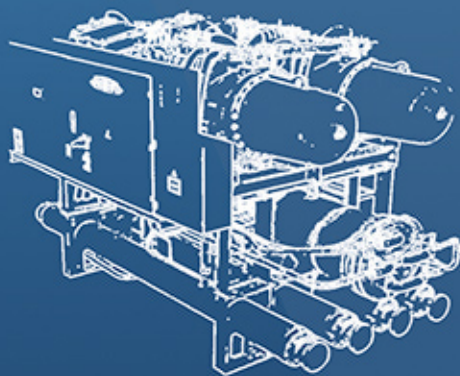




**WATER TO WATER
CHILLERS
FROM 5 KW TO 1000 KW
HYDRA WR**



HYDRA WR

WATER TO WATER CHILLERS
FROM 5 KW TO 1000 KW



General Features

Water to water chiller units for indoor installation. They are projected to obtain a noiseless efficient and reliable working, easy to install and of reduced maintenance. All the units are completed tested before their delivery

Technical Features

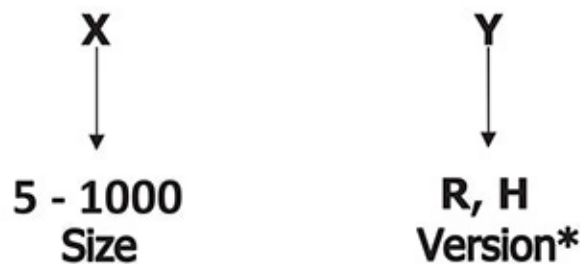
- **Frame:** Self-supporting frame made by carbon steel profiles. Steel screws and bolts.
- **A/C water heat exchanger:** Shell and tube type heat exchanger, made of a carbon steel shell, copper exchanger pipes SFCu DIN 1787 with two independents circuits, brass baffle plates, steel screws. The exchanger is covered externally by insulating material to prevent the formation of condensate and the heat exchange with the environment. Antifreeze protection is constituted by outlet water temperature probe and differential water pressure device.
- **Cold source water exchanger SF:** water cooled condenser are shell and tube type with water flowing through the tubes and refrigerant in the shell. Each condenser is constructed with carbon steel shell and copper tubes with integral fins. Tubes plates are carbon steel.
- **Refrigerant circuit:** made of pickled copper, it includes lamination device, dehydrator filter, high and low pressure switches, sight glass, service connections, liquid line shut off faucet and solenoid valve, inversion valve, no return valves, liquid receiver and separator.
- **Compressors:** compact screw type, three phase, double rotors, completed with crankcase heater and internal electric thermo protection, optimized for application with water cooled (Vi=2,3). Suction and discharge shut off valves standard. Capacity control standard is 3 steps, optional continuous 33-100%. Motor starting is part winding or star delta type according to the compressor size.
- **Electrical board:** it includes automatic main circuit breaker, automatic compressors switches, compressor contactors, automatic auxiliaries switch, electrical terminal interface. All wires and terminals are identified. In agreement with standard EN60204.
- **Microprocessor:** it controls automatically the regulation of the water temperature, the compressor timing and the alarms. It visualizes on the display the running condition of the unit, the plant return and delivery water temperature, and the alarms code.
- **Pressure differential detector water side:** it works as flow control, it operate when water flow reach the minimum level.
- **Electronic expansion valve:** for the condensed refrigerant rolling. In comparison with the thermostatic valve it enables fast response time according to the load variation by enhancing the unit performances.

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Model Number Nomenclature

HYDRA W



*

Only cooling

Heat pump



Main components

Compressor: They are rotary blades type on the smaller sizes, scroll or semi-hermetic screw on the bigger.



Water-refrigerant heat exchanger: plates, shell & tubes type.



Microprocessor: it controls all device functions.



Pressure differential detector water side: it works as flow control, it operate when water flow reach the minimum level.



Expansion valve: thermostatic on smaller sizes, electronic on bigger sizes.



Accessories

Compressors soft starters: enables the gradual start of compressors by limiting the initial starting current.

Control system and remote assistance: it allows the assistance and the unit control by means of web browser. Web server remote connection through corporate network. In case of alarm an alert can be sent via SMS or e-mail. For simultaneous control till 6 or 18 units.



Capacitor bank for compressor: the tools brings the consumption of the unit to $\cos\phi=0,95$ by decreasing the absorbed reactive power

Refrigerant gauges: installed on the unit, they show the operative pressures of the cooling circuit on high and low pressure side.



Compressor faucet valves: they isolate the compressors from the cooling circuit by enhancing the maintenance operations.



De-superheaters: permits to recover till 25% of condensing heating for other purposes.



Total heat recovery: heat exchanger that allows the condensation heat recovery for others uses.



Pump kit: it gives to the water the pressure head necessary to pass through the hydraulic circuit and reach the terminals, to assemble.



Accessories

Complete Hydraulic kit

installed on separate units (see UP technical data).

Pump: it gives to the water the pressure head necessary to pass through the hydraulic circuit and reach the terminals. **Tank:** made in high-quality carbon steel, insulated with injected rigid polyurethane with low thermal conductivity to minimize dispersions.



Expansion vessel: absorbs liquid volume variations caused by working temperature variations. In epoxy powder coated steel, long-lasting duration with steady membrane made in SBR rubber.



Inlet water filter: retains impurities of the water circuit which can damage the pumping unit and the exchanger.



Flow switch: mounted on the exit of the exchanger (user side) detects the water flow lack by an alarm to the control system.



See water condenser: conceived for see water as cooling fluid. Composed by heads, tube plates and coated in carbon steel with water see resistant covering, pipes in CuNi 90/10 alloy

Stepless: compressor capacity with continuous control instead of step regulation.

Rubber anti-vibration dampers: they reduce the vibrations transmission produced by the device.



Spring anti-vibration dampers: they are more effective than rubber dampers, reduce the vibrations transmission produced by the device.



Heat pump version: the unit works to produce warm water by mean of an external water source.

