



SPR

Industrial dehumidifiers for swimming pools
with high efficiency recovery

TECHNICAL DATA SHEET

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SPR

Dehumidifier for industries with high efficiency recuperator

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HiDew
Dehumidifiers

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DESCRIPTION OF THE PRODUCT



SPR units with heat recovery are designed to be used in small, medium and large sized swimming pools where the adjustment of the humidity level and/or prevention of condensation phenomena are required, even in 24h running and where a constant air exchange is necessary.

SPR dehumidifiers combine cutting-edge technical solutions and pleasant aesthetics.

the fans are electronic type with permanent magnet brushless motor and state of the art built-in inverter and ensure high performance by optimising the power consumption.

The top-quality refrigeration, hydraulic, aerolic and electrical components place the SPR units with heat recovery of the dehumidifiers at a state of the art level in terms of efficiency, reliability and sound power emitted.

INTERNAL COMPONENTS

REFRIGERATION CIRCUITS

The refrigeration circuit is made in-house, using major brand components, Cu-DHP quality copper pipes by qualified operators through quality assurance processes in compliance with Directive 97/23/EC for all brazing and testing operations. All the machines are made with a single double refrigeration circuit with R410A eco-friendly refrigerant gas.

Refrigeration components:

- Compressors: only scroll compressors of a major international brand are used. The motors are thermally protected by an internal protection device that controls the temperature of the windings and deactivates the power supply when necessary.
- molecular sieve filter drier
- thermostatic valve
- liquid indicator
- liquid interception solenoid valve
- Schrader valves for inspection and/or maintenance
- Heat exchange coils with surface treatment for greater resistance to corrosive atmosphere
- copper pipe and aluminium fin

VENTILATION

The fans are radial with reverse blades, directly coupled to the permanent magnet brushless motor, thereby ensuring reduced consumption and sound power emission.

This solution allows installing the ACF (automatic control flow) option, which permits the self-calibration of the unit to the set air flow rate without the need for manual adjustment through dampers, always maintaining the design flow rate.

STRUCTURE

The unit has a unique design that gives the assembly a pleasant aesthetic as well as ensure complete inaccessibility, with closed unit, to all components: this aspect, together with the use of high quality equipment, reduces the level of emitted sound power, to exceptionally low levels.

Most panels can be removed for complete access to the unit. Access to filters, fans, compressor compartment and recuperator is required for routine maintenance. Access is facilitated by removable panels that enable working completely free of obstacles.

All screws and fastening systems are made with non-oxidising materials, stainless steel or carbon steel with surface passivation treatments.

The components distribution guarantees easy access and the lay-out an optimum distribution of the weights on the unit plan.

SERIES

You can choose from a range of 13 models, classified according to the frame and dehumidification yield:

FRAME 2

0130	0160	0190
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FRAME 3

0210	0260	0300
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FRAME 4

0350	0450	0580
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FRAME 5

0750	0950
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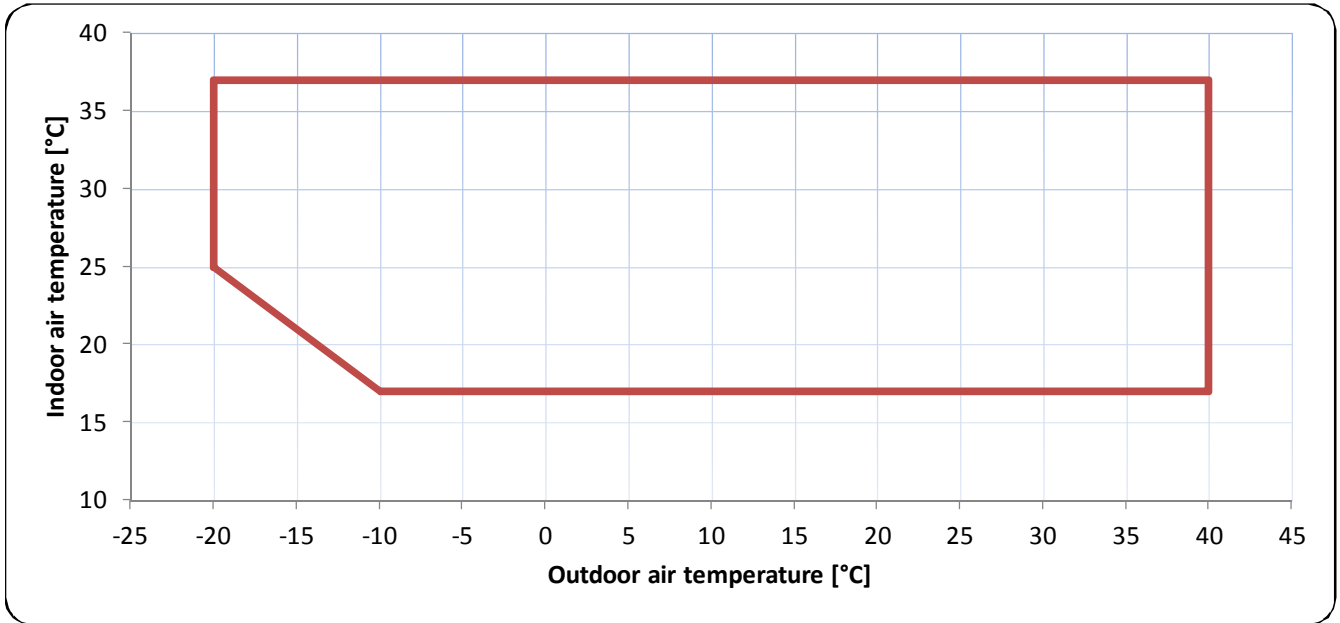
FRAME 6

1100	1400
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Units of the same frame have the same external dimensions.
The numerical value is indicative of the dehumidification ability in litres/day.

