LG
Life's Good

MULTI V™ 5
WITH
LGRED°

OUTDOOR UNIT
ENGINEERING MANUAL

Variable Refrigerant Flow Outdoor Units
6.0 to 42.0 Tons

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A summary list of safety precautions is on page 3.

To access additional technical documentation such as submittals, indoor unit engineering manuals, installation, service, product data performance, general best practice, and building ventilation manuals, as well as white papers, catalogs, LATS software programs, and more, log in to www.lghvac.com.

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TABLE OF SYMBOLS

⚠ **DANGER**	*This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.*
⚠ **WARNING**	*This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*
⚠ **CAUTION**	*This symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.*
⚠ **NOTE**	*This symbol indicates situations that may result in equipment or property damage accidents only.*
Note:	*This symbol indicates information related to the current procedure.*
	This symbol indicates an action that should not be performed.

UNIT NOMENCLATURE

Outdoor Units

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Outdoor Units (ODU)

ARU	M	072	B	T	E	5

Family
ARU = Multi V Outdoor Unit (Refrigerant R410A)

Type
M = Combination (Heat Pump or Heat Recovery)

Capacity (Mbh)

072 = 72	192 = 192	312 = 312	432 = 432
096 = 96	216 = 216	336 = 336	456 = 456
121 = 121	241 = 240	360 = 360	480 = 480
144 = 144	264 = 264	384 = 384	504 = 504
168 = 168	288 = 288	408 = 408	

Electrical Ratings
B = 208–230V/60Hz/3Ph
D = 460V/60Hz/3Ph

Airflow Configuration
T = Top Discharge

Efficiency
E = High Efficiency

Generation
5 = Fifth

Heat Recovery Units (HRU)

PRHR	02	3A

Family
PRHR = Multi V Heat Recovery Unit (HRU)
(Refrigerant R410A)

Number of Ports
02 = Two Ports
03 = Three Ports
04 = Four Ports
06 = Six Ports
08 = Eight Ports

Series Number
2A = Series Number
3A = Series Number

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LG

LG Air Conditioner Technical Solution (LATS) Software

A properly designed and installed refrigerant piping system is critical to the optimal performance of LG air-conditioning systems. To assist engineers, LG offers, free of charge, LG Air Conditioner Technical Solution (LATS) software—a total design solution for LG air conditioning systems.

Note:

To reduce the risk of designing an improper applied system or one that will not operate correctly, LG requires that LATS software be used on all projects.

Formats

LATS is available to LG customers in two user interfaces: LATS HVAC and LATS REVIT. LATS formats are available through www.myLGHVAC.com, or contact an LG Sales Representative.

LATS HVAC is a Windows®-based application that aids engineers in designing LG Variable Refrigerant Flow (VRF), Multi F / Multi F MAX, Single-Zone, and Energy Recovery Ventilator (ERV) systems.

**Windows® is a registered mark of Microsoft® Corporation.*

LATS Revit integrates the LG LATS program with Revit® software**. It permits engineers to layout and validate Multi V VRF systems directly into Revit drawings.

***Revit® is a registered mark of Autodesk, Inc.*

Features

All LG product design criteria have been loaded into the program, making LATS simple to use: double click or drag and drop the component choices. Build systems in Tree Mode where the refrigerant system can be viewed. Switch to a Schematic diagram to see the electrical and communications wiring.

LATS software permits the user to input region data, indoor and outdoor design temperatures, modify humidity default values, zoning, specify type and size of outdoor units and indoor units, and input air flow and external static pressure (ESP) for ducted indoor units.

The program can also do the following:

- Import building loads from a separate Excel file.
- Present options for outdoor unit auto selection.
- Automatically calculate component capacity based on design conditions for the chosen region.
- Verify if the height differences between the various system components are within system limits.
- Provide the correct size of each refrigerant piping segment and LG Y-Branches and Headers.
- Adjust overall piping system length when elbows are added.
- Check for component piping limitations and flag if any parameters are broken.
- Factor operation and capacity for defrost operation.
- Calculate refrigerant charge, noting any additional trim charge.
- Suggest accessories for indoor units and outdoor units.
- Run system simulation.

Note:

Features depend on which LATS program is being used, and the type of system being designed.

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LG AIR CONDITIONER TECHNICAL SOLUTION (LATS)

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LATS Generates a Complete Project Report

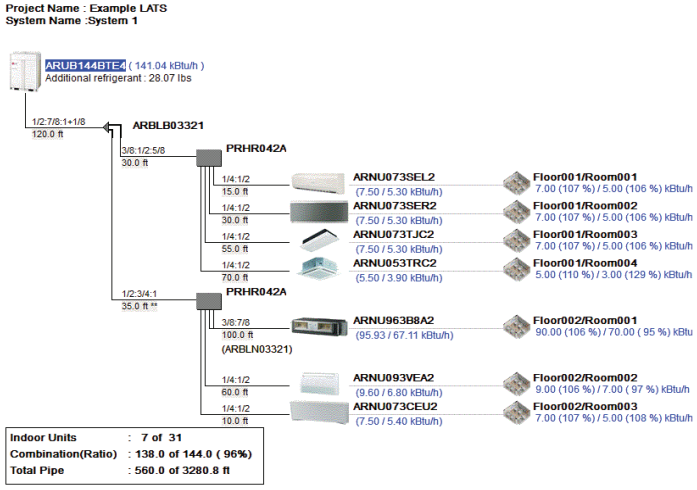
LATS software also generates a report containing project design parameters, cooling and heating design data, system component performance, and capacity data. The report includes system combination ratio and refrigerant charge calculations; and provides detailed bill of material, including outdoor units, indoor units, control devices, accessories, refrigerant pipe sizes segregated by building, by system, by pipe size, and by pipe segments. LATS can generate an Excel GERP report that can imported into the LG SOPS pricing and ordering system.

Proper Design to Install Procedure

LG encourages a two report design-to-install-procedure. After the design engineer determines building / zone loads and other details, the engineer opens the LATS program and inputs the project's information. When the design is complete, the "Auto Piping" and "System Check" functions must be used to verify piping sizes, limitations, and if any design errors are present. If errors are found, engineers must adjust the design, and run Auto Piping and System Check again. When the design passes the checks, then the engineer prints out a project "Shop Drawing" (LATS Tree Diagram) and provides it to the installing contractor. The contractor must follow the LATS Tree Diagram when building the piping system, but oftentimes the design changes on the building site:

- Architect has changed location and/or purpose of room(s).
- Outdoor unit cannot be placed where originally intended.
- Structural elements prevent routing the piping as planned.
- Air conditioning system conflicts with other building systems (plumbing, gas lines, etc.).

Figure 1: Example of a LATS Tree Diagram.



The contractor must mark any deviation from the design on the Shop Drawing, including as-built straight lines and elbows. This "Mark Up" drawing must be returned to the design engineer or Rep, who must input contractor changes into the LATS file. (Copy the original LATS software file, save and rename as a separate file, and modify all piping lengths by double-clicking on each length and editing information.) Like the shop drawing, the Auto Piping and System Check must also be run on this new "As Built" drawing. The design engineer or Rep must then provide the final As Built file to the contractor. The Mark Up version must be compared to the As Built version for:

- Differences in pipe diameter(s). If incorrect diameters have been installed, the piping must be changed out. If pipe diameters have changed, check to see if Y-Branches will also need to be changed.
- Changes to outdoor unit and indoor unit capacities. Capacities changes may impact line length changes.
- Additional refrigerant charge quantity ("Trim Charge"). Trim charge will change if piping lengths and diameters change. The As Built version must reflect installed piping lengths to ensure correct trim charge.

All documents submitted by the contractor, as well as the Shop Drawing and the As Built Drawing files must be provided for commissioning purposes. Model and serial numbers for all system components must also be submitted. If the steps previously detailed are not followed, and all documents are not provided to the commissioning agent, the project runs the risk of not being commissioned and voiding any limited warranty LG offers on the equipment.

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REFRIGERANT CHARGE WORKSHEET

System R410A Refrigerant Charge Calculator (lbs.)

System Tag or ID:	Job Name: _____
	Project Manager: _____ Date: _____

Line #	Description			Chassis I.D.	Size	Quantity	CF (Ref.)[1]	Total (lbs.)
1	Linear feet of 1/4" liquid line tubing[2]			—	—		0.015	
2	Linear feet of 3/8" liquid line tubing[2]			—	—		0.041	
3	Linear feet of 1/2" liquid line tubing[2]			—	—		0.079	
4	Linear feet of 5/8" liquid line tubing[2]			—	—		0.116	
5	Linear feet of 3/4" liquid line tubing[2]			—	—		0.179	
6	Linear feet of 7/8" liquid line tubing[2]			—	—		0.238	
7	Linear feet of 1" liquid line tubing[2]			—	—		0.323	
8	Standard + Art Cool Mirror			SJ, SK	5k to 15k		0.53	
9	Standard + Art Cool Mirror			SJ, SK	18k to 24k		0.62	
10	Standard			SR	30k to 36k		1.01	
11	Art Cool Gallery			SF	9k to 12k		0.22	
12	1-Way Cassette			TU	7k to 12k		0.44	
13	1-Way Cassette			TT	18k to 24k		0.64	
14	2-Way Cassette			TS	18k to 24k		0.75	
15	4-Way 2' x 2' Cassette			TR	5k to 7k		0.40	
16	4-Way 2' x 2' Cassette			TR	9k to 12k		0.55	
17	4-Way 2' x 2' Cassette			TQ	15k to 18k		0.71	
18	4-Way 3' x 3' Cassette			TA	7k to 48k		1.5	
19	Mid Static Ducted			M1	7k to 24k		0.57	
20	High Static Ducted			M2	7k to 24k		0.77	
21	High Static Ducted			M2	28k to 42k		1.15	
22	High Static Ducted			M3	28k to 54k		1.35	
23	High Static Ducted			B8	36k to 96k		2.20	
24	Low Static Ducted, Low Static Ducted Bottom Return			L1	5k to 9k		0.31	
25	Low Static Ducted, Low Static Ducted Bottom Return			L2	12k to 18k		0.42	
26	Low Static Ducted, Low Static Ducted Bottom Return			L3	21k to 24k		0.55	
27	Vertical / Horizontal Air Handling Unit			NJ	12k to 30k		1.04	
28	Vertical / Horizontal Air Handling Unit			NJ	36k		1.57	
29	Vertical / Horizontal Air Handling Unit			NK	42k to 54k		2.00	
30	Floor Standing			CE (U)	7k to 15k		0.37	
31	Floor Standing			CF (U)	18k to 24k		0.82	
32	HRU: PRHR022A/023A, 032A/033A, 042A/043A			—	—		1.1	
33	HRU: PRHR063A, 083A			—	—		2.2	
34	**ADDITIONAL Refrigerant Charge Required** (Sum of lines 1 – 33)							
35	Outdoor Unit Factory Refrigerant Charge	35A	ARUM072*TE5		72k		14.3	
		35B	ARUM096*TE5		96k		23.2	
		35C	ARUM121*TE5		121k		23.2	
		35D	ARUM144*TE5		144k		26.5	
		35E	ARUM168*TE5		168k		26.5	
		35F	ARUM192*TE5		192k		30.9	
		35G	ARUM216*TE5		216k		37.5	
		35H	ARUM241*TE5		241k		37.5	
36	**Total ODU FACTORY Refrigerant Charge** (Sum of factory refrigerant charges for all ODUs in the system, lines 35A -35H)							
37	**TOTAL SYSTEM CHARGE** Sum of Additional Refrigerant Charge Required (line 34) and Total ODU Factory Refrigerant Charge (line 35)							

[1]CF (Ref.) = Correction Factor for Refrigerant Charge. [2]For refrigerant charge purposes, consider only the liquid line; ignore the vapor line(s).

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Multi V 5 with LGRED° Outdoor Units

General

LG Multi V 5 Variable Refrigerant Flow (VRF) outdoor unit can be configured to operate as a Heat Pump system or a Heat Recovery System. Single, dual, or triple frame outdoor unit combinations are connected to indoor units with a single refrigerant piping system using factory designed and supplied Y-branches, Headers, and/or Heat Recovery Units and have integrated controls.

The system is capable of being designed for minimum piping and maximum design flexibility. Each Heat Recovery Unit piping port is independently capable of operating in either heating or cooling mode regardless of the mode of other piping ports on the same heat recovery unit or in the system. The Heat Recovery Unit is capable of changing mode of individual indoor units or zones (cooling to heating or heating to cooling) within a maximum time frame of three (3) minutes to ensure indoor temperature can be properly maintained.

LG components are manufactured in a facility registered to ISO 9001 and ISO 14001, which is a set of standards applying to environmental protection set by the International Organization for Standardization (ISO). The units are Electrical Testing Laboratories (ETL) listed and bear the ETL label. All internal wiring is in accordance with the National Electrical Code (NEC).

Temperature Ranges

Heat Pump Configuration

In Heat Pump configuration, the system can operate in heating only mode (i.e., all indoor units in heating mode) from -22°F to 61°F outdoor ambient wet bulb. Heat Pump systems can operate in cooling mode from 5°F to 122°F outdoor ambient dry bulb. Optional low ambient cooling kit extends the cooling only operating range (i.e., all indoor units in cooling mode) down to -9.9°F. See the Multi V 5 Installation Manual for DIP switch settings for Heat Pump operation.

Heat Recovery Configuration

In Heat Recovery configuration, the system can operate in heating only mode (i.e., all indoor units in heating mode) from -22°F to 61°F outdoor ambient wet bulb. Heat Recovery systems can operate in cooling only mode from 5°F to 122°F outdoor ambient dry bulb. Optional low ambient cooling kit extends cooling only operation range (i.e. all indoor units in cooling mode) down to -9.9°F. Heat Recovery synchronous operation range is 14°F to 81°F outdoor ambient dry bulb. See the Multi V 5 Installation Manual for DIP switch settings for Heat Recovery operation.

Casing / Frame

Outdoor units are constructed with galvanized steel, bonderized and finished with baked enamel paint. Each frame has a removable inspection panel to allow access to service tool connections, DIP switches, auto addressing, and error codes. The entire front panel of the outdoor unit is removable for maintenance.

Outdoor unit frames are completely factory assembled, piped and wired. Dual and triple frame outdoor units are field piped with factory designed and supplied outdoor unit Y-branch kits to manifold them together into a single refrigerant circuit.

Refrigerant System

The refrigeration system consists of a single refrigeration circuit and uses R410A refrigerant. The outdoor unit is provided with factory installed components, including a refrigerant strainer, check valves, oil separator, oil level sensor, accumulator, four-way reversing valves, electronically controlled expansion valve (EEV), high and low side charging ports, high pressure safety switch, service valves, and interconnecting piping. Also included is an integral subcooler assembly consisting of a double spiral tube-type subcooling heat exchanger and EEV providing modulation of up to 23ºF subcooling.

Compressors

All 3-phase outdoor unit frames ≤130MBh nominal capacity are equipped with one digitally controlled inverter-driven hermetic scroll compressor to modulate capacity (variable from 12 to 150Hz). All 3-phase outdoor unit frames ≥130MBh nominal capacity are equipped with two digitally controlled inverter-driven hermetic scroll compressors to modulate capacity (variable from 12 to 150Hz). An internal thermal overload, and a factory-mounted 60 watt crankcase heater are included on all compressors.

Outdoor Unit Coil

The outdoor unit coils are of a nonferrous construction with louvered aluminum fins on copper tubing, and are protected by a metal guard. Coil fins have a factory applied corrosion resistant Black Fin™ II and hydrophilic coating.

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MECHANICAL SPECIFICATIONS

Multi V 5 Outdoor Units

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Fans and Motors

All outdoor unit frames <80MBh include one direct drive, variable speed, biomimetic enhanced, propeller type fan. All outdoor unit frames >80MBh include two direct drive, variable speed, biomimetic enhanced, propeller type fans. All fan motors have inherent protection, permanently lubricated bearings, and are variable speed with a maximum speed up to 1,150 rpm. Fan guards are provided to limit contact with moving parts. All Heat Pump / Heat Recovery outdoor units have vertical discharge airflow. Optional air guides can be field installed to change discharge airflow from vertical to horizontal. Outdoor units have an additional static pressure capability up to 0.32" WG with a DIP switch setting.

Electrical

Outdoor units are available in 208-230V/60 Hz/3-phase or 460V/60 Hz/3-phase. The unit controls include current protection logic.

Controls

Outdoor units are factory wired with necessary electrical control components, integral microprocessors, printed circuit boards, thermistors, sensors, terminal blocks, and lugs for power wiring.

The control circuit between the indoor units, heat recovery units, and outdoor unit is a variable low voltage DC communication completed using a two conductor, stranded, and shielded cable for the RS-485 daisy chain communication wiring. Microprocessor-based algorithms provide component protection, soft-start capability, refrigeration system pressure, temperature, defrost, and ambient control.

System Features

Advanced Smart Load Control

Automatically adjusts system target pressures based on outdoor temperature,and indoor and outdoor humidity for increased cooling and heating performance.

Intelligent Heating

By monitoring the outdoor ambient humidity, the target high refrigerant pressure and compressor frequency can be reduced to extend heating operation, delay defrost operation initialization, and reduce power consumption.

Advanced Comfort Cooling

By monitoring the indoor temperature and setpoint differential, plus the indoor zone humidity level, the target indoor unit refrigerant superheat and flow rate can be adjusted for improved comfort and cooling efficiency.

HiPOR™ (High Pressure Oil Return)

Refrigerant oil is captured from the compressor discharge by the centrifugal oil separator and then returned to the compressor through a separate oil injection pipe, preventing efficiency loss inherent in returning oil to the suction side of the compressor.

Smart Oil Control

Actively monitors the oil level inside each compressor and only initiates an oil return cycle to flush oil in the piping system back to the compressor oil sump when the oil level is too low, preventing the need for timed oil return cycles while maintaining proper oil level.

Active Refrigerant Control

Depending on the operating mode and conditions, the system refrigerant level is automatically adjusted for increased part load and heating operation efficiency.

Variable Path Heat Exchanger

Depending on the operating mode and conditions, both the refrigerant flow path and velocity are adjusted automatically for improved efficiency.

Vapor Injection

In heating mode, warm refrigerant vapor discharged by the subcooling heat exchanger is injected into the compressor scroll chamber, improving heating performance at low outdoor ambient conditions.

Advanced PCB Cooling

Improved cooling performance of the inverter drive control board by using liquid refrigerant instead of heat pipe or heat sink cooling methods using outdoor fan airflow.

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GENERAL DATA

208-230V Outdoor Unit Specifications

Table 1: Single Frame 208-230V Outdoor Units.

Unit Model Number		ARUM072BTE5 6.0 Ton	ARUM096BTE5 8.0 Ton	ARUM121BTE5 10.0 Ton	ARUM144BTE5 12.0 Ton
Individual Component Model Numbers		-	-	-	-
Cooling Performance					
Nominal Cooling Capacity (Btu/h)[1]		72,000	96,000	119,700	144,000
Rated Cooling Capacity (Btu/h)[1]		69,000	92,000	114,000	138,000
Heating Performance					
Nominal Heating Capacity (Btu/h)[1]		81,000	108,000	135,000	162,000
Rated Heating Capacity (Btu/h)[1]		77,000	103,000	129,000	152,000
Operating Range					
Cooling (°F DB)		5 to 122	5 to 122	5 to 122	5 to 122
Heating (°F WB)[2]		-22 to +61	-22 to +61	-22 to +61	-22 to +61
Synchronous — Cooling Based (°F DB)		14 to 81	14 to 81	14 to 81	14 to 81
Synchronous — Heating Based (°F WB)		14 to 61	14 to 61	14 to 61	14 to 61
Compressor					
Inverter Quantity		HSS DC Scroll x 1	HSS DC Scroll x 1	HSS DC Scroll x 1	HSS DC Scroll x 2
Oil/Type		PVE / FVC68D	PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Top Discharge)					
Type		Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)
Motor Output (kW) x Qty.		1.5 x 1	0.9 x 2	0.9 x 2	0.9 x 2
Motor/Drive		Brushless Digitally Controlled / Direct			
Operating Range (RPM)	Cooling	0 - 1,000	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 1,000	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		8,470	11,300	11,300	11,300
ESP (in. w.g.; Selectable Range)		0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32
Unit Data					
Refrigerant Type		R410A	R410A	R410A	R410A
Refrigerant Control/Location		EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Factory Charge lbs. of R410A		14.3	23.2	23.2	26.5
Max. No. Indoor Units/System[3]		13	16	20	24
Sound Pressure dB(A)[4]		58.0	58.0	59.0	60.0
Net Unit Weight (lbs.)		430	507	507	639
Shipping Weight (lbs.)		452	534	534	666
Communication Cables[5,6]		2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger					
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Fin™ II Coated / Hydrophilic			
Rows/Fins per inch		2 / 17	2 / 17	2 / 17	3 / 17
Piping for Heat Recovery Operation[7]					
Liquid Line Connection (in., OD)		3/8 Braze	3/8 Braze	1/2 Braze	1/2 Braze
Low Pressure Vapor Line Connection (in., OD)		3/4 Braze	7/8 Braze	1-1/8 Braze	1-1/8 Braze
High Pressure Vapor Line Connection (in., OD)		5/8 Braze	3/4 Braze	3/4 Braze	7/8 Braze
Piping for Heat Pump Operation[7]					
Liquid Line Connection (in., OD)		3/8 Braze	3/8 Braze	1/2 Braze	1/2 Braze
Vapor Line Connection (in., OD)		3/4 Braze	7/8 Braze	1-1/8 Braze	1-1/8 Braze

[1]Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at www.ahridirectory.org.

[2]Low ambient performance with LGRED° heat technology is included in units produced after Feb. 2019.

[3]The System Combination Ratio must be between 50–130%.

[4]Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

[5]Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

[6]Power wiring is field provided, solid or stranded, and must comply with the applicable local and national codes. See the Electrical Data section for more details.

[7]LG requires that LATS software be used on all projects to ensure correct line sizing. Designer must verify the shop drawing design against the as built design using LATS. Contractor must also use LG manufactured Y-Branch and Header Kits only.

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GENERAL DATA

208 / 230V Outdoor Unit Specifications

Table 2: Single Frame 208-230V Outdoor Units, continued.

Unit Model Number		ARUM168BTE5 14.0 Ton	ARUM192BTE5 16.0 Ton	ARUM216BTE5 18.0 Ton	ARUM241BTE5 20.0 Ton
Individual Component Model Numbers		-	-	-	-
Cooling Performance					
Nominal Cooling Capacity (Btu/h)[1]		168,000	192,000	216,000	233,100
Rated Cooling Capacity (Btu/h)[1]		160,000	184,000	206,000	222,000
Heating Performance					
Nominal Heating Capacity (Btu/h)[1]		189,000	216,000	243,000	243,000
Rated Heating Capacity (Btu/h)[1]		180,000	206,000	230,000	230,000
Operating Range					
Cooling (°F DB)		5 to 122	5 to 122	5 to 122	5 to 122
Heating (°F WB)[2]		-22 to +61	-22 to +61	-22 to +61	-22 to +61
Synchronous — Cooling Based (°F DB)		14 to 81	14 to 81	14 to 81	14 to 81
Synchronous — Heating Based (°F WB)		14 to 61	14 to 61	14 to 61	14 to 61
Compressor					
Inverter Quantity		HSS DC Scroll x 2	HSS DC Scroll x 2	HSS DC Scroll x 2	HSS DC Scroll x 2
Oil/Type		PVE / FVC68D	PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Top Discharge)					
Type		Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)
Motor Output (kW) x Qty.		0.9 x 2	0.9 x 2	0.9 x 2	0.90 x 2
Motor/Drive		Brushless Digitally Controlled / Direct			
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 1,150	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		11,300	11,300	11,300	11,300
ESP (in. w.g.; Selectable Range)		0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32
Unit Data					
Refrigerant Type		R410A	R410A	R410A	R410A
Refrigerant Control/Location		EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Factory Charge lbs. of R410A		26.5	30.9	37.5	37.5
Max. No. Indoor Units/System[3]		29	32	35	39
Sound Pressure dB(A)[4]		61.0	62.0	64.0	65.0
Net Unit Weight (lbs.)		639	659	666	666
Shipping Weight (lbs.)		666	688	694	694
Communication Cables[5,6]		2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger					
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Fin™ II Coating / Hydrophilic			
Rows/Fins per inch		3 / 17	3 / 17	3 / 17	3 / 17
Piping for Heat Recovery Operation[7]					
Liquid Line Connection (in., OD)		5/8 Braze	5/8 Braze	5/8 Braze	5/8 Braze
Low Pressure Vapor Line Connection (in., OD)		1-1/8 Braze	1-1/8 Braze	1-1/8 Braze	1-3/8 Braze
High Pressure Vapor Line Connection (in., OD)		7/8 Braze	1-1/8 Braze	1-1/8 Braze	1-1/8 Braze
Piping for Heat Pump Operation[7]					
Liquid Line Connection (in., OD)		5/8 Braze	5/8 Braze	5/8 Braze	5/8 Braze
Vapor Line Connection (in., OD)		1-1/8 Braze	1-1/8 Braze	1-1/8 Braze	1-3/8 Braze

[1]Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at www.ahridirectory.org.

[2]Low ambient performance with LGRED° heat technology is included in units produced after Feb. 2019.

[3]The System Combination Ratio must be between 50–130%.

[4]Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

[5]Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

[6]Power wiring is field provided, solid or stranded, and must comply with the applicable local and national codes. See the Electrical Data section for more details.

[7]LG requires that LATS software be used on all projects to ensure correct line sizing. Designer must verify the shop drawing design against the as built design using LATS. Contractor must also use LG manufactured Y-Branch and Header Kits only.

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GENERAL DATA

208-230V Outdoor Unit Specifications

Table 3: Dual Frame 208-230V Outdoor Units.

Unit Model Number		ARUM264BTE5 22.0 Ton	ARUM288BTE5 24.0 Ton	ARUM312BTE5 26.0 Ton	ARUM336BTE5 28.0 Ton
Individual Component Model Numbers		ARUM096BTE5 + ARUM168BTE5	ARUM096BTE5 + ARUM192BTE5	ARUM096BTE5 + ARUM216BTE5	ARUM121BTE5 + ARUM216BTE5
Cooling Performance					
Nominal Cooling Capacity (Btu/h)[1]		264,000	288,000	312,000	336,000
Rated Cooling Capacity (Btu/h)[1]		252,000	276,000	298,000	320,000
Heating Performance					
Nominal Heating Capacity (Btu/h)[1]		297,000	324,000	351,000	378,000
Rated Heating Capacity (Btu/h)[1]		282,000	308,000	332,000	358,000
Operating Range					
Cooling (°F DB)		5 to 122	5 to 122	5 to 122	5 to 122
Heating (°F WB)[2]		-22 to +61	-22 to +61	-22 to +61	-22 to +61
Synchronous — Cooling Based (°F DB)		14 to 81	14 to 81	14 to 81	14 to 81
Synchronous — Heating Based (°F WB)		14 to 61	14 to 61	14 to 61	14 to 61
Compressor					
Inverter Quantity		HSS DC Scroll x 3	HSS DC Scroll x 3	HSS DC Scroll x 3	HSS DC Scroll x 3
Oil/Type		PVE / FVC68D	PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Top Discharge)					
Type		Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)
Motor Output (kW) x Qty.		0.90 x 2 + 0.90 x 2	0.90 x 2 + 0.90 x 2	0.90 x 2 + 0.90 x 2	0.90 x 2 + 0.90 x 2
Motor/Drive		Brushless Digitally Controlled / Direct			
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 1,150	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		22,600	22,600	22,600	22,600
ESP (in. w.g.; Selectable Range)		0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32
Unit Data					
Refrigerant Type		R410A	R410A	R410A	R410A
Refrigerant Control/Location		EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Factory Charge lbs. of R410A		23.2 + 26.5	23.2 + 30.9	23.2 + 37.5	23.2 + 37.5
Max. No. Indoor Units/System[3]		42	45	52	55
Sound Pressure dB(A)[4]		63.0	63.0	65.0	65.0
Net Unit Weight (lbs.)		507 + 639	507 + 659	507 + 666	507 + 666
Shipping Weight (lbs.)		534 + 666	534 + 688	534 + 694	534 + 694
Communication Cables[5,6]		2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger					
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Fin™ II Coating / Hydrophilic			
Rows/Fins per inch		2 / 17 + 3 / 17	2 / 17 + 3 / 17	2 / 17 + 3 / 17	2 / 17 + 3 / 17
Piping for Heat Recovery Operation[7]					
Liquid Line Connection (in., OD)		3/8 & 5/8 Braze	3/8 & 5/8 Braze	3/8 & 5/8 Braze	1/2 & 5/8 Braze
Low Pressure Vapor Line Connection (in., OD)		7/8 & 1-1/8 Braze	7/8 & 1-1/8 Braze	7/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze
High Pressure Vapor Line Connection (in., OD)		3/4 & 7/8 Braze	3/4 & 1-1/8 Braze	3/4 & 1-1/8 Braze	3/4 & 1-1/8 Braze
Piping for Heat Pump Operation[7]					
Liquid Line Connection (in., OD)		3/8 & 5/8 Braze	3/8 & 5/8 Braze	3/8 & 5/8 Braze	1/2 & 5/8 Braze
Vapor Line Connection (in., OD)		7/8 & 1-1/8 Braze	7/8 & 1-1/8 Braze	7/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze

[1]Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at www.ahridirectory.org.

[2]Low ambient performance with LGRED° heat technology is included in units produced after Feb. 2019.

[3]The System Combination Ratio must be between 50–130%.

[4]Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

[5]Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

[6]Power wiring is field provided, solid or stranded, and must comply with the applicable local and national codes. See the Electrical Data section for more details.

[7]LG requires that LATS software be used on all projects to ensure correct line sizing. Designer must verify the shop drawing design against the as built design using LATS. Contractor must also use LG manufactured Y-Branch and Header Kits only.

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GENERAL DATA

208-230V Outdoor Unit Specifications

MULTI V 5 WITH LGRED°

Table 4: Dual Frame 208-230V Outdoor Units, continued.

Combination Unit Model Number		ARUM360BTE5 30.0 Ton	ARUM384BTE5 32.0 Ton	ARUM408BTE5 34.0 Ton
Individual Component Model Numbers		ARUM144BTE5 + ARUM216BTE5	ARUM168BTE5 + ARUM216BTE5	ARUM192BTE5 + ARUM216BTE5
Cooling Performance				
Nominal Cooling Capacity (Btu/h)[1]		360,000	384,000	408,000
Rated Cooling Capacity (Btu/h)[1]		344,000	366,000	390,000
Heating Performance				
Nominal Heating Capacity (Btu/h)[1]		405,000	432,000	459,000
Rated Heating Capacity (Btu/h)[1]		364,000	388,000	412,000
Operating Range				
Cooling (°F DB)		5 to 122	5 to 122	5 to 122
Heating (°F WB)[2]		-22 to +61	-22 to +61	-22 to +61
Synchronous — Cooling Based (°F DB)		14 to 81	14 to 81	14 to 81
Synchronous — Heating Based (°F WB)		14 to 61	14 to 61	14 to 61
Compressor				
Inverter Quantity		HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4
Oil/Type		PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Top Discharge)				
Type		Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)
Motor Output (kW) x Qty.		0.90 x 2 + 0.90 x 2	0.90 x 2 + 0.90 x 2	0.90 x 2 + 0.90 x 2
Motor/Drive		Brushless Digitally Controlled / Direct		
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		22,600	22,600	22,600
ESP (in. w.g.; Selectable Range)		0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32
Unit Data				
Refrigerant Type		R410A	R410A	R410A
Refrigerant Control/Location		EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Factory Charge lbs. of R410A		26.5 + 37.5	26.5 + 37.5	30.9 + 37.5
Max. No. Indoor Units/System[3]		58	61	64
Sound Pressure dB(A)[4]		66.0	66.0	66.0
Net Unit Weight (lbs.)		639 + 666	639 + 666	659 + 666
Shipping Weight (lbs.)		666 + 694	666 + 694	688 + 694
Communication Cables[5,6]		2 x 18	2 x 18	2 x 18
Heat Exchanger				
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Fin™ II Coating / Hydrophilic		
Rows/Fins per inch		3 / 17 x 2	3 / 17 x 2	3 / 17 x 2
Piping for Heat Recovery Operation[7]				
Liquid Line Connection (in., OD)		1/2 & 5/8 Braze	5/8 & 5/8 Braze	5/8 & 5/8 Braze
Low Pressure Vapor Line Connection (in., OD)		1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze
High Pressure Vapor Line Connection (in., OD)		7/8 & 1-1/8 Braze	7/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze
Piping for Heat Pump Operation[7]				
Liquid Line Connection (in., OD)		1/2 & 5/8 Braze	5/8 & 5/8 Braze	5/8 & 5/8 Braze
Vapor Line Connection (in., OD)		1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze

[1]Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at www.ahridirectory.org.

[2]Low ambient performance with LGRED° heat technology is included in units produced after Feb. 2019.

[3]The System Combination Ratio must be between 50–130%.

[4]Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

[5]Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

[6]Power wiring is field provided, solid or stranded, and must comply with the applicable local and national codes. See the Electrical Data section for more details.

[7]LG requires that LATS software be used on all projects to ensure correct line sizing. Designer must verify the shop drawing design against the as built design using LATS. Contractor must also use LG manufactured Y-Branch and Header Kits only.

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GENERAL DATA

208-230V Outdoor Unit Specifications

Table 5: Triple Frame 208-230V Outdoor Units.

Combination Unit Model Number		ARUM432BTE5 36.0 Ton	ARUM456BTE5 38.0 Ton	ARUM480BTE5 40.0 Ton	ARUM504BTE5 42.0 Ton
Individual Component Model Numbers		ARUM121BTE5 + ARUM121BTE5 + ARUM192BTE5	ARUM121BTE5 + ARUM121BTE5 + ARUM216BTE5	ARUM121BTE5 + ARUM144BTE5 + ARUM216BTE5	ARUM121BTE5 + ARUM168BTE5 + ARUM216BTE5
Cooling Performance					
Nominal Cooling Capacity (Btu/h)[1]		430,500	455,700	476,700	504,000
Rated Cooling Capacity (Btu/h)[1]		410,000	434,000	454,000	480,000
Heating Performance					
Nominal Heating Capacity (Btu/h)[1]		486,000	513,000	540,000	567,000
Rated Heating Capacity (Btu/h)[1]		436,000	458,000	484,000	506,000
Operating Range					
Cooling (°F DB)		5 to 122	5 to 122	5 to 122	5 to 122
Heating (°F WB)[2]		-22 to +61	-22 to +61	-22 to +61	-22 to +61
Synchronous — Cooling Based (°F DB)		14 to 81	14 to 81	14 to 81	14 to 81
Synchronous — Heating Based (°F WB)		14 to 61	14 to 61	14 to 61	14 to 61
Compressor					
Inverter Quantity		HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 5	HSS DC Scroll x 5
Oil/Type		PVE / FVC68D	PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Top Discharge)					
Type		Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)
Motor Output (kW) x Qty.		0.90x2 + 0.90x2 + 0.90x2	0.90x2 + 0.90x2 + 0.90x2	0.90x2 + 0.90x2 + 0.90x2	0.90x2 + 0.90x2 + 0.90x2
Motor/Drive		Brushless Digitally Controlled / Direct			
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 1,150	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		33,900	33,900	33,900	33,900
ESP (in. w.g.; Selectable Range)		0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32
Unit Data					
Refrigerant Type		R410A	R410A	R410A	R410A
Refrigerant Control/Location		EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Factory Charge lbs. of R410A		23.2 + 23.2 + 30.9	23.2 + 23.2 + 37.5	23.2 + 26.5 + 37.5	23.2 + 26.5 + 37.5
Max. No. Indoor Units/System[3]		64	64	64	64
Sound Pressure dB(A)[4]		66.0	66.0	67.0	67.0
Net Unit Weight (lbs.)		507 + 507 + 659	507 + 507 + 666	507 + 639 + 666	507 + 639 + 666
Shipping Weight (lbs.)		534 + 534 + 688	534 + 534 + 694	534 + 666 + 694	534 + 666 + 694
Communication Cables[5,6]		2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger					
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Fin™ II Coating / Hydrophilic			
Rows/Fins per inch		2/17 x 2 + 3/17	2 / 17 x 2 + 3 / 17	2 / 17 + 3 / 17 x 2	2 / 17 + 3 / 17 x 2
Piping for Heat Recovery Operation[7]					
Liquid Line Connection (in., OD)		1/2 & 1/2 & 5/8 Braze	1/2 & 1/2 & 5/8 Braze	1/2 & 1/2 & 5/8 Braze	1/2 & 5/8 & 5/8 Braze
Low Pressure Vapor Line Conn. (in., OD)		1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze
High Pressure Vapor Line Conn. (in., OD)		3/4 & 3/4 & 1-1/8 Braze	3/4 & 3/4 & 1-1/8 Braze	3/4 & 7/8 & 1-1/8 Braze	3/4 & 7/8 & 1-1/8 Braze
Piping for Heat Pump Operation[7]					
Liquid Line Connection (in., OD)		1/2 + 1/2 + 5/8 Braze	1/2 & 1/2 & 5/8 Braze	1/2 & 1/2 & 5/8 Braze	1/2 & 5/8 & 5/8 Braze
Vapor Line Connection (in., OD)		1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze

[1]Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at www.ahridirectory.org.

[2]Low ambient performance with LGRED° heat technology is included in units produced after Feb. 2019.

[3]The System Combination Ratio must be between 50–130%.

[4]Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

[5]Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

[6]Power wiring is field provided, solid or stranded, and must comply with the applicable local and national codes. See the Electrical Data section for more details.

[7]LG requires that LATS software be used on all projects to ensure correct line sizing. Designer must verify the shop drawing design against the as built design using LATS. Contractor must also use LG manufactured Y-Branch and Header Kits only.

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GENERAL DATA

460V Outdoor Unit Specifications

MULTI V 5 WITH LGRED°

Table 6: Single Frame 460V Outdoor Units.

Unit Model Number		ARUM072DTE5 6.0 Ton	ARUM096DTE5 8.0 Ton	ARUM121DTE5 10.0 Ton	ARUM144DTE5 12.0 Ton
Individual Component Model Numbers		-	-	-	-
Cooling Performance					
Nominal Cooling Capacity (Btu/h)[1]		72,000	96,000	119,700	144,000
Rated Cooling Capacity (Btu/h)[1]		69,000	92,000	114,000	138,000
Heating Performance					
Nominal Heating Capacity (Btu/h)[1]		81,000	108,000	135,000	162,000
Rated Heating Capacity (Btu/h)[1]		77,000	103,000	129,000	152,000
Operating Range					
Cooling (°F DB)		5 to 122	5 to 122	5 to 122	5 to 122
Heating (°F WB)[2]		-22 to +61	-22 to +61	-22 to +61	-22 to +61
Synchronous — Cooling Based (°F DB)		14 to 81	14 to 81	14 to 81	14 to 81
Synchronous — Heating Based (°F WB)		14 to 61	14 to 61	14 to 61	14 to 61
Compressor					
Inverter Quantity		HSS DC Scroll x 1	HSS DC Scroll x 1	HSS DC Scroll x 1	HSS DC Scroll x 2
Oil/Type		PVE / FVC68D	PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Top Discharge)					
Type		Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)
Motor Output (kW) x Qty.		1.2 x 1	0.9 x 2	0.9 x 2	0.9 x 2
Motor/Drive		Brushless Digitally Controlled / Direct			
Operating Range (RPM)	Cooling	0 - 1,000	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 1,000	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		8,470	11,300	11,300	11,300
ESP (in. w.g.; Selectable Range)		0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32
Unit Data					
Refrigerant Type		R410A	R410A	R410A	R410A
Refrigerant Control/Location		EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Factory Charge lbs. of R410A		14.3	23.2	23.2	26.5
Max. No. Indoor Units/System[3]		13	16	20	24
Sound Pressure dB(A)[4]		58.0	58.0	59.0	60.0
Net Unit Weight (lbs.)		430	507	507	639
Shipping Weight (lbs.)		452	534	534	666
Communication Cables[5,6]		2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger					
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Fin™ II Coating / Hydrophilic			
Rows/Fins per inch		2 / 17	2 / 17	2 / 17	3 / 17
Piping for Heat Recovery Operation[7]					
Liquid Line Connection (in., OD)		3/8 Braze	3/8 Braze	1/2 Braze	1/2 Braze
Low Pressure Vapor Line Connection (in., OD)		3/4 Braze	7/8 Braze	1-1/8 Braze	1-1/8 Braze
High Pressure Vapor Line Connection (in., OD)		5/8 Braze	3/4 Braze	3/4 Braze	7/8 Braze
Piping for Heat Pump Operation[7]					
Liquid Line Connection (in., OD)		3/8 Braze	3/8 Braze	1/2 Braze	1/2 Braze
Vapor Line Connection (in., OD)		3/4 Braze	7/8 Braze	1-1/8 Braze	1-1/8 Braze

[1]Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at www.ahridirectory.org.

[2]Low ambient performance with LGRED° heat technology is included in units produced after Feb. 2019.

[3]The System Combination Ratio must be between 50–130%.

[4]Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

[5]Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

[6]Power wiring is field provided, solid or stranded, and must comply with the applicable local and national codes. See the Electrical Data section for more details.

[7]LG requires that LATS software be used on all projects to ensure correct line sizing. Designer must verify the shop drawing design against the as built design using LATS. Contractor must also use LG manufactured Y-Branch and Header Kits only.

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GENERAL DATA

460V Outdoor Unit Specifications

Table 7: Single Frame 460V Outdoor Units, continued.

Unit Model Number		ARUM168DTE5 14.0 Ton	ARUM192DTE5 16.0 Ton	ARUM216DTE5 18.0 Ton	ARUM241DTE5 20.0 Ton
Individual Component Model Numbers		-	-	-	-
Cooling Performance					
Nominal Cooling Capacity (Btu/h)[1]		168,000	192,000	216,000	233,100
Rated Cooling Capacity (Btu/h)[1]		160,000	184,000	206,000	222,000
Heating Performance					
Nominal Heating Capacity (Btu/h)[1]		189,000	216,000	243,000	243,000
Rated Heating Capacity (Btu/h)[1]		180,000	206,000	230,000	230,000
Operating Range					
Cooling (°F DB)		5 to 122	5 to 122	5 to 122	5 to 122
Heating (°F WB)[2]		-22 to +61	-22 to +61	-22 to +61	-22 to +61
Synchronous — Cooling Based (°F DB)		14 to 81	14 to 81	14 to 81	14 to 81
Synchronous — Heating Based (°F WB)		14 to 61	14 to 61	14 to 61	14 to 61
Compressor					
Inverter Quantity		HSS DC Scroll x 2	HSS DC Scroll x 2	HSS DC Scroll x 2	HSS DC Scroll x 2
Oil/Type		PVE / FVC68D	PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Top Discharge)					
Type		Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)
Motor Output (kW) x Qty.		0.9 x 2	0.9 x 2	0.9 x 2	0.9 x 2
Motor/Drive		Brushless Digitally Controlled / Direct			
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 1,150	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		11,300	11,300	11,300	11,300
ESP (in. w.g.; Selectable Range)		0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32
Unit Data					
Refrigerant Type		R410A	R410A	R410A	R410A
Refrigerant Control/Location		EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Factory Charge lbs. of R410A		26.5	30.9	37.5	37.5
Max. No. Indoor Units/System[3]		29	32	35	39
Sound Pressure dB(A)[4]		61.0	62.0	64.0	65.0
Net Unit Weight (lbs.)		639	659	666	666
Shipping Weight (lbs.)		666	688	694	694
Communication Cables[5,6]		2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger					
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Fin™ II Coating / Hydrophilic			
Rows/Fins per inch		3 / 17	3 / 17	3 / 17	3 / 17
Piping for Heat Recovery Operation[7]					
Liquid Line Connection (in., OD)		5/8 Braze	5/8 Braze	5/8 Braze	5/8 Braze
Low Pressure Vapor Line Connection (in., OD)		1-1/8 Braze	1-1/8 Braze	1-1/8 Braze	1-3/8 Braze
High Pressure Vapor Line Connection (in., OD)		7/8 Braze	1-1/8 Braze	1-1/8 Braze	1-1/8 Braze
Piping for Heat Pump Operation[7]					
Liquid Line Connection (in., OD)		5/8 Braze	5/8 Braze	5/8 Braze	5/8 Braze
Vapor Line Connection (in., OD)		1-1/8 Braze	1-1/8 Braze	1-1/8 Braze	1-3/8 Braze

[1]Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at www.ahridirectory.org.

[2]Low ambient performance with LGRED° heat technology is included in units produced after Feb. 2019.

[3]The System Combination Ratio must be between 50–130%.

[4]Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

[5]Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

[6]Power wiring is field provided, solid or stranded, and must comply with the applicable local and national codes. See the Electrical Data section for more details.

[7]LG requires that LATS software be used on all projects to ensure correct line sizing. Designer must verify the shop drawing design against the as built design using LATS. Contractor must also use LG manufactured Y-Branch and Header Kits only.

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GENERAL DATA

460V Outdoor Unit Specifications

Table 8: Dual Frame 460V Outdoor Units.

Combination Unit Model Number		ARUM264DTE5 22.0 Ton	ARUM288DTE5 24.0 Ton	ARUM312DTE5 26.0 Ton	ARUM336DTE5 28.0 Ton
Individual Component Model Numbers		ARUM096DTE5 + ARUM168DTE5	ARUM096DTE5 + ARUM192DTE5	ARUM096DTE5 + ARUM216DTE5	ARUM121DTE5 + ARUM216DTE5
Cooling Performance					
Nominal Cooling Capacity (Btu/h)[1]		264,000	288,000	312,000	336,000
Rated Cooling Capacity (Btu/h)[1]		252,000	276,000	298,000	320,000
Heating Performance					
Nominal Heating Capacity (Btu/h)[1]		297,000	324,000	351,000	378,000
Rated Heating Capacity (Btu/h)[1]		282,000	308,000	332,000	358,000
Operating Range					
Cooling (°F DB)		5 to 122	5 to 122	5 to 122	5 to 122
Heating (°F WB)[2]		-22 to +61	-22 to +61	-22 to +61	-22 to +61
Synchronous — Cooling Based (°F DB)		14 to 81	14 to 81	14 to 81	14 to 81
Synchronous — Heating Based (°F WB)		14 to 61	14 to 61	14 to 61	14 to 61
Compressor					
Inverter Quantity		HSS DC Scroll x 3	HSS DC Scroll x 3	HSS DC Scroll x 3	HSS DC Scroll x 3
Oil/Type		PVE / FVC68D	PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Top Discharge)					
Type		Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)
Motor Output (kW) x Qty.		0.90 x 2 + 0.90 x 2	0.90 x 2 + 0.90 x 2	0.90 x 2 + 0.90 x 2	0.90 x 2 + 0.90 x 2
Motor/Drive		Brushless Digitally Controlled / Direct			
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 1,150	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		22,600	22,600	22,600	22,600
ESP (in. w.g.; Selectable Range)		0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32
Unit Data					
Refrigerant Type		R410A	R410A	R410A	R410A
Refrigerant Control/Location		EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Factory Charge lbs. of R410A		23.2 + 26.5	23.2 + 30.9	23.2 + 37.5	23.2 + 37.5
Max. No. Indoor Units/System[3]		42	45	52	55
Sound Pressure dB(A)[4]		63.0	63.0	65.0	65.0
Net Unit Weight (lbs.)		507 + 639	507 + 659	507 + 666	507 + 666
Shipping Weight (lbs.)		534 + 666	534 + 688	534 + 694	534 + 694
Communication Cables[5,6]		2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger					
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Fin™ II Coating / Hydrophilic			
Rows/Fins per inch		2 / 17 + 3 / 17	2 / 17 + 3 / 17	2 / 17 + 3 / 17	2 / 17 + 3 / 17
Piping for Heat Recovery Operation[7]					
Liquid Line Connection (in., OD)		3/8 & 5/8 Braze	3/8 & 5/8 Braze	3/8 & 5/8 Braze	1/2 & 5/8 Braze
Low Pressure Vapor Line Connection (in., OD)		7/8 & 1-1/8 Braze	7/8 & 1-1/8 Braze	7/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze
High Pressure Vapor Line Connection (in., OD)		3/4 & 7/8 Braze	3/4 & 1-1/8 Braze	3/4 & 1-1/8 Braze	3/4 & 1-1/8 Braze
Piping for Heat Pump Operation[7]					
Liquid Line Connection (in., OD)		3/8 & 5/8 Braze	3/8 & 5/8 Braze	3/8 & 5/8 Braze	1/2 & 5/8 Braze
Vapor Line Connection (in., OD)		7/8 & 1-1/8 Braze	7/8 & 1-1/8 Braze	7/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze

[1]Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at www.ahridirectory.org.

[2]Low ambient performance with LGRED° heat technology is included in units produced after Feb. 2019.

[3]The System Combination Ratio must be between 50–130%.

[4]Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

[5]Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

[6]Power wiring is field provided, solid or stranded, and must comply with the applicable local and national codes. See the Electrical Data section for more details.

[7]LG requires that LATS software be used on all projects to ensure correct line sizing. Designer must verify the shop drawing design against the as built design using LATS. Contractor must also use LG manufactured Y-Branch and Header Kits only.

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GENERAL DATA

460V Outdoor Unit Specifications

Table 9: Dual Frame 460V Outdoor Units, continued.

Combination Unit Model Number		ARUM360DTE5 30.0 Ton	ARUM384DTE5 32.0 Ton	ARUM408DTE5 34.0 Ton
Individual Component Model Numbers		ARUM144DTE5 + ARUM216DTE5	ARUM168DTE5 + ARUM216DTE5	ARUM192DTE5 + ARUM216DTE5
Cooling Performance				
Nominal Cooling Capacity (Btu/h)[1]		360,000	384,000	408,000
Rated Cooling Capacity (Btu/h)[1]		344,000	366,000	390,000
Heating Performance				
Nominal Heating Capacity (Btu/h)[1]		405,000	432,000	459,000
Rated Heating Capacity (Btu/h)[1]		364,000	388,000	412,000
Operating Range				
Cooling (°F DB)		5 to 122	5 to 122	5 to 122
Heating (°F WB)[2]		-22 to +61	-22 to +61	-22 to +61
Synchronous — Cooling Based (°F DB)		14 to 81	14 to 81	14 to 81
Synchronous — Heating Based (°F WB)		14 to 61	14 to 61	14 to 61
Compressor				
Inverter Quantity		HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4
Oil/Type		PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Top Discharge)				
Type		Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)
Motor Output (kW) x Qty.		0.90 x 2 + 0.90 x 2	0.90 x 2 + 0.90 x 2	0.90 x 2 + 0.90 x 2
Motor/Drive		Brushless Digitally Controlled / Direct		
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		22,600	22,600	22,600
ESP (in. w.g.; Selectable Range)		0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32
Unit Data				
Refrigerant Type		R410A	R410A	R410A
Refrigerant Control/Location		EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Factory Charge lbs. of R410A		26.5 + 37.5	26.5 + 37.5	30.9 + 37.5
Max. No. Indoor Units/System[3]		58	61	64
Sound Pressure dB(A)[4]		66.0	66.0	66.0
Net Unit Weight (lbs.)		639 + 666	639 + 666	659 + 666
Shipping Weight (lbs.)		666 + 694	666 + 694	688 + 694
Communication Cables[5,6]		2 x 18	2 x 18	2 x 18
Heat Exchanger				
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Fin™ II Coating / Hydrophilic		
Rows/Fins per inch		3 / 17 x 2	3 / 17 x 2	3 / 17 x 2
Piping for Heat Recovery Operation[7]				
Liquid Line Connection (in., OD)		1/2 & 5/8 Braze	5/8 & 5/8 Braze	5/8 & 5/8 Braze
Low Pressure Vapor Line Connection (in., OD)		1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze
High Pressure Vapor Line Connection (in., OD)		7/8 & 1-1/8 Braze	7/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze
Piping for Heat Pump Operation[7]				
Liquid Line Connection (in., OD)		1/2 & 5/8 Braze	5/8 & 5/8 Braze	5/8 & 5/8 Braze
Vapor Line Connection (in., OD)		1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 Braze

[1]Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at www.ahridirectory.org.

[2]Low ambient performance with LGRED° heat technology is included in units produced after Feb. 2019.

[3]The System Combination Ratio must be between 50–130%.

[4]Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

[5]Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

[6]Power wiring is field provided, solid or stranded, and must comply with the applicable local and national codes. See the Electrical Data section for more details.

[7]LG requires that LATS software be used on all projects to ensure correct line sizing. Designer must verify the shop drawing design against the as built design using LATS. Contractor must also use LG manufactured Y-Branch and Header Kits only.

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GENERAL DATA

460V Outdoor Unit Specifications

MULTI V 5 WITH LGRED

Table 10: Triple Frame 460V Outdoor Units.

