



MULTI VTM **S**

ENGINEERING MANUAL

Variable Refrigerant Flow Outdoor Units
3.0, 4.0, and 4.4 Tons



PROPRIETARY DATA NOTICE

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A summary list of safety precautions is on page 3.

For more technical materials such as submittals, catalogs, installation, owner's, and service manuals, visit www.lghvac.com.

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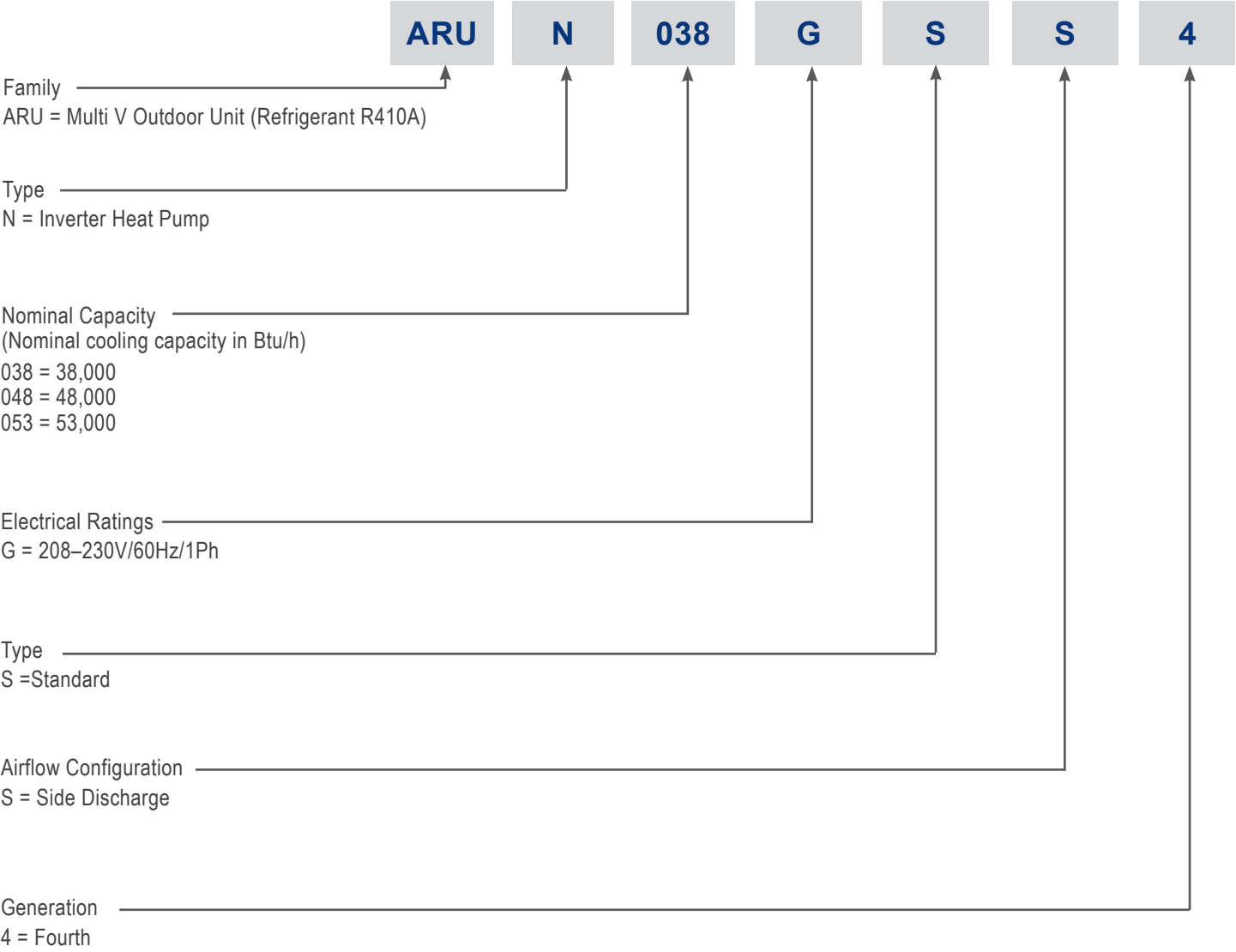
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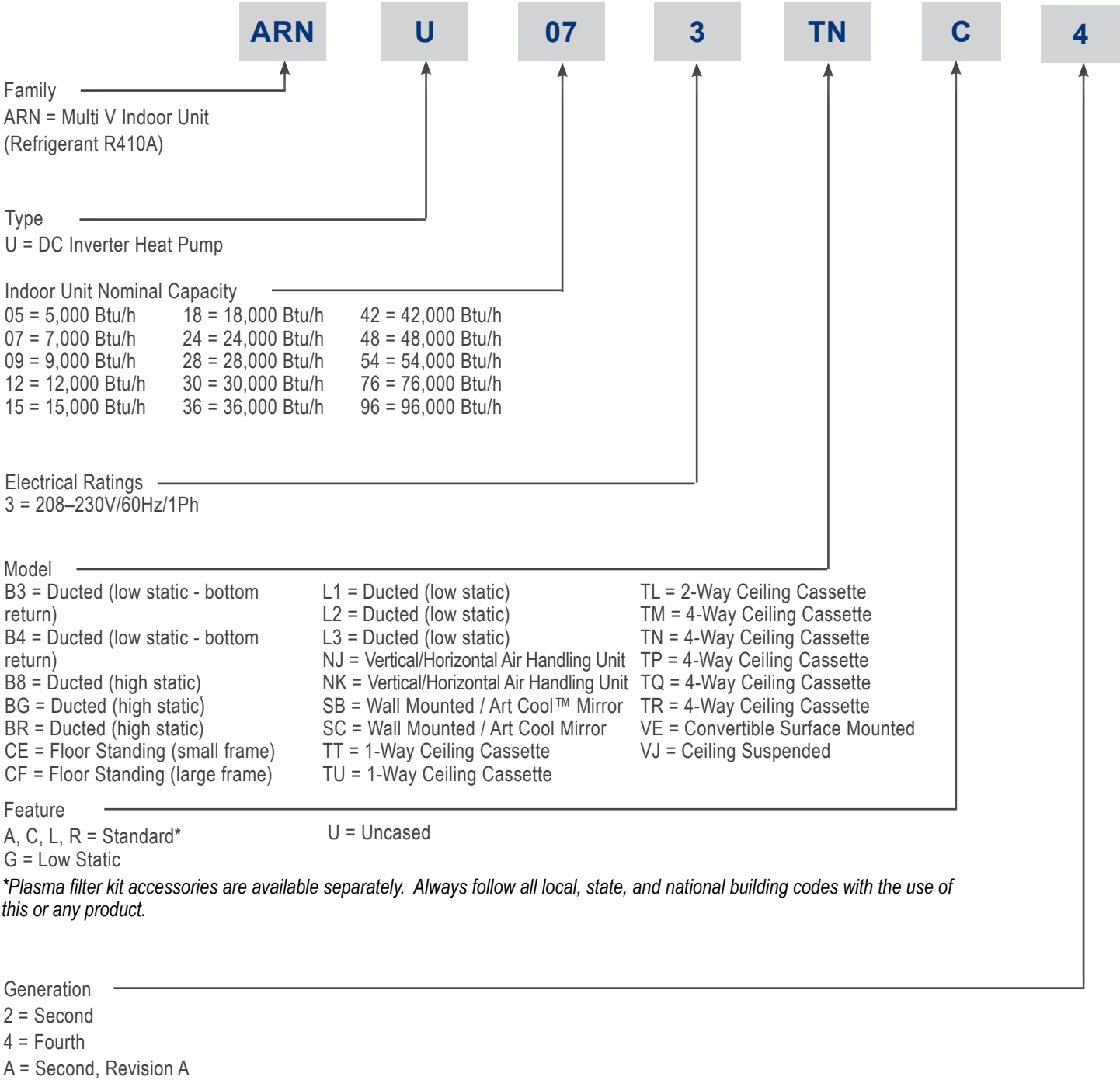
 DANGER	This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	This symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
Note:	This symbol indicates situations that may result in equipment or property damage accidents only.
	This symbol indicates an action should not be completed.

Outdoor Units

Outdoor Units (ODU)



Indoor Units (IDU)



%OA	Percentage Outdoor Air	IDU	Indoor Unit
%RA	Percentage Return Air	IEQ	Indoor Environmental Quality (LEED Related)
ABS	Acrylonitrile Butadiene Styrene	ISO	International Organization for Standardization
AC	Air Conditioner	IUCF	Indoor Unit Correction Factor
ACP	Advanced Control Platform	KTL	Korea Testing Laboratories
AHRI	Air-Conditioning, Heating, and Refrigeration Institute	LEED	Leadership in Energy and Environmental Design
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning	LGAP	LG Air Conditioner Protocol
AHU	Air Handling Unit	MAT	Mixed Air Temperature
AWG	American Wire Gauge	MBh	Thousands BTUs per hour
BLDC	Brushless Digitally Controlled	MCA	Maximum Circuit Ampacity
Btu/h	British Thermal Units per hour	MFS	Maximum Fuel Size
CCR	Corrected Capacity Ratio	MOCP	Maximum Overcurrent Protection
CDOA	Coupled Dedicated Outdoor Air	MR	Materials and Resources (LEED Related)
CFM	Cubic Feet per Minute	NC	New Construction (LEED Related)
CI	Commercial Interiors (LEED® Related)		Normally Closed
COP	Coefficient Of Performance	NEC	National Electrical Code
CR	Combination Ratio	NO	Normally Open
CR	Credit (LEED Related)	OAT	Outdoor Air Temperature
CS	Core and Shell (LEED Related)	O&M	Existing Building Operations and Maintenance (LEED Related)
DB	Dry Bulb	ODU	Outdoor Unit
dB(A)	Decibels with "A" frequency weighting	OUCF	Outdoor Unit Correction Factor
DDOAS	Decoupled Dedicated Outdoor Air	PDI	Power Distribution Integrator
DI	Digital Input	PI	Power Input
DO	Digital Output	PR	Prerequisite (LEED Related)
EA	Energy and Atmosphere (LEED Related)	PTAC	Packaged Terminal Air Conditioner
EEV	Electronic Expansion Valve	PVE	Polyvinyl Ether
ELF	Equivalent Length in Feet	RAT	Return Air Temperature
EPDM	Ethylene Propylene Diene M-Class Rubber	RCL	Refrigerant Concentration Limit
ESP	External Static Pressure	RP	Regional Priority (LEED Related)
ETL	Electronic Testing Laboratories	RUR	Running Unit Ratio
FLA	Full Load Amps	K12	K-12 Schools (LEED Related)
GND	Ground	USGBC	U.S. Green Building Council (LEED Related)
HACR	Heating, Air Conditioning, and Refrigeration	VAH	Vertical Air Handler
HiPOR™	High Pressure Oil Return	VAV	Variable Air Volume
H/M/L	High/Medium/Low	VRF	Variable Refrigerant Flow
HVAC	Heating, , Ventilation and Air Conditioning	VRP	Ventilation Rate Procedure
IAQ	Indoor Air Quality	WB	Wet Bulb
ID	Innovations in Design (LEED Related)	WE	Water Efficiency (LEED Related)

PRODUCT DATA

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MECHANICAL SPECIFICATIONS



Multi V S Outdoor Units—ARUN038, 048, 053GSS4

General

The LG Multi V S heat pump system consists of an outdoor unit, one or more indoor units, integrated system controls, and interconnecting field-provided refrigerant pipe containing various fittings including Y-Branch kits and Header kits supplied by LG. LG components are manufactured in a facility that meets or exceeds International Organization for Standardization (ISO) 9001 and 14001. The units are listed by Intertek (ETL) and bear the ETL listed mark.

Casing

The outdoor unit case is constructed from 22-gauge coated metal. Exterior panels are cleaned and finished with a weather-resistant baked enamel finish. An easily removable front corner panel is provided to allow access to major components and control devices. Outdoor unit fans are covered with guards made of heavy gauge, heavy duty polymeric resin. The outdoor unit coil is protected with a heavy gauge steel wire guard finished with baked enamel. Paint color is "warm gray."

Refrigeration System

The refrigeration system consists of a single refrigeration circuit and uses refrigerant R410A. The outdoor unit is provided with factory installed components, including a refrigerant strainer, oil separator, accumulator, hot gas bypass valve, liquid injection valve, four-way reversing valve, electronic controlled expansion valve (EEV), high and low side charging ports, service valves, and interconnecting piping. Also included is an integral subcooler assembly consisting of a double spiral tube type heat exchanger and EEV providing refrigerant subcooling modulation up to 14°F. The unit comes factory charged with 6.6 pounds of refrigerant.

Refrigeration Oil Control

The refrigeration oil level in the compressor is maintained using a two-stage oil control system. The compressor discharge port is equipped with an oil filtering device designed to restrict oil loss from the compressor. The high-pressure discharge vapor leaves the compressor and immediately enters a centrifugal oil separator that has no moving parts designed to extract oil from the refrigerant gas stream. A gravity drain returns captured oil back to the compressor sump. The outdoor unit microprocessor is programmed to flush the refrigerant piping system for a minimum period of three (3) minutes after eight (8) hours of compressor operation.

Single Inverter / Compressor

The outdoor unit is equipped with one hermetic, digitally-controlled, inverter starting compressor. The compressor is specifically designed for the refrigerant provided and is manufactured by LG. The frequency inverter is designed by LG and is capable of providing a modulation range from 20Hz–90Hz in Cooling mode and 20Hz–100Hz in Heating mode. The compressor motor is suction gas-cooled and has an acceptable voltage range of $\pm 10\%$ of nameplate voltage.

External suction and discharge temperature and pressure sensors are provided to protect the compressor from damage caused by over

/ under temperature or over / under pressure conditions. The compressor is provided with a positive displacement oil pump providing sufficient oil film on all bearing surfaces across the entire inverter modulation range. The compressor is factory charged with Polyvinylether (PVE) refrigeration oil having no hygroscopic properties. Compressor bearings are Teflon® coated. The compressor is wrapped with a heat resistant, sound attenuating blanket and mounted on rubber isolation grommets.

Outdoor Unit Coil

Outdoor unit coils are a minimum of two rows, 14 fins per inch, and manufactured using copper tubes with mechanically bonded aluminum louvered fins. Fin surfaces are coated with Gold-Fin™ corrosion resistant hydrophilic silica gel coating. Coils are pressure tested at a minimum of 551 psig.

Fans and Motors

Units are furnished with two axial flow fans providing horizontal airflow from the rear and discharging from the front of the unit. Fan blades are 20-1/2 inch diameter, balanced, and made of durable Lupos (ABS) polymeric resin. Motors are designed to operate between 110 and 850 RPM in Cooling mode and between 110 and 850 RPM in Heating mode. Both fans are driven by digitally controlled inverters that vary the fan speed. Motors are brushless, digitally controlled (BLDC) and have permanently lubricated and sealed ball bearings. All outdoor unit fans are controlled by an inverter drive mounted near the main microprocessor.

The outdoor unit fan speed is controlled using an algorithm that provides three pre-programmed fan speeds. DIP Switch adjustable settings limit night time (off peak) fan speed to reduce fan generated noise by up to 10 dB(A).

Outdoor Unit Controls

Outdoor units are factory wired with necessary electrical control components, printed circuit boards, thermistors, sensors, terminal blocks, and lugs for power wiring. The control wiring circuit is low voltage and includes a control power transformer, fuses, and interconnecting wiring harness with plug connectors. Microprocessor based algorithms provide component protection, soft-start capability, refrigeration system pressure and temperature control, defrost, and ambient control. The unit is designed to provide continuous compressor operation from -9.9°F to +122°F in cooling mode (with optional low ambient kit).

When the system is started, the connected indoor units are automatically assigned an electronic address by the outdoor unit's microprocessor. Additionally, each indoor unit is capable of

Figure 1: Multi V S Outdoor Unit.



accepting a manual assignment of a secondary electronic address that, if used, provides unit tag identification when integrating with LG VNet control devices.

While operating in the Heating mode, the outdoor unit has a demand based defrost control algorithm and a refrigeration system pump down cycle designed to store up to 6.6 lbs of the system refrigerant charge in the outdoor unit. In Heating mode, a cooperative control algorithm automatically balances, in real-time, the distribution of refrigerant to the indoor units when the system's refrigerant mass flow is insufficient to satisfy the demand of all indoor units when the system is called on to operate outside the system design parameters.

In 10-second intervals, the outdoor unit microprocessor will record the last three minutes of system run-time data in non-volatile memory. Upon unit malfunction, or a power outage that results in a system shutdown, the stored system operational data may be retrieved and analyzed to assist in diagnosing a system malfunction.

The outdoor unit microprocessor is provided with a three-digit, LED display that communicates active system information and / or malfunction codes. The microprocessor has an algorithm that actively verifies the operational condition of system sensors and thermistors. A refrigerant auto-trim-charge algorithm assists the installer with properly charging the system.

A power conditioning circuit is provided and designed to protect the unit's inverter compressor and outdoor unit fan motors from phase failure, phase reversal, sense an under-voltage or over-voltage condition, and to prevent transmission of power irregularities to the supply power source. A snow throw algorithm is provided and designed to reduce snow buildup on the discharge side louvers grille at regular intervals.

GENERAL DATA



Specifications / Electrical Data

Table 1: 208-230V Heat Pump Unit Specifications.

Model Numbers	3.0 Ton	4.0 Ton	4.4 Ton
	ARUN038GSS4	ARUN048GSS4	ARUN053GSS4
Cooling Performance			
Nominal Cooling Capacity (Btu/h) ¹	39,500	50,000	55,500
Rated Cooling Capacity (Btu/h) ²	38,000	48,000	53,000
Heating Performance			
Nominal Heating Capacity (Btu/h) ¹	44,000	56,500	61,500
Rated Heating Capacity (Btu/h) ²	42,000	54,000	59,000
Operating Range			
Cooling (°F DB)	23 - 122	23 - 122	23 - 122
Heating (°F WB)	-4 - +61	-4 - +61	-4 - +61
Compressor			
Inverter Type / Quantity	DC Inverter Starting / 1	DC Inverter Starting / 1	DC Inverter Starting / 1
Oil / Type	PVE / FVC68D	PVE / FVC68D	PVE / FVC68D
Fan (Side Discharge)			
Type	Axial Flow Fan	Axial Flow Fan	Axial Flow Fan
Motor Output (kW) x Qty.	0.124 x 2	0.124 x 2	0.124 x 2
Motor / Drive	Brushless Digitally Controlled / Direct		
Operating Range (RPM)	Cooling	0 - 850	0 - 850
	Heating	0 - 850	0 - 850
Maximum Air Volume (CFM)	3,885	3,885	3,885
Unit Data			
Refrigerant Type	R410A	R410A	R410A
Refrigerant Control/Location	EEV / Indoor Unit	EEV / Indoor Unit	EEV / Indoor Unit
Max. Number Indoor Units / System ³	6	8	9
Sound Pressure dB(A) ⁴	50	51	52
Net Unit Weight (lbs.)	207	207	207
Shipping Weight (lbs.)	218	218	218
Communication Cables ^{5,6}	2 x 18	2 x 18	2 x 18
Heat Exchanger			
Material and Fin Coating	Copper Tube/Aluminum Fin and GoldFin™/Hydrophilic		
Rows / Fins per inch	2 / 14	2 / 14	2 / 14
Piping⁷			
Liquid Line Connection (in., OD)	3/8 Braze	3/8 Braze	3/8 Braze
Vapor Line Connection (in., OD)	5/8 Braze	5/8 Braze	3/4 Braze
Factory Charge lbs. of R410A	6.6	6.6	6.6

¹Nominal capacity applied with non-ducted indoor units, and is rated 0 ft. above sea level with 25 ft. of refrigerant line per indoor unit and a 0 ft. level difference between outdoor and indoor units. All capacities are net with a Combination Ratio between 95–105%.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB) and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and 59°F wet bulb (WB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

²Rated capacity is certified under AHRI Standard 210 / 240 See www.ahrinet.org for information.

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

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

⁵All communication cable to be minimum 18 AWG, 2-conductor, stranded, shielded, and must comply with applicable local and national codes.

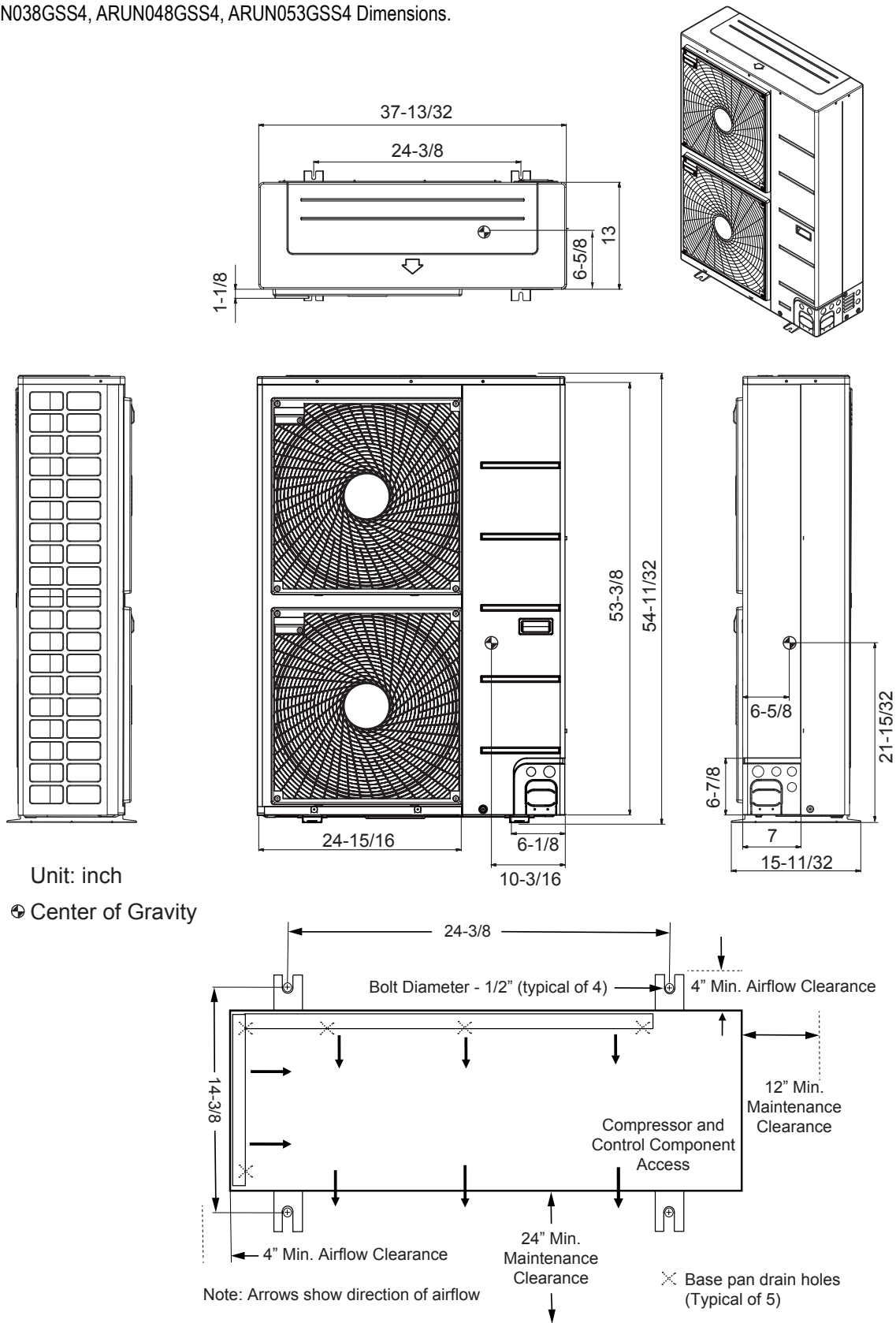
⁶Power wiring cable is field provided and must comply with the applicable local and national codes. See below for detailed electrical data.

⁷Refer to the Refrigerant Piping section of this manual for correct line sizing. Contractor must use LG manufactured Y-Branch and Header Kits only. Designer must verify refrigerant piping design configuration using LG's computerized refrigerant piping (LATS Multi V) software to validate the pipe design.

Table 2: 208-230V Heat Pump Unit Electrical Data.

Nominal Tons	Unit Model No.	Compressor Motor		Condenser Fan Motor		MCA	MOCP
		Quantity	Motor Amps	Fan Qty.	Amps		
			RLA (Ea.)		FLA (Ea.)		
3.0	ARUN038GSS4	1	19.5	2	1.0	25	40
4.0	ARUN048GSS4	1	23.1	2	1.0	30	50
4.4	ARUN053GSS4	1	25.2	2	1.0	33	50

Figure 2: ARUN038GSS4, ARUN048GSS4, ARUN053GSS4 Dimensions.



WIRING DIAGRAM



ARUN038GSS4, ARUN048GSS4, ARUN053GSS4

Figure 3: ARUN038GSS4, ARUN048GSS4, ARUN053GSS4 Wiring Diagram.

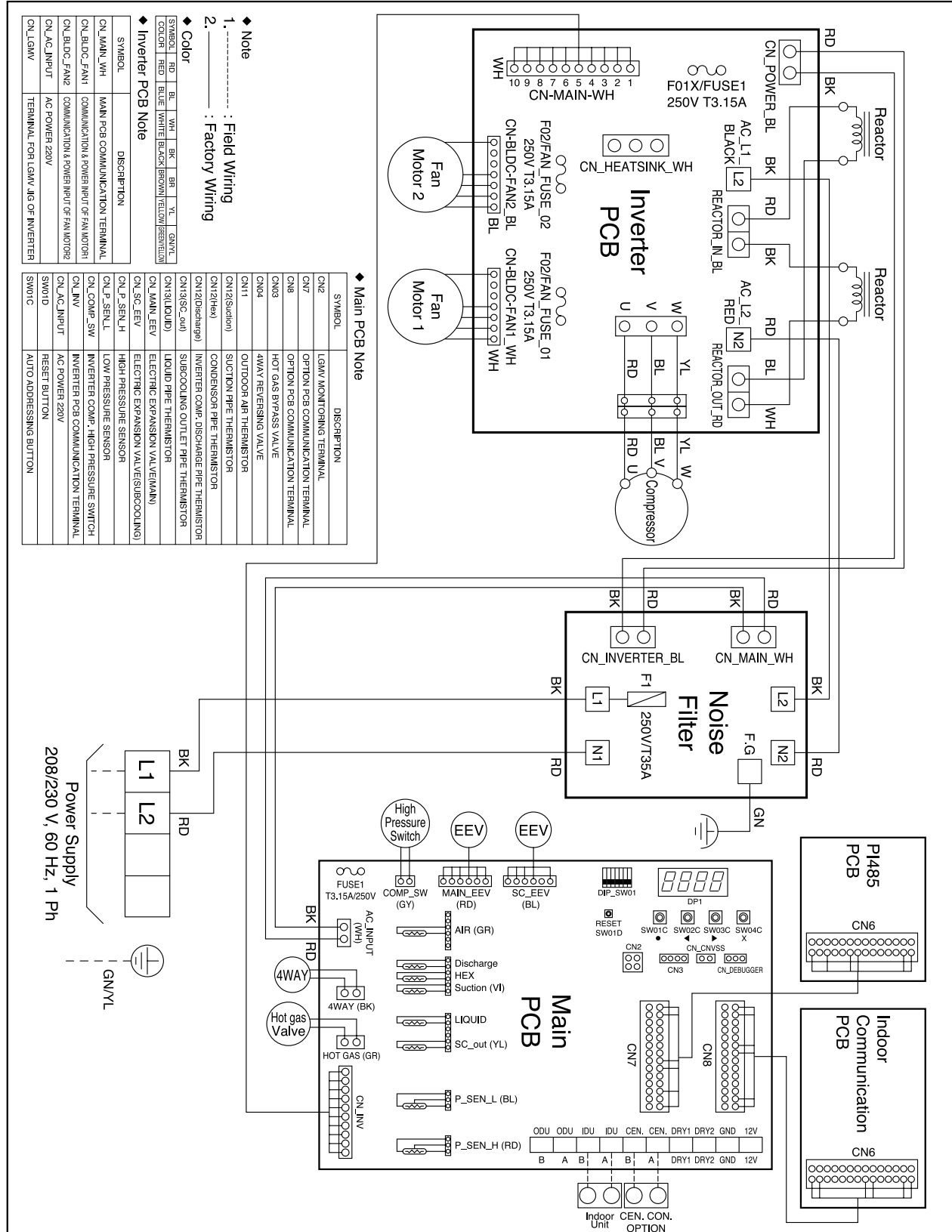
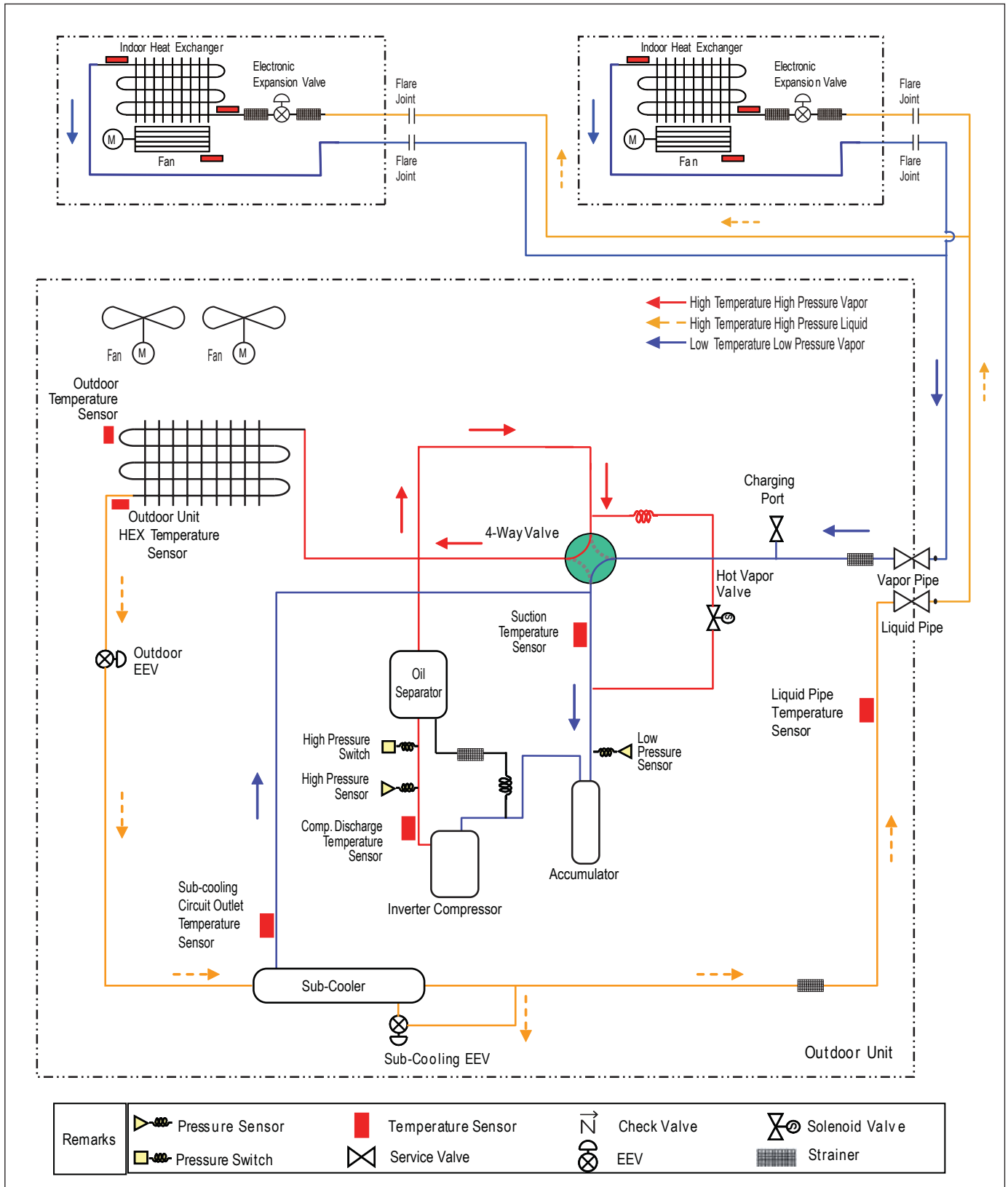


Figure 4: ARUN038GSS4, ARUN048GSS4, ARUN053GSS4 — Cooling Mode.



REFRIGERANT FLOW DIAGRAMS

MULTI VTM S

ARUN038GSS4, ARUN048GSS4, ARUN053GSS4

Heating Mode

Figure 5: ARUN038GSS4, ARUN048GSS4, ARUN053GSS4 — Heating Mode.

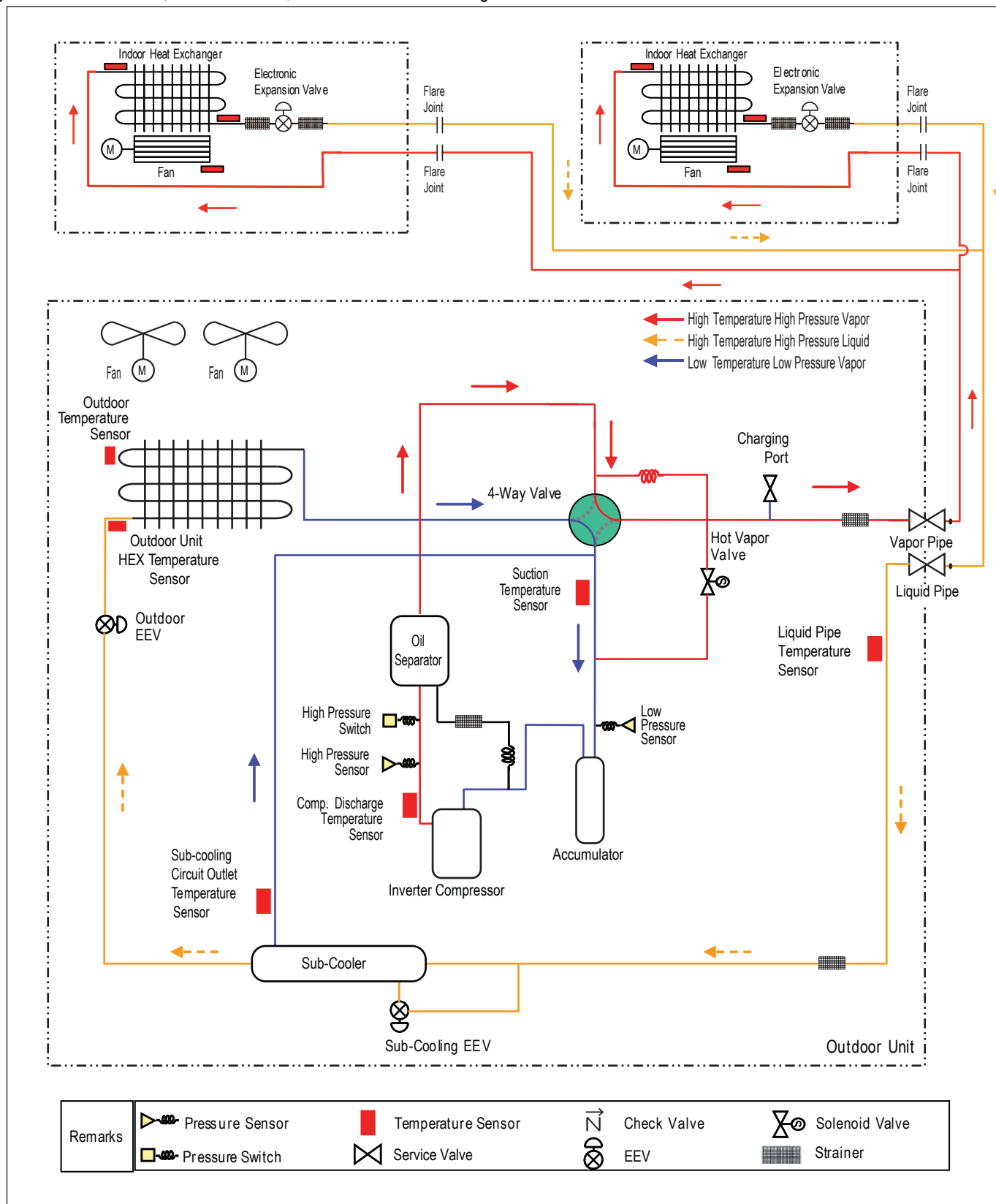
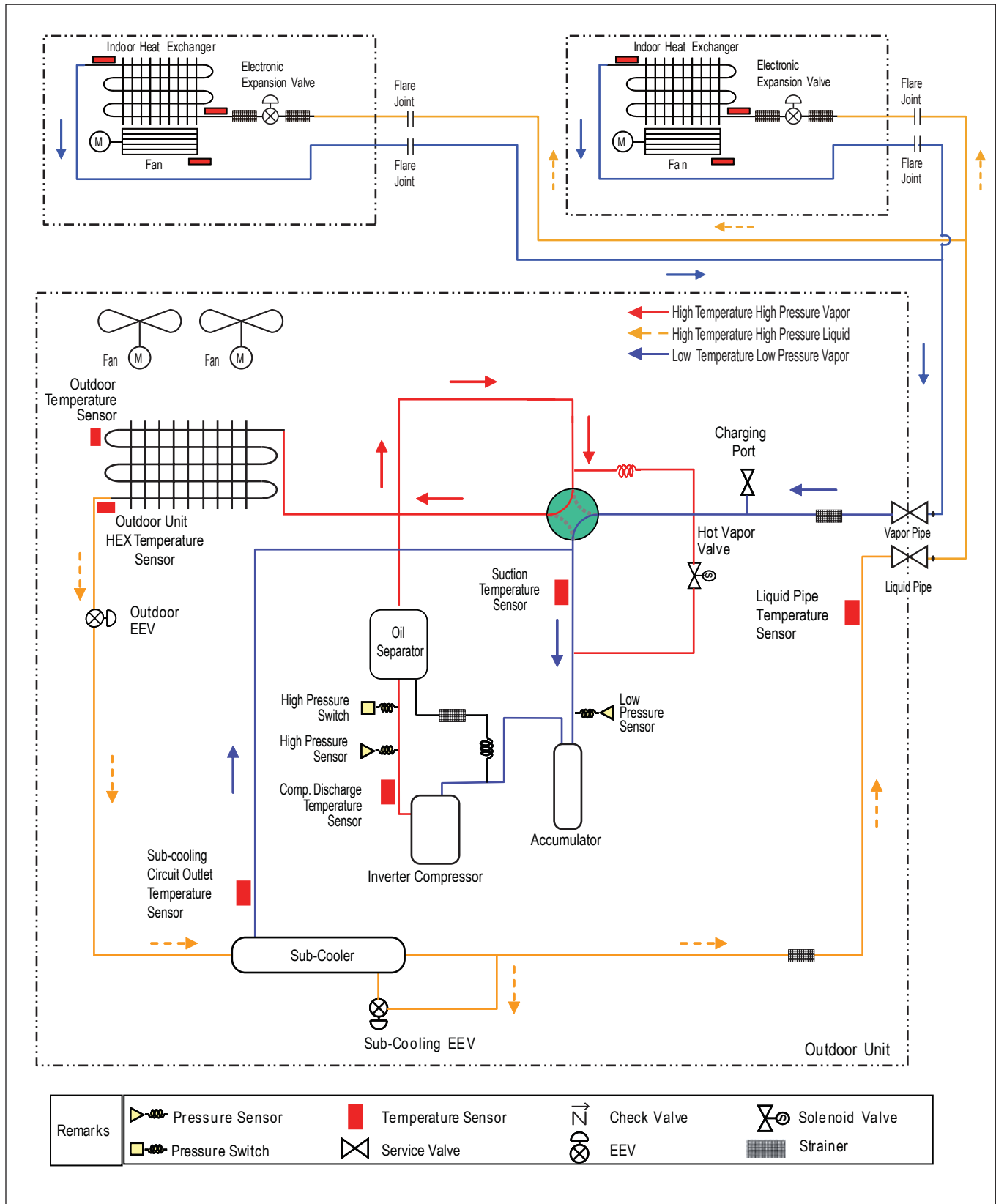


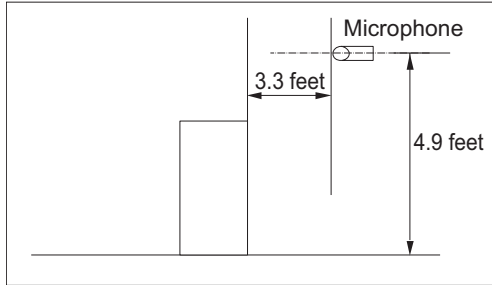
Figure 6: ARUN038GSS4, ARUN048GSS4, ARUN053GSS4 — Oil Return / Defrost.



