



Internal Use Only

<http://biz.lgservice.com>

# ***MULTI V*<sup>™</sup> PLUS II System**

## **Outdoor Unit R410A**

# **SERVICE MANUAL R410A (Exploded View)**

**MODEL : ARUN Series**

### **CAUTION**

Before Servicing the unit, read the safety precautions in General SVC manual.  
Only for authorized service personnel.

# ARUN Series

<b>1. Specifications .....</b>	<b>3</b>
<b>2. Function .....</b>	<b>5</b>
<b>3. Dimensions .....</b>	<b>6</b>
<b>4. Piping Diagrams .....</b>	<b>8</b>
<b>5. Wiring Diagrams .....</b>	<b>13</b>
<b>6. Exploded View &amp; Replacement Parts List.....</b>	<b>16</b>

# 1. Specification

## 1.1 Heat Recovery(208/230V)

Heat Recovery(208/230V, 60Hz)

HP(Equivalent horsepower)			8	10	12	16
Ton			6.5	8.0	9.5	12.5
Model Name	Combination Unit		<b>ARUB076BT2</b>	<b>ARUB096BT2</b>	<b>ARUB115BT2</b>	<b>ARUB154BT2</b>
		Independent Unit	<b>ARUB076BT2</b>	<b>ARUB096BT2</b>	<b>ARUB115BT2</b>	<b>ARUB076BT2</b> <b>ARUB076BT2</b>
Capacity	Cooling	kW	22.4	28.0	33.6	44.8
		kcal/h	19,300	24,100	28,900	38,500
		Btu/h	76,400	95,500	114,700	152,900
	Heating	kW	25.2	31.5	37.8	50.4
		kcal/h	21,700	27,100	32,500	43,300
		Btu/h	86,000	107,500	129,000	172,000
Input	Cooling	kW	6.20	7.8	10.8	12.40
	Heating	kW	7.00	8.8	11.1	14.00
Casing Color			Warm Gray	Warm Gray	Warm Gray	Warm Gray
Heat Exchanger			Gold fin	Gold fin	Gold fin	Gold fin
Compressor	Type		DC Scroll	DC Scroll	DC Scroll	DC Scroll
	Piston Displacement	cm <sup>3</sup> /rev	38.3 + 59.8	38.3 + 59.8	38.3 + 59.8	(38.3 + 59.8)x2
	Number of Revolution	R.P.M	3,600 + 3,500	3,600 + 3,500	3,600 + 3,500	(3,600 + 3,500)x2
	Motor Output x Number	W	(4,130 + 5,280)x1	(4,130 + 5,280)x1	(4,130 + 5,280)x1	(4,130 + 5,280)x2
	Starting Method		Direct On Line	Direct On Line	Direct On Line	Direct On Line
	Oil Type		FVC68D(PVE)	FVC68D(PVE)	FVC68D(PVE)	FVC68D(PVE)
	Oil Charge	cc	5,600	5,600	5,600	5,600x2
Fan	Type		Propeller fan	Propeller fan	Propeller fan	Propeller fan
	Motor Output x Number	W	350 x 2	350 x 2	350 x 2	350 x 4
	Air Flow Rate(High)	CMM	190	190	190	380
		cfm	6,700	6,700	6,700	13,400
	Drive		DC INVERTER	DC INVERTER	DC INVERTER	DC INVERTER
	Discharge	Side / Top	TOP	TOP	TOP	TOP
Pipe Connctions	Liquid(flare)	mm(inch)	9.52(3/8)	9.52(3/8)	12.7(1/2)	12.7(1/2)
	Suction Gas	mm(inch)	19.05(3/4)	22.2(7/8)	28.58(1 1/8)	28.58(1 1/8)
	Discharge Gas	mm(inch)	15.88(5/8)	19.05(3/4)	19.05(3/4)	22.2(7/8)
Dimensions (WxHxD)	mm		1,280x1,607x730	1,280x1,607x730	1,280x1,607x730	(1,280x1,607x730)x2
	inch		50-3/8 x 63-5/16 x 28-11/16	50-3/8 x 63-5/16 x 28-11/16	50-3/8 x 63-5/16 x 28-11/16	(50-3/8 x 63-5/16 x 28-11/16)x2
Net Weight	kg		285	285	285	285+285
	lbs		628	628	628	628+628
Communication Cable		mm <sup>2</sup>	CVV-SB 1.25x2C	CVV-SB 1.25x2C	CVV-SB 1.25x2C	CVV-SB 1.25x2C
Refrigerant	Refrigerant name		R410A	R410A	R410A	R410A
	Control		EEV	EEV	EEV	EEV
Power Supply		Ø, V, Hz	3, 208/230, 60	3, 208/230, 60	3, 208/230, 60	3, 208/230, 60

### Notes:

- Capacities are based on the following conditions:
  - Cooling \* Indoor temp. 27°C[80.6°F]DB/ 19°C[66.2°F]WB
  - \* Outdoor temp. 35°C[95°F]DB/ 24°C[75.2°F]WB
  - \* Interconnecting Piping Length 7.5m(25ft)
  - \* Level Difference of Zero
  - Heating \* Indoor temp. 20°C[68°F]DB/ 15°C[59°F]WB
  - \* Outdoor temp. 7°C[44.6°F]DB/ 6°C[42.8°F]WB
  - \* Interconnecting Piping Length 7.5m(25ft)
  - \* Level Difference of Zero

### Conversion Formula

kcal/h= kW x 860  
 Btu/h = kW x 3412  
 cfm = m<sup>3</sup>/min x 35.3  
 l/s = CMM x 1000/60

- Capacities are net capacities
- Due to our policy of innovation some specifications may be changed without prior notification
- EEV : Electronic Expansion Valve