Combination Unit Model Number		ARUM432DTE5 36.0 Ton	ARUM456DTE5 38.0 Ton	ARUM480DTE5 40.0 Ton	ARUM504DTE5 42.0 Ton
Individual Component Model Numbers		ARUM121DTE5 + ARUM121DTE5 + ARUM192DTE5	ARUM121DTE5 + ARUM121DTE5 + ARUM216DTE5	ARUM121DTE5 + ARUM144DTE5 + ARUM216DTE5	ARUM121DTE5 + ARUM168DTE5 + ARUM216DTE5
Cooling Performance					
Nominal Cooling Capacity (Btu/h)[1]		430,500	455,700	476,700	504,000
Rated Cooling Capacity (Btu/h)[1]		410,000	434,000	454,000	480,000
Heating Performance					
Nominal Heating Capacity (Btu/h)[1]		486,000	513,000	540,000	567,000
Rated Heating Capacity (Btu/h)[1]		436,000	458,000	484,000	506,000
Operating Range					
Cooling (°F DB)		5 to 122	5 to 122	5 to 122	5 to 122
Heating (°F WB)[2]		-22 to +61	-22 to +61	-22 to +61	-22 to +61
Synchronous — Cooling Based (°F DB)		14 to 81	14 to 81	14 to 81	14 to 81
Synchronous — Heating Based (°F WB)		14 to 61	14 to 61	14 to 61	14 to 61
Compressor					
Inverter Quantity		HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 5	HSS DC Scroll x 5
Oil/Type		PVE / FVC68D	PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Top Discharge)					
Type		Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)	Propeller (BLDC)
Motor Output (kW) x Qty.		0.90x2 + 0.90x2 + 0.90x2	0.90x2 + 0.90x2 + 0.90x2	0.90x2 + 0.90x2 + 0.90x2	0.90x2 + 0.90x2 + 0.90x2
Motor/Drive		Brushless Digitally Controlled / Direct			
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 1,150	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		33,900	33,900	33,900	33,900
ESP (in. w.g.; Selectable Range)		0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32	0.16 ~ 0.32
Unit Data					
Refrigerant Type		R410A	R410A	R410A	R410A
Refrigerant Control/Location		EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Factory Charge lbs. of R410A		23.2 + 23.2 + 30.9	23.2 + 23.2 + 37.5	23.2 + 26.5 + 37.5	23.2 + 26.5 + 37.5
Max. No. Indoor Units/System[3]		64	64	64	64
Sound Pressure dB(A)[4]		66.0	66.0	67.0	67.0
Net Unit Weight (lbs.)		507 + 507 + 659	507 + 507 + 666	507 + 639 + 666	507 + 639 + 666
Shipping Weight (lbs.)		534 + 534 + 688	534 + 534 + 694	534 + 666 + 694	534 + 666 + 694
Communication Cables[5,6]		2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger					
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Fin™ II Coating / Hydrophilic			
Rows/Fins per inch		2/17 x 2 + 3/17	2 / 17 x 2 + 3 / 17	2 / 17 + 3 / 17 x 2	2 / 17 + 3 / 17 x 2
Piping for Heat Recovery Operation[7]					
Liquid Line Connection (in., OD)		1/2 & 1/2 & 5/8 Braze	1/2 & 1/2 & 5/8 Braze	1/2 & 1/2 & 5/8 Braze	1/2 & 5/8 & 5/8 Braze
Low Pressure Vapor Line Conn. (in., OD)		1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze
High Pressure Vapor Line Conn. (in., OD)		3/4 & 3/4 & 1-1/8 Braze	3/4 & 3/4 & 1-1/8 Braze	3/4 & 7/8 & 1-1/8 Braze	3/4 & 7/8 & 1-1/8 Braze
Piping for Heat Pump Operation[7]					
Liquid Line Connection (in., OD)		1/2 & 1/2 & 5/8 Braze	1/2 & 1/2 & 5/8 Braze	1/2 & 1/2 & 5/8 Braze	1/2 & 5/8 & 5/8 Braze
Vapor Line Connection (in., OD)		1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze	1-1/8 & 1-1/8 & 1-1/8 Braze

[1]Rated capacity is certified under AHRI Standard 1230. Ratings are subject to change without notice. Current certified ratings are available at www.ahridirectory.org.

[2]Low ambient performance with LGRED° heat technology is included in units produced after Feb. 2019.

[3]The System Combination Ratio must be between 50–130%.

[4]Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

[5]Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.

[6]Power wiring is field provided, solid or stranded, and must comply with the applicable local and national codes. See the Electrical Data section for more details.

[7]LG requires that LATS software be used on all projects to ensure correct line sizing. Designer must verify the shop drawing design against the as built design using LATS. Contractor must also use LG manufactured Y-Branch and Header Kits only.

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ELECTRICAL DATA

208-230V Outdoor Unit Electrical Data

Table 11: 208-230V, 60Hz, 3-Phase Outdoor Units.

Nom. Tons	Unit Model Nos.	Compressor (Comp.)								Condenser Fan Motor(s)				MCA			MOCP			RFA		
		Comp. Qty.	Motor Amps						Fan Qty.	Amps				Frame			Frame			Frame		
			Motor RLA (Ea.)							FLA (Ea.)												
			Frame																			
			1		2		3			Frame				1	2	3	1	2	3	1	2	3
			Comp. A	Comp. B	Comp. A	Comp. B	Comp. A	Comp. B		1	2	3										
6.0	ARUM072BTE5	1	14.1	-	-	-	-	-	1	5.0	-	-		22.6	-	-	35	-	-	35	-	-
8.0	ARUM096BTE5	1	16.4	-	-	-	-	-	2	8.0	-	-		28.5	-	-	40	-	-	40	-	-
10.0	ARUM121BTE5	1	18.3	-	-	-	-	-	2	8.0	-	-		30.9	-	-	40	-	-	40	-	-
12.0	ARUM144BTE5	2	19.8	18.3	-	-	-	-	2	8.0	-	-		51.1	-	-	70	-	-	70	-	-
14.0	ARUM168BTE5	2	21.2	19.1	-	-	-	-	2	8.0	-	-		53.6	-	-	70	-	-	70	-	-
16.0	ARUM192BTE5	2	23.3	20.8	-	-	-	-	2	8.0	-	-		57.9	-	-	80	-	-	80	-	-
18.0	ARUM216BTE5	2	24.3	21.9	-	-	-	-	2	8.0	-	-		60.3	-	-	80	-	-	80	-	-
20.0	ARUM241BTE5	2	25.6	23.2	-	-	-	-	2	8.0	-	-		63.2	-	-	80	-	-	80	-	-
22.0	ARUM264BTE5	3	21.2	19.1	16.4	-	-	-	4	8.0	8.0	-		53.6	28.5	-	70	40	-	70	40	-
24.0	ARUM288BTE5	3	23.3	20.8	16.4	-	-	-	4	8.0	8.0	-		57.9	28.5	-	80	40	-	80	40	-
26.0	ARUM312BTE5	3	24.3	21.9	16.4	-	-	-	4	8.0	8.0	-		60.3	28.5	-	80	40	-	80	40	-
28.0	ARUM336BTE5	3	24.3	21.9	18.3	-	-	-	4	8.0	8.0	-		60.3	30.9	-	80	40	-	80	40	-
30.0	ARUM360BTE5	4	24.3	21.9	19.8	18.3	-	-	4	8.0	8.0	-		60.3	51.1	-	80	70	-	80	70	-
32.0	ARUM384BTE5	4	24.3	21.9	21.2	19.1	-	-	4	8.0	8.0	-		60.3	53.6	-	80	70	-	80	70	-
34.0	ARUM408BTE5	4	24.3	21.9	23.3	20.8	-	-	4	8.0	8.0	-		60.3	57.9	-	80	80	-	80	80	-
36.0	ARUM432BTE5	4	23.3	20.8	18.3	-	18.3	-	6	8.0	8.0	8.0		57.9	30.9	30.9	80	40	40	80	40	40
38.0	ARUM456BTE5	4	24.3	21.9	18.3	-	18.3	-	6	8.0	8.0	8.0		60.3	30.9	30.9	80	40	40	80	40	40
40.0	ARUM480BTE5	5	24.3	21.9	19.8	18.3	18.3	-	6	8.0	8.0	8.0		60.3	51.1	30.9	80	70	40	80	70	40
42.0	ARUM504BTE5	5	24.3	21.9	21.2	19.1	18.3	-	6	8.0	8.0	8.0		60.3	53.6	30.9	80	70	40	80	70	40

For component model numbers, see the specification tables.

Voltage tolerance is 187V to 253V.

Maximum allowable voltage unbalance is 2%.

MCA = Minimum Circuit Ampacity.

Maximum Overcurrent Protection (MOCP) is calculated as follows: (Largest motor FLA x 2.25) + (Sum of other motor FLA) rounded down to the nearest standard fuse size.

RFA = Recommended Fuse Amps.

*SCCR rating: 56 kA RMS symmetrical 208V maximum / 62 kA RMS symmetrical 230V maximum.

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ELECTRICAL DATA

460V Outdoor Unit Electrical Data

Table 12: 460V, 60Hz, 3-Phase Outdoor Units.

Nom. Tons	Unit Model Nos.	Compressor (Comp.)								Condenser Fan Motor(s)				MCA			MOCP			RFA		
		Comp. Qty.	Motor Amps						Fan Qty.	Amps				Frame			Frame			Frame		
			Motor RLA (Ea.)							FLA (Ea.)												
			Frame							Frame												
			1		2		3							1	2	3	1	2	3	1	2	3
			Comp. A	Comp. B	Comp. A	Comp. B	Comp. A	Comp. B		1	2	3										
6.0	ARUM072DTE5	1	7.8	-	-	-	-	-	1	3.0	-	-	12.8	-	-	20	-	-	20	-	-
8.0	ARUM096DTE5	1	9.1	-	-	-	-	-	2	5.0	-	-	16.4	-	-	25	-	-	25	-	-
10.0	ARUM121DTE5	1	10.7	-	-	-	-	-	2	5.0	-	-	18.4	-	-	25	-	-	25	-	-
12.0	ARUM144DTE5	2	10.3	8.5	-	-	-	-	2	5.0	-	-	26.4	-	-	35	-	-	35	-	-
14.0	ARUM168DTE5	2	11.4	9.2	-	-	-	-	2	5.0	-	-	28.5	-	-	35	-	-	35	-	-
16.0	ARUM192DTE5	2	14.8	12.2	-	-	-	-	2	5.0	-	-	35.7	-	-	50	-	-	50	-	-
18.0	ARUM216DTE5	2	15.5	13.9	-	-	-	-	2	5.0	-	-	38.3	-	-	50	-	-	50	-	-
20.0	ARUM241DTE5	2	16.9	15.3	-	-	-	-	2	5.0	-	-	41.4	-	-	50	-	-	50	-	-
22.0	ARUM264DTE5	3	11.4	9.2	9.1	-	-	-	4	5.0	5.0	-	28.5	16.4	-	35	25	-	35	25	-
24.0	ARUM288DTE5	3	14.8	12.2	9.1	-	-	-	4	5.0	5.0	-	35.7	16.4	-	50	25	-	50	25	-
26.0	ARUM312DTE5	3	15.5	13.9	9.1	-	-	-	4	5.0	5.0	-	38.3	16.4	-	50	25	-	50	25	-
28.0	ARUM336DTE5	3	15.5	13.9	10.7	-	-	-	4	5.0	5.0	-	38.3	18.4	-	50	25	-	50	25	-
30.0	ARUM360DTE5	4	15.5	13.9	10.3	8.5	-	-	4	5.0	5.0	-	38.3	26.4	-	50	35	-	50	35	-
32.0	ARUM384DTE5	4	15.5	13.9	11.4	9.2	-	-	4	5.0	5.0	-	38.3	28.5	-	50	35	-	50	35	-
34.0	ARUM408DTE5	4	15.5	13.9	14.8	12.2	-	-	4	5.0	5.0	-	38.3	35.7	-	50	50	-	50	50	-
36.0	ARUM432DTE5	4	14.8	12.2	10.7	-	10.7	-	6	5.0	5.0	5.0	35.7	18.4	18.4	50	25	25	50	25	25
38.0	ARUM456DTE5	4	15.5	13.9	10.7	-	10.7	-	6	5.0	5.0	5.0	38.3	18.4	18.4	50	25	25	50	25	25
40.0	ARUM480DTE5	5	15.5	13.9	10.3	8.5	10.7	-	6	5.0	5.0	5.0	38.3	26.4	18.4	50	35	25	50	35	25
42.0	ARUM504DTE5	5	15.5	13.9	11.4	9.2	10.7	-	6	5.0	5.0	5.0	38.3	28.5	18.4	50	35	25	50	35	25

For component model numbers, see the specification tables.

Voltage tolerance is 414V to 528V.

Maximum allowable voltage unbalance is 2%.

MCA = Minimum Circuit Ampacity.

Maximum Overcurrent Protection (MOCP) is calculated as follows: (Largest motor FLA x 2.25) + (Sum of other motor FLA) rounded down to the nearest standard fuse size.

RFA = Recommended Fuse Amps.

*SCCR rating: 65 kA RMS symmetrical 460V maximum.

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CONNECTION LIMITATIONS

Table 13: Outdoor Unit Connection Limitations.

Outdoor Unit Model No.		Nominal Cooling (Btu/h)	Indoor Units		
			Sum of Indoor Unit Nominal Cooling Capacities (Btu/h)		
208-230V	460V		Max. Qty.	Min. Capacity (Btu/h) (50%)*	Max. Capacity (Btu/h) (130%)
ARUM072BTE5	ARUM072DTE5	72,000	13	36,000	93,600
ARUM096BTE5	ARUM096DTE5	96,000	16	48,000	124,800
ARUM121BTE5	ARUM121DTE5	119,700	20	60,000	156,000
ARUM144BTE5	ARUM144DTE5	144,000	24	72,000	187,200
ARUM168BTE5	ARUM168DTE5	168,000	29	84,000	218,400
ARUM192BTE5	ARUM192DTE5	192,000	32	96,000	249,600
ARUM216BTE5	ARUM216DTE5	216,000	35	108,000	280,800
ARUM241BTE5	ARUM241DTE5	233,100	39	120,000	312,000
ARUM264BTE5	ARUM264DTE5	264,000	42	132,000	343,200
ARUM288BTE5	ARUM288DTE5	288,000	45	144,000	374,400
ARUM312BTE5	ARUM312DTE5	312,000	52	156,000	405,600
ARUM336BTE5	ARUM336DTE5	336,000	55	168,000	436,800
ARUM360BTE5	ARUM360DTE5	360,000	58	180,000	468,000
ARUM384BTE5	ARUM384DTE5	384,000	61	192,000	499,200
ARUM408BTE5	ARUM408DTE5	408,000	64	204,000	530,400
ARUM432BTE5	ARUM432DTE5	430,500	64	216,000	561,600
ARUM456BTE5	ARUM456DTE5	455,700	64	228,000	592,800
ARUM480BTE5	ARUM480DTE5	476,700	64	240,000	624,000
ARUM504BTE5	ARUM504DTE5	504,000	64	252,000	655,200

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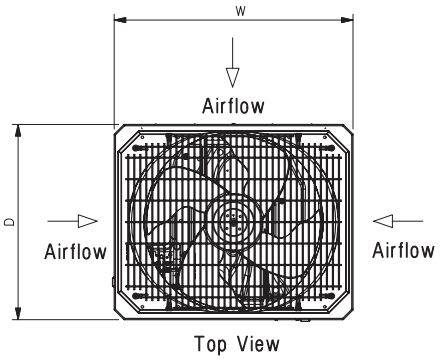
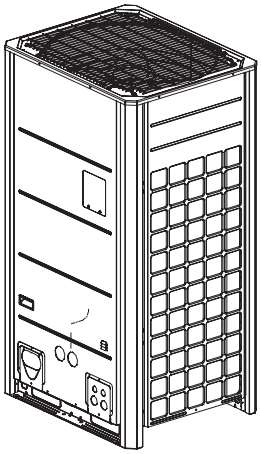
DIMENSIONS

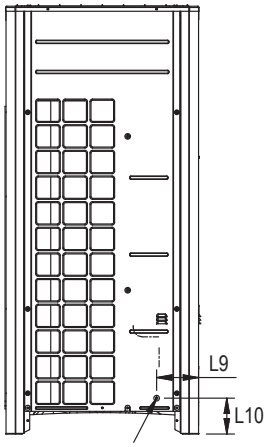
ARUM072BTE5 / DTE5

MULTI V 5 WITH LGRED

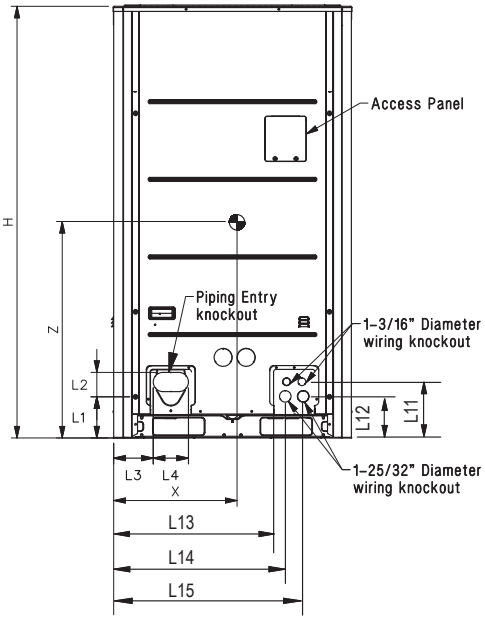


Top View

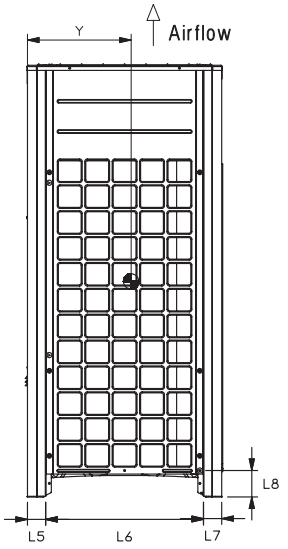




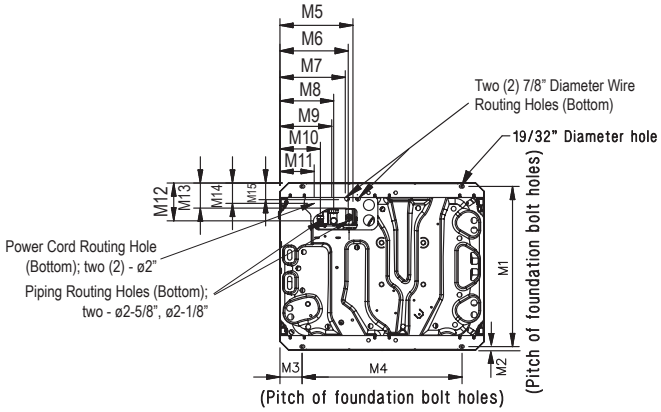
Left Side View



Front View



Right Side View



Bottom Mounting Holes

M1	28–25/32”
M2	5/8”
M3	3–31/32”
M4	28–3/4”
M5	13 – 1/8”
M6	12 – 5/16”
M7	11 – 3/4”
M8	9 – 11/16”
M9	9 – 5/16”
M10	7 – 5/16”
M11	6 – 3/16”
M12	6 – 13/16”
M13	4 – 1/2”
M14	3 – 11/16”
M15	3”

W	36–5/8”
H	66–17/32”
D	29–29/32”
L1	6–5/16”
L2	3–3/4”
L3	6–3/32”
L4	5–13/32”
L5	2–25/32”
L6	24–9/32”
L7	2–25/32”
L8	4–1/16”
L9	6 – 1/2”
L10	5 – 9/16”
L11	8 – 5/8”
L12	6 – 7/16”
L13	24 – 5/8”
L14	26 – 7/16”
L15	29 – 3/16”

Center of Gravity

X	18–3/16”
Y	16–5/16”
Z	31–15/32”

All dimensions have a tolerance of ± 0.25 in.
[Unit: inch]

= Center of Gravity

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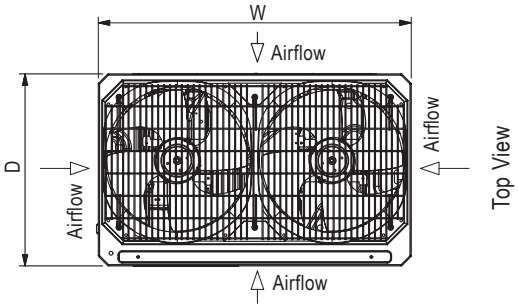
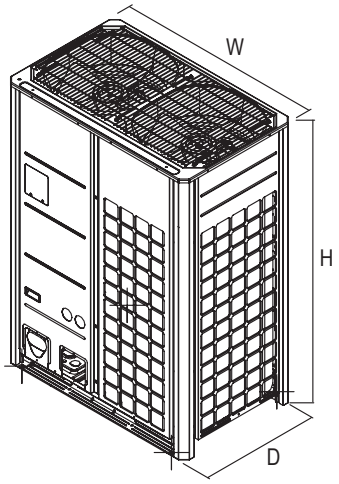
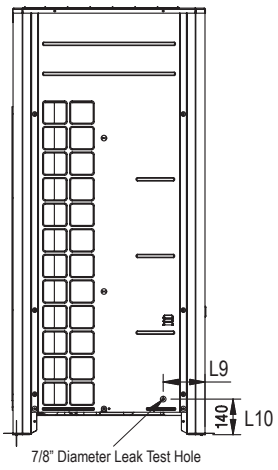
DIMENSIONS

ARUM096BTE5 / DTE5, 121BTE5 / DTE5, 144BTE5 / DTE5, 168BTE5 / DTE5, 192BTE5 / DTE5, 216BTE5 / DTE5, 241BTE5 / DTE5

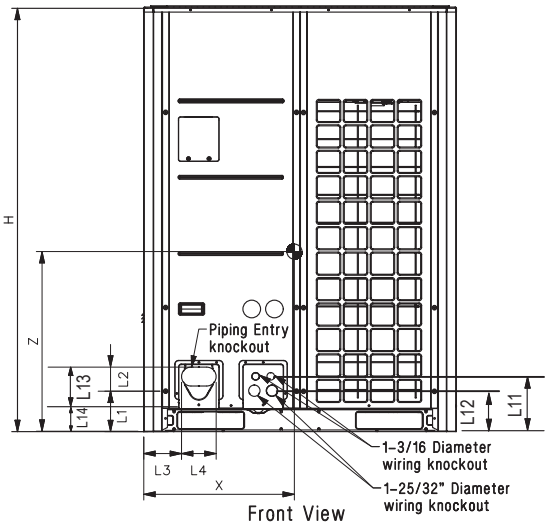
Note: Please refer to multi-frame placement information and piping rules in the Multi V 5 Engineering Manual and the Multi V 5 Installation Manual. Minimum spacing between frames is 1 inch.



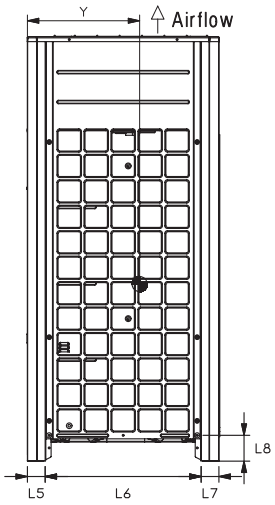




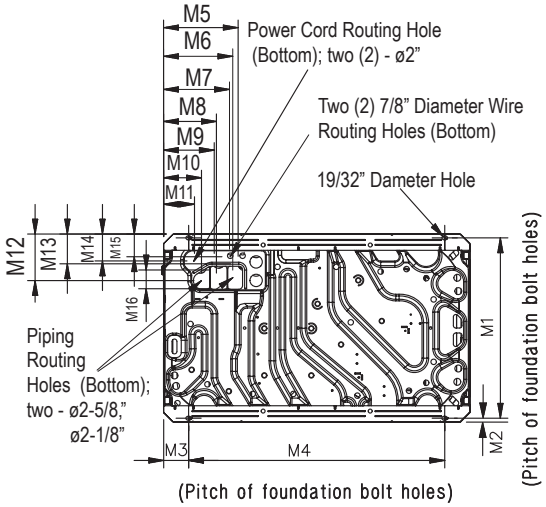
Left Side View



Front View



Right Side View



Bottom Mounting Holes

W	48–13/16"
H	66–17/32"
D	29–29/32"
L1	6–5/16"
L2	3–3/4"
L3	5–29/32"
L4	5–13/32"
L5	2–25/32"
L6	24–9/32"
L7	2–25/32"
L8	4–1/32"
L9	6 – 1/2"
L10	5 – 9/16"
L11	8 – 5/8"
L12	6 – 7/16"
L13	9 – 15/16"
L14	3 – 5/8"

M1	28–25/32"
M2	5/8"
M3	3–15/16"
M4	40–15/16"
M5	11 – 15/16"
M6	11 – 1/16"
M7	10 – 1/2"
M8	8 – 7/16"
M9	8 – 1/8"
M10	6 – 1/16"
M11	4 – 15/16"
M12	7 – 1/2"
M13	4 – 13/16"
M14	4 – 5/16"
M15	3 – 5/8"
M16	3"

Center of Gravity

X	23–7/32"
Y	15–5/8"
Z	25–9/16"

All dimensions have a tolerance of ±0.25 in.
[Unit: inch]

= Center of Gravity

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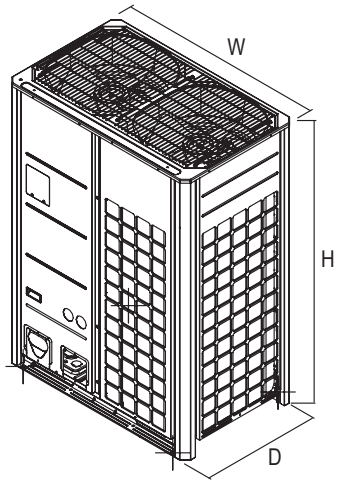
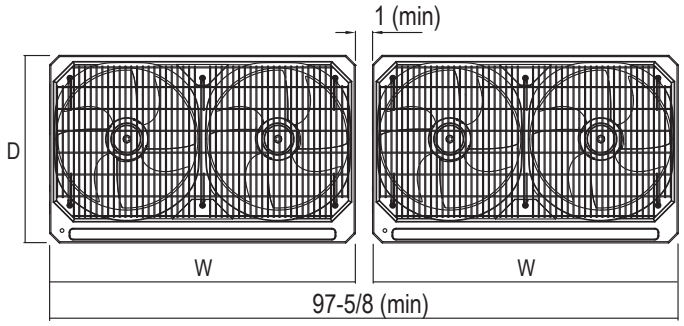
DIMENSIONS

ARUM264BTE5 / DTE5, 288BTE5 / DTE5, 312BTE5 / DTE5, 336BTE5 / DTE5,360BTE5 / DTE5, 384BTE5 / DTE5, 408BTE5 / DTE5

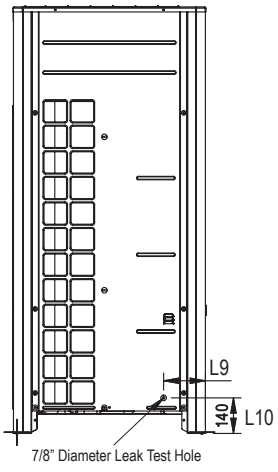
MULTI V 5 WITH LGRED



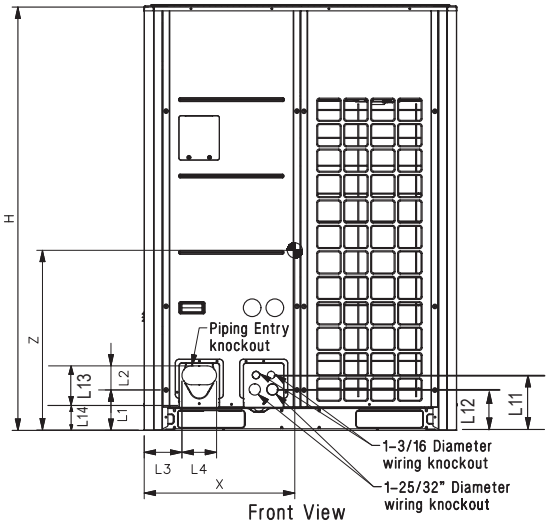
Typical Dual Frame Configuration



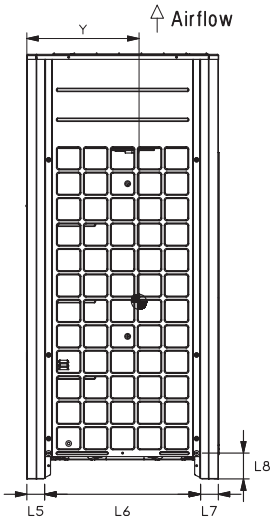
Note: Please refer to multi-frame placement information and piping rules in the Multi V 5 Engineering Manual and the Multi V 5 Installation Manual. Minimum spacing between frames is 1 inch.



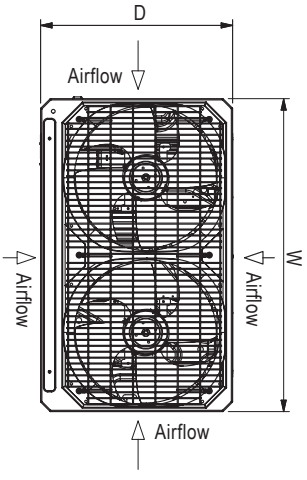
Left Side View



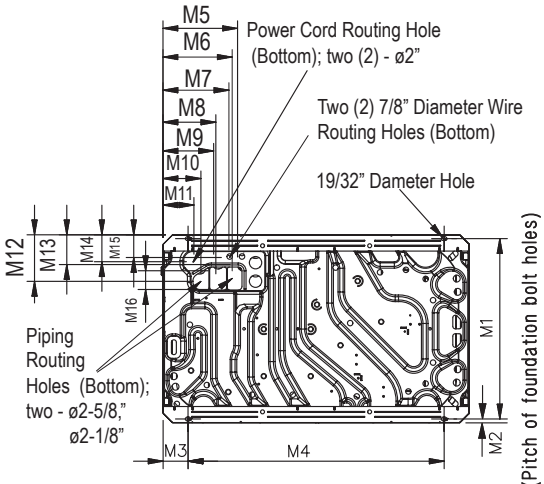
Front View



Right Side View



Top View



Bottom Mounting Holes

M1	28–25/32"
M2	5/8"
M3	3–15/16"
M4	40–15/16"
M5	11 – 15/16"
M6	11 – 1/16"
M7	10 – 1/2"
M8	8 – 7/16"
M9	8 – 1/8"
M10	6 – 1/16"
M11	4 – 15/16"
M12	7 – 1/2"
M13	4 – 13/16"
M14	4 – 5/16"
M15	3 – 5/8"
M16	3"

W	48–13/16"
H	66–17/32"
D	29–29/32"
L1	6–5/16"
L2	3–3/4"
L3	5–29/32"
L4	5–13/32"
L5	2–25/32"
L6	24–9/32"
L7	2–25/32"
L8	4–1/32"
L9	6 – 1/2"
L10	5 – 9/16"
L11	8 – 5/8"
L12	6 – 7/16"
L13	9 – 15/16"
L14	3 – 5/8"

Center of Gravity

X	23–7/32"
Y	15–5/8"
Z	25–9/16"

All dimensions have a tolerance of ± 0.25 in.

[Unit: inch]

= Center of Gravity

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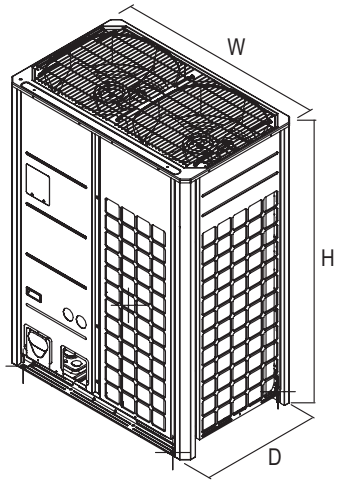
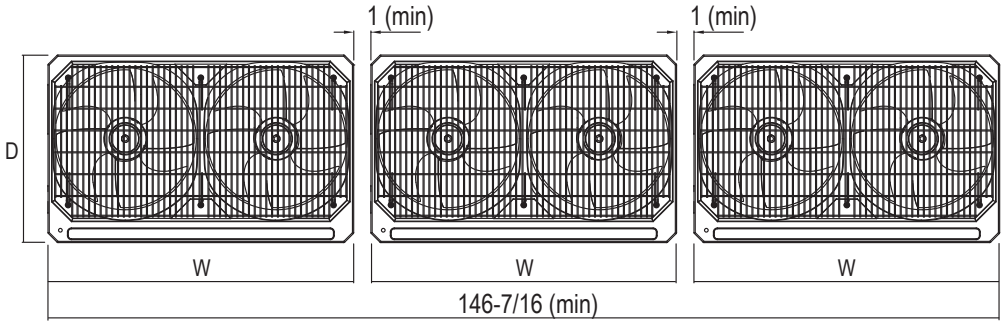
DIMENSIONS

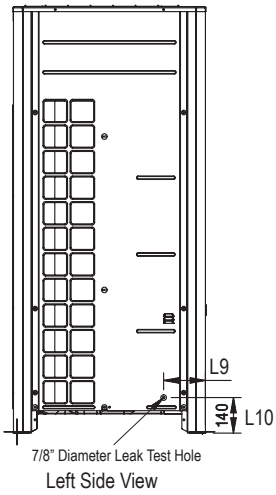
ARUM432BTE5 / DTE5, 456BTE5 / DTE5, 480BTE5 / DTE5, 504BTE5 / DTE5



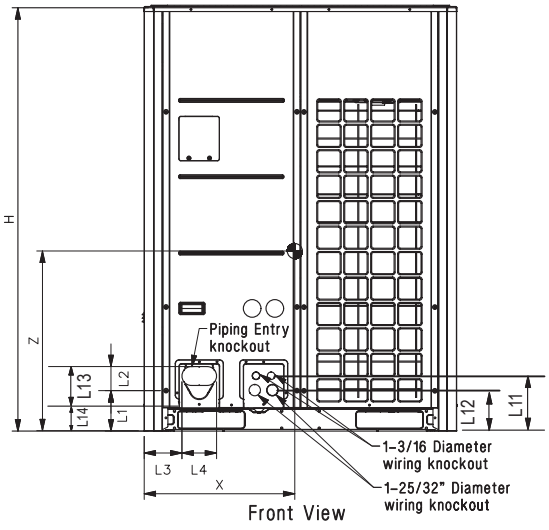
Typical Triple Frame Configuration



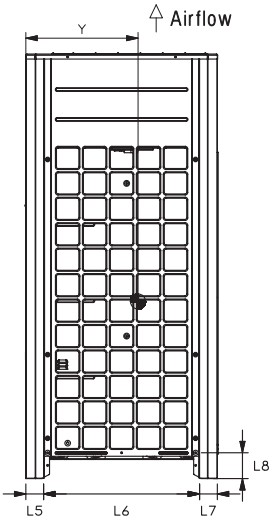
Note: Please refer to multi-frame placement information and piping rules in the Multi V 5 Engineering Manual and the Multi V 5 Installation Manual. Minimum spacing between frames is 1 inch.



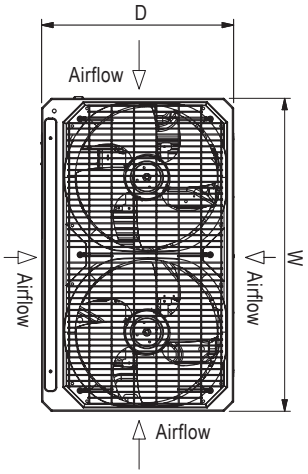
Left Side View



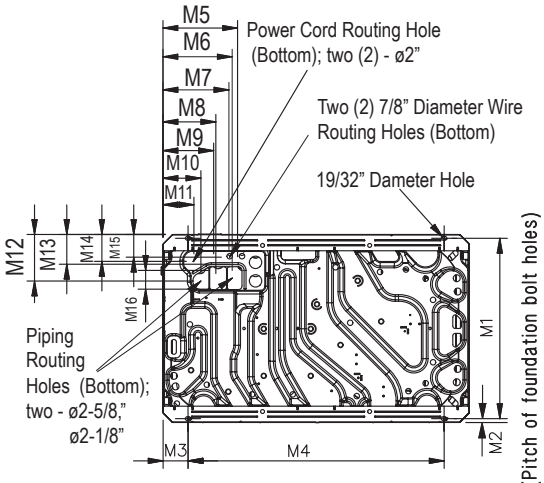
Front View



Right Side View



Top View



Bottom Mounting Holes

M1	28–25/32"
M2	5/8"
M3	3–15/16"
M4	40–15/16"
M5	11 – 15/16"
M6	11 – 1/16"
M7	10 – 1/2"
M8	8 – 7/16"
M9	8 – 1/8"
M10	6 – 1/16"
M11	4 – 15/16"
M12	7 – 1/2"
M13	4 – 13/16"
M14	4 – 5/16"
M15	3 – 5/8"
M16	3"

W	48–13/16"
H	66–17/32"
D	29–29/32"
L1	6–5/16"
L2	3–3/4"
L3	5–29/32"
L4	5–13/32"
L5	2–25/32"
L6	24–9/32"
L7	2–25/32"
L8	4–1/32"
L9	6 – 1/2"
L10	5 – 9/16"
L11	8 – 5/8"
L12	6 – 7/16"
L13	9 – 15/16"
L14	3 – 5/8"

Center of Gravity

X	23–7/32"
Y	15–5/8"
Z	25–9/16"

All dimensions have a tolerance of ± 0.25 in.
[Unit: inch]

= Center of Gravity

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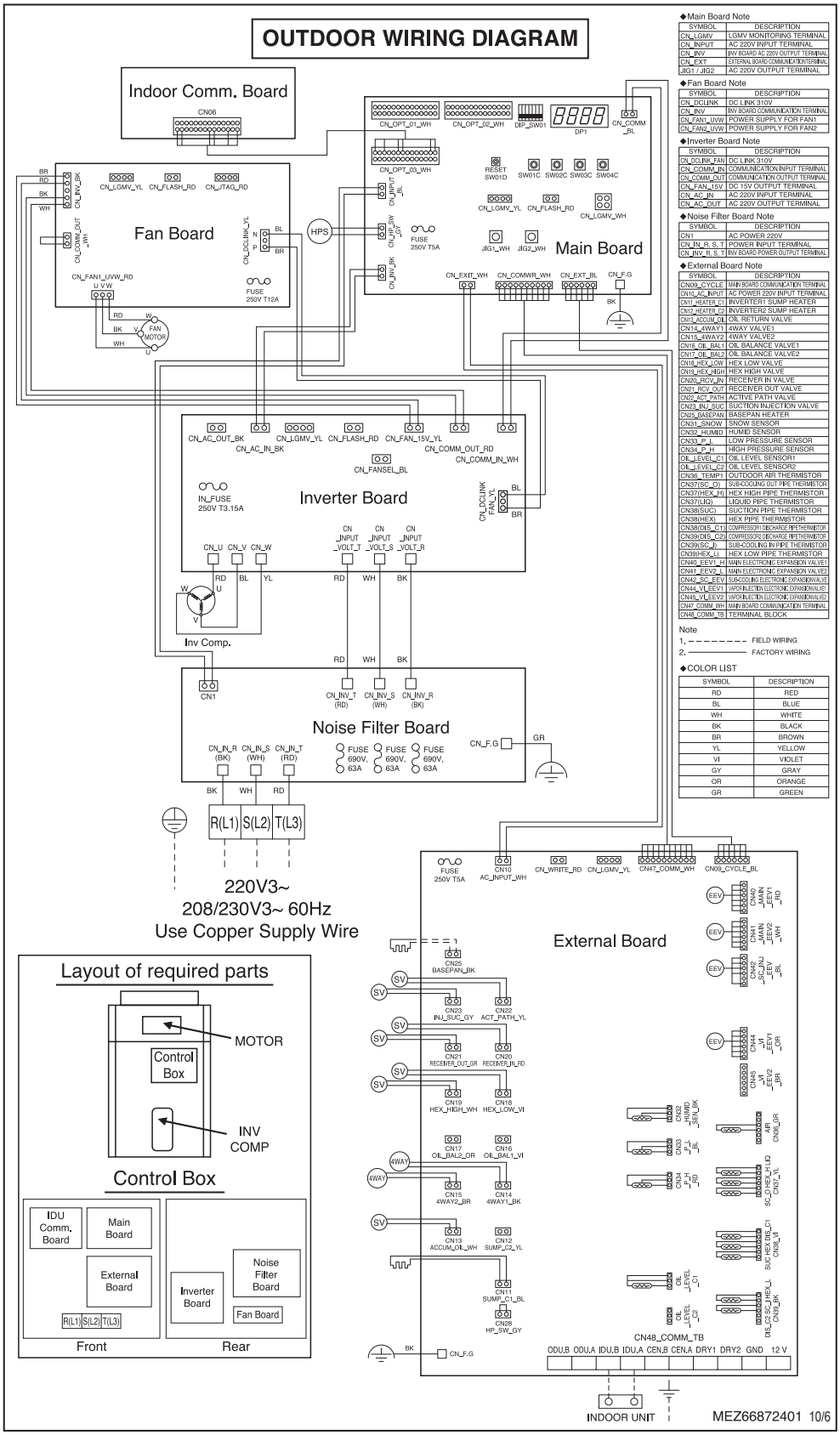
WIRING DIAGRAMS

208-230V Outdoor Units

ARUM072BTE5

MULTI V 5 WITH LGRED



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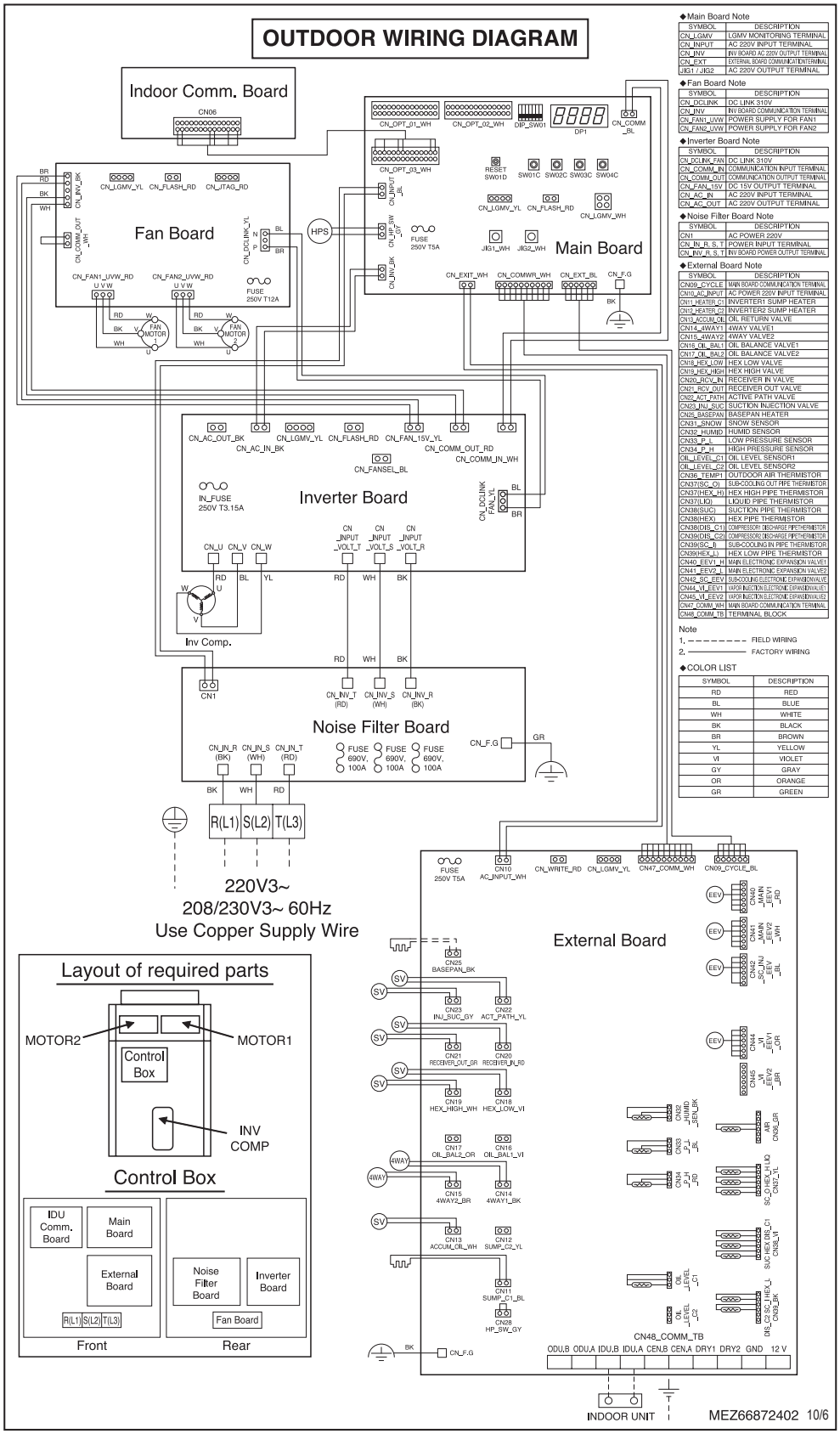
WIRING DIAGRAMS

208-230V Outdoor Units

ARUM096BTE5 / ARUM121BTE5



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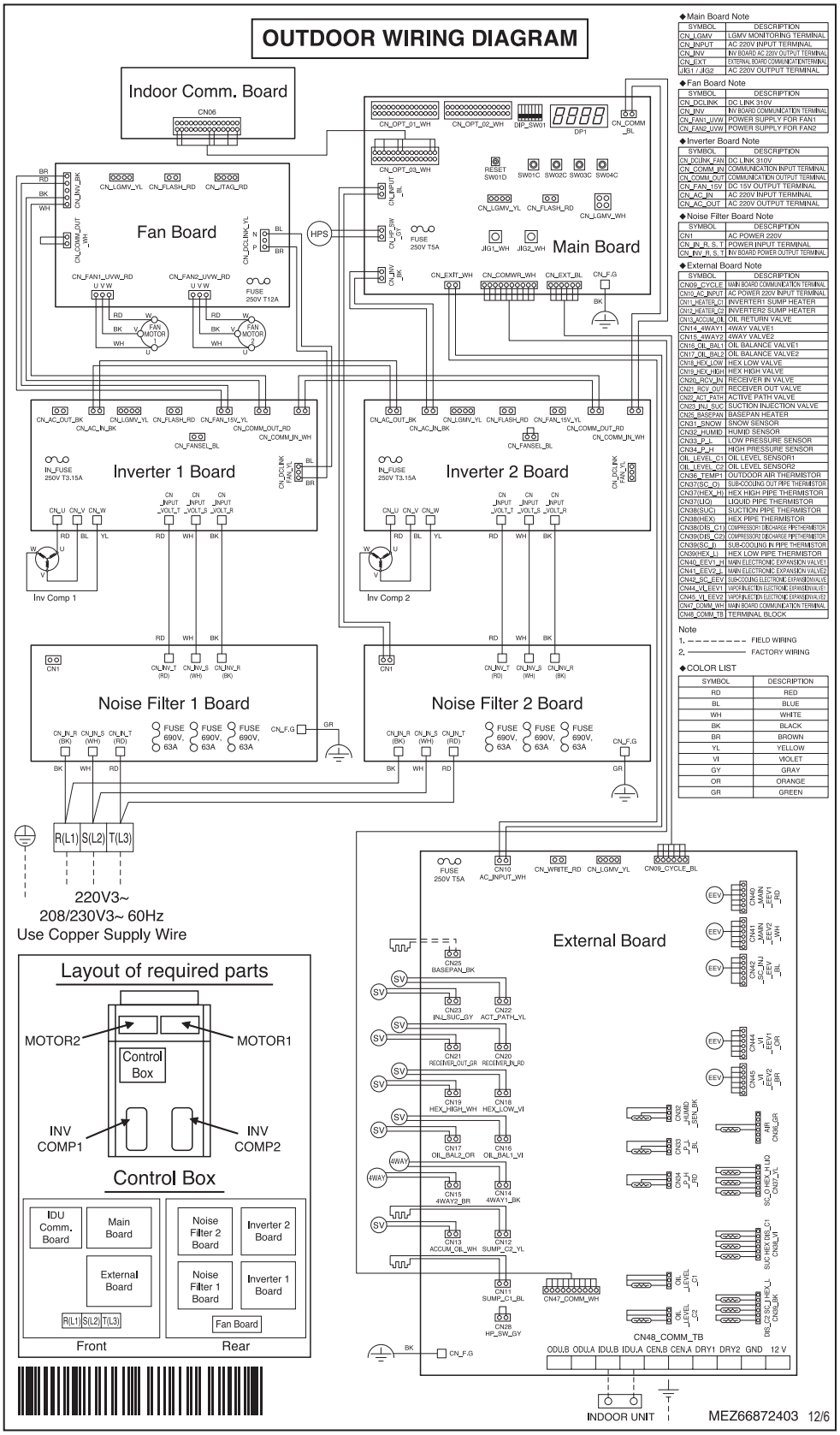
WIRING DIAGRAMS

208-230V Outdoor Units

ARUM144BTE5 / ARUM168BTE5

MULTI V 5 WITH LGRED



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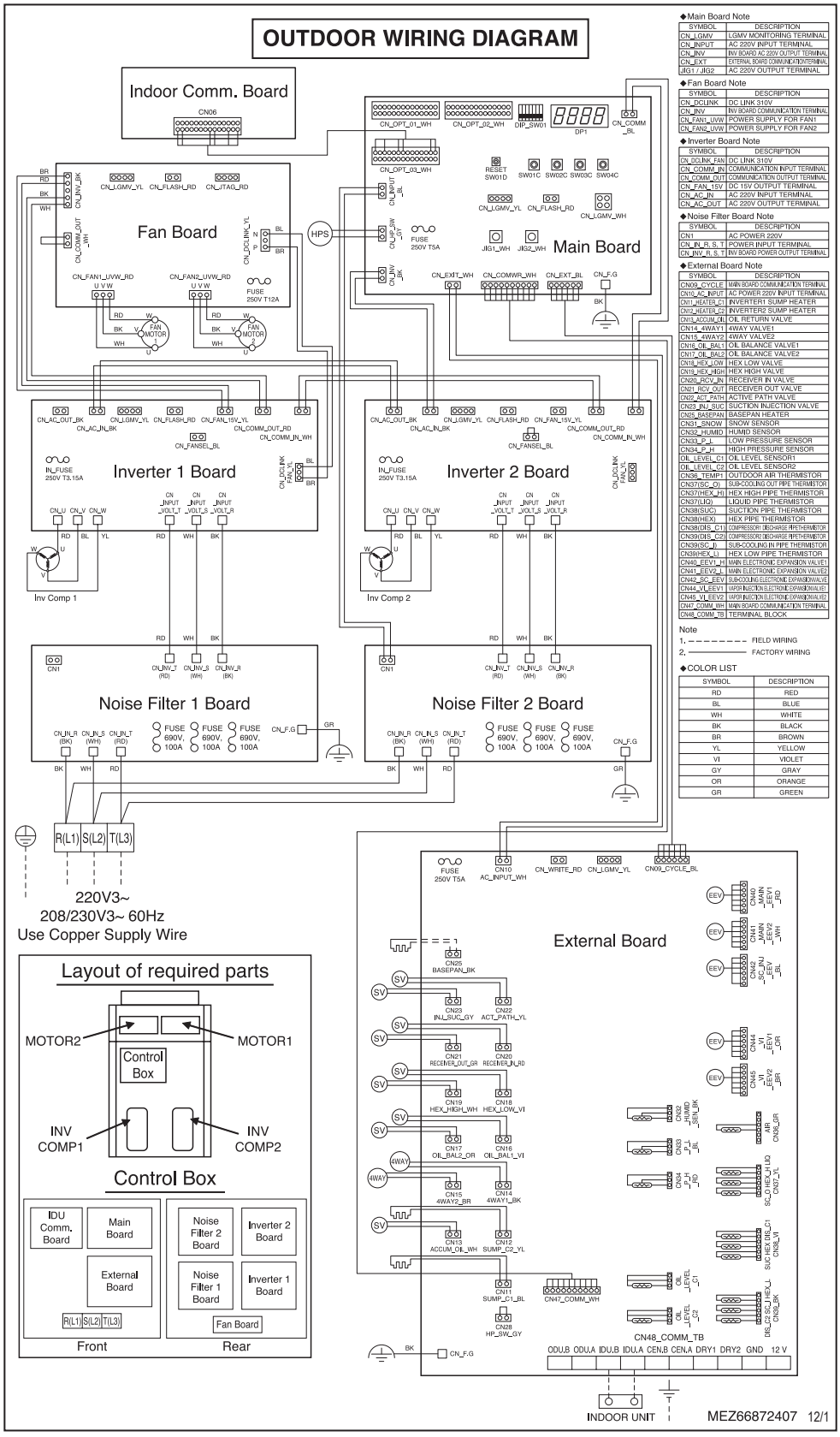
WIRING DIAGRAMS

208-230V Outdoor Units

ARUM192BTE5 / ARUM216BTE5 / ARUM241BTE5



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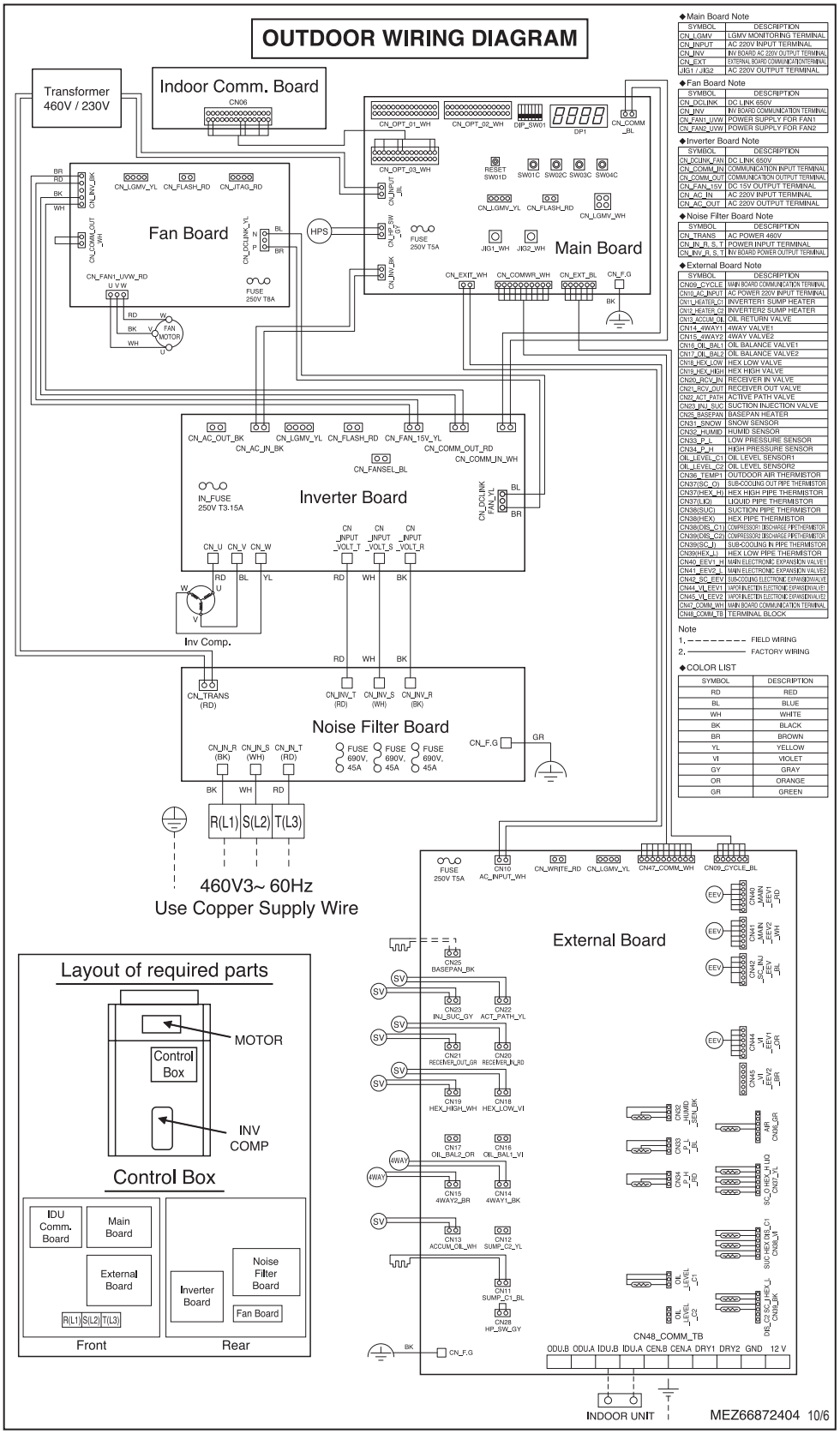
WIRING DIAGRAMS

