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## CATALOGUE 2020 HEAT PUMP COMMERCIAL



HOT WATER | RENEWABLE

# HEAT PUMP TECHNOLOGY

Heat pump commercial uses a thermodynamic cycle to heat the water through the air sucked by the thermal group inverting the heat natural flow. A refrigerant fluid (R417A), through status changes, compression and expansion cycles, withdraws the heat in the air at low temperature and gives it to domestic water at a higher temperature. This is the reverse mechanism to the one used in refrigerators.

The product electric consumption is only the one necessary to let the fan (that captures the air) and the compressor (that allows the refrigerant fluid to circulate in the system) work.

## THERMODYNAMIC CYCLE

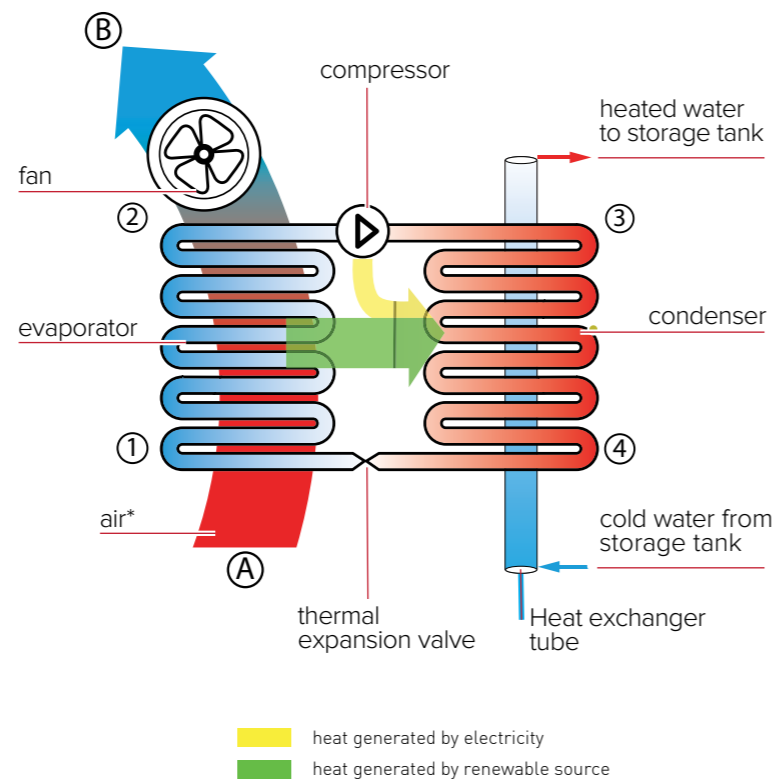
**A-B** External air is aspirated inside the heat pump thanks to a fan; when passing through the fins of the evaporator, the air gives its heat and lose 10°C approx. Finally it is expelled.

**1-2** The refrigerant fluid goes through the evaporator and absorbs the heat given by the air. During this process it changes its physical status and evaporate, keeping temperature and pressure almost constant. (10°C ; 5 bar).

**2-3** The refrigerant fluid crosses the compressor and experiences a pressure rising which involves an increase of temperature. At the end of the process the fluid is overheated vapor and its temperature and pressure are 70°C and 20 bar respectively.

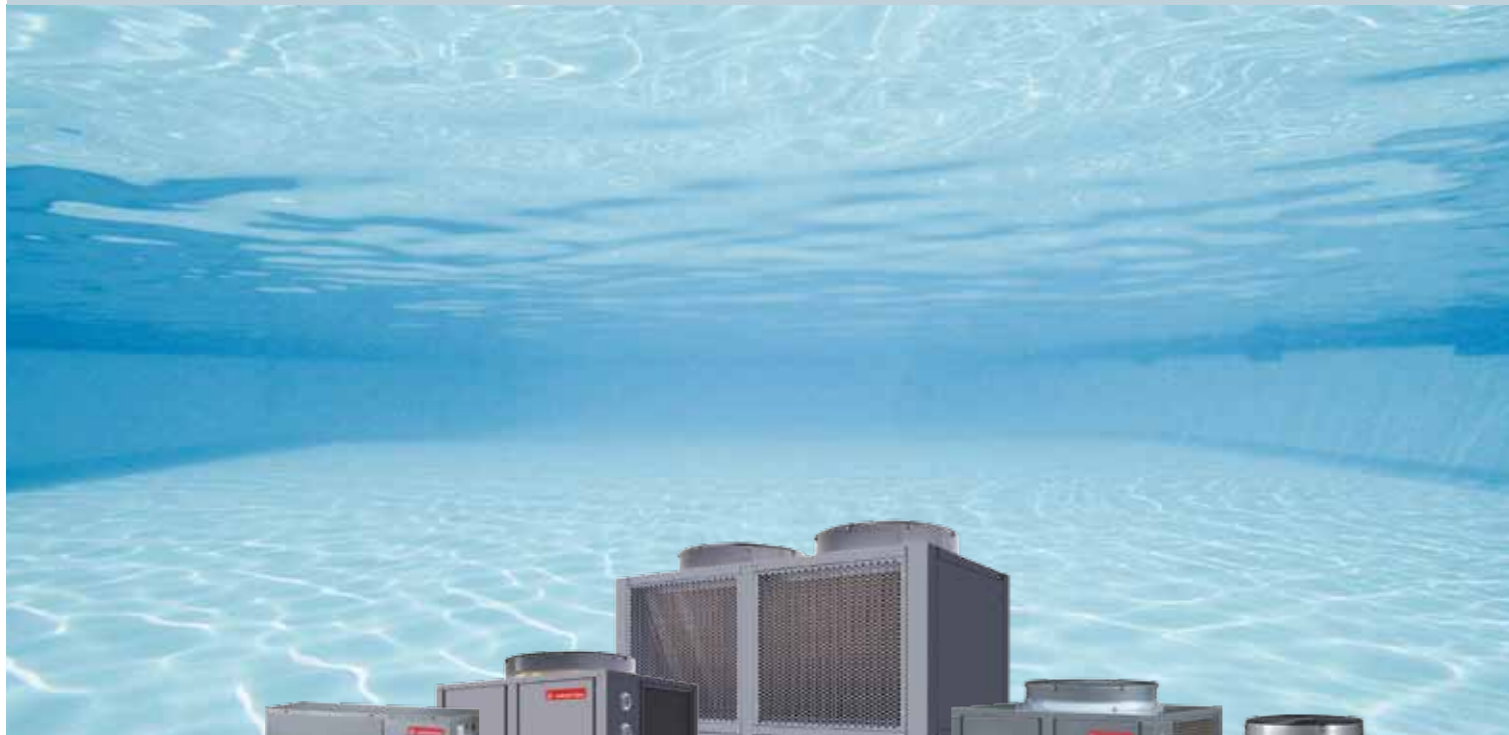
**3-4** Within the condenser, the refrigerant fluid gives its heat to the water which warms up. By doing this, the refrigerant condensate at constant pressure (20 bar) and then experiences a significant reduction of temperature. (70 →40°C).

**4-1** The refrigerant fluid passes through the expansion valve, suddenly loose both pressure and temperature and partially evaporate thus returning to the initial conditions of temperature and pressure. (40→10°C; 5 bar). The thermodynamical cycle can now start over.