# Specification

## Heat Recovery(208/230V, 60Hz)

HP(Equivalent horsepower)			18	20	22	24
Ton			14.5	16.0	17.5	19.0
Model Name		Combination Unit	ARUB173BT2	ARUB192BT2	ARUB211BT2	ARUB230BT2
		Independent Unit	ARUB096BT2 ARUB076BT2	ARUB096BT2 ARUB096BT2	ARUB115BT2 ARUB096BT2	ARUB115BT2 ARUB115BT2
Capacity	Cooling	kW	50.4	56.0	61.6	67.2
		kcal/h	43,300	48,200	53,000	57,800
		Btu/h	172,000	191,100	210,200	229,300
	Heating	kW	56.7	63.0	69.3	75.6
		kcal/h	48,800	54,200	59,600	65,000
		Btu/h	193,500	225,000	236,500	258,000
Input	Cooling	kW	14.00	15.60	18.60	21.60
	Heating	kW	15.80	17.60	19.90	22.20
Casing Color			Warm Gray	Warm Gray	Warm Gray	Warm Gray
Heat Exchanger			Gold fin	Gold fin	Gold fin	Gold fin
Compressor	Type		DC Scroll	DC Scroll	DC Scroll	DC Scroll
	Piston Displacement	cm <sup>3</sup> /rev	(38.3 + 59.8)x2	(38.3 + 59.8)x2	(38.3 + 59.8)x2	(38.3 + 59.8)x2
	Number of Revolution	R.P.M	(3,600+3,500)x2	(3,600+3,500)x2	(3,600+3,500)x2	(3,600+3,500)x2
	Motor Output x Number	W	(4,130 + 5,280)x2	(4,130 + 5,280)x2	(4,130 + 5,280)x2	(4,130 + 5,280)x2
	Starting Method		Direct On Line	Direct On Line	Direct On Line	Direct On Line
	Oil Type		FVC68D(PVE)	FVC68D(PVE)	FVC68D(PVE)	FVC68D(PVE)
	Oil Charge	cc	5,600x2	5,600x2	5,600x2	5,600x2
Fan	Type		Propeller fan	Propeller fan	Propeller fan	Propeller fan
	Motor Output x Number	W	350 x 4	350 x 4	350 x 4	350 x 4
	Air Flow Rate(High)	CMM	380	380	380	380
		cfm	13,400	13,400	13,400	13,400
	Drive		DC INVERTER	DC INVERTER	DC INVERTER	DC INVERTER
Discharge	Side / Top	TOP	TOP	TOP	TOP	
Pipe Connctions	Liquid(flare)	mm(inch)	15.88(5/8)	15.88(5/8)	15.88(5/8)	15.88(5/8)
	Suction Gas	mm(inch)	28.58(1 1/8)	28.58(1 1/8)	34.9(1 3/8)	34.9(1 3/8)
	Discharge Gas	mm(inch)	22.2(7/8)	22.2(7/8)	28.58(1 1/8)	28.58(1 1/8)
Dimensions (WxHxD)	mm		(1,280x1,607x730)x2	(1,280x1,607x730)x2	(1,280x1,607x730)x2	(1,280x1,607x730)x2
	inch		(50-3/8 x 63-5/16 x 28-11/16)x2	(50-3/8 x 63-5/16 x 28-11/16)x2	(50-3/8 x 63-5/16 x 28-11/16)x2	(50-3/8 x 63-5/16 x 28-11/16)x2
Net Weight	kg		285+285	285+285	285+285	285+285
	lbs		628+628	628+628	628+628	628+628
Communication Cable		mm <sup>2</sup>	CVV-SB 1.25x2C	CVV-SB 1.25x2C	CVV-SB 1.25x2C	CVV-SB 1.25x2C
Refrigerant	Refrigerant name		R410A	R410A	R410A	R410A
	Control		EEV	EEV	EEV	EEV
Power Supply		∅, V, Hz	3, 208/230, 60	3, 208/230, 60	3, 208/230, 60	3, 208/230, 60

### Notes:

- Capacities are based on the following conditions:
  - Cooling \* Indoor temp. 27°C[80.6°F]DB/ 19°C[66.2°F]WB
  - \* Outdoor temp. 35°C[95°F]DB/ 24°C[75.2°F]WB
  - \* Interconnecting Piping Length 7.5m(25ft)
  - \* Level Difference of Zero
  - Heating \* Indoor temp. 20°C[68°F]DB/ 15°C[59°F]WB
  - \* Outdoor temp. 7°C[44.6°F]DB/ 6°C[42.8°F]WB
  - \* Interconnecting Piping Length 7.5m(25ft)
  - \* Level Difference of Zero

2. Capacities are net capacities

3. Due to our policy of innovation some specifications may be changed without prior notification

4. EEV : Electronic Expansion Valve

### Conversion Formula

kcal/h= kW x 860
Btu/h = kW x 3412
cfm = m <sup>3</sup> /min x 35.3
l/s = CMM x 1000/60

## 2. Functions

Category	Function	Single Unit	Series Unit
Reliability	Defrost/ Deicing	O	O
	High pressure switch	O	O
	Low pressure switch	O	O
	Phase protection	O	O
	Restart delay(3-minutes)	O	O
	Self diagnosis	O	O
	Soft start	O	O
	Trial operation	O	O
Convenience	Auto operation(Artificial intelligence)	O	O
	Auto restart operation	O	O
CAC network Function	Network Solution(LGAP)	O	O
	Power Distribution Indicator(PNU-D1S00)	O	O
Other	Thermistor	-	-

O : Applied    X : Not applied    - : No reation

Option : Model name & price are different according to options, and assembled in factory with main unit

Accessory : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separated package.

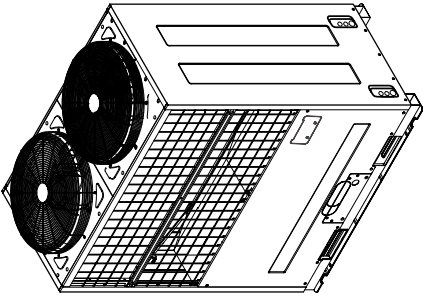
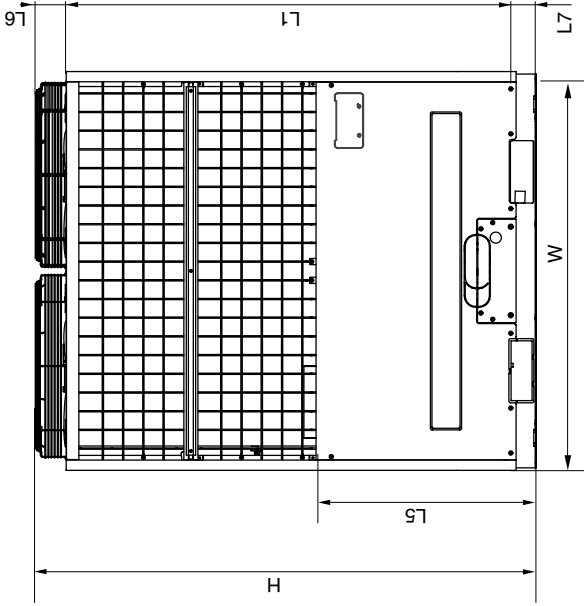
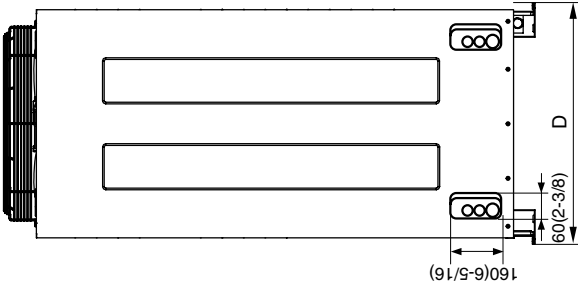

Category	Device	Super II
CAC Network	Network Solution(LGAP)	O
	Simple Central Controller	PQCSB101S0
	Function Controller	PQCSC101S0
	PC Central control Software	PQCSS513A0
	Deluxe Central Controller	PQCSW502A2
	Power Distribution Indicator(PDI)	PQNUD1S00
	CNU2(I-Gataway)	PQNFG14B0
	Dry contact(Outdoor Unit)	PRDSBM
	Dry contact(Indoor Unit)	PQDSB
	AC Smart	PQCSW320A0E
	ACP	PQCPA11A0E/B11A0E
	AC Manager	PQCSS520A0E
	LONWORKS Gateway (BNU-LW)	PQNFB16A1
BACnet Gateway (BNU-BN)	PQNFB17B0	
Program	LG MV	Option
Other	Y branch	Accessory
	Header branch	Accessory
	Air Guide	Accessory

O : Applied    X : Not applied    - : No reation

Option : Model name & price are different according to options, and assembled in factory with main unit

Accessory : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separated package.

