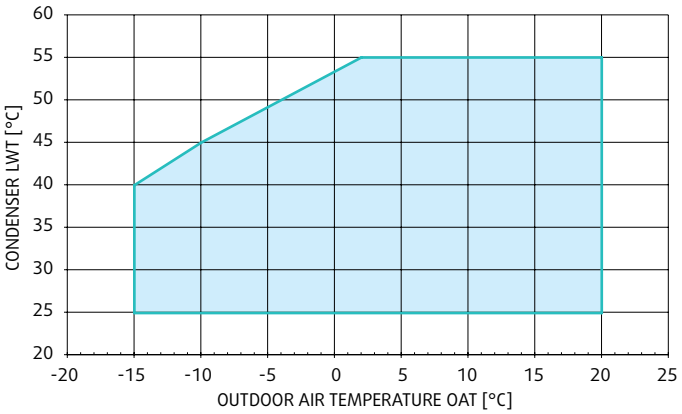
Cooling operation / Max capacity



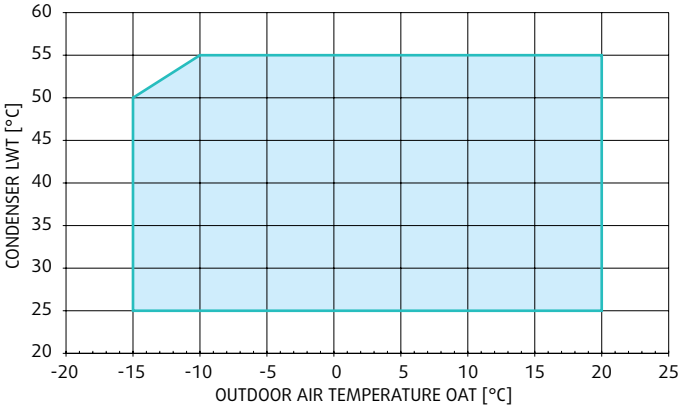
Cooling operation / Nominal capacity



Heating operation / Max capacity

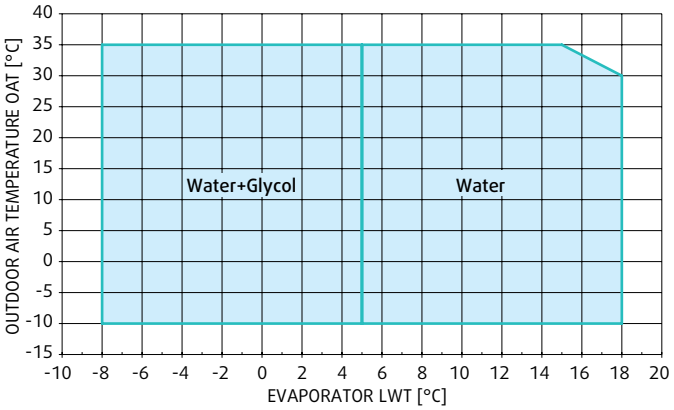


Heating operation / Nominal capacity



Operating Limits - SyScroll 30 Air EVO HP

Cooling operation / Max capacity



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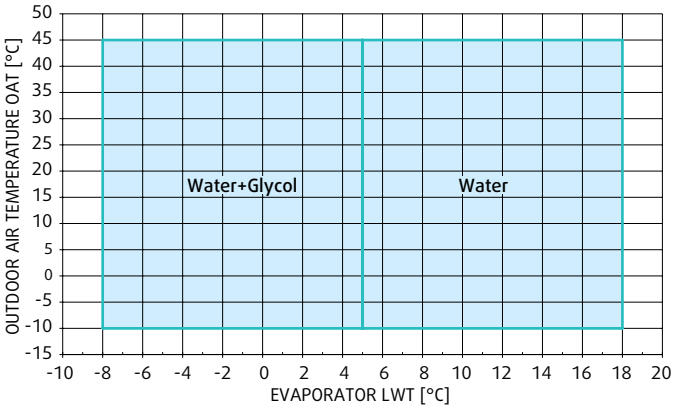
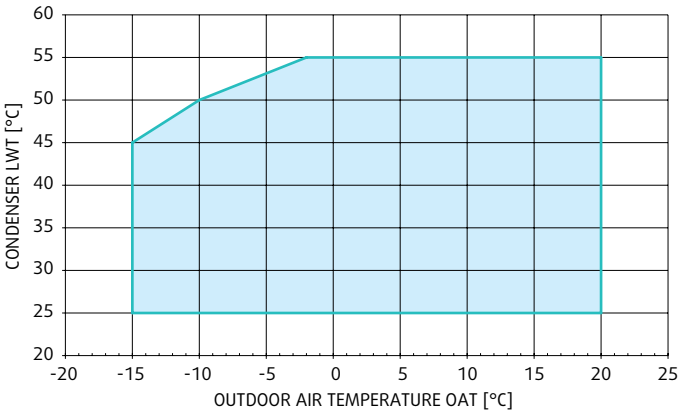
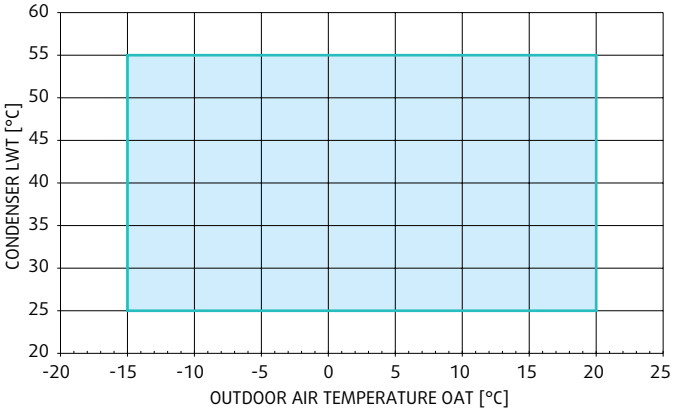