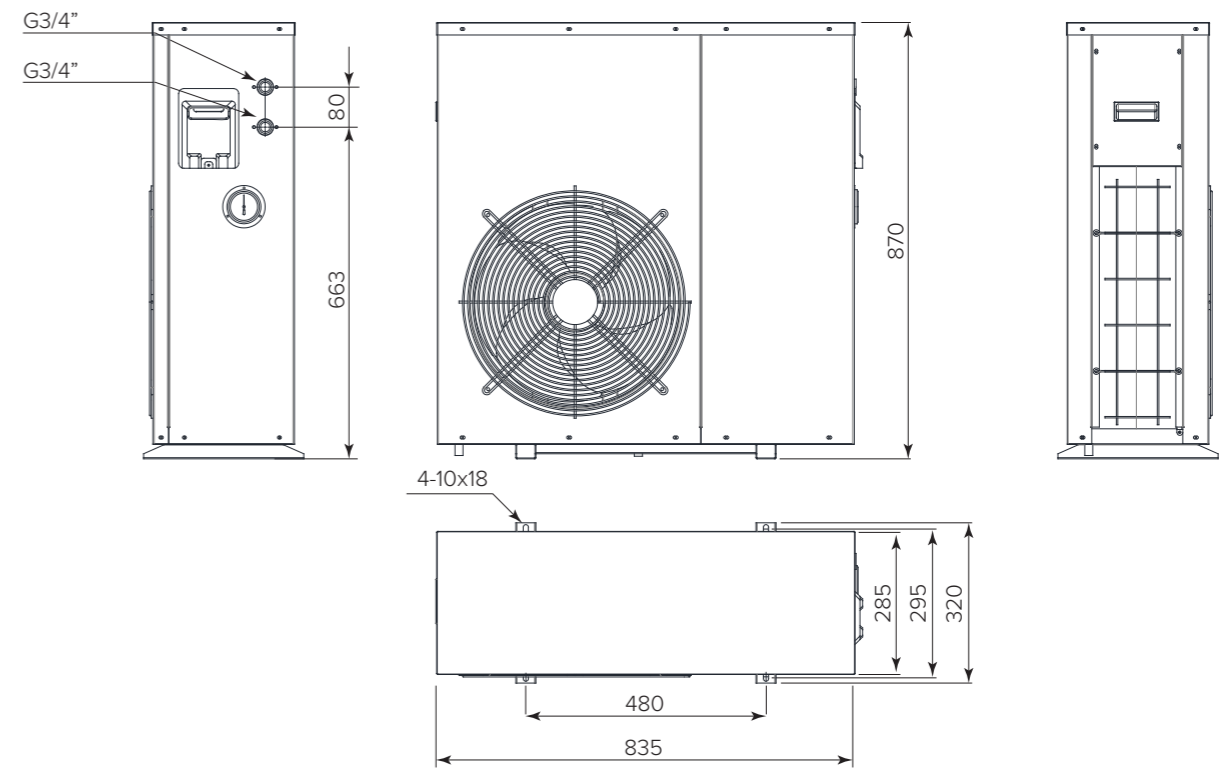


# HEAT PUMP RANGE

AIR TO WATER	WATER TO WATER	SWIMMING POOL
 <b>AR-6PM</b>	 <b>AR-40WTP</b>	 <b>AR-6SM</b>
 <b>AR-10PM</b>	 <b>AR-80WTP</b>	 <b>AR-8SM</b>
 <b>AR-17PTP</b>	 <b>AR-160WTP</b>	 <b>AR-12SM</b>
 <b>AR-35PTP</b>		 <b>AR-20STP</b>
 <b>AR-80PTP</b>		 <b>AR-50STP</b>
 <b>AR-120PTP</b>		