OPERATION LIMITS

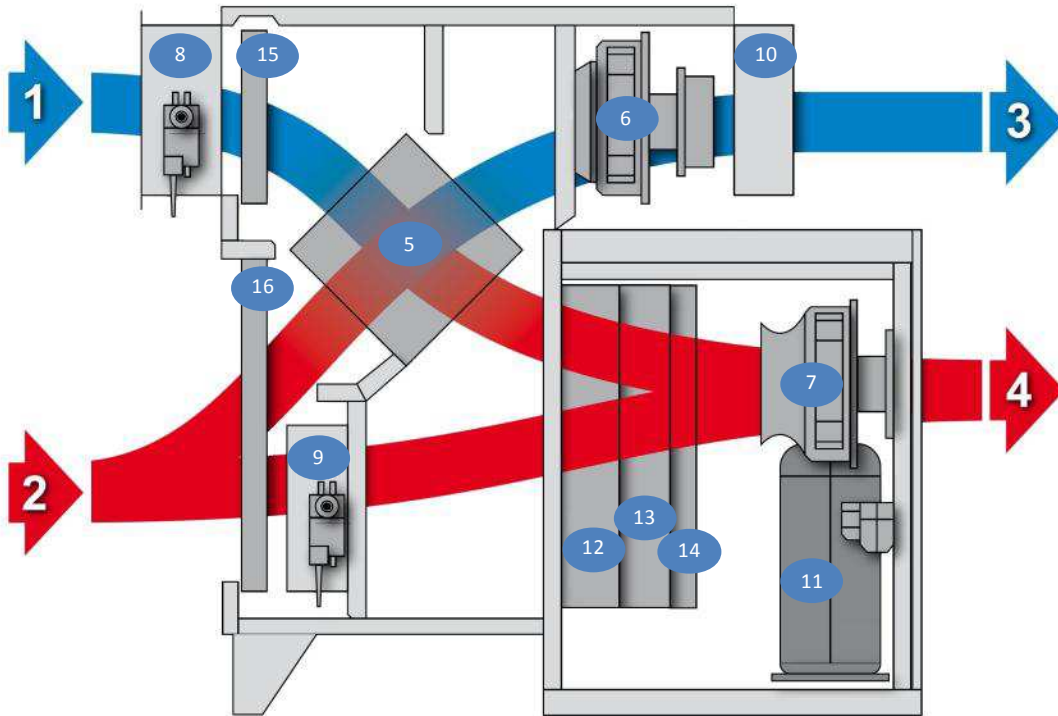
Machine functioning is not guaranteed outside the above-stated limits



AIR FLOWS

The SPR range dehumidifiers are designed to dehumidify, heat and renew air (recovering heat from the expelled air) from ambients.

APPLIANCE LAYOUT DIAGRAM



1. Air intake from outdoors
2. Air intake from the environment
3. Exhaust air expelled outside
4. Exchanged air flow in the environment
5. High efficiency cross-flow heat recovery
6. Exhaust air intake fan
7. Air flow fan
8. External air intake damper
9. Environment air recirculation damper
10. Gravity expulsion air damper
11. Compressor
12. Evaporator coil
13. Condenser coil
14. Water reheat coil (optional)
15. External fresh air filter
16. Indoor recirculation air filter

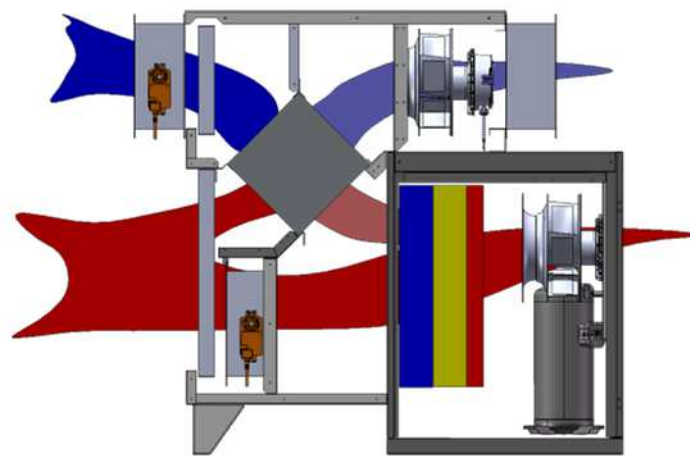
The SPR units can renew ambient air up to a maximum of 75% of the machine nominal flow rate. The fresh air value must be specified when ordering. The manufacturer will calibrate the damper and intake fan to respect the wanted fresh air value.

Below is an illustration of the operational principle in winter mode, highlighting the air flows and the heat exchange with heat recuperator:

RECIRCULATION AND EXCHANGE

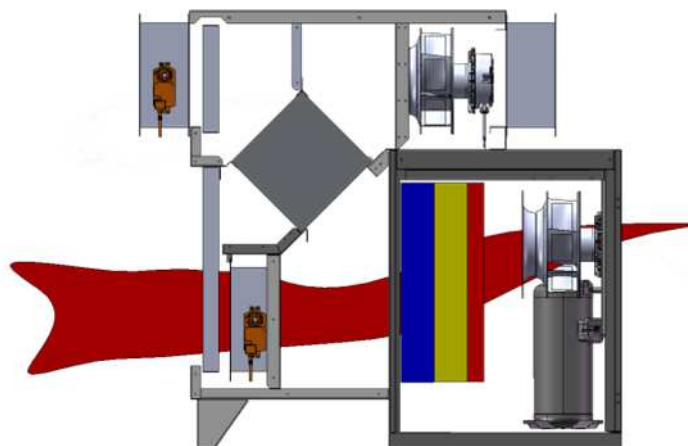
In this case the recirculation damper is opened partially, the intake fan is turned on and the air flow is dehumidified and exchanged.

The outdoor air sucked by the recirculation fan, passes through the damper before being cleaned by the filter. The lower part of the ambient air sucked by both fans, enters the recovery section through a filter and is divided into two directions: one part passes through the calibration damper and continues up to the dehumidify and reheat coils, while the other part (sucked by intake fan) passes through the recuperator before being expelled through the damper. Both air flows reverse their temperature as they pass through the recuperator. In fact, it is the cold air flow that absorbs heat from the hot air flow, and this phenomenon is proportional to the degree of efficiency of the heat recuperator that throughout the SPR range, is always very high, normally around 85%. It follows that the outside air destined to renew air is heated when it enters the machine and passes through the recuperator, while the internal part of the air destined for expulsion, cools generating significant energy savings for ambient heating/air conditioning. All air intended for the ambient is filtered, dehumidified and heated, if required.



RECIRCULATION ONLY

In this case the recirculation shutter is opened fully, the air intake fan shut off and the air flow will only be dehumidified. If wanting to stop air exchange, the intake fan will turn off, the intake damper will close, the recirculation damper will fully open and all the recirculation air sucked by the supply fan will directly transit through the coils



AVAILABLE OPTIONS**ACF: AUTOMATIC CONTROL FLOW**

This option allows setting a constant air flow rate in the unit; in the event of pressure drops along the ducts other than those foreseen by the system designer, the unit will adapt to maintain the set air flow rate, regardless of the shape, length and pressure drop of the duct.