Heating operation / Max capacity



Heating operation / Nominal capacity



Performances corrective factors (brine)

Unit capacity, absorbed power, brine flow rate, brine pressure drop, have to be corrected according following formula:

CORRECTED UNIT CAPACITY

$Q_{CORRECTED/GLYCOL} = Q_{NOMINAL} \times K_c \times K_c^{E,P}$

Where K_c : Capacity corrective factor according to LWT (ΔT = 5 [K]) → refer to Table 1
K_c^E : Capacity corrective factor according to glycol percentage (ETHYLENE GLYCOL) → refer to Table 2
K_c^P : Capacity corrective factor according to glycol percentage (PROPYLENE GLYCOL) → refer to Table 4

CORRECTED UNIT ABSORBED POWER

$P_{CORRECTED/GLYCOL} = P_{NOMINAL} \times K_i \times K_i^{E,P}$

Where K_i : Absorbed power corrective factor according to LWT (ΔT = 5 [K]) → refer to Table 1
K_i^E : Absorbed power corrective factor according to glycol percentage (ETHYLENE GLYCOL) → refer to Table 2
K_i^P : Absorbed power corrective factor according to glycol percentage (PROPYLENE GLYCOL) → refer to Table 4

CORRECTED BRINE FLOW RATE

$G_{CORRECTED/GLYCOL} = G_{RE\text{-}CALCULATED} \times K_f^{E,P}$

Where $G_{RE\text{-}CALCULATED}$: Flow rate according to $P_{CORRECTED/GLYCOL}$ ($P_{CORRECTED/GLYCOL} \times 860 / \Delta T / 3600$)
K_f^E : Flow rate corrective factor according to glycol percentage (ETHYLENE GLYCOL) → refer to Table 2
K_f^P : Flow rate corrective factor according to glycol percentage (PROPYLENE GLYCOL) → refer to Table 4

CORRECTED BRINE PRESSURE DROP

$\Delta P_{CORRECTED/GLYCOL} = \Delta_{PRE\text{-}CALCULATED} \times K_p^{E,P}$

Where $\Delta P_{RE\text{-}CALCULATED}$: Pressure drop according to to $G_{CORRECTED/GLYCOL}$ ($K_{BPHE} \times (G_{CORRECTED/GLYCOL})^2$)
K_p^E : Pressure drop corrective factor according to glycol percentage (ETHYLENE GLYCOL) → refer to Table 2
K_p^P : Pressure drop corrective factor according to glycol percentage (PROPYLENE GLYCOL) → refer to Table 5

Table 1

		K_c	K_i
Leaving water temperature [LWT] (°C) (ΔT=5 [K])	7	1,000	1,000
	4	0,887	0,940
	2	0,816	0,900
	0	0,748	0,865
	-2	0,685	0,826
	-4	0,624	0,788
	-6	0,568	0,753
	-8	0,513	0,718
	-10	0,461	0,683

Table 2

Ethylene Glycol Percentage		0%	10%	20%	30%	35%	40%
Freezing point (*)	°C	0	-4	-10	-10	-21	-21
Minimum leaving water temperature allowed	°C	6	2	-2	-2	-8	-8
Capacity corrective factor (**)	K_c^E	1	0,995	0,985	0,985	0,963	0,963
Absorbed power corrective factor (**)	K_i^E	1	0,998	0,995	0,995	0,983	0,983
Flow rate corrective factor	K_f^E	1	1,015	1,050	1,050	1,123	1,123
Pressure drop corrective factor (***)	K_p^E	1	1,070	1,160	1,160	1,283	1,283

(*) ASHRAE Handbook Fundamentals.
(**) Valid for LWT=7 [°C]. If LWT<7 [°C] consider $K_c \times K_c^E$ and $K_i \times K_i^E$
(***) Valid for LWT > 5 [°C]. If LWT<5°C → refer to Table 3

Table 3

Ethylene Glycol Percentage	LWT [°C]	Corrective factor K_f^E	Corrective factor K_p^E
10%	5	1,0154	1,0710
	4	1,0154	1,0760
	3	1,0154	1,0810
	2	1,0154	1,0850
20%	1	1,0417	1,1930
	0	1,0423	1,2000
	-1	1,0428	1,2080
	-2	1,0434	1,2150
30%	-3	1,0927	1,2990
	-4	1,0936	1,3060
	-5	1,0945	1,3200
	-6	1,0954	1,3330

Table 4

Propylene Glycol Percentage		0%	10%	20%	30%	40%
Freezing point (*)	°C	0	-3	-7	-13	-22
Capacity corrective factor (**)	K_c^P	1	0,991	0,977	0,945	0,911
Absorbed power corrective factor (**)	K_i^P	1	0,994	0,991	0,975	0,966
Flow rate corrective factor	K_f^P	1	1,005	1,030	1,067	1,130