ACOUSTIC DATA

Sound Pressure Levels - Measurement Location

Figure 7: Acoustic Measurement Location.



- Measurement taken 4.9' above finished floor, and at a distance of 3.3' from face of fan discharge.
- 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 levels are measured in dB(A)±3.
- Tested in anechoic chamber per ISO Standard 3745.
- Off-Peak Operation: Logic takes advantage of lower outdoor ambient temperatures and limits the outdoor unit fan speed during nighttime operation to lower the unit sound level.

Table 3: Multi V S Outdoor Unit Sound Pressure Levels.

Model	Cooling Operation		Heating Operation	
	Peak	Off-Peak	Peak	Off-Peak
ARUN038GSS4	50	40-46	52	41-47
ARUN048GSS4	51	41-47	53	42-48
ARUN053GSS4	52	42-48	54	43-49

Figure 8: Cooling Sound Pressure Level Diagrams.

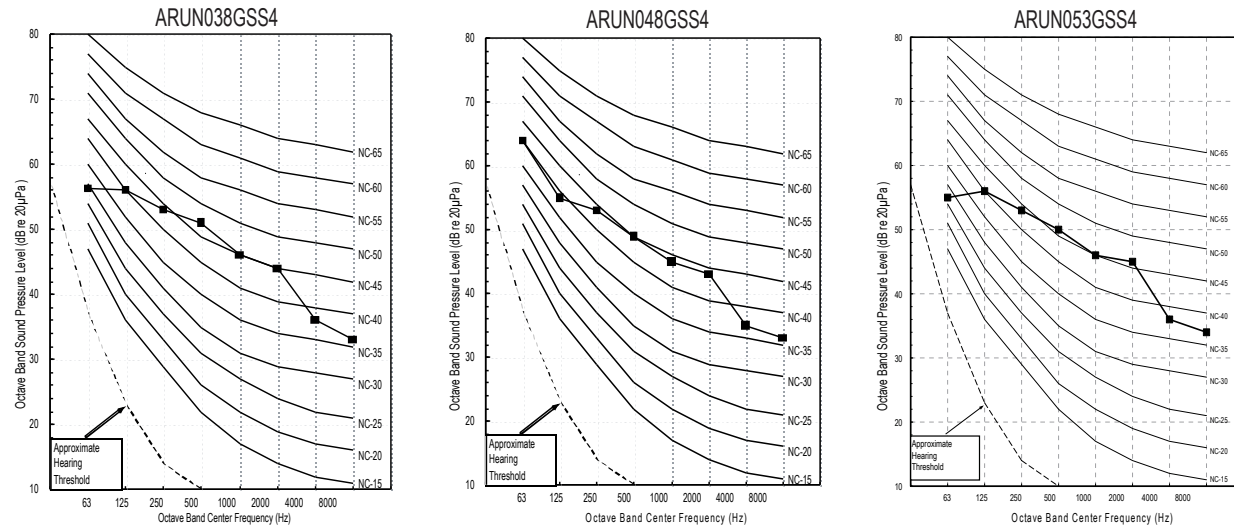


Figure 9: Heating Sound Pressure Level Diagrams.

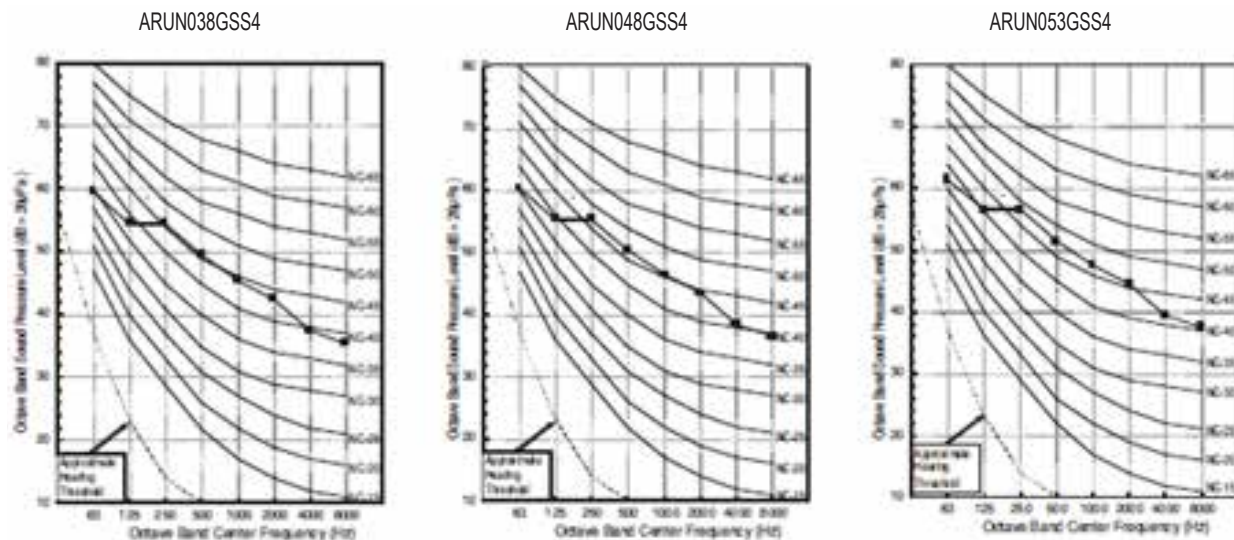
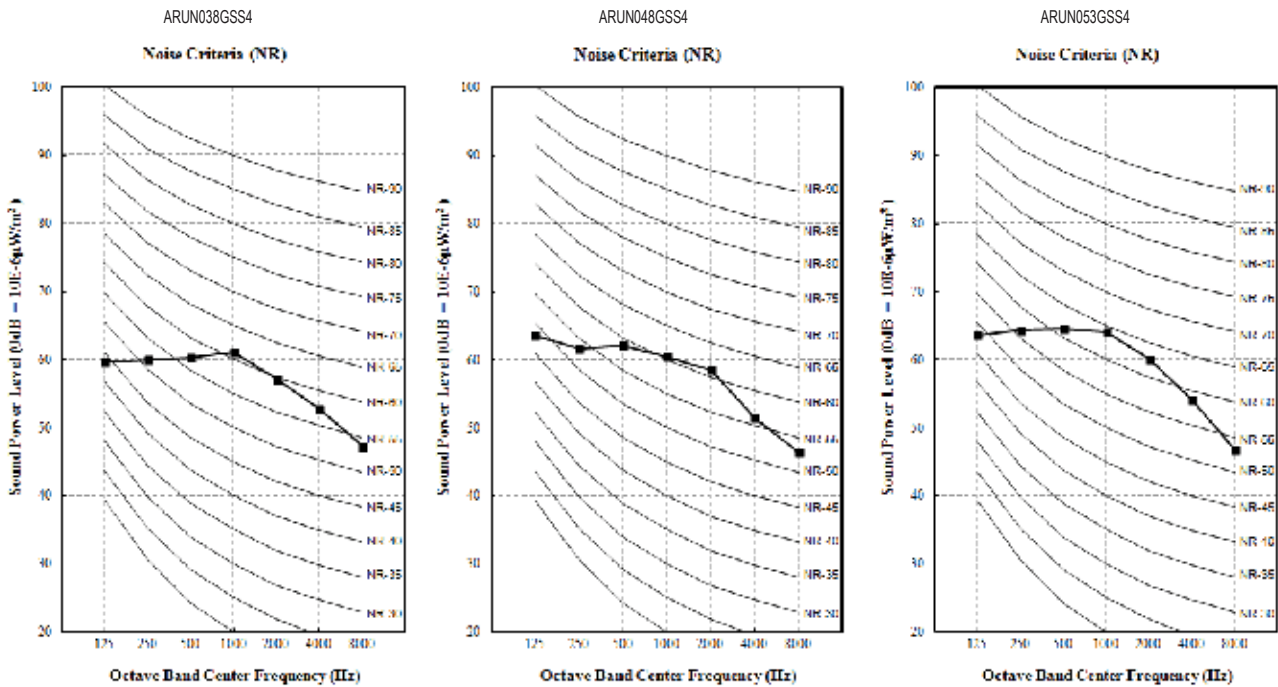


Table 4: Multi V S Outdoor Unit Sound Power Levels.

Models	dB(A)
ARUN038GSS4	66.0
ARUN048GSS4	67.0
ARUN053GSS4	69.0

- Data is valid under diffuse field conditions.
- Data is valid under nominal operating conditions.
- 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/m²







Figure 10: Sound Power Level Diagrams.



OUTDOOR UNIT ACCESSORIES



Table 5: Summary Data—Specialty Application Devices.




Specialty Application Device	Name	Model No.	Connect to	Application	Binary Signals Input/Output	Description
	Simple Dry Contact	PQDSB1	Indoor Unit	On/Off, Run Status, Error Status	1/2	Enables the indoor unit to be controlled and monitored by third party controls using binary inputs and outputs.
	Dry Contact for Economizer, occupied/unoccupied	PQDSBC1		On/Off, Mode, Controller Lock, Power Save, Run Status, Error Status	2/2	
	Dry Contact Unit for 24V Thermostat	PDRYCB300		On/Off, Thermo On/Off, Mode, Fan Speed, Run Status, Error Status	---	Enables the indoor unit to be controlled and monitored by a third party thermostat or controller.
	Digital Output (DO) Kit	PQNFP00T0	Comm Bus	On/Off	0/1	One 25A DPST normally open relay. Used with central controller to control third party device manually or by schedule.
	I/O Module	PEXPMB000	AC Smart IV and ACP IV	Third party equipment control. Allows system expansion through Digital and Analog inputs and outputs.	---	3 Digital Inputs: Dry Contact input only 3 Digital Outputs: Max. 2A@30VAC/DC 4 Analog Outputs: 0 to 10 VDC, configurable; 0 to 20 mA, configurable 4 Universal Inputs individually configurable as analog or digital: Analog: Voltage, Current, Thermistor (NTC, PT, Ni) Digital for Dry Contact input only
	Auxiliary Heater Relay Kit	PRARH0	Indoor Unit	Third party supplemental heat control	0/1	Adds coordinated control of an external heater with normal heat pump operations.
		PRARS0				
	Auxiliary Two-Stage Heater Relay Kit	PRARH1	Indoor Unit	Third party supplemental heat control	0/2	Adds coordinated control of an external heater with normal heat pump operations.
	Power Distribution Indicator (PDI) Premium	PQNUD1S41	Comm Bus	Energy consumption monitoring	8 Watt Node Meters	Monitors total outdoor unit power consumption for up to eight systems, and distributes per indoor unit based on weighted calculation.
	Mode Selector Switch	PRDSBM	Outdoor Unit	Multi V Heat Pump Only	---	Locks outdoor unit into Heat, Cool, or Fan Mode.

Before specifying or placing an order, refer to the V-Net Network Solution Engineering Product Data Book and review the detailed technical data provided to fully understand the capabilities and limitations of these devices.

For information on controller compatibility refer to the Controls and Options Table on page 25.




Table 6: Summary Data—Central Controllers (connect to the outdoor unit terminals Internet A, Internet B).

Central Controller	Name	Model No.	Devices per Controller	Systems per Comm Bus	Devices per Comm Bus	No. of Comm Bus Ports	Binary Signals Input/Output	Power, Conn	Description
	AC Smart IV	PACS4B000	128	16	128	1	2 DI / 2 DO	24 VAC	Monitors / operates indoor units through a touch screen. Manages up to 128 devices. Advanced functions include programmable schedules, temperature setpoint range lock, remote controller lock, run time limit, manual control and scheduling of digital output kit, peak / demand control, visual floor plan navigation, web access, operation and error history log, one digital input and two digital outputs for device interlocking and error e-mail notification.
	AC Ez	PQCSZ250S0	32	16	256	1	---	12 VDC, ODU	Provides for scheduling in addition to basic indoor unit control and monitoring.
	Advanced Control Platform IV (ACP IV)	PACP4B000	256	16	64	4	10/4	24 VAC	Provides for scheduling, remote controller lock, setpoint range limit, web access, peak / demand control, PDI integration, and AC Manager Plus integration advanced functionality in addition to basic unit control and monitoring.

Before specifying or placing an order, refer to the V-Net Network Solution Engineering Product Data Book and review the detailed technical data provided to fully understand the capabilities and limitations of these devices. For information on controller compatibility refer to the Controls and Options Table on page 38.

Table 7: Summary Data—Integration Solutions (connect to outdoor unit terminals Internet A, Internet B).

Integration Solution	Name	Model No.	Devices per Controller	Systems per Comm Bus	Devices per Comm Bus	No. of Comm Bus Ports	Power	Binary Signals Input/Output	Description
	ACP IV BACnet TM Gateway*	PQNFB17C1	256	16	256	4	24 VAC	10/4	Allow integration of LG equipment for control and monitoring by open protocol BACnet TM and LonWorks TM building automation and controls systems.*
	LonWorks TM Gateway*	PLNWK100	64	16	64	1	24 VAC	2/2	

Before specifying or placing an order, refer to the V-Net Network Solution Engineering Product Data Book and review the detailed technical data provided to fully understand the capabilities and limitations of these devices. For information on controller compatibility refer to the Controls and Options Table on page 25.

* BACnetTM is a trademark of ASHRAE; LonWorksTM is a trademark of Echelon Corporation.

LG Monitoring View (LGMV) Diagnostic Software and Cable

(PRCTSL1 and PRCTFE1)

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

- Actual inverter compressor speed
- Target inverter compressor speed
- Actual outdoor fan speed
- Target outdoor unit fan speed
- Actual superheat
- Target superheat
- Actual subcooler circuit superheat
- Target subcooler circuit superheat
- Main EEV position
- Subcooling EEV position
- Inverter compressor current transducer value
- Outdoor air temperature
- Actual high pressure/saturation temperature
- Actual low pressure/saturation temperature
- Suction temperature
- Inverter compressor discharge temperature
- Constant speed compressor discharge temperature
- Front outdoor coil pipe temperature
- Back outdoor coil pipe temperature
- Liquid line pipe temperature
- Subcooler inlet temperature
- Subcooler outlet temperature
- Average indoor unit (IDU) pipe temperature
- Inverter compressor operation indicator light
- Four-way reversing valve operation indicator light
- Pressure graph showing actual low pressure and actual high pressure levels
- Error code display
- Operating mode indicator
- Target high pressure
- Target low pressure
- PCB (printed circuit board) version
- Software version
- Installer name
- Model number 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
 - IDUs
 - 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 IDU's default setpoints of 86°F in heat mode or 64°F in cool mode.
4. Setting: Converts metric values to imperial values.
5. Making Data: Recording of real time data to a separate file created to be stored on the user's computer.
6. Loading Data: Recorded data from a saved ".CSV" file can be loaded to create an LGMV session.
7. Electrical Data: The lower half of main screen is changed to show the following:
 - Inverter compressor
 - Amps
 - Volts
 - Power Hz
 - Inverter control board fan Hz
 - Constant compressor
 - Current transducer value
 - Phase

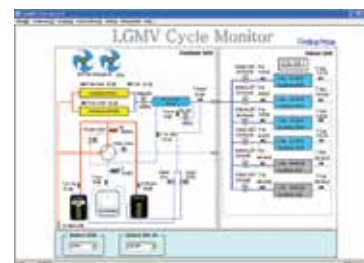


Figure 11: MV Cycleview.

The software is available in a high version with all of the features listed above. The low version has all features as the high version without Target High Pressure and Target Low Pressure values shown on main screen.







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

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

Recommended Minimum PC Configuration:

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

Table 8: Summary Data—Wall-Mounted / Ceiling Cassette Indoor Units.

Unit/Type ¹	ARNU*****2	Dimensions (W x D x H) (inches)	Nominal Capacity Btu/h		Air Flow Rate (CFM) (H/M/L ⁴)	Weight (lbs.)	Pipe Connections (inches, O.D.) (Liquid, Vapor)
			Cooling ³	Heating ³			
Wall Mounted—ART COOL™ Mirror 	053 SBR4	35-1/4 x 8-1/8 x 11-7/16	5,500	6,100	230/212/194	24	1/4, 1/2
	073 SBR4		7,500	8,500	247/230/194		
	093 SBR4		9,600	10,900	290/247/194		
	123 SBR4		12,300	13,600	336/290/230		
	153 SBR4		15,400	17,100	371/318/247		
	183 SCR4	40-9/16 x 9-11/16 x 12-13/16	19,100	21,500	441/424/399	34	3/8, 5/8
	243 SCR4		24,200	27,300	494/449/406		
Wall Mounted—Standard 	053 SBL4	35-1/4 x 8-15/16 x 11-7/16	5,500	6,100	1,120/1,080/1,050	22	1/4, 1/2
	073 SBL4		7,500	8,500	1,190/1,120/1,050		
	093 SBL4		9,600	10,900	1,260/1,190/1,050		
	123 SBL4		12,300	13,600	1,420/1,260/1,120		
	153 SBL4		15,400	17,100	1,550/1,350/1,190		
	183 SCL4	40-5/16 x 9-7/8 x 12-13/16	19,100	21,500	1,120/1,050/980	31	3/8, 5/8
	243 SCL4		24,200	27,300	1,280/1,140/1,000		
Ceiling Cassette—One Way 	073 TUC4	Body: 33-7/8 x 17-3/4 x 6-11/16 Panel: 43-5/16 x 19-3/4 x 1-3/8	7,500	8,500	290/258/226	Body: 33 Panel: 10	1/4, 1/2
	093 TUC4		9,600	10,900	325/304/290		
	123 TUC4		12,300	13,600	353/325/290		
	183 TTC4	Body: 46-1/2 x 17-3/4 x 6-7/8 Panel: 55-15/16 x 19-3/4 x 1-3/8	19,100	21,500	470/427/385	Body: 42 Panel: 13	3/8, 5/8
	243 TTC4		24,200	24,200	515/470/406		
Ceiling Cassette—Two Way 	183 TLC4	Body: 32-11/16 x 21-5/8 x 8-7/8 Panel: 41-5/16 x 25-3/16 x 1-5/8	19,100	21,500	459/424/353	Body: 49 Panel: 11	1/4, 1/2
	243 TLC4		24,200	27,300	601/530/459		3/8, 5/8
Ceiling Cassette—Four Way (2' x 2') 	053 TRC4	Body: 22-7/16 x 22-7/16 x 8-7/16 Panel: 27-9/16 x 27-9/16 x 7/8	5,500	6,100	265/247/212	Body: 29 Panel: 7	1/4, 1/2
	073 TRC4		7,500	8,500	265/247/212		
	093 TRC4		9,600	10,900	283/265/251		
	123 TRC4		12,300	13,600	307/283/247		
	153 TQC4	Body: 22-7/16 x 22-7/16 x 10-3/32 Panel: 27-9/16 x 27-9/16 x 7/8	15,400	17,100	388/353/328	Body: 35 Panel: 7	
	183 TQC4		19,100	21,500	396/388/353		
Ceiling Cassette—Four Way (3' x 3') 	243 TPC4	Body: 33-1/16 x 33-1/16 x 8 Panel: 37-3/8 x 37-3/8 x 1-7/16	24,200	27,300	600/530/459	Body: 48 Panel: 13	3/8, 5/8
	283 TPC4		28,000	31,500	671/565/494		
	073 TNA4	Body: 33-1/16 x 33-1/16 x 9-11/16 Panel: 37-3/8 x 37-3/8 x 1-7/16	7,500	8,500	459/424/388	Body: 54 Panel: 13	
	093 TNA4		9,600	10,900	477/424/388		
	123 TNA4		12,300	13,600	494/459/424		
	153 TNA4		15,400	17,100	530/459/424		
	183 TNA4		19,100	21,500	565/530/424		
	243 TNA4		24,200	27,300	742/671/600		
	363 TNC4		36,200	40,600	883/777/706		
	243 TMA4	Body: 33-1/16 x 33-1/16 x 11-5/16 Panel: 37-3/8 x 37-3/8 x 1-7/16	24,200	27,300	777/706/635	Body: 59 Panel: 13	
	283 TMA4		28,000	31,500	812/741/635		
	363 TMA4		36,200	40,600	918/812/706		
	423 TMC4		42,000	43,800	1,059/918/812		
	483 TMC4		48,100	51,200	1,130/953/883		

¹All indoor units require 208–230V/60Hz/1Ph and an AWG18-2 communication cable.

²Model number shows nominal capacity and frame size designator.



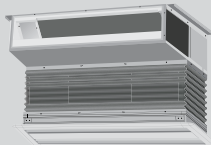

³Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB) and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and 60°F wet bulb (WB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

⁴H/M/L = High/Medium/Low

INDOOR UNIT QUICK REFERENCE

Table 9: Summary Data—Recessed Mounted Indoor Units.

Unit/Type ¹	ARNU ^{*****2}	Dimensions (W x D x H) (inches)	Nominal Capacity Btu/h		Air Flow Rate (CFM) (H/M/L ⁴)	Weight (lbs.)	Pipe Connections (inches, O.D.) (Liquid, Vapor)	Max. ESP (inches)	
			Cooling ³	Heating ³					
<div>Ducted High Static</div> 	073 BGA4	46-1/2 x 17-3/4 x 11-3/4	7,500	8,500	441/406/332	84	3/8, 5/8	0.62	
	093 BGA4		9,600	10,900	452/406/332				
	123 BGA4		12,300	13,600	477/427/332				
	153 BGA4		15,400	17,100	487/417/293				
	183 BGA4		19,100	21,500	537/487/417				
	243 BGA4		24,200	27,300	671/537/487				
	283 BGA4		28,000	31,500	915/851/770				
	363 BGA4		36,200	40,600	1,141/1,024/894				
	423 BGA4		42,000	43,800	1,218/1,141/1,084				
	283 BRA4	48-7/16 x 23-3/8 x 15	28,000	31,500	1,151/1,105/1,074	112		0.78	
	363 BRA4		36,200	40,600	1,430/1,151/1,105				
	423 BRA4		42,000	43,800	1,497/1,430/1,151				
	483 BRA4		48,100	51,200	1,568/1,395/1,183				
	543 BRA4		54,000	61,400	1,819/1,678/1,395				
	363 B8A4	61-1/2 x 27-1/8 x 18-1/8	36,200	40,600	1,896/1,748/1,550	192	3/8, 3/4	0.98	
	423 B8A4		42,000	43,800	1,963/1,786/1,589				
	483 B8A4		48,100	51,200	2,048/1,846/1,670		3/8, 7/8		
	763 B8A4		76,400	86,000	2,050/1,766/1,766				
	963 B8A4		95,900	107,500	2,542/2,260/2,260				
<div>Ducted Low Static</div> 	073 L1G4	27-9/16 x 27-9/16 x 7-1/2	7,500	8,500	270/230/200	39	1/4, 1/2	0.19	
	093 L1G4		9,600	10,900	320/250/200				
	123 L2G4	35-7/16 x 27-9/16 x 7-1/2	12,300	13,600	360/310/250	51			
	153 L2G4		15,400	17,100	450/360/310				
	183 L2G4		19,100	21,500	530/450/360				
	243 L3G4	43-5/16 x 27-9/16 x 7-1/2	24,000	27,300	710/570/430	60	3/8, 5/8		
<div>Ducted Low Static - Built In</div> 	073 B3G4	32-5/8 x 22-5/8 x 7-1/2	7,500	8,500	283/229/194	46	1/4, 1/2	0.15	
	093 B3G4		9,600	10,900	318/247/212				
	123 B3G4		12,300	13,600	353/283/229				
	153 B3G4		15,400	17,100	388/353/283				
	183 B4G4	43-5/16 x 22-5/8 x 7-1/2	19,100	21,500	494/424/353	57			3/8, 5/8
	243 B4G4		24,200	27,300	600/530/353				
<div>Vertical/Horizontal Air Handling Unit</div> 	123 NJA4	18 x 21-1/4 x 48-11/16	12,000	13,500	530/480/380	117	3/8, 5/8	1.0	
	183 NJA4		18,000	20,000	580/530/480				
	243 NJA4		24,000	27,000	710/640/480				
	303 NJA4		30,000	34,000	880/800/630				
	363 NJA4		36,000	40,000	990/880/800	121			
	423 NKA4	25 x 21-1/4 x 55-3/16	42,000	46,000	1,250/1,100/1,000	165			
	483 NKA4		48,000	54,000	1,400/1,260/1,000				
	543 NKA4		54,000	60,000	1,475/1,400/1,260				

¹All indoor units require 208–230V/60Hz/1Ph and an AWG18-2 communication cable.





²Model number shows nominal capacity and frame size designator.

³Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB) and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and 60°F wet bulb (WB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

⁴H/M/L = High/Medium/Low

Table 10: Summary Data—Surface Mounted / Floor Standing Indoor Units.

Unit/Type ¹	ARNU**** ²	Dimensions (W x D x H) (inches)	Nominal Capacity Btu/h		Air Flow Rate (CFM) (H/M/L ⁴)	Weight (lbs.)	Pipe Connections (inches, O.D.) (Liquid, Vapor)
			Cooling ³	Heating ³			
Ceiling Suspended 	183 VJA2	37-7/16 x 8-11/16 x 25-5/8	19,100	21,500	565/495/424	55	1/4, 1/2
	243 VJA2		24,200	27,300	636/565/495		3/8, 5/8
Convertible Surface Mounted 	093 VEA2	35-7/16 x 7-7/8 x 19-5/16	9,600	10,900	268/243/219	31	1/4, 1/2
	123 VEA2		12,300	13,600	325/268/244		
Floor Standing – Cased 	073 CEA4	42 x 8 x 25	7,500	8,500	300/265/229	60	1/4, 1/2
	093 CEA4		9,600	10,900	335/300/265		
	123 CEA4		12,300	13,600	371/335/300		
	153 CEA4		15,400	17,100	406/353/335		
	183 CFA4	52-15/16 x 8 x 25	19,100	21,500	565/494/424	75	3/8, 5/8
	243 CFA4		24,200	27,300	635/565/494		
Floor Standing – Uncased 	073 CEU4	38-1/2 x 7-15/16 x 25-3/16	7,500	8,500	300/265/229	46	1/4, 1/2
	093 CEU4		9,600	10,900	335/300/265		
	123 CEU4		12,300	13,600	371/335/300		
	153 CEU4		15,400	17,100	406/353/335		
	183 CFU4	49-7/16 x 7-1/2 x 25-3/16	19,100	21,500	565/494/424	58	3/8, 5/8
	243 CFU4		24,200	27,300	635/565/494		

¹All indoor units require 208–230V/60Hz/1Ph and an AWG18-2 communication cable.







²Model number shows nominal capacity and frame size designator.

³Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB) and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and 60°F wet bulb (WB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

⁴H/M/L = High/Medium/Low



Table 11: Summary Data—Zone Controllers

Zone Controller	Name	Model No.	Case Color	Max Wire Length (ft)	Description
	Simple Controller with mode selection	PQRCVCL0Q	Black	164	Allows control of indoor unit on/off, operation mode, fan speed, and temperature setpoint for up to 16 indoor units.
		PQRCVCL0QW	White		
	Simple Controller without mode selection	PQRCHCA0Q	Black	164	Allows control of indoor unit on/off, fan speed, and temperature setpoint for up to 16 indoor units.
		PQRCHCA0QW	White		
	LG Premium Controller	PREMTA000	Ivory	164	Allows control of indoor unit on/off, operation mode, occupied/unoccupied temperature setpoints, fan speed, and air flow direction for up to 16 indoor units. Programmable schedule with 5 events per day with control of occupied/unoccupied, on/off, mode, setpoints and fan speed. Advanced functions include two setpoint autochangeover, minimum difference between setpoints, setback, timed override, target energy consumption display, check energy display and master/slave.
	LG Programmable Thermostat	PREMTB10U	White	164	Allows control of indoor unit on/off, operation mode, occupied and unoccupied temperature setpoints, fan speed, and airflow direction for up to 16 indoor units. Programmable schedule with 5 events per day with control of occupied unoccupied, on/off, mode, setpoints and fan speed. Advanced functions include two setpoint autochangeover, minimum difference between setpoints, setback and timed override.
	Wireless Handheld	PQWRHQ0FDB	Ivory	----	Allows control of indoor unit on/off, operation mode, fan speed, and temperature setpoint.
	Wall-Mounted Remote Temperature Sensor	PQRSTA0	Ivory	50	Allows remote temperature measurement for cassette and ducted units.

Before specifying or placing an order, refer to the V-Net Network Solution Engineering Product Data Book and review the detailed technical data provided to fully understand the capabilities and limitations of these devices.

For information on controller compatibility refer to the Controls and Options Table on page 106.

Table 12: Summary Data—Zone Controller Communication Cables

Communication Cable	Name	Model No.	Wire Length (ft.)	Description
	Wired Remote Group Control Cable Assembly	PZCWRCG3	33	Required when grouping multiple indoor units with a single zone controller.
	Wired Remote/Group Control Extension Cable	PZCWRC1	33	Increases the distance between a remote controller and an indoor unit or between indoor units in a control group.

Before specifying or placing an order, refer to the V-Net Network Solution Engineering Product Data Book and review the detailed technical data provided to fully understand the capabilities and limitations of these devices.

For information on controller compatibility refer to the Controls and Options Table on page 25.

Table 13: Indoor Units—Controls and Options.

Feature		Wall Mount, Std. Finish	Wall Mount, ART COOL™ Mirror	1-Way Cassette	2-Way Cassette	4-Way Cassette		Duct High Static	Duct Low Static	Duct Low Static, Bottom Return	Vert.-Horiz. AHU (NJ)	Vert.-Horiz. AHU (NK)	Ceiling Suspend.	Convert. Surface Mount	Floor Mount, Cased	Floor Mount, Uncased
Nominal Size (MBh)		5–24	7–24	7–24	18–24	5–18	24–48	7–96	7–24	7–24	12–36	42–53	18–24	9–12	7–24	7–24
Airflow	Air supply outlets	1	1	1	2	4	4	1	1	1	1	1	1	1	1	1
	Airflow direction (left/right)	manual	auto										manual	manual		
	Auto airflow direction (up/down)	√	√	√	√	√	√						√	√		
	Fan speed (Heating mode)	3	3	4	4	4	4	3	3	3	3	3	3	3	3	3
	Fan speed (Cooling mode)	4	4	5	5	5	5	3	3	3	3	3	4	4	3	3
	Fan speed (fan mode)	3	3	4	4	4	4	3	3	3	3	3	3	3	3	3
	Chaos swing (random louver swing)	√	√													
	Chaos wind (random fan speed)	√	√	√	√	√	√						√	√		
Operation	Jet-cool (power cooling)	√	√	√	√	√	√						√	√		
	E.S.P. control							√	√	√	√	√				
	High ceiling			√	√	√	√			√	√	√	√	√	√	√
	Auto-restart after power restore	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Hot start	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Diagnostics	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Auto changeover ¹	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Auto operation ⁶	√	√	√	√	√	√	√	√							
	Auto clean (coil dry)	√	√							√	√	√	√	√	√	√
	Child lock	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Dual thermistor control	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Dual set-point control*	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Filter life display*	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Power consumption display (with PDI)*	√	√	√	√	√	√	√	√				√	√		
	External on/off control*	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Forced operation	√	√	√	√	√	√			√	√	√	√	√	√	√
	Group control – Requires the use of one Group control cable kit (PZCWRG3) for every additional indoor unit	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Timer (on/off)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Weekly schedule	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Test operation mode	√	√	√	√	√	√	√	√		√	√				
Filter	Plasma ³	0	√	0	0	0	0									
	Washable anti-fungal ²	√	√	√	√	√	√	√	√	0			0	0	0	0
Controllers	7-day programmable controller	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Simple controller w/mode	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Simple controller w/o mode	0	0	0	0	0	0	0	0	0 ⁴	0	0	0	0	0 ⁴	0 ⁴
	Wireless controller	0	0	0	0	0	0	0 ⁴	0 ⁴	√						
Others	Condensate lift			√	√	√	√	√	√	√						
	Ventilation air			√		√ ⁵	√ ⁵	√	√				√	√	√	
	Casing	√	√	√	√	√	√									
	Standard grille			√	√	√	√									
	Auto elevation grille					0				0						
	Suction grille									0						
	Suction canvas										√	√				
	Aux. heat kit															

*To enable new Generation 4 features, outdoor unit DIP Switch No. 3 must be set to ON.

¹For Heat Recovery systems only.

²Primary washable filters.

³Plasma filter kit accessories available separately.

⁴Requires 7-day programmable zone controller.

⁵Requires ventilation kit PTVK430 or PTVK420 (For TP, TN, TM frames) (Temperature, humidity, and volume limitations apply).

⁶Heat Pump systems only.