# 3. Dimensions

<p>Outdoor Unit(208/230V)</p> <p>ARUB076BT2 ARUB096BT2 ARUB115BT2</p>	<p>[Unit: mm(inch)]</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>W</td><td>mm(inch)</td><td>1280(50-3/8)</td></tr> <tr><td>H</td><td>mm(inch)</td><td>1607(63-5/16)</td></tr> <tr><td>D</td><td>mm(inch)</td><td>730(28-11/16)</td></tr> <tr><td>L1</td><td>mm(inch)</td><td>1427(56-1/8)</td></tr> <tr><td>L2</td><td>mm(inch)</td><td>692(27-3/16)</td></tr> <tr><td>L3</td><td>mm(inch)</td><td>670(26-5/16)</td></tr> <tr><td>L4</td><td>mm(inch)</td><td>900(35-3/8)</td></tr> <tr><td>L5</td><td>mm(inch)</td><td>704(27-11/16)</td></tr> <tr><td>L6</td><td>mm(inch)</td><td>99(3-7/8)</td></tr> <tr><td>L7</td><td>mm(inch)</td><td>82(3-3/16)</td></tr> </table>	W	mm(inch)	1280(50-3/8)	H	mm(inch)	1607(63-5/16)	D	mm(inch)	730(28-11/16)	L1	mm(inch)	1427(56-1/8)	L2	mm(inch)	692(27-3/16)	L3	mm(inch)	670(26-5/16)	L4	mm(inch)	900(35-3/8)	L5	mm(inch)	704(27-11/16)	L6	mm(inch)	99(3-7/8)	L7	mm(inch)	82(3-3/16)	
W	mm(inch)	1280(50-3/8)																														
H	mm(inch)	1607(63-5/16)																														
D	mm(inch)	730(28-11/16)																														
L1	mm(inch)	1427(56-1/8)																														
L2	mm(inch)	692(27-3/16)																														
L3	mm(inch)	670(26-5/16)																														
L4	mm(inch)	900(35-3/8)																														
L5	mm(inch)	704(27-11/16)																														
L6	mm(inch)	99(3-7/8)																														
L7	mm(inch)	82(3-3/16)																														
																																
		<p><b>LG Electronics</b></p> <p>LG Electronics USA, HVAC Division 1000 Sylvan Avenue, Englewood Cliffs, NJ 07632 <a href="http://www.lgusa.com">www.lgusa.com</a> / <a href="http://www.lghvac.com">www.lghvac.com</a></p>																														
<p>76, Seongsan-dong, Changwon City, Gyeongnam, 641-713, Korea <a href="http://www.lgeaircon.com">www.lgeaircon.com</a></p>		<p>CHASSIS CODE: UW1</p>																														

[Unit: mm(inch)]

W	mm (inch)
	1280(50-3/8)
H	mm (inch)
	1607(63-5/16)
D	mm (inch)
	730(28-11/16)
L1	mm (inch)
	1427(56-1/8)
L2	mm (inch)
	692(27-3/16)
L3	mm (inch)
	670(26-5/16)
L4	mm (inch)
	900(35-3/8)
L5	mm (inch)
	10(3/8)
L6	mm (inch)
	704(27-11/16)
L7	mm (inch)
	99(3-7/8)
L8	mm (inch)
	82(3-3/16)

**Outdoor Unit(208/230V)**

ARUB154BT2  
ARUB173BT2  
ARUB192BT2  
ARUB211BT2  
ARUB230BT2

**Notes:**

1. Height of walls in case of pattern 1:  
Front side:1500mm(59-1/16 inch), Suction side:500mm(19-11/16 inch)
2. If the above wall heights are exceeded, then h1/2 and h2/2 should be added to the front and suction side service spaces respectively as shown in the following figure.
3. When installing the units, the most appropriate pattern should be selected from those shown. In order to obtain the best fit in the space available, always bear in mind the need to leave enough room for a person to pass between units and wall and for the air to circulate freely. Your layout should take into account the possibility of short circuits.
4. The Units should be installed to leave sufficient space in front for the on site refrigerant piping work to be carried out comfortably.

**LG Electronics USA, HVAC Division**  
1000 Sylvan Avenue, Englewood Cliffs, NJ 07632  
www.lgusa.com / www.lghvac.com

**LG Electronics**

76, Seongsan-dong, Changwon City, Gyeongnam,  
641-713, Korea  
www.lgeaircon.com