(*) ASHRAE Handbook Fundamentals.
(**) Valid for LWT=7 [°C]. If LWT<7 [°C] consider K_c x K_c^P and K_i x K_i^P

Table 5

Ethylene Glycol Percentage	LWT [°C]	Corrective factor K_p^P
10%	5	1,112
	4	1,134
20%	5	1,175
	4	1,196
	3	1,206
30%	5	1,290
	4	1,300
	3	1,310
	0	1,362
	-2	1,393
	-4	1,414
40%	5	1,433
	4	1,435
	3	1,456
	0	1,497
	-2	1,549
	-4	1,580
	-6	1,612
	-8	1,653

Technical data

Model		20			30		
NET(1) Data @ Eurovent LCP/A/CHF conditions(2)							
Heating capacity - (min / **nom** / max)	kW	9,94	**20,4**	29,4	11,5	**26,1**	34,0
Power input	kW	2,98	5,02	8,37	3,01	6,45	9,80
COP	kW/kW	3,34	**4,06**	3,51	3,82	**4,05**	3,47
EUROVENT CLASS			**A**			**A**	
Capacity range	%	49%	**-**	144%	44%	**-**	130%
Cooling Capacity - (min / **nom** / max)	kW	9,33	**20,0**	28,0	13,9	**29,0**	35,9
Power input	kW	2,38	4,15	6,61	3,51	7,24	13,0
EER	kW/kW	3,92	**4,82**	4,24	3,96	**4,01**	2,76
EUROVENT CLASS			**A**			**A**	
Capacity range	%	47%	**-**	140%	48%	**-**	124%
NET(1) Data @ Eurovent LCP/A/AC conditions(3)							
Heating capacity - (min / **nom** / max)	kW	8,90	**20,4**	27,4	10,2	**26,1**	33,5
Power input	kW	3,34	6,44	9,64	3,97	8,42	11,6
COP	kW/kW	2,66	**3,17**	2,84	2,57	**3,10**	2,89
EUROVENT CLASS			**B**			**B**	
Capacity range	%	44%	**-**	134%	39%	**-**	128%
Cooling Capacity - (min / **nom** / max)	kW	6,60	**20,0**	25,2	9,43	**29,0**	31,1
Power input	kW	2,52	6,65	10,3	3,14	10,7	12,4
EER	kW/kW	2,62	**3,01**	2,45	3,00	**2,71**	2,51
EUROVENT CLASS			**B**			**C**	
Capacity range	%	33%	**-**	126%	33%	**-**	107%
EER 75%	kW/kW		3,83			3,65	
EER 50%	kW/kW		4,53			4,48	
EER 25%	kW/kW		3,80			4,79	
NET(1) ESEER	kW/kW		**4,08**			**4,23**	
Number of Refrigerant Circuits				1			
Part Load Steps	%			Stepless			
Power Supply	V/ph/Hz			400/3+N/50			
Startup Type				Soft-start (inverter)			
Maximum Absorbed Power	kW		13,2			15,8	
Maximum Current (FLA)	A		25,9			30,9	
Startup Current (LRA)	A		3,9			3,9	
Refrigerant							
Type				R410A			
Compressor							
Number / Type				1 / Scroll (BLDC Motor)			
Crankcase Heater	W			40			
Internal heat exchanger							
Number				1			
Type				Brazed plate			
Water flow Rate / Water Pressure Drop	l/h / kPa			Refer to hydraulic circuit data			
Antifreeze Heater	W			35			
Fans							
Number			2			2	
Air Flow Rate	m^3/h		10.848			10.425	
Input Power	kW		0,54			0,54	
Pump							
Number			1			1	
Input Power	kW		0,56			0,63	
Water flow Rate / Water Pressure Drop	l/h / kPa			Refer to hydraulic circuit data			
Water Connections							
Type				Male GAS Threaded			
Inlet Diameter / Outlet Diameter	inch			1" 1/4			
Weight							
Shipping	kg		266			281	
Operating	kg		260			275	
Dimensions							
Length	mm		1.477			1.477	
Width	mm		539			539	
Height	mm		1.615			1.615	
Acoustic Data							
Sound Power Level	dB(A)		74			75	
Sound Pressure Level(4)	dB(A)		43			44	

(1) According EN 14511-2011 standard.
(2) Eurovent LCP/A/CHF conditions in heating mode: water heat exchanger EWT/LWT → 30°C/35°C, OAT → 7°C db/6°C WB.
Eurovent LCP/A/CHF conditions in cooling mode: water heat exchanger EWT/LWT → 23°C/18°C, OAT → 35°C.
(3) Eurovent LCP/A/AC conditions in heating mode: water heat exchanger EWT/LWT → 40°C/45°C, OAT → 7°C db/6°C WB.
Eurovent LCP/A/AC conditions in cooling mode: water heat exchanger EWT/LWT → 12°C/7°C, OAT → 35°C.
(4) Sound Pressure calculated at 10m. Values refers to ISO Standard 3744 with parallepiped shape.