HOT WATER RE-HEAT COIL

It consists of a hot water re-heat coil and its purpose is to heat the supply air through hot water coming from a boiler or a heat pump.

HOT WATER RE-HEAT COIL WITH MODULATING or ON/OFF VALVE

It consists of a hot water reheat coil and a valve and their purpose is to heat the environment through hot water coming from a boiler or a heat pump, tracking a set temperature set on the user command.

DE-SUPER HEATER

It consists of a device able to dissipate the compressor heat load; it is suitable for installations in public or private swimming pools where the pool water requires heating.

DIRTY FILTER SENSOR

It consists of a differential pressure switch, which detects when the filters are clogged and compromise proper unit operation. This means the filters must be cleaned when signalled and not constantly.

SOFT START

It consists in a soft start device for every compressor in order to reduce inrush current upon start-up, following a pre-set ramp.

SERIAL BOARD RS 485

Connection to RS485 bus is made available for unit supervision by remote or by home automation system. (further information available from the technical department).

AIR FILTERS WITH EU4 EFFICIENCY

This type of filter, replacing the polyurethane model in the dehumidifier, increases air purification and holds dust particles more effectively.

CONDENSATE DRAIN PUMP

It consists in a pump that collects and drains the condensate of the dehumidifier. This option is particularly useful when the dehumidifier cannot drain the condensate by gravity (for example when located in a basement). The pump is equipped with a double contact float, which activates it and, if a certain threshold is exceeded, turns the compressors off and sets off the alarm.

CLOCK - TIME SLOTS BOARD

It consists of an additional clock board and a control software that allow the dehumidifier to operate in daily time slots, setting the humidity, temperature, air renewal and on-off values.

STAINLESS STEEL STRUCTURE

All units can be equipped with stainless steel structure.

ELECTRIC COILS

It consists of multi-stage electric coils and allows heating the supply air when hot water is not available. Safety is ensured by a thermostat, which, in the event of overheating, immediately switches the coils off and sets off an alarm.

WALL REMOTE TERMINAL

It consists of an outdoor device to be fitted on the wall that controls all dehumidifier functions. The electronic control on the machine and the remote terminal are identical from a dimensional, aesthetic and electronic (hardware) point of view.

OUTDOOR VERSION

Thanks to specific modifications to the carpentry and electronics, the unit can be installed outdoors without inserting it in a specific technical room.

PRESSURE GAUGES

All units can be equipped with high and low pressure gauges for every refrigerant circuit. They immediately show the pressure levels in the refrigerant circuit.

SUMMER/WINTER FUNCTION

The summer/winter function allows heating with hot water in the winter and cool with cold water in the summer.

This option must be combined with [hot water reheat coil with modulating valve].

TECHNICAL DATA
INTRODUCTION
POWER SUPPLY TOLERANCES

230V / 1~+N / 50Hz → +/- 10%
 400V / 3~+N / 50Hz → +/- 10%

STORAGE LIMITS

TEMPERATURE → -10 ÷ +43 °C
 HUMIDITY → 90 % rh

TECHNICAL DATA TABLES
FRAME 2

MODEL		130	160	190
<i>Compressor</i>	type	rotating		scroll
<i>Refrigeration circuits</i>	No.	1		
<i>Refrigerant</i>	type	R410A		
<i>Dehumidification power</i>	L/24h	128	157	190
<i>Recuperator efficiency in winter</i>	%	70		
<i>Recovery heat output in winter</i>	W	8700	11600	
<i>Nominal absorbed power</i>	kW	1.5	2.4	3.7
<i>Nominal absorbed current</i>	A	7	11	18
<i>Maximum absorbed power</i>	kW	3.2	4.3	6
<i>Maximum absorbed current</i>	A	14	19	27
<i>Inrush current</i>	A	43	68	103
<i>Power supply</i>	V / Ph / Hz	230/1~+N/50		
<i>Hot water coil heat output</i>	kW	9.8		
<i>Water coil nominal capacity</i>	m³/h	0.84		
<i>Water pressure drop</i>	kPa	38		
<i>Air flow fan</i>	No.	1		
<i>Air expulsion fan</i>	No.	1		
<i>Recirculation air flow rate</i>	m³/h	1200	1600	
<i>Intake air flow rate</i>	m³/h	0 – 1200		
<i>Recirculation static pressure</i>	Pa	400	350	
<i>Intake static pressure</i>	Pa	400		
<i>Maximum allowable pressure high pressure side (PS)</i>	bar-r	42		
<i>Dimensions (base x depth x height)</i>	mm	550 x 1452 x 1320		
<i>Unladen weight</i>	Kg	155	160	165

FRAME 3

<i>MODEL</i>		<i>210</i>	<i>260</i>	<i>300</i>
<i>Compressor</i>	<i>type</i>	scroll		
<i>Refrigeration circuits</i>	<i>No.</i>	1		
<i>Refrigerant</i>	<i>type</i>	R410A		
<i>Dehumidification power</i>	<i>L/24h</i>	210	268	302
<i>Recuperator efficiency in winter</i>	<i>%</i>	70		
<i>Recovery heat output in winter</i>	<i>W</i>	14500	20350	
<i>Nominal absorbed power</i>	<i>kW</i>	3.7	4.8	5
<i>Nominal absorbed current</i>	<i>A</i>	6	8	8
<i>Maximum absorbed power</i>	<i>kW</i>	6.5	7.7	7.9
<i>Maximum absorbed current</i>	<i>A</i>	10	12	13
<i>Inrush current</i>	<i>A</i>	51	66	66
<i>Power supply</i>	<i>V / Ph / Hz</i>	400 / 3~+N / 50		
<i>Hot water coil heat output</i>	<i>kW</i>	16.5	17	
<i>Water coil nominal capacity</i>	<i>m³/h</i>	1.42	1.46	
<i>Water pressure drop</i>	<i>kPa</i>	30	31	
<i>Air flow fan</i>	<i>No.</i>	1		
<i>Air expulsion fan</i>	<i>No.</i>	1		
<i>Recirculation air flow rate</i>	<i>m³/h</i>	2000	2800	
<i>Intake air flow rate</i>	<i>m³/h</i>	0 - 2000		
<i>Recirculation static pressure</i>	<i>Pa</i>	400	200	
<i>Intake static pressure</i>	<i>Pa</i>	430	400	
<i>Maximum allowable pressure high pressure side (PS)</i>	<i>bar-r</i>	42		
<i>Dimensions (base x depth x height)</i>	<i>mm</i>	850 x 1452 x 1320		
<i>Unladen weight</i>	<i>Kg</i>	200	210	220

The dehumidifying capacity is declared in 30°C nominal point at 80% RH net of the contribution of fresh air.