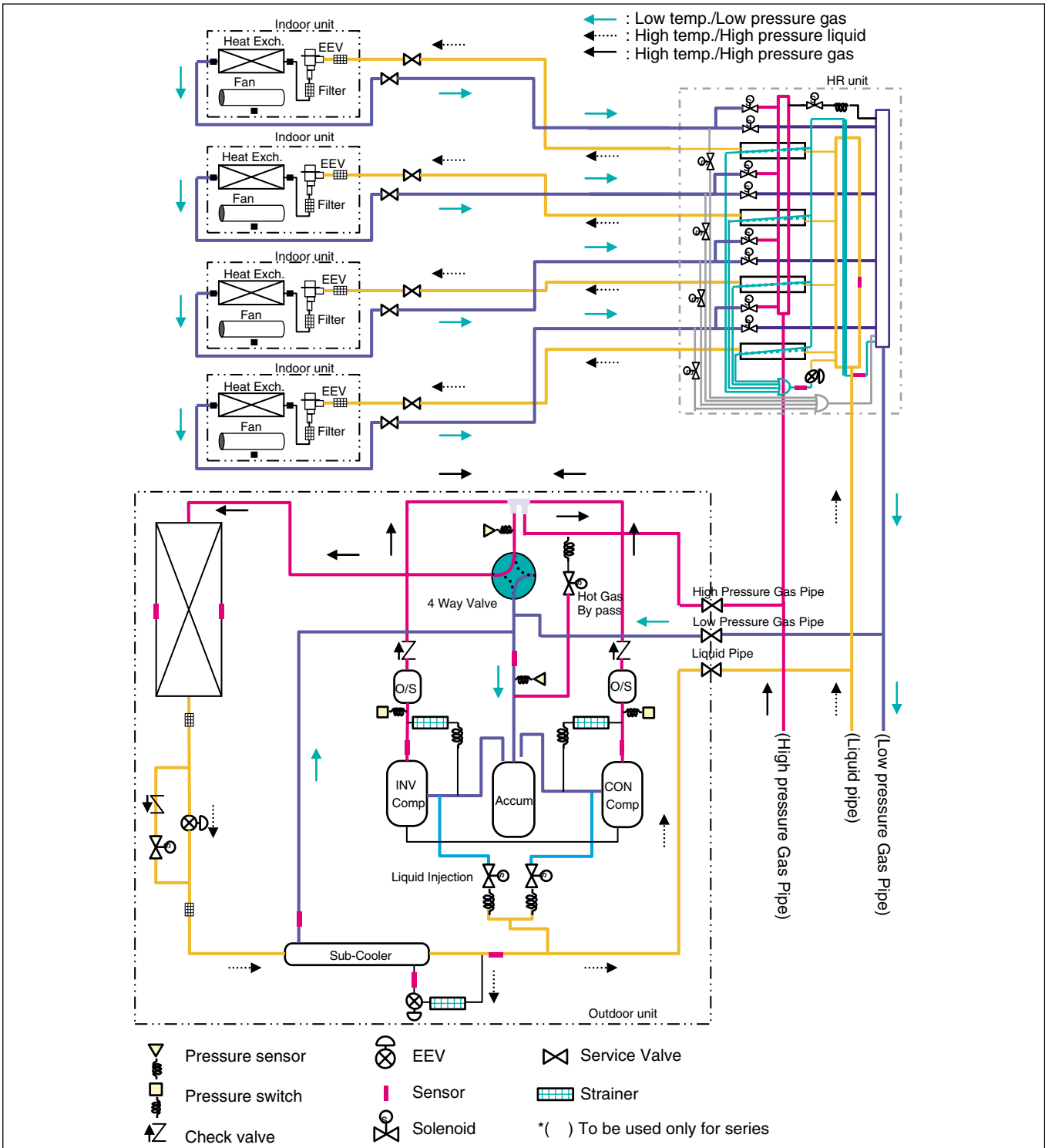
**CHASSIS CODE: UW1**

# 4. Piping Diagrams

## 4.1 Heat Pump Model

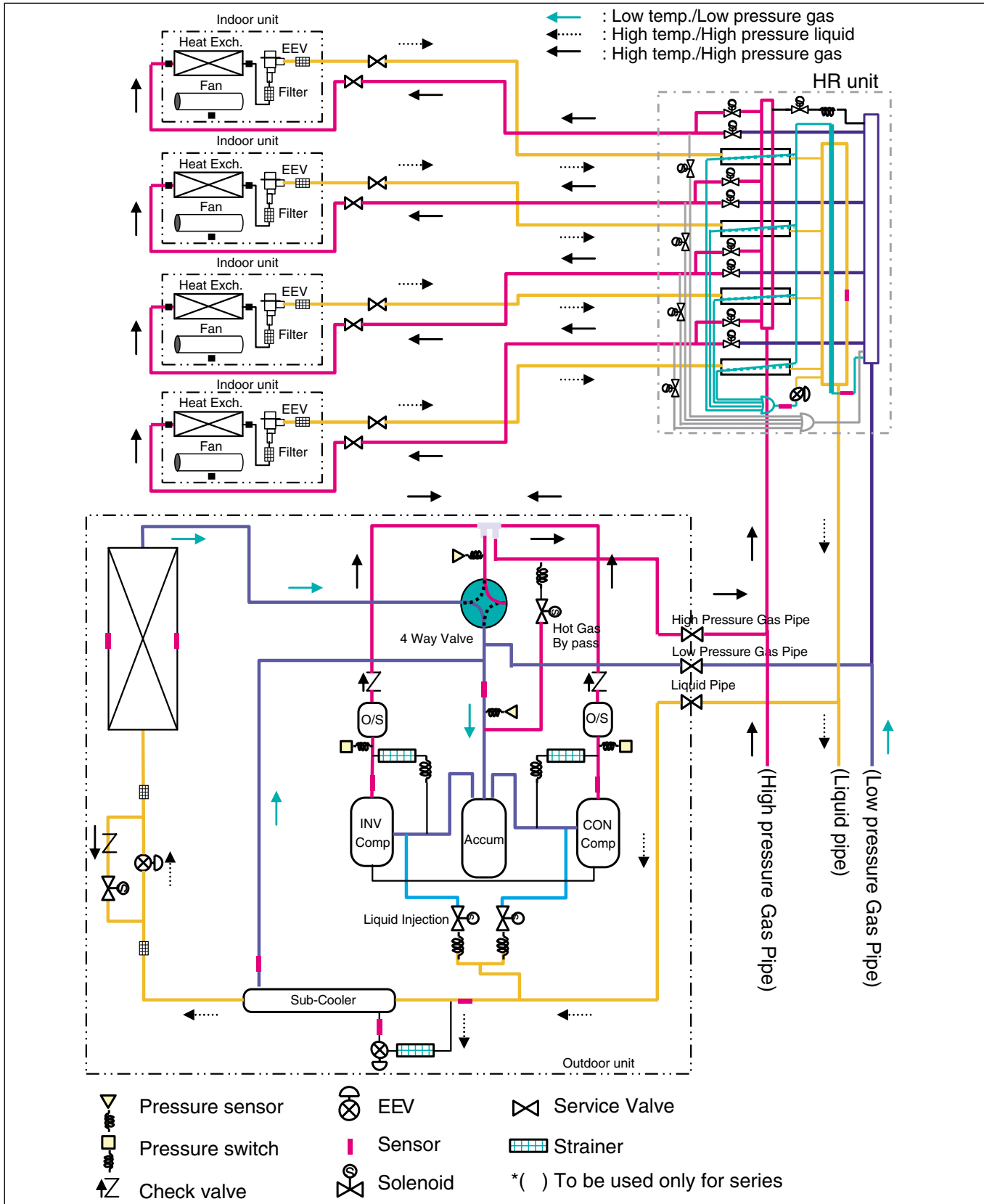
### 4.1.1 ARUB076BT2, ARUB096BT2, ARUB115BT2