Electrical Data

Syscroll Air EVO HP		20	30
Power supply	V/ph/Hz	400 ± (10%)/3+N/50	
Maximum power input	kW	13,2	15,8
Maximum current input	A	25,9	30,9
Start-up corrent	A	3,9	3,9
External fuses	A	32	32
Max cable section (*)	mm^2	10	10
Heat exchanger resistance			
Power supply	V/ph/Hz	230 ± (10%)/1/50	
Maximum power input	W	35	

(*) The dimensioning of the unit's power cables is the responsibility of the installer, who shall consider: the rating, the maximum working temperature in the room, the type of insulation and the cable laying, the maximum lenght of the power supply line.

Compressor data

Syscroll Air EVO HP		20	30
Power supply	V/ph/Hz	400 ± (10%)/3/50	
Number		1	
Maximum power input	kW	11,9	14,4
Nominal current input	A	15,0	20,0
Maximum current input	A	22,0	27,0
Crankcase heater (230±(10%)/1/50)	W	40	

Fan data

Syscroll Air EVO HP		20	30
Power supply	V/ph/Hz	230 ± (10%)/1/50	
Number		2	
Maximum power input	kW	0,3+0,3	
Nominal current input	A	1,3+1,3	

Pump data

Syscroll Air EVO HP		20	30
Power supply	V/ph/Hz	400 ± (10%)/3/50	
Number		1	
Maximum power input	kW	0,72	
Nominal current input	A	1,3	

Sound Data

Size	Octave Band (Hz)								Sound Power Level dB(A)	Sound Pressure Level* dB(A)
	63	125	250	500	1000	2000	4000	8000		
	Sound Power Level (dB)									
20	84	68	71	70	70	65	59	54	74	42
30	86	69	72	71	70	66	59	56	75	43

* Sound pressure level at 10 m. Values refers to ISO Standard 3744 with parallepiped shape.

Nominal performances* (different speeds) - SyScroll 20 Air EVO HP

Cooling operation

SYSCROLL 20 Air EVO HP		OAT (°C)														
		25			30			35			40			45		
		P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW
LWT (°C)	5	20,0	5,98	3,34	20,0	7,05	2,84	20,0	7,77	2,57	20,0	9,72	2,06	19,4	11,3	1,71
	7	20,0	5,08	3,94	20,0	5,82	3,44	20,0	6,65	3,01	20,0	8,56	2,34	20,0	10,6	1,89
	10	20,0	4,10	4,88	20,0	4,83	4,14	20,0	5,93	3,37	20,0	7,55	2,65	20,0	9,49	2,11
	15	20,0	3,60	5,56	20,0	4,08	4,90	20,0	4,72	4,24	20,0	5,96	3,36	20,0	7,49	2,67
	18	20,0	3,47	5,76	20,0	3,92	5,10	20,0	4,15	4,82	20,0	5,55	3,60	20,0	7,12	2,81

Heating operation

SYSCROLL 20 Air EVO HP		OAT (°C)											
		-15			-10			-7			-2		
		P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW
LWT (°C)	35	12,8	7,67	1,67	16,5	7,82	2,11	19,7	7,95	2,48	20,5	7,59	2,69
	40	13,6	8,36	1,62	16,9	8,50	1,99	19,5	8,61	2,26	20,4	8,61	2,37
	45	12,3	8,21	1,50	17,3	9,18	1,88	19,3	9,26	2,08	20,4	8,98	2,28
	50	9,82	7,42	1,32	14,0	7,97	1,75	16,1	9,44	1,71	20,4	9,87	2,07
	55				10,3	7,28	1,42	12,8	8,32	1,54	18,8	9,47	1,98

SYSCROLL 20 Air EVO HP		OAT (°C)								
		2			7			12		
		P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW
LWT (°C)	35	20,4	6,68	3,06	20,4	5,02	4,06	20,4	4,40	4,65
	40	20,4	7,35	2,78	20,4	6,09	3,36	20,4	4,97	4,11
	45	20,4	8,01	2,55	20,4	6,44	3,17	20,4	5,58	3,66
	50	20,4	8,46	2,42	20,4	7,14	2,86	20,4	6,23	3,28
	55	20,4	8,85	2,31	20,4	8,41	2,43	20,4	6,93	2,95

(*) NET data (according EN 14511-2011 standard).

Max performances* (different speeds) - SyScroll 20 Air EVO HP

Cooling operation

SYSCROLL 20 Air EVO HP		OAT (°C)														
		25			30			35			40			45		
		P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW
LWT (°C)	5	25,6	8,82	2,90	24,4	9,48	2,57	23,4	10,2	2,30	21,3	10,7	1,98	19,4	11,3	1,71
	7	28,6	8,95	3,20	26,8	9,6	2,79	25,2	10,3	2,46	23,0	10,9	2,11	20,9	11,6	1,81
	10	33,1	9,13	3,63	30,5	9,8	3,12	27,9	10,4	2,69	25,6	11,2	2,30	23,3	11,9	1,96
	15	40,6	9,44	4,30	36,7	10,1	3,64	32,3	10,6	3,04	30,0	11,6	2,60	27,1	12,4	2,19
	18	31,5	5,93	5,31	29,4	6,51	4,52	28,0	6,61	4,24	25,6	7,86	3,26	22,9	8,62	2,66