Current and power consumption are declared in 30°C nominal point at 80% UR and air renewal at 30%.

The efficiency of heat recovery is declared in wintry conditions outside air -5° C/80% UR, indoor air 26° C/60% UR, maximum air exchange. With lower air exchange, the efficiency of heat recovery increases.

The recovered heat output is declared with maximum air exchange.

The power absorbed by the circulation fan is declared with nominal air flow and useful 50 Pa

The power absorbed by the intake fan is declared with 30% air exchange and useful 50 Pa

The hot water coil capacity is declared with 30°C environment temperature and water 80/70°C

The exchanged air flow is set at the factory and is defined when the order is made

The static pressure of the circulation fan is declared at nominal flow

The static pressure of the intake fan is declared with a 30% air exchange

FRAME 4

MODEL		350	450	580
Compressor	type	scroll		
Refrigeration circuits	No.	1		
Refrigerant	type	R410A		
Dehumidification power	L/24h	358	452	581
Recuperator efficiency in winter	%	70		
Recovery heat output in winter	W	27500	29000	35000
Nominal absorbed power	kW	4.8	5.7	8.7
Nominal absorbed current	A	8	10	15
Maximum absorbed power	kW	9.6	11.2	14.4
Maximum absorbed current	A	15	17	23
Inrush current	A	68	71	101
Power supply	V / Ph / Hz	400 / 3~+N / 50		
Hot water coil heat output	kW	26.5		27
Water coil nominal capacity	m³/h	2.28		2.32
Water pressure drop	kPa	40		
Air flow fan	No.	1		
Air expulsion fan	No.	1		
Recirculation air flow rate	m³/h	3800	4000	4800
Intake air flow rate	m³/h	0 - 2000		
Recirculation static pressure	Pa	460	440	400
Intake static pressure	Pa	500	480	420
Maximum allowable pressure high pressure side (PS)	bar-r	42		
Dimensions (base x depth x height)	mm	850 x 1682 x 1769		
Unladen weight	Kg	250	270	300

The dehumidifying capacity is declared in 30°C nominal point at 80% RH net of the contribution of fresh air.

Current and power consumption are declared in 30°C nominal point at 80% UR and air renewal at 30%.

The efficiency of heat recovery is declared in wintry conditions outside air -5° C/80% UR, indoor air 26° C/60% UR, maximum air exchange. With lower air exchange, the efficiency of heat recovery increases.

The recovered heat output is declared with maximum air exchange.

The power absorbed by the circulation fan is declared with nominal air flow and useful 50 Pa

The power absorbed by the intake fan is declared with 30% air exchange and useful 50 Pa

The hot water coil capacity is declared with 30°C environment temperature and water 80/70°C

The exchanged air flow is set at the factory and is defined when the order is made

The static pressure of the circulation fan is declared at nominal flow

The static pressure of the intake fan is declared with a 30% air exchange

FRAME 5

MODEL		750	950
<i>Compressor</i>	type	scroll	
<i>Refrigeration circuits</i>	No.	1	
<i>Refrigerant</i>	type	R410A	
<i>Dehumidification power</i>	L/24h	760	955
<i>Recuperator efficiency in winter</i>	%	70	
<i>Recovery heat output in winter</i>	W	51000	60000
<i>Nominal absorbed power</i>	kW	9.9	13.2
<i>Nominal absorbed current</i>	A	18	24
<i>Maximum absorbed power</i>	kW	19	22.7
<i>Maximum absorbed current</i>	A	31	37
<i>Inrush current</i>	A	155	205
<i>Power supply</i>	V / Ph / Hz	400 / 3~+N / 50	
<i>Hot water coil heat output</i>	kW	48	55
<i>Water coil nominal capacity</i>	m³/h	4.13	4.73
<i>Water pressure drop</i>	kPa	36	38
<i>Air flow fan</i>	No.	2	
<i>Air expulsion fan</i>	No.	1	
<i>Recirculation air flow rate</i>	m³/h	7000	8200
<i>Intake air flow rate</i>	m³/h	0 - 6000	
<i>Recirculation static pressure</i>	Pa	650	600
<i>Intake static pressure</i>	Pa	480	450
<i>Maximum allowable pressure high pressure side (PS)</i>	bar-r	42	
<i>Dimensions (base x depth x height)</i>	mm	1400 x 2331 x 1950	
<i>Unladen weight</i>	Kg	350	400

The dehumidifying capacity is declared in 30°C nominal point at 80% RH net of the contribution of fresh air.

Current and power consumption are declared in 30°C nominal point at 80% UR and air renewal at 30%.

The efficiency of heat recovery is declared in wintry conditions outside air -5° C/80% UR, indoor air 26° C/60% UR, maximum air exchange. With lower air exchange, the efficiency of heat recovery increases.

The recovered heat output is declared with maximum air exchange.

The power absorbed by the circulation fan is declared with nominal air flow and useful 50 Pa

The power absorbed by the intake fan is declared with 30% air exchange and useful 50 Pa

The hot water coil capacity is declared with 30°C environment temperature and water 80/70°C

The exchanged air flow is set at the factory and is defined when the order is made

The static pressure of the circulation fan is declared at nominal flow

The static pressure of the intake fan is declared with a 30% air exchange

FRAME 6

MODEL		1100	1400
Compressor	type	scroll	
Refrigeration circuits	nr	2	
Refrigerant	type	R410A	
Dehumidification power	L/24h	1.120	1.380
Recuperator efficiency in winter	%	70	
Recovery heat output in winter	W	80.000	90.800
Nominal absorbed power	kW	15	18,1
Nominal absorbed current	A	25,5	32
Maximum absorbed power	kW	31	33,4
Maximum absorbed current	A	49	56
Inrush current	A	132	197
Power supply	V / Ph / Hz	400 / 3~+N / 50	
Hot water coil heat output	kW	76	83
Water coil nominal capacity	m³/h	6,53	7,13
Water pressure drop	kPa	47	55
Air flow fan	nr	2	
Air expulsion fan	nr	2	
Recirculation air flow rate	m³/h	11.000	12.500
Intake air flow rate	m³/h	0 / 11.000	0 / 12.500
Recirculation static pressure	Pa	750	600
Intake static pressure	Pa	1050	950
Maximum allowable pressure high pressure side (PS)	bar-r	42	
Dimensions (base x depth x height)	mm	2700 x 1950 x 2340	
Unladen weight	Kg	870	1060

The dehumidifying capacity is declared in 30°C nominal point at 80% RH net of the contribution of fresh air.

