R32

MULTI V™ i

OUTDOOR UNIT ENGINEERING MANUAL



Variable Refrigerant Flow Outdoor Units
6.0 to 44.0 Tons

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A summary list of safety precautions is on page 4.

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TABLE OF SYMBOLS

	*Indicates that this appliance uses a flammable refrigerant. If the refrigerant leaks and exposed to an external ignition source, there is a risk of fire.*
⚠ DANGER	*Indicates a hazardous situation that, if not avoided, WILL RESULT IN DEATH OR SERIOUS INJURY.[1]*
⚠ WARNING	*Indicates a hazardous situation that, if not avoided, COULD RESULT IN DEATH OR SERIOUS INJURY.[1]*
⚠ CAUTION	*Indicates a hazardous situation that, if not avoided, COULD RESULT IN MINOR OR MODERATE INJURY.[1]*
NOTICE	*Indicates information considered important, but not hazard-related; indicates situations that may result in equipment or property damage accidents.[1]*
	*This symbol indicates an action that should not be performed.*

[1]Signal words, symbols, and definitions taken from American National Standards Institute (ANSI) Z535.6. See https://www.ansi.org/ for more information.



R32 Refrigerant

LG Electronic split system heating and air conditioning (HVAC) products now contain R32 refrigerant. While R32 refrigerant is slightly flammable, it has a higher efficiency, a lower Global Warming Potential (GWP) value, and is more environmentally friendly than R410A.
R32 Ozone Depletion Potential (ODP) Value: 0.
R32 Global Warming Potential (GWP) Value: 675.

The amount of refrigerant depends on outdoor unit to indoor unit configuration. All refrigerant piping system components (copper piping, joints, and other fittings) must be selected and installed to conform with Refrigeration Safety Regulation standards. Use LG Air Conditioner Technical Solution (LATS) Software to verify the refrigerant amount needed for each installation.

⚠ WARNING

- *This HVAC system contains fluorinated greenhouse gases in the form of R32 refrigerant. ⃠ Do not leak refrigerant gas into the atmosphere.*
- *Only use R32 as the refrigerant in these HVAC systems. If other substances are added, it may cause an explosion.*
- *R32 refrigerant is slightly flammable. When handled properly, it does not leak. If the refrigerant leaks in the installation area and comes in contact with a flame, it may generate a fire and / or harmful gas.*
- *If a leak occurs, immediately turn off any combustion devices, ventilate the installation area, and contact the dealer / contractor where the HVAC unit was purchased. ⃠ Do not operate the unit until the refrigerant leaked is repaired.*

⚠ CAUTION

- *Piping wall thickness must comply with all applicable local, state, and federal regulations for the design pressures listed by the manufacturer. ⃠ Unapproved piping must not be used.*
- *To prevent piping from softening, ⃠ do not heat the piping more than necessary.*

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Outdoor Units (ODU)

ZRU	M	072	B	T	6	E

Family
ZRU = Multi V VRF Outdoor Unit (Refrigerant R32)

Type
M = Combination (Heat Pump / 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 / 265 = 264	384 = 384	504 = 504
168 = 168	288 = 288	408 = 408	528= 528

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

Airflow Configuration
T = Top Discharge

Efficiency
E = High Efficiency

Generation
6 = Sixth

Heat Recovery Units (HRU)

PRHR	02	4	C

Family
Multi V R32 Heat Recovery Unit (HRU)

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

Series Number:
4, 5

Type
1Ø, 208/230V, 60Hz
C = Includes Shutoff Valve

Shutoff Valve Units (SVU)

PRHPZ	02	0	A

Family
Multi V R32 Shutoff Valve Unit (SVU)

Number of Ports
01 = One Port
02 = Two Ports
03 = Three Ports
04 = Four Ports

Series Number

Type
1Ø, 208/230V, 60Hz

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LG AIR CONDITIONER TECHNICAL SOLUTION (LATS)

MULTI V™ i

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. Contact your LG Rep for the best software program for your application.

NOTICE

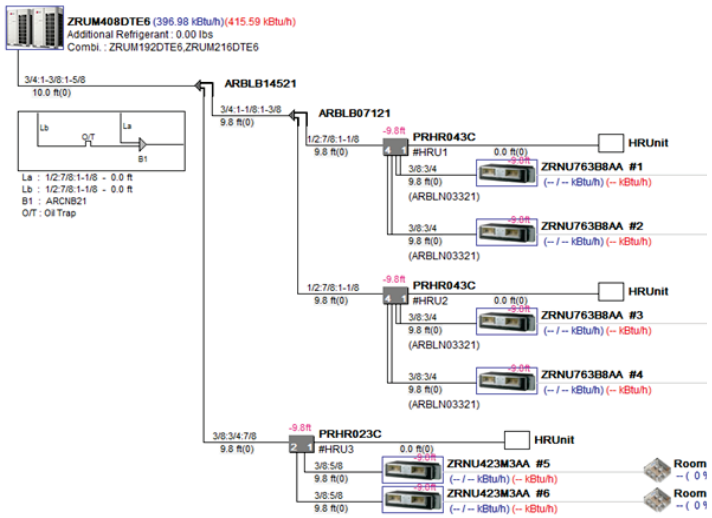
To reduce the risk of designing an improper applied system or one that will not operate correctly, LG requires that LATS software be used on all projects.

Formats

LATS is available to LG customers in two user interfaces: LATS HVAC and LATS Revit. Both 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, DOAS, and Energy Recovery Ventilator (ERV) systems.
**Windows® is a registered mark of Microsoft® Corporation.*

Figure 1: LATS Example (Tree Diagram; Illustrative Purposes Only. System will Vary Depending On Model).



LATS Revit integrates the LG LATS program with Revit® software**. It permits engineers to layout and validate LG VRF, Multi F / Multi F MAX, Single-Zone, and DOAS 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:

- 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.

NOTICE

Features depend on which LATS program is being used, and the type of system being designed. Contact your LG representative for the best software program for your application.

NOTICE

Any field changes, such as re-routing, shortening or lengthening a pipe segment, adding or eliminating elbows and/or fittings, re-sizing, adding, or eliminating indoor units, changing the mounting height, or moving the location of a device or fitting during installation must be done with caution and ALWAYS VERIFIED in LATS SOFTWARE BEFORE supplies are purchased or installed. Doing so will lead to a more profitable installation, reduce the potential for rework, and will reduce the potential for multiple visits to the job site to complete the system set up.

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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 be 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.).

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 if Y-Branches will also need to be changed.
- Changes to outdoor unit and indoor unit capacities. Capacities changes will 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.

NOTICE

Features depend on which LATS program is being used, and the type of system being designed. Contact your LG representative for the best software program for your application.

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REFRIGERANT CHARGE WORKSHEET

MULTI V i

Multi V i System R32 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]		—	—		0.013	
2	Linear feet of 3/8" liquid line tubing[2]		—	—		0.036	
3	Linear feet of 1/2" liquid line tubing[2]		—	—		0.069	
4	Linear feet of 5/8" liquid line tubing[2]		—	—		0.103	
5	Linear feet of 3/4" liquid line tubing[2]		—	—		0.158	
6	Linear feet of 7/8" liquid line tubing[2]		—	—		0.210	
7	Linear feet of 1" liquid line tubing[2]		—	—		0.284	
8	Standard + Art Cool Mirror		SJ	5k to 15k		0.44	
9	Standard + Art Cool Mirror		SK	18k to 24k		0.51	
10	Standard		SR	30k to 36k		1.08	
11	1-Way Cassette		TC	7k to 18k		0.42	
12	2-Way Cassette		TS	18k to 24k		0.62	
13	4-Way 2' x 2' Cassette		TR	5k to 7k		0.33	
14	4-Way 2' x 2' Cassette		TR	9k to 12k		0.46	
15	4-Way 2' x 2' Cassette		TQ	15k to 18k		0.57	
16	4-Way 3' x 3' Cassette		TA	7k to 48k		1.23	
17	4-Way 3' x 3' Cassette		TB	7k to 15k		0.57	
18	High Static Ducted		M2	7k to 24k		0.64	
19	High Static Ducted		M3	28k		1.10	
20	High Static Ducted		B8	36k to 96k		1.83	
21	Mid Static Ducted		M2	36k to 42k		0.95	
22	Mid Static Ducted		M3	48k		1.10	
23	Low Static Ducted, Low Static Ducted Bottom Return		L1	7k to 9k		0.26	
24	Low Static Ducted, Low Static Ducted Bottom Return		L2	12k to 18k		0.37	
25	Low Static Ducted, Low Static Ducted Bottom Return		L3	24k		0.49	
26	Vertical / Horizontal Air Handling Unit		NA	12k to 24k		0.86	
27	Vertical / Horizontal Air Handling Unit		NB	30k to 48k		1.68	
28	Vertical / Horizontal Air Handling Unit		NC	54k to 60k		1.68	
29	Floor Standing		CE (U)	7k to 15k		0.31	
30	Floor Standing		CF (U)	18k to 24k		0.68	
31	Ceiling Suspended		VM1	18k to 24k		0.44	
32	Ceiling Suspended		VM2	36k to 48k		0.66	
33	Heat Recovery Units (HRU): PRHR024C, 034C, 044C		—	—		1.0	
34	Heat Recovery Units (HRU): PRHR065C, 085C		—	—		2.0	
35	**ADDITIONAL Refrigerant Charge Required** (Sum of lines 1 – 34						
36	Outdoor Unit Factory Refrigerant Charge (lbs.)	36A	ZRUM072*TE6	72k		16.53	
		36B	ZRUM096*TE6	96k		20.94	
		36C	ZRUM121*TE6	121k		20.94	
		36D	ZRUM144*TE6	144k		26.46	
		36E	ZRUM168*TE6	168k		26.46	
		36F	ZRUM192*TE6	192k		30.86	
		36G	ZRUM216*TE6	216k		37.48	
		36H	ZRUM241*TE6	241k		37.48	
		36I	ZRUM264*TE6	264K		37.48	
37	**Total FACTORY Outdoor Unit (ODU) Refrigerant Charge** (Sum of factory refrigerant charges for all ODUs in the system)						
38	**TOTAL SYSTEM CHARGE** Sum of ADDITIONAL Refrigerant Charge Required (line 35) and Total FACTORY ODU Refrigerant Charge (line 37)						

[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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OUTDOOR UNIT PRODUCT DATA

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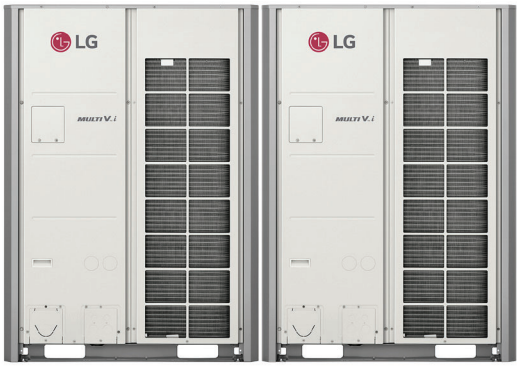
Multi V i Outdoor Units

General

LG Multi V i 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.

Figure 2: Multi V i Dual UXB + UXB Frame Outdoor Unit.



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 125.6°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 i 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 125.6°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.

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 R32 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 is included on all compressors.

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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™ and hydrophilic coating.

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.

AI Engine Features

- AI Smart Care
- AI Indoor Space Care
- AI Smart Metering
- AI Energy Management
- AI Smart Diagnosis
- Sound Level Adaptive Control
- Weather Information Interlocking

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.

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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.

Refrigerant Leak Detection
Indoor units contain an R32 refrigerant leak sensor. The sensors are designed to control optional refrigerant piping shutoff valves if a leak is detected. Shutoff valve units are available as a separate LG accessory or included as components in LG Heat Recovery Unit accessories. The sensor can enable four individual controller displayed error codes for leak detection (CH230), sensor fault (CH228), 6 months life remaining (CH236) and end of life (CH229).

Table 1: Indoor Unit Refrigerant Leak Sensor Specifications.

Item	Specification
Refrigerant	R32
Detection Concentration	5,000 ppm
Power Supply	DC 5V
Operating Temperature	-25 to +140°F
Lifetime	10 years

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

Unit Model Number / Tons		ZRUM072BTE6 6.0 Ton	ZRUM096BTE6 8.0 Ton	ZRUM121BTE6 10.0 Ton	ZRUM144BTE6 12.0 Ton	ZRUM168BTE6 14.0 Ton
Individual Frame Model Numbers		-	-	-	-	
Frame Size		**UXA**	**UXB**	**UXB**	**UXB**	**UXB**
Cooling Performance						
Nominal Cooling Capacity (Btu/h)[1]		72,000	96,000	119,700	144,000	168,000
Rated Cooling Capacity (Btu/h)[1]		69,000	92,000	114,000	138,000	160,000
Heating Performance						
Nominal Heating Capacity (Btu/h)[1]		81,000	108,000	135,000	162,000	189,000
Rated Heating Capacity (Btu/h)[1]		77,000	103,000	129,000	152,000	180,000
Operating Range						
Cooling (°F DB)		5 to 125.6	5 to 125.6	14 to 125.6	5 to 125.6	5 to 125.6
Heating (°F WB)		-22 to +61	-22 to +61	-22 to +61	-22 to +61	-22 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	HSS DC Scroll x 2
Oil/Type		FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)
Fan (Top Discharge)						
Type		Propeller	Propeller	Propeller	Propeller	Propeller
Motor Output (kW) x Qty.		1.5 x 1	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 - 950	0 - 1,150	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 950	80 - 1,150	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		7,770	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	0.16 - 0.32
Unit Data						
Refrigerant Type		R32	R32	R32	R32	R32
Refrigerant Control/Location		EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit
Factory Charge lbs. of R32		16.53	20.94	20.94	26.46	26.46
Max. No. Indoor Units/System[2]		13	16	20	24	29
Sound Pressure dB(A)[3]		59.0	60.0	60.0	61.0	61.0
Net Unit Weight (lbs.)		469	551	551	653	653
Shipping Weight (lbs.)		496	584	584	687	687
Communication Cable[4,5]		2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger						
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Coated Fin™ / Hydrophilic				
Rows/Fins per inch		3/17	3/17	3/17	3/17	3/17
Piping for Heat Recovery Operation[6]						
Liquid Line Connection (in., OD)		3/8 Braze	3/8 Braze	1/2 Braze	1/2 Braze	1/2 Braze
Low Pressure Vapor Line Connection (in., OD)		3/4 Braze	3/4 Braze	7/8 Braze	7/8 Braze	7/8 Braze
High Pressure Vapor Line Connection (in., OD)		5/8 Braze	5/8 Braze	3/4 Braze	3/4 Braze	3/4 Braze
Piping for Heat Pump Operation[6]						
Liquid Line Connection (in., OD)		3/8 Braze	3/8 Braze	1/2 Braze	1/2 Braze	1/2 Braze
Vapor Line Connection (in., OD)		3/4 Braze	3/4 Braze	7/8 Braze	7/8 Braze	7/8 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]The System Combination Ratio must be between 50–130%.

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

[4]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.

[5]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.

[6]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

MULTI V™ i

208-230V Outdoor Unit Specifications

Table 3: Single Frame 208-230V Outdoor Units., continued.

Unit Model Number / Tons		ZRUM192BTE6 16.0 Ton	ZRUM216BTE6 18.0 Ton	ZRUM241BTE6 20.0 Ton	ZRUM264BTE6 22.0 Ton
Individual Frame Model Numbers		-	-	-	-
Frame Size		**UXB**	**UXC**	**UXC**	**UXC**
Cooling Performance					
Nominal Cooling Capacity (Btu/h)[1]		192,000	216,000	233,100	264,000
Rated Cooling Capacity (Btu/h)[1]		184,000	206,000	222,000	252,000
Heating Performance					
Nominal Heating Capacity (Btu/h)[1]		216,000	243,000	270,000	270,000
Rated Heating Capacity (Btu/h)[1]		206,000	230,000	256,000	256,000
Operating Range					
Cooling (°F DB)		5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6
Heating (°F WB)		-22 to +61	-22 to +61	-22 to +61	-22 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		FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)
Fan (Top Discharge)					
Type		Propeller	Propeller	Propeller	Propeller
Motor Output (kW) x Qty.		0.9 x 2	1.5 x 2	1.5 x 2	1.5 x 2
Motor/Drive		Brushless Digitally Controlled / Direct			
Operating Range (RPM)	Cooling	0 - 1,150	0 - 940	0 - 940	0 - 940
	Heating	80 - 1,150	80 - 940	80 - 940	80 - 940
Maximum Air Volume (CFM)		11,300	14,000	14,000	14,000
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		R32	R32	R32	R32
Refrigerant Control/Location		EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit
Factory Charge lbs. of R32		30.86	37.48	37.48	37.48
Max. No. Indoor Units/System[2]		32	35	39	42
Sound Pressure dB(A)[3]		62.0	64.0	65.0	65.0
Net Unit Weight (lbs.)		656	787	787	787
Shipping Weight (lbs.)		692	820	820	820
Communication Cable[4,5]		2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger					
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Coated Fin™ / Hydrophilic			
Rows/Fins per inch		3/17	3/17	3/17	3/17
Piping for Heat Recovery Operation[6]					
Liquid Line Connection (in., OD)		1/2 Braze	1/2 Braze	1/2 Braze	5/8 Braze
Low Pressure Vapor Line Connection (in., OD)		1-1/8 Braze	1-1/8 Braze	1-1/8 Braze	1-1/8 Braze
High Pressure Vapor Line Connection (in., OD)		7/8 Braze	7/8 Braze	7/8 Braze	7/8 Braze
Piping for Heat Pump Operation[6]					
Liquid Line Connection (in., OD)		1/2 Braze	1/2 Braze	1/2 Braze	5/8 Braze
Vapor Line Connection (in., OD)		1-1/8 Braze	1-1/8 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]The System Combination Ratio must be between 50–130%.

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

[4]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.

[5]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.

[6]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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Table 4: Dual Frame 208-230V Outdoor Units.

Unit Model Number / Tons		ZRUM265BTE6 22.0 Ton	ZRUM288BTE6 24.0 Ton	ZRUM312BTE6 26.0 Ton	ZRUM336BTE6 28.0 Ton	ZRUM360BTE6 30.0 Ton
Individual Frame Model Numbers		**ZRUM144BTE6 + ZRUM121BTE6**	**ZRUM144BTE6 + ZRUM144BTE6**	**ZRUM168BTE6 + ZRUM144BTE6**	**ZRUM192BTE6 + ZRUM144BTE6**	**ZRUM216BTE6 + ZRUM144BTE6**
Frame Size(s)		**UXB + UXB**	**UXB + UXB**	**UXB + UXB**	**UXB + UXB**	**UXC + UXB**
Cooling Performance						
Nominal Cooling Capacity (Btu/h)[1]		264,000	288,000	312,000	336,000	360,000
Rated Cooling Capacity (Btu/h)[1]		252,000	276,000	298,000	320,000	340,000
Heating Performance						
Nominal Heating Capacity (Btu/h)[1]		264,000	324,000	351,000	378,000	405,000
Rated Heating Capacity (Btu/h)[1]		252,000	308,000	332,000	358,000	364,000
Operating Range						
Cooling (°F DB)		5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6
Heating (°F WB)		-22 to +61	-22 to +61	-22 to +61	-22 to +61	-22 to +61
Compressor						
Inverter Quantity		HSS DC Scroll x 3	HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4
Oil/Type		FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)
Fan (Top Discharge)						
Type		Propeller	Propeller	Propeller	Propeller	Propeller
Motor Output (kW) x Qty.		0.9 x 4	0.9 x 4	0.9 x 4	0.9 x 4	1.5 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	0-940 / 0 -1,150
	Heating	80 - 1,150	80 - 1,150	80 - 1,150	80 - 1,150	80-940 / 80-1,150
Maximum Air Volume (CFM)		22,600	22,600	22,600	22,600	25,300
ESP (in. w.g.; Selectable Range)		0.16 - 0.32	0.16 - 0.32	0.16 - 0.32	0.16 - 0.32	0.16 - 0.32
Unit Data						
Refrigerant Type		R32	R32	R32	R32	R32
Refrigerant Control/Location		EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit
Factory Charge lbs. of R32		26.46 + 20.94	26.46 + 26.46	26.46 + 26.46	30.86 + 26.46	37.48 + 26.46
Max. No. Indoor Units/System[2]		42	45	52	55	58
Sound Pressure dB(A)[3]		63.5	64.0	64.0	64.5	66.0
Net Unit Weight (lbs.)		653 + 551	653 + 653	653 + 653	656 + 653	787 + 653
Shipping Weight (lbs.)		687 + 584	687 + 687	687 + 687	692 + 687	820 + 687
Communication Cable[4,5]		2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger						
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Coated Fin™ / Hydrophilic				
Rows/Fins per inch (per Frame)		3/17	3/17	3/17	3/17	3/17
Piping for Heat Recovery Operation[6]						
Liquid Line Connection (in., OD)		1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze
Low Pressure Vapor Line Connection (in., OD)		7/8 + 7/8 Braze	7/8 + 7/8 Braze	7/8 + 7/8 Braze	1-1/8 + 7/8 Braze	1-1/8 + 7/8 Braze
High Pressure Vapor Line Connection (in., OD)		3/4 + 3/4 Braze	3/4 + 3/4 Braze	3/4 + 3/4 Braze	7/8 + 3/4 Braze	7/8 + 3/4 Braze
Piping for Heat Pump Operation[6]						
Liquid Line Connection (in., OD)		1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze
Vapor Line Connection (in., OD)		7/8 + 7/8 Braze	7/8 + 7/8 Braze	7/8 + 7/8 Braze	1-1/8 + 7/8 Braze	1-1/8 + 7/8 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]The System Combination Ratio must be between 50–130%.

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

[4]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.

[5]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.

[6]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

MULTI V™ i

208-230V Outdoor Unit Specifications

Table 5: Dual Frame 208-230V Outdoor Units, continued.

Unit Model Number / Tons		ZRUM384BTE6 32.0 Ton	ZRUM408BTE6 34.0 Ton	ZRUM432BTE6 36.0 Ton	ZRUM456BTE6 38.0 Ton	ZRUM480BTE6 40.0 Ton
Individual Frame Model Numbers		**ZRUM216BTE6 + ZRUM168BTE6**	**ZRUM216BTE6 + ZRUM192BTE6**	**ZRUM216BTE6 + ZRUM216BTE6**	**ZRUM241BTE6 + ZRUM216BTE6**	**ZRUM241BTE6 + ZRUM241BTE6**
Frame Size(s)		**UXC + UXB**	**UXC + UXB**	**UXC + UXC**	**UXC + UXC**	**UXC + UXC**
Cooling Performance						
Nominal Cooling Capacity (Btu/h)[1]		384,000	408,000	430,500	455,700	476,700
Rated Cooling Capacity (Btu/h)[1]		360,000	390,000	410,000	434,000	454,000
Heating Performance						
Nominal Heating Capacity (Btu/h)[1]		432,000	459,000	486,000	513,000	540,000
Rated Heating Capacity (Btu/h)[1]		388,000	412,000	436,000	458,000	484,000
Operating Range						
Cooling (°F DB)		5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6
Heating (°F WB)		-22 to +61	-22 to +61	-22 to +61	-22 to +61	-22 to +61
Compressor						
Inverter Quantity		HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4
Oil/Type		FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)
Fan (Top Discharge)						
Type		Propeller	Propeller	Propeller	Propeller	Propeller
Motor Output (kW) x Qty.		1.5 x 2 + 0.9 x 2	1.5 x 2 + 0.9 x 2	1.5 x 4	1.5 x 4	1.5 x 4
Motor/Drive		Brushless Digitally Controlled / Direct				
Operating Range (RPM)	Cooling	0-940 / 0-1,150	0-940 / 0-1,150	0 - 940	0-940	0-940
	Heating	80-940 / 80-1,150	80-940 / 80-1,150	80 - 940	80 - 940	80 - 940
Maximum Air Volume (CFM)		25,300	25,300	28,000	28,000	28,000
ESP (in. w.g.; Selectable Range)		0.16 - 0.32	0.16 - 0.32	0.16 - 0.32	0.16 - 0.32	0.16 - 0.32
Unit Data						
Refrigerant Type		R32	R32	R32	R32	R32
Refrigerant Control/Location		EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit
Factory Charge lbs. of R32		37.48 + 26.46	37.48 + 30.86	37.48 + 37.48	37.48 + 37.48	37.48 + 37.48
Max. No. Indoor Units/System[2]		61	64	64	64	64
Sound Pressure dB(A)[3]		66.0	66.5	67.0	67.5	68.0
Net Unit Weight (lbs.)		787 + 653	787+ 656	787 + 787	787 + 787	787 + 787
Shipping Weight (lbs.)		820 + 687	820 + 692	820 + 820	820 + 820	820 + 820
Communication Cable[4,5]		2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger						
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Coated Fin™ / Hydrophilic				
Rows/Fins per inch (per Frame)		3/17	3/17	3/17	3/17	3/17
Piping for Heat Recovery Operation[6]						
Liquid Line Connection (in., OD)		1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze
Low Pressure Vapor Line Connection (in., OD)		1-1/8 + 7/8 Braze	1-1/8+1-1/8 Braze	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 + 3/4 Braze	7/8 + 7/8 Braze	7/8 + 7/8 Braze	7/8 + 7/8 Braze	7/8 + 7/8 Braze
Piping for Heat Pump Operation[6]						
Liquid Line Connection (in., OD)		1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze
Vapor Line Connection (in., OD)		1-1/8 + 7/8 Braze	1-1/8+1-1/8 Braze	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]The System Combination Ratio must be between 50–130%.

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

[4]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.

[5]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.

[6]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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Table 6: Triple Frame 208-230V Outdoor Units.

Unit Model Number / Tons		ZRUM504BTE6 42.0 Ton	ZRUM528BTE6 44.0 Ton
Individual Frame Model Numbers		ZRUM192BTE6 + ZRUM192BTE6 + ZRUM121BTE6	ZRUM192BTE6 + ZRUM168BTE6 + ZRUM168BTE6
Frame Size		UXB + UXB + UXB	UXB + UXB + UXB
Cooling Performance			
Nominal Cooling Capacity (Btu/h)[1]		504,000	525,000
Rated Cooling Capacity (Btu/h)[1]		480,000	500,000
Heating Performance			
Nominal Heating Capacity (Btu/h)[1]		567,000	594,000
Rated Heating Capacity (Btu/h)[1]		506,000	526,000
Operating Range			
Cooling (°F DB)		5 to 125.6	5 to 125.6
Heating (°F WB)		-22 to +61	-22 to +61
Compressor			
Inverter Quantity		HSS DC Scroll x 5	HSS DC Scroll x 6
Oil/Type		FW68L (PVE)	FW68L (PVE)
Fan (Top Discharge)			
Type		Propeller	Propeller
Motor Output (kW) x Qty.		0.9 x 6	0.9 x 6
Motor/Drive		Brushless Digitally Controlled / Direct	
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,150
	Heating	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		33,900	33,900
ESP (in. w.g.; Selectable Range)		0.16 - 0.32	0.16 - 0.32
Unit Data			
Refrigerant Type		R32	R32
Refrigerant Control/Location		EEV/Outdoor Unit	EEV/Outdoor Unit
Factory Charge lbs. of R32		30.86 + 30.86 +20.94	30.86 + 26.46 + 26.46
Max. No. Indoor Units/System[2]		64	64
Sound Pressure dB(A)[3]		66.0	66.0
Net Unit Weight (lbs.)		656 + 656 + 551	656 + 653 + 653
Shipping Weight (lbs.)		692 + 692 + 584	692+ 687 + 687
Communication Cable[4,5]		2 x 18	2 x 18
Heat Exchanger			
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Coated Fin™ / Hydrophilic	
Rows/Fins per inch (per Frame)		3/17	3/17
Piping for Heat Recovery Operation[6]			
Liquid Line Connection (in., OD)		1/2 + 1/2 + 1/2 Braze	1/2 + 1/2 + 1/2 Braze
Low Pressure Vapor Line Connection (in., OD)		1-1/8 + 1-1/8 + 7/8 Braze	1-1/8 + 1-1/8 + 7/8 Braze
High Pressure Vapor Line Connection (in., OD)		7/8 + 7/8 + 3/4 Braze	7/8 + 3/4 + 3/4 Braze
Piping for Heat Pump Operation[6]			
Liquid Line Connection (in., OD)		1/2 + 1/2 + 1/2 Braze	1/2 + 1/2 + 1/2 Braze
Vapor Line Connection (in., OD)		1-1/8 + 1-1/8 + 7/8 Braze	1-1/8 + 7/8 + 7/8 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]The System Combination Ratio must be between 50–130%.

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

[4]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.

[5]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.

[6]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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460V Outdoor Unit Specifications

Table 7: Single Frame 460V Outdoor Units.

Unit Model Number / Tons		ZRUM072DTE6 6.0 Ton	ZRUM096DTE6 8.0 Ton	ZRUM121DTE6 10.0 Ton	ZRUM144DTE6 12.0 Ton	ZRUM168DTE6 14.0 Ton
Individual Frame Model Numbers		-	-	-	-	-
Frame Size		**UXA**	**UXB**	**UXB**	**UXB**	**UXB**
Cooling Performance						
Nominal Cooling Capacity (Btu/h)[1]		72,000	96,000	119,700	144,000	168,000
Rated Cooling Capacity (Btu/h)[1]		69,000	92,000	114,000	138,000	160,000
Heating Performance						
Nominal Heating Capacity (Btu/h)[1]		81,000	108,000	135,000	162,000	189,000
Rated Heating Capacity (Btu/h)[1]		77,000	103,000	129,000	152,000	180,000
Operating Range						
Cooling (°F DB)		5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6
Heating (°F WB)		-22 to +61	-22 to +61	-22 to +61	-22 to +61	-22 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	HSS DC Scroll x 2
Oil/Type		FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)
Fan (Top Discharge)						
Type		Propeller	Propeller	Propeller	Propeller	Propeller
Motor Output (kW) x Qty.		1.2 x 1	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 - 950	0 - 1,150	0 - 1,150	0 - 1,150	0 - 1,150
	Heating	80 - 950	80 - 1,150	80 - 1,150	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		7,770	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	0.16 - 0.32
Unit Data						
Refrigerant Type		R32	R32	R32	R32	R32
Refrigerant Control/Location		EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit
Factory Charge lbs. of R32		16.53	20.94	20.94	26.46	26.46
Max. No. Indoor Units/System[2]		13	16	20	24	29
Sound Pressure dB(A)[3]		59.0	60.0	60.0	61.0	61.0
Net Unit Weight (lbs.)		469	551	551	653	653
Shipping Weight (lbs.)		496	584	584	687	687
Communication Cable[4,5]		2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger						
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Coated Fin™ / Hydrophilic				
Rows/Fins per inch		3/17	3/17	3/17	3/17	3/17
Piping for Heat Recovery Operation[6]						
Liquid Line Connection (in., OD)		3/8 Braze	3/8 Braze	1/2 Braze	1/2 Braze	1/2 Braze
Low Pressure Vapor Line Connection (in., OD)		3/4 Braze	3/4 Braze	7/8 Braze	7/8 Braze	7/8 Braze
High Pressure Vapor Line Connection (in., OD)		5/8 Braze	5/8 Braze	3/4 Braze	3/4 Braze	3/4 Braze
Piping for Heat Pump Operation[6]						
Liquid Line Connection (in., OD)		3/8 Braze	3/8 Braze	1/2 Braze	1/2 Braze	1/2 Braze
Vapor Line Connection (in., OD)		3/4 Braze	3/4 Braze	7/8 Braze	7/8 Braze	7/8 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]The System Combination Ratio must be between 50–130%.

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

[4]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.

[5]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.

[6]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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Table 8: Single Frame 460V Outdoor Units, continued.

Unit Model Number / Tons		ZRUM192DTE6 16.0 Ton	ZRUM216DTE6 18.0 Ton	ZRUM241DTE6 20.0 Ton	ZRUM264DTE6 22.0 Ton
Individual Frame Model Numbers		-	-	-	-
Frame Size		**UXB**	**UXC**	**UXC**	**UXC**
Cooling Performance					
Nominal Cooling Capacity (Btu/h)[1]		192,000	216,000	233,100	264,000
Rated Cooling Capacity (Btu/h)[1]		184,000	206,000	222,000	252,000
Heating Performance					
Nominal Heating Capacity (Btu/h)[1]		216,000	243,000	270,000	270,000
Rated Heating Capacity (Btu/h)[1]		206,000	230,000	256,000	256,000
Operating Range					
Cooling (°F DB)		5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6
Heating (°F WB)		-22 to +61	-22 to +61	-22 to +61	-22 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		FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)
Fan (Top Discharge)					
Type		Propeller	Propeller	Propeller	Propeller
Motor Output (kW) x Qty.		0.9 x 2	1.5 x 2	1.5 x 2	1.5 x 2
Motor/Drive		Brushless Digitally Controlled / Direct			
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,020	0 - 1,020	0 - 1,020
	Heating	80 - 1,150	80 - 1,020	80 - 1,020	80 - 1,020
Maximum Air Volume (CFM)		11,300	15,185	15,185	15,185
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		R32	R32	R32	R32
Refrigerant Control/Location		EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit
Factory Charge lbs. of R32		30.86	37.48	37.48	37.48
Max. No. Indoor Units/System[2]		32	35	39	42
Sound Pressure dB(A)[3]		62.0	64.0	65.0	65.0
Net Unit Weight (lbs.)		656	787	787	787
Shipping Weight (lbs.)		692	820	820	820
Communication Cable[4,5]		2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger					
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Coated Fin™ / Hydrophilic			
Rows/Fins per inch		3/17	3/17	3/17	3/17
Piping for Heat Recovery Operation[6]					
Liquid Line Connection (in., OD)		1/2 Braze	1/2 Braze	1/2 Braze	5/8 Braze
Low Pressure Vapor Line Connection (in., OD)		1-1/8 Braze	1-1/8 Braze	1-1/8 Braze	1-1/8 Braze
High Pressure Vapor Line Connection (in., OD)		7/8 Braze	7/8 Braze	7/8 Braze	7/8 Braze
Piping for Heat Pump Operation[6]					
Liquid Line Connection (in., OD)		1/2 Braze	1/2 Braze	1/2 Braze	5/8 Braze
Vapor Line Connection (in., OD)		1-1/8 Braze	1-1/8 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]The System Combination Ratio must be between 50–130%.

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

[4]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.

[5]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.

[6]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.

Unit Model Number / Tons		ZRUM265DTE6 22.0 Ton	ZRUM288DTE6 24.0 Ton	ZRUM312DTE6 26.0 Ton	ZRUM336DTE6 28.0 Ton	ZRUM360DTE6 30.0 Ton
Individual Frame Model Numbers		**ZRUM144DTE6 + ZRUM121DTE6**	**ZRUM144DTE6 + ZRUM144DTE6**	**ZRUM168DTE6 + ZRUM144DTE6**	**ZRUM192DTE6 + ZRUM144DTE6**	**ZRUM216DTE6 + ZRUM144DTE6**
Frame Size(s)		**UXB + UXB**	**UXB + UXB**	**UXB + UXB**	**UXB + UXB**	**UXC + UXB**
Cooling Performance						
Nominal Cooling Capacity (Btu/h)[1]		264,000	288,000	312,000	336,000	360,000
Rated Cooling Capacity (Btu/h)[1]		252,000	276,000	298,000	320,000	340,000
Heating Performance						
Nominal Heating Capacity (Btu/h)[1]		297,000	324,000	351,000	378,000	405,000
Rated Heating Capacity (Btu/h)[1]		282,000	308,000	332,000	358,000	364,000
Operating Range						
Cooling (°F DB)		5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6
Heating (°F WB)		-22 to +61	-22 to +61	-22 to +61	-22 to +61	-22 to +61
Compressor						
Inverter Quantity		HSS DC Scroll x 3	HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4
Oil/Type		FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)
Fan (Top Discharge)						
Type		Propeller	Propeller	Propeller	Propeller	Propeller
Motor Output (kW) x Qty.		0.9 x 4	0.9 x 4	0.9 x 4	0.9 x 4	1.5 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	0-1,020/0-1,150
	Heating	80 - 1,150	80 - 1,150	80 - 1,150	80 - 1,150	80-1,020/80-1,150
Maximum Air Volume (CFM)		22,600	22,600	22,600	22,600	26,485
ESP (in. w.g.; Selectable Range)		0.16 - 0.32	0.16 - 0.32	0.16 - 0.32	0.16 - 0.32	0.16 - 0.32
Unit Data						
Refrigerant Type		R32	R32	R32	R32	R32
Refrigerant Control/Location		EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit
Factory Charge lbs. of R32		26.46 + 20.94	26.46 + 26.46	26.46 + 26.46	30.86 + 26.46	37.48 + 26.46
Max. No. Indoor Units/System[2]		42	45	52	55	58
Sound Pressure dB(A)[3]		63.5	64.0	64.0	64.5	66.0
Net Unit Weight (lbs.)		653 + 551	653 + 653	653 + 653	656 + 653	787 + 653
Shipping Weight (lbs.)		687 + 584	687 + 687	687 + 687	692 + 687	820 + 687
Communication Cable[4,5]		2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger						
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Coated Fin™ / Hydrophilic				
Rows/Fins per inch (per Frame)		3/17	3/17	3/17	3/17	3/17
Piping for Heat Recovery Operation[6]						
Liquid Line Connection (in., OD)		1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze
Low Pressure Vapor Line Connection (in., OD)		7/8 + 7/8 Braze	7/8 + 7/8 Braze	7/8 + 7/8 Braze	1-1/8 + 7/8 Braze	1-1/8 + 7/8 Braze
High Pressure Vapor Line Connection (in., OD)		3/4 + 3/4 Braze	3/4 + 3/4 Braze	3/4 + 3/4 Braze	7/8 + 3/4 Braze	7/8 + 3/4 Braze
Piping for Heat Pump Operation[6]						
Liquid Line Connection (in., OD)		1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze
Vapor Line Connection (in., OD)		7/8 + 7/8 Braze	7/8 + 7/8 Braze	7/8 + 7/8 Braze	1-1/8 + 7/8 Braze	1-1/8 + 7/8 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]The System Combination Ratio must be between 50–130%.

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

[4]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.

[5]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.

[6]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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Table 10: Dual Frame 460V Outdoor Units, continued.

Unit Model Number / Tons		ZRUM384DTE6 32.0 Ton	ZRUM408DTE6 34.0 Ton	ZRUM432DTE6 36.0 Ton	ZRUM456DTE6 38.0 Ton	ZRUM480DTE6 40.0 Ton
Individual Frame Model Numbers		**ZRUM216DTE6 + ZRUM168DTE6**	**ZRUM216DTE6 + ZRUM192DTE6**	**ZRUM216DTE6 + ZRUM216DTE6**	**ZRUM241DTE6 + ZRUM216DTE6**	**ZRUM241DTE6 + ZRUM241DTE6**
Frame Size(s)		**UXC + UXB**	**UXC + UXB**	**UXC + UXC**	**UXC + UXC**	**UXC + UXC**
Cooling Performance						
Nominal Cooling Capacity (Btu/h)[1]		384,000	408,000	430,500	455,700	476,700
Rated Cooling Capacity (Btu/h)[1]		360,000	390,000	410,000	434,000	454,000
Heating Performance						
Nominal Heating Capacity (Btu/h)[1]		432,000	459,000	486,000	513,000	540,000
Rated Heating Capacity (Btu/h)[1]		388,000	412,000	436,000	458,000	484,000
Operating Range						
Cooling (°F DB)		5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6	5 to 125.6
Heating (°F WB)		-22 to +61	-22 to +61	-22 to +61	-22 to +61	-22 to +61
Compressor						
Inverter Quantity		HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4	HSS DC Scroll x 4
Oil/Type		FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)	FW68L (PVE)
Fan (Top Discharge)						
Type		Propeller	Propeller	Propeller	Propeller	Propeller
Motor Output (kW) x Qty.		1.5 x 2 + 0.9 x 2	1.5 x 2 + 0.9 x 2	1.5 x 4	1.5 x 4	1.5 x 4
Motor/Drive		Brushless Digitally Controlled / Direct				
Operating Range (RPM)	Cooling	0-1,020/0-1,150	0-1,020/0-1,150	0 - 1,020	0 - 1,020	0 - 1,020
	Heating	80-1,020/80-1,150	80-1,020/80-1,150	80 - 1,020	80 - 1,020	80 - 1,020
Maximum Air Volume (CFM)		26,485	26,485	30,370	30,370	30,370
ESP (in. w.g.; Selectable Range)		0.16 - 0.32	0.16 - 0.32	0.16 - 0.32	0.16 - 0.32	0.16 - 0.32
Unit Data						
Refrigerant Type		R32	R32	R32	R32	R32
Refrigerant Control/Location		EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit	EEV/Outdoor Unit
Factory Charge lbs. of R32		37.48 + 26.46	37.48 + 30.86	37.48 + 37.48	37.48 + 37.48	37.48 + 37.48
Max. No. Indoor Units/System[2]		61	64	64	64	64
Sound Pressure dB(A)[3]		66.0	66.5	67.0	67.5	68.0
Net Unit Weight (lbs.)		787 + 653	787+ 656	787 + 787	787 + 787	787 + 787
Shipping Weight (lbs.)		820 + 687	820 + 692	820 + 820	820 + 820	820 + 820
Communication Cable[4,5]		2 x 18	2 x 18	2 x 18	2 x 18	2 x 18
Heat Exchanger						
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Coated Fin™ / Hydrophilic				
Rows/Fins per inch (per Frame)		3/17	3/17	3/17	3/17	3/17
Piping for Heat Recovery Operation[6]						
Liquid Line Connection (in., OD)		1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze
Low Pressure Vapor Line Connection (in., OD)		1-1/8 + 7/8 Braze	1-1/8+1-1/8 Braze	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 + 3/4 Braze	7/8 + 7/8 Braze	7/8 + 7/8 Braze	7/8 + 7/8 Braze	7/8 + 7/8 Braze
Piping for Heat Pump Operation[6]						
Liquid Line Connection (in., OD)		1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze	1/2 + 1/2 Braze
Vapor Line Connection (in., OD)		1-1/8 + 7/8 Braze	1-1/8+1-1/8 Braze	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]The System Combination Ratio must be between 50–130%.

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

[4]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.

[5]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.

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GENERAL DATA

460V Outdoor Unit Specifications

Table 11: Triple Frame 460V Outdoor Units.

Unit Model Number / Tons		ZRUM504DTE6 42.0 Ton	ZRUM528DTE6 44.0 Ton
Individual Frame Model Numbers		ZRUM192DTE6 + ZRUM192DTE6 + ZRUM121DTE6	ZRUM192DTE6 + ZRUM168DTE6 + ZRUM168DTE6
Frame Size		UXB + UXB + UXB	UXB + UXB + UXB
Cooling Performance			
Nominal Cooling Capacity (Btu/h)[1]		504,000	525,000
Rated Cooling Capacity (Btu/h)[1]		480,000	500,000
Heating Performance			
Nominal Heating Capacity (Btu/h)[1]		567,000	594,000
Rated Heating Capacity (Btu/h)[1]		506,000	526,000
Operating Range			
Cooling (°F DB)		5 to 125.6	5 to 125.6
Heating (°F WB)		-22 to +61	-22 to +61
Compressor			
Inverter Quantity		HSS DC Scroll x 5	HSS DC Scroll x 6
Oil/Type		FW68L (PVE)	FW68L (PVE)
Fan (Top Discharge)			
Type		Propeller	Propeller
Motor Output (kW) x Qty.		0.9 x 6	0.9 x 6
Motor/Drive		Brushless Digitally Controlled / Direct	
Operating Range (RPM)	Cooling	0 - 1,150	0 - 1,150
	Heating	80 - 1,150	80 - 1,150
Maximum Air Volume (CFM)		33,900	33,900
ESP (in. w.g.; Selectable Range)		0.16 - 0.32	0.16 - 0.32
Unit Data			
Refrigerant Type		R32	R32
Refrigerant Control/Location		EEV/Outdoor Unit	EEV/Outdoor Unit
Factory Charge lbs. of R32		30.86 + 30.86 + 20.94	30.86 + 26.46 + 26.46
Max. No. Indoor Units/System[2]		64	64
Sound Pressure dB(A)[3]		66.0	66.0
Net Unit Weight (lbs.)		656 + 656 + 551	656 + 653 + 653
Shipping Weight (lbs.)		692 + 692 + 584	692+ 687 + 687
Communication Cable[4,5]		2 x 18	2 x 18
Heat Exchanger			
Material and Fin Coating		Copper Tube / Aluminum Fin and Black Coated Fin™ / Hydrophilic	
Rows/Fins per inch (per Frame)		3/17	3/17
Piping for Heat Recovery Operation[6]			
Liquid Line Connection (in., OD)		1/2 + 1/2 + 1/2 Braze	1/2 + 1/2 + 1/2 Braze
Low Pressure Vapor Line Connection (in., OD)		1-1/8 + 1-1/8 + 7/8 Braze	1-1/8 + 7/8 + 7/8 Braze
High Pressure Vapor Line Connection (in., OD)		7/8 + 7/8 + 3/4 Braze	7/8 + 3/4 + 3/4 Braze
Piping for Heat Pump Operation[6]			
Liquid Line Connection (in., OD)		1/2 + 1/2 + 1/2 Braze	1/2 + 1/2 + 1/2 Braze
Vapor Line Connection (in., OD)		1-1/8 + 1-1/8 + 7/8 Braze	1-1/8 + 7/8 + 7/8 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]The System Combination Ratio must be between 50–130%.

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

[4]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.

[5]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.

[6]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 12: 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							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	ZRUM072BTE6	1	20.5	-	-	-	-	-	1	5.0	-	-		31.8	-	-	35	-	-	35	-	-
8.0	ZRUM096BTE6	1	19.9	-	-	-	-	-	2	8.4	-	-		36.4	-	-	40	-	-	40	-	-
10.0	ZRUM121BTE6	1	20.7	-	-	-	-	-	2	8.4	-	-		36.4	-	-	40	-	-	40	-	-
12.0	ZRUM144BTE6	2	22.5	19.3	-	-	-	-	2	8.4	-	-		63.6	-	-	70	-	-	70	-	-
14.0	ZRUM168BTE6	2	22.5	20	-	-	-	-	2	8.4	-	-		63.6	-	-	70	-	-	70	-	-
16.0	ZRUM192BTE6	2	26	23.8	-	-	-	-	2	8.4	-	-		72.7	-	-	80	-	-	80	-	-
18.0	ZRUM216BTE6	2	24.4	23.0	-	-	-	-	2	10.0	-	-		72.7	-	-	80	-	-	80	-	-
20.0	ZRUM241BTE6	2	24.2	24.0	-	-	-	-	2	10.0	-	-		72.7	-	-	80	-	-	80	-	-
22.0	ZRUM264BTE6	2	30	25.5	-	-	-	-	2	10.0	-	-		81.8	-	-	90	-	-	90	-	-
22.0	ZRUM265BTE6	3	22.5	19.3	20.7	-	-	-	4	8.4	8.4	-		63.6	36.4	-	70	40	-	70	40	-
24.0	ZRUM288BTE6	4	22.5	19.3	22.5	19.3	-	-	4	8.4	8.4	-		63.6	63.6	-	70	70	-	70	70	-
26.0	ZRUM312BTE6	4	22.5	20	22.5	19.3	-	-	4	8.4	8.4	-		63.6	63.6	-	70	70	-	70	70	-
28.0	ZRUM336BTE6	4	26	23.8	22.5	19.3	-	-	4	8.4	8.4	-		72.7	63.6	-	80	70	-	80	70	-
30.0	ZRUM360BTE6	4	24.4	23.0	22.5	19.3	-	-	4	10.0	8.4	-		72.7	63.6	-	80	70	-	80	70	-
32.0	ZRUM384BTE6	4	24.4	23.0	22.5	20	-	-	4	10.0	8.4	-		72.7	63.6	-	80	70	-	80	70	-
34.0	ZRUM408BTE6	4	24.4	23.0	26	23.8	-	-	4	10.0	8.4	-		72.7	72.7	-	80	80	-	80	80	-
36.0	ZRUM432BTE6	4	24.4	23.0	24.4	23.0	-	-	4	10.0	10.0	-		72.7	72.7	-	80	80	-	80	80	-
38.0	ZRUM456BTE6	4	24.2	24.0	24.4	23.0	-	-	4	10.0	10.0	-		72.7	72.7	-	80	80	-	80	80	-
40.0	ZRUM480BTE6	4	24.2	24.0	24.2	24.0	-	-	4	10.0	10.0	-		72.7	72.7	-	80	80	-	80	80	-
42.0	ZRUM504BTE6	5	26	23.8	26	23.8	20.7	-	6	8.4	8.4	8.4		72.7	72.7	36.4	80	80	40	80	80	40
44.0	ZRUM528BTE6	6	26	23.8	22.5	20	22.5	20	6	8.4	8.4	8.4		72.7	63.6	63.6	80	70	70	80	70	70

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: 5 kA RMS symmetrical 208V maximum / 5 kA RMS symmetrical 230V maximum.

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ELECTRICAL DATA

460V Outdoor Unit Electrical Data

Table 13: 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	1	2	3
			Comp. A	Comp. B	Comp. A	Comp. B	Comp. A	Comp. B		1	2	3												
6.0	ZRUM072DTE6	1	11.5	-	-	-	-	-	1	3.0	-	-	18.2	-	-	20	-	-	20	-	-	20	-	-
8.0	ZRUM096DTE6	1	12.4	-	-	-	-	-	2	5.0	-	-	22.7	-	-	25	-	-	25	-	-	25	-	-
10.0	ZRUM121DTE6	1	13.2	-	-	-	-	-	2	5.0	-	-	22.7	-	-	25	-	-	25	-	-	25	-	-
12.0	ZRUM144DTE6	2	10	9.7	-	-	-	-	2	5.0	-	-	31.8	-	-	35	-	-	35	-	-	35	-	-
14.0	ZRUM168DTE6	2	11	9.5	-	-	-	-	2	5.0	-	-	31.8	-	-	35	-	-	35	-	-	35	-	-
16.0	ZRUM192DTE6	2	15	14.2	-	-	-	-	2	5.0	-	-	45.5	-	-	50	-	-	50	-	-	50	-	-
18.0	ZRUM216DTE6	2	14.6	14.0	-	-	-	-	2	7.0	-	-	45.5	-	-	50	-	-	50	-	-	50	-	-
20.0	ZRUM241DTE6	2	16	13.4	-	-	-	-	2	7.0	-	-	45.5	-	-	50	-	-	50	-	-	50	-	-
22.0	ZRUM264DTE6	2	20	16.6	-	-	-	-	2	7.0	-	-	54.5	-	-	60	-	-	60	-	-	60	-	-
22.0	ZRUM265DTE6	3	10	9.7	13.2	-	-	-	4	5.0	5.0	-	31.8	22.7	-	35	25	-	35	25	-	35	25	-
24.0	ZRUM288DTE6	4	10	9.7	10	9.7	-	-	4	5.0	5.0	-	31.8	31.8	-	35	35	-	35	35	-	35	35	-
26.0	ZRUM312DTE6	4	11	9.5	10	9.7	-	-	4	5.0	5.0	-	31.8	31.8	-	35	35	-	35	35	-	35	35	-
28.0	ZRUM336DTE6	4	15	14.2	10	9.7	-	-	4	5.0	5.0	-	45.5	31.8	-	50	35	-	50	35	-	50	35	-
30.0	ZRUM360DTE6	4	14.6	14.0	10	9.7	-	-	4	7.0	5.0	-	45.5	31.8	-	50	35	-	50	35	-	50	35	-
32.0	ZRUM384DTE6	4	14.6	14.0	11	9.5	-	-	4	7.0	5.0	-	45.5	31.8	-	50	35	-	50	35	-	50	35	-
34.0	ZRUM408DTE6	4	14.6	14.0	15	14.2	-	-	4	7.0	5.0	-	45.5	45.5	-	50	50	-	50	50	-	50	50	-
36.0	ZRUM432DTE6	4	14.6	14.0	14.6	14.0	-	-	4	7.0	7.0	-	45.5	45.5	-	50	50	-	50	50	-	50	50	-
38.0	ZRUM456DTE6	4	16	13.4	14.6	14.0	-	-	4	7.0	7.0	-	45.5	45.5	-	50	50	-	50	50	-	50	50	-
40.0	ZRUM480DTE6	4	16	13.4	16	13.4	-	-	4	7.0	7.0	-	45.5	45.5	-	50	50	-	50	50	-	50	50	-
42.0	ZRUM504DTE6	5	15	14.2	15	14.2	13.2	-	6	5.0	5.0	5.0	45.5	45.5	22.7	50	50	25	50	50	25	50	50	25
44.0	ZRUM528BTE6	6	15	14.2	11	9.5	11	9.5	6	5.0	5.0	5.0	45.5	31.8	31.8	50	35	35	50	35	35	50	35	35

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: 5 kA RMS symmetrical 460V maximum.

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Table 14: Outdoor Unit Connection Limitations.

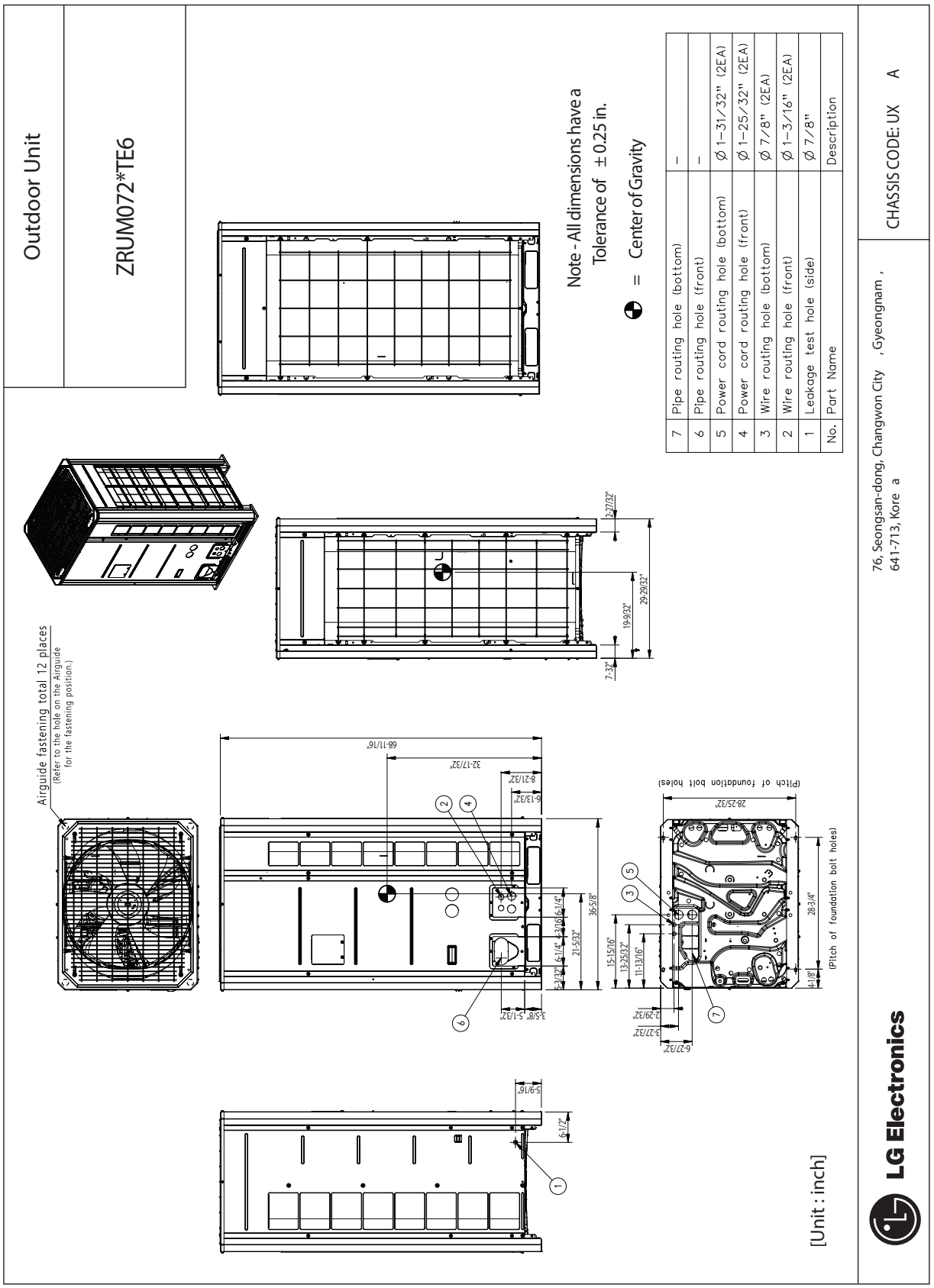
Outdoor Unit Model No.		Nominal Cooling (Btu/h)	Indoor Units		
			Sum of Indoor Unit Nominal Cooling Capacities (Btu/h)		
208-230V	460V		Max. Qty.	Min. Capacity (Btu/h) (50%)	Max. Capacity (Btu/h) (130%)
ZRUM072BTE6	ZRUM072DTE6	72,000	13	36,000	93,600
ZRUM096BTE6	ZRUM096DTE6	96,000	16	48,000	124,800
ZRUM121BTE6	ZRUM121DTE6	119,700	20	60,000	156,000
ZRUM144BTE6	ZRUM144DTE6	144,000	24	72,000	187,200
ZRUM168BTE6	ZRUM168DTE6	168,000	29	84,000	218,400
ZRUM192BTE6	ZRUM192DTE6	192,000	32	96,000	249,600
ZRUM216BTE6	ZRUM216DTE6	216,000	35	108,000	280,800
ZRUM241BTE6	ZRUM241DTE6	233,100	39	120,000	312,000
ZRUM264BTE6	ZRUM264DTE6	264,000	42	132,000	343,200
ZRUM265BTE6	ZRUM265DTE6	264,000	42	132,000	343,200
ZRUM288BTE6	ZRUM288DTE6	288,000	45	144,000	374,400
ZRUM312BTE6	ZRUM312DTE6	312,000	52	156,000	405,600
ZRUM336BTE6	ZRUM336DTE6	336,000	55	168,000	436,800
ZRUM360BTE6	ZRUM360DTE6	360,000	58	180,000	468,000
ZRUM384BTE6	ZRUM384DTE6	384,000	61	192,000	499,200
ZRUM408BTE6	ZRUM408DTE6	408,000	64	204,000	530,400
ZRUM432BTE6	ZRUM432DTE6	430,500	64	216,000	561,600
ZRUM456BTE6	ZRUM456DTE6	455,700	64	228,000	592,800
ZRUM480BTE6	ZRUM480DTE6	476,700	64	240,000	624,000
ZRUM504BTE6	ZRUM504DTE6	504,000	64	252,000	655,200
ZRUM528BTE6	ZRUM528DTE6	525,000	64	262,500	682,500

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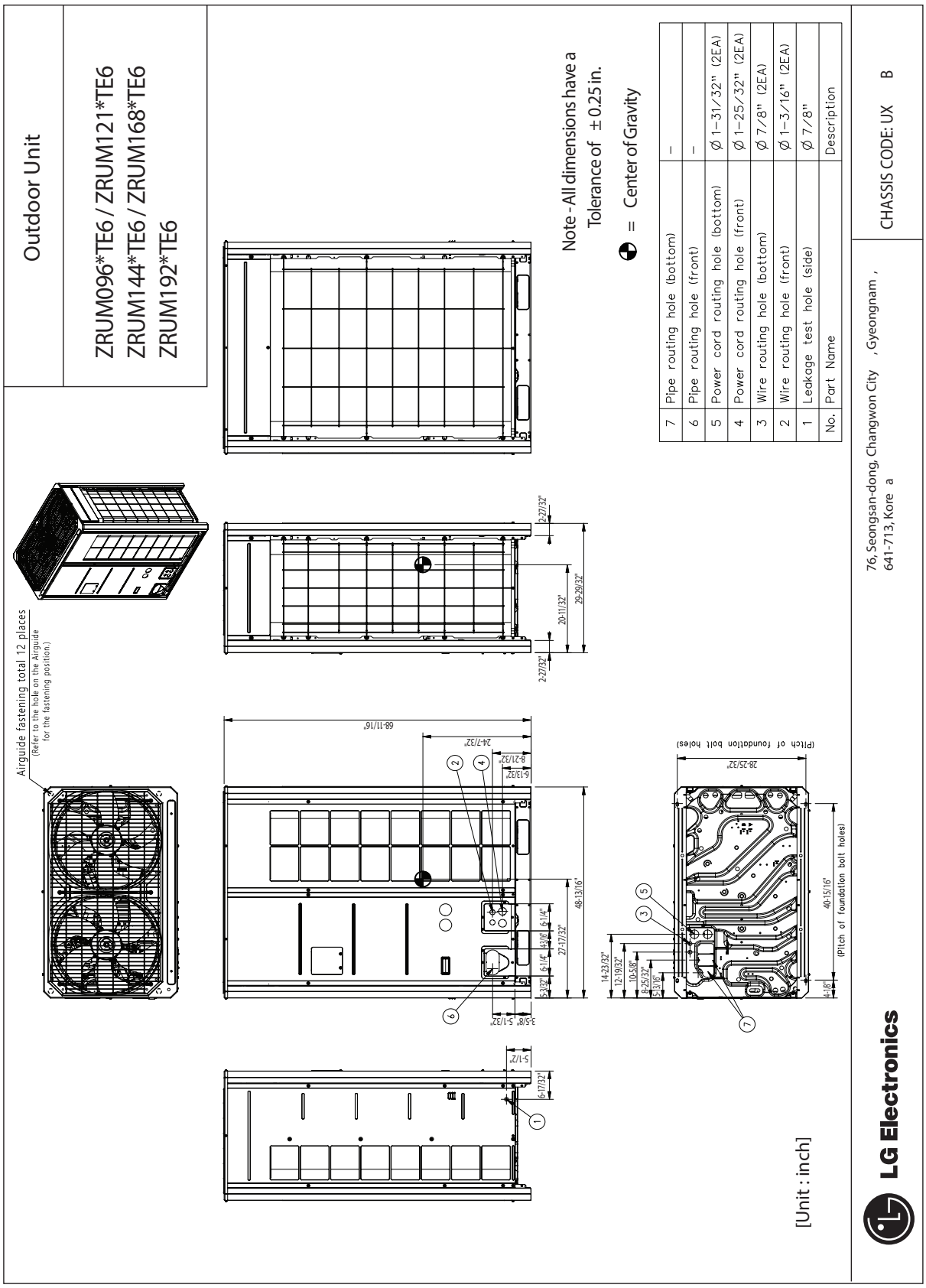
Single Frame UXA: ZRUM072BTE6 / 72DTE6



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Single Frame UXB: ZRUM096-121-144-168-192BTE6 / 096-121-144-168-192DTE6



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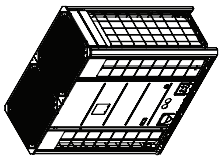
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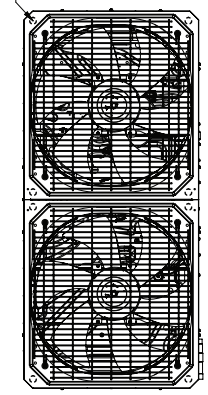
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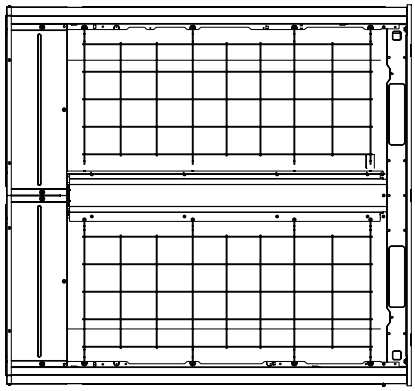
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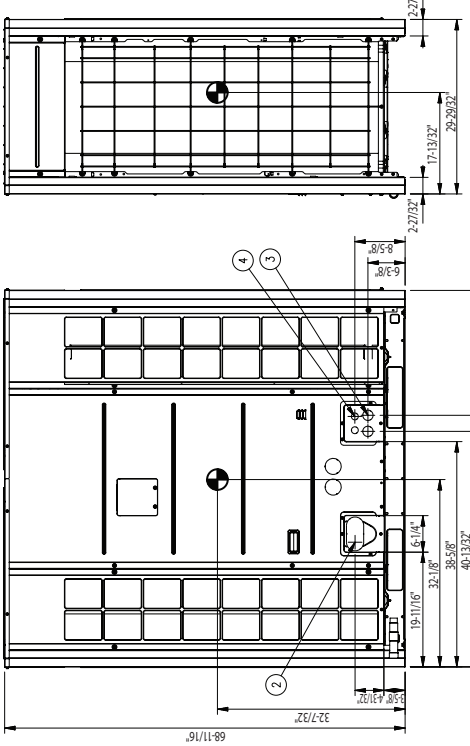
Outdoor Unit

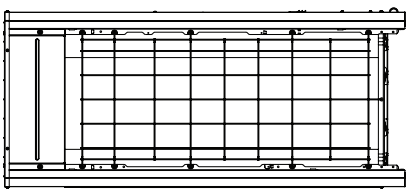
ZRUM216*TE6 / ZRUM241*TE6
ZRUM264*TE6

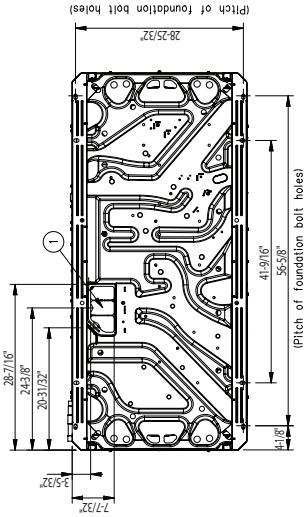












Note - All dimensions have a Tolerance of ± 0.25 in.