Heating operation

SYSCROLL 20 Air EVO HP		OAT (°C)											
		-15			-10			-7			-2		
		P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW
LWT (°C)	35	12,8	7,67	1,67	16,5	7,82	2,11	19,7	7,95	2,48	22,4	8,05	2,79
	40	13,6	8,36	1,62	16,9	8,50	1,99	19,5	8,61	2,26	22,3	8,72	2,55
	45	12,3	8,21	1,50	17,3	9,18	1,88	19,3	9,26	2,08	22,1	9,39	2,36
	50	9,82	7,42	1,32	14,0	7,97	1,75	16,1	9,44	1,71	22,0	10,1	2,18
	55				10,3	7,28	1,42	12,8	8,32	1,54	18,8	9,47	1,98

SYSCROLL 20 Air EVO HP		OAT (°C)								
		2			7			12		
		P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW
LWT (°C)	35	23,4	8,05	2,90	29,4	8,37	3,52	33,4	8,48	3,94
	40	23,8	8,76	2,72	28,5	9,01	3,16	32,1	9,11	3,52
	45	24,2	9,47	2,56	27,4	9,64	2,84	30,7	9,74	3,16
	50	24,6	10,2	2,42	26,5	10,3	2,58	29,4	10,4	2,84
	55	25,1	10,9	2,30	25,5	10,9	2,34	28,1	11,0	2,55

Nominal performances* (different speeds) - SyScroll 30 Air EVO HP

Cooling operation

SYSCROLL 30 Air EVO HP		OAT (°C)														
		25			30			35			40			45		
		P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW
LWT (°C)	5	29,0	7,84	3,70	29,0	9,38	3,09	29,0	10,8	2,69	27,1	12,9	2,11	23,0	11,5	2,01
	7	29,0	7,28	3,98	29,0	9,31	3,11	29,0	10,7	2,71	29,0	12,7	2,28	24,0	12,2	1,97
	10	29,0	7,13	4,07	29,0	7,69	3,77	29,0	10,1	2,88	28,9	12,1	2,39	24,8	11,2	2,22
	15	29,0	5,91	4,91	29,0	6,84	4,24	29,0	7,72	3,76	29,0	10,1	2,88	25,5	9,88	2,58
	18	29,0	5,32	5,45	29,0	6,31	4,60	29,0	7,24	4,01	29,0	9,61	3,02	25,9	9,64	2,69

Heating operation

SYSCROLL 30 Air EVO HP		OAT (°C)											
		-15			-10			-7			-2		
		P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW
LWT (°C)	35	17,7	8,53	2,07	21,5	8,82	2,43	24,5	9,03	2,71	26,1	8,59	3,04
	40	17,8	9,20	1,94	21,5	9,52	2,25	24,0	9,72	2,47	26,1	9,57	2,73
	45	18,0	9,87	1,82	21,5	10,2	2,10	23,6	10,4	2,27	26,1	10,6	2,47
	50	15,3	10,0	1,53	21,5	10,9	1,96	23,1	11,1	2,08	26,1	10,9	2,40
	55	10,5	8,89	1,18	14,4	9,06	1,58	20,1	10,3	1,96	26,1	11,8	2,20

SYSCROLL 30 Air EVO HP		OAT (°C)								
		2			7			12		
		P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW
LWT (°C)	35	26,1	7,80	3,35	26,1	6,45	4,05	26,1	5,51	4,74
	40	26,1	8,59	3,04	26,1	7,46	3,50	26,1	6,20	4,21
	45	26,1	9,32	2,80	26,1	8,42	3,10	26,1	6,94	3,76
	50	26,1	10,0	2,61	26,1	9,02	2,89	26,1	7,50	3,48
	55	26,1	11,8	2,21	26,1	9,85	2,65	26,1	7,68	3,40

(*) NET data (according EN 14511-2011 standard).

Max performances* (different speeds) - SyScroll 30 Air EVO HP

Cooling operation

SYSCROLL 30 Air EVO HP		OAT (°C)														
		25			30			35			40			45		
		P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW	P_{COOL} (kW)	P_{ABS} (kW)	EER kW/kW
LWT (°C)	5	33,6	10,4	3,22	31,9	11,2	2,84	30,3	12,1	2,51	27,1	12,9	2,11	23,0	11,5	2,01
	7	35,2	10,8	3,25	33,6	11,5	2,91	31,1	12,4	2,51	29,0	12,7	2,28	24,0	12,2	1,97
	10	36,8	11,0	3,34	35,6	11,9	3,00	33,5	12,8	2,62	28,9	12,1	2,39	24,8	11,2	2,22
	15	40,1	11,6	3,45	37,9	12,6	3,01	36,2	13,6	2,67	30,5	11,2	2,72	25,5	9,88	2,58
	18	42,5	12,1	3,52	39,8	13,0	3,05	35,9	13,0	2,76	31,1	11,3	2,75	25,9	9,64	2,69