Current and power consumption are declared in 30°C nominal point at 80% UR and air renewal at 30%.

The efficiency of heat recovery is declared in wintry conditions outside air -5° C/80% UR, indoor air 26° C/60% UR, maximum air exchange. With lower air exchange, the efficiency of heat recovery increases.

The recovered heat output is declared with maximum air exchange.

The power absorbed by the circulation fan is declared with nominal air flow and useful 50 Pa

The power absorbed by the intake fan is declared with 30% air exchange and useful 50 Pa

The hot water coil capacity is declared with 30°C environment temperature and water 80/70°C

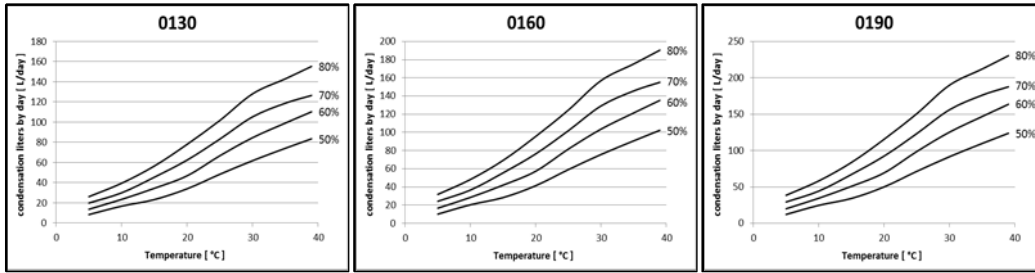
The exchanged air flow is set at the factory and is defined when the order is made

The static pressure of the circulation fan is declared at nominal flow

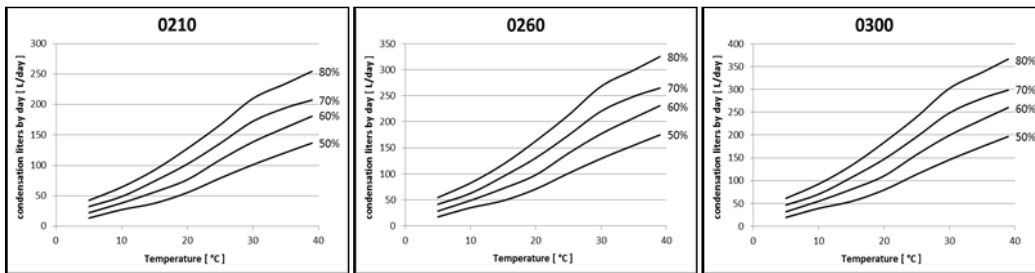
The static pressure of the intake fan is declared with a 30% air exchange

YIELD CURVES

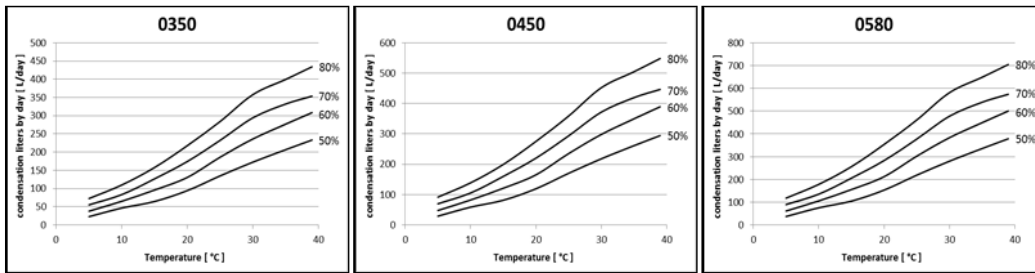
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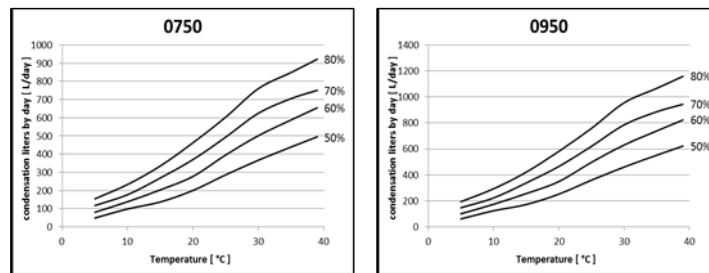
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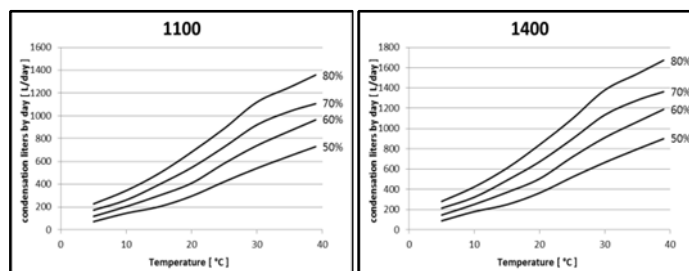
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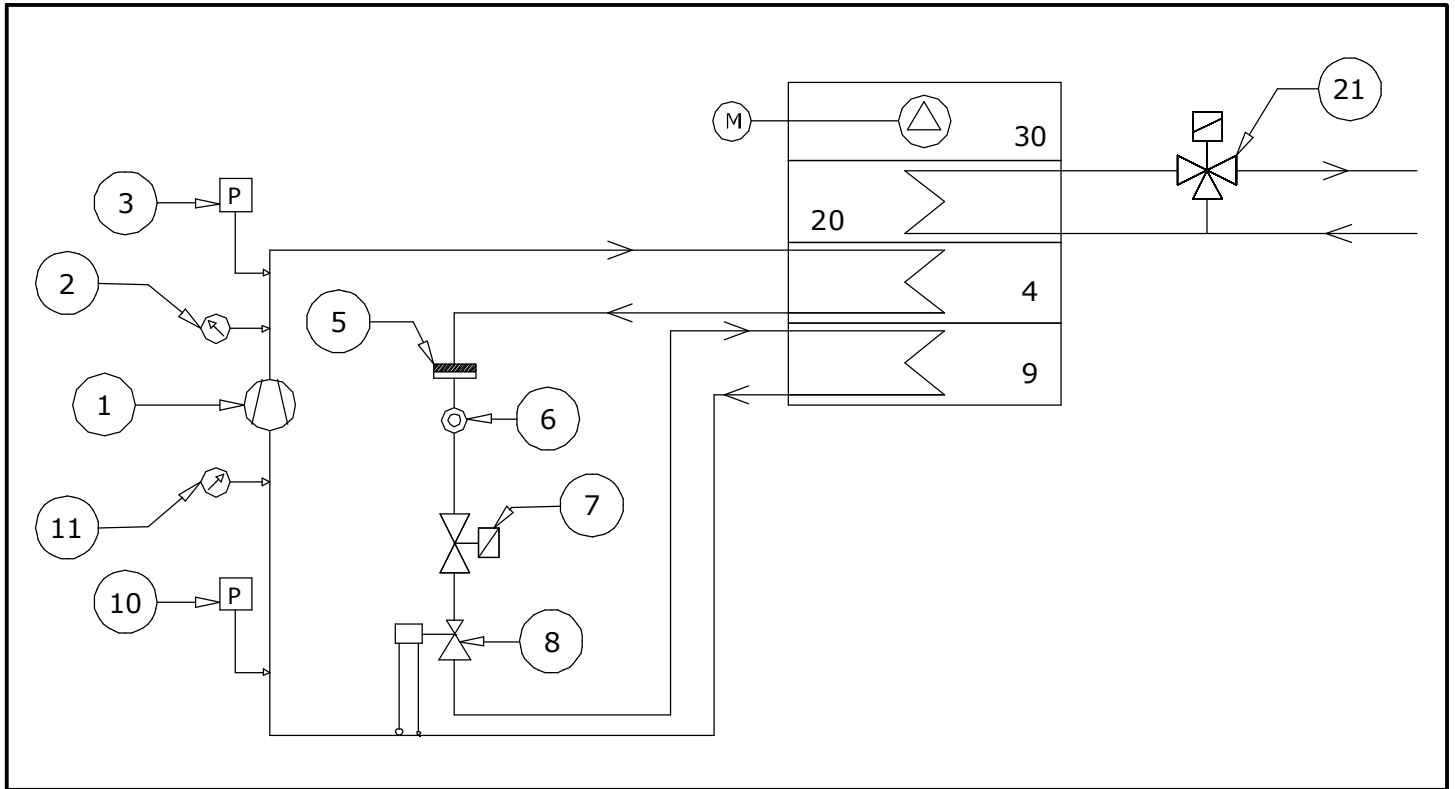
FRAME 5