√ = Standard feature

0 = Unit option

PERFORMANCE DATA

Cooling Capacity Data on page 28

Heating Capacity Data on page 43

PERFORMANCE DATA



Cooling Capacity

ARUN038GSS4

38,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
130%	-9.9	34.6	1.13	41.0	1.37	47.7	1.62	49.5	1.75	50.2	1.89	51.9	2.17	53.1	2.24
	-5	34.6	1.19	41.0	1.44	47.7	1.71	49.5	1.85	50.2	1.99	51.9	2.29	53.1	2.36
	0	34.6	1.24	41.0	1.50	47.7	1.78	49.5	1.92	50.2	2.07	51.9	2.38	53.1	2.46
	5	34.6	1.28	41.0	1.56	47.7	1.85	49.5	1.99	50.2	2.15	51.9	2.46	53.1	2.55
	10	34.6	1.32	41.0	1.60	47.7	1.90	49.5	2.05	50.2	2.21	51.9	2.54	53.1	2.62
	14	34.6	1.37	41.0	1.66	47.7	1.97	49.5	2.12	50.2	2.29	51.9	2.63	53.1	2.71
	20	34.6	1.39	41.0	1.69	47.7	2.00	49.5	2.16	50.2	2.32	51.9	2.66	53.1	2.75
	25	34.6	1.41	41.0	1.71	47.7	2.02	49.5	2.18	50.2	2.35	51.9	2.69	53.1	2.79
	30	34.6	1.43	41.0	1.73	47.7	2.05	49.5	2.21	50.2	2.38	51.9	2.72	53.1	2.82
	35	34.6	1.45	41.0	1.75	47.7	2.07	49.5	2.24	50.2	2.41	51.9	2.76	53.1	2.85
	40	34.6	1.46	41.0	1.77	47.7	2.09	49.5	2.26	50.2	2.43	51.9	2.79	53.1	2.89
	45	34.6	1.48	41.0	1.79	47.7	2.12	49.5	2.29	50.2	2.46	51.9	2.82	53.1	2.92
	50	34.6	1.49	41.0	1.81	47.7	2.14	49.5	2.31	50.2	2.48	51.9	2.85	53.1	2.95
	55	34.6	1.52	41.0	1.84	47.7	2.18	48.8	2.36	49.5	2.53	51.2	2.90	52.4	2.97
	60	34.6	1.57	41.0	1.91	47.0	2.27	47.7	2.45	48.2	2.63	50.0	2.99	51.2	3.00
	65	34.6	1.60	41.0	1.95	46.3	2.31	47.0	2.50	47.5	2.68	49.3	3.09	50.5	3.11
	70	34.6	1.54	41.0	1.87	45.4	2.30	46.0	2.53	46.7	2.78	48.4	3.09	49.6	3.12
	75	34.6	1.58	41.0	1.99	44.7	2.46	45.3	2.72	46.0	2.98	47.7	3.23	48.9	3.26
	80	34.6	1.79	41.0	2.27	43.5	2.82	44.0	3.11	44.7	3.42	46.4	3.51	47.7	3.54
	85	34.6	1.91	41.0	2.43	42.8	3.01	43.5	3.32	44.0	3.63	45.7	3.66	46.9	3.69
	90	34.6	2.16	40.3	2.76	41.6	3.42	42.1	3.78	42.8	3.91	44.5	3.94	45.7	3.98
	95	34.9	2.30	40.1	2.93	41.3	3.65	42.0	4.04	42.5	4.05	44.2	4.09	45.5	4.13
	100	34.9	2.48	39.4	3.17	40.6	3.96	41.3	4.25	41.8	4.27	43.7	4.31	44.9	4.35
	105	34.9	2.80	38.3	3.59	39.5	4.46	40.1	4.57	40.8	4.59	42.2	4.63	42.8	4.68
	110	34.9	3.14	36.7	4.05	38.2	4.87	38.4	4.89	38.9	4.91	39.8	4.96	39.9	5.00
	115	34.7	3.64	35.4	4.65	35.4	5.13	35.4	5.13	35.4	5.13	35.9	5.14	36.1	5.15
	118	30.2	3.08	30.8	3.94	30.8	4.32	30.8	4.36	30.8	4.36	31.3	4.36	31.1	4.37
	122	24.1	2.34	24.7	3.00	24.6	3.29	24.6	3.29	24.7	3.30	25.1	3.31	25.1	3.32
120%	-9.9	31.4	1.06	37.5	1.29	43.6	1.52	46.7	1.64	48.8	1.77	51.0	2.03	52.1	2.10
	-5	31.4	1.12	37.5	1.36	43.6	1.61	46.7	1.73	48.8	1.87	51.0	2.14	52.1	2.22
	0	31.4	1.17	37.5	1.41	43.6	1.67	46.7	1.80	48.8	1.95	51.0	2.23	52.1	2.31
	5	31.4	1.21	37.5	1.46	43.6	1.73	46.7	1.87	48.8	2.02	51.0	2.31	52.1	2.39
	10	31.4	1.24	37.5	1.51	43.6	1.78	46.7	1.92	48.8	2.07	51.0	2.38	52.1	2.46
	14	31.4	1.29	37.5	1.56	43.6	1.85	46.7	1.99	48.8	2.15	51.0	2.47	52.1	2.55
	20	31.4	1.31	37.5	1.58	43.6	1.88	46.7	2.02	48.8	2.18	51.0	2.50	52.1	2.58
	25	31.4	1.33	37.5	1.60	43.6	1.90	46.7	2.05	48.8	2.21	51.0	2.53	52.1	2.62
	30	31.4	1.34	37.5	1.62	43.6	1.92	46.7	2.08	48.8	2.23	51.0	2.56	52.1	2.65
	35	31.4	1.36	37.5	1.64	43.6	1.94	46.7	2.10	48.8	2.26	51.0	2.59	52.1	2.68
	40	31.4	1.38	37.5	1.66	43.6	1.97	46.7	2.13	48.8	2.29	51.0	2.62	52.1	2.71
	45	31.4	1.39	37.5	1.68	43.6	1.99	46.7	2.15	48.8	2.31	51.0	2.65	52.1	2.74
	50	31.4	1.41	37.5	1.70	43.6	2.01	46.7	2.18	48.8	2.34	51.0	2.68	52.1	2.77
	55	31.4	1.43	37.5	1.73	43.6	2.05	46.7	2.22	48.3	2.39	50.3	2.73	51.6	2.80
	60	31.4	1.48	37.5	1.80	43.6	2.14	46.4	2.31	46.9	2.48	49.1	2.81	50.1	2.86
	65	31.4	1.51	37.5	1.83	43.6	2.18	45.7	2.35	46.4	2.53	48.4	2.91	49.6	2.93
	70	31.4	1.48	37.5	1.80	43.6	2.21	44.8	2.43	45.3	2.67	47.5	2.97	48.6	2.99
	75	31.4	1.52	37.5	1.92	43.6	2.37	44.1	2.61	44.8	2.86	46.8	3.11	48.0	3.13
	80	31.4	1.72	37.5	2.18	42.4	2.71	42.9	2.99	43.4	3.28	45.5	3.37	46.6	3.40
	85	31.4	1.83	37.5	2.33	41.7	2.89	42.2	3.19	42.9	3.48	44.8	3.51	46.1	3.54
	90	31.4	2.08	37.5	2.65	40.5	3.28	41.0	3.63	41.5	3.76	43.6	3.79	44.7	3.82
	95	31.8	2.20	37.9	2.82	40.2	3.50	40.7	3.87	41.4	3.89	43.3	3.93	44.6	3.96
	100	31.8	2.39	37.9	3.05	39.5	3.80	40.2	4.08	40.7	4.10	42.8	4.14	43.9	4.18
	105	31.8	2.69	37.3	3.45	38.4	4.29	39.1	4.38	39.6	4.41	41.6	4.45	42.2	4.49
	110	31.8	3.02	36.4	3.89	37.5	4.67	37.7	4.70	38.2	4.71	39.4	4.76	39.6	4.80
	115	30.9	3.49	35.0	4.47	35.0	4.93	35.0	4.93	35.0	4.93	35.9	4.94	36.1	4.95
	118	27.6	3.08	30.5	3.79	30.5	4.14	30.5	4.18	30.5	4.18	31.3	4.19	31.1	4.20
	122	22.0	2.34	24.4	2.88	24.3	3.15	24.4	3.16	24.4	3.17	25.1	3.18	25.1	3.19

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

The System Combination Ratio must be between 50-130%.

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

ARUN038GSS4

Cooling Capacity

38,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
110%	-9.9	29.1	0.98	34.8	1.18	40.4	1.40	43.2	1.52	46.0	1.62	50.7	1.85	51.8	1.92
	-5	29.1	1.03	34.8	1.24	40.4	1.48	43.2	1.60	46.0	1.71	50.7	1.96	51.8	2.03
	0	29.1	1.07	34.8	1.29	40.4	1.53	43.2	1.66	46.0	1.78	50.7	2.03	51.8	2.11
	5	29.1	1.11	34.8	1.34	40.4	1.59	43.2	1.72	46.0	1.85	50.7	2.11	51.8	2.19
	10	29.1	1.14	34.8	1.38	40.4	1.64	43.2	1.77	46.0	1.90	50.7	2.17	51.8	2.25
	14	29.1	1.19	34.8	1.43	40.4	1.70	43.2	1.84	46.0	1.97	50.7	2.25	51.8	2.33
	20	29.1	1.20	34.8	1.45	40.4	1.72	43.2	1.86	46.0	2.00	50.7	2.29	51.8	2.37
	25	29.1	1.22	34.8	1.47	40.4	1.74	43.2	1.89	46.0	2.02	50.7	2.32	51.8	2.40
	30	29.1	1.23	34.8	1.49	40.4	1.76	43.2	1.91	46.0	2.05	50.7	2.35	51.8	2.43
	35	29.1	1.25	34.8	1.51	40.4	1.79	43.2	1.93	46.0	2.08	50.7	2.38	51.8	2.47
	40	29.1	1.27	34.8	1.53	40.4	1.81	43.2	1.96	46.0	2.11	50.7	2.42	51.8	2.50
	45	29.1	1.29	34.8	1.56	40.4	1.84	43.2	1.99	46.0	2.14	50.7	2.46	51.8	2.54
	50	29.1	1.31	34.8	1.58	40.4	1.87	43.2	2.03	46.0	2.18	50.7	2.50	51.8	2.58
	55	29.1	1.33	34.8	1.61	40.4	1.91	43.2	2.07	46.0	2.22	50.0	2.54	51.0	2.60
	60	29.1	1.37	34.8	1.67	40.4	1.99	43.2	2.15	46.0	2.31	48.7	2.62	49.8	2.64
	65	29.1	1.40	34.8	1.71	40.4	2.03	43.2	2.19	46.0	2.35	48.0	2.71	49.1	2.73
	70	29.1	1.42	34.8	1.72	40.4	2.12	43.2	2.33	45.1	2.56	47.1	2.84	48.2	2.87
	75	29.1	1.45	34.8	1.84	40.4	2.27	43.2	2.50	44.4	2.74	46.4	2.98	47.5	3.00
	80	28.8	1.65	34.4	2.09	40.0	2.59	42.2	2.86	42.7	3.15	44.7	3.23	45.7	3.26
	85	28.8	1.76	34.4	2.23	40.0	2.77	41.5	3.06	42.1	3.34	44.0	3.37	45.0	3.40
	90	28.8	1.99	34.4	2.54	39.8	3.15	40.3	3.48	40.8	3.60	42.7	3.63	43.8	3.67
	95	28.8	2.11	34.4	2.70	39.1	3.36	39.6	3.72	40.1	3.73	42.0	3.76	43.1	3.80
	100	28.8	2.29	34.4	2.92	38.6	3.64	39.1	3.91	39.6	3.93	41.5	3.97	42.5	4.00
	105	28.8	2.58	34.4	3.31	37.4	4.11	37.9	4.21	38.4	4.23	40.3	4.26	41.3	4.31
	110	28.8	2.89	34.4	3.73	36.2	4.48	36.3	4.50	36.9	4.52	38.0	4.56	38.2	4.61
	115	28.8	3.35	34.4	4.28	34.7	4.72	34.7	4.72	34.8	4.72	35.5	4.73	35.7	4.74
	118	27.9	3.05	29.9	3.63	30.2	3.97	30.2	4.01	30.3	4.01	30.9	4.02	30.8	4.02
	122	22.3	2.31	24.0	2.76	24.1	3.02	24.1	3.03	24.3	3.04	24.8	3.04	24.8	3.06
100%	-9.9	25.6	0.86	30.5	1.04	35.5	1.23	38.0	1.34	41.8	1.45	46.8	1.67	49.4	1.74
	-5	25.6	0.91	30.5	1.10	35.5	1.30	38.0	1.41	41.8	1.53	46.8	1.77	49.4	1.84
	0	25.6	0.94	30.5	1.14	35.5	1.35	38.0	1.47	41.8	1.59	46.8	1.84	49.4	1.91
	5	25.6	0.98	30.5	1.18	35.5	1.40	38.0	1.53	41.8	1.65	46.8	1.90	49.4	1.98
	10	25.6	1.01	30.5	1.22	35.5	1.44	38.0	1.57	41.8	1.70	46.8	1.96	49.4	2.04
	14	25.6	1.04	30.5	1.26	35.5	1.49	38.0	1.63	41.8	1.76	46.8	2.03	49.4	2.11
	20	25.6	1.08	30.5	1.30	35.5	1.54	38.0	1.67	41.8	1.82	46.8	2.09	49.4	2.17
	25	25.6	1.10	30.5	1.33	35.5	1.58	38.0	1.71	41.8	1.86	46.8	2.14	49.4	2.22
	30	25.6	1.13	30.5	1.37	35.5	1.62	38.0	1.75	41.8	1.91	46.8	2.19	49.4	2.27
	35	25.6	1.15	30.5	1.39	35.5	1.64	38.0	1.78	41.8	1.94	46.8	2.22	49.4	2.31
	40	25.6	1.17	30.5	1.41	35.5	1.67	38.0	1.81	41.8	1.97	46.8	2.26	49.4	2.35
	45	25.6	1.19	30.5	1.44	35.5	1.70	38.0	1.84	41.8	2.01	46.8	2.31	49.4	2.40
	50	25.6	1.22	30.5	1.47	35.5	1.74	38.0	1.88	41.8	2.05	46.8	2.35	49.4	2.45
	55	25.6	1.24	30.5	1.50	35.5	1.77	38.0	1.92	41.8	2.09	46.8	2.39	48.9	2.48
	60	25.6	1.28	30.5	1.55	35.5	1.85	38.0	2.00	41.8	2.18	46.7	2.47	47.5	2.53
	65	25.6	1.30	30.5	1.59	35.5	1.88	38.0	2.04	41.8	2.22	46.0	2.55	47.0	2.60
	70	25.6	1.34	30.5	1.63	35.5	2.01	38.0	2.21	41.8	2.46	45.1	2.73	46.0	2.78
	75	25.6	1.38	30.5	1.74	35.5	2.15	38.0	2.37	41.8	2.64	44.4	2.86	45.4	2.90
	80	25.6	1.57	30.5	1.98	35.5	2.46	38.0	2.71	41.8	3.03	43.2	3.11	44.0	3.15
	85	25.6	1.67	30.5	2.12	35.5	2.63	38.0	2.90	41.6	3.21	42.5	3.24	43.5	3.28
	90	25.6	1.89	30.5	2.40	35.5	2.98	38.0	3.30	40.2	3.46	41.2	3.49	42.1	3.54
	95	25.6	2.00	30.5	2.56	35.5	3.18	38.0	3.52	39.7	3.59	40.5	3.62	41.6	3.67
	100	25.6	2.16	30.5	2.76	35.5	3.44	37.3	3.70	39.0	3.77	40.0	3.81	40.9	3.86
	105	25.6	2.43	30.5	3.11	35.3	3.87	36.3	3.96	37.8	4.04	38.8	4.08	39.7	4.13
	110	25.6	2.71	30.5	3.49	34.9	4.20	35.6	4.22	36.4	4.30	36.9	4.34	37.6	4.41
	115	25.6	3.12	30.5	3.99	33.2	4.40	34.2	4.40	35.1	4.47	35.4	4.47	35.5	4.50
	118	25.6	3.15	26.8	3.74	28.9	3.70	29.8	3.73	30.5	3.79	30.8	3.80	30.7	3.82
	122	21.9	2.85	21.5	2.85	23.0	2.82	23.8	2.82	24.4	2.87	24.7	2.88	24.7	2.90

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

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

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

PERFORMANCE DATA



Cooling Capacity

ARUN038GSS4

38,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
90%	-9.9	23.1	0.77	27.5	0.92	32.1	1.09	34.3	1.17	36.5	1.25	40.9	1.44	45.3	1.58
	-5	23.1	0.81	27.5	0.97	32.1	1.15	34.3	1.23	36.5	1.32	40.9	1.52	45.3	1.67
	0	23.1	0.84	27.5	1.01	32.1	1.19	34.3	1.28	36.5	1.37	40.9	1.58	45.3	1.73
	5	23.1	0.87	27.5	1.05	32.1	1.24	34.3	1.33	36.5	1.42	40.9	1.64	45.3	1.80
	10	23.1	0.90	27.5	1.08	32.1	1.27	34.3	1.37	36.5	1.46	40.9	1.68	45.3	1.85
	14	23.1	0.93	27.5	1.12	32.1	1.32	34.3	1.42	36.5	1.51	40.9	1.74	45.3	1.91
	20	23.1	0.96	27.5	1.16	32.1	1.37	34.3	1.47	36.5	1.58	40.9	1.81	45.3	1.99
	25	23.1	0.99	27.5	1.19	32.1	1.41	34.3	1.52	36.5	1.63	40.9	1.86	45.3	2.05
	30	23.1	1.02	27.5	1.23	32.1	1.45	34.3	1.56	36.5	1.68	40.9	1.91	45.3	2.11
	35	23.1	1.05	27.5	1.27	32.1	1.49	34.3	1.61	36.5	1.73	40.9	1.97	45.3	2.18
	40	23.1	1.08	27.5	1.30	32.1	1.54	34.3	1.66	36.5	1.78	40.9	2.03	45.3	2.24
	45	23.1	1.11	27.5	1.33	32.1	1.57	34.3	1.70	36.5	1.83	40.9	2.07	45.3	2.29
	50	23.1	1.13	27.5	1.36	32.1	1.61	34.3	1.73	36.5	1.87	40.9	2.12	45.3	2.34
	55	23.1	1.15	27.5	1.38	32.1	1.64	34.3	1.77	36.5	1.90	40.9	2.16	45.3	2.36
	60	23.1	1.19	27.5	1.44	32.1	1.70	34.3	1.84	36.5	1.98	40.9	2.25	44.9	2.39
	65	23.1	1.21	27.5	1.47	32.1	1.73	34.3	1.87	36.5	2.01	40.9	2.29	44.6	2.51
	70	23.1	1.24	27.5	1.51	32.1	1.80	34.3	1.98	36.5	2.16	40.9	2.55	43.8	2.70
	75	23.1	1.27	27.5	1.58	32.1	1.92	34.3	2.12	36.5	2.32	40.9	2.66	43.1	2.82
	80	23.1	1.42	27.5	1.79	32.1	2.20	34.3	2.42	36.5	2.65	40.9	2.94	41.9	3.06
	85	23.1	1.51	27.5	1.91	32.1	2.35	34.3	2.58	36.5	2.83	40.4	3.10	41.2	3.19
	90	23.1	1.71	27.5	2.16	32.1	2.66	34.3	2.94	36.5	3.22	39.2	3.39	40.0	3.44
	95	23.1	1.82	27.5	2.29	32.1	2.84	34.3	3.13	36.5	3.44	38.5	3.52	39.4	3.57
	100	23.1	1.88	27.5	2.39	32.1	2.96	34.3	3.26	36.5	3.52	38.0	3.67	38.7	3.71
	105	23.1	2.18	27.5	2.77	32.1	3.34	34.3	3.57	36.1	3.77	36.8	3.94	37.3	3.98
	110	23.1	2.50	27.5	3.20	32.1	3.67	34.3	3.85	34.6	4.09	35.1	4.23	35.3	4.27
	115	23.1	2.71	27.5	3.47	30.0	3.86	32.5	4.03	33.0	4.22	33.3	4.31	33.4	4.37
	118	23.1	2.87	26.8	3.74	26.1	3.25	28.3	3.42	28.7	3.58	29.0	3.66	28.8	3.70
	122	21.9	2.85	21.5	2.85	20.8	2.47	22.6	2.58	23.0	2.71	23.3	2.77	23.2	2.81
80%	-9.9	20.5	0.66	24.4	0.80	28.5	0.93	30.4	1.01	32.4	1.09	36.3	1.24	40.2	1.39
	-5	20.5	0.70	24.4	0.85	28.5	0.98	30.4	1.07	32.4	1.15	36.3	1.31	40.2	1.46
	0	20.5	0.73	24.4	0.88	28.5	1.02	30.4	1.11	32.4	1.20	36.3	1.36	40.2	1.52
	5	20.5	0.76	24.4	0.91	28.5	1.06	30.4	1.15	32.4	1.24	36.3	1.41	40.2	1.58
	10	20.5	0.78	24.4	0.94	28.5	1.09	30.4	1.18	32.4	1.27	36.3	1.46	40.2	1.62
	14	20.5	0.81	24.4	0.97	28.5	1.13	30.4	1.23	32.4	1.32	36.3	1.51	40.2	1.68
	20	20.5	0.84	24.4	1.01	28.5	1.17	30.4	1.27	32.4	1.37	36.3	1.56	40.2	1.74
	25	20.5	0.86	24.4	1.03	28.5	1.21	30.4	1.31	32.4	1.40	36.3	1.61	40.2	1.80
	30	20.5	0.89	24.4	1.06	28.5	1.25	30.4	1.35	32.4	1.44	36.3	1.65	40.2	1.85
	35	20.5	0.91	24.4	1.09	28.5	1.28	30.4	1.38	32.4	1.48	36.3	1.70	40.2	1.90
	40	20.5	0.94	24.4	1.12	28.5	1.32	30.4	1.42	32.4	1.52	36.3	1.75	40.2	1.96
	45	20.5	0.95	24.4	1.14	28.5	1.34	30.4	1.44	32.4	1.54	36.3	1.77	40.2	1.98
	50	20.5	0.96	24.4	1.15	28.5	1.35	30.4	1.46	32.4	1.56	36.3	1.79	40.2	2.01
	55	20.5	0.98	24.4	1.17	28.5	1.38	30.4	1.49	32.4	1.59	36.3	1.83	40.2	2.04
	60	20.5	1.01	24.4	1.21	28.5	1.43	30.4	1.54	32.4	1.66	36.3	1.89	40.2	2.13
	65	20.5	1.03	24.4	1.24	28.5	1.46	30.4	1.57	32.4	1.69	36.3	1.93	40.2	2.18
	70	20.5	1.06	24.4	1.27	28.5	1.50	30.4	1.62	32.4	1.76	36.3	2.08	40.2	2.41
	75	20.5	1.08	24.4	1.30	28.5	1.57	30.4	1.73	32.4	1.88	36.3	2.21	40.2	2.54
	80	20.5	1.18	24.4	1.47	28.5	1.79	30.4	1.96	32.4	2.14	36.3	2.54	40.2	2.83
	85	20.5	1.26	24.4	1.56	28.5	1.91	30.4	2.09	32.4	2.29	36.3	2.71	40.2	2.91
	90	20.5	1.41	24.4	1.77	28.5	2.16	30.4	2.38	32.4	2.61	36.3	2.98	39.5	3.08
	95	20.5	1.50	24.4	1.88	28.5	2.31	30.4	2.52	32.4	2.77	36.3	3.08	38.7	3.16
	100	20.5	1.62	24.4	2.02	28.5	2.49	30.4	2.70	32.4	2.88	36.3	3.21	37.8	3.27
	105	20.5	1.84	24.4	2.32	28.5	2.77	30.4	2.90	32.4	3.09	35.9	3.33	36.7	3.43
	110	20.5	2.09	24.4	2.64	28.5	2.94	30.4	3.10	32.4	3.33	34.6	3.46	34.8	3.61
	115	20.5	2.24	24.4	2.82	28.5	3.04	30.4	3.26	30.4	3.41	30.6	3.53	30.6	3.75
	118	20.5	2.38	24.4	3.00	26.1	3.25	26.7	3.09	26.4	2.89	26.6	3.00	26.4	3.18
	122	20.5	2.57	21.6	2.83	20.8	2.47	21.3	2.34	21.2	2.19	21.4	2.27	21.2	2.42

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

The System Combination Ratio must be between 50-130%.

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).



ARUN038GSS4

Cooling Capacity

38,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
70%	-9.9	18.0	0.59	21.4	0.70	24.9	0.82	26.6	0.88	28.3	0.94	31.7	1.07	35.3	1.20
	-5	18.0	0.62	21.4	0.74	24.9	0.87	26.6	0.93	28.3	0.99	31.7	1.13	35.3	1.27
	0	18.0	0.64	21.4	0.77	24.9	0.90	26.6	0.96	28.3	1.03	31.7	1.18	35.3	1.32
	5	18.0	0.67	21.4	0.79	24.9	0.93	26.6	1.00	28.3	1.07	31.7	1.22	35.3	1.37
	10	18.0	0.69	21.4	0.82	24.9	0.96	26.6	1.03	28.3	1.10	31.7	1.26	35.3	1.40
	14	18.0	0.71	21.4	0.85	24.9	1.00	26.6	1.07	28.3	1.14	31.7	1.30	35.3	1.46
	20	18.0	0.74	21.4	0.87	24.9	1.03	26.6	1.10	28.3	1.17	31.7	1.34	35.3	1.50
	25	18.0	0.76	21.4	0.90	24.9	1.05	26.6	1.13	28.3	1.21	31.7	1.38	35.3	1.55
	30	18.0	0.78	21.4	0.92	24.9	1.08	26.6	1.16	28.3	1.24	31.7	1.41	35.3	1.59
	35	18.0	0.80	21.4	0.95	24.9	1.11	26.6	1.19	28.3	1.27	31.7	1.45	35.3	1.63
	40	18.0	0.82	21.4	0.97	24.9	1.14	26.6	1.22	28.3	1.31	31.7	1.49	35.3	1.67
	45	18.0	0.83	21.4	0.99	24.9	1.15	26.6	1.24	28.3	1.33	31.7	1.51	35.3	1.70
	50	18.0	0.85	21.4	1.00	24.9	1.17	26.6	1.26	28.3	1.35	31.7	1.54	35.3	1.73
	55	18.0	0.86	21.4	1.02	24.9	1.19	26.6	1.28	28.3	1.37	31.7	1.56	35.3	1.76
	60	18.0	0.88	21.4	1.06	24.9	1.24	26.6	1.33	28.3	1.42	31.7	1.62	35.3	1.83
	65	18.0	0.90	21.4	1.08	24.9	1.26	26.6	1.35	28.3	1.45	31.7	1.65	35.3	1.86
	70	18.0	0.92	21.4	1.10	24.9	1.30	26.6	1.39	28.3	1.50	31.7	1.71	35.3	1.98
	75	18.0	0.94	21.4	1.12	24.9	1.32	26.6	1.44	28.3	1.56	31.7	1.83	35.3	2.09
	80	18.0	1.01	21.4	1.24	24.9	1.50	26.6	1.64	28.3	1.77	31.7	2.02	35.3	2.32
	85	18.0	1.08	21.4	1.32	24.9	1.60	26.6	1.75	28.3	1.91	31.7	2.15	35.3	2.42
	90	18.0	1.21	21.4	1.49	24.9	1.81	26.6	1.98	28.3	2.16	31.7	2.40	35.3	2.62
	95	18.0	1.28	21.4	1.58	24.9	1.93	26.6	2.11	28.3	2.29	31.7	2.53	35.3	2.70
	100	18.0	1.38	21.4	1.71	24.9	2.08	26.6	2.27	28.3	2.36	31.7	2.64	35.3	2.78
	105	18.0	1.56	21.4	1.95	24.9	2.29	26.6	2.43	28.3	2.57	31.7	2.78	35.3	2.94
	110	18.0	1.76	21.4	2.21	24.9	2.42	26.6	2.57	28.3	2.78	31.7	2.90	34.3	3.16
	115	18.0	1.89	21.4	2.36	24.9	2.51	26.6	2.72	28.3	2.86	31.7	2.99	32.3	3.37
	118	18.0	2.01	21.4	2.50	24.9	2.66	26.6	2.88	25.8	2.86	26.6	2.54	26.4	2.86
	122	18.0	2.17	21.4	2.71	22.3	2.54	21.3	2.37	20.6	2.17	21.4	1.92	21.2	2.17
60%	-9.9	15.4	0.51	18.3	0.59	21.4	0.69	22.7	0.74	24.3	0.80	27.3	0.90	30.2	1.01
	-5	15.4	0.54	18.3	0.62	21.4	0.73	22.7	0.78	24.3	0.84	27.3	0.95	30.2	1.07
	0	15.4	0.56	18.3	0.65	21.4	0.76	22.7	0.81	24.3	0.88	27.3	0.99	30.2	1.11
	5	15.4	0.58	18.3	0.67	21.4	0.79	22.7	0.84	24.3	0.91	27.3	1.03	30.2	1.15
	10	15.4	0.60	18.3	0.69	21.4	0.81	22.7	0.87	24.3	0.93	27.3	1.06	30.2	1.18
	14	15.4	0.62	18.3	0.72	21.4	0.84	22.7	0.90	24.3	0.97	27.3	1.10	30.2	1.22
	20	15.4	0.64	18.3	0.74	21.4	0.87	22.7	0.93	24.3	1.00	27.3	1.13	30.2	1.27
	25	15.4	0.65	18.3	0.76	21.4	0.89	22.7	0.96	24.3	1.02	27.3	1.16	30.2	1.30
	30	15.4	0.67	18.3	0.79	21.4	0.91	22.7	0.98	24.3	1.05	27.3	1.19	30.2	1.34
	35	15.4	0.68	18.3	0.81	21.4	0.94	22.7	1.01	24.3	1.08	27.3	1.22	30.2	1.37
	40	15.4	0.70	18.3	0.83	21.4	0.96	22.7	1.03	24.3	1.11	27.3	1.25	30.2	1.41
	45	15.4	0.71	18.3	0.83	21.4	0.97	22.7	1.04	24.3	1.12	27.3	1.26	30.2	1.42
	50	15.4	0.71	18.3	0.84	21.4	0.98	22.7	1.05	24.3	1.12	27.3	1.28	30.2	1.43
	55	15.4	0.72	18.3	0.86	21.4	1.00	22.7	1.07	24.3	1.14	27.3	1.30	30.2	1.46
	60	15.4	0.75	18.3	0.88	21.4	1.03	22.7	1.11	24.3	1.19	27.3	1.34	30.2	1.52
	65	15.4	0.76	18.3	0.90	21.4	1.05	22.7	1.13	24.3	1.21	27.3	1.37	30.2	1.54
	70	15.4	0.78	18.3	0.92	21.4	1.08	22.7	1.16	24.3	1.24	27.3	1.41	30.2	1.60
	75	15.4	0.79	18.3	0.94	21.4	1.10	22.7	1.18	24.3	1.28	27.3	1.50	30.2	1.71
	80	15.4	0.84	18.3	1.03	21.4	1.23	22.7	1.34	24.3	1.46	27.3	1.68	30.2	1.93
	85	15.4	0.89	18.3	1.09	21.4	1.31	22.7	1.43	24.3	1.56	27.3	1.76	30.2	1.99
	90	15.4	1.00	18.3	1.23	21.4	1.48	22.7	1.62	24.3	1.75	27.3	1.97	30.2	2.17
	95	15.4	1.06	18.3	1.31	21.4	1.57	22.7	1.73	24.3	1.85	27.3	2.06	30.2	2.29
	100	15.4	1.14	18.3	1.40	21.4	1.70	22.7	1.86	24.3	1.94	27.3	2.19	30.2	2.39
	105	15.4	1.30	18.3	1.60	21.4	1.87	22.7	1.98	24.3	2.11	27.3	2.32	30.2	2.60
	110	15.4	1.46	18.3	1.81	21.4	2.02	22.7	2.10	24.3	2.28	27.3	2.48	30.2	2.84
	115	15.4	1.56	18.3	1.94	21.4	2.10	22.7	2.22	24.3	2.36	27.3	2.63	30.2	3.03
	118	15.4	1.65	18.3	2.05	21.4	2.23	22.7	2.36	24.3	2.51	26.6	2.54	26.4	2.86
	122	15.4	1.78	18.3	2.22	21.4	2.41	21.2	2.40	20.6	2.22	21.4	1.92	21.2	2.17

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

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

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.
0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

PERFORMANCE DATA



Cooling Capacity

ARUN038GSS4

38,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
	-9.9	12.8	0.44	15.3	0.51	17.8	0.58	19.0	0.62	20.2	0.67	22.7	0.74	25.1	0.82
	-5	12.8	0.46	15.3	0.54	17.8	0.61	19.0	0.65	20.2	0.70	22.7	0.78	25.1	0.87
	0	12.8	0.48	15.3	0.56	17.8	0.63	19.0	0.68	20.2	0.73	22.7	0.81	25.1	0.90
	5	12.8	0.50	15.3	0.59	17.8	0.66	19.0	0.71	20.2	0.76	22.7	0.84	25.1	0.94
	10	12.8	0.51	15.3	0.60	17.8	0.67	19.0	0.73	20.2	0.78	22.7	0.87	25.1	0.96
	14	12.8	0.53	15.3	0.62	17.8	0.70	19.0	0.75	20.2	0.81	22.7	0.90	25.1	1.00
	20	12.8	0.55	15.3	0.64	17.8	0.73	19.0	0.78	20.2	0.84	22.7	0.93	25.1	1.03
	25	12.8	0.57	15.3	0.66	17.8	0.75	19.0	0.80	20.2	0.86	22.7	0.96	25.1	1.07
	30	12.8	0.58	15.3	0.68	17.8	0.78	19.0	0.83	20.2	0.88	22.7	0.99	25.1	1.10
	35	12.8	0.60	15.3	0.69	17.8	0.80	19.0	0.85	20.2	0.90	22.7	1.01	25.1	1.13
	40	12.8	0.61	15.3	0.71	17.8	0.82	19.0	0.87	20.2	0.93	22.7	1.04	25.1	1.16
	45	12.8	0.62	15.3	0.72	17.8	0.83	19.0	0.88	20.2	0.94	22.7	1.05	25.1	1.17
	50	12.8	0.63	15.3	0.73	17.8	0.84	19.0	0.89	20.2	0.95	22.7	1.07	25.1	1.19
	55	12.8	0.64	15.3	0.75	17.8	0.85	19.0	0.91	20.2	0.97	22.7	1.09	25.1	1.21
	60	12.8	0.66	15.3	0.77	17.8	0.88	19.0	0.94	20.2	1.00	22.7	1.12	25.1	1.26
	65	12.8	0.67	15.3	0.78	17.8	0.89	19.0	0.95	20.2	1.01	22.7	1.14	25.1	1.28
	70	12.8	0.69	15.3	0.79	17.8	0.91	19.0	0.98	20.2	1.04	22.7	1.18	25.1	1.32
	75	12.8	0.69	15.3	0.81	17.8	0.93	19.0	0.99	20.2	1.06	22.7	1.20	25.1	1.34
	80	12.8	0.71	15.3	0.85	17.8	1.00	19.0	1.08	20.2	1.16	22.7	1.34	25.1	1.52
	85	12.8	0.76	15.3	0.90	17.8	1.06	19.0	1.15	20.2	1.24	22.7	1.42	25.1	1.63
	90	12.8	0.85	15.3	1.01	17.8	1.20	19.0	1.29	20.2	1.39	22.7	1.61	25.1	1.84
	95	12.8	0.89	15.3	1.07	17.8	1.26	19.0	1.37	20.2	1.48	22.7	1.71	25.1	1.95
	100	12.8	0.94	15.3	1.13	17.8	1.34	19.0	1.45	20.2	1.57	22.7	1.81	25.1	2.08
	105	12.8	1.03	15.3	1.25	17.8	1.48	19.0	1.60	20.2	1.73	22.7	2.01	25.1	2.31
	110	12.8	1.14	15.3	1.38	17.8	1.64	19.0	1.78	20.2	1.93	22.7	2.24	25.1	2.58
	115	12.8	1.22	15.3	1.48	17.8	1.76	19.0	1.91	20.2	2.08	22.7	2.42	25.1	2.78
	118	12.8	1.31	15.3	1.60	17.8	1.91	19.0	2.08	20.2	2.26	22.7	2.54	25.1	2.86
	122	12.8	1.45	15.3	1.77	17.8	2.12	19.0	2.31	20.2	2.22	21.4	1.92	21.2	2.17

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

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

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.
0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