= Center of Gravity

No.	Part Name	Description
4	Wire routing hole (front)	Ø 1-3/16" (2EA)
3	Power cord routing hole (front)	Ø 1-25/32" (2EA)
2	Pipe routing hole (front)	-
1	Pipe routing hole (bottom)	-

[Unit : inch]

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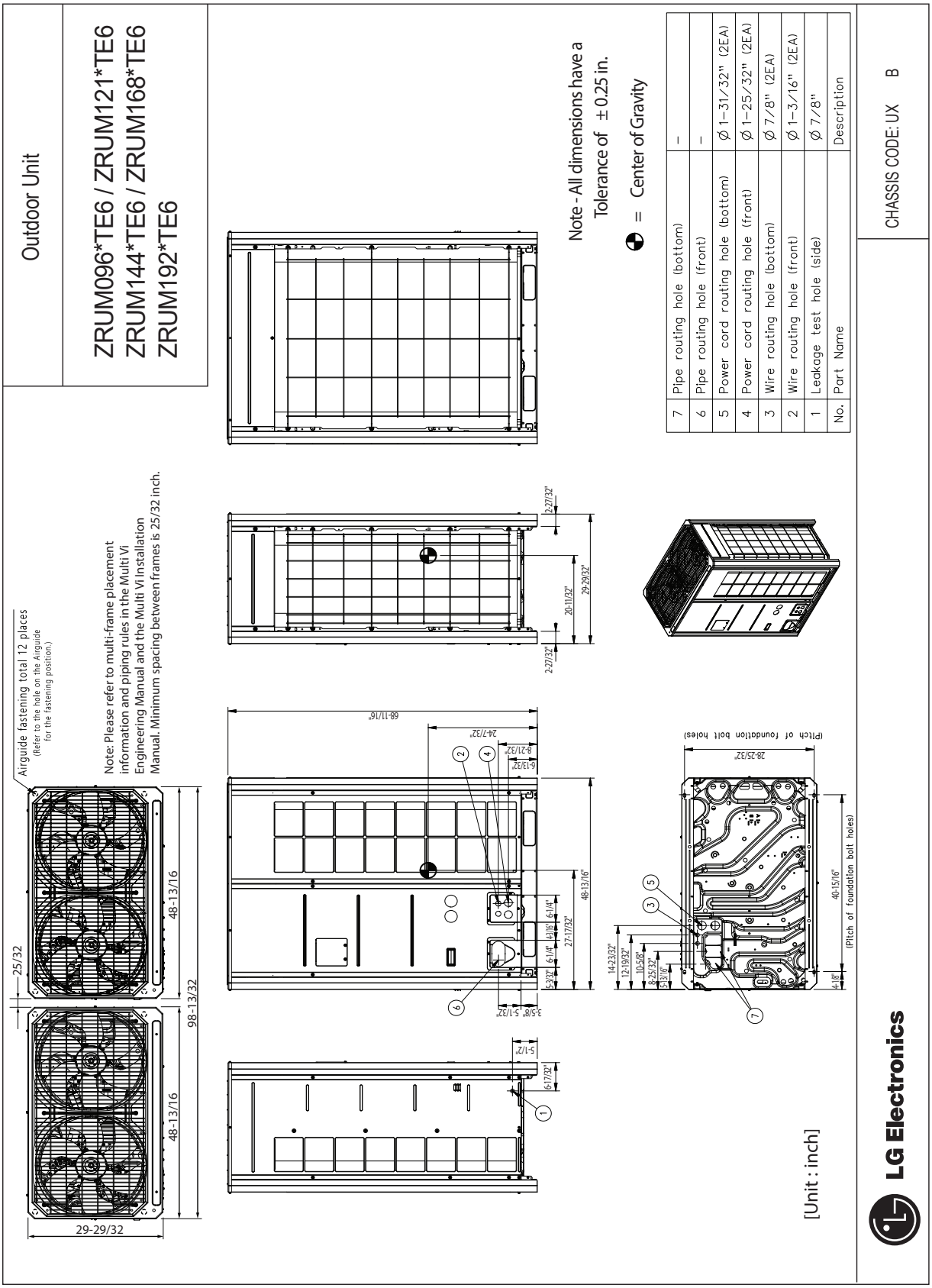
76, Seongsan-dong, Changwon City , Gyeongnam , 641-713, Kore a

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Dual Frame UXB + UXB: ZRUM265-288-312-336BTE6 / 265-288-312-336DTE6

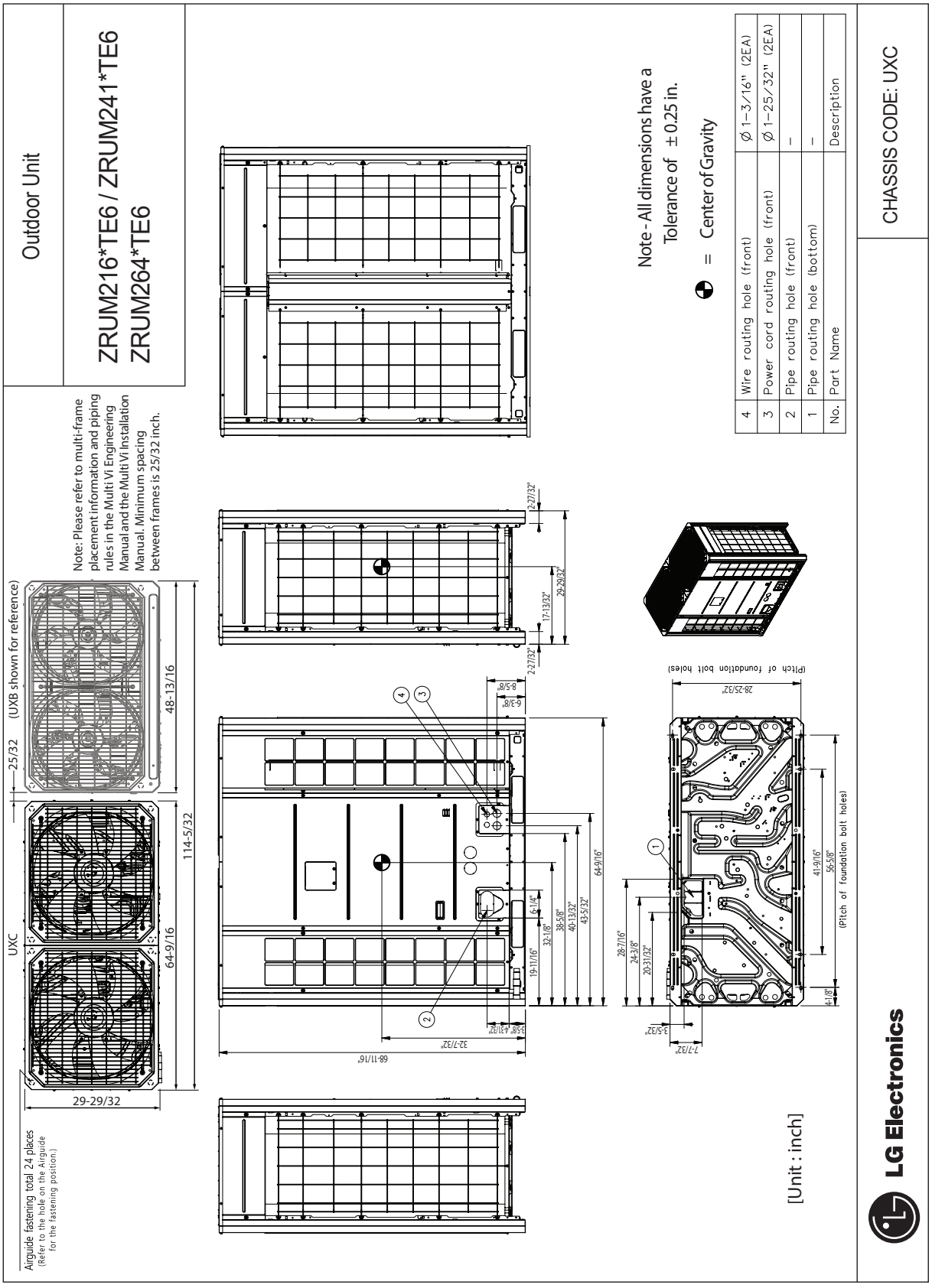


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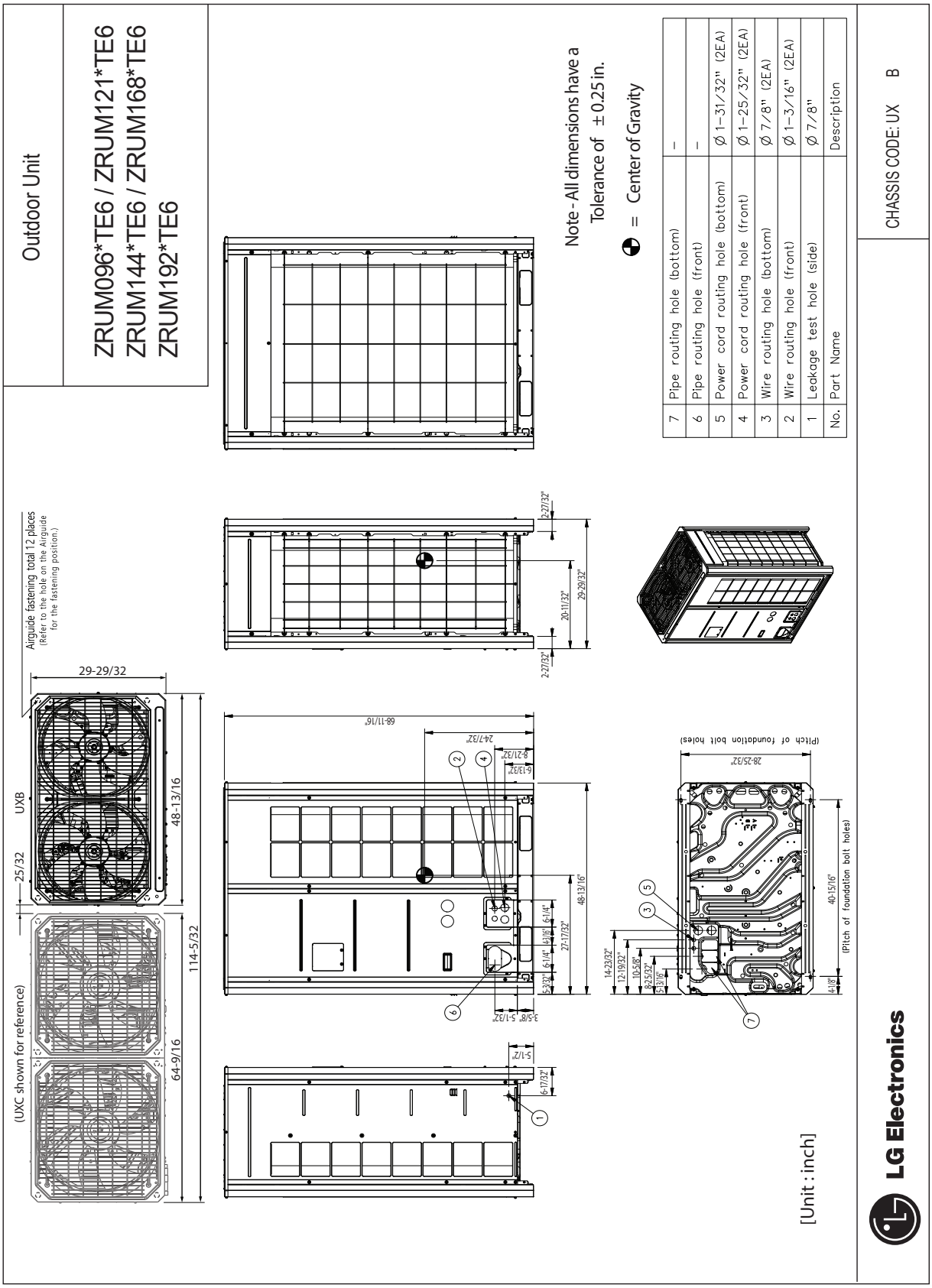
Dual Frame (UXC + UXB) UXC: ZRUM360-384-408BTE6 / 360-384-408DTE6



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Dual Frame (UXC + UXB) UXB: ZRUM360-384-408BTE6 / 360-384-408DTE6

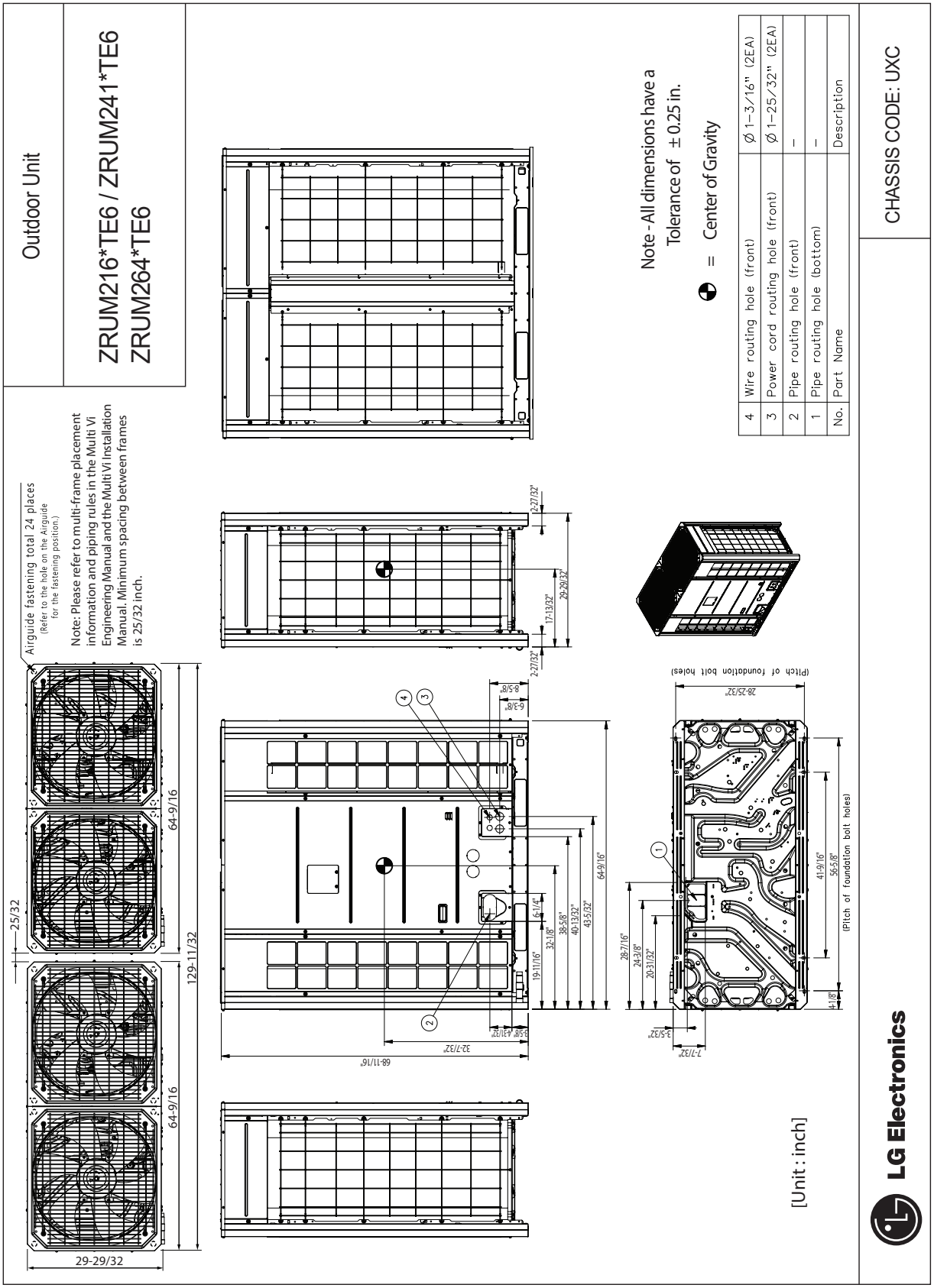


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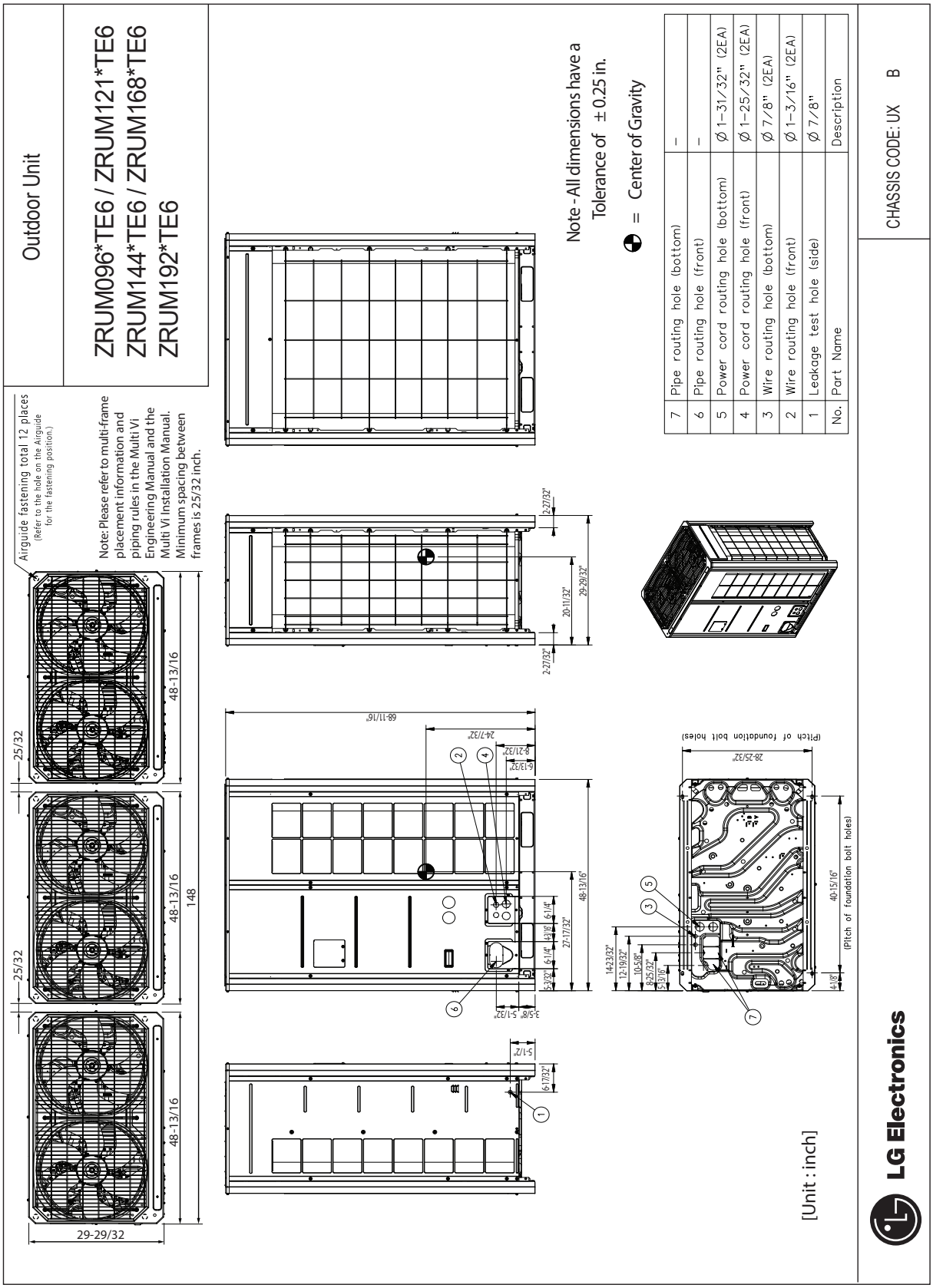
Dual Frame UXC + UXC: ZRUM432-456-480BTE6 / 432-456-480DTE6



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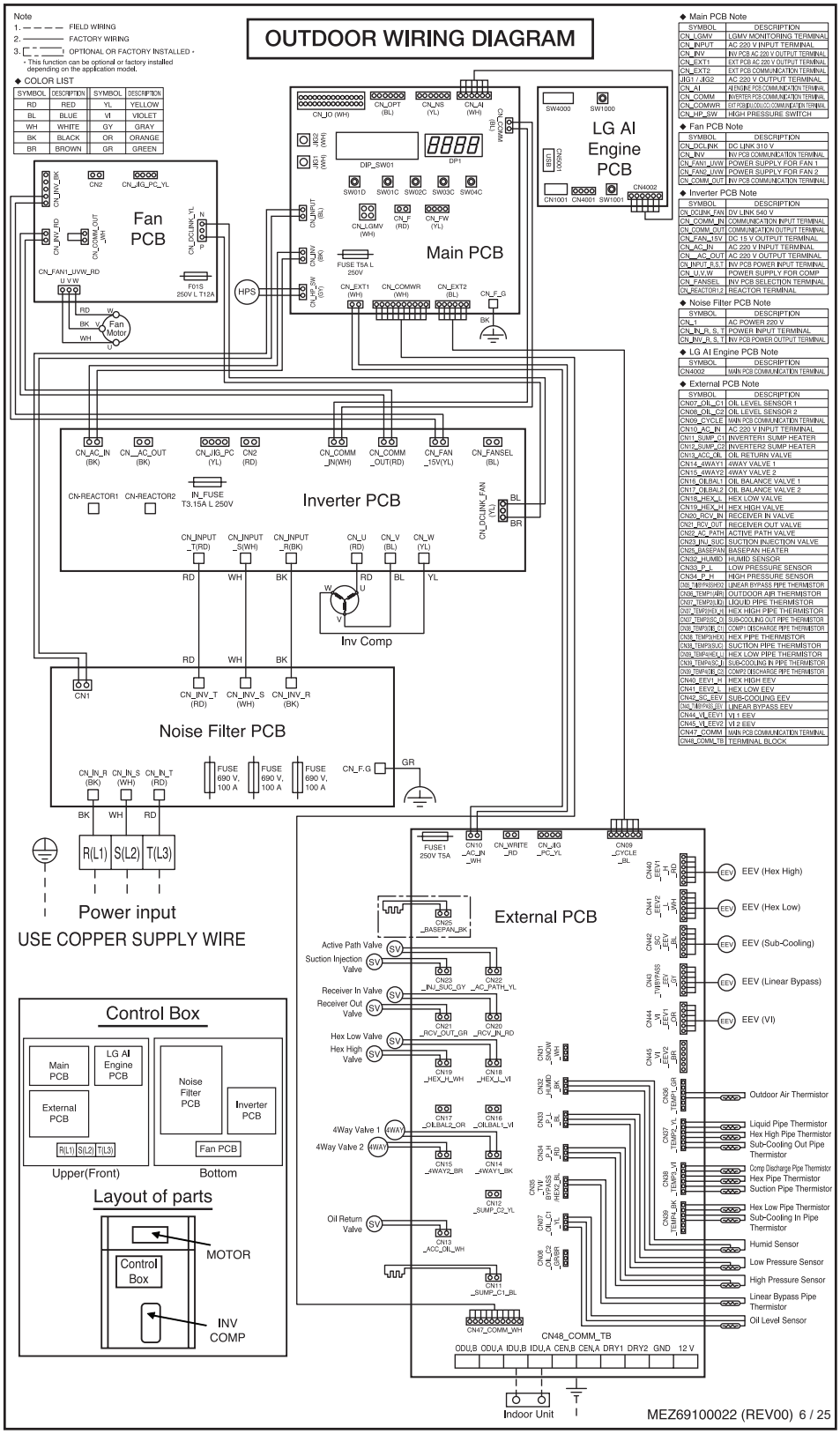
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Triple Frame UXB + UXB + UXB: ZRUM504-528BTE6 / 504-528DTE6



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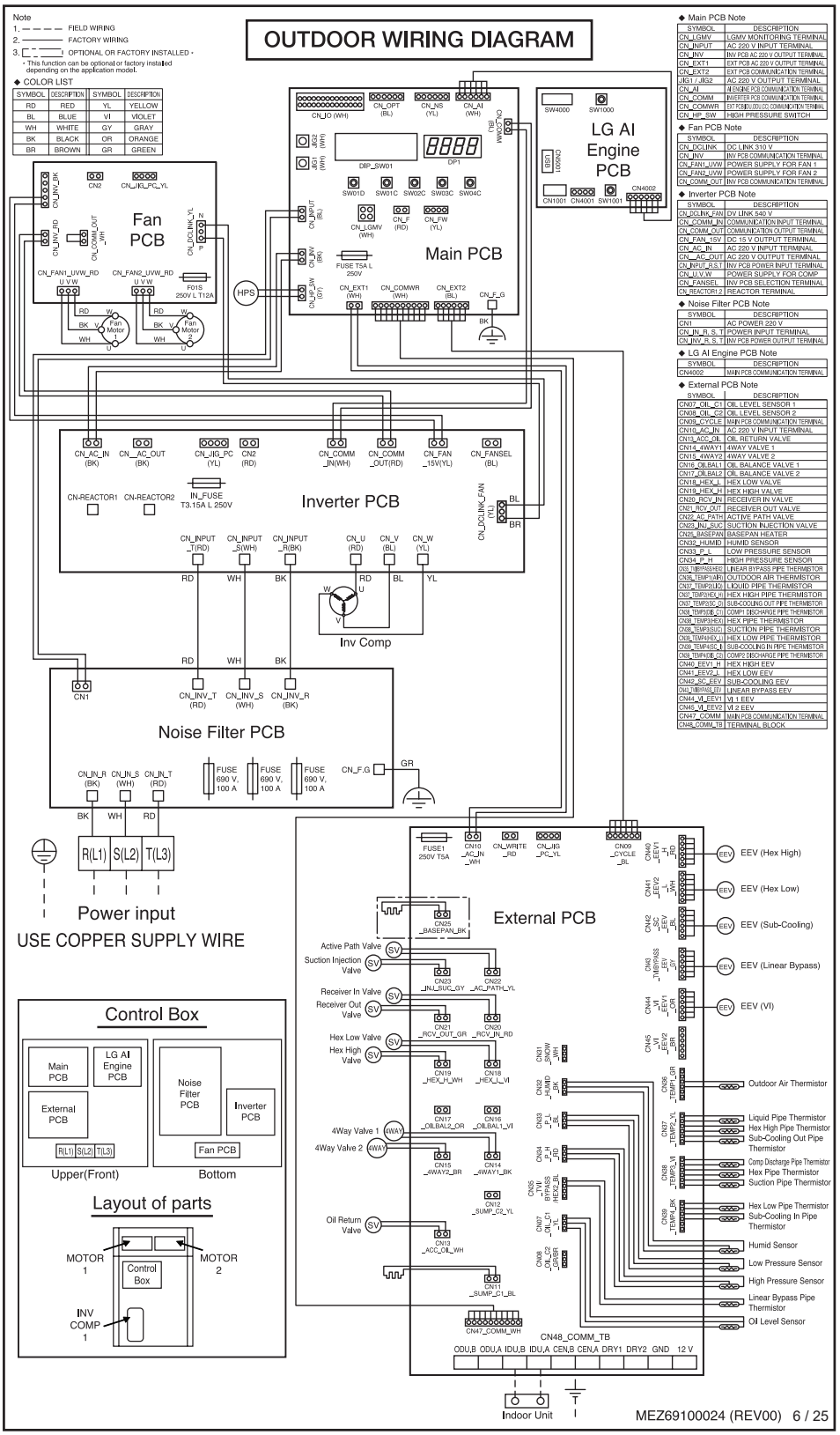
ZRUM072BTE6



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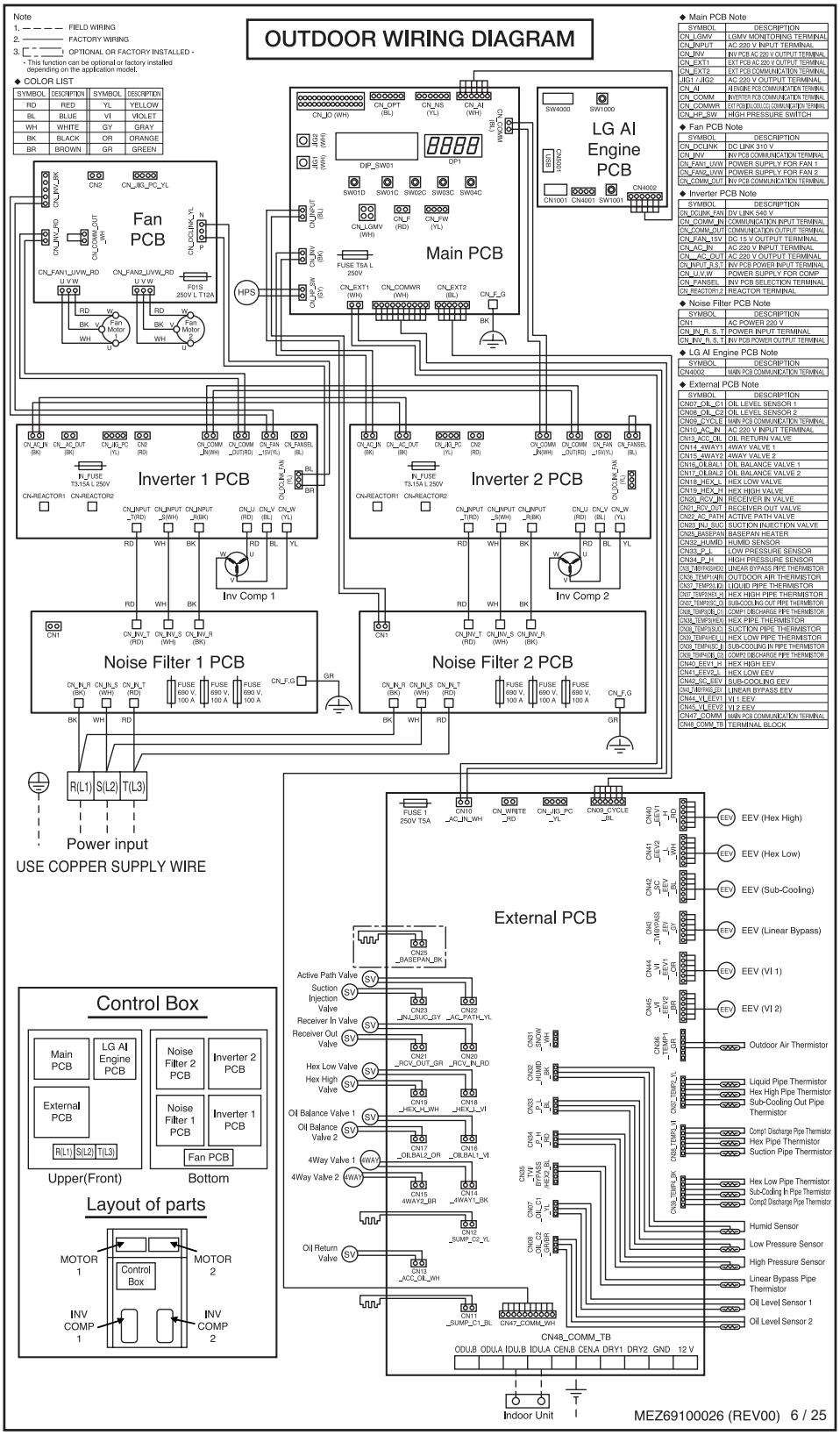
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ZRUM096BTE6, ZRUM121BTE6



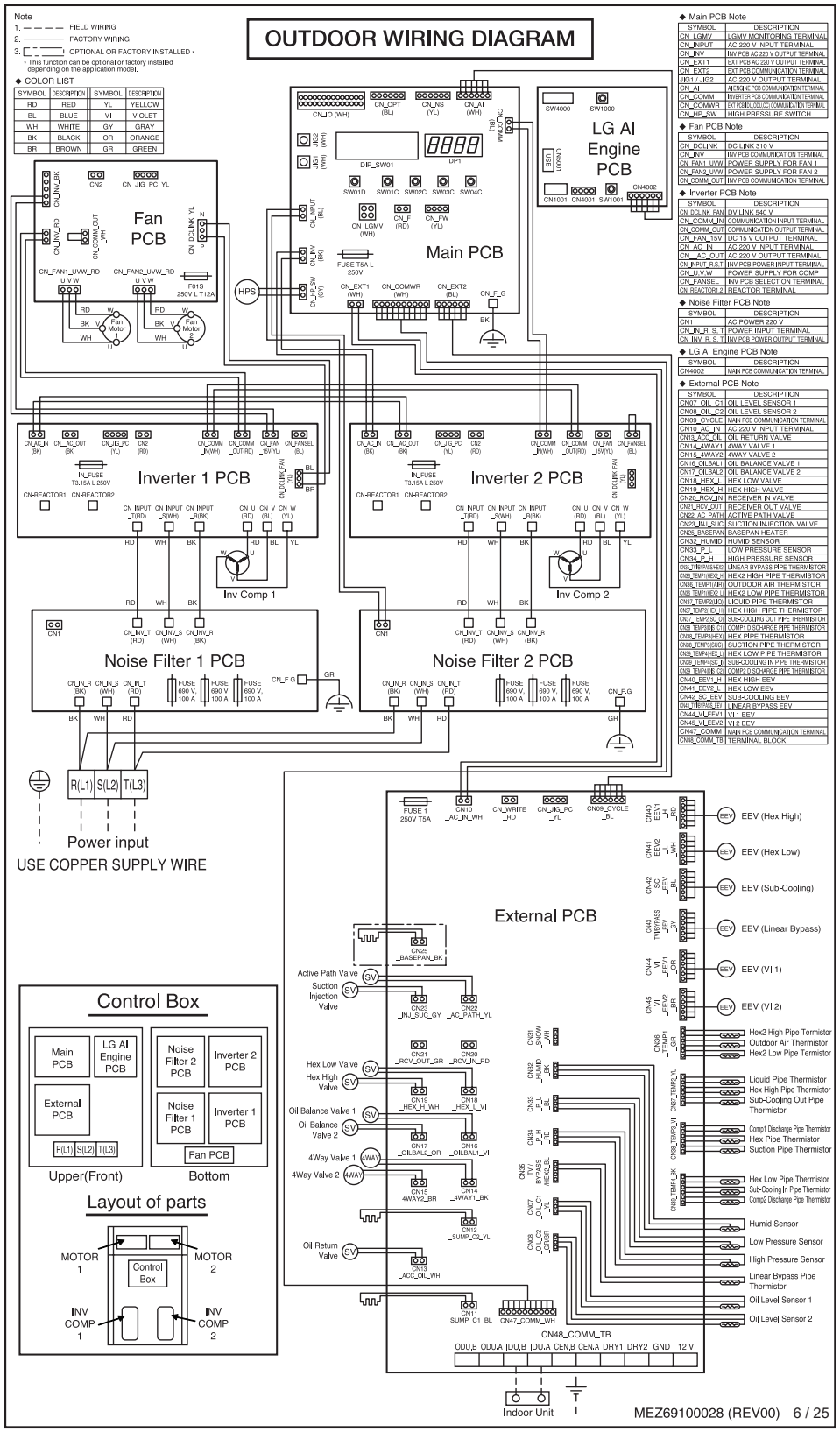
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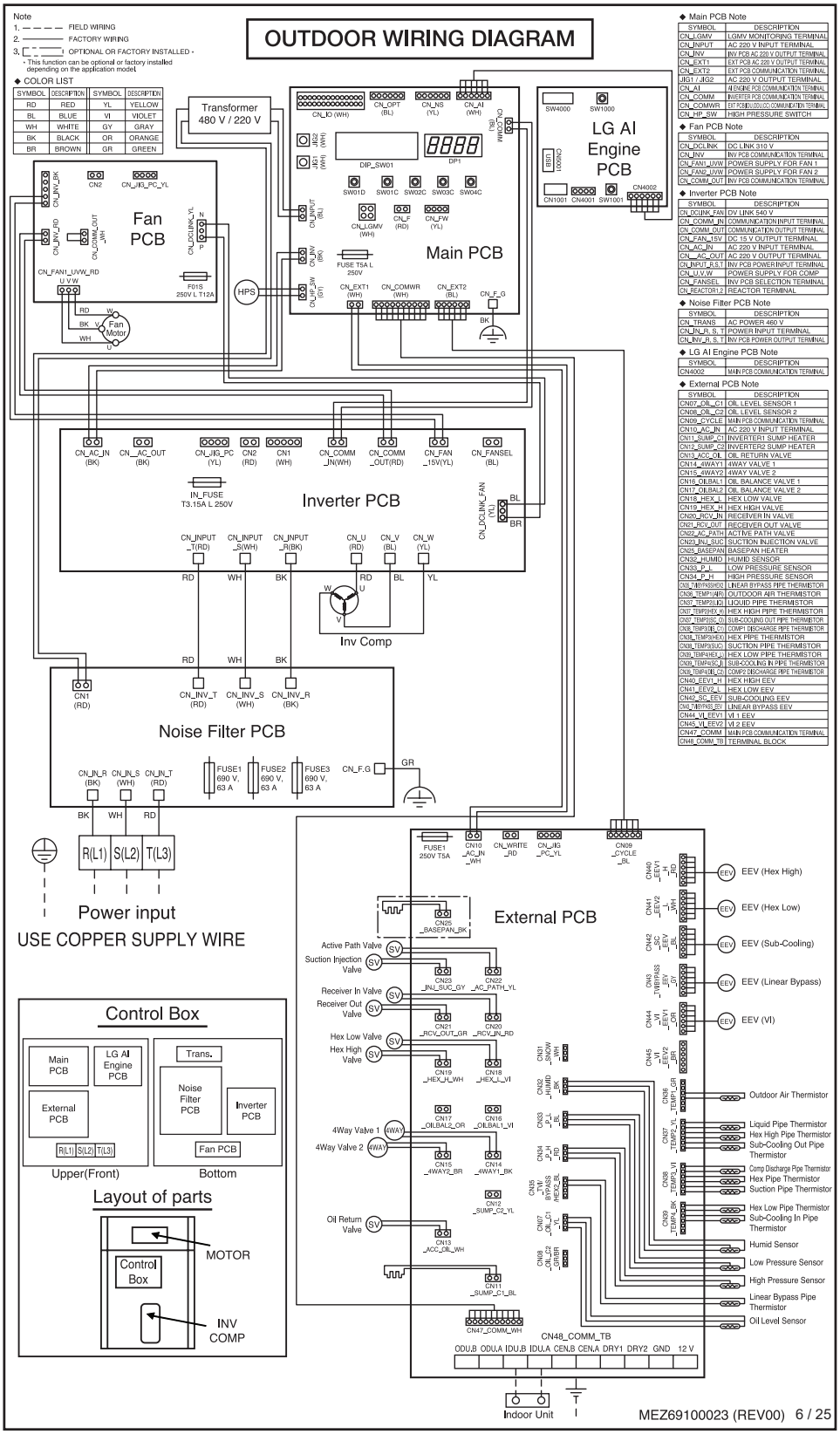
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ZRUM216BTE6, ZRUM241BTE6, ZRUM264BTE6



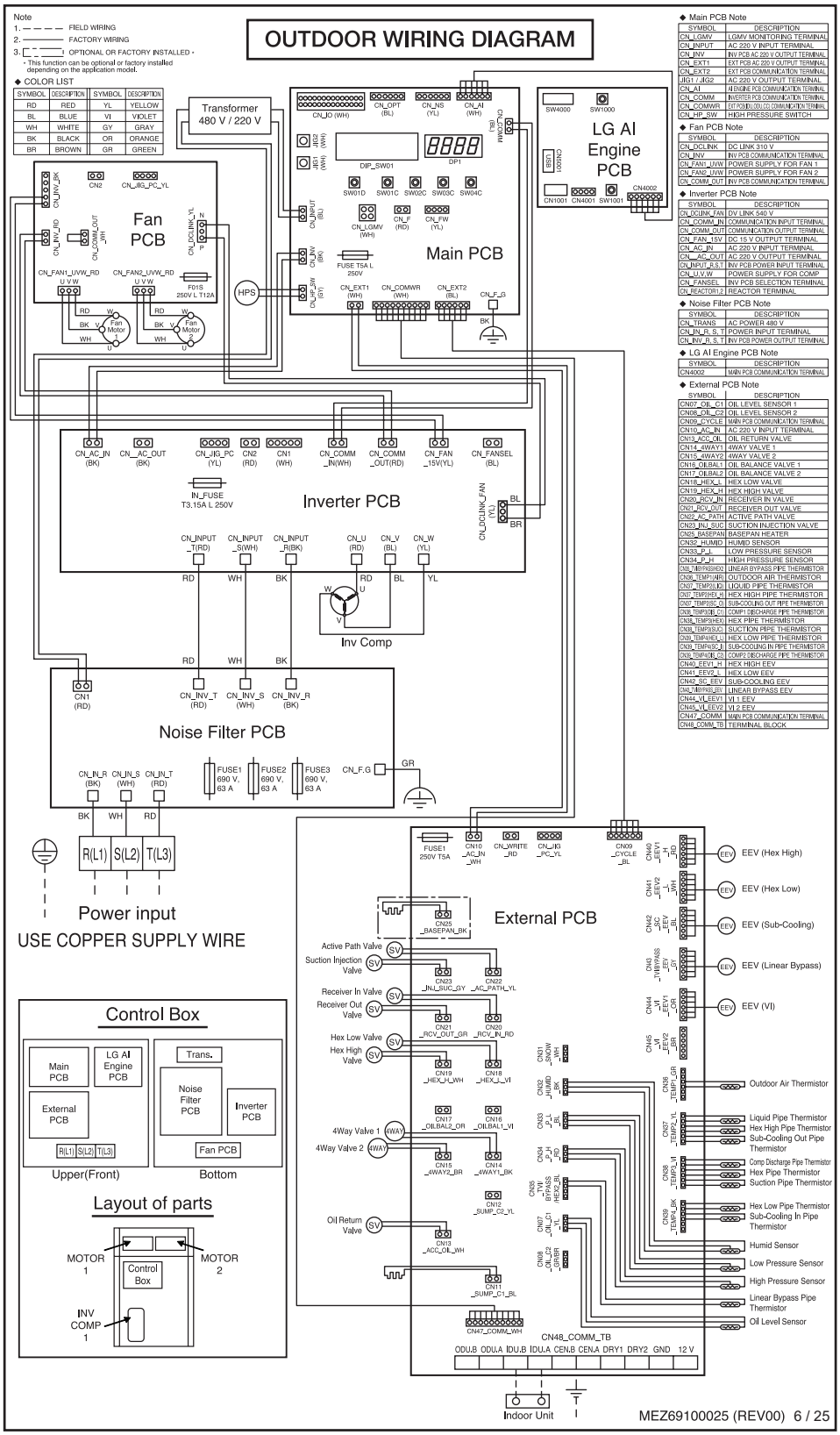
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ZRUM072DTE6



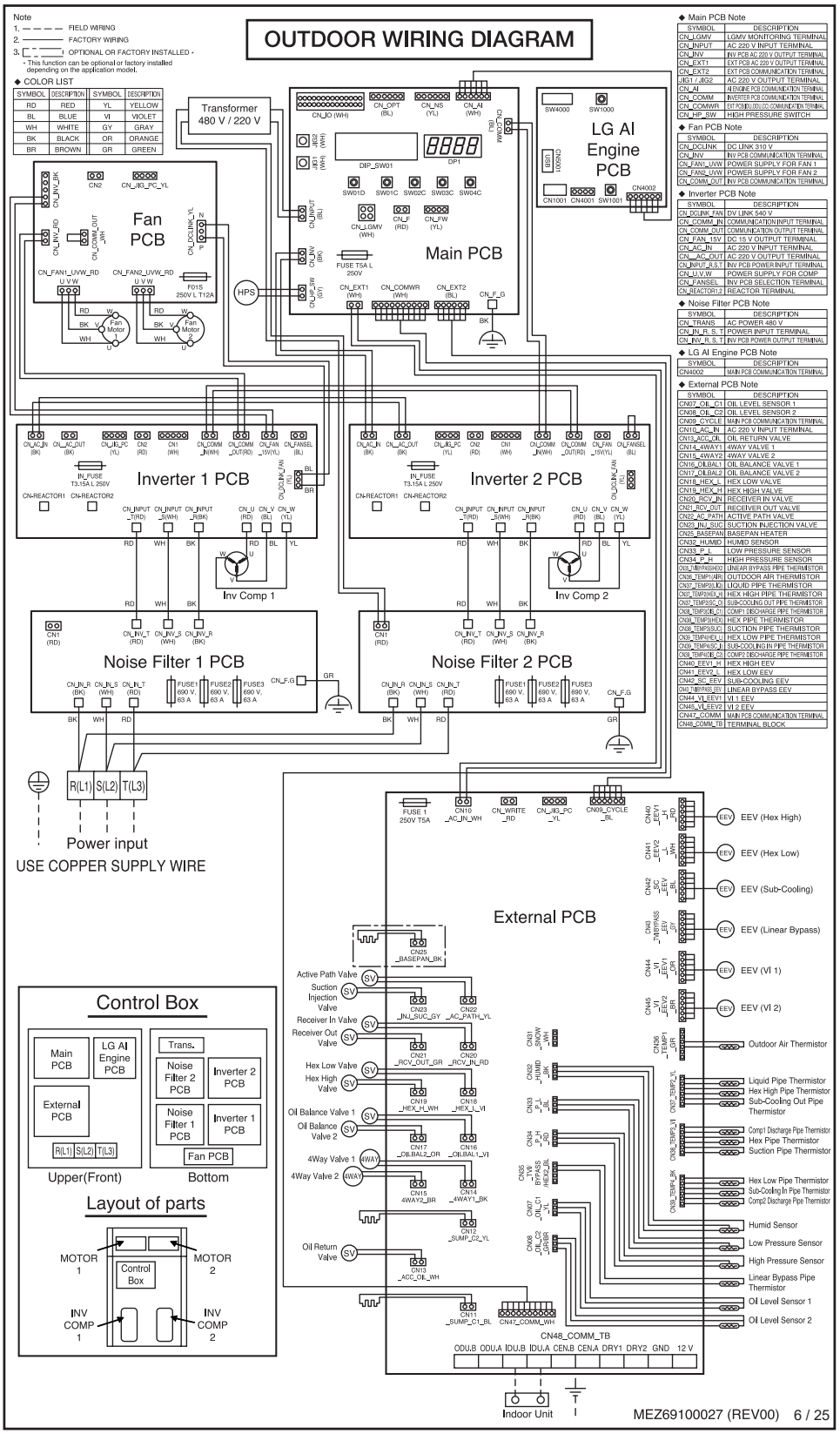
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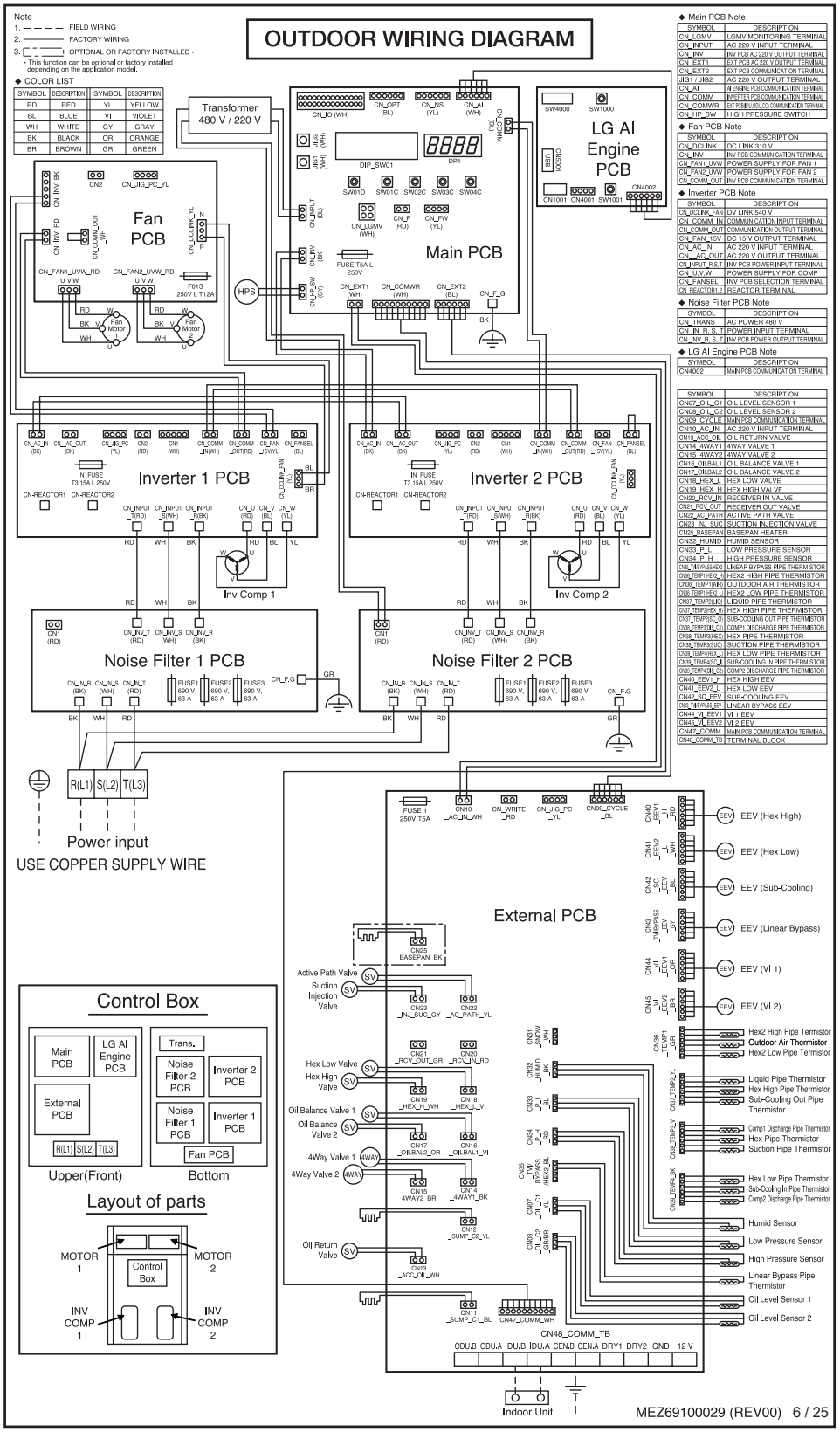
ZRUM144DTE6, ZRUM168DTE6, ZRUM192DTE6



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ZRUM216DTE6, ZRUM241DTE6, ZRUM264DTE6



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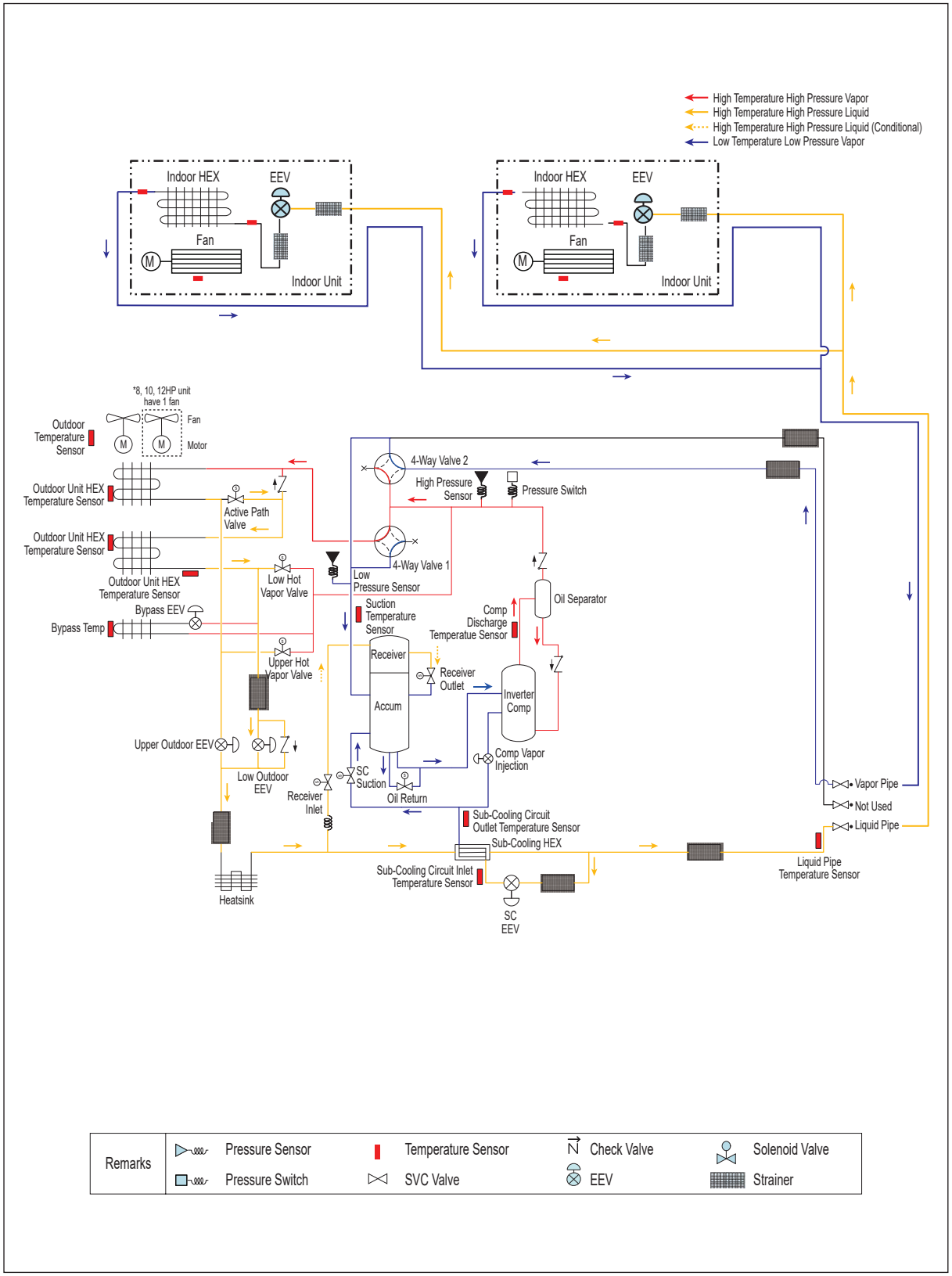
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

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Heat Pump Operation—Cooling Mode

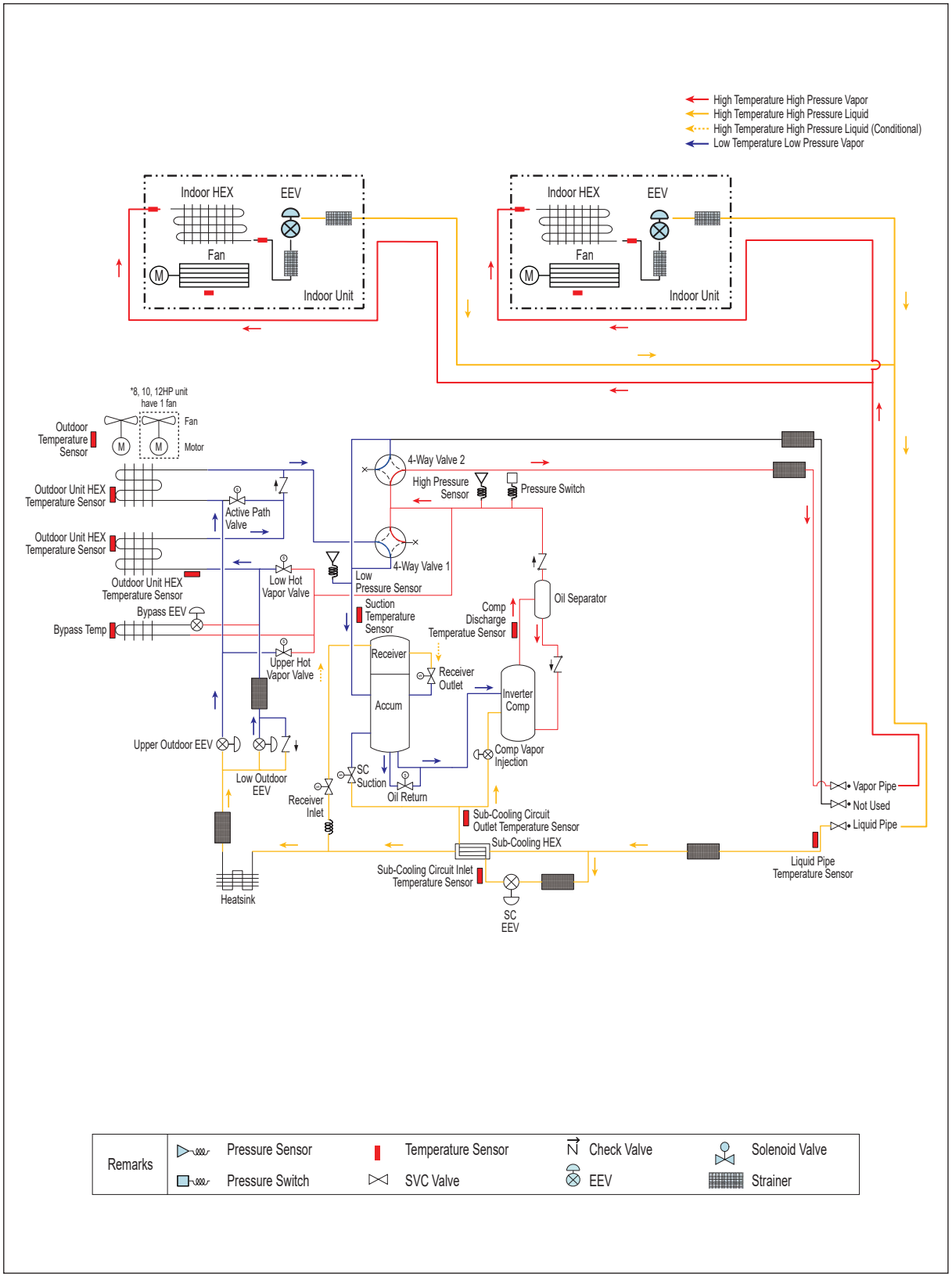
Heat Pump – Cooling Mode



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Heat Pump – Heating Mode



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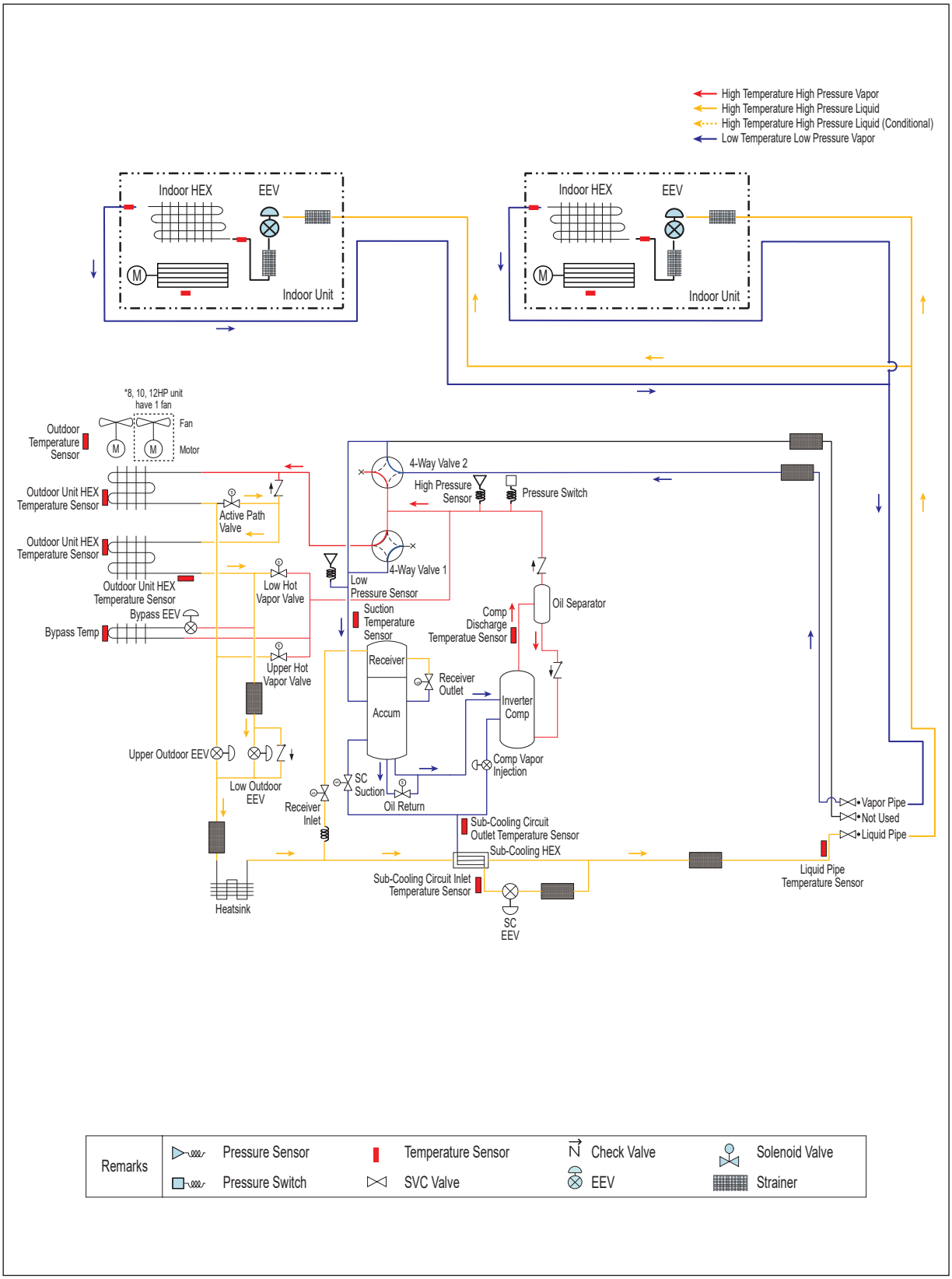
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM072BTE6 / DTE6, ZRUM096BTE6 / DTE6, ZRUM121BTE6 / DTE6

Heat Pump Operation—Oil Return and Defrost

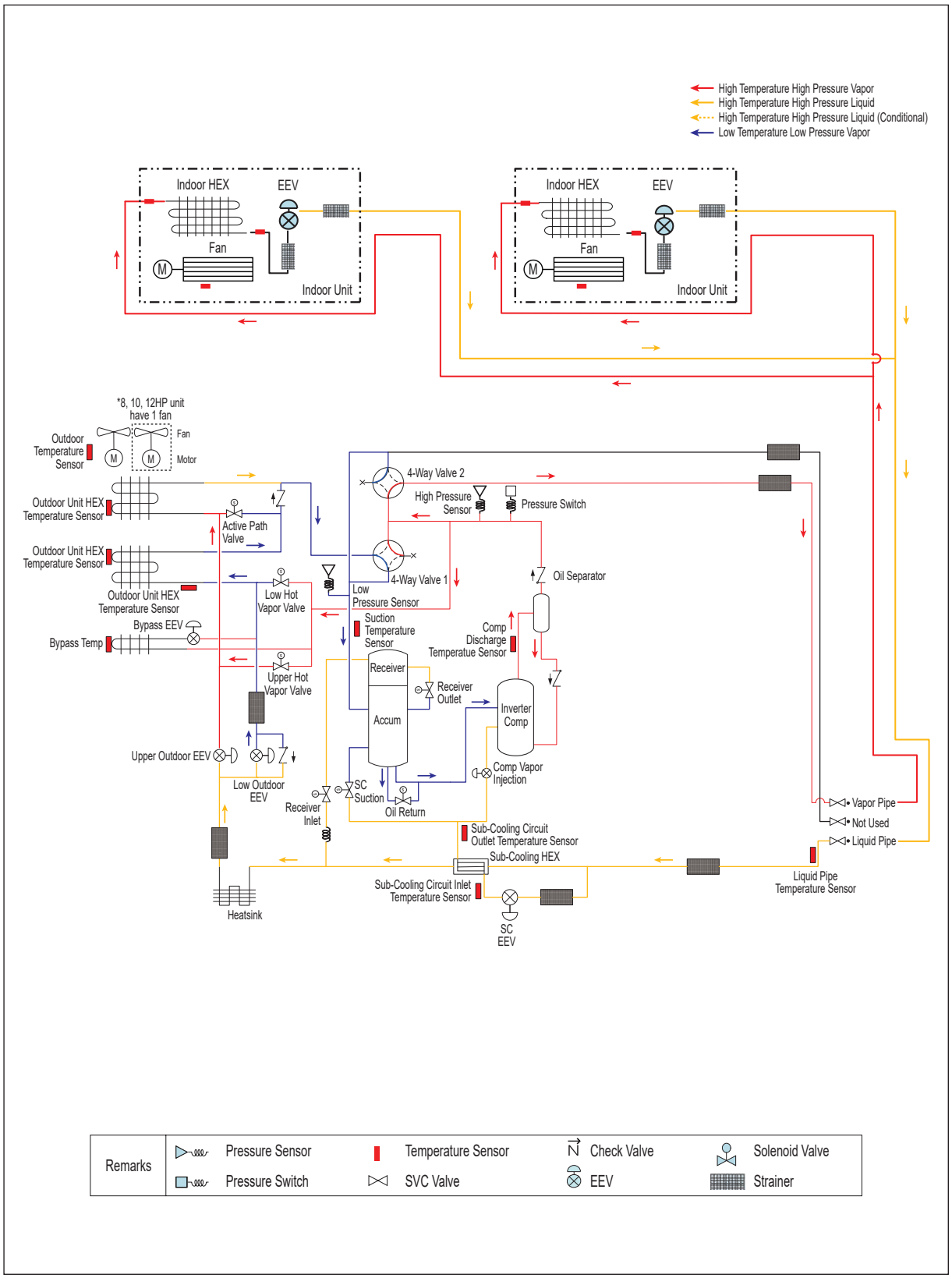
Heat Pump – Oil Return and Defrost Operation



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Heat Pump – Upper HEX Defrost Operation



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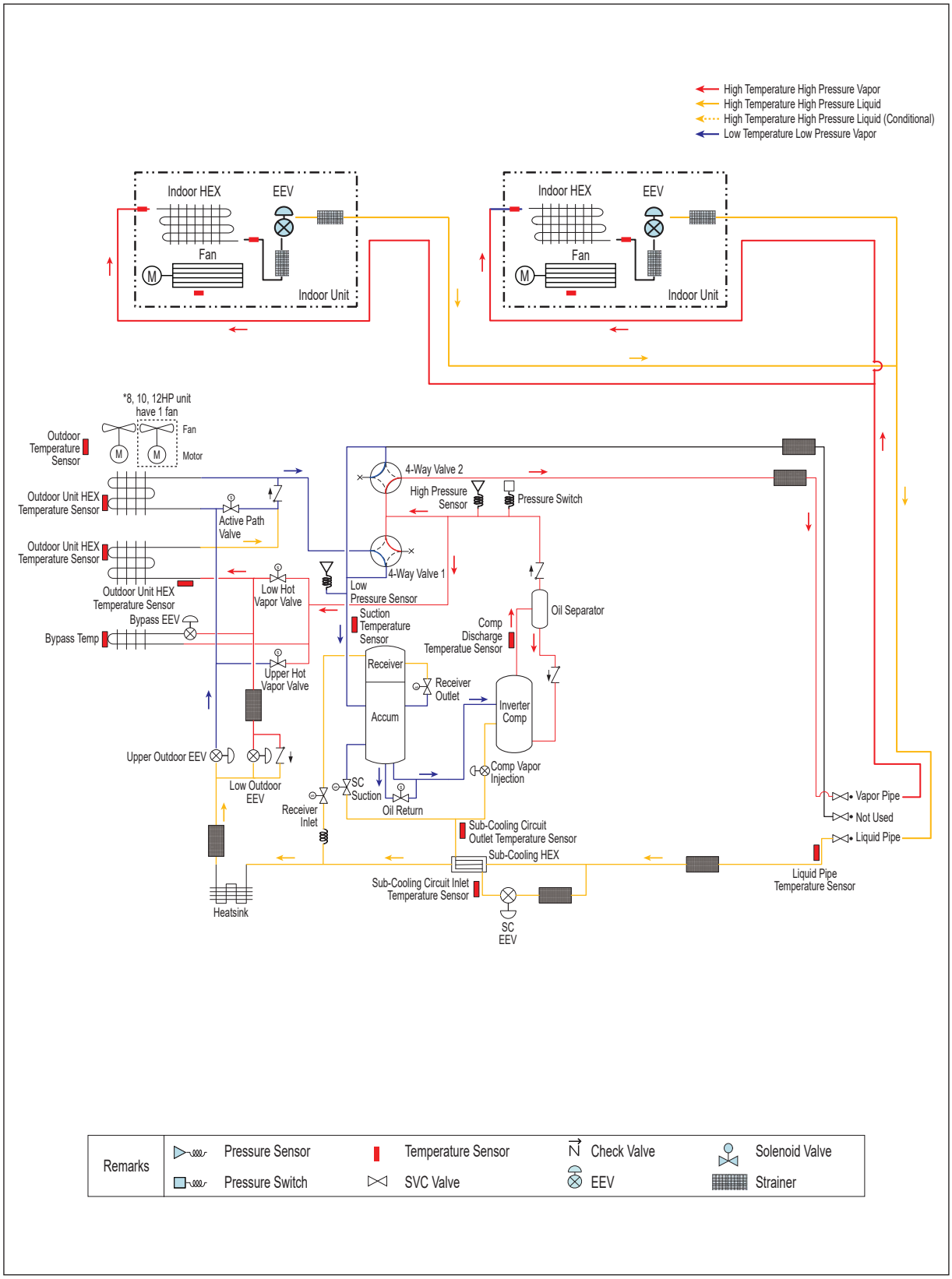
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM072BTE6 / DTE6, ZRUM096BTE6 / DTE6, ZRUM121BTE6 / DTE6