460V Outdoor Units

ARUM072DTE5



◆Main Board Note

SYMBOL	DESCRIPTION
CN_LGMV	LGMV MONITORING TERMINAL
CN_INPUT	AC 220V INPUT TERMINAL
CN_INV	INV BOARD AC 220V OUTPUT TERMINAL
CN_EXT	EXTERNAL BOARD COMMUNICATION TERMINAL
JIG1 / JIG2	AC 220V OUTPUT TERMINAL

◆Fan Board Note

SYMBOL	DESCRIPTION
CN_DCLINK	DC LINK 650V
CN_INV	INV BOARD COMMUNICATION TERMINAL
CN_FAN1_UVW	POWER SUPPLY FOR FAN1
CN_FAN2_UVW	POWER SUPPLY FOR FAN2

◆Inverter Board Note

SYMBOL	DESCRIPTION
CN_DCLINK_FAN	DC LINK 650V
CN_COMM_IN	COMMUNICATION INPUT TERMINAL
CN_COMM_OUT	COMMUNICATION OUTPUT TERMINAL
CN_FAN_15V	DC 15V OUTPUT TERMINAL
CN_AC_IN	AC 220V INPUT TERMINAL
CN_AC_OUT	AC 220V OUTPUT TERMINAL

◆Noise Filter Board Note

SYMBOL	DESCRIPTION
CN_TRANS	AC POWER 460V
CN_IN_R, S, T	POWER INPUT TERMINAL
CN_INV_R, S, T	INV BOARD POWER OUTPUT TERMINAL

◆External Board Note

SYMBOL	DESCRIPTION
CN09_CYCLE	MAIN BOARD COMMUNICATION TERMINAL
CN10_AC_INPUT	AC POWER 220V INPUT TERMINAL
CN11_HEATER_C1	INVERTER1 SUMP HEATER
CN12_HEATER_C2	INVERTER2 SUMP HEATER
CN13_ACCUM_OIL	OIL RETURN VALVE
CN14_4WAY1	4WAY VALVE1
CN15_4WAY2	4WAY VALVE2
CN16_OIL_BAL1	OIL BALANCE VALVE1
CN17_OIL_BAL2	OIL BALANCE VALVE2
CN18_HEX_LOW	HEX LOW VALVE
CN19_HEX_HIGH	HEX HIGH VALVE
CN20_RCV_IN	RECEIVER IN VALVE
CN21_RCV_OUT	RECEIVER OUT VALVE
CN22_ACT_PATH	ACTIVE PATH VALVE
CN23_INJ_SUC	SUCTION INJECTION VALVE
CN25_BASEPAN	BASEPAN HEATER
CN31_SNOW	SNOW SENSOR
CN32_HUMID	HUMID SENSOR
CN33_P_L	LOW PRESSURE SENSOR
CN34_P_H	HIGH PRESSURE SENSOR
OIL_LEVEL_C1	OIL LEVEL SENSOR1
OIL_LEVEL_C2	OIL LEVEL SENSOR2
CN36_TEMP1	OUTDOOR AIR THERMISTOR
CN37(SC_O)	SUB-COOLING OUT PIPE THERMISTOR
CN37(HEX_H)	HEX HIGH PIPE THERMISTOR
CN37(LIQ)	LIQUID PIPE THERMISTOR
CN38(SUC)	SUCTION PIPE THERMISTOR
CN38(HEX)	HEX PIPE THERMISTOR
CN38(DIS_C1)	COMPRESSOR1 DISCHARGE PIPE THERMISTOR
CN39(DIS_C2)	COMPRESSOR2 DISCHARGE PIPE THERMISTOR
CN39(SC_I)	SUB-COOLING IN PIPE THERMISTOR
CN39(HEX_L)	HEX LOW PIPE THERMISTOR
CN40_EEV1_H	MAIN ELECTRONIC EXPANSION VALVE1
CN41_EEV2_L	MAIN ELECTRONIC EXPANSION VALVE2
CN42_SC_EEV	SUB-COOLING ELECTRONIC EXPANSION VALVE
CN44_VI_EEV1	VAPOR INJECTION ELECTRONIC EXPANSION VALVE1
CN45_VI_EEV2	VAPOR INJECTION ELECTRONIC EXPANSION VALVE2
CN47_COMM_WH	MAIN BOARD COMMUNICATION TERMINAL
CN48_COMM_TB	TERMINAL BLOCK

Note

1. ---------- FIELD WIRING
2. ———— FACTORY WIRING

◆COLOR LIST

SYMBOL	DESCRIPTION
RD	RED
BL	BLUE
WH	WHITE
BK	BLACK
BR	BROWN
YL	YELLOW
VI	VIOLET
GY	GRAY
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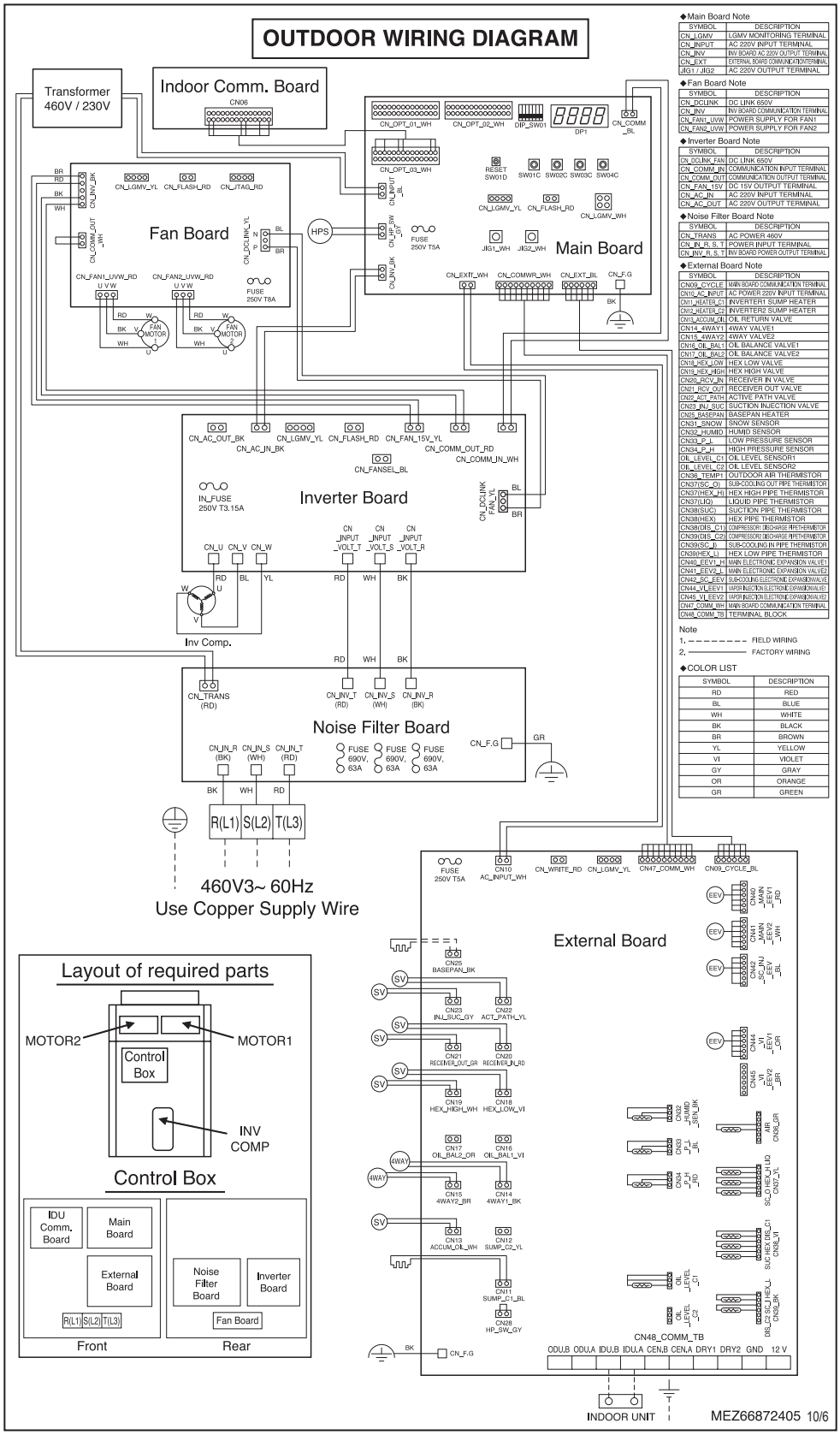
WIRING DIAGRAMS

460V Outdoor Units

ARUM096DTE5 / ARUM121DTE5



◆Main Board Note

SYMBOL	DESCRIPTION
CN_LGMV	LGMV MONITORING TERMINAL
CN_INPUT	AC 220V INPUT TERMINAL
CN_INV	INV BOARD AC 220V OUTPUT TERMINAL
CN_EXT	EXTERNAL BOARD COMMUNICATIONTERMINAL
JIG1 / JIG2	AC 220V OUTPUT TERMINAL

◆Fan Board Note

SYMBOL	DESCRIPTION
CN_DCLINK	DC LINK 650V
CN_INV	INV BOARD COMMUNICATION TERMINAL
CN_FAN1_UVW	POWER SUPPLY FOR FAN1
CN_FAN2_UVW	POWER SUPPLY FOR FAN2

◆Inverter Board Note

SYMBOL	DESCRIPTION
CN_DCLINK_FAN	DC LINK 650V
CN_COMM_IN	COMMUNICATION INPUT TERMINAL
CN_COMM_OUT	COMMUNICATION OUTPUT TERMINAL
CN_FAN_15V	DC 15V OUTPUT TERMINAL
CN_AC_IN	AC 220V INPUT TERMINAL
CN_AC_OUT	AC 220V OUTPUT TERMINAL

◆Noise Filter Board Note

SYMBOL	DESCRIPTION
CN_TRANS	AC POWER 460V
CN_IN_R, S, T	POWER INPUT TERMINAL
CN_INV_R, S, T	INV BOARD POWER OUTPUT TERMINAL

◆External Board Note

SYMBOL	DESCRIPTION
CN09_CYCLE	MAIN BOARD COMMUNICATION TERMINAL
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CN21_RCV_OUT	RECEIVER OUT VALVE
CN22_ACT_PATH	ACTIVE PATH VALVE
CN23_INJ_SUC	SUCTION INJECTION VALVE
CN25_BASEPAN	BASEPAN HEATER
CN31_SNOW	SNOW SENSOR
CN32_HUMID	HUMID SENSOR
CN33_P_L	LOW PRESSURE SENSOR
CN34_P_H	HIGH PRESSURE SENSOR
OIL_LEVEL_C1	OIL LEVEL SENSOR1
OIL_LEVEL_C2	OIL LEVEL SENSOR2
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CN37(SC_O)	SUB-COOLING OUT PIPE THERMISTOR
CN37(HEX_H)	HEX HIGH PIPE THERMISTOR
CN37(LIQ)	LIQUID PIPE THERMISTOR
CN38(SUC)	SUCTION PIPE THERMISTOR
CN38(HEX)	HEX PIPE THERMISTOR
CN38(DIS_C1)	COMPRESSOR DISCHARGE PIPETHERMISTOR
CN39(DIS_C2)	COMPRESSOR DISCHARGE PIPETHERMISTOR
CN39(SC_I)	SUB-COOLING IN PIPE THERMISTOR
CN39(HEX_L)	HEX LOW PIPE THERMISTOR
CN40_EEV1_H	MAIN ELECTRONIC EXPANSION VALVE1
CN41_EEV2_L	MAIN ELECTRONIC EXPANSION VALVE2
CN42_SC_EEV	SUB-COOLING ELECTRONIC EXPANSIONVALVE
CN44_VI_EEV1	VAPOR INJECTION ELECTRONIC EXPANSIONVALVE1
CN45_VI_EEV2	VAPOR INJECTION ELECTRONIC EXPANSIONVALVE2
CN47_COMM_WH	MAIN BOARD COMMUNICATION TERMINAL
CN48_COMM_TB	TERMINAL BLOCK

Note

1. ---------- FIELD WIRING
2. ---------- FACTORY WIRING

◆COLOR LIST

SYMBOL	DESCRIPTION
RD	RED
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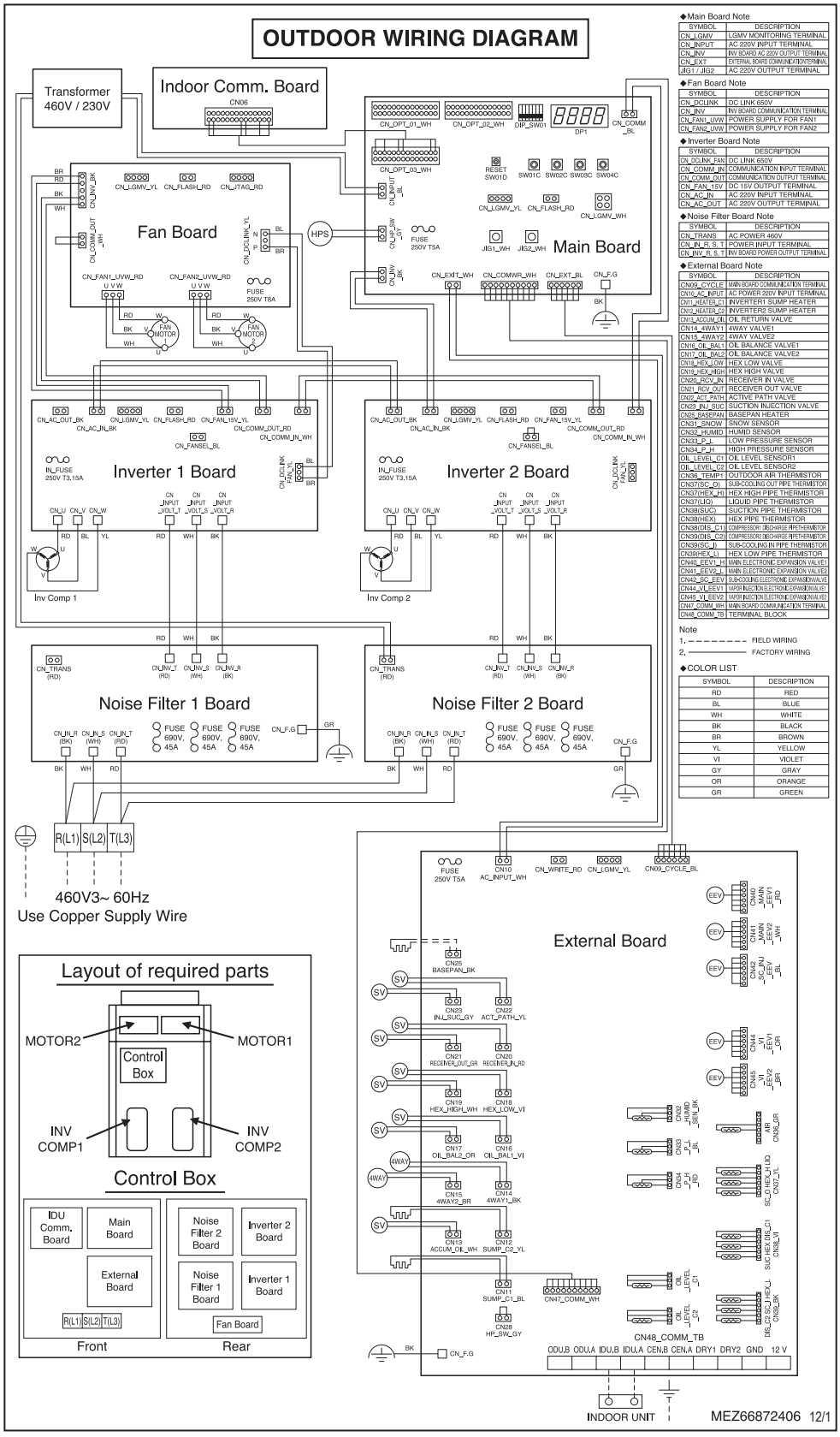
WIRING DIAGRAMS

460V Outdoor Units

ARUM144DTE5 / ARUM168DTE5



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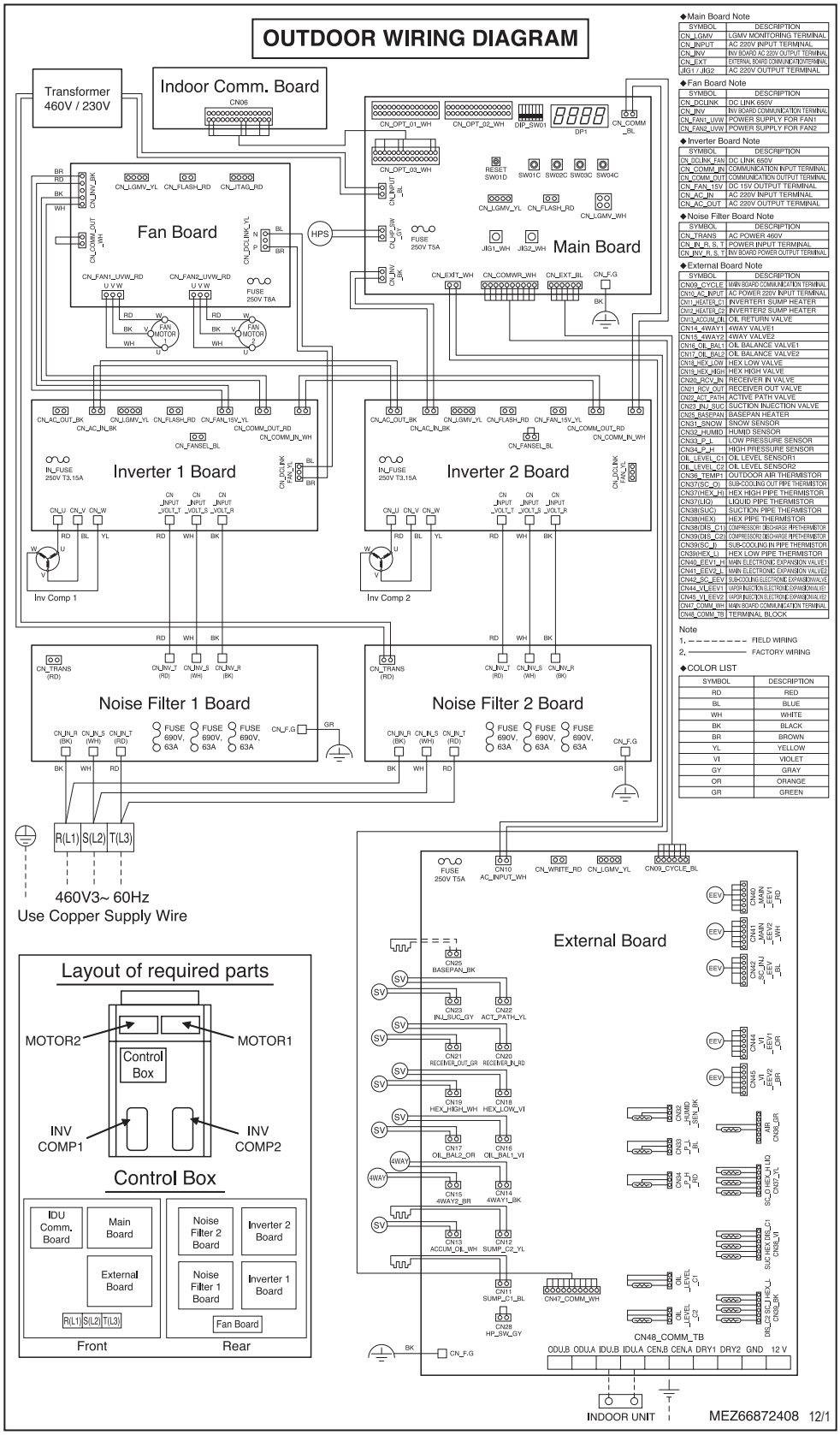
WIRING DIAGRAMS

460V Outdoor Units

ARUM192DTE5 / ARUM216DTE5 / ARUM241DTE5



◆Main Board Note

SYMBOL	DESCRIPTION
CN_LGMV	LGMV MONITORING TERMINAL
CN_INPUT	AC 220V INPUT TERMINAL
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CN_EXT	EXTERNAL BOARD COMMUNICATIONTERMINAL
JIG1 / JIG2	AC 220V OUTPUT TERMINAL

◆Fan Board Note

SYMBOL	DESCRIPTION
CN_DCLINK	DC LINK 650V
CN_INV	INV BOARD COMMUNICATION TERMINAL
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CN_FAN2_UVW	POWER SUPPLY FOR FAN2

◆Inverter Board Note

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CN_DCLINK_FAN	DC LINK 650V
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CN_AC_IN	AC 220V INPUT TERMINAL
CN_AC_OUT	AC 220V OUTPUT TERMINAL

◆Noise Filter Board Note

SYMBOL	DESCRIPTION
CN_TRANS	AC POWER 460V
CN_IN_R, S, T	POWER INPUT TERMINAL
CN_INV_R, S, T	INV BOARD POWER OUTPUT TERMINAL

◆External Board Note

SYMBOL	DESCRIPTION
CN09_CYCLE	MAIN BOARD COMMUNICATION TERMINAL
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CN21_RCV_OUT	RECEIVER OUT VALVE
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CN23_INJ_SUC	SUCTION INJECTION VALVE
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CN37(HEX_H)	HEX HIGH PIPE THERMISTOR
CN37(LIQ)	LIQUID PIPE THERMISTOR
CN38(SUC)	SUCTION PIPE THERMISTOR
CN38(HEX)	HEX PIPE THERMISTOR
CN38(DIS_C1)	COMPRESSOR DISCHARGE PIPETHERMISTOR
CN39(DIS_C2)	COMPRESSOR2 DISCHARGE PIPETHERMISTOR
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CN39(HEX_L)	HEX LOW PIPE THERMISTOR
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CN42_SC_EEV	SUB-COOLING ELECTRONIC EXPANSIONVALVE
CN44_VI_EEV1	VAPOR INJECTION ELECTRONIC EXPANSIONVALVE1
CN45_VI_EEV2	VAPOR INJECTION ELECTRONIC EXPANSIONVALVE2
CN47_COMM_WH	MAIN BOARD COMMUNICATION TERMINAL
CN48_COMM_TB	TERMINAL BLOCK

Note
1. ---------- FIELD WIRING
2. ———— FACTORY WIRING

◆COLOR LIST

SYMBOL	DESCRIPTION
RD	RED
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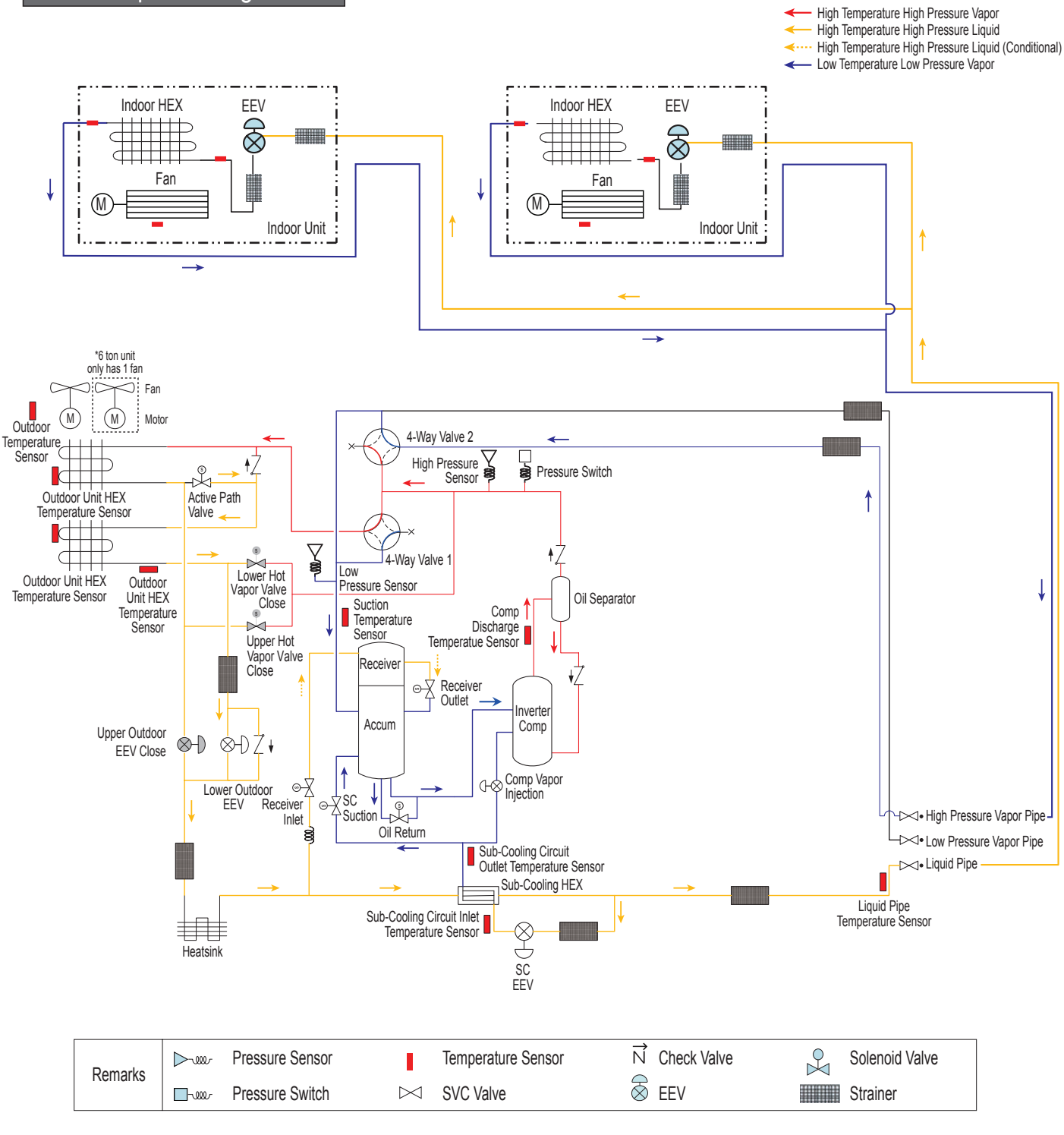
REFRIGERANT FLOW DIAGRAMS

MULTI V 5 WITH LGRED

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Pump Operation — Cooling Mode

Heat Pump – Cooling Mode



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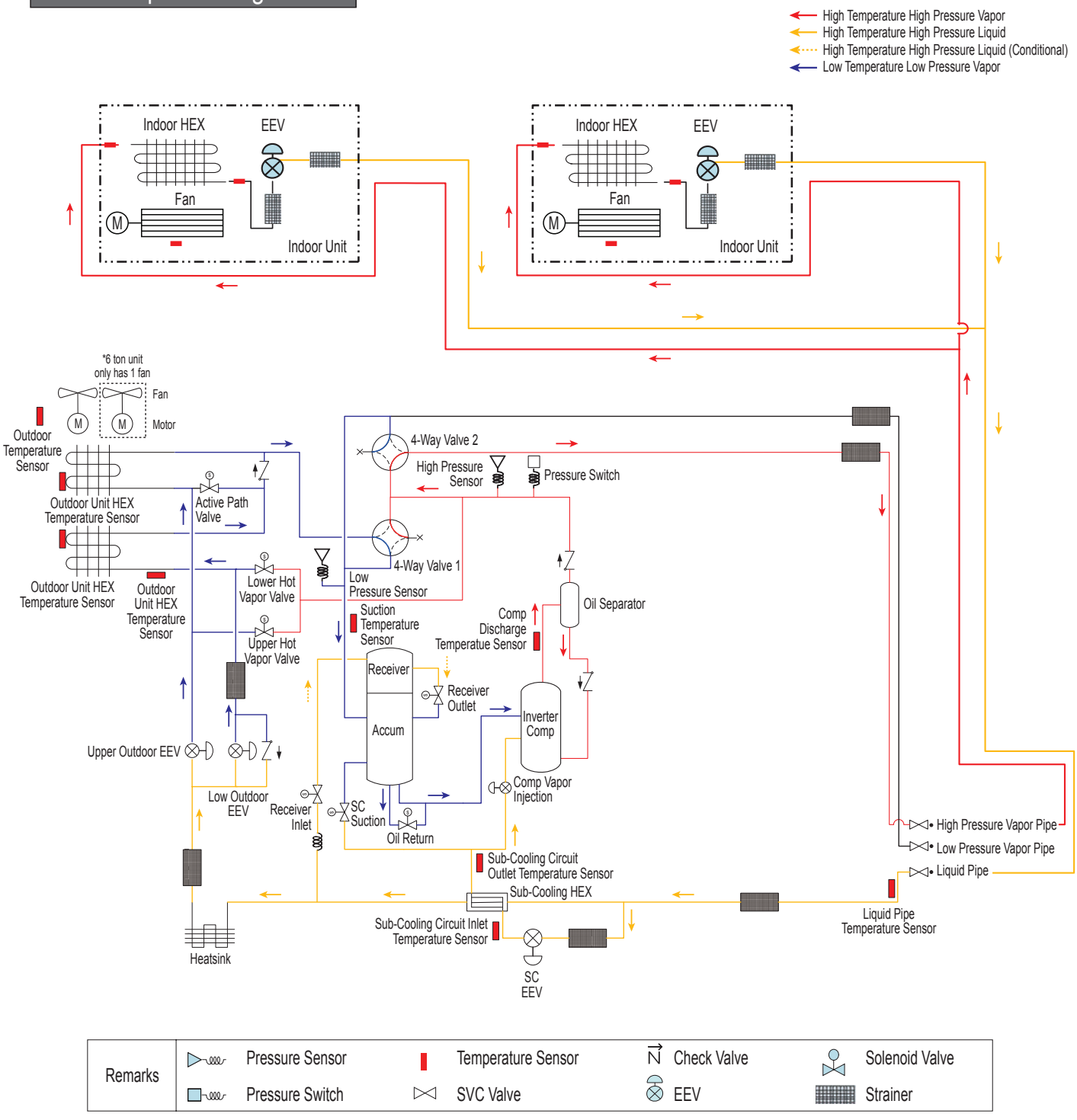
REFRIGERANT FLOW DIAGRAMS

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Pump Operation — Heating Mode

Heat Pump – Heating Mode



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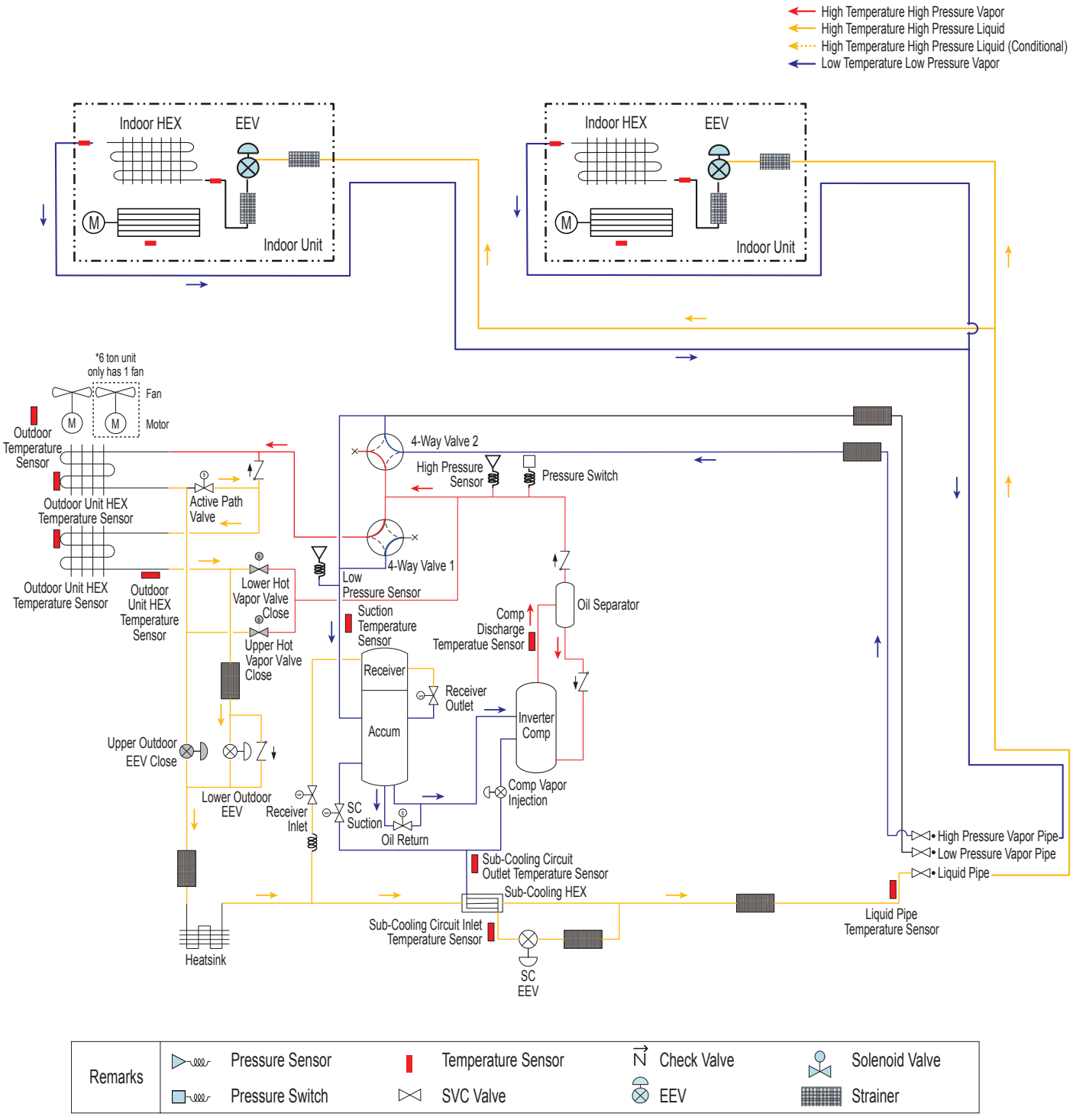
REFRIGERANT FLOW DIAGRAMS

MULTI V 5 WITH LGRED

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Pump Operation — Oil Return and Defrost

Heat Pump – Oil Return and Defrost Operation



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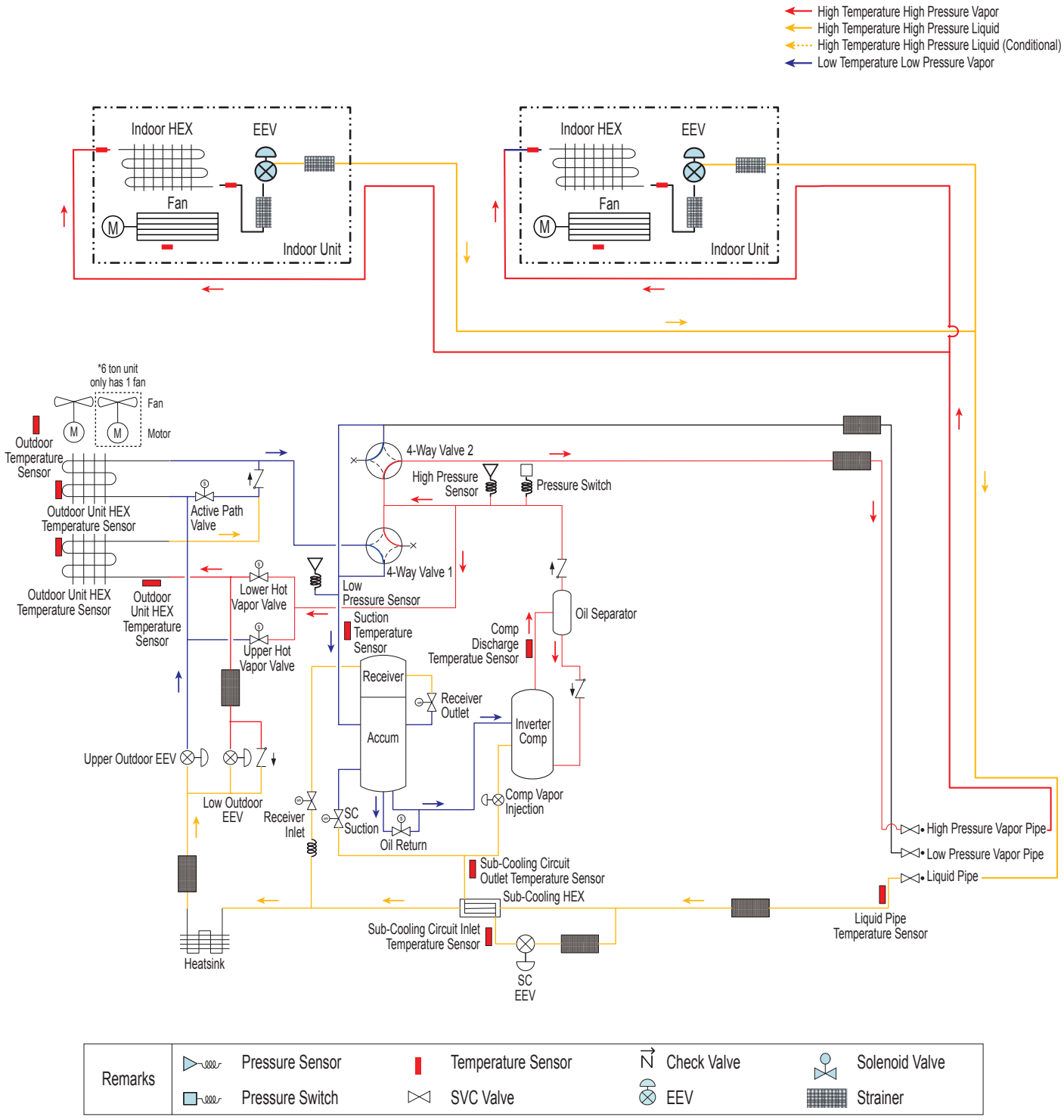
REFRIGERANT FLOW DIAGRAMS

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Pump Operation — Lower Heat Exchanger Defrost

Heat Pump – Lower HEX Defrost Operation



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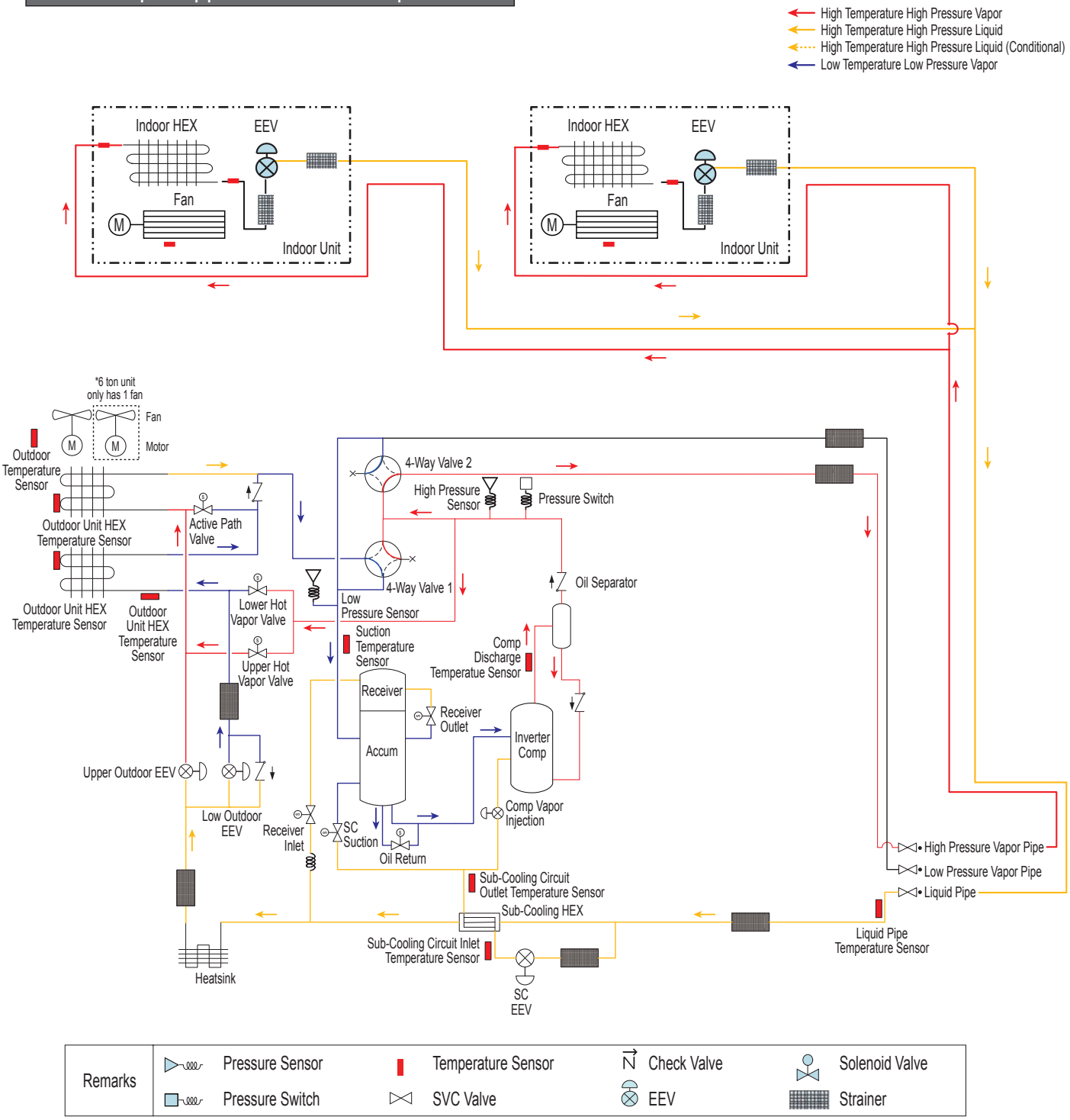
REFRIGERANT FLOW DIAGRAMS

MULTI V 5 WITH LGRED

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Pump Operation — Upper Heat Exchanger Defrost

Heat Pump – Upper HEX Defrost Operation



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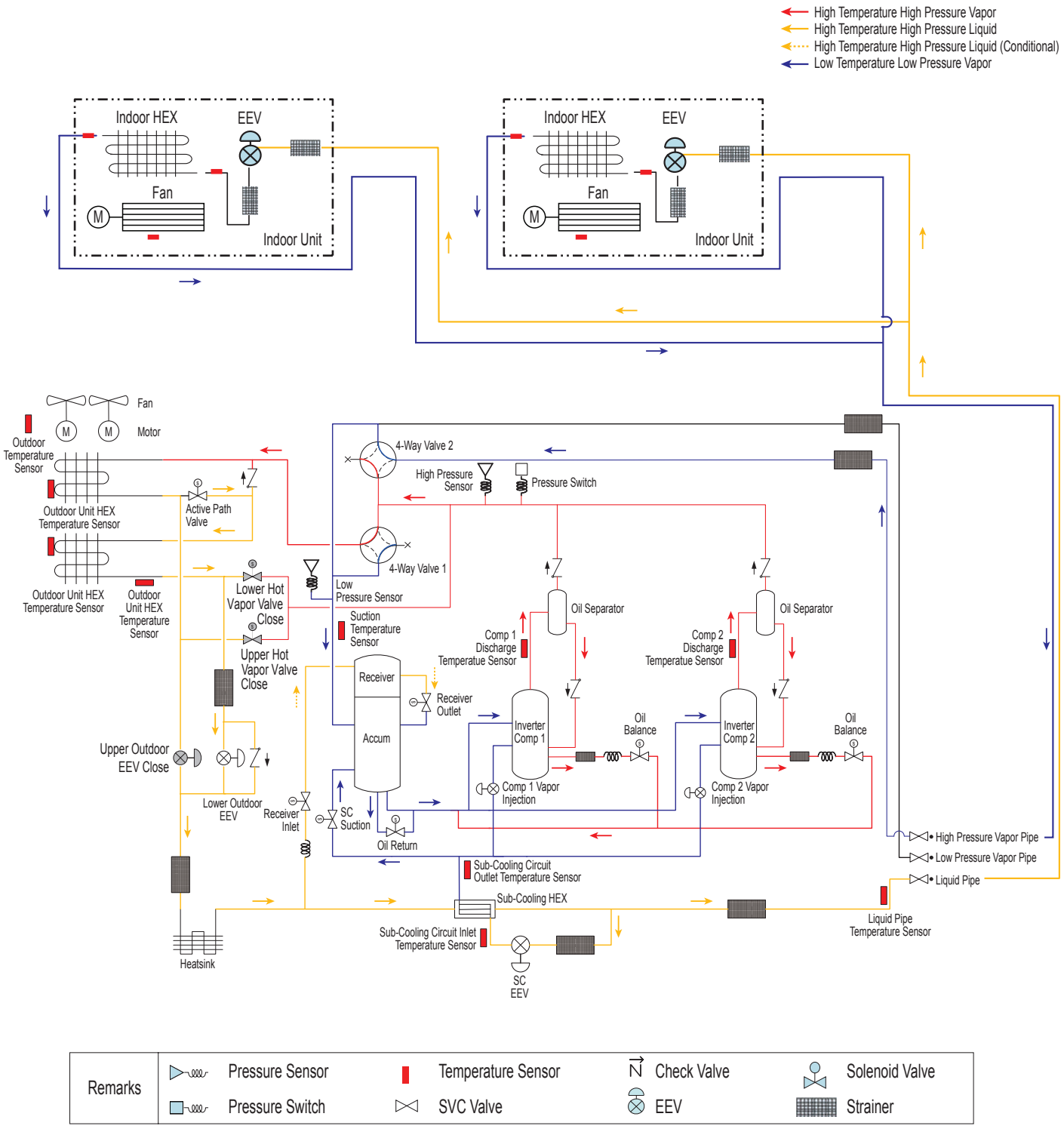
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Pump Operation — Cooling Mode

Heat Pump – Cooling Mode



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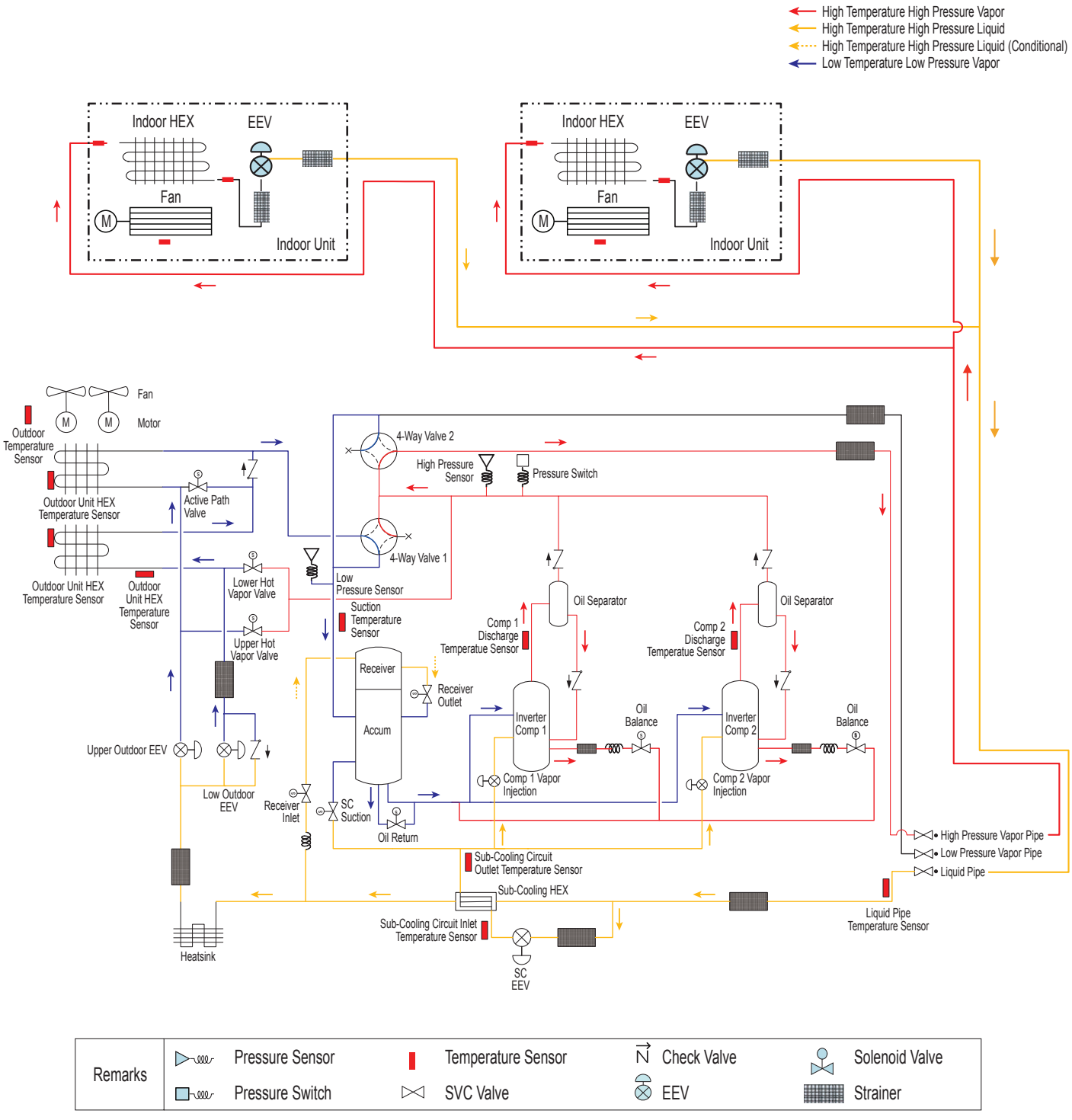
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Pump Operation — Heating Mode

MULTI V 5 WITH LGRED

Heat Pump – Heating Mode



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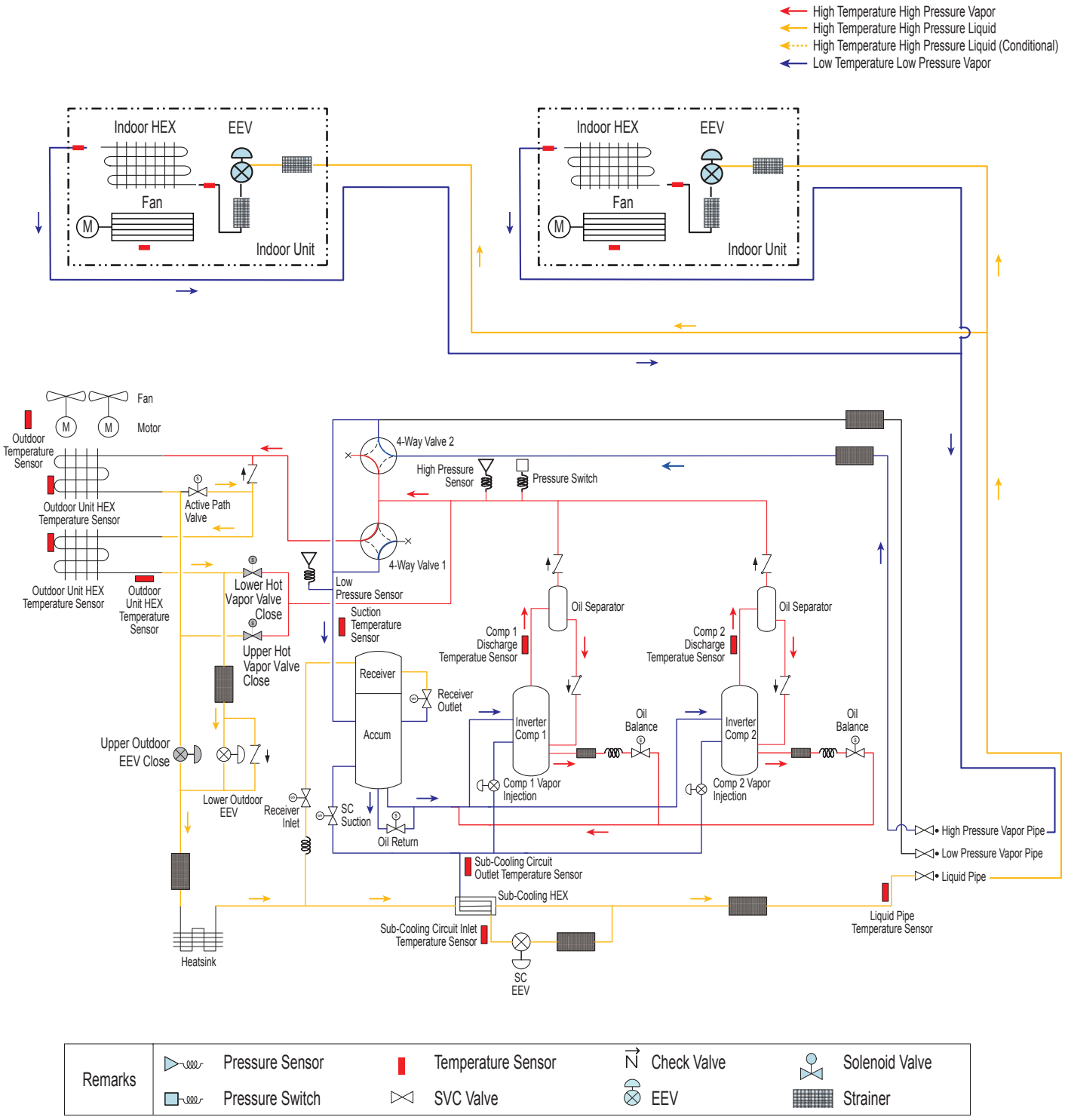
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Pump Operation — Oil Return and Defrost