ARUN048GSS4

Cooling Capacity

48,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
130%	-9.9	43.6	1.62	51.8	1.96	60.3	2.33	62.5	2.51	63.4	2.71	65.6	3.11	67.1	3.21
	-5	43.6	1.71	51.8	2.07	60.3	2.46	62.5	2.65	63.4	2.86	65.6	3.28	67.1	3.39
	0	43.6	1.78	51.8	2.15	60.3	2.56	62.5	2.76	63.4	2.98	65.6	3.41	67.1	3.52
	5	43.6	1.84	51.8	2.23	60.3	2.65	62.5	2.86	63.4	3.08	65.6	3.54	67.1	3.65
	10	43.6	1.89	51.8	2.30	60.3	2.73	62.5	2.94	63.4	3.17	65.6	3.64	67.1	3.76
	14	43.6	1.96	51.8	2.38	60.3	2.83	62.5	3.05	63.4	3.29	65.6	3.77	67.1	3.89
	20	43.6	1.99	51.8	2.42	60.3	2.87	62.5	3.10	63.4	3.33	65.6	3.82	67.1	3.95
	25	43.6	2.02	51.8	2.45	60.3	2.90	62.5	3.13	63.4	3.37	65.6	3.87	67.1	4.00
	30	43.6	2.05	51.8	2.48	60.3	2.93	62.5	3.17	63.4	3.41	65.6	3.91	67.1	4.04
	35	43.6	2.07	51.8	2.51	60.3	2.97	62.5	3.21	63.4	3.45	65.6	3.96	67.1	4.09
	40	43.6	2.10	51.8	2.54	60.3	3.01	62.5	3.25	63.4	3.49	65.6	4.00	67.1	4.14
	45	43.6	2.12	51.8	2.57	60.3	3.04	62.5	3.28	63.4	3.53	65.6	4.05	67.1	4.18
	50	43.6	2.14	51.8	2.59	60.3	3.07	62.5	3.32	63.4	3.56	65.6	4.08	67.1	4.23
	55	43.6	2.18	51.8	2.64	60.3	3.13	61.6	3.39	62.5	3.63	64.7	4.16	66.2	4.26
	60	43.6	2.25	51.8	2.73	59.4	3.26	60.2	3.52	60.9	3.78	63.1	4.29	64.7	4.30
	65	43.6	2.30	51.8	2.79	58.5	3.32	59.4	3.59	60.0	3.85	62.2	4.43	63.8	4.46
	70	43.6	2.21	51.8	2.69	57.4	3.30	58.1	3.64	58.9	3.99	61.1	4.43	62.7	4.48
	75	43.6	2.27	51.8	2.86	56.5	3.54	57.2	3.90	58.1	4.28	60.2	4.64	61.8	4.67
	80	43.6	2.57	51.8	3.26	54.9	4.04	55.6	4.46	56.5	4.91	58.6	5.04	60.2	5.08
	85	43.6	2.74	51.8	3.48	54.1	4.32	54.9	4.76	55.6	5.20	57.7	5.25	59.3	5.29
	90	43.6	3.11	51.0	3.96	52.5	4.91	53.2	5.43	54.1	5.61	56.2	5.66	57.7	5.71
	95	44.1	3.29	50.6	4.21	52.2	5.24	53.1	5.79	53.7	5.81	55.9	5.87	57.4	5.92
	100	44.1	3.56	49.7	4.55	51.3	5.68	52.2	6.09	52.8	6.13	55.2	6.18	56.8	6.24
	105	44.1	4.02	48.4	5.15	49.9	6.40	50.7	6.55	51.5	6.59	53.3	6.65	54.0	6.71
	110	44.1	4.51	46.4	5.81	48.3	6.99	48.5	7.02	49.2	7.04	50.2	7.11	50.4	7.18
	115	43.9	5.22	44.7	6.68	44.7	7.36	44.7	7.36	44.7	7.36	45.3	7.38	45.5	7.39
	118	38.2	4.42	38.9	5.66	38.9	6.19	38.9	6.25	38.9	6.25	39.5	6.26	39.3	6.27
	122	30.5	3.36	31.2	4.30	31.0	4.71	31.1	4.73	31.2	4.73	31.7	4.74	31.6	4.76
120%	-9.9	39.7	1.52	47.4	1.85	55.1	2.19	59.0	2.36	61.7	2.54	64.5	2.92	65.8	3.01
	-5	39.7	1.61	47.4	1.95	55.1	2.31	59.0	2.49	61.7	2.68	64.5	3.08	65.8	3.18
	0	39.7	1.67	47.4	2.03	55.1	2.40	59.0	2.59	61.7	2.79	64.5	3.20	65.8	3.31
	5	39.7	1.73	47.4	2.10	55.1	2.49	59.0	2.68	61.7	2.89	64.5	3.32	65.8	3.43
	10	39.7	1.78	47.4	2.16	55.1	2.56	59.0	2.76	61.7	2.98	64.5	3.41	65.8	3.53
	14	39.7	1.85	47.4	2.24	55.1	2.65	59.0	2.86	61.7	3.08	64.5	3.54	65.8	3.66
	20	39.7	1.88	47.4	2.27	55.1	2.69	59.0	2.90	61.7	3.13	64.5	3.59	65.8	3.71
	25	39.7	1.90	47.4	2.30	55.1	2.72	59.0	2.94	61.7	3.17	64.5	3.63	65.8	3.75
	30	39.7	1.93	47.4	2.33	55.1	2.75	59.0	2.98	61.7	3.20	64.5	3.67	65.8	3.80
	35	39.7	1.95	47.4	2.36	55.1	2.79	59.0	3.02	61.7	3.24	64.5	3.71	65.8	3.84
	40	39.7	1.97	47.4	2.39	55.1	2.82	59.0	3.05	61.7	3.28	64.5	3.76	65.8	3.89
	45	39.7	2.00	47.4	2.41	55.1	2.86	59.0	3.09	61.7	3.32	64.5	3.80	65.8	3.94
	50	39.7	2.02	47.4	2.44	55.1	2.89	59.0	3.12	61.7	3.36	64.5	3.85	65.8	3.98
	55	39.7	2.05	47.4	2.49	55.1	2.94	59.0	3.19	61.0	3.42	63.6	3.91	65.1	4.01
	60	39.7	2.12	47.4	2.58	55.1	3.07	58.6	3.31	59.3	3.56	62.0	4.04	63.3	4.11
	65	39.7	2.16	47.4	2.63	55.1	3.12	57.7	3.38	58.6	3.62	61.1	4.17	62.7	4.20
	70	39.7	2.12	47.4	2.58	55.1	3.17	56.6	3.49	57.3	3.83	60.0	4.25	61.3	4.30
	75	39.7	2.17	47.4	2.75	55.1	3.39	55.7	3.74	56.6	4.11	59.1	4.46	60.7	4.49
	80	39.7	2.47	47.4	3.13	53.5	3.88	54.2	4.29	54.9	4.71	57.5	4.84	58.9	4.88
	85	39.7	2.63	47.4	3.34	52.7	4.15	53.3	4.57	54.2	5.00	56.6	5.04	58.2	5.08
	90	39.7	2.98	47.4	3.80	51.1	4.71	51.8	5.21	52.4	5.39	55.1	5.43	56.4	5.48
	95	40.1	3.16	47.9	4.04	50.8	5.03	51.4	5.56	52.3	5.58	54.7	5.63	56.3	5.69
	100	40.1	3.42	47.9	4.37	49.9	5.45	50.8	5.85	51.4	5.88	54.1	5.94	55.4	5.99
	105	40.1	3.86	47.1	4.95	48.6	6.15	49.4	6.29	50.0	6.32	52.5	6.38	53.4	6.44
	110	40.1	4.33	45.9	5.57	47.4	6.71	47.6	6.74	48.3	6.76	49.8	6.83	50.0	6.89
	115	39.0	5.01	44.3	6.41	44.3	7.07	44.3	7.07	44.3	7.07	45.3	7.08	45.5	7.09
	118	34.8	4.42	38.5	5.43	38.5	5.94	38.5	6.00	38.5	6.00	39.5	6.01	39.3	6.02
	122	27.8	3.36	30.9	4.13	30.7	4.53	30.8	4.54	30.9	4.54	31.7	4.56	31.6	4.57

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

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

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

PERFORMANCE DATA



Cooling Capacity

ARUN048GSS4

48,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
110%	-9.9	36.8	1.40	43.9	1.69	51.0	2.01	54.6	2.17	58.1	2.33	64.0	2.66	65.4	2.76
	-5	36.8	1.48	43.9	1.79	51.0	2.12	54.6	2.29	58.1	2.46	64.0	2.81	65.4	2.91
	0	36.8	1.54	43.9	1.86	51.0	2.20	54.6	2.39	58.1	2.56	64.0	2.92	65.4	3.03
	5	36.8	1.60	43.9	1.93	51.0	2.28	54.6	2.47	58.1	2.65	64.0	3.02	65.4	3.14
	10	36.8	1.64	43.9	1.98	51.0	2.35	54.6	2.55	58.1	2.73	64.0	3.11	65.4	3.23
	14	36.8	1.70	43.9	2.05	51.0	2.43	54.6	2.64	58.1	2.83	64.0	3.22	65.4	3.34
	20	36.8	1.73	43.9	2.09	51.0	2.47	54.6	2.67	58.1	2.87	64.0	3.28	65.4	3.40
	25	36.8	1.75	43.9	2.11	51.0	2.50	54.6	2.70	58.1	2.90	64.0	3.32	65.4	3.44
	30	36.8	1.77	43.9	2.14	51.0	2.53	54.6	2.74	58.1	2.94	64.0	3.37	65.4	3.48
	35	36.8	1.79	43.9	2.17	51.0	2.56	54.6	2.77	58.1	2.98	64.0	3.42	65.4	3.54
	40	36.8	1.82	43.9	2.20	51.0	2.60	54.6	2.81	58.1	3.02	64.0	3.47	65.4	3.58
	45	36.8	1.85	43.9	2.23	51.0	2.64	54.6	2.86	58.1	3.07	64.0	3.52	65.4	3.64
	50	36.8	1.88	43.9	2.27	51.0	2.69	54.6	2.91	58.1	3.12	64.0	3.58	65.4	3.70
	55	36.8	1.91	43.9	2.32	51.0	2.74	54.6	2.97	58.1	3.19	63.1	3.64	64.5	3.74
	60	36.8	1.97	43.9	2.40	51.0	2.85	54.6	3.08	58.1	3.31	61.5	3.76	62.9	3.79
	65	36.8	2.01	43.9	2.45	51.0	2.91	54.6	3.15	58.1	3.37	60.6	3.88	62.0	3.91
	70	36.8	2.03	43.9	2.47	51.0	3.04	54.6	3.35	57.0	3.67	59.5	4.08	60.8	4.12
	75	36.8	2.09	43.9	2.63	51.0	3.25	54.6	3.59	56.1	3.94	58.6	4.27	59.9	4.30
	80	36.4	2.37	43.5	3.00	50.5	3.72	53.3	4.11	54.0	4.52	56.4	4.64	57.8	4.68
	85	36.4	2.52	43.5	3.20	50.5	3.98	52.5	4.38	53.1	4.79	55.5	4.83	56.9	4.87
	90	36.4	2.86	43.5	3.64	50.3	4.52	50.9	4.99	51.6	5.17	54.0	5.21	55.3	5.26
	95	36.4	3.03	43.5	3.88	49.4	4.82	50.0	5.33	50.7	5.35	53.1	5.40	54.4	5.45
	100	36.4	3.28	43.5	4.19	48.7	5.23	49.4	5.61	50.0	5.64	52.4	5.69	53.7	5.74
	105	36.4	3.70	43.5	4.74	47.2	5.90	47.9	6.03	48.5	6.06	50.8	6.12	52.1	6.18
	110	36.4	4.15	43.5	5.34	45.7	6.43	45.9	6.46	46.6	6.48	48.0	6.55	48.2	6.61
	115	36.4	4.81	43.5	6.15	43.8	6.78	43.8	6.78	44.0	6.78	44.9	6.79	45.1	6.80
	118	35.2	4.38	37.8	5.21	38.1	5.70	38.1	5.75	38.3	5.75	39.1	5.76	38.9	5.77
	122	28.1	3.32	30.3	3.96	30.4	4.34	30.5	4.35	30.7	4.35	31.4	4.37	31.3	4.39
100%	-9.9	32.4	1.23	38.6	1.49	44.8	1.77	48.0	1.92	52.8	2.08	59.2	2.40	62.5	2.50
	-5	32.4	1.30	38.6	1.57	44.8	1.86	48.0	2.03	52.8	2.20	59.2	2.53	62.5	2.64
	0	32.4	1.35	38.6	1.63	44.8	1.94	48.0	2.11	52.8	2.28	59.2	2.64	62.5	2.74
	5	32.4	1.40	38.6	1.69	44.8	2.01	48.0	2.19	52.8	2.37	59.2	2.73	62.5	2.84
	10	32.4	1.44	38.6	1.74	44.8	2.07	48.0	2.25	52.8	2.44	59.2	2.81	62.5	2.93
	14	32.4	1.50	38.6	1.81	44.8	2.14	48.0	2.33	52.8	2.52	59.2	2.91	62.5	3.03
	20	32.4	1.54	38.6	1.87	44.8	2.21	48.0	2.40	52.8	2.60	59.2	3.00	62.5	3.12
	25	32.4	1.58	38.6	1.91	44.8	2.26	48.0	2.45	52.8	2.67	59.2	3.07	62.5	3.19
	30	32.4	1.62	38.6	1.96	44.8	2.32	48.0	2.51	52.8	2.74	59.2	3.14	62.5	3.26
	35	32.4	1.65	38.6	1.99	44.8	2.36	48.0	2.55	52.8	2.78	59.2	3.19	62.5	3.32
	40	32.4	1.67	38.6	2.03	44.8	2.40	48.0	2.59	52.8	2.83	59.2	3.24	62.5	3.37
	45	32.4	1.71	38.6	2.07	44.8	2.44	48.0	2.65	52.8	2.88	59.2	3.31	62.5	3.44
	50	32.4	1.74	38.6	2.11	44.8	2.50	48.0	2.70	52.8	2.94	59.2	3.37	62.5	3.51
	55	32.4	1.77	38.6	2.15	44.8	2.54	48.0	2.76	52.8	3.00	59.2	3.43	61.8	3.56
	60	32.4	1.83	38.6	2.23	44.8	2.65	48.0	2.86	52.8	3.12	58.9	3.54	60.0	3.62
	65	32.4	1.87	38.6	2.27	44.8	2.70	48.0	2.92	52.8	3.18	58.0	3.66	59.4	3.73
	70	32.4	1.93	38.6	2.34	44.8	2.88	48.0	3.17	52.8	3.53	56.9	3.92	58.0	3.99
	75	32.4	1.98	38.6	2.50	44.8	3.08	48.0	3.40	52.8	3.79	56.1	4.11	57.4	4.16
	80	32.4	2.25	38.6	2.84	44.8	3.53	48.0	3.89	52.8	4.34	54.5	4.46	55.6	4.52
	85	32.4	2.39	38.6	3.04	44.8	3.77	48.0	4.15	52.5	4.61	53.6	4.65	55.0	4.71
	90	32.4	2.71	38.6	3.45	44.8	4.28	48.0	4.73	50.8	4.97	52.1	5.01	53.2	5.08
	95	32.4	2.87	38.6	3.67	44.8	4.57	48.0	5.05	50.1	5.15	51.2	5.19	52.5	5.27
	100	32.4	3.10	38.6	3.96	44.8	4.94	47.1	5.30	49.2	5.41	50.5	5.46	51.7	5.54
	105	32.4	3.48	38.6	4.46	44.5	5.56	45.8	5.68	47.8	5.80	49.0	5.85	50.2	5.93
	110	32.4	3.89	38.6	5.01	44.0	6.03	45.0	6.06	45.9	6.17	46.7	6.23	47.5	6.32
	115	32.4	4.47	38.6	5.72	41.9	6.31	43.2	6.31	44.3	6.41	44.7	6.42	44.9	6.46
	118	32.4	4.51	33.8	5.37	36.5	5.31	37.6	5.36	38.6	5.44	38.9	5.45	38.8	5.48
	122	27.7	4.09	27.1	4.08	29.1	4.04	30.1	4.05	30.9	4.12	31.2	4.13	31.2	4.17

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

The System Combination Ratio must be between 50-130%.

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).



ARUN048GSS4

Cooling Capacity

48,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
90%	-9.9	29.1	1.10	34.7	1.32	40.5	1.56	43.3	1.68	46.1	1.79	51.6	2.06	57.2	2.26
	-5	29.1	1.16	34.7	1.39	40.5	1.64	43.3	1.77	46.1	1.89	51.6	2.18	57.2	2.39
	0	29.1	1.21	34.7	1.45	40.5	1.71	43.3	1.84	46.1	1.97	51.6	2.26	57.2	2.49
	5	29.1	1.25	34.7	1.50	40.5	1.77	43.3	1.91	46.1	2.04	51.6	2.35	57.2	2.58
	10	29.1	1.29	34.7	1.54	40.5	1.82	43.3	1.96	46.1	2.10	51.6	2.41	57.2	2.65
	14	29.1	1.34	34.7	1.60	40.5	1.89	43.3	2.03	46.1	2.17	51.6	2.50	57.2	2.75
	20	29.1	1.38	34.7	1.66	40.5	1.96	43.3	2.11	46.1	2.26	51.6	2.59	57.2	2.85
	25	29.1	1.42	34.7	1.71	40.5	2.02	43.3	2.18	46.1	2.34	51.6	2.67	57.2	2.94
	30	29.1	1.46	34.7	1.76	40.5	2.08	43.3	2.24	46.1	2.41	51.6	2.74	57.2	3.03
	35	29.1	1.51	34.7	1.82	40.5	2.14	43.3	2.31	46.1	2.48	51.6	2.82	57.2	3.12
	40	29.1	1.55	34.7	1.87	40.5	2.21	43.3	2.38	46.1	2.56	51.6	2.91	57.2	3.21
	45	29.1	1.59	34.7	1.91	40.5	2.26	43.3	2.43	46.1	2.62	51.6	2.97	57.2	3.29
	50	29.1	1.63	34.7	1.96	40.5	2.31	43.3	2.49	46.1	2.68	51.6	3.04	57.2	3.36
	55	29.1	1.65	34.7	1.99	40.5	2.35	43.3	2.54	46.1	2.73	51.6	3.10	57.2	3.39
	60	29.1	1.71	34.7	2.07	40.5	2.44	43.3	2.64	46.1	2.84	51.6	3.22	56.7	3.43
	65	29.1	1.74	34.7	2.11	40.5	2.49	43.3	2.69	46.1	2.89	51.6	3.28	56.4	3.60
	70	29.1	1.79	34.7	2.17	40.5	2.58	43.3	2.84	46.1	3.10	51.6	3.66	55.3	3.87
	75	29.1	1.82	34.7	2.27	40.5	2.76	43.3	3.04	46.1	3.33	51.6	3.82	54.4	4.04
	80	29.1	2.04	34.7	2.57	40.5	3.15	43.3	3.47	46.1	3.80	51.6	4.22	52.9	4.39
	85	29.1	2.17	34.7	2.74	40.5	3.37	43.3	3.70	46.1	4.06	51.0	4.45	52.1	4.57
	90	29.1	2.45	34.7	3.10	40.5	3.82	43.3	4.21	46.1	4.62	49.5	4.87	50.6	4.94
	95	29.1	2.61	34.7	3.29	40.5	4.07	43.3	4.49	46.1	4.94	48.6	5.05	49.7	5.12
	100	29.1	2.69	34.7	3.43	40.5	4.24	43.3	4.67	46.1	5.04	48.0	5.27	48.9	5.33
	105	29.1	3.12	34.7	3.98	40.5	4.80	43.3	5.12	45.6	5.41	46.5	5.65	47.1	5.72
	110	29.1	3.58	34.7	4.59	40.5	5.26	43.3	5.52	43.7	5.86	44.3	6.06	44.6	6.13
	115	29.1	3.88	34.7	4.97	37.9	5.54	41.0	5.78	41.6	6.05	42.0	6.18	42.2	6.26
	118	29.1	4.12	33.8	5.37	33.0	4.66	35.7	4.90	36.2	5.13	36.6	5.25	36.4	5.31
	122	27.7	4.09	27.1	4.08	26.3	3.55	28.6	3.71	29.0	3.89	29.4	3.98	29.3	4.04
80%	-9.9	25.9	0.95	30.9	1.15	36.0	1.33	38.4	1.45	40.9	1.56	45.9	1.78	50.8	1.99
	-5	25.9	1.01	30.9	1.21	36.0	1.41	38.4	1.53	40.9	1.65	45.9	1.88	50.8	2.10
	0	25.9	1.05	30.9	1.26	36.0	1.46	38.4	1.59	40.9	1.72	45.9	1.96	50.8	2.18
	5	25.9	1.08	30.9	1.31	36.0	1.52	38.4	1.65	40.9	1.78	45.9	2.03	50.8	2.26
	10	25.9	1.12	30.9	1.34	36.0	1.56	38.4	1.70	40.9	1.83	45.9	2.09	50.8	2.33
	14	25.9	1.16	30.9	1.39	36.0	1.62	38.4	1.76	40.9	1.90	45.9	2.16	50.8	2.41
	20	25.9	1.20	30.9	1.44	36.0	1.68	38.4	1.82	40.9	1.96	45.9	2.24	50.8	2.50
	25	25.9	1.24	30.9	1.48	36.0	1.74	38.4	1.88	40.9	2.01	45.9	2.31	50.8	2.58
	30	25.9	1.27	30.9	1.53	36.0	1.79	38.4	1.93	40.9	2.07	45.9	2.37	50.8	2.66
	35	25.9	1.31	30.9	1.57	36.0	1.84	38.4	1.98	40.9	2.13	45.9	2.44	50.8	2.73
	40	25.9	1.34	30.9	1.61	36.0	1.89	38.4	2.04	40.9	2.18	45.9	2.50	50.8	2.80
	45	25.9	1.36	30.9	1.63	36.0	1.92	38.4	2.07	40.9	2.21	45.9	2.54	50.8	2.84
	50	25.9	1.38	30.9	1.66	36.0	1.94	38.4	2.10	40.9	2.24	45.9	2.57	50.8	2.88
	55	25.9	1.40	30.9	1.68	36.0	1.98	38.4	2.13	40.9	2.29	45.9	2.62	50.8	2.93
	60	25.9	1.45	30.9	1.74	36.0	2.05	38.4	2.21	40.9	2.38	45.9	2.71	50.8	3.05
	65	25.9	1.47	30.9	1.77	36.0	2.09	38.4	2.25	40.9	2.43	45.9	2.76	50.8	3.12
	70	25.9	1.52	30.9	1.82	36.0	2.15	38.4	2.32	40.9	2.53	45.9	2.98	50.8	3.45
	75	25.9	1.54	30.9	1.86	36.0	2.26	38.4	2.48	40.9	2.69	45.9	3.17	50.8	3.64
	80	25.9	1.69	30.9	2.11	36.0	2.57	38.4	2.81	40.9	3.07	45.9	3.65	50.8	4.07
	85	25.9	1.80	30.9	2.24	36.0	2.74	38.4	3.00	40.9	3.29	45.9	3.89	50.8	4.17
	90	25.9	2.03	30.9	2.55	36.0	3.10	38.4	3.41	40.9	3.74	45.9	4.27	50.0	4.42
	95	25.9	2.15	30.9	2.69	36.0	3.31	38.4	3.62	40.9	3.98	45.9	4.42	48.9	4.54
	100	25.9	2.32	30.9	2.90	36.0	3.57	38.4	3.88	40.9	4.13	45.9	4.60	47.8	4.69
	105	25.9	2.65	30.9	3.32	36.0	3.97	38.4	4.16	40.9	4.43	45.3	4.78	46.4	4.92
	110	25.9	3.00	30.9	3.79	36.0	4.22	38.4	4.44	40.9	4.78	43.7	4.96	43.9	5.17
	115	25.9	3.21	30.9	4.05	36.0	4.36	38.4	4.67	38.4	4.89	38.6	5.07	38.6	5.38
	118	25.9	3.41	30.9	4.30	33.0	4.66	33.7	4.43	33.4	4.15	33.6	4.30	33.3	4.56
	122	25.9	3.69	27.2	4.06	26.3	3.55	26.9	3.35	26.8	3.14	27.0	3.26	26.8	3.47

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

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

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

PERFORMANCE DATA



Cooling Capacity

ARUN048GSS4

48,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
70%	-9.9	22.7	0.84	27.0	1.00	31.5	1.18	33.6	1.26	35.8	1.34	40.1	1.54	44.6	1.72
	-5	22.7	0.89	27.0	1.06	31.5	1.24	33.6	1.33	35.8	1.42	40.1	1.62	44.6	1.82
	0	22.7	0.92	27.0	1.10	31.5	1.29	33.6	1.38	35.8	1.47	40.1	1.69	44.6	1.89
	5	22.7	0.96	27.0	1.14	31.5	1.34	33.6	1.43	35.8	1.53	40.1	1.75	44.6	1.96
	10	22.7	0.99	27.0	1.17	31.5	1.38	33.6	1.48	35.8	1.57	40.1	1.80	44.6	2.02
	14	22.7	1.02	27.0	1.21	31.5	1.43	33.6	1.53	35.8	1.63	40.1	1.87	44.6	2.09
	20	22.7	1.06	27.0	1.25	31.5	1.47	33.6	1.58	35.8	1.69	40.1	1.93	44.6	2.16
	25	22.7	1.09	27.0	1.29	31.5	1.51	33.6	1.62	35.8	1.73	40.1	1.97	44.6	2.22
	30	22.7	1.12	27.0	1.32	31.5	1.55	33.6	1.66	35.8	1.78	40.1	2.02	44.6	2.28
	35	22.7	1.15	27.0	1.36	31.5	1.59	33.6	1.71	35.8	1.83	40.1	2.08	44.6	2.34
	40	22.7	1.17	27.0	1.39	31.5	1.63	33.6	1.75	35.8	1.87	40.1	2.13	44.6	2.40
	45	22.7	1.19	27.0	1.41	31.5	1.66	33.6	1.78	35.8	1.90	40.1	2.17	44.6	2.43
	50	22.7	1.21	27.0	1.44	31.5	1.68	33.6	1.81	35.8	1.94	40.1	2.20	44.6	2.48
	55	22.7	1.23	27.0	1.47	31.5	1.71	33.6	1.84	35.8	1.97	40.1	2.24	44.6	2.53
	60	22.7	1.27	27.0	1.52	31.5	1.77	33.6	1.91	35.8	2.04	40.1	2.33	44.6	2.62
	65	22.7	1.29	27.0	1.54	31.5	1.80	33.6	1.94	35.8	2.08	40.1	2.37	44.6	2.67
	70	22.7	1.33	27.0	1.59	31.5	1.86	33.6	2.00	35.8	2.15	40.1	2.45	44.6	2.83
	75	22.7	1.35	27.0	1.61	31.5	1.89	33.6	2.07	35.8	2.24	40.1	2.62	44.6	3.00
	80	22.7	1.45	27.0	1.78	31.5	2.15	33.6	2.35	35.8	2.55	40.1	2.90	44.6	3.33
	85	22.7	1.54	27.0	1.89	31.5	2.29	33.6	2.50	35.8	2.74	40.1	3.09	44.6	3.47
	90	22.7	1.73	27.0	2.14	31.5	2.60	33.6	2.83	35.8	3.10	40.1	3.45	44.6	3.77
	95	22.7	1.83	27.0	2.27	31.5	2.76	33.6	3.02	35.8	3.29	40.1	3.62	44.6	3.88
	100	22.7	1.98	27.0	2.45	31.5	2.98	33.6	3.26	35.8	3.39	40.1	3.79	44.6	3.99
	105	22.7	2.24	27.0	2.80	31.5	3.29	33.6	3.48	35.8	3.68	40.1	3.99	44.6	4.22
	110	22.7	2.53	27.0	3.17	31.5	3.48	33.6	3.69	35.8	3.99	40.1	4.16	43.3	4.54
	115	22.7	2.71	27.0	3.38	31.5	3.60	33.6	3.90	35.8	4.11	40.1	4.29	40.8	4.83
	118	22.7	2.88	27.0	3.59	31.5	3.82	33.6	4.13	32.6	4.11	33.6	3.64	33.3	4.10
	122	22.7	3.11	27.0	3.89	28.1	3.65	26.9	3.40	26.1	3.11	27.0	2.76	26.8	3.12
60%	-9.9	19.5	0.73	23.1	0.85	27.0	0.99	28.7	1.06	30.6	1.14	34.5	1.30	38.1	1.45
	-5	19.5	0.77	23.1	0.89	27.0	1.05	28.7	1.12	30.6	1.21	34.5	1.37	38.1	1.53
	0	19.5	0.80	23.1	0.93	27.0	1.09	28.7	1.17	30.6	1.26	34.5	1.42	38.1	1.59
	5	19.5	0.83	23.1	0.96	27.0	1.13	28.7	1.21	30.6	1.30	34.5	1.47	38.1	1.65
	10	19.5	0.85	23.1	0.99	27.0	1.16	28.7	1.24	30.6	1.34	34.5	1.52	38.1	1.69
	14	19.5	0.89	23.1	1.03	27.0	1.21	28.7	1.29	30.6	1.39	34.5	1.57	38.1	1.76
	20	19.5	0.91	23.1	1.06	27.0	1.25	28.7	1.33	30.6	1.43	34.5	1.62	38.1	1.82
	25	19.5	0.93	23.1	1.10	27.0	1.28	28.7	1.37	30.6	1.47	34.5	1.67	38.1	1.87
	30	19.5	0.96	23.1	1.13	27.0	1.31	28.7	1.41	30.6	1.51	34.5	1.71	38.1	1.92
	35	19.5	0.98	23.1	1.16	27.0	1.34	28.7	1.44	30.6	1.55	34.5	1.75	38.1	1.97
	40	19.5	1.01	23.1	1.19	27.0	1.38	28.7	1.48	30.6	1.59	34.5	1.80	38.1	2.02
	45	19.5	1.02	23.1	1.20	27.0	1.39	28.7	1.49	30.6	1.60	34.5	1.81	38.1	2.04
	50	19.5	1.02	23.1	1.21	27.0	1.40	28.7	1.51	30.6	1.61	34.5	1.83	38.1	2.06
	55	19.5	1.04	23.1	1.23	27.0	1.43	28.7	1.54	30.6	1.64	34.5	1.87	38.1	2.09
	60	19.5	1.07	23.1	1.27	27.0	1.48	28.7	1.59	30.6	1.70	34.5	1.93	38.1	2.17
	65	19.5	1.09	23.1	1.29	27.0	1.51	28.7	1.62	30.6	1.73	34.5	1.97	38.1	2.22
	70	19.5	1.12	23.1	1.33	27.0	1.55	28.7	1.66	30.6	1.78	34.5	2.03	38.1	2.30
	75	19.5	1.14	23.1	1.35	27.0	1.58	28.7	1.70	30.6	1.84	34.5	2.15	38.1	2.45
	80	19.5	1.21	23.1	1.47	27.0	1.77	28.7	1.93	30.6	2.09	34.5	2.40	38.1	2.77
	85	19.5	1.28	23.1	1.56	27.0	1.88	28.7	2.06	30.6	2.24	34.5	2.53	38.1	2.86
	90	19.5	1.44	23.1	1.77	27.0	2.13	28.7	2.32	30.6	2.51	34.5	2.83	38.1	3.12
	95	19.5	1.52	23.1	1.87	27.0	2.26	28.7	2.48	30.6	2.66	34.5	2.96	38.1	3.28
	100	19.5	1.63	23.1	2.01	27.0	2.43	28.7	2.67	30.6	2.78	34.5	3.14	38.1	3.42
	105	19.5	1.86	23.1	2.29	27.0	2.69	28.7	2.84	30.6	3.02	34.5	3.33	38.1	3.73
	110	19.5	2.09	23.1	2.60	27.0	2.90	28.7	3.02	30.6	3.27	34.5	3.56	38.1	4.07
	115	19.5	2.24	23.1	2.78	27.0	3.01	28.7	3.19	30.6	3.38	34.5	3.77	38.1	4.35
	118	19.5	2.37	23.1	2.95	27.0	3.20	28.7	3.39	30.6	3.60	33.6	3.64	33.3	4.10
	122	19.5	2.55	23.1	3.19	27.0	3.46	26.8	3.44	26.0	3.18	27.0	2.76	26.8	3.12

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

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

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Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).



ARUN048GSS4
Cooling Capacity
48,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
50%	-9.9	16.2	0.63	19.3	0.74	22.5	0.83	24.0	0.89	25.5	0.96	28.7	1.06	31.7	1.18
	-5	16.2	0.66	19.3	0.78	22.5	0.87	24.0	0.94	25.5	1.01	28.7	1.12	31.7	1.24
	0	16.2	0.69	19.3	0.81	22.5	0.91	24.0	0.98	25.5	1.05	28.7	1.17	31.7	1.29
	5	16.2	0.71	19.3	0.84	22.5	0.94	24.0	1.01	25.5	1.09	28.7	1.21	31.7	1.34
	10	16.2	0.73	19.3	0.86	22.5	0.97	24.0	1.04	25.5	1.12	28.7	1.24	31.7	1.38
	14	16.2	0.76	19.3	0.90	22.5	1.00	24.0	1.08	25.5	1.16	28.7	1.29	31.7	1.43
	20	16.2	0.79	19.3	0.92	22.5	1.04	24.0	1.12	25.5	1.20	28.7	1.34	31.7	1.48
	25	16.2	0.81	19.3	0.95	22.5	1.08	24.0	1.15	25.5	1.23	28.7	1.38	31.7	1.53
	30	16.2	0.84	19.3	0.97	22.5	1.11	24.0	1.18	25.5	1.26	28.7	1.42	31.7	1.58
	35	16.2	0.86	19.3	0.99	22.5	1.14	24.0	1.22	25.5	1.30	28.7	1.45	31.7	1.62
	40	16.2	0.88	19.3	1.02	22.5	1.17	24.0	1.25	25.5	1.33	28.7	1.49	31.7	1.66
	45	16.2	0.89	19.3	1.04	22.5	1.19	24.0	1.26	25.5	1.35	28.7	1.51	31.7	1.68
	50	16.2	0.91	19.3	1.05	22.5	1.20	24.0	1.28	25.5	1.37	28.7	1.53	31.7	1.71
	55	16.2	0.93	19.3	1.07	22.5	1.22	24.0	1.30	25.5	1.39	28.7	1.56	31.7	1.73
	60	16.2	0.94	19.3	1.10	22.5	1.26	24.0	1.35	25.5	1.44	28.7	1.61	31.7	1.80
	65	16.2	0.95	19.3	1.12	22.5	1.28	24.0	1.37	25.5	1.46	28.7	1.64	31.7	1.83
	70	16.2	0.98	19.3	1.14	22.5	1.31	24.0	1.41	25.5	1.49	28.7	1.69	31.7	1.89
	75	16.2	0.99	19.3	1.16	22.5	1.34	24.0	1.43	25.5	1.52	28.7	1.72	31.7	1.93
	80	16.2	1.02	19.3	1.22	22.5	1.44	24.0	1.55	25.5	1.67	28.7	1.92	31.7	2.19
	85	16.2	1.09	19.3	1.29	22.5	1.52	24.0	1.65	25.5	1.77	28.7	2.04	31.7	2.33
	90	16.2	1.21	19.3	1.45	22.5	1.72	24.0	1.85	25.5	1.99	28.7	2.30	31.7	2.64
	95	16.2	1.28	19.3	1.53	22.5	1.81	24.0	1.97	25.5	2.12	28.7	2.45	31.7	2.80
	100	16.2	1.35	19.3	1.62	22.5	1.92	24.0	2.08	25.5	2.25	28.7	2.60	31.7	2.98
	105	16.2	1.47	19.3	1.79	22.5	2.12	24.0	2.30	25.5	2.48	28.7	2.88	31.7	3.31
	110	16.2	1.63	19.3	1.98	22.5	2.35	24.0	2.55	25.5	2.77	28.7	3.22	31.7	3.70
	115	16.2	1.74	19.3	2.12	22.5	2.53	24.0	2.75	25.5	2.98	28.7	3.47	31.7	3.99
	118	16.2	1.88	19.3	2.30	22.5	2.74	24.0	2.99	25.5	3.24	28.7	3.64	31.7	4.10
	122	16.2	2.08	19.3	2.54	22.5	3.04	24.0	3.32	25.5	3.18	27.0	2.76	26.8	3.12