Reversible unit: the unit can work both as chiller or heat pump thanks to the inversion on the inlet side water of AC water circuits and source water.

HT version: the unit produces water at high temperature using screw compressors suitable for high pressures condensation ($V_i=3,1$). Capacities are available on selection software according to the working temperatures.

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Technical Features

Model		5	6	8	10m	10	14	18	25	30	35
Cooling Capacity	kW	5,5	6,5	7,5	9,1	9,2	14,1	17,8	25,2	29,3	36,2
Compressors type		Scroll									
Refrigerant type		R410A									
N° circuits/compressors		1/1									
N° capacity steps		1									
A/C Water flow	m ³ /h	0,9	1,1	1,3	1,6	1,6	2,4	3,1	4,3	5,0	6,2
A/C water pressure drops	kPa	31,3	43,0	30,3	43,3	44,2	51,3	38,3	47,5	50,0	47,0
Source water flow	m ³ /h	1,2	1,4	1,6	1,9	1,9	3,0	3,7	5,3	6,1	7,6
Source water pressure drops	kPa	31,3	43,0	30,3	43,3	44,2	51,3	38,3	38,8	42,0	47,0
Nominal absorbed power	kW	2,0	2,2	2,6	2,6	2,6	3,8	4,5	6,5	7,3	8,9
Nominal absorbed current	A	10	11	13	13	5	7	8	12	13	16
Sound Pressure Level ⁽¹⁾	dB(A)	45	45	48	45	45	48	48	51	51	45*
Electrical supply		400/50/3+N+PE									
Shipping weight	kg	140	140	145	145	148	148	155	175	184	260

Model		45	50	60	75	90	100	120	150	180	200
Cooling Capacity	kW	44,4	50,5	58,4	72,5	88,8	101,0	117,0	145,0	178,0	199,4
Compressors type		Scroll									
Refrigerant type		R410A									
N° circuits/compressors		1/1	2/1				4/2				
N° capacity steps		1	2				4				
A/C Water flow	m ³ /h	7,6	8,7	10,0	12,5	15,3	17,3	20,0	24,8	30,5	34,2
A/C water pressure drops	kPa	40,0	51,4	68,0	23,3	31,4	36,5	38,6	46,2	50,3	52,9
Source water flow	m ³ /h	9,3	10,6	12,3	15,2	18,7	20,7	24,1	29,1	35,5	41,3
Source water pressure drops	kPa	40,0	51,4	68,0	23,3	31,4	36,5	38,6	46,2	48,8	49,6
Nominal absorbed power	kW	11,2	12,6	14,4	17,9	21,9	25,0	28,6	35,6	44,1	45,7
Nominal absorbed current	A	20,0	23,0	26,0	32,0	39,0	50,7	57,7	65,3	79,6	81,6
Sound Pressure Level ⁽¹⁾	dB(A)	45*	46*	52*	52*	53*	55*	55*	56*	56*	56*
Electrical supply		400/50/3+N+PE									
Shipping weight	kg	320	360	420	520	630	720	730	1020	1250	1400

Technical Features

Model		250	300	360	400	450	480
Cooling Capacity	kW	257,2	301,5	353,6	402,1	449,9	483,6
Compressors type		Screw					
Refrigerant type		R134a					
N° circuits/compressors		2/2					
N° capacity steps		6					
A/C Water flow	m ³ /h	44.2	51.5	60.8	69.2	77.4	83,02
A/C water pressure drops	kPa	39	34	43	55	50	59
Source water flow	m ³ /h	54,4	63,8	74,0	84,9	95,3	103,4
Source water pressure drops	kPa	27	20	39	50	52	45
Nominal absorbed power	kW	59,2	66,9	86,5	94,6	103,8	113,7
Nominal absorbed current	A	98,4	109,6	141,8	155,2	170,2	188,2
Sound Pressure Level ⁽¹⁾	dB(A)	58*	58*	60*	60*	62*	62*
Electrical supply		400/50/3+N+PE					
Shipping weight	kg	2.200	2.200	2280	2390	2450	2.520

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Model		520	580	650	700	800	900	1000
Cooling Capacity	kW	518,1	584,5	649,5	699,9	783,4	884,3	1001,3
Compressors type		Screw						
Refrigerant type		R134a						
N° circuits/compressors		2/2						
N° capacity steps		6						
A/C Water flow	m ³ /h	100,5	100,5	111,7	120,13	134,8	152,1	172,2
A/C water pressure drops	kPa	42	52	52	46	47	53	54
Source water flow	m ³ /h	108,1	123,0	136,1	148,2	160,9	183,3	207,6
Source water pressure drops	kPa	55	55	47	49	37	46	45
Nominal absorbed power	kW	115,6	121,6	134,8	156,2	187,2	197,8	208,5
Nominal absorbed current	A	189,6	199,4	221,2	259,2	257,2	324,4	360,6
Sound Pressure Level ⁽¹⁾	dB(A)	62*	63*	63*	63*	* 65*	* 65	66
Electrical supply		400/50/3+N+PE						
Shipping weight	kg	2890	3130	3390	3700	3960	4350	4730

References Conditions

Cooling:
 Water source temperature T=30/35°C
 A/C water temperature T=12/7°C

(1) Full sound pressure level measured at 1m from the unit in free field (ISO3744)
 *Full sound pressure level measured at 10m from the unit in free field (ISO3744)

Operation Limits	Cooling		
		Min	Max
*Inlet A/C water temperature	°C	9	23
*Outlet A/C water temperature	°C	4	18
*Source water inlet temperature	°C	10	30
* Without ethylene glycol			
It is prescribed use of pressostatic valve			