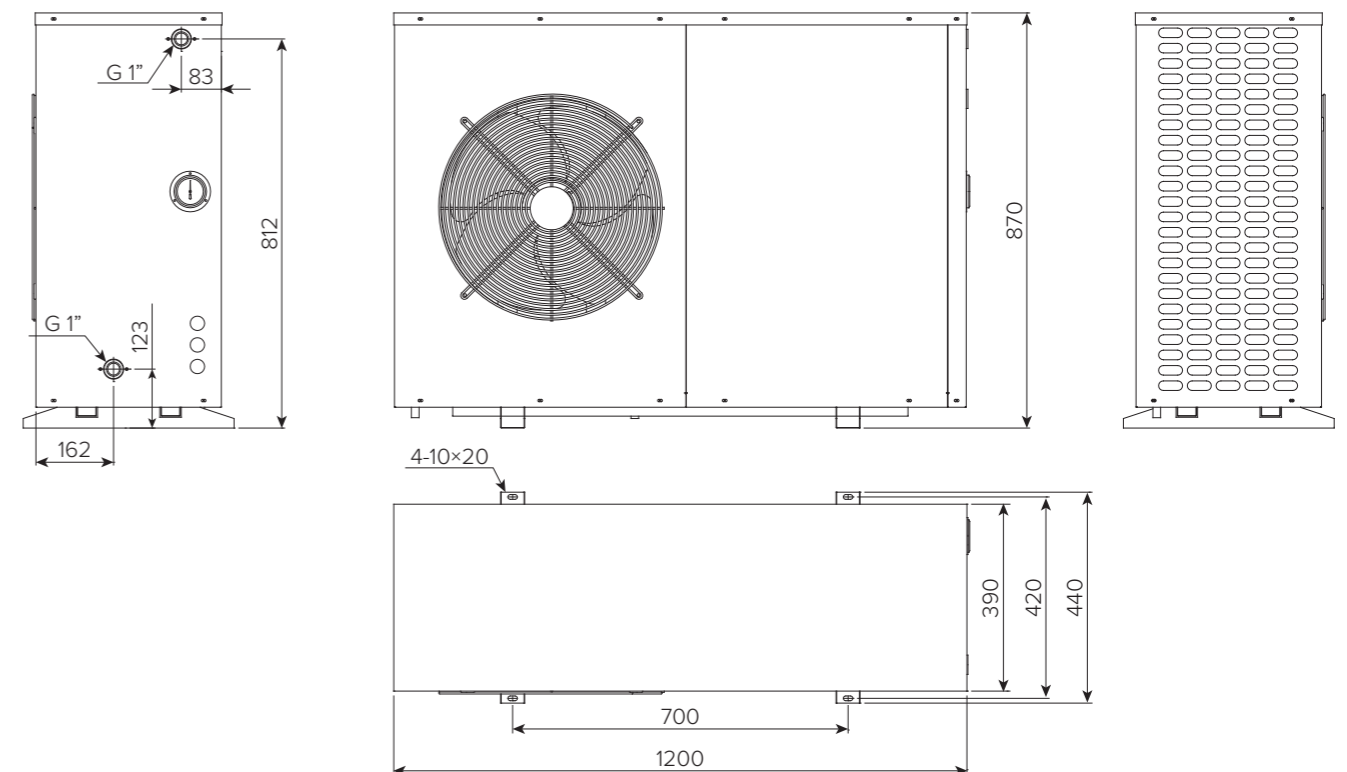
### DIMENSION AR-6PM



TECHNICAL DATA	AR-6PM	AR-10PM	AR-17PTP	AR-35PTP	AR-80PTP	AR-120PTP
Voltage [V]	220	220	380	380	380	380
Phase	Single phase	Single phase	Three phase	Three phase	Three phase	Three phase
Frequency [Hz]	50	50	50	50	50	50
Heating capacity* [kW]	5,80	11,20	21,70	45,30	85	127
Rated power input* [kW]	1,36	2,83	5,31	11,27	19,7	29,5
Maximum current [A]	9	20	14	29	49	73,5
Heating water capacity [L/H]	124	240	465	970	2435	3638
COP*	4,26	3,96	4,09	4,02	4,3	4,3
Refrigerant	R417 A	R417 A	R417 A	R417 A	R410 A	R410 A
Refrigerant charge [gram]	1200	2100	3900	3700x2	3700x2	3700x2
Compressor						
Type	Rotary	Rotary	Rotary	Rotary	Scroll	Scroll
Brand	Highly	Highly	Highly	Highly	Sanyo	Sanyo
Quantity	1	1	1	2	4	6
Condenser	Tube in tube	Tube in tube	Tube in tube	Tube in tube	Tube in tube	Tube in tube
Circulation pump	Grundfos	Grundfos	-	-	-	-
Rated water flow rate [m <sup>3</sup> /h]	1,6	2,00	4,00	8,00	16	24
Pressure Drop [KPa]	40	45	60	75	75	100
Circulation pump pressure head [m]	2,5	3,5	-	-	-	-
Max. water temperature [°C]	60	60	60	60	60	60
Operation temp. range [°C]	-10 ~ 45	-10 ~ 45	-10 ~ 45	-10 ~ 45	-10 ~ 45	-10 ~ 45
Noise [dB(A)]	≤56	≤58	≤60	≤62	≤64	≤65
Connection [inch]	G3/4"	G1"	G1"	G1-1/4"	G2"	G2-1/2"
Weight [Kg]	65	84	160	290	633	893
Index protection	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4
Insulation class	1	1	1	1	1	1
Dimension [mm]	835x320x870	1200x440x870	830x850x1120	1230x1040x1420	2200x1135x2080	2400x1300x2150

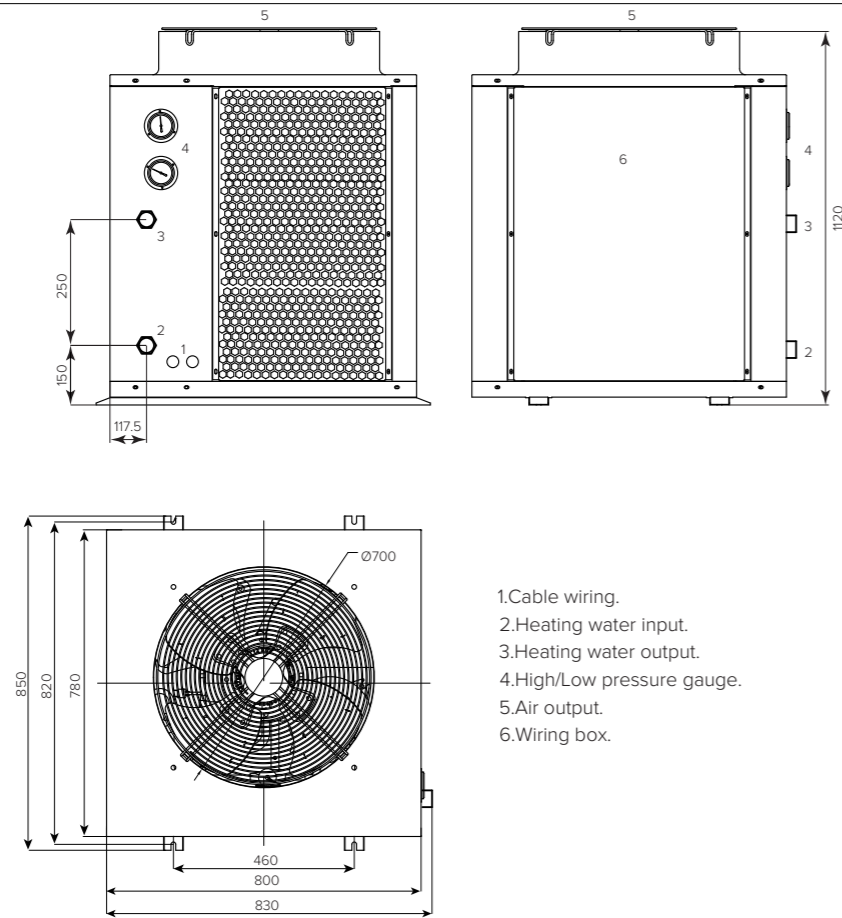
\*Heating by Ambient temp.(DB/WB) : 30 C and Water temp.(in /out): 25 C/55 C ;