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

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

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

PERFORMANCE DATA



Cooling Capacity

ARUN053GSS4

53,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
130%	-9.9	48.2	1.89	57.2	2.29	66.5	2.72	69.0	2.93	70.0	3.16	72.4	3.63	74.1	3.75
	-5	48.2	1.99	57.2	2.42	66.5	2.87	69.0	3.09	70.0	3.34	72.4	3.83	74.1	3.95
	0	48.2	2.07	57.2	2.51	66.5	2.98	69.0	3.22	70.0	3.47	72.4	3.98	74.1	4.11
	5	48.2	2.15	57.2	2.60	66.5	3.09	69.0	3.34	70.0	3.60	72.4	4.12	74.1	4.26
	10	48.2	2.21	57.2	2.68	66.5	3.18	69.0	3.43	70.0	3.70	72.4	4.24	74.1	4.38
	14	48.2	2.29	57.2	2.78	66.5	3.30	69.0	3.56	70.0	3.84	72.4	4.40	74.1	4.54
	20	48.2	2.33	57.2	2.82	66.5	3.34	69.0	3.61	70.0	3.89	72.4	4.46	74.1	4.61
	25	48.2	2.36	57.2	2.86	66.5	3.38	69.0	3.66	70.0	3.93	72.4	4.51	74.1	4.66
	30	48.2	2.39	57.2	2.89	66.5	3.42	69.0	3.70	70.0	3.98	72.4	4.56	74.1	4.72
	35	48.2	2.42	57.2	2.93	66.5	3.46	69.0	3.74	70.0	4.03	72.4	4.61	74.1	4.77
	40	48.2	2.45	57.2	2.96	66.5	3.50	69.0	3.79	70.0	4.07	72.4	4.67	74.1	4.83
	45	48.2	2.47	57.2	2.99	66.5	3.54	69.0	3.83	70.0	4.11	72.4	4.72	74.1	4.88
	50	48.2	2.50	57.2	3.02	66.5	3.58	69.0	3.87	70.0	4.16	72.4	4.76	74.1	4.93
	55	48.2	2.54	57.2	3.08	66.5	3.65	68.0	3.95	69.0	4.24	71.4	4.85	73.1	4.96
	60	48.2	2.62	57.2	3.19	65.6	3.80	66.5	4.10	67.3	4.41	69.7	5.00	71.4	5.02
	65	48.2	2.68	57.2	3.26	64.6	3.87	65.6	4.18	66.3	4.49	68.7	5.16	70.4	5.21
	70	48.2	2.58	57.2	3.13	63.4	3.85	64.1	4.24	65.1	4.65	67.5	5.17	69.2	5.22
	75	48.2	2.64	57.2	3.34	62.4	4.12	63.1	4.55	64.1	4.99	66.5	5.41	68.2	5.45
	80	48.2	3.00	57.2	3.80	60.7	4.72	61.4	5.21	62.4	5.72	64.7	5.88	66.5	5.93
	85	48.2	3.20	57.2	4.06	59.7	5.04	60.7	5.55	61.4	6.07	63.8	6.12	65.5	6.17
	90	48.2	3.62	56.3	4.61	58.0	5.72	58.7	6.33	59.7	6.55	62.0	6.60	63.8	6.66
	95	48.7	3.84	55.9	4.91	57.6	6.11	58.6	6.75	59.3	6.78	61.7	6.84	63.4	6.91
	100	48.7	4.16	54.9	5.31	56.6	6.62	57.6	7.11	58.4	7.15	60.9	7.21	62.7	7.28
	105	48.7	4.69	53.4	6.01	55.1	7.47	56.0	7.64	56.8	7.68	58.8	7.75	59.7	7.83
	110	48.7	5.26	51.2	6.77	53.3	8.15	53.5	8.19	54.3	8.21	55.4	8.30	55.7	8.37
	115	48.5	6.09	49.3	7.79	49.3	8.59	49.3	8.59	49.3	8.59	50.1	8.60	50.3	8.62
	118	42.1	5.16	42.9	6.60	43.0	7.22	43.0	7.29	43.0	7.29	43.6	7.30	43.4	7.31
	122	33.7	3.91	34.4	5.02	34.2	5.50	34.3	5.51	34.4	5.52	35.0	5.53	34.9	5.56
120%	-9.9	43.9	1.78	52.3	2.15	60.8	2.55	65.2	2.75	68.1	2.97	71.2	3.40	72.7	3.52
	-5	43.9	1.88	52.3	2.27	60.8	2.69	65.2	2.90	68.1	3.13	71.2	3.59	72.7	3.71
	0	43.9	1.95	52.3	2.37	60.8	2.80	65.2	3.02	68.1	3.26	71.2	3.73	72.7	3.86
	5	43.9	2.02	52.3	2.45	60.8	2.90	65.2	3.13	68.1	3.37	71.2	3.87	72.7	4.00
	10	43.9	2.08	52.3	2.52	60.8	2.99	65.2	3.22	68.1	3.47	71.2	3.98	72.7	4.11
	14	43.9	2.16	52.3	2.61	60.8	3.09	65.2	3.34	68.1	3.60	71.2	4.12	72.7	4.26
	20	43.9	2.19	52.3	2.65	60.8	3.14	65.2	3.39	68.1	3.65	71.2	4.18	72.7	4.33
	25	43.9	2.22	52.3	2.68	60.8	3.18	65.2	3.43	68.1	3.69	71.2	4.23	72.7	4.38
	30	43.9	2.25	52.3	2.72	60.8	3.21	65.2	3.47	68.1	3.73	71.2	4.28	72.7	4.43
	35	43.9	2.28	52.3	2.75	60.8	3.25	65.2	3.52	68.1	3.78	71.2	4.33	72.7	4.48
	40	43.9	2.30	52.3	2.79	60.8	3.29	65.2	3.56	68.1	3.83	71.2	4.39	72.7	4.54
	45	43.9	2.33	52.3	2.81	60.8	3.33	65.2	3.60	68.1	3.87	71.2	4.43	72.7	4.59
	50	43.9	2.35	52.3	2.85	60.8	3.37	65.2	3.64	68.1	3.91	71.2	4.49	72.7	4.64
	55	43.9	2.39	52.3	2.90	60.8	3.43	65.2	3.72	67.4	3.99	70.2	4.56	71.9	4.68
	60	43.9	2.47	52.3	3.00	60.8	3.58	64.7	3.86	65.4	4.15	68.5	4.71	69.9	4.79
	65	43.9	2.52	52.3	3.07	60.8	3.64	63.7	3.94	64.7	4.23	67.5	4.86	69.2	4.90
	70	43.9	2.47	52.3	3.01	60.8	3.70	62.5	4.07	63.2	4.47	66.2	4.96	67.7	5.01
	75	43.9	2.54	52.3	3.20	60.8	3.96	61.5	4.37	62.5	4.79	65.2	5.20	67.0	5.23
	80	43.9	2.88	52.3	3.65	59.1	4.53	59.9	5.00	60.6	5.49	63.5	5.64	65.0	5.69
	85	43.9	3.07	52.3	3.90	58.2	4.84	58.9	5.33	59.9	5.83	62.5	5.88	64.3	5.93
	90	43.9	3.48	52.3	4.43	56.5	5.49	57.2	6.08	57.9	6.29	60.8	6.33	62.3	6.40
	95	44.3	3.69	52.9	4.71	56.1	5.86	56.8	6.48	57.8	6.51	60.4	6.57	62.2	6.63
	100	44.3	3.99	52.9	5.10	55.1	6.36	56.1	6.82	56.8	6.86	59.7	6.92	61.2	6.99
	105	44.3	4.50	52.1	5.77	53.6	7.17	54.5	7.34	55.2	7.38	58.0	7.44	58.9	7.51
	110	44.3	5.05	50.7	6.50	52.4	7.82	52.5	7.86	53.3	7.89	55.0	7.96	55.2	8.04
	115	43.1	5.85	48.9	7.48	48.9	8.25	48.9	8.25	48.9	8.25	50.1	8.26	50.3	8.28
	118	38.5	5.16	42.5	6.34	42.5	6.93	42.5	7.00	42.5	7.00	43.6	7.01	43.4	7.02
	122	30.7	3.91	34.1	4.82	33.9	5.28	34.0	5.29	34.1	5.30	35.0	5.31	34.9	5.33

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

The System Combination Ratio must be between 50-130%.

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).



ARUN053GSS4

Cooling Capacity

53,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
110%	-9.9	40.6	1.64	48.5	1.97	56.3	2.34	60.2	2.54	64.2	2.72	70.7	3.10	72.2	3.22
	-5	40.6	1.73	48.5	2.08	56.3	2.47	60.2	2.68	64.2	2.87	70.7	3.27	72.2	3.39
	0	40.6	1.80	48.5	2.17	56.3	2.57	60.2	2.78	64.2	2.98	70.7	3.40	72.2	3.53
	5	40.6	1.86	48.5	2.25	56.3	2.66	60.2	2.89	64.2	3.09	70.7	3.53	72.2	3.66
	10	40.6	1.91	48.5	2.31	56.3	2.74	60.2	2.97	64.2	3.18	70.7	3.63	72.2	3.76
	14	40.6	1.98	48.5	2.39	56.3	2.84	60.2	3.08	64.2	3.30	70.7	3.76	72.2	3.90
	20	40.6	2.01	48.5	2.43	56.3	2.88	60.2	3.12	64.2	3.35	70.7	3.82	72.2	3.96
	25	40.6	2.04	48.5	2.46	56.3	2.92	60.2	3.15	64.2	3.39	70.7	3.88	72.2	4.01
	30	40.6	2.06	48.5	2.50	56.3	2.95	60.2	3.19	64.2	3.43	70.7	3.93	72.2	4.06
	35	40.6	2.09	48.5	2.53	56.3	2.99	60.2	3.24	64.2	3.48	70.7	3.99	72.2	4.13
	40	40.6	2.12	48.5	2.57	56.3	3.04	60.2	3.28	64.2	3.53	70.7	4.04	72.2	4.18
	45	40.6	2.16	48.5	2.61	56.3	3.08	60.2	3.34	64.2	3.59	70.7	4.11	72.2	4.25
	50	40.6	2.19	48.5	2.65	56.3	3.14	60.2	3.39	64.2	3.64	70.7	4.18	72.2	4.32
	55	40.6	2.23	48.5	2.70	56.3	3.20	60.2	3.46	64.2	3.72	69.7	4.25	71.2	4.36
	60	40.6	2.30	48.5	2.80	56.3	3.33	60.2	3.60	64.2	3.86	67.9	4.38	69.4	4.42
	65	40.6	2.35	48.5	2.86	56.3	3.39	60.2	3.67	64.2	3.94	66.9	4.53	68.4	4.56
	70	40.6	2.37	48.5	2.88	56.3	3.55	60.2	3.90	62.9	4.28	65.7	4.76	67.2	4.80
	75	40.6	2.43	48.5	3.07	56.3	3.80	60.2	4.19	61.9	4.59	64.7	4.98	66.2	5.02
	80	40.2	2.76	48.0	3.50	55.7	4.34	58.9	4.79	59.6	5.27	62.3	5.41	63.8	5.46
	85	40.2	2.94	48.0	3.74	55.7	4.64	57.9	5.11	58.7	5.59	61.3	5.64	62.8	5.68
	90	40.2	3.33	48.0	4.25	55.5	5.27	56.2	5.83	57.0	6.03	59.6	6.07	61.1	6.13
	95	40.2	3.54	48.0	4.52	54.5	5.62	55.3	6.22	56.0	6.24	58.6	6.30	60.1	6.36
	100	40.2	3.83	48.0	4.89	53.8	6.10	54.5	6.54	55.3	6.58	57.8	6.64	59.3	6.70
	105	40.2	4.31	48.0	5.53	52.1	6.88	52.8	7.04	53.6	7.07	56.1	7.14	57.6	7.20
	110	40.2	4.84	48.0	6.23	50.5	7.50	50.7	7.54	51.4	7.56	53.0	7.64	53.2	7.71
	115	40.2	5.60	48.0	7.17	48.4	7.91	48.4	7.91	48.6	7.91	49.6	7.92	49.8	7.93
	118	38.9	5.11	41.7	6.07	42.1	6.65	42.1	6.71	42.3	6.71	43.1	6.72	43.0	6.73
	122	31.1	3.87	33.5	4.62	33.6	5.06	33.6	5.07	33.9	5.08	34.6	5.09	34.6	5.12
100%	-9.9	35.7	1.44	42.6	1.74	49.5	2.06	53.0	2.24	58.2	2.43	65.3	2.80	69.0	2.92
	-5	35.7	1.52	42.6	1.83	49.5	2.17	53.0	2.37	58.2	2.56	65.3	2.96	69.0	3.08
	0	35.7	1.58	42.6	1.91	49.5	2.26	53.0	2.46	58.2	2.66	65.3	3.07	69.0	3.20
	5	35.7	1.64	42.6	1.98	49.5	2.34	53.0	2.55	58.2	2.76	65.3	3.19	69.0	3.32
	10	35.7	1.69	42.6	2.03	49.5	2.41	53.0	2.63	58.2	2.84	65.3	3.28	69.0	3.41
	14	35.7	1.75	42.6	2.11	49.5	2.50	53.0	2.72	58.2	2.94	65.3	3.40	69.0	3.54
	20	35.7	1.80	42.6	2.18	49.5	2.58	53.0	2.80	58.2	3.04	65.3	3.50	69.0	3.64
	25	35.7	1.85	42.6	2.23	49.5	2.64	53.0	2.86	58.2	3.12	65.3	3.58	69.0	3.72
	30	35.7	1.89	42.6	2.29	49.5	2.71	53.0	2.93	58.2	3.19	65.3	3.66	69.0	3.81
	35	35.7	1.92	42.6	2.33	49.5	2.75	53.0	2.97	58.2	3.25	65.3	3.72	69.0	3.87
	40	35.7	1.95	42.6	2.36	49.5	2.79	53.0	3.02	58.2	3.30	65.3	3.78	69.0	3.93
	45	35.7	2.00	42.6	2.41	49.5	2.85	53.0	3.09	58.2	3.36	65.3	3.86	69.0	4.01
	50	35.7	2.03	42.6	2.46	49.5	2.91	53.0	3.15	58.2	3.43	65.3	3.94	69.0	4.09
	55	35.7	2.07	42.6	2.51	49.5	2.97	53.0	3.21	58.2	3.50	65.3	4.00	68.2	4.15
	60	35.7	2.14	42.6	2.60	49.5	3.09	53.0	3.34	58.2	3.64	65.1	4.13	66.3	4.23
	65	35.7	2.18	42.6	2.65	49.5	3.15	53.0	3.41	58.2	3.71	64.1	4.27	65.6	4.35
	70	35.7	2.25	42.6	2.73	49.5	3.36	53.0	3.70	58.2	4.12	62.9	4.58	64.1	4.66
	75	35.7	2.30	42.6	2.91	49.5	3.60	53.0	3.97	58.2	4.42	61.9	4.79	63.4	4.85
	80	35.7	2.62	42.6	3.32	49.5	4.11	53.0	4.54	58.2	5.07	60.2	5.20	61.4	5.27
	85	35.7	2.79	42.6	3.54	49.5	4.40	53.0	4.84	58.0	5.37	59.2	5.42	60.7	5.49
	90	35.7	3.16	42.6	4.02	49.5	4.99	53.0	5.52	56.1	5.80	57.5	5.84	58.7	5.93
	95	35.7	3.35	42.6	4.28	49.5	5.33	53.0	5.89	55.3	6.00	56.5	6.06	58.0	6.15
	100	35.7	3.62	42.6	4.62	49.5	5.76	52.1	6.18	54.4	6.31	55.8	6.37	57.1	6.46
	105	35.7	4.06	42.6	5.21	49.2	6.48	50.6	6.63	52.7	6.76	54.1	6.82	55.4	6.91
	110	35.7	4.54	42.6	5.85	48.6	7.03	49.7	7.07	50.7	7.20	51.5	7.27	52.5	7.37
	115	35.7	5.22	42.6	6.68	46.3	7.36	47.7	7.36	48.9	7.47	49.3	7.49	49.6	7.54
	118	35.7	5.26	37.4	6.26	40.3	6.19	41.5	6.25	42.6	6.34	43.0	6.35	42.8	6.39
	122	30.6	4.77	30.0	4.76	32.1	4.71	33.2	4.72	34.1	4.80	34.5	4.82	34.4	4.86

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

The System Combination Ratio must be between 50-130%.

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

PERFORMANCE DATA



Cooling Capacity

ARUN053GSS4

53,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
90%	-9.9	32.2	1.28	38.3	1.54	44.7	1.82	47.8	1.96	50.9	2.09	57.0	2.41	63.2	2.64
	-5	32.2	1.36	38.3	1.62	44.7	1.92	47.8	2.06	50.9	2.20	57.0	2.54	63.2	2.79
	0	32.2	1.41	38.3	1.69	44.7	2.00	47.8	2.15	50.9	2.29	57.0	2.64	63.2	2.90
	5	32.2	1.46	38.3	1.75	44.7	2.07	47.8	2.22	50.9	2.38	57.0	2.74	63.2	3.00
	10	32.2	1.50	38.3	1.80	44.7	2.13	47.8	2.29	50.9	2.45	57.0	2.82	63.2	3.09
	14	32.2	1.56	38.3	1.87	44.7	2.20	47.8	2.37	50.9	2.53	57.0	2.92	63.2	3.20
	20	32.2	1.61	38.3	1.94	44.7	2.29	47.8	2.46	50.9	2.64	57.0	3.02	63.2	3.33
	25	32.2	1.66	38.3	2.00	44.7	2.36	47.8	2.54	50.9	2.73	57.0	3.11	63.2	3.43
	30	32.2	1.71	38.3	2.06	44.7	2.42	47.8	2.61	50.9	2.81	57.0	3.20	63.2	3.53
	35	32.2	1.76	38.3	2.12	44.7	2.50	47.8	2.69	50.9	2.90	57.0	3.29	63.2	3.64
	40	32.2	1.81	38.3	2.18	44.7	2.57	47.8	2.77	50.9	2.99	57.0	3.39	63.2	3.75
	45	32.2	1.86	38.3	2.23	44.7	2.63	47.8	2.84	50.9	3.06	57.0	3.47	63.2	3.83
	50	32.2	1.90	38.3	2.28	44.7	2.69	47.8	2.90	50.9	3.12	57.0	3.55	63.2	3.92
	55	32.2	1.92	38.3	2.32	44.7	2.74	47.8	2.96	50.9	3.18	57.0	3.62	63.2	3.95
	60	32.2	1.99	38.3	2.41	44.7	2.84	47.8	3.08	50.9	3.31	57.0	3.76	62.6	4.00
	65	32.2	2.02	38.3	2.46	44.7	2.90	47.8	3.14	50.9	3.37	57.0	3.83	62.2	4.20
	70	32.2	2.08	38.3	2.53	44.7	3.01	47.8	3.31	50.9	3.62	57.0	4.27	61.0	4.51
	75	32.2	2.12	38.3	2.64	44.7	3.22	47.8	3.55	50.9	3.88	57.0	4.45	60.1	4.71
	80	32.2	2.38	38.3	3.00	44.7	3.67	47.8	4.05	50.9	4.43	57.0	4.92	58.4	5.12
	85	32.2	2.53	38.3	3.19	44.7	3.93	47.8	4.32	50.9	4.74	56.3	5.19	57.5	5.34
	90	32.2	2.86	38.3	3.62	44.7	4.46	47.8	4.91	50.9	5.39	54.7	5.67	55.8	5.76
	95	32.2	3.04	38.3	3.84	44.7	4.75	47.8	5.24	50.9	5.76	53.7	5.89	54.9	5.97
	100	32.2	3.14	38.3	4.00	44.7	4.95	47.8	5.45	50.9	5.88	53.0	6.14	53.9	6.21
	105	32.2	3.64	38.3	4.64	44.7	5.60	47.8	5.97	50.3	6.31	51.4	6.59	52.0	6.67
	110	32.2	4.18	38.3	5.35	44.7	6.14	47.8	6.44	48.3	6.84	48.9	7.07	49.3	7.15
	115	32.2	4.53	38.3	5.80	41.9	6.46	45.3	6.74	46.0	7.06	46.4	7.21	46.6	7.31
	118	32.2	4.81	37.4	6.26	36.5	5.44	39.5	5.72	40.0	5.99	40.4	6.12	40.2	6.20
	122	30.6	4.77	30.0	4.76	29.1	4.14	31.5	4.33	32.1	4.53	32.4	4.64	32.4	4.71
80%	-9.9	28.6	1.11	34.1	1.34	39.8	1.56	42.4	1.69	45.2	1.82	50.6	2.08	56.1	2.32
	-5	28.6	1.17	34.1	1.41	39.8	1.64	42.4	1.78	45.2	1.92	50.6	2.20	56.1	2.45
	0	28.6	1.22	34.1	1.47	39.8	1.71	42.4	1.86	45.2	2.00	50.6	2.28	56.1	2.54
	5	28.6	1.27	34.1	1.52	39.8	1.77	42.4	1.92	45.2	2.07	50.6	2.37	56.1	2.64
	10	28.6	1.30	34.1	1.57	39.8	1.82	42.4	1.98	45.2	2.13	50.6	2.44	56.1	2.71
	14	28.6	1.35	34.1	1.63	39.8	1.89	42.4	2.05	45.2	2.21	50.6	2.52	56.1	2.81
	20	28.6	1.40	34.1	1.68	39.8	1.96	42.4	2.13	45.2	2.29	50.6	2.62	56.1	2.92
	25	28.6	1.44	34.1	1.73	39.8	2.03	42.4	2.19	45.2	2.35	50.6	2.69	56.1	3.01
	30	28.6	1.49	34.1	1.78	39.8	2.09	42.4	2.26	45.2	2.41	50.6	2.77	56.1	3.10
	35	28.6	1.53	34.1	1.83	39.8	2.15	42.4	2.31	45.2	2.48	50.6	2.84	56.1	3.19
	40	28.6	1.57	34.1	1.88	39.8	2.20	42.4	2.38	45.2	2.55	50.6	2.92	56.1	3.27
	45	28.6	1.59	34.1	1.90	39.8	2.24	42.4	2.41	45.2	2.58	50.6	2.96	56.1	3.32
	50	28.6	1.61	34.1	1.93	39.8	2.27	42.4	2.45	45.2	2.62	50.6	3.00	56.1	3.36
	55	28.6	1.64	34.1	1.96	39.8	2.31	42.4	2.49	45.2	2.67	50.6	3.06	56.1	3.42
	60	28.6	1.69	34.1	2.03	39.8	2.39	42.4	2.58	45.2	2.77	50.6	3.17	56.1	3.56
	65	28.6	1.72	34.1	2.07	39.8	2.44	42.4	2.63	45.2	2.83	50.6	3.22	56.1	3.64
	70	28.6	1.77	34.1	2.13	39.8	2.51	42.4	2.71	45.2	2.95	50.6	3.48	56.1	4.02
	75	28.6	1.80	34.1	2.17	39.8	2.63	42.4	2.89	45.2	3.14	50.6	3.70	56.1	4.24
	80	28.6	1.97	34.1	2.46	39.8	3.00	42.4	3.28	45.2	3.58	50.6	4.25	56.1	4.74
	85	28.6	2.10	34.1	2.62	39.8	3.20	42.4	3.50	45.2	3.84	50.6	4.53	56.1	4.86
	90	28.6	2.36	34.1	2.97	39.8	3.62	42.4	3.98	45.2	4.36	50.6	4.98	55.2	5.15
	95	28.6	2.51	34.1	3.14	39.8	3.86	42.4	4.22	45.2	4.64	50.6	5.15	54.0	5.29
	100	28.6	2.71	34.1	3.39	39.8	4.16	42.4	4.52	45.2	4.82	50.6	5.37	52.8	5.47
	105	28.6	3.09	34.1	3.88	39.8	4.64	42.4	4.85	45.2	5.17	50.0	5.58	51.3	5.74
	110	28.6	3.50	34.1	4.42	39.8	4.92	42.4	5.18	45.2	5.57	48.3	5.78	48.5	6.03
	115	28.6	3.75	34.1	4.72	39.8	5.08	42.4	5.45	42.4	5.70	42.6	5.91	42.6	6.27
	118	28.6	3.98	34.1	5.02	36.5	5.44	37.2	5.17	36.9	4.84	37.1	5.02	36.8	5.32
	122	28.6	4.30	30.1	4.73	29.1	4.14	29.7	3.91	29.5	3.66	29.8	3.80	29.6	4.04

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

The System Combination Ratio must be between 50-130%.

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).



ARUN053GSS4

Cooling Capacity

53,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
70%	-9.9	25.1	0.98	29.8	1.17	34.8	1.37	37.1	1.47	39.5	1.57	44.2	1.79	49.2	2.01
	-5	25.1	1.04	29.8	1.23	34.8	1.45	37.1	1.55	39.5	1.65	44.2	1.89	49.2	2.12
	0	25.1	1.08	29.8	1.28	34.8	1.51	37.1	1.61	39.5	1.72	44.2	1.97	49.2	2.20
	5	25.1	1.12	29.8	1.33	34.8	1.56	37.1	1.67	39.5	1.78	44.2	2.04	49.2	2.28
	10	25.1	1.15	29.8	1.37	34.8	1.61	37.1	1.72	39.5	1.83	44.2	2.10	49.2	2.35
	14	25.1	1.19	29.8	1.42	34.8	1.67	37.1	1.78	39.5	1.90	44.2	2.18	49.2	2.44
	20	25.1	1.23	29.8	1.46	34.8	1.72	37.1	1.84	39.5	1.97	44.2	2.25	49.2	2.52
	25	25.1	1.27	29.8	1.50	34.8	1.76	37.1	1.89	39.5	2.02	44.2	2.30	49.2	2.59
	30	25.1	1.30	29.8	1.54	34.8	1.80	37.1	1.94	39.5	2.07	44.2	2.36	49.2	2.65
	35	25.1	1.34	29.8	1.58	34.8	1.86	37.1	1.99	39.5	2.13	44.2	2.42	49.2	2.73
	40	25.1	1.37	29.8	1.62	34.8	1.90	37.1	2.04	39.5	2.19	44.2	2.49	49.2	2.80
	45	25.1	1.39	29.8	1.65	34.8	1.93	37.1	2.08	39.5	2.22	44.2	2.53	49.2	2.84
	50	25.1	1.42	29.8	1.68	34.8	1.96	37.1	2.11	39.5	2.26	44.2	2.57	49.2	2.89
	55	25.1	1.44	29.8	1.71	34.8	2.00	37.1	2.14	39.5	2.30	44.2	2.62	49.2	2.95
	60	25.1	1.48	29.8	1.77	34.8	2.07	37.1	2.23	39.5	2.38	44.2	2.72	49.2	3.06
	65	25.1	1.51	29.8	1.80	34.8	2.10	37.1	2.27	39.5	2.43	44.2	2.77	49.2	3.11
	70	25.1	1.55	29.8	1.85	34.8	2.17	37.1	2.33	39.5	2.50	44.2	2.86	49.2	3.30
	75	25.1	1.57	29.8	1.88	34.8	2.21	37.1	2.41	39.5	2.62	44.2	3.06	49.2	3.50
	80	25.1	1.69	29.8	2.08	34.8	2.51	37.1	2.74	39.5	2.97	44.2	3.38	49.2	3.88
	85	25.1	1.80	29.8	2.21	34.8	2.68	37.1	2.92	39.5	3.20	44.2	3.60	49.2	4.05
	90	25.1	2.02	29.8	2.50	34.8	3.03	37.1	3.30	39.5	3.62	44.2	4.02	49.2	4.39
	95	25.1	2.14	29.8	2.65	34.8	3.22	37.1	3.53	39.5	3.84	44.2	4.23	49.2	4.52
	100	25.1	2.31	29.8	2.86	34.8	3.48	37.1	3.80	39.5	3.95	44.2	4.42	49.2	4.65
	105	25.1	2.62	29.8	3.26	34.8	3.83	37.1	4.06	39.5	4.29	44.2	4.66	49.2	4.92
	110	25.1	2.95	29.8	3.70	34.8	4.06	37.1	4.30	39.5	4.65	44.2	4.85	47.8	5.29
	115	25.1	3.17	29.8	3.94	34.8	4.20	37.1	4.55	39.5	4.79	44.2	5.00	45.1	5.64
	118	25.1	3.36	29.8	4.19	34.8	4.46	37.1	4.82	36.0	4.79	37.1	4.24	36.8	4.78
	122	25.1	3.63	29.8	4.54	31.0	4.26	29.7	3.96	28.8	3.63	29.8	3.22	29.6	3.63
60%	-9.9	21.5	0.85	25.6	0.99	29.8	1.16	31.7	1.24	33.8	1.33	38.1	1.51	42.1	1.69
	-5	21.5	0.90	25.6	1.04	29.8	1.22	31.7	1.31	33.8	1.41	38.1	1.59	42.1	1.78
	0	21.5	0.93	25.6	1.08	29.8	1.27	31.7	1.36	33.8	1.46	38.1	1.66	42.1	1.85
	5	21.5	0.97	25.6	1.12	29.8	1.32	31.7	1.41	33.8	1.52	38.1	1.72	42.1	1.92
	10	21.5	1.00	25.6	1.16	29.8	1.36	31.7	1.45	33.8	1.56	38.1	1.77	42.1	1.98
	14	21.5	1.03	25.6	1.20	29.8	1.41	31.7	1.50	33.8	1.62	38.1	1.83	42.1	2.05
	20	21.5	1.06	25.6	1.24	29.8	1.45	31.7	1.56	33.8	1.67	38.1	1.89	42.1	2.12
	25	21.5	1.09	25.6	1.28	29.8	1.49	31.7	1.60	33.8	1.71	38.1	1.94	42.1	2.18
	30	21.5	1.12	25.6	1.31	29.8	1.53	31.7	1.64	33.8	1.76	38.1	1.99	42.1	2.24
	35	21.5	1.14	25.6	1.35	29.8	1.57	31.7	1.68	33.8	1.80	38.1	2.04	42.1	2.30
	40	21.5	1.17	25.6	1.38	29.8	1.61	31.7	1.73	33.8	1.85	38.1	2.10	42.1	2.36
	45	21.5	1.18	25.6	1.40	29.8	1.62	31.7	1.74	33.8	1.87	38.1	2.11	42.1	2.37
	50	21.5	1.19	25.6	1.41	29.8	1.64	31.7	1.76	33.8	1.88	38.1	2.14	42.1	2.40
	55	21.5	1.21	25.6	1.43	29.8	1.67	31.7	1.79	33.8	1.91	38.1	2.18	42.1	2.44
	60	21.5	1.25	25.6	1.48	29.8	1.73	31.7	1.86	33.8	1.99	38.1	2.25	42.1	2.54
	65	21.5	1.27	25.6	1.51	29.8	1.76	31.7	1.89	33.8	2.02	38.1	2.30	42.1	2.59
	70	21.5	1.30	25.6	1.55	29.8	1.81	31.7	1.94	33.8	2.08	38.1	2.36	42.1	2.68
	75	21.5	1.33	25.6	1.57	29.8	1.84	31.7	1.98	33.8	2.14	38.1	2.50	42.1	2.86
	80	21.5	1.41	25.6	1.72	29.8	2.06	31.7	2.25	33.8	2.44	38.1	2.80	42.1	3.23
	85	21.5	1.50	25.6	1.82	29.8	2.19	31.7	2.40	33.8	2.61	38.1	2.95	42.1	3.33
	90	21.5	1.68	25.6	2.06	29.8	2.48	31.7	2.71	33.8	2.93	38.1	3.30	42.1	3.64
	95	21.5	1.78	25.6	2.18	29.8	2.63	31.7	2.89	33.8	3.10	38.1	3.45	42.1	3.83
	100	21.5	1.91	25.6	2.35	29.8	2.84	31.7	3.11	33.8	3.24	38.1	3.66	42.1	3.99
	105	21.5	2.17	25.6	2.67	29.8	3.13	31.7	3.32	33.8	3.53	38.1	3.89	42.1	4.35
	110	21.5	2.44	25.6	3.03	29.8	3.38	31.7	3.52	33.8	3.81	38.1	4.16	42.1	4.75
	115	21.5	2.61	25.6	3.24	29.8	3.51	31.7	3.72	33.8	3.95	38.1	4.39	42.1	5.07
	118	21.5	2.76	25.6	3.44	29.8	3.73	31.7	3.95	33.8	4.20	37.1	4.24	36.8	4.78
	122	21.5	2.98	25.6	3.72	29.8	4.04	29.6	4.01	28.7	3.71	29.8	3.22	29.6	3.63

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

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

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

PERFORMANCE DATA



Cooling Capacity

ARUN053GSS4

53,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp. (°F DB)	Indoor Air Temp. °F DB/°F WB													
		68/57		73/61		79/64		80/67		85/70		88/73		91/76	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%		MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW	MBh	kW
	-9.9	17.9	0.73	21.3	0.86	24.8	0.96	26.5	1.04	28.2	1.12	31.7	1.24	35.0	1.38
	-5	17.9	0.77	21.3	0.91	24.8	1.02	26.5	1.10	28.2	1.18	31.7	1.31	35.0	1.45
	0	17.9	0.80	21.3	0.95	24.8	1.06	26.5	1.14	28.2	1.23	31.7	1.36	35.0	1.51
	5	17.9	0.83	21.3	0.98	24.8	1.10	26.5	1.18	28.2	1.27	31.7	1.41	35.0	1.56
	10	17.9	0.86	21.3	1.01	24.8	1.13	26.5	1.22	28.2	1.31	31.7	1.45	35.0	1.61
	14	17.9	0.89	21.3	1.04	24.8	1.17	26.5	1.26	28.2	1.36	31.7	1.50	35.0	1.67
	20	17.9	0.92	21.3	1.08	24.8	1.22	26.5	1.31	28.2	1.40	31.7	1.56	35.0	1.73
	25	17.9	0.95	21.3	1.10	24.8	1.26	26.5	1.34	28.2	1.44	31.7	1.61	35.0	1.78
	30	17.9	0.98	21.3	1.13	24.8	1.30	26.5	1.38	28.2	1.47	31.7	1.65	35.0	1.84
	35	17.9	1.00	21.3	1.16	24.8	1.33	26.5	1.42	28.2	1.51	31.7	1.70	35.0	1.88
	40	17.9	1.03	21.3	1.19	24.8	1.37	26.5	1.45	28.2	1.55	31.7	1.74	35.0	1.93
	45	17.9	1.04	21.3	1.21	24.8	1.38	26.5	1.47	28.2	1.57	31.7	1.76	35.0	1.96
	50	17.9	1.06	21.3	1.23	24.8	1.41	26.5	1.49	28.2	1.60	31.7	1.79	35.0	1.99
	55	17.9	1.08	21.3	1.25	24.8	1.43	26.5	1.52	28.2	1.62	31.7	1.82	35.0	2.02
	60	17.9	1.10	21.3	1.28	24.8	1.47	26.5	1.57	28.2	1.67	31.7	1.88	35.0	2.10
	65	17.9	1.11	21.3	1.30	24.8	1.49	26.5	1.60	28.2	1.70	31.7	1.91	35.0	2.14
	70	17.9	1.15	21.3	1.33	24.8	1.53	26.5	1.64	28.2	1.74	31.7	1.97	35.0	2.20
	75	17.9	1.16	21.3	1.35	24.8	1.56	26.5	1.66	28.2	1.78	31.7	2.00	35.0	2.25
	80	17.9	1.19	21.3	1.43	24.8	1.67	26.5	1.81	28.2	1.94	31.7	2.24	35.0	2.55
	85	17.9	1.27	21.3	1.51	24.8	1.78	26.5	1.92	28.2	2.07	31.7	2.38	35.0	2.72
	90	17.9	1.42	21.3	1.69	24.8	2.00	26.5	2.16	28.2	2.33	31.7	2.69	35.0	3.08
	95	17.9	1.49	21.3	1.79	24.8	2.11	26.5	2.29	28.2	2.47	31.7	2.86	35.0	3.27
	100	17.9	1.57	21.3	1.89	24.8	2.24	26.5	2.43	28.2	2.62	31.7	3.03	35.0	3.47
	105	17.9	1.72	21.3	2.09	24.8	2.47	26.5	2.68	28.2	2.90	31.7	3.36	35.0	3.86
	110	17.9	1.90	21.3	2.30	24.8	2.74	26.5	2.98	28.2	3.23	31.7	3.75	35.0	4.32
	115	17.9	2.03	21.3	2.47	24.8	2.95	26.5	3.20	28.2	3.47	31.7	4.05	35.0	4.65
	118	17.9	2.20	21.3	2.68	24.8	3.20	26.5	3.48	28.2	3.78	31.7	4.24	35.0	4.78
	122	17.9	2.42	21.3	2.96	24.8	3.54	26.5	3.87	28.2	3.71	29.8	3.22	29.6	3.63

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

Cooling range with the Low Ambient Baffle Kit (sold separately) is -9.9°F to +122°F.

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

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.
0 ft. level difference between outdoor and indoor units.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB), and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).