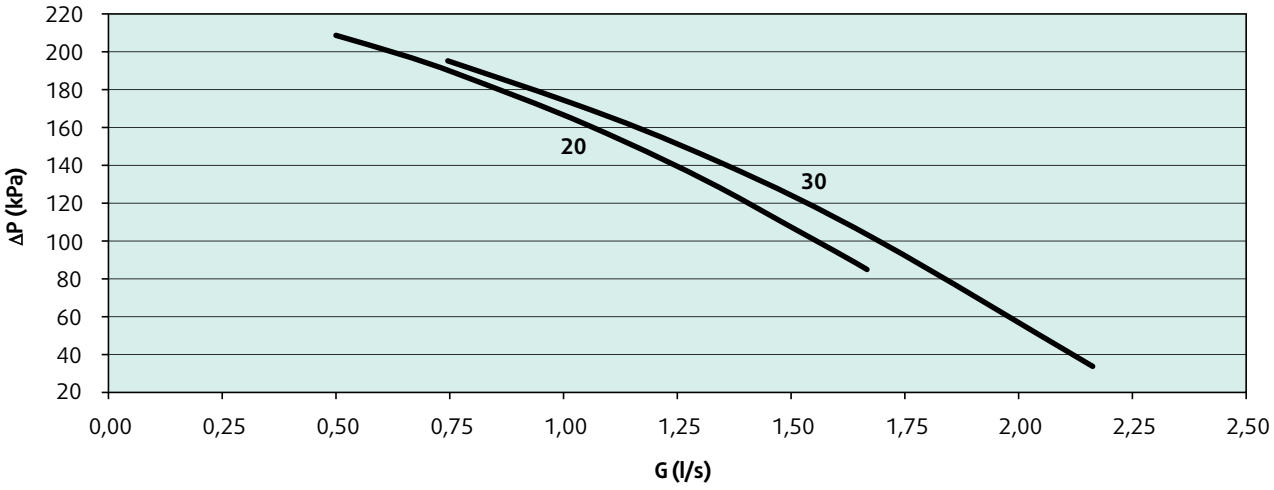
Heating operation

SYSCROLL 30 Air EVO HP		OAT (°C)											
		-15			-10			-7			-2		
		P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW
LWT (°C)	35	17,7	8,53	2,07	21,5	8,82	2,43	24,5	9,03	2,71	27,5	9,27	2,97
	40	17,8	9,20	1,94	21,5	9,52	2,25	24,0	9,72	2,47	27,3	10,0	2,72
	45	18,0	9,87	1,82	21,5	10,2	2,10	23,6	10,4	2,27	27,0	10,8	2,50
	50	15,3	10,0	1,53	21,5	10,9	1,96	23,1	11,1	2,08	26,8	11,6	2,31
	55	10,5	8,89	1,18	14,4	9,06	1,58	20,1	10,3	1,96	26,5	12,3	2,15

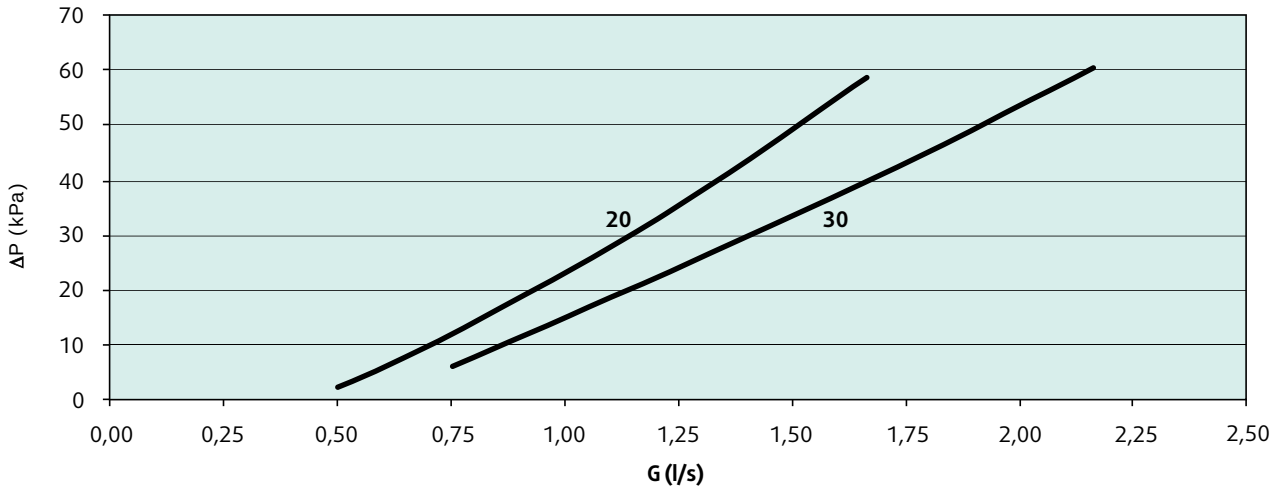
SYSCROLL 30 Air EVO HP		OAT (°C)								
		2			7			12		
		P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW	P_{HEAT} (kW)	P_{ABS} (kW)	COP kW/kW
LWT (°C)	35	29,3	9,40	3,12	34,0	9,80	3,47	39,0	10,1	3,86
	40	29,5	10,3	2,87	33,8	10,7	3,16	37,8	10,9	3,47
	45	29,6	11,1	2,67	33,5	11,6	2,89	36,6	11,7	3,13
	50	29,8	12,0	2,49	33,2	12,5	2,66	35,5	12,5	2,84
	55	30,0	12,8	2,34	33,0	13,4	2,46	34,3	13,3	2,58

(*) NET data (according EN 14511-2011 standard).