Fouling Factor Correction

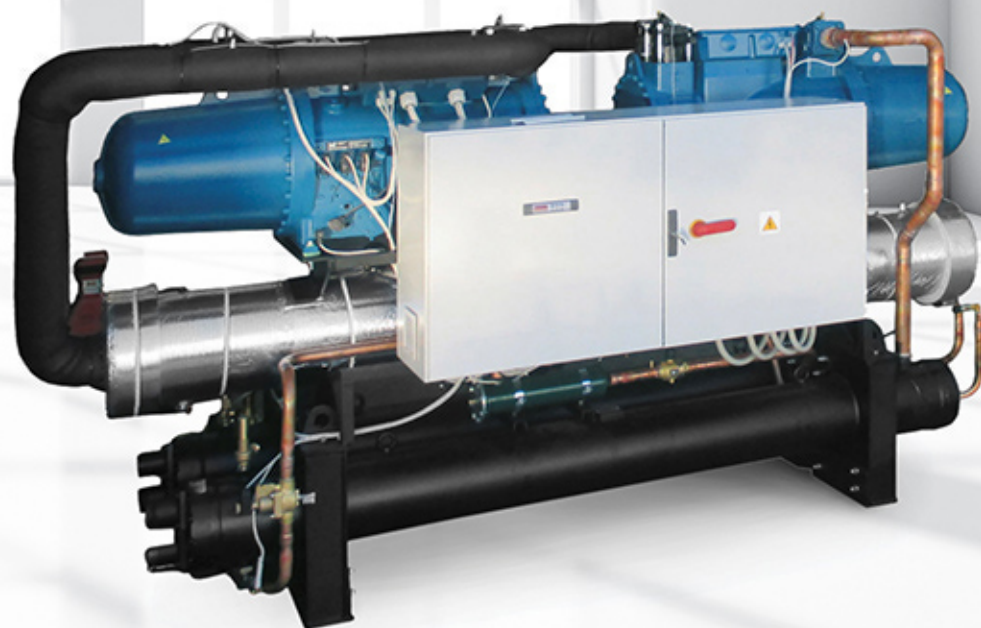
Unit performances reported in the table are given for the condition of clean exchanger (fouling factor=0). For different fouling factors values, unit performances should be corrected with the correction factors shown above.

Evaporator fouling factors (m ² °C/W)	F1	F2
0 (Clean evaporator)	1	1
0.44 x 10 ⁻⁴	0,98	0,99
0.88 x 10 ⁻⁴	0,96	0,99
1.76 x 10 ⁻⁴	0,93	0,98
F1 = capacity correction factors F2 = compressor power input correction factors		

Ethylene glycol percent by weight (%)	10	20	30	40	50
Freezing point	-3.6	-8.7	-15.3	-23.5	-35.5
Cooling capacity corr. Factor	0,986	0,980	0,973	0,966	0,960
Power input corr. Factor	1,000	0,995	0,990	0,985	0,975
Mixture flow corr. Factor	1,023	1,054	1,092	1,140	1,200
Pressure drop corr. Factor	1,061	1,114	1,190	1,244	1,310

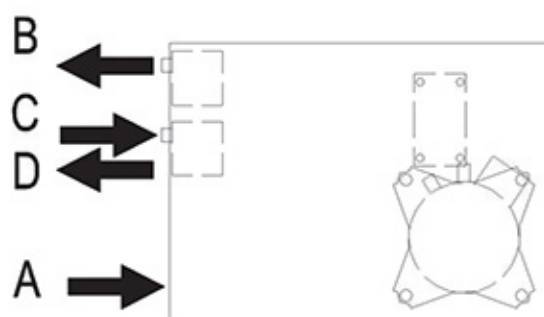
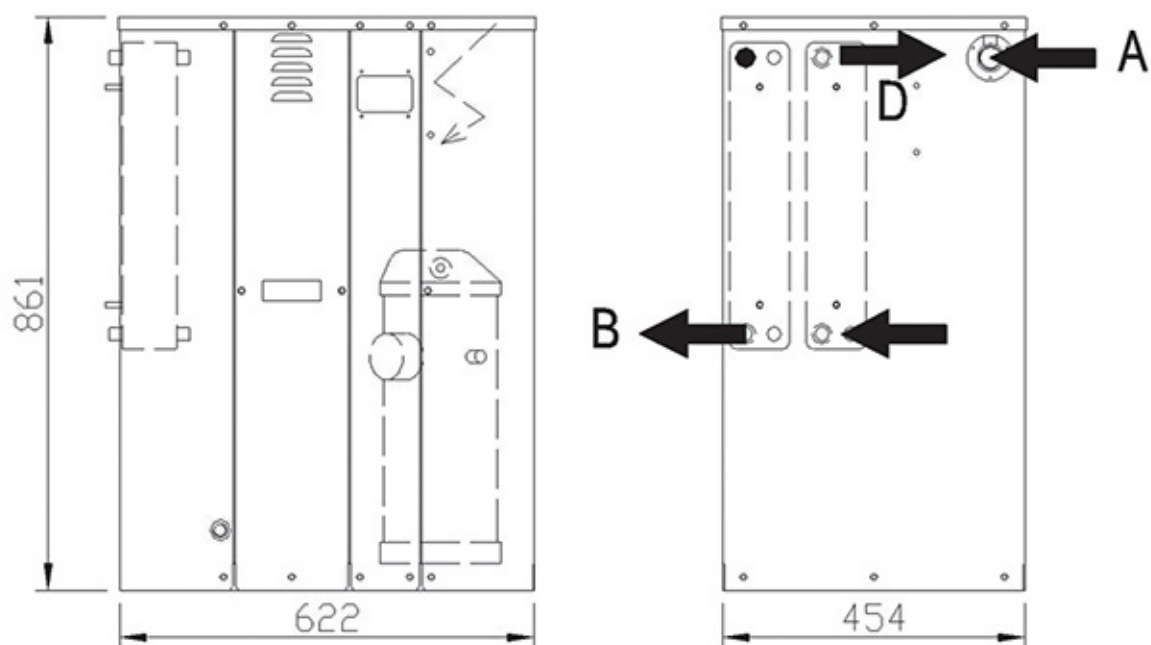
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DIMENSIONAL DRAWING