Heat Pump Operation—Lower Heat Exchanger Defrost

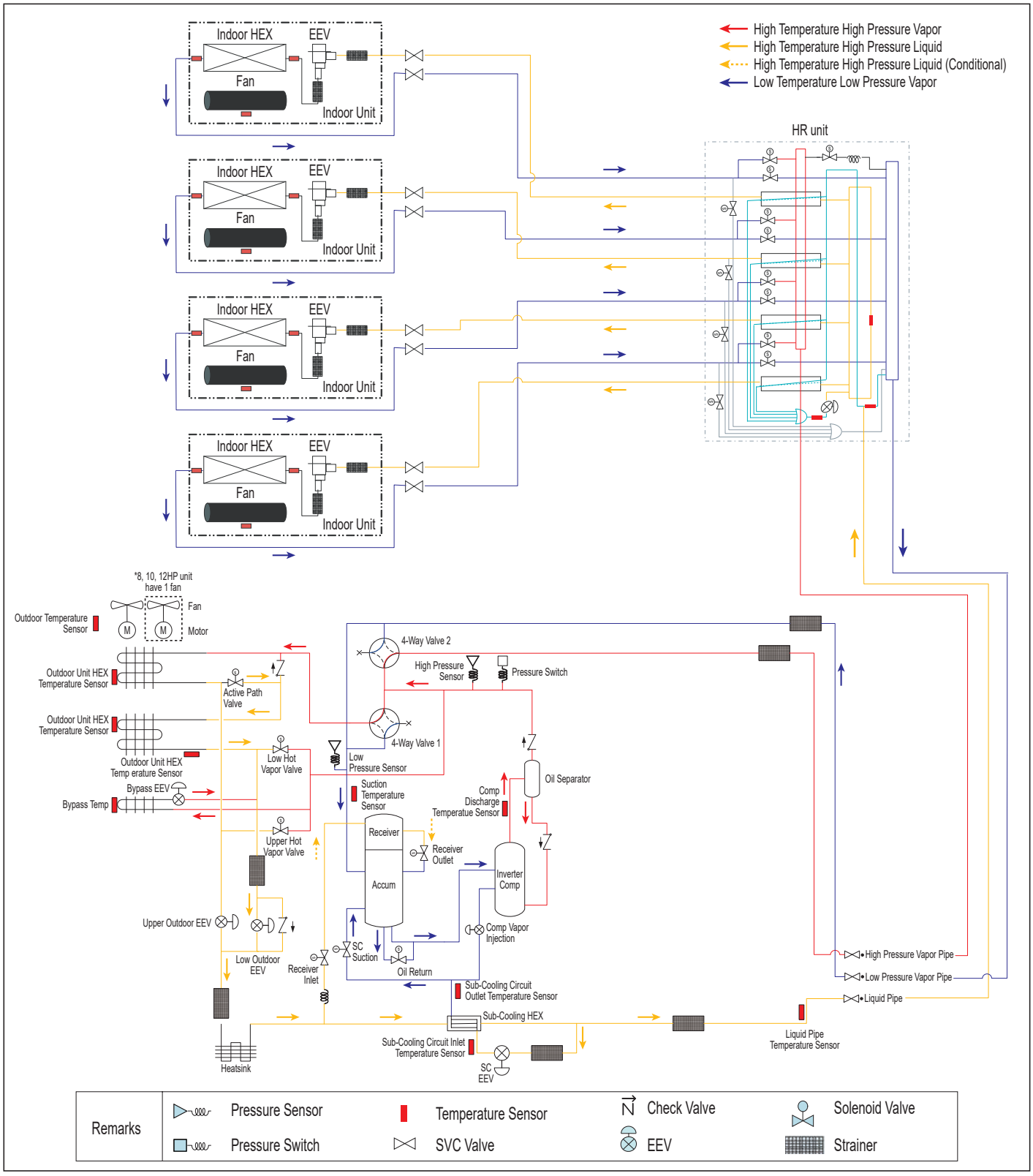
Heat Pump – Lower HEX Defrost Operation



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Heat Recovery – Cooling Mode



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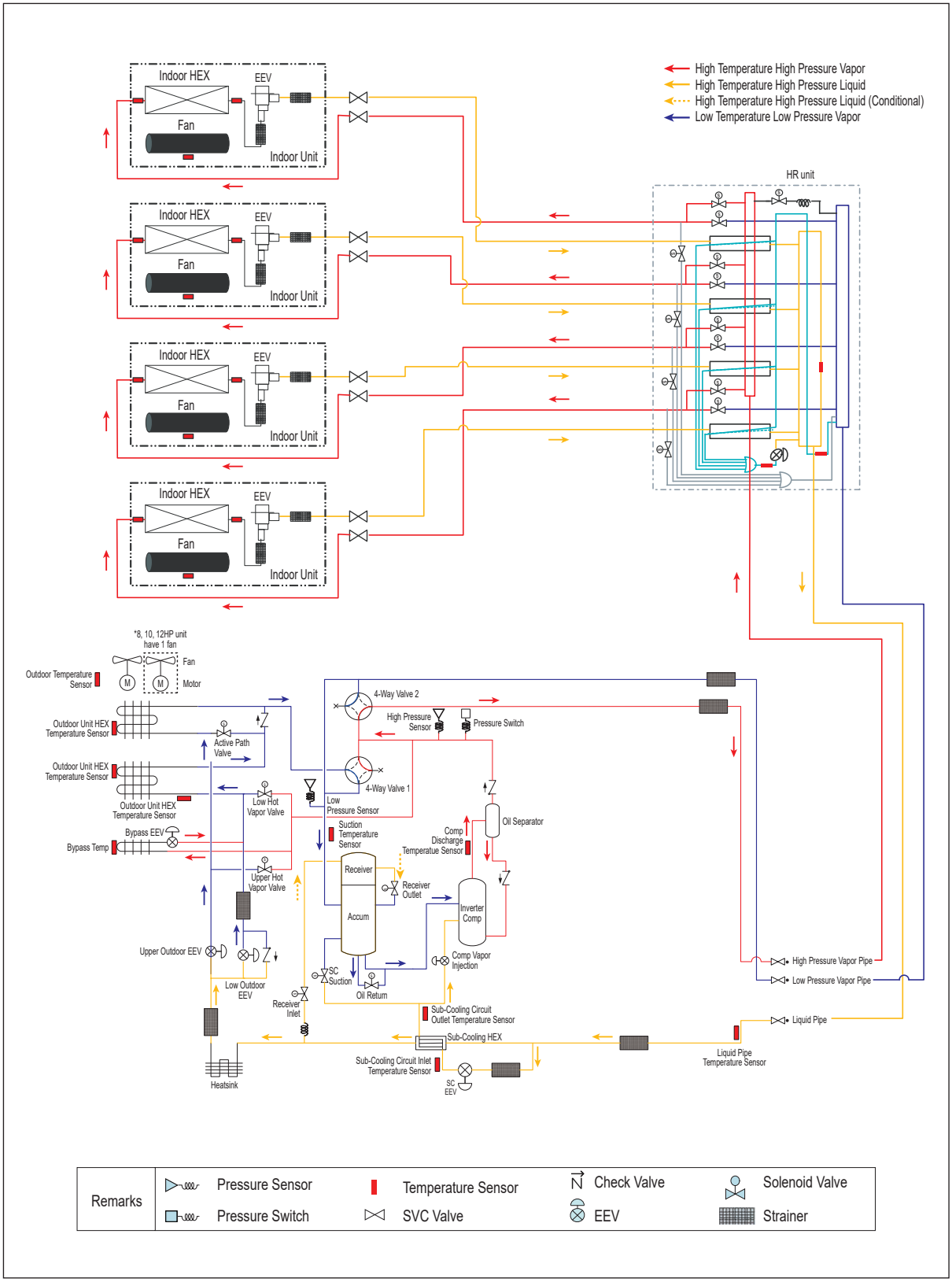
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM072BTE6 / DTE6, ZRUM096BTE6 / DTE6, ZRUM121BTE6 / DTE6

Heat Recovery Operation—Heating Mode

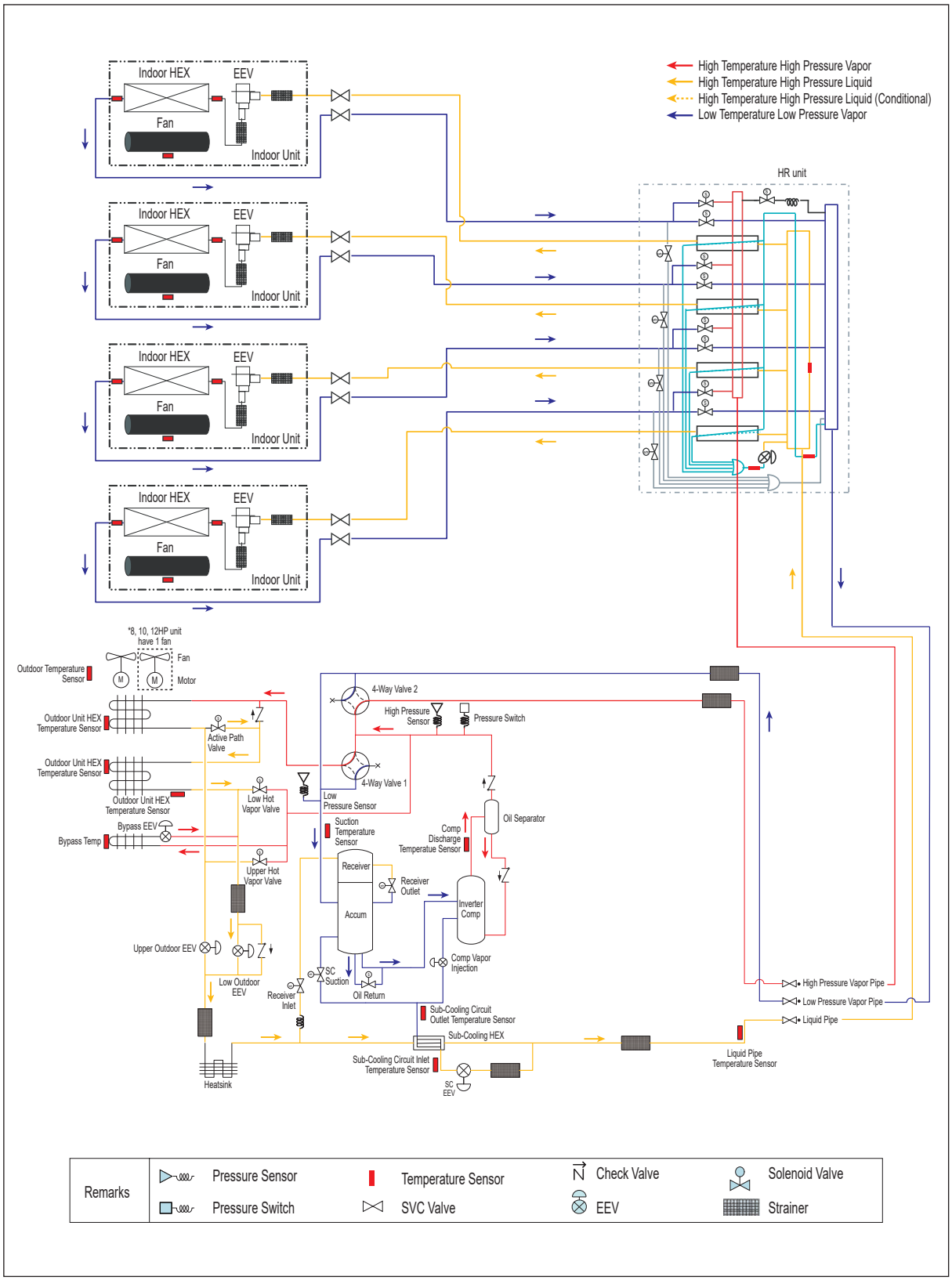
Heat Recovery – Heating Mode



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Heat Recovery – Oil Return and Defrost Operation



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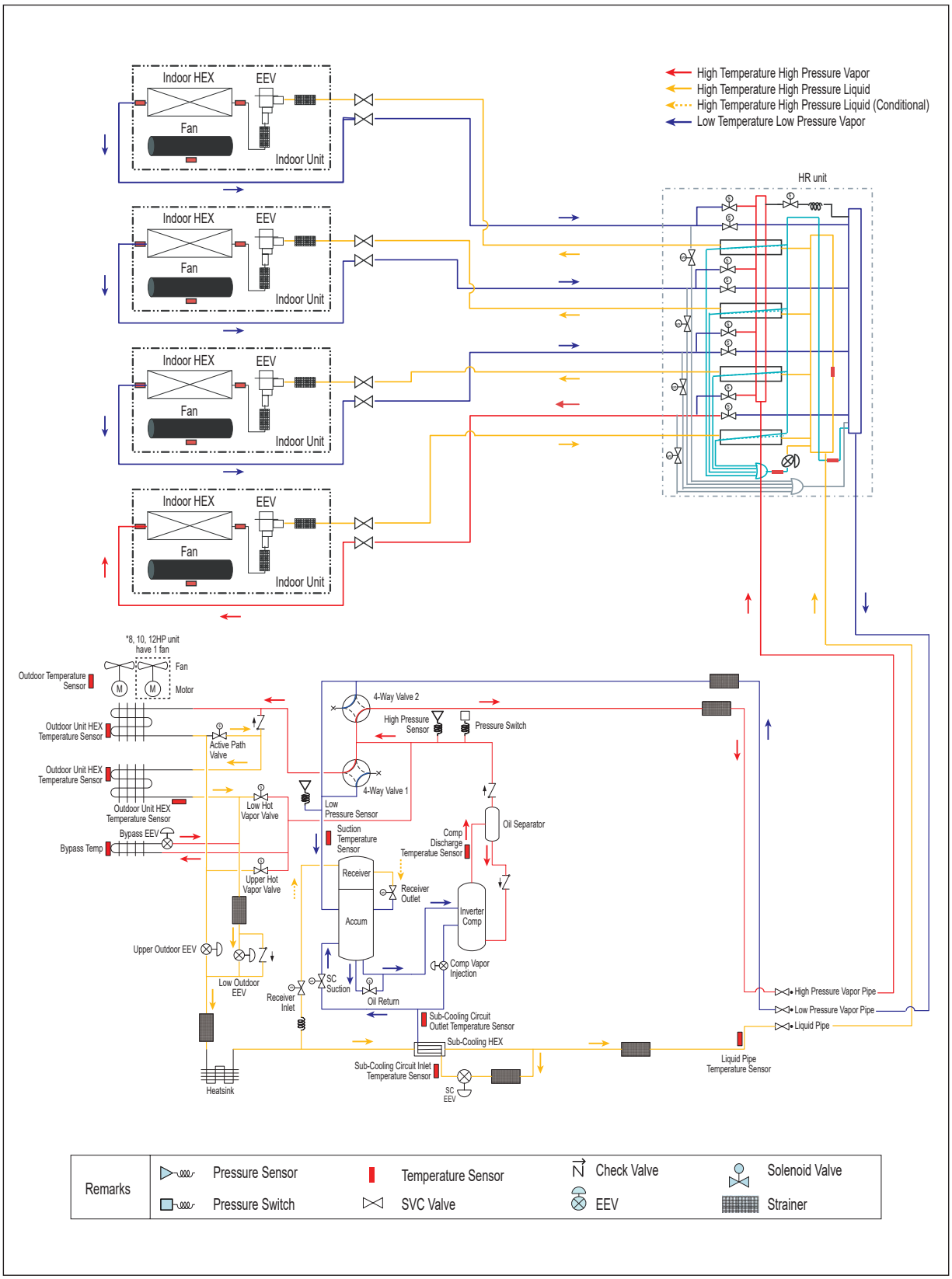
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM072BTE6 / DTE6, ZRUM096BTE6 / DTE6, ZRUM121BTE6 / DTE6

Heat Recovery Operation—Cooling-based Simultaneous Operation

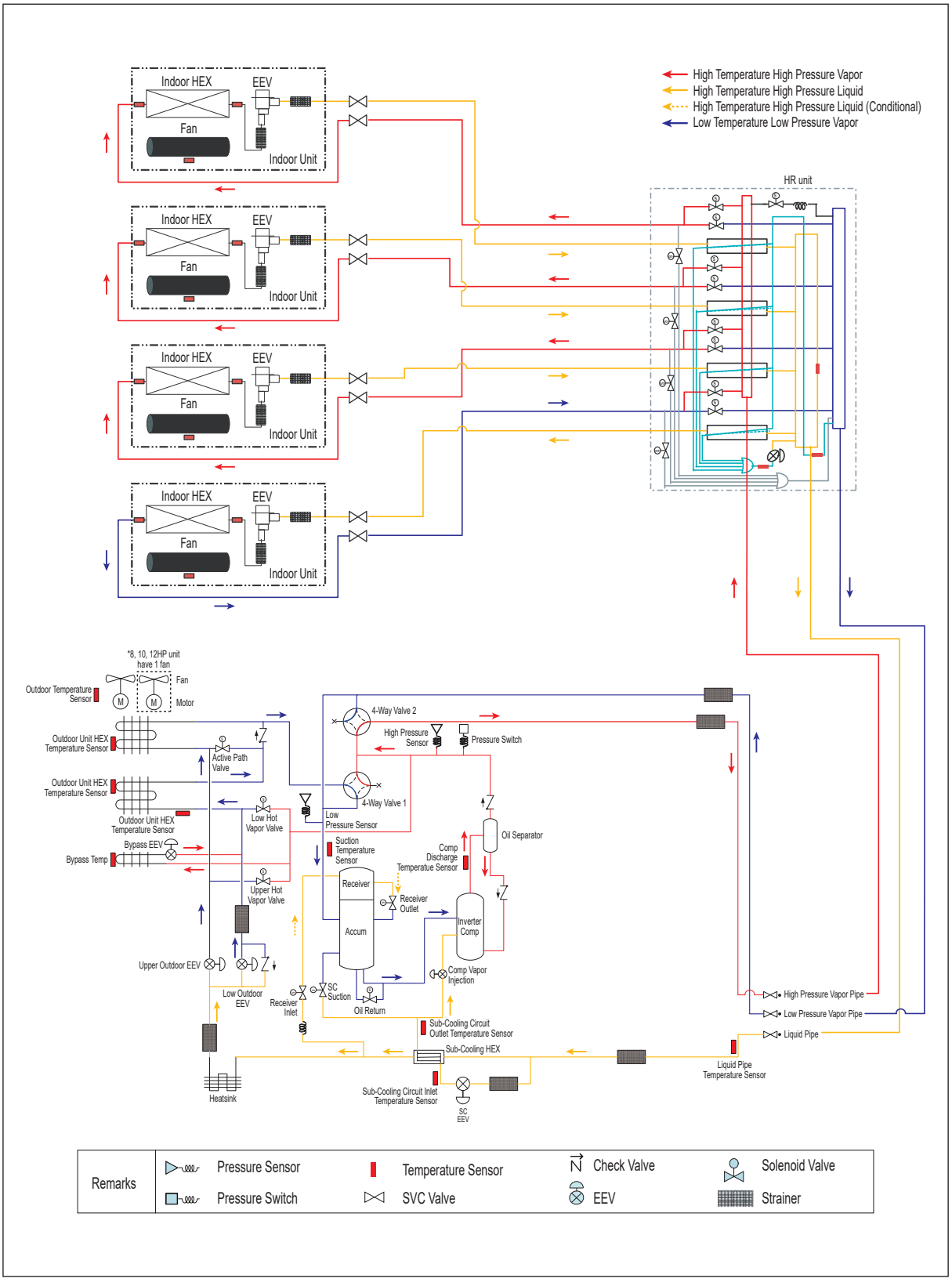
Heat Recovery – Cooling-based Simultaneous Operation



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Heat Recovery – Heating-based Simultaneous Operation



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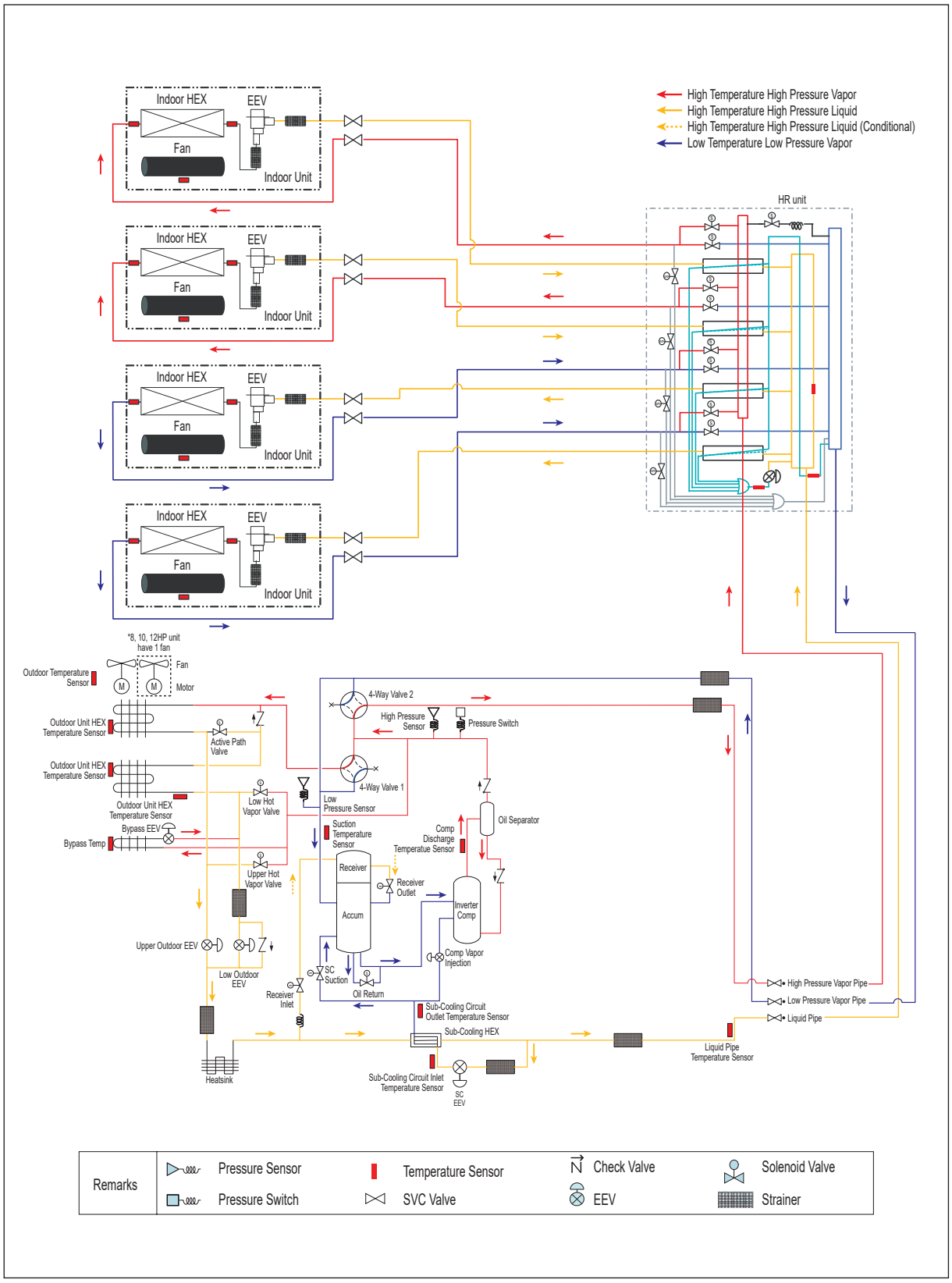
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM072BTE6 / DTE6, ZRUM096BTE6 / DTE6, ZRUM121BTE6 / DTE6

Heat Recovery Operation—Balanced Simultaneous Operation

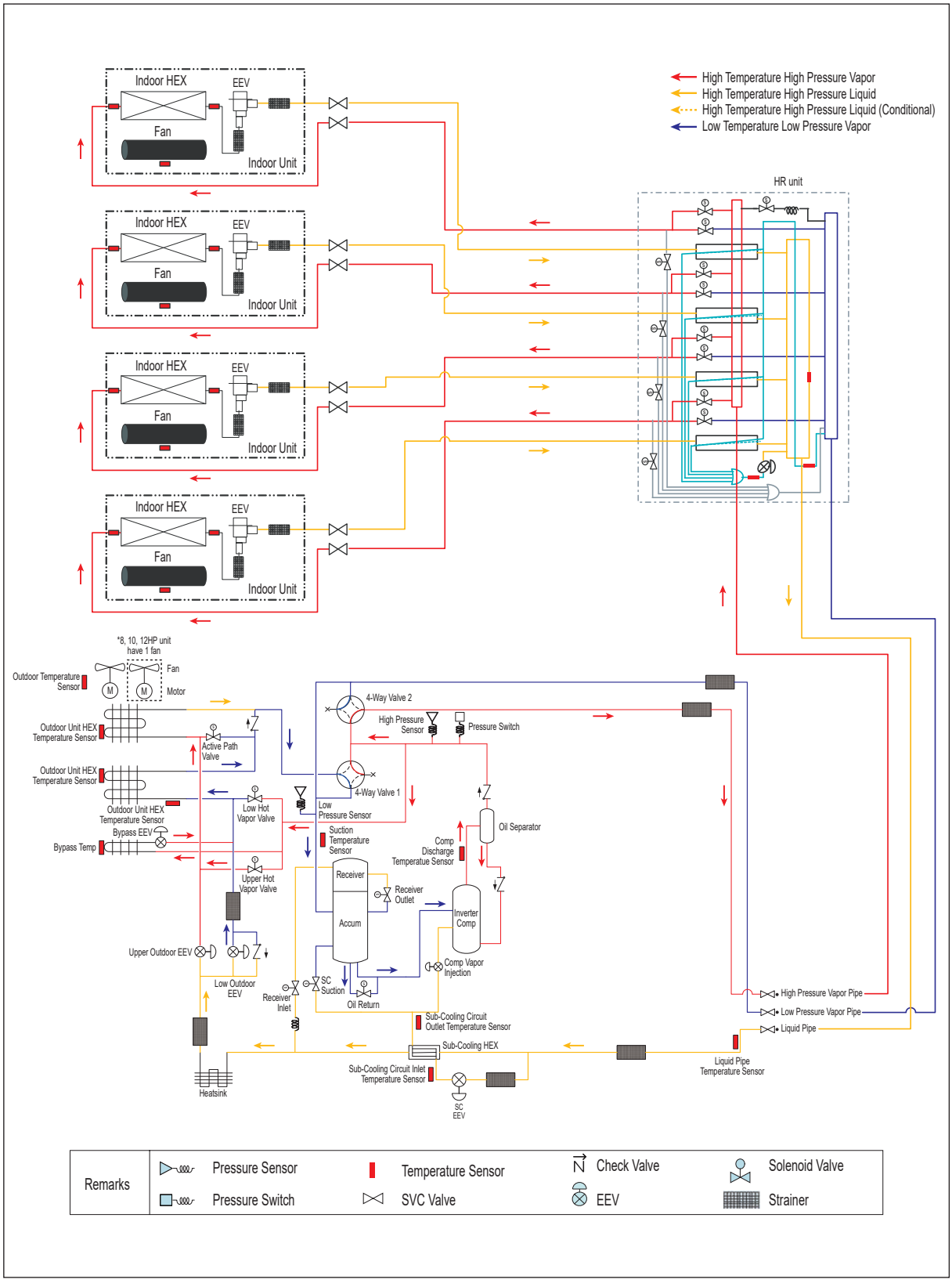
Heat Recovery – Balanced Simultaneous Operation



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Heat Recovery – Upper HEX Defrost Operation



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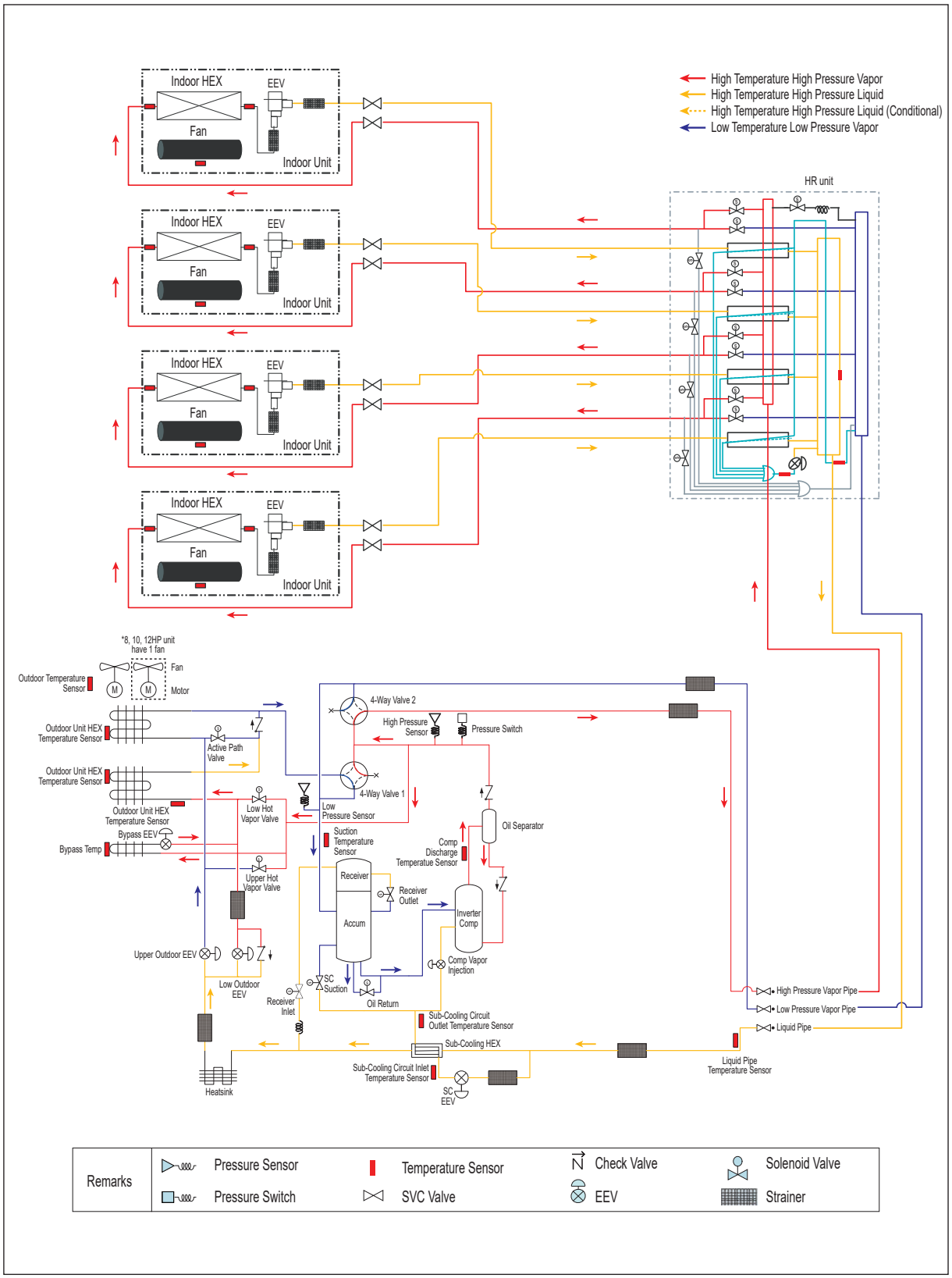
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM072BTE6 / DTE6, ZRUM096BTE6 / DTE6, ZRUM121BTE6 / DTE6

Heat Recovery Operation—Lower HEX Defrost Operation

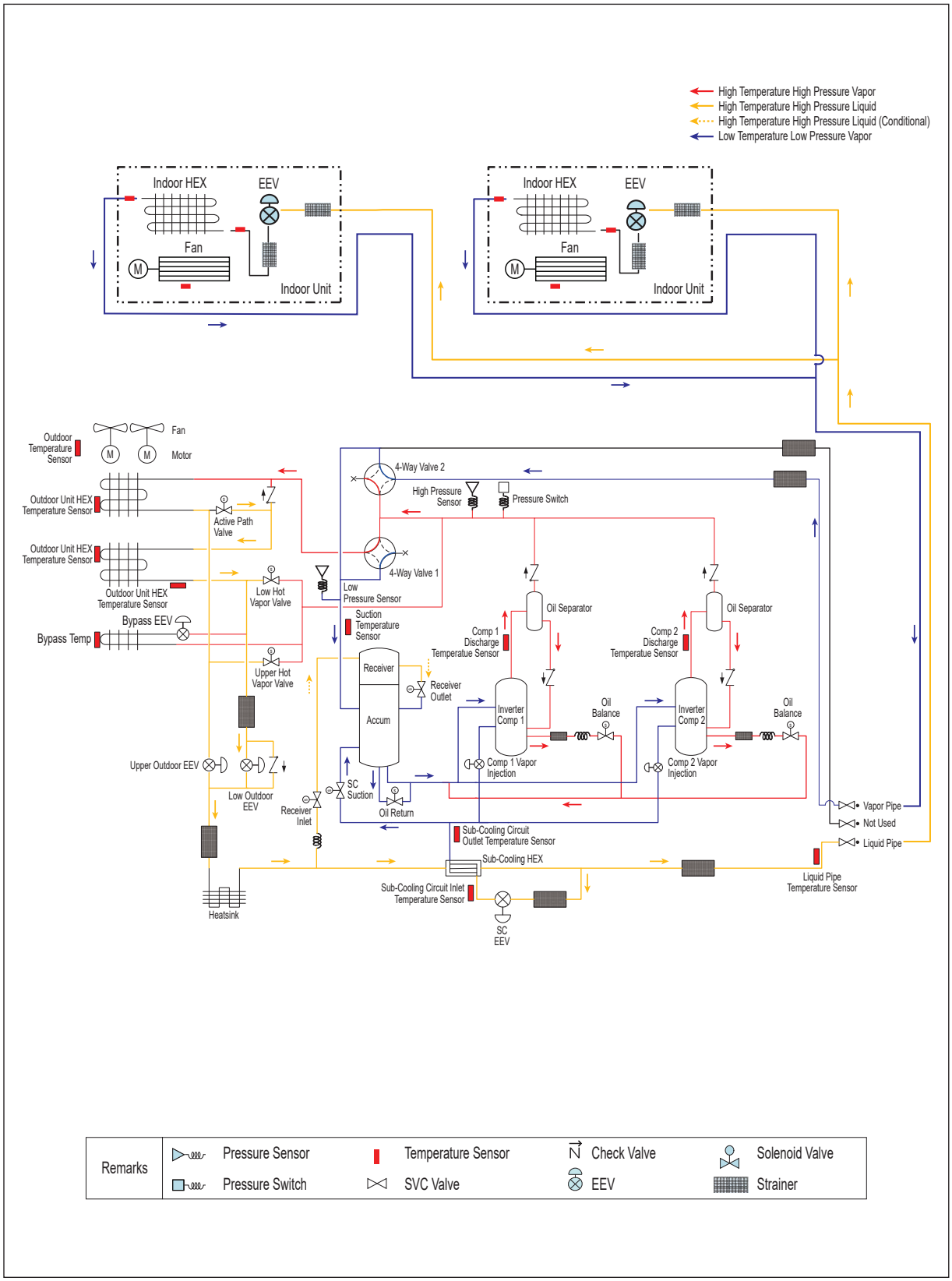
Heat Recovery – Lower HEX Defrost Operation



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Heat Pump – Cooling Mode



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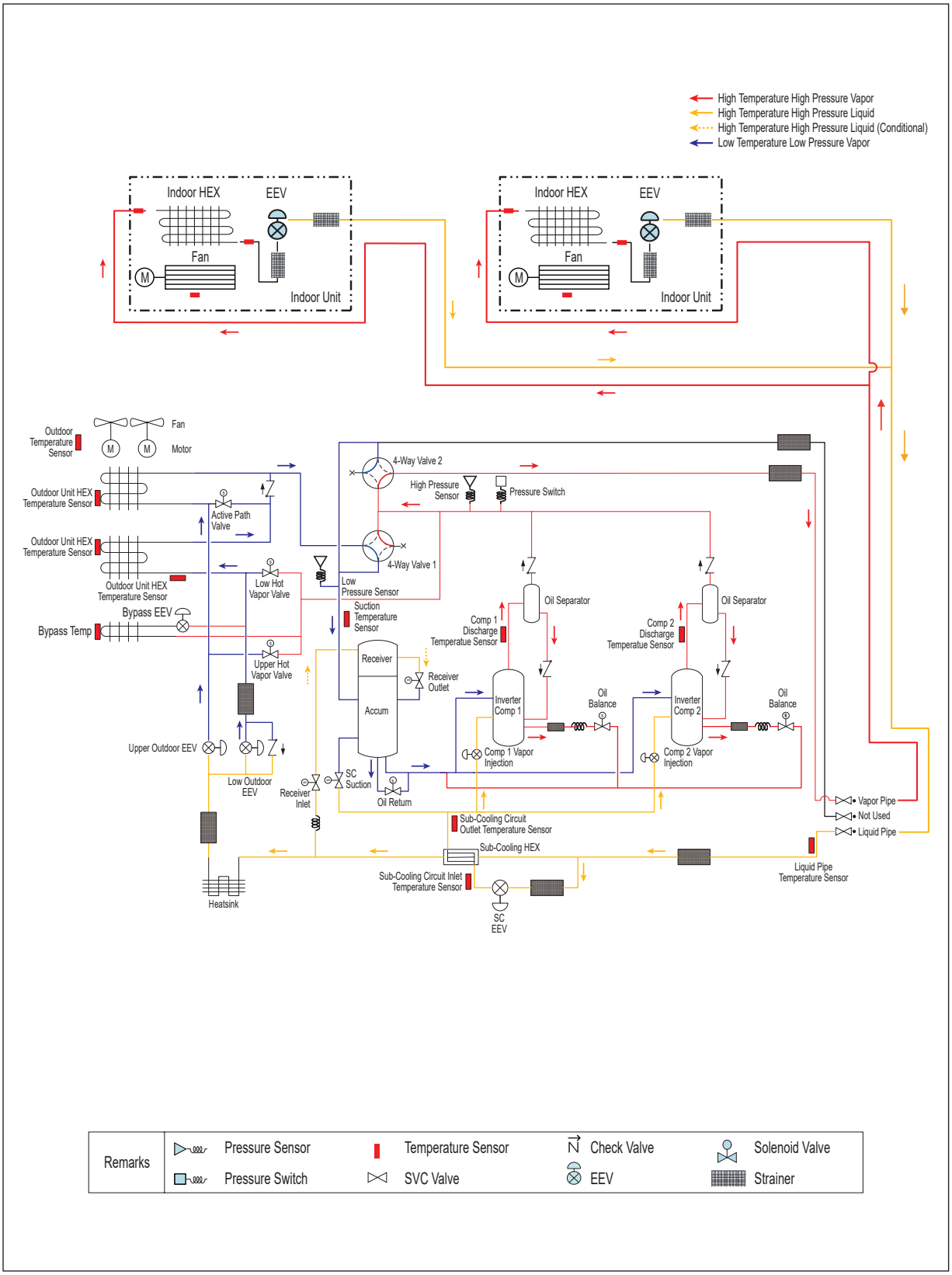
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM144BTE6 / DTE6, ZRUM168BTE6 / DTE6, ZRUM192BTE6 / DTE6

Heat Pump Operation—Heating Mode

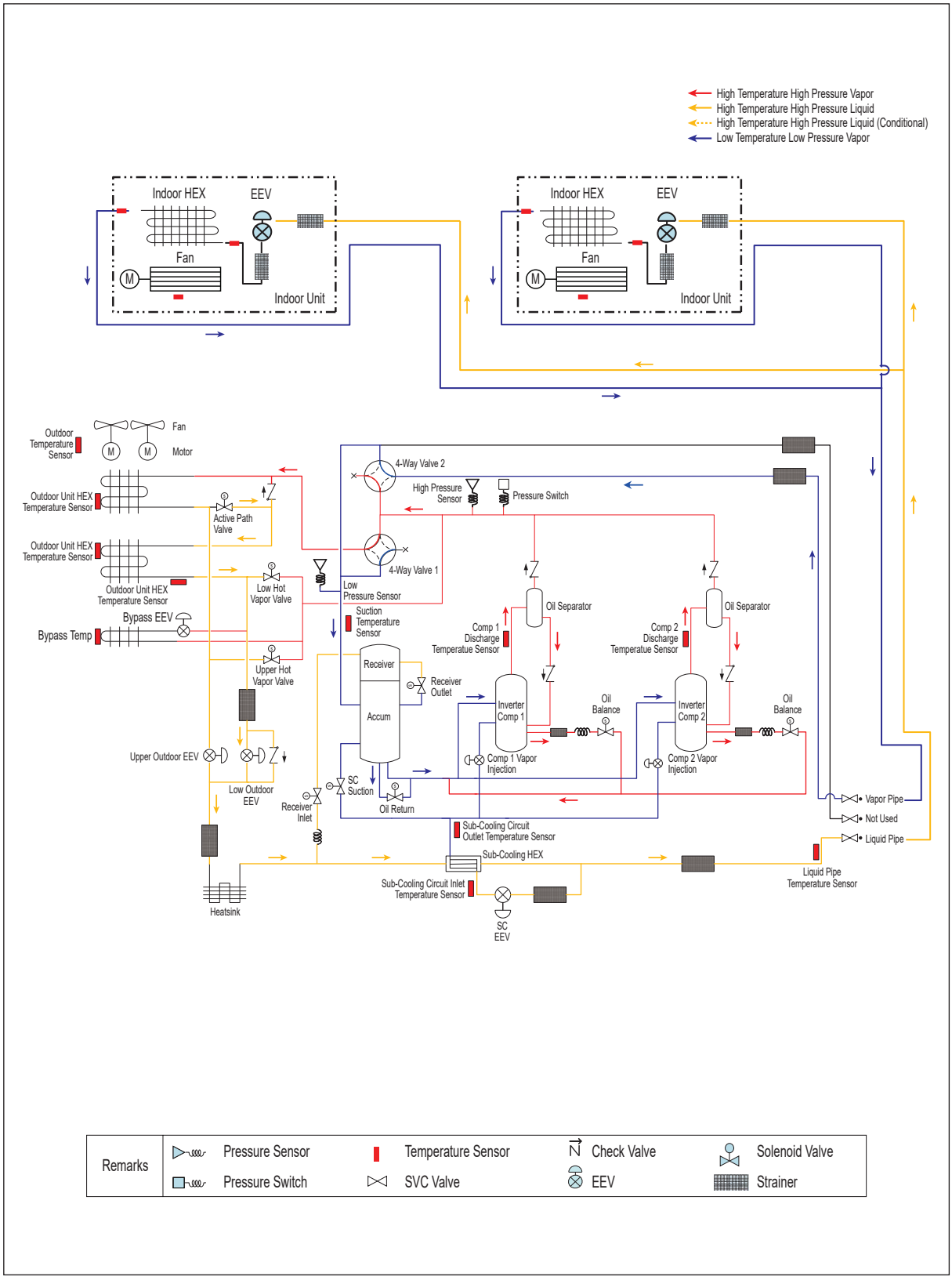
Heat Pump – Heating Mode



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Heat Pump – Oil Return and Defrost Operation



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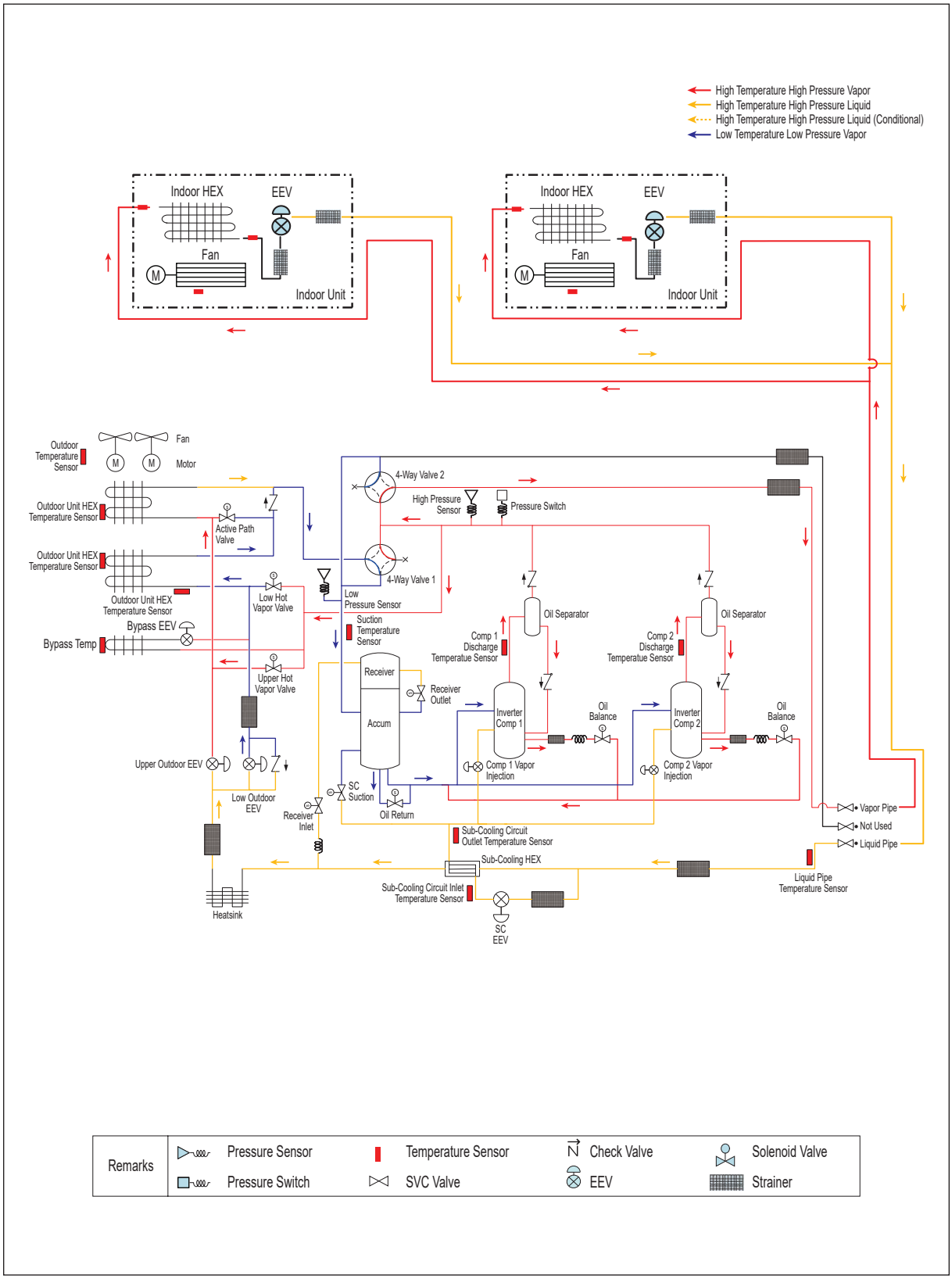
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM144BTE6 / DTE6, ZRUM168BTE6 / DTE6, ZRUM192BTE6 / DTE6

Heat Pump Operation—Upper HEX Defrost Operation

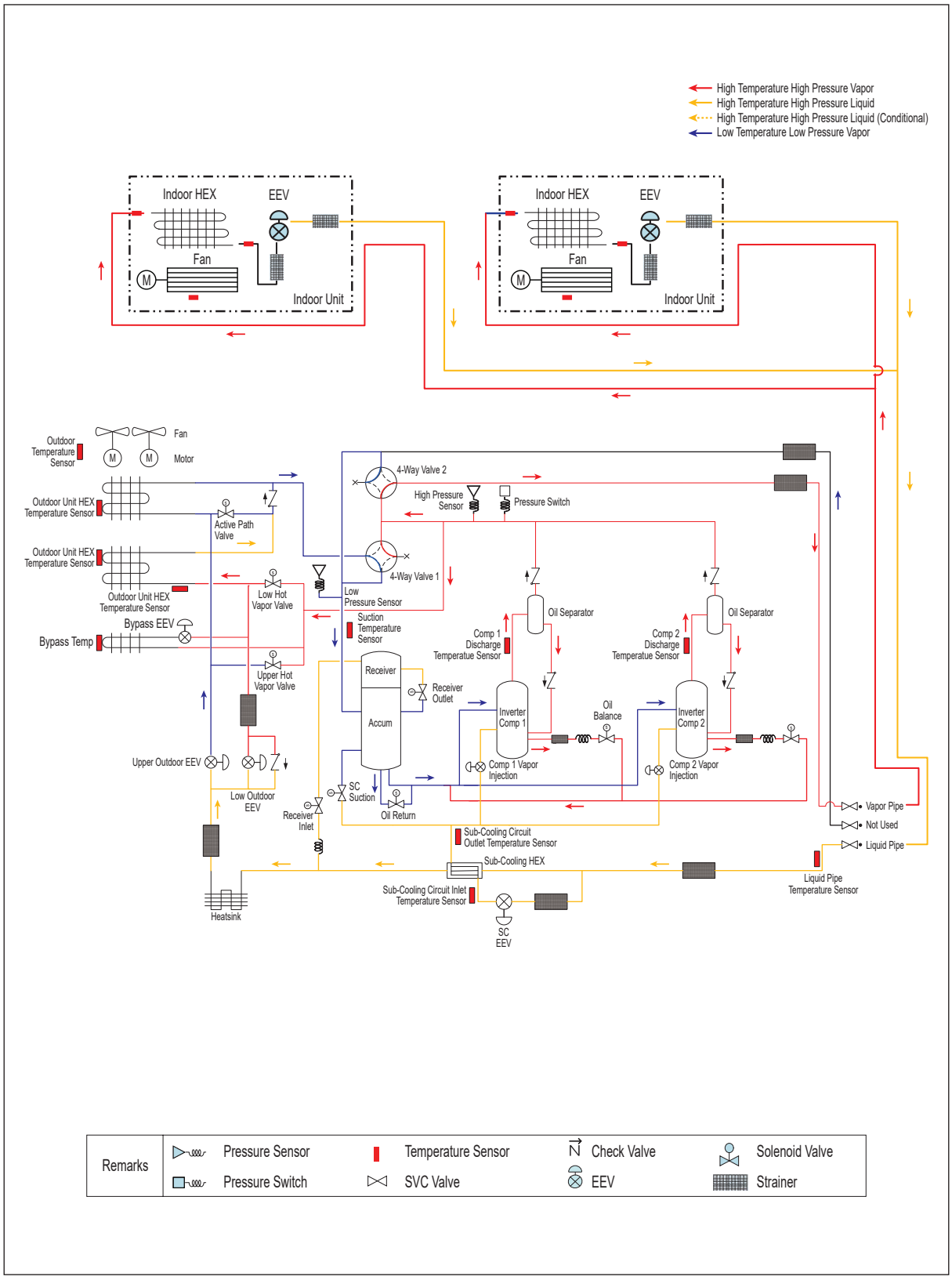
Heat Pump – Upper HEX Defrost Operation



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Heat Pump – Lower HEX Defrost Operation



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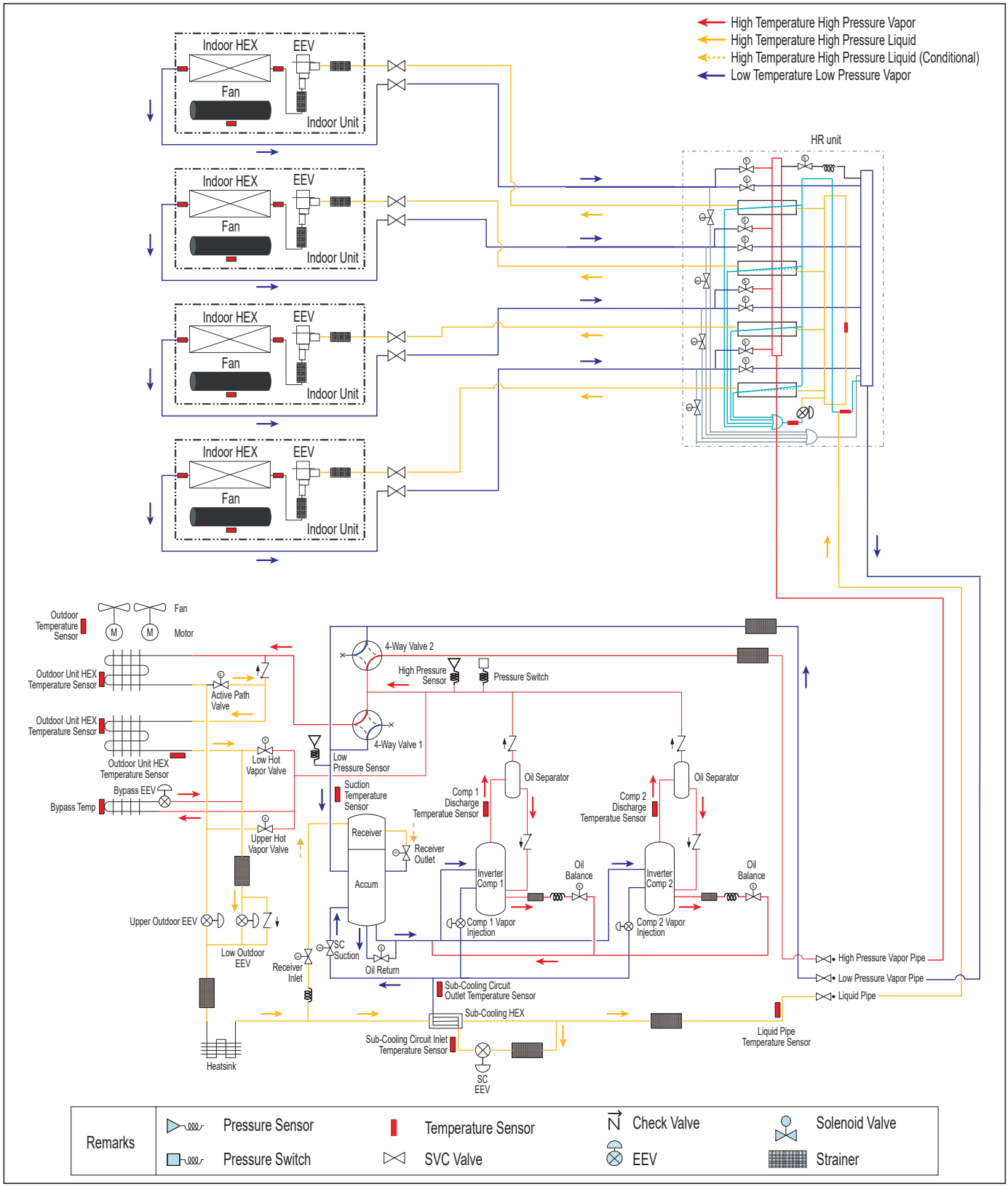
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM144BTE6 / DTE6, ZRUM168BTE6 / DTE6, ZRUM192BTE6 / DTE6

Heat Recovery Operation—Cooling Mode

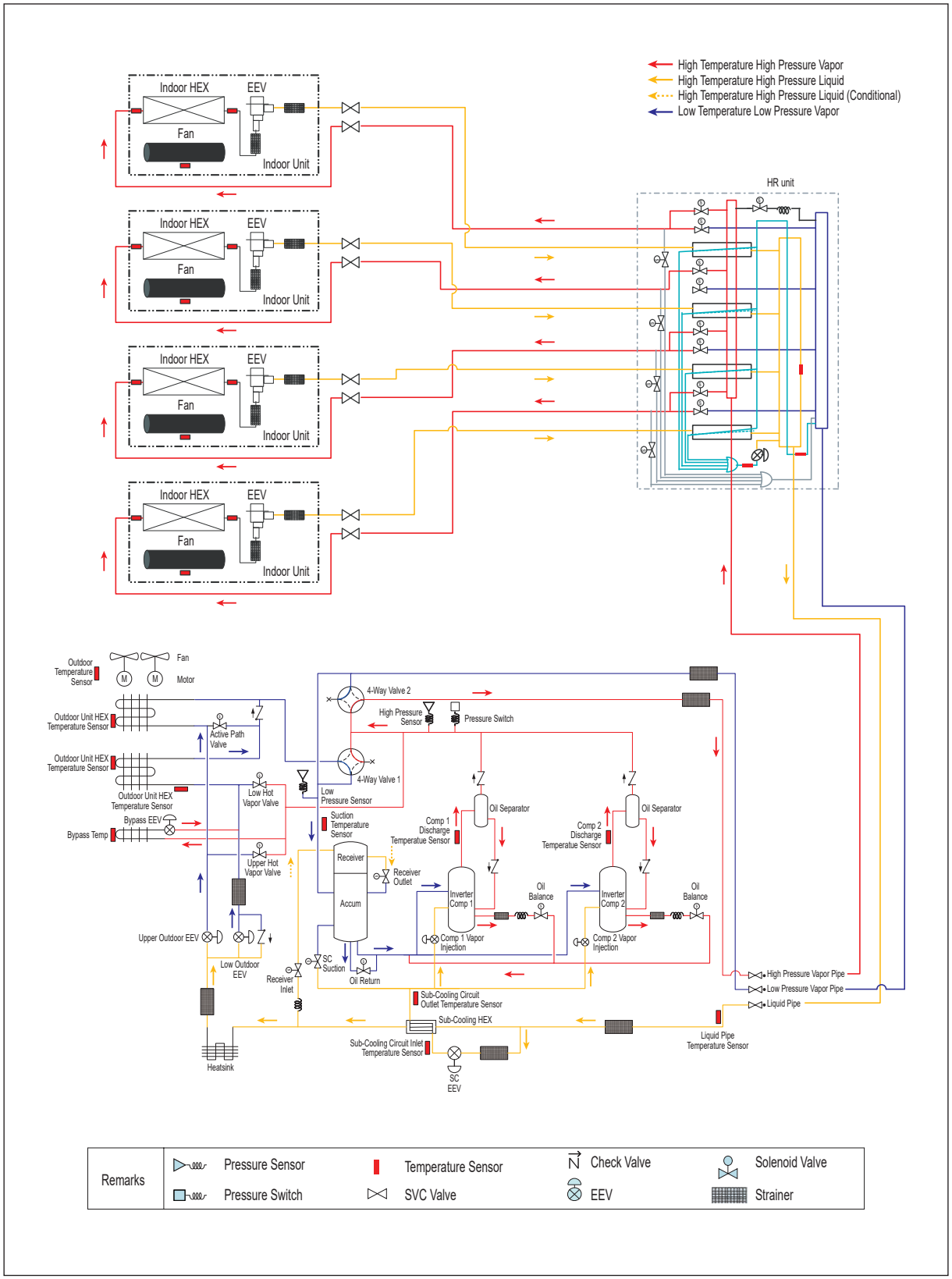
Heat Recovery – Cooling Mode



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Heat Recovery – Heating Mode



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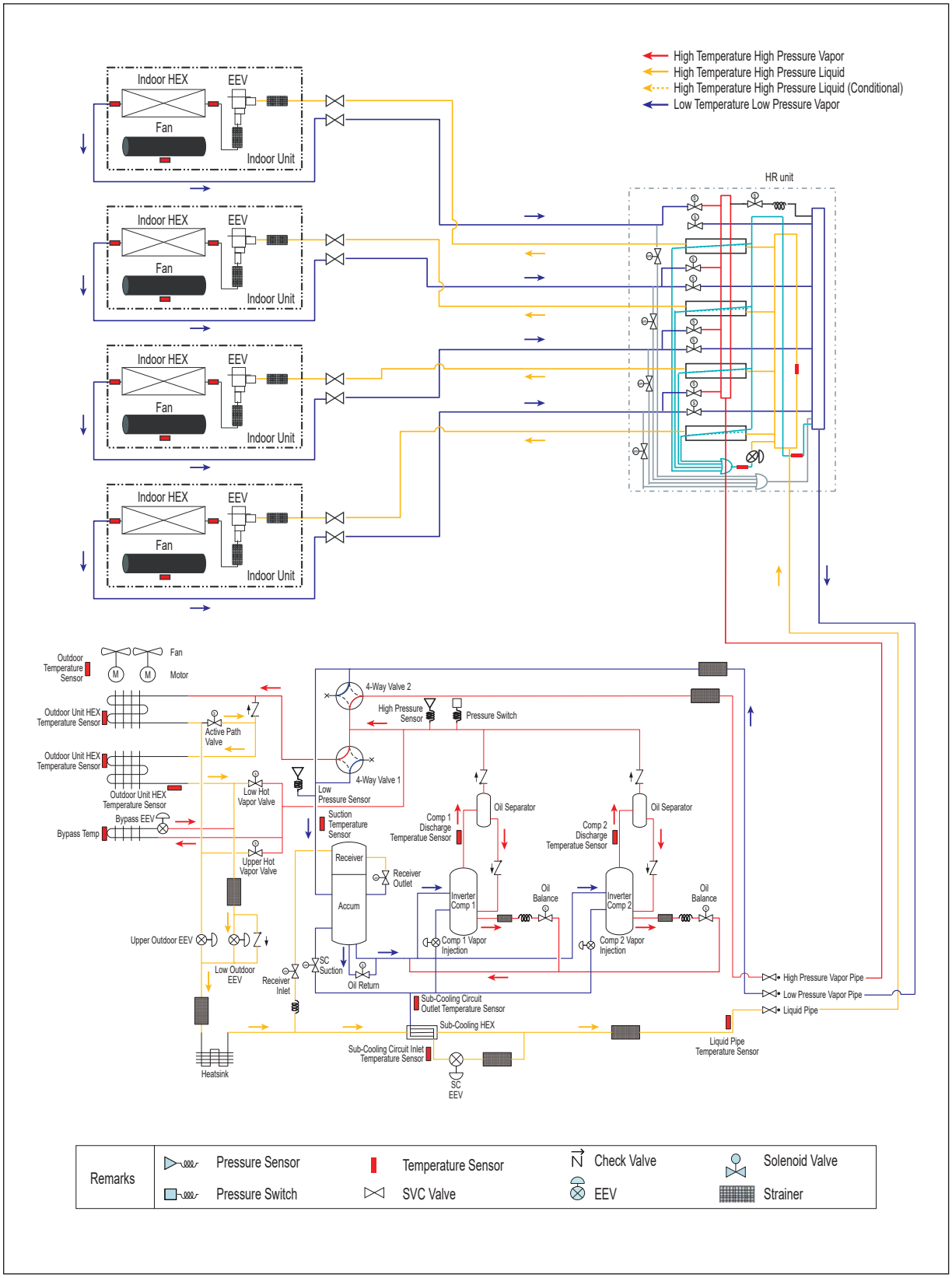
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM144BTE6 / DTE6, ZRUM168BTE6 / DTE6, ZRUM192BTE6 / DTE6

Heat Recovery Operation—Oil Return and Defrost Operation

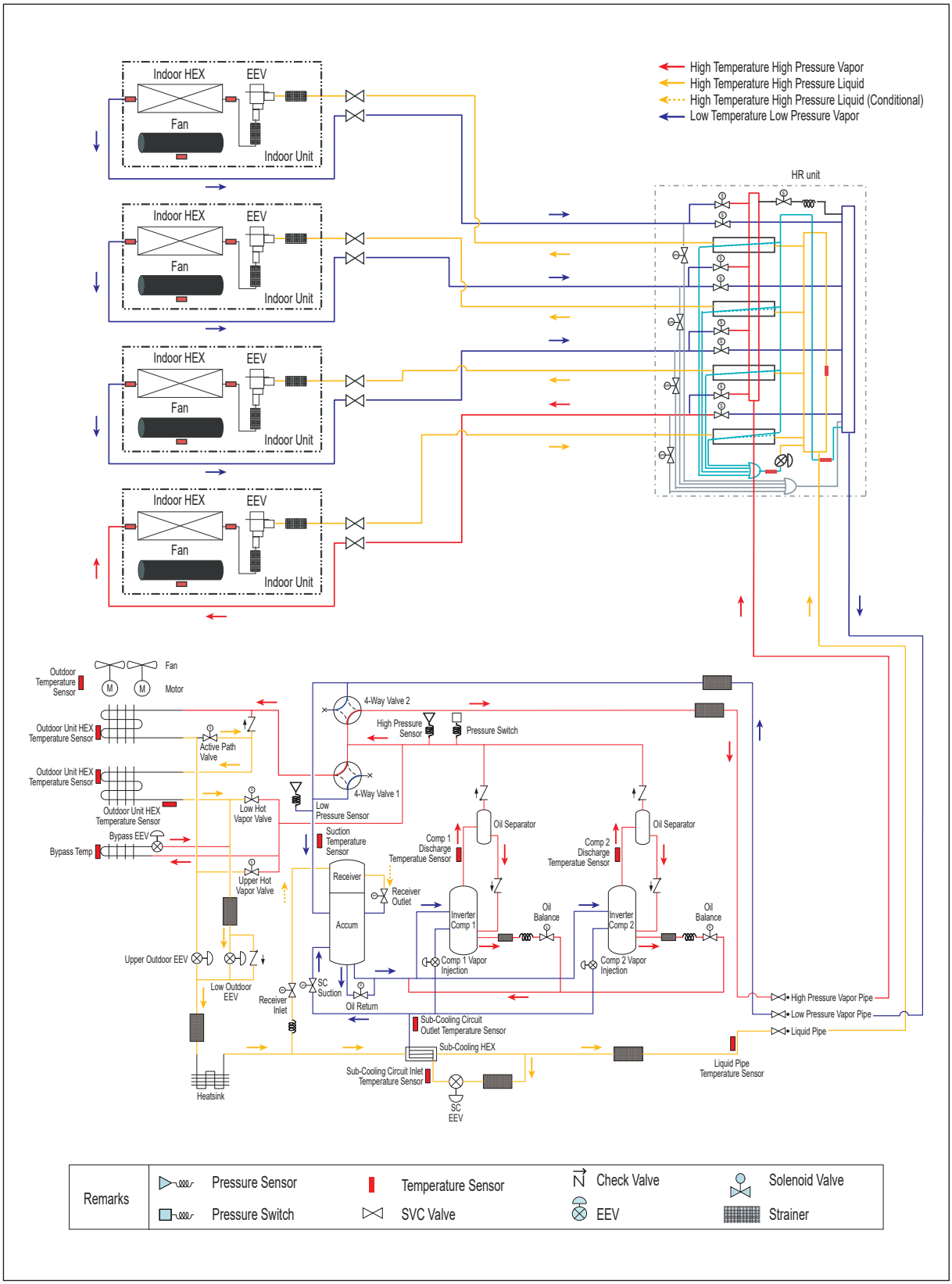
Heat Recovery – Oil Return and Defrost Operation



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Heat Recovery – Cooling-based Simultaneous Operation



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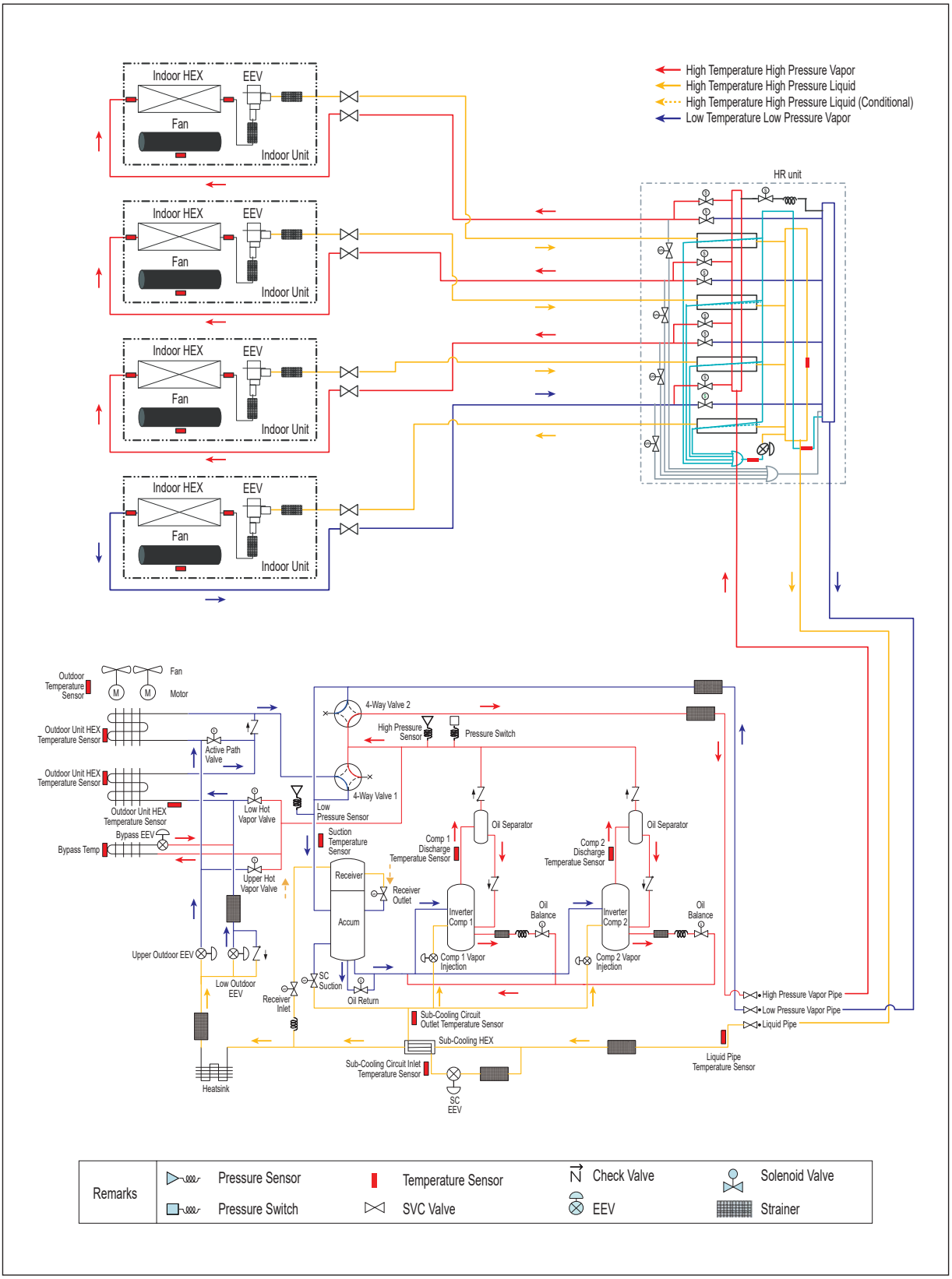
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM144BTE6 / DTE6, ZRUM168BTE6 / DTE6, ZRUM192BTE6 / DTE6