#### Cooling Operation

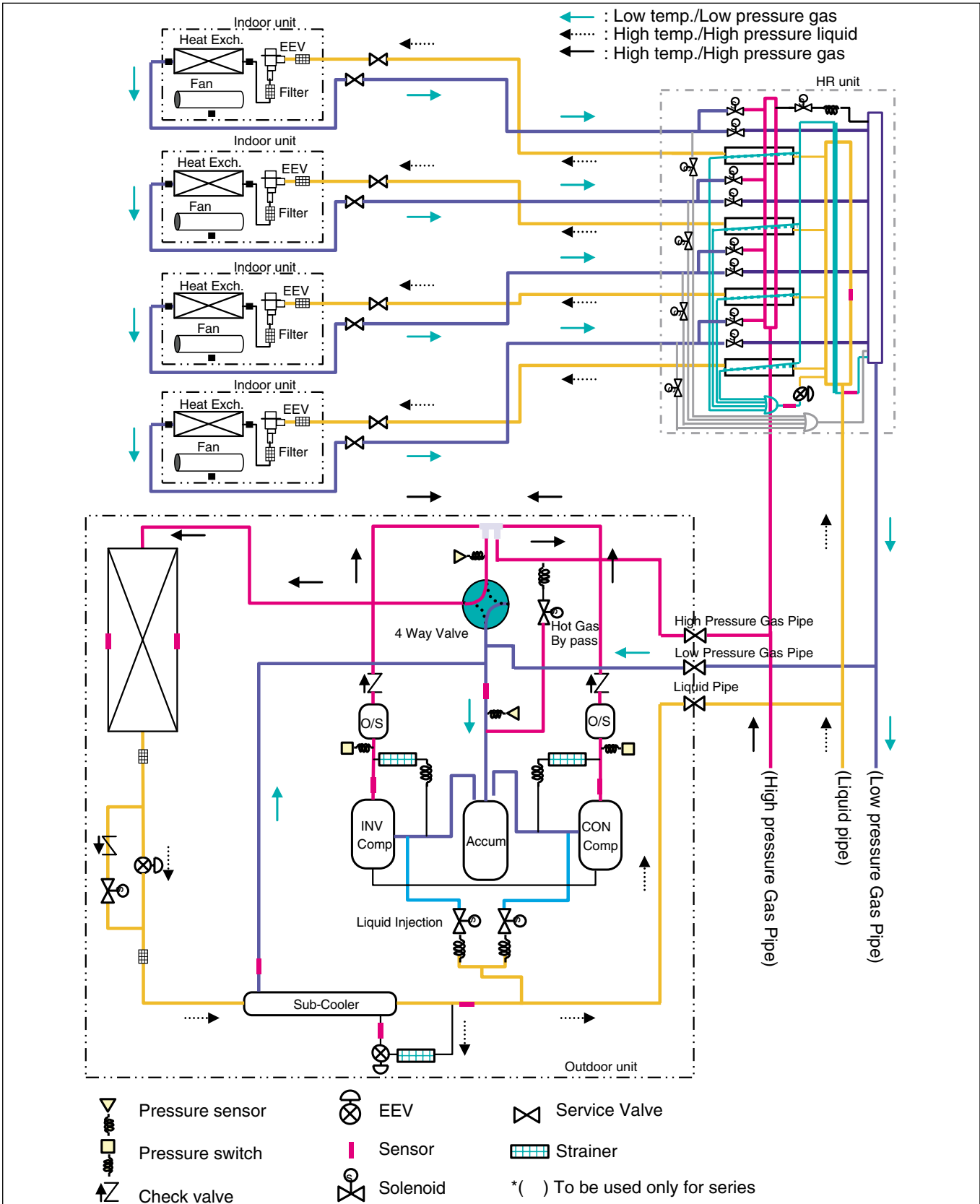




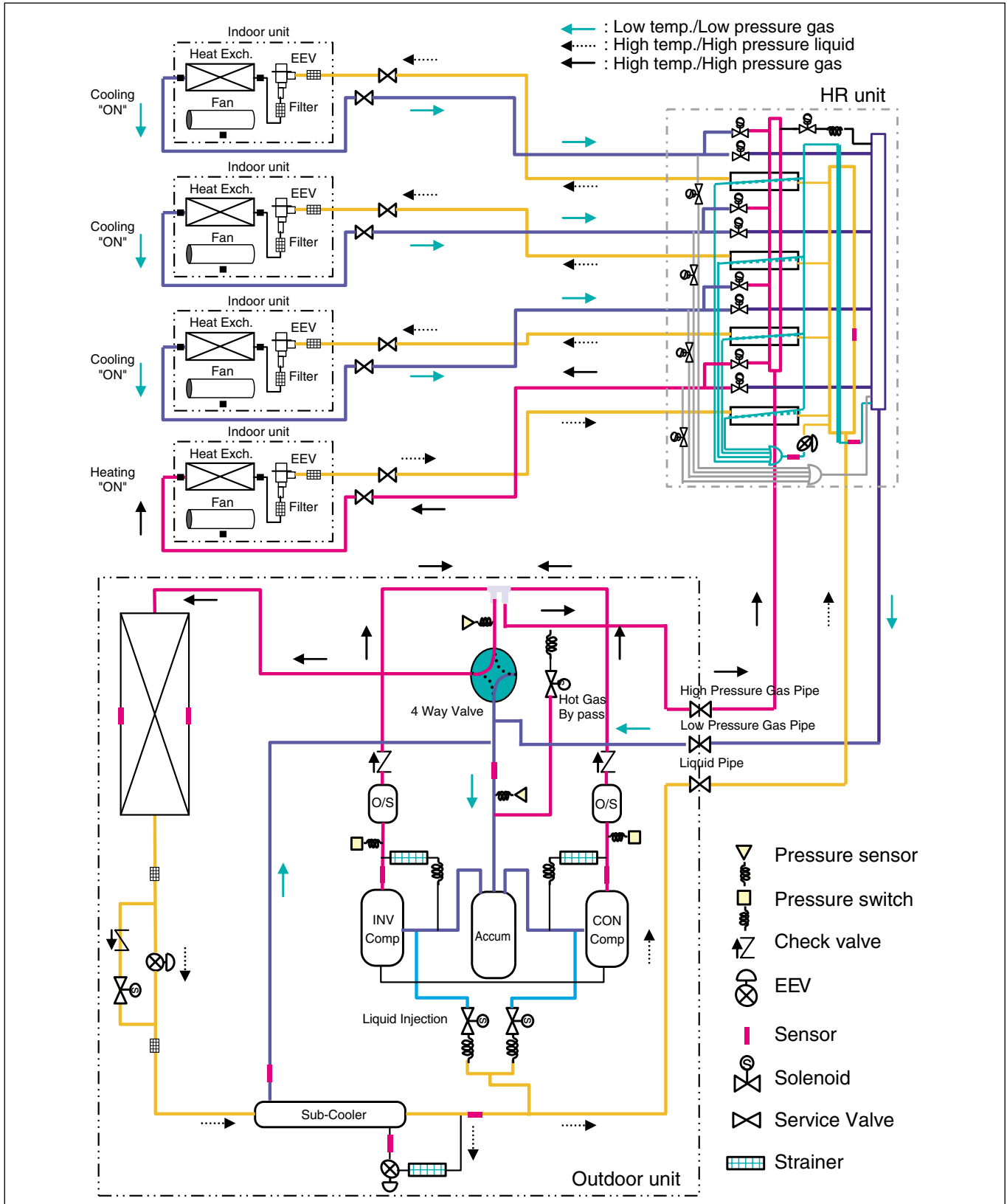
## Heating Operation



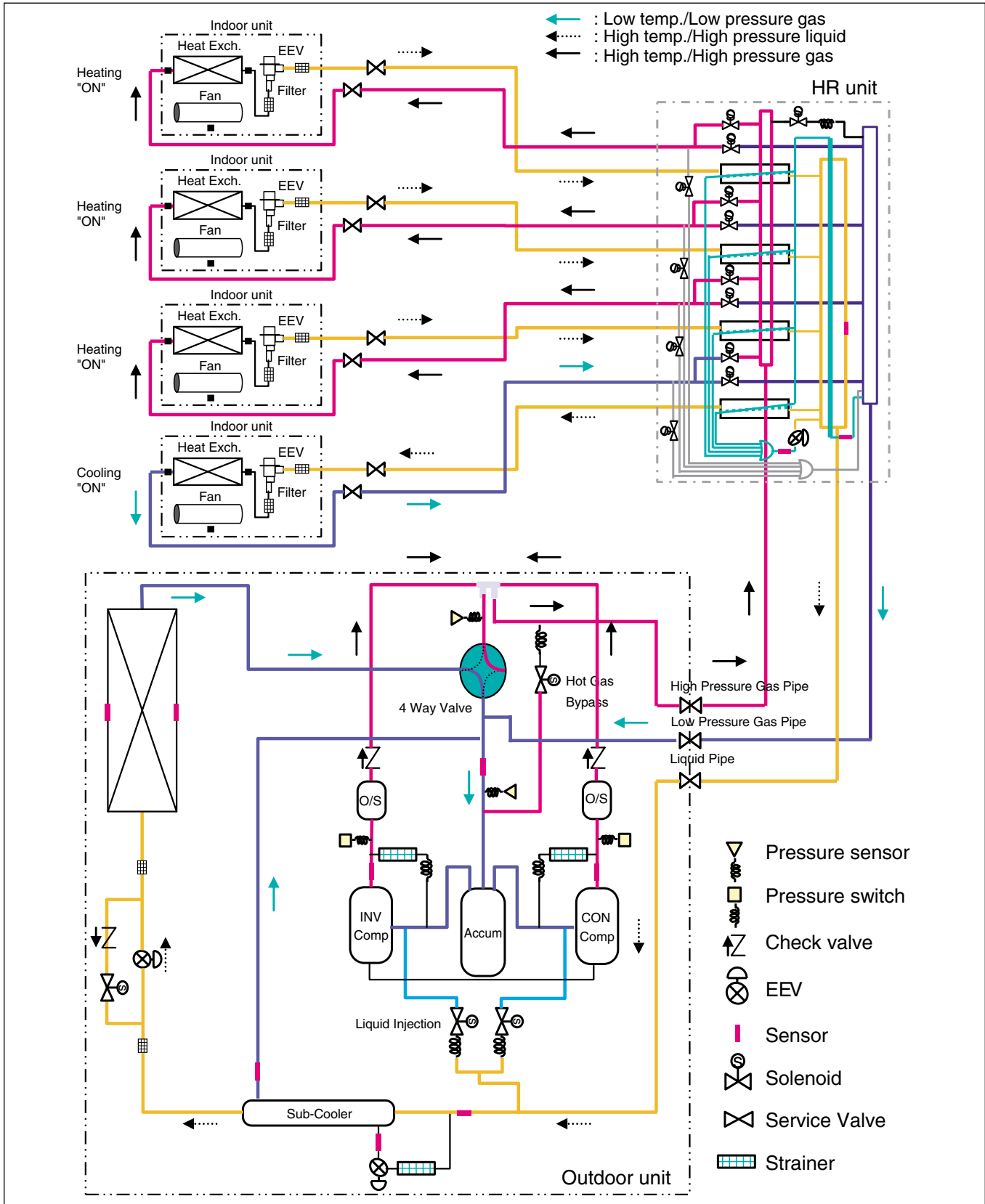