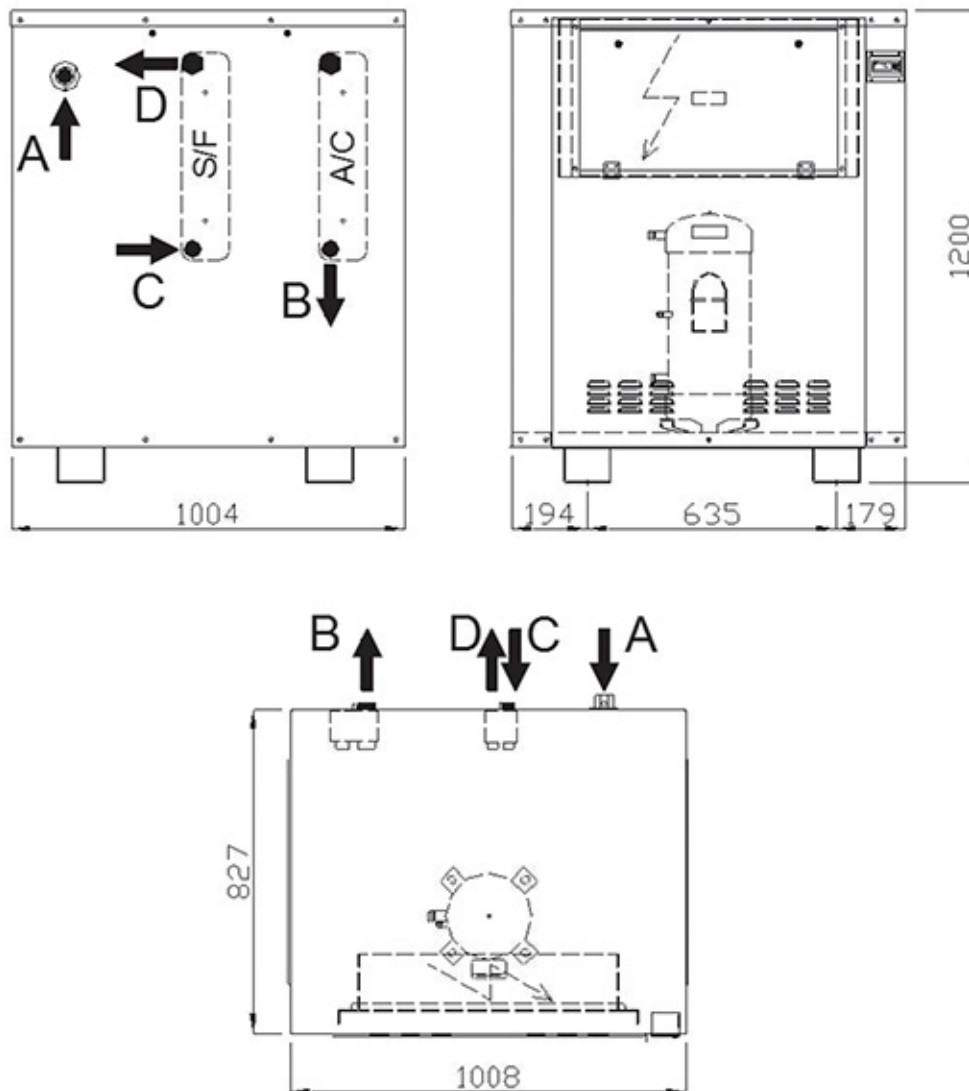
Hydra WR 5-18



A	INLET A/C WATER
B	OUTLET A/C WATER
C	INLET SOURCE WATER 1
D	OUTLET SOURCE WATER 1

DIMENSIONAL DRAWING

Hydra WR 25-45



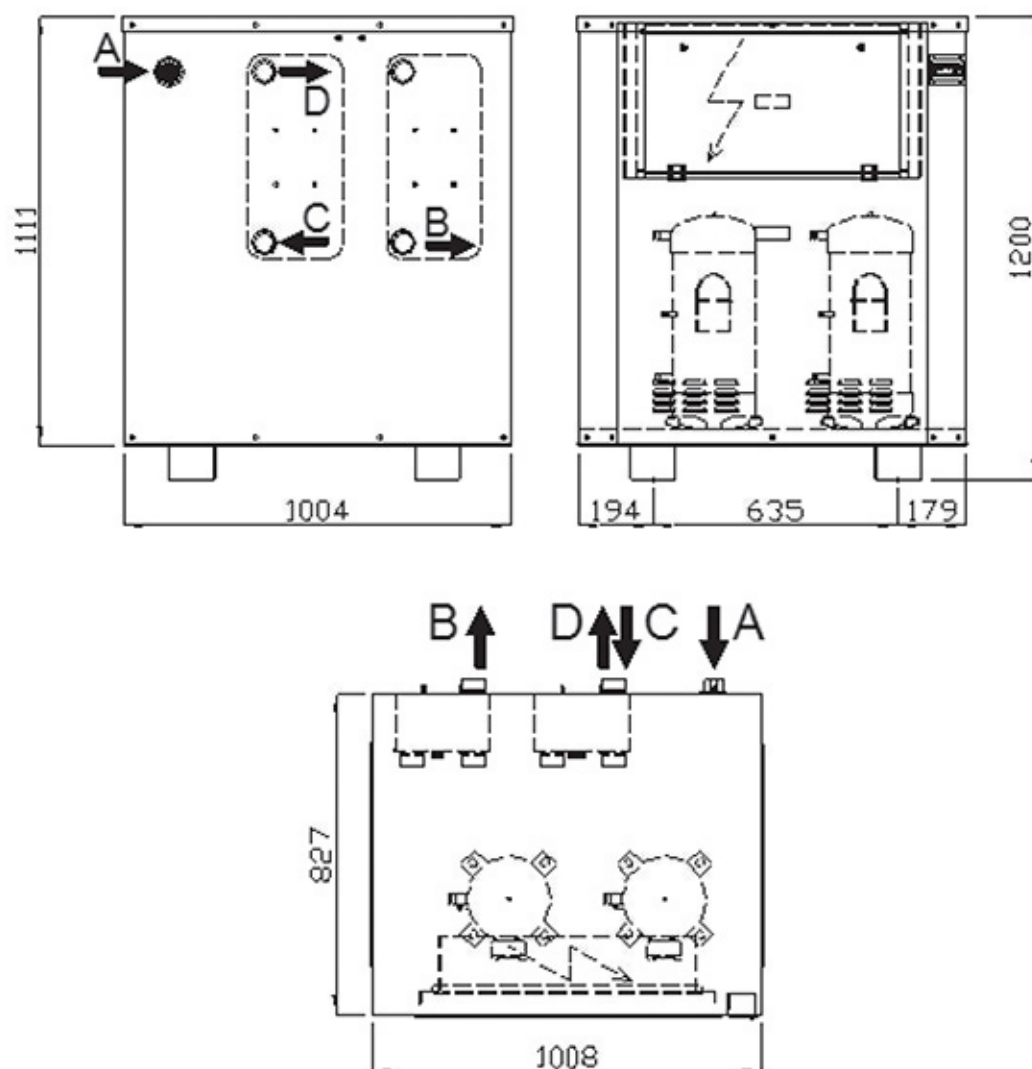
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A	INLET A/C WATER
B	OUTLET A/C WATER
C	INLET SOURCE WATER 1
D	OUTLET SOURCE WATER 1