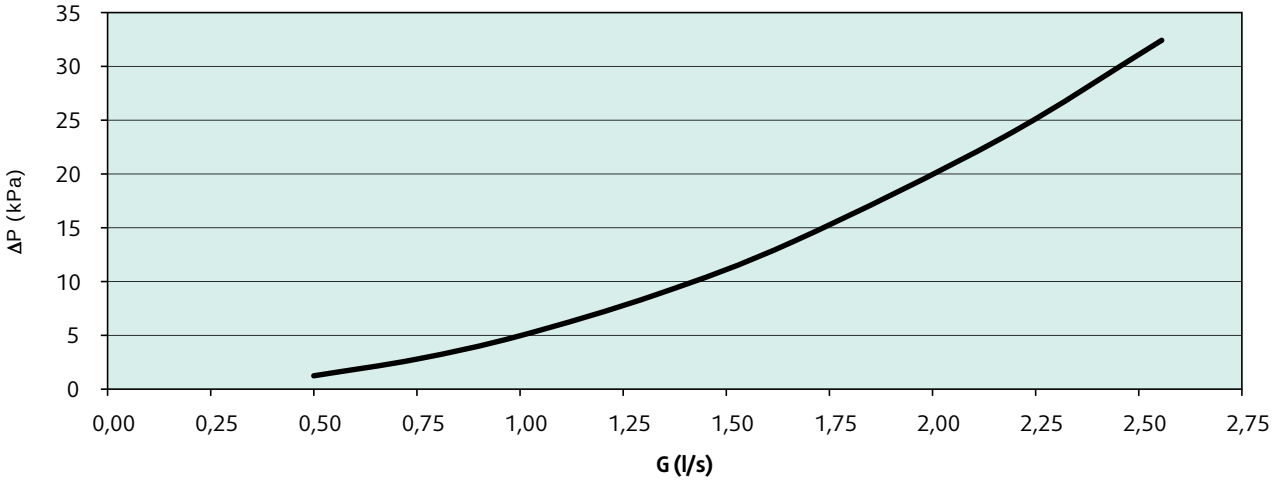
Pump Available Static Pressure



Water Circuit Pressure Drop



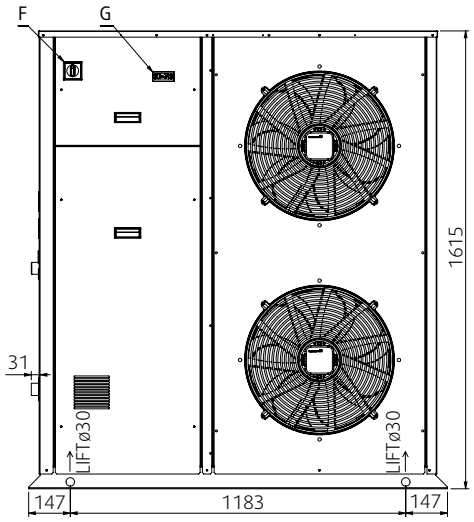
Water Filter* Pressure Drop



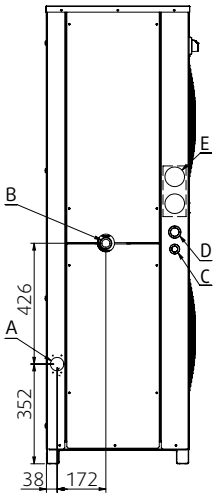
* Φ 1"1/4 diameter, filtration capacity 500 µm / 35 mesh.

Dimensions SyScroll 20-30 Air

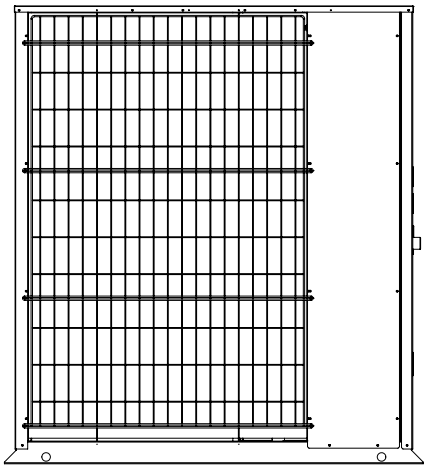
Front view



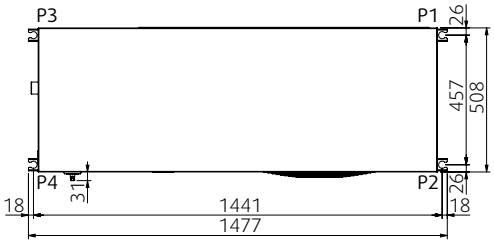
Side view



Rear view



Top view

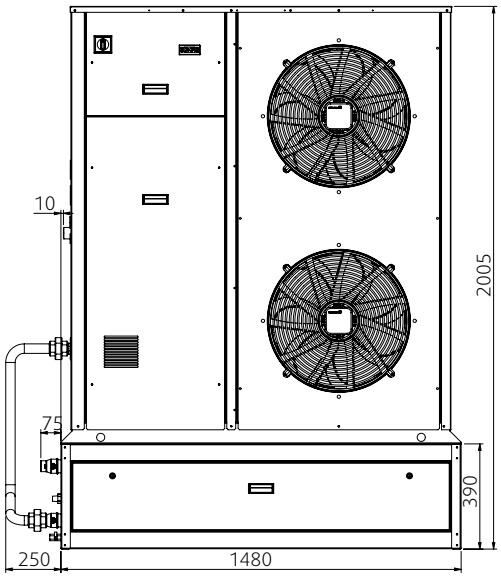


NOTES

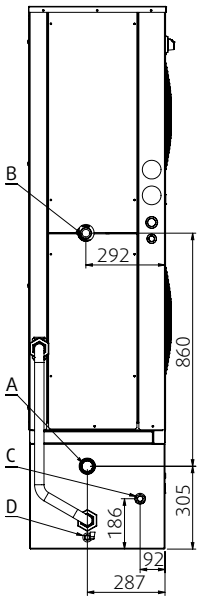
A Water inlet ø 1 1/4" MGT
B Water outlet ø 1 1/4" MGT
C Auxiliary lines
D Electrical power supply
E Gauge kit (optional)
F Main switch
G Control keypad/display