### DIMENSION AR-10PM

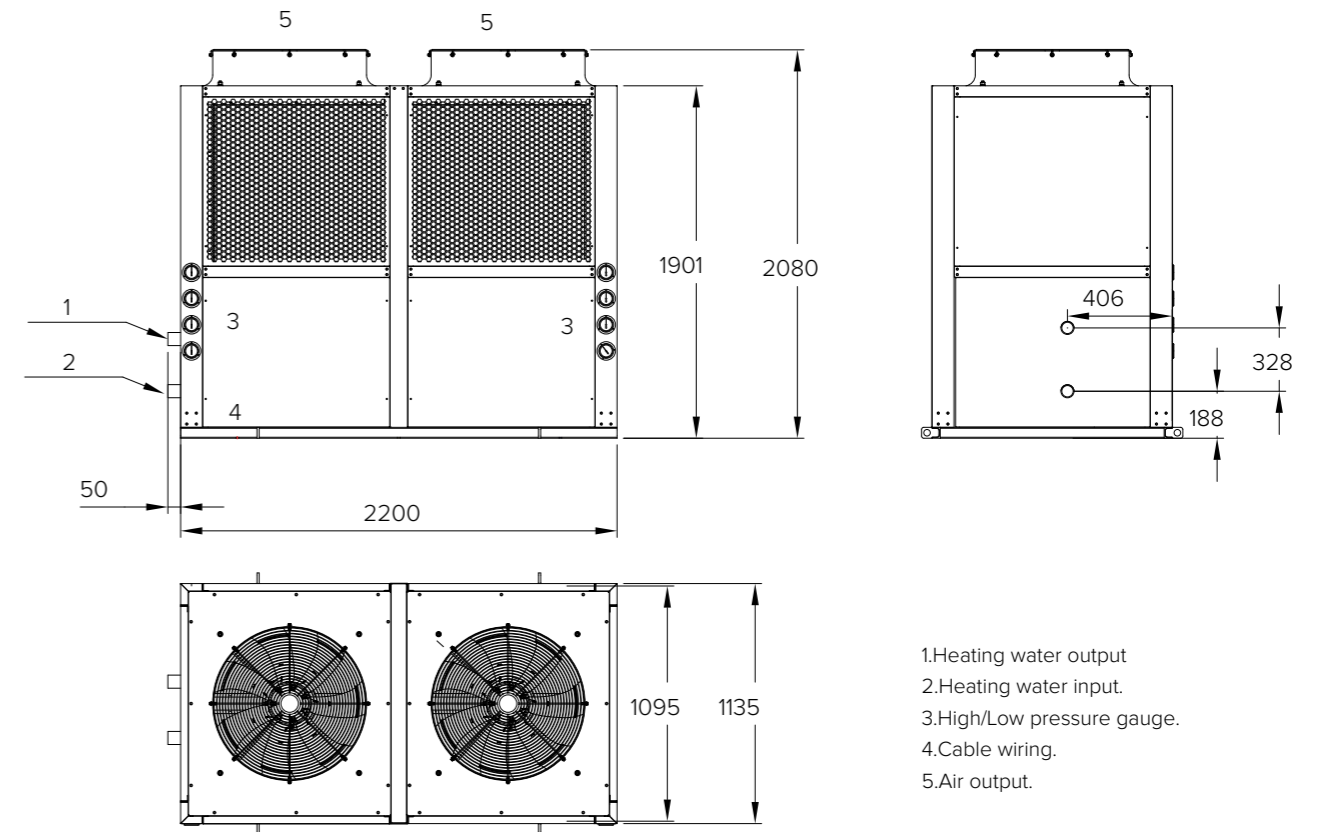




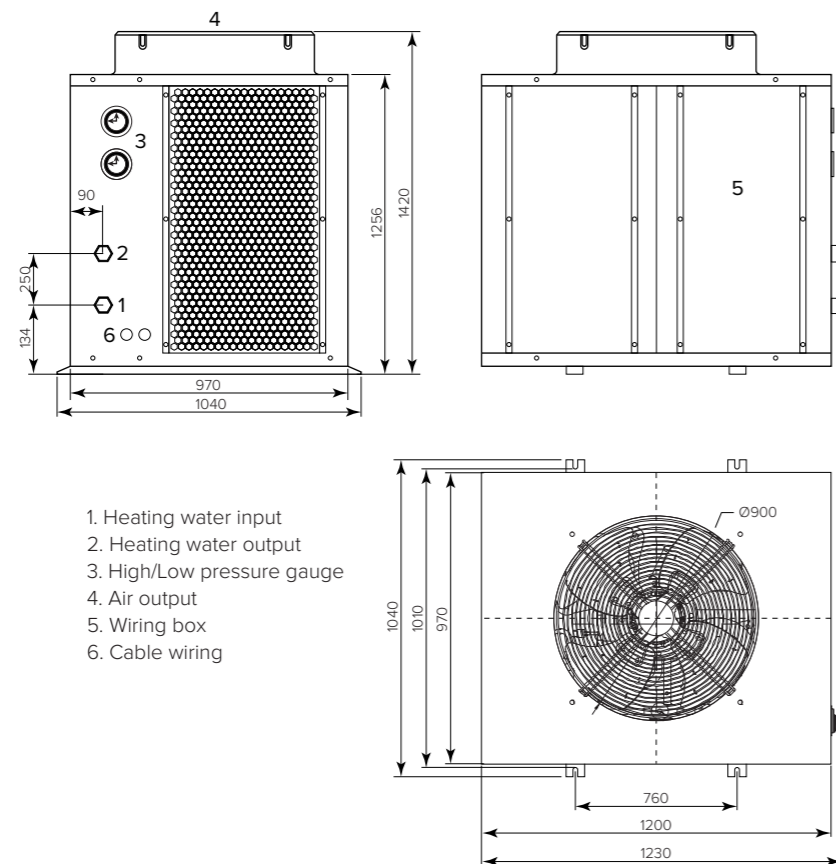
## DIMENSION AR-17PTP



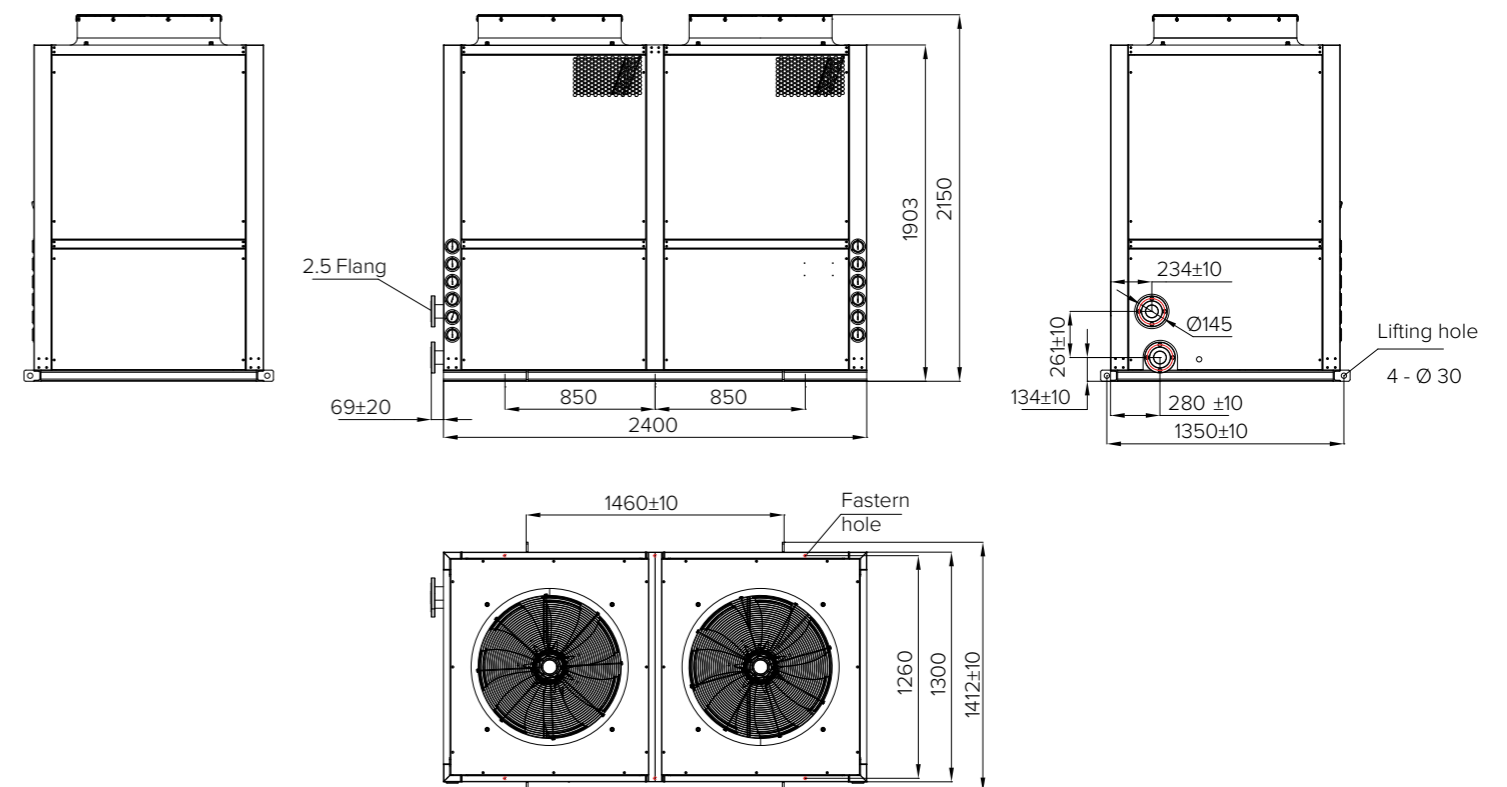
## DIMENSION AR-80PTP



## DIMENSION AR-35PTP

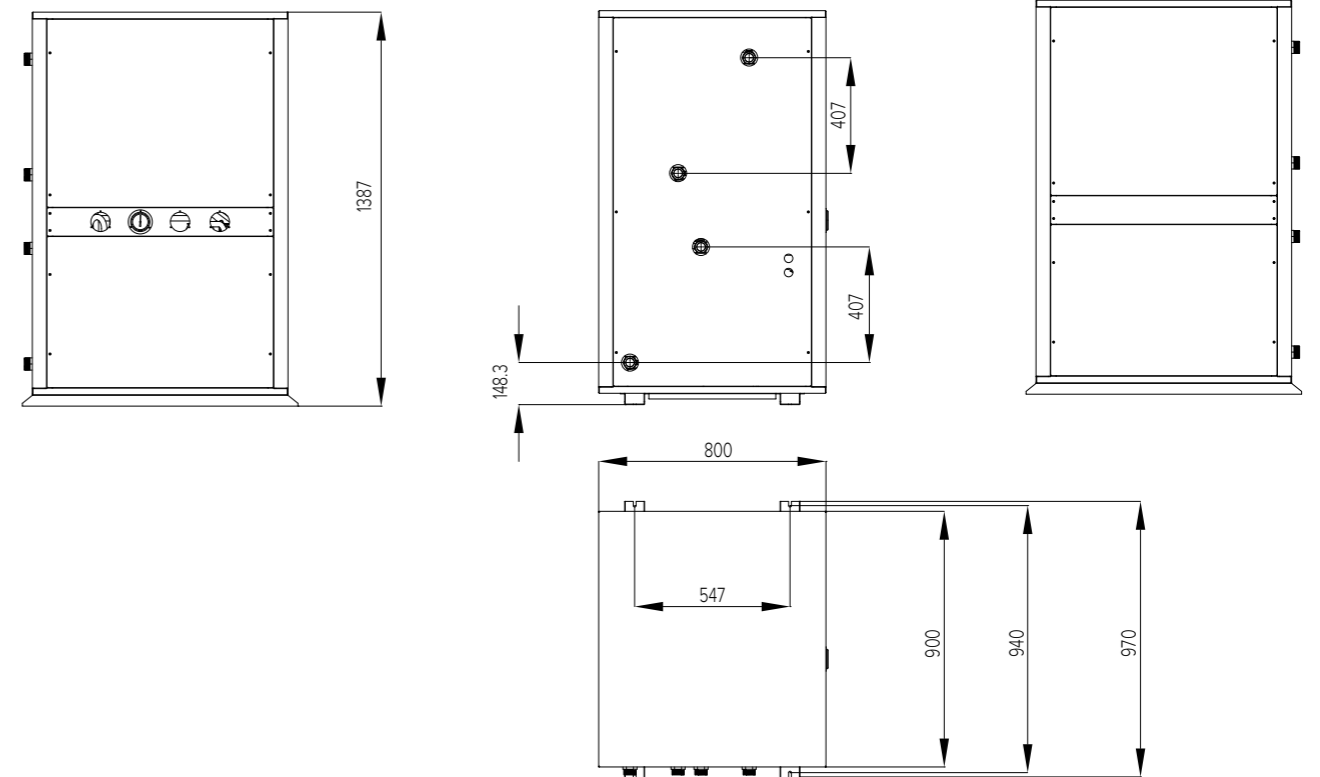


## DIMENSION AR-120PTP





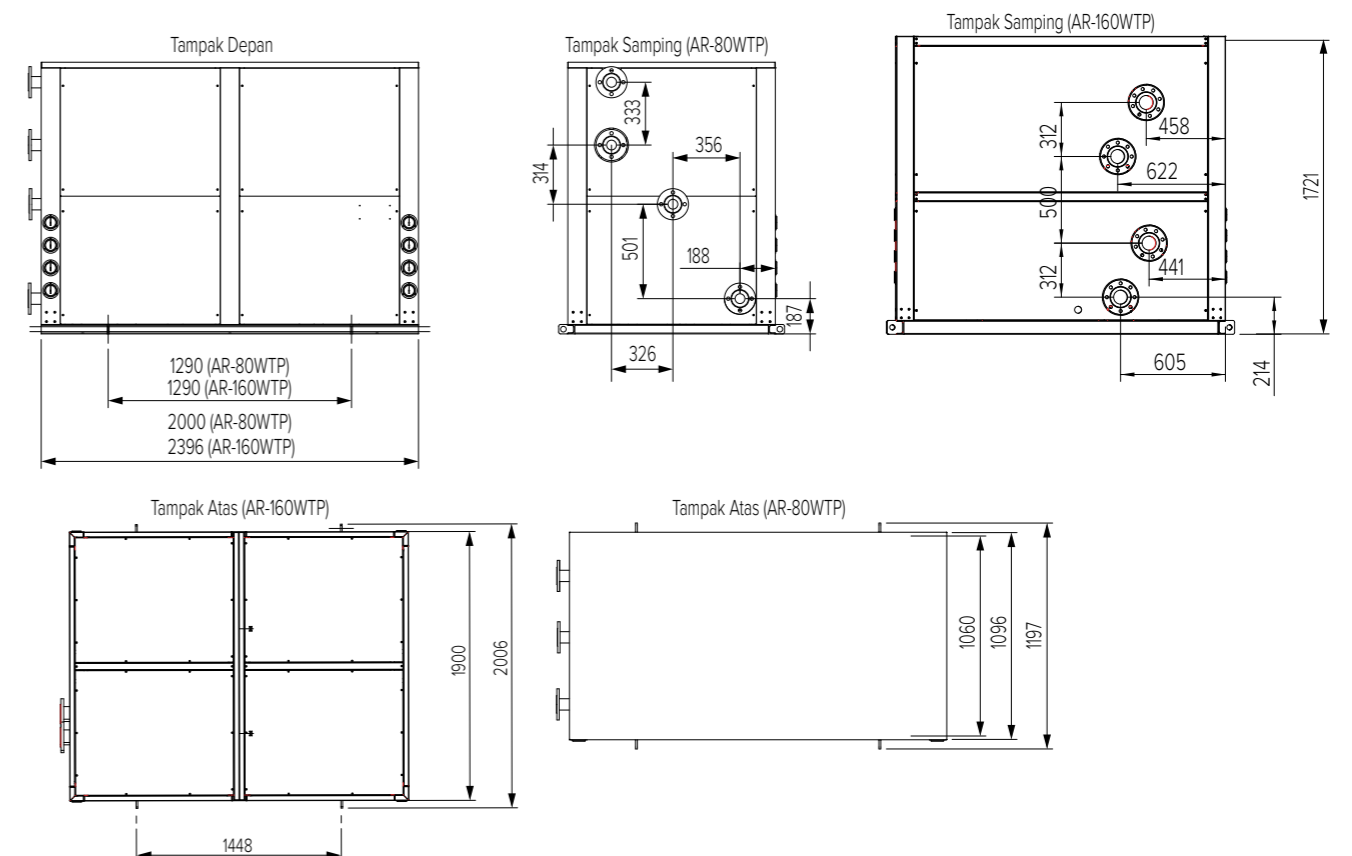
DIMENSION AR-40WTP



TECHNICAL DATA	AR-40WTP	AR-80WTP	AR-160WTP
Voltage [V]	380	380	380
Phase	Three phase	Three phase	Three phase
Frequency [Hz]	50	50	50
Heating capacity* [kW]	42	80	160
Rated power input* [kW]	9,2	17	36
Maximum current [A]	25	49	98
Heating water capacity [L/H]	903	1720	3440
COP*	4,7	4,7	4,7
Refrigerant	R410a	R410a	R410a
Compressor			
Type	Scroll	Scroll	Scroll
Brand	Sanyo	Sanyo	Sanyo
Quantity	2	4	8
Condenser	Tube in tube	Tube in tube	Tube in tube
Circulation pump	-	-	-
Rated hot water flow rate [m³/h]	8	16	32
Rated water source flow rate [m³/h]	6,4	13	26
Pressure Drop / Heating side [KPa]	65	110	140
Pressure Drop / Source side [KPa]	50	70	100
Circulation pump pressure head [m]	-	-	-
Max. water temperature [°C]	60	60	60
Water source temp. range [°C]	-10 ~ 35	-10 ~ 35	-10 ~ 35
Ground source temp. range [°C]	7 ~ 35	7 ~ 35	7 ~ 35
Noise [dB(A)]	≤55	≤55	≤55
Connection [inch]	G1-1/4"	G2"	G3"
Weight [Kg]	250	500	920
Index protection	IPX4	IPX4	IPX4
Dimension [mm]	900×800×1387	2000×1060×1440	2400×1900×1721