Heat Recovery Operation—Heating-based Simultaneous Operation

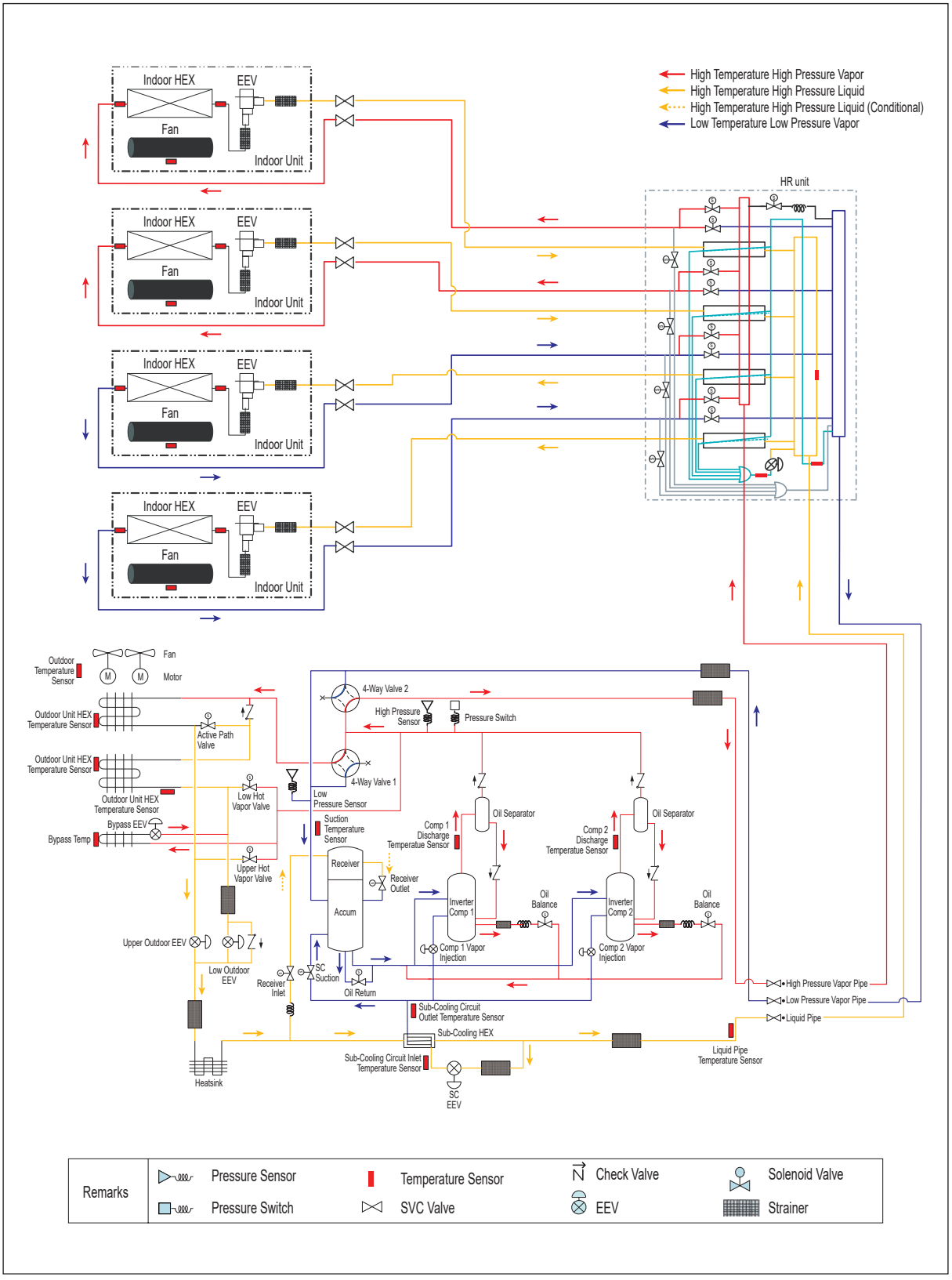
Heat Recovery – Heating-based Simultaneous Operation



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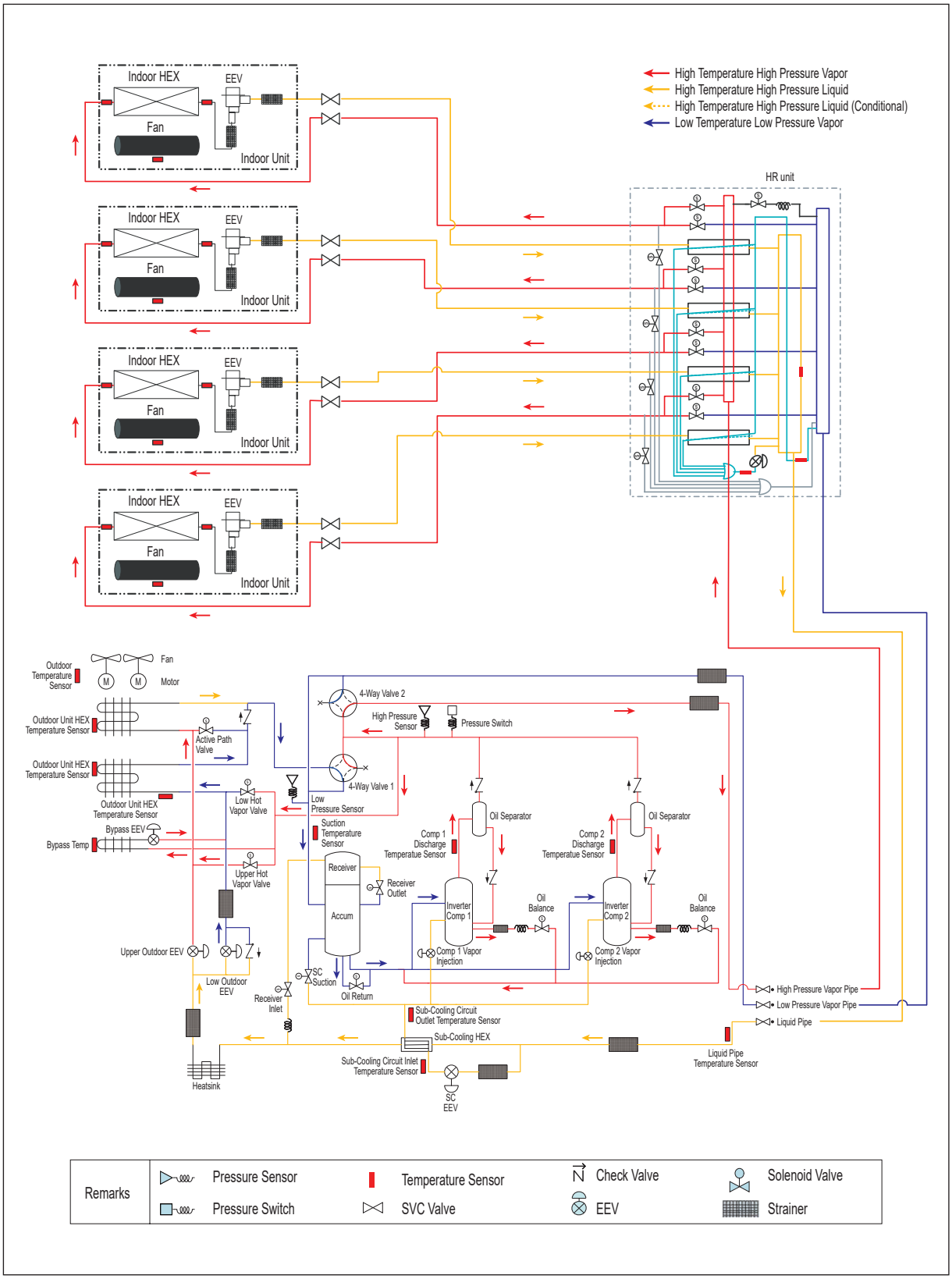
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Heat Recovery – Balanced Simultaneous Operation



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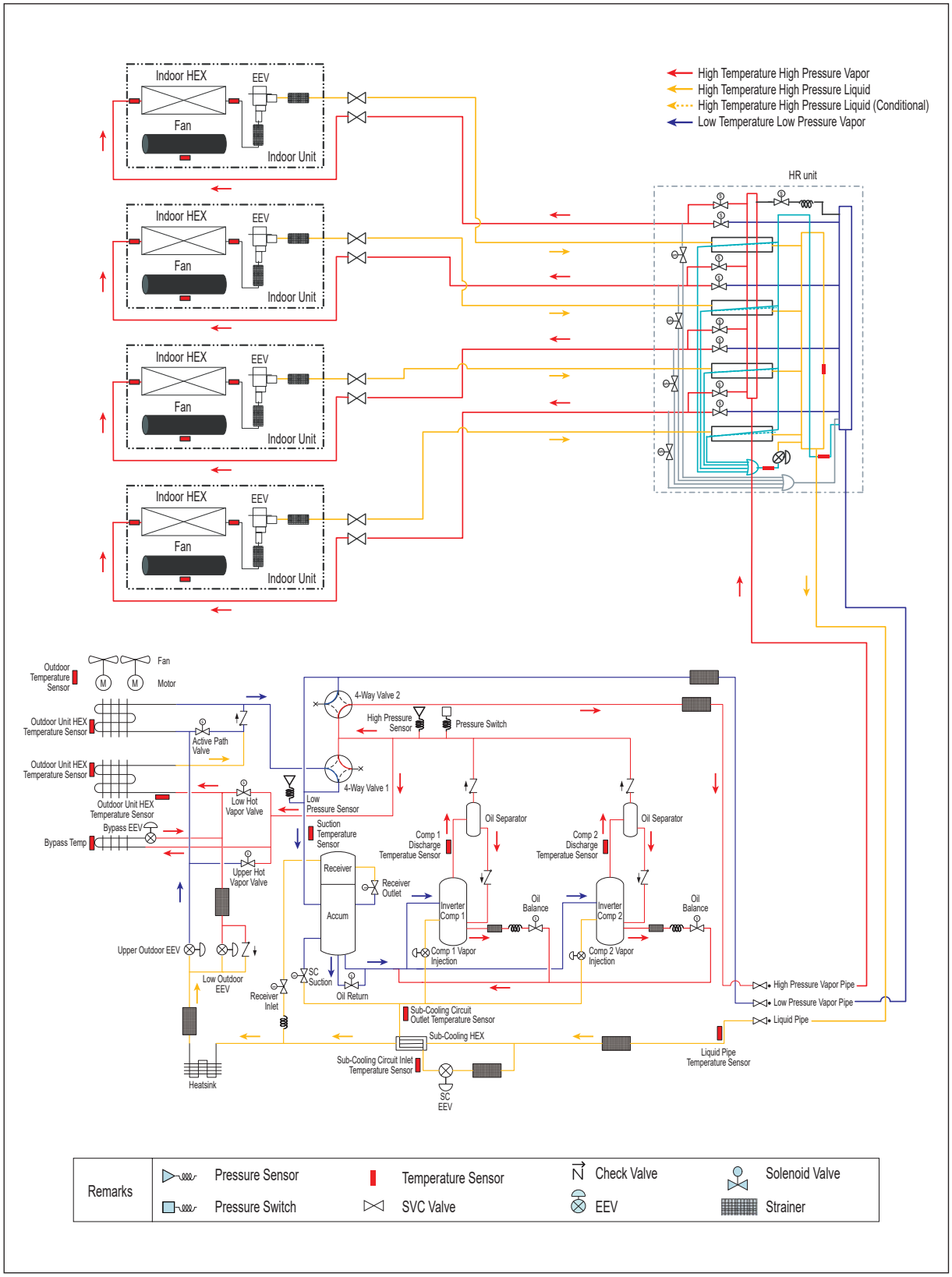
Heat Recovery – Upper HEX Defrost Operation



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Heat Recovery – Lower HEX Defrost Operation



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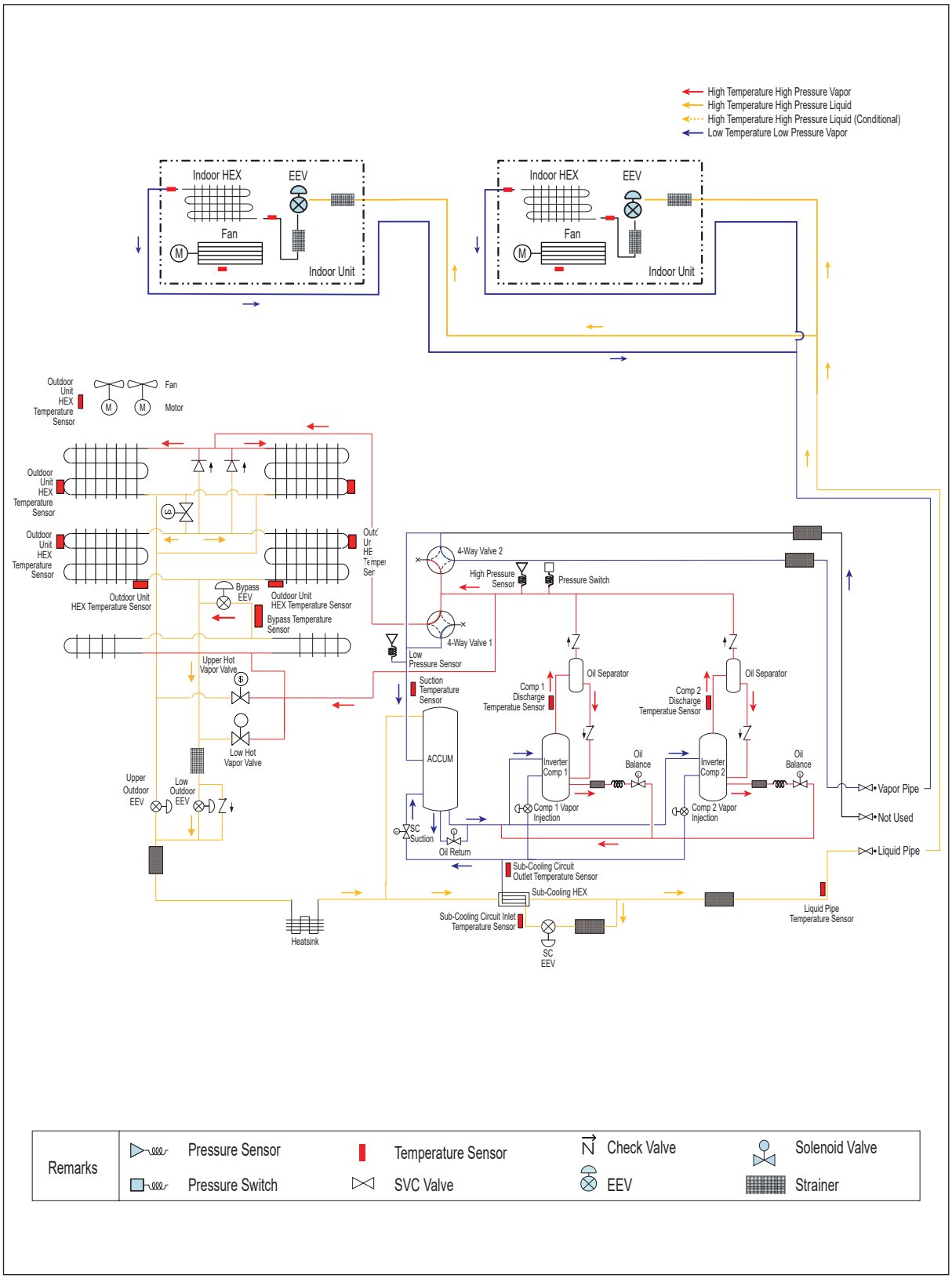
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM216BTE6 / DTE6, ZRUM241BTE6 / DTE6, ZRUM264BTE6 / DTE6

Heat Pump Operation—Cooling Mode

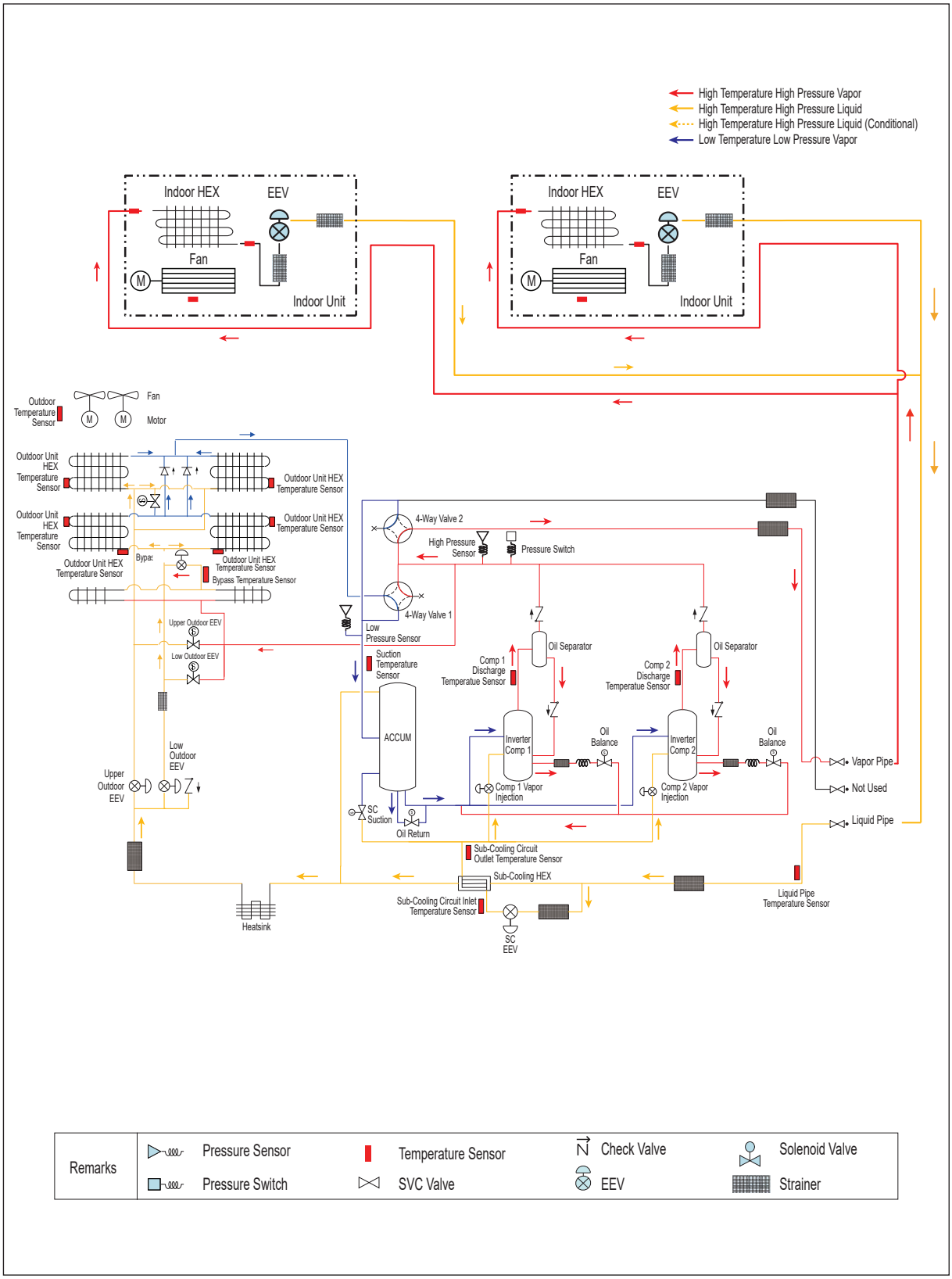
Heat Pump – Cooling Mode



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Heat Pump – Heating Mode



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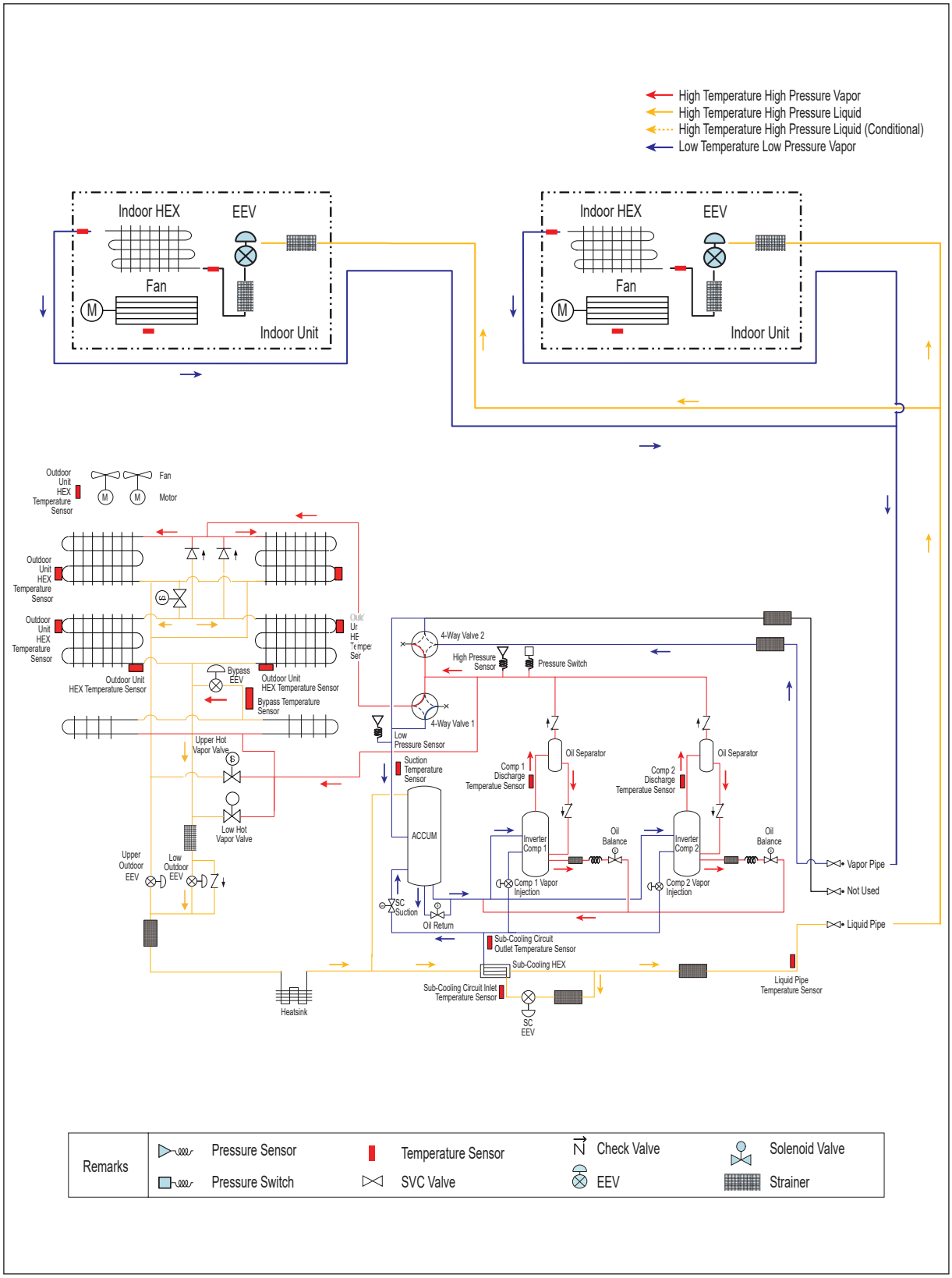
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM216BTE6 / DTE6, ZRUM241BTE6 / DTE6, ZRUM264BTE6 / DTE6

Heat Pump Operation—Oil Return and Defrost Operation

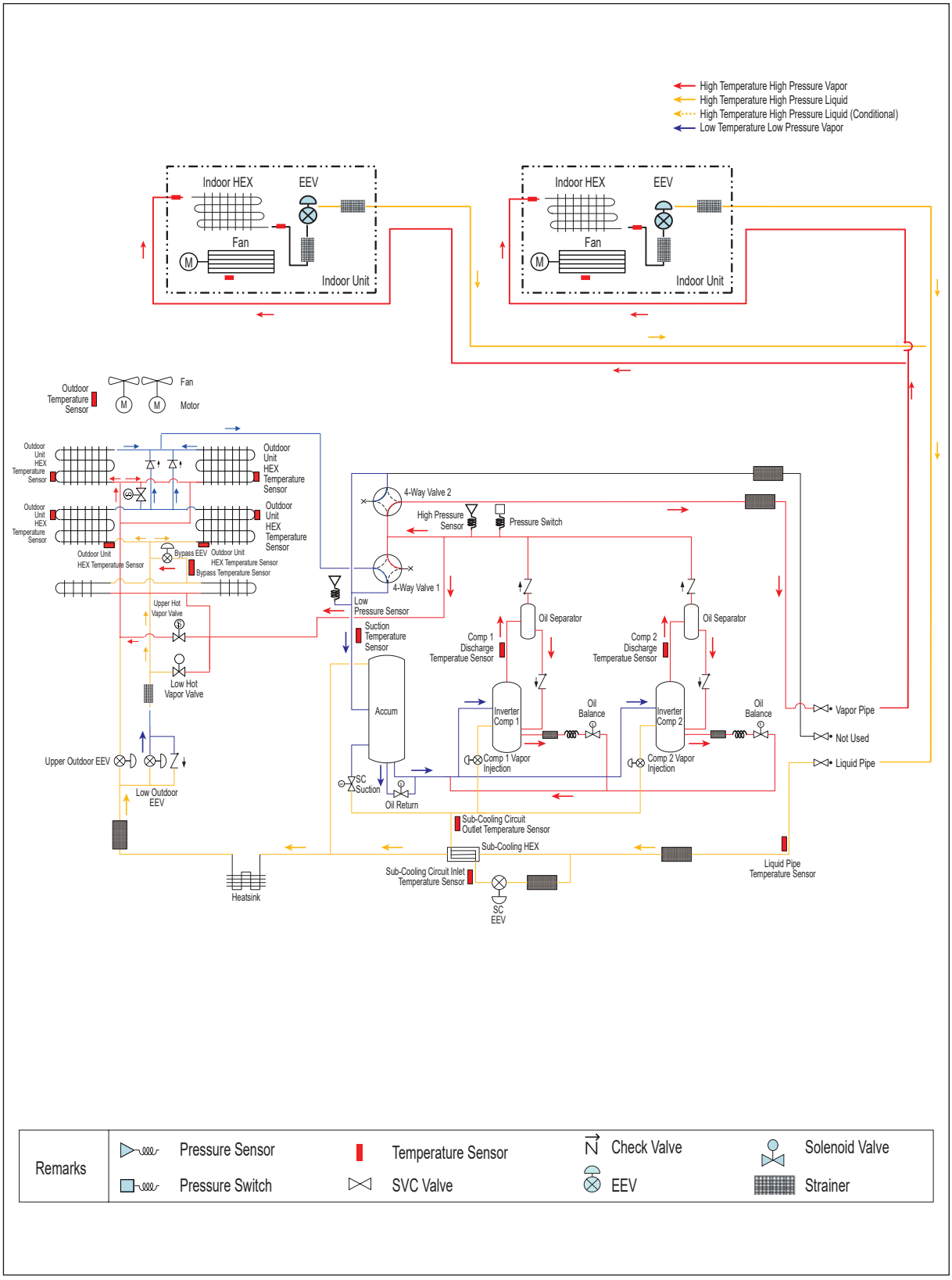
Heat Pump – Oil Return and Defrost Operation



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Heat Pump – Upper HEX Defrost Operation



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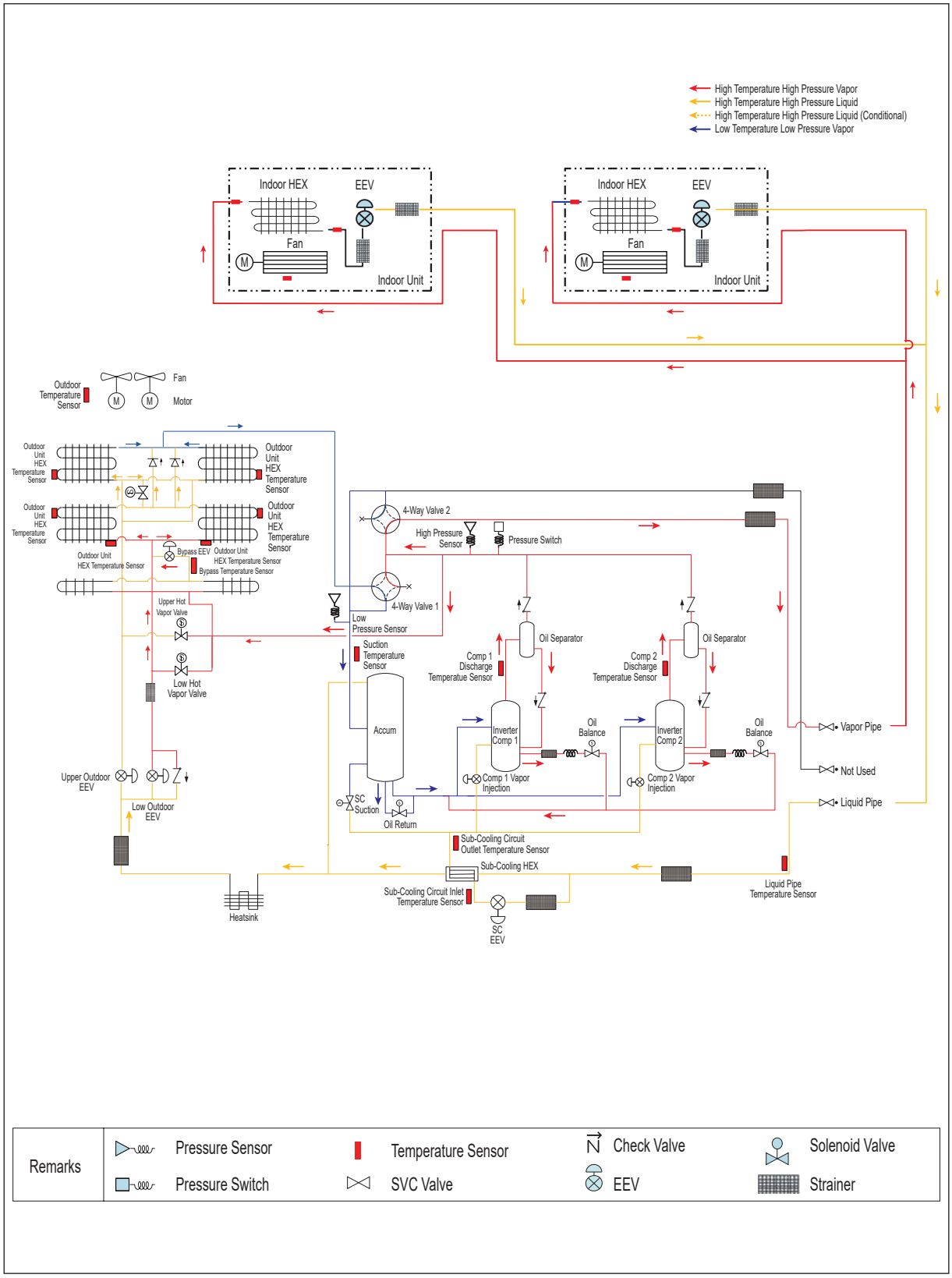
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM216BTE6 / DTE6, ZRUM241BTE6 / DTE6, ZRUM264BTE6 / DTE6

Heat Pump Operation—Lower HEX Defrost Operation

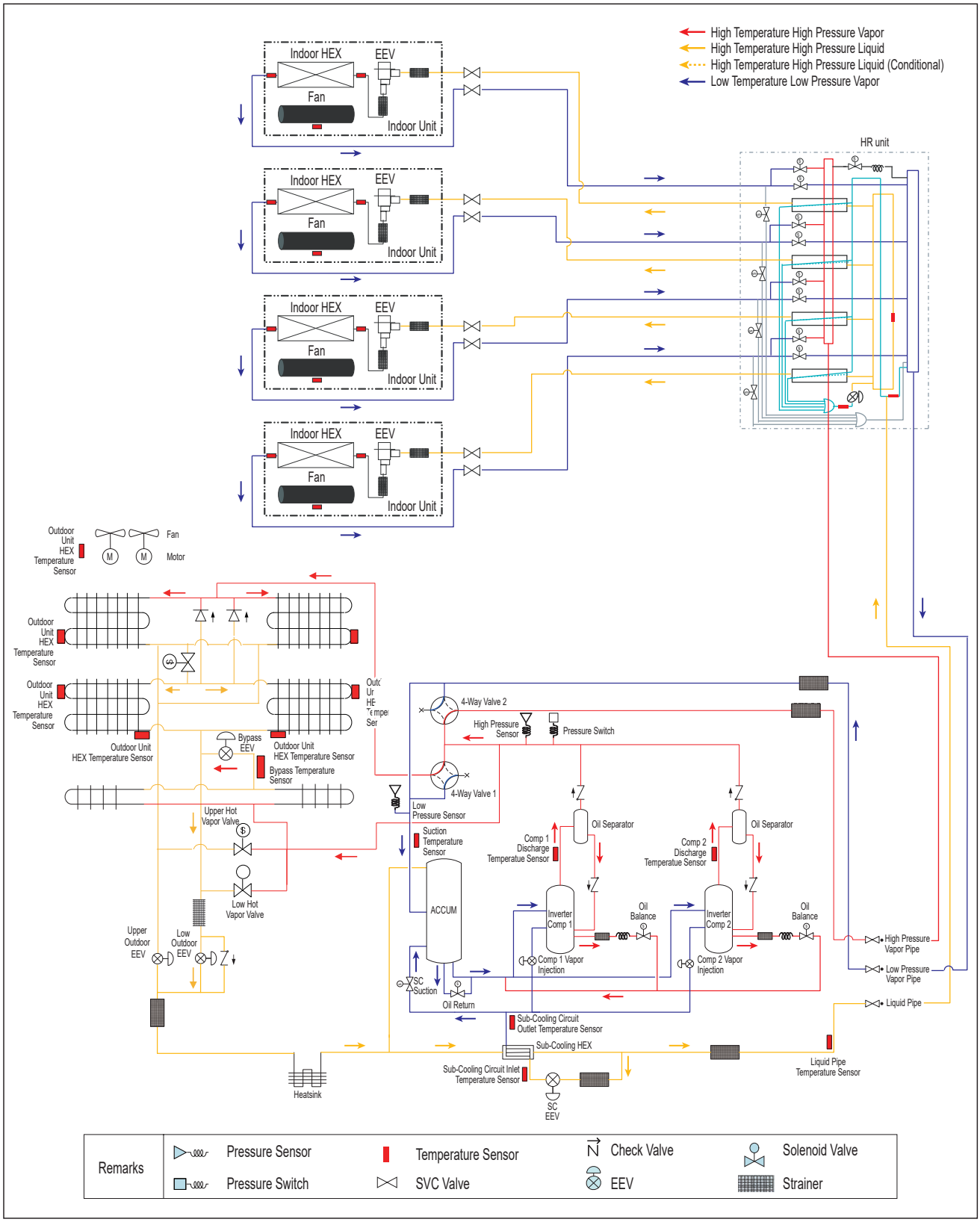
Heat Pump – Lower HEX Defrost Operation



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Heat Recovery – Cooling Mode



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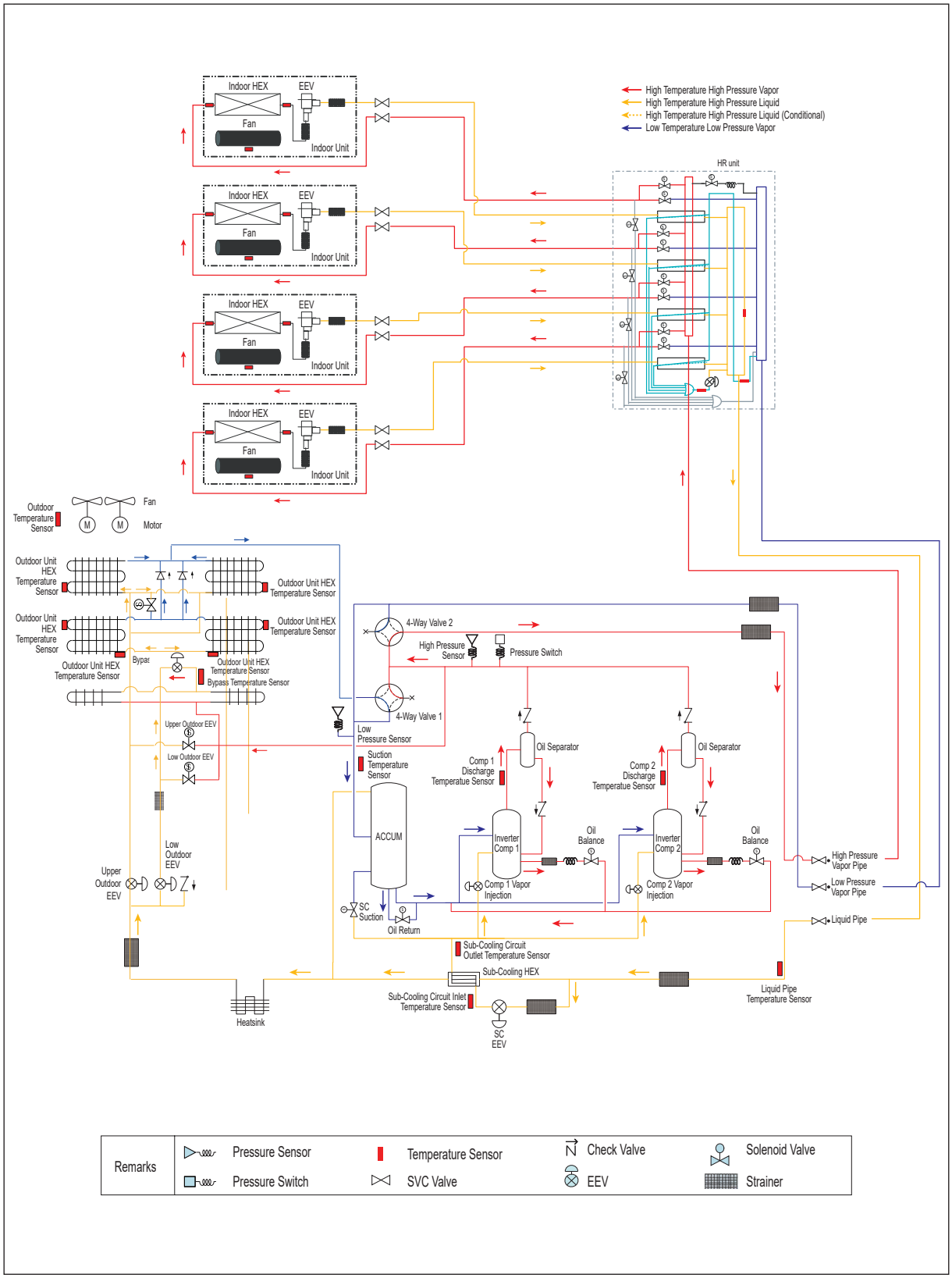
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM216BTE6 / DTE6, ZRUM241BTE6 / DTE6, ZRUM264BTE6 / DTE6

Heat Recovery Operation—Heating Mode

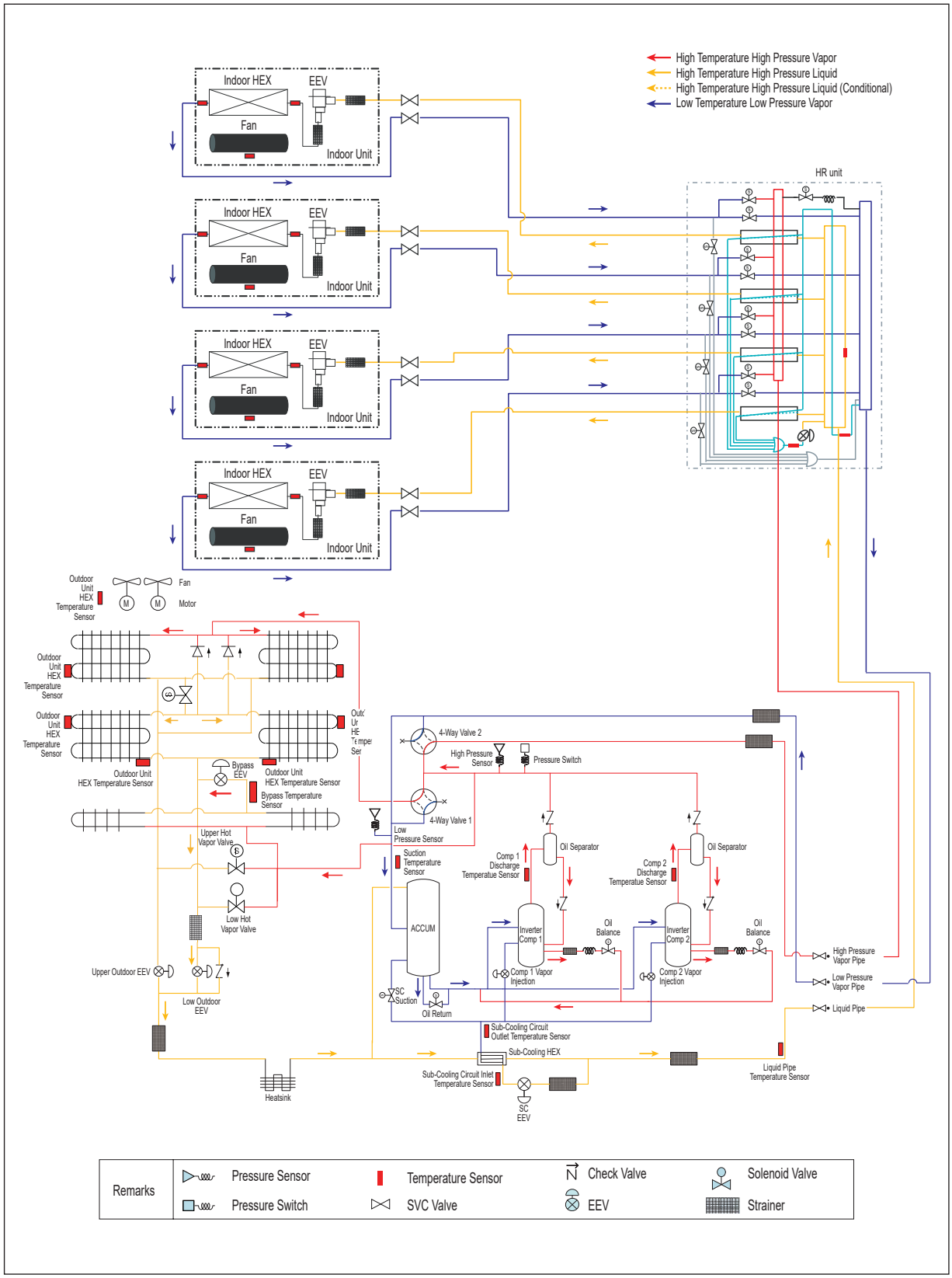
Heat Recovery – Heating Mode



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Heat Recovery – Oil Return and Defrost Operation



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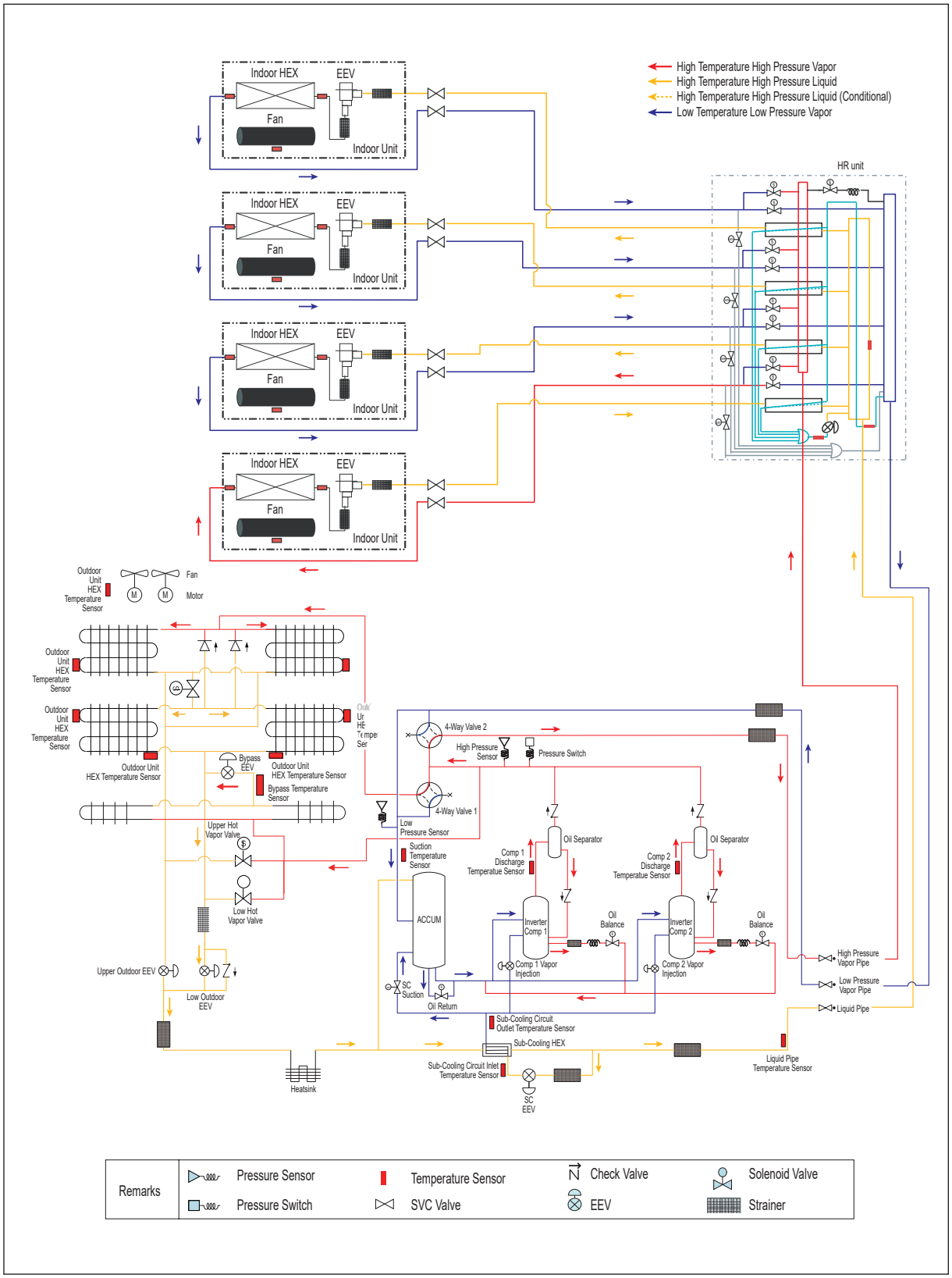
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM216BTE6 / DTE6, ZRUM241BTE6 / DTE6, ZRUM264BTE6 / DTE6

Heat Recovery Operation—Cooling-based Simultaneous Operation

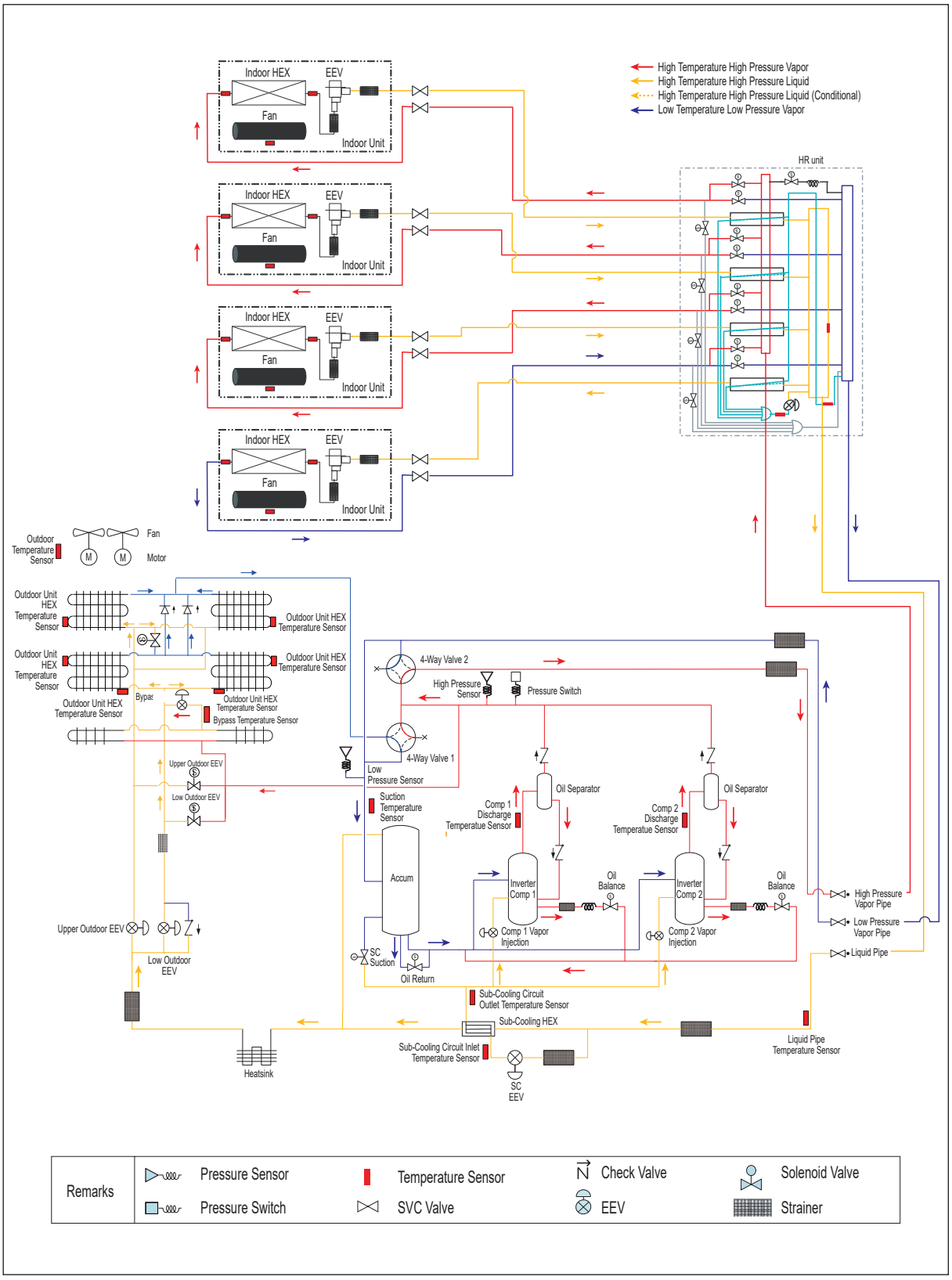
Heat Recovery – Cooling-based Simultaneous Operation



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Heat Recovery – Heating-based Simultaneous Operation



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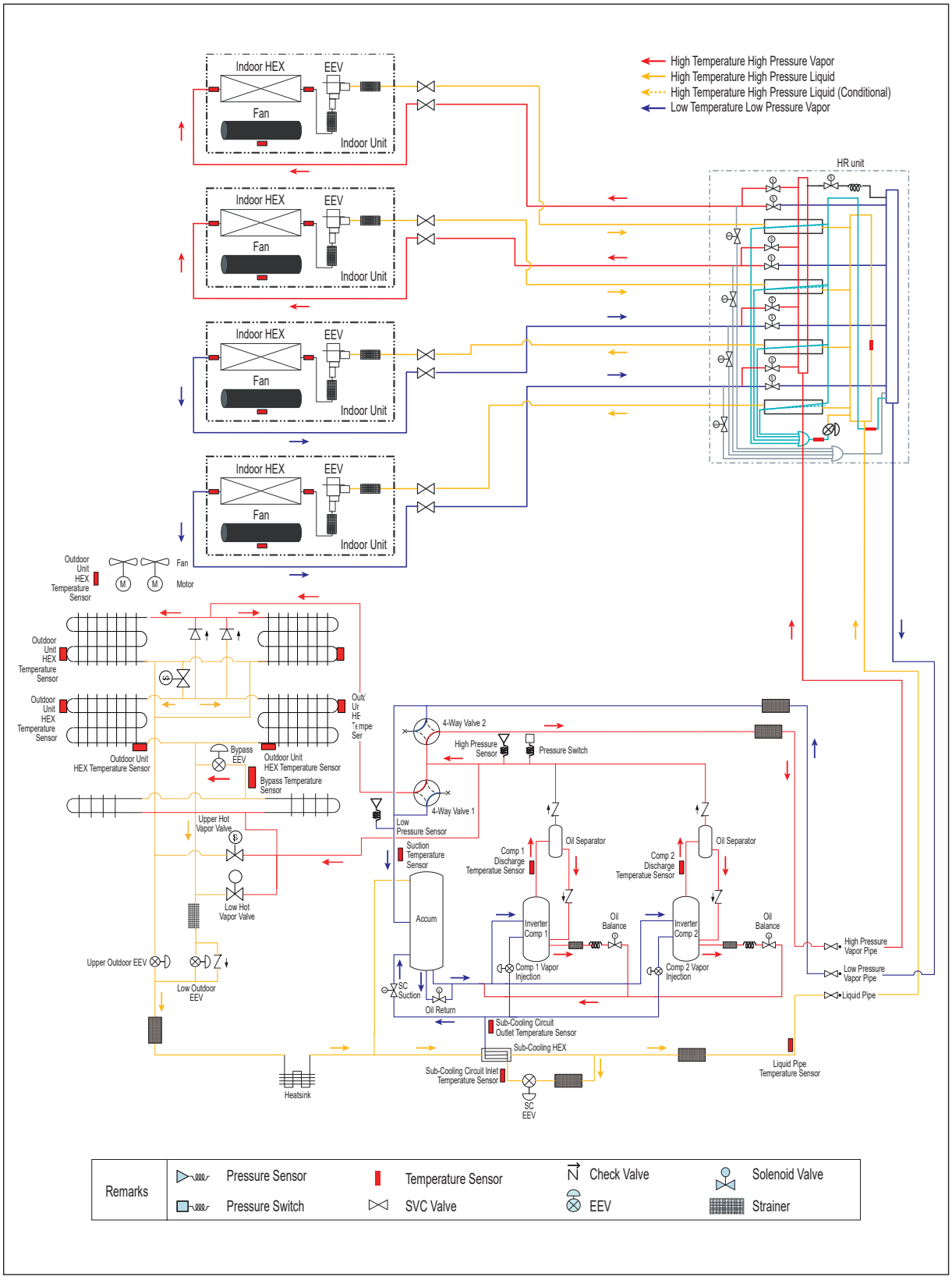
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM216BTE6 / DTE6, ZRUM241BTE6 / DTE6, ZRUM264BTE6 / DTE6

Heat Recovery Operation—Balanced Simultaneous Operation

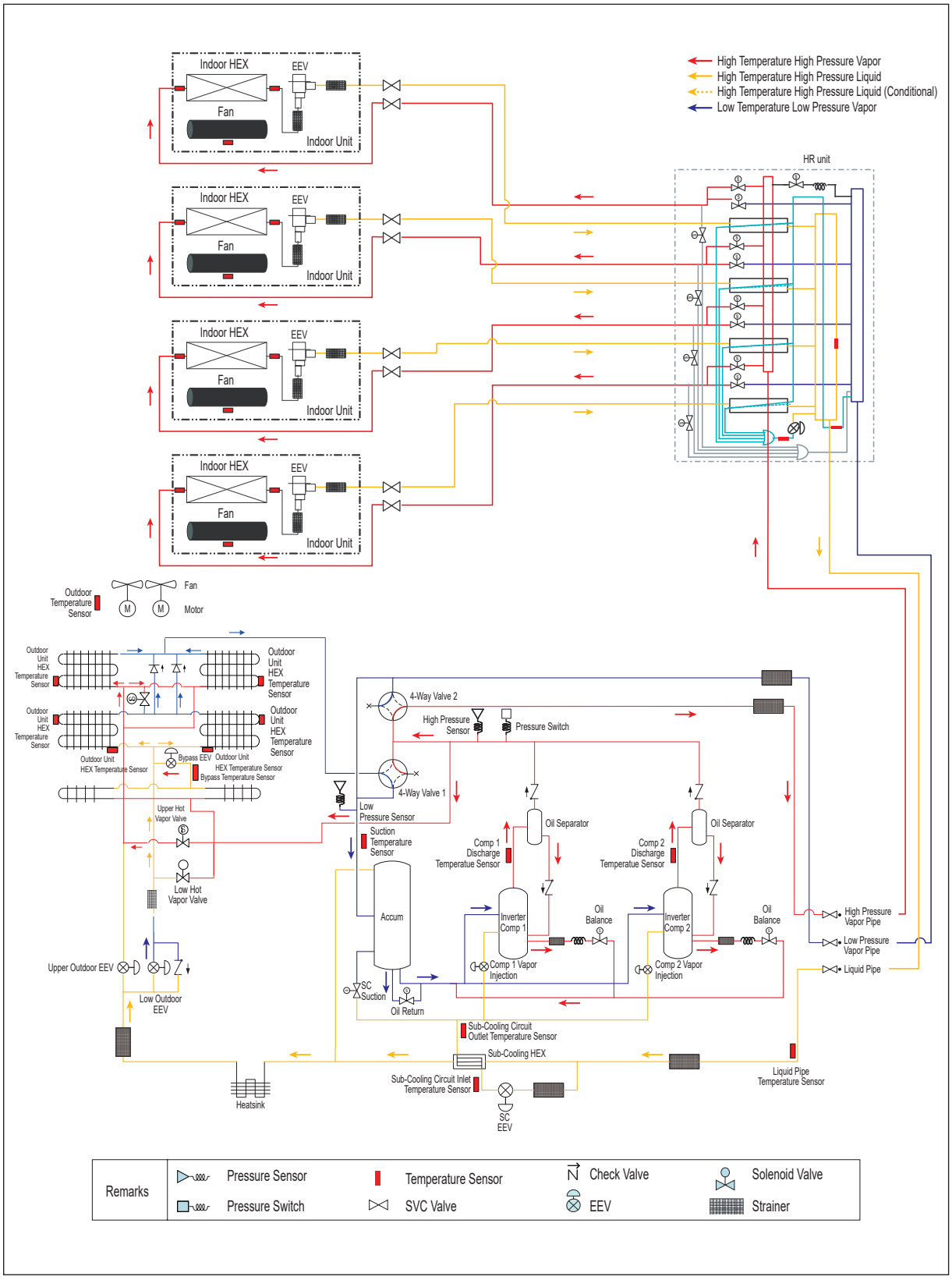
Heat Recovery – Balanced Simultaneous Operation



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Heat Recovery – Upper HEX Defrost Operation



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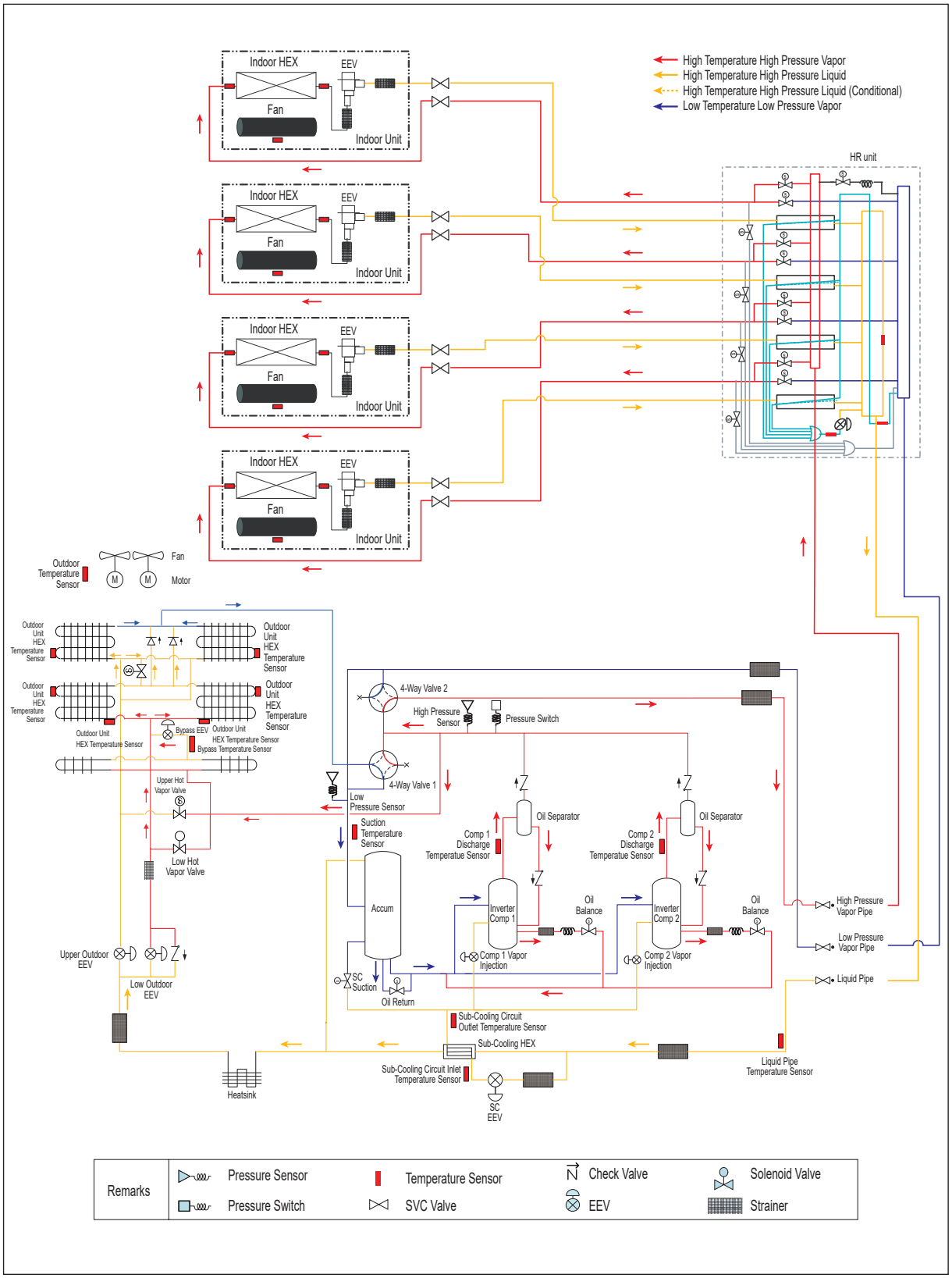
REFRIGERANT FLOW DIAGRAMS

MULTI V™ i

ZRUM216BTE6 / DTE6, ZRUM241BTE6 / DTE6, ZRUM264BTE6 / DTE6

Heat Recovery Operation—Lower HEX Defrost Operation

Heat Recovery – Lower HEX Defrost Operation



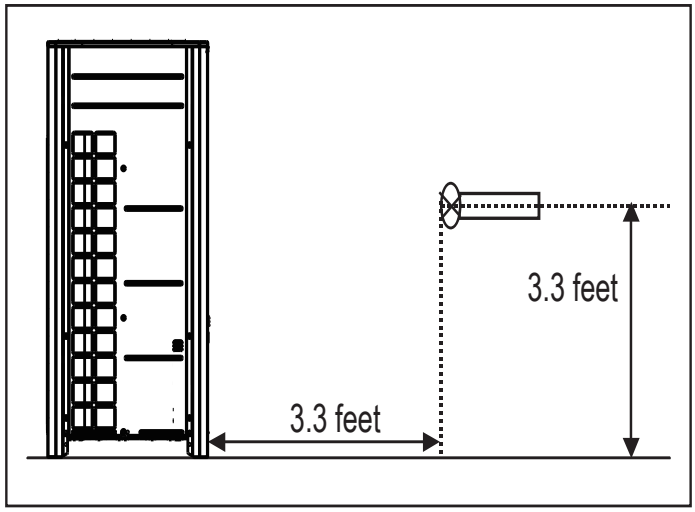
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Table 15: Outdoor Unit Sound Pressure Levels.

Outdoor Unit Models			dB(A)
Nominal Tons	208-230V	460V	
6	ZRUM072BTE6	ZRUM072DTE6	59.0
8	ZRUM096BTE6	ZRUM096DTE6	60.0
10	ZRUM121BTE6	ZRUM121DTE6	60.0
12	ZRUM144BTE6	ZRUM144DTE6	61.0
14	ZRUM168BTE6	ZRUM168DTE6	61.0
16	ZRUM192BTE6	ZRUM192DTE6	62.0
18	ZRUM216BTE6	ZRUM216DTE6	64.0
20	ZRUM241BTE6	ZRUM241DTE6	65.0
22	ZRUM264BTE6	ZRUM264BTE6	65.0
22	ZRUM265BTE6	ZRUM265DTE6	63.5
24	ZRUM288BTE6	ZRUM288DTE6	64
26	ZRUM312BTE6	ZRUM312DTE6	64
28	ZRUM336BTE6	ZRUM336DTE6	64.5
30	ZRUM360BTE6	ZRUM360DTE6	66
32	ZRUM384BTE6	ZRUM384DTE6	66
34	ZRUM408BTE6	ZRUM408DTE6	66.5
36	ZRUM432BTE6	ZRUM432DTE6	67
38	ZRUM456BTE6	ZRUM456DTE6	67.5
40	ZRUM480BTE6	ZRUM480DTE6	68
42	ZRUM504BTE6	ZRUM504DTE6	66
44	ZRUM528BTE6	ZRUM528DTE6	66

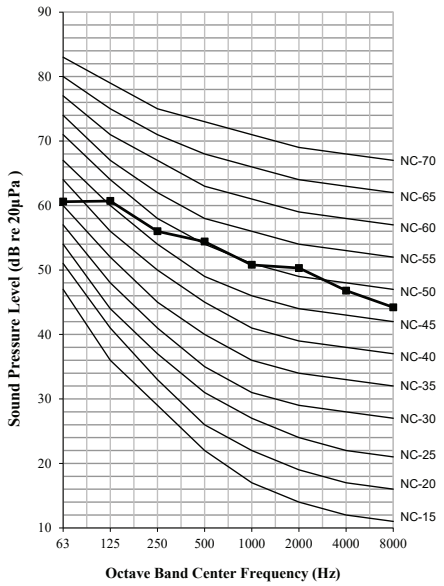
Figure 3: Sound Pressure Measurement Location.



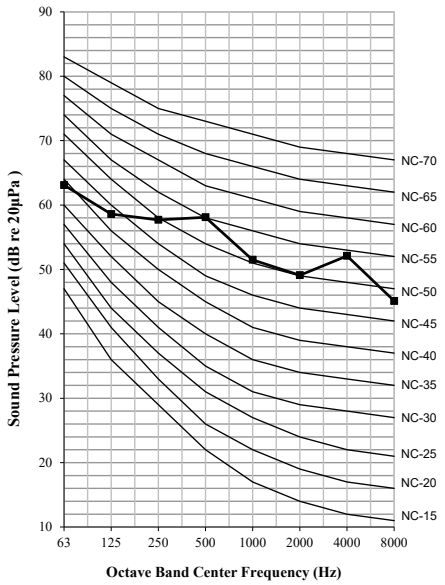
- Measurement taken 3.3' above finished floor, and at a distance of 3.3' from face of unit.
- Measurements taken with no attenuation and units operating at full load normal operating condition.
- Sound level will vary depending on a range of factors such as construction (acoustic absorption coefficient) 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 4: ZRUM072-096-121BTE6 / DTE6 Sound Pressure Levels.