FRAME 6



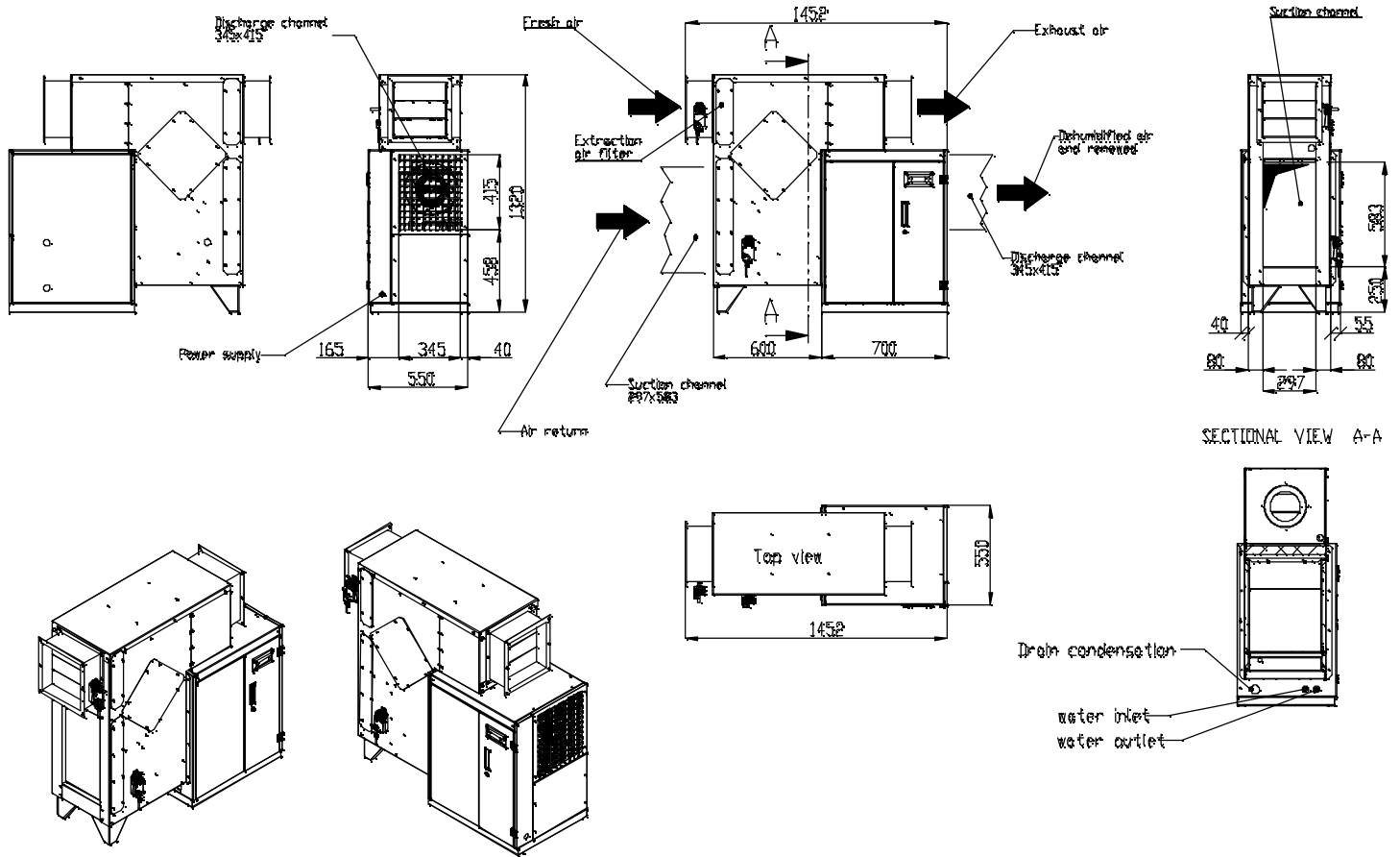
FUNCTIONAL DIAGRAM



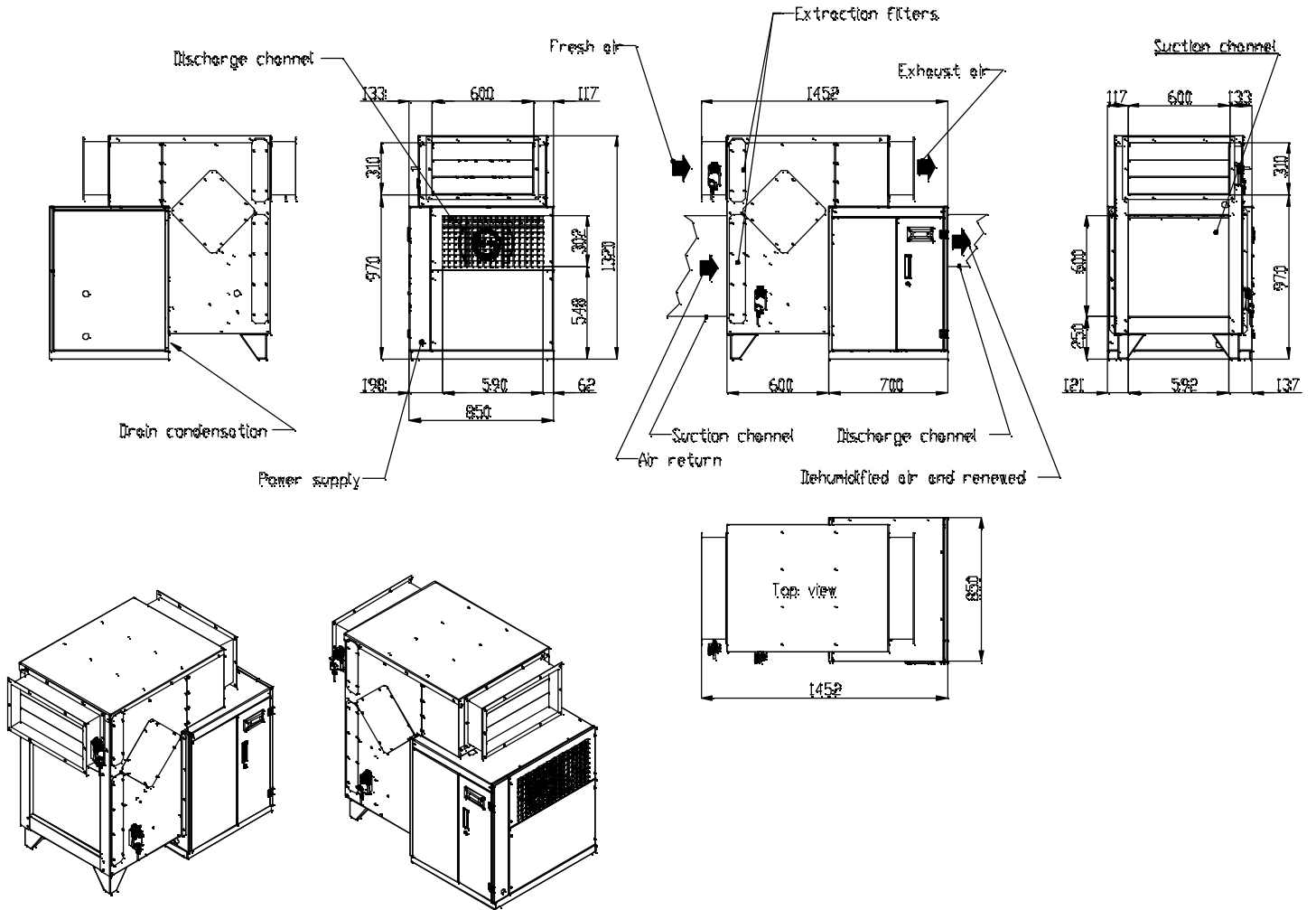
- 1 compressor
- 2 high pressure pressure gauge
- 3 high pressure pressure switch
- 4 condensation coil
- 5 dehydrating filter
- 6 flow indicator
- 7 solenoid valve
- 8 thermostatic valve
- 9 evaporator coil
- 10 low pressure pressure switch
- 11 low pressure pressure gauge
- 20 water reheat coil [optional]
- 21 3-way water valve [optional]
- 30 fan/fans