DIMENSIONAL DRAWING

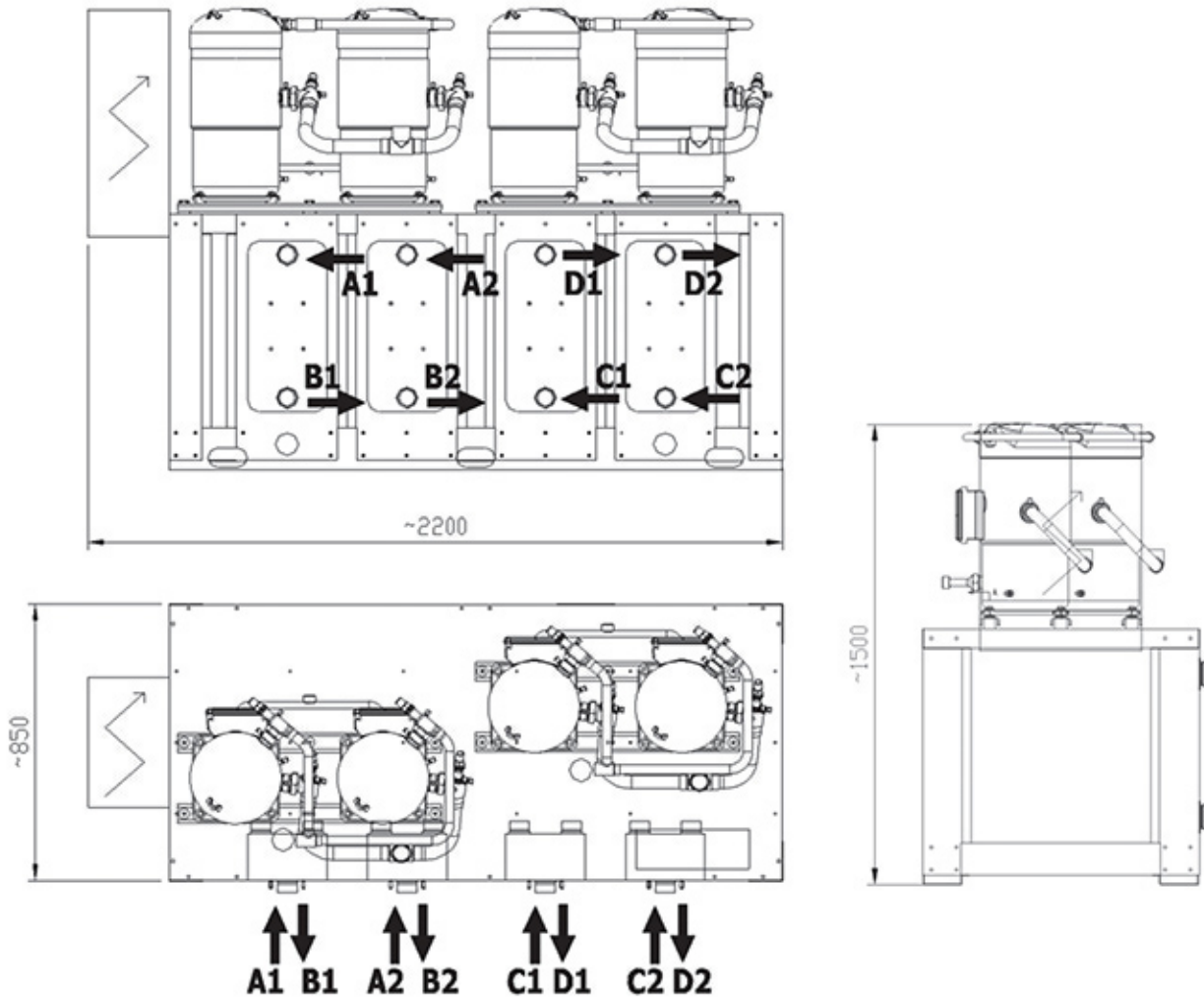
Hydra WR 50-90



A	INLET A/C WATER
B	OUTLET A/C WATER
C	INLET SOURCE WATER 1
D	OUTLET SOURCE WATER 1

DIMENSIONAL DRAWING

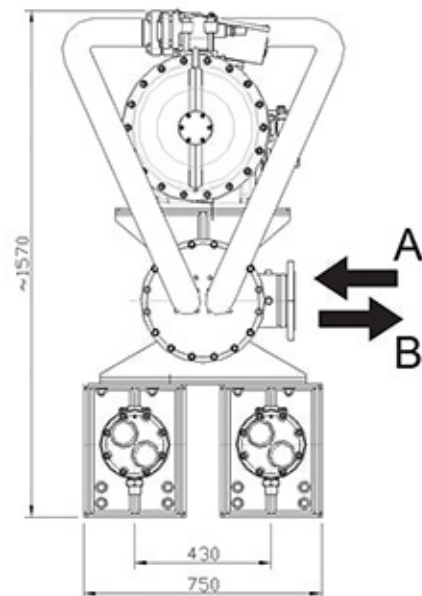
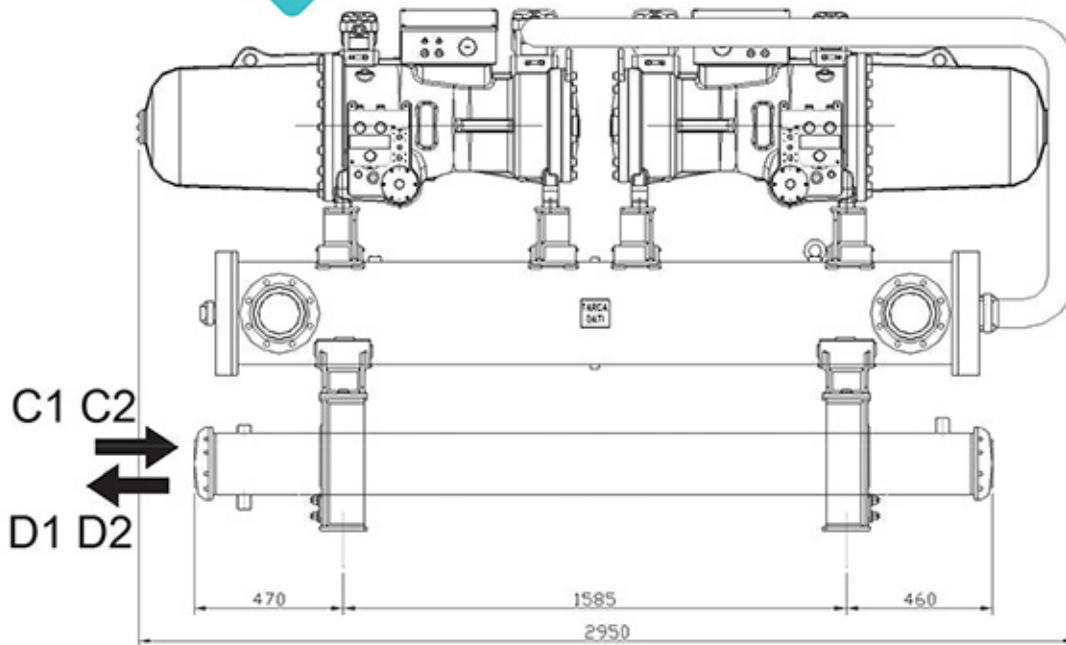
Hydra WR 100-200