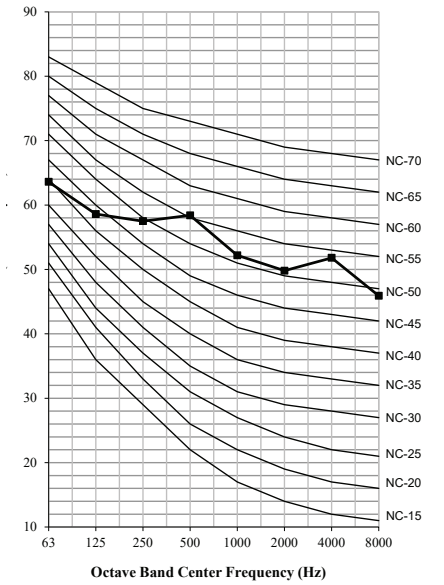
ZRUM072BTE6 / DTE6



ZRUM096BTE6 / DTE6



ZRUM121BTE6 / DTE6



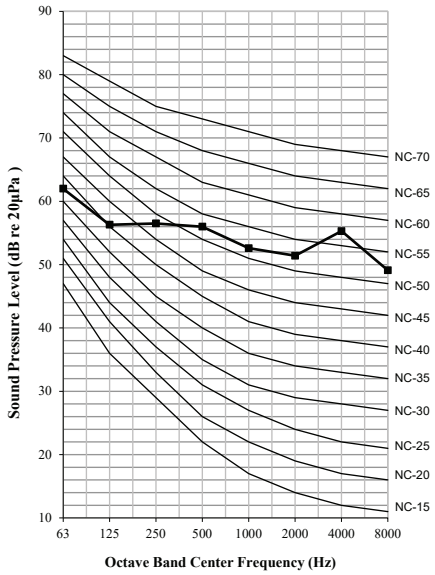
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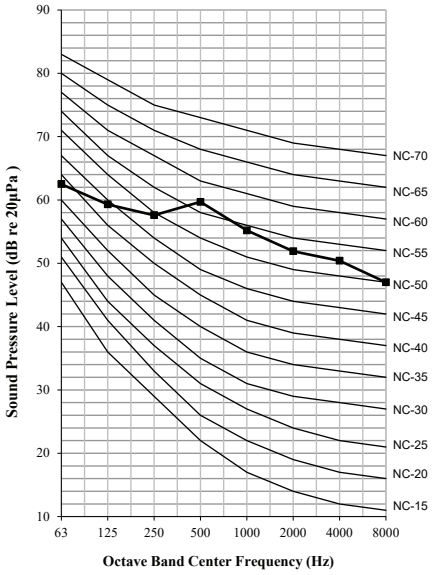
Sound Pressure Levels

Figure 5: ZRUM144-168-192BTE6 / DTE6 Sound Pressure Levels.

ZRUM144BTE6 / DTE6



ZRUM168BTE6 / DTE6



ZRUM192BTE6 / DTE6

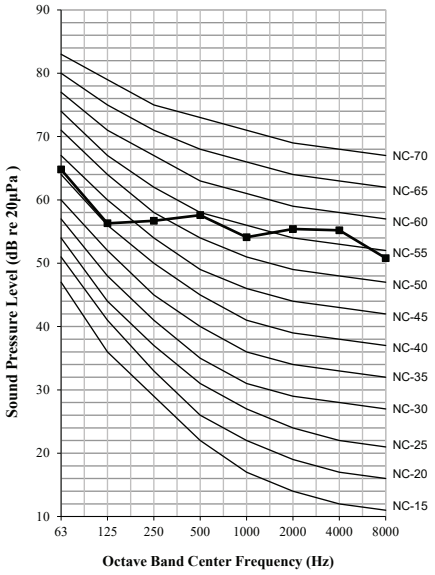
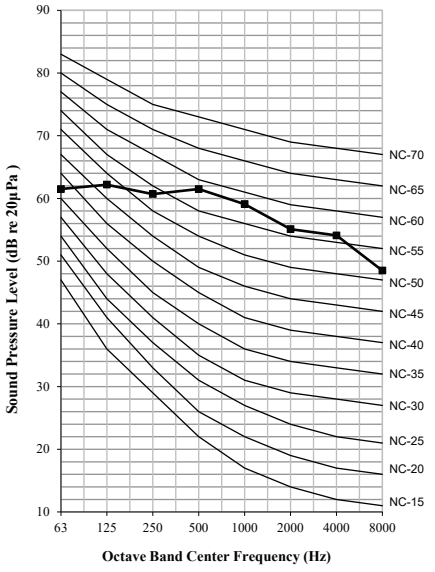
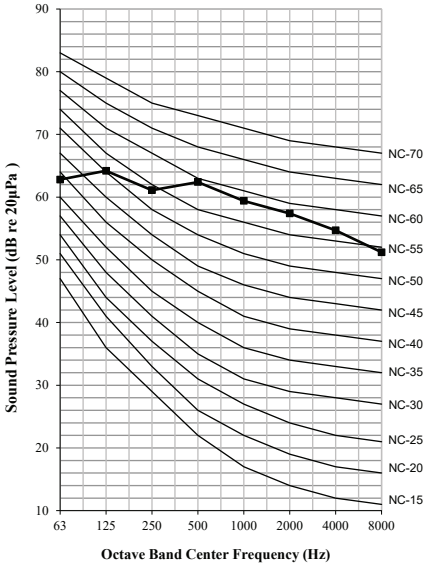


Figure 6: ZRUM216-241-264BTE6 / DTE6 Sound Pressure Levels.

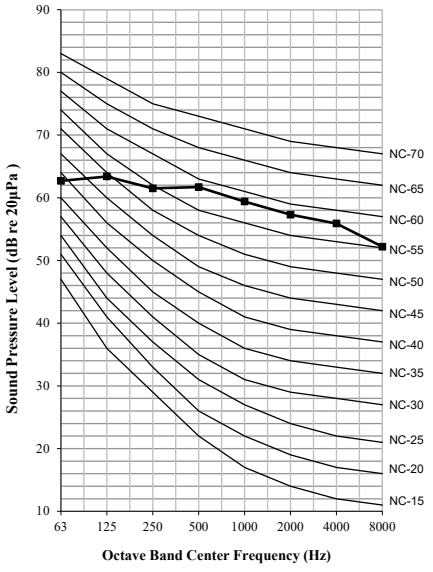
ZRUM216BTE6 / DTE6



ZRUM241BTE6 / DTE6



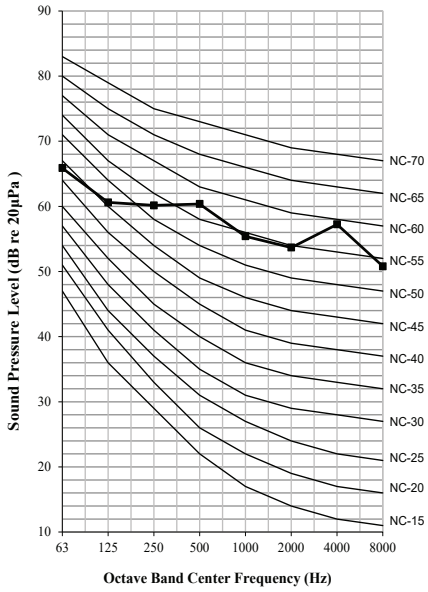
ZRUM264BTE6 / DTE6



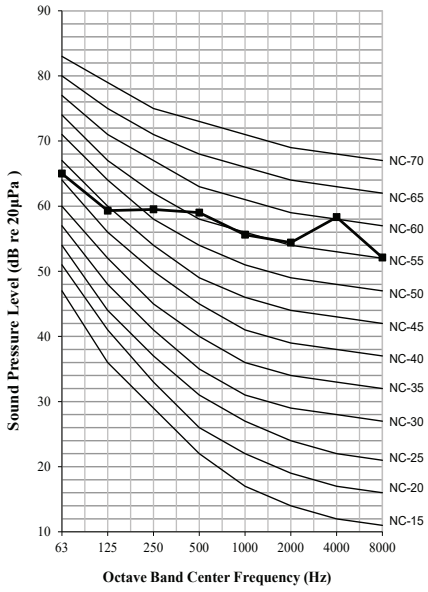
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Figure 7: ZRUM265-288-312BTE6 / DTE6 Sound Pressure Levels.

ZRUM265BTE6 / DTE6



ZRUM288BTE6 / DTE6



ZRUM312BTE6 / DTE6

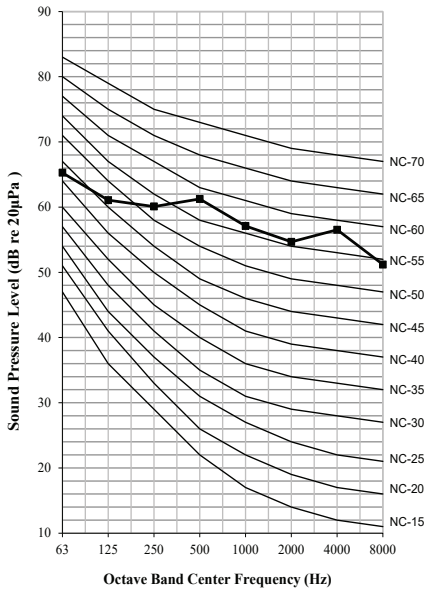
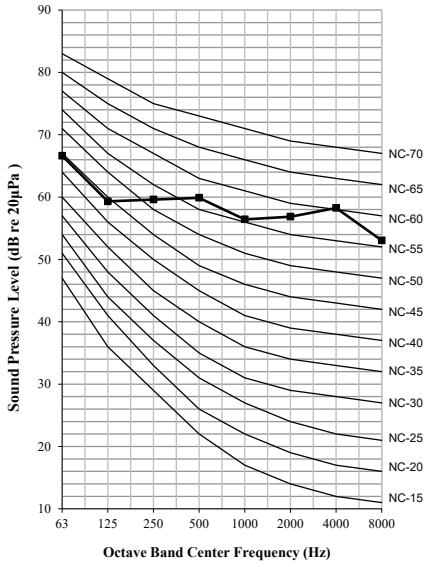
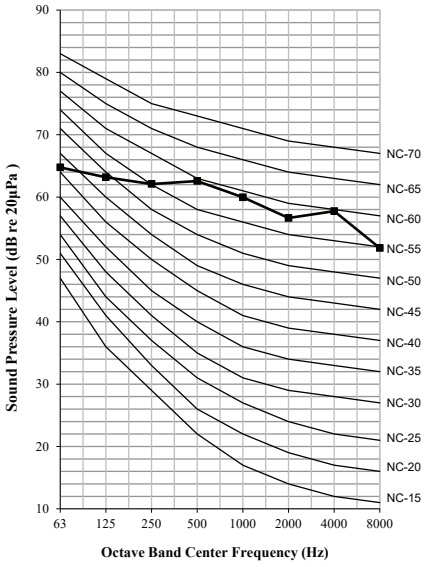


Figure 8: ZRUM336-360-384BTE6 / DTE6 Sound Pressure Levels.

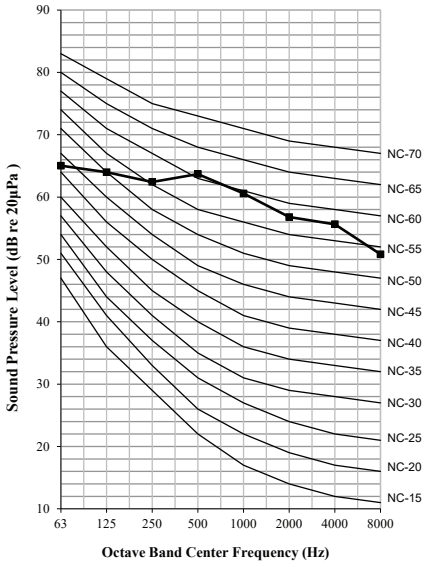
ZRUM336BTE6 / DTE6



ZRUM360BTE6 / DTE6



ZRUM384BTE6 / DTE6



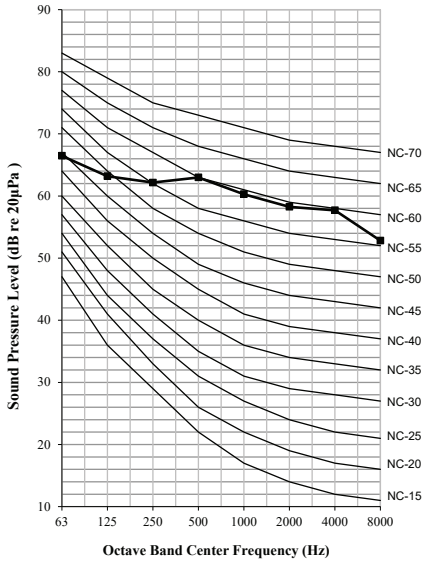
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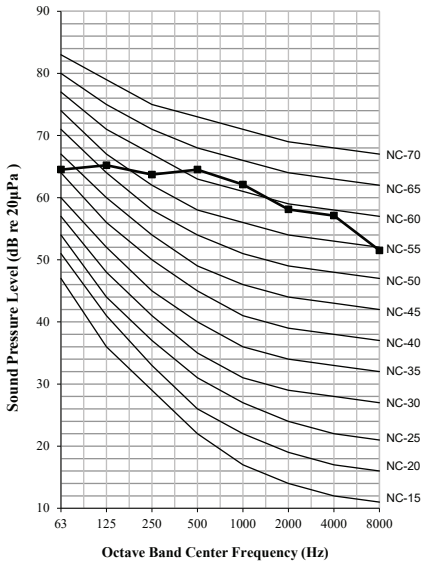
Sound Pressure Levels

Figure 9: ZRUM408-432-456BTE6 / DTE6 Sound Pressure Levels.

ZRUM408BTE6 / DTE6



ZRUM432BTE6 / DTE6



ZRUM456BTE6 / DTE6

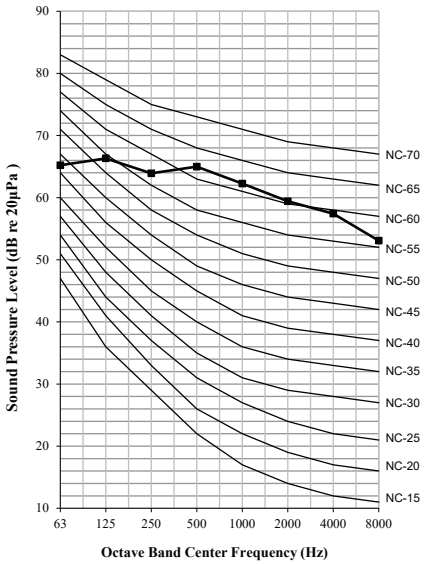
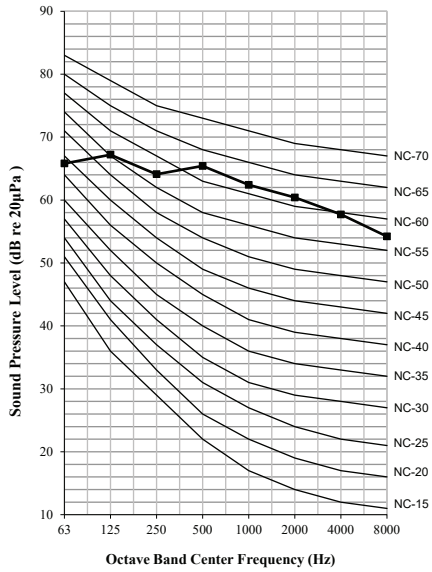
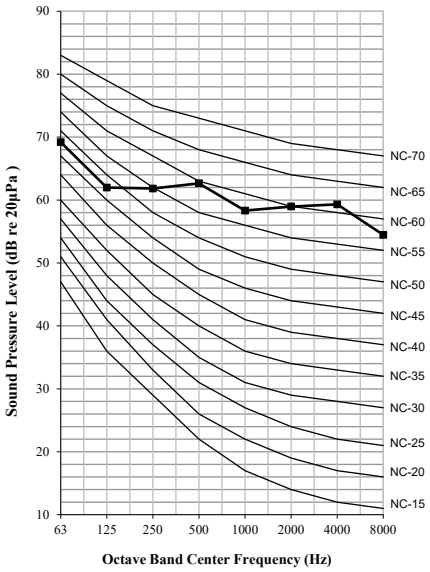


Figure 10: ZRUM480-504-528BTE6 / DTE6 Sound Pressure Levels.

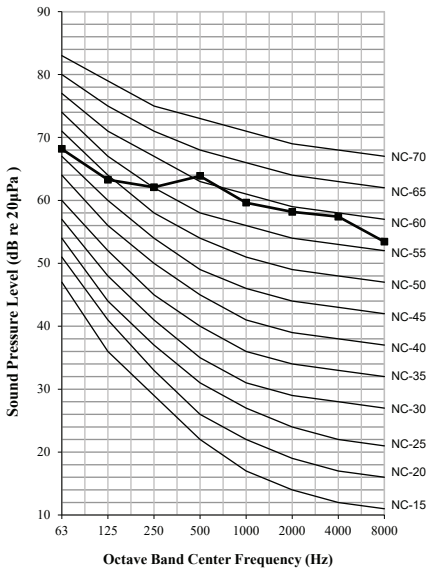
ZRUM480BTE6 / DTE6



ZRUM504BTE6 / DTE6



ZRUM528BTE6 / DTE6



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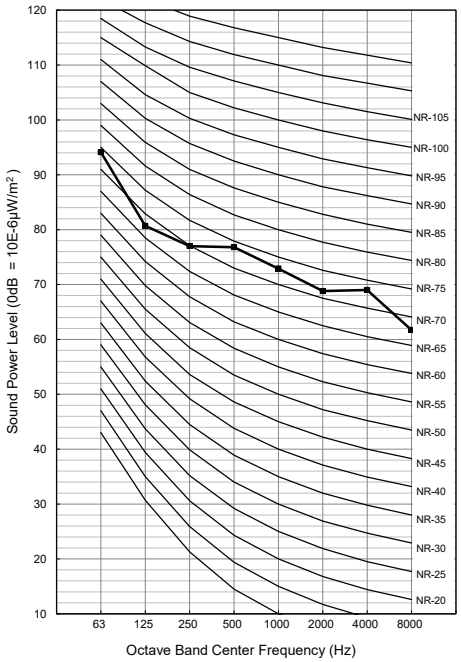
Table 16: Outdoor Unit Sound Power Levels.

Outdoor Unit Models			dB(A)
Nominal Tons	208-230V	460V	
6	ZRUM072BTE6	ZRUM072DTE6	80.0
8	ZRUM096BTE6	ZRUM096DTE6	81.0
10	ZRUM121BTE6	ZRUM121DTE6	81.0
12	ZRUM144BTE6	ZRUM144DTE6	85.0
14	ZRUM168BTE6	ZRUM168DTE6	85.0
16	ZRUM192BTE6	ZRUM192DTE6	86.0
18	ZRUM216BTE6	ZRUM216DTE6	84.0
20	ZRUM241BTE6	ZRUM241DTE6	85.0
22	ZRUM264BTE6	ZRUM264BTE6	89.0
22	ZRUM265BTE6	ZRUM265DTE6	86.5
24	ZRUM288BTE6	ZRUM288DTE6	88.0
26	ZRUM312BTE6	ZRUM312DTE6	88.0
28	ZRUM336BTE6	ZRUM336DTE6	88.5
30	ZRUM360BTE6	ZRUM360DTE6	87.5
32	ZRUM384BTE6	ZRUM384DTE6	87.5
34	ZRUM408BTE6	ZRUM408DTE6	88.0
36	ZRUM432BTE6	ZRUM432DTE6	87.0
38	ZRUM456BTE6	ZRUM456DTE6	87.5
40	ZRUM480BTE6	ZRUM480DTE6	88.0
42	ZRUM504BTE6	ZRUM504DTE6	89.5
44	ZRUM528BTE6	ZRUM528DTE6	90.0

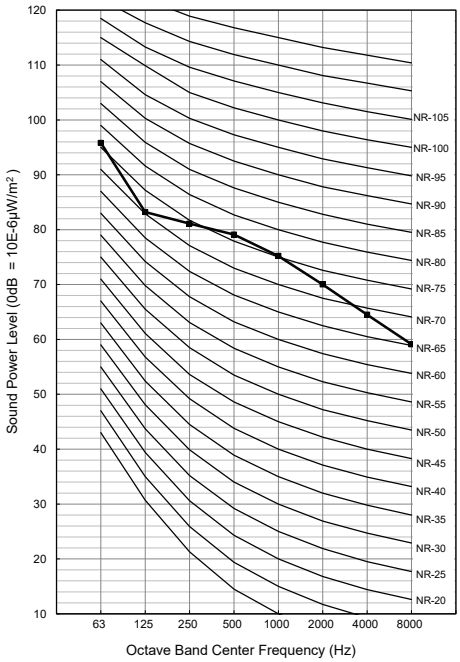
- Data is valid under diffuse field conditions.
- Data is valid under nominal operating conditions.
- Sound level may be increased in static pressure mode or if air guide is used.
- Sound power level is measured using rated conditions, and tested in a reverberation room per ISO 3741 standards.
- Sound 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 11: ZRUM072-096-121BTE6 / DTE6 Sound Power Levels.

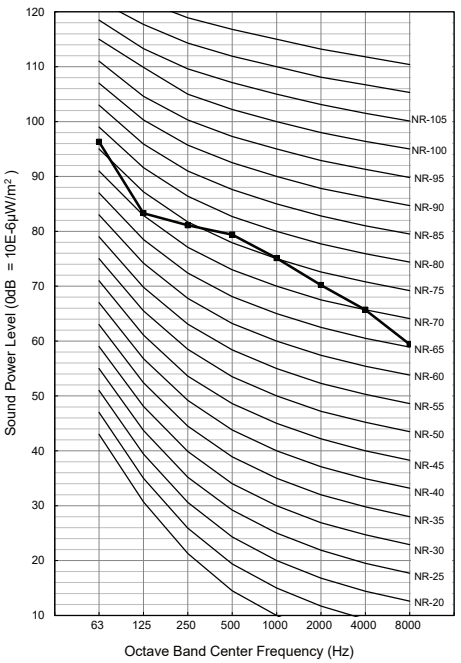
ZRUM072BTE6 / DTE6



ZRUM096BTE6 / DTE6



ZRUM121BTE6 / DTE6



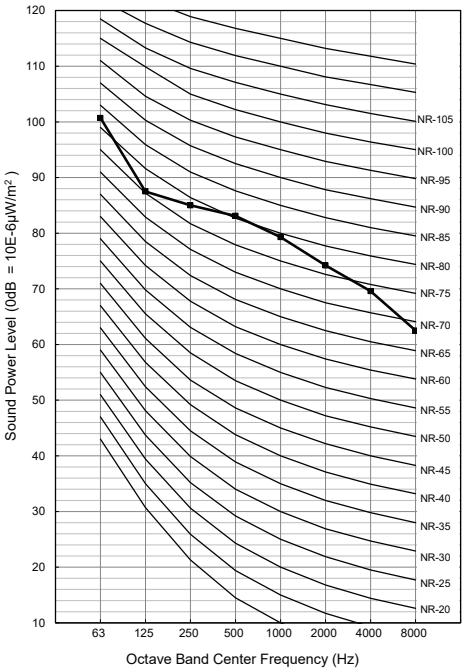
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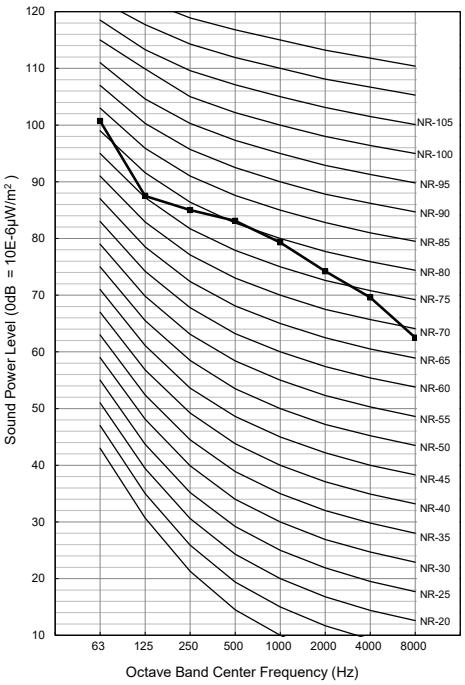
Sound Power Levels

Figure 12: ZRUM144-168-192BTE6 / DTE6 Sound Power Levels.

ZRUM144BTE6 / DTE6



ZRUM168BTE6 / DTE6



ZRUM192BTE6 / DTE6

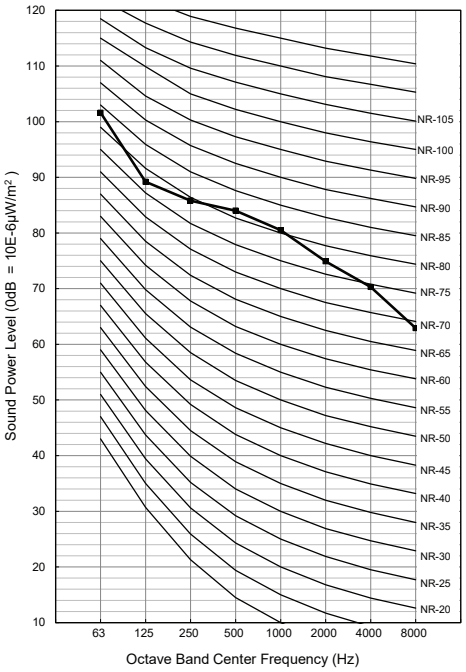
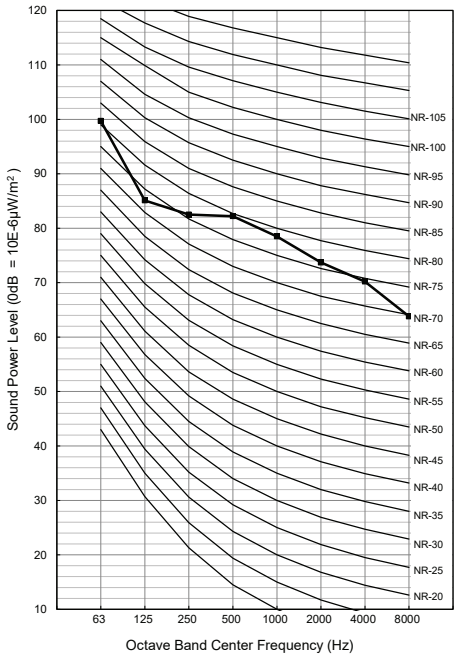
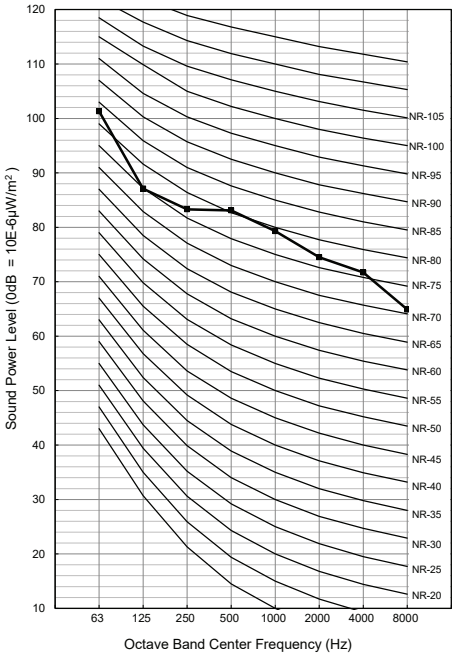


Figure 13: ZRUM216-241-264BTE6 / DTE6 Sound Power Levels.

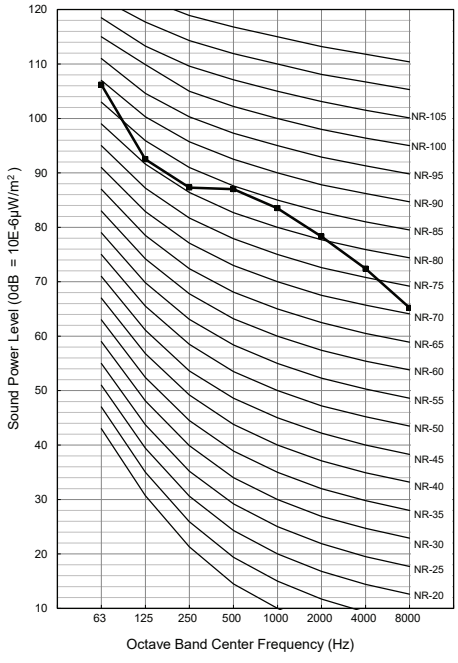
ZRUM216BTE6 / DTE6



ZRUM241BTE6 / DTE6



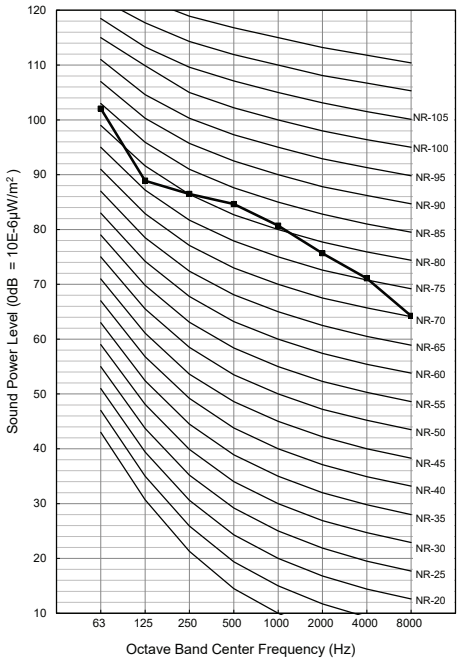
ZRUM264BTE6 / DTE6



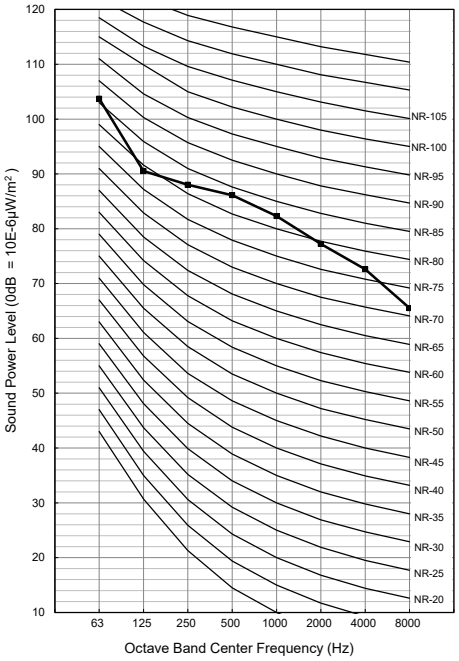
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Figure 14: ZRUM265-288-312BTE6 / DTE6 Sound Power Levels.

ZRUM265BTE6 / DTE6



ZRUM288BTE6 / DTE6



ZRUM312BTE6 / DTE6

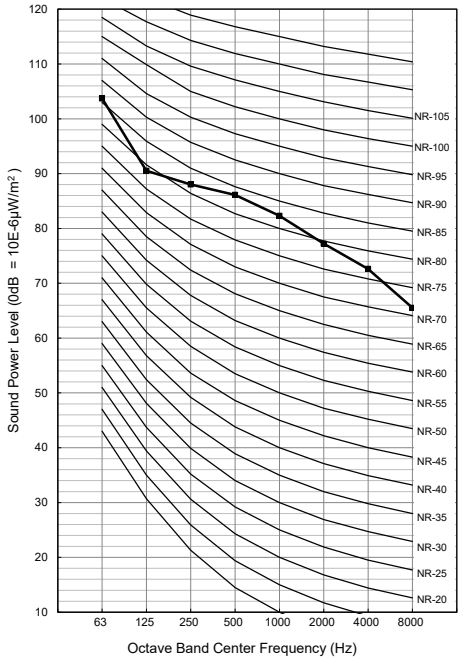
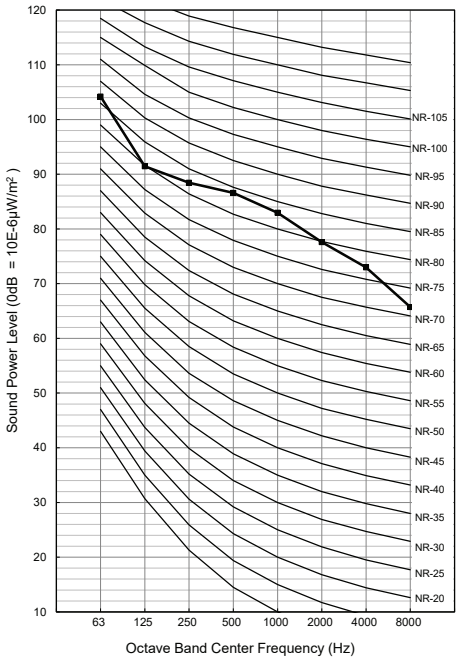
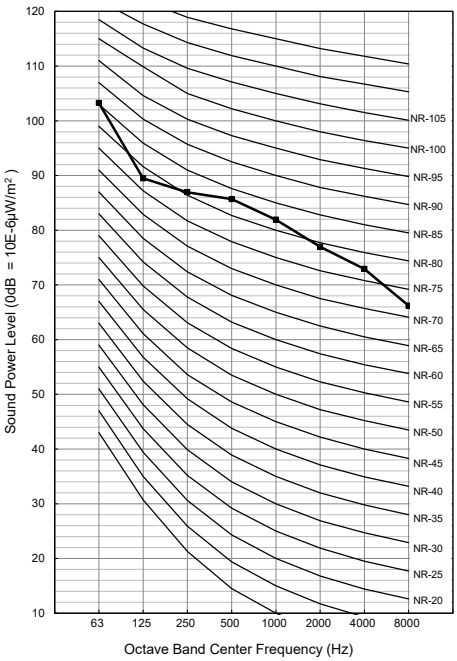


Figure 15: ZRUM336-360-384 BTE6 / DTE6 Sound Power Levels.

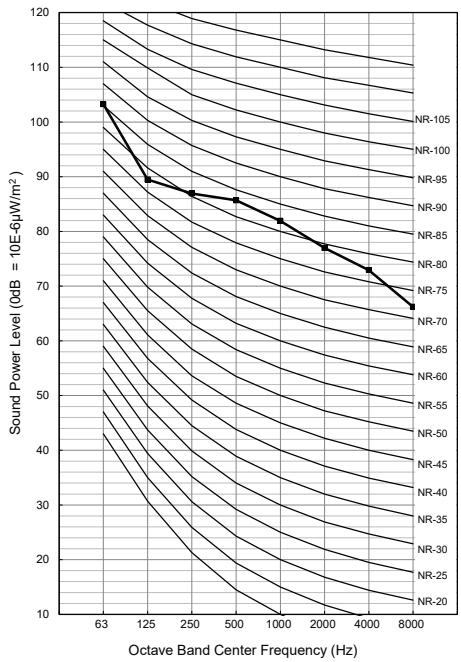
ZRUM336BTE6 / DTE6



ZRUM360BTE6 / DTE6



ZRUM384BTE6 / DTE6



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Figure 16: ZRUM408-432-456BTE6 / DTE6 Sound Power Levels.

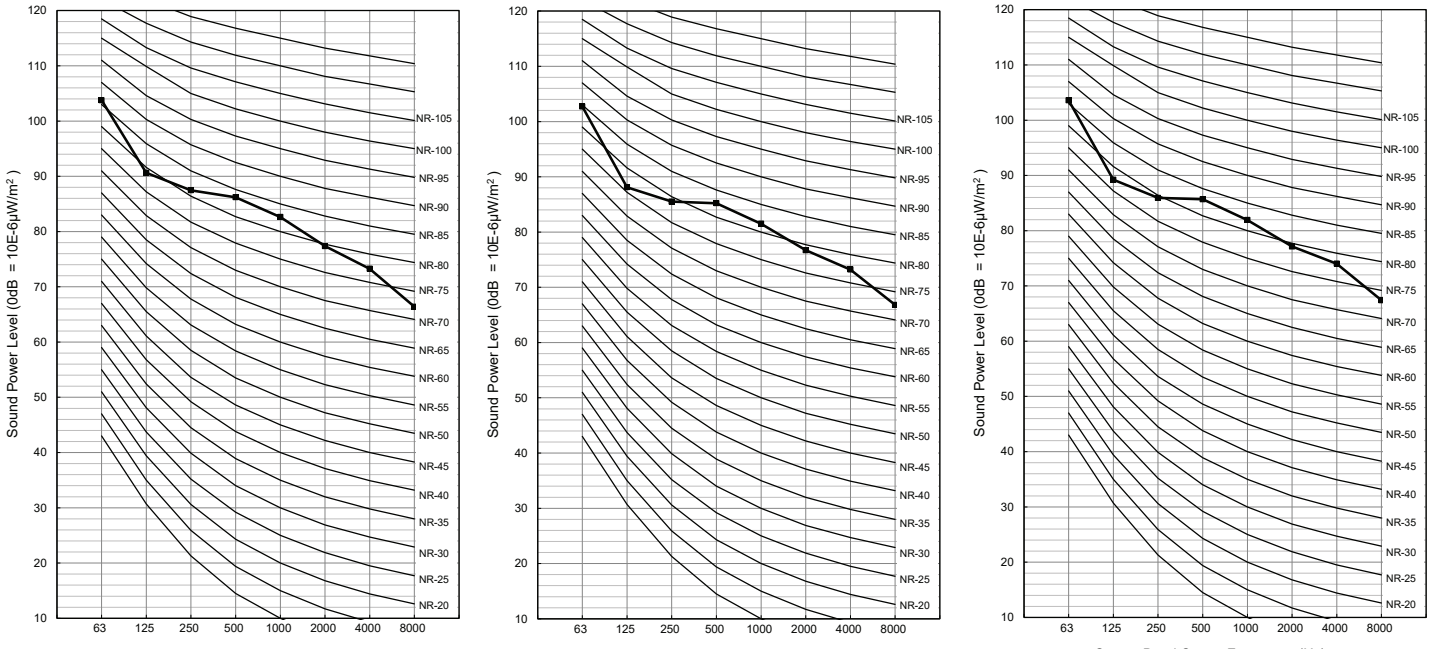
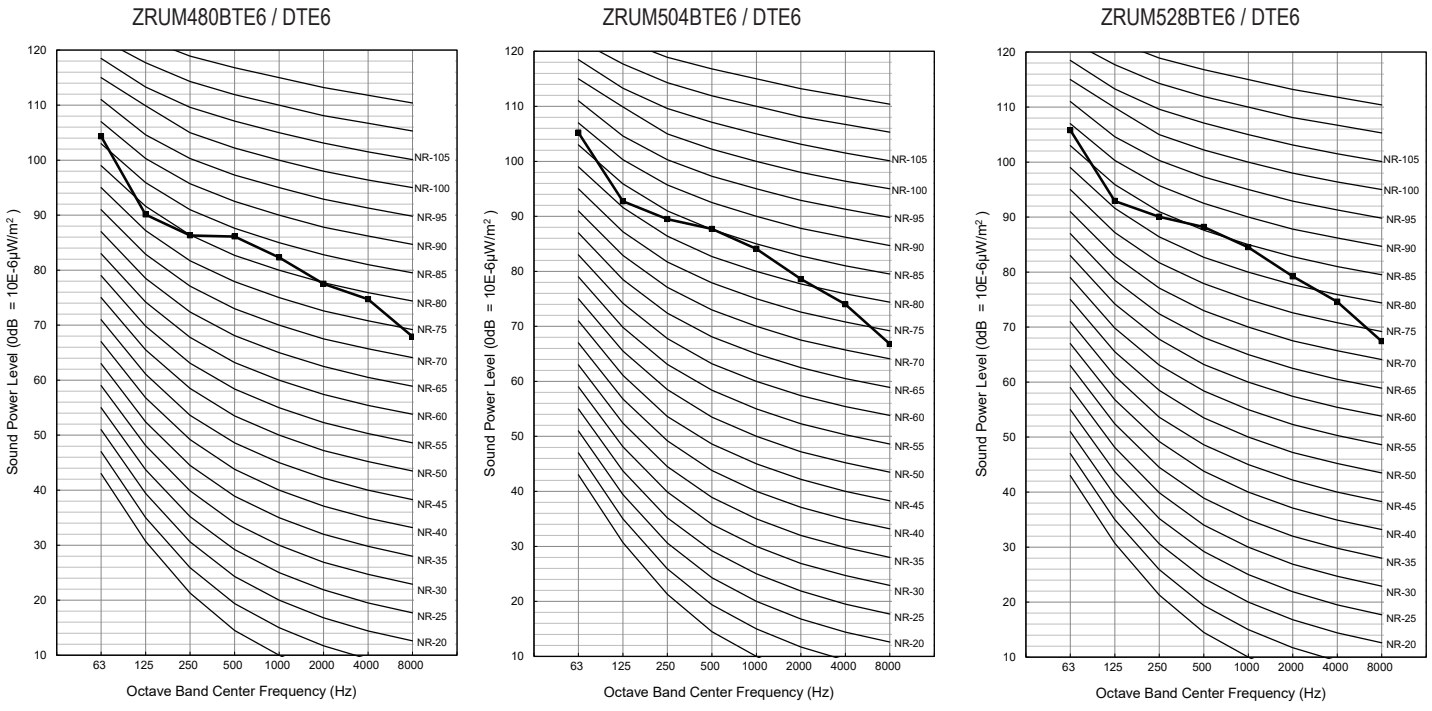


Figure 17: ZRUM480-504-528BTE6 / DTE6 Sound Power Levels.

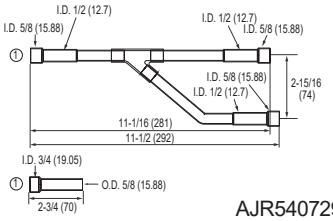
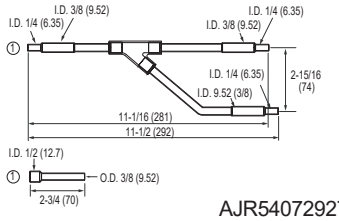
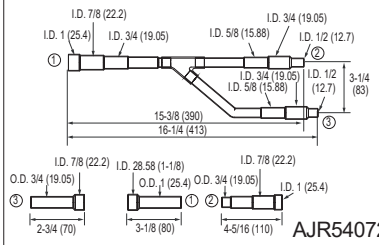
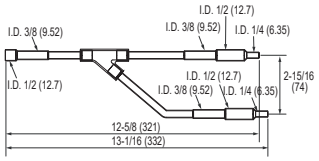
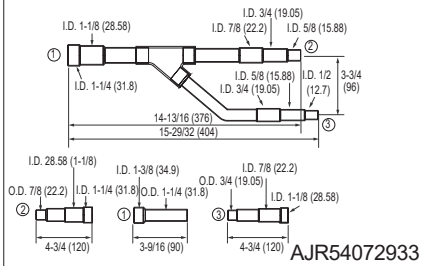
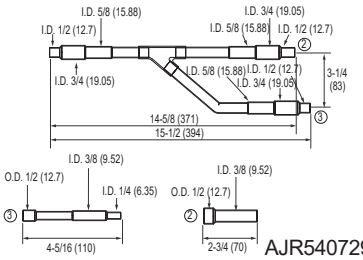
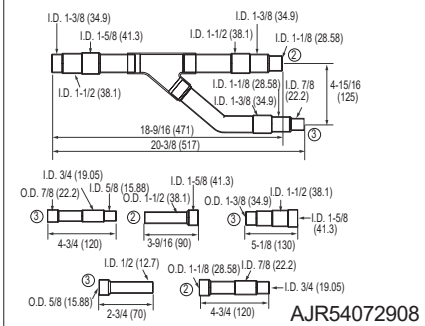
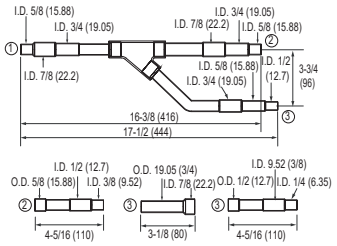
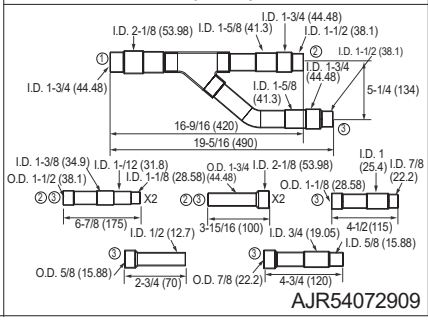
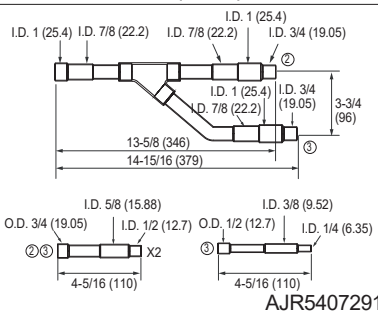


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Indoor Unit Y-Branches for Heat Pump Operation

(Unit: Inch [mm])

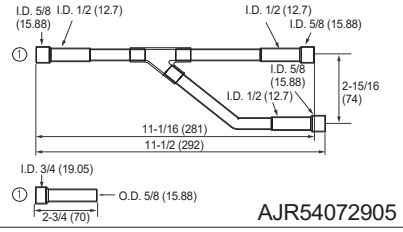
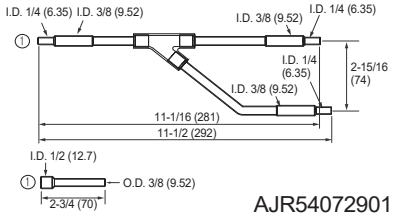
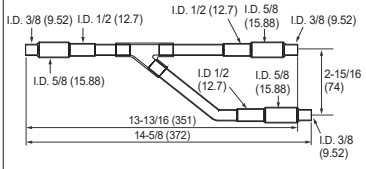
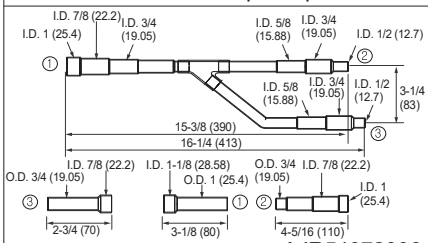
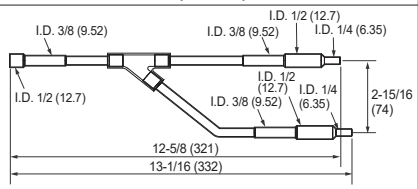
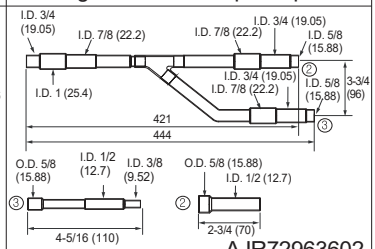
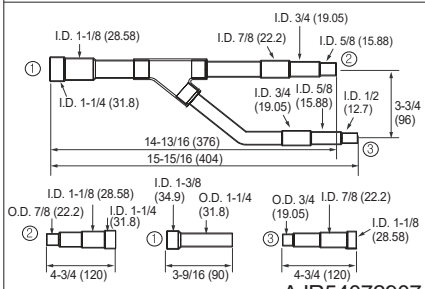
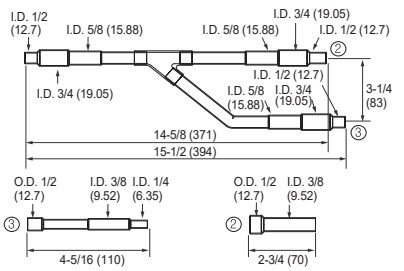
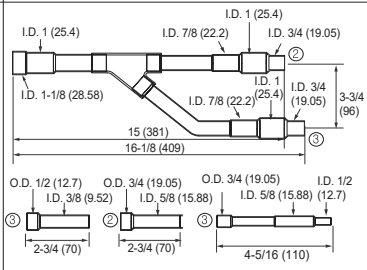
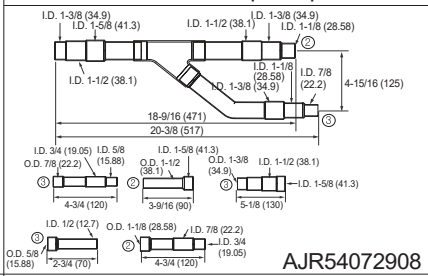
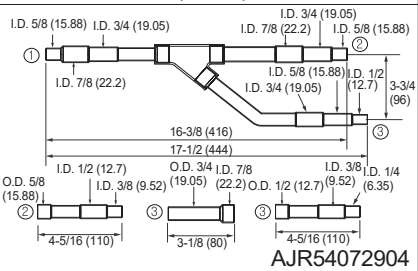
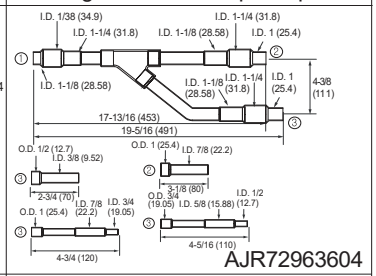
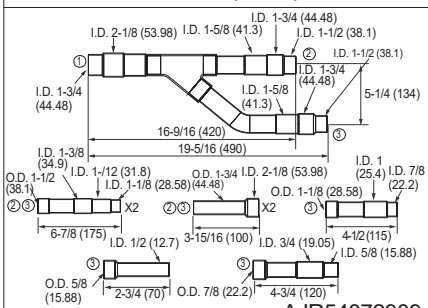
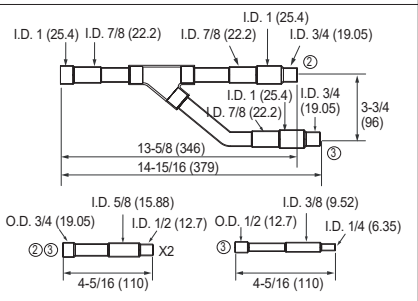
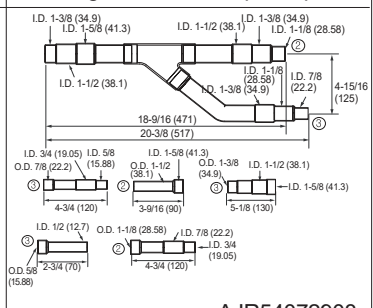
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	Vapor Pipe	Liquid Pipe
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	Vapor Pipe	Liquid Pipe
ARBLN03321	 AJR54072930	 AJR54072928
	Vapor Pipe	Liquid Pipe
ARBLN07121	 AJR54072933	 AJR54072931
	Vapor Pipe	Liquid Pipe
ARBLN14521	 AJR54072908	 AJR54072932
	Vapor Pipe	Liquid Pipe
ARBLN23220	 AJR54072909	 AJR54072910

Outdoor Unit Product Data

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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
ARBLB03321	 AJR54072906	 AJR54072902	 AJR72963602
ARBLB07121	 AJR54072907	 AJR54072903	 AJR72963603
ARBLB14521	 AJR54072908	 AJR54072904	 AJR72963604
ARBLB23220	 AJR54072909	 AJR54072910	 AJR54072908

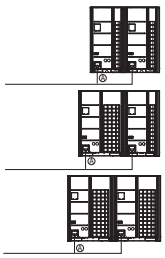
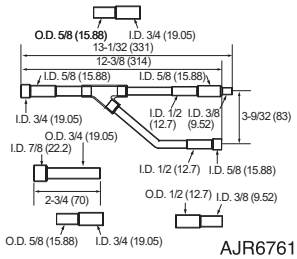
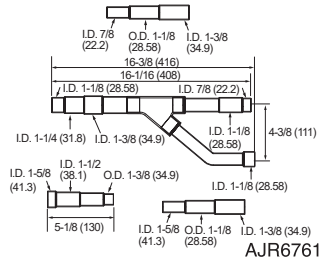
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Outdoor Unit Y-Branches for Heat Pump Operation

Y-Branches for Dual-Frame Systems

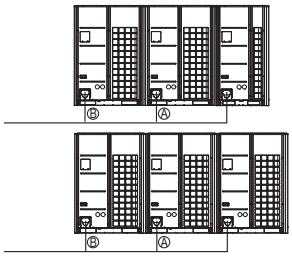
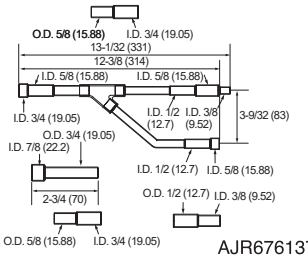
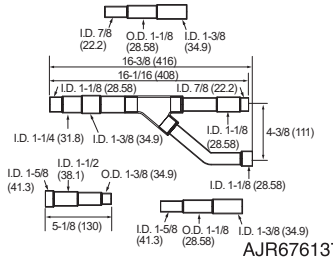
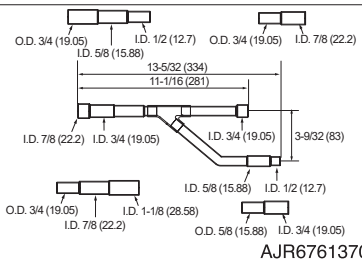
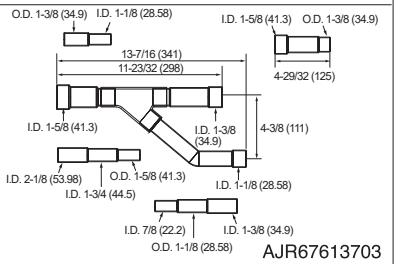
Unit: Inch (mm)

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

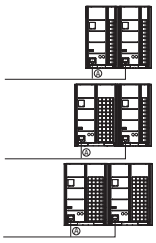
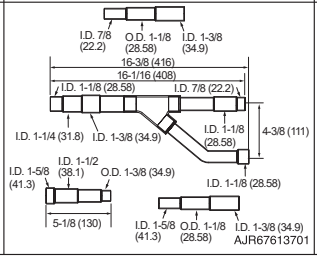
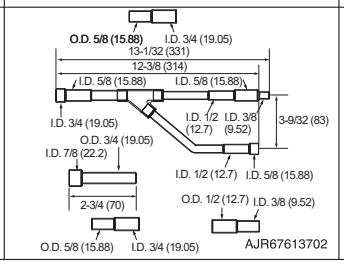
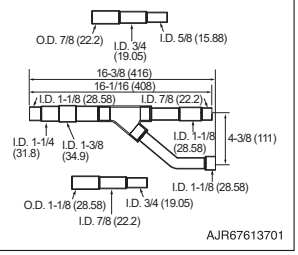
*For example, the indicated Ø3/8 (9.52) is the outside diameter (O.D.) of the field-joined piping.

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Outdoor Unit Y-branches for Heat Recovery Operation

Y-Branches for Dual-Frame Systems

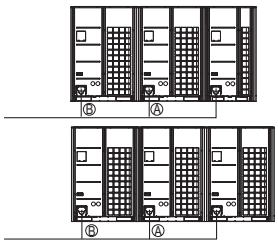
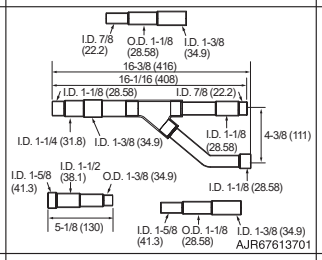
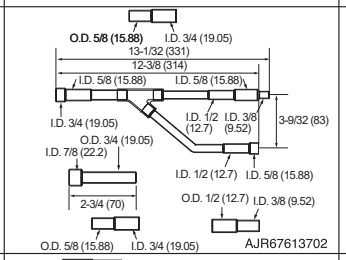
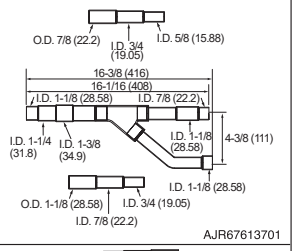
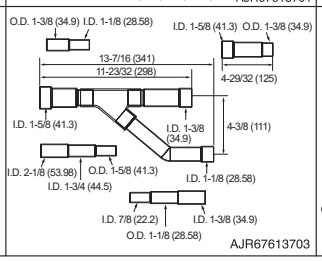
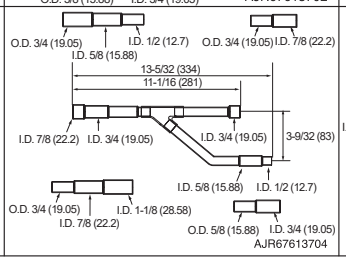
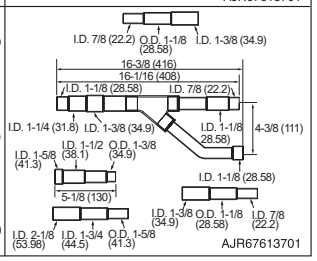
Unit: Inch (mm)

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			

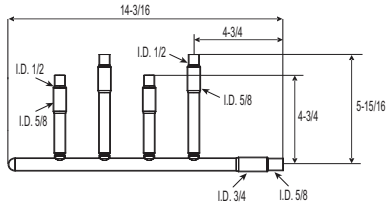
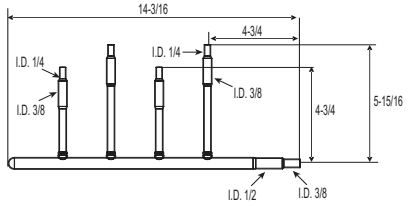
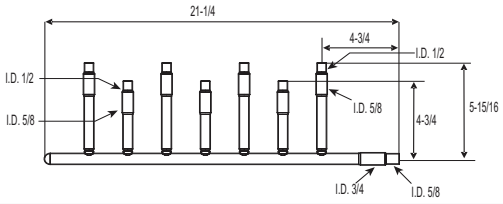
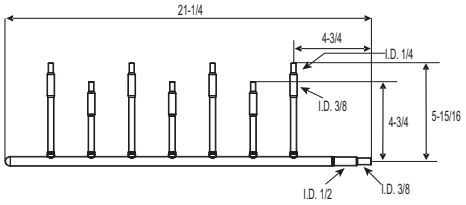
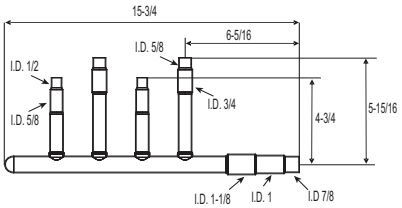
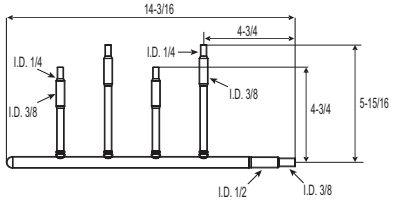
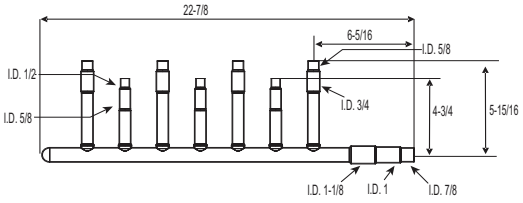
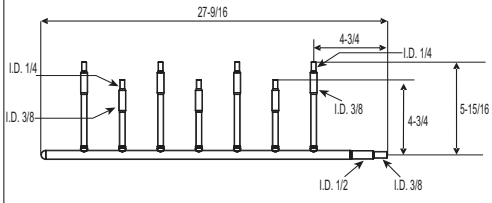
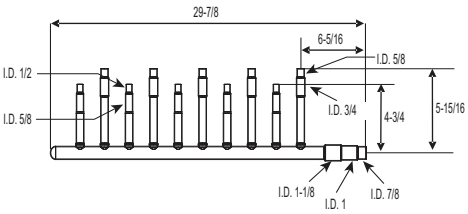
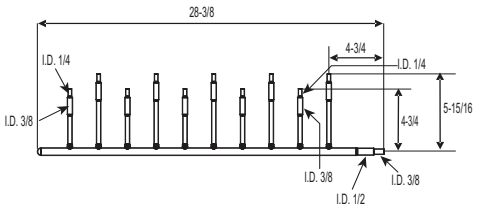
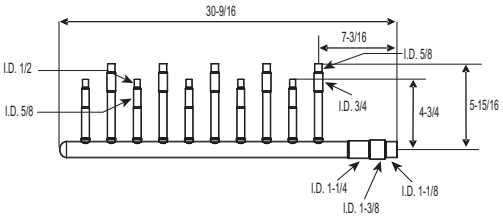
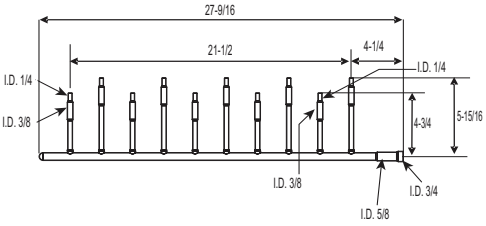
*For example, the indicated Ø3/8 (9.52) is the outside diameter (O.D.) of the field-joined piping.

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Headers

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

(ZAGDKA51B, ZAGDKA52B, ZAGDKA53A)

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

Use ZAGDKA51B air guides with the following models: UXA Frame 6-ton Outdoor Units ZRUM072BTE6 / ZRUM072DTE6.

Use ZAGDKA52B air guides with the following models: UXB Frame 8-ton to 16-ton Outdoor Units ZRUM096BTE6 / ZRUM096DTE6, ZRUM121BTE6 / ZRUM121DTE6, ZRUM144BTE6 / ZRUM144DTE6, ZRUM168BTE6 / ZRUM168DTE6, ZRUM192BTE6 / ZRUM192DTE6.

Use ZAGDKA53A air guides with the following models: UXC Frame 18-ton to 22-ton Outdoor Units ZRUM216BTE6 / ZRUM216DTE6, ZRUM241BTE6 / ZRUM241DTE6, ZRUM264BTE6 / ZRUM264DTE6.

Hail Guard Kits

(ZHGDKA51B, ZHGDKA52B, ZHGDKA53A)

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

Kit includes:

- Right wind baffle (All model nos.)
- Left wind baffle (All model nos.)
- Rear wind baffle (All model nos.)
- (50) #10 x 1/2 self-drilling hex head screws (All model nos.)
- Front wind baffle (ZHGDKA52B, ZHGDKA53A only)

Use ZHGDKA51B with the following models: UXA Frame 6-ton Outdoor Units ZRUM072BTE6 / ZRUM072DTE6.

Use ZHGDKA52B with the following models: UXB Frame 8-ton to 16-ton Outdoor Units ZRUM096BTE6 / ZRUM096DTE6, ZRUM121BTE6 / ZRUM121DTE6, ZRUM144BTE6 / ZRUM144DTE6, ZRUM168BTE6 / ZRUM168DTE6, ZRUM192BTE6 / ZRUM192DTE6.

Use ZHGDKA53A air guides with the following models: UXC Frame 18-ton to 22-ton Outdoor Units ZRUM216BTE6 / ZRUM216DTE6, ZRUM241BTE6 / ZRUM241DTE6, ZRUM264BTE6 / ZRUM264DTE6.

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

(ZLABKA51B, ZLABKA52B, ZLABKA53A)

Optional low ambient baffle kits allow for Multi V i 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
- Front 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 ZLABKA51B with the following models: UXA Frame 6-ton Outdoor Units ZRUM072BTE6 / ZRUM072DTE6.

Use ZLABKA52B with the following models: UXB Frame 8-ton to 16-ton Outdoor Units ZRUM096BTE6 / ZRUM096DTE6, ZRUM121BTE6 / ZRUM121DTE6, ZRUM144BTE6 / ZRUM144DTE6, ZRUM168BTE6 / ZRUM168DTE6, ZRUM192BTE6 / ZRUM192DTE6.

Use ZLABKA53A air guides with the following models: UXC Frame 18-ton to 22-ton Outdoor Units ZRUM216BTE6 / ZRUM216DTE6, ZRUM241BTE6 / ZRUM241DTE6, ZRUM264BTE6 / ZRUM264DTE6.

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

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Drain Pan Heaters

(ZPLT1A51B, ZPLT1A52B, ZPLT1A53A, ZPLT2A51B, ZPLT2A52B, ZPLT2A53A)

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.

For 208/230V Outdoor Units

ZPLT1A51B Drain Pan Heaters are for use with UXA 6-ton Outdoor Units ZRUM072BTE6.

ZPLT1A52B Drain Pan Heaters are for use with UXB 8-ton to 16-ton Outdoor Units ZRUM096BTE6, ZRUM121BTE6, ZRUM144BTE6, ZRUM168BTE6, ZRUM192BTE6.

ZPLT1A53A Drain Pan Heaters are for use with UXC Frame 18-ton to 22-ton Outdoor Units ZRUM216BTE6, ZRUM241BTE6, ZRUM264BTE6.

For 460V Outdoor Units

ZPLT2A51B Drain Pan Heaters are for use with UXA 6-ton Outdoor Units ZRUM072DTE6

ZPLT2A52B Drain Pan Heaters are for use with UXB 8-ton to 16-ton Outdoor Units ZRUM096DTE6, ZRUM121DTE6, ZRUM144DTE6, ZRUM168DTE6, ZRUM192DTE6.

ZPLT2A53A Drain Pan Heaters are for use with UXC Frame 18-ton to 22-ton Outdoor Units ZRUM216DTE6, ZRUM241DTE6, ZRUM264DTE6.

Contact an LG Sales Representative for more information.

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LG Monitoring View (LGMV) Diagnostic Software and Cable

LG Monitoring View (LGMV) is a maintenance and troubleshooting tool for Multi V™ air conditioning systems. LGMV formats are available for computer or mobile phone use.

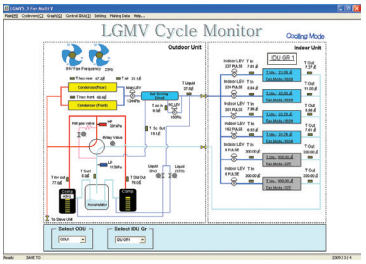
The main screen for LGMV allows the user to view the following real time data:

- 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
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 IDUs 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: Screen is changed to show the following:
   - Inverter compressor
     - Amps / Volts / Power Hz
     - Inverter control board fan Hz
   - Constant compressor
     - Current transducer value
     - Phase

Figure 18: Sample Cycleview (Computer View Example).



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

This software can be used to both pre-set-up 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.

LGMV is available in different formats. Contact your LG Sales Representative for system requirements and for more information.

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ThinQ

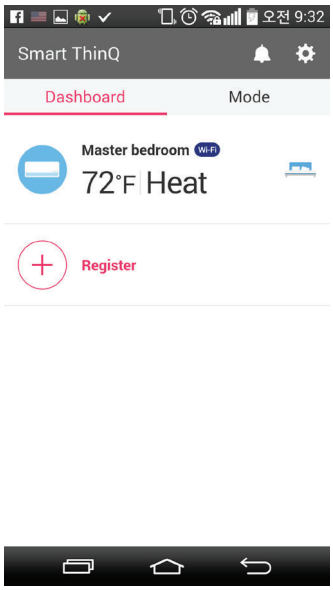
LG ThinQ is a built-in Wi-Fi module, along with a free smart phone app that provides monitoring and remote control capabilities for use with certain LG indoor units. The app has the following features and benefits:

- Sign in to the app using LG credentials, or using Google® or Facebook® login credentials. Users only have to log in to the app once; the app remembers login details for subsequent logins.
- View current temperature settings of the air conditioning unit and change temperature, fan speed, and air flow direction from anywhere in the house or at a remote location (through the use of wireless connection). Multiple users can control the household air conditioning unit remotely.
- Monitor filter usage of the unit.
- Set up weekly schedules to start and stop air conditioner activity.
- Set up the unit to run in different Modes, depending on the user's schedule. Set up specific temperatures for when the user is home, away on vacation, or sleeping.
- Troubleshoot problems, and view tips on general maintenance of the system using the Smart Diagnosis function.

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Contact your LG Sales Representative or visit www.lghvac.com for system requirements, how to download the app, a user's manual, or other information.

Figure 19: Example of an LG Smart ThinQ Screen (appearances my differ depending on version of software).



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HEAT RECOVERY UNIT PRODUCT DATA

Mechanical Specifications on page 99
General Data on page 100
Electrical Data on page 102
Dimensions on page 103
Wiring Diagram on page 105
Refrigerant Flow Diagrams on page 109
Fan Curve Values on page 111
Acoustic Data on page 112
Accessories on page 113

Multi V Heat Recovery Units

Figure 20: Four-Port Heat Recovery Unit.



General

Multi V heat recovery units are for use with R32 Multi V i, Multi V Water and Multi V 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.

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 and are internally insulated. All heat recovery units include refrigerant leak sensors and knockouts for enclosure ventilation applications.

Refrigerant Valves

Each heat recovery port is circuited with two two-position motorized valves to control R32 refrigerant flow path to allow indoor units to operate in heating or cooling mode. Six and eight-port heat recovery units use EEVs for refrigerant flow control. R32 heat recovery units include built-in shutoff valves.

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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Figure 21: Two-Port Heat Recovery Unit.



Figure 22: Three-Port Heat Recovery Unit.



Figure 23: Four-Port Heat Recovery Unit.

NOTICE

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

Table 17: Two-, Three-, and Four-Port Heat Recovery Unit Specifications.