\*Water source temp 15 °C, and Water temp.(in /out): 15 °C /55 °C ;

DIMENSION AR-80WTP - AR-160WTP



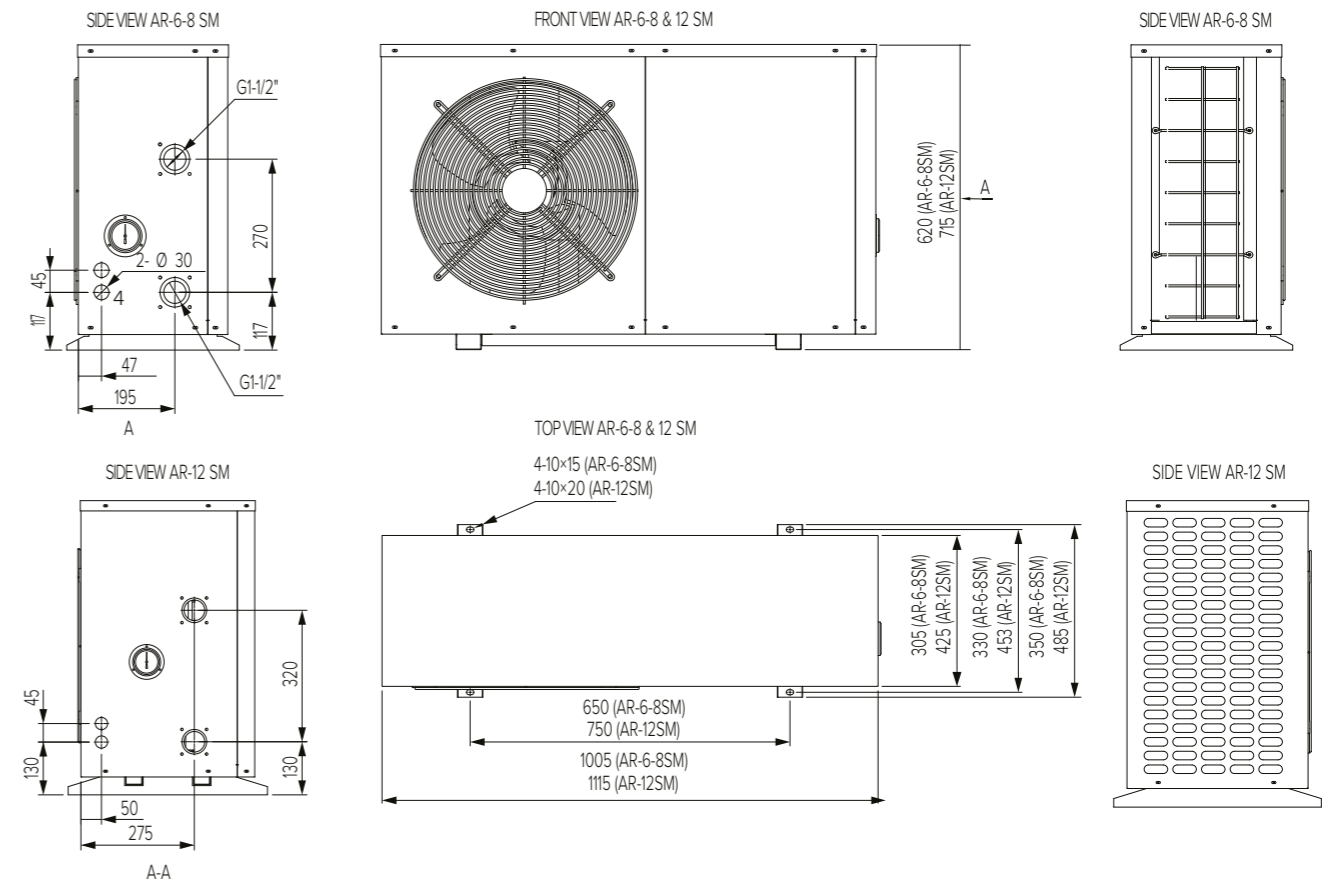




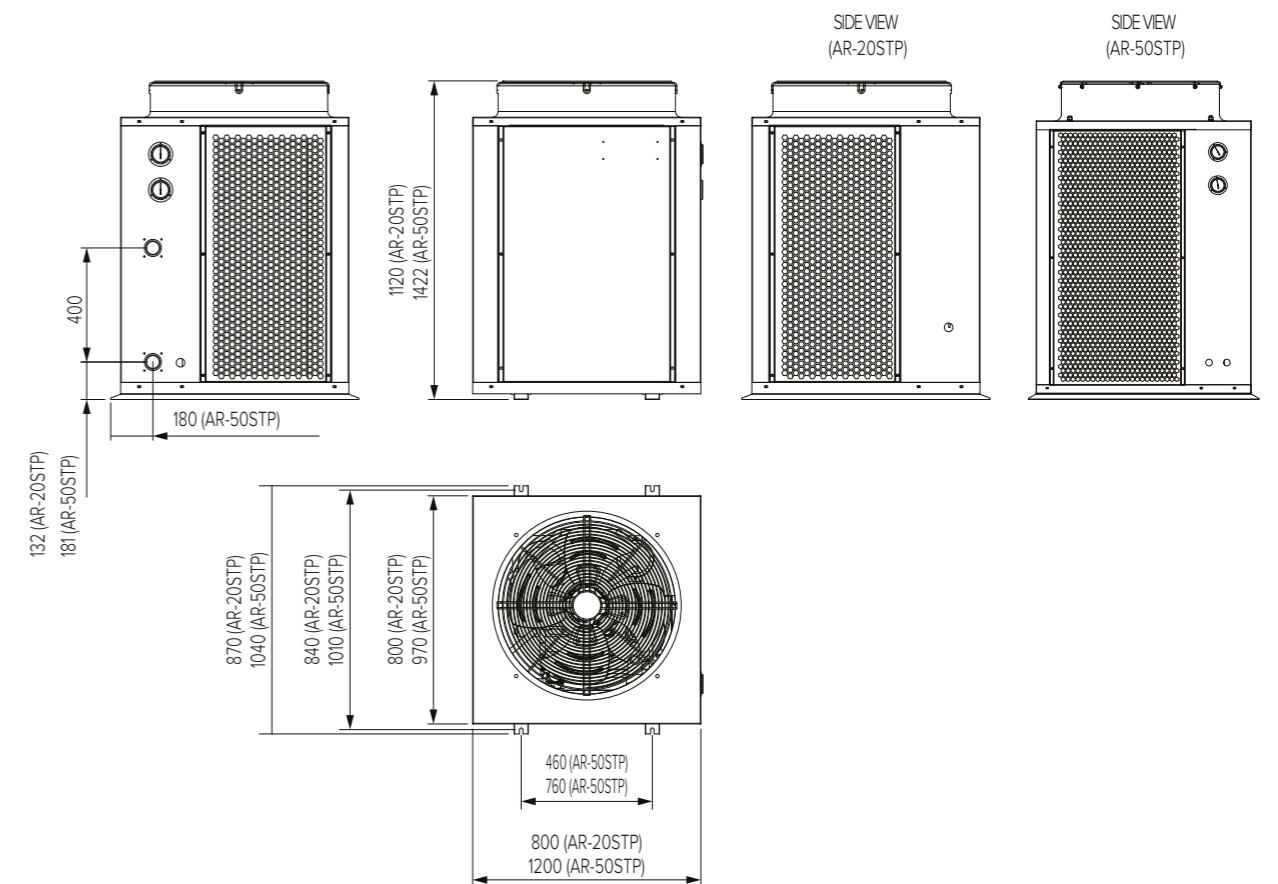
TECHNICAL DATA	AR-6SM	AR-8SM	AR-12SM	AR-20STP	AR-50STP
Voltage [V]	220	220	220	380	380
Phase	Single phase	Single phase	Single phase	Three phase	Three phase
Frequency [Hz]	50	50	50	50	50
Heating capacity* [kW]	4,8	7,1	11	20	46,5
Rated power input* [kW]	1,0	1,5	2,1	4,4	9,6
Maximum current [A]	7	10	14	15	30
COP*	5,2	5,2	5,2	5,2	5,25
Refrigerant	R410a	R410a	R410a	R410a	R410a
Compressor					
Type	Rotary	Rotary	Rotary	Scroll	Scroll
Brand	Panasonic	Panasonic	Panasonic	Sanyo	Sanyo
Condenser	Titanium	Titanium	Titanium	Titanium	Titanium
Rated water flow rate [m³/h]	2	3	4,5	9	15
Pressure Drop [KPa]	1,5	4	4	10	25
Max. water temperature [°C]	45	45	45	45	45
Operation temp. range [°C]	-10 ~ 45	-10 ~ 45	-10 ~ 45	-10 ~ 45	-10 ~ 45
Noise [dB(A)]	≤48	≤48	≤48	≤45	≤60
Connection [inch]	G1-1/2"	G1-1/2"	G1-1/2"	G1-1/2"	G2"
Weight [Kg]	58	67	84	110	290
Index protection	IPX4	IPX4	IPX4	IPX4	IPX4
Dimension [mm]	1005x305x620	1005x305x620	1115x305x620	1345 x 350 x 1265	1200x970x1425