ARUN038GSS4

Heating Capacity

38,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp.		Indoor Air Temp. °F DB/°F WB															
			59		61		64		67		70		73		76		80	
	°F DB	°F WB	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW
130	-4.0	-4.4	33.2	3.13	33.2	3.37	33.2	3.74	33.1	4.04	33.0	4.35	33.0	4.66	33.0	4.81	33.0	5.02
	0.0	-0.4	35.1	3.40	35.1	3.64	35.1	4.01	35.0	4.31	34.9	4.62	34.9	4.93	34.9	5.09	34.9	5.29
	5.0	4.5	37.5	3.74	37.5	3.98	37.5	4.35	37.4	4.65	37.3	4.96	37.3	5.27	37.3	5.42	37.3	5.63
	10.0	9.0	39.9	4.08	39.9	4.32	39.9	4.69	39.8	4.99	39.6	5.30	39.6	5.61	39.6	5.76	39.6	5.97
	15.0	14.0	42.2	4.41	42.2	4.65	42.2	5.02	42.1	5.32	42.0	5.63	42.0	5.94	42.0	6.09	42.0	6.30
	20.0	19.0	44.7	4.75	44.7	5.00	44.7	5.36	44.5	5.67	44.4	5.97	44.4	6.08	44.4	5.95	44.4	5.78
	25.0	23.0	47.1	5.09	47.1	5.34	47.1	5.70	46.9	5.88	46.8	6.05	46.8	5.79	46.8	5.67	46.8	5.50
	30.0	28.0	49.5	5.43	49.5	5.67	49.5	6.04	49.3	5.90	49.2	5.75	48.9	5.51	48.3	5.38	47.5	5.22
	35.0	32.0	51.9	6.06	51.9	6.01	51.9	5.93	51.7	5.69	51.6	5.45	50.5	5.22	48.4	5.10	45.6	4.94
	40.0	36.0	54.3	6.10	54.3	5.87	54.3	5.53	54.1	5.34	53.9	5.15	51.2	4.93	48.2	4.81	44.1	4.65
	45.0	41.0	56.1	5.42	56.1	5.31	56.1	5.14	55.3	4.99	54.5	4.84	51.2	4.64	48.2	4.53	44.1	4.37
	47.0	43.0	56.1	5.28	56.1	5.17	56.1	5.00	55.3	4.86	54.5	4.71	51.2	4.52	48.2	4.41	44.1	4.25
	50.0	46.0	56.1	5.09	56.1	4.98	56.1	4.82	55.3	4.68	54.5	4.54	51.2	4.35	48.2	4.24	44.1	4.10
	55.0	51.0	56.1	4.77	56.1	4.67	56.1	4.52	55.3	4.39	54.5	4.26	51.2	4.09	48.2	3.98	44.1	3.85
120	60.0	56.0	56.1	4.44	56.1	4.35	56.1	4.21	55.3	4.09	54.5	3.96	51.2	3.80	48.2	3.71	44.1	3.58
	-4.0	-4.4	32.9	3.49	32.9	3.74	32.9	4.10	32.8	4.23	32.7	4.35	32.7	4.82	32.7	4.92	32.7	5.06
	0.0	-0.4	34.8	3.76	34.8	4.01	34.8	4.37	34.7	4.50	34.6	4.62	34.6	5.09	34.6	5.19	34.6	5.33
	5.0	4.5	37.2	4.10	37.2	4.35	37.2	4.71	37.1	4.83	37.0	4.96	37.0	5.43	37.0	5.53	37.0	5.67
	10.0	9.0	39.6	4.44	39.6	4.69	39.6	5.05	39.5	5.17	39.4	5.30	39.4	5.77	39.4	5.87	39.4	6.01
	15.0	14.0	41.9	4.77	41.9	5.02	41.9	5.38	41.8	5.50	41.7	5.63	41.7	6.10	41.7	6.20	41.7	6.34
	20.0	19.0	44.4	5.12	44.4	5.36	44.4	5.73	44.2	5.93	44.1	6.14	44.1	5.96	44.1	5.88	44.1	5.77
	25.0	23.0	46.7	5.46	46.7	5.70	46.7	6.07	46.6	5.96	46.5	5.85	46.2	5.69	45.6	5.61	44.9	5.51
	30.0	28.0	49.1	6.11	49.1	6.04	49.1	5.93	49.0	5.75	48.8	5.56	47.6	5.42	45.4	5.34	42.4	5.24
	35.0	32.0	51.5	6.12	51.5	5.90	51.5	5.58	51.0	5.42	50.5	5.27	48.2	5.15	45.2	5.08	41.3	4.98
	40.0	36.0	53.9	5.60	53.9	5.45	53.9	5.22	52.5	5.10	51.1	4.98	48.2	4.88	45.2	4.81	41.3	4.71
	45.0	41.0	56.0	5.10	55.6	5.01	55.0	4.87	53.1	4.78	51.1	4.68	48.2	4.61	45.2	4.54	41.3	4.45
	47.0	43.0	56.0	4.96	55.6	4.87	55.0	4.74	53.1	4.65	51.1	4.56	48.2	4.49	45.2	4.42	41.3	4.33
	50.0	46.0	56.0	4.78	55.6	4.69	55.0	4.57	53.1	4.48	51.1	4.39	48.2	4.32	45.2	4.26	41.3	4.17
	55.0	51.0	56.0	4.49	55.6	4.41	55.0	4.29	53.1	4.21	51.1	4.12	48.2	4.06	45.2	3.99	41.3	3.91
	60.0	56.0	56.0	4.17	55.6	4.10	55.0	3.99	53.1	3.91	51.1	3.83	48.2	3.77	45.2	3.72	41.3	3.64
110	-4.0	-4.4	32.8	3.94	32.8	4.10	32.8	4.35	32.7	4.56	32.6	4.77	32.6	5.00	32.6	5.24	32.6	5.55
	0.0	-0.4	34.7	4.21	34.7	4.37	34.7	4.62	34.5	4.83	34.4	5.04	34.4	5.28	34.4	5.51	34.4	5.82
	5.0	4.5	37.0	4.55	37.0	4.71	37.0	4.96	36.9	5.17	36.8	5.38	36.8	5.61	36.8	5.85	36.8	6.16
	10.0	9.0	39.4	4.89	39.4	5.05	39.4	5.30	39.3	5.51	39.1	5.72	39.1	5.95	39.1	6.19	39.1	6.50
	15.0	14.0	41.7	5.22	41.7	5.38	41.7	5.63	41.6	5.84	41.4	6.05	41.4	6.09	41.4	5.89	41.4	5.63
	20.0	19.0	44.1	5.57	44.1	5.73	44.1	5.97	44.0	5.97	43.8	5.97	42.8	5.79	40.9	5.61	38.4	5.37
	25.0	23.0	46.5	6.09	46.5	6.07	46.5	6.03	46.1	5.85	45.6	5.67	43.2	5.50	40.8	5.33	37.5	5.11
	30.0	28.0	48.9	6.04	48.9	5.89	48.9	5.66	47.4	5.51	45.9	5.36	43.2	5.21	40.8	5.06	37.5	4.85
	35.0	32.0	51.9	5.58	51.2	5.46	50.2	5.29	48.1	5.18	45.9	5.06	43.2	4.92	40.8	4.78	37.5	4.60
	40.0	36.0	54.9	5.12	53.2	5.04	50.6	4.92	48.2	4.84	45.9	4.76	43.2	4.63	40.8	4.51	37.5	4.34
	45.0	41.0	55.4	4.67	53.5	4.63	50.6	4.56	48.2	4.50	45.9	4.45	43.2	4.34	40.8	4.23	37.5	4.08
	47.0	43.0	55.4	4.55	53.5	4.50	50.6	4.44	48.2	4.39	45.9	4.33	43.2	4.23	40.8	4.12	37.5	3.97
	50.0	46.0	55.4	4.38	53.5	4.34	50.6	4.27	48.2	4.22	45.9	4.17	43.2	4.07	40.8	3.97	37.5	3.82
	55.0	51.0	55.4	4.11	53.5	4.07	50.6	4.01	48.2	3.97	45.9	3.92	43.2	3.82	40.8	3.72	37.5	3.59
	60.0	56.0	55.4	3.83	53.5	3.79	50.6	3.73	48.2	3.69	45.9	3.64	43.2	3.55	40.8	3.46	37.5	3.34

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).
 The System Combination Ratio must be between 50–130%.
 Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.
 Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

PERFORMANCE DATA



Heating Capacity

ARUN038GSS4

38,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp.		Indoor Air Temp. °F DB/°F WB															
			59		61		64		67		70		73		76		80	
	°F DB	°F WB	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW
100	-4.0	-4.4	32.6	4.18	32.6	4.35	32.6	4.59	32.5	4.76	32.4	4.93	32.4	5.27	32.4	5.46	32.4	5.72
	0.0	-0.4	34.5	4.46	34.4	4.62	34.3	4.86	34.2	5.03	34.2	5.20	34.2	5.54	34.2	5.73	34.2	5.99
	5.0	4.5	36.8	4.79	36.8	4.96	36.8	5.20	36.7	5.37	36.6	5.54	36.6	5.88	36.6	6.07	36.6	6.33
	10.0	9.0	39.3	5.13	39.2	5.30	39.0	5.54	39.0	5.71	39.0	5.88	38.5	6.08	37.6	5.98	36.3	5.84
	15.0	14.0	41.5	5.46	41.5	5.63	41.5	5.87	41.4	5.90	41.3	5.92	39.5	5.82	37.2	5.64	34.1	5.41
	20.0	19.0	44.8	5.88	44.7	5.97	44.4	6.11	43.2	5.86	42.0	5.61	39.5	5.48	37.2	5.31	34.1	5.09
	25.0	23.0	47.7	6.28	47.0	6.02	46.0	5.64	44.0	5.47	42.0	5.30	39.5	5.15	37.2	4.99	34.1	4.78
	30.0	28.0	50.0	5.85	48.4	5.63	46.2	5.31	44.1	5.15	42.0	5.00	39.5	4.82	37.2	4.67	34.1	4.47
	35.0	32.0	50.8	5.42	48.9	5.25	46.2	4.99	44.1	4.84	42.0	4.69	39.5	4.50	37.2	4.35	34.1	4.17
	40.0	36.0	50.8	4.99	48.9	4.86	46.2	4.66	44.1	4.52	42.0	4.38	39.5	4.17	37.2	4.03	34.1	3.86
	45.0	41.0	50.8	4.57	48.9	4.48	46.2	4.34	44.1	4.21	42.0	4.08	39.5	3.84	37.2	3.72	34.1	3.55
	47.0	43.0	50.8	4.45	48.9	4.36	46.2	4.22	44.1	4.10	42.0	3.97	39.5	3.74	37.2	3.62	34.1	3.46
	50.0	46.0	50.8	4.29	48.9	4.20	46.2	4.07	44.1	3.95	42.0	3.82	39.5	3.61	37.2	3.49	34.1	3.33
	55.0	51.0	50.8	4.03	48.9	3.94	46.2	3.82	44.1	3.70	42.0	3.59	39.5	3.38	37.2	3.27	34.1	3.13
	60.0	56.0	50.8	3.74	48.9	3.67	46.2	3.55	44.1	3.45	42.0	3.34	39.5	3.15	37.2	3.05	34.1	2.91
90	-4.0	-4.4	32.5	4.15	32.5	4.27	32.5	4.45	32.4	4.65	32.3	4.86	32.3	5.23	32.3	5.53	32.3	5.94
	0.0	-0.4	34.5	4.42	34.4	4.54	34.3	4.72	34.2	4.92	34.2	5.13	34.1	5.50	33.9	5.80	33.6	6.21
	5.0	4.5	36.8	4.76	36.8	4.88	36.8	5.06	36.6	5.26	36.5	5.46	35.6	5.69	34.2	5.68	32.3	5.66
	10.0	9.0	39.3	5.10	39.2	5.22	39.0	5.40	38.6	5.60	38.3	5.80	36.2	5.58	34.0	5.33	31.1	5.00
	15.0	14.0	41.5	5.43	41.5	5.55	41.5	5.73	40.0	5.66	38.5	5.60	36.2	5.29	34.0	5.05	31.1	4.74
	20.0	19.0	45.9	5.93	44.4	5.81	42.2	5.63	40.3	5.46	38.5	5.28	36.2	5.00	34.0	4.77	31.1	4.46
	25.0	23.0	46.6	5.58	44.8	5.47	42.2	5.30	40.3	5.13	38.5	4.97	36.2	4.70	34.0	4.49	31.1	4.20
	30.0	28.0	46.6	5.23	44.8	5.12	42.2	4.97	40.3	4.81	38.5	4.66	36.2	4.41	34.0	4.21	31.1	3.93
	35.0	32.0	46.6	4.88	44.8	4.78	42.2	4.63	40.3	4.49	38.5	4.35	36.2	4.12	34.0	3.92	31.1	3.67
	40.0	36.0	46.6	4.52	44.8	4.43	42.2	4.30	40.3	4.17	38.5	4.04	36.2	3.83	34.0	3.64	31.1	3.40
	45.0	41.0	46.6	4.18	44.8	4.09	42.2	3.97	40.3	3.85	38.5	3.73	36.2	3.54	34.0	3.37	31.1	3.14
	47.0	43.0	46.6	4.07	44.8	3.99	42.2	3.86	40.3	3.75	38.5	3.63	36.2	3.44	34.0	3.28	31.1	3.05
	50.0	46.0	46.6	3.92	44.8	3.84	42.2	3.72	40.3	3.61	38.5	3.50	36.2	3.32	34.0	3.16	31.1	2.94
	55.0	51.0	46.6	3.68	44.8	3.60	42.2	3.49	40.3	3.39	38.5	3.28	36.2	3.11	34.0	2.96	31.1	2.76
	60.0	56.0	46.6	3.42	44.8	3.35	42.2	3.25	40.3	3.15	38.5	3.05	36.2	2.90	34.0	2.76	31.1	2.57
80	-4.0	-4.4	32.4	3.68	32.4	3.79	32.4	3.95	32.3	4.19	32.2	4.42	31.7	4.90	30.6	5.13	29.2	5.44
	0.0	-0.4	34.3	3.96	34.3	4.06	34.3	4.22	34.0	4.46	33.8	4.69	32.3	5.08	30.4	5.11	27.9	5.16
	5.0	4.5	36.7	4.29	36.7	4.40	36.7	4.56	35.6	4.80	34.4	5.03	32.3	4.97	30.4	4.82	27.8	4.62
	10.0	9.0	40.3	4.63	39.3	4.74	37.8	4.90	36.1	4.97	34.4	5.05	32.3	4.72	30.4	4.57	27.8	4.38
	15.0	14.0	41.7	5.01	40.1	5.07	37.8	5.16	36.1	4.97	34.4	4.78	32.3	4.48	30.4	4.34	27.8	4.15
	20.0	19.0	41.7	5.08	40.1	4.99	37.8	4.86	36.1	4.68	34.4	4.50	32.3	4.23	30.4	4.09	27.8	3.90
	25.0	23.0	41.7	4.77	40.1	4.69	37.8	4.56	36.1	4.40	34.4	4.23	32.3	3.98	30.4	3.85	27.8	3.67
	30.0	28.0	41.7	4.47	40.1	4.39	37.8	4.27	36.1	4.11	34.4	3.96	32.3	3.73	30.4	3.60	27.8	3.43
	35.0	32.0	41.7	4.16	40.1	4.09	37.8	3.97	36.1	3.83	34.4	3.69	32.3	3.48	30.4	3.36	27.8	3.19
	40.0	36.0	41.7	3.86	40.1	3.78	37.8	3.68	36.1	3.55	34.4	3.42	32.3	3.24	30.4	3.12	27.8	2.96
	45.0	41.0	41.7	3.55	40.1	3.49	37.8	3.39	36.1	3.27	34.4	3.15	32.3	2.99	30.4	2.88	27.8	2.72
	47.0	43.0	41.7	3.46	40.1	3.39	37.8	3.30	36.1	3.18	34.4	3.07	32.3	2.91	30.4	2.80	27.8	2.65
	50.0	46.0	41.7	3.33	40.1	3.27	37.8	3.17	36.1	3.06	34.4	2.95	32.3	2.81	30.4	2.70	27.8	2.55
	55.0	51.0	41.7	3.13	40.1	3.07	37.8	2.98	36.1	2.88	34.4	2.77	32.3	2.63	30.4	2.53	27.8	2.40
	60.0	56.0	41.7	2.91	40.1	2.85	37.8	2.77	36.1	2.67	34.4	2.58	32.3	2.45	30.4	2.36	27.8	2.23

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).

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

Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.

Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

ARUN038GSS4

Heating Capacity

38,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp.		Indoor Air Temp. °F DB/°F WB															
			59		61		64		67		70		73		76		80	
	°F DB	°F WB	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW
70	-4.0	-4.4	31.7	3.54	31.7	3.71	31.7	3.95	30.4	4.25	29.2	4.55	27.6	4.91	26.0	5.02	23.9	5.17
	0.0	-0.4	34.0	3.81	33.2	3.98	32.1	4.22	30.7	4.54	29.2	4.86	27.6	4.87	26.0	4.79	23.9	4.68
	5.0	4.5	35.3	4.15	34.0	4.32	32.1	4.56	30.7	4.70	29.2	4.84	27.6	4.61	26.0	4.53	23.9	4.41
	10.0	9.0	35.3	4.49	34.0	4.65	32.1	4.90	30.7	4.73	29.2	4.57	27.6	4.35	26.0	4.26	23.9	4.14
	15.0	14.0	35.3	5.06	34.0	4.92	32.1	4.70	30.7	4.50	29.2	4.31	27.6	4.10	26.0	4.00	23.9	3.87
	20.0	19.0	35.3	4.73	34.0	4.60	32.1	4.40	30.7	4.21	29.2	4.03	27.6	3.84	26.0	3.73	23.9	3.59
	25.0	23.0	35.3	4.40	34.0	4.28	32.1	4.10	30.7	3.93	29.2	3.76	27.6	3.58	26.0	3.47	23.9	3.32
	30.0	28.0	35.3	4.08	34.0	3.97	32.1	3.80	30.7	3.65	29.2	3.49	27.6	3.32	26.0	3.20	23.9	3.05
	35.0	32.0	35.3	3.76	34.0	3.65	32.1	3.50	30.7	3.36	29.2	3.22	27.6	3.06	26.0	2.94	23.9	2.78
	40.0	36.0	35.3	3.43	34.0	3.34	32.1	3.20	30.7	3.08	29.2	2.95	27.6	2.80	26.0	2.67	23.9	2.51
	45.0	41.0	35.3	3.12	34.0	3.04	32.1	2.91	30.7	2.80	29.2	2.69	27.6	2.55	26.0	2.42	23.9	2.24
	47.0	43.0	35.3	3.04	34.0	2.96	32.1	2.84	30.7	2.73	29.2	2.62	27.6	2.48	26.0	2.35	23.9	2.18
	50.0	46.0	35.3	2.92	34.0	2.85	32.1	2.73	30.7	2.63	29.2	2.52	27.6	2.39	26.0	2.27	23.9	2.10
	55.0	51.0	35.3	2.74	34.0	2.67	32.1	2.57	30.7	2.47	29.2	2.37	27.6	2.24	26.0	2.13	23.9	1.98
	60.0	56.0	35.3	2.55	34.0	2.49	32.1	2.39	30.7	2.29	29.2	2.20	27.6	2.09	26.0	1.98	23.9	1.84
60	-4.0	-4.4	30.0	3.59	29.1	3.74	27.6	3.98	26.3	4.29	25.0	4.60	23.6	4.66	22.3	4.54	20.6	4.39
	0.0	-0.4	30.2	3.86	29.2	4.02	27.6	4.25	26.3	4.45	25.0	4.65	23.6	4.48	22.3	4.33	20.6	4.13
	5.0	4.5	30.2	4.20	29.2	4.35	27.6	4.59	26.3	4.49	25.0	4.39	23.6	4.22	22.3	4.07	20.6	3.87
	10.0	9.0	30.2	4.76	29.2	4.69	27.6	4.59	26.3	4.36	25.0	4.13	23.6	3.96	22.3	3.82	20.6	3.62
	15.0	14.0	30.2	4.63	29.2	4.49	27.6	4.30	26.3	4.08	25.0	3.87	23.6	3.71	22.3	3.56	20.6	3.37
	20.0	19.0	30.2	4.32	29.2	4.19	27.6	3.99	26.3	3.80	25.0	3.61	23.6	3.44	22.3	3.30	20.6	3.11
	25.0	23.0	30.2	4.01	29.2	3.89	27.6	3.70	26.3	3.52	25.0	3.35	23.6	3.19	22.3	3.05	20.6	2.86
	30.0	28.0	30.2	3.71	29.2	3.59	27.6	3.40	26.3	3.24	25.0	3.08	23.6	2.93	22.3	2.79	20.6	2.60
	35.0	32.0	30.2	3.41	29.2	3.29	27.6	3.11	26.3	2.96	25.0	2.82	23.6	2.67	22.3	2.53	20.6	2.35
	40.0	36.0	30.2	3.10	29.2	2.98	27.6	2.81	26.3	2.69	25.0	2.56	23.6	2.41	22.3	2.27	20.6	2.10
	45.0	41.0	30.2	2.81	29.2	2.69	27.6	2.52	26.3	2.42	25.0	2.31	23.6	2.16	22.3	2.03	20.6	1.85
	47.0	43.0	30.2	2.73	29.2	2.62	27.6	2.46	26.3	2.35	25.0	2.25	23.6	2.10	22.3	1.97	20.6	1.81
	50.0	46.0	30.2	2.63	29.2	2.53	27.6	2.37	26.3	2.27	25.0	2.17	23.6	2.02	22.3	1.90	20.6	1.74
	55.0	51.0	30.2	2.47	29.2	2.37	27.6	2.22	26.3	2.13	25.0	2.03	23.6	1.90	22.3	1.78	20.6	1.63
	60.0	56.0	30.2	2.30	29.2	2.21	27.6	2.07	26.3	1.98	25.0	1.89	23.6	1.77	22.3	1.66	20.6	1.52
50	-4.0	-4.4	25.3	3.30	24.4	3.54	23.0	3.91	21.9	4.10	20.9	4.29	19.7	4.06	18.5	3.86	17.0	3.60
	0.0	-0.4	25.3	3.57	24.4	3.81	23.0	4.18	21.9	4.15	20.9	4.13	19.7	3.87	18.5	3.68	17.0	3.43
	5.0	4.5	25.3	4.15	24.4	4.15	23.0	4.15	21.9	4.01	20.9	3.87	19.7	3.64	18.5	3.45	17.0	3.21
	10.0	9.0	25.3	4.34	24.4	4.16	23.0	3.88	21.9	3.75	20.9	3.62	19.7	3.40	18.5	3.23	17.0	3.00
	15.0	14.0	25.3	4.05	24.4	3.88	23.0	3.62	21.9	3.50	20.9	3.37	19.7	3.17	18.5	3.01	17.0	2.79
	20.0	19.0	25.3	3.75	24.4	3.59	23.0	3.35	21.9	3.23	20.9	3.11	19.7	2.93	18.5	2.78	17.0	2.58
	25.0	23.0	25.3	3.45	24.4	3.30	23.0	3.09	21.9	2.97	20.9	2.86	19.7	2.69	18.5	2.55	17.0	2.36
	30.0	28.0	25.3	3.15	24.4	3.02	23.0	2.82	21.9	2.71	20.9	2.61	19.7	2.46	18.5	2.32	17.0	2.15
	35.0	32.0	25.3	2.85	24.4	2.73	23.0	2.55	21.9	2.46	20.9	2.36	19.7	2.22	18.5	2.10	17.0	1.94
	40.0	36.0	25.3	2.55	24.4	2.45	23.0	2.29	21.9	2.20	20.9	2.10	19.7	1.98	18.5	1.87	17.0	1.73
	45.0	41.0	25.3	2.26	24.4	2.17	23.0	2.03	21.9	1.95	20.9	1.86	19.7	1.76	18.5	1.66	17.0	1.52
	47.0	43.0	25.3	2.20	24.4	2.12	23.0	1.98	21.9	1.90	20.9	1.81	19.7	1.71	18.5	1.61	17.0	1.48
	50.0	46.0	25.3	2.12	24.4	2.04	23.0	1.91	21.9	1.83	20.9	1.75	19.7	1.65	18.5	1.55	17.0	1.43
	55.0	51.0	25.3	1.99	24.4	1.91	23.0	1.79	21.9	1.71	20.9	1.64	19.7	1.55	18.5	1.46	17.0	1.34
	60.0	56.0	25.3	1.85	24.4	1.78	23.0	1.67	21.9	1.59	20.9	1.52	19.7	1.44	18.5	1.36	17.0	1.25

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).
 The System Combination Ratio must be between 50–130%.
 Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.
 Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

PERFORMANCE DATA

Heating Capacity

MULTI V^S

ARUN048GSS4

48,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp.		Indoor Air Temp. °F DB/°F WB															
			59		61		64		67		70		73		76		80	
	°F DB	°F WB	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW
130	-4.0	-4.4	42.7	3.90	42.7	4.20	42.7	4.66	42.5	5.04	42.4	5.41	42.4	5.81	42.4	6.00	42.4	6.25
	0.0	-0.4	45.1	4.23	45.1	4.54	45.1	4.99	45.0	5.37	44.8	5.75	44.8	6.14	44.8	6.33	44.8	6.59
	5.0	4.5	48.2	4.66	48.2	4.96	48.2	5.41	48.0	5.79	47.9	6.17	47.9	6.57	47.9	6.76	47.9	7.01
	10.0	9.0	51.3	5.08	51.3	5.38	51.3	5.84	51.1	6.22	51.0	6.60	51.0	6.99	51.0	7.18	51.0	7.43
	15.0	14.0	54.3	5.49	54.3	5.79	54.3	6.25	54.1	6.63	54.0	7.01	54.0	7.40	54.0	7.59	54.0	7.84
	20.0	19.0	57.4	5.92	57.4	6.22	57.4	6.68	57.3	7.06	57.1	7.44	57.1	7.83	57.1	8.02	57.1	8.27
	25.0	23.0	60.5	6.34	60.5	6.65	60.5	7.10	60.3	7.32	60.2	7.54	60.2	7.92	60.2	8.11	60.2	8.36
	30.0	28.0	63.6	6.76	63.6	7.07	63.6	7.52	63.4	7.74	63.2	7.96	63.2	8.34	63.2	8.53	63.2	8.78
	35.0	32.0	66.7	7.18	66.7	7.49	66.7	7.93	66.5	8.15	66.3	8.37	66.3	8.75	66.3	8.94	66.3	9.19
	40.0	36.0	69.8	7.60	69.8	7.91	69.8	8.35	69.6	8.57	69.3	8.79	69.3	9.17	69.3	9.36	69.3	9.61
	45.0	41.0	72.1	8.02	72.1	8.33	72.1	8.77	71.9	8.99	71.6	9.21	71.6	9.59	71.6	9.78	71.6	10.03
	47.0	43.0	72.1	8.02	72.1	8.33	72.1	8.77	71.9	8.99	71.6	9.21	71.6	9.59	71.6	9.78	71.6	10.03
	50.0	46.0	72.1	8.02	72.1	8.33	72.1	8.77	71.9	8.99	71.6	9.21	71.6	9.59	71.6	9.78	71.6	10.03
	55.0	51.0	72.1	8.02	72.1	8.33	72.1	8.77	71.9	8.99	71.6	9.21	71.6	9.59	71.6	9.78	71.6	10.03
	60.0	56.0	72.1	8.02	72.1	8.33	72.1	8.77	71.9	8.99	71.6	9.21	71.6	9.59	71.6	9.78	71.6	10.03
120	-4.0	-4.4	42.3	4.35	42.3	4.66	42.3	5.11	42.2	5.26	42.1	5.41	42.1	5.81	42.1	6.13	42.1	6.30
	0.0	-0.4	44.8	4.69	44.8	4.99	44.8	5.45	44.7	5.60	44.5	5.75	44.5	6.14	44.5	6.47	44.5	6.64
	5.0	4.5	47.9	5.11	47.9	5.41	47.9	5.87	47.7	6.02	47.6	6.17	47.6	6.57	47.6	6.89	47.6	7.06
	10.0	9.0	50.9	5.53	50.9	5.84	50.9	6.29	50.8	6.44	50.6	6.60	50.6	6.99	50.6	7.31	50.6	7.48
	15.0	14.0	53.9	5.95	53.9	6.25	53.9	6.70	53.8	6.86	53.6	7.01	53.6	7.40	53.6	7.79	53.6	7.96
	20.0	19.0	57.0	6.38	57.0	6.68	57.0	7.13	56.9	7.39	56.7	7.55	56.7	7.94	56.7	8.33	56.7	8.50
	25.0	23.0	60.1	6.80	60.1	7.10	60.1	7.56	59.9	7.72	59.7	7.88	59.7	8.27	59.7	8.66	59.7	8.83
	30.0	28.0	63.2	7.22	63.2	7.52	63.2	7.98	63.0	8.14	62.8	8.30	62.8	8.69	62.8	9.08	62.8	9.25
	35.0	32.0	66.2	7.64	66.2	7.94	66.2	8.40	66.0	8.56	65.8	8.72	65.8	9.11	65.8	9.50	65.8	9.67
	40.0	36.0	69.3	8.06	69.3	8.36	69.3	8.82	69.1	8.98	68.9	9.14	68.9	9.53	68.9	9.92	68.9	10.09
	45.0	41.0	72.0	8.48	72.0	8.78	72.0	9.24	71.8	9.40	71.6	9.56	71.6	9.95	71.6	10.34	71.6	10.51
	47.0	43.0	72.0	8.48	72.0	8.78	72.0	9.24	71.8	9.40	71.6	9.56	71.6	9.95	71.6	10.34	71.6	10.51
	50.0	46.0	72.0	8.48	72.0	8.78	72.0	9.24	71.8	9.40	71.6	9.56	71.6	9.95	71.6	10.34	71.6	10.51
	55.0	51.0	72.0	8.48	72.0	8.78	72.0	9.24	71.8	9.40	71.6	9.56	71.6	9.95	71.6	10.34	71.6	10.51
	60.0	56.0	72.0	8.48	72.0	8.78	72.0	9.24	71.8	9.40	71.6	9.56	71.6	9.95	71.6	10.34	71.6	10.51
110	-4.0	-4.4	42.1	4.91	42.1	5.11	42.1	5.41	42.0	5.68	41.9	5.95	41.9	6.23	41.9	6.52	41.9	6.91
	0.0	-0.4	44.6	5.25	44.6	5.45	44.6	5.75	44.4	6.02	44.3	6.28	44.3	6.57	44.3	6.86	44.3	7.25
	5.0	4.5	47.6	5.67	47.6	5.87	47.6	6.17	47.4	6.44	47.3	6.70	47.3	6.99	47.3	7.28	47.3	7.67
	10.0	9.0	50.6	6.09	50.6	6.29	50.6	6.60	50.5	6.86	50.3	7.13	50.3	7.41	50.3	7.70	50.3	8.09
	15.0	14.0	53.6	6.50	53.6	6.70	53.6	7.01	53.5	7.27	53.3	7.54	53.3	7.83	53.3	8.12	53.3	8.51
	20.0	19.0	56.7	6.93	56.7	7.13	56.7	7.44	56.6	7.70	56.4	7.97	56.4	8.26	56.4	8.55	56.4	8.94
	25.0	23.0	59.8	7.35	59.8	7.56	59.8	7.87	59.7	8.13	59.5	8.40	59.5	8.69	59.5	8.98	59.5	9.37
	30.0	28.0	62.8	7.77	62.8	7.98	62.8	8.29	62.7	8.55	62.5	8.82	62.5	9.11	62.5	9.40	62.5	9.79
	35.0	32.0	65.8	8.19	65.8	8.40	65.8	8.71	65.7	8.97	65.5	9.24	65.5	9.53	65.5	9.82	65.5	10.21
	40.0	36.0	68.9	8.61	68.9	8.82	68.9	9.13	68.8	9.39	68.6	9.66	68.6	9.95	68.6	10.24	68.6	10.63
	45.0	41.0	71.3	9.03	71.3	9.24	71.3	9.55	71.2	9.81	71.0	10.08	71.0	10.37	71.0	10.66	71.0	11.05
	47.0	43.0	71.3	9.03	71.3	9.24	71.3	9.55	71.2	9.81	71.0	10.08	71.0	10.37	71.0	10.66	71.0	11.05
	50.0	46.0	71.3	9.03	71.3	9.24	71.3	9.55	71.2	9.81	71.0	10.08	71.0	10.37	71.0	10.66	71.0	11.05
	55.0	51.0	71.3	9.03	71.3	9.24	71.3	9.55	71.2	9.81	71.0	10.08	71.0	10.37	71.0	10.66	71.0	11.05
	60.0	56.0	71.3	9.03	71.3	9.24	71.3	9.55	71.2	9.81	71.0	10.08	71.0	10.37	71.0	10.66	71.0	11.05

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).
The System Combination Ratio must be between 50–130%.
Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.
Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

ARUN048GSS4

Heating Capacity

48,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp.		Indoor Air Temp. °F DB/°F WB															
			59		61		64		67		70		73		76		80	
	°F DB	°F WB	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW
100	-4.0	-4.4	41.9	5.21	41.9	5.41	41.9	5.72	41.8	5.93	41.7	6.14	41.7	6.56	41.7	6.80	41.7	7.12
	0.0	-0.4	44.3	5.55	44.2	5.75	44.1	6.06	44.0	6.27	44.0	6.48	44.0	6.90	44.0	7.14	44.0	7.46
	5.0	4.5	47.3	5.97	47.3	6.17	47.3	6.48	47.1	6.69	47.0	6.90	47.0	7.32	47.0	7.56	47.0	7.88
	10.0	9.0	50.5	6.39	50.4	6.60	50.2	6.90	50.1	7.11	50.1	7.32	49.5	7.57	48.3	7.44	46.6	7.28
	15.0	14.0	53.3	6.81	53.3	7.01	53.3	7.31	53.2	7.34	53.1	7.38	50.8	7.25	47.9	7.03	43.9	6.73
	20.0	19.0	57.6	7.33	57.4	7.44	57.1	7.61	55.6	7.30	54.0	6.99	50.8	6.83	47.9	6.62	43.9	6.34
	25.0	23.0	61.3	7.82	60.5	7.50	59.1	7.02	56.6	6.81	54.0	6.60	50.8	6.42	47.9	6.22	43.9	5.96
	30.0	28.0	64.2	7.28	62.3	7.02	59.4	6.61	56.7	6.42	54.0	6.22	50.8	6.01	47.9	5.82	43.9	5.57
	35.0	32.0	65.3	6.75	62.9	6.53	59.4	6.21	56.7	6.03	54.0	5.84	50.8	5.60	47.9	5.42	43.9	5.19
	40.0	36.0	65.3	6.22	62.9	6.05	59.4	5.81	56.7	5.63	54.0	5.46	50.8	5.19	47.9	5.03	43.9	4.80
	45.0	41.0	65.3	5.70	62.9	5.58	59.4	5.40	56.7	5.24	54.0	5.08	50.8	4.79	47.9	4.63	43.9	4.43
	47.0	43.0	65.3	5.55	62.9	5.43	59.4	5.26	56.7	5.10	54.0	4.95	50.8	4.66	47.9	4.51	43.9	4.31
	50.0	46.0	65.3	5.34	62.9	5.23	59.4	5.07	56.7	4.92	54.0	4.76	50.8	4.49	47.9	4.34	43.9	4.15
	55.0	51.0	65.3	5.01	62.9	4.91	59.4	4.76	56.7	4.61	54.0	4.47	50.8	4.21	47.9	4.08	43.9	3.90
	60.0	56.0	65.3	4.66	62.9	4.57	59.4	4.42	56.7	4.29	54.0	4.16	50.8	3.92	47.9	3.79	43.9	3.62
90	-4.0	-4.4	41.8	5.17	41.8	5.32	41.8	5.55	41.6	5.80	41.5	6.05	41.5	6.51	41.5	6.89	41.5	7.40
	0.0	-0.4	44.3	5.50	44.2	5.66	44.1	5.88	44.0	6.13	43.9	6.38	43.8	6.85	43.5	7.23	43.2	7.74
	5.0	4.5	47.3	5.93	47.3	6.08	47.3	6.31	47.1	6.56	46.9	6.81	45.8	7.09	44.0	7.07	41.5	7.05
	10.0	9.0	50.5	6.35	50.4	6.50	50.2	6.73	49.7	6.98	49.2	7.23	46.5	6.95	43.7	6.64	39.9	6.22
	15.0	14.0	53.3	6.76	53.3	6.91	53.3	7.14	51.4	7.06	49.5	6.97	46.5	6.59	43.7	6.30	39.9	5.90
	20.0	19.0	59.0	7.39	57.1	7.24	54.2	7.02	51.8	6.80	49.5	6.58	46.5	6.22	43.7	5.94	39.9	5.56
	25.0	23.0	59.9	6.95	57.6	6.81	54.2	6.60	51.8	6.39	49.5	6.19	46.5	5.86	43.7	5.59	39.9	5.23
	30.0	28.0	59.9	6.51	57.6	6.38	54.2	6.18	51.8	5.99	49.5	5.80	46.5	5.49	43.7	5.24	39.9	4.90
	35.0	32.0	59.9	6.07	57.6	5.95	54.2	5.77	51.8	5.59	49.5	5.41	46.5	5.13	43.7	4.89	39.9	4.57
	40.0	36.0	59.9	5.63	57.6	5.52	54.2	5.35	51.8	5.19	49.5	5.03	46.5	4.77	43.7	4.54	39.9	4.23
	45.0	41.0	59.9	5.20	57.6	5.10	54.2	4.94	51.8	4.79	49.5	4.65	46.5	4.41	43.7	4.19	39.9	3.91
	47.0	43.0	59.9	5.07	57.6	4.96	54.2	4.81	51.8	4.67	49.5	4.52	46.5	4.29	43.7	4.08	39.9	3.80
	50.0	46.0	59.9	4.88	57.6	4.78	54.2	4.63	51.8	4.49	49.5	4.36	46.5	4.13	43.7	3.93	39.9	3.66
	55.0	51.0	59.9	4.58	57.6	4.49	54.2	4.35	51.8	4.22	49.5	4.09	46.5	3.88	43.7	3.69	39.9	3.44
	60.0	56.0	59.9	4.26	57.6	4.17	54.2	4.05	51.8	3.92	49.5	3.80	46.5	3.61	43.7	3.43	39.9	3.20
80	-4.0	-4.4	41.6	4.59	41.6	4.72	41.6	4.92	41.5	5.21	41.3	5.51	40.7	6.10	39.3	6.39	37.5	6.77
	0.0	-0.4	44.1	4.93	44.1	5.06	44.1	5.26	43.8	5.55	43.4	5.85	41.5	6.32	39.1	6.37	35.8	6.42
	5.0	4.5	47.2	5.35	47.2	5.48	47.2	5.68	45.8	5.97	44.3	6.27	41.5	6.19	39.1	6.00	35.8	5.75
	10.0	9.0	51.8	5.77	50.6	5.90	48.6	6.10	46.5	6.19	44.3	6.29	41.5	5.88	39.1	5.70	35.8	5.45
	15.0	14.0	53.6	6.24	51.6	6.31	48.6	6.43	46.5	6.19	44.3	5.95	41.5	5.58	39.1	5.40	35.8	5.16
	20.0	19.0	53.6	6.33	51.6	6.22	48.6	6.05	46.5	5.83	44.3	5.61	41.5	5.26	39.1	5.09	35.8	4.86
	25.0	23.0	53.6	5.95	51.6	5.84	48.6	5.68	46.5	5.48	44.3	5.27	41.5	4.95	39.1	4.79	35.8	4.57
	30.0	28.0	53.6	5.57	51.6	5.47	48.6	5.31	46.5	5.12	44.3	4.93	41.5	4.65	39.1	4.49	35.8	4.27
	35.0	32.0	53.6	5.18	51.6	5.09	48.6	4.95	46.5	4.77	44.3	4.59	41.5	4.34	39.1	4.18	35.8	3.98
	40.0	36.0	53.6	4.80	51.6	4.71	48.6	4.58	46.5	4.42	44.3	4.25	41.5	4.03	39.1	3.88	35.8	3.68
	45.0	41.0	53.6	4.43	51.6	4.34	48.6	4.22	46.5	4.07	44.3	3.92	41.5	3.73	39.1	3.58	35.8	3.39
	47.0	43.0	53.6	4.31	51.6	4.23	48.6	4.11	46.5	3.96	44.3	3.82	41.5	3.63	39.1	3.49	35.8	3.30
	50.0	46.0	53.6	4.15	51.6	4.07	48.6	3.95	46.5	3.82	44.3	3.68	41.5	3.49	39.1	3.36	35.8	3.18
	55.0	51.0	53.6	3.90	51.6	3.82	48.6	3.71	46.5	3.58	44.3	3.45	41.5	3.28	39.1	3.15	35.8	2.99
	60.0	56.0	53.6	3.62	51.6	3.56	48.6	3.45	46.5	3.33	44.3	3.21	41.5	3.05	39.1	2.93	35.8	2.78