A	INLET A/C WATER
B	OUTLET A/C WATER
C	INLET SOURCE WATER 1
D	OUTLET SOURCE WATER 1

DIMENSIONAL DRAWING

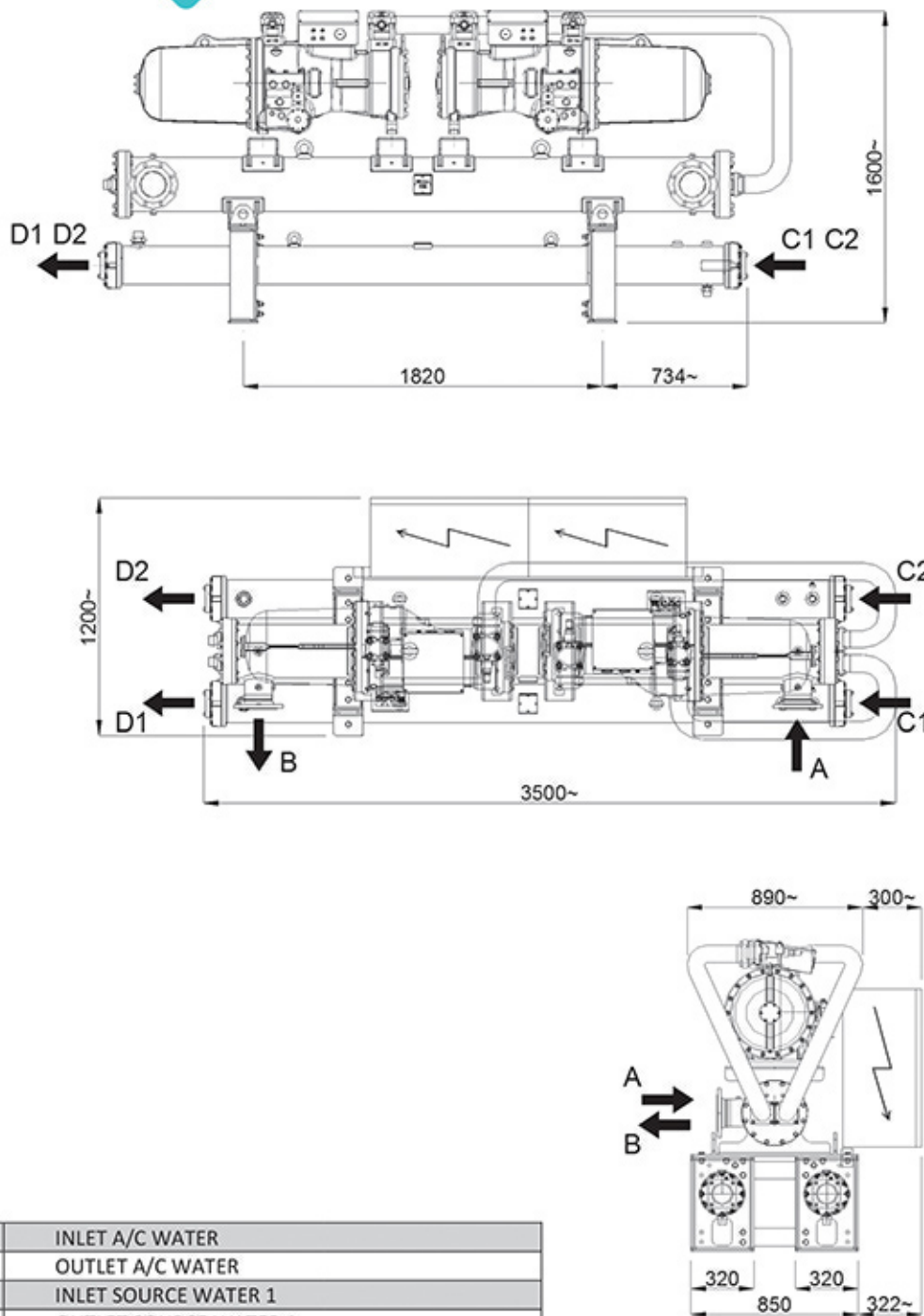
Hydra 250



A	INLET A/C WATER
B	OUTLET A/C WATER
C	INLET SOURCE WATER 1
D	OUTLET SOURCE WATER 1

DIMENSIONAL DRAWING

Hydra 300 - 450