\*Heating by Ambient temp.(DB/WB) : 20 C and Water temp. (in /out): 15 C/28 C;

DIMENSION AR-6SM / AR-8SM / AR-12SM

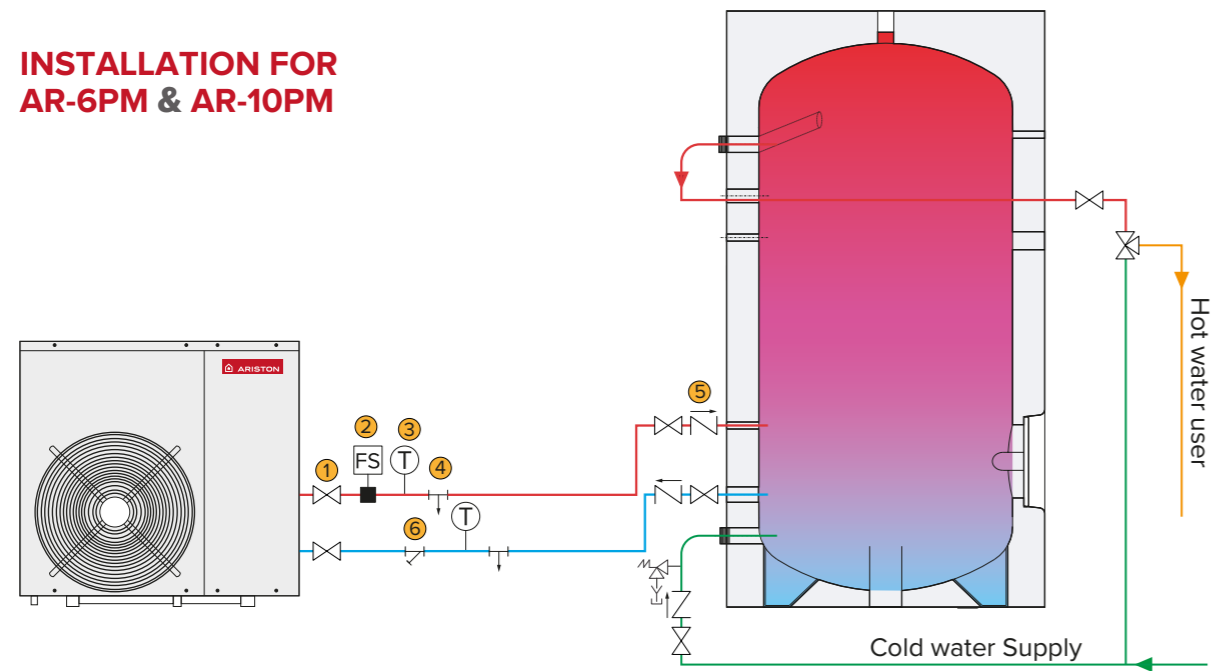


DIMENSION AR-20STP / AR-50STP



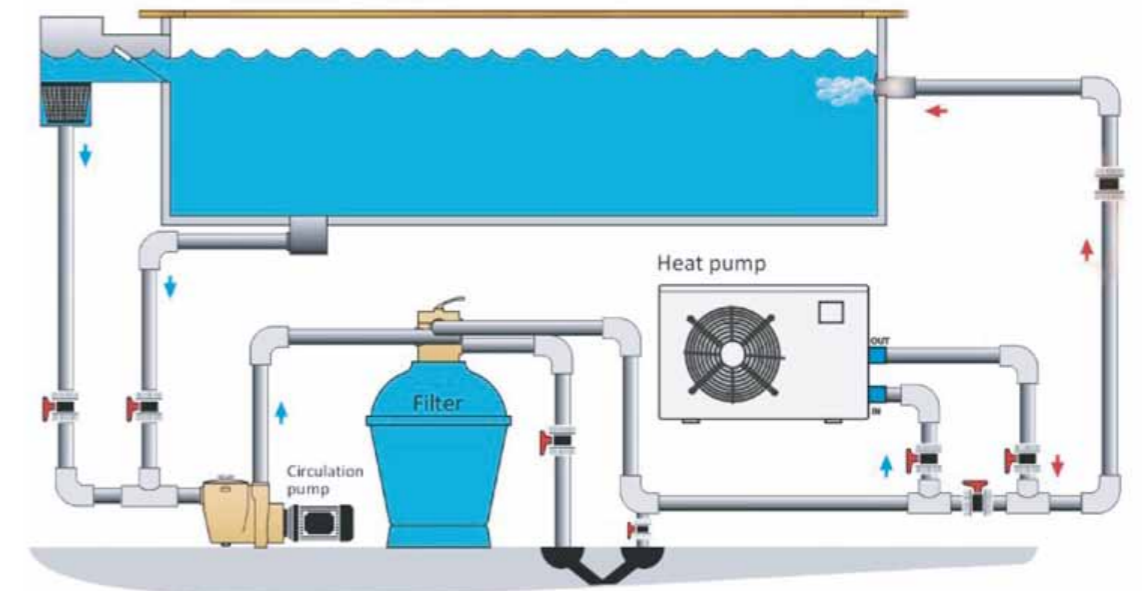
# INSTALLATION GUIDE

## INSTALLATION FOR AR-6PM & AR-10PM

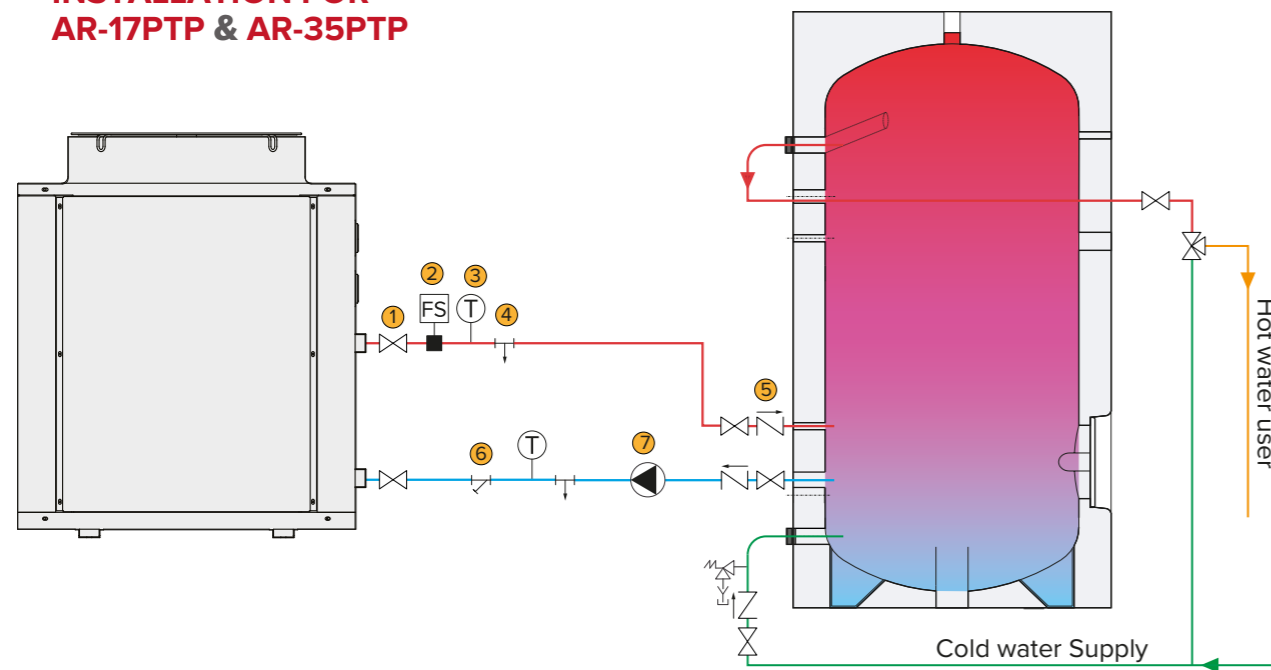