Model			PRHR024C	PRHR034C	PRHR044C
Number of Ports			2	3	4
Max. Connectable No. of Indoor Units			16	24	32
Max. Connectable 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.	55.1	61.5	68.1
Shipping Weight		lbs.	71.7	79.4	86.0
Dimensions (W x H x D)		Inches	19-1/4 x 9-1/2 x 31-3/32		
Refrigerant Type			R32		
Refrigerant Control			Motorized Valve		
Casing			Galvanized Steel Plate		
Connecting Pipes	To Indoor Units	Liquid Pipe (inches)	Ø3/8 – Ø1/4		
		Vapor Pipe (inches)	Ø5/8 – Ø1/2		
	To Outdoor Units	Liquid (inches)	Ø3/8	Ø1/2	Ø5/8
		Low Pressure Vapor (inches)	Ø7/8	Ø1-1/8	Ø1-1/8
		High Pressure Vapor (inches)	Ø3/4	Ø7/8	Ø7/8

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Figure 24: Six-Port Heat Recovery Unit.



Figure 25: Eight-Port Heat Recovery Unit.

NOTICE

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

Table 18: Six- and Eight-Port Heat Recovery Unit Specifications.

Model			PRHR065C	PRHR085C
Number of Ports			6	8
Max. Connectable No. of Indoor Units			48	64
Max. Connectable 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.	100.8	113.5
Shipping Weight		lbs.	126.3	140.0
Dimensions (W x H x D)		Inches	35-15/32 x 9-7/16 x 31-3/32	
Rerfrigerant Type			R32	
Refrigerant Control			EEV	
Casing			Galvanized Steel Plate	
Connecting Pipes	To Indoor Units	Liquid Pipe (inches)	Ø3/8 – Ø1/4	
		Vapor Pipe (inches)	Ø5/8 – Ø1/2	
	To Outdoor Units	Liquid (inches)	Ø5/8	Ø5/8
		Low Pressure Vapor (inches)	Ø1-1/8	Ø1-1/8
		High Pressure Vapor (inches)	Ø7/8	Ø7/8

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Table 19: Heat Recovery Unit Electrical Data.

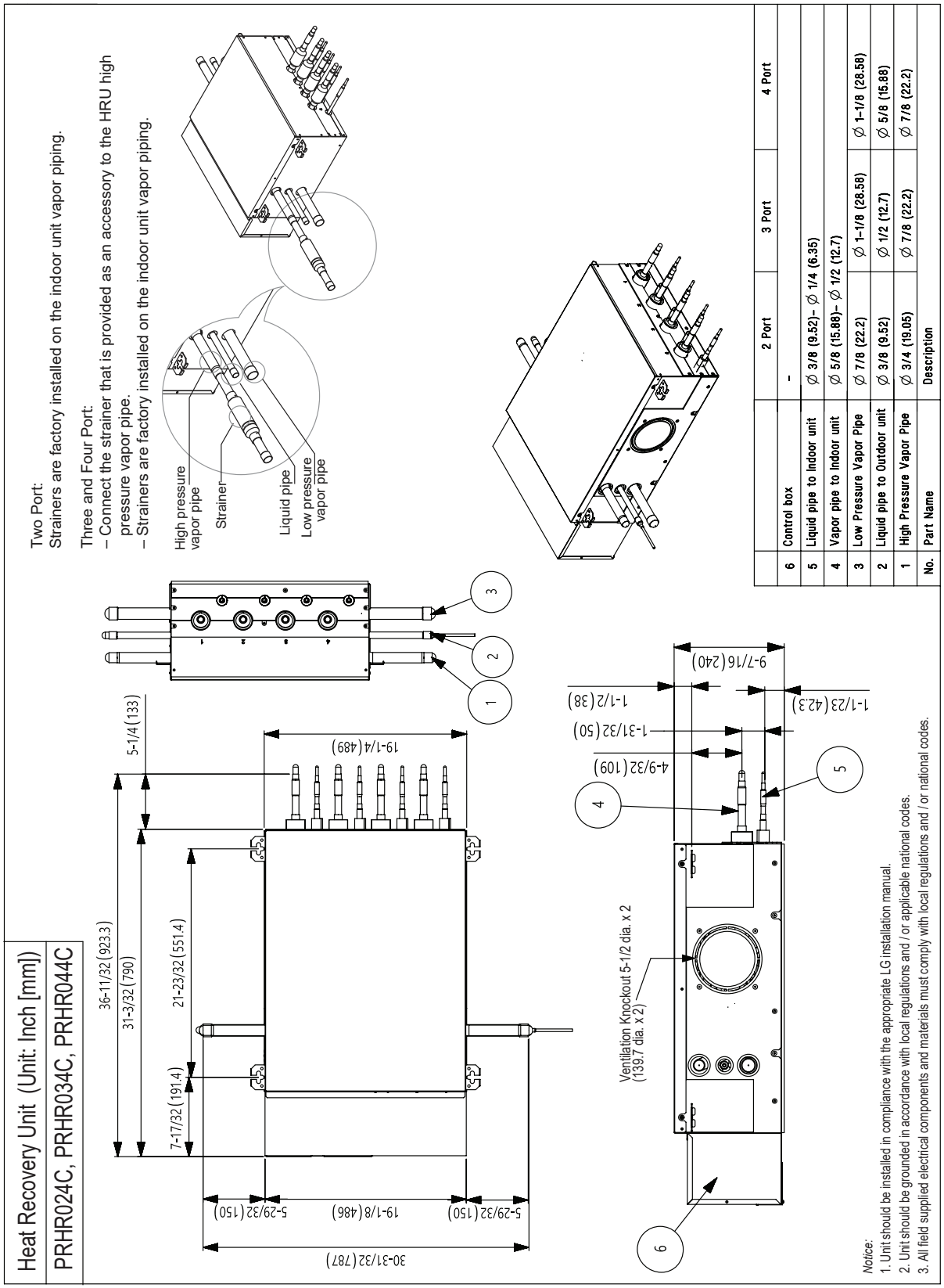
Unit Model No.	Voltage Range	Rated Amps	MCA	MFA	Power Supply			Power Input (W)	
					Hz	Volts	Phase	Cooling	Heating
PRHR024C	187-253	0.38	0.875	15	60	208-230	1	54.2	51.6
PRHR034C									
PRHR044C									
PRHR065C		0.43						98.7	94
PRHR085C									

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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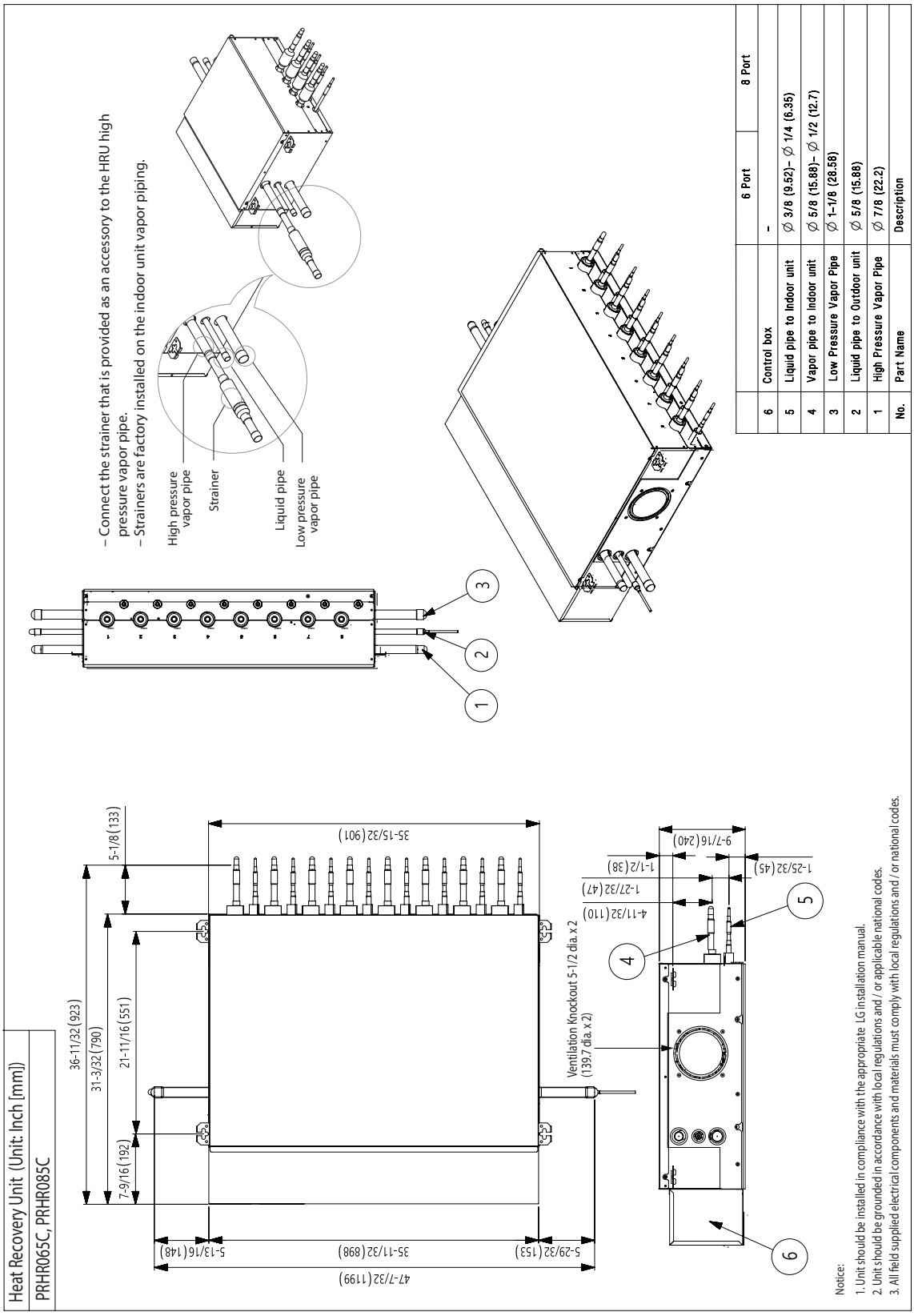
Figure 26: PRHR024C, PRHR034C and PRHR044C Dimensions.



No.	Part Name	Description	2 Port	3 Port	4 Port
6	Control box	-	-		
5	Liquid pipe to Indoor unit		Ø 3/8 (9.52)– Ø 1/4 (6.35)		
4	Vapor pipe to Indoor unit		Ø 5/8 (15.88)– Ø 1/2 (12.7)		
3	Low Pressure Vapor Pipe		Ø 7/8 (22.2)	Ø 1-1/8 (28.58)	Ø 1-1/8 (28.58)
2	Liquid pipe to Outdoor unit		Ø 3/8 (9.52)	Ø 1/2 (12.7)	Ø 5/8 (15.88)
1	High Pressure Vapor Pipe		Ø 3/4 (19.05)	Ø 7/8 (22.2)	Ø 7/8 (22.2)

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Figure 27: PRHR065C and PRHR085C Dimensions.

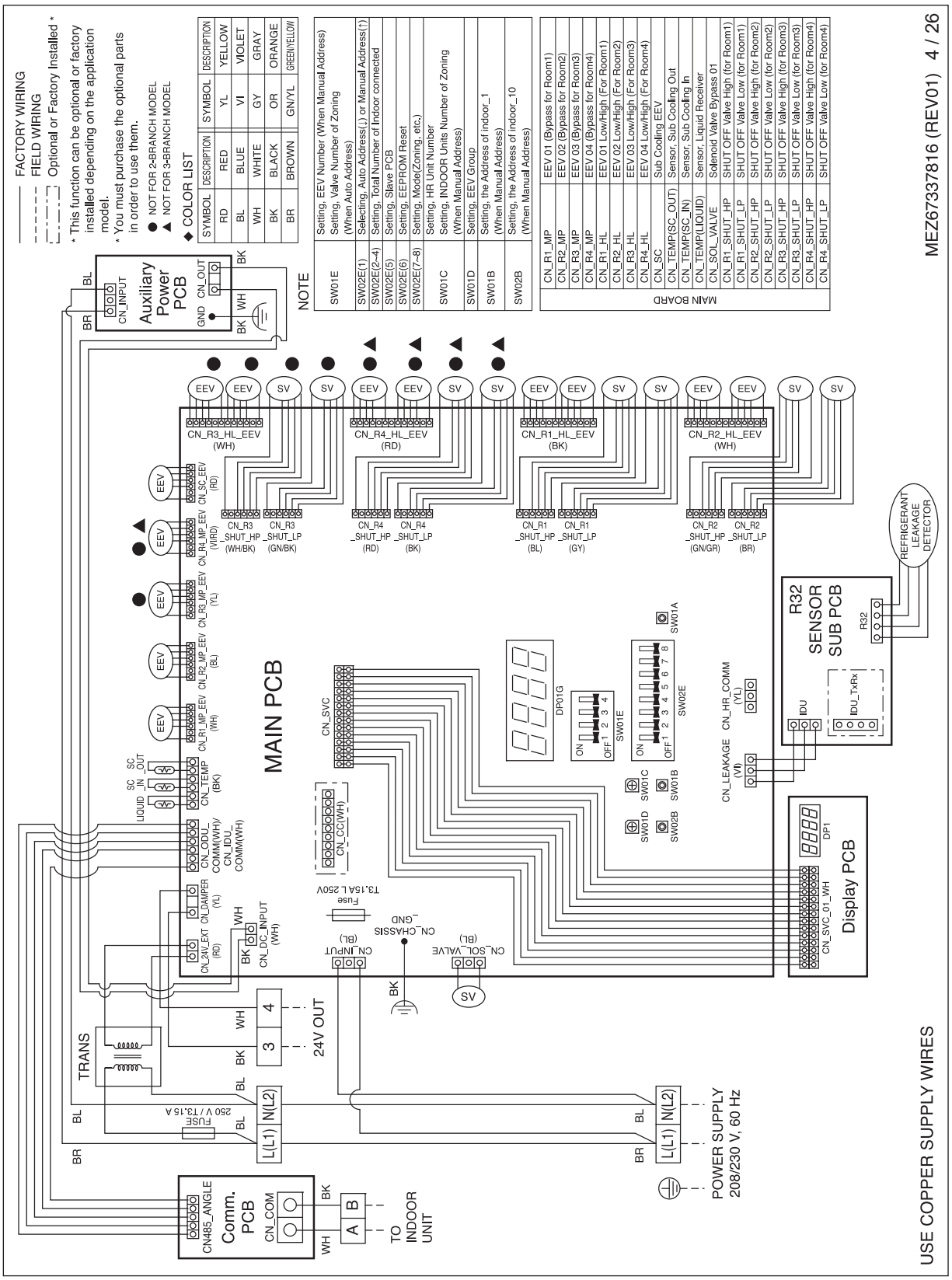


No.	Part Name	Description	6 Port	8 Port
6	Control box	–	–	
5	Liquid pipe to Indoor unit	Ø 3/8 (9.52)– Ø 1/4 (6.35)		
4	Vapor pipe to Indoor unit	Ø 5/8 (15.88)– Ø 1/2 (12.7)		
3	Low Pressure Vapor Pipe	Ø 1–1/8 (28.58)		
2	Liquid pipe to Outdoor unit	Ø 5/8 (15.88)		
1	High Pressure Vapor Pipe	Ø 7/8 (22.2)		

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Figure 28: PRHR024C, PRHR034C, and PRHR044C Wiring Diagram.



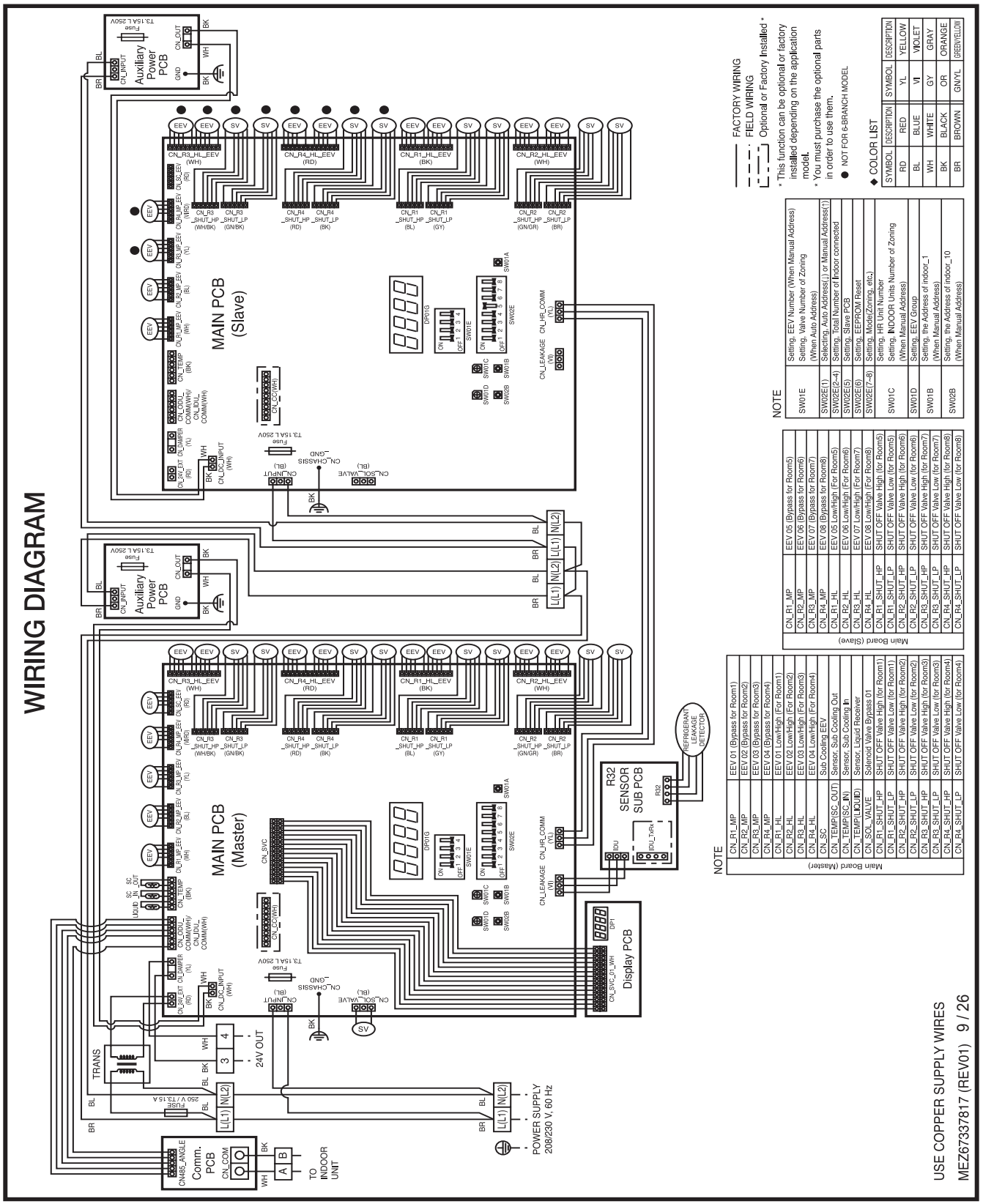
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Table 20: PRHR024C, PRHR034C, and PRHR044C Wiring Diagram Legend

Terminal	Description
Main PCB	
CN_24V-EXT(RD)	24V In (From Transformer)
CN_DAMPER(YL)	24V Out (For Relay)
CN_ODU_COMM(WH)/CN_IDU_COMM(WH)	Communication PCB (RS-485)
CN_TEMP(BK)	Thermistor (SC / In / Out / Liquid Pipe)
CN_R1_MP_EEV(WH)	EEV 01 (Bypass for Room 1)
CN_R2_MP_EEV(BL)	EEV 02 (Bypass for Room 2)
CN_R3_MP_EEV(YL)	EEV 03 (Bypass for Room 3)
CN_R4_MP_EEV(VI/RD)	EEV 04 (Bypass for Room 4)
CN_SC_EEV(RD)	Sub Cooling EEV
CN_R3_HL_EEV(WH)	EEV 03 Low / High (For Room 3)
CN_R3_SHUT_HP(WH/BK)	Shut Off Valve High (for Room 3)
CN_R3_SHUT_LP(GN/BK)	Shut Off Valve Low (for Room 3)
CN_R4_HL_EEV(RD)	EEV 04 Low / High (For Room 4)
CN_R4_SHUT_HP(RD)	Shut Off Valve High (for Room 4)
CN_R4_SHUT_LP(BK)	Shut Off Valve Low (for Room 4)
CN_R1_HL_EEV(BK)	EEV 01 Low / High (For Room 1)
CN_R1_SHUT_HP(BL)	Shut Off Valve High (for Room 1)
CN_R1_SHUT_LP(GY)	Shut Off Valve Low (for Room 1)
CN_R2_HL_EEV(WH)	EEV 02 Low / High (For Room 2)
CN_R2_SHUT_HP(GN/GR)	Shut Off Valve High (for Room 2)
CN_R2_SHUT_LP(BR)	Shut Off Valve Low (for Room 2)
CN_HR_COMM(YL)	Connection Sub PCB
CN_LEAKAGE(VI)	Leak Detector
CN_SVC	Display PCB
CN_SOL_VALVE(BL)	Liquid Bypass Valve
CN_CHASSIS_GND	PCB Functional Ground
CN_INPUT(BL)	Main Power
CN_CC(WH)	Dry Contact
CN_DC_INPUT(WH)	Auxiliary Power PCB
DIP Switch Settings	
SW01E	Setting, EEV Number (Manual Addressing)
	Setting, Valve Zone Number (Auto Addressing)
SW02E(1)	Selecting Auto Address (↓) or Manual Address (↑)
SW02E(2~4)	Setting, Total Number of Indoor Units Connected
SW02E(5)	Setting, Sub PCB
SW02E(6)	Setting, EEPROM Reset
SW02E(7~8)	Setting, Mode (Zoning, etc.)
SW01A	Reset
SW01D	Setting, EEV Group
SW01C	Setting, HR Unit Number
	Setting, Indoor Units Zone Number (Manual Addressing)
SW02B	Setting, the Address of indoor_10 (Manual Addressing)
SW01B	Setting, the Address of indoor_1 (Manual Addressing)

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Figure 29: PRHR065C and PRHR085C Wiring Diagram.



Heat Recovery Unit Product Data

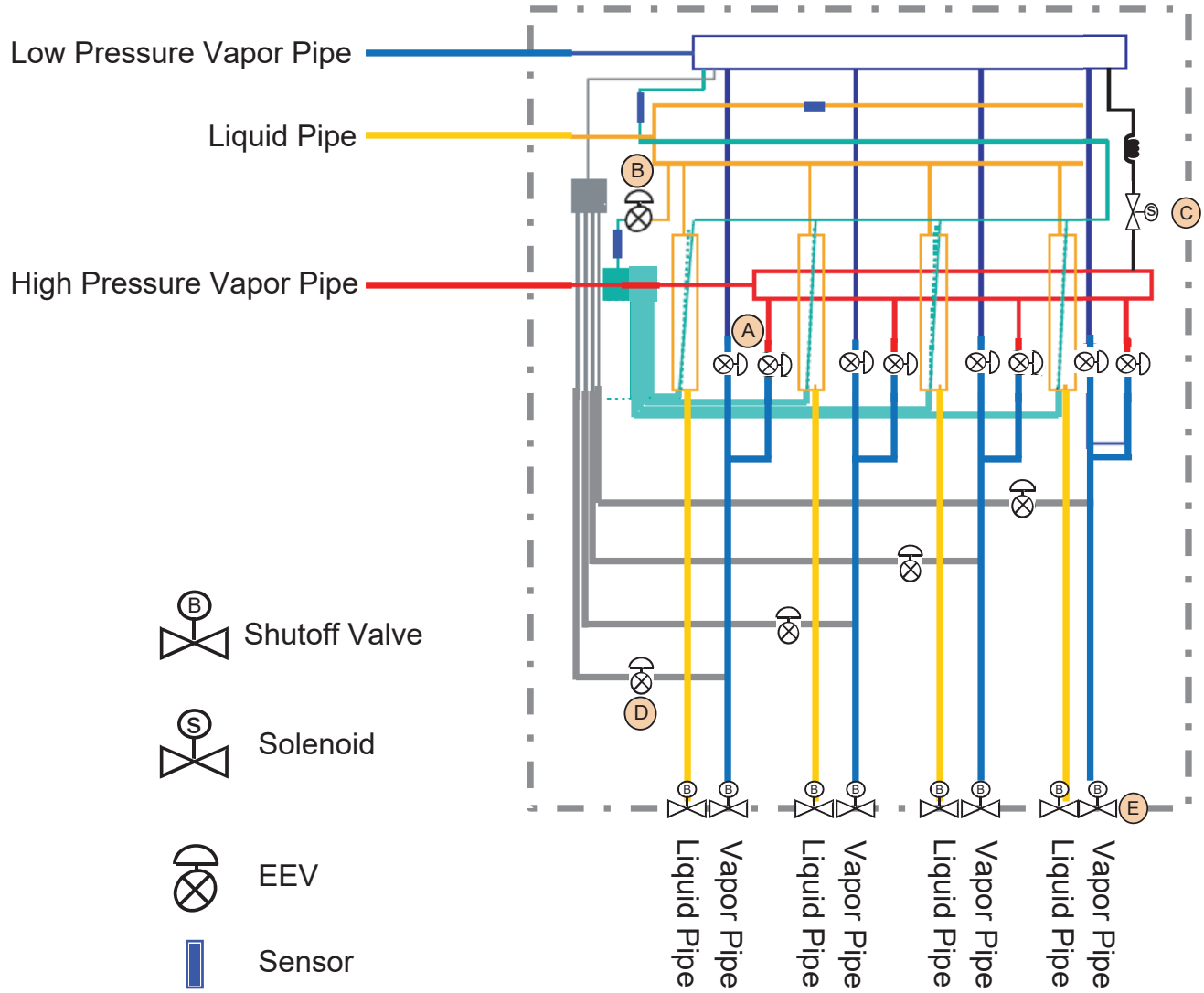
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Table 21: PRHR065C and PRHR085C Wiring Diagram Legend

Terminal	Description
Main PCB	
CN_24V-EXT(RD)	24V In (From Transformer)
CN_DAMPER(YL)	24V Out (For Relay)
CN_ODU_COMM(WH)/CN_IDU_COMM(WH)	Communication PCB (RS-485)
CN_TEMP(BK)	Thermistor (SC / In / Out / Liquid Pipe)
CN_R1_MP_EEV(WH)	EEV 01 (Bypass for Room 1)
CN_R2_MP_EEV(BL)	EEV 02 (Bypass for Room 2)
CN_R3_MP_EEV(YL)	EEV 03 (Bypass for Room 3)
CN_R4_MP_EEV(VI/RD)	EEV 04 (Bypass for Room 4)
CN_SC_EEV(RD)	Sub Cooling EEV
CN_R3_HL_EEV(WH)	EEV 03 Low / High (For Room 3)
CN_R3_SHUT_HP(WH/BK)	Shut Off Valve High (for Room 3)
CN_R3_SHUT_LP(GN/BK)	Shut Off Valve Low (for Room 3)
CN_R4_HL_EEV(RD)	EEV 04 Low / High (For Room 4)
CN_R4_SHUT_HP(RD)	Shut Off Valve High (for Room 4)
CN_R4_SHUT_LP(BK)	Shut Off Valve Low (for Room 4)
CN_R1_HL_EEV(BK)	EEV 01 Low / High (For Room 1)
CN_R1_SHUT_HP(BL)	Shut Off Valve High (for Room 1)
CN_R1_SHUT_LP(GY)	Shut Off Valve Low (for Room 1)
CN_R2_HL_EEV(WH)	EEV 02 Low / High (For Room 2)
CN_R2_SHUT_HP(GN/GR)	Shut Off Valve High (for Room 2)
CN_R2_SHUT_LP(BR)	Shut Off Valve Low (for Room 2)
CN_HR_COMM(YL)	Connection Sub PCB
CN_LEAKAGE(VI)	Leak Detector
CN_SVC	Display PCB
CN_SOL_VALVE(BL)	Liquid Bypass Valve
CN_CHASSIS_GND	PCB Functional Ground
CN_INPUT(BL)	Main Power
CN_CC(WH)	Dry Contact
CN_DC_INPUT(WH)	Auxiliary Power PCB
DIP Switch Settings	
SW01E	Setting, EEV Number (Manual Addressing)
	Setting, Valve Zone Number (Auto Addressing)
SW02E(1)	Selecting Auto Address (↓) or Manual Address (↑)
SW02E(2~4)	Setting, Total Number of Indoor Units Connected
SW02E(5)	Setting, Sub PCB
SW02E(6)	Setting, EEPROM Reset
SW02E(7~8)	Setting, Mode (Zoning, etc.)
SW01A	Reset
SW01D	Setting, EEV Group
SW01C	Setting, HR Unit Number
	Setting, Indoor Units Zone Number (Manual Addressing)
SW02B	Setting, the Address of indoor_10 (Manual Addressing)
SW01B	Setting, the Address of indoor_1 (Manual Addressing)

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Figure 30: PRHR024C, PRHR034C, and PRHR044C Refrigerant Flow Diagram.



Ⓐ: Switches operation between cooling and heating using the two valves.

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

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

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

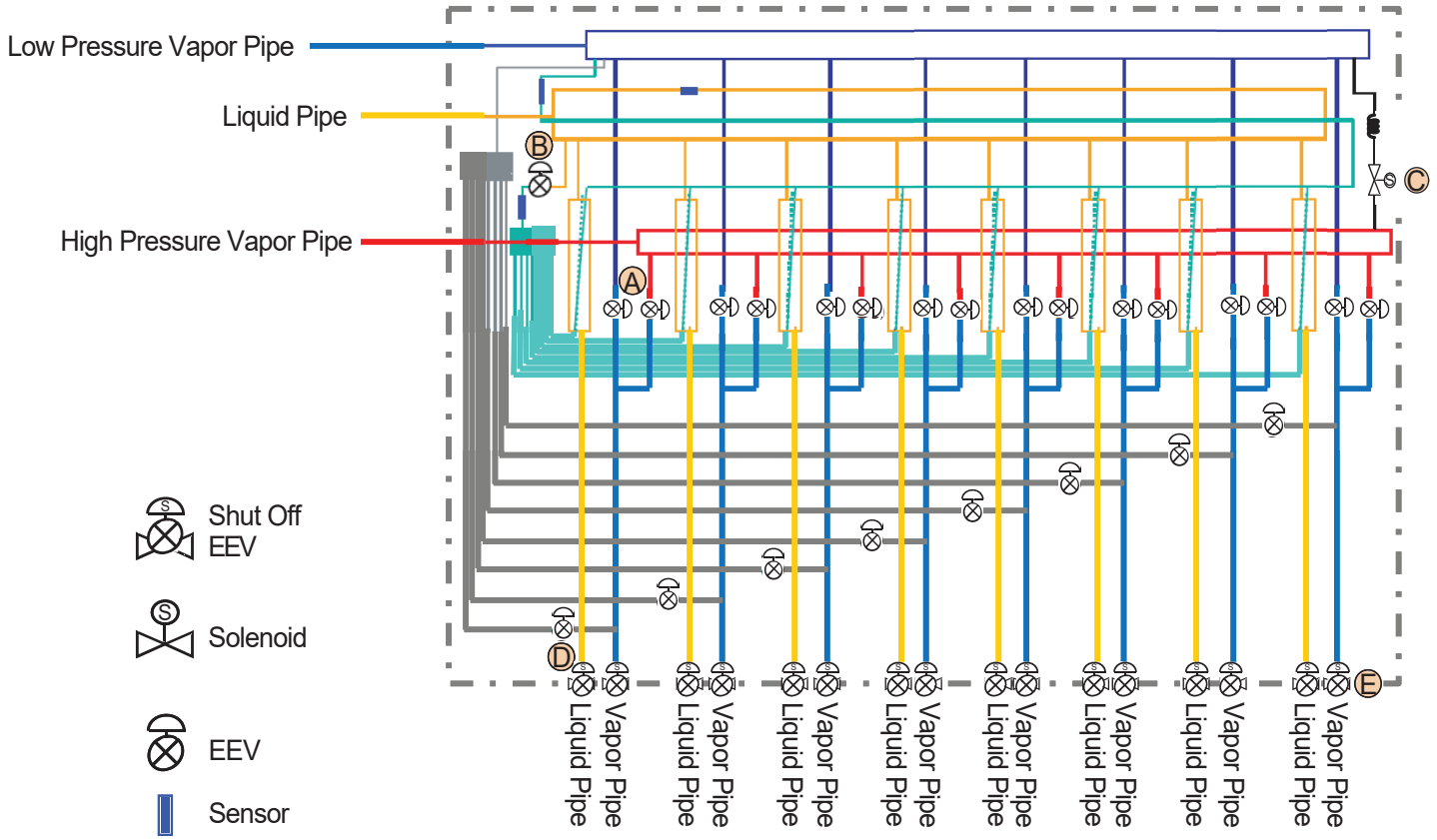
Ⓔ: Blocks refrigerant flow if leak is detected.

NOTICE

Refrigerant diagram above represents the PRHR044C model. Appearances will differ depending on model.

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Figure 31: PRHR065C and PRHR085C Refrigerant Flow Diagram.



Ⓐ: Switches operation between cooling and heating using the two valves.

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

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

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

Ⓔ: Blocks refrigerant flow if leak is detected.

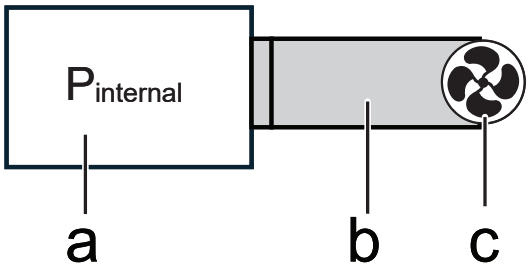
NOTICE

Refrigerant diagram above represents the PRHR085C model. Appearances will differ depending on model.

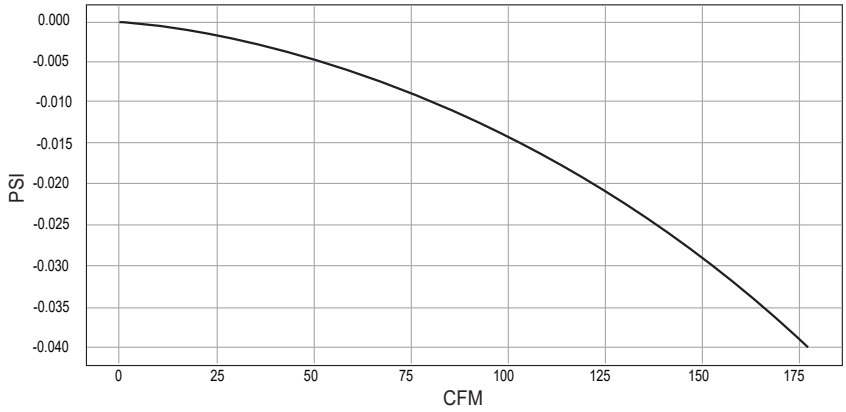
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Enclosure Ventilation (UL 60335-2-40: 2022 Edition 4)

- The ventilation airflow must be set higher than 11.11 CFM (18.87m³/h), and the internal negative pressure must be set higher than 0.08 in. w.g. (20 Pa).
- The internal pressure of the Heat Recovery Unit must not drop more than 1.4 in. w.g. (350 Pa) below the surrounding ambient pressure.

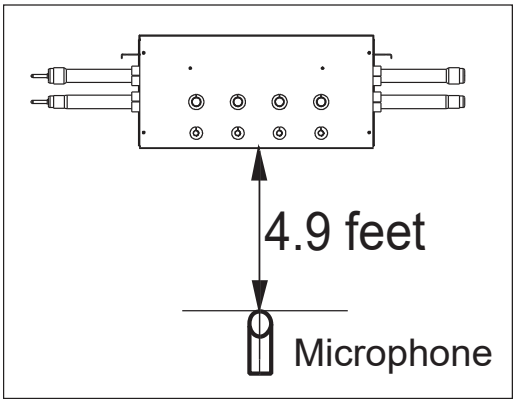


a	Heat Recovery Unit
b	Ductwork
c	Extraction Fan



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Figure 33: 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:

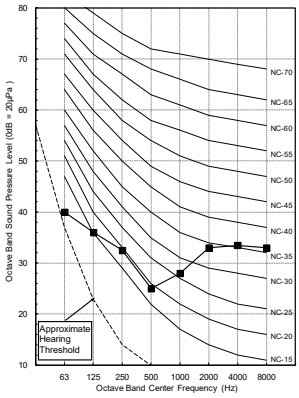
- Power source: 220V 60Hz
- Reference acoustic pressure: 0dB = 20μPa.
- Cooling: Indoor Temperature 80.6°F D.B., 66.2°F W.B., Outdoor Temperature 95°F D.B., 75.2°F W.B.
- Heating: Indoor Temperature 68°F D.B., 59°F W.B., Outdoor Temperature 44.6°F D.B., 42.8°F W.B.

Table 22: PRHR**4C / 5C Sound Pressure Levels.

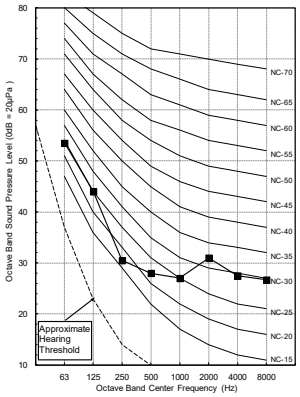
Operation Mode	Sound Pressure Levels dB(A)
Cooling	31
Heating	31
Simultaneous	38
Changeover From Cooling to Heating	33
Changeover From Heating to Cooling	38

Figure 32: PRHR**4C / 5C Sound Pressure Level Diagrams.

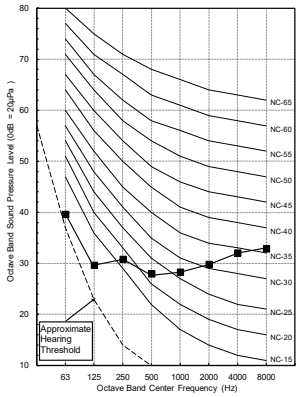
Cooling



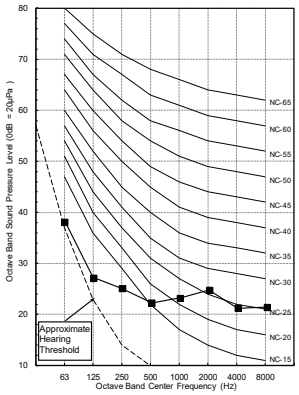
Heating



Changeover from Cooling to Heating



Changeover from Heating to Cooling

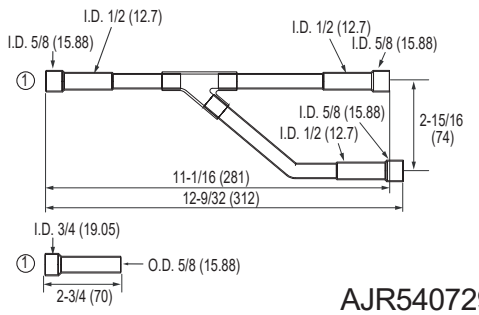


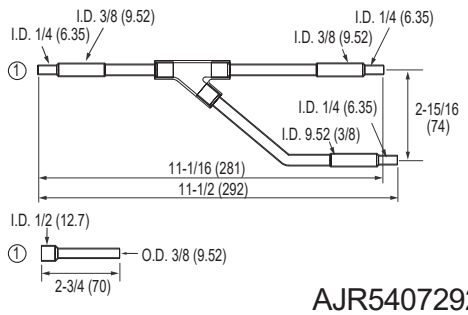
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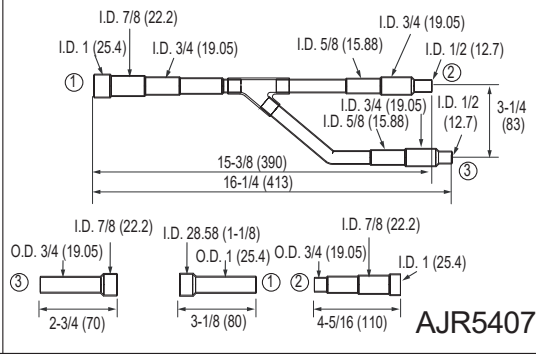
Combining Heat Recovery Ports for Large Indoor Units

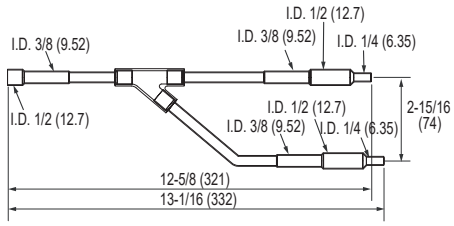
It is necessary to combine two ports on a system designed for heat recovery operation when installing a single indoor unit with a capacity exceeding 54,000 Btu/h. Two neighboring heat recovery ports are combined using a reverse Y-branch that is then connected to the one large indoor unit.

(Unit: Inch [mm])

<table>
<tr><th>Models</th><th colspan="2">Pipe</th></tr>
<tr><td rowspan="2">ARBLN01621</td><td>Vapor Pipe</td><td>Liquid Pipe</td></tr>
<tr><td>

AJR54072929


AJR54072927</td></tr>
<tr><td rowspan="2">ARBLN03321</td><td>Vapor Pipe</td><td>Liquid Pipe</td></tr>
<tr><td>

AJR54072930


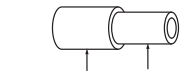
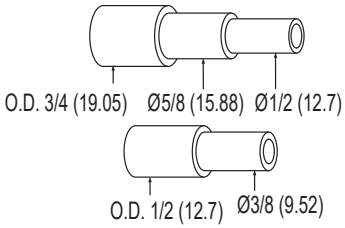
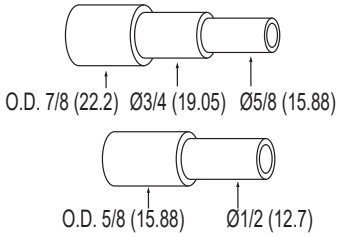
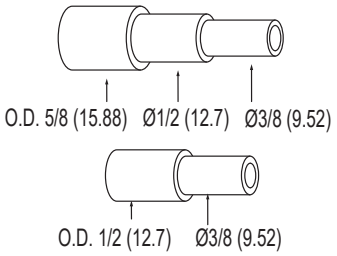
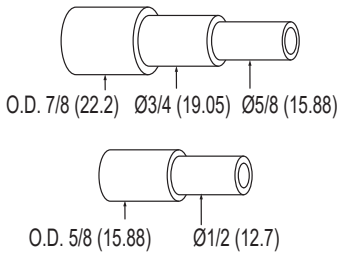
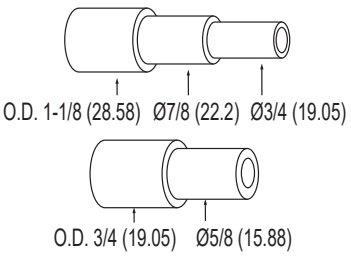
AJR54072928</td></tr>
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Reducers

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.

Unit: Inches (mm)

Model		Liquid Piping	Vapor Piping	
			High Pressure	Low Pressure
Heat Recovery Unit Reducer	PRHR024C			
	PRHR034C PRHR044C PRHR065C PRHR085C			

Strainers

Strainers are provided as an accessory to three (3), four (4), six (6), and eight (8) port heat recovery units, and are to be installed on the high pressure vapor pipe to the indoor unit.

Models		High Pressure Vapor Pipe
Strainer	For Three-, Four-, Six-, and Eight-Port Heat Recovery Units	

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SHUTOFF VALVE UNIT PRODUCT DATA

General Data on page 116
Electrical Data on page 117
Dimensions on page 118
Wiring Diagrams on page 120
Refrigerant Flow Diagrams on page 124
Fan Curve Values on page 126
Accessories on page 127



Figure 34: One-Port Shutoff Valve Unit.



Figure 35: Two-Port Shutoff Valve Unit.



Figure 36: Three-Port Shutoff Valve Unit.



Figure 37: Four-Port Shutoff Valve Unit.

Table 23: Shutoff Valve Unit Specifications.

Model			PRHPZ010A	PRHPZ020A	PRHPZ030A	PRHPZ040A
Number of Ports			1	2	3	4
Max. Connectable No. of Indoor Units			8	16	24	32
Max. Connectable No. of Indoor Units on each port			8	8	8	8
Max. Port Capacity (each port)		Btu/h	60,000	60,000	60,000	60,000
Max. Unit Capacity (sum of ports)		Btu/h	60,000	120,000	180,000	230,000
Net Weight		lbs.	14.9	42.1	45.4	48.1
Shipping Weight		lbs.	19.4	56.0	59.7	62.4
Net Dimensions (W x H x D)		Inches	13 x 8-25/32 x 11-27/64	37-1/2 x 10-5/8 x 24-5/8		
Shipping Dimensions (W x H x D)		Inches	26-17/32 x 11-15/16 x 14-1/32	42-13/32 x 13-45/64 x 29-7/8		
Refrigerant Type			R32	R32	R32	R32
Refrigerant Control			Motorized Valve			
Casing			Galvanized Steel Plate			
Connecting Pipes	To Indoor Units	Liquid Pipe (inches)	Ø3/8 – Ø1/4 Braze			
		Vapor Pipe (inches)	Ø5/8 – Ø1/2 Braze			
	To Outdoor Units	Liquid Pipe (inches)	N / A	Ø3/8 Braze	Ø1/2 Braze	Ø5/8 Braze
		Vapor Pipe (inches)	N / A	Ø7/8 Braze	Ø1-1/8 Braze	Ø1-1/8 Braze

NOTICE

The two-, three-, and 4-port shutoff valve units include refrigerant leak sensors and knockouts for enclosure ventilation applications. The single port units do not.

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Table 24: Shutoff Valve Unit Electrical Data.

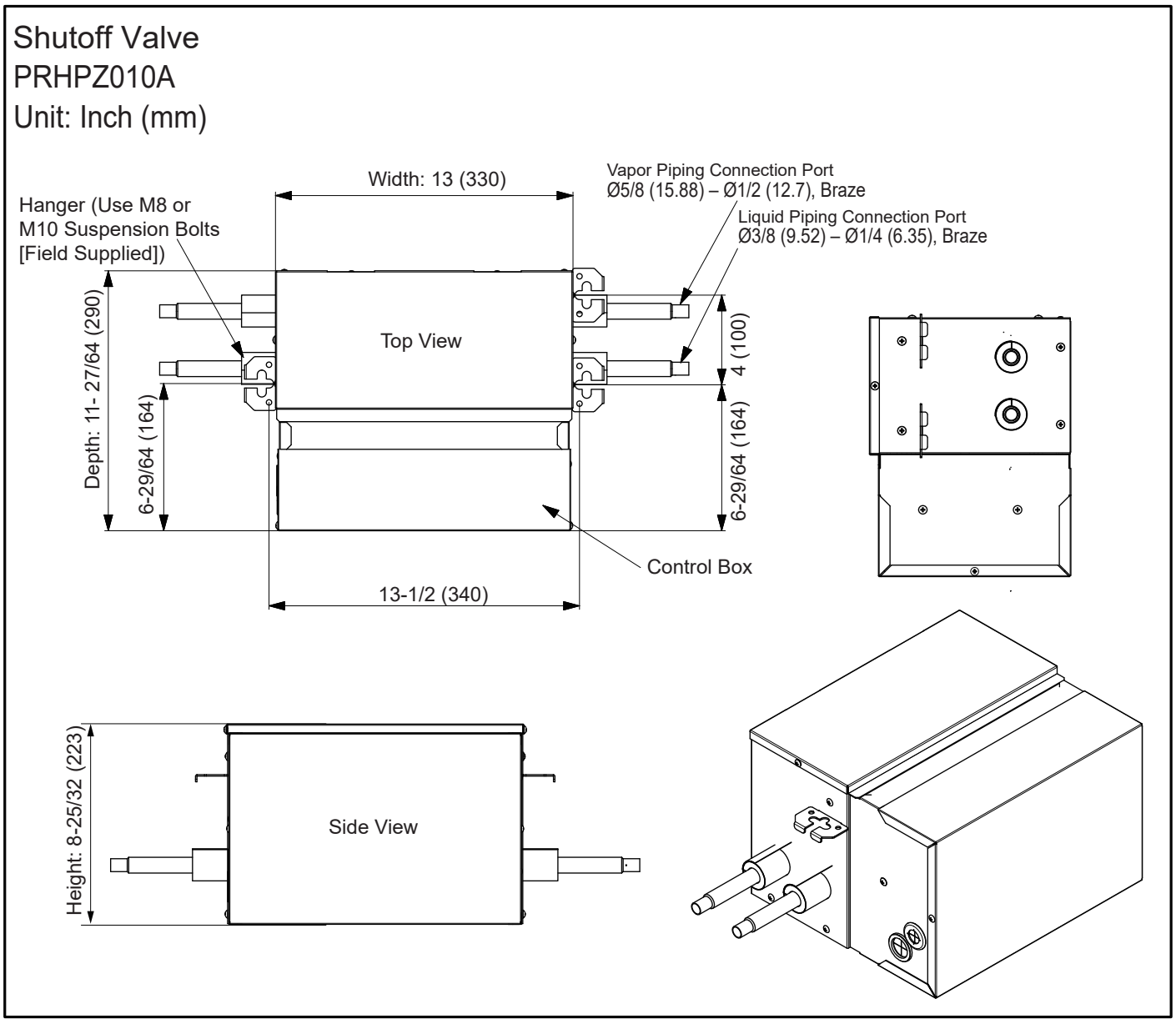
Unit Model No.	Voltage Range	Rated Amps	MCA	MFA	Power Supply			Power Input (W)	
					Hz	Volts	Phase	Cooling	Heating
PRHPZ010A	187-253	0.10	0.5	15	60	208-230	1	30	30
PRHPZ020A		0.28	0.875	15				49.2	46.6
PRHPZ030A		0.28	0.875	15				49.2	46.6
PRHPZ040A		0.28	0.875	15				49.2	46.6

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.

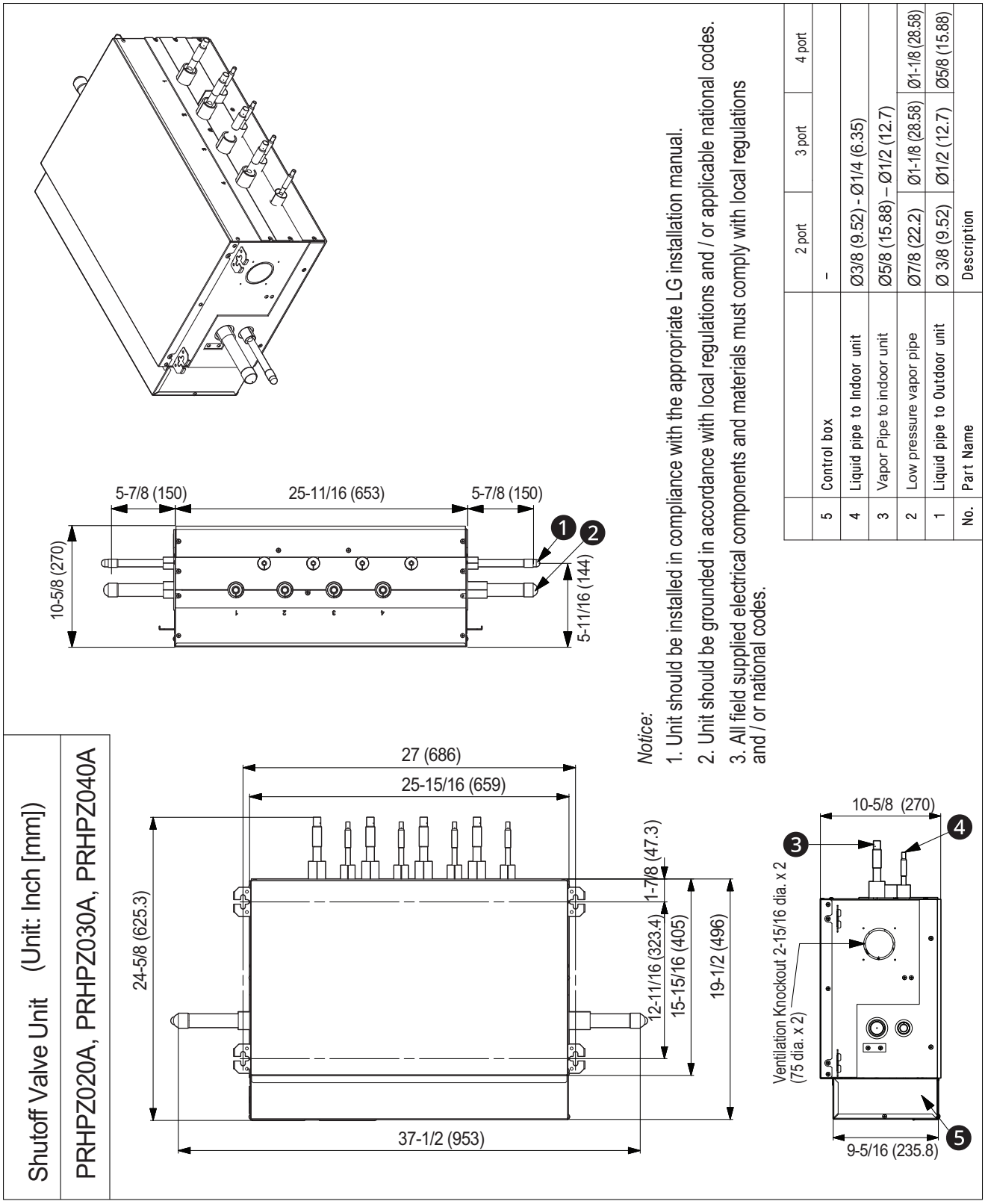
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Figure 38: PRHPZ010A Dimensions.



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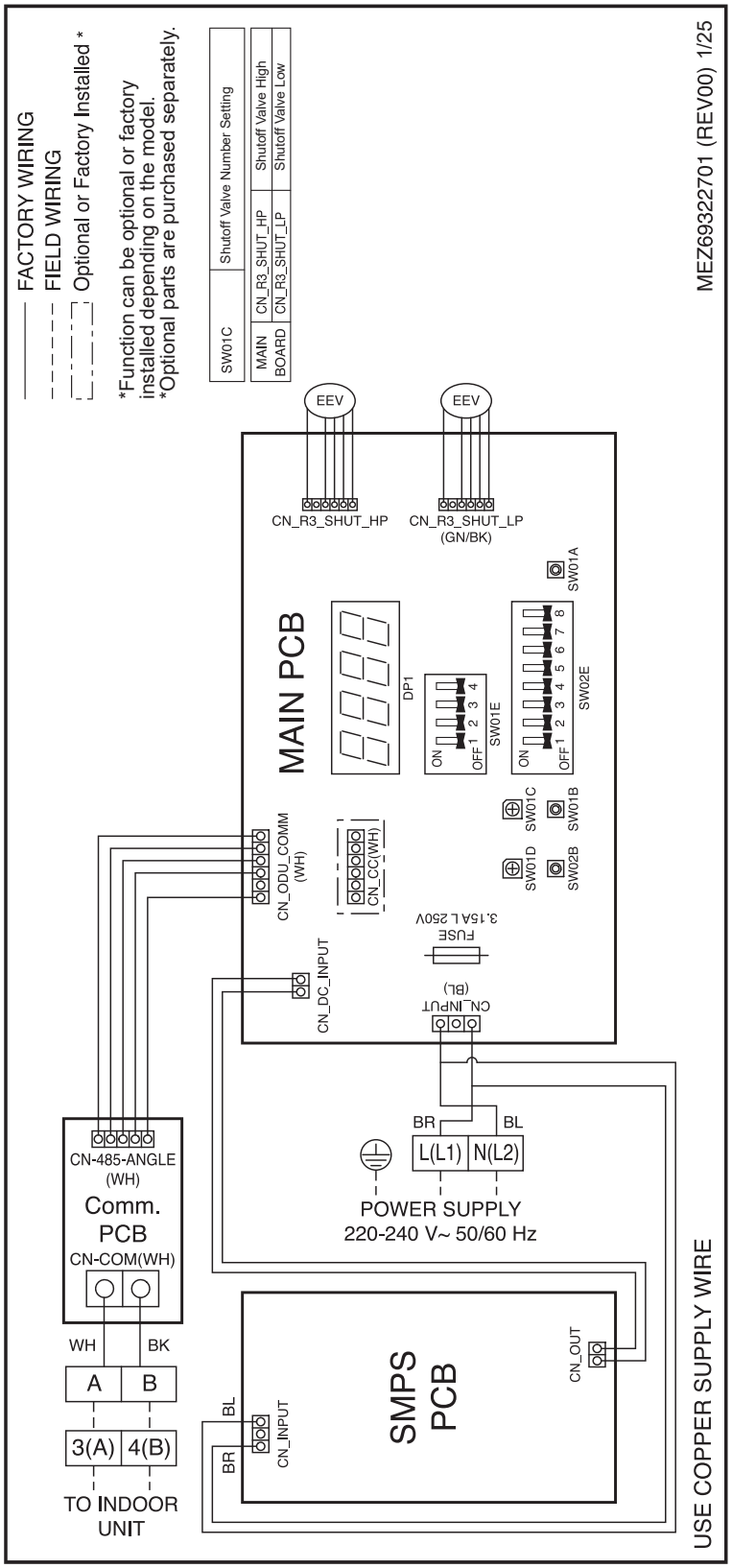
Figure 39: PRHPZ020A, PRHPZ030A, and PRHPZ040A Dimensions.



No.	Part Name	Description		
5	Control box	–		
4	Liquid pipe to Indoor unit	Ø3/8 (9.52)	Ø1/4 (6.35)	
3	Vapor Pipe to indoor unit	Ø5/8 (15.88)	Ø1/2 (12.7)	
2	Low pressure vapor pipe	Ø7/8 (22.2)	Ø1-1/8 (28.58)	Ø1-1/8 (28.58)
1	Liquid pipe to Outdoor unit	Ø 3/8 (9.52)	Ø1/2 (12.7)	Ø5/8 (15.88)
		2 port	3 port	4 port

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Figure 40: PRHPZ010A Wiring Diagram.



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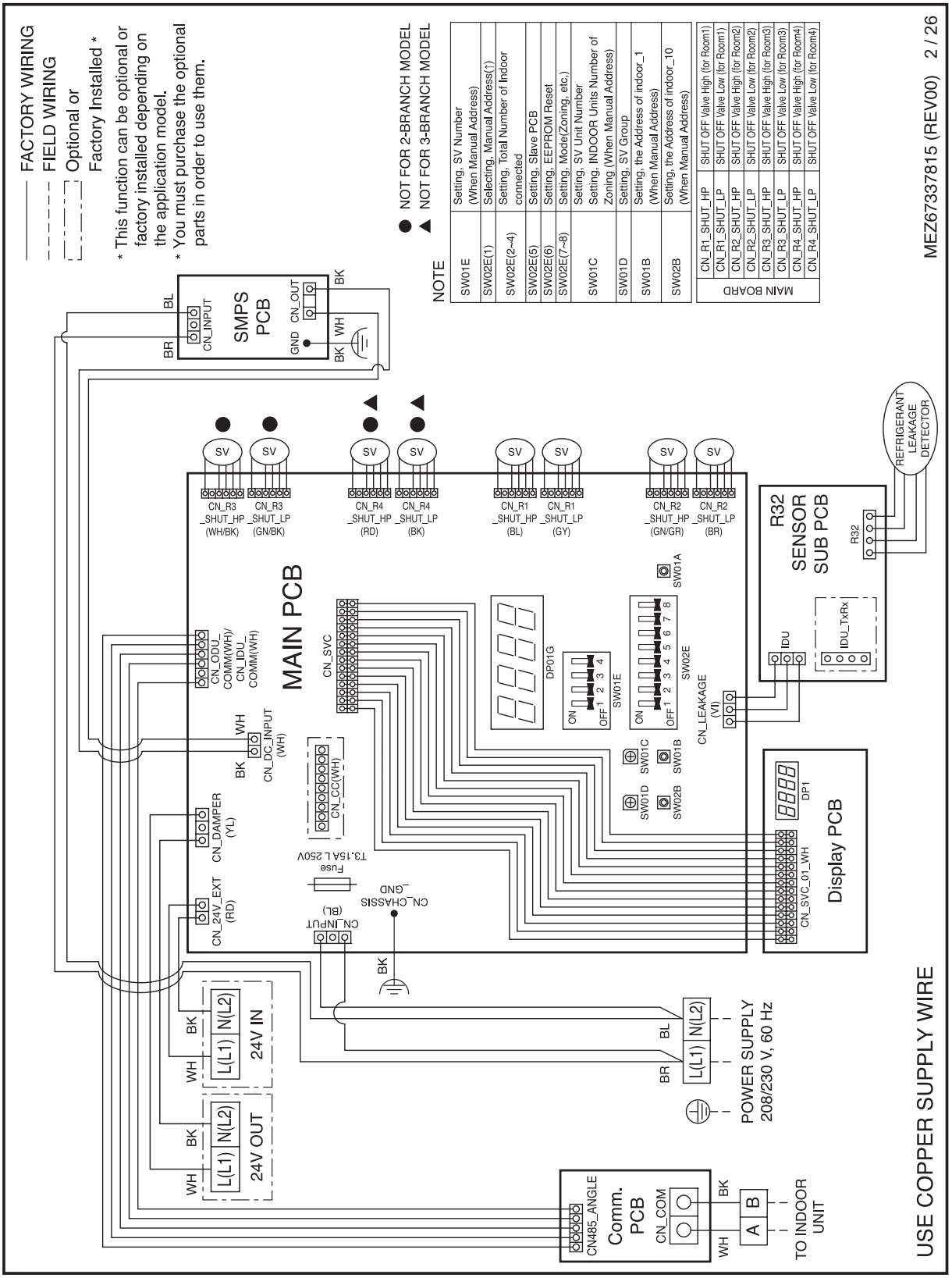
LG

Table 25: PRHPZ010A Wiring Diagram Legend

Terminal	Description
Main PCB	
CN_INPUT (BL)	Main Power
CN_DC_INPUT	Auxiliary Power PCB
CN_ODU_COMM (WH)	Communication PCB (RS-485)
CN_CC (WH)	Dry Contact
CN_R3_SHUT_HP(WH/BK)	Shutoff Valve High
CN_R3_SHUT_LP (GN/BK)	Shutoff Valve Low
DIP Switch Settings	
SW01E	Setting, Shutoff Valve Number (Manual Addressing)
SW02E(1)	Selecting Manual Address (↑)
SW02E(2~4)	Setting, Total Number of Indoor Units Connected
SW02E(5)	Setting, Sub PCB
SW02E(6)	Setting, EEPROM Reset
SW02E(7~8)	Setting, Mode (Zoning, etc.)
SW01A	Reset
SW01D	Setting, Shutoff Valve Group
SW01C	Setting, Shutoff Valve Unit Number
SW02B	Setting, the Address of indoor_10 (Manual Addressing)
SW01B	Setting, the Address of indoor_1 (Manual Addressing)

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Figure 41: PRHPZ020A, PRHPZ030A, and PRHPZ040A Wiring Diagram.



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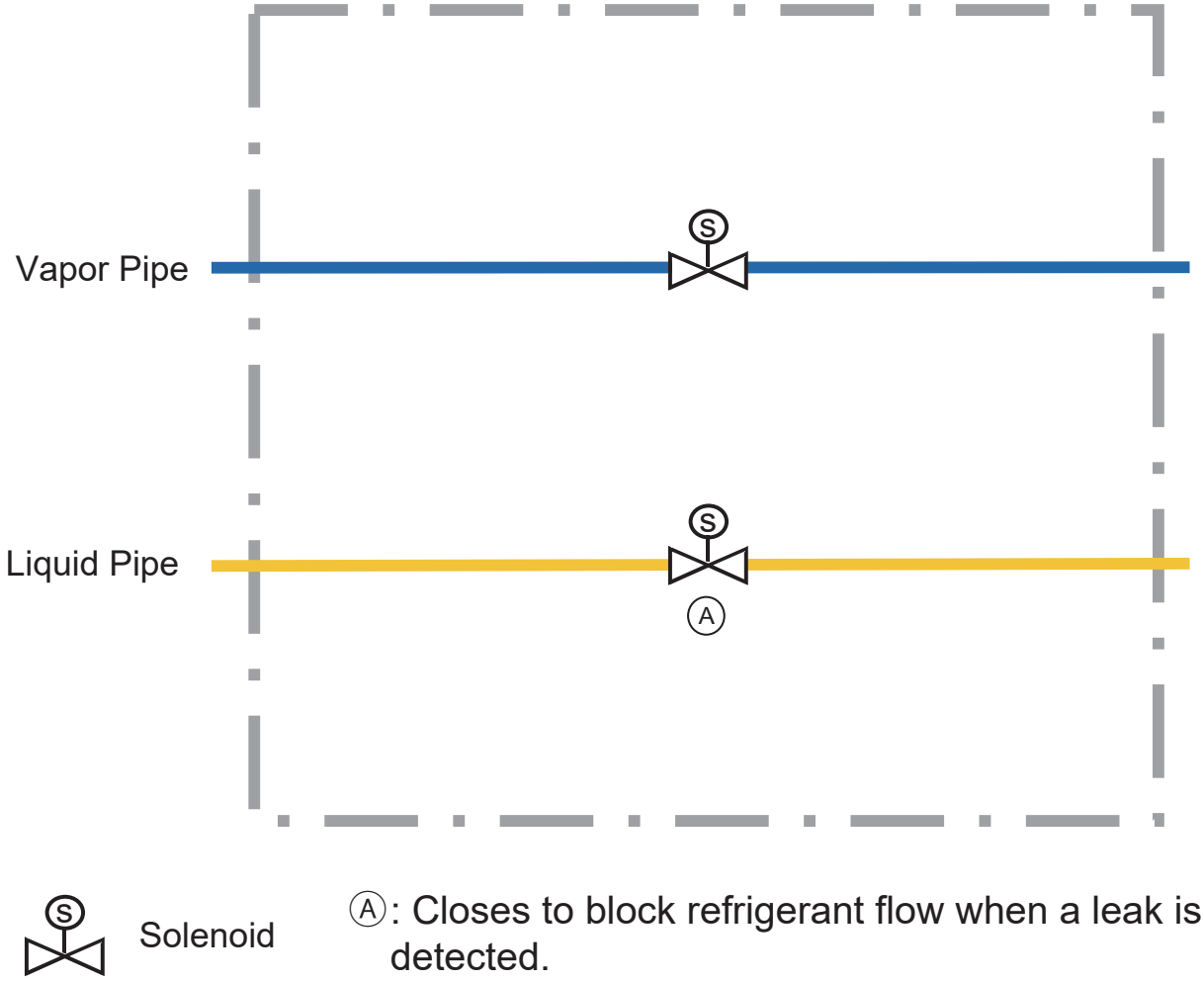
LG

Table 26: PRHPZ020A, PRHPZ030A, and PRHPZ040A Wiring Diagram Legend.