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).
 The System Combination Ratio must be between 50–130%.
 Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.
 Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

PERFORMANCE DATA



Heating Capacity

ARUN048GSS4

48,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp.		Indoor Air Temp. °F DB/°F WB															
			59		61		64		67		70		73		76		80	
	°F DB	°F WB	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW
70	-4.0	-4.4	40.7	4.41	40.7	4.62	40.7	4.92	39.1	5.29	37.5	5.67	35.5	6.11	33.4	6.25	30.7	6.44
	0.0	-0.4	43.7	4.75	42.7	4.95	41.3	5.26	39.4	5.65	37.5	6.05	35.5	6.07	33.4	5.97	30.7	5.83
	5.0	4.5	45.4	5.17	43.7	5.37	41.3	5.68	39.4	5.85	37.5	6.03	35.5	5.75	33.4	5.64	30.7	5.49
	10.0	9.0	45.4	5.59	43.8	5.80	41.3	6.10	39.4	5.90	37.5	5.69	35.5	5.42	33.4	5.31	30.7	5.15
	15.0	14.0	45.4	6.30	43.8	6.12	41.3	5.86	39.4	5.61	37.5	5.36	35.5	5.11	33.4	4.98	30.7	4.82
	20.0	19.0	45.4	5.89	43.8	5.72	41.3	5.48	39.4	5.25	37.5	5.02	35.5	4.78	33.4	4.65	30.7	4.48
	25.0	23.0	45.4	5.48	43.8	5.33	41.3	5.11	39.4	4.89	37.5	4.68	35.5	4.45	33.4	4.32	30.7	4.14
	30.0	28.0	45.4	5.08	43.8	4.94	41.3	4.73	39.4	4.54	37.5	4.35	35.5	4.13	33.4	3.99	30.7	3.80
	35.0	32.0	45.4	4.68	43.8	4.55	41.3	4.36	39.4	4.19	37.5	4.01	35.5	3.81	33.4	3.66	30.7	3.46
	40.0	36.0	45.4	4.27	43.8	4.16	41.3	3.99	39.4	3.83	37.5	3.68	35.5	3.49	33.4	3.33	30.7	3.12
	45.0	41.0	45.4	3.88	43.8	3.78	41.3	3.63	39.4	3.49	37.5	3.35	35.5	3.17	33.4	3.01	30.7	2.79
	47.0	43.0	45.4	3.78	43.8	3.68	41.3	3.53	39.4	3.40	37.5	3.26	35.5	3.09	33.4	2.93	30.7	2.72
	50.0	46.0	45.4	3.64	43.8	3.55	41.3	3.40	39.4	3.27	37.5	3.14	35.5	2.98	33.4	2.82	30.7	2.62
	55.0	51.0	45.4	3.42	43.8	3.33	41.3	3.20	39.4	3.07	37.5	2.95	35.5	2.79	33.4	2.65	30.7	2.46
	60.0	56.0	45.4	3.18	43.8	3.10	41.3	2.97	39.4	2.86	37.5	2.74	35.5	2.60	33.4	2.46	30.7	2.29
60	-4.0	-4.4	38.6	4.47	37.4	4.66	35.5	4.95	33.9	5.34	32.2	5.73	30.3	5.81	28.7	5.66	26.4	5.46
	0.0	-0.4	38.9	4.81	37.5	5.00	35.5	5.29	33.9	5.54	32.2	5.79	30.3	5.58	28.7	5.39	26.4	5.14
	5.0	4.5	38.9	5.23	37.5	5.42	35.5	5.71	33.9	5.59	32.2	5.46	30.3	5.26	28.7	5.07	26.4	4.82
	10.0	9.0	38.9	5.93	37.5	5.84	35.5	5.71	33.9	5.43	32.2	5.14	30.3	4.94	28.7	4.75	26.4	4.51
	15.0	14.0	38.9	5.76	37.5	5.60	35.5	5.35	33.9	5.09	32.2	4.82	30.3	4.62	28.7	4.44	26.4	4.20
	20.0	19.0	38.9	5.38	37.5	5.22	35.5	4.97	33.9	4.73	32.2	4.49	30.3	4.29	28.7	4.11	26.4	3.88
	25.0	23.0	38.9	5.00	37.5	4.84	35.5	4.61	33.9	4.39	32.2	4.17	30.3	3.97	28.7	3.79	26.4	3.56
	30.0	28.0	38.9	4.62	37.5	4.47	35.5	4.24	33.9	4.04	32.2	3.84	30.3	3.64	28.7	3.47	26.4	3.24
	35.0	32.0	38.9	4.24	37.5	4.09	35.5	3.87	33.9	3.69	32.2	3.52	30.3	3.32	28.7	3.15	26.4	2.93
	40.0	36.0	38.9	3.86	37.5	3.72	35.5	3.50	33.9	3.35	32.2	3.19	30.3	3.00	28.7	2.83	26.4	2.61
	45.0	41.0	38.9	3.50	37.5	3.35	35.5	3.14	33.9	3.01	32.2	2.88	30.3	2.69	28.7	2.53	26.4	2.31
	47.0	43.0	38.9	3.40	37.5	3.27	35.5	3.06	33.9	2.93	32.2	2.80	30.3	2.62	28.7	2.46	26.4	2.25
	50.0	46.0	38.9	3.28	37.5	3.15	35.5	2.95	33.9	2.82	32.2	2.70	30.3	2.52	28.7	2.37	26.4	2.17
	55.0	51.0	38.9	3.08	37.5	2.95	35.5	2.77	33.9	2.65	32.2	2.53	30.3	2.36	28.7	2.22	26.4	2.03
	60.0	56.0	38.9	2.86	37.5	2.75	35.5	2.57	33.9	2.46	32.2	2.36	30.3	2.20	28.7	2.07	26.4	1.89
50	-4.0	-4.4	32.5	4.11	31.3	4.41	29.5	4.87	28.2	5.10	26.9	5.34	25.3	5.06	23.8	4.81	21.8	4.48
	0.0	-0.4	32.5	4.45	31.3	4.75	29.5	5.20	28.2	5.17	26.9	5.14	25.3	4.82	23.8	4.58	21.8	4.27
	5.0	4.5	32.5	5.17	31.3	5.17	29.5	5.17	28.2	4.99	26.9	4.82	25.3	4.53	23.8	4.30	21.8	4.00
	10.0	9.0	32.5	5.41	31.3	5.18	29.5	4.83	28.2	4.67	26.9	4.51	25.3	4.23	23.8	4.02	21.8	3.74
	15.0	14.0	32.5	5.04	31.3	4.83	29.5	4.51	28.2	4.36	26.9	4.20	25.3	3.95	23.8	3.75	21.8	3.48
	20.0	19.0	32.5	4.66	31.3	4.47	29.5	4.17	28.2	4.03	26.9	3.88	25.3	3.65	23.8	3.46	21.8	3.21
	25.0	23.0	32.5	4.29	31.3	4.11	29.5	3.84	28.2	3.70	26.9	3.56	25.3	3.35	23.8	3.18	21.8	2.94
	30.0	28.0	32.5	3.92	31.3	3.76	29.5	3.51	28.2	3.38	26.9	3.25	25.3	3.06	23.8	2.90	21.8	2.68
	35.0	32.0	32.5	3.55	31.3	3.40	29.5	3.18	28.2	3.06	26.9	2.94	25.3	2.76	23.8	2.61	21.8	2.41
	40.0	36.0	32.5	3.18	31.3	3.05	29.5	2.85	28.2	2.74	26.9	2.62	25.3	2.47	23.8	2.33	21.8	2.15
	45.0	41.0	32.5	2.82	31.3	2.71	29.5	2.53	28.2	2.43	26.9	2.32	25.3	2.19	23.8	2.06	21.8	1.90
	47.0	43.0	32.5	2.75	31.3	2.63	29.5	2.47	28.2	2.36	26.9	2.26	25.3	2.13	23.8	2.01	21.8	1.84
	50.0	46.0	32.5	2.65	31.3	2.54	29.5	2.38	28.2	2.27	26.9	2.17	25.3	2.05	23.8	1.93	21.8	1.78
	55.0	51.0	32.5	2.48	31.3	2.38	29.5	2.23	28.2	2.14	26.9	2.04	25.3	1.93	23.8	1.82	21.8	1.67
	60.0	56.0	32.5	2.31	31.3	2.22	29.5	2.07	28.2	1.99	26.9	1.90	25.3	1.79	23.8	1.69	21.8	1.55

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).
 The System Combination Ratio must be between 50–130%.
 Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.
 Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).



ARUN053GSS4

Heating Capacity

53,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp.		Indoor Air Temp. °F DB/°F WB															
			59		61		64		67		70		73		76		80	
	°F DB	°F WB	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW
130	-4.0	-4.4	46.6	4.70	46.6	5.06	46.6	5.61	46.5	6.07	46.3	6.53	46.3	7.00	46.3	7.23	46.3	7.53
	0.0	-0.4	49.3	5.10	49.3	5.47	49.3	6.02	49.1	6.48	49.0	6.93	49.0	7.41	49.0	7.64	49.0	7.94
	5.0	4.5	52.7	5.61	52.7	5.98	52.7	6.53	52.5	6.99	52.3	7.44	52.3	7.92	52.3	8.14	52.3	8.45
	10.0	9.0	56.0	6.12	56.0	6.49	56.0	7.04	55.9	7.49	55.7	7.95	55.7	8.42	55.7	8.65	55.7	8.96
	15.0	14.0	59.3	6.62	59.3	6.99	59.3	7.53	59.1	7.99	59.0	8.45	59.0	8.92	59.0	9.15	59.0	9.46
	20.0	19.0	62.8	7.14	62.8	7.50	62.8	8.05	62.6	8.51	62.4	8.97	62.4	9.13	62.4	8.94	62.4	8.68
	25.0	23.0	66.1	7.65	66.1	8.01	66.1	8.56	65.9	8.83	65.7	9.09	65.7	8.70	65.7	8.51	65.7	8.26
	30.0	28.0	69.5	8.15	69.5	8.52	69.5	9.07	69.3	8.85	69.1	8.64	68.7	8.27	67.8	8.08	66.7	7.83
	35.0	32.0	72.9	8.11	72.9	9.03	72.9	8.91	72.6	8.55	72.4	8.18	71.0	7.84	68.0	7.66	64.1	7.41
	40.0	36.0	76.2	9.16	76.2	8.82	76.2	8.31	76.0	8.02	75.8	7.73	71.9	7.41	67.7	7.23	62.0	6.99
	45.0	41.0	78.8	8.14	78.8	7.97	78.8	7.72	77.7	7.49	76.6	7.27	71.9	6.97	67.7	6.80	62.0	6.56
	47.0	43.0	78.8	7.93	78.8	7.76	78.8	7.51	77.7	7.30	76.6	7.08	71.9	6.79	67.7	6.62	62.0	6.39
	50.0	46.0	78.8	7.64	78.8	7.48	78.8	7.23	77.7	7.03	76.6	6.82	71.9	6.54	67.7	6.37	62.0	6.15
	55.0	51.0	78.8	7.17	78.8	7.02	78.8	6.79	77.7	6.60	76.6	6.40	71.9	6.14	67.7	5.98	62.0	5.78
	60.0	56.0	78.8	6.67	78.8	6.53	78.8	6.32	77.7	6.13	76.6	5.95	71.9	5.71	67.7	5.57	62.0	5.37
120	-4.0	-4.4	46.3	5.25	46.3	5.61	46.3	6.16	46.1	6.34	46.0	6.53	46.0	7.24	46.0	7.39	46.0	7.60
	0.0	-0.4	48.9	5.65	48.9	6.02	48.9	6.57	48.8	6.75	48.6	6.93	48.6	7.65	48.6	7.80	48.6	8.00
	5.0	4.5	52.3	6.16	52.3	6.53	52.3	7.08	52.1	7.26	52.0	7.44	52.0	8.15	52.0	8.31	52.0	8.51
	10.0	9.0	55.6	6.67	55.6	7.04	55.6	7.59	55.5	7.77	55.3	7.95	55.3	8.66	55.3	8.82	55.3	9.02
	15.0	14.0	58.9	7.17	58.9	7.53	58.9	8.08	58.7	8.27	58.5	8.45	58.5	9.16	58.5	9.31	58.5	9.52
	20.0	19.0	62.3	7.69	62.3	8.05	62.3	8.60	62.1	8.91	61.9	9.22	61.9	8.95	61.9	8.83	61.9	8.67
	25.0	23.0	65.7	8.20	65.7	8.56	65.7	9.11	65.5	8.95	65.3	8.78	64.9	8.54	64.1	8.43	63.1	8.27
	30.0	28.0	69.0	9.18	69.0	9.07	69.0	8.91	68.8	8.63	68.6	8.35	66.9	8.14	63.8	8.03	59.6	7.88
	35.0	32.0	72.4	9.19	72.4	8.86	72.4	8.38	71.7	8.14	71.0	7.91	67.6	7.73	63.5	7.62	58.0	7.48
	40.0	36.0	75.7	8.41	75.7	8.18	75.7	7.84	73.8	7.66	71.8	7.47	67.6	7.33	63.5	7.22	58.0	7.08
	45.0	41.0	78.7	7.65	78.1	7.52	77.3	7.31	74.6	7.17	71.8	7.03	67.6	6.92	63.5	6.82	58.0	6.68
	47.0	43.0	78.7	7.45	78.1	7.32	77.3	7.12	74.6	6.98	71.8	6.85	67.6	6.74	63.5	6.63	58.0	6.50
	50.0	46.0	78.7	7.18	78.1	7.05	77.3	6.86	74.6	6.73	71.8	6.60	67.6	6.49	63.5	6.39	58.0	6.26
	55.0	51.0	78.7	6.74	78.1	6.62	77.3	6.44	74.6	6.31	71.8	6.19	67.6	6.09	63.5	6.00	58.0	5.88
	60.0	56.0	78.7	6.27	78.1	6.16	77.3	5.99	74.6	5.87	71.8	5.76	67.6	5.66	63.5	5.58	58.0	5.47
110	-4.0	-4.4	46.0	5.92	46.0	6.16	46.0	6.53	45.9	6.85	45.7	7.17	45.7	7.52	45.7	7.87	45.7	8.33
	0.0	-0.4	48.7	6.32	48.7	6.57	48.7	6.93	48.5	7.25	48.4	7.58	48.4	7.92	48.4	8.27	48.4	8.74
	5.0	4.5	52.0	6.83	52.0	7.08	52.0	7.44	51.8	7.76	51.7	8.08	51.7	8.43	51.7	8.78	51.7	9.25
	10.0	9.0	55.3	7.34	55.3	7.59	55.3	7.95	55.2	8.27	55.0	8.59	55.0	8.94	55.0	9.29	55.0	9.76
	15.0	14.0	58.6	7.84	58.6	8.08	58.6	8.45	58.4	8.77	58.2	9.09	58.2	9.14	58.2	8.85	58.1	8.46
	20.0	19.0	62.0	8.36	62.0	8.60	62.0	8.97	61.8	8.97	61.6	8.97	60.1	8.69	57.5	8.42	53.9	8.07
	25.0	23.0	65.3	9.15	65.3	9.11	65.3	9.05	64.7	8.78	64.1	8.51	60.7	8.26	57.3	8.01	52.7	7.68
	30.0	28.0	68.6	9.07	68.6	8.84	68.6	8.50	66.6	8.28	64.5	8.06	60.7	7.82	57.3	7.60	52.7	7.29
	35.0	32.0	72.9	8.38	72.0	8.21	70.5	7.94	67.5	7.77	64.5	7.60	60.7	7.39	57.3	7.18	52.7	6.90
	40.0	36.0	77.2	7.69	74.7	7.57	71.0	7.39	67.7	7.27	64.5	7.14	60.7	6.95	57.3	6.77	52.7	6.51
	45.0	41.0	77.9	7.02	75.1	6.95	71.0	6.84	67.7	6.76	64.5	6.69	60.7	6.52	57.3	6.35	52.7	6.12
	47.0	43.0	77.9	6.83	75.1	6.76	71.0	6.66	67.7	6.59	64.5	6.51	60.7	6.35	57.3	6.18	52.7	5.96
	50.0	46.0	77.9	6.58	75.1	6.52	71.0	6.42	67.7	6.34	64.5	6.27	60.7	6.11	57.3	5.95	52.7	5.74
	55.0	51.0	77.9	6.18	75.1	6.12	71.0	6.02	67.7	5.95	64.5	5.88	60.7	5.74	57.3	5.59	52.7	5.39
	60.0	56.0	77.9	5.75	75.1	5.69	71.0	5.60	67.7	5.54	64.5	5.47	60.7	5.34	57.3	5.20	52.7	5.01

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).
 The System Combination Ratio must be between 50–130%.
 Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.
 Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

PERFORMANCE DATA



Heating Capacity

ARUN053GSS4

53,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp.		Indoor Air Temp. °F DB/°F WB															
			59		61		64		67		70		73		76		80	
	°F DB	°F WB	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW
100	-4.0	-4.4	45.8	6.28	45.8	6.53	45.8	6.89	45.7	7.15	45.5	7.41	45.5	7.91	45.5	8.20	45.5	8.58
	0.0	-0.4	48.4	6.69	48.3	6.93	48.2	7.30	48.1	7.56	48.0	7.81	48.0	8.31	48.0	8.60	48.0	8.99
	5.0	4.5	51.6	7.20	51.6	7.44	51.6	7.81	51.5	8.07	51.3	8.32	51.3	8.82	51.3	9.11	51.3	9.50
	10.0	9.0	55.2	7.71	55.0	7.95	54.8	8.32	54.8	8.57	54.8	8.83	54.1	9.13	52.8	8.98	50.9	8.78
	15.0	14.0	58.3	8.21	58.3	8.45	58.3	8.82	58.1	8.85	58.0	8.89	55.5	8.74	52.3	8.47	47.9	8.12
	20.0	19.0	63.0	8.83	62.7	8.97	62.4	9.17	60.7	8.80	59.0	8.42	55.5	8.23	52.3	7.98	47.9	7.64
	25.0	23.0	67.0	9.43	66.0	9.04	64.6	8.46	61.8	8.21	59.0	7.96	55.5	7.74	52.3	7.50	47.9	7.18
	30.0	28.0	70.2	8.78	68.1	8.46	64.9	7.98	61.9	7.74	59.0	7.50	55.5	7.25	52.3	7.02	47.9	6.72
	35.0	32.0	71.4	8.14	68.8	7.88	64.9	7.49	61.9	7.26	59.0	7.04	55.5	6.75	52.3	6.54	47.9	6.26
	40.0	36.0	71.4	7.50	68.8	7.30	64.9	7.00	61.9	6.79	59.0	6.58	55.5	6.26	52.3	6.06	47.9	5.79
	45.0	41.0	71.4	6.87	68.8	6.73	64.9	6.52	61.9	6.32	59.0	6.13	55.5	5.77	52.3	5.59	47.9	5.34
	47.0	43.0	71.4	6.69	68.8	6.55	64.9	6.34	61.9	6.15	59.0	5.96	55.5	5.62	52.3	5.44	47.9	5.20
	50.0	46.0	71.4	6.44	68.8	6.31	64.9	6.11	61.9	5.93	59.0	5.74	55.5	5.41	52.3	5.24	47.9	5.00
	55.0	51.0	71.4	6.05	68.8	5.92	64.9	5.74	61.9	5.56	59.0	5.39	55.5	5.08	52.3	4.92	47.9	4.70
	60.0	56.0	71.4	5.62	68.8	5.51	64.9	5.33	61.9	5.17	59.0	5.01	55.5	4.73	52.3	4.57	47.9	4.37
90	-4.0	-4.4	45.6	6.23	45.6	6.41	45.6	6.69	45.5	6.99	45.4	7.29	45.4	7.85	45.4	8.31	45.4	8.92
	0.0	-0.4	48.4	6.64	48.3	6.82	48.2	7.09	48.1	7.40	48.0	7.70	47.9	8.26	47.6	8.72	47.2	9.33
	5.0	4.5	51.6	7.14	51.6	7.33	51.6	7.60	51.4	7.90	51.3	8.21	50.0	8.54	48.0	8.53	45.4	8.50
	10.0	9.0	55.2	7.65	55.0	7.84	54.8	8.11	54.3	8.41	53.8	8.71	50.9	8.38	47.8	8.00	43.6	7.50
	15.0	14.0	58.3	8.15	58.3	8.33	58.3	8.61	56.2	8.51	54.0	8.40	50.9	7.95	47.8	7.59	43.6	7.11
	20.0	19.0	64.5	8.91	62.4	8.73	59.2	8.46	56.6	8.19	54.0	7.93	50.9	7.50	47.8	7.16	43.6	6.70
	25.0	23.0	65.4	8.38	63.0	8.21	59.2	7.96	56.6	7.71	54.0	7.46	50.9	7.06	47.8	6.74	43.6	6.30
	30.0	28.0	65.4	7.85	63.0	7.69	59.2	7.46	56.6	7.23	54.0	6.99	50.9	6.62	47.8	6.31	43.6	5.90
	35.0	32.0	65.4	7.32	63.0	7.18	59.2	6.95	56.6	6.74	54.0	6.53	50.9	6.18	47.8	5.89	43.6	5.50
	40.0	36.0	65.4	6.79	63.0	6.66	59.2	6.45	56.6	6.26	54.0	6.06	50.9	5.75	47.8	5.47	43.6	5.10
	45.0	41.0	65.4	6.27	63.0	6.15	59.2	5.96	56.6	5.78	54.0	5.60	50.9	5.31	47.8	5.06	43.6	4.71
	47.0	43.0	65.4	6.11	63.0	5.98	59.2	5.80	56.6	5.63	54.0	5.45	50.9	5.17	47.8	4.92	43.6	4.59
	50.0	46.0	65.4	5.88	63.0	5.76	59.2	5.59	56.6	5.42	54.0	5.25	50.9	4.98	47.8	4.74	43.6	4.42
	55.0	51.0	65.4	5.52	63.0	5.41	59.2	5.24	56.6	5.09	54.0	4.93	50.9	4.68	47.8	4.45	43.6	4.15
	60.0	56.0	65.4	5.14	63.0	5.03	59.2	4.88	56.6	4.73	54.0	4.58	50.9	4.35	47.8	4.14	43.6	3.86
80	-4.0	-4.4	45.5	5.53	45.5	5.69	45.5	5.93	45.3	6.29	45.2	6.64	44.5	7.35	43.0	7.70	41.0	8.17
	0.0	-0.4	48.2	5.94	48.2	6.10	48.2	6.34	47.8	6.69	47.5	7.05	45.4	7.62	42.7	7.67	39.1	7.74
	5.0	4.5	51.6	6.45	51.6	6.61	51.6	6.84	50.0	7.20	48.4	7.56	45.4	7.46	42.7	7.23	39.1	6.93
	10.0	9.0	56.6	6.96	55.2	7.11	53.1	7.35	50.8	7.47	48.4	7.58	45.4	7.09	42.7	6.87	39.1	6.58
	15.0	14.0	58.5	7.52	56.4	7.61	53.1	7.75	50.8	7.46	48.4	7.18	45.4	6.72	42.7	6.51	39.1	6.23
	20.0	19.0	58.5	7.63	56.4	7.50	53.1	7.29	50.8	7.03	48.4	6.76	45.4	6.35	42.7	6.14	39.1	5.86
	25.0	23.0	58.5	7.17	56.4	7.04	53.1	6.85	50.8	6.60	48.4	6.35	45.4	5.97	42.7	5.77	39.1	5.51
	30.0	28.0	58.5	6.71	56.4	6.59	53.1	6.41	50.8	6.18	48.4	5.95	45.4	5.60	42.7	5.41	39.1	5.15
	35.0	32.0	58.5	6.25	56.4	6.14	53.1	5.96	50.8	5.75	48.4	5.54	45.4	5.23	42.7	5.04	39.1	4.80
	40.0	36.0	58.5	5.79	56.4	5.68	53.1	5.52	50.8	5.32	48.4	5.13	45.4	4.86	42.7	4.68	39.1	4.44
	45.0	41.0	58.5	5.34	56.4	5.24	53.1	5.08	50.8	4.91	48.4	4.73	45.4	4.49	42.7	4.32	39.1	4.09
	47.0	43.0	58.5	5.20	56.4	5.10	53.1	4.95	50.8	4.78	48.4	4.60	45.4	4.37	42.7	4.21	39.1	3.98
	50.0	46.0	58.5	5.00	56.4	4.91	53.1	4.77	50.8	4.60	48.4	4.43	45.4	4.21	42.7	4.05	39.1	3.84
	55.0	51.0	58.5	4.70	56.4	4.61	53.1	4.47	50.8	4.32	48.4	4.16	45.4	3.95	42.7	3.80	39.1	3.60
	60.0	56.0	58.5	4.37	56.4	4.29	53.1	4.16	50.8	4.02	48.4	3.87	45.4	3.68	42.7	3.54	39.1	3.35

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).
The System Combination Ratio must be between 50–130%.
Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.
Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).



ARUN053GSS4

Heating Capacity

53,000 Btu/h 208-230V Heat Pump Units

Combination (%)	Outdoor air temp.		Indoor Air Temp. °F DB/°F WB															
			59		61		64		67		70		73		76		80	
	°F DB	°F WB	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW	TC MBh	PI kW
70	-4.0	-4.4	44.5	5.32	44.5	5.57	44.5	5.93	42.8	6.38	41.0	6.83	38.8	7.37	36.5	7.54	33.6	7.76
	0.0	-0.4	47.7	5.73	46.7	5.97	45.1	6.34	43.1	6.81	41.0	7.29	38.8	7.32	36.5	7.19	33.6	7.03
	5.0	4.5	49.6	6.24	47.8	6.48	45.1	6.85	43.1	7.06	41.0	7.27	38.8	6.93	36.5	6.80	33.6	6.62
	10.0	9.0	49.6	6.74	47.8	6.99	45.1	7.35	43.1	7.11	41.0	6.86	38.8	6.54	36.5	6.40	33.6	6.21
	15.0	14.0	49.6	7.59	47.8	7.38	45.1	7.06	43.1	6.76	41.0	6.46	38.8	6.16	36.5	6.01	33.6	5.81
	20.0	19.0	49.6	7.10	47.8	6.90	45.1	6.60	43.1	6.33	41.0	6.05	38.8	5.76	36.5	5.60	33.6	5.40
	25.0	23.0	49.6	6.61	47.8	6.43	45.1	6.16	43.1	5.90	41.0	5.65	38.8	5.37	36.5	5.21	33.6	4.99
	30.0	28.0	49.6	6.13	47.8	5.96	45.1	5.71	43.1	5.47	41.0	5.24	38.8	4.98	36.5	4.81	33.6	4.58
	35.0	32.0	49.6	5.64	47.8	5.49	45.1	5.26	43.1	5.05	41.0	4.84	38.8	4.59	36.5	4.41	33.6	4.17
	40.0	36.0	49.6	5.15	47.8	5.02	45.1	4.81	43.1	4.62	41.0	4.43	38.8	4.20	36.5	4.01	33.6	3.76
	45.0	41.0	49.6	4.68	47.8	4.56	45.1	4.38	43.1	4.21	41.0	4.04	38.8	3.83	36.5	3.63	33.6	3.37
	47.0	43.0	49.6	4.56	47.8	4.44	45.1	4.26	43.1	4.10	41.0	3.93	38.8	3.72	36.5	3.53	33.6	3.28
	50.0	46.0	49.6	4.39	47.8	4.28	45.1	4.10	43.1	3.95	41.0	3.79	38.8	3.59	36.5	3.40	33.6	3.16
	55.0	51.0	49.6	4.12	47.8	4.01	45.1	3.85	43.1	3.70	41.0	3.55	38.8	3.37	36.5	3.20	33.6	2.97
	60.0	56.0	49.6	3.83	47.8	3.73	45.1	3.58	43.1	3.44	41.0	3.31	38.8	3.13	36.5	2.97	33.6	2.76
60	-4.0	-4.4	42.2	5.39	40.8	5.62	38.8	5.97	37.0	6.44	35.2	6.90	33.1	7.00	31.3	6.82	28.9	6.59
	0.0	-0.4	42.5	5.80	41.0	6.03	38.8	6.38	37.0	6.68	35.2	6.98	33.1	6.73	31.3	6.50	28.9	6.20
	5.0	4.5	42.5	6.31	41.0	6.54	38.8	6.89	37.0	6.74	35.2	6.59	33.1	6.34	31.3	6.12	28.9	5.82
	10.0	9.0	42.5	7.15	41.0	7.05	38.8	6.89	37.0	6.54	35.2	6.20	33.1	5.95	31.3	5.73	28.9	5.43
	15.0	14.0	42.5	6.95	41.0	6.75	38.8	6.45	37.0	6.13	35.2	5.81	33.1	5.57	31.3	5.35	28.9	5.06
	20.0	19.0	42.5	6.48	41.0	6.29	38.8	6.00	37.0	5.71	35.2	5.41	33.1	5.17	31.3	4.96	28.9	4.67
	25.0	23.0	42.5	6.03	41.0	5.84	38.8	5.55	37.0	5.29	35.2	5.02	33.1	4.78	31.3	4.57	28.9	4.29
	30.0	28.0	42.5	5.57	41.0	5.38	38.8	5.11	37.0	4.87	35.2	4.63	33.1	4.39	31.3	4.19	28.9	3.91
	35.0	32.0	42.5	5.11	41.0	4.93	38.8	4.66	37.0	4.45	35.2	4.24	33.1	4.00	31.3	3.80	28.9	3.53
	40.0	36.0	42.5	4.66	41.0	4.48	38.8	4.22	37.0	4.03	35.2	3.85	33.1	3.61	31.3	3.42	28.9	3.15
	45.0	41.0	42.5	4.22	41.0	4.04	38.8	3.79	37.0	3.63	35.2	3.47	33.1	3.24	31.3	3.04	28.9	2.78
	47.0	43.0	42.5	4.10	41.0	3.94	38.8	3.69	37.0	3.53	35.2	3.38	33.1	3.15	31.3	2.96	28.9	2.71
	50.0	46.0	42.5	3.95	41.0	3.79	38.8	3.55	37.0	3.40	35.2	3.25	33.1	3.04	31.3	2.85	28.9	2.61
	55.0	51.0	42.5	3.71	41.0	3.56	38.8	3.33	37.0	3.20	35.2	3.06	33.1	2.85	31.3	2.68	28.9	2.45
	60.0	56.0	42.5	3.45	41.0	3.31	38.8	3.10	37.0	2.97	35.2	2.84	33.1	2.65	31.3	2.49	28.9	2.28
50	-4.0	-4.4	35.5	4.95	34.2	5.32	32.3	5.87	30.8	6.15	29.4	6.43	27.6	6.10	26.0	5.80	23.9	5.40
	0.0	-0.4	35.5	5.36	34.2	5.73	32.3	6.27	30.8	6.23	29.4	6.20	27.6	5.81	26.0	5.53	23.9	5.14
	5.0	4.5	35.5	6.24	34.2	6.23	32.3	6.23	30.8	6.02	29.4	5.82	27.6	5.46	26.0	5.19	23.9	4.82
	10.0	9.0	35.5	6.52	34.2	6.24	32.3	5.83	30.8	5.63	29.4	5.44	27.6	5.10	26.0	4.85	23.9	4.51
	15.0	14.0	35.5	6.08	34.2	5.82	32.3	5.44	30.8	5.25	29.4	5.06	27.6	4.76	26.0	4.52	23.9	4.19
	20.0	19.0	35.5	5.62	34.2	5.39	32.3	5.03	30.8	4.85	29.4	4.68	27.6	4.40	26.0	4.17	23.9	3.87
	25.0	23.0	35.5	5.18	34.2	4.96	32.3	4.63	30.8	4.47	29.4	4.30	27.6	4.04	26.0	3.83	23.9	3.55
	30.0	28.0	35.5	4.73	34.2	4.53	32.3	4.23	30.8	4.08	29.4	3.92	27.6	3.69	26.0	3.49	23.9	3.23
	35.0	32.0	35.5	4.28	34.2	4.10	32.3	3.84	30.8	3.69	29.4	3.54	27.6	3.33	26.0	3.15	23.9	2.91
	40.0	36.0	35.5	3.83	34.2	3.67	32.3	3.44	30.8	3.30	29.4	3.16	27.6	2.98	26.0	2.81	23.9	2.59
	45.0	41.0	35.5	3.40	34.2	3.26	32.3	3.05	30.8	2.93	29.4	2.80	27.6	2.64	26.0	2.49	23.9	2.28
	47.0	43.0	35.5	3.31	34.2	3.18	32.3	2.97	30.8	2.85	29.4	2.72	27.6	2.57	26.0	2.42	23.9	2.22
	50.0	46.0	35.5	3.19	34.2	3.06	32.3	2.86	30.8	2.74	29.4	2.62	27.6	2.47	26.0	2.33	23.9	2.14
	55.0	51.0	35.5	2.99	34.2	2.87	32.3	2.69	30.8	2.57	29.4	2.46	27.6	2.32	26.0	2.19	23.9	2.01
	60.0	56.0	35.5	2.78	34.2	2.67	32.3	2.50	30.8	2.39	29.4	2.29	27.6	2.16	26.0	2.04	23.9	1.87

TC = Total Capacity (MBh). PI = Power Input (kW) (includes compressor and outdoor fan).
 The System Combination Ratio must be between 50–130%.
 Nominal capacity as rated: 0 ft. above sea level with 25 ft. of refrigerant piping.

0 ft. level difference between outdoor and indoor units.
 Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

CORRECTION FACTORS

Defrost Correction Factor for Heating Operation on page 54

Elevation Correction Factors on page 54

Note:

The correction factors shown below are calculated in the LATS Multi V software program. These factors are only to be used when performing manual calculations.

Defrost Correction Factor for Heating Operation

Capacity tables do not take into consideration capacity reduction when frost has accumulated on the condenser coil, nor during defrost operation. Integrated heating capacity values can be obtained as follows:

Formula: $A = B \times C$

Where: A = Integrated heating capacity

B = Heating capacity value given in table of capacity characteristics

C = Integrated correction factor for frost accumulation

Table 1: Outdoor Unit Frost Accumulation Factor (Heating)¹.

Entering DB (°F)	19.4	23.0	26.6	32.0	37.4	41.0	44.6
Derate factor	0.98	0.95	0.93	0.86	0.93	0.96	1.0

¹At 85% outdoor air relative humidity.

Note:

There will be temporary reduction in capacity when snow piles up on the outside surface of the outdoor unit heat exchanger. The level of capacity reduction depends on a number of factors, for example, outdoor temperature (°F DB), relative humidity (RH), and the amount of frost present.

Elevation Correction Factors

For each outdoor unit, calculate the equivalent length of the liquid line from the outdoor unit to the farthest indoor unit. Also, determine the elevation difference of farthest indoor unit above or below the outdoor unit. Find corresponding cooling capacity correction factor in the table below. Multiply the cooling correction factor by standard cooling capacity. The resultant is the NET cooling capacity.

Note:

The correction factors shown below are calculated in the LATS Multi V software program. These factors are only to be used when performing manual calculations.

Table 2: Multi V S Cooling Correction Factors.