# INSTALLATION GUIDE

## INSTALLATION FOR AR-6SM & AR-20STP

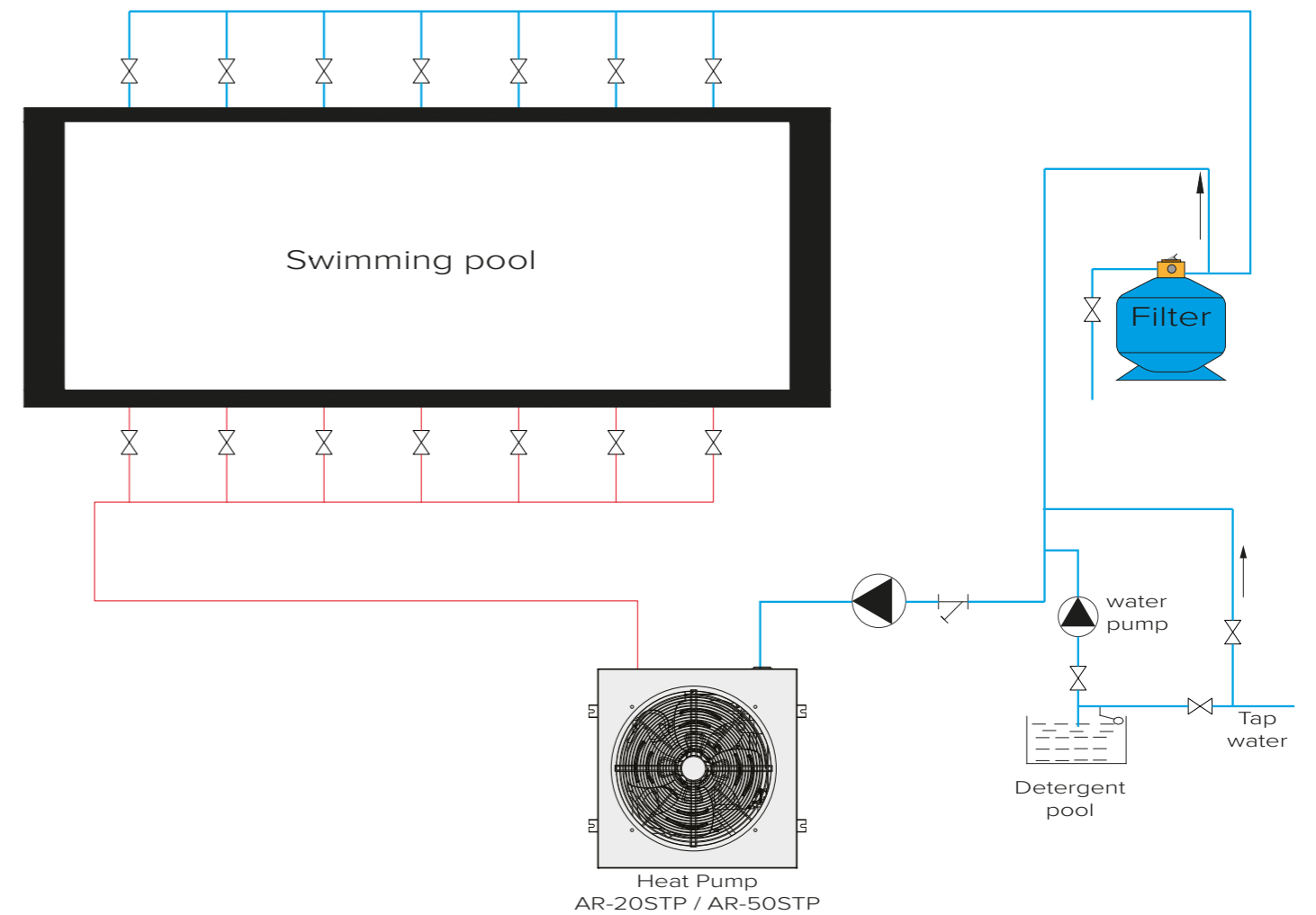


## INSTALLATION FOR AR-17PTP & AR-35PTP



### Legenda:

- ① Ball valve
- ② Flow switch
- ③ Thermometer
- ④ Drain & Filling valve
- ⑤ Check valve
- ⑥ Y Strain
- ⑦ Pump







## AFTER SALE SERVICE



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