Dimensions Hydrokit 20-30

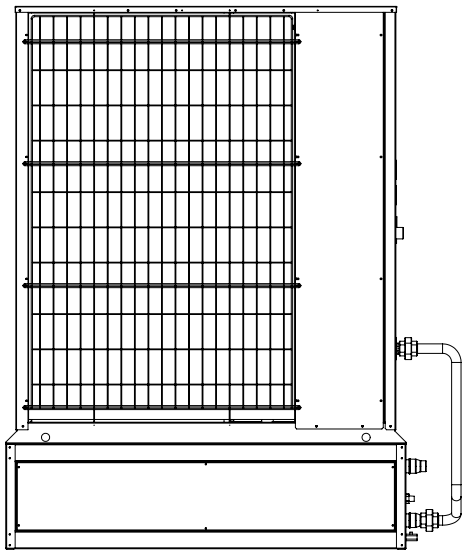
Front view



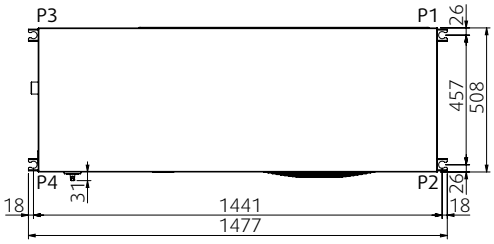
Side view



Rear view



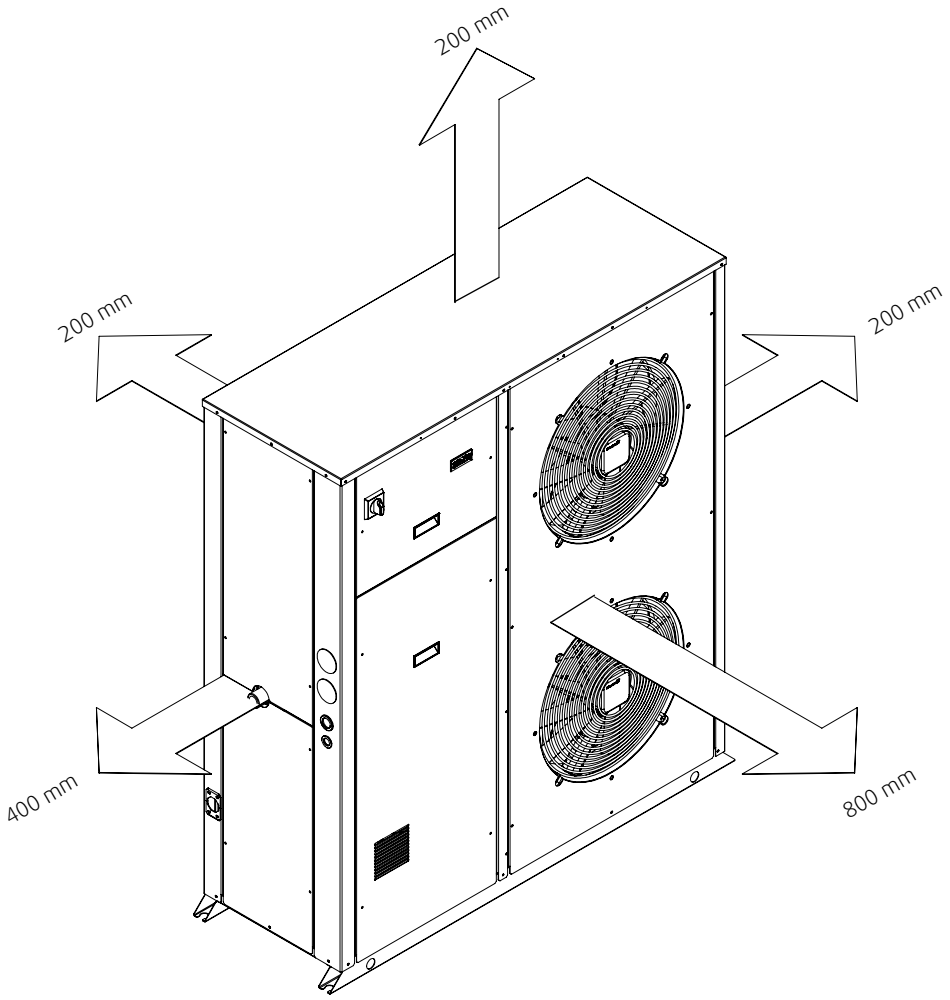
Top view



NOTES

A Water inlet ø 1 1/4" MGT
B Water outlet ø 1 1/4" MGT
C Tank fill ø 1 1/2" MGT
D Water drain ø 3/8" MGT

Space requirements



Notes

Notes

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