### Oil Return/ Defrost Operation



**Simultaneous Operation Mode 1 (Cooling Based operation)**



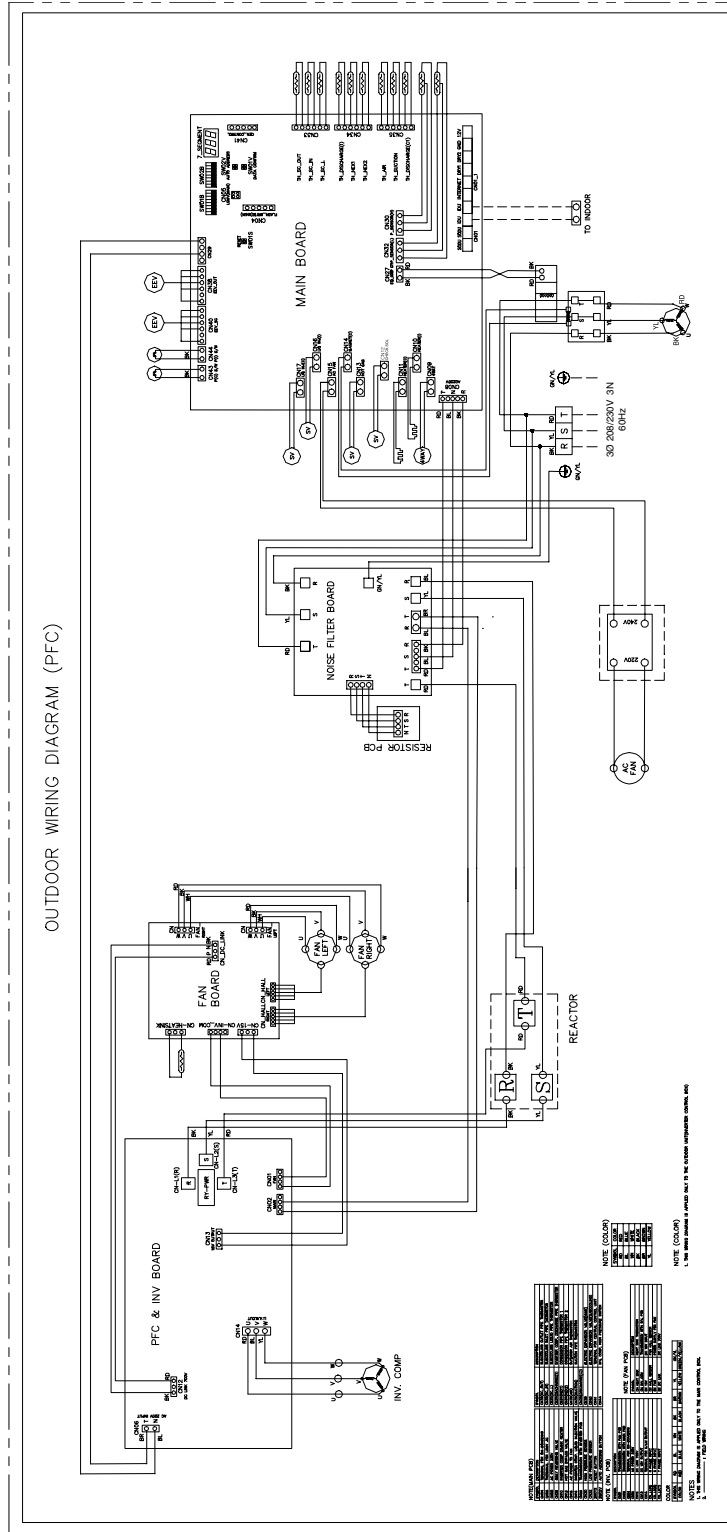
**Simultaneous Operation Mode 2 (Heating Based operation)**