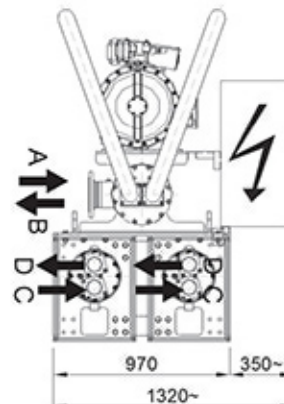
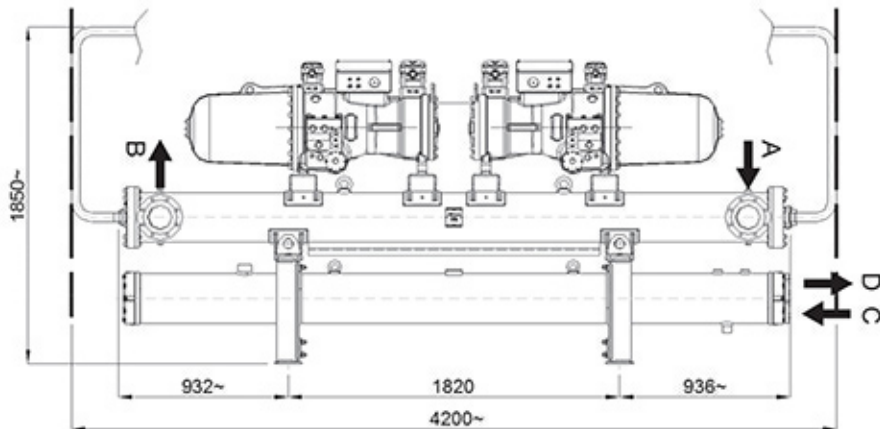
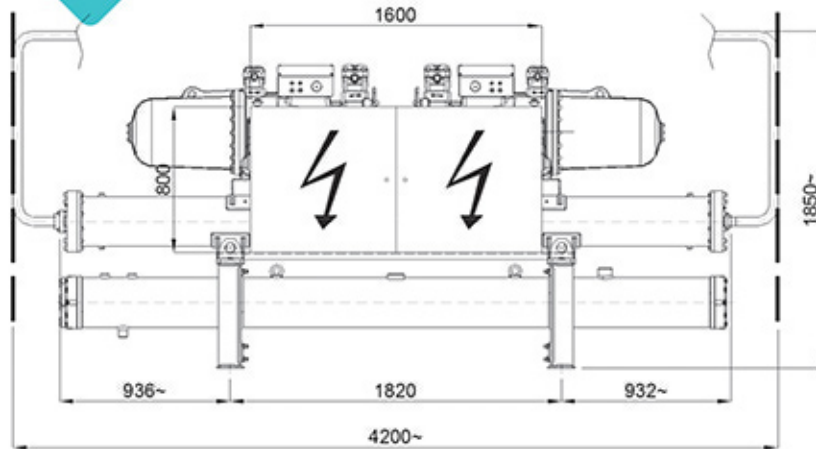
WATER TO
WATER
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A	INLET A/C WATER
B	OUTLET A/C WATER
C	INLET SOURCE WATER 1
D	OUTLET SOURCE WATER 1