Heat Pump – Oil Return and Defrost Operation



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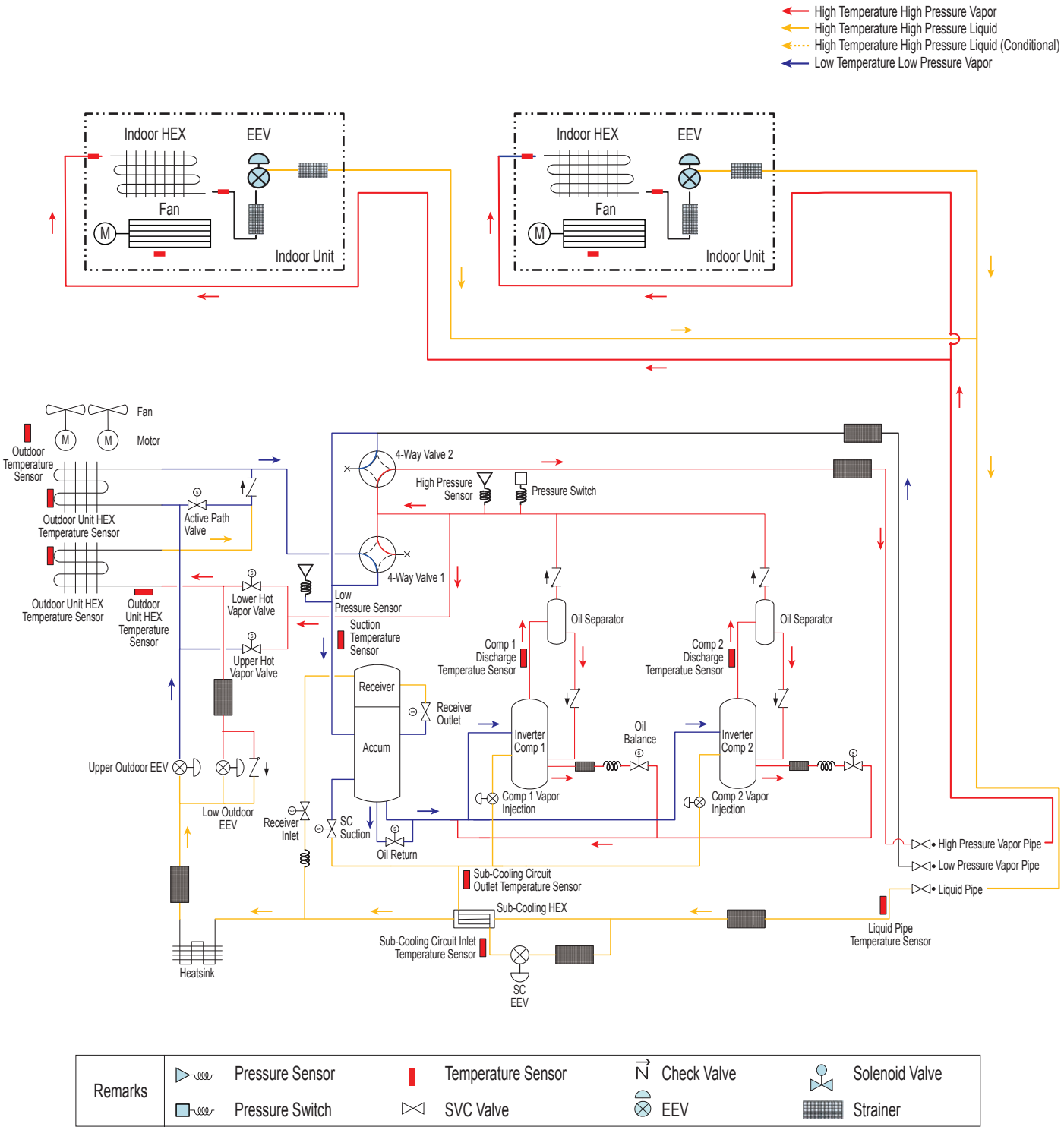
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Pump Operation — Lower Heat Exchanger Defrost

MULTI V 5 WITH LGRED

Heat Pump – Lower HEX Defrost Operation



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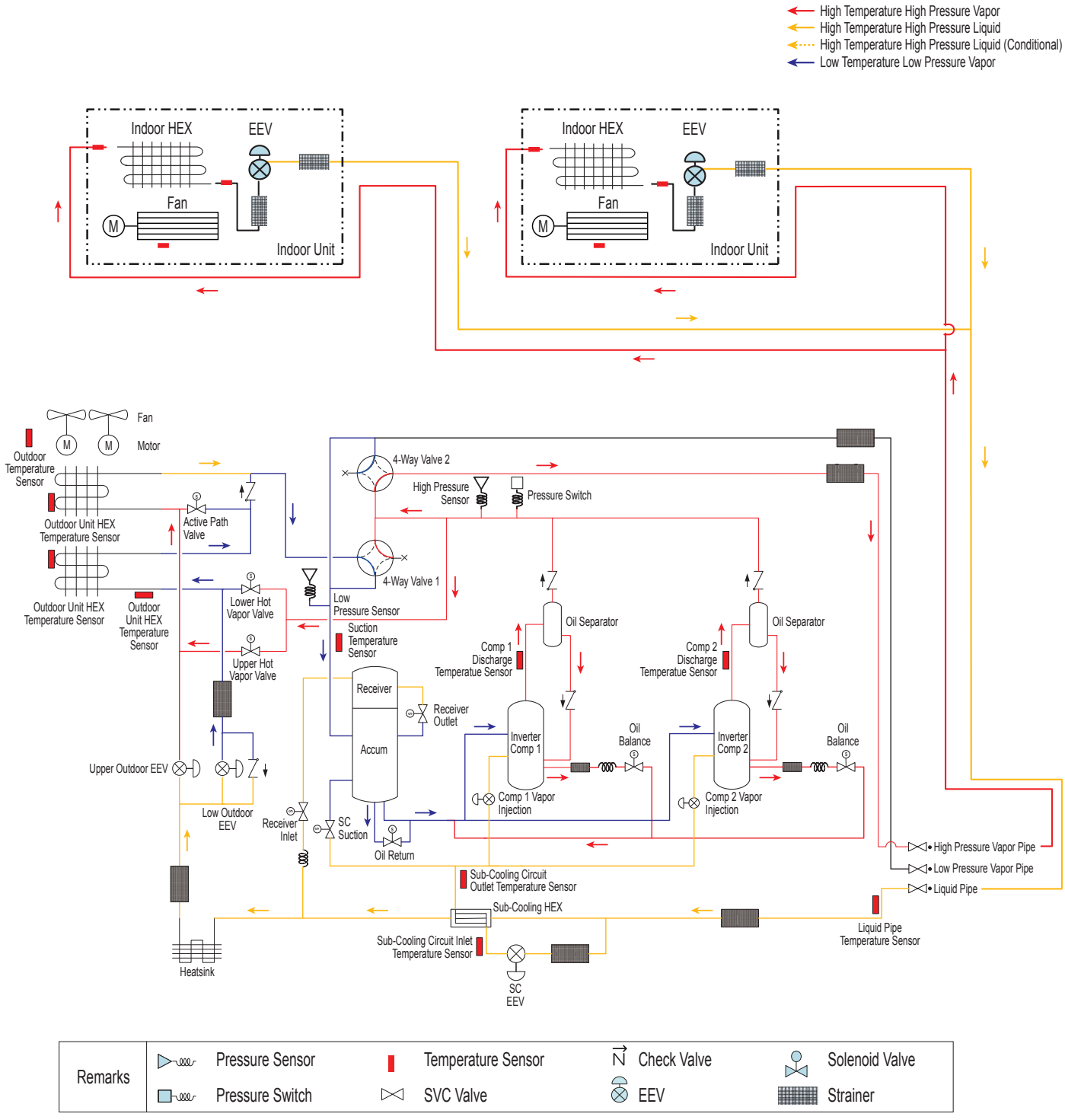
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Pump Operation — Upper Heat Exchanger Defrost

Heat Pump – Upper HEX Defrost Operation



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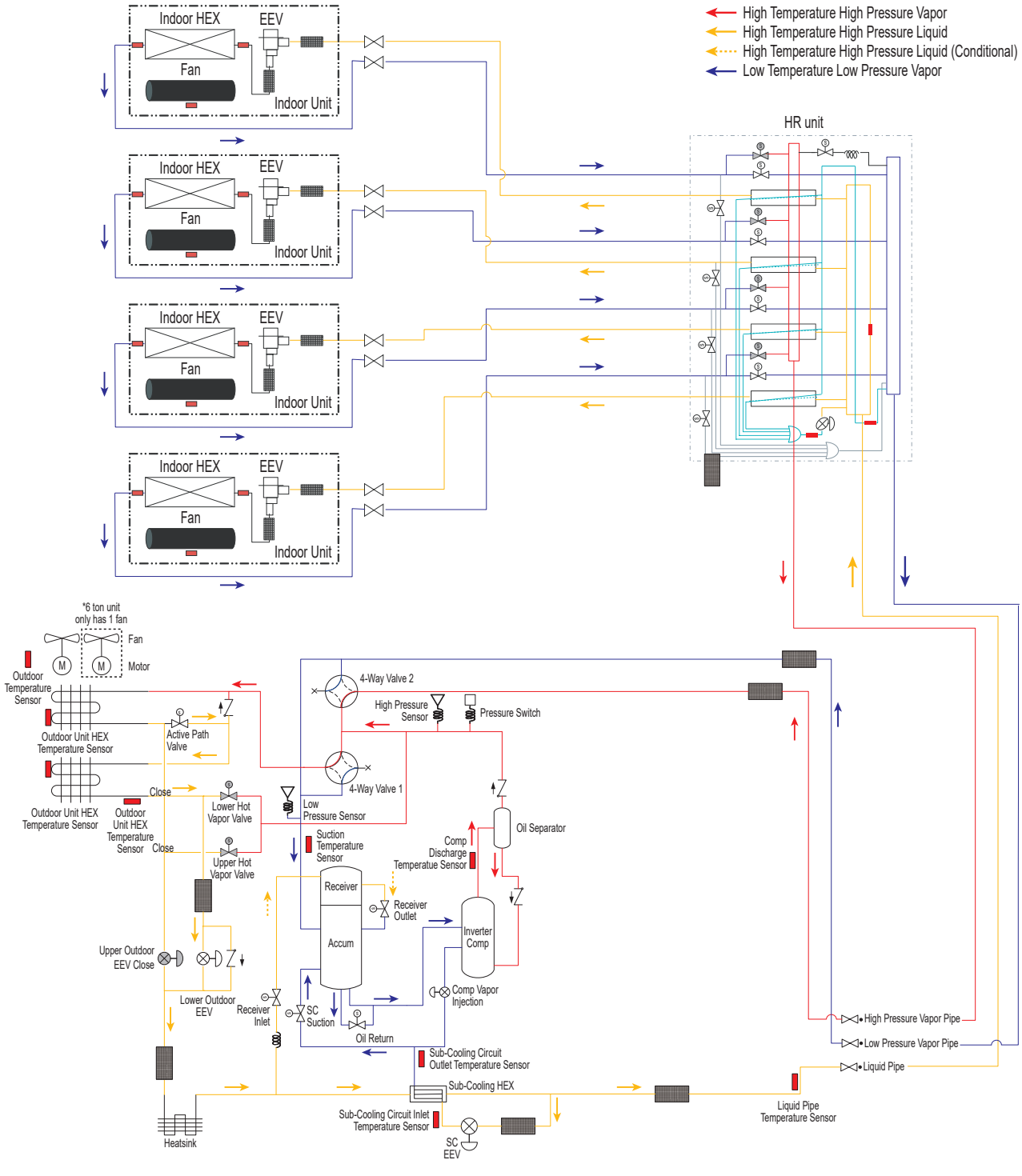
REFRIGERANT FLOW DIAGRAMS

MULTI V 5 WITH LGRED

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Recovery Operation — Cooling Mode

Heat Recovery – Cooling Mode



Remarks							
	Pressure Sensor		Temperature Sensor		Check Valve		Solenoid Valve
	Pressure Switch		SVC Valve		EEV		Strainer

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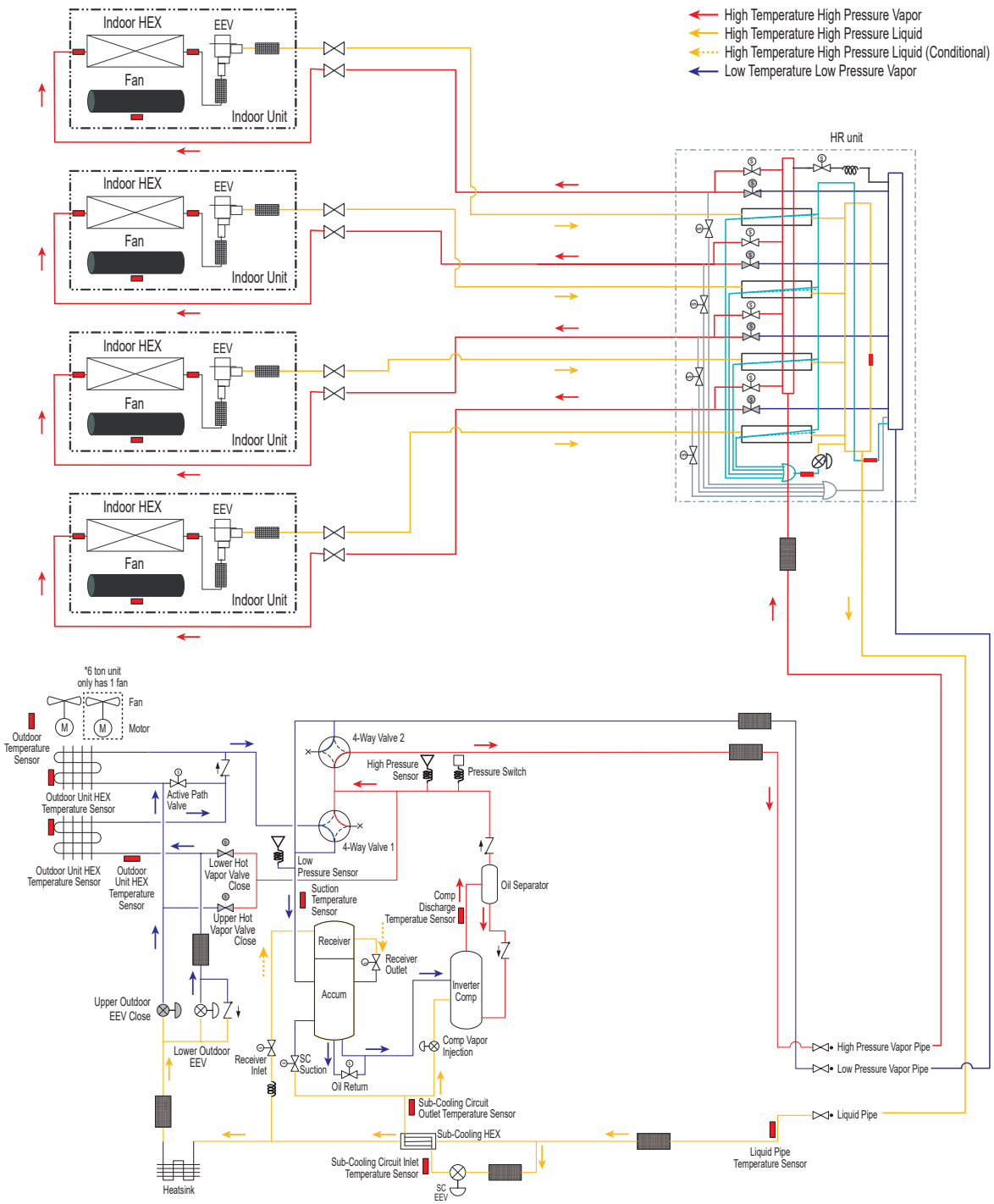
REFRIGERANT FLOW DIAGRAMS

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Recovery Operation — Heating Mode

Heat Recovery – Heating Mode



Remarks				
	Pressure Sensor	Temperature Sensor	Check Valve	Solenoid Valve
	Pressure Switch	SVC Valve	EEV	Strainer

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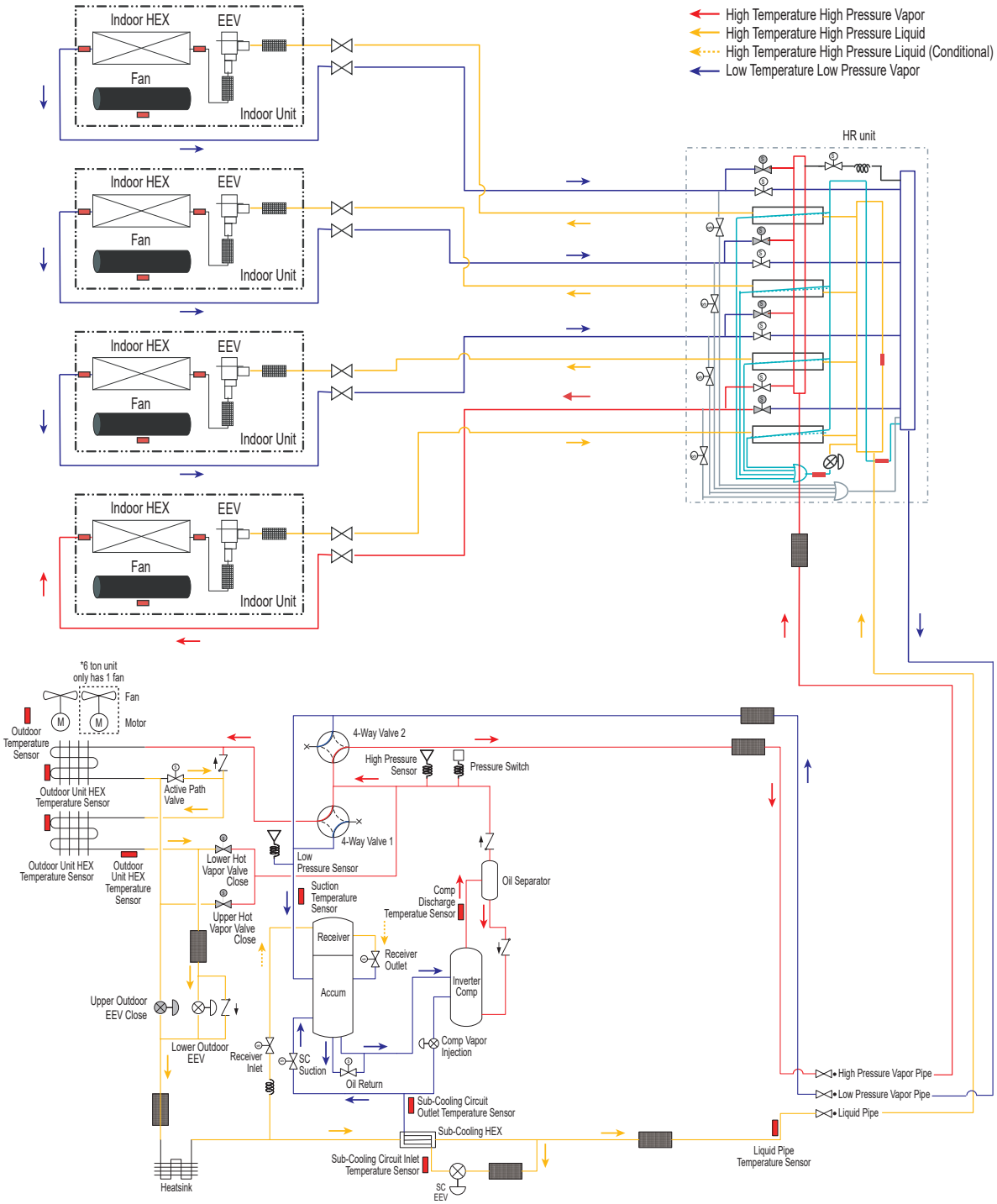
REFRIGERANT FLOW DIAGRAMS

MULTI V 5 WITH LGRED

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Recovery Operation — Cooling-Based Simultaneous Mode

Heat Recovery – Cooling-Based Simultaneous Operation



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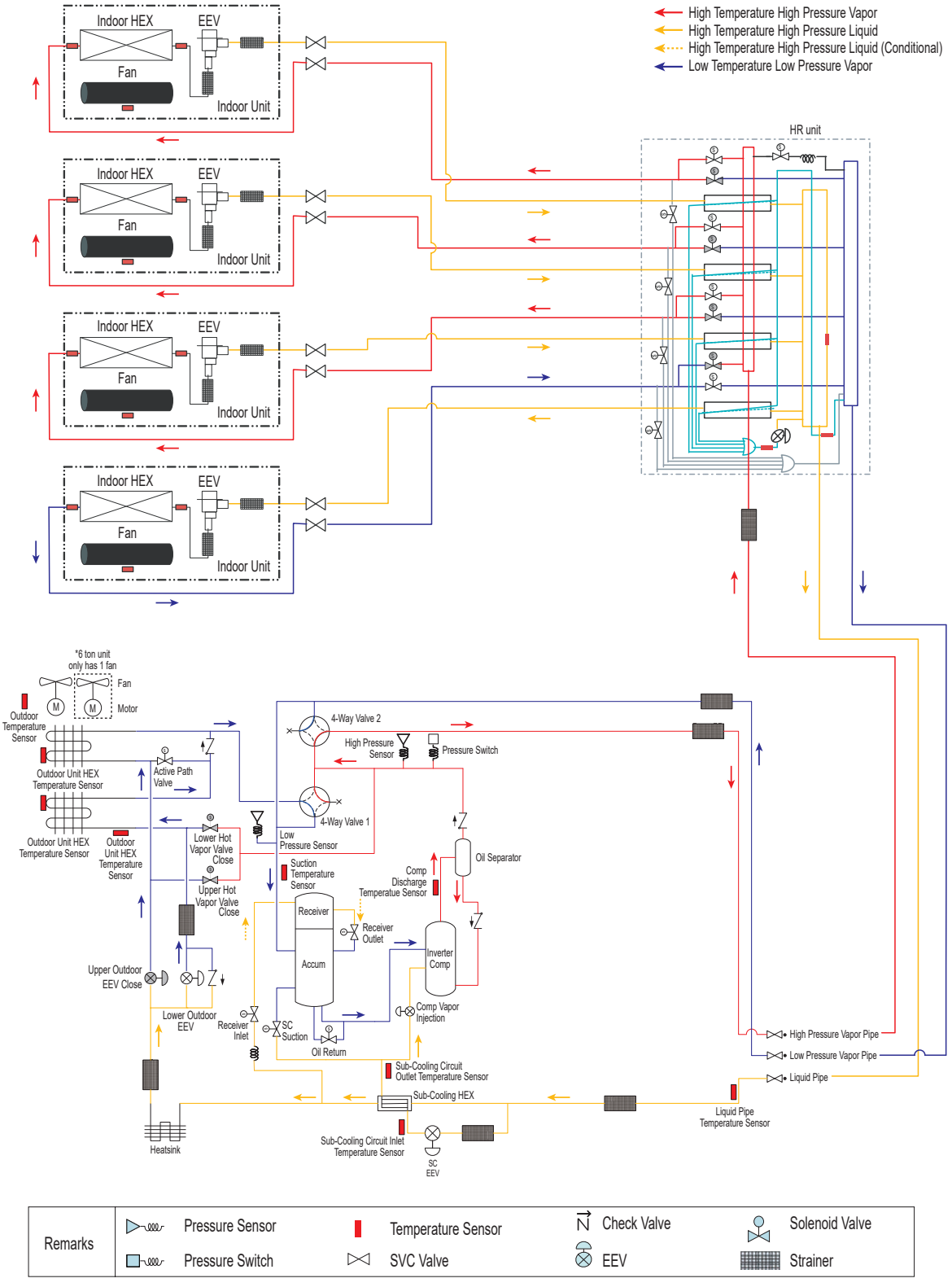
REFRIGERANT FLOW DIAGRAMS

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Recovery Operation — Heating-Based Simultaneous Mode

Heat Recovery – Heating-Based Simultaneous Operation



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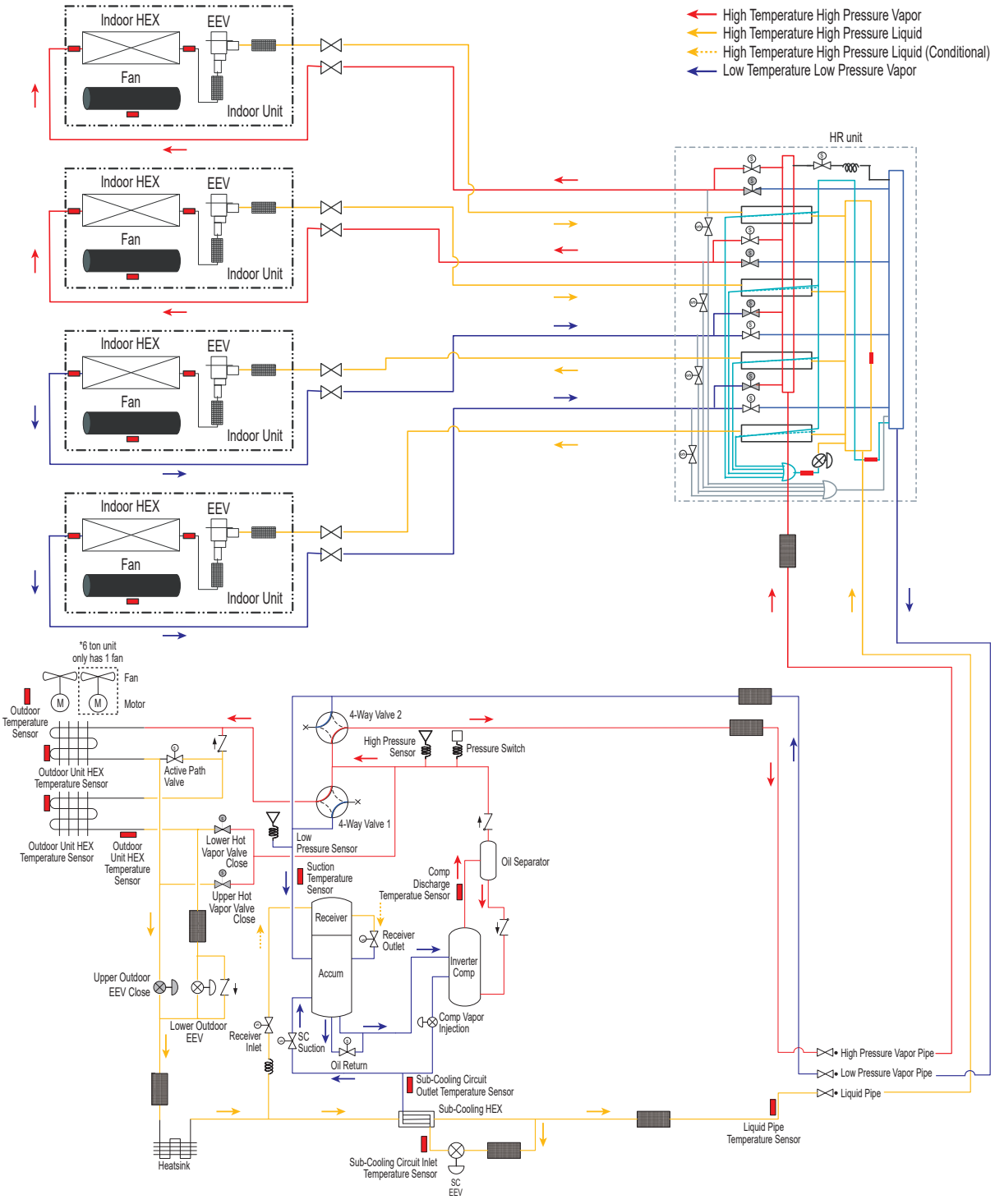
REFRIGERANT FLOW DIAGRAMS

MULTI V 5 WITH LGRED

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Recovery Operation — Balanced Simultaneous Mode

Heat Recovery – Balanced Simultaneous Operation



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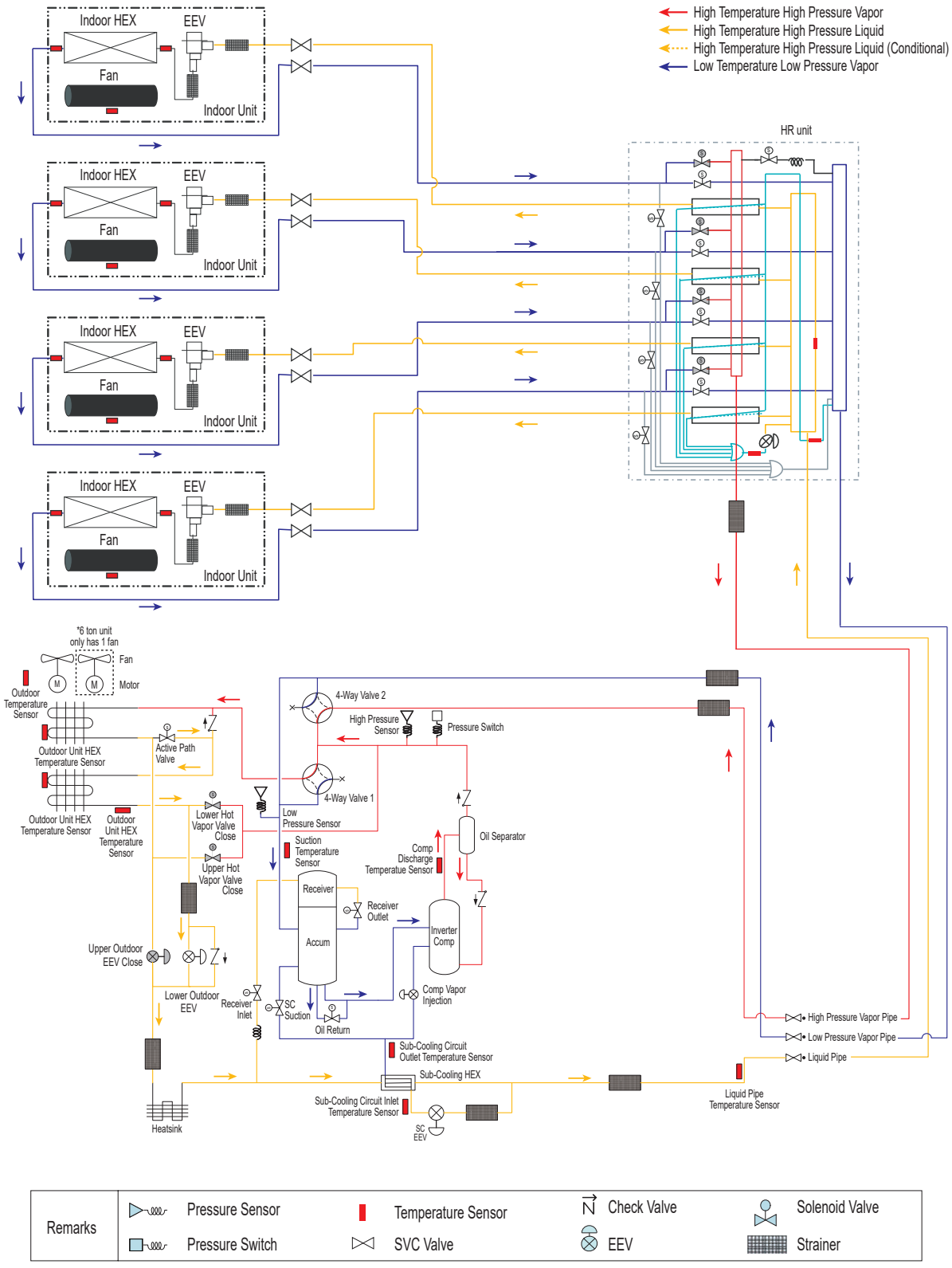
REFRIGERANT FLOW DIAGRAMS

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Recovery Operation — Oil Return and Defrost

Heat Recovery – Oil Return and Defrost Operation



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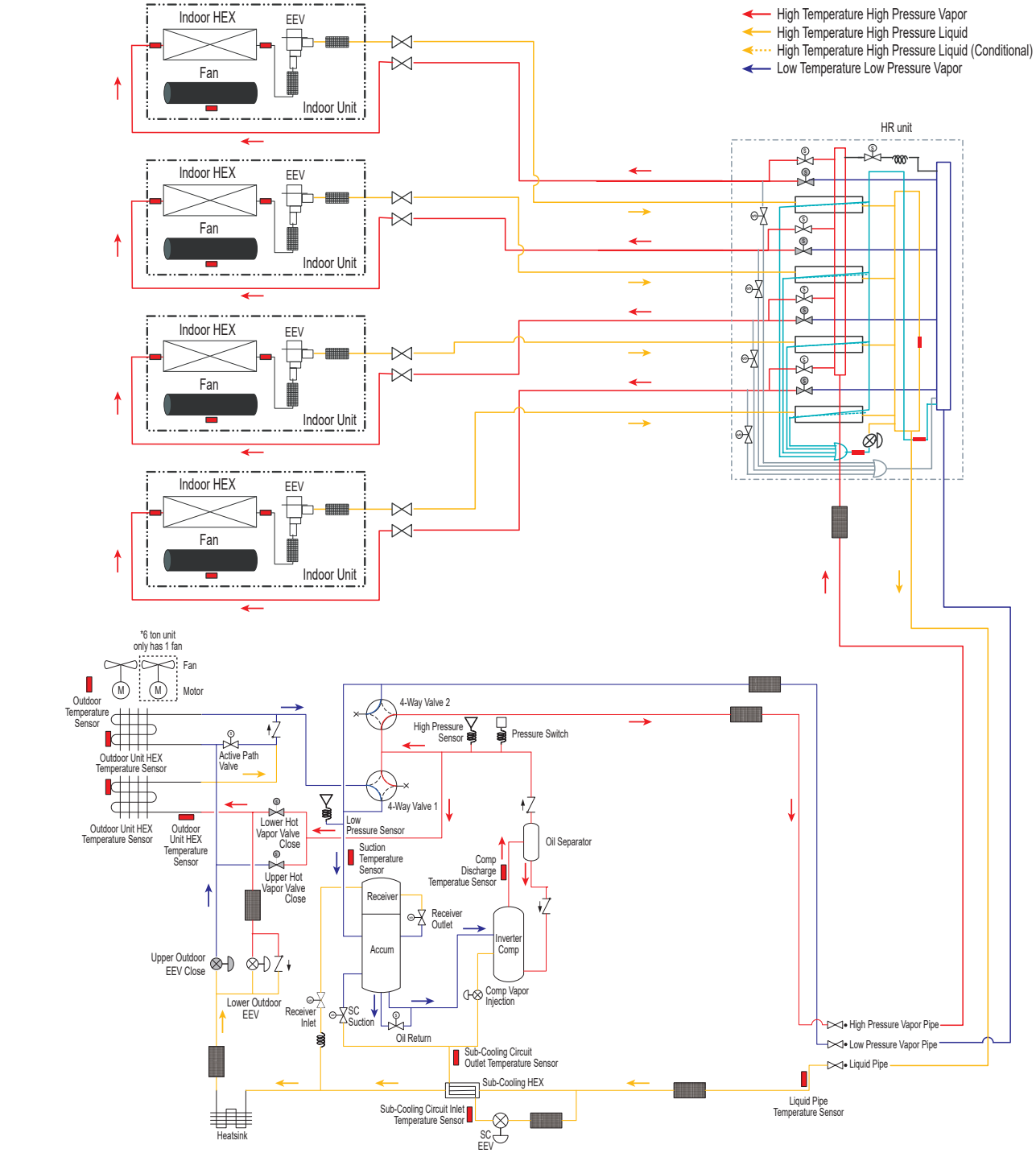
REFRIGERANT FLOW DIAGRAMS

MULTI V 5 WITH LGRED

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Recovery Operation — Lower Heat Exchanger Defrost

Heat Recovery – Lower HEX Defrost Operation



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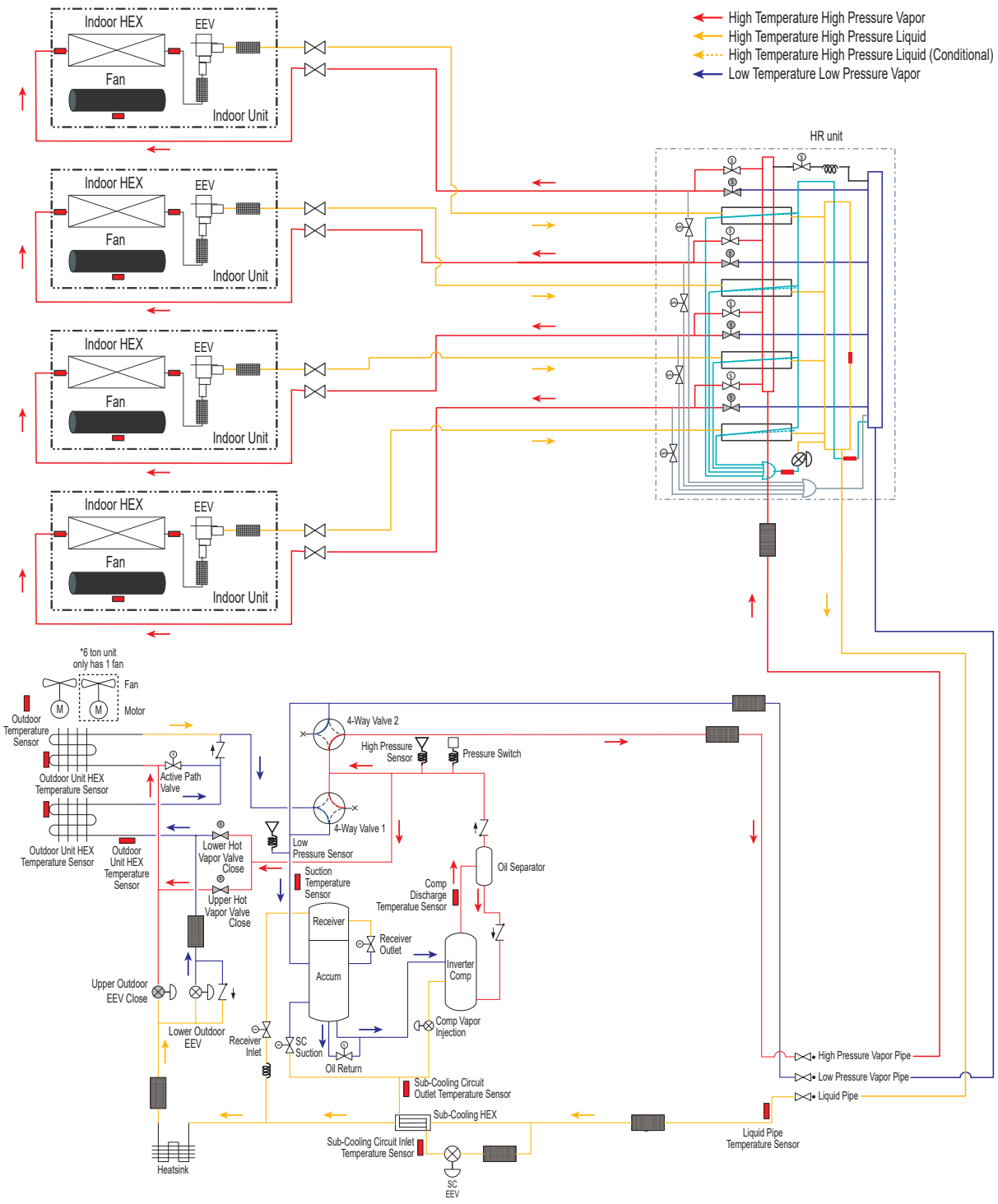
REFRIGERANT FLOW DIAGRAMS

ARUM072BTE5 / DTE5, ARUM096BTE5 / DTE5, ARUM121BTE5 / DTE5

Heat Recovery Operation — Upper Heat Exchanger Defrost

Heat Recovery – Upper HEX Defrost Operation



Remarks							
	Pressure Sensor		Temperature Sensor		Check Valve		Solenoid Valve
	Pressure Switch		SVC Valve		EEV		Strainer

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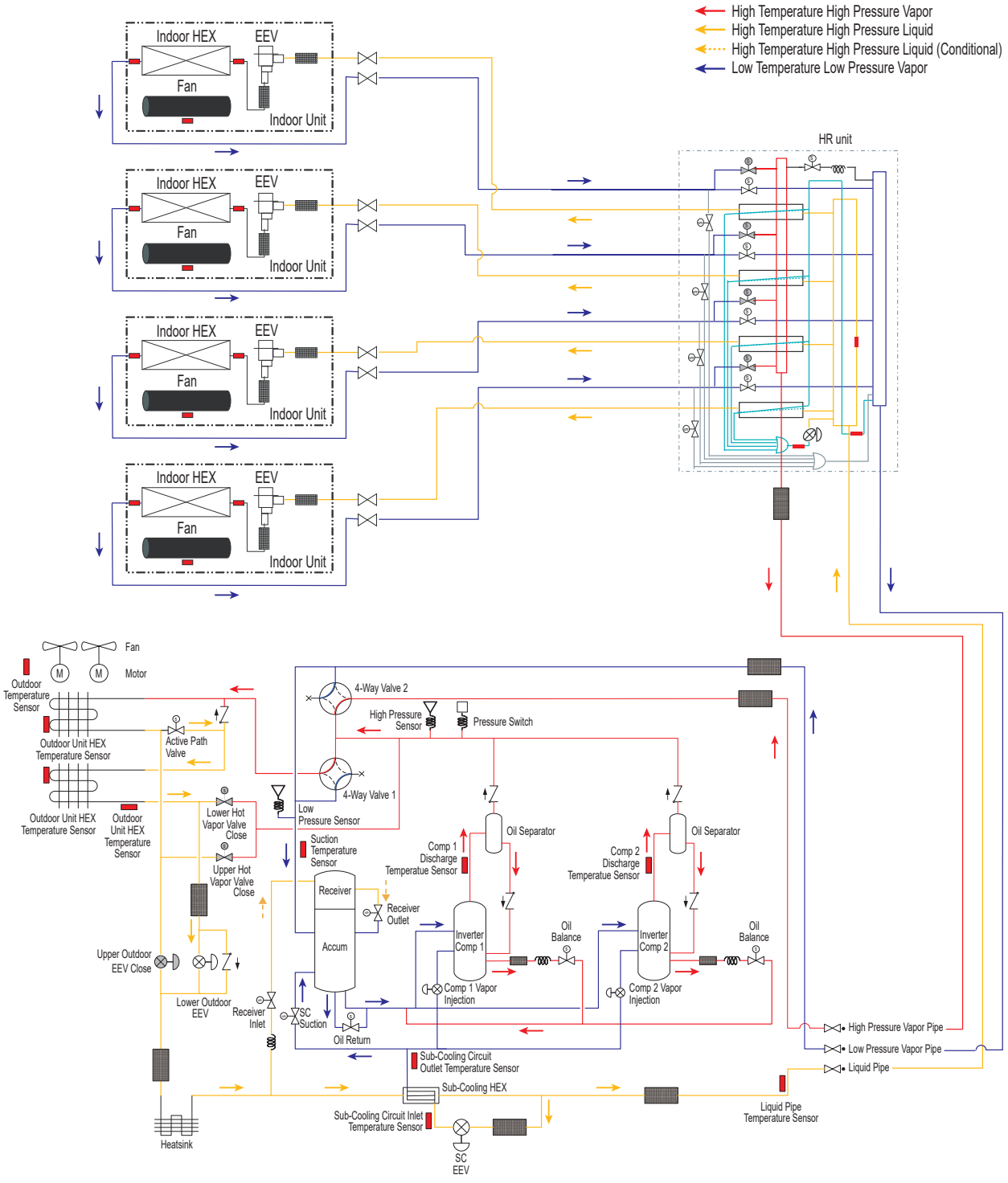
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Recovery Operation — Cooling Mode

MULTI V 5 WITH LGRED

Heat Recovery – Cooling Mode



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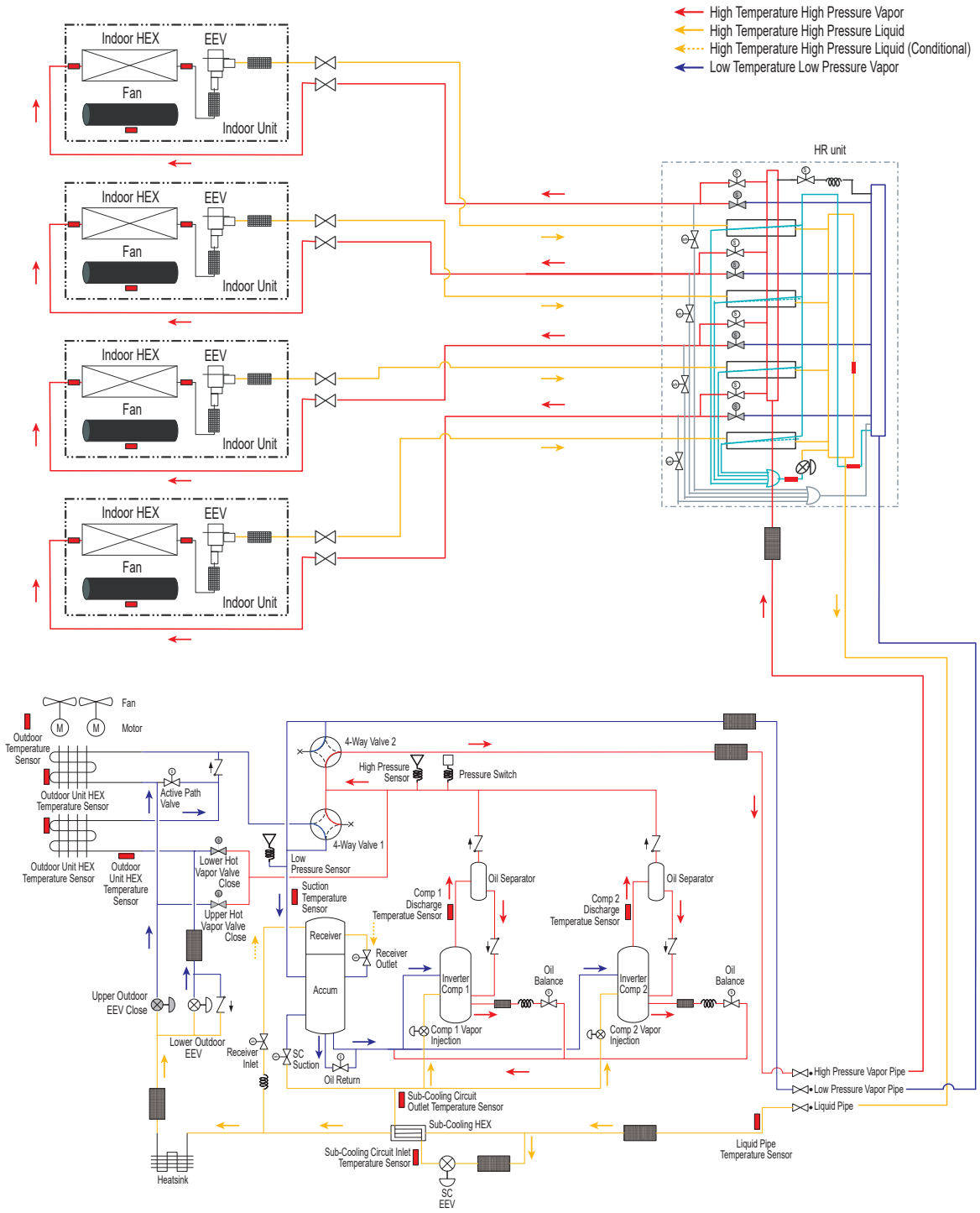
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Recovery Operation — Heating Mode

Heat Recovery – Heating Mode



Remarks							
	Pressure Sensor		Temperature Sensor		Check Valve		Solenoid Valve
	Pressure Switch		SVC Valve		EEV		Strainer

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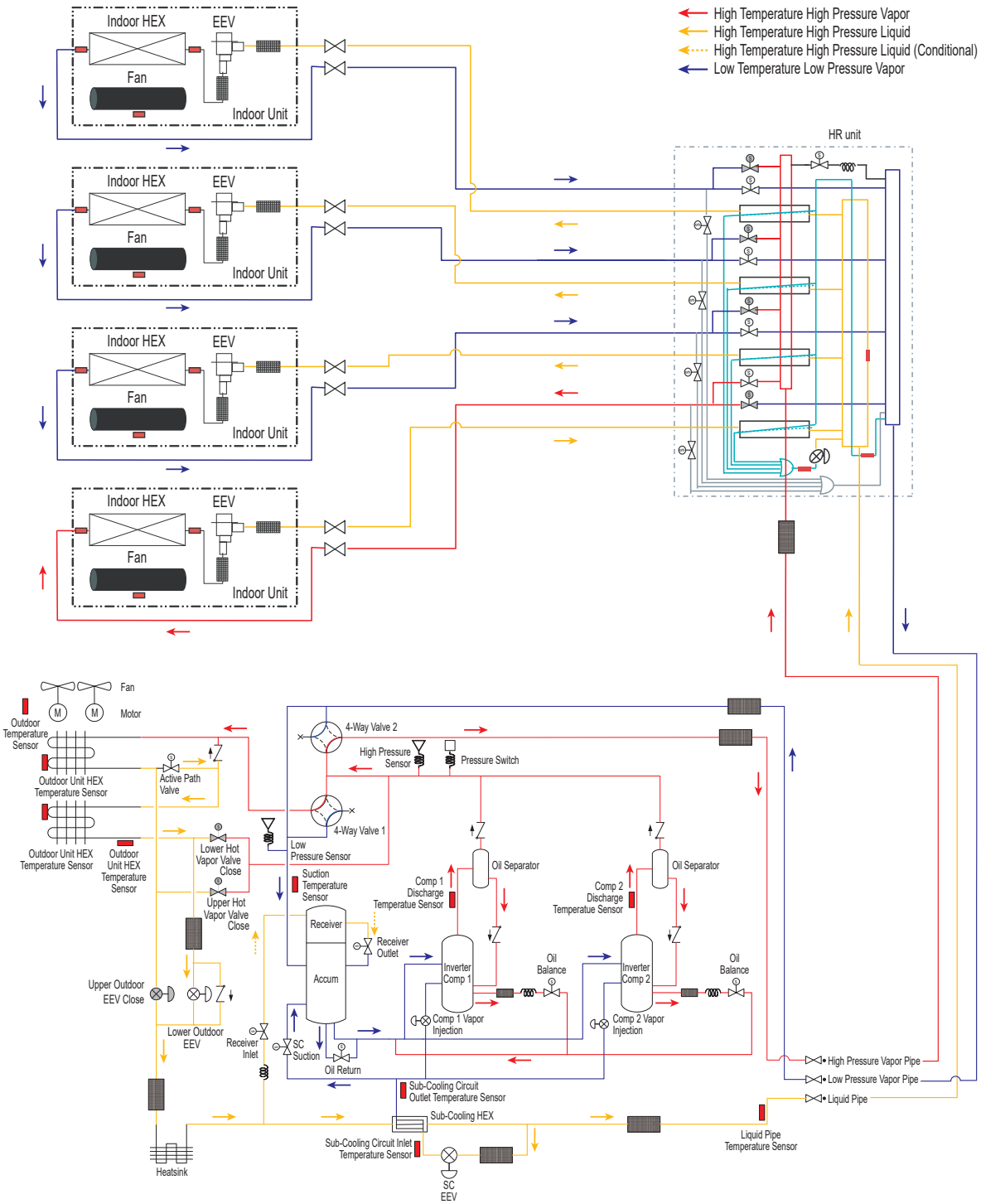
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Recovery Operation — Cooling-Based Simultaneous Mode

MULTI V 5 WITH LGRED

Heat Recovery – Cooling-Based Simultaneous Operation



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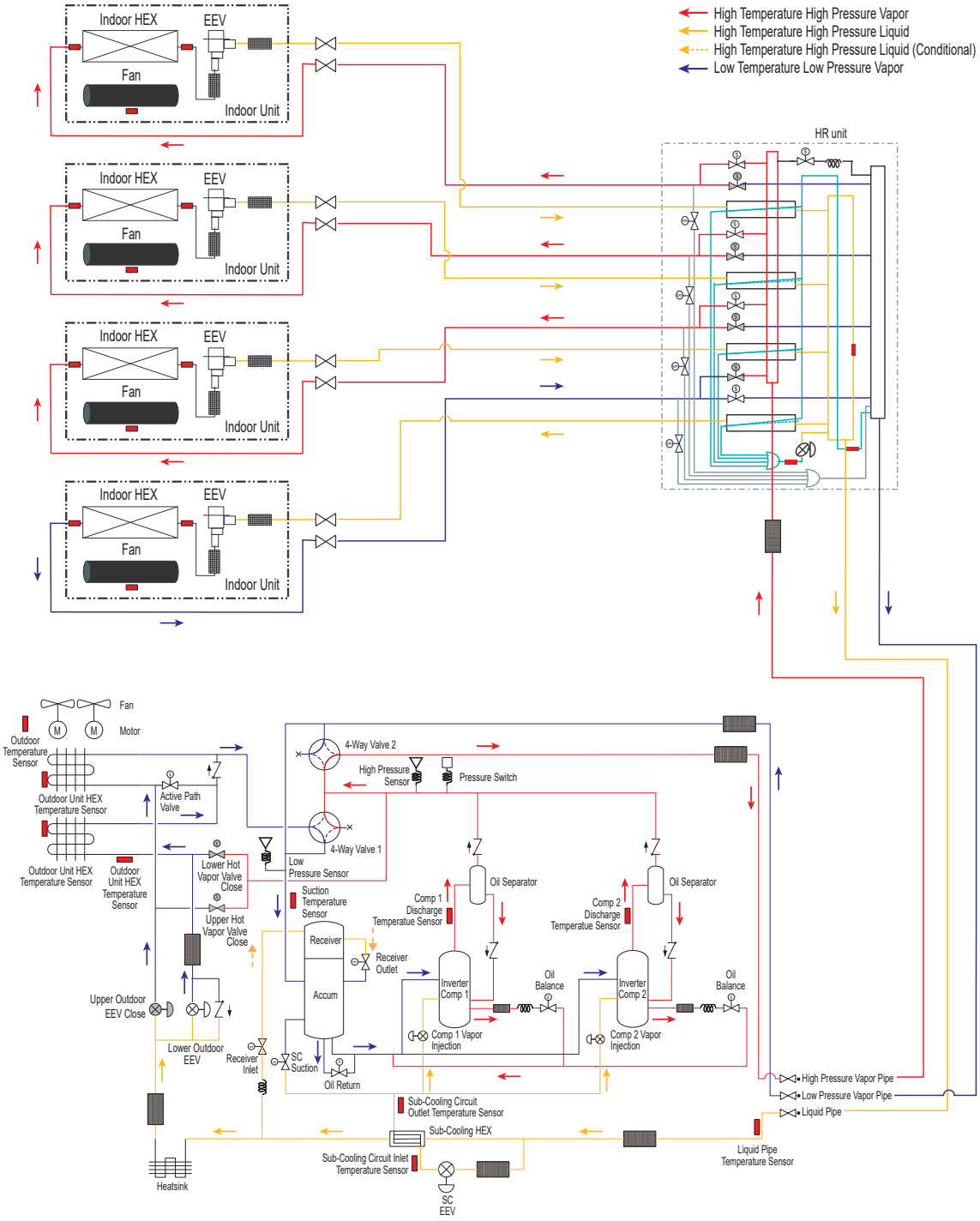
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Recovery Operation — Heating-Based Simultaneous Mode