Terminal	Description
Main PCB	
CN_24V_EXT(RD)	24V In (Field Supply)
CN_DAMPER(YL)	24V Out (For Relay)
CN_DC_INPUT(WH)	Auxiliary Power PCB
CN_ODU_COMM(WH) / CN_IDU_COMM(WH)	Communication PCB (RS-485)
CN_R3_SHUT_HP(WH/BK)	Shutoff Valve High (for Room 3)
CN_R3_SHUT_LP (GN/BK)	ShutoffValve Low (for Room 3)
CN_R4_SHUT_HP(RD)	Shutoff Valve High (for Room 4)
CN_R4_SHUT_LP(BK)	Shutoff Valve Low (for Room 4)
CN_R1_SHUT_HP(BL)	Shutoff Valve High (for Room 1)
CN_R1_SHUT_LP(GY)	Shutoff Valve Low (for Room 1)
CN_R2_SHUT_HP(GN/GR)	Shutoff Valve High (for Room 2)
CN_R2_SHUT_LP(BR)	Shutoff Valve Low (for Room 2)
CN_LEAKAGE(VI)	Leak Detector
CN_SVC	Display PCB
CN_CC(WH)	Dry Contact
CN_CHASSIS_GND	PCB Functional Ground
CN_INPUT(BL)	Main Power
DIP Switch Settings	
SW01E	Setting, Shutoff Valve Number (Manual Addressing)
SW02E(1)	Selecting Manual Address (↑)
SW02E(2~4)	Setting, Total Number of Indoor Units Connected
SW02E(5)	Setting, Sub PCB
SW02E(6)	Setting, EEPROM Reset
SW02E(7~8)	Setting, Mode (Zoning, etc.)
SW01A	Reset
SW01D	Setting, Shutoff Valve Group
SW01C	Setting, Shutoff Valve Unit Number
	Setting, Indoor Units Zone Number (Manual Addressing)
SW02B	Setting, Address of Indoor_10 (Manual Addressing)
SW01B	Setting, Address of Indoor_1 (Manual Addressing)

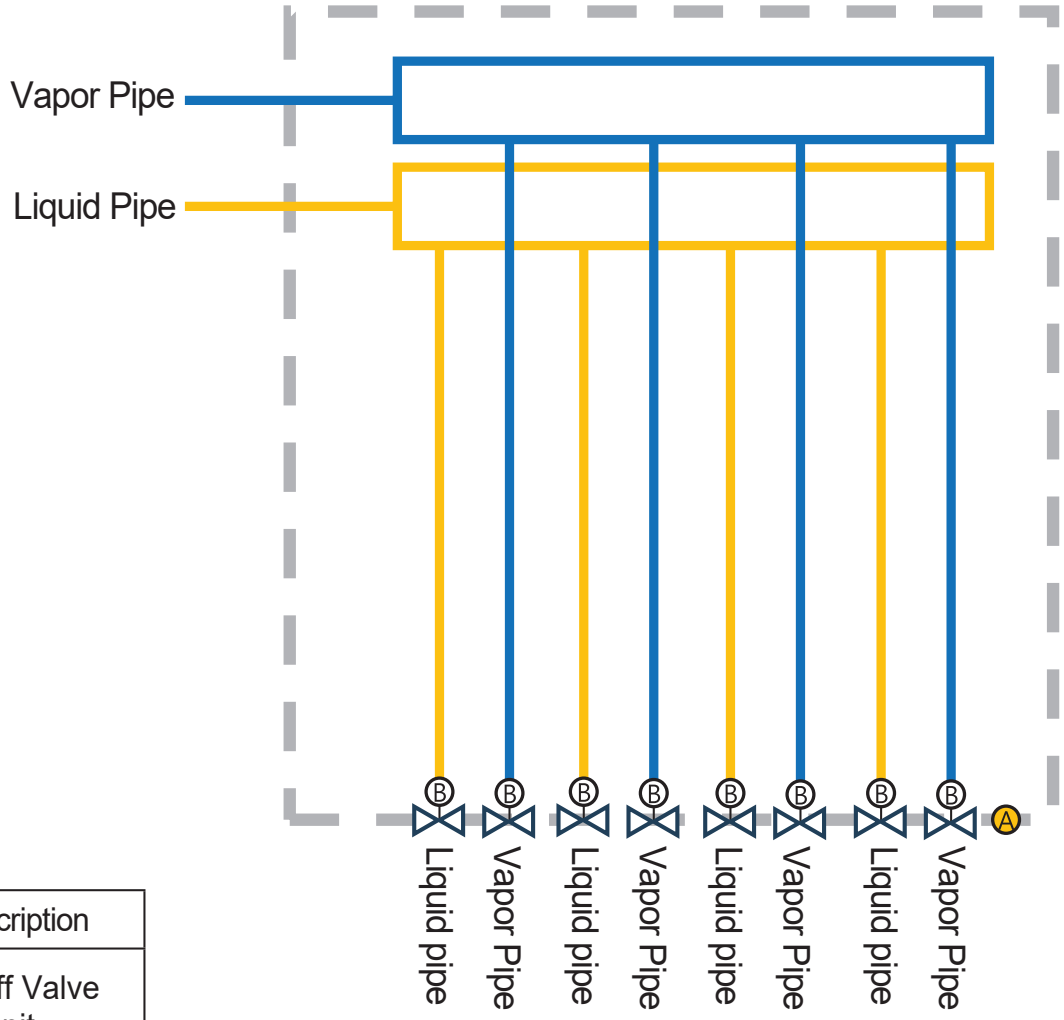
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Figure 42: PRHPZ010A Refrigerant Flow Diagram.



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Figure 43: PRHPZ020A, PRHPZ030A, and PRHPZ040A Refrigerant Flow Diagram.



Symbol	Description
Ⓑ	Shutoff Valve Unit

Ⓐ :Closes to block refrigerant flow when a leak is detected.

NOTICE

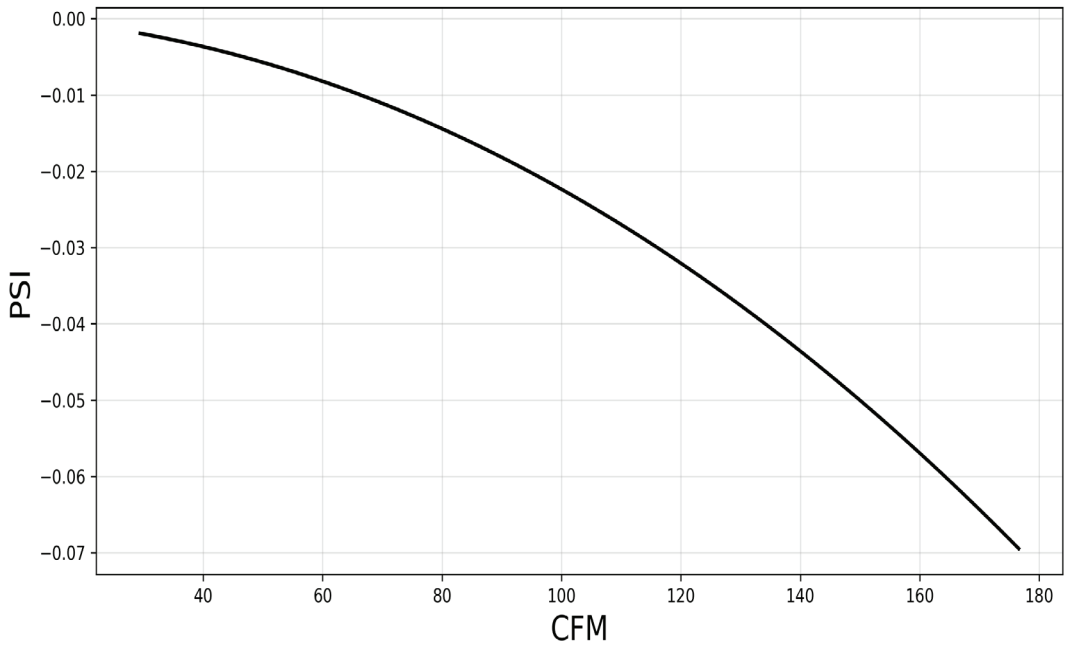
Refrigerant diagram above represents the PRHPZ040A model. Appearances will differ depending on model.

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Enclosure Ventilation (UL 60335-2-40: 2022 Edition 4)

- The ventilation airflow must be set higher than 11.11 CFM (18.87m³/h), and the internal negative pressure must be set higher than 0.08 in. w.g. (20 Pa).
- The internal pressure of the Shutoff Valve Unit must not drop more than 1.4 in. w.g (350 Pa) below the surrounding ambient pressure.

CFM / PSI Performance Curve



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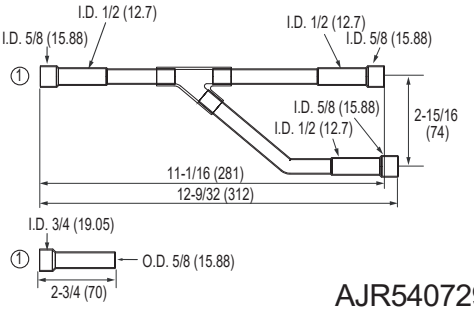
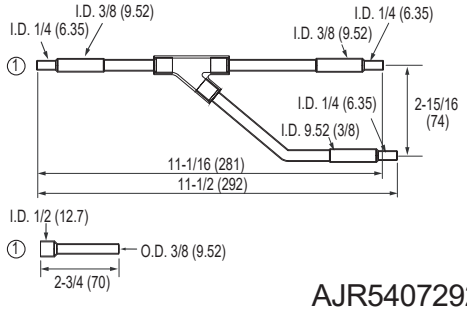
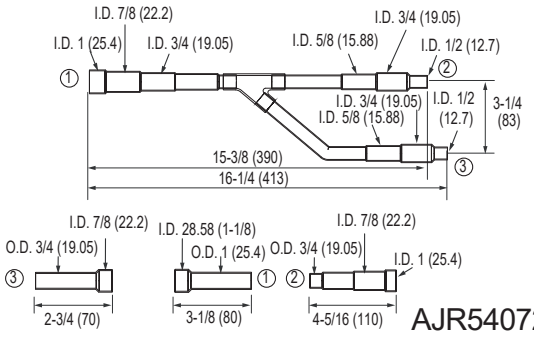
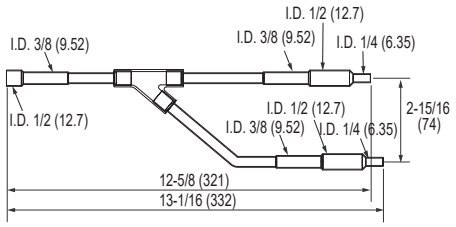
Table 27: Ventilation Accessories Overview (Sold Separately).

Accessory	Model Number
Ventilation Flange only for 2-3-4 ports	PTVK430
Simple Dry Contact (1 contact, 24 VAC external power) only for 2-3-4-ports	PDRYCB100

Combining Shutoff Valve Unit Ports for Large Indoor Units

It is necessary to combine two ports when installing a single indoor unit with a capacity exceeding 54,000 Btu/h. Two neighboring shutoff valve ports are combined using a reverse Y-branch that is then connected to the one large indoor unit.

(Unit: Inch [mm])

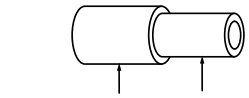
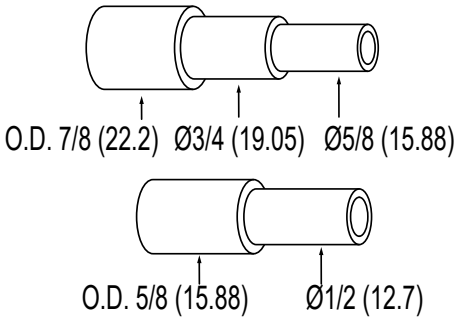
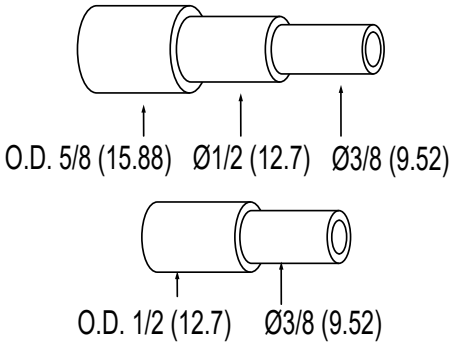
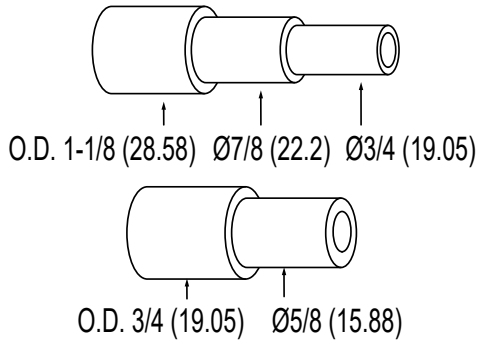
Models	Pipe	
	Vapor Pipe	Liquid Pipe
ARBLN01621	 AJR54072929	 AJR54072927
ARBLN03321	 AJR54072930	 AJR54072928

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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 shutoff valve unit connections.

Unit: Inches (mm)

Model		Liquid Piping	Vapor Piping
Shutoff Valve Unit Reducer	PRHPZ020A		
	PRHPZ030A PRHPZ040A		

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ELECTRICAL CONNECTIONS

General Guidelines on page 130
System for Heat Pump Operation on page 131
System for Heat Recovery Operation on page 132
Heat Recovery Unit Wiring Connections on page 133
Shutoff Valve Unit Wiring Connections on page 134

GENERAL POWER WIRING / COMMUNICATION CABLE GUIDELINES

MULTI V i

General Power Wiring / Communications Cable Guidelines

- Follow all applicable local, state, and federal wiring and installation codes.
- Follow manufacturer's circuit diagrams displayed on the inside of the control box covers.
- Have a separate power supply for each outdoor unit in dual and triple frame systems,
- Have a separate power supply for the heat recovery units / indoor units.
- Provide a circuit breaker switch between each power source and the outdoor unit(s).
- 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 the main outdoor unit to the indoor units / heat recovery units to be 18 AWG, 2-conductor, twisted, stranded, shielded. Ensure the communication cable shield is properly grounded to the main outdoor unit frame only. ⃠Do not ground the outdoor unit to indoor unit(s) / heat recovery units 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.*

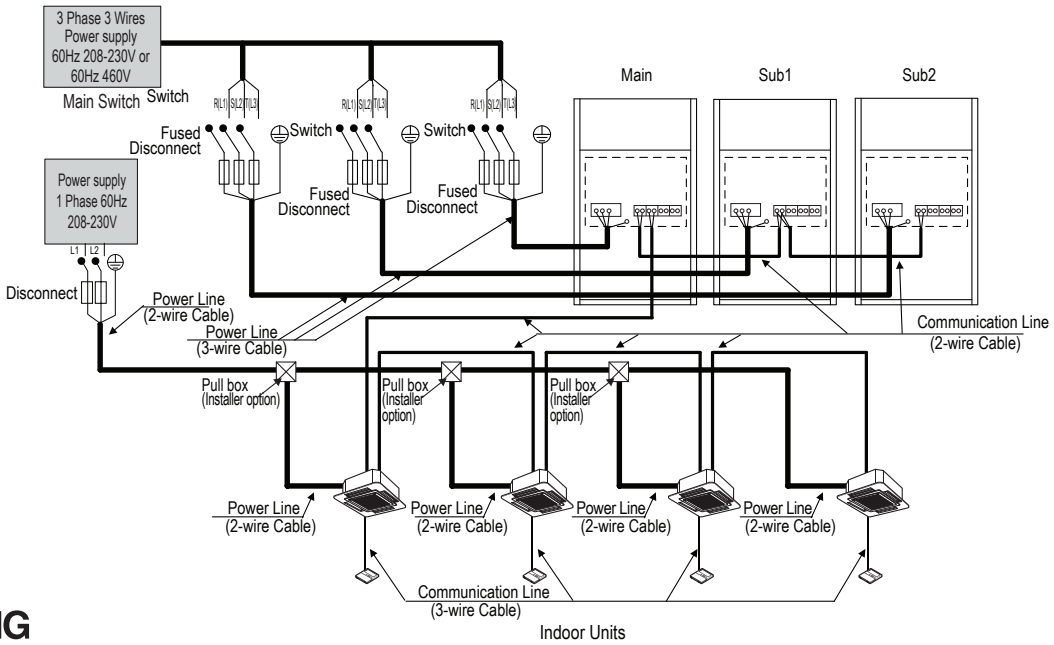
NOTICE

- *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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Figure 44: Example of a Typical Heat Pump Operation Power Wiring and Communications Cable Schematic.



⚠ WARNING

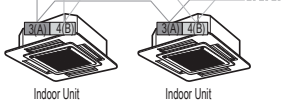
- *Ground wiring is required to prevent accidental electrical shock during current leakage, communication problems from electrical noise, and motor current leakage. ⃠ Do not connect the ground line to the pipes. There is risk of fire, electric shock, explosion, physical injury or death.*
- *Install a 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

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				

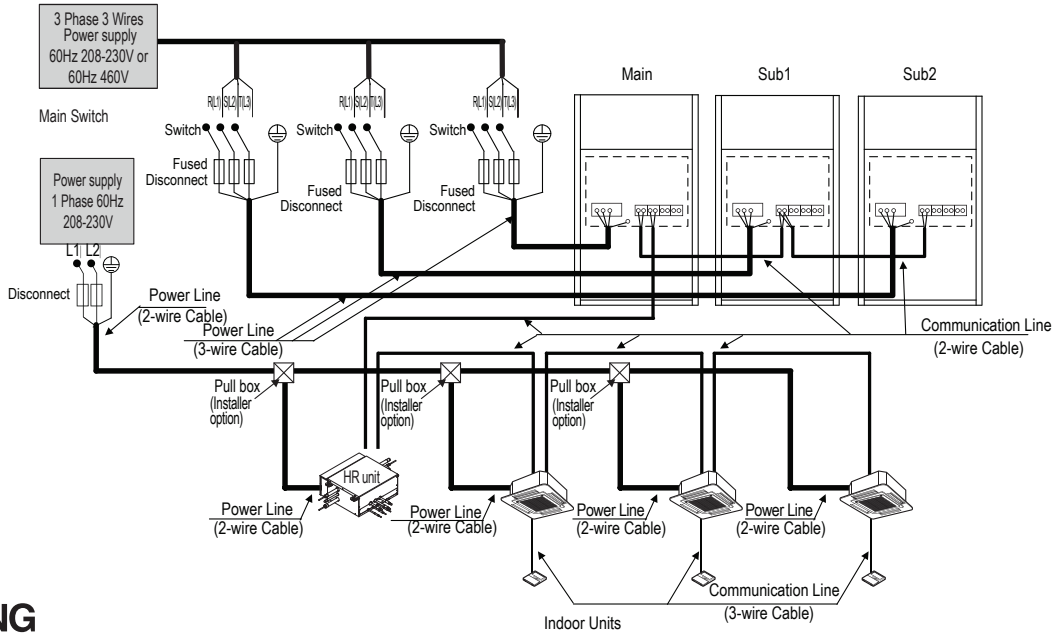
NOTICE

- *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 45: Example of a Typical Heat Recovery Operation Power Wiring and Communications Cable Schematic.



⚠ WARNING

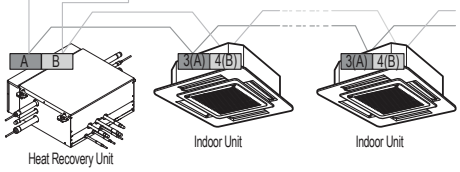
- *Ground wiring is required to prevent accidental electrical shock during current leakage, communication problems from electrical noise, and motor current leakage. ⃠ Do not connect the ground line to the pipes. There is risk of fire, electric shock, explosion, physical injury or death.*
- *Install a 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				

NOTICE

- *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 the heat recovery unit control box cover (see image below).
2. Insert the power wiring / communications cable from the outdoor unit using the access holes.
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.

NOTICE

All communication and power wiring must be connected to the terminals using connectors certified or recognized according to UL and CSA standards.

Figure 46: Accessing the Heat Recovery Control Unit Control Box.

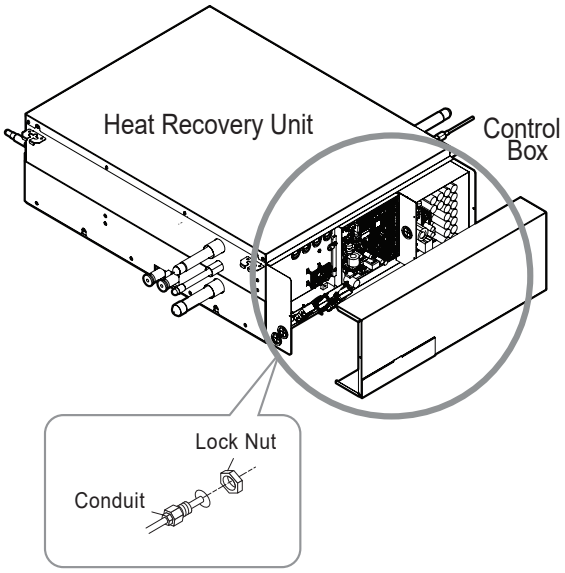


Figure 47: Control Box Connections.

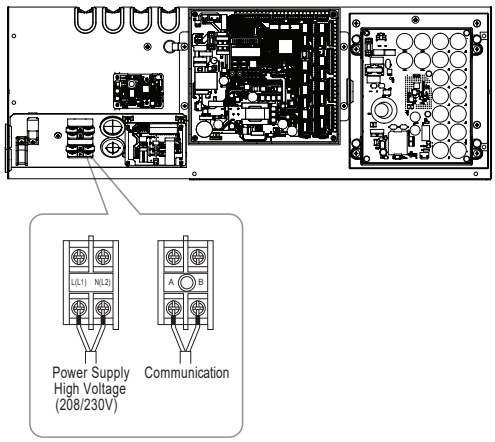
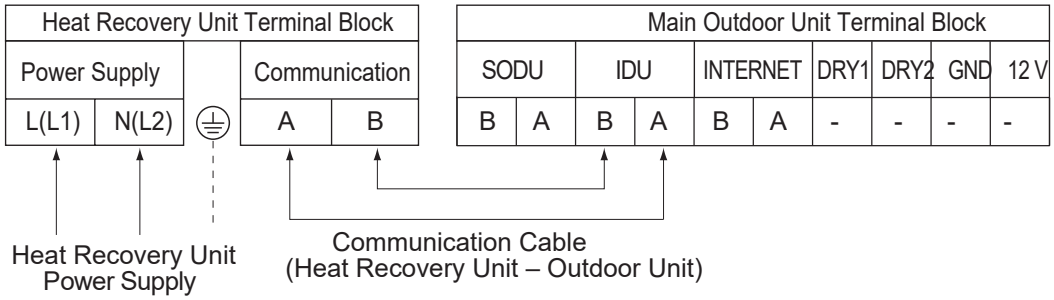


Figure 48: Close Up of Heat Recovery Unit to Outdoor Unit Terminal Block Connections.



⚠ WARNING

Ensure that all wiring is tightly connected and that the terminal screws are not loose. Loose wiring can cause the terminal to overheat, resulting in fire, physical injury, or death.

NOTICE

Ensure that all wiring is tightly connected and that the terminal screws are not loose. Loose wiring can cause the terminal malfunction.

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SHUTOFF VALVE UNIT WIRING CONNECTIONS

Shutoff Valve Unit Power Wiring and Communications Cable Connections

1. Open the shutoff valve unit control box cover (see image below).
2. Insert the power wiring / communications cable from the outdoor unit using the access holes.
3. Connect each wire to its appropriate terminal on the shutoff valve unit control board. Verify that the color and terminal numbers from the outdoor unit wiring match the color and terminal numbers on the shutoff valve unit.
4. Secure the power wiring / communications cable.

NOTICE

All communication and power wiring must be connected to the terminals using connectors certified or recognized according to UL and CSA standards.

Figure 49: Accessing the One-Port Shutoff Valve Unit Control Box.

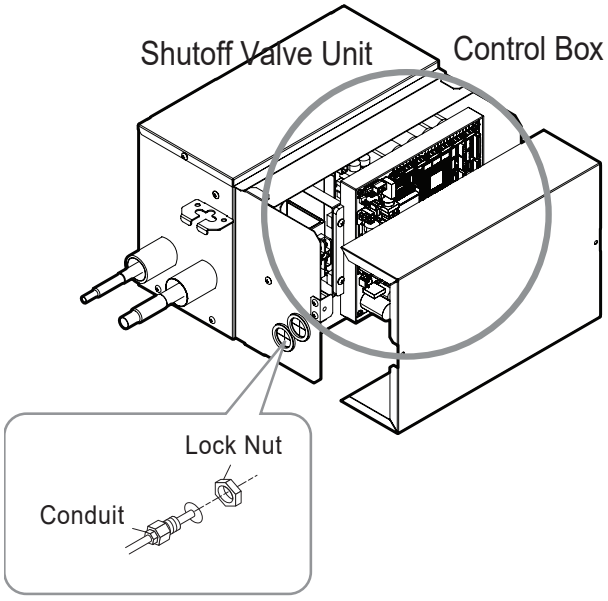


Figure 50: One-Port Shutoff Valve Control Box Connections.

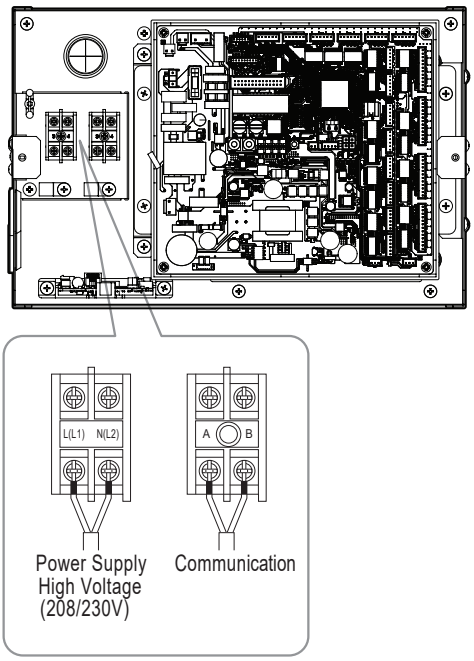


Figure 51: Close Up of the One-Port Shutoff Valve Unit to Outdoor Unit Terminal Block Connections.

Shutoff Valve Unit				(Main) Outdoor Unit									
Terminal Block			Terminal Block	SODU		IDU		INTERNET		DRY1	DRY2	GND	12 V
L(L1)	N(L2)	⏚	A	B	B	A	B	A	B	A	-	-	-	-

Power Supply

Communication Cable
(Shutoff Valve Unit to Outdoor Unit)

⚠ WARNING

Ensure that all wiring is tightly connected and that the terminal screws are not loose. Loose wiring can cause the terminal to overheat, resulting in fire, physical injury, or death.

NOTICE

Ensure that all wiring is tightly connected and that the terminal screws are not loose. Loose wiring can cause the terminal malfunction.

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Figure 52: Accessing the Two-, Three-, and Four-Port Shutoff Valve Unit Control Box.

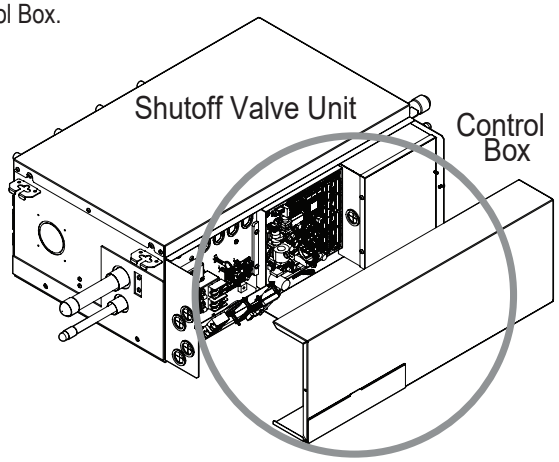
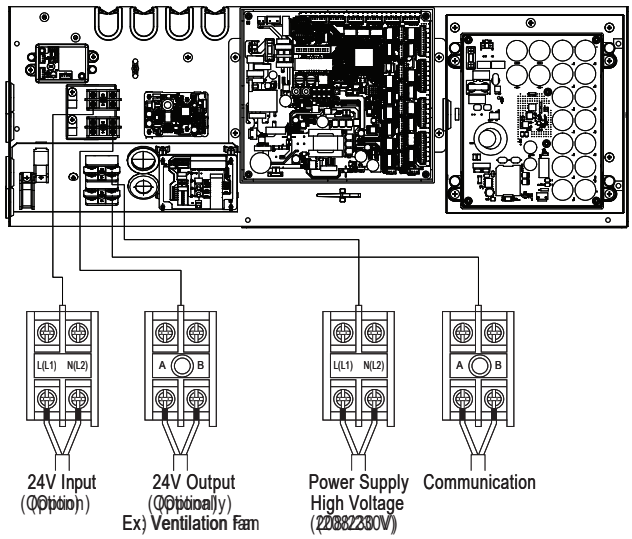


Figure 53: Two-, Three-, and Four-Port Shutoff Valve Control Box Connections.



⚠ WARNING

Ensure that all wiring is tightly connected and that the terminal screws are not loose. Loose wiring can cause the terminal to overheat, resulting in fire, physical injury, or death.

NOTICE

Ensure that all wiring is tightly connected and that the terminal screws are not loose. Loose wiring can cause the terminal malfunction.

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PIPING LIMITATIONS AND PLACEMENT CONSIDERATIONS

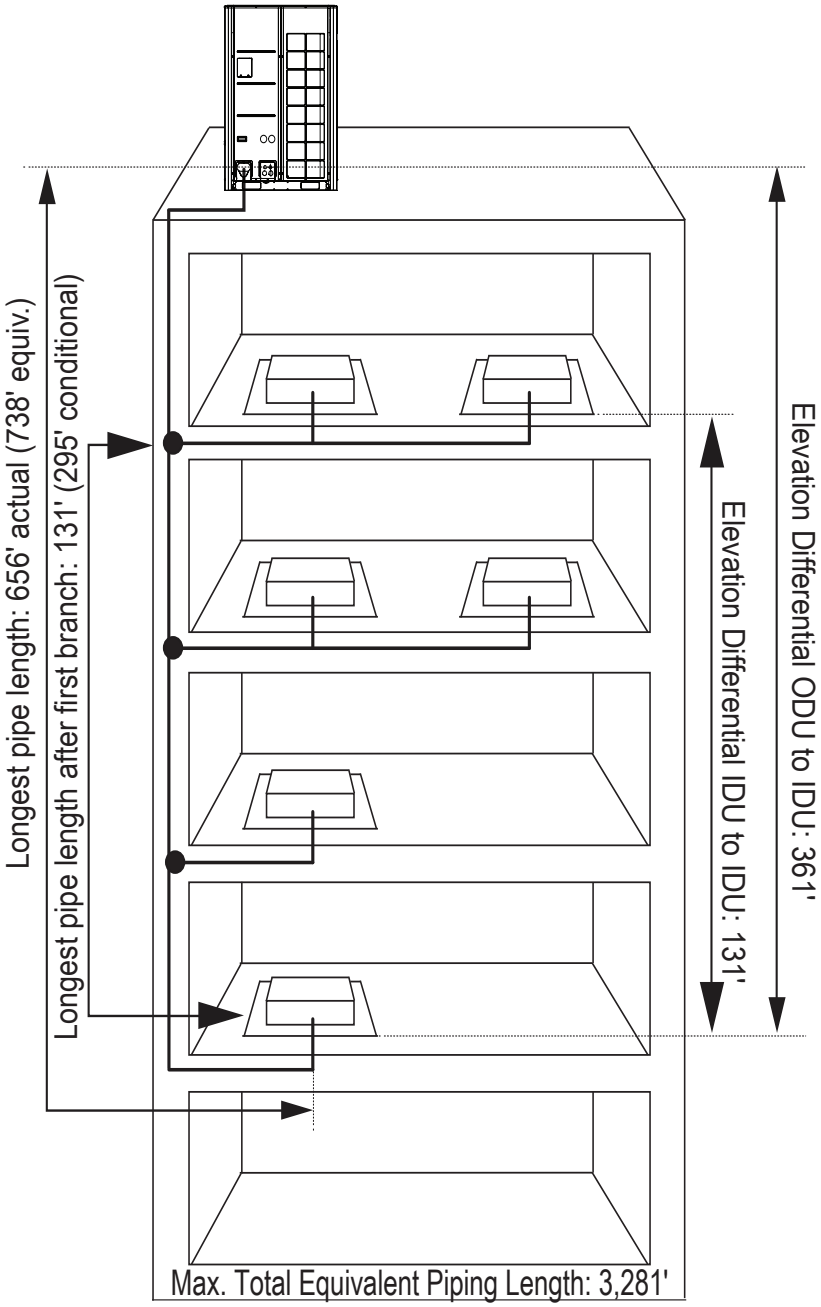
Piping Limitations for Heat Pump Systems on page 137
Piping Limitations for Heat Recovery Systems on page 147
Refrigerant Piping for Separated Outdoor Units on page 156
Selecting the Best Location for Outdoor Unit(s) on page 159
Outdoor Unit Clearance Requirements on page 161
Installing Outdoor Units Indoors on page 162
Selecting the Best Location for the Heat Recovery Unit(s) on page 164
Selecting the Best Location for the Shutoff Valve Unit(s) on page 166

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

NOTICE

Various tools are available to assist in properly designing LG R32 systems. Refer to the "R32 Application Guide"; the "Simple Calculator for Capacity, Refrigerant Charge and ESP"; the "LG Air Conditioner Technical Solutions" (LATS) software program; and the local LG Sales Representative.

Figure 54: Typical Heat Pump System Building Layout with Piping Limitations*



**See next page for table.*

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PIPING LIMITATIONS

MULTI V i

Systems Designed for Heat Pump Operation

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

NOTICE

Various tools are available to assist in properly designing LG R32 systems. Refer to the "R32 Application Guide"; the "Simple Calculator for Capacity, Refrigerant Charge and ESP"; the "LG Air Conditioner Technical Solutions" (LATS) software program; and the local LG Sales Representative.

Table 28: Piping Limitations for Heat Pump Operation (See page 141).

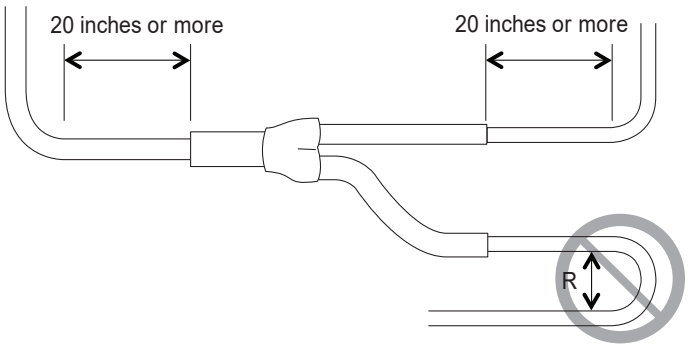
Installation Method			Y-Branch	Combo Y-branch and Header	Header[1]
Maximum Pipe Length	ODU ↔ IDU	Longest Actual Pipe Length (Standard Application)	≤492 feet	≤492 feet	≤656 feet
		Longest Actual Pipe Length (Conditional Application)	≤656 feet	≤656 feet	N / A
		Equivalent Pipe Length (Standard Application)	≤574 feet	≤574 feet	≤738 feet
		Equivalent Pipe Length (Conditional Application)	≤738 feet	≤738 feet	N / A
		Total Pipe Length (A + ΣB + ΣC)	≤3,281 feet	≤3,281 feet	≤3,281 feet
Maximum Elevation Differential	ODU ↔ IDU	Elevation Differential (Elevation1)	≤361 feet	≤361 feet	≤361 feet
	IDU ↔ IDU	Elevation Differential (Elevation2)	≤131 feet	≤131 feet	≤131 feet
Longest Pipe Length After First Branch		Pipe Length ℓ (Standard Application)	≤131 feet	≤131 feet	≤131 feet
		Pipe Length ℓ (Conditional Application)	≤295 feet	≤295 feet	N / A
height[1]		Elevation Differential Outdoor Unit to Outdoor Unit	16.4 feet	16.4 feet	16.4 feet
Distance between Outdoor Unit to Outdoor Unit			≤33 feet (Equivalent pipe length: ≤43 feet)		
Distance between Fittings and Indoor Units[1,2]			≥20 inches		
Distance between Fittings and Y-branches, and between Fittings and Headers[1,2]			≥20 inches		
Distance between two Y-branches or two Headers[1,2]			≥20 inches		
Distance between series-piped Shutoff Valve Units[2]			≥20 inches		
Height Differential between two Shutoff Valve Units if installed with a Y-branch			≤98 feet		
Height Differential between two series-piped Shutoff Valve Units			≤16 feet		

[1]Assume equivalent pipe length of a Y-branch is 1.6 feet, and equivalent pipe length of a header is 3.3 feet. Fittings refers to long radius 90° and 45° elbows.

[2]Must be at least 20 inches of straight pipe before and/or after Indoor Units, Y-branches, and Headers. Failure to provide 20 inches of straight pipe for these system components may affect performance or result in noise.

NOTICE

- *Bending radius should be at least twice the diameter of the pipe.*
- *Bend pipe after 20 inches or more from Y-branch or header.*
  If possible ⃠ do not use a U-type bend as it may affect performance or result in noise.
  If a U-type bend is necessary, the radius should be more than 8 inches.



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Systems Designed for Heat Pump Operation

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

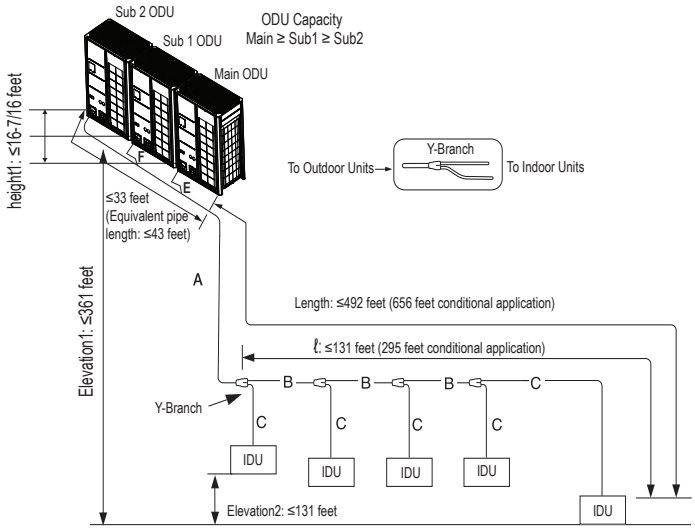
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Example of Pipe Sizing When Installing a Heat Pump System, Y-branch Method

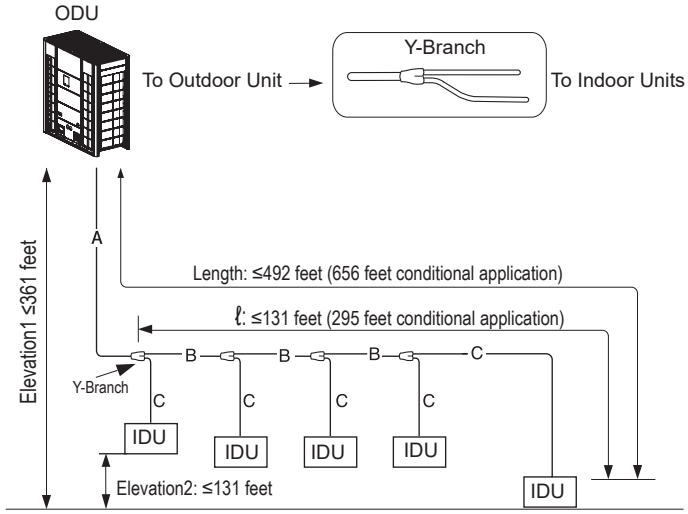
Example: Triple Frame - Five (5) Indoor Units Connected

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 Units.
E: ARCNN31 Outdoor Unit Y-branch.
F: ARCNN21 Outdoor Unit Y-branch.



Example: Single Frame - 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 Units.



NOTICE

- *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.*

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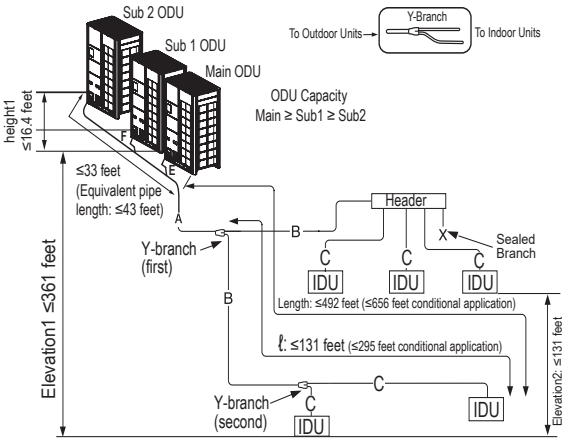
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Example of Pipe Sizing When Installing a Heat Pump System, Combination Y-branch and Header Method

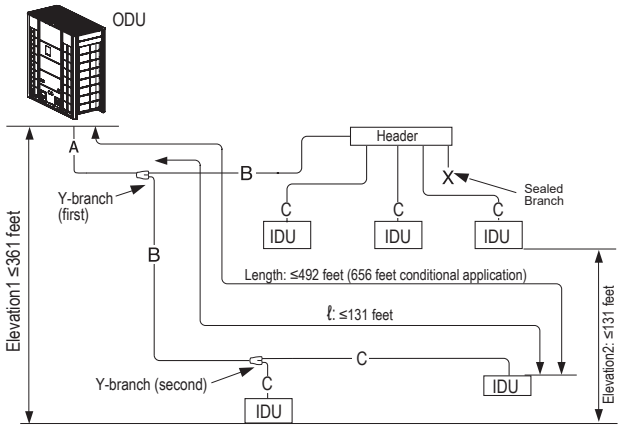
Example: Triple Frame - Five (5) Indoor Units Connected

ODU: Outdoor Units.
IDU: Indoor Units.
A: Main Pipe from Outdoor Unit to First Y-branch.
B: Y-branch to Y-branch or Y-branch to Header.
C: Y-branch to Indoor Unit or Header to Indoor Unit.
D: ARCNN31 Outdoor Unit Y-branch
E: ARCNN21 Outdoor Unit Y-branch



Example: Single Frame - Five (5) Indoor Units Connected

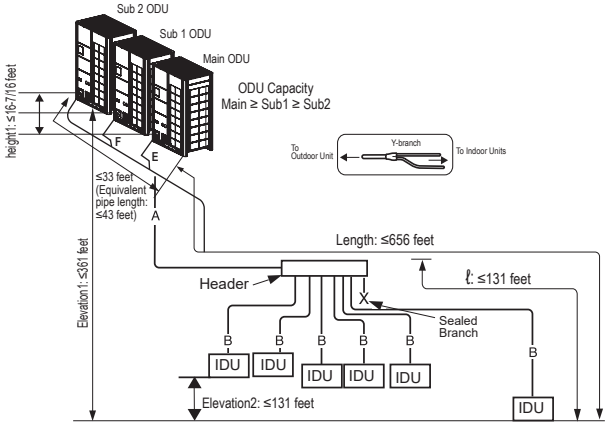
ODU: Outdoor Units.
IDU: Indoor Units.
A: Main Pipe from Outdoor Unit to First Y-branch.
B: Y-branch to Y-branch or Y-branch to Header.
C: Y-branch to Indoor Unit or Header to Indoor Unit.



Example of Pipe Sizing When Installing a Heat Pump System, Header Method

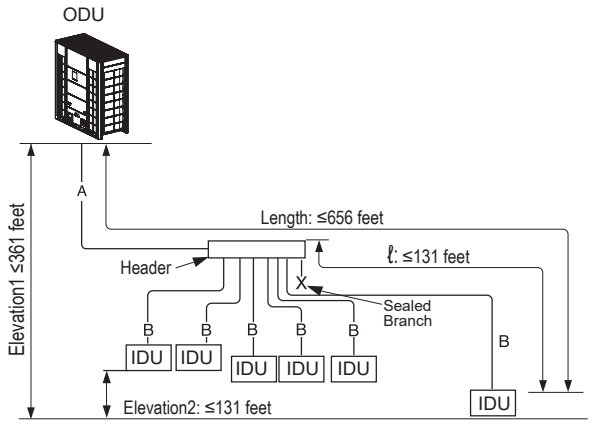
Example: Triple Frame - Six (6) Indoor Units Connected

ODU: Outdoor Units.
IDU: Indoor Units.
A: Main Pipe from Outdoor Unit to Header.
B: Header to Indoor Units.
D: ARCNN31 Outdoor Unit Y-branch
E: ARCNN21 Outdoor Unit Y-branch



Example: Single Frame - Six (6) Indoor Units Connected

ODU: Outdoor Units.
IDU: Indoor Units.
A: Main Pipe from Outdoor Unit to Header.
B: Header to Indoor Units.



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NOTICE

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NOTICE

- *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 29: 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 ~ 8	3/8Ø	3/4Ø	1/2Ø	7/8Ø	1/2Ø	No Increase
10 ~ 14	1/2Ø	7/8Ø	5/8Ø	1-1/8Ø	5/8Ø	No Increase
16 ~ 20	1/2Ø	1-1/8Ø	5/8Ø	No Increase	5/8Ø	No Increase
22	5/8Ø	1-1/8Ø	3/4Ø	1-1/4Ø	3/4Ø	No Increase
24 ~ 30	5/8Ø	1-3/8Ø	3/4Ø	1-1/2Ø	3/4Ø	No Increase
32 ~ 44	3/4Ø	1-5/8Ø	7/8Ø	No Increase	7/8Ø	No Increase

NOTICE

Various tools are available to assist in properly designing LG R32 split systems. Refer to the "R32 Application Guide"; the "Simple Calculator for Capacity, Refrigerant Charge and ESP"; the "LG Air Conditioner Technical Solutions" (LATS) software program; and the local LG Sales Representative.

Table 30: 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
<96,200	3/8Ø	3/4Ø
<114,700	3/8Ø	7/8Ø
<172,000	1/2Ø	7/8Ø
<242,000	1/2Ø	1-1/8Ø
<264,200	5/8Ø	1-1/8Ø
<360,100	5/8Ø	1-3/8Ø
<592,500	3/4Ø	1-5/8Ø
<630,700	7/8Ø	1-5/8Ø
<993,600	7/8Ø	2-1/8Ø

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

Table 31: 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

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

NOTICE

Various tools are available to assist in properly designing LG R32 split systems. Refer to the "R32 Application Guide"; the "Simple Calculator for Capacity, Refrigerant Charge and ESP"; the "LG Air Conditioner Technical Solutions" (LATS) software program; and the local LG Sales Representative.

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.

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 32: 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

Systems Designed for Heat Pump Operation

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

NOTICE

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Connective Capacity Limit

1. The maximum total capacity of each shutoff valve unit branch is 60,000 Btu/h.
2. The maximum total capacity of indoor units is 230,000 Btu/h.
3. If an indoor unit capacity is larger than 60,000 Btu/h (large capacity 76,000 and 96,000 Btu/h indoor units), two pipes next to each other on one shutoff valve unit must be connected by a Y-branch unit and then connected to one indoor unit.
4. Serial Connection of Shutoff Valves
   - Maximum total sum of indoor units must be ≤230,00 Btu/h.
   - Maximum number of indoor units per a branch is eight (8).

Shutoff Valve Unit Piping

- Pipe installation is from outdoor units to shutoff valve units, and from shutoff valve units to indoor units.
- Two pipes: Vapor Pipe, Liquid Pipe.

Figure 55: Shutoff Valve Unit Piping System.

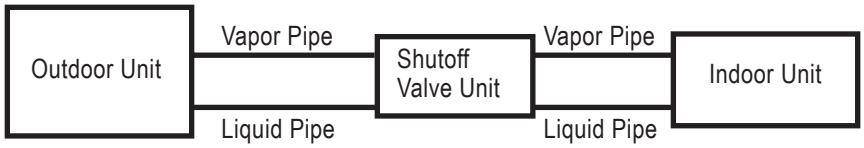
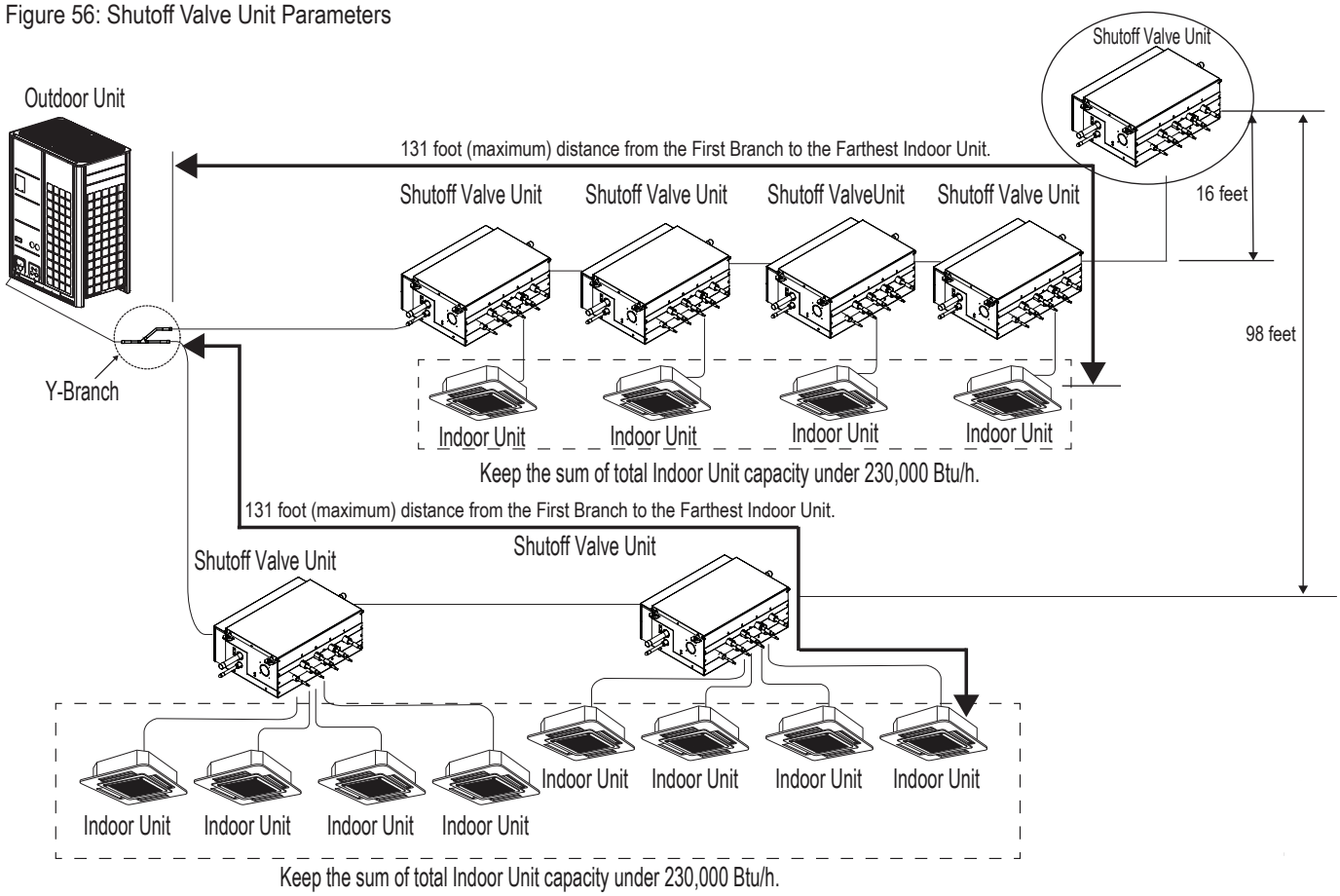


Figure 56: Shutoff Valve Unit Parameters



NOTICE

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Systems Designed for Heat Pump Operation

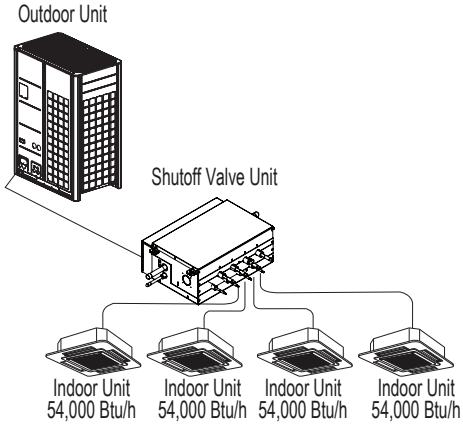
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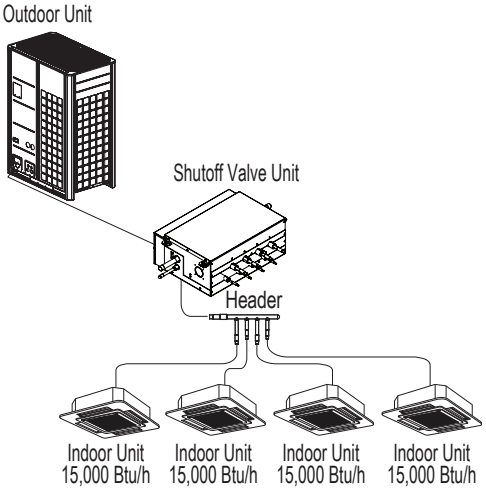
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Sample Layouts

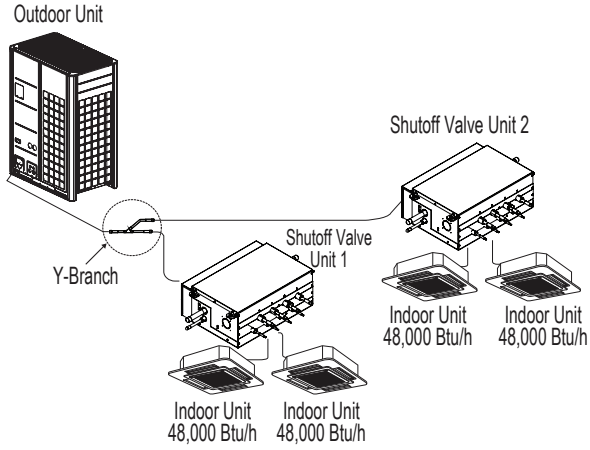
Systems designed for heat pump operation can be designed with a variety of Y-branches / Headers / Shutoff Valve Units combinations.

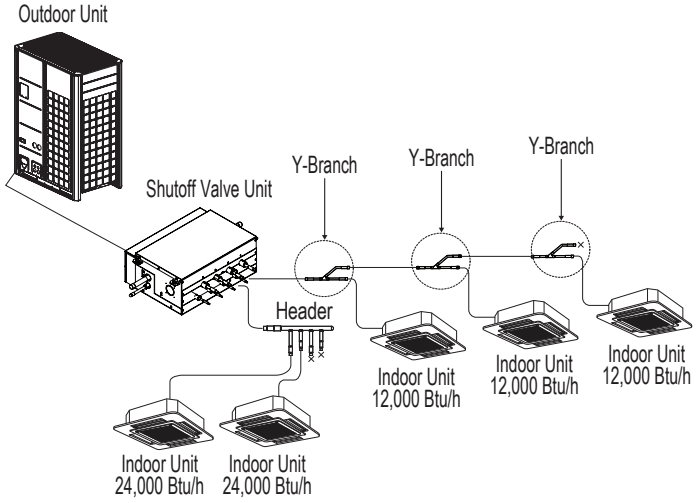


Maximum total Indoor Unit capacity is up to 230,000 Btu/h, depending on shutoff valve unit model.



Maximum total Indoor Unit capacity per Shutoff Valve Unit branch pipe is 60,000 Btu/h.





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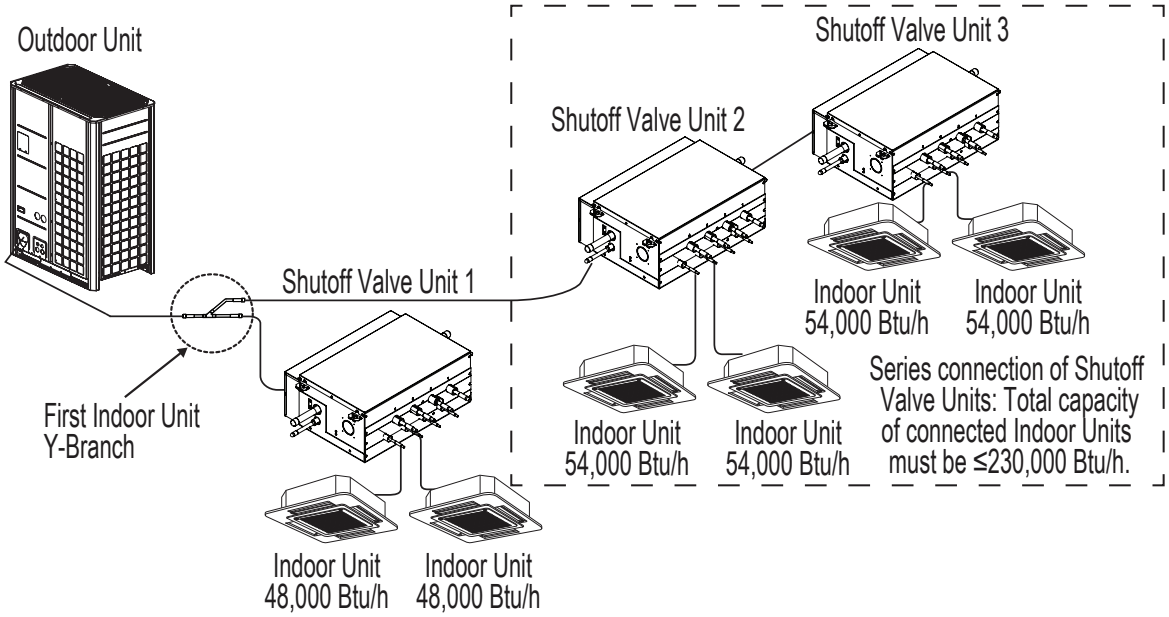
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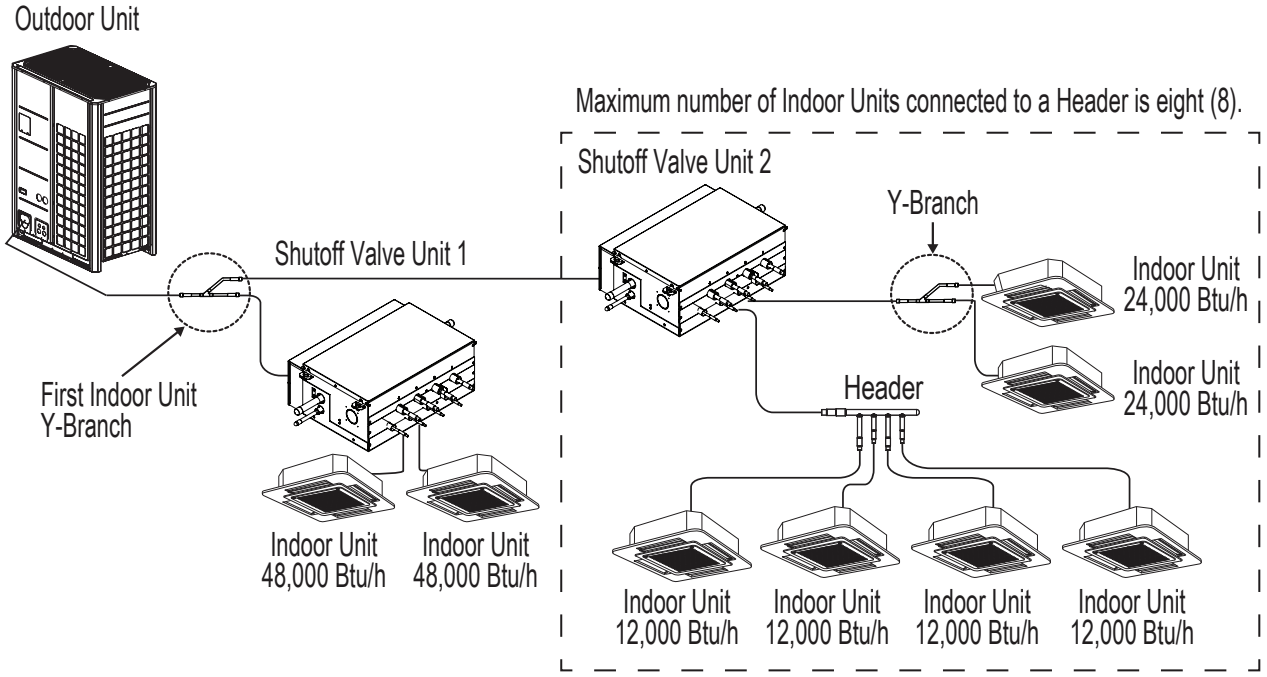
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Sample Layouts, Continued.





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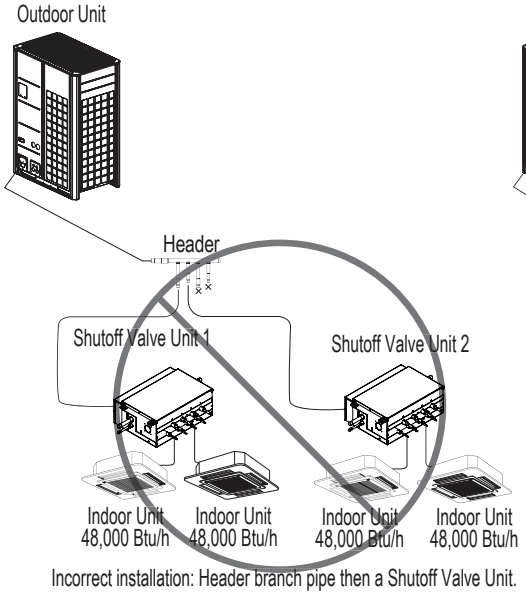
Systems Designed for Heat Pump Operation

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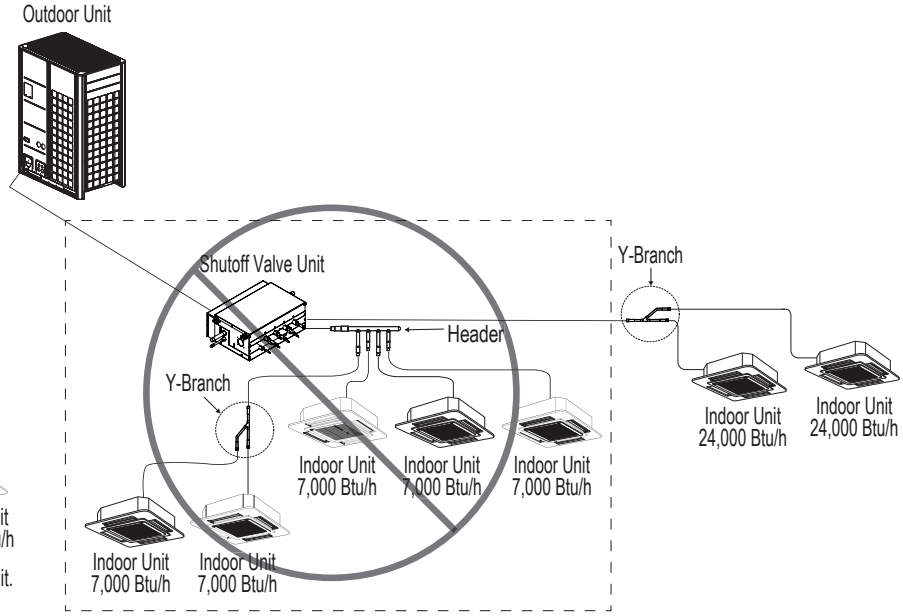
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Incorrect Layouts



Incorrect installation: Header branch pipe then a Shutoff Valve Unit.



Incorrect installation: Shutoff Valve Unit, then a Header branch pipe, then a Y-Branch and Header Branch pipe.

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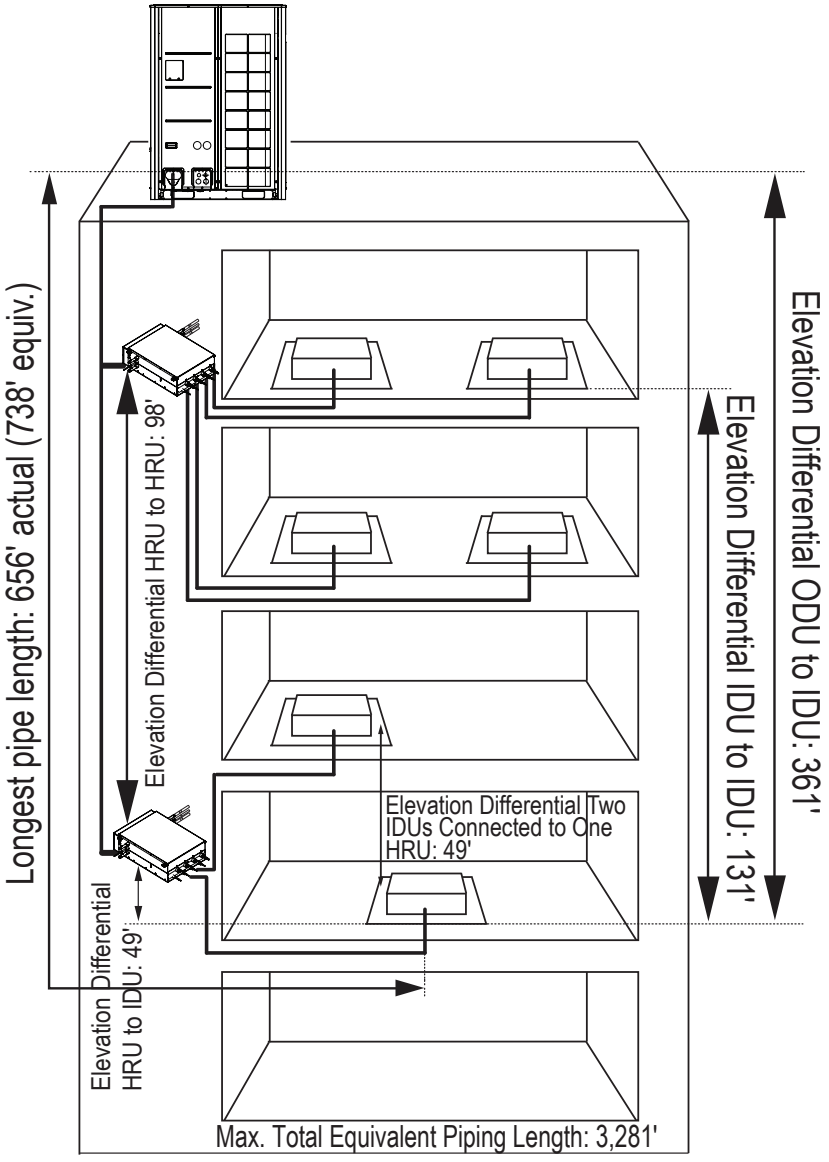
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Figure 57: Typical Heat Recovery System Building Layout with Piping Limitations.



*See next page for table.

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Systems Designed for Heat Recovery Operation

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Table 33: Piping Limitations for Heat Recovery Operation (See pages 149 to 150).

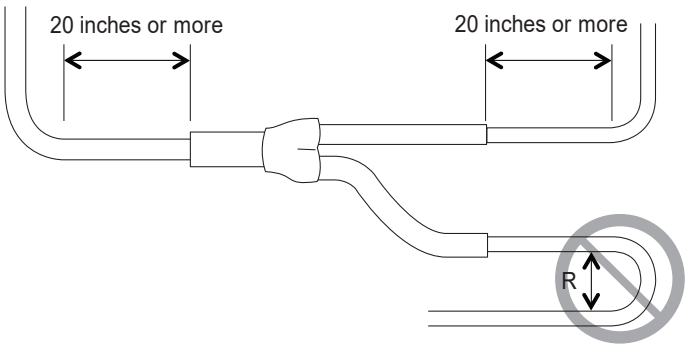
Length	Total pipe length	Longest actual pipe length	Equivalent pipe length[1]
	A + ΣB + ΣC ≤ 3,281 feet	≤492 feet (656 feet conditional application)	≤574 feet (738 feet conditional application)
ℓ	Longest pipe length after first branch		
	≤131 feet (295 feet conditional application)		
Elevation1	Elevation differential (Outdoor Unit ↔ Indoor Unit)		
	Height ≤361 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		
height[1]	Elevation differential (Outdoor Unit ↔ Outdoor Unit)		
	≤16.4 feet		
Distance between Outdoor Unit to Outdoor Unit		≤33 feet (Equivalent pipe length: ≤43 feet)	
Distance between Fittings and Indoor Units[1,2]		≥20 inches	
Distance between Fittings and Y-branches, and between Fittings and Headers[1,2]		≥20 inches	
Distance between two Y-branches or two Headers[1,2]		≥20 inches	
Distance between series-piped Heat Recovery Units[2]		≥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 a Y-branch is 1.6 feet, and equivalent pipe length of a header is 3.3 feet. Fittings refers to long radius 90° and 45° elbows.

[2]Must be at least 20 inches of straight pipe before and/or after Indoor Units, Heat Recovery Units, Y-branches and Headers. Failure to provide 20 inches of straight pipe for these system components may affect performance or result in noise.

NOTICE

- *Bending radius should be at least twice the diameter of the pipe.*
- *Bend pipe after 20 inches or more from Y-branch or header.*
  If possible ⃠ do not use a U-type bend as it may affect performance or result in noise.
  If a U-type bend is necessary, the radius should be more than 8 inches.



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NOTICE

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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.

HRU: Heat Recovery Units.

IDU: Indoor Units.