Elevation Differences (ft.)	Equivalent Length (ELF) ¹											
	25	33	66	98	131	164	197	230	263	295	328	≥361
HU—Indoor units above Outdoor Unit (ft.)												
0	1.00	0.99	0.97	0.95	0.93	0.91	0.88	0.87	0.85	0.83	0.83	0.82
25	1.00	0.99	0.97	0.95	0.93	0.91	0.88	0.87	0.85	0.83	0.83	0.82
33	-	0.99	0.97	0.95	0.93	0.91	0.88	0.86	0.85	0.83	0.82	0.82
66	-	-	0.96	0.95	0.93	0.90	0.88	0.86	0.85	0.83	0.82	0.82
98	-	-	-	0.94	0.92	0.90	0.88	0.86	0.84	0.83	0.82	0.82
131	-	-	-	-	0.92	0.90	0.88	0.86	0.84	0.83	0.82	0.82
164	-	-	-	-	-	0.90	0.88	0.86	0.84	0.83	0.82	0.82
HL—Outdoor Unit Above Indoor Units (ft.)												
0	1.00	0.99	0.97	0.95	0.93	0.91	0.90	0.87	0.88	0.84	0.86	0.84
25	1.00	0.99	0.97	0.95	0.93	0.91	0.90	0.87	0.88	0.84	0.86	0.84
33	-	0.99	0.98	0.95	0.93	0.91	0.90	0.88	0.88	0.84	0.86	0.84
66	-	-	0.98	0.95	0.93	0.91	0.90	0.88	0.88	0.84	0.86	0.84
98	-	-	-	0.96	0.93	0.91	0.90	0.88	0.89	0.84	0.86	0.84
131	-	-	-	-	0.93	0.91	0.90	0.88	0.89	0.84	0.86	0.84

¹ ELF = Equivalent Pipe Length—Sum of the actual pipe length plus allocations for pressure drop through elbows, valves, and other fittings in equivalent length.



APPLICATION GUIDELINES

Equipment Selection Procedure on page 56

Building Ventilation Design Guide on page 61

Placement Considerations on page 64

LATS Multi V Piping Design Software

The proper design and installation of the refrigerant piping system is a critical element of a Multi V system. Multi V S Heat Pump systems require two pipes between components – a liquid line and a vapor line. A properly designed refrigerant piping system ensures that refrigerant is delivered to the indoor unit coils for optimal system performance and capacity.

LG Air Conditioner Technical Solution (LATS) software is a total design solution for LG Multi V S air conditioning systems. This Windows®-based application assists the design engineer with specifying and sizing outdoor and indoor units (by calculating component capacity based on design conditions), laying out the refrigeration distribution pipe system, checking piping limitations, calculating refrigerant charge, and generating equipment schedules and piping diagrams in (.dxf) format for use on CAD building design drawings.*

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



To ensure that the refrigerant piping design meets LG's quality standards, a LATS refrigerant piping design must be provided with every Multi V S order. Following the installation, if any changes or variations to the design are necessary, a new LATS file must be created and provided to LG prior to system commissioning to ensure the proper pipe size has not changed.

Adjusting LATS Multi V S Output for Altitude

When a system is installed at elevations significantly above sea level, consider the impact air density has on the capacity of the indoor and air-source units. LATS does not de-rate indoor unit capacity for high altitude applications. Be sure to apply locally accepted correction factors when calculating actual indoor unit capacities at that altitude.

Design Choices

LATS Multi V software is flexible, offering the HVAC system engineer an easy to use Tree mode.

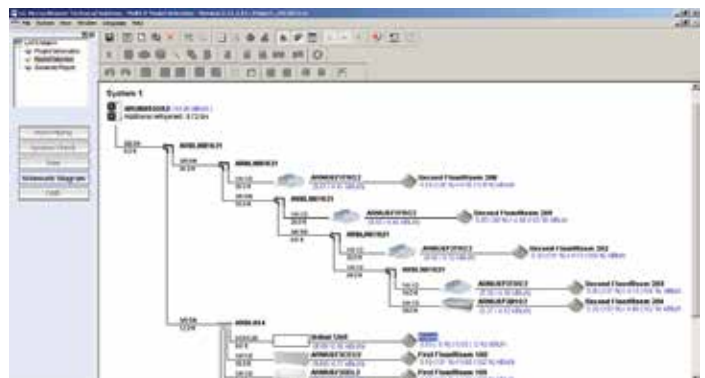
Tree Mode

Using the Tree mode, the engineer can quickly create a one-line schematic drawing of a Multi V system. Integration of the engineered pipe system into the building drawings is done at a later date by the draftsman using standard drafting software tools.

Import building loads from an external file (.xls format).

- System components selected using an easy drag and drop process.
- Automatically analyzes and checks the design complies with most piping design limitations.
- Sizes refrigerant piping.
- Generates a system engineering report (.xls format).
- Generates an equipment schedule (.xls or .dxf format).
- Generates a system piping diagram (.dxf format).

Figure 71: Screenshot of LATS Pipe System Design Tool in Tree Mode.



LATS Report

LATS Multi V software generates a report file (.xls format) containing project design parameters, cooling and heating design day system component performance, and capacity data. The report calculates the system combination ratio, calculates the system refrigerant charge, and provides detailed bill of material information including a list of Multi V outdoor units, air handlers, control devices, accessories, refrigerant pipe sizes segregated by building, by system, by pipe size, and by pipe segments.

Note:

The following procedure is a representation on how LATS Multi V Piping Design software works when designing a Multi V HVAC system. It should not replace the use of LG's LATS Multi V complimentary selection software, but should instead be used in conjunction with it. Contact your LG representative to obtain a copy of the software and the user's manual.

Always use LATS Multi V Software

To properly select, size, and verify that the Multi V system components are optimized, follow the recommendations and instructions provided in this section:

- Zone the building.
- Determine the ventilation method.
- Select the indoor unit(s).
- Select the outdoor unit(s).
- Perform system sizing checks.
 - Calculate the Corrected Capacity Ratio (CCR).
 - Determine the system Combination Ratio (CR).
 - Determine the Running (indoor) Unit Ratio (RUR).

When using the LATS Multi V software, the default indoor design day conditions of 80.6°F DB / 67°F WB in cooling mode and 68°F DB / 56.7°F WB in heating mode may need to be adjusted to reflect the designer's preferred return air design temperature.

Note:

Data provided in the LATS tree mode diagram or report file is not valid until the "Auto-Piping" and "System Check" routines are run without errors. Errors will be reported immediately in pop-up dialog boxes or red lines surrounding indoor unit(s) and / or along pipe segments. If errors are indicated, modify the pipe system design and / or system components and re-run LATS.

Zone the Building

Multi V S Heat Pump is a two-pipe heat pump system that can cool or heat, but not both simultaneously. When designing a heat pump system, the designer typically combines spaces with similar load profiles located near or adjacent to each other into "thermal zones." After combining like spaces into thermal zones that will be served by a single (or grouped) indoor unit(s), calculate the peak cooling and heating loads for each thermal zone.

Calculate the Ventilation Method

Decide how ventilation air will be introduced to each space. Some models of Multi V indoor units have field-installed accessories available to accommodate the direct connection of ventilation ductwork to the unit. It is recommended, however, that additional considerations be assessed and understood when using direct connection accessories. For more information, contact your LG applied equipment representative or visit www.lg-vrf.com for technical product information.

Note:

In all cases, LG recommends ducting pre-treated room neutral, ventilation air directly to the space. If the ventilation air is not tempered to room neutral conditions before introduction to the conditioned space, remember to add the ventilation air load(s) to the space load before sizing the indoor unit(s). Local codes or other professional design guidelines, such as ASHRAE 62.1, will dictate the volume of ventilation air required.

It may be prudent to oversize the dedicated outdoor air system considering there will be a few days of the year when weather conditions exceed the design day conditions. This will minimize the possibility of ventilation air conditions causing the space temperature to drift outside design day parameters in the case where a decoupled outside air system is used, or the indoor unit's entering air temperature falls outside the approved design temperature range if a coupled outside air system is used.

Designing for Extreme Climatic Conditions

The Multi V S air-cooled outdoor unit(s) may have to operate in weather conditions more extreme than a typical design day. Design days are the days of the year that either cooling or heating capacity is needed the most. In light of this, it may be prudent to size the outdoor unit considering the anticipated worst weather day conditions to ensure adequate capacity year round.

When design outdoor ambient conditions are outside the cataloged air-cooled outdoor unit operating range, the net refrigeration effect (capacity) delivered to the indoor units cannot be guaranteed. As a result, the outdoor unit's net refrigeration capacity available for use by the indoor units will be slightly reduced under certain extreme ambient air conditions. (For cooling and heating capacity performance data, see the Performance Data section.)

In lieu of designing for extreme weather conditions beyond the cataloged temperature range, consider limiting the maximum and / or minimum temperature of the air around the Multi V outdoor air-cooled unit, or consider a Multi V water-cooled unit.

When installing a Multi V outdoor unit indoors, provide a condensate drain pan with drain in locations where frozen run-off water may present a slipping danger.

Heating Season

Provide a ventilated equipment enclosure equipped with an auxiliary heat source, or place the outdoor unit(s) within the confines of the building envelope. On retrofit projects, it is best practice to position the outdoor unit(s) in former chiller, boiler, or air handler rooms. These strategies are commonly used on air-cooled projects to eliminate "extreme" over-sizing of the outdoor unit(s).

The enclosure will eliminate other potential operational problems from occurring, including the build-up of snow and ice on the unit case, fan shroud and fan blade, limit the capacity reduction effect of operating the outdoor unit at extremely low temperatures, and may reduce the size and initial cost of the Multi V S outdoor unit.

Cooling Season

An enclosure housing the outdoor unit or roof structure designed to shade the outdoor unit will protect the unit(s) from the negative impact of direct sun exposure, hail, and on sunny days, increase the cooling capacity by reducing the refrigerant condensing temperature.

Note:

When the designer provides the LATS software with ambient air design conditions that are above or below the cataloged operational temperature range, the software will override the designer's specified conditions and will size the refrigerant pipe system using the maximum or minimum cataloged ambient air operating temperature. The report generated by LATS will reflect the outdoor ambient air conditions the designer provides, but the indoor and outdoor unit(s) cooling and heating corrected capacities calculated and shown in the report will be based on the cataloged ambient air operating temperature limits. On these projects, the designer must manually estimate the corrected cooling and heating capacity of the outdoor unit when specified ambient conditions are outside the cataloged range.

Select the Indoor Unit(s)

The building sensible cooling load is typically the critical load to satisfy. In coastal areas or humid applications, such as high occupancy spaces, both the latent and sensible cooling loads should be considered. In areas where the cooling and heating loads are similar or the heating load may exceed the total cooling load, the designer should verify the indoor unit selection satisfies both the heating and cooling requirements.

Determine how many indoor units will be required. Refer to the specification tables to obtain the maximum number of indoor units allowed on Multi V S Heat Pump units. If the quantity of indoor units exceeds the maximum allowed for the outdoor model selected, consider increasing the size of the outdoor unit or split the indoor units into two groups served by separate outdoor units.

Calculate the entering mixed air conditions. Verify the entering air temperature is between 57°F to 76°F WB in Cooling Mode, and between 64°F to 75°F DB in Heating Mode.

To calculate the indoor unit entering mixed air temperature:

$$MAT = \frac{(RAT \times \%RA) + (OAT \times \%OA)}{100}$$

Where:
 MAT = Mixed air temperature
 RAT = Return air temperature
 OAT = Outside air temperature
 %RA = Percentage of return air
 %OA = Percentage of outdoor air

Note:

When the indoor unit entering air temperature is outside the cataloged operational limits, operational abnormalities may occur. These include frost accumulating on the coil, low or high suction temperature, low or high head pressure, low or high discharge temperature, or complete system shutdown.

Indoor unit *nominal* cooling capacity ratings, among other parameters, are based on an entering air condition of 80°F DB / 67°F WB and a 95°F DB outdoor ambient temperature. *Nominal* heating capacity ratings are based on an indoor unit entering air condition of 70°F DB and an outdoor ambient air temperature of 47°F DB / 43°F WB.

Capacity Correction

The *corrected* cooling/heating capacity is different from the nominal cooling / heating capacity. The corrected capacity reported by LATS includes changes in unit performance after considering refrigerant line pressure drop, the system's Combination Ratio (CR), and the effect design ambient operating conditions has on the system's cooling capability.

Depending on the location of the building, additional capacity correction factors may need to be applied to the corrected capacity values provided by LATS. (For correction factors, see the separate Performance Data section.)

Altitude Correction

On air-cooled systems, the impact of air density must be considered on systems installed at a significant altitude above sea level. To calculate the effect on the indoor unit's cooling capacity, manually apply locally accepted altitude correction factors. LATS does not de-rate indoor unit capacity for altitude.

Minimum Air Change Requirements

Avoid over-sizing indoor units in an attempt to increase the air exchange rate in the space. VRF systems are designed for minimum airflow over the coil to maximize latent capacity while cooling, maintain a comfortable, consistent discharge air temperature while heating, and minimize fan motor power consumption. In extreme cases, over-sizing indoor units may compromise the outdoor unit's ability to effectively match the space load(s).

Check the Indoor Unit Selection(s)

Verify the sensible (and total) corrected cooling capacity. For each indoor unit the corrected capacity must be at least equal to the sum of the appropriate cooling design day space load(s) (plus ventilation load, if applicable) for the space(s) served by the indoor unit.

Verify the corrected heating capacity. For each indoor unit, the corrected capacity must be at least equal to the sum of the heating design day space load (plus ventilation load, if applicable) for all spaces served by the indoor unit.

Select the Outdoor Unit

After all indoor units are properly sized to offset the applicable loads in each space, begin the selection of the outdoor unit by choosing a size that meets both the block load cooling requirement and offsets the sum of the peak heating load.

After making an outdoor unit selection, look up the outdoor unit's corrected cooling and heating capacity at the specified ambient design conditions. Use values reported by LATS or find it in the tables provided in the Performance Data section.

Capacity Correction

For air-cooled systems operating in cooling mode, a capacity correction factor may apply to account for the length of the system's liquid pipe and elevation difference between the outdoor unit and the indoor unit(s). If the outdoor units corrected cooling capacity was derived from the LATS report, the elevation difference correction factor has already been applied. If the corrected cooling capacity was found using corrected capacity tables found in the Performance Data section, apply the appropriate elevation difference factor also found in the Performance Data section. Multiply the outdoor unit corrected cooling capacity by the elevation difference correction factor. For high altitude locations, locally accepted altitude correction factors must be manually applied to outdoor unit capacity. LATS will not de-rate outdoor unit capacity for altitude.

Frost Accumulation

The outdoor unit heating capacity may need to be adjusted for frost accumulation on air-cooled systems. If design day conditions are below the dew-point of the surrounding air, frost may not be a problem and no correction factor is needed. In certain weather conditions, however, frost may form and accumulate on the air-cooled outdoor unit coil and impact the coils ability to transfer heat. If significant frost accumulates on the outdoor unit coil, a defrost algorithm will start automatically. The timing between defrost periods is determined by the system's ability to achieve a target head pressure value.

LATS will automatically apply a frost accumulation factor if the check box labeled "Defrost Factor" in the outdoor unit selection dialog box is marked. The dialog box can be accessed by double-clicking on the outdoor unit image. If checked, the corrected outdoor unit capacity provided by the LATS report and displayed on the tree mode piping diagram will already be adjusted for outdoor unit coil frost accumulation.

If the corrected heating capacity was found using the Performance Data tables, the frost accumulation factor must be applied. (For correction factors, see the Performance Data section.)

Note:

In LATS always run the Auto-Pipe and System Check features following any change in the outdoor unit selection to verify the system design is acceptable.

Check the Indoor Unit Selection(s)

After applying the appropriate correction factors to the outdoor unit, verify the corrected cooling capacity is at least equal to the total building load (considering building diversity, if applicable), and the corrected heating capacity is at least equal to the sum of the peak heating loads for all spaces and/or thermal zones served by the system.

System Sizing Checks

Calculate the Corrected Capacity Ratio (CCR)

The system's CCR is defined as the sum of the space loads divided by the outdoor unit corrected capacity after all applicable correction factors are applied. Calculate this ratio for both the cooling and heating design days.

$$CCR\%_{(Clg)} = \left(\frac{\text{Total Cooling Block Load}}{\text{Actual Corrected Outdoor Unit Cooling Capacity}} \right) \times 100 \leq 100\%$$

$$CCR\%_{(Htg)} = \left(\frac{\text{Heating Peak Load}}{\text{Actual Corrected Outdoor Unit Heating Capacity}} \right) \times 100 \leq 100\%$$

The outdoor unit selected should be large enough to offset the total block cooling load for all spaces served by the VRF system during the peak cooling load hour on the cooling design day (account for ventilation air cooling load if the ventilation air has not been pretreated to room neutral conditions).

The corrected cooling capacity ratio (CCR% [clg]) should never exceed 100% plus building diversity. If it does, increase the size of the outdoor unit or change the system design by moving some of the building load and associated indoor unit(s) to another Multi V system.

The outdoor unit should also be large enough to offset the sum of the building's space heating loads without considering building diversity. In the heating season, it is typical that all spaces served by the system will peak simultaneously in the early morning, thus building diversity should never be considered. If the corrected heating capacity ratio (CCR% [htg]) exceeds 100%, increase the size of the outdoor unit or change the system design by moving some of the building load to another Multi V system.

Determine the System Combination Ratio (CR)

The system's CR compares the nominal capacity of all connected indoor units with the nominal capacity of the outdoor unit serving them. Locate nominal capacity information for indoor and outdoor units in the General Data Tables of their respective Engineering Manuals.

For example,

If a VRF system has an outdoor unit with a nominal capacity of C and four indoor units having nominal capacity ratings of W, X, Y, and Z respectively, the CR would be determined as follows:

$$CR\% = \left(\frac{W + X + Y + Z}{C} \right) \times 100$$

Note:

The Multi V system will not commission, start or operate unless the CR is between 50% and 130%.

If the CR is over 100%, the designer is under-sizing the outdoor unit relative to the combined nominal capacity of the connected indoor units. In some applications, under-sizing of the outdoor unit is prudent as it reduces the initial equipment investment and will properly perform as long as the designer:

1. Knows the indoor unit(s) are oversized relative to the actual load(s) in the spaces served.
2. Knows the space loads will peak at different times of the day (i.e., building has "load diversity").

In some designs, over-sized indoor units may be unavoidable in the case where the smallest size indoor unit available from LG is larger than what is necessary to satisfy the space load. This scenario may occur when an indoor unit selection one size down from the selected unit is slightly short of fulfilling the design load requirements, and the designer must choose the next largest size unit.

Note:

If the outdoor unit is properly sized to offset the building's total cooling block load and the system's combination ratio is above 130%, indoor units are likely oversized. In applications where all indoor units are "right-sized" and there is no building diversity, the system's CR will likely be $\leq 100\%$.

If the CR is above 130%, review the indoor unit choices and downsize, or select a larger outdoor unit. Consider moving indoor units to another Multi V, Multi F, or single-split system if the outdoor unit size cannot be increased.

If the CR falls below 50%, select a smaller outdoor unit or consider adding more or larger indoor unit(s) to the system. This situation is common on multi-phase projects where the design calls for the majority of indoor units be added to the system at a later date. To raise the CR above the minimum 50% requirement:

3. Consider including additional indoor units on the first phase
4. Design two smaller systems in lieu of a single larger system. Connect all "first phase" indoor units to the outdoor unit being installed on the first phase, and delay the installation of the additional outdoor unit until a later date.

Conclusions and Recommendations

- Always use LATS Multi V system design software to check a design.
- Validate that each indoor unit is appropriately sized. Before validating, if the indoor units have been properly sized, the outdoor unit's size must be temporarily adjusted to make the system's CR $\leq 100\%$.
- Using the indoor unit's corrected capacity for cooling and heating provided by LATS and apply a correction factor for altitude if appropriate.
- Verify that the outdoor unit selection for each system is properly sized. Verify that the corrected capacity for cooling and heating provided by LATS is sufficient to offset the block building space load after applying additional correction factors for capacity and frost accumulation, if appropriate.
- For each Multi V system, calculate the cooling and heating design days.

1. Corrected Capacity Ratio (CCR).
2. Combination Ratio (CR).

After these system checks are complete and design limitations are adhered, the system's indoor and outdoor components should be properly sized and the system's performance should now be optimized. The VRF system component size selections should be acceptable.

At any time, if further system design assistance is needed or you have a unique application you would like to discuss, contact your LG applied equipment representative for assistance.

ASHRAE Standards 62.1 and 62.2 (depending on if the building is residential or commercial), and local codes specify the minimum volume of airflow that must be provided to an occupied space. Outdoor air is required to minimize adverse health effects, and it provides acceptable indoor air quality for building occupants. Indoor units located within the zone typically require less airflow to condition the space. During the design phase, refer to the airflow capabilities listed in the specification tables for each product. Choose the best method for the application out of the five (5) ventilation options available.

Note:

Disclaimer

Although we believe that these building ventilation methods have been portrayed accurately, none of the methods have been tested, verified, or evaluated by LG Electronics, U.S.A., Inc.. In all cases, the designer, installer, and contractor should understand if the suggested method is used, it is used at their own risk. LG Electronics U.S.A., Inc., takes no responsibility and offers no warranty, expressed or implied, or statutory and the implied warranties of merchantability and fitness for a particular purpose are excluded should the building ventilation methods fail to perform as stated or intended.

- For a complete copy of Standard 62.1-2010, refer to the American Standard of Heating and Air Conditioning Engineers (ASHRAE) website at www.ashrae.org.
- For more information on how to properly size a ventilation air pretreatment system, refer to the article, "Selecting DOAS Equipment with Reserve Capacity" by John Murphy, published in the ASHRAE Journal, April 2010.

Method 1: Decoupled Dedicated Outdoor Air System (DDOAS)

Provide a separate, dedicated outdoor-air system designed to filter, condition, and dehumidify ventilation air and deliver it directly to the conditioned space through a separate register or grille. This approach requires a separate independent ventilation duct system not associated with the Multi V S system.

Note:

LG recommends using the DDOAS method in all installations.

Advantages

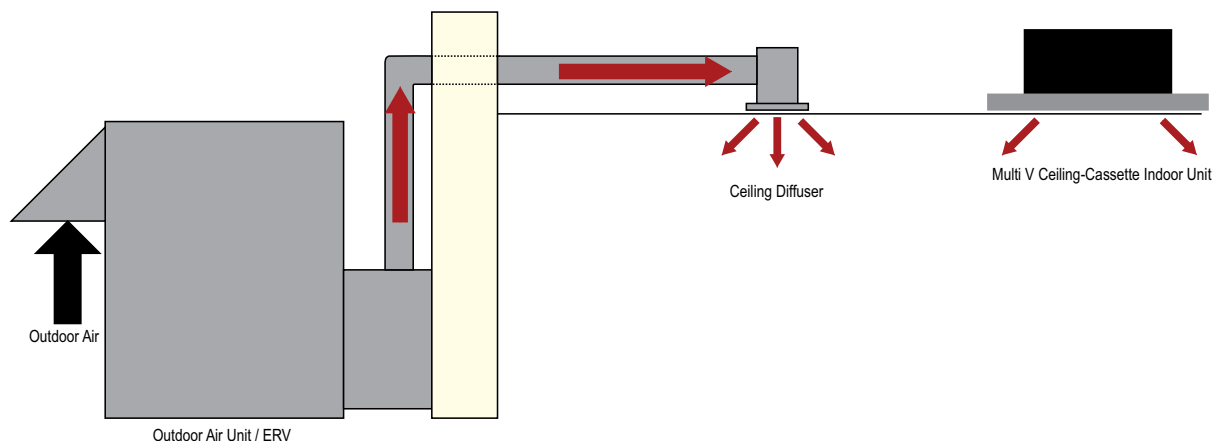
- May be used with a full lineup of the indoor units.
- The outdoor air unit may supply "neutral" air to the occupant space even when the Multi V indoor unit fan changes speed or cycles on and off. DDOAS controls do not have to be interlocked with the Multi V S system.
- In lieu of installing localized smaller outside air treatment equipment throughout the building, this method centralizes the ventilation air source making service and filter changes easier.
- Third-party demand control ventilation controls are more readily accommodated.

Disadvantages

- Ceiling space is required to accommodate ductwork between the centralized outdoor air unit and ceiling diffusers.

Note:

Methodology illustrations are for examples only and do not depict actual indoor units for the specific outdoor unit pairing. These are generic illustrations to show ventilation design only.



Method 2: Unconditioned Outdoor Air (Non-Ducted, Natural Ventilation)

Natural ventilation devices, such as operable windows or louvers may be used to ventilate the building when local code permits. The open area of a window or the free area of a louver must meet the minimum percentage of the net occupied floor area.

Advantages

- Occupants control the volume of the ventilation air manually.
- Useful for historic buildings that have no ceiling space available for outdoor air ductwork.
- May be used with the full lineup of Multi V indoor units.

Disadvantages

- In some locations, it may be difficult to control humidity levels when windows are open.
- Thermal comfort levels may be substandard when windows are open.
- Indoor units may have to be oversized to account for the added heating and cooling loads when windows are open.
- Provides outdoor air to perimeter spaces only. Additional mechanical ventilation system may be required to satisfy requirements for interior spaces.
- Outdoor air loads may be difficult to calculate since the quantity of outdoor air is not regulated.
- May affect indoor unit proper operation when open.

Method 3: Unconditioned Outdoor Air Ducted to Indoor Units

Untreated outdoor air is channeled through a duct system that is piped to the return air duct on Multi V ducted indoor units or to the frame of Multi V 1-way and 4-way cassettes.

Note:

Outside air may flow backward through the return air-filter grille when the indoor unit fan speed slows or stops in response to changes in the space load. This may result in captured particulate on the filter media being blown back into the conditioned space.

Advantages

- May require less ductwork if indoor units are placed near outdoor walls or a roof deck.
- Controls must be interlocked to shut off the outdoor air supply fan when the space is unoccupied.
- Third-party demand-control ventilation controls may be installed to regulate outdoor intake based on the CO₂ levels of the occupied space.

Disadvantages

- Fan(s) will be required to push outdoor air to the indoor unit to overcome the additional static pressure.
- Ventilation air must be pre-filtered before mixing with the return air stream. LG indoor cassette models are configured to introduce the ventilation air downstream of the return air filter media.
- Ducted, 1-way, and 4-way cassette models are the only indoor units that accept the connection of an outdoor air duct to the unit case.
- Mixed air conditions must be between a minimum of 59°F DB while operating in heating and a maximum of 76°F WB while operating in cooling. Depending on the ventilation air volume requirement, the location choices are limited where untreated outside air may be introduced to the building using this method.
- Larger indoor units may be required to satisfy for additional outdoor air.
- Motorized dampers may be required to prevent outdoor air flow through the indoor unit when the indoor unit is not operating.
- An LG Dry Contact adapter may be necessary to interlock the motorized damper with the indoor unit.
- While operating in heating, the untreated outdoor air may delay the start of the indoor unit fan impacting building comfort.
- In most cases, in lieu of using the factory mounted return-air thermistor on indoor units, a remote wall temperature sensor or zone controller will be needed for each indoor unit to provide an accurate reading of the conditioned area temperature.

Method 4: Unconditioned Outdoor Air (Non-Ducted, Fan Assisted Ventilation)

When approved by local codes, the fan assisted ventilation method uses exhaust fans to remove air from the building, and outdoor air is drawn into occupied spaces through a wall louver or gravity roof intake hood. Supply fans can also be used to push the outdoor air into the space and building positive pressure will vent the exhaust air through louvers or roof-mounted exhaust hoods. Outdoor air is neither cooled nor heated before entering the building.

Note:

This may result in loss of building pressurization control, increasing infiltration loads with adverse effects.

Advantages

- Outdoor air may be manually controlled by the occupant or automatic controls may be installed to open/close outdoor air dampers or to turn on/off ventilation fans.
- Useful for large open spaces like warehouses, garages, and workshops.
- Outdoor air volume is a known quantity. Air loads may be easier to calculate since fans will regulate the amount of outdoor air.
- May be used with a full lineup of Multi V indoor units.

Disadvantages

- In some locations of the country, it may be difficult to control humidity levels while outdoor air louvers/hoods are opened.
- Thermal comfort levels may be substandard when louvers/hoods are opened.
- Indoor units may have to be oversized to account for the added heating/cooling loads when louvers/hoods are open.
- Hot, cold, and/or humid areas may be present if the outdoor air is not evenly distributed to the different spaces.

Method 5: Coupled Dedicated Outdoor Air (CDOA)

A separate, dedicated outdoor air system delivers air directly to a Multi V indoor unit or to the return air duct system. After mixing with the return air stream, ventilation air passes through the indoor unit and into the conditioned space. The pretreatment system is capable of filtering, conditioning, and dehumidifying outdoor air to room neutral conditions.

Note:

Outside air may flow backward through the return air-filter grille when the indoor unit fan speed is reduced or stops when the space load is satisfied. This may result in captured particulate on the filter media being blown back into the conditioned space.

Advantages

- Separate ceiling registers or grilles for introduction of the outside air to the conditioned space may be avoided.

Disadvantages

- Ducted, 1-way, and 4-way cassette indoor units are the only models designed for direct connection of an outside air duct.
- The building occupant may not notice the outdoor air pretreatment system has malfunctioned until the unconditioned outdoor air exceeds the indoor unit mixed air limits of 59°F DB for heating and 76°F WB for cooling.
- If the coil entering air condition limitation is exceeded, the indoor unit may malfunction and ceases to operate.
- If the outdoor air unit cooling or heating system fails, the malfunction may be masked by the indoor unit ramping up operating parameters to compensate for the failure.
- Motorized dampers may be required to prevent outdoor air from entering the indoor unit while the indoor unit has cycled off.
- An LG Dry Contact adapter is necessary to interlock the motorized damper with the indoor unit fan operation.
- In lieu of using the factory mounted return-air thermistor, a remote wall temperature sensor or zone controller may be required to provide an accurate conditioned space temperature reading.

Outdoor Units

Selecting the Best Location—Outdoor Units

⚠ DANGER

To avoid the possibility of fire, do not install the unit in an area where combustible gas may generate, flow, stagnate, or leak. Failure to do so will cause serious bodily injury or death.

⚠ WARNING

⊘ Do not install the unit in a location where acidic solution and spray (sulfur) are often used as this may cause serious bodily injury or death. ⊘ Do not use the unit in environments where oil, steam, or sulfuric gas are present as this may cause serious 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.

Note:

- Select a location for installing the outdoor unit that will meet the following general conditions:
- A location strong enough 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) 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. Properly install and insulate any drain hoses to prevent the hose from freezing, cracking, leaking, and damaging the outdoor unit.
- Install a fence to prevent vermin from crawling into the unit or unauthorized individuals from accessing it.



- Where it will not be subjected to direct thermal radiation from other heat sources, nor an area that would not 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 not disturb inhabitants of surrounding buildings.
- Where the unit will not be exposed to direct, strong winds.

Additionally, the following conditions should be taken into considerations when the unit operates in defrost mode:

- 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.)
- Sidewalks or parking lots near the outdoor unit may accumulate moisture after unit operates in defrost mode that can turn to ice and create unsafe conditions.

⚠ CAUTION

Choose an area where run-off from defrost will not accumulate and freeze 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.

Note:

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

The indoor unit may take longer to provide heat, or heating performance will be reduced in winter if the 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.

General Mounting

Securely attach the outdoor unit to a condenser pad, base rails, or other mounting platform that is securely anchored to the ground or building structure. See the figures below, and follow the applicable local codes for clearance, mounting, anchor, and vibration attenuation requirements.

Figure 72: Outdoor Unit—Mounting and Service Clearances (Plan View).¹

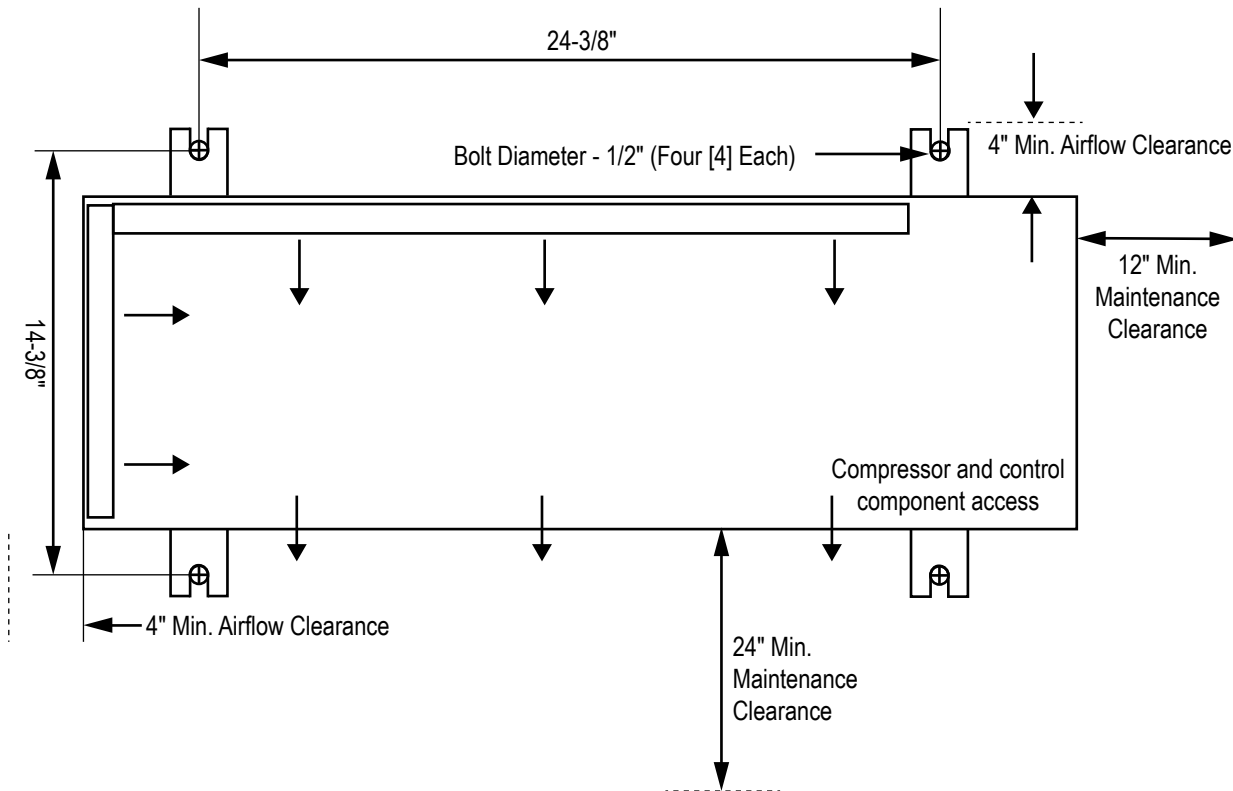


Figure 73: Outdoor Unit—Mounting and Service Clearances (Elevation View).

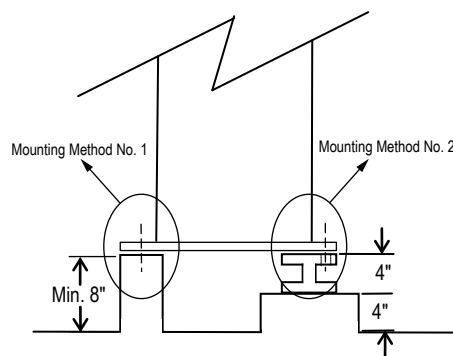


Figure 74: Mounting Method No. 1.²

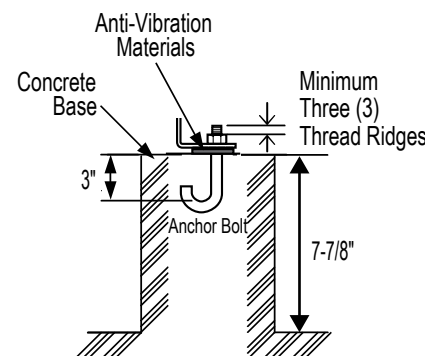
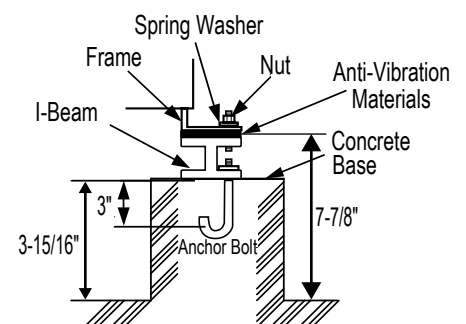


Figure 75: Mounting Method No. 2.²



Note:

1. Minimum airflow clearance specifications are based on a single unit installation without obstructions. Refer to "Clearance Requirements" for specific airflow clearance requirements when obstructions are present.
2. All referenced materials are to be field-supplied.
3. Images are not to scale. All dimensions ± 0.25 inches.

PLACEMENT CONSIDERATIONS



Outdoor Units

The Multi V S condensing unit is designed to operate properly in a wide range of environmental conditions, but correct placement of the outdoor unit is essential for maximizing unit performance. Consider the following factors that impact system performance.

Wind Protection

If the outdoor unit is placed on a roof, position it with the compressor end (no coil surface) in the direction of the prevailing wind as shown in the figure at right. In cooler climates, it may be beneficial to position the unit in direct sunlight to assist with defrost operations.

If the outdoor unit is not placed on a roof, place it on the leeward side of the building or in a location where the unit will not be exposed to constant wind.

If placement exposes the unit to constant wind activity, construct a wind break in front of the unit. Follow the placement guidelines set forth in "Clearance Requirements" on next page.

Figure 76: Prevailing Wind Direction.

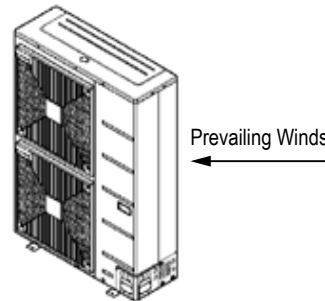