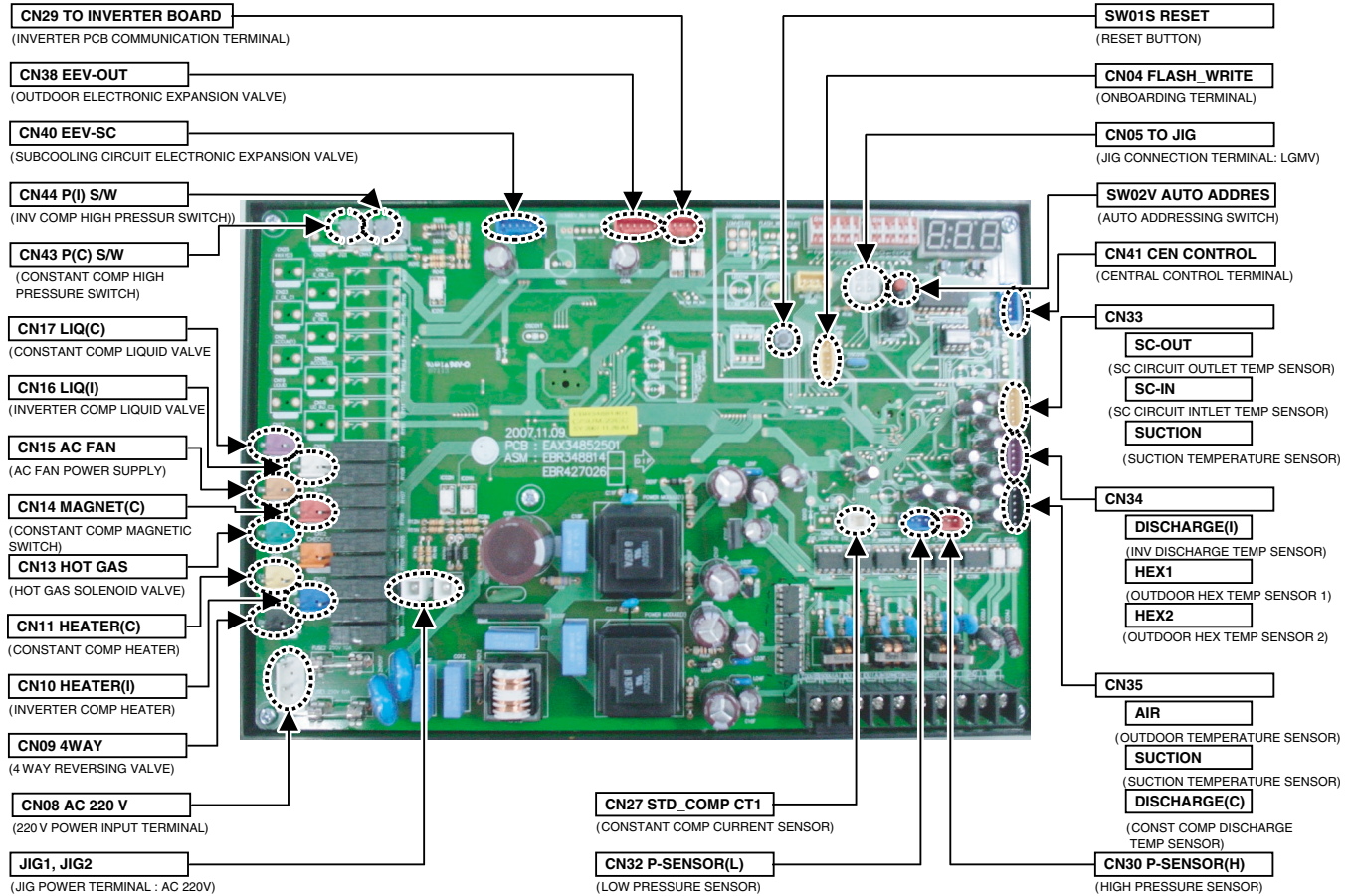
# 5. Wiring Diagrams

## 5.1 Heat Pump Model

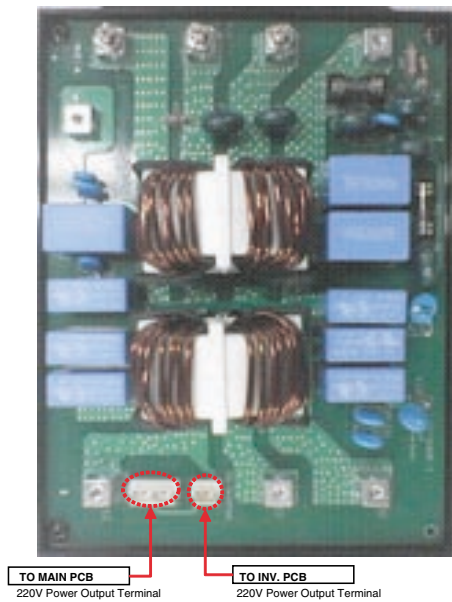
### 5.1.1 3Ø 208/230V (ARUB076BT2, ARUB096BT2, ARUB115BT2)



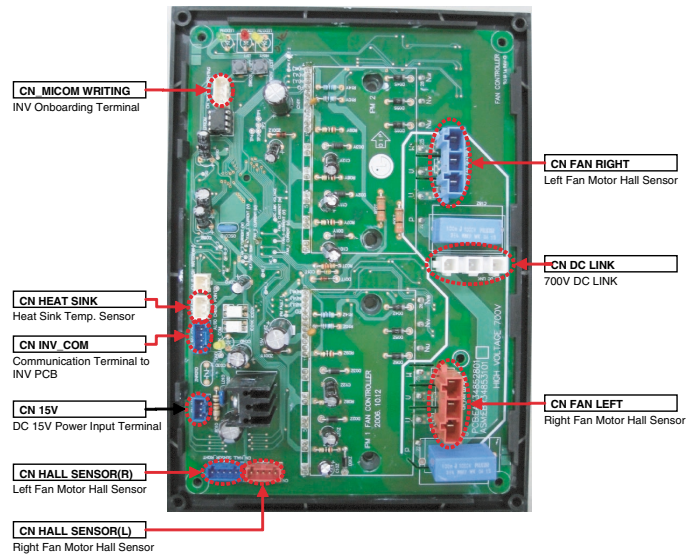
■ Main PCB



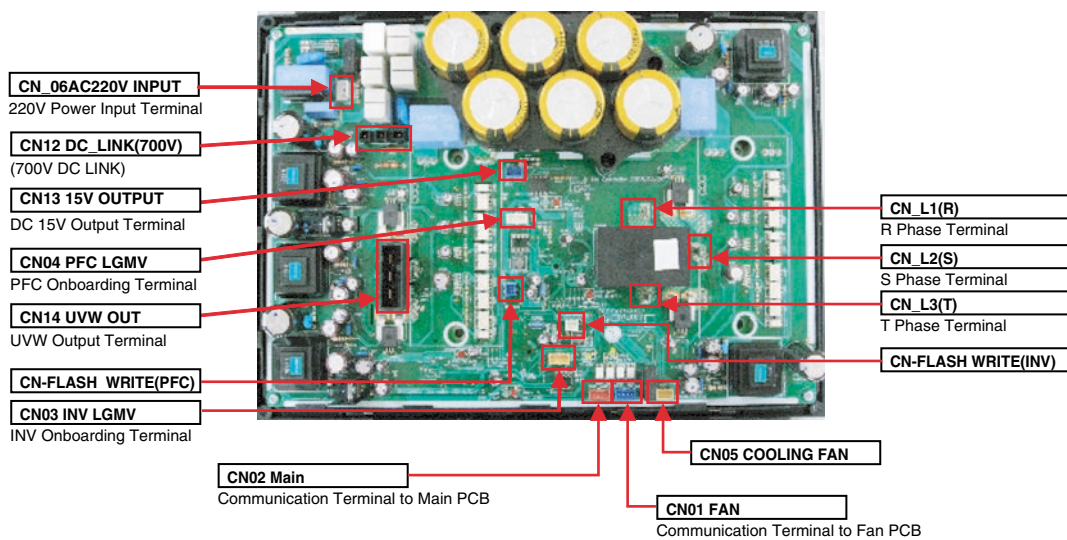
■ Noize Filter



■ FAN PCB(UW1)