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

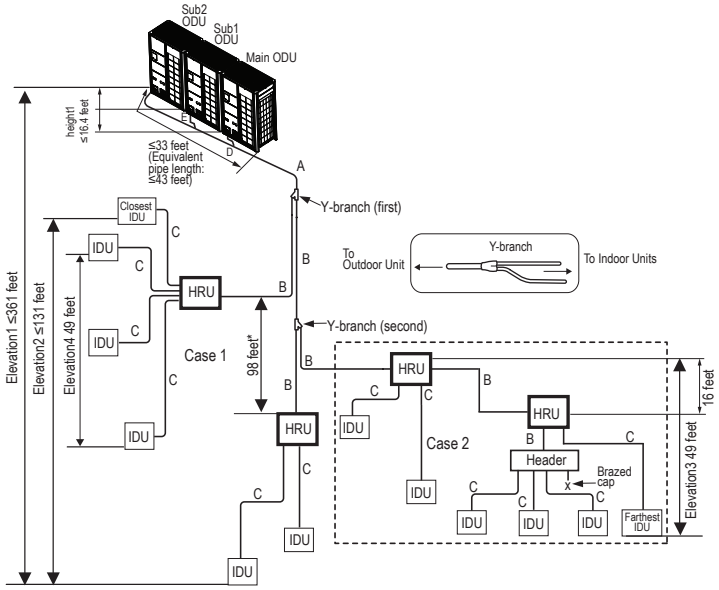
B: Heat Recovery Unit to Heat Recovery Unit, Y-branch to Heat Recovery Unit, Heat Recovery Unit to Header, or Y-branch to Y-branch.

C: Heat Recovery Unit / Header to Indoor Unit.

D: ARCNB31 Outdoor Unit Y-branch.

E: ARCNB21 Outdoor Unit Y-branch.

Figure 58: 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.

NOTICE

- *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 34: Main Pipe (A) Diameters from Outdoor Unit to First Y-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 (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)	Liquid Pipe (inches OD)	Low Pressure Vapor Pipe (inches OD)	High Pressure Vapor Pipe (inches OD)
6 ~ 8	3/8Ø	3/4Ø	5/8Ø	1/2Ø	7/8Ø	3/4Ø	1/2Ø	No Increase	No Increase
10 ~ 14	1/2Ø	7/8Ø	3/4Ø	5/8Ø	1-1/8Ø	7/8Ø	5/8Ø	No Increase	No Increase
16 ~ 20	1/2Ø	1-1/8Ø	7/8Ø	5/8Ø	No Increase	No Increase	5/8Ø	No Increase	No Increase
22	5/8Ø	1-1/8Ø	7/8Ø	3/4Ø	1-1/4Ø	1-1/8Ø	3/4Ø	No Increase	No Increase
24 ~ 30	5/8Ø	1-3/8Ø	1-1/8Ø	3/4Ø	1-1/2Ø	1-1/4Ø	3/4Ø	No Increase	No Increase
32 ~ 44	3/4Ø	1-5/8Ø	1-3/8Ø	7/8Ø	No Increase	No Increase	7/8Ø	No Increase	No Increase

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Table 35: 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
<96,200	3/8Ø	3/4Ø	5/8Ø
<114,700	3/8Ø	7/8Ø	3/4Ø
<172,000	1/2Ø	7/8Ø	3/4Ø
<242,000	1/2Ø	1-1/8Ø	7/8Ø
≤264,200	5/8Ø	1-1/8Ø	7/8Ø
<360,100	5/8Ø	1-3/8Ø	1-1/8Ø
<592,500	3/4Ø	1-5/8Ø	1-3/8Ø
<630,700	7/8Ø	1-5/8Ø	1-3/8Ø
≤993,600	7/8Ø	2-1/8Ø	1-5/8Ø

Table 36: 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

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

NOTICE

Various tools are available to assist in properly designing LG R32 split systems. Refer to the "R32 Application Guide"; the "Simple Calculator for Capacity, Refrigerant Charge and ESP"; the "LG Air Conditioner Technical Solutions" (LATS) software program; and the local LG Sales Representative.

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.

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 37: 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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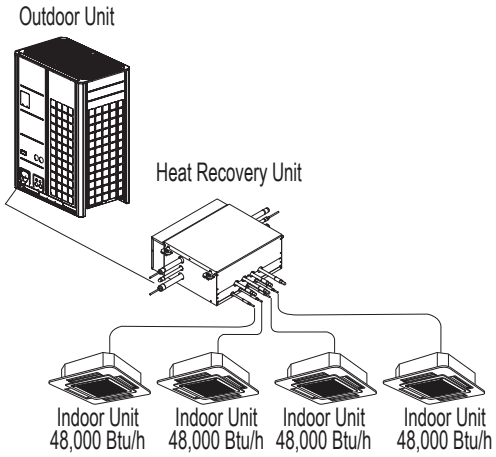
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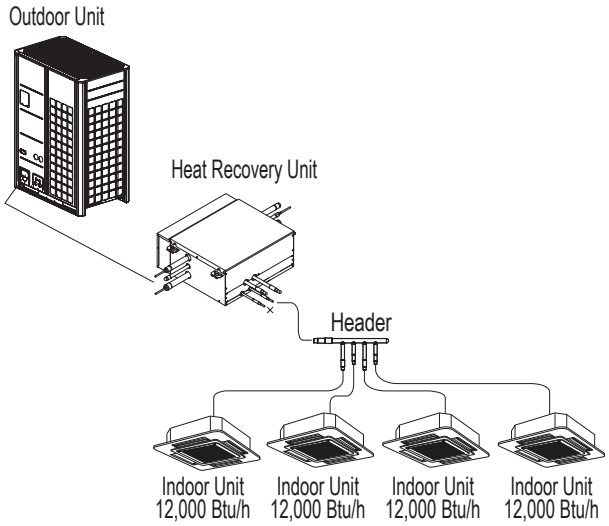
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Sample Layouts

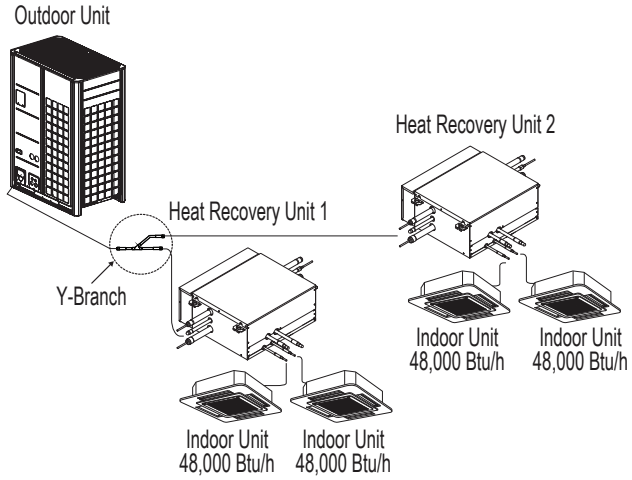
Systems designed for heat recovery operation can be designed with a variety of Y-branches / Headers / Heat Recovery Units combinations.

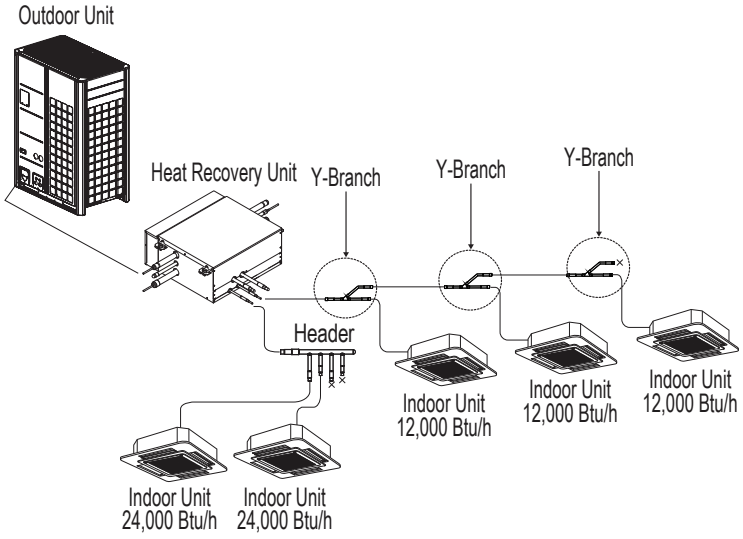


Maximum total Indoor Unit capacity is up to 230,000 Btu/h, depending on heat recovery unit model.



Maximum total Indoor Unit capacity per Heat Recovery Unit branch pipe is 60,000 Btu/h.





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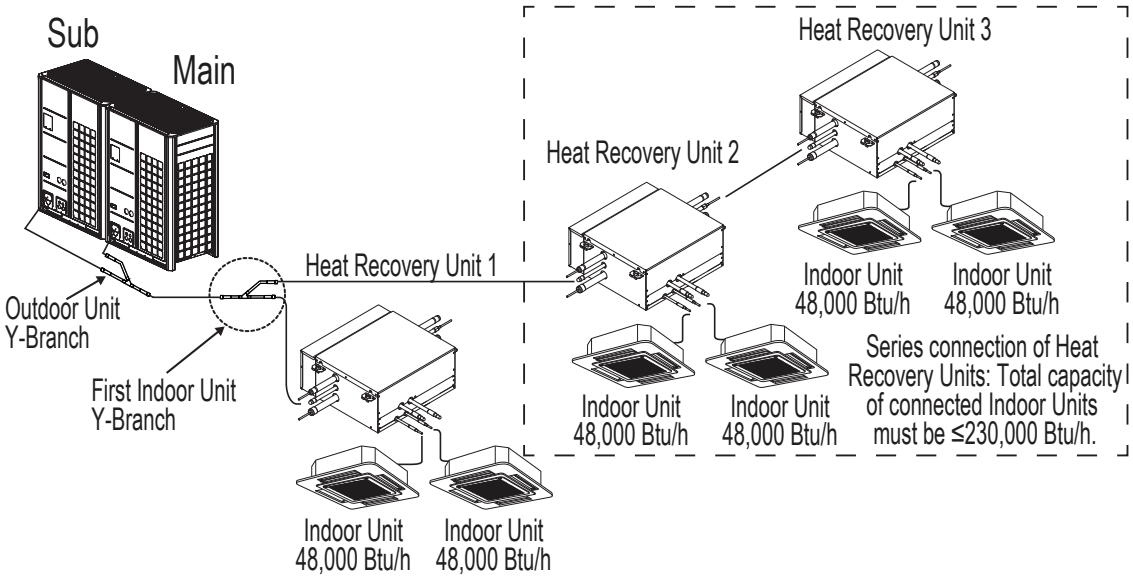
Systems Designed for Heat Recovery Operation

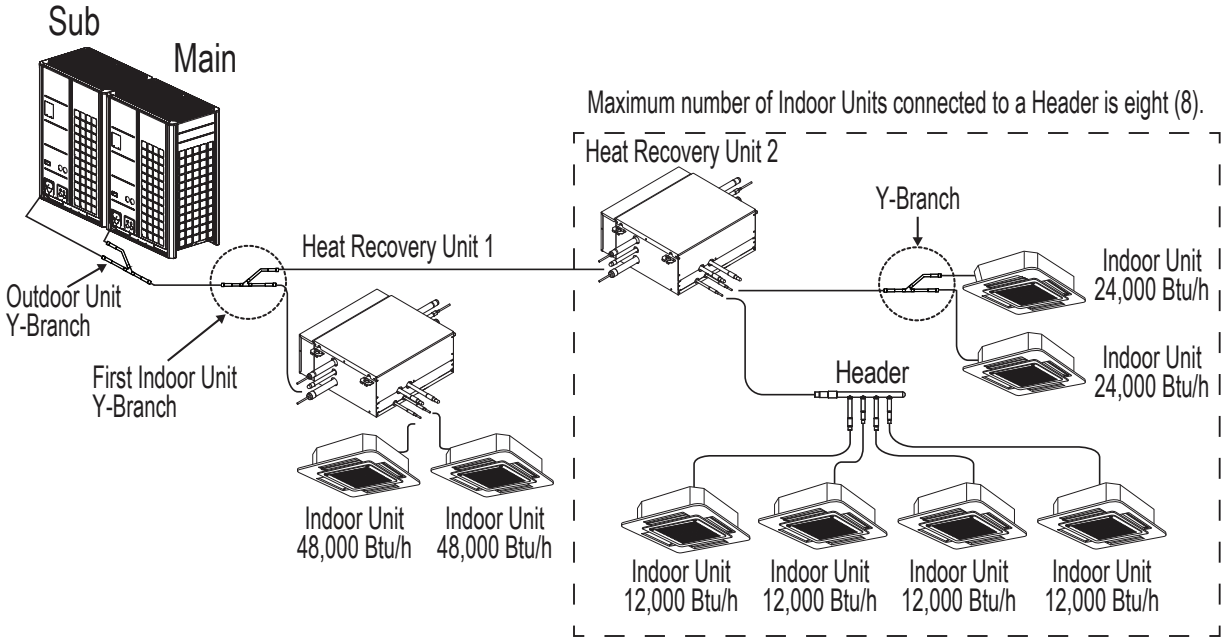
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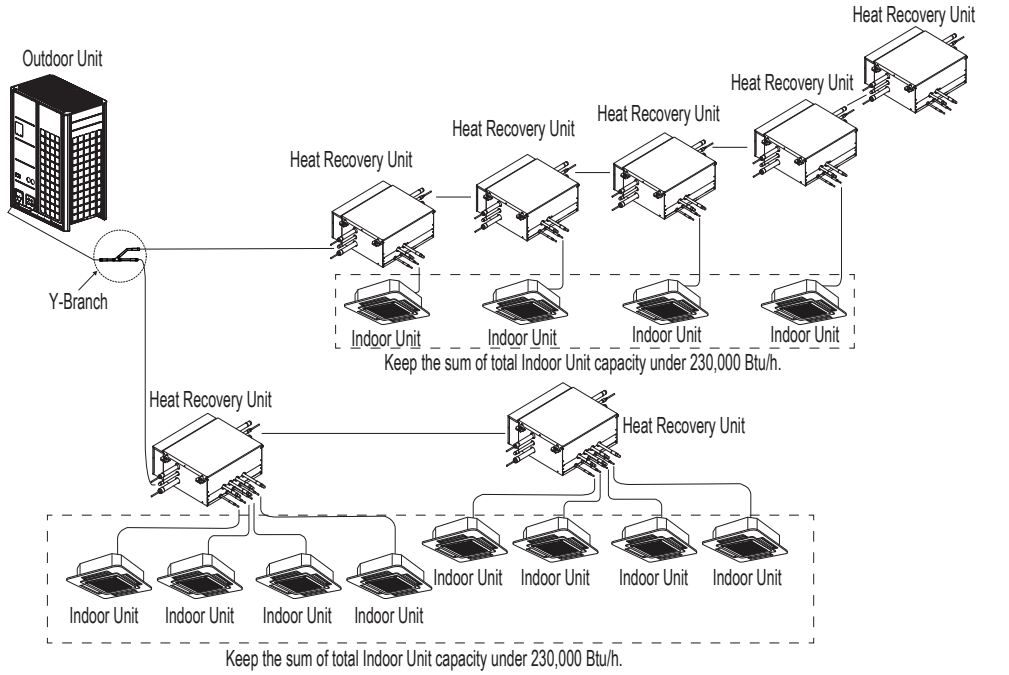
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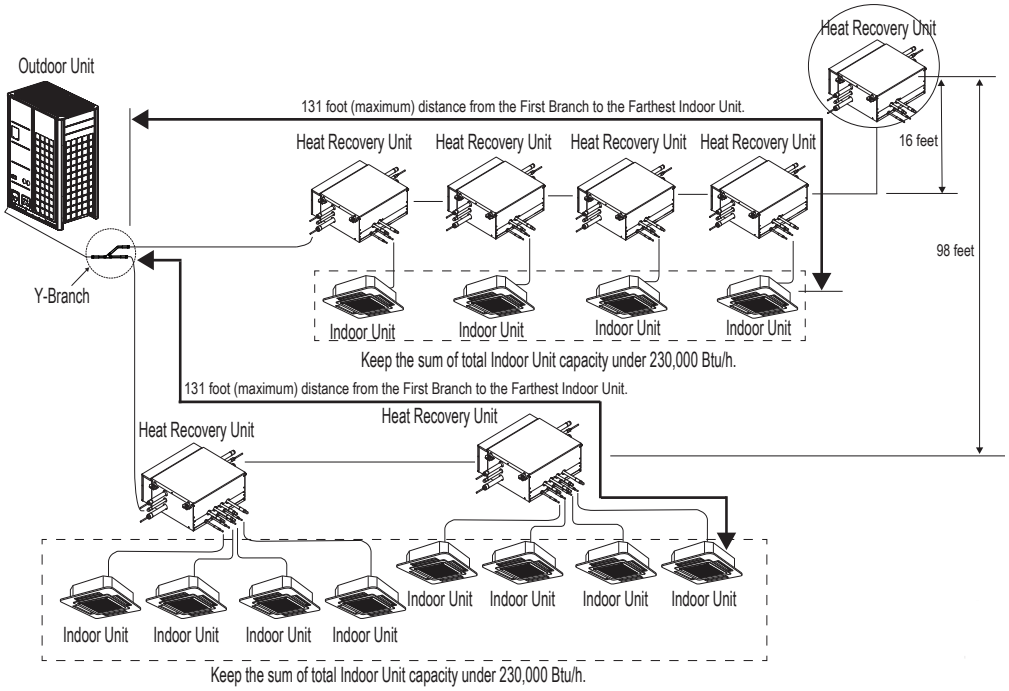
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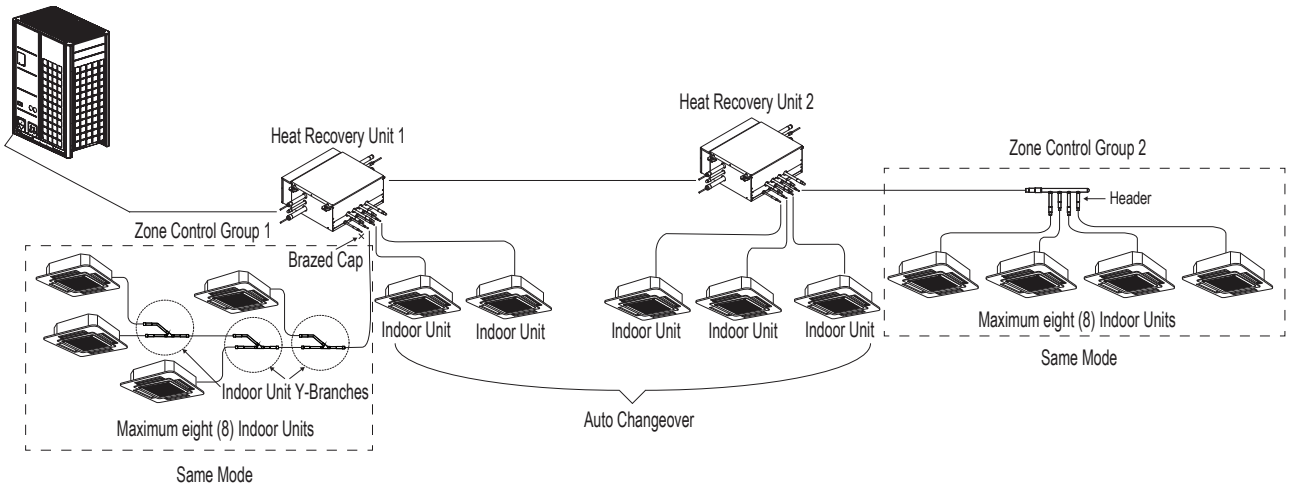
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Sample Layouts, Continued.

Zone Control

For zone control, up to eight (8) indoor units with a maximum capacity of 60,000 Btu/h can be connected to one port on the heat recovery unit. Y-Branches or Headers can be used, depending on what is best for the application.



- One heat recovery unit branch pipe can support a maximum of 60,000 Btu/h total indoor unit cooling capacity.
- PRHR044C heat recovery unit can support a maximum of 230,000 Btu/h total capacity and up to 32 connected indoor units (maximum indoor units per heat recovery unit branch pipe is 8).
- Zone control groups cannot operate in "Auto changeover" or "Mode override" functions.
- In the zone control group, if some indoor units are operating in cooling or heating mode, the other indoor units cannot change over to / operate in the opposite mode.

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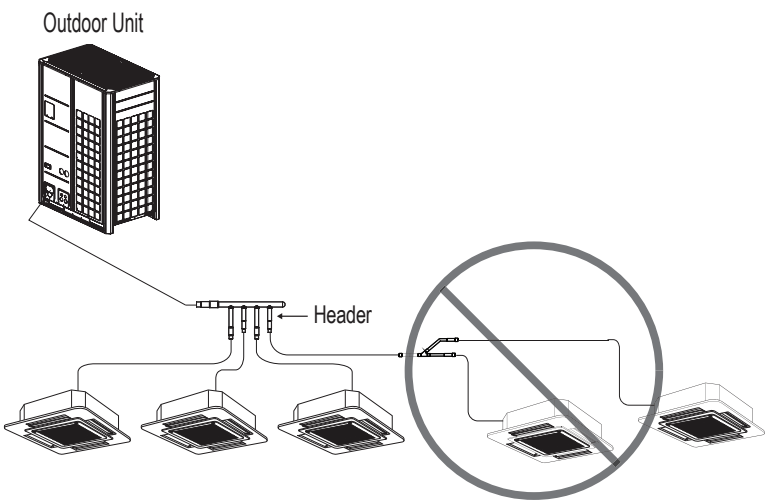
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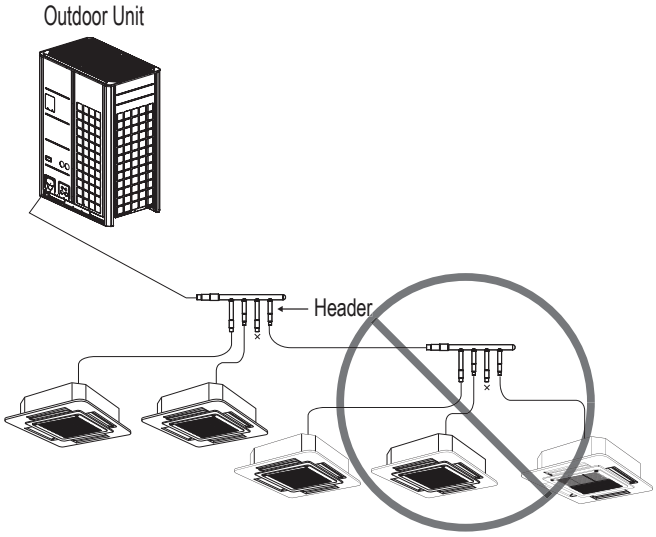
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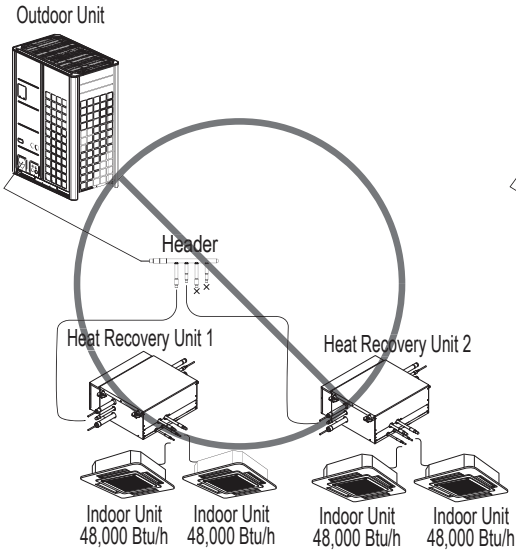
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Incorrect Layouts

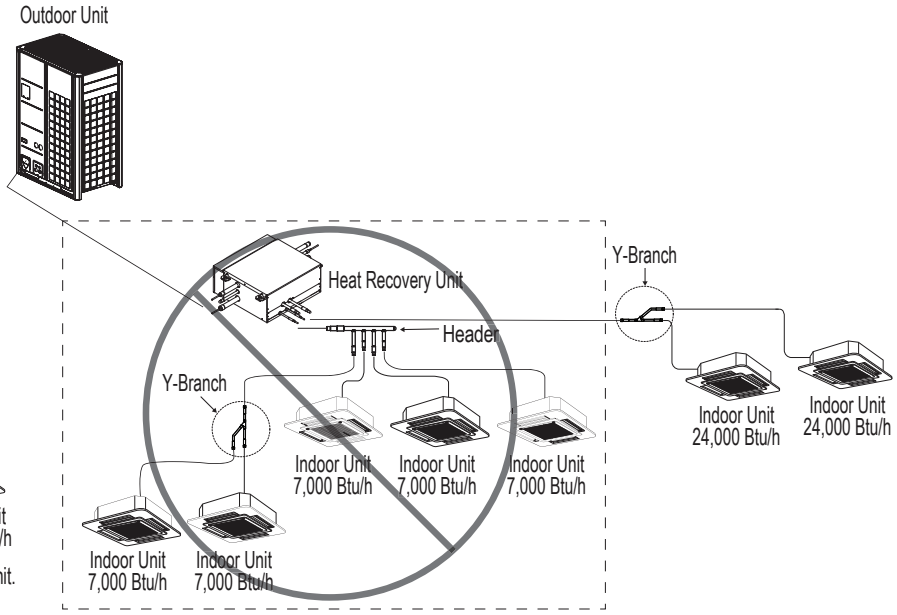
A second branch cannot be made after a Header.







Incorrect installation: Header branch pipe then a Heat Recovery Unit.



Incorrect installation: Heat Recovery Unit, then a Header branch pipe, then a Y-Branch and Header Branch pipe.

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REFRIGERANT PIPING FOR SEPARATED OUTDOOR UNITS

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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 either end of the outdoor unit Y-branch.

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

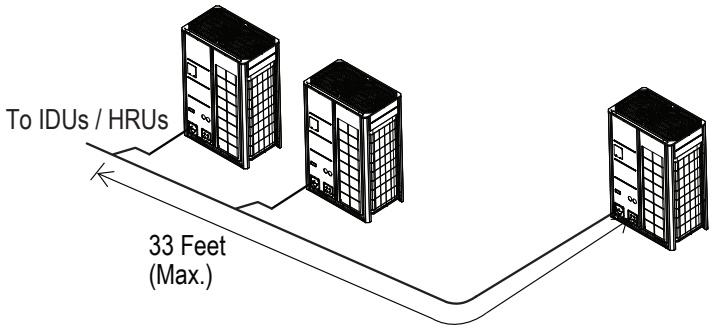
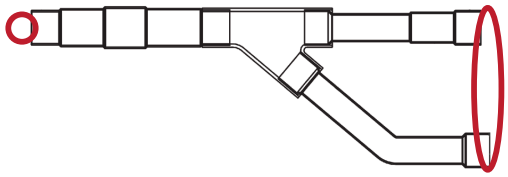
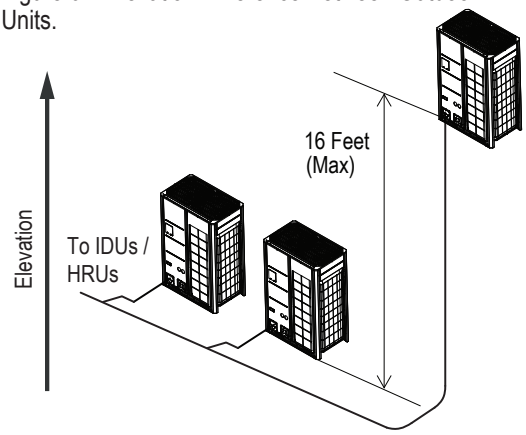


Figure 59: Y-branch Measurement Location.



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

Figure 61: 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 62: Traps for Heat Pump and Heat Recovery Systems.

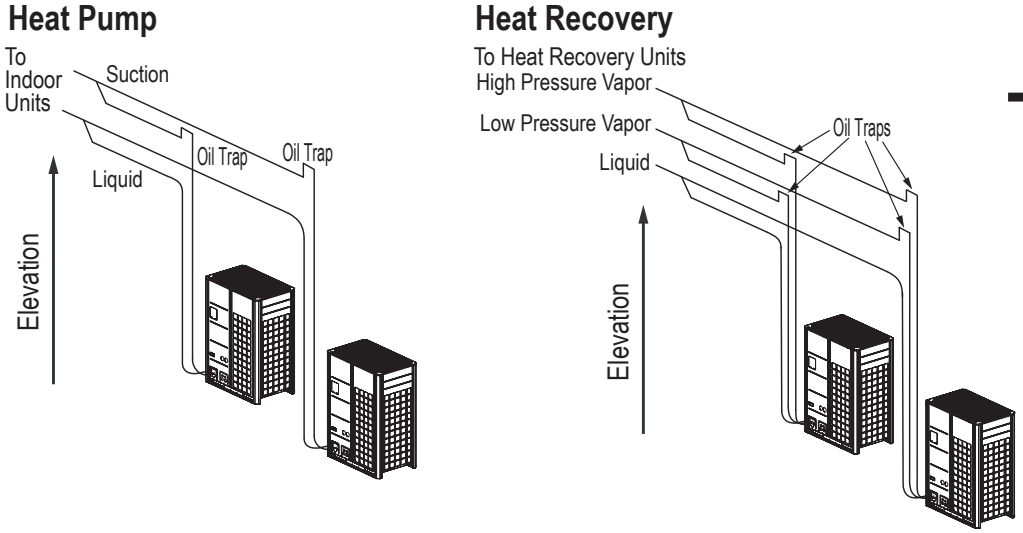
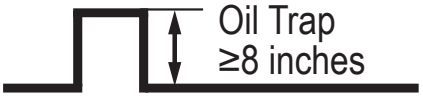


Figure 63: Close Up of An Inverted Oil Trap.



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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 64: Examples of Inverted Traps.

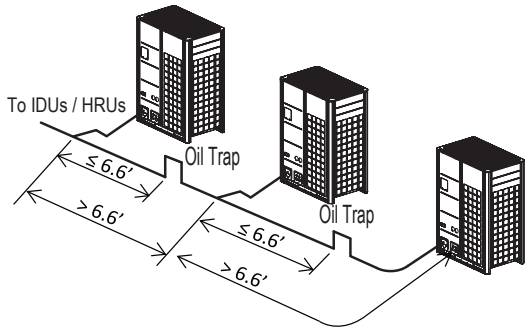
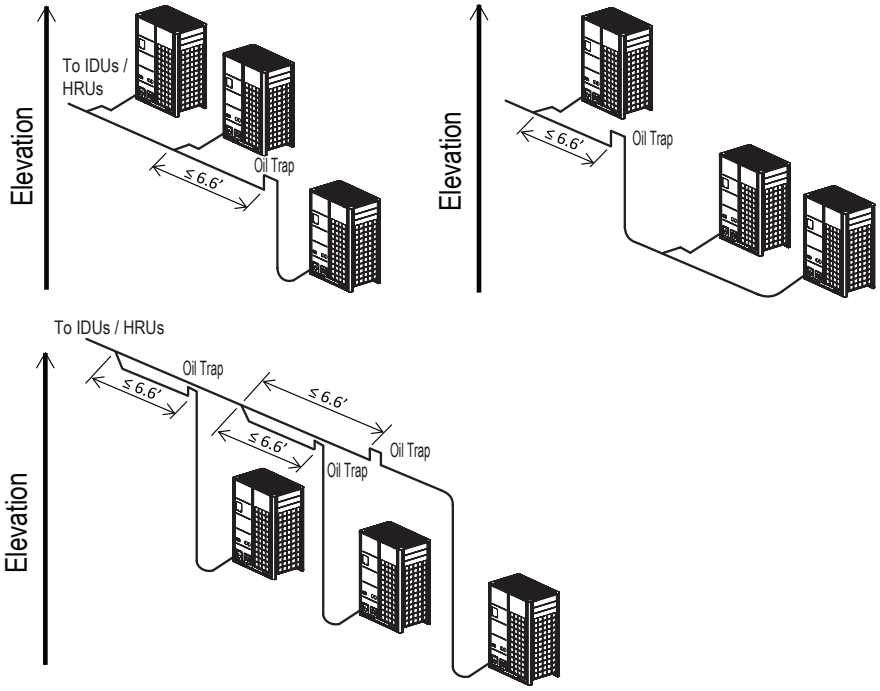


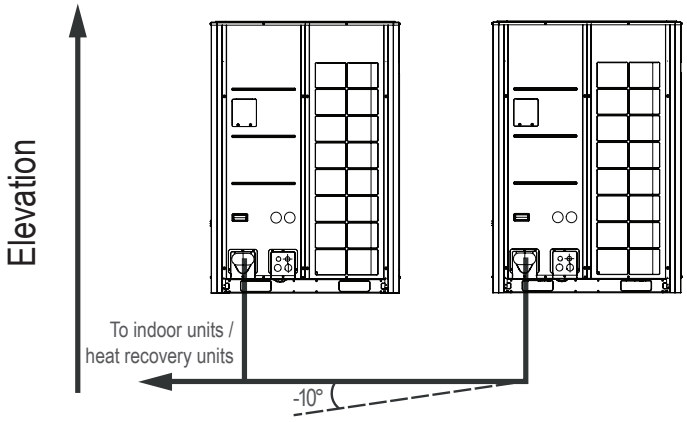
Figure 65: Inverted Trap Applications.



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 66: Allowable Pipe Slope.



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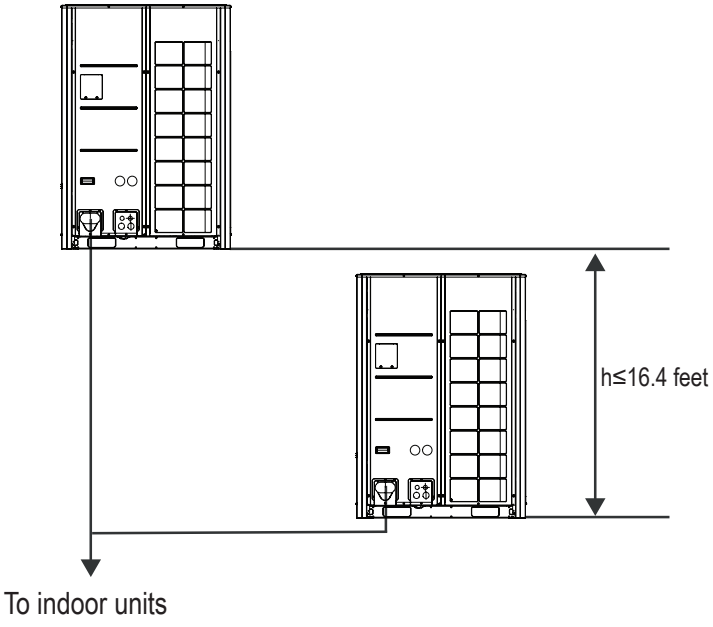
REFRIGERANT PIPING FOR SEPARATED OUTDOOR UNITS

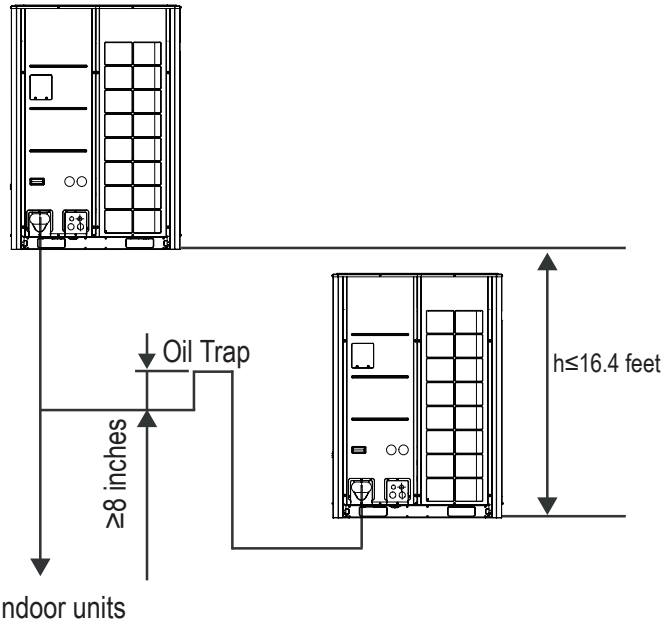
NOTICE

Various tools are available to assist in properly designing LG R32 systems. Refer to the "R32 Application Guide"; the "Simple Calculator for Capacity, Refrigerant Charge and ESP"; the "LG Air Conditioner Technical Solutions" (LATS) software program; and the local LG Sales Representative.

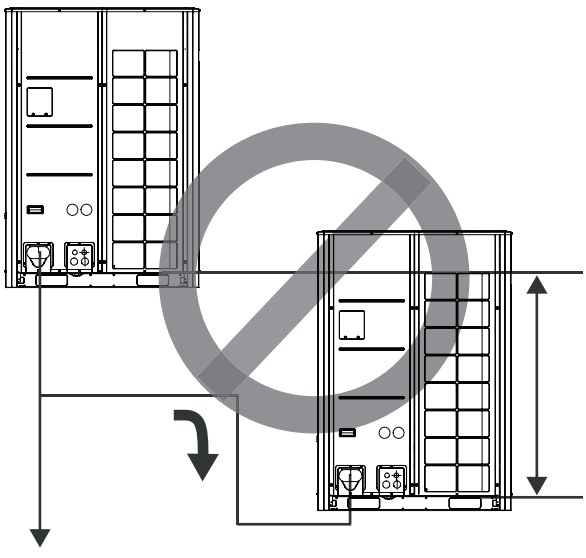
Height Differential for Separated Outdoor Units

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





Example of an Incorrect Height Differential



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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 pests 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 (inlet and outlet) are not buried by direct, heavy snowfall or are directly facing seasonal winds. 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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Planning for Snow and Ice, continued.

NOTICE

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.

NOTICE

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.

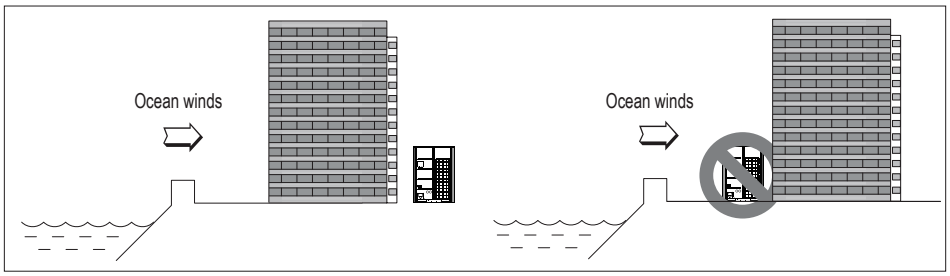
Oceanside Installation Precautions

NOTICE

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

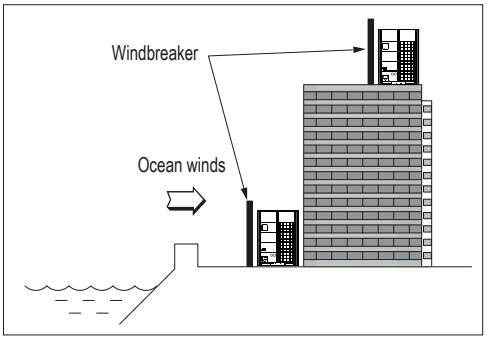
- Avoid installing the outdoor unit where it would be directly exposed to ocean winds.
- Install the outdoor unit on the side of the building opposite from direct ocean winds.
- Select a location with good drainage.
- Periodically clean dust or salt particles off of the heat exchanger with water.

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.



NOTICE

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

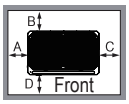
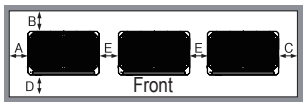
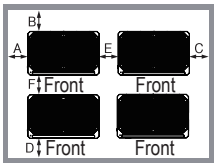
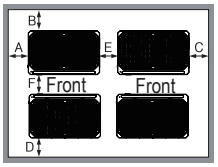
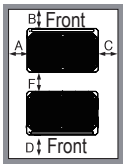
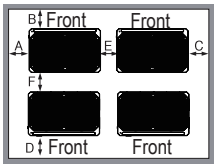
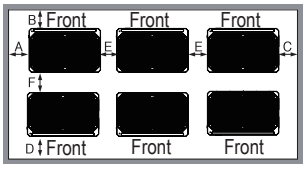
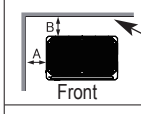
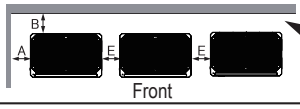


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Outdoor Unit Installation Space

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 ≥ 1"; C ≥ 2"	Example No. 2 A ≥ 2"; 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 ≥ 12" C ≥ 1" D ≥ 20" E ≥ 1" F ≥ 24"	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"	

NOTICE

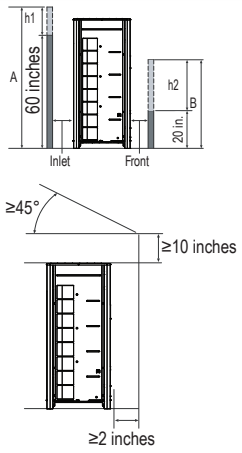
Different clearances are required if a Low Ambient Cooling Kit is installed. Refer to the Low Ambient Cooling Kit Installation Manual for clearance information.

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PLACEMENT CONSIDERATIONS

Outdoor Unit Clearance Requirements / Installing Outdoor Units Indoors

Outdoor Unit Installation Space, continued.

Wall Height Limitations (When the Unit[s] is [are] Surrounded by Four [4] Walls)		• Wall height at the inlet of the outdoor unit must be ≤60 inches. • Wall height at the front 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 INLET side by 1/2 of h1. - Additional space on the FRONT 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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Installing Outdoor Units Indoors, continued.

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..

NOTICE

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

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PLACEMENT CONSIDERATIONS

MULTI V™ i

Selecting the Best Location / Clearance Requirements for the Heat Recovery Unit(s)

NOTICE

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 generates will not disturb occupants in the surrounding rooms.
- Install so that the refrigerant piping, drainage piping, and electrical wiring system are easily accessible.

Dont's

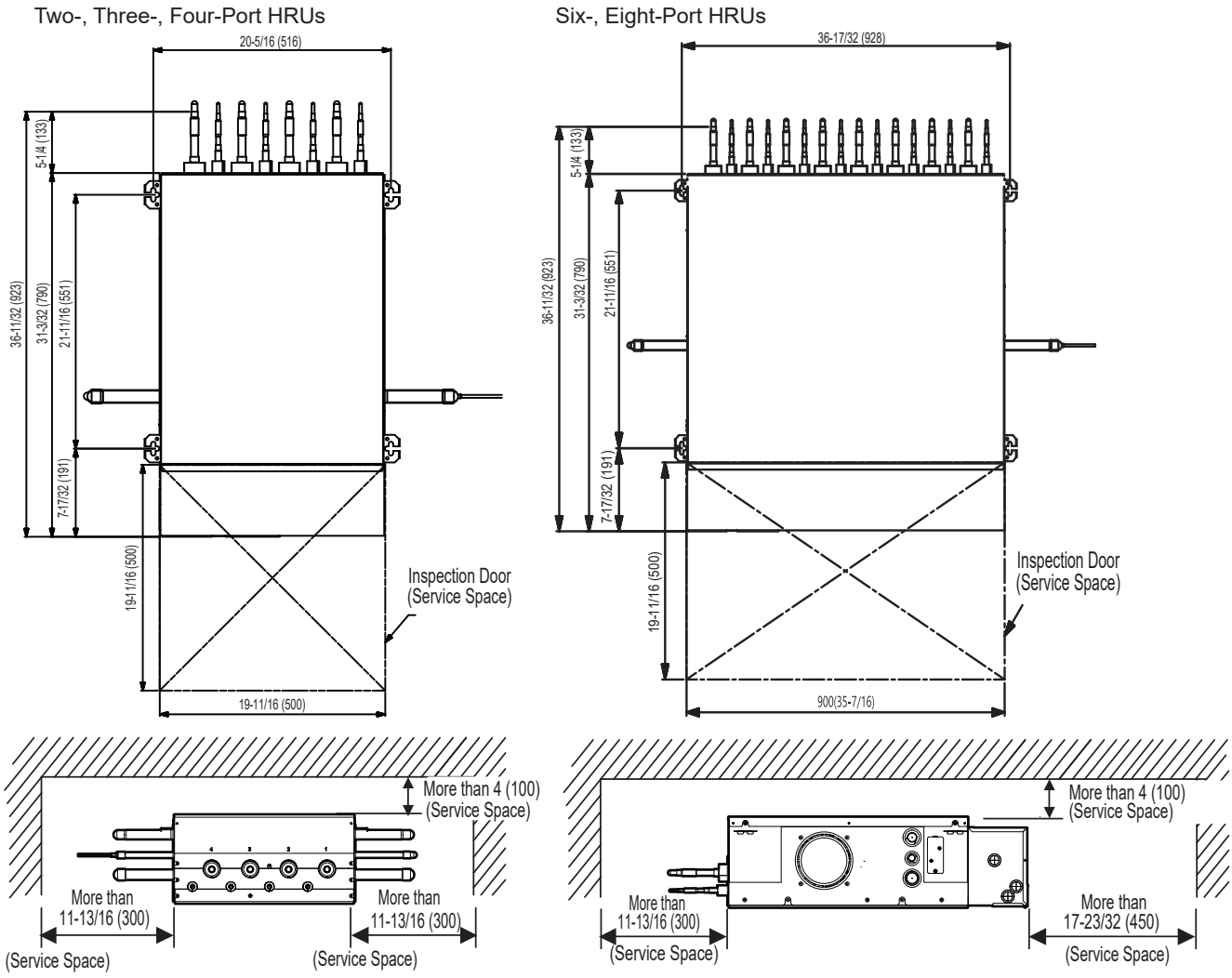
- *Refrigerant pipes must not exceed lengths specified by LG Electronics.*
- *Do not install the heat recovery unit in a location where rain may enter.*
- *Do not install the heat recovery unit in a location where it would be subjected to strong radiant heat from heat sources.*
- *Avoid an installation environment where more than 80% high humidity, or where oil splattering and / or vapor spray will occur.*
- *Avoid an installation environment where high-frequency electric noise could occur.*

Figure 67: PRHR024C, PRHR034C, PRHR044C, PRHR065C, and PRHR085C Clearance Requirements.

Two-, Three-, Four-, Six-, and Eight-Port Heat Recovery Units

When NOT connecting the strainer directly to the heat recovery unit.

Unit: Inch (mm)



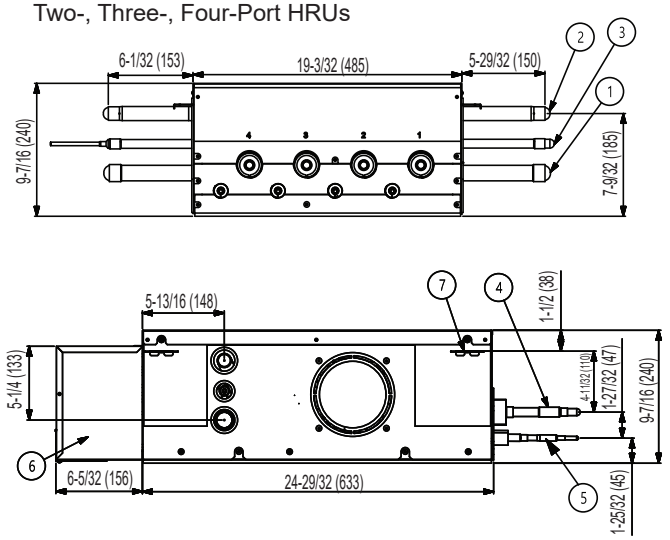
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Figure 68: PRHR034C, PRHR044C, PRHR065C, and PRHR085C Clearance Requirements, continued.

When connecting the strainer directly to the heat recovery unit (Except PRHR024C). Unit: Inch (mm)

Two-, Three-, Four-Port HRUs



Six-, Eight-Port HRUs

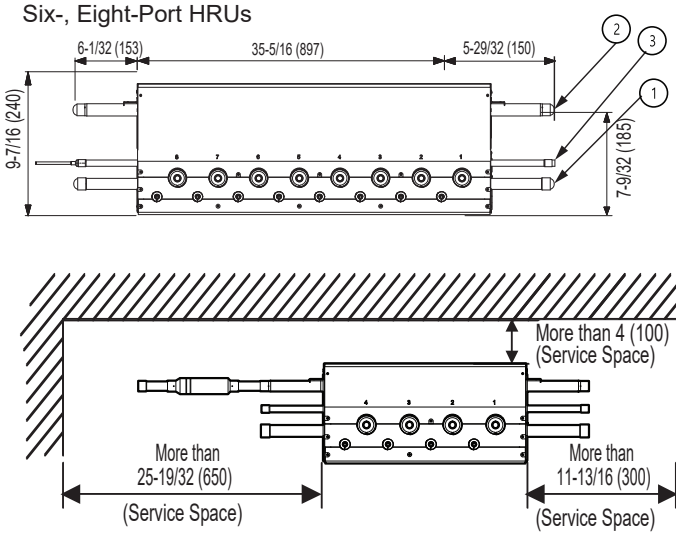
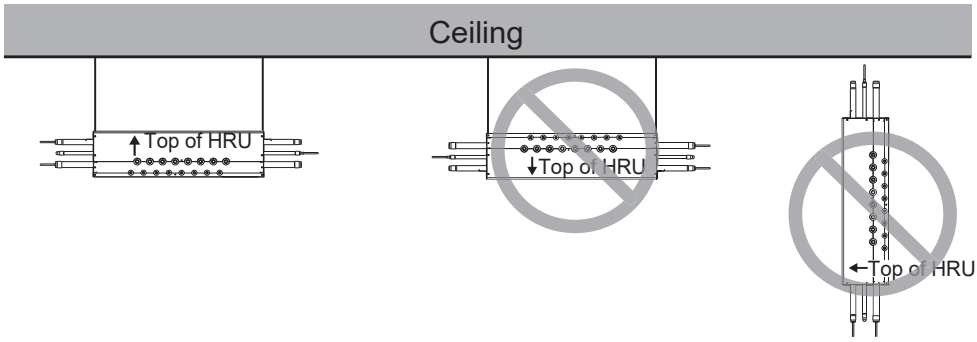


Table 38: PRHR024C, PRHR034C, PRHR044C, PRHR065C, and PRHR085C Heat Recovery Unit Components and Legend.

Part No.	Part Name	Connection Size (in.) / Type				
		PRHR024C	PRHR034C	PRHR044C	PRHR065C	PRHR085C
1	Low Pressure Vapor Pipe Connection Port	Ø7/8 Braze	Ø1-1/8 Braze	Ø1-1/8 Braze	Ø1-1/8 Braze	Ø1-1/8 Braze
2	High Pressure Vapor Pipe Connection Port	Ø3/4 Braze	Ø7/8 Braze	Ø7/8 Braze	Ø7/8 Braze	Ø7/8 Braze
3	Liquid Pipe Connection Port	Ø3/8 Braze	Ø1/2 Braze	Ø5/8 Braze	Ø5/8 Braze	Ø5/8 Braze
4	Indoor Unit Vapor Pipe Connection Port	Ø5/8 Braze – Ø1/2 Braze				
5	Indoor Unit Liquid Pipe Connection Port	Ø3/8 Braze – Ø1/4 Braze				
6	Control Box	–	–	–	-	-
7	Hanger Bracket	M8 or M10 Suspension Bolt				
8	Drain Hole	Connect the drain hose (field supplied), and tighten with a metal clamp (included).				

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

Figure 69: Install the Heat Recovery Unit Top Side Up.



NOTICE

Heat Recovery Unit must be installed so that the top side faces up. If the heat recovery unit is installed incorrectly, it may fail.

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PLACEMENT CONSIDERATIONS

MULTI V™ i

Selecting the Best Location / Clearance Requirements for the Shutoff Valve Unit(s)

Select an installation space for the shutoff valve unit that meets the following conditions:

- Install the shutoff valve unit indoors in a level and upright position.
- Ensure there is enough space in the installation area for service access.
- Install the shutoff valve unit in a location where any sound it generates will not disturb occupants in the surrounding rooms.
- Install so that the refrigerant piping and electrical wiring system are easily accessible.

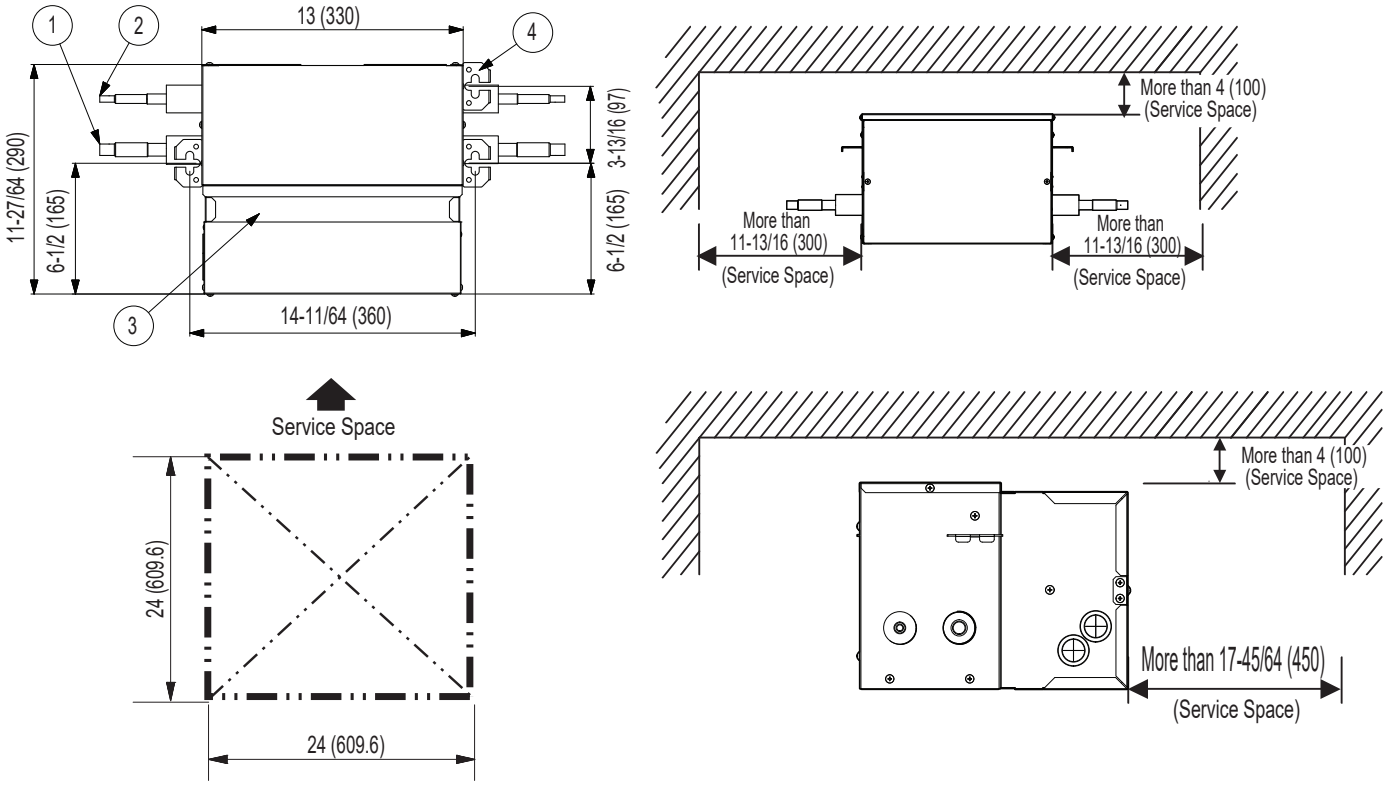
Dont's

- *Refrigerant pipes must not exceed lengths specified by LG Electronics.*
- *Do not install the shutoff valve unit in a location where rain may enter.*
- *Do not install the shutoff valve unit in a location where it would be subjected to strong radiant heat from heat sources.*
- *Avoid an installation environment with no more than 80% high humidity, or where oil splattering and / or vapor spray will occur.*
- *Avoid an installation environment where high-frequency electric noise could occur.*

Figure 70: PRHPZ010A Clearance Requirements.

One-Port Shutoff Valve Units

Unit: Inch (mm)



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Figure 71: PRHPZ010A Clearance Requirements, Continued.

One-Port Shutoff Valve Units

Unit: Inch (mm)

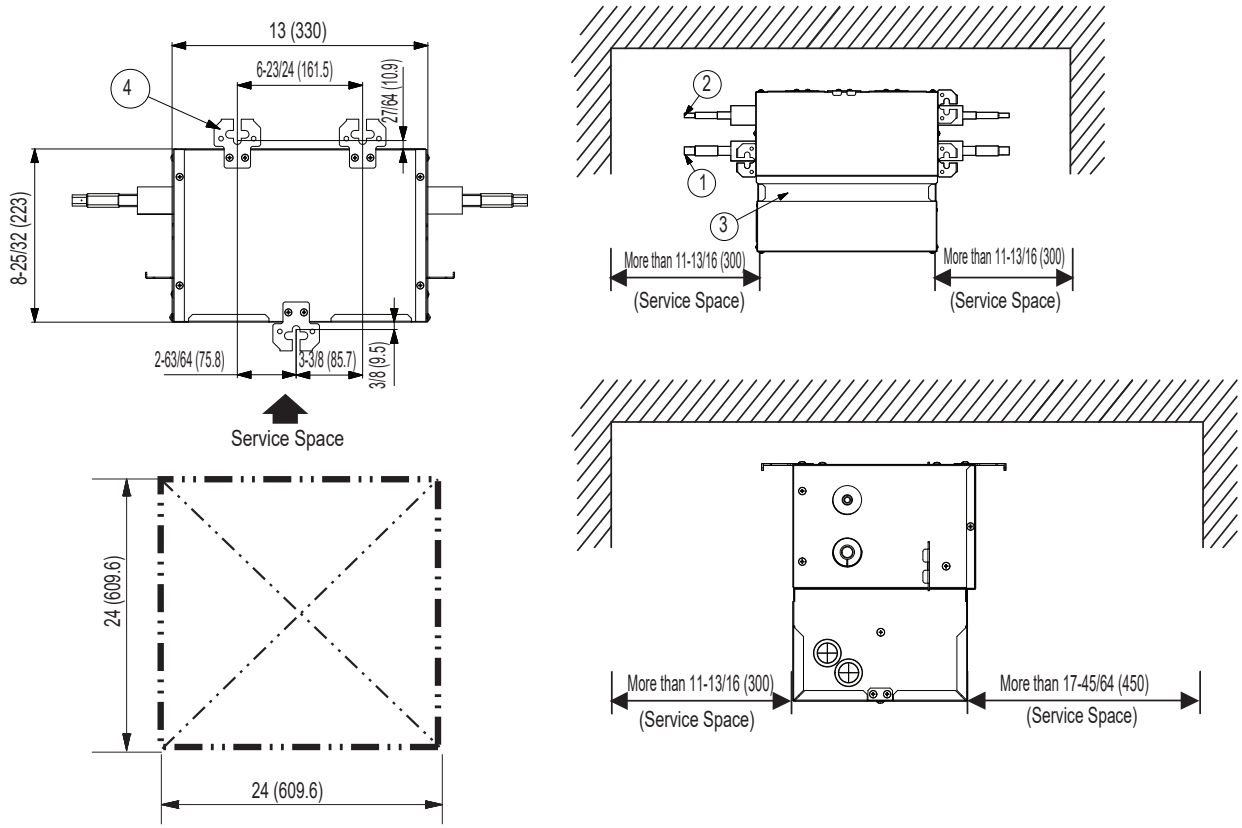


Table 39: PRHPZ010A Shutoff Valve Unit Components and Legend.

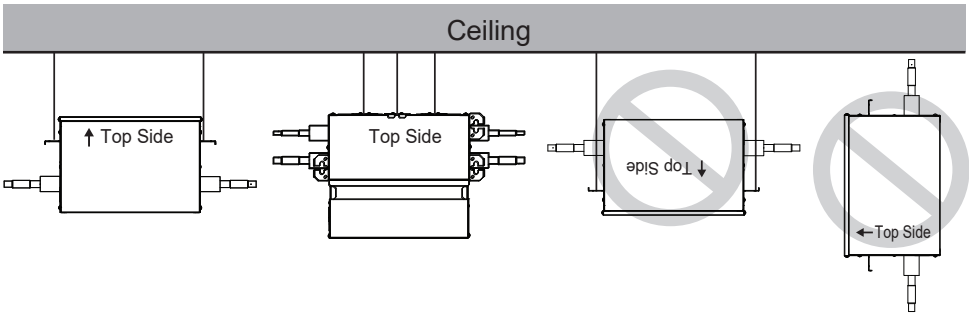
Part No.	Part Name	Connection Size (in.) / Type
		PRHPZ010A
1	Vapor Pipe Connection Port	Ø5/8 Braze – Ø1/2 Braze
2	Liquid Pipe Connection Port	Ø3/8 Braze – Ø1/4 Braze
3	Control Box	–
4	Hanger Bracket	M8 or M10 Suspension Bolt

[1]Include an access panel at the side of the shutoff valve unit where the control box is located.

NOTICE

Use the hanger accessories (included) when rotating the Shutoff Valve Units 90° in certain installations.

Figure 72: Install the One-Shutoff Valve Unit Top Side Up or Towards the Front.



NOTICE

The one-port shutoff valve unit must be installed so that the top side faces up or towards the front. If the shutoff valve unit is installed incorrectly, it may fail.

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PLACEMENT CONSIDERATIONS

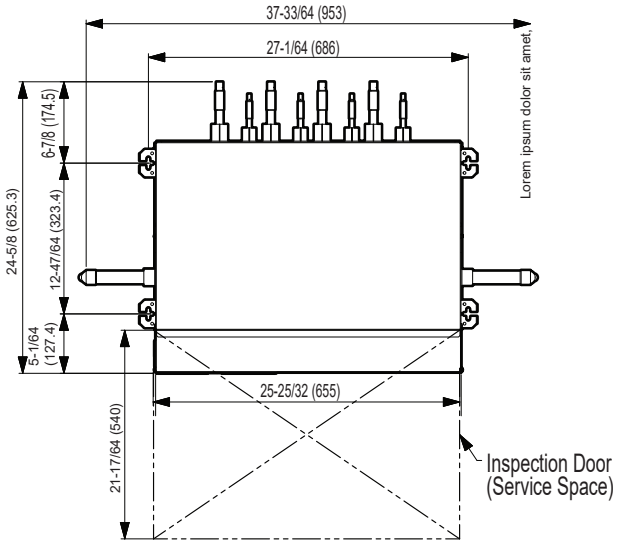
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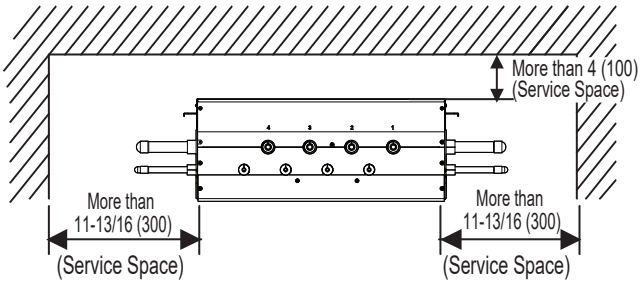
Selecting the Best Location / Clearance Requirements for the Shutoff Valve Unit(s)

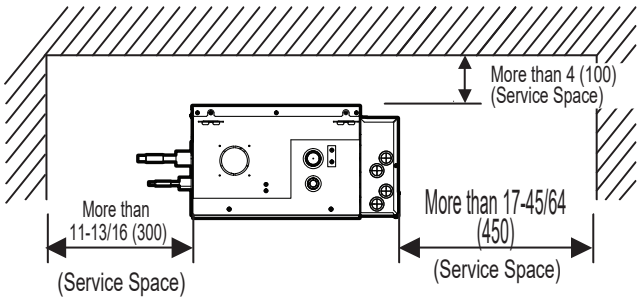
Figure 73: PRHPZ020A, PRHPZ030A, and PRHPZ040A Clearance Requirements.

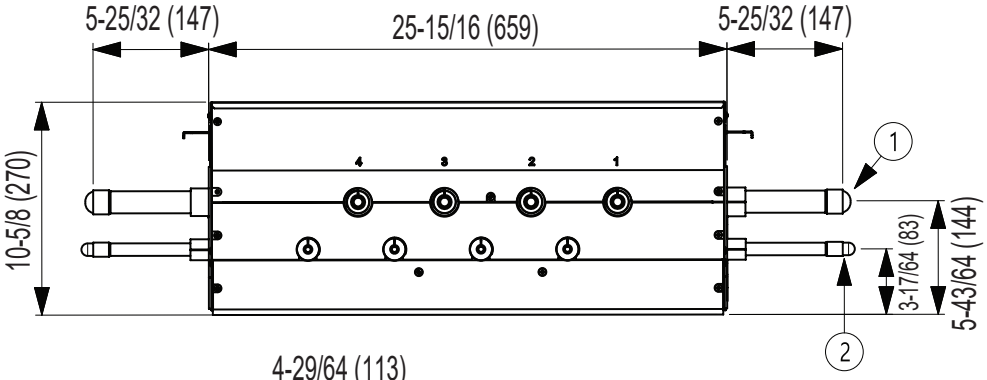
Two-, Three-, and Four-Port Shutoff Valve Units

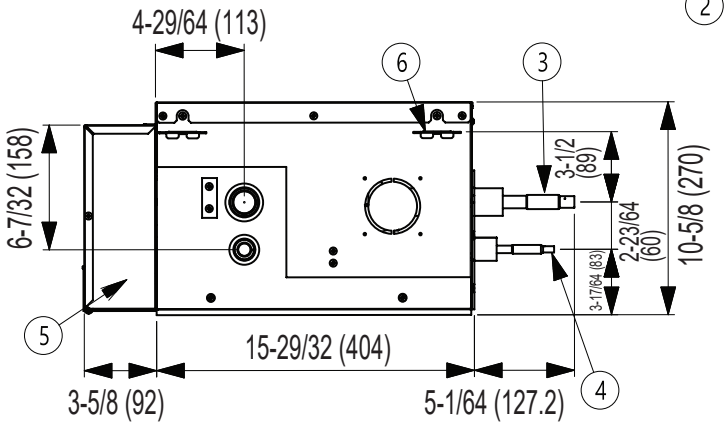
Unit: Inch (mm)











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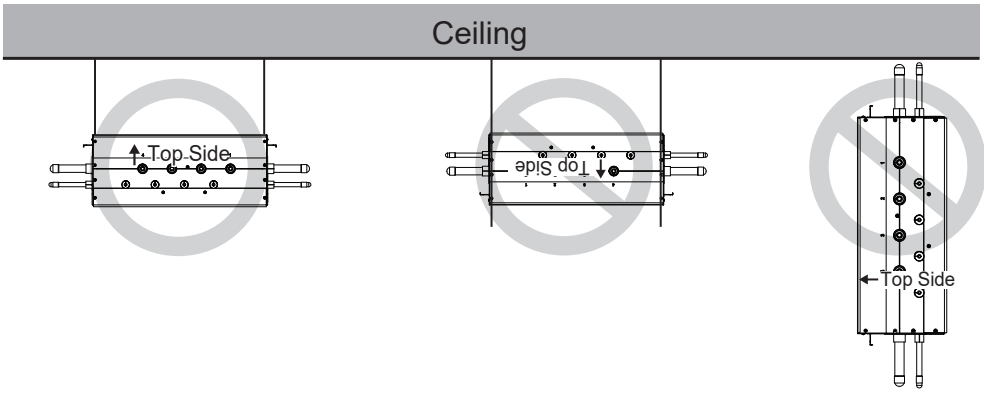
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Table 40: PRHPZ020A, PRHPZ030A, and PRHPZ040A Shutoff Valve Unit Components and Legend.

Part No.	Part Name	Connection Size (in.) / Type		
		PRHPZ020A	PRHPZ030A	PRHPZ040A
1	Outdoor Unit Vapor Pipe Connection Port	Ø7/8 Braze	Ø1-1/8 Braze	Ø1-1/8 Braze
2	Outdoor Unit Liquid Pipe Connection Port	Ø3/8 Braze	Ø1/2 Braze	Ø5/8 Braze
3	Indoor Unit Vapor Pipe Connection Port	Ø5/8 Braze – Ø1/2 Braze		
4	Indoor Unit Liquid Pipe Connection Port	Ø3/8 Braze – Ø1/4 Braze		
5	Control Box	–	–	–
6	Hanger Bracket	M8 or M10 Suspension Bolt		

[1]Include an access panel at the side of the shutoff valve unit where the control box is located.
[2]If reducers are used, service space must be increased equal to the dimensions of the reducer.

Figure 74: Install the Shutoff Valve Unit Top Side Up.



NOTICE

The two-, three- and four-port shutoff valve units must be installed so that the top side faces up. If these shutoff valve unit is installed incorrectly, they may fail.

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LIMITED WARRANTY (USA)

The product's full Limited Warranty terms and conditions and arbitration requirements are available at https://www.lghvac.com.

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