Heat Recovery – Heating-Based Simultaneous Operation



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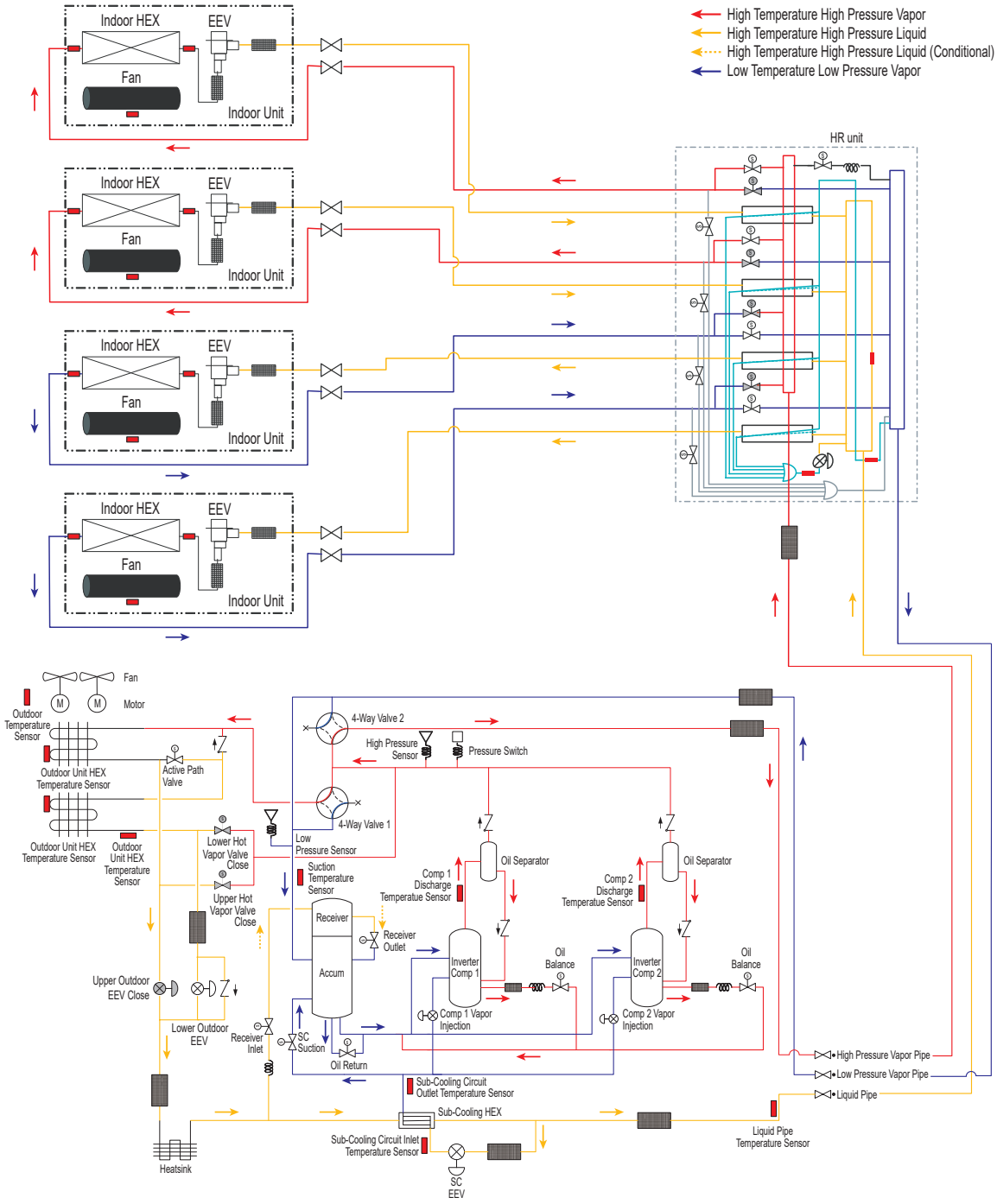
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Recovery Operation — Balanced Simultaneous Mode

MULTI V 5 WITH LGRED

Heat Recovery – Balanced Simultaneous Operation



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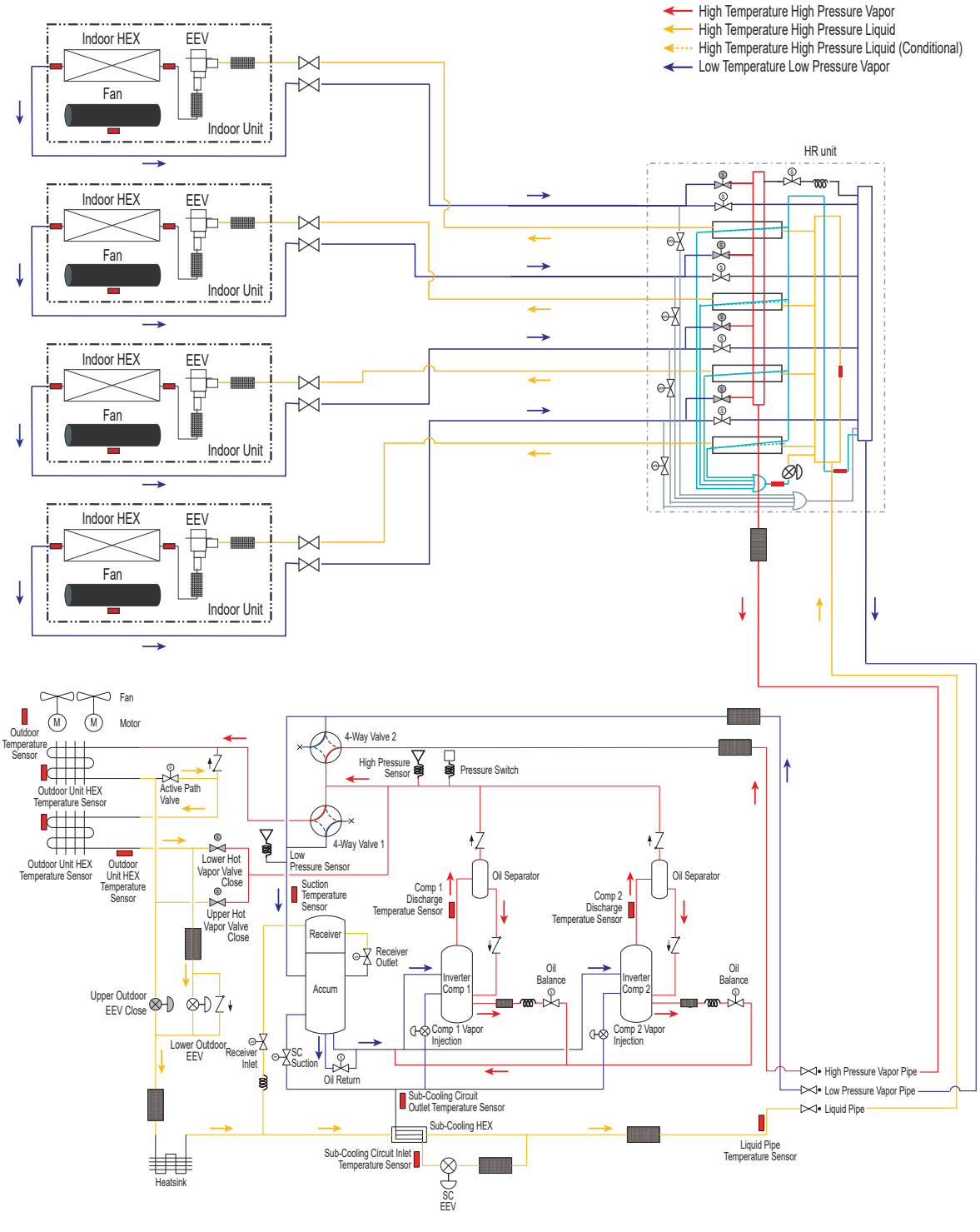
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Recovery Operation — Oil Return and Defrost

Heat Recovery – Oil Return and Defrost Operation



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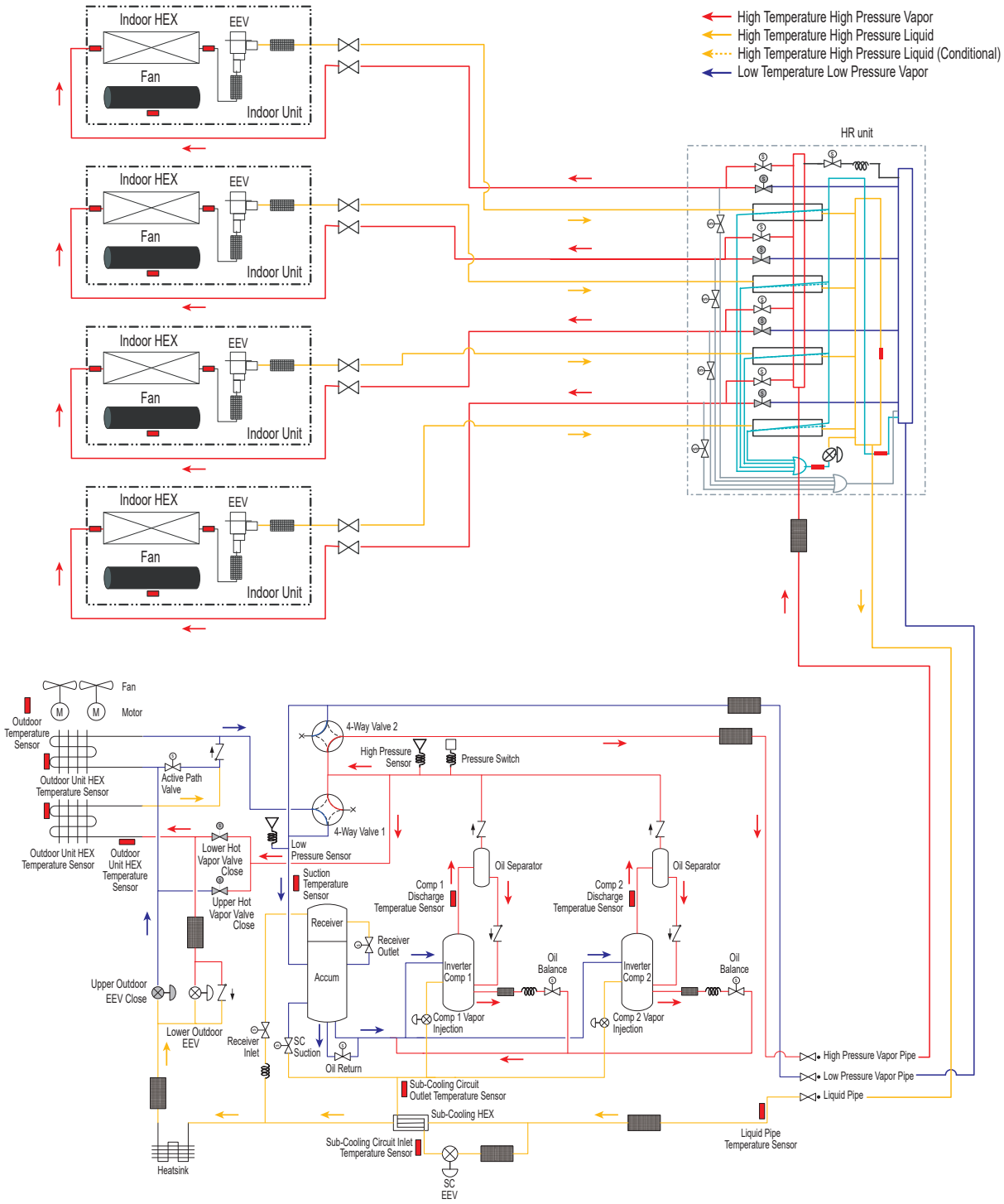
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Recovery Operation — Lower Heat Exchanger Defrost

MULTI V 5 WITH LGRED

Heat Recovery – Lower HEX Defrost Operation



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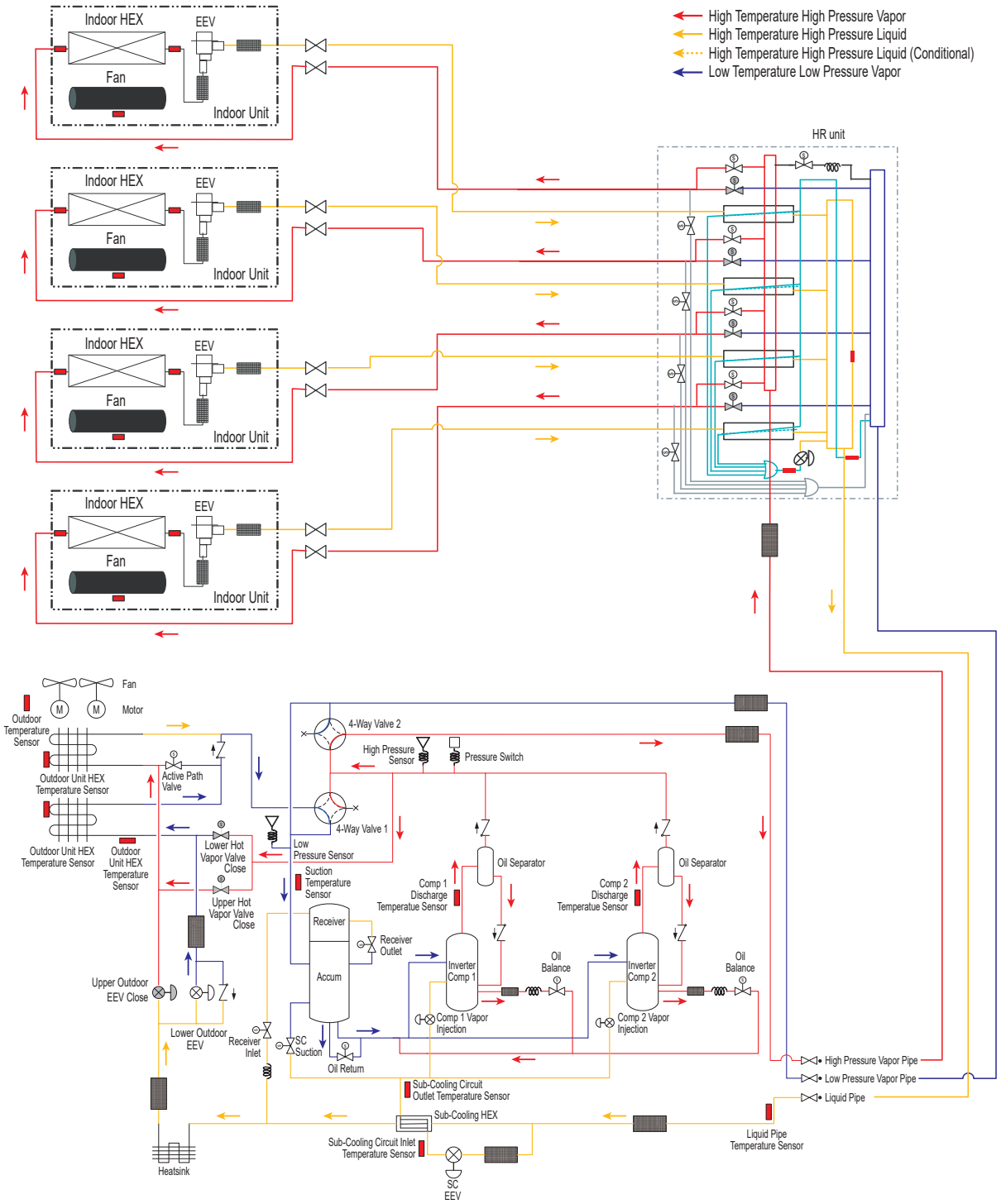
REFRIGERANT FLOW DIAGRAMS

ARUM144, 168, 192, 216, 241BTE5 / DTE5

Heat Recovery Operation — Upper Heat Exchanger Defrost

Heat Recovery – Upper HEX Defrost Operation



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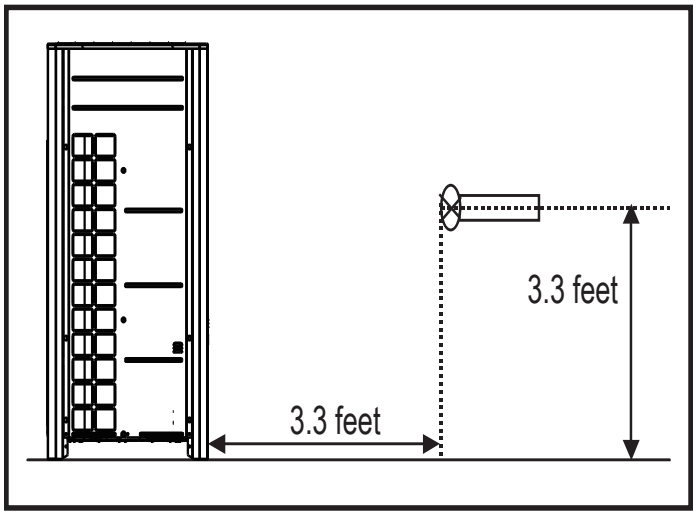
ACOUSTIC DATA

Sound Pressure Levels

Table 14: Outdoor Unit Sound Pressure Levels.

Outdoor Unit Models			dB(A)
Nominal Tons	208-230V	460V	
6	ARUM072BTE5	ARUM072DTE5	58.0
8	ARUM096BTE5	ARUM096DTE5	58.0
10	ARUM121BTE5	ARUM121DTE5	59.0
12	ARUM144BTE5	ARUM144DTE5	60.0
14	ARUM168BTE5	ARUM168DTE5	61.0
16	ARUM192BTE5	ARUM192DTE5	62.0
18	ARUM216BTE5	ARUM216DTE5	64.0
20	ARUM241BTE5	ARUM241DTE5	65.0
22	ARUM264BTE5	ARUM264BTE5	63.0
24	ARUM288BTE5	ARUM288DTE5	63.0
26	ARUM312BTE5	ARUM312DTE5	65.0
28	ARUM336BTE5	ARUM336DTE5	65.0
30	ARUM360BTE5	ARUM360DTE5	66.0
32	ARUM384BTE5	ARUM384DTE5	66.0
34	ARUM408BTE5	ARUM408DTE5	66.0
36	ARUM432BTE5	ARUM432DTE5	66.0
38	ARUM456BTE5	ARUM456DTE5	66.0
40	ARUM480BTE5	ARUM480DTE5	67.0
42	ARUM504BTE5	ARUM504DTE5	67.0

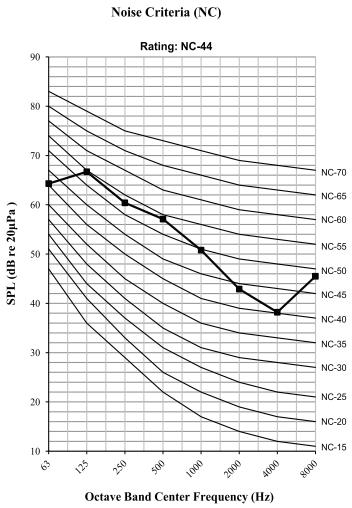
Figure 2: Sound Pressure Measurement Location.



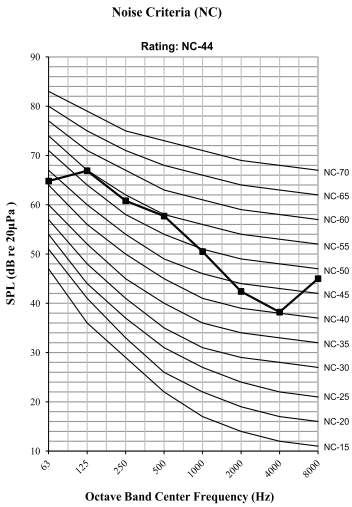
- Measurement taken 3.3' above finished floor, and at a distance of 3.3' from face of unit.
- Measurements taken with no attenuation and units operating at full load normal operating condition.
- Sound level will vary depending on a range of factors such as construction (acoustic absorption coefficient) of particular area in which the equipment is installed.
- Sound level may be increased in static pressure mode or if an air guide is used.
- Sound levels are measured in dB(A)±3.
- Tested in anechoic chamber per ISO Standard 3745.

Figure 3: ARUM072-096-121BTE5 / DTE5 Sound Pressure Levels.

ARUM072BTE5 / DTE5



ARUM096BTE5 / DTE5



ARUM121BTE5 / DTE5

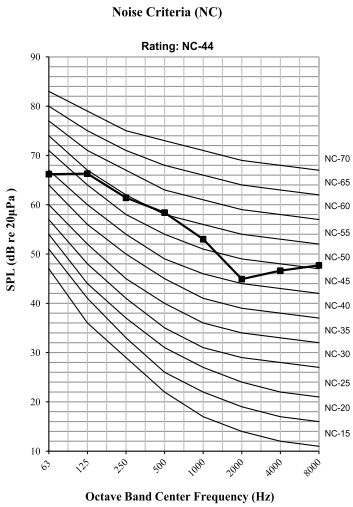


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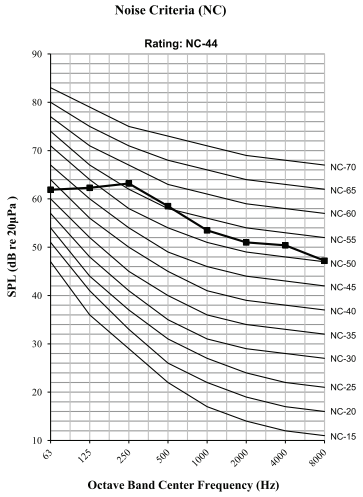
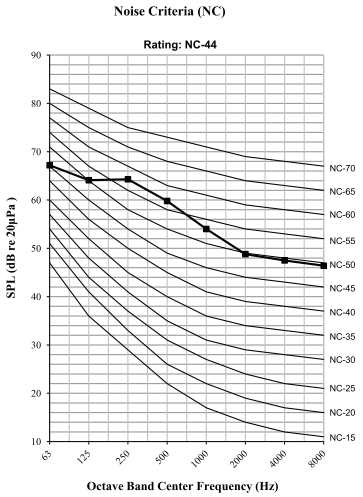
Figure 4: ARUM144-168-192BTE5 / DTE5 Sound Pressure Levels.

ARUM144BTE5 / DTE5



ARUM168BTE5 / DTE5



ARUM192BTE5 / DTE5

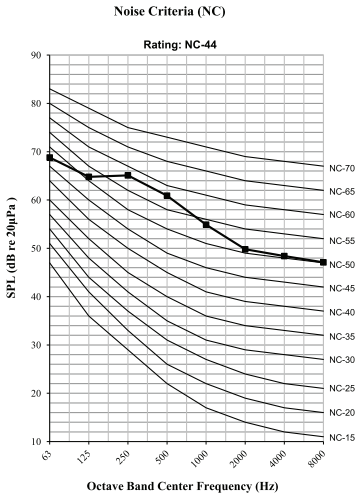
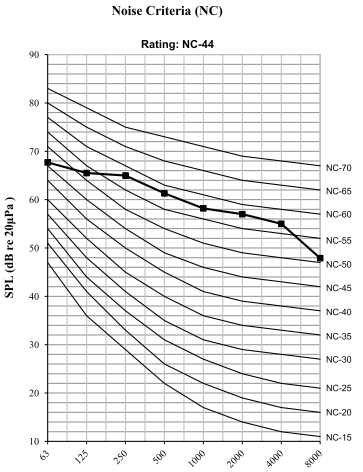
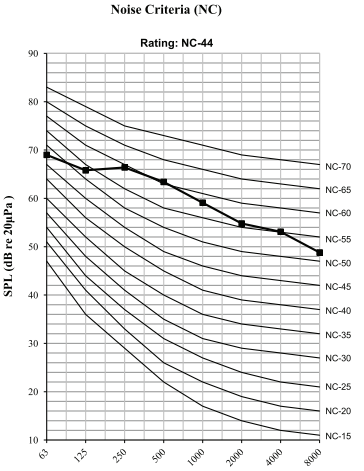


Figure 5: ARUM216-241-264BTE5 / DTE5 Sound Pressure Levels.

ARUM216BTE5 / DTE5



ARUM241BTE5 / DTE5



ARUM264BTE5 / DTE5

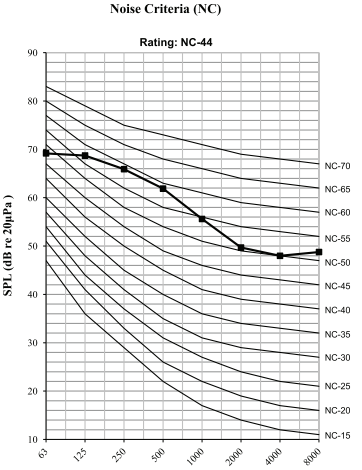
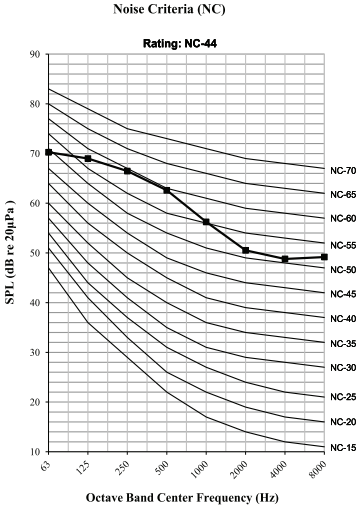
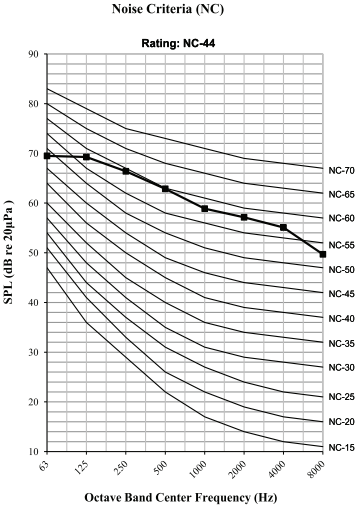


Figure 6: ARUM288-312-336BTE5 / DTE5 Sound Pressure Levels.

ARUM288BTE5 / DTE5



ARUM312BTE5 / DTE5



ARUM336BTE5 / DTE5

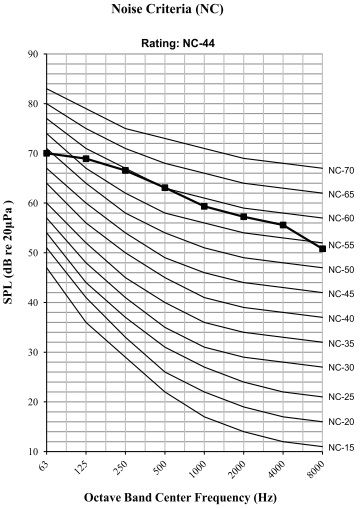


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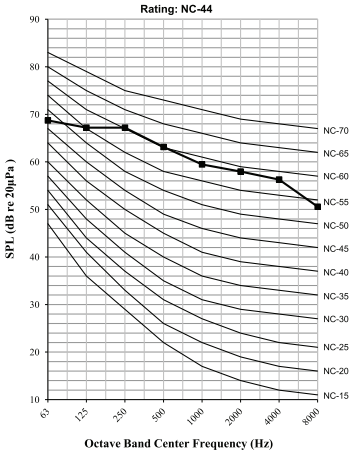
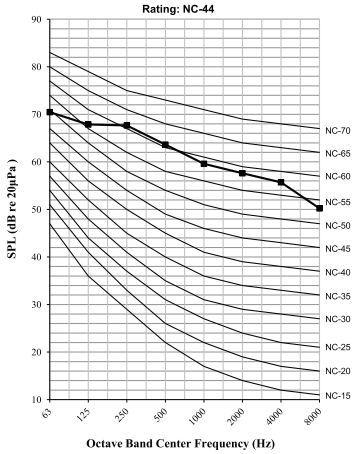
Figure 7: ARUM360-384-408BTE5 / DTE5 Sound Pressure Levels.

ARUM360BTE5 / DTE5



ARUM384BTE5 / DTE5



ARUM408BTE5 / DTE5

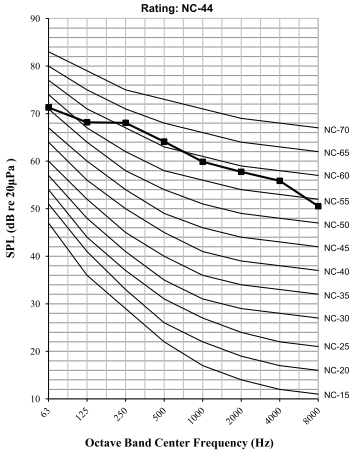
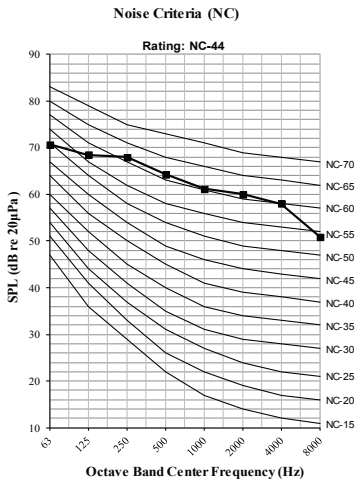
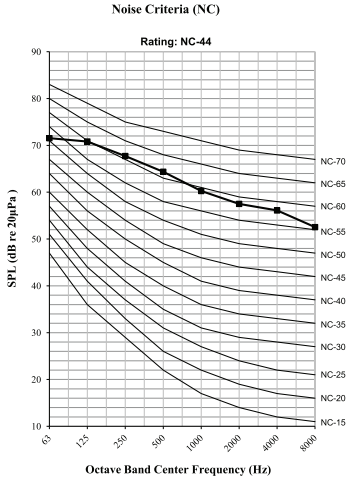


Figure 8: ARUM432-456-480BTE5 / DTE5 Sound Pressure Levels.

ARUM432BTE5 / DTE5



ARUM456BTE5 / DTE5



ARUM480BTE5 / DTE5

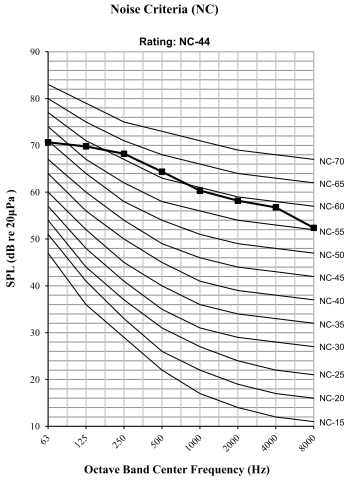
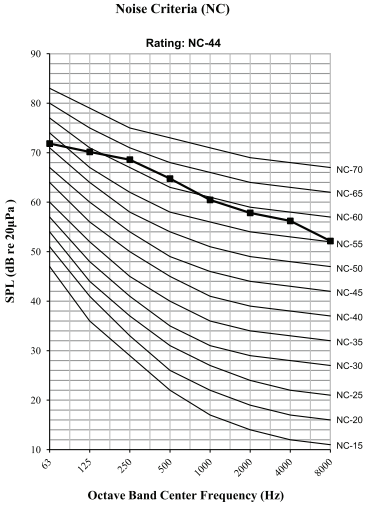


Figure 9: ARUM504BTE5 / DTE5 Sound Pressure Levels.

ARUM504BTE5 / DTE5



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ACOUSTIC DATA

Sound Power Levels

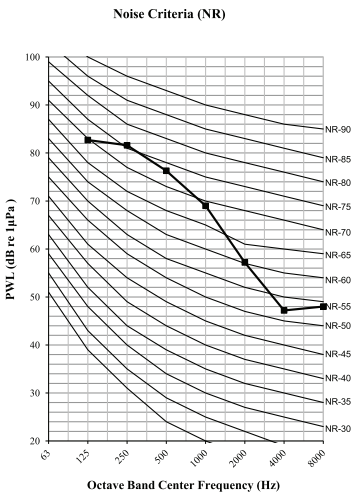
Table 15: Outdoor Unit Sound Power Levels.

Outdoor Unit Models			dB(A)
Nominal Tons	208-230V	460V	
6	ARUM072BTE5	ARUM072DTE5	77.0
8	ARUM096BTE5	ARUM096DTE5	78.0
10	ARUM121BTE5	ARUM121DTE5	79.0
12	ARUM144BTE5	ARUM144DTE5	83.0
14	ARUM168BTE5	ARUM168DTE5	85.0
16	ARUM192BTE5	ARUM192DTE5	87.0
18	ARUM216BTE5	ARUM216DTE5	88.0
20	ARUM241BTE5	ARUM241DTE5	88.0
22	ARUM264BTE5	ARUM264BTE5	86.0
24	ARUM288BTE5	ARUM288DTE5	87.0
26	ARUM312BTE5	ARUM312DTE5	88.0
28	ARUM336BTE5	ARUM336DTE5	88.0
30	ARUM360BTE5	ARUM360DTE5	89.0
32	ARUM384BTE5	ARUM384DTE5	89.0
34	ARUM408BTE5	ARUM408DTE5	90.0
36	ARUM432BTE5	ARUM432DTE5	89.0
38	ARUM456BTE5	ARUM456DTE5	89.0
40	ARUM480BTE5	ARUM480DTE5	89.0
42	ARUM504BTE5	ARUM504DTE5	90.0

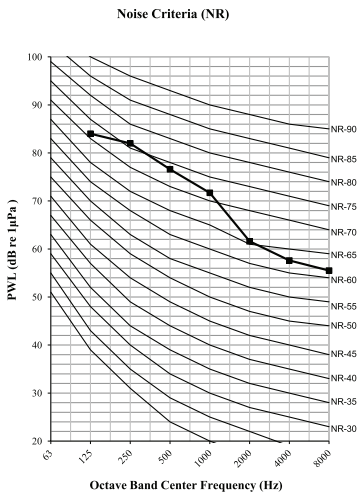
- Data is valid under diffuse field conditions.
- Data is valid under nominal operating conditions.
- Sound level may be increased in static pressure mode or if air guide is used.
- Sound power level is measured using rated conditions, and tested in a reverberation room per ISO 3741 standards.
- Sound level will vary depending on a range of factors such as construction (acoustic absorption coefficient) of particular area in which the equipment is installed.
- Reference acoustic intensity: 0dB = 10E-6μW/m^2

Figure 10: ARUM072-096-121BTE5 / DTE5 Sound Power Levels.

ARUM072BTE5 / DTE5



ARUM096BTE5 / DTE5



ARUM121BTE5 / DTE5

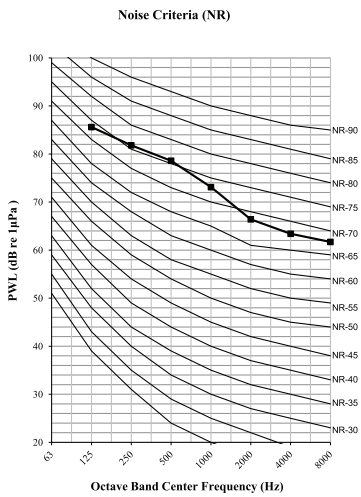


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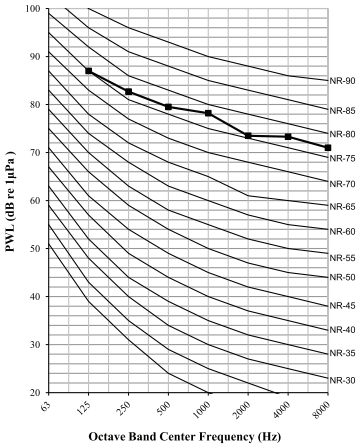
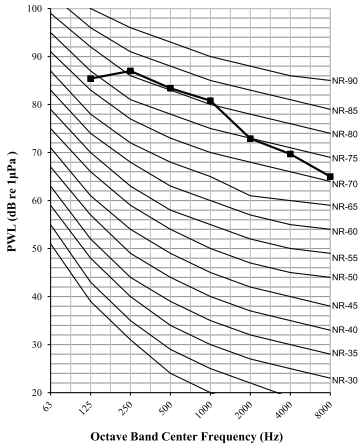
Figure 11: ARUM144-168-192BTE5 / DTE5 Sound Power Levels.

ARUM144BTE5 / DTE5



ARUM168BTE5 / DTE5



ARUM192BTE5 / DTE5

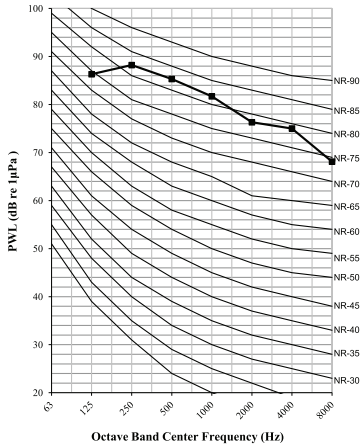
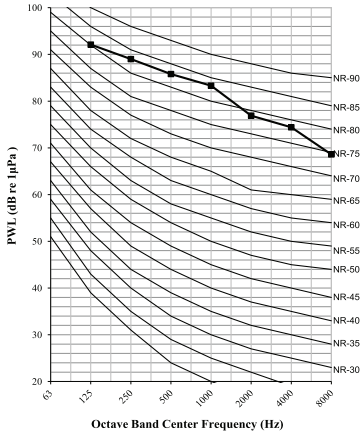
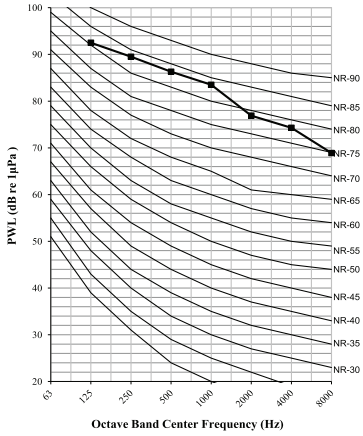


Figure 12: ARUM216-241-264BTE5 / DTE5 Sound Power Levels.

ARUM216BTE5 / DTE5



ARUM241BTE5 / DTE5



ARUM264BTE5 / DTE5

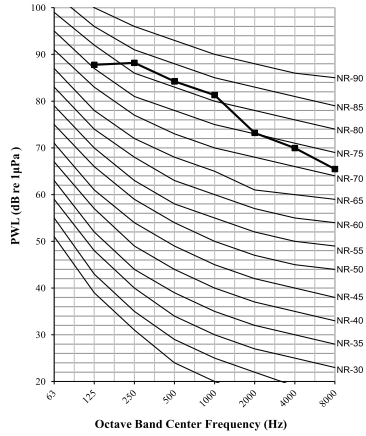
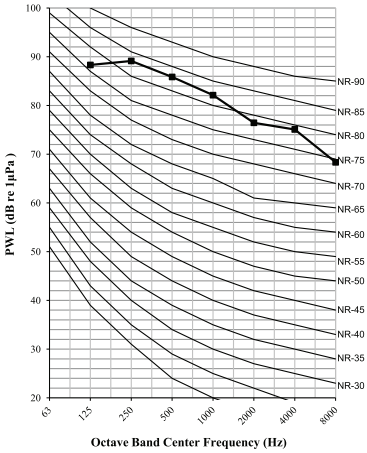
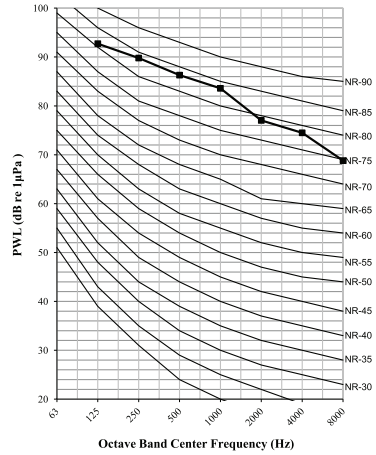


Figure 13: ARUM288-312-336BTE5 / DTE5 Sound Power Levels.

ARUM288BTE5 / DTE5



ARUM312BTE5 / DTE5



ARUM336BTE5 / DTE5

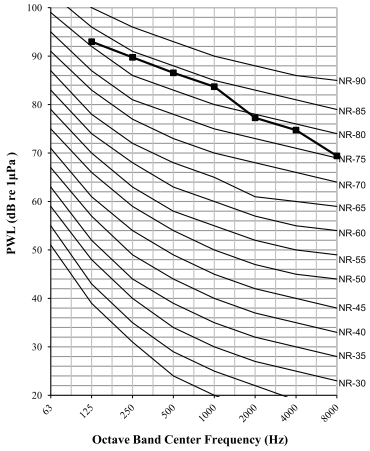


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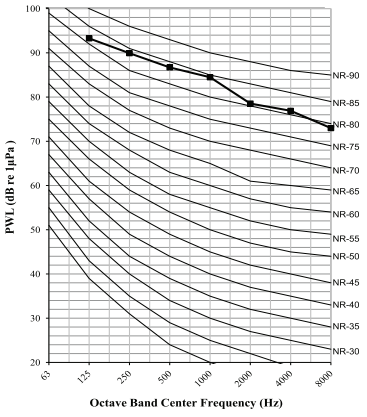
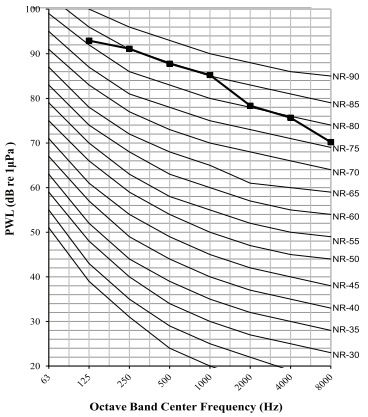
Figure 14: ARUM360-384-408BTE5 / DTE5 Sound Power Levels.

ARUM360BTE5 / DTE5



ARUM384BTE5 / DTE5



ARUM408BTE5 / DTE5

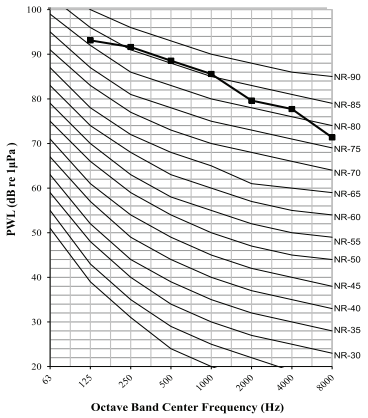
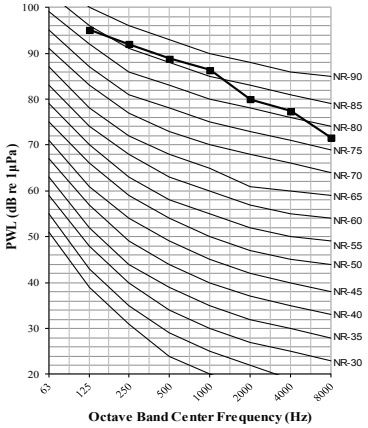
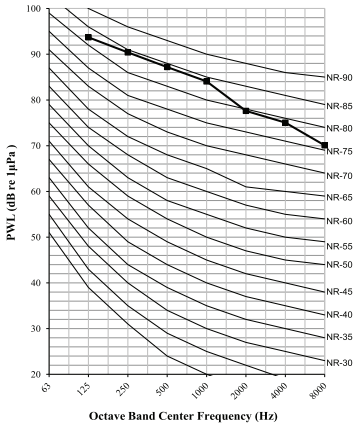


Figure 15: ARUM432-456-480BTE5 / DTE5 Sound Power Levels.

ARUM432BTE5 / DTE5



ARUM456BTE5 / DTE5



ARUM480BTE5 / DTE5

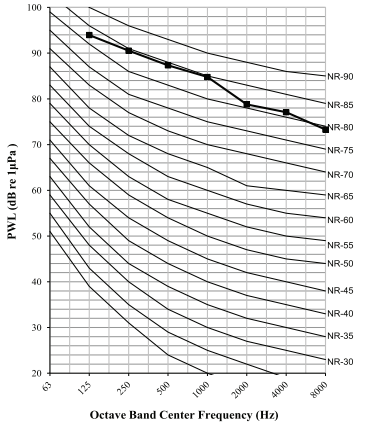
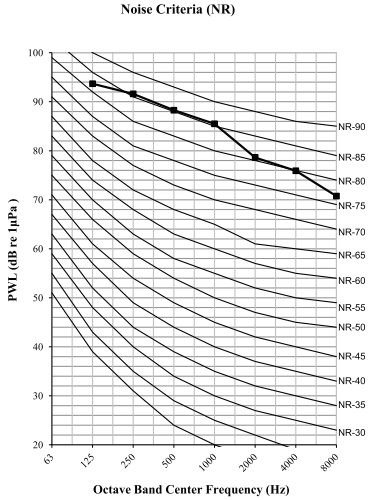


Figure 16: ARUM504BTE5 / DTE5 Sound Power Levels.

ARUM504BTE5 / DTE5



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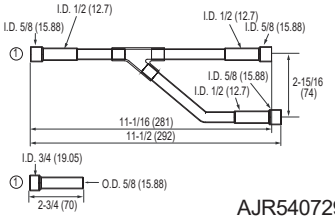
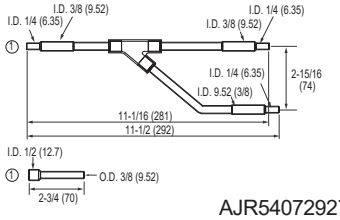
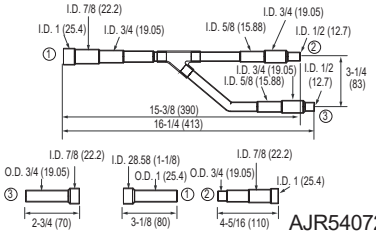
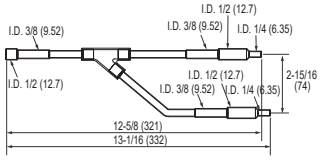
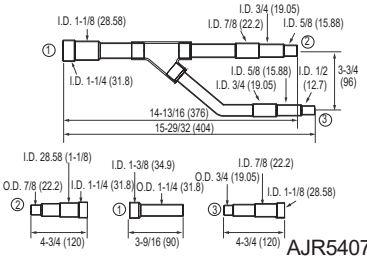
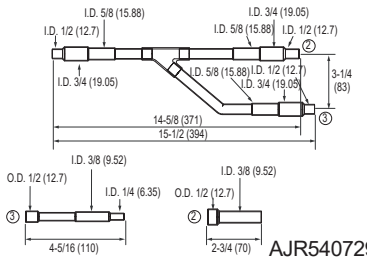
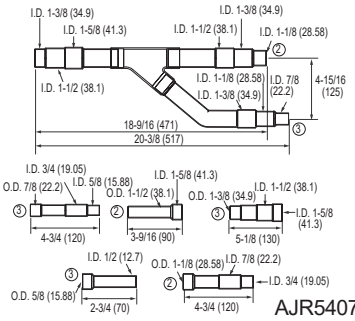
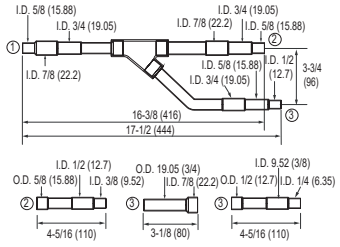
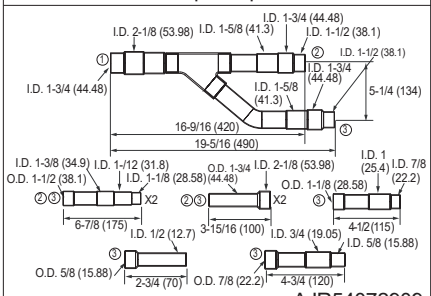
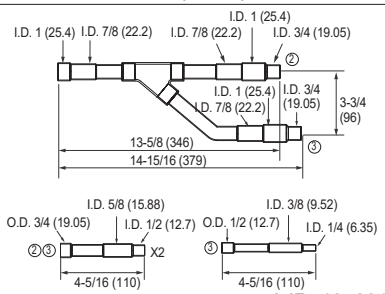
Indoor Unit Y-Branches for Heat Pump Operation

(Unit: Inch [mm])

Models	Pipe	
	Vapor Pipe	Liquid Pipe
ARBLN01621	 AJR54072929	 AJR54072927
ARBLN03321	 AJR54072930	 AJR54072928
ARBLN07121	 AJR54072933	 AJR54072931
ARBLN14521	 AJR54072908	 AJR54072932
ARBLN23220	 AJR54072909	 AJR54072910

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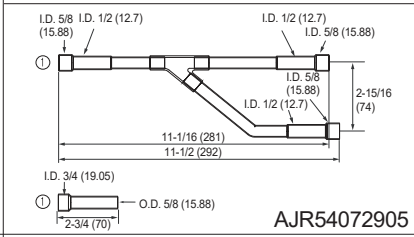
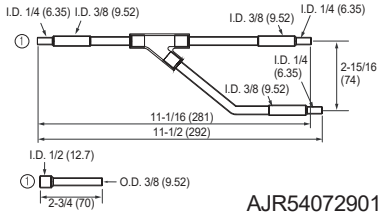
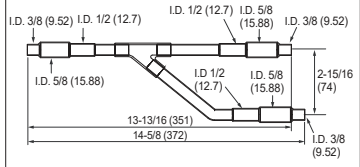
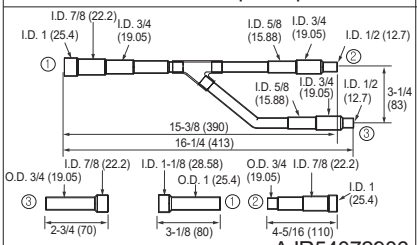
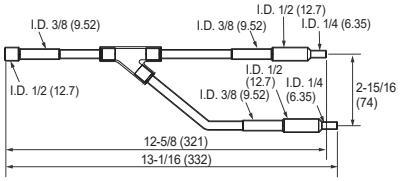
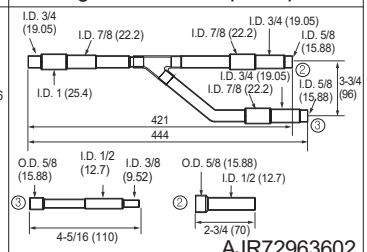
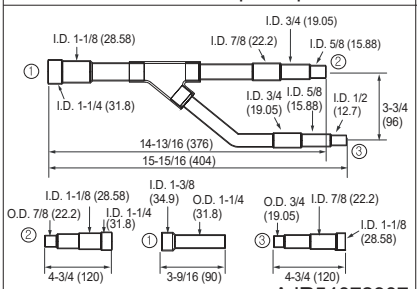
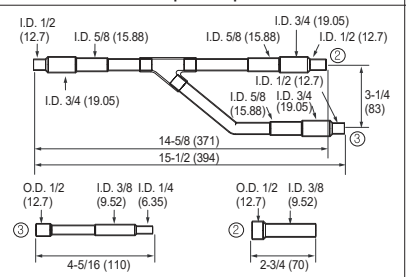
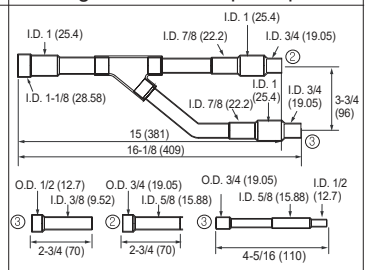
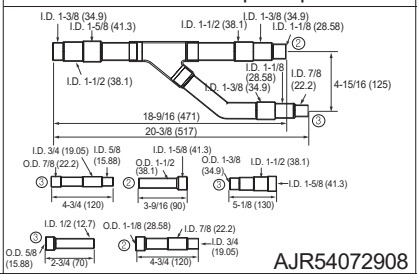
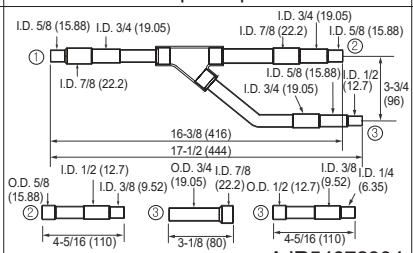
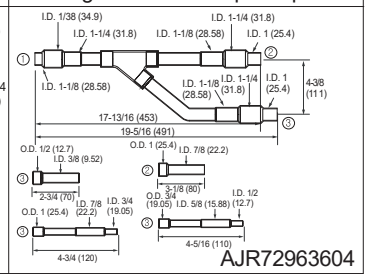
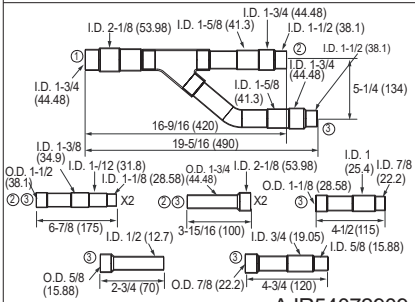
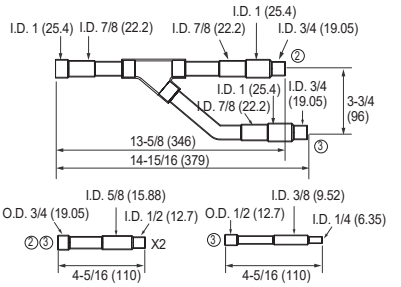
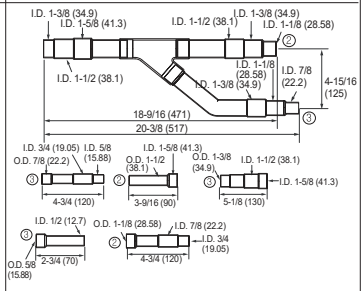
Indoor Unit Y-branches for Heat Recovery Operation

(Unit: Inch [mm])

Models	Pipe		
	Low-Pressure Vapor Pipe	Liquid Pipe	High-Pressure Vapor Pipe
ARBLB01621	 AJR54072905	 AJR54072901	 AJR72963601
	Low-Pressure Vapor Pipe	Liquid Pipe	High-Pressure Vapor Pipe
ARBLB03321	 AJR54072906	 AJR54072902	 AJR72963602
	Low-Pressure Vapor Pipe	Liquid Pipe	High-Pressure Vapor Pipe
ARBLB07121	 AJR54072907	 AJR54072903	 AJR72963603
	Low-Pressure Vapor Pipe	Liquid Pipe	High-Pressure Vapor Pipe
ARBLB14521	 AJR54072908	 AJR54072904	 AJR72963604
	Low-Pressure Vapor Pipe	Liquid Pipe	High-Pressure Vapor Pipe
ARBLB23220	 AJR54072909	 AJR54072910	 AJR54072908

Outdoor Unit Product Data

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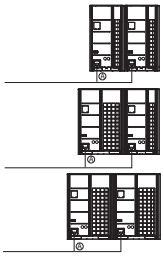
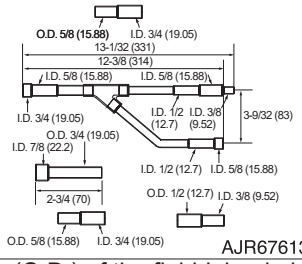
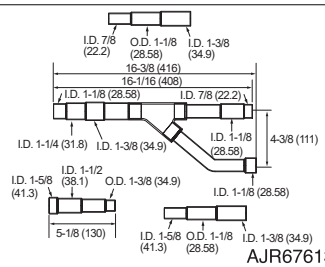
Outdoor Unit Y-branches for Heat Pump Operation

Y-Branches for Dual-Frame Systems

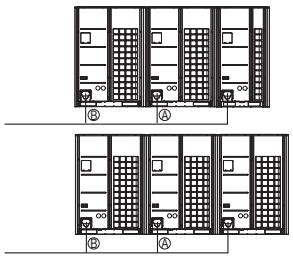
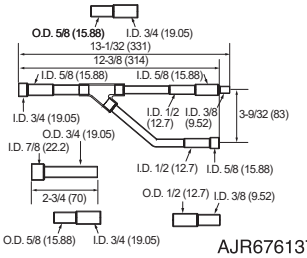
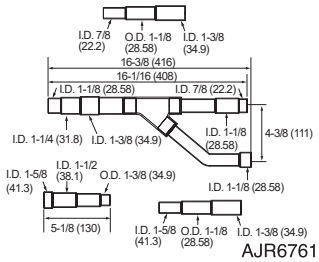
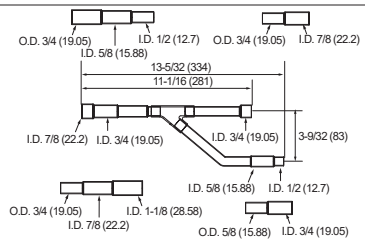
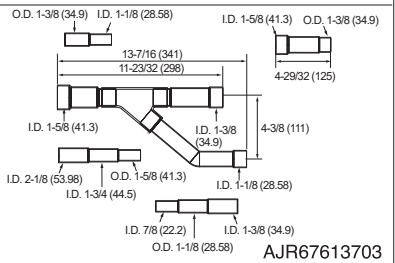
Unit: Inch (mm)

Combination	Multi-Frame Connector	Liquid Pipe	Vapor Pipe
	Ⓐ ARCNN21	 AJR67613702	 AJR67613701

*For example, the indicated Ø3/8 (9.52) is the outside diameter (O.D.) of the field-joined piping.