DIMENSIONAL DRAWING

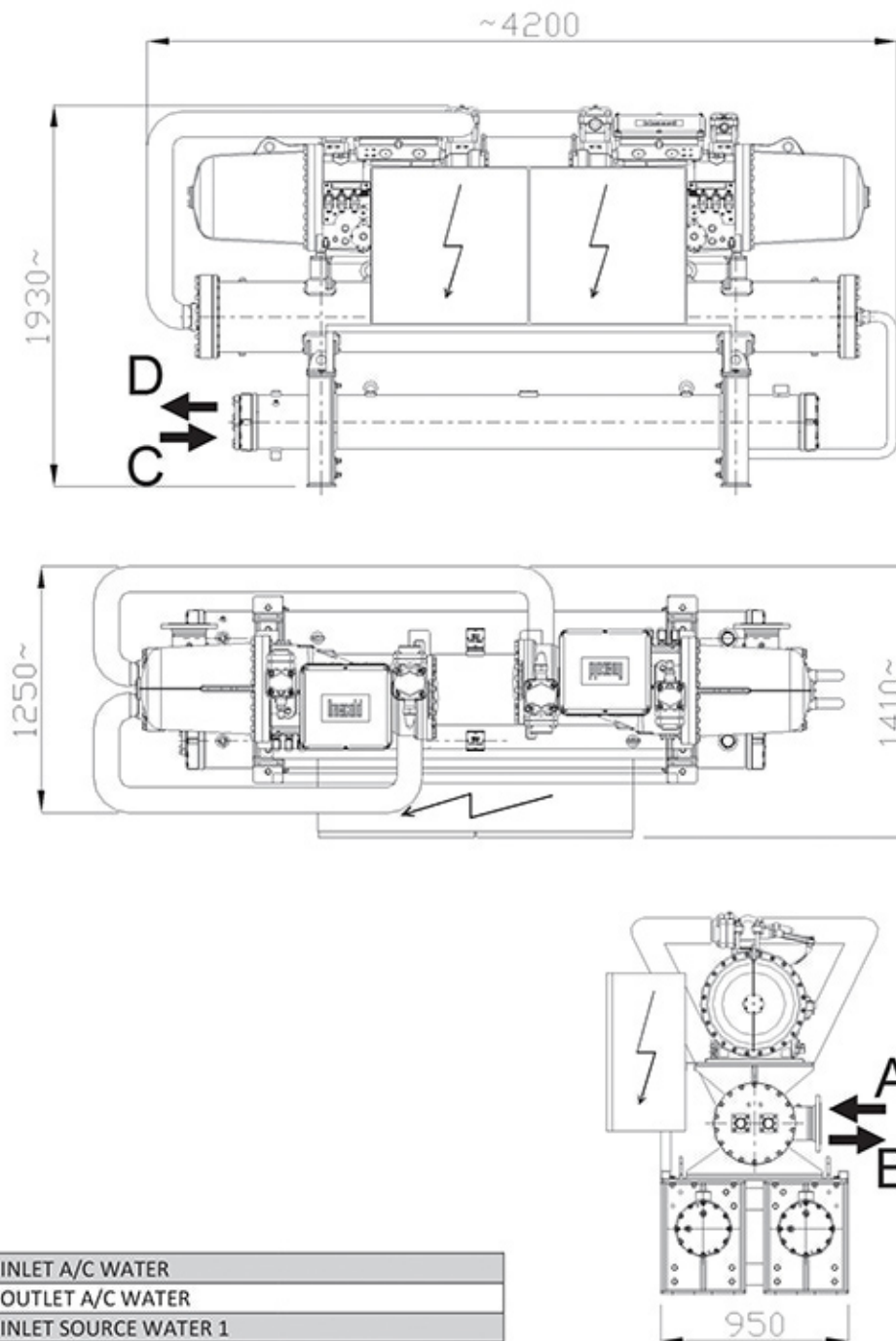
Hydra 480 - 580



A	INLET A/C WATER
B	OUTLET A/C WATER
C	INLET SOURCE WATER 1
D	OUTLET SOURCE WATER 1

DIMENSIONAL DRAWING

Hydra 650 - 800



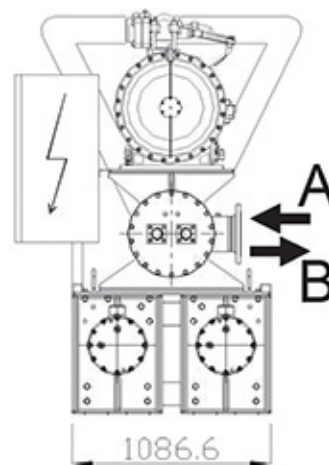
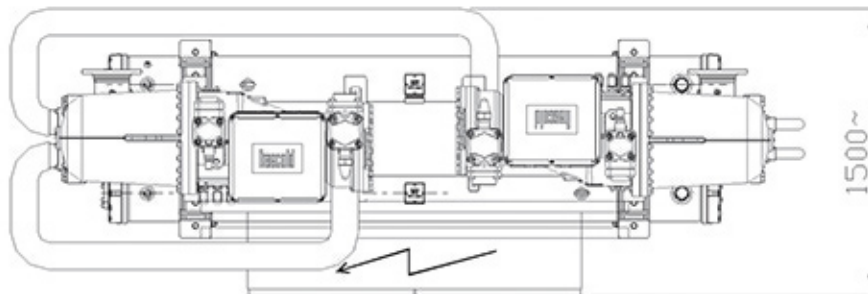
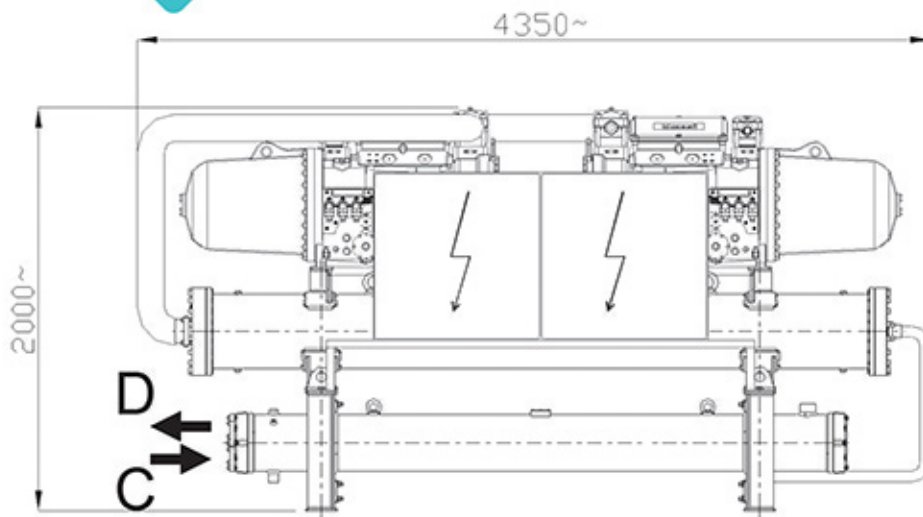
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A	INLET A/C WATER
B	OUTLET A/C WATER
C	INLET SOURCE WATER 1
D	OUTLET SOURCE WATER 1

DIMENSIONAL DRAWING

Hydra 900 - 1000



A	INLET A/C WATER
B	OUTLET A/C WATER
C	INLET SOURCE WATER 1
D	OUTLET SOURCE WATER 1