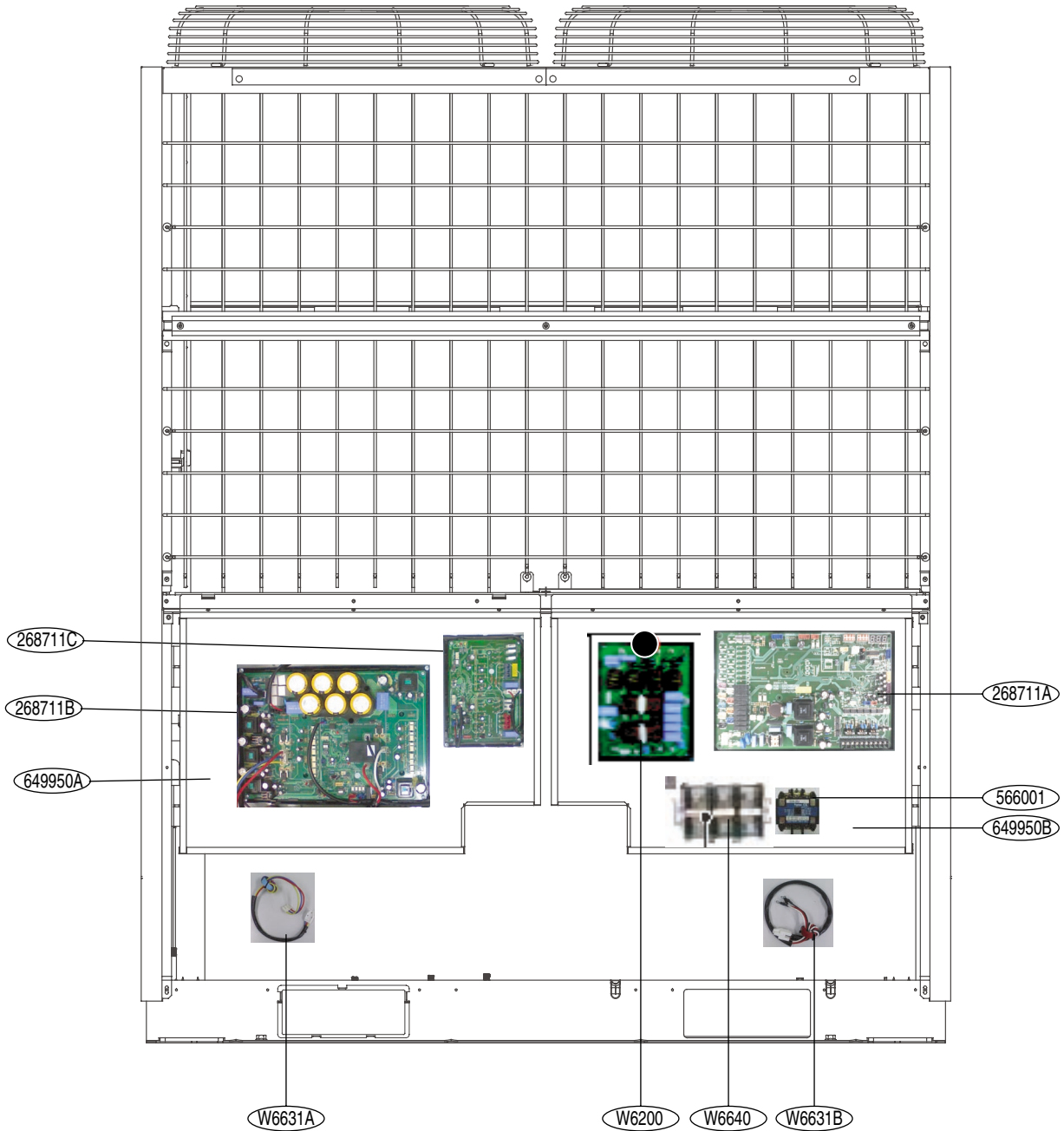
■ Inverter PCB (3Ø 208/230V)



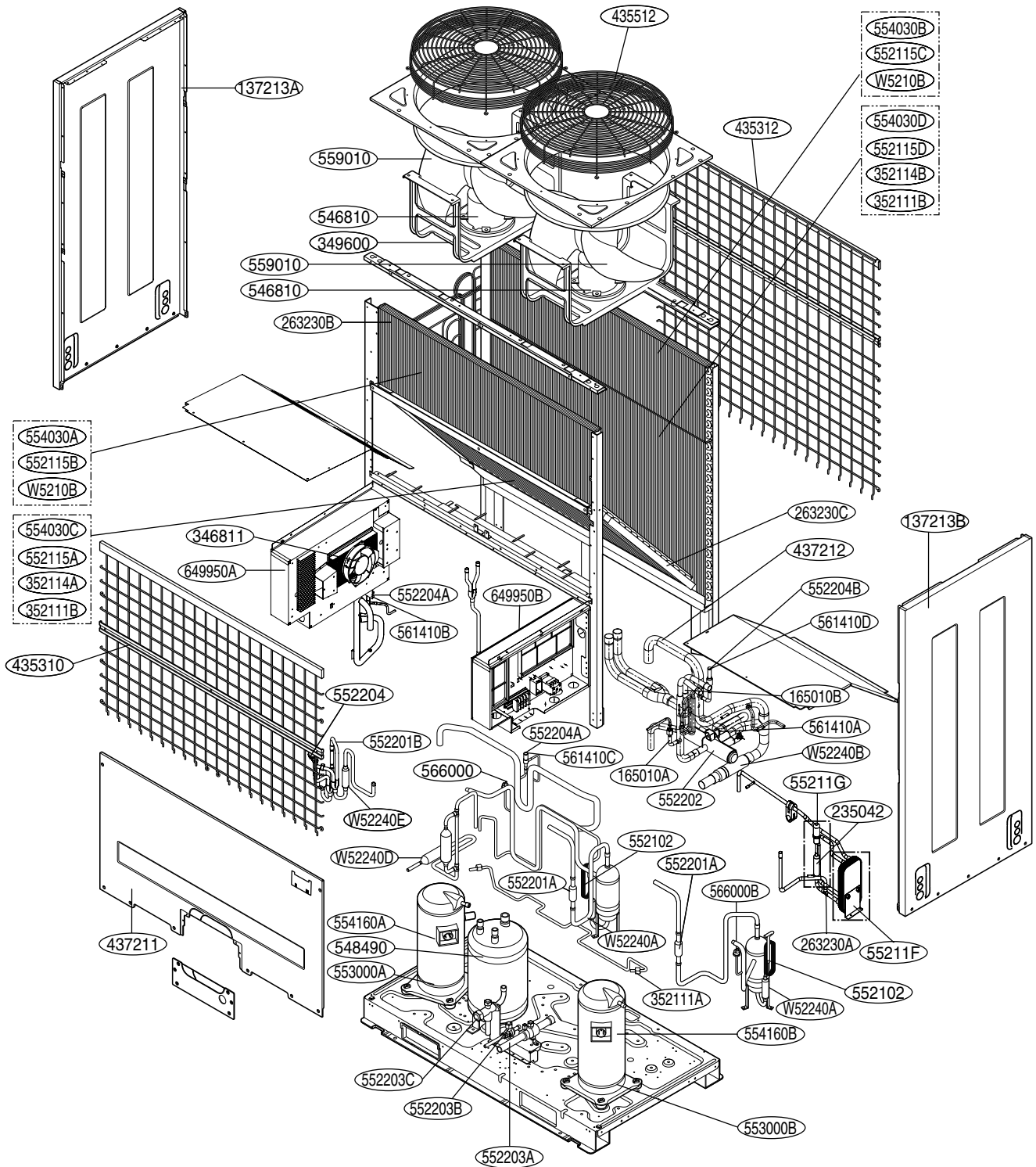
# 6. Exploded View

## Outdoor Unit

### UW1 Chassis (208/230V, ARUB076BT2/096BT2/115BT2)







THERMISTOR 1	263230A	Liquid Pipe + sub Cooler IN + Sub Cooler OUT	Housing color : yellow
THERMISTOR 2	263230B	Inv. discharge + HEX(Front) + HEX (back)	Housing color : purple
THERMISTOR 3	263230C	Air + suction Pipe	Housing color : black



P/NO : MFL54555502

JUNE, 2008