Y-Branches for Triple-Frame Systems

Unit: Inch (mm)

Combination	Multi-Frame Connector	Liquid Pipe	Vapor Pipe
	Ⓐ ARCNN21	 AJR67613702	 AJR67613701
	Ⓑ ARCNN31	 AJR67613704	 AJR67613703

*For example, the indicated Ø3/8 (9.52) is the outside diameter (O.D.) of the field-joined piping.

MEZ62225511 7/16/2018

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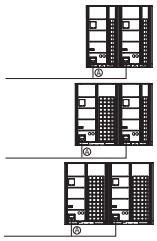
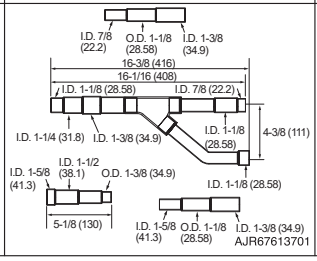
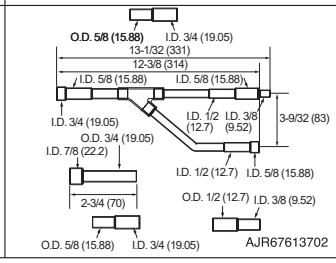
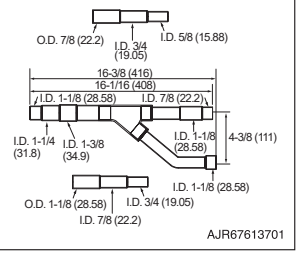
Outdoor Unit Y-branches for Heat Recovery Operation

Y-Branches for Dual-Frame Systems

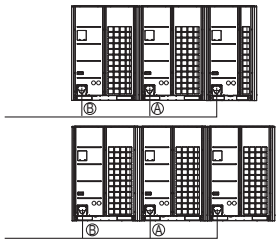
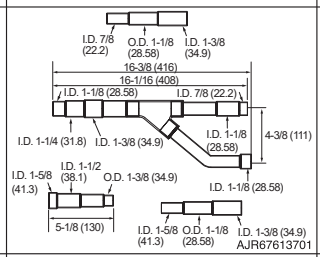
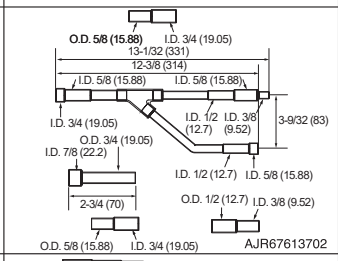
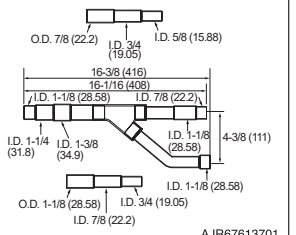
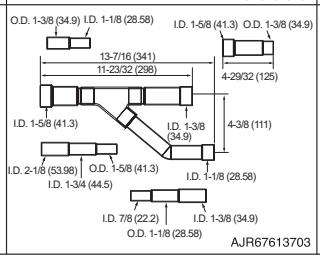
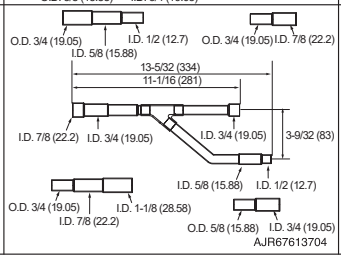
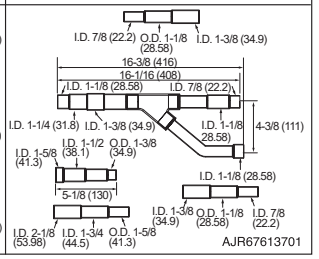
Unit: Inch (mm)

Combination	Multi-Frame Connector	Low Pressure Vapor Pipe	Liquid Pipe	High Pressure Vapor Pipe
	Ⓐ ARCNB21			

*For example, the indicated Ø3/8 (9.52) is the outside diameter (O.D.) of the field-joined piping.

Y-Branches for Triple-Frame Systems

Unit: Inch (mm)

Combination	Multi-Frame Connector	Low Pressure Vapor Pipe	Liquid Pipe	High Pressure Vapor Pipe
	Ⓐ ARCNB21			
	Ⓑ ARCNB31			

*For example, the indicated Ø3/8 (9.52) is the outside diameter (O.D.) of the field-joined piping.

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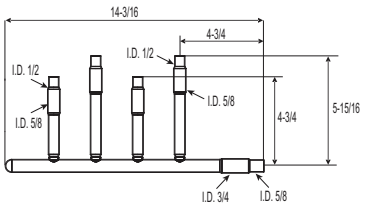
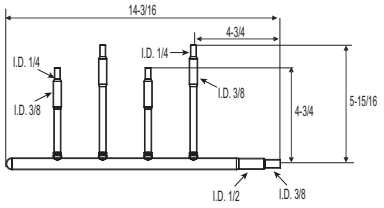
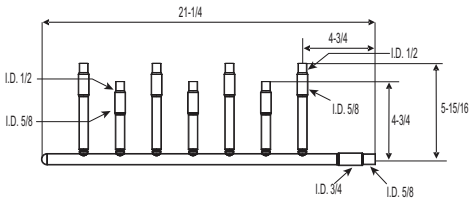
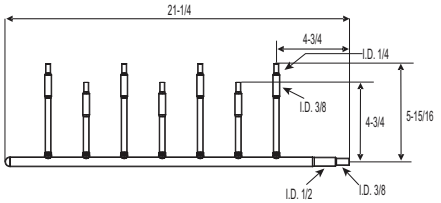
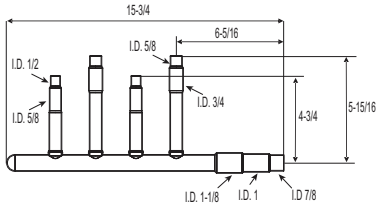
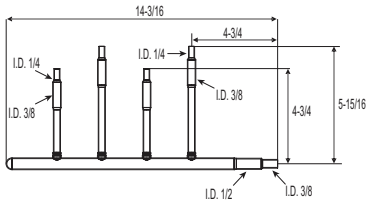
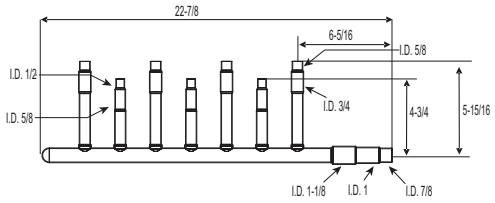
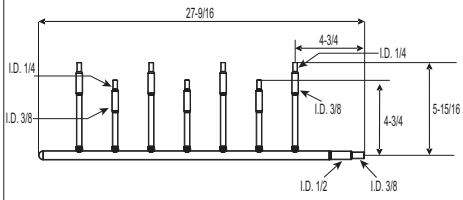
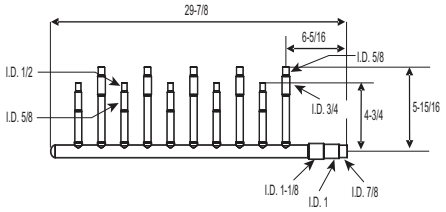
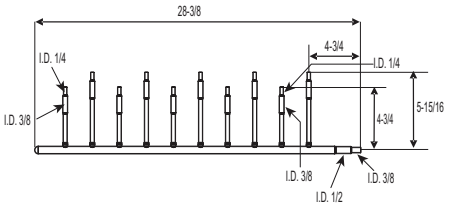
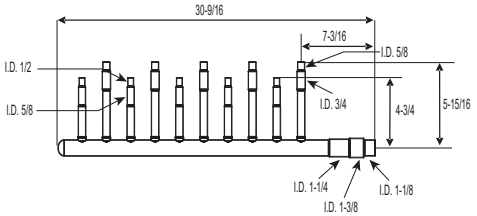
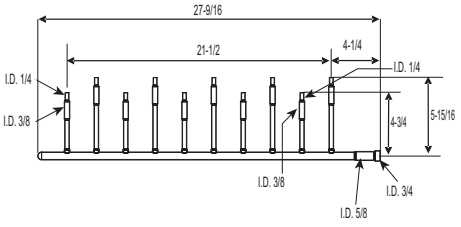
Headers for Heat Pump and Heat Recovery Operation

Unit: Inch

Models	Vapor pipe	Liquid pipe
4 branch ARBL054		
7 branch ARBL057		
4 branch ARBL104		
7 branch ARBL107		
10 branch ARBL1010		
10 branch ARBL2010		

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Air Guides

(ZAGDKA51A and ZAGDKA52A)

Optional air guides are available for Multi V 5 outdoor units to change the discharge direction from vertical to horizontal.

Use ZAGDKA51A air guides with the following models: 6-ton Outdoor Units ARUM072BTE5 / ARUM072DTE5.

Use ZAGDKA52A air guides with the following models: 8-ton to 20-ton Outdoor Units ARUM096BTE5 / ARUM096DTE5, ARUM121BTE5 / ARUM121DTE5, ARUM144BTE5 / ARUM144DTE5, ARUM168BTE5 / ARUM168DTE5, ARUM192BTE5 / ARUM192DTE5, ARUM216BTE5 / ARUM216DTE5, ARUM241BTE5 / ARUM241DTE5.

Hail Guard Kits

(ZHGDKA51A and ZHGDKA52A)

Optional hail guard kits help protect the heat exchangers in Multi V 5 outdoor units.

Each kit includes:

- Right wind baffle
- Left wind baffle
- Rear wind baffle
- (50) #10 x 1/2 self-drilling hex head screws

Use ZHGDKA51A with the following Multi V 5 models: 6-ton Outdoor Units ARUM072BTE5 / ARUM072DTE5.

Use ZHGDKA52A with the following Multi V 5 models:8-ton to 20-ton Outdoor Units ARUM096BTE5 / ARUM096DTE5, ARUM121BTE5 / ARUM121DTE5, ARUM144BTE5 / ARUM144DTE5, ARUM168BTE5 / ARUM168DTE5, ARUM192BTE5 / ARUM192DTE5, ARUM216BTE5 / ARUM216DTE5, ARUM241BTE5 / ARUM241DTE5.

Contact an LG Sales Representative to verify how many kits are needed for the dual and triple frame combination outdoor units.

Low Ambient Baffle Kits

(ZLABKA51A and ZLABKA52A)

Optional low ambient baffle kits allow for Multi V 5 outdoor unit operation down to -9.9°F in cooling mode. When used with heat recovery operation, low ambient cooling to -9.9°F is possible only when all indoor units are operating in cooling mode. The low ambient wind baffle kit does not impact synchronous operating range.

Each kit includes:

- Right wind baffle
- Left wind baffle
- Rear wind baffle
- Top discharge elbow with motorized damper and 24V damper actuator
- (50) #10 x 1/2 self-drilling hex head screws
- Sealtite connector (for routing of actuator control and power wiring down to outdoor unit electrical box)
- PRVC2 Control kit is a required accessory (sold separately)

Use ZLABKA51A with the following Multi V 5 models: 6-ton Outdoor Units ARUM072BTE5 / ARUM072DTE5.

Use ZLABKA52A with the following Multi V 5 models: 8-ton to 20-ton Outdoor Units ARUM096BTE5 / ARUM096DTE5, ARUM121BTE5 / ARUM121DTE5, ARUM144BTE5 / ARUM144DTE5, ARUM168BTE5 / ARUM168DTE5, ARUM192BTE5 / ARUM192DTE5, ARUM216BTE5 / ARUM216DTE5, ARUM241BTE5 / ARUM241DTE5

Contact an LG Sales Representative to verify how many kits are needed for the dual and triple frame combination outdoor units.

Drain Pan Heaters

(ZPLT1A51A, ZPLT1A52A, ZPLT2A51A, ZPLT2A52A)

Optional drain pan heaters are electric coils installed in the bottom of the outdoor unit chassis intended to prevent ice buildup in extreme winter conditions. The drain pan heater is energized when the unit is in heating mode, compressor is running, and outdoor ambient temperature drops below 32°F. When the outdoor ambient temperature rises above 32°F, the drain pan heater automatically shuts off.

ZPLT1A51A Drain Pan Heaters are for use with 6-ton Outdoor Units ARUM072BTE5

ZPLT1A52A Drain Pan Heaters are for use with 8-ton to 20-ton Outdoor Units ARUM096BTE5, ARUM121BTE5, ARUM144BTE5, ARUM168BTE5, ARUM192BTE5, ARUM216BTE5, ARUM241BTE5

ZPLT2A51A Drain Pan Heaters are for use with 6-ton Outdoor Units ARUM072DTE5

ZPLT2A52A Drain Pan Heaters are for use with 8-ton to 20-ton Outdoor Units ARUM096DTE5, ARUM121DTE5, ARUM144DTE5, ARUM168DTE5, ARUM192DTE5, ARUM216DTE5, ARUM241DTE5

Contact an LG Sales Representative for more information.

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LG Monitoring View (LGMV) Diagnostic Software and Cable

LGMV software allows the service technician or commissioning agent to connect a computer USB port to the outdoor unit main printed circuit board (PCB) using an accessory cable without the need for a separate interface device. The main screen for LGMV allows the user to view the following real time data on one screen:

- Actual inverter compressor speed
- Target inverter compressor speed
- Actual outdoor fan speed
- Target outdoor unit fan speed
- Actual superheat
- Target superheat
- Actual subcooler circuit superheat
- Target subcooler circuit superheat
- Main EEV position
- Subcooling EEV position
- Inverter compressor current transducer value
- Outdoor air temperature
- Actual high pressure/saturation temperature
- Actual low pressure/saturation temperature
- Suction temperature
- Inverter compressor discharge temperature
- Constant speed compressor discharge temperature
- Front outdoor coil pipe temperature
- Back outdoor coil pipe temperature
- Liquid line pipe temperature
- Subcooler inlet temperature
- Subcooler outlet temperature
- Average indoor unit (IDU) pipe temperature
- Inverter compressor operation indicator light
- Four-way reversing valve operation indicator light
- Pressure graph showing actual low pressure and actual high pressure levels
- Error code display
- Operating mode indicator
- Target high pressure
- Target low pressure
- PCB (printed circuit board) version
- Software version
- Installer name
- Model no. of outdoor units
- Site name
- Total number of connected indoor units
- Communication indicator lights
- Indoor unit capacity
- Indoor unit operating mode
- Indoor unit fan speed
- Indoor unit EEV position
- Indoor unit room temperature
- Indoor unit inlet pipe temperature
- Indoor unit outlet pipe temperature
- Indoor unit error code

Additional screens can be accessed by tabs on the main screen:

1. Cycleview: Graphic of internal components including:
   - Compressors showing actual speeds
   - EEVs
   - Indoor Units
   - Liquid injection valves
   - Temperature and pressure sensors
   - Four-way reversing valve
   - Outdoor fans showing status and speeds

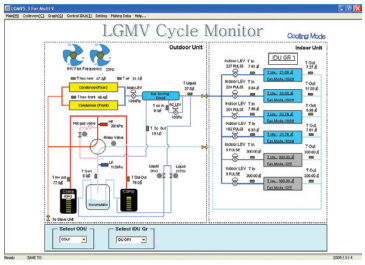

Figure 17: MV Cycleview.

2. Graph: Full screen graph of actual high and low pressures and high and low pressure limits. A sliding bar enables user to go back in time and view data.
3. Control IDU: Enables user to turn on all IDU's default setpoints of 86°F in heat mode or 64°F in cool mode.
4. Setting: Converts metric values to imperial values.
5. Making Data: Recording of real time data to a separate file created to be stored on the user's computer.
6. Loading Data: Recorded data from a saved ".CSV" file can be loaded to create an LGMV session.
7. Electrical Data: The lower half of main screen is changed to show the following:
   - Inverter compressor
     - Amps
     - Volts
     - Power Hz
     - Inverter control board fan Hz
   - Constant compressor
     - Current transducer value
     - Phase

In lieu of connecting to the outdoor unit, user has the option to connect to the indoor unit with the use of a USB to RS-485 connector kit. When connected through the indoor unit, user will not be able to record data.

This software can be used to both commission new systems and troubleshoot existing systems. LGMV data can be recorded to a ".CSV" file and emailed to an LG representative to assist with diagnostic evaluations.

Recommended Minimum PC Configuration:

- CPU: Pentium® IV 1.6 GHz
- Operating System: Windows® NT/2000/XP/Vista
- Main Memory: 256 MB
- Hard Disk: 600 MB when operating
- Web Browser: Internet Explorer® 5.0

LGMV is available in different formats, including Mobile LGMV, which is an app for use on wireless devices. Contact your LG Sales Representative for more information.

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HEAT RECOVERY UNIT PRODUCT DATA

Mechanical Specifications on page 76
General Data on page 77
Electrical Data on page 79
Wiring Diagrams on page 80
External Dimensions on page 84
Refrigerant Flow Diagram on page 89
Acoustic Data on page 90
Accessories on page 91

MECHANICAL SPECIFICATIONS

Multi V Heat Recovery Units

Four-port Heat Recovery Unit.

General

Multi V heat recovery units are for use with Multi V 5, Water IV, and S heat recovery outdoor units to permit simultaneous heating and cooling operation. Heat recovery units have two (2), three (3), four (4), six (6), or eight (8) ports for connections to indoor units. Each port is capable of connecting from one (1) indoor unit up to eight (8) indoor units up to a maximum nominal capacity of ≤60 MBh. When multiple indoor units are connected to one port, all indoor units on that port must operate in the same mode (cooling or heating). Individual indoor units ≥60 MBh nominal capacity must use two (2) neighboring heat recovery unit ports twinned together using a reverse Y-branch kit. Connect largest indoor unit to first port of the heat recovery unit. Each heat recovery unit can support a maximum capacity (sum of ports) of up to 230 MBh.

Heat recovery ports can operate in heating or cooling mode independently, regardless of the mode of any other port on the unit or in the system except where heat recovery unit ports are twinned. Heat recovery units contain one double spiral subcooling heat exchanger per port, are internally insulated, and do not require a condensate drain.

Casing and Construction

Heat recovery units are completely factory assembled, internally piped, wired, and are designed for indoor installation. Casing is constructed of galvanized steel, and houses piping, valves and controls to divert refrigerant controlling each port to operate in either heating or cooling mode. Heat recovery units contain one double spiral subcooling heat exchanger per port, are internally insulated, and do not require a condensate drain.

Refrigerant Valves

Each heat recovery port is circuited with two two-position motorized valves to control R410A refrigerant flow path to allow indoor units to operate in heating or cooling mode.

Refrigerant Piping

Units can be piped in series and / or parallel to optimize cost between material and labor. Up to 16 heat recovery units can be piped in series, parallel, or a combination of series and parallel to optimize cost between material and labor. Any series string of heat recovery ports/units can connect up to 230 MBh of indoor unit nominal capacity (series string is defined a heat recovery units piped in series).

Heat recovery unit piping limitations also depend on the allowable piping parameters of the outdoor unit installed.

- Indoor units up to 131 equivalent feet of piping length from the heat recovery unit to which it is connected.
- Indoor units up to 295 equivalent feet of piping length from the first branch.
- Difference between highest and lowest elevation indoor units piped to separate parallel heat recovery units (HRUs) up to 131 feet in elevation.
- Difference between highest and lowest heat recovery units piped in parallel up to 98 feet in elevation.
- Difference between highest and lowest elevation heat recovery units piped in series up to 16 feet in elevation.
- Elevation difference of series connected heat recovery units cannot exceed 16 feet.

All refrigerant lines from the outdoor unit to the heat recovery units, and from the heat recovery units to the indoor units must be field insulated separately.

Electrical

Heat recovery units require 208-230V, 1-phase, 60 Hz electrical power, and are capable of operation within ±10% of nominal voltage.

Controls

Heat recovery units include factory-installed control boards with integral microprocessors. Heat recovery unit control boards communicate with the main control board in the outdoor unit and interface with the VRF equipment controls system. The control circuit between the indoor units, heat recovery units and the outdoor unit is RS-485 daisy chain communication over two-conductor, twisted, stranded, shielded, 18 AWG cable.

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GENERAL DATA

PRHR023A, PRHR033A, PRHR043A

Figure 18: Two-Port Heat Recovery Unit.

Figure 19: Three-Port Heat Recovery Unit.

Figure 20: Four-Port Heat Recovery Unit.

Note:

Heat recovery units can only be used with LG systems piped for heat recovery operation.

Table 16: Heat Recovery Unit Specifications.

Model			PRHR023A	PRHR033A	PRHR043A
Number of Ports			2	3	4
Max. Connectible No. of Indoor Units			16	24	32
Max. Connectible No. of Indoor Units on each port			8	8	8
Max. Port Capacity (each port)		Btu/h	60,000	60,000	60,000
Max. Unit Capacity (sum of ports)		Btu/h	120,000	180,000	230,000
Net Weight		lbs.	33	37	40
Shipping Weight		lbs.	46	50	53
Dimensions (W x H x D)		Inches	19-1/8 x 8-5/8 x 18-15/16		
Casing			Galvanized Steel Plate		
Connecting Pipes	To Indoor Units	Liquid Pipe (inches)	3/8	3/8	3/8
		Vapor Pipe (inches)	5/8	5/8	5/8
	To Outdoor Units	Liquid (inches)	3/8	1/2	5/8
		Low-pressure Vapor (inches)	7/8	1-1/8	1-1/8
		High-pressure Vapor (inches)	3/4	7/8	7/8
Insulation Material			Polyethylene Foam		

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GENERAL DATA

PRHR063A, PRHR083A

Figure 21: Six-Port Heat Recovery Unit.

Figure 22: Eight-Port Heat Recovery Unit.

Note:

Heat recovery units can only be used with LG systems piped for heat recovery operation.

Table 17: Heat Recovery Unit Specifications, continued.

Model			PRHR063A	PRHR083A
Number of Ports			6	8
Max. Connectible No. of Indoor Units			48	64
Max. Connectible No. of Indoor Units on each port			8	8
Max. Port Capacity (each port)		Btu/h	60,000	60,000
Max. Unit Capacity (sum of ports)		Btu/h	230,000	230,000
Net Weight		lbs.	60	68
Shipping Weight		lbs.	75	82
Dimensions (W x H x D)		Inches	31-1/4 x 8-5/8 x 18-15/16	
Casing			Galvanized Steel Plate	
Connecting Pipes	To Indoor Units	Liquid Pipe (inches)	3/8	3/8
		Vapor Pipe (inches)	5/8	5/8
	To Outdoor Units	Liquid (inches)	5/8	5/8
		Low-pressure Vapor (inches)	1-1/8	1-1/8
		High-pressure Vapor (inches)	7/8	7/8
Insulation Material			Polyethylene Foam	

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ELECTRICAL DATA

Table 18: Heat Recovery Unit Electrical Data.

Unit Model No.	Voltage Range	Rated Amps	MCA	MFA	Power Supply			Power Input (W)	
					Hz	Volts	Phase	Cooling	Heating
PRHR023A	187-253	0.06	0.17	15	60	208-230	1	39.8	37.2
PRHR033A									
PRHR043A									
PRHR063A		0.09	0.27					75.9	72.1
PRHR083A									

MCA : Minimum Circuit Ampacity.
MFA : Maximum Fuse Amps.

Units are suitable for use on an electrical system where voltage supplied to unit terminals is within the listed range limits.
Select wire size based on the larger MCA value.
Instead of a fuse, use the circuit breaker.

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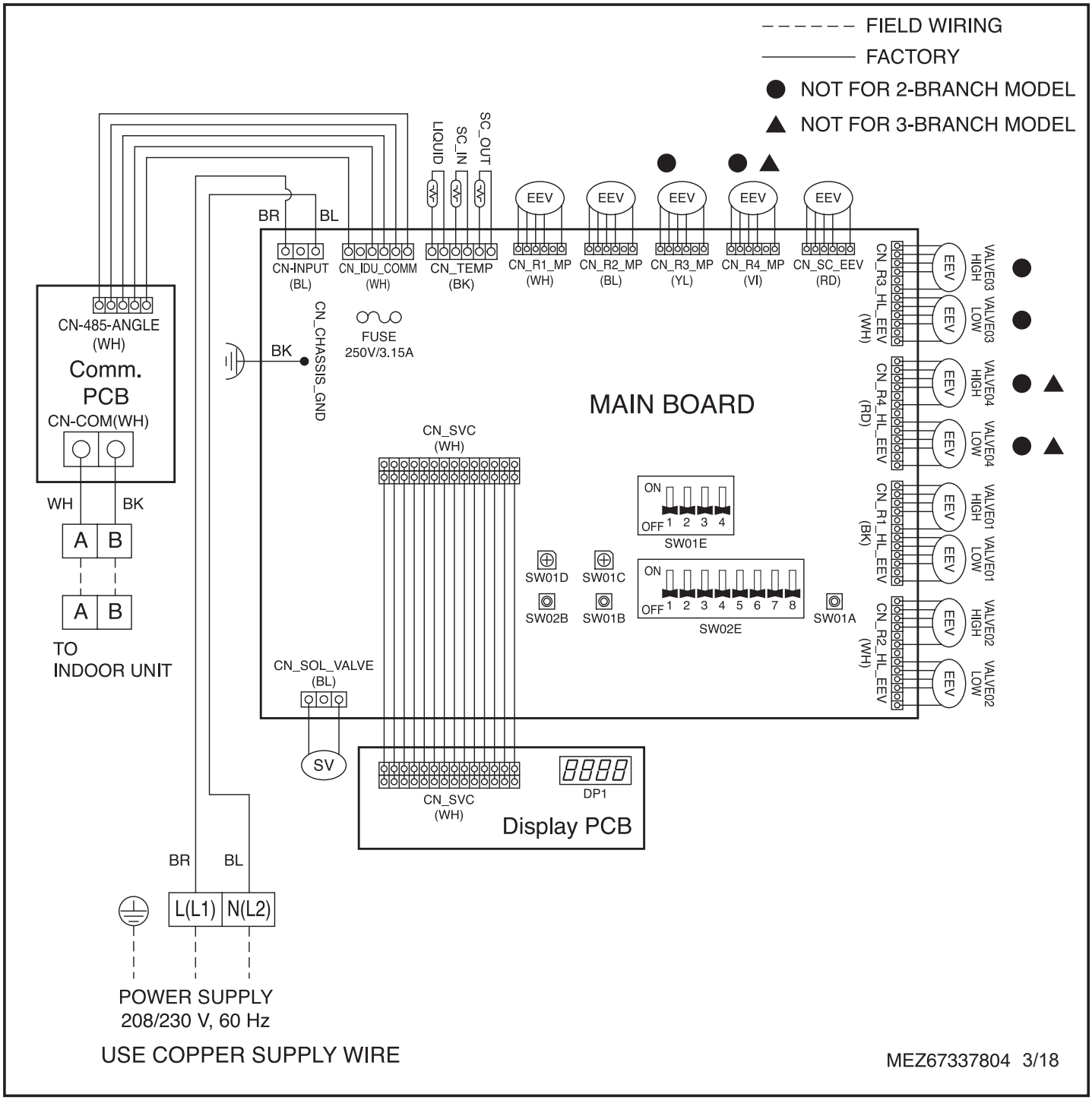
WIRING DIAGRAM

PRHR023A, PRHR033A, PRHR043A

Figure 23: PRHR023A, PRHR033A, and PRHR043A Wiring Diagram.



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WIRING DIAGRAM

PRHR023A, PRHR033A, PRHR043A

Table 19: PRHR023A, PRHR033A, and PRHR043A Wiring Diagram Legend.

Description	Purpose	Function
Terminals		
CN-INPUT (BL)	Power Input	Power Supply Input
CN_IDU_COMM (WH)	Communication	Communication Connection Between Indoor Units and Heat Recovery Units
CN_TEMP (LIQUID) (BK)	Liquid Temperature Receiver Sensor	Liquid Temperature Sensor
CN_TEMP (SC_IN) (BK)	Subcooling Inlet Sensor	Subcooling Inlet Sensor
CN_TEMP (SC_OUT) (BK)	Subcooling Outlet Sensor	Subcooling Outlet Sensor
CN_R1_MP (WH)	EEV 01	EEV 01 (Bypass for Room or Zone 1)
CN_R2_MP (BL)	EEV 02	EEV 02 (Bypass for Room or Zone 2)
CN_R3_MP (YL)	EEV 03	EEV 03 (Bypass for Room or Zone 3)
CN_R4_MP (VI)	EEV 04	EEV 04 (Bypass for Room or Zone 4)
CN_SC_EEV (RD)	Subcooling EEV	Subcooling EEV
CN_R3_HL_EEV (WH)	Low / High EEV 03	Low / High EEV 03 for Room or Zone 3
CN_R4_HL_EEV (RD)	Low / High EEV 04	Low / High EEV 04 for Room or Zone 4
CN_R1_HL_EEV (BK)	Low / High EEV 01	Low / High EEV 01 for Room or Zone 1
CN_R2_HL_EEV (WH)	Low / High EEV 02	Low / High EEV 02 for Room or Zone 2
CN_SVC (WH)	Display	For Display PCB
CN_SOL_VALVE (BL)	Solenoid Valve Bypass 01	Solenoid Valve Bypass 01
CN_CHASSIS_GND (BK)	Ground Terminal	Ground Terminal for Heat Recovery Unit Chassis
DIP Switch Banks		
SW01E	EEV or Zone Address Setting	Sets EEV Number When Using Manual Addressing; Sets Time of Zoning Address When Using Automatic Addressing
SW02E (No. 1)	Address Method	Selects Automatic or Manual Addressing Procedure
SW02E (Nos. 2 through 4)	Setting for Number of Indoor Units	Setting for Total Number of Indoor Units Connected
SW02E (No. 5)	Slave PCB Setting	Sets Slave PCB
SW02E (No. 6)	EEPROM Reset	Resets EEPROM to Save Settings
SW02E (Nos. 7 and 8)	Mode Setting (Zoning, etc.)	Sets the Mode (Zoning, etc.)
Rotary Dials and Tact Switches		
SW01B	Indoor Address Setting (Increase by One)	Increases the Indoor Address by One When Using the Manual Addressing Procedure
SW01C	Heat Recovery Unit Number Setting; EEV Zoning Number Setting	Sets the Heat Recovery Unit Number; Sets the EEV Zoning Number When Using the Manual Addressing Procedure
SW01D	EEV Group Setting	Sets the EEV Group
SW02B	Indoor Address Setting (Increase by Ten)	Increases the Indoor Address by Ten When Using the Manual Addressing Procedure

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Figure 24: PRHR063A and PRHR083A Wiring Diagram.

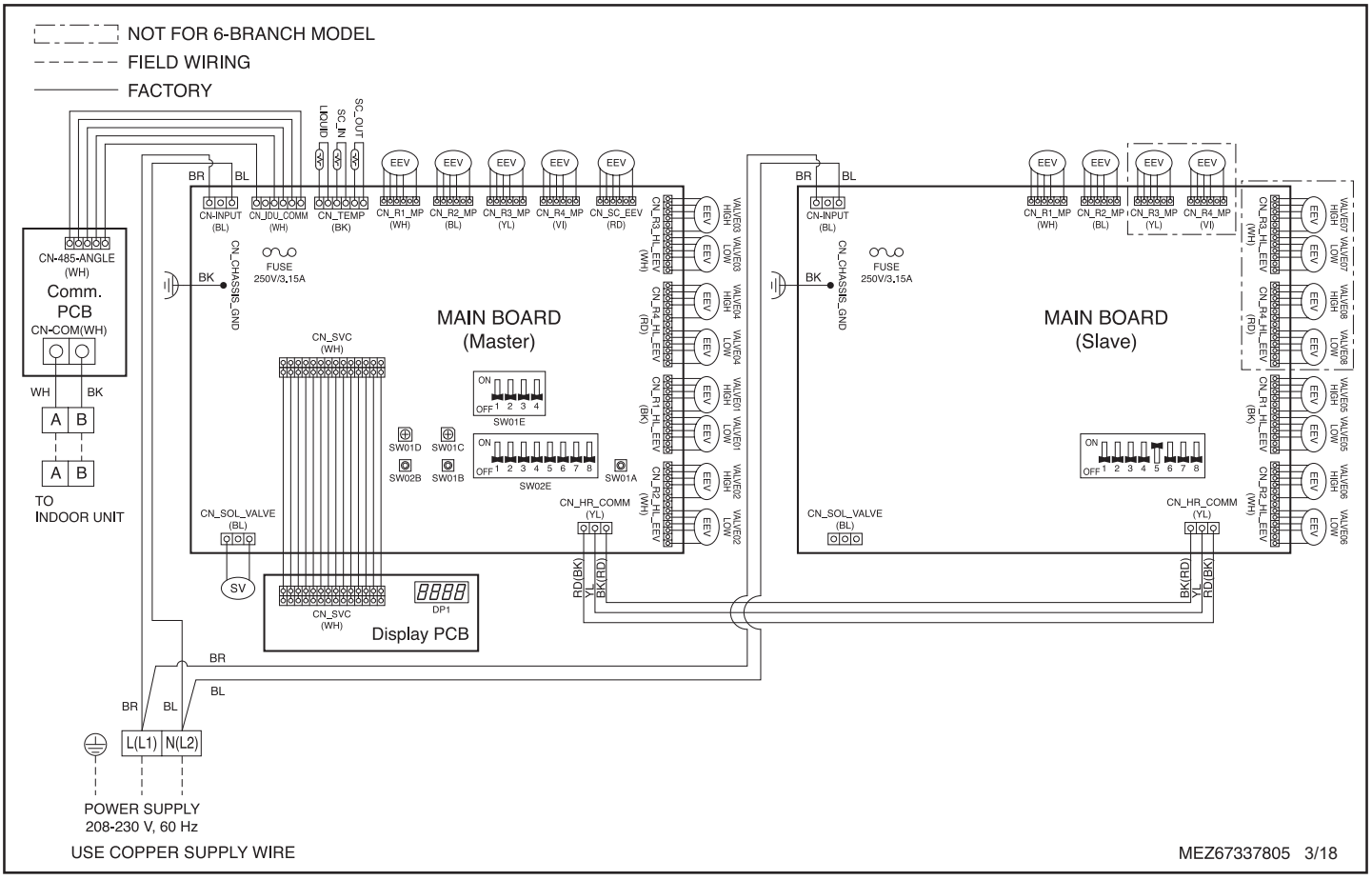

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Table 20: PRHR063A and PRHR083A Wiring Diagram Legend.

Description	Purpose	Function
Main PCB Terminals		
CN-INPUT (BL)	Power Input	Power Supply Input
CN_IDU_COMM (WH)	Communication	Communication Connection Between Indoor Units and Heat Recovery Units
CN_TEMP (LIQUID) (BK)	Liquid Temperature Receiver Sensor	Liquid Temperature Sensor
CN_TEMP (SC_IN) (BK)	Subcooling Inlet Sensor	Subcooling Inlet Sensor
CN_TEMP (SC_OUT) (BK)	Subcooling Outlet Sensor	Subcooling Outlet Sensor
CN_R1_MP (WH)	EEV 01	EEV 01 (Bypass for Room or Zone 1)
CN_R2_MP (BL)	EEV 02	EEV 02 (Bypass for Room or Zone 2)
CN_R3_MP (YL)	EEV 03	EEV 03 (Bypass for Room or Zone 3)
CN_R4_MP (VI)	EEV 04	EEV 04 (Bypass for Room or Zone 4)
CN_SC_EEV (RD)	Subcooling EEV	Subcooling EEV
CN_R3_HL_EEV (WH)	Low / High EEV 03	Low / High EEV 03 for Room or Zone 3
CN_R4_HL_EEV (RD)	Low / High EEV 04	Low / High EEV 04 for Room or Zone 4
CN_R1_HL_EEV (BK)	Low / High EEV 01	Low / High EEV 01 for Room or Zone 1
CN_R2_HL_EEV (WH)	Low / High EEV 02	Low / High EEV 02 for Room or Zone 2
CN_HR_COMM (YL)	Master and Slave PCB Communication	Communication Connection Between Heat Recovery Unit Master and Slave PCBs
CN_SVC (WH)	Display	For Display PCB
CN_SOL_VALVE (BL)	Solenoid Valve Bypass 01	Solenoid Valve Bypass 01
CN_CHASSIS_GND (BK)	Ground Terminal	Ground Terminal for Heat Recovery Unit Chassis
Slave PCB Terminals		
CN-INPUT (BL)	Power Input	Power Supply Input
CN_R1_MP (WH)	EEV 05	EEV 05 (Bypass for Room or Zone 5)
CN_R2_MP (BL)	EEV 06	EEV 06 (Bypass for Room or Zone 6)
CN_R3_MP (YL)	EEV 07	EEV 07 (Bypass for Room or Zone 7)
CN_R4_MP (VI)	EEV 08	EEV 08 (Bypass for Room or Zone 8)
CN_R3_HL_EEV (WH)	Low / High EEV 07	Low / High EEV 07 for Room or Zone 7
CN_R4_HL_EEV (RD)	Low / High EEV 08	Low / High EEV 04 for Room or Zone 8
CN_R1_HL_EEV (BK)	Low / High EEV 05	Low / High EEV 05 for Room or Zone 5
CN_R2_HL_EEV (WH)	Low / High EEV 06	Low / High EEV 02 for Room or Zone 6
CN_HR_COMM (YL)	Master and Slave PCB Communication	Communication Connection Between Heat Recovery Unit Master and Slave PCBs
CN_SOL_VALVE (BL)	N/A	N/A
CN_CHASSIS_GND (BK)	Ground Terminal	Ground Terminal for Heat Recovery Unit Chassis
Main PCB DIP Switch Banks		
SW01E	EEV or Zone Address Setting	Sets EEV Number When Using Manual Addressing; Sets Time of Zoning Address When Using Automatic Addressing
SW02E (No. 1)	Address Method	Selects Automatic or Manual Addressing Procedure
SW02E (Nos. 2 through 4)	Setting for Number of Indoor Units	Setting for Total Number of Indoor Units Connected
SW02E (No. 5)	Slave PCB Setting	Sets Slave PCB
SW02E (No. 6)	EEPROM Reset	Resets EEPROM to Save Settings
SW02E (Nos. 7 and 8)	Mode Setting (Zoning, etc.)	Sets the Mode (Zoning, etc.)
Main PCB Buttons		
SW01B	Indoor Address Setting (Increase by One)	Increases the Indoor Address by One When Using the Manual Addressing Procedure
SW01C	Heat Recovery Unit Number Setting; EEV Zoning Number Setting	Sets the Heat Recovery Unit Number; Sets the EEV Zoning Number When Using the Manual Addressing Procedure
SW01D	EEV Group Setting	Sets the EEV Group
SW02B	Indoor Address Setting (Increase by Ten)	Increases the Indoor Address by Ten When Using the Manual Addressing Procedure

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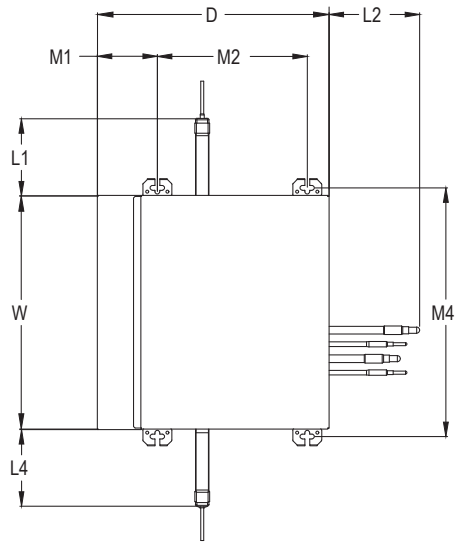
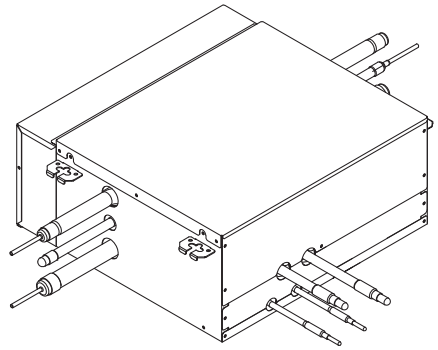
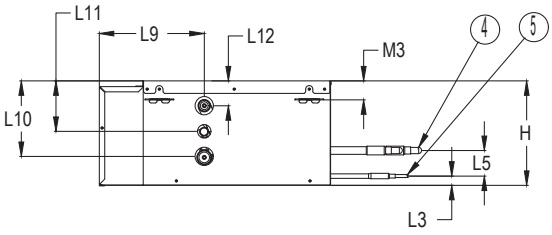
EXTERNAL DIMENSIONS

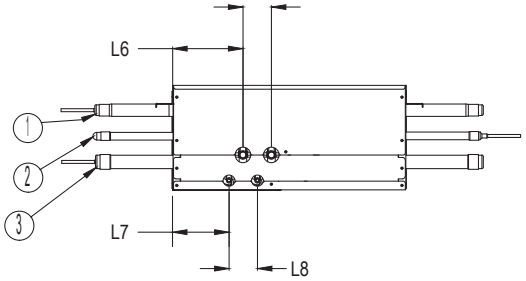
PRHR023A





Strainers are factory installed on the indoor unit vapor piping.





W	19-1/8″
H	8-5/8″
D	18-15/16″
L1	5-15/16″
L2	6-15/16″
L3	3/4″
L4	5-15/16″
L5	2-3/16″
L6	5-3/4″
L7	4-9/16″
L8	2-5/16″
L9	8-9/16″
L10	6-3/16″
L11	3-9/16″
L12	2″
M1	4-15/16″
M2	12-1/4″
M3	1-1/2″
M4	20-3/8″

[Unit: inch]

Note:

1. Unit should be installed in compliance with the appropriate LG installation manual.
2. Unit should be grounded in accordance with the local regulations or applicable national codes.
3. All electrical components and materials supplied from the site must comply with the local regulations or national codes.

No.	Part Name
6	Control box
5	Liquid pipe to Indoor unit
4	Vapor pipe to Indoor unit
3	Low pressure vapor pipe
2	Liquid pipe to Outdoor unit
1	High pressure vapor pipe

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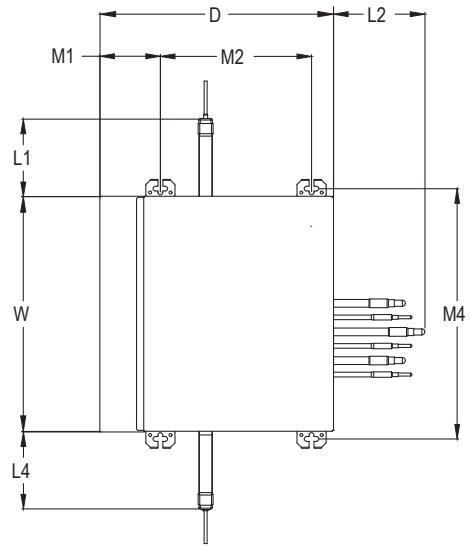
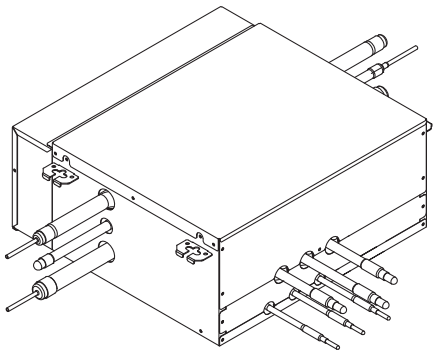
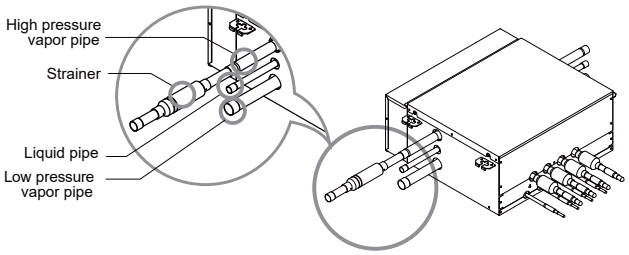
EXTERNAL DIMENSIONS

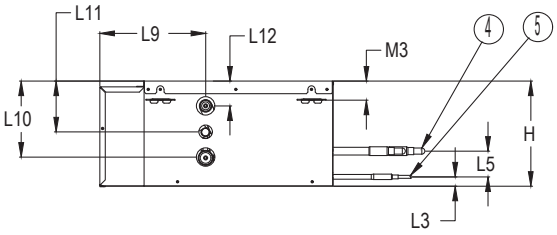
PRHR033A

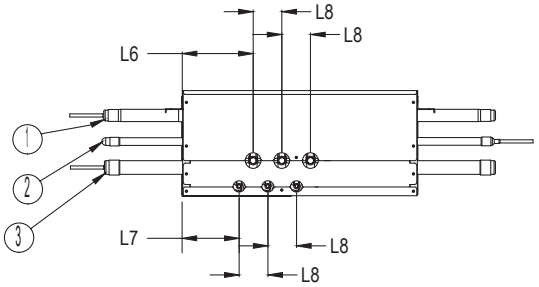




– Connect the strainer that is provided as an accessory to the HRU high pressure vapor pipe.
– Strainers are factory installed on the indoor unit vapor piping.







W	19-1/8″
H	8-5/8″
D	18-15/16″
L1	5-15/16″
L2	6-15/16″
L3	3/4″
L4	5-15/16″
L5	2-3/16″
L6	5-3/4″
L7	4-9/16″
L8	2-5/16″
L9	8-9/16″
L10	6-3/16″
L11	3-9/16″
L12	2″
M1	4-15/16″
M2	12-1/4″
M3	1-1/2″
M4	20-3/8″

[Unit: inch]

Note:

1. Unit should be installed in compliance with the appropriate LG installation manual.
2. Unit should be grounded in accordance with the local regulations or applicable national codes.
3. All electrical components and materials supplied from the site must comply with the local regulations or national codes.

No.	Part Name
6	Control box
5	Liquid pipe to Indoor unit
4	Vapor pipe to Indoor unit
3	Low pressure vapor pipe
2	Liquid pipe to Outdoor unit
1	High pressure vapor pipe

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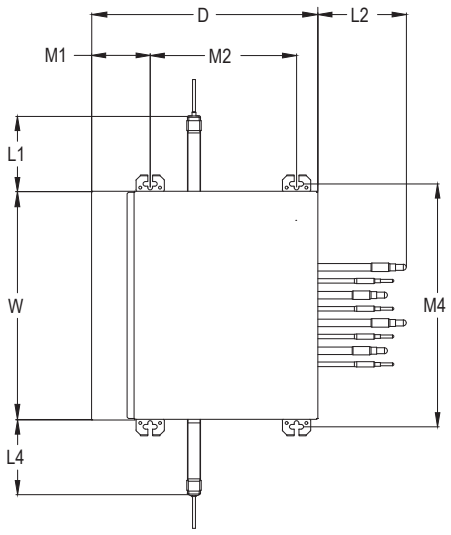
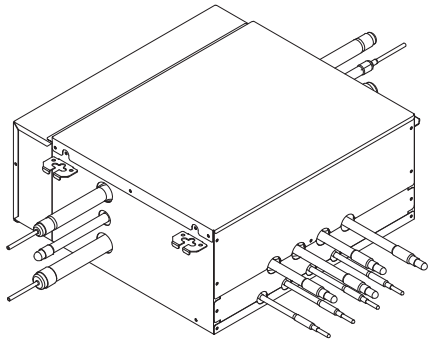
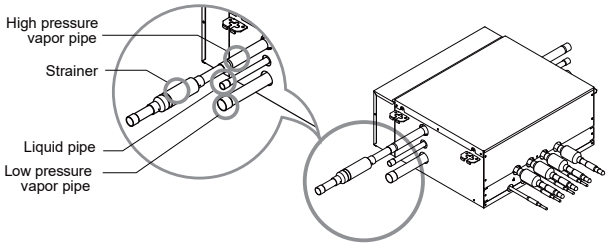
EXTERNAL DIMENSIONS

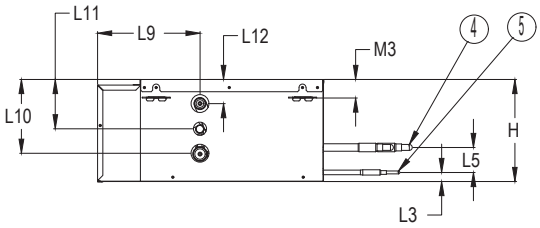
PRHR043A

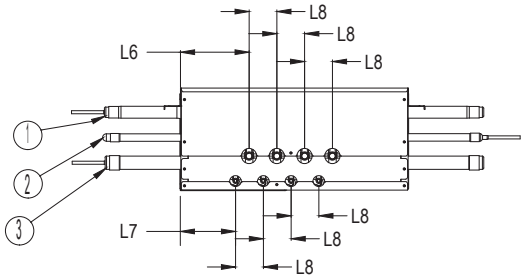




– Connect the strainer that is provided as an accessory to the HRU high pressure vapor pipe.
– Strainers are factory installed on the indoor unit vapor piping.







W	19-1/8″
H	8-5/8″
D	18-15/16″
L1	5-15/16″
L2	6-15/16″
L3	3/4″
L4	5-15/16″
L5	2-3/16″
L6	5-3/4″
L7	4-9/16″
L8	2-5/16″
L9	8-9/16″
L10	6-3/16″
L11	3-9/16″
L12	2″
M1	4-15/16″
M2	12-1/4″
M3	1-1/2″
M4	20-3/8″

[Unit: inch]

Note:

1. Unit should be installed in compliance with the appropriate LG installation manual.
2. Unit should be grounded in accordance with the local regulations or applicable national codes.
3. All electrical components and materials supplied from the site must comply with the local regulations or national codes.