OVERALL DRAWINGS

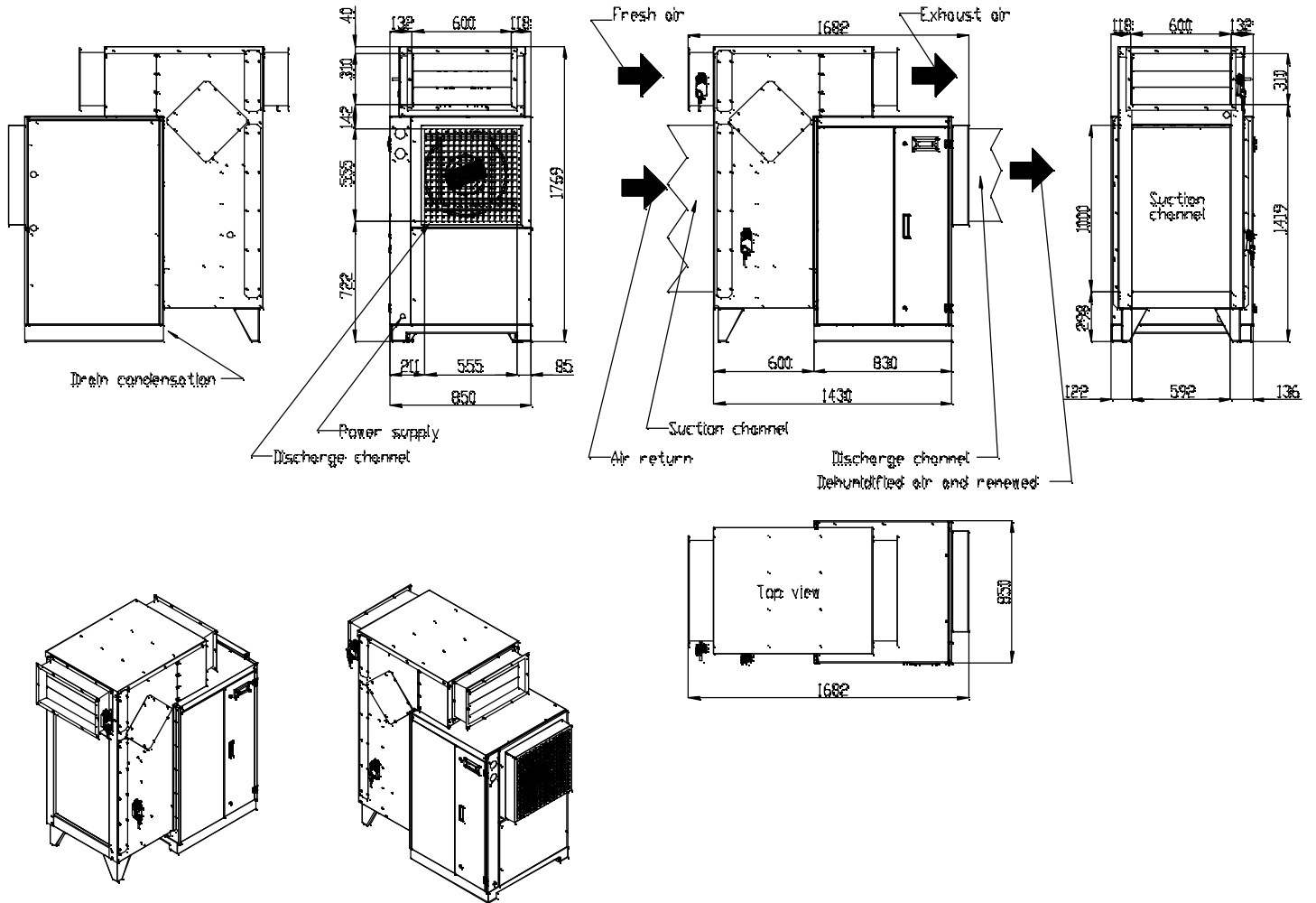
FRAME 2



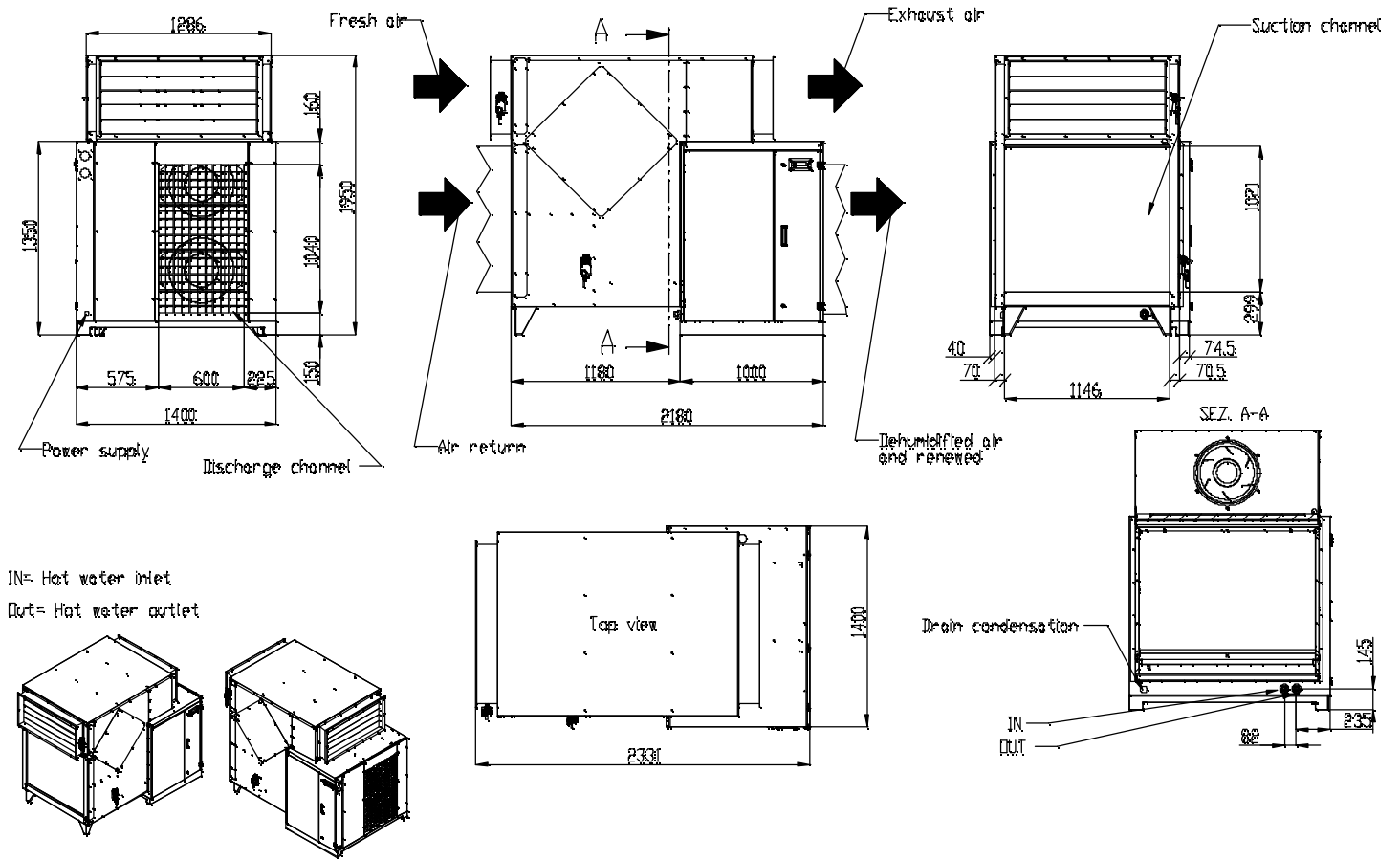
FRAME 3



FRAME 4



FRAME 5



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