No.	Part Name
6	Control box
5	Liquid pipe to Indoor unit
4	Vapor pipe to Indoor unit
3	Low pressure vapor pipe
2	Liquid pipe to Outdoor unit
1	High pressure vapor pipe

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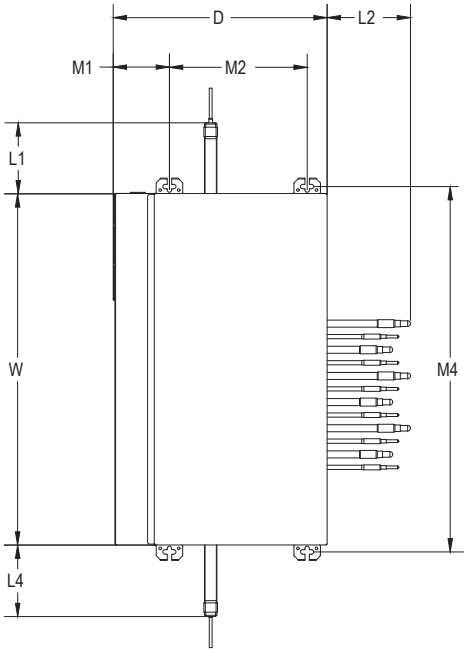
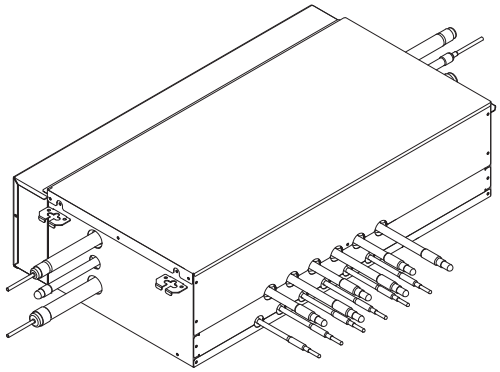
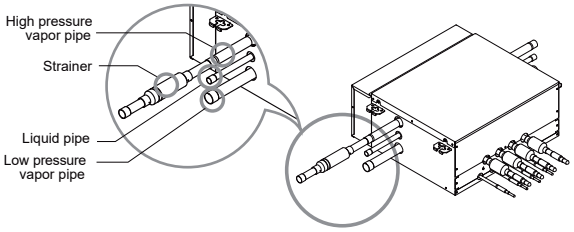
EXTERNAL DIMENSIONS

PRHR063A



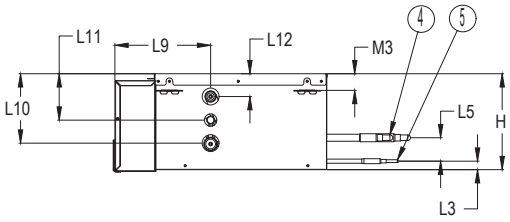


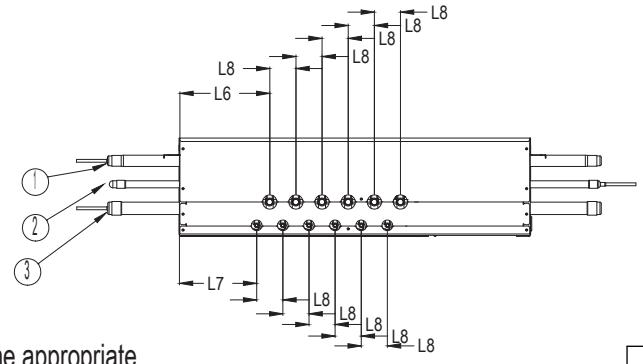
– Connect the strainer that is provided as an accessory to the HRU high pressure vapor pipe.
– Strainers are factory installed on the indoor unit vapor piping.



W	31-1/4″
H	8-5/8″
D	18-15/16″
L1	6-5/16″
L2	6-15/16″
L3	3/4″
L4	6-5/16″
L5	2-3/16″
L6	8-1/16″
L7	6-7/8″
L8	2-5/16″
L9	8-9/16″
L10	6-3/16″
L11	3-9/16″
L12	2″
M1	4-15/16″
M2	12-1/4″
M3	1-1/2″
M4	32-1/2″

[Unit: inch]





Note:

1. Unit should be installed in compliance with the appropriate LG installation manual.
2. Unit should be grounded in accordance with the local regulations or applicable national codes.
3. All electrical components and materials supplied from the site must comply with the local regulations or national codes.

No.	Part Name
6	Control box
5	Liquid pipe to Indoor unit
4	Vapor pipe to Indoor unit
3	Low pressure vapor pipe
2	Liquid pipe to Outdoor unit
1	High pressure vapor pipe

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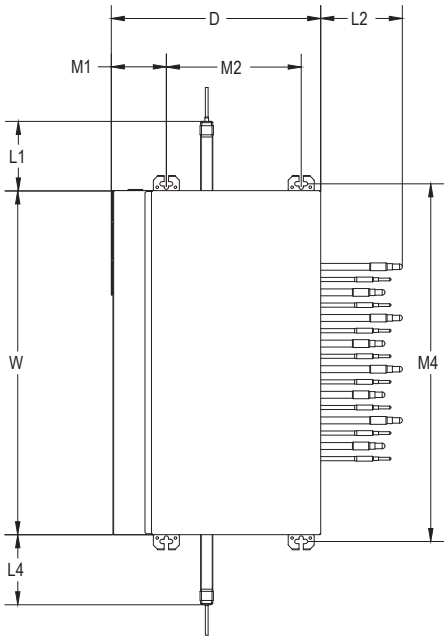
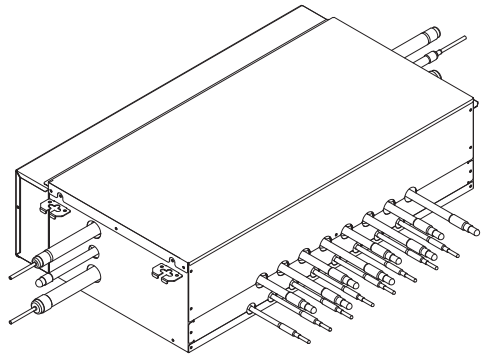
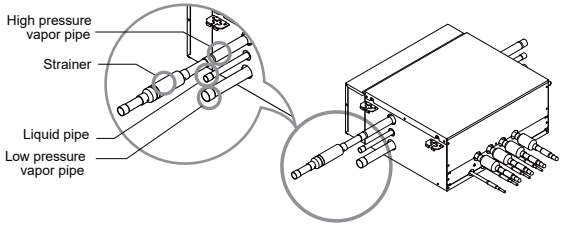
EXTERNAL DIMENSIONS

PRHR083A



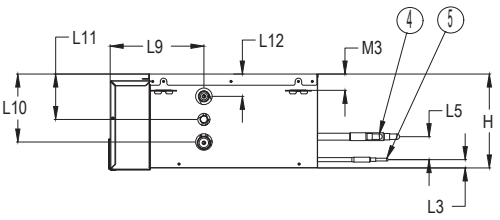


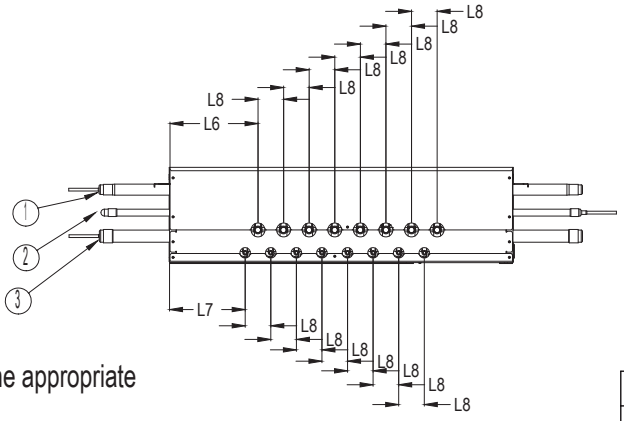
– Connect the strainer that is provided as an accessory to the HRU high pressure vapor pipe.
– Strainers are factory installed on the indoor unit vapor piping.



W	31-1/4″
H	8-5/8″
D	18-15/16″
L1	6-5/16″
L2	6-15/16″
L3	3/4″
L4	6-5/16″
L5	2-3/16″
L6	8-1/16″
L7	6-7/8″
L8	2-5/16″
L9	8-9/16″
L10	6-3/16″
L11	3-9/16″
L12	2″
M1	4-15/16″
M2	12-1/4″
M3	1-1/2″
M4	32-1/2″

[Unit: inch]





Note:

1. Unit should be installed in compliance with the appropriate LG installation manual.
2. Unit should be grounded in accordance with the local regulations or applicable national codes.
3. All electrical components and materials supplied from the site must comply with the local regulations or national codes.

No.	Part Name
6	Control box
5	Liquid pipe to Indoor unit
4	Vapor pipe to Indoor unit
3	Low pressure vapor pipe
2	Liquid pipe to Outdoor unit
1	High pressure vapor pipe

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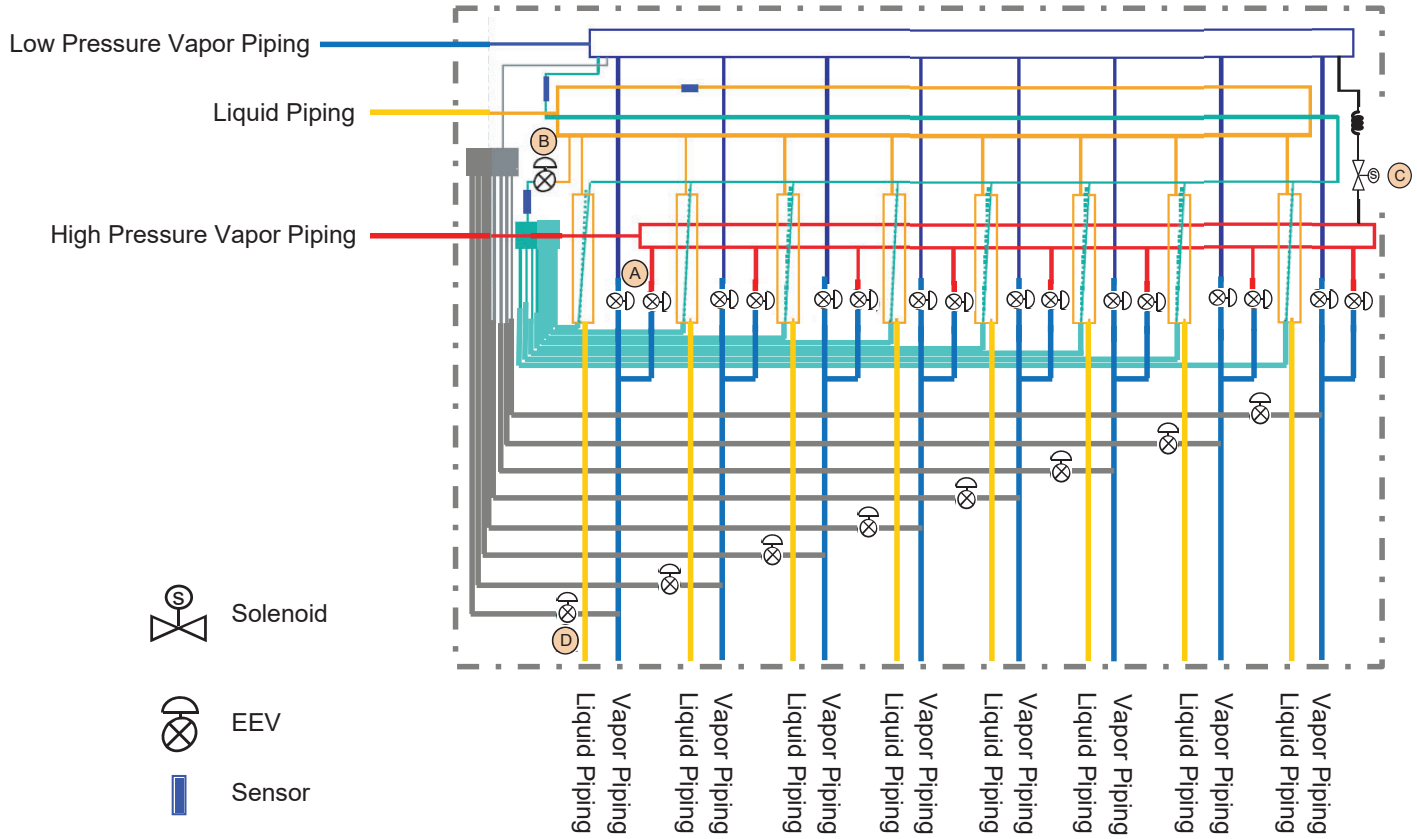
REFRIGERANT FLOW DIAGRAM



A : Switch operation between cooling and heating by two (2) valves.

B : Decreases noise following subcooling operation between inlet of one indoor unit and outlet of another indoor unit during simultaneous operation.

C : Prevents liquid from entering high pressure vapor valve and heat recovery unit during cooling mode.

D : Controls pressure between the high and low pressure vapor piping when operation mode switches.

Note:

Refrigerant diagram above represents the PRHR083A model. Appearances may differ depending on model.

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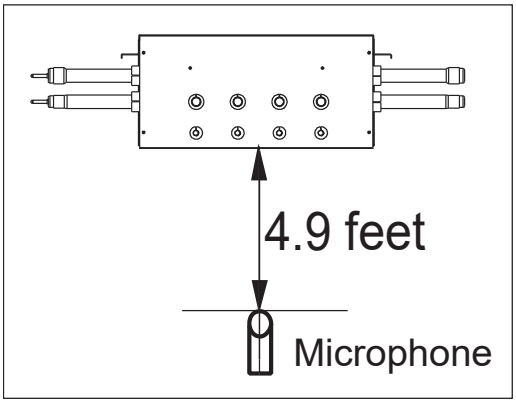
ACOUSTIC DATA

Sound Pressure Levels

Figure 26: Sound Pressure Measurement Location.



- Measurements are taken 4.9 ft. away from the center of the unit.
- Sound level will vary depending on a range of factors including the construction (acoustic absorption coefficient) of a particular room in which the unit was installed.
- Sound pressure levels are measured in dB(A) with a tolerance of ±3.
- Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

Operating Conditions:

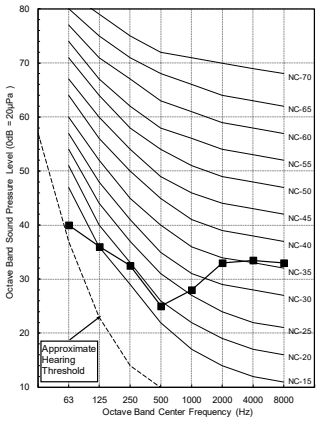
- Power source: 220V 60Hz
- Reference acoustic pressure: 0dB = 20μPa.
- Cooling: Indoor Temperature 80.6°F D.B., 66.2°F W.B., Outdoor Temperature 95°F D.B., 75.2°F W.B.
- Heating: Indoor Temperature 68°F D.B., 59°F W.B., Outdoor Temperature 44.6°F D.B., 42.8°F W.B.

Table 21: PRHR**3A Sound Pressure Levels.

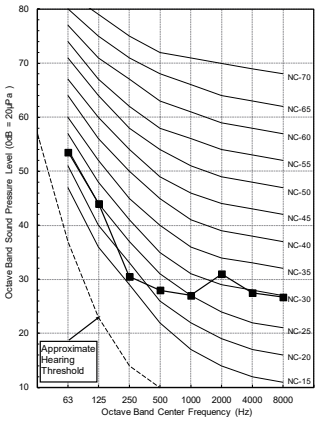
Operation Mode	Sound Pressure Levels dB(A)
Cooling	31
Heating	31
Simultaneous	38
Changeover From Cooling to Heating	33
Changeover From Heating to Cooling	38

Figure 25: PRHR**3A Sound Pressure Level Diagrams.

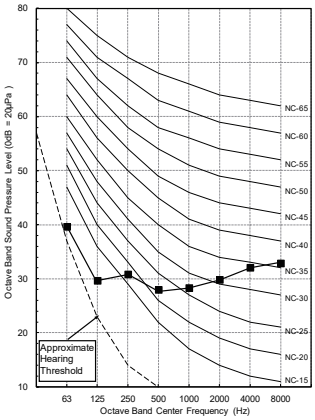
Cooling



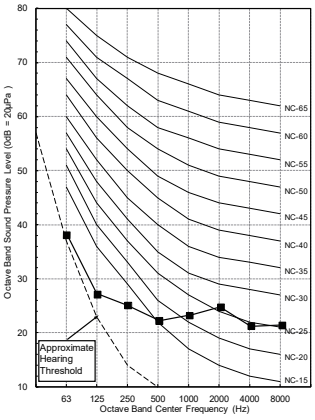
Heating



Changeover from Cooling to Heating



Changeover from Heating to Cooling



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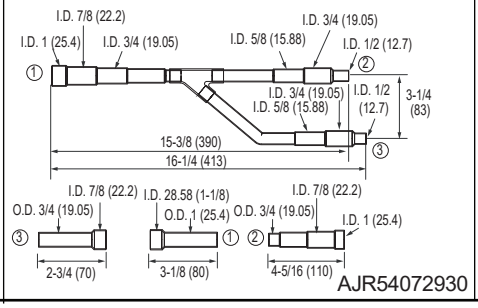
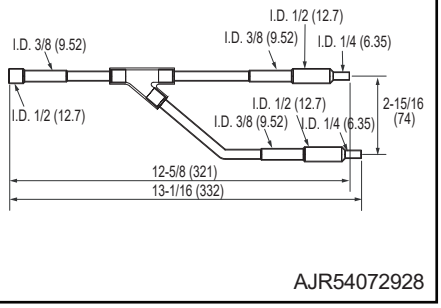
Combining Heat Recovery Ports for Large Indoor Units

It is necessary to combine two ports on a system designed for heat recovery operation when installing a single indoor unit with a capacity exceeding 60,000 Btu/h. Two neighboring heat recovery ports are combined using a reverse Y-branch that is then connected to the one large indoor unit (Kit sold separately).

Table 22: Y-Branch for Twinning Large Indoor Units.

Unit: Inch

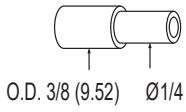
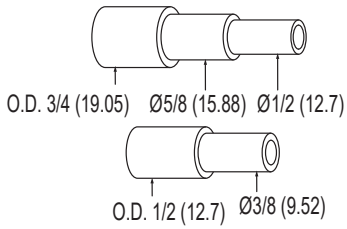
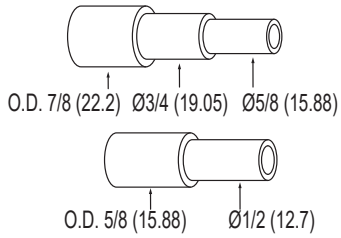
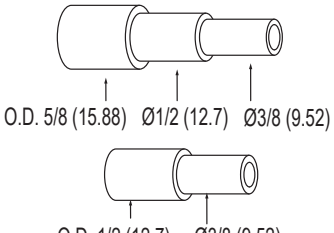
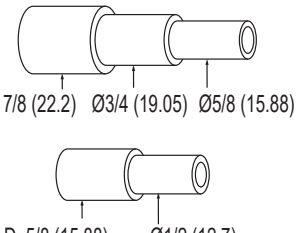
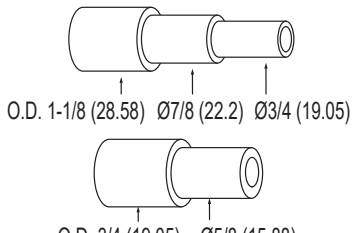
Kit Model No.	Vapor Pipe Dimensions	Liquid Pipe Dimensions
ARBLN03321		

Reducers

It may be necessary to install a reducer if the indoor unit piping or outdoor unit piping is too large or too small for the heat recovery unit connections.

Table 23: Reducers for Heat Recovery Units.

Unit: Inches (mm)

Model		Liquid Piping	Vapor Piping	
			High Pressure	Low Pressure
Heat Recovery Unit Reducer	PRHR023A			
	PRHR033A PRHR043A PRHR063A PRHR083A			

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ELECTRICAL CONNECTIONS

General Guidelines on page 93

System for Heat Pump Operation on page 94

System for Heat Recovery Operation on page 95

Heat Recovery Unit Wiring Connections on page 96

LGRED, HRU Compatibility, and Gen 4 DIP Switch Settings on page 97

GENERAL POWER WIRING / COMMUNICATION CABLE GUIDELINES

General Power Wiring / Communications Cable Guidelines

- Follow manufacturer's circuit diagrams displayed on the inside of the control box covers.
- Have a separate power supply for the heat recovery units / indoor units.
- Provide a circuit breaker switch between the power source and the outdoor unit.
- Confirm power source specifications.
- Confirm that the electrical capacity is sufficient.
- Starting current must be maintained ±10 percent of the rated current marked on the name plate.
- Confirm wiring / cable thickness specifications:
  - Power wiring is field supplied. Wire size is selected based on the larger MCA value, and must comply with the applicable local and national codes.
  - Communication cable between Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes.
- It is recommended that a circuit breaker is installed, especially if conditions could become wet or moist.
- Include a disconnect in the power wiring system, add an air gap contact separation of at least 1/8 inch in each active (phase) conductor.
- Any openings where the field wiring enters the cabinet must be completely sealed.

⚠ WARNING

- *Terminal screws may loosen during transport. Properly tighten the terminal connections during installation or risk electric shock, physical injury or death.*
- *Loose wiring may cause the wires to burnout or the terminal to overheat and catch fire. There is a risk of electric shock, physical injury or death.*

Note:

- *Terminal screws may loosen during transport. Properly tighten the terminal connections during installation or risk equipment malfunction or property damage.*
- *Loose wiring may cause unit malfunction, the wires to burnout or the terminal to overheat and catch fire. There is a risk of equipment malfunction or property damage.*
- Confirm that the electrical capacity is sufficient. *A voltage drop may cause magnetic switch vibration, fuse breaks, or disturbance to the normal function of an overload protection device.*

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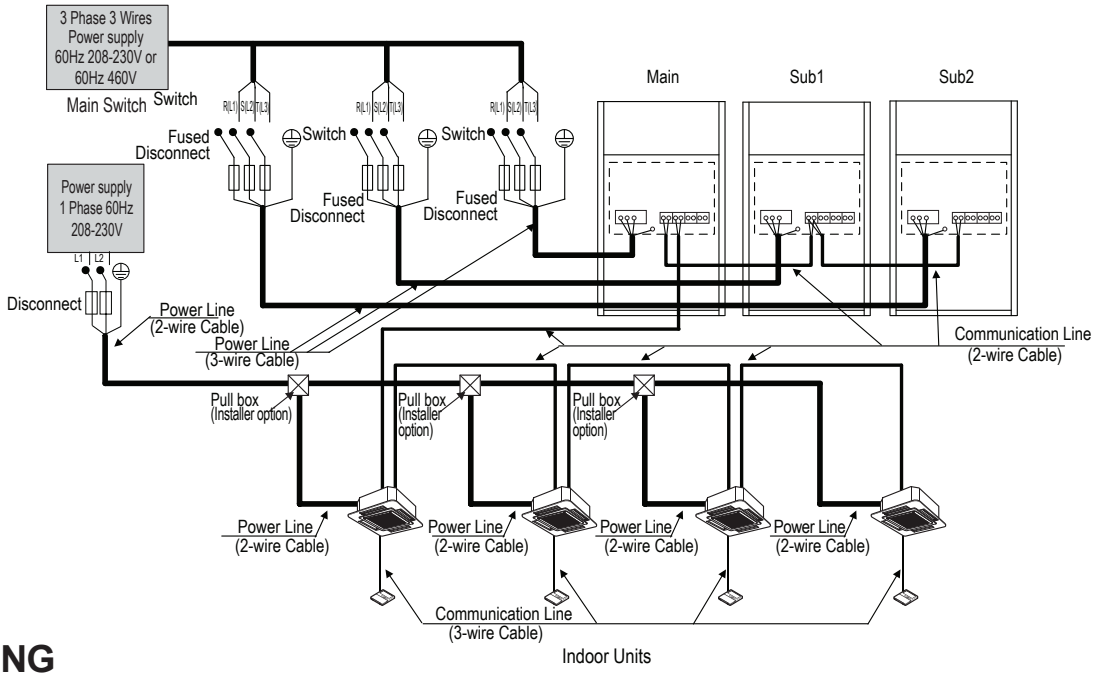
SYSTEM FOR HEAT PUMP OPERATION, 208-230V AND 460V

Figure 27: Example of a Typical Heat Pump Operation Power Wiring and Communications Cable Schematic.

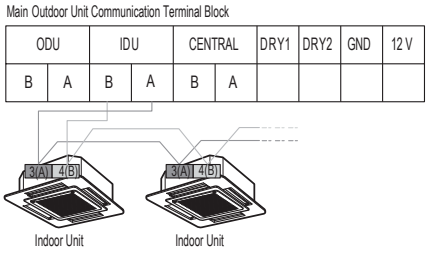


⚠ WARNING

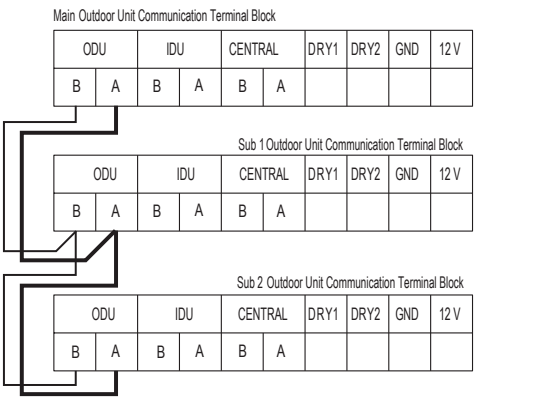
- *Ground wiring is required to prevent accidental electrical shock during current leakage, communication problems from electrical noise, and motor current leakage. ⃠ Do not connect the ground line to the pipes. There is risk of fire, electric shock, explosion, physical injury or death.*
- *Install a main shutoff switch that interrupts all power sources simultaneously. There is risk of fire, electric shock, explosion, physical injury or death.*
- *Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs communication cable at any other point. Wiring must comply with all applicable local and national codes. Inadequate connections may generate heat, cause a fire, and physical injury or death.*
- *The GND terminal at the main PCB is a negative terminal for dry contact, not a ground. Inadequate connections may generate heat, cause a fire, and physical injury or death.*

Heat Pump Operation

Communications Cable Between Main Outdoor Unit and Indoor Unit



Communications Cable Between Main Outdoor Unit and Sub Outdoor Unit(s)



⚠ NOTE

- *Make sure that the terminal numbers of main outdoor unit and sub outdoor unit(s) match (A to A, B to B). The system will malfunction if not properly wired.*
- *Maintain polarity throughout the communication network. The system will malfunction if not properly wired.*
- *If the system operates in reversed phase, it may break the compressors and other components.*
- *If there is a possibility of reversed phase, phase loss, momentary blackout, or the power goes on and off while the system is operating, install a field-supplied phase loss protection circuit. Operating the system in reverse phase may break the compressor and other unit components.*

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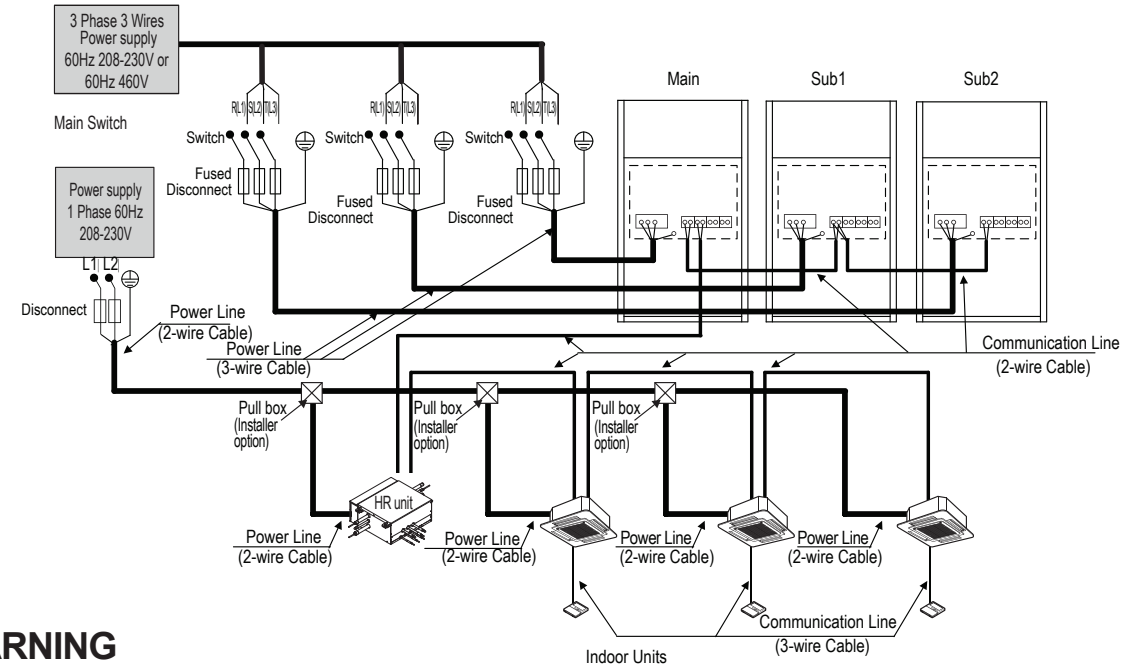
SYSTEM FOR HEAT RECOVERY OPERATION, 208-230V AND 460V

Figure 28: Example of a Typical Heat Recovery Operation Power Wiring and Communications Cable Schematic.



⚠ WARNING

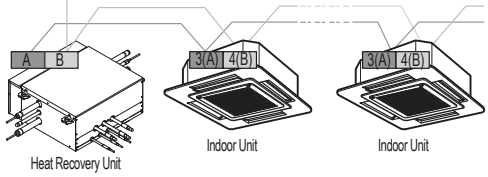
- *Ground wiring is required to prevent accidental electrical shock during current leakage, communication problems from electrical noise, and motor current leakage. ⃠ Do not connect the ground line to the pipes. There is risk of fire, electric shock, explosion, physical injury or death.*
- *Install a main shutoff switch that interrupts all power sources simultaneously. There is risk of fire, electric shock, explosion, physical injury or death.*
- *Communication cable between Main ODU to Sub ODU(s), and Main ODU to IDUs / HRUs to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the Main ODU chassis only. ⃠ Do not ground the ODU to IDUs / HRUs communication cable at any other point. Wiring must comply with all applicable local and national codes. Inadequate connections may generate heat, cause a fire, and physical injury or death.*
- *The GND terminal at the main PCB is a negative terminal for dry contact, not a ground. Inadequate connections may generate heat, cause a fire, and physical injury or death.*

Heat Recovery Operation

Communications Cable Between Main Outdoor Unit and Heat Recovery Units / Indoor Units

Main Outdoor Unit Communication Terminal Block

ODU		IDU		CENTRAL		DRY1	DRY2	GND	12 V
B	A	B	A	B	A				



Communications Cable Between Main Outdoor Unit and Sub Outdoor Unit(s)

Main Outdoor Unit Communication Terminal Block

ODU		IDU		CENTRAL		DRY1	DRY2	GND	12 V
B	A	B	A	B	A				

Sub 1 Outdoor Unit Communication Terminal Block

ODU		IDU		CENTRAL		DRY1	DRY2	GND	12 V
B	A	B	A	B	A				

Sub 2 Outdoor Unit Communication Terminal Block

ODU		IDU		CENTRAL		DRY1	DRY2	GND	12 V
B	A	B	A	B	A				

⚠ NOTE

- *Make sure that the terminal numbers of main outdoor unit and sub outdoor unit(s) match (A to A, B to B). The system will malfunction if not properly wired.*
- *Maintain polarity throughout the communication network. The system will malfunction if not properly wired.*
- *If the system operates in reversed phase, it may break the compressors and other components.*
- *If there is a possibility of reversed phase, phase loss, momentary blackout, or the power goes on and off while the system is operating, install a field-supplied phase loss protection circuit. Operating the system in reverse phase may break the compressor and other unit components.*

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Heat Recovery Unit Power Wiring and Communications Cable Connections

1. Open (disassemble) the heat recovery unit control box cover from the bottom.
2. Insert the power wiring / communications cable from the outdoor unit using the designated path in the heat recovery unit.
3. Connect each wire to its appropriate terminal on the heat recovery unit control board. Verify that the color and terminal numbers from the outdoor unit wiring match the color and terminal numbers on the heat recovery unit.
4. Secure the power wiring / communications cable.

Figure 29: Opening the Heat Recovery Control Unit Control Box Cover.

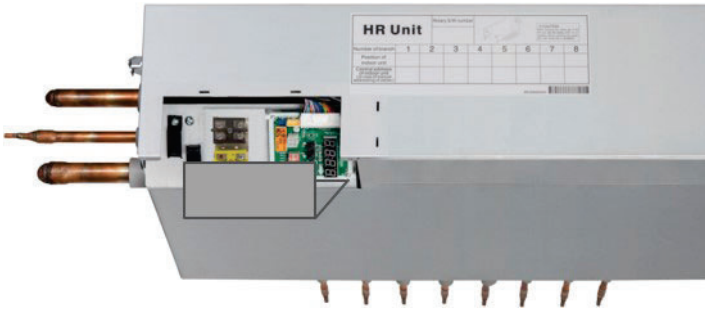


Figure 30: Heat Recovery Unit Control Box With the Cover Removed.

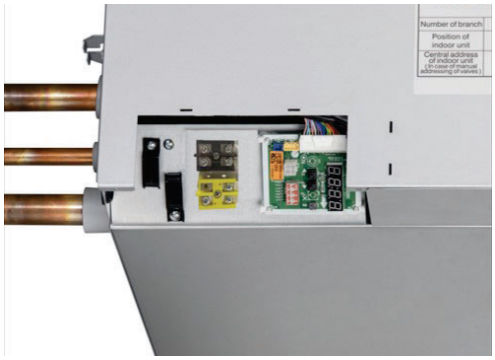


Figure 32: Location / Path of Power Wiring / Communications Cable Terminals in Heat Recovery Units.

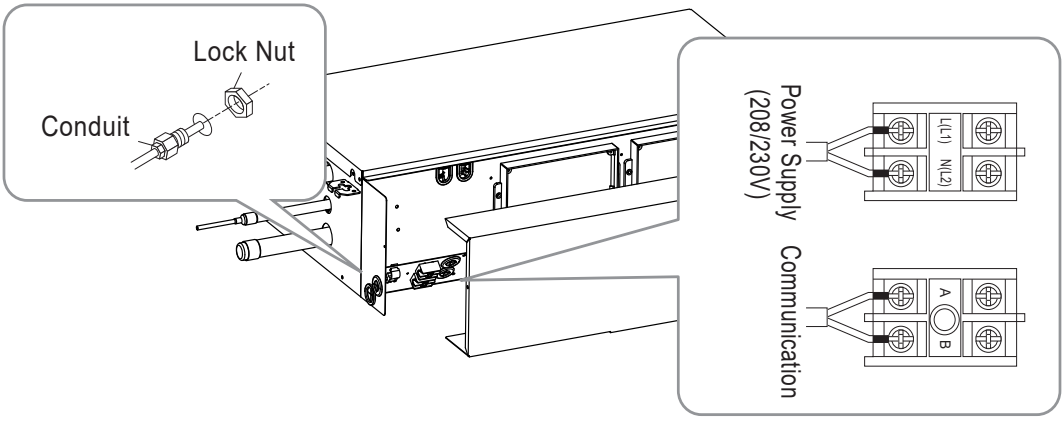
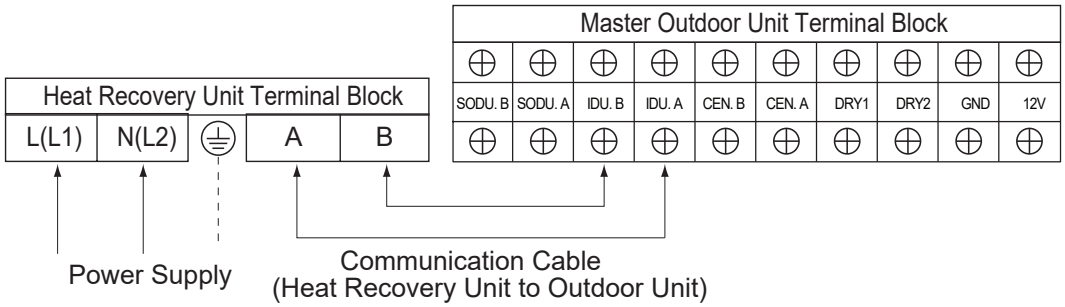


Figure 31: Close Up of Heat Recovery Unit Terminal Block.



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LGRED, HRU COMPATIBILITY, AND GEN 4 DIP SWITCH SETTINGS

LGRED Technology

LGRED technology is included in Multi V 5 air-source units produced after February 2019. The feature allows heat pump or heat recovery systems to operate in heating only mode (i.e., all indoor units in heating mode) down to -22°F outdoor ambient wet bulb by updating the main PCB software (v1.26) and replacing an air temperature sensor. Multi V 5 air-source units without these changes can only operate down to -13°F. For more information, contact your local LG sales representative.

PRHR*3A Heat Recovery Units

The PRHR*3A series of heat recovery units were released in June 2018, and are not automatically backwards compatible with all LG manufactured VRF air / water source units. The 3A heat recovery units will be compatible with many LG manufactured air source / water source units if the its "Starting Production Date," the "Production Starting Serial No.," and / or the "Upgrade Software Service" dates fall after the dates shown below (see table).

LG VRF systems can operate with both old 2A heat recovery units and new 3A heat recovery units if the outdoor unit software has been upgraded. If a system includes a mix of both old and new heat recovery units, system design must follow 2A HRU series piping rules. For more information, contact your local LG sales representative.

Table 24: PRHR*3 Heat Recovery Unit to Air / Water Source Unit Compatibility.

	Model	Starting Production Date	Production Starting Serial No.	Upgrade Software Service
Multi V 5 with LGRED*	ARUM****TE5	February 1, 2019	1902xxx	N/A
Multi V 5	ARUM****TE5	February 1, 2018	1802xxx	September 28, 2018
Multi V S	ARUB060GSS4	October 1, 2018	1810xxx	September 28, 2018
Multi V Water IV	ARWB****AS4	October 1, 2018	1810xxx	September 28, 2018
Multi V IV	ARUB****TE4	N/A	N/A	October 31, 2018
Multi V II and III	ARUB****TE2, ARUB****TE3	N/A	N/A	N/A
Multi V Water II	ARWB****A2	N/A	N/A	N/A

*Low ambient performance with LGRED° heat technology is included in Multi V 5 air source units produced after February 2019.

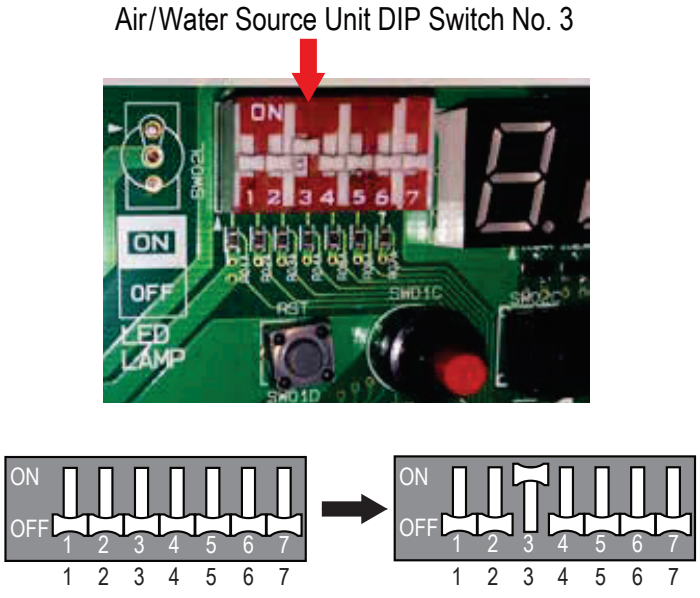
Generation 4 Indoor Units

LG's indoor units are designated Generation 4 (Gen 4). For Gen 4 indoor units to operate with Gen 4 indoor unit features, the air conditioning system must meet the following requirements:

- All indoor units, heat recovery units, and air / water source units must be Gen 4 or higher.
- All air / water source units must have Gen 4 or higher software factory or field installed.
- Air / water source units DIP switch 3 must be set to ON (factory default setting is OFF).
- All controllers must support Gen 4 indoor unit features.

The figure at right shows the outdoor unit DIP switch. All air and water source units, indoor units, heat recovery units, and controllers in a system must be Gen 4 compatible or the system will not operate with Gen 4 indoor unit features.

Figure 33: Location and Setting of Outdoor Unit DIP Switch 3.



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PIPING LIMITATIONS AND PLACEMENT CONSIDERATIONS

Piping Limitations on page 99

Refrigerant Piping for Separated Outdoor Units on page 105

Selecting the Best Location for Outdoor Unit(s) on page 108

Outdoor Unit Clearance Requirements on page 110

Installing Outdoor Units Indoors on page 111

PIPING LIMITATIONS

For Systems Designed for Heat Pump Operation

Following pages present Multi V 5 piping limitations and are for illustrative purposes only. Designers MUST use LATS when designing LG VRF systems.

Figure 34: Typical Heat Pump System Building Layout with Piping Limitations.

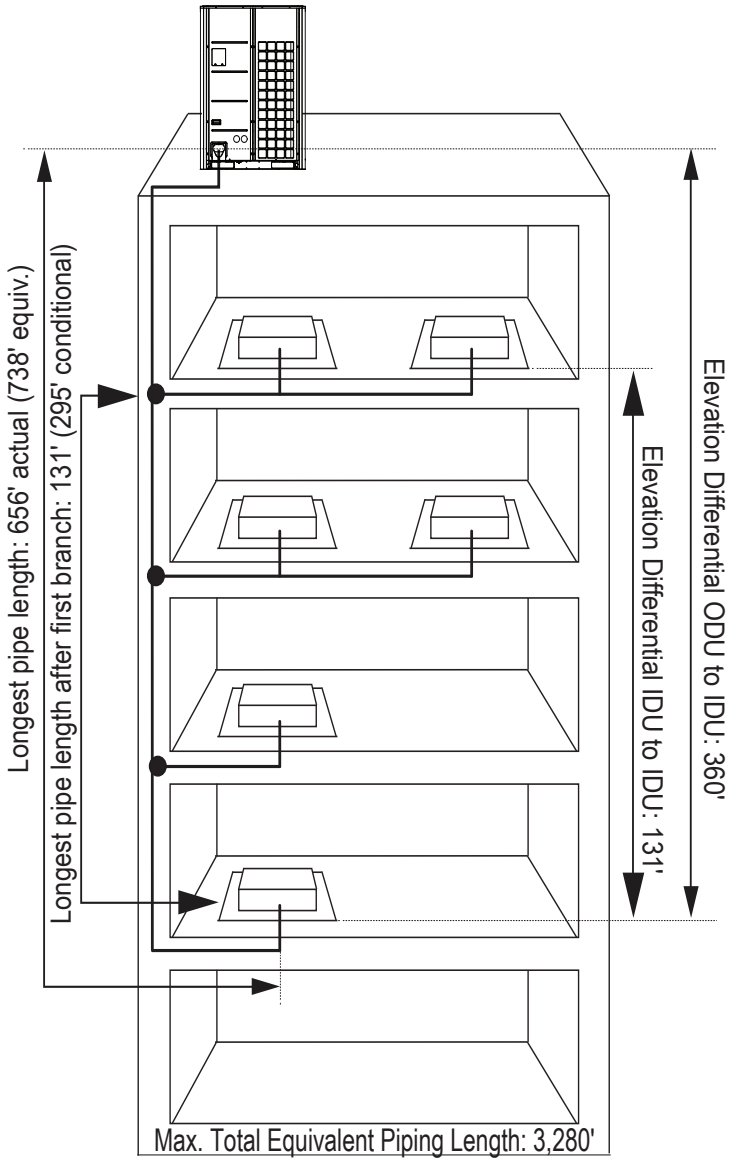

Table 25: Piping Limitations for Heat Pump Operation (See next page).

Length	Total pipe length	Longest actual pipe length	Equivalent pipe length[1]
	A + ΣB + ΣC ≤ 3,280 feet	≤492 feet (656 feet conditional application)	≤574 feet (738 feet conditional application)
ℓ	Longest pipe length after first branch		
	≤131 feet (295 feet conditional application)		
Elevation1	Elevation differential (Outdoor Unit ↔ Indoor Unit)		
	Height ≤360 feet		
Elevation2	Elevation differential (Indoor Unit ↔ Indoor Unit)		
	height ≤131 feet		
height1	Elevation differential (Outdoor Unit ↔ Outdoor Unit)		
	16.4 feet		
Distance between Outdoor Unit to Outdoor Unit		≤33 feet (Max. 43 feet for ODU ≥12 tons)	
Distance between fittings and Indoor Unit		≥20 inches	
Distance between fittings and Y-branches / Headers		≥20 inches	
Distance between two Y-branches / Headers		≥20 inches	

[1]Assume equivalent pipe length of Y-branch is 1.6 feet, and equivalent pipe length of header is 3.3 feet.

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PIPING LIMITATIONS

For Systems Designed for Heat Pump Operation

MULTI V 5 WITH LGRED°

Following pages present Multi V 5 piping limitations and are for illustrative purposes only. Designers MUST use LATS when designing LG VRF systems.

Example of Pipe Sizing When Installing a Heat Pump System

Example: Five (5) indoor Units Connected

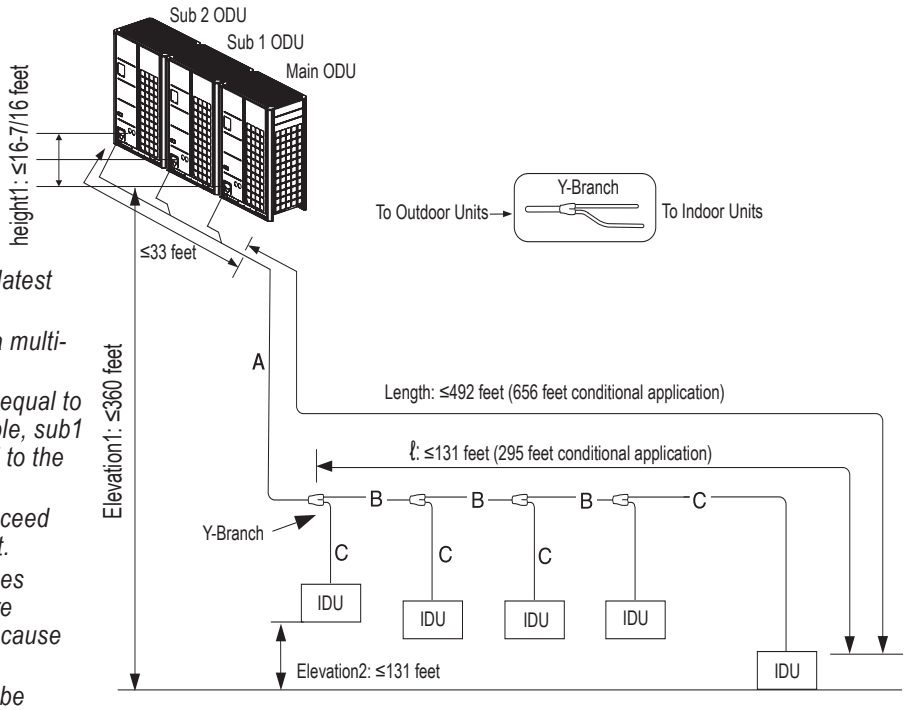
ODU: Outdoor Units.

IDU: Indoor Units.

A: Main Pipe from Outdoor Unit to Y-branch.

B: Y-branch to Y-branch.

C: Y-branch to Indoor Unit.



Note:

- *Always reference the LATS HVAC software report (latest version).*
- *Larger-capacity outdoor units must be the main in a multi-frame system.*
- *Main outdoor unit capacity must be greater than or equal to the sub1 outdoor unit capacity, and, where applicable, sub1 outdoor unit capacity must be greater than or equal to the sub2 outdoor unit capacity.*
- *Connection piping from branch to branch cannot exceed the main pipe diameter (A) used by the outdoor unit.*
- *Install the header branches so that the pipe distances between the between the connected indoor units are minimized. Large differences in pipe distances can cause indoor unit performances to fluctuate.*
- ⃠ *Y-branches and other header branches cannot be installed downstream of the initial header branch.*

Table 26: Main Pipe (A) Diameters from Outdoor Unit to First Y-branch / Header Branch.

ODU Capacity (ton)	Pipe diameter when pipe length is <295 feet (Standard)		Pipe diameter when pipe length is ≥295 feet (ODU ↔ IDU)		Pipe diameter when height differential (ODU ↔ IDU) is >164 feet	
	Liquid pipe (in. OD)	Vapor pipe (in. OD)	Liquid pipe (in. OD)	Vapor pipe (in. OD)	Liquid pipe (in. OD	Vapor pipe (in. OD)
6	3/8Ø	3/4Ø	1/2Ø	7/8Ø	1/2Ø	No Increase
8	3/8Ø	7/8Ø	1/2Ø	1-1/8Ø	1/2Ø	No Increase
10-12	1/2Ø	1-1/8Ø	5/8Ø	No Increase	5/8Ø	No Increase
14-18	5/8Ø	1-1/8Ø	3/4Ø	1-3/8Ø	3/4Ø	No Increase
20	5/8Ø	1-3/8Ø	3/4Ø	No Increase	3/4Ø	No Increase
22-28	3/4Ø	1-3/8Ø	7/8Ø	1-5/8Ø	7/8Ø	No Increase
30-42	3/4Ø	1-5/8Ø	7/8Ø	No Increase	7/8Ø	No Increase

Table 27: Pipe Diameters (B) from Y-branch to Y-branch / Header.

Downstream Total Capacity of IDUs (Btu/h)	Liquid pipe (inches OD)	Vapor pipe (inches OD)
≤19,100	1/4Ø	1/2Ø
≤54,600	3/8Ø	5/8Ø
≤76,400	3/8Ø	3/4Ø
≤114,700	3/8Ø	7/8Ø
≤172,000	1/2Ø	1-1/8Ø
≤229,400	5/8Ø	1-1/8Ø
≤248,500	5/8Ø	1-3/8Ø
≤344,000	3/4Ø	1-3/8Ø
≤592,500	3/4Ø	1-5/8Ø

[1]For the first branch pipe, use the branch pipe that matches main pipe A diameter.

Table 28: Indoor Unit Connecting Pipe from Branch (C).

Indoor Unit Capacity[1]	Liquid pipe (inches OD)	Vapor pipe (inches OD)
≤19,100	1/4Ø	1/2Ø
≤54,600	3/8Ø	5/8Ø
≤76,400	3/8Ø	3/4Ø

[1]9,600-24,200 Btu/h 4-way 3 feet x 3 feet Cassette and 15,400-24,200 Btu/h High Static Ducted indoor units have 3/8Ø (liquid) and 5/8Ø (vapor).

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PIPING LIMITATIONS

For Systems Designed for Heat Pump Operation

Following pages present Multi V 5 piping limitations and are for illustrative purposes only. Designers MUST use LATS when designing LG VRF systems.

Conditional Applications

Conditional applications are computed in LATS. See below for an explanation of when pipes are upsized.

If the equivalent length between the first Y-branch to the farthest indoor unit is >131 feet (up to 295 feet maximum):

- Pipe segment diameters between the first Y-branch and the second Y-branch must be sized up by one. This applies to both liquid and low pressure vapor pipes. If the next size up is not available, or if the piping segment diameters are the same as main pipe (A) diameters, sizing up is not possible.
- While calculating the entire refrigerant pipe length, pipe lengths for ΣB must be multiplied by two: A+(ΣBx2)+ΣC ≤3,281 feet.
- Length of pipe (C) from each indoor unit to the closest Y-branch or header ≤131 feet.
- [Length of pipe from outdoor unit to farthest indoor unit (A+B+C)] - [Length of pipe from outdoor unit to closest indoor unit (A+B+C)] ≤131 feet.
- When an indoor unit is connected directly after the first branch (installing the pipe of an indoor unit connected directly after the first branch that is between 131 feet and 295 feet):
  - Pipe diameter must be sized up by one.
  - Pipe length must be multiplied by two: A+(ΣBx2)+C(1)+ΣC ≤3,280 feet.

If the pipe (B) diameters after the first branch are bigger than the main pipe (A) diameters, pipe (B) must changed to match main pipe (A) sizes.

If one (or both) of the conditions below are met, the main pipe must be upsized:

- The equivalent length between outdoor unit and the farthest indoor unit is 295 feet or more (liquid and vapor pipes are upsized).
- The elevation distance between outdoor unit and indoor unit is 164 feet or more (only the liquid pipe is upsized).

Refer Table 26 on the previous page for Main pipe (A) diameter from the outdoor unit to the first Y-branch / header branch.

Example: When an indoor unit combination ratio of 120% is connected to a 22-ton outdoor unit:
Outdoor unit main pipe (A) diameters: 1-3/8Ø inches (vapor) and 5/8Ø inches (liquid).

1. Pipe (B) diameters: 1-3/8Ø (vapor) and 3/4Ø (liquid) (after the first branch, when indoor unit combination ratio is 120% [26 tons]).
2. After the first branch, pipe (B) diameters must be changed to 1-3/8Ø inches (vapor) and 5/8Ø inches (liquid) to match main pipe (A) sizes.

Instead of using the total indoor unit capacity to choose main pipe (A) diameters, use outdoor unit capacity to choose downstream main pipe (A) diameters. ⃠ Do not permit connection pipes (B) from branch to branch to exceed main pipe (A) diameters as indicated by outdoor unit capacity. Example: When an indoor unit combination ratio of 120% is connected to a 20-ton outdoor unit (24 tons), and indoor unit with a 7,000 Btu/h capacity is located at the first branch:

1. Main pipe (A) diameters on a 20-ton outdoor unit: 1-1/8Ø inches (vapor) and 5/8Ø inches (liquid).
2. Pipe diameters between first and second branches, however, are: 1-3/8Ø (vapor) and 3/4Ø (liquid) (connected downstream indoor unit capacity is 20 tons).
3. If main pipe (A) diameters of a 20-ton outdoor unit are 1-1/8Ø (vapor) and 5/8Ø (liquid), then the pipe diameters between the first and second branches must be changed to match.

Note that the pipe diameters computed in LATS may not be standard ACR copper tube sizes that are commonly available. In these instances, refer to the table below and use the next commonly available pipe size. Please refer to the Copper Development Association Inc. *Publication A4015-14/19: Copper Tube Handbook* for additional information.

Table 29: LATS Conditional Piping Upsizing.

LATS Conditional Applications Upsized Pipe Diameters	Standard Size Commonly Available ACR Pipe Diameters
1" →	1-1/8"
1-1/4" →	1-3/8"
1-1/2" →	1-5/8"

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PIPING LIMITATIONS

For Systems Designed for Heat Recovery Operation

MULTI V 5 WITH LGRED

Following pages present Multi V 5 piping limitations and are for illustrative purposes only. Designers MUST use LATS when designing LG VRF systems.

Figure 35: Typical Heat Recovery System Building Layout with Piping Limitations.

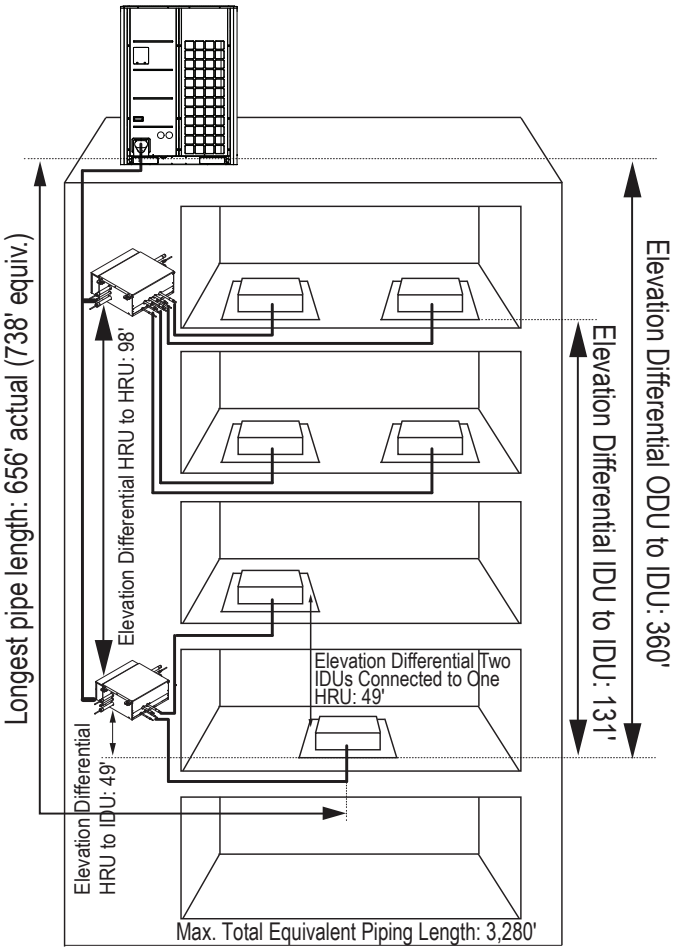

Table 30: Piping Limitations for Heat Recovery Operation (See next page).

Length	Total pipe length	Longest actual pipe length	Equivalent pipe length[1]
	A + ΣB + ΣC ≤ 3,280 feet	≤492 feet (656 feet conditional application)	≤574 feet (738 feet conditional application)
ℓ	Longest pipe length after first branch		
	≤131 feet (295 feet conditional application)		
Elevation1	Elevation differential (Outdoor Unit ↔ Indoor Unit)		
	Height ≤360 feet		
Elevation2	Elevation differential (Indoor Unit ↔ Indoor Unit)		
	height ≤131 feet		
Elevation3	Elevation differential (Indoor Unit ↔ Heat Recovery Unit [single heat recovery unit or series heat recovery units])		
	49 feet		
Elevation4	Elevation differential (Indoor Unit ↔ Indoor Unit [connected to same Heat Recovery Unit])		
	49 feet		
height1	Elevation differential (Outdoor Unit ↔ Outdoor Unit)		
	≤16.4 feet		
Distance between Outdoor Unit to Outdoor Unit		≤33 feet (Max. 43 feet for Outdoor Unit ≥12 tons)	
Distance between fittings and Indoor Unit		≥20 inches	
Distance between fittings and Y-branches / Headers		≥20 inches	
Distance between two Y-branches / Headers		≥20 inches	
Height differential between two Heat Recovery Units if installed with a Y-branch		≤98 feet	
Height differential between two series-piped Heat Recovery Units		≤16 feet	

[1]Assume equivalent pipe length of Y-branch is 1.6 feet, and equivalent pipe length of header is 3.3 feet.

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PIPING LIMITATIONS

For Systems Designed for Heat Recovery Operation

Following pages present Multi V 5 piping limitations and are for illustrative purposes only. Designers MUST use LATS when designing LG VRF systems.

Example of Pipe Sizing When Installing a Heat Recovery System

Example: Triple-frame system, four (4) heat recovery units, one (1) header, and twelve (12) indoor units connected

ODU: Outdoor Units. IDU: Indoor units.

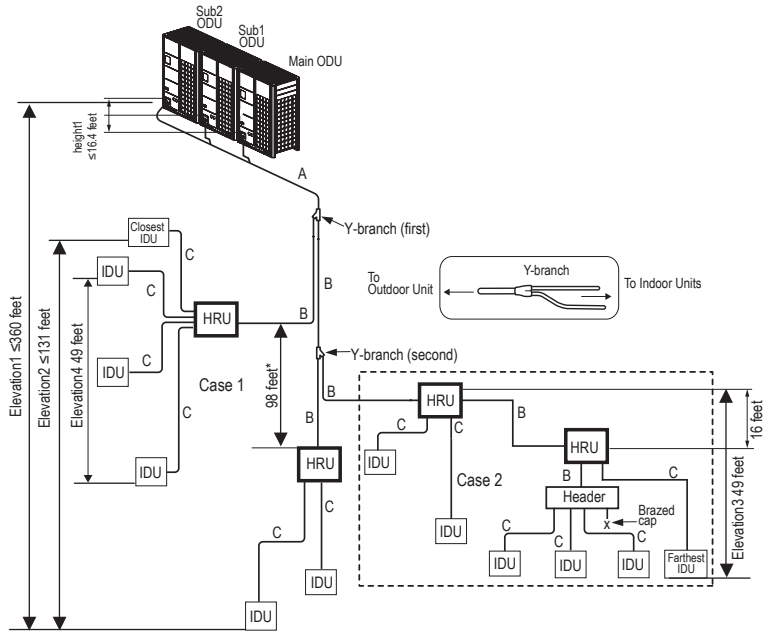
HRU: Heat Recovery Units.

A: Main Pipe from Outdoor Unit to First Y-branch.

B: Heat Recovery Unit to Heat Recovery Unit, Y-branch to Heat Recovery Unit, Heat Recovery Unit to Header, or Y-branch to Y-branch.

C: Heat Recovery Unit / Header to Indoor Unit.

Figure 36: Heat Recovery Triple Frame Connections.



Case 1: Maximum height is 131 feet if installed with a Y-branch.
Case 2: Maximum height is 16 feet in heat recovery control unit series connection.
*Up to 131 feet may be possible with certain applications. Contact LG Engineering for additional information.

Note:

- *Always reference the LATS HVAC software report (latest version).*
- *Larger-capacity outdoor units must be the main in a multi-frame system.*
- *Main outdoor unit capacity must be greater than or equal to the sub1 outdoor unit capacity, and, where applicable, sub1 outdoor unit capacity must be greater than or equal to the sub2 outdoor unit capacity.*
- *Connection piping from branch to branch cannot exceed the main pipe diameter (A) used by the outdoor unit.*
- *Install the header branches or heat recovery units so that the pipe distances between the between the connected indoor units are minimized. Large differences in pipe distances can cause indoor unit performances to fluctuate.*
- ⃠ *Y-branches and other header branches cannot be installed downstream of the initial header branch.*
- *Total capacity of indoor units in series connection of heat recovery units ≤230,000 Btu/h.*
- *If large capacity indoor units (>60,000 Btu/h with piping sizes >5/8Ø / 3/8Ø) are installed, the valve group setting must be used. (Refer to the PCB of the heat recovery unit for the valve group control setting.)*

Table 31: Main Pipe (A) Diameters from Outdoor Unit to First Y-branch.

ODU Capacity (ton)	Standard Pipe Diameter			Pipe diameter when pipe length is ≥295 feet or when height differential (ODU ↔ IDU) is >164 feet		
	Liquid Pipe (inches OD)	Low Pressure Vapor Pipe (inches OD)	High Pressure Vapor Pipe (inches OD)	Liquid Pipe (inches OD)	Low Pressure Vapor Pipe (inches OD)	High Pressure Vapor Pipe (inches OD)
6	3/8Ø	3/4Ø	5/8Ø	1/2Ø	No Increase	No Increase
8	3/8Ø	7/8Ø	3/4Ø	1/2Ø	No Increase	No Increase
10	1/2Ø	1-1/8Ø	3/4Ø	5/8Ø	No Increase	No Increase
12	1/2Ø	1-1/8Ø	7/8Ø	5/8Ø	No Increase	No Increase
14	5/8Ø	1-1/8Ø	7/8Ø	3/4Ø	No Increase	No Increase
16-18	5/8Ø	1-1/8Ø	1-1/8Ø	3/4Ø	No Increase	No Increase
20	5/8Ø	1-3/8Ø	1-1/8Ø	3/4Ø	No Increase	No Increase
22-28	3/4Ø	1-3/8Ø	1-1/8Ø	7/8Ø	No Increase	No Increase
30-42	3/4Ø	1-5/8Ø	1-1/8Ø	7/8Ø	No Increase	No Increase

Table 32: Refrigerant Pipe (B) Diameters between Y-branches and Y-branches / Heat Recovery Unit / Headers.

Downstream IDU total capacity (Btu/h)	Liquid Pipe (inches OD)	Vapor pipe (inches OD)	
		Low Pressure	High Pressure
≤19,100	1/4Ø	1/2Ø	3/8Ø
<54,600	3/8Ø	5/8Ø	1/2Ø
<76,400	3/8Ø	3/4Ø	5/8Ø
<114,700	3/8Ø	7/8Ø	3/4Ø
<172,000	1/2Ø	1-1/8Ø	7/8Ø
<229,400	5/8Ø	1-1/8Ø	7/8Ø
<248.500	5/8Ø	1-3/8Ø	1-1/8Ø
<344,000	3/4Ø	1-3/8Ø	1-1/8Ø
<592,500	3/4Ø	1-5/8Ø	1-3/8Ø

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PIPING LIMITATIONS

For Systems Designed for Heat Recovery Operation

Following pages present Multi V 5 piping limitations and are for illustrative purposes only. Designers MUST use LATS when designing LG VRF systems.

Table 33: Indoor Unit Connecting Pipe from Branch (C).

Indoor Unit Capacity[1]	Liquid pipe (inches OD)	Vapor pipe (inches OD)
≤19,100	1/4Ø	1/2Ø
≤54,600	3/8Ø	5/8Ø
≤76,400	3/8Ø	3/4Ø
≤95,900	3/8Ø	7/8Ø

[1]9,600-24,200 Btu/h 4-way 3 feet x 3 feet Cassette and 15,400-24,200 Btu/h High Static Ducted IDUs have 3/8Ø (liquid) and 5/8Ø (vapor).

Conditional Applications

Conditional applications are computed in LATS. See below for an explanation of when pipes are upsized.

If the equivalent length between the first Y-branch to the farthest indoor unit is >131 feet (up to 295 feet maximum):

- Pipe segment diameters between the first Y-branch and the second Y-branch must be sized up by one. This applies to both liquid and low pressure vapor pipes. If the next size up is not available, or if the piping segment diameters are the same as main pipe (A) diameters, sizing up is not possible.
- While calculating the entire refrigerant pipe length, pipe lengths for ΣB must be multiplied by two: A+(ΣBx2)+ΣC ≤3,281 feet.
- Length of pipe (C) from each indoor unit to the closest Y-branch or header ≤131 feet.
- [Length of pipe from outdoor unit to farthest indoor unit (A+B+C)] - [Length of pipe from outdoor unit to closest indoor unit (A+B+C)] ≤131 feet.

If the pipe (B) diameters after the first branch are bigger than the main pipe (A) diameters, pipe (B) must changed to match main pipe (A) sizes.

If one (or both) of the conditions below are met, the main pipe must be upsized:

- The equivalent length between outdoor unit and the farthest indoor unit is 295 feet or more (liquid and vapor pipes are upsized).
- The elevation distance between outdoor unit and indoor unit is 164 feet or more (only the liquid pipe is upsized).

Refer to Table 31 on the previous page for Main pipe (A) diameter from the outdoor unit to the first Y-branch / header branch.

Example: When an indoor unit combination ratio of 120% is connected to a 22-ton outdoor unit:
Outdoor unit main pipe (A) diameters: 1-3/8Ø inches (vapor) and 5/8Ø inches (liquid).

1. Pipe (B) diameters: 1-3/8Ø (vapor) and 3/4Ø (liquid) (after the first branch, when indoor unit combination ratio is 120% [26 tons]).
2. After the first branch, pipe (B) diameters must be changed to 1-3/8Ø inches (vapor) and 5/8Ø inches (liquid) to match main pipe (A) sizes.

Instead of using the total indoor unit capacity to choose main pipe (A) diameters, use outdoor unit capacity to choose downstream main pipe (A) diameters. ⃠ Do not permit connection pipes (B) from branch to branch to exceed main pipe (A) diameters as indicated by outdoor unit capacity. Example: When an indoor unit combination ratio of 120% is connected to a 20-ton outdoor unit (24 tons), and indoor unit with a 7,000 Btu/h capacity is located at the first branch:

1. Main pipe (A) diameters on a 20-ton outdoor unit: 1-1/8Ø inches (vapor) and 5/8Ø inches (liquid).
2. Pipe diameters between first and second branches, however, are: 1-3/8Ø (vapor) and 3/4Ø (liquid) (connected downstream indoor unit capacity is 20 tons).
3. If main pipe (A) diameters of a 20-ton outdoor unit are 1-1/8Ø (vapor) and 5/8Ø (liquid), then the pipe diameters between the first and second branches must be changed to match.

Note that the pipe diameters computed in LATS may not be standard ACR copper tube sizes that are commonly available. In these instances, refer to the table below and use the next commonly available pipe size. Please refer to the Copper Development Association Inc. *Publication A4015-14/19: Copper Tube Handbook* for additional information.

Table 34: LATS Conditional Piping Upsizing.

LATS Conditional Applications Upsized Pipe Diameters	Standard Size Commonly Available ACR Pipe Diameters
1" →	1-1/8"
1-1/4" →	1-3/8"
1-1/2" →	1-5/8"

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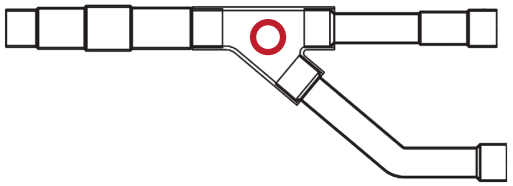
REFRIGERANT PIPING FOR SEPARATED OUTDOOR UNITS

Dual-frame and triple-frame systems must be installed with all outdoor units located next to each other. In conditions where the dual-frame or triple-frame outdoor units need to be separated, the following rules must be followed (rules ⃠ do not apply to single-frame outdoor units):

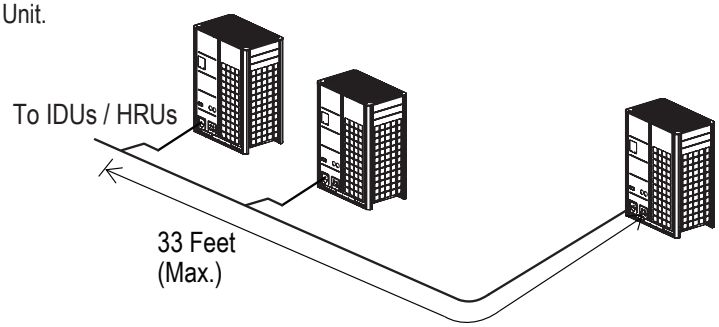
1. Measurements.
All measurements must be made from the union center of the outdoor unit Y-branch.

Figure 37: Y-branch Measurement Location.



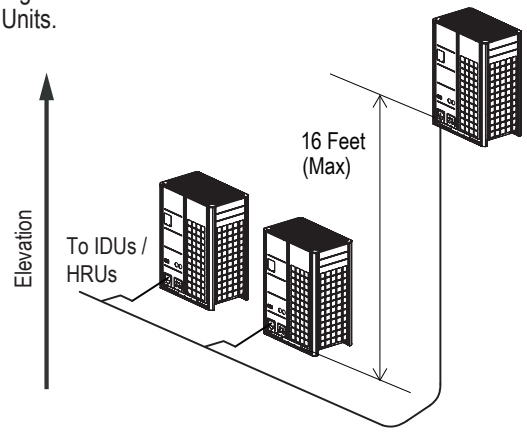
2. Maximum pipe length from first outdoor unit Y-branch to farthest outdoor unit.
Total pipe length from the first outdoor unit Y-branch to the piping connection at the farthest outdoor unit must not exceed thirty-three (33) feet.

Figure 38: Maximum Pipe Length from First Outdoor Unit Y-branch to Farthest Outdoor Unit.



3. Elevation difference between outdoor units.
The elevation difference between the highest and lowest elevation outdoor unit must not exceed sixteen (16) feet.

Figure 39: Elevation Difference Between Outdoor Units.



Trapping

1. When required, all traps must be inverted type traps ≥8" in the vapor line(s).
   a. Heat pump outdoor units would be trapped in the suction vapor line, and heat recovery outdoor units would be trapped in the high AND low pressure vapor lines.

   b. Inverted traps are defined as any piping that is ≥8" in a vertical direction up the horizontal pipe it elevates from.

Figure 40: Traps for Heat Pump and Heat Recovery Systems.

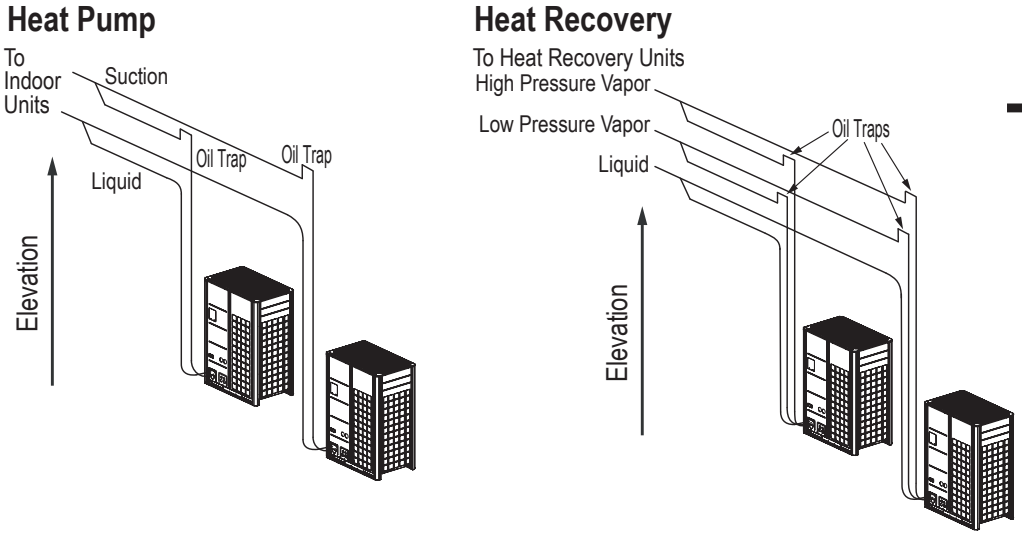
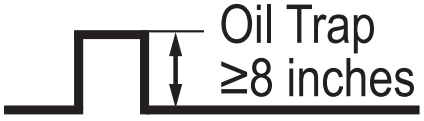


Figure 41: Close Up of An Inverted Oil Trap.



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REFRIGERANT PIPING FOR SEPARATED OUTDOOR UNITS

1. Inverted traps are required when:
   a. Piping in a horizontal direction from the outdoor Y-branch towards an outdoor unit or another outdoor unit Y-branch is greater than 6.6'. The inverted trap must be installed close to the outdoor unit Y-branch (no more than 6.6' away, 20" is optimum).

   b. Anytime piping turns downward, leave an outdoor unit Y-branch toward an outdoor unit or another outdoor unit Y-branch. The inverted trap must be installed close to the outdoor unit Y-branch (no more than 6.6' away, 20" is optimum), and before the pipe toward the outdoor unit turns downward.

Figure 42: Examples of Inverted Traps.

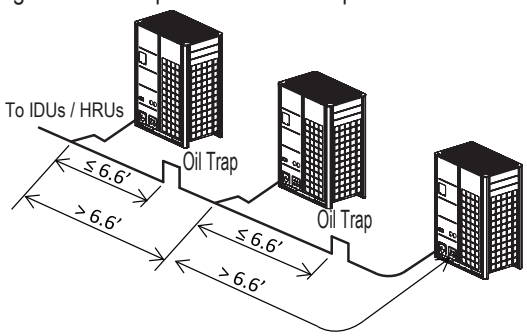
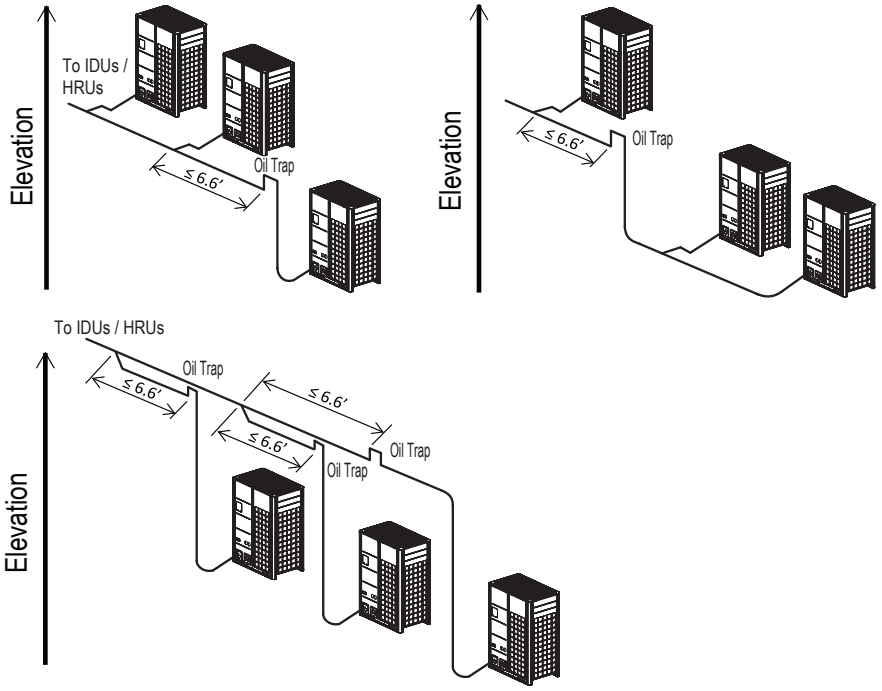


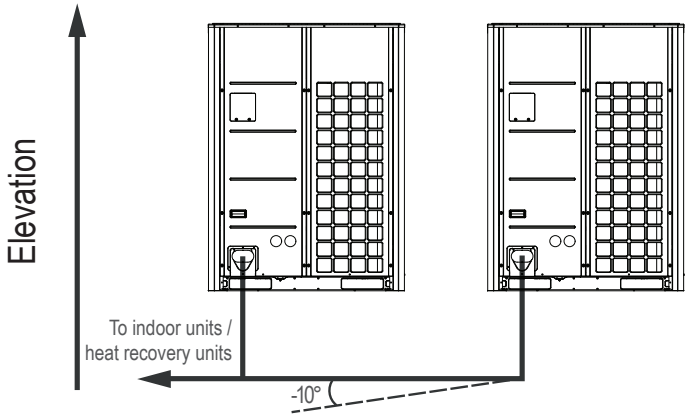
Figure 43: Inverted Trap Applications.



Pipe Slope

Horizontal pipe slope must be level or slightly away from the outdoor units, otherwise refrigerant and oil will migrate toward the outdoor units and accumulate in the pipe segment serving the frame that is not running or at the lowest elevation. Piping must never slope more than -10° (see figure) without installing an inverted trap within 6.6' of the outdoor unit Y-branch and before the pipe slopes downward toward the outdoor unit.

Figure 44: Allowable Pipe Slope.



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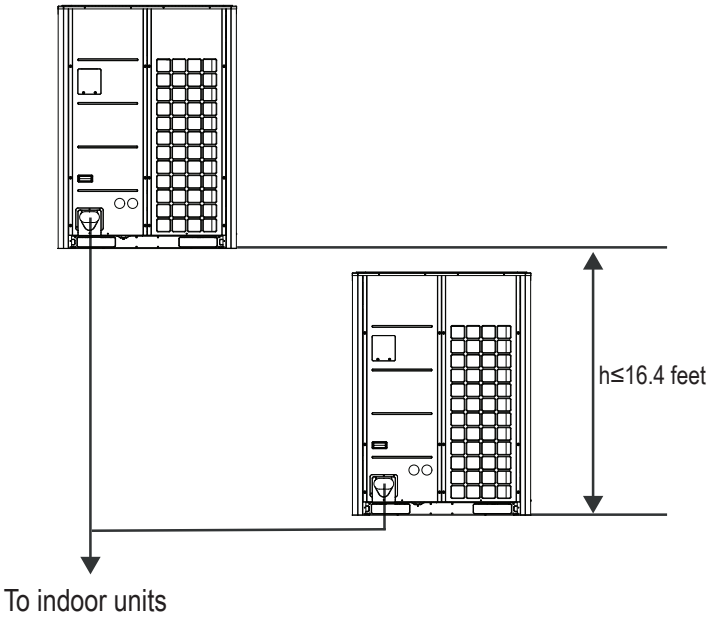
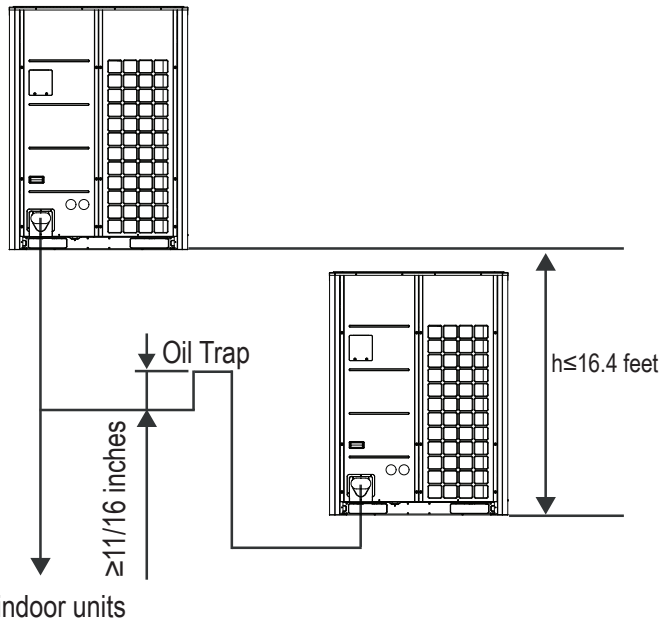
REFRIGERANT PIPING FOR SEPARATED OUTDOOR UNITS

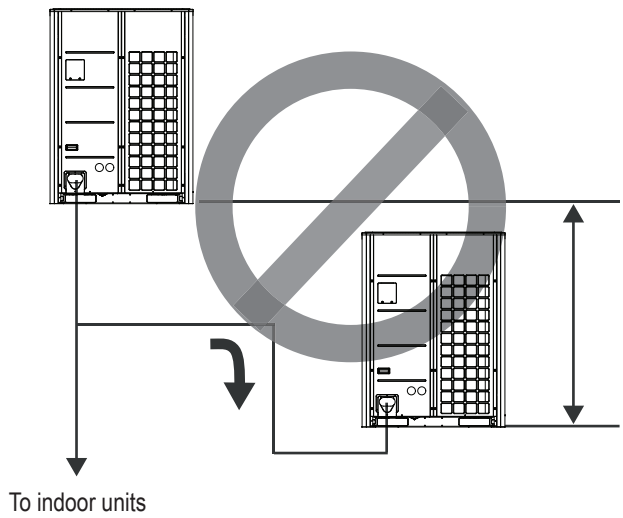
Height Differential for Separated Outdoor Units

Maximum allowable height differential (h) between two outdoor units is 16.4 feet.





Example of an Incorrect Height Differential



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PLACEMENT CONSIDERATIONS

Selecting the Best Location for the Outdoor Unit(s)

Selecting the Best Location for the Outdoor Unit(s)

⚠ DANGER

- ⃠ *Do not install the unit in an area where combustible gas may generate, flow, stagnate, or leak. These conditions can cause a fire, resulting in bodily injury or death.*
- ⃠ *Do not install the unit in a location where acidic solution and spray (sulfur) are often used as it can cause bodily injury or death.*
- ⃠ *Do not use the unit in environments where oil, steam, or sulfuric gas are present as it can cause bodily injury or death.*

⚠ CAUTION

When deciding on a location to place the outdoor unit, be sure to choose an area where run-off from defrost will not accumulate and freeze on sidewalks or driveways, which may create unsafe conditions. Properly install and insulate any drain hoses to prevent the hose from freezing, cracking, leaking, and causing unsafe conditions from frozen condensate.

⚠ WARNING

Install a fence to prevent vermin from crawling into the unit or unauthorized individuals from accessing it.

Select a location for installing the outdoor unit that will meet the following conditions:

- Where there is enough strength to bear the weight of the outdoor unit.
- A location that allows for optimum air flow and is easily accessible for inspection, maintenance, and service.
- Where piping between the outdoor unit and indoor unit(s) / heat recovery units are within allowable limits.
- Include space for drainage to ensure condensate flows properly out of the unit when it is in heating mode. Avoid placing the outdoor unit in a low-lying area where water could accumulate.
- If the outdoor unit is installed in a highly humid environment (near an ocean, lake, etc.), ensure that the site is well-ventilated and has a lot of natural light (Example: Install on a rooftop).

⃠ Don'ts

- *Where it will be subjected to direct thermal radiation from other heat sources, or an area that would expose the outdoor unit to heat or steam like discharge from boiler stacks, chimneys, steam relief ports, other air conditioning units, kitchen vents, plumbing vents, and other sources of extreme temperatures.*
- *Where high-frequency electrical noise / electromagnetic waves will not affect operation.*
- *Where operating sound from the unit will disturb inhabitants of surrounding buildings.*
- *Where the unit will be exposed to direct, strong winds.*
- *Where the discharge of one outdoor unit will blow into the inlet side of an adjacent unit (when installing multiple outdoor units).*

Planning for Snow and Ice

To ensure the outdoor unit operates properly, certain measures are required in locations where there is a possibility of heavy snowfall or severe windchill or cold:

1. Prepare for severe winter wind chills and heavy snowfall, even in areas of the country where these are unusual phenomena.
2. Position the outdoor unit so that its airflow fans are not buried by direct, heavy snowfall. If snow piles up and blocks the airflow, the system may malfunction.
3. Remove any snow that has accumulated four (4) inches or more on the top of the outdoor unit.
4. In climates that may experience significant snow buildup, mount the outdoor unit on a raised, field-provided platform or stand. The raised support platform must be high enough to allow the unit to remain above possible snow drifts, and must be higher than the maximum anticipated snowfall for the location.
5. Design the mounting base to prevent snow accumulation on the platform in front or back of the unit frame.
6. Provide a field fabricated snow protection hood to keep snow and ice and/or drifting snow from accumulating on the coil surfaces.
7. Install a hail guard kit and air guide accessories (sold separately) to prevent snow or rain from accumulating on the fan inlet / outlet guards.
8. Consider tie-down requirements in case of high winds or where required by local codes.

⚠ CAUTION

When deciding on a location to place the outdoor unit, be sure to choose an area where run-off from defrost will not accumulate and freeze on sidewalks or driveways, which may create unsafe conditions. Properly install and insulate any drain hoses to prevent the hose from freezing, cracking, leaking, and causing unsafe conditions from frozen condensate.

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PLACEMENT CONSIDERATIONS

Selecting the Best Location for the Outdoor Unit(s)

Planning for Snow and Ice, continued.

⚠NOTE

Choose an area where run-off from defrost mode will not accumulate and freeze on sidewalks or driveways. Properly install and insulate any drain hoses to prevent the hose from freezing, cracking, leaking, and damaging the outdoor unit.

Note:

The system may take longer to provide heat, or heating performance will be reduced in winter if the outdoor unit is installed:

1. *In a narrow, shady location.*
2. *Near a location that has a lot of ground moisture.*
3. *In a highly humid environment.*
4. *In an area in which condensate does not drain properly.*

Tie-Downs and Wind Restraints

The strength of Multi V frames is adequate to be used with field-provided wind restraint tie-downs. The overall tie-down configuration must be approved by a local professional engineer. Always refer to local code when designing a wind restraint system.

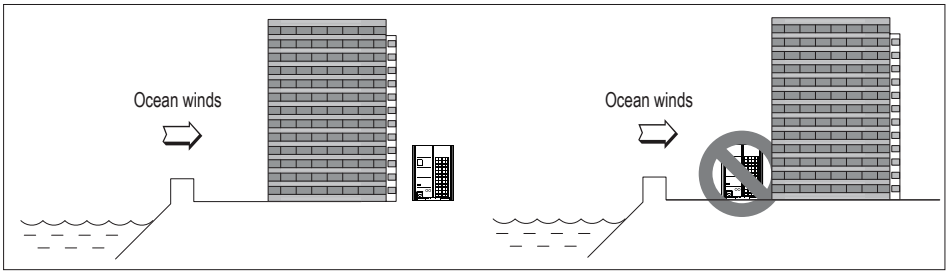
Oceanside Installation Precautions

⚠NOTE

Ocean winds may cause corrosion, particularly on the condenser and evaporator fins, which, in turn could cause product malfunction or inefficient performance.

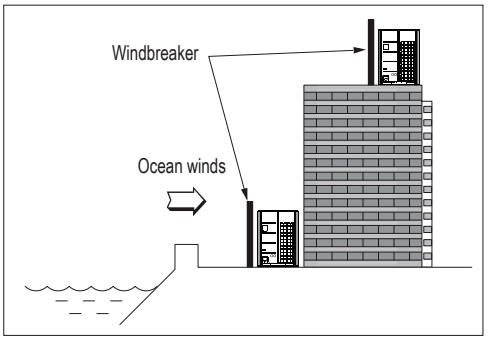
- Avoid installing the outdoor unit where it would be directly exposed to ocean winds.
- Install the outdoor unit on the side of the building opposite from direct ocean winds.
- Select a location with good drainage.
- Periodically clean dust or salt particles off of the heat exchanger with water.

If the outdoor unit must be placed in a location where it would be subjected to direct ocean winds, install a concrete windbreaker strong enough to block any winds. Windbreaker height and width must be more than 150% of the outdoor unit, and be installed at least 27-1/2 inches away from the outdoor unit to allow for airflow.



Note:

Additional anti-corrosion treatment may need to be applied to the outdoor unit at oceanside locations.



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PLACEMENT CONSIDERATIONS

Outdoor Unit Clearance Requirements

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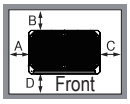
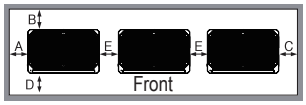
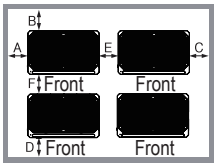
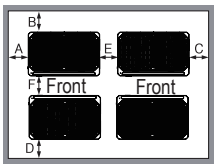
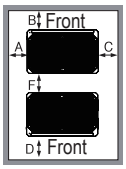
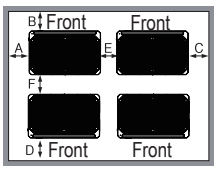
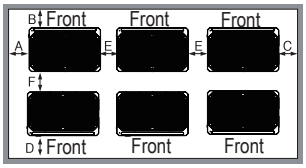
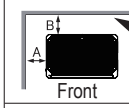
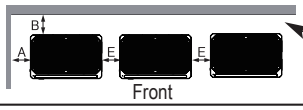
Outdoor Unit Installation Space

Proper airflow through the outdoor unit coil is critical for proper unit operation. When installing the outdoor unit, consider service, inlet, and outlet, and minimum allowable space requirements as illustrated in the diagrams below.

Description	Installation Area	Example No. 1 A and C ≥ 1"	Example No. 2 A and C ≥ 2"
Unit(s) is (are) Enclosed by Four (4) Walls		A ≥ 1" B ≥ 12" C ≥ 1" D ≥ 20"	A ≥ 2" B ≥ 4" C ≥ 2" D ≥ 20"
		A ≥ 1" B ≥ 12" C ≥ 1" D ≥ 20" E ≥ 1"	A ≥ 2" B ≥ 4" C ≥ 2" D ≥ 20" E ≥ 4"
		A ≥ 1" B ≥ 20" C ≥ 1" D ≥ 20" E ≥ 1" F ≥ 36"	A ≥ 2" B ≥ 4" C ≥ 2" D ≥ 20" E ≥ 4" F ≥ 20"
		A ≥ 1" B ≥ 12" C ≥ 1" D ≥ 12" E ≥ 1" F ≥ 20"	A ≥ 2" B ≥ 4" C ≥ 2" D ≥ 4" E ≥ 4" F ≥ 20"
Unit(s) is (are) Facing Away From Each Other (To the Rear)		A ≥ 1" B ≥ 20" C ≥ 1" D ≥ 20" F ≥ 36"	A ≥ 2" B ≥ 20" C ≥ 2" D ≥ 20" F ≥ 24"
		A ≥ 1" B ≥ 20" C ≥ 1" D ≥ 20" E ≥ 1" F ≥ 48"	A ≥ 2" B ≥ 20" C ≥ 2" D ≥ 20" E ≥ 4" F ≥ 36"
		A ≥ 1" B ≥ 20" C ≥ 1" D ≥ 20" E ≥ 1" F ≥ 71"	A ≥ 2" B ≥ 20" C ≥ 2" D ≥ 20" E ≥ 4" F ≥ 48"
Two (2) Sides Are Enclosed By Walls		A ≥ 1" B ≥ 12"	
		A ≥ 8" B ≥ 12" E ≥ 16"	

Note:

Different clearances are required if a Low Ambient Cooling Kit is installed. Refer to the Low Ambient Cooling Kit Installation Manual for clearance information.

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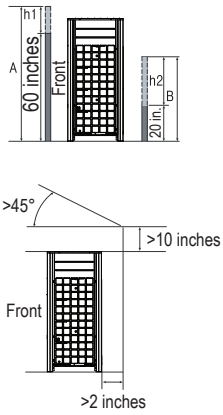
Outdoor Unit Installation Space, continued.

Wall Height Limitations (When the Unit[s] is [are] Surrounded by Four [4] Walls)	 	• Wall height at the front of the outdoor unit must be ≤60 inches. • Wall height at the inlet side of the outdoor unit must be ≤20 inches. • There are no height limitations for the walls at the sides of the outdoor unit. • If the wall heights at the front and inlet sides of the outdoor unit are higher than allowable limits, additional space must be included. - Additional space on the FRONT side by 1/2 of h1. - Additional space on the INLET side by 1/2 of h2. - h1 = A (the actual height) - 60. - h2 = B (the actual height) - 20.

Installing Outdoor Units Indoors

LG Multi V outdoor units are engineered to be mounted outdoors and include technology designed to minimize the negative effects of winter weather's freezing rain, sleet, and snow. Some building projects, however, necessitate placing the HVAC outdoor units indoors:

- Lack of ground space.
- Lack of an appropriate outdoor location that meets system design requirements.
- When mounting on the roof is not an option due to a lack of roof space.
- Roof warranty will be voided if mechanical equipment is placed on the membrane.
- On retrofit projects, a former chiller/boiler/air handler equipment room, mechanical area, or penthouse already exists.
- Where a project has vertical, self-contained VAV air handlers on each floor (in lieu of a centralized mechanical room).
- To curtail the potential need for redundant zone heating devices such as wall-fin radiators or duct heaters.
- In extremely cold environments where there is a significant amount of run-time at temperatures well below freezing outside the outdoor unit ambient air temperature range published in this engineering manual.

Benefits of Installing Outdoor Units Indoors

- Shelters the outdoor unit from direct exposure to prevailing winds that decrease the heating capability of the outdoor unit.
- Protects equipment from freezing precipitation and/or potential ice build-up that could hinder unit operation.
- Maintains coil heat transfer efficiency by reducing the number of and shortening the cycle time for defrost operation.
- Easier maintenance and servicing during inclement weather.
- When mounted in a fully enclosed space, limiting the ambient air temperature may allow the Multi V system designer to eliminate oversizing the outdoor unit to compensate for loss of capacity at low ambient temperatures.
- May also curtail the need to provide inefficient redundant zone heating devices such as wall-fin radiators and second-stage ancillary heating devices.

Design Considerations Include:

- Enclosure types and elements such as louvers, rain hoods, dampers and controls, heating methods and sizing of heating devices
- Heating strategies
- Duct design
- Condensate handling

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PLACEMENT CONSIDERATIONS

Installing Outdoor Units Indoors

General Guidelines

- Follow ASHRAE 62.1 design guidelines.
- Depending on the project / application, a roof over the outdoor units in combination with a wind break may be all that is necessary.
- Consider the potential for snow accumulation near louvers/roof openings. Outside air intakes and discharge ducts/louvers must be engineered to clear anticipated snow accumulation levels by at least one (1) foot.
- In situations where operation is anticipated at temperatures of -13°F and lower, ancillary heat must be provided to heat the outdoor unit coils to assure continuous compressor operation and heating.

It may be necessary to use an air guide accessory to prevent discharge air from short-cycling back to the coil inlet.

- Another option is to field manufacture ductwork and mount on top of the unit to encompass the outdoor unit fan discharge and connect to the exterior discharge grille on the building.
- Avoid using a single duct on multi-fan units to prevent short cycling. Provide a dedicated duct for each outdoor unit fan discharge.
- Consider the direction of prevailing winds and opening placement. If possible, locate inlet openings upwind of discharge openings and other exhaust outlets.
- When inlet and outlet openings are placed on the same wall, minimum distance between the two openings must be approximately three (3) feet (minimum distance varies significantly with variations in outlet opening face velocity).
- If roof-mounted ventilation openings are used, strategically locate the inlet ventilation opening(s) upwind of the outlet opening(s).
- Discharge and supply ductwork must be designed to avoid weather related long periods of water entrainment.

Provide a means to drain the condensate generated during heating mode and defrost cycle in addition to rainwater that infiltrates the inlet louver enclosed area.

- Install a field-provided drain pan under the outdoor units and provide a path to a nearby floor drain.
- If the ambient air temperature is expected to drop below 32°F in the enclosure, heat the bottom surface of the pan, drain line, and floor drain so that the condensate does not freeze before reaching the drain.

Allow for ventilation intake and exhaust air based on maximum outdoor unit fan capacity.

- Select the size, type and orientation of architectural louvers with adequate “net free area” face velocity to ensure the total external static pressure from the outdoor unit fan does not exceed design limitations.
- No obstructions must be placed in front of the louver that could hamper the free flow (throw) of air.
- Roof top openings and / or discharge and supply louvers must be equipped with screens to prevent bird and insect infiltration.

As always, the best solution for each project balances acceptable heating performance (considering local weather conditions), capital costs, life cycle energy consumption, and limitations set forth by local building codes. For more detailed information on how to design indoor spaces for LG Multi V outdoor units, see the white paper “Air-Source VRF Mechanical Room Design Considerations for Outdoor Unit Placement in Enclosures” on www.lghvac.com..

Note:

For detailed placement considerations and installation requirements for indoor units, refer to its Indoor Unit Engineering and / or Installation Manuals.

Note:

For placement considerations for Heat Recovery Units, refer to the applicable Engineering Manual on www.lghvac.com.

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Selecting the Best Location / Clearance Requirements

Note:

Heat recovery units are for use with systems designed for heat recovery operation only.

Select an installation space for the heat recovery unit that meets the following conditions:

- Install the heat recovery unit indoors in a level and upright position.
- Ensure there is enough space in the installation area for service access.
- Install the heat recovery unit in a location where any sound it may generate will not disturb occupants in the surrounding rooms.
- Install the refrigerant piping and electrical wiring system in an easily accessible location.

Dont's

- *Refrigerant pipes must not exceed lengths specified by LG Electronics.*
- *Do not install the heat recovery unit in a location where it would be subjected to strong radiation heat from heat sources.*
- *Avoid an installation environment where oil splattering or vapor spray may occur.*
- *Avoid an installation environment where high-frequency electric noise could occur.*
- *Condensate drain piping is not required.*

Figure 45: PRHR023A to 043A Clearance Requirements.

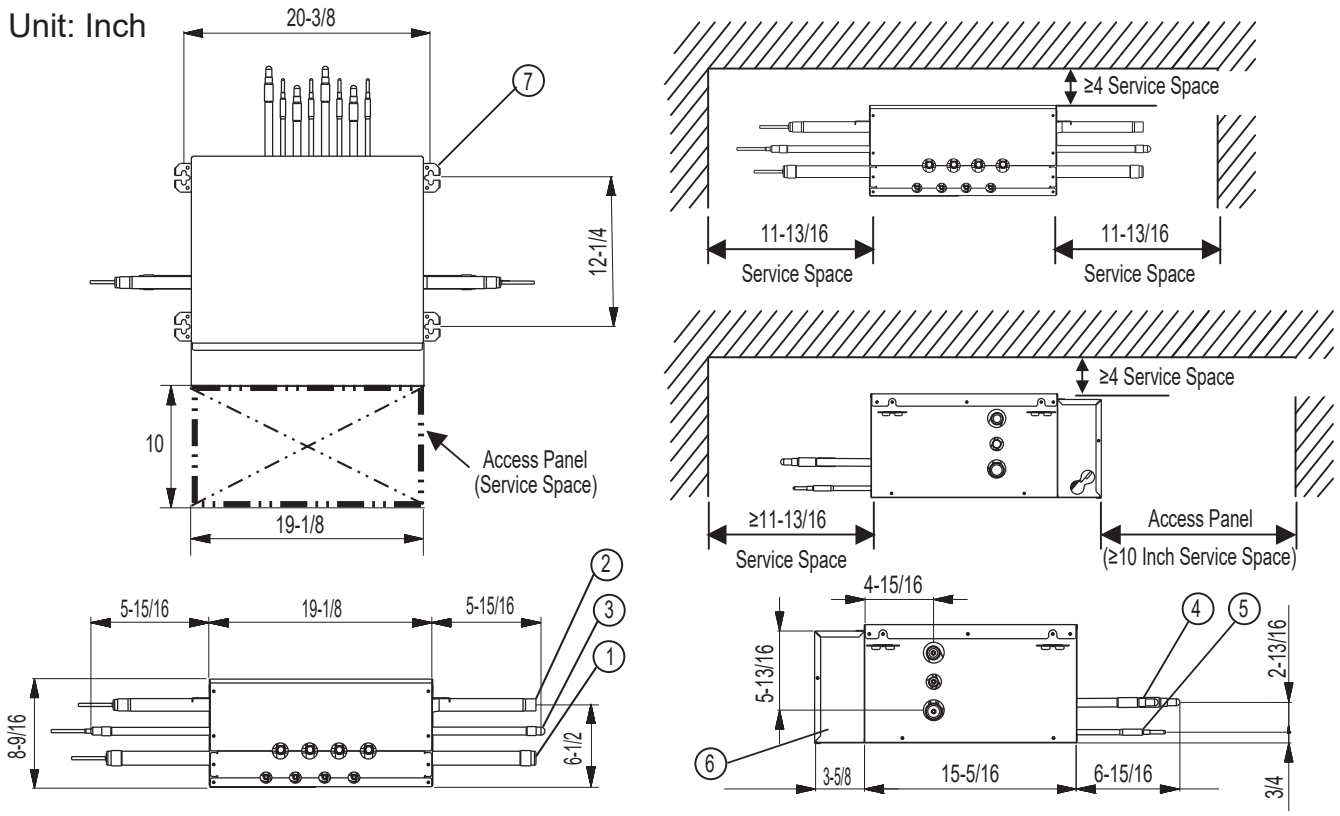

Table 35: PRHR023A to 043A Heat Recovery Unit Components.

No.	Component Name	Connection Size (in.) / Type		
		PRHR023A	PRHR033A	PRHR043A
1	Low Pressure Vapor Pipe Connection Port	7/8 Braze	1-1/8 Braze	1-1/8 Braze
2	High Pressure Vapor Pipe Connection Port	3/4 Braze	7/8 Braze	7/8 Braze
3	Liquid Pipe Connection Port	3/8 Braze	1/2 Braze	5/8 Braze
4	Indoor Unit Vapor Pipe Connection Port	5/8 Braze	5/8 Braze	5/8 Braze
5	Indoor Unit Liquid Pipe Connection Port	3/8 Braze	3/8 Braze	3/8 Braze
6	Control Box	–	–	–
7	Metal Hanger Bracket (Field-Supplied Suspension Bolt)	5/16 or 7/16	5/16 or 7/16	5/16 or 7/16

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PLACEMENT CONSIDERATIONS

Selecting the Best Location for the Heat Recovery Unit(s)

Selecting the Best Location / Clearance Requirements, Continued.

Figure 47: PRHR063A and PRHR083A Clearance Requirements.

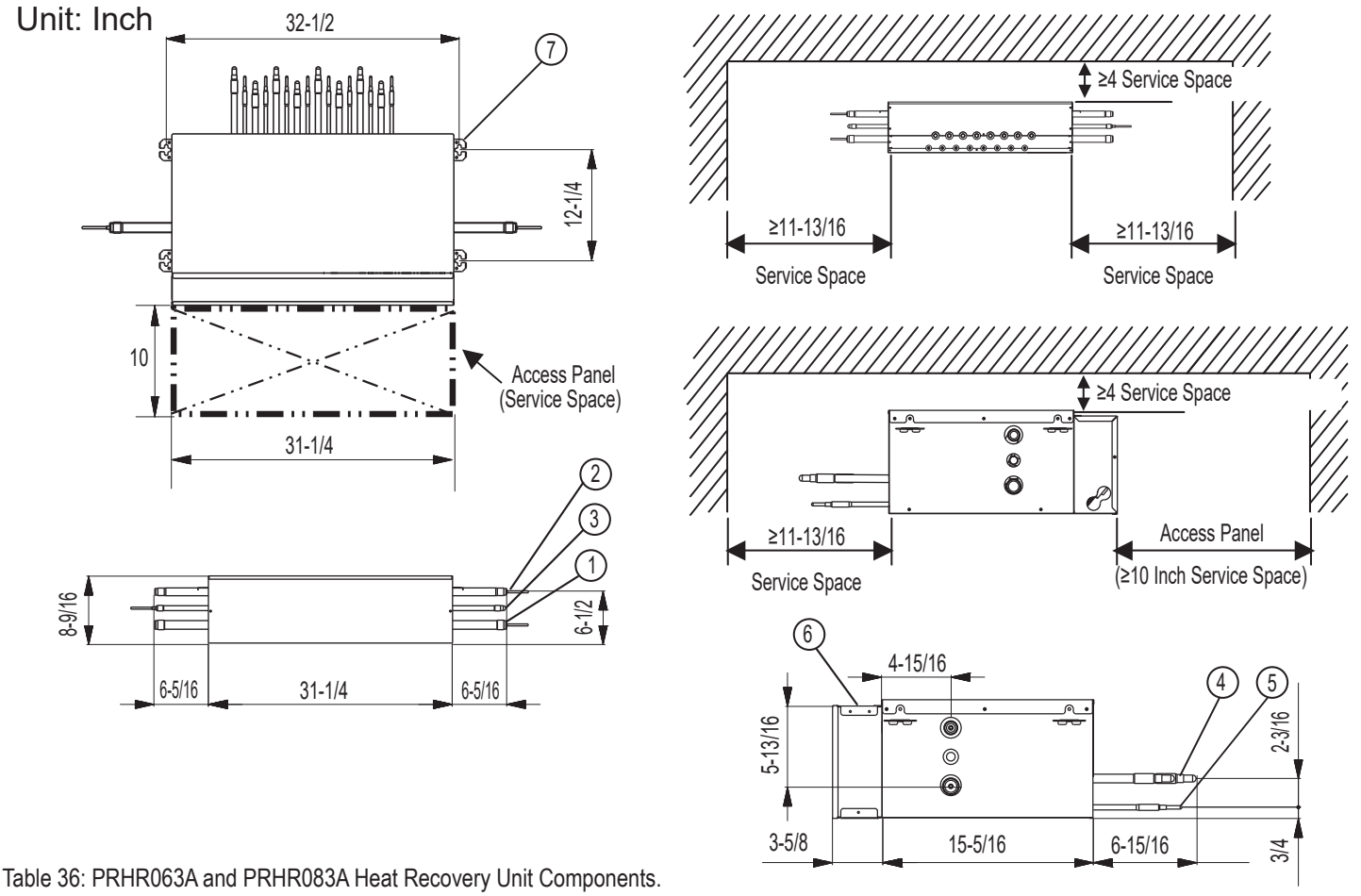
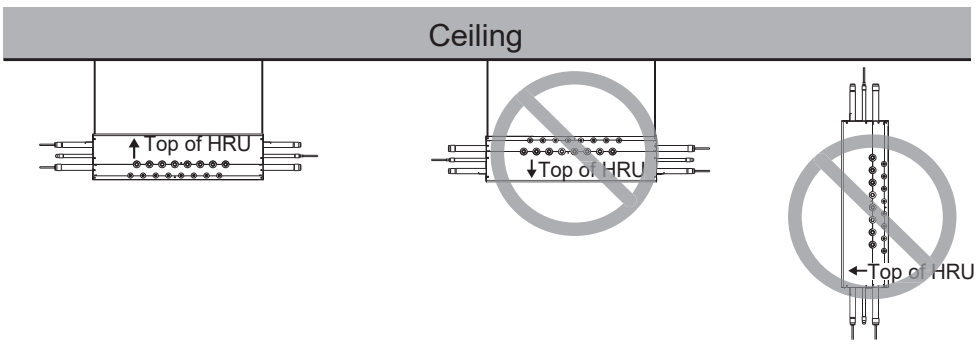


Table 36: PRHR063A and PRHR083A Heat Recovery Unit Components.

No.	Component Name	Connection Size (in.)/ Type	
		PRHR063A	PRHR083A
1	Low Pressure Vapor Pipe Connection Port	1-1/8 Braze	1-1/8 Braze
2	High Pressure Vapor Pipe Connection Port	7/8 Braze	7/8 Braze
3	Liquid Pipe Connection Port	5/8 Braze	5/8 Braze
4	Indoor Unit Vapor Pipe Connection Port	5/8 Braze	5/8 Braze
5	Indoor Unit Liquid Pipe Connection Port	3/8 Braze	3/8 Braze
6	Control Box	–	–
7	Metal Hanger Bracket (Field-Supplied Suspension Bolt)	5/16 or 7/16	5/16 or 7/16

Figure 46: Installing the Heat Recovery Unit Top Side Up.



Note:

- *Include an access panel at the side of the heat recovery unit where the control box is located.*
- *If reducers are used, service space must be increased equal to the dimensions of the reducer.*

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To access additional technical documentation such as submittals, indoor unit engineering manuals, installation, service, product data performance, general best practice, and building ventilation manuals, as well as white papers, catalogs, LATS software programs, and more, visit www.lghvac.com.

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Supersedes: EM_MultiV5_LGRED_OutdoorUnits_01_24
EM_MultiV5_LGRED_OutdoorUnits_04_19
EM_MultiV5_LGRED_OutdoorUnits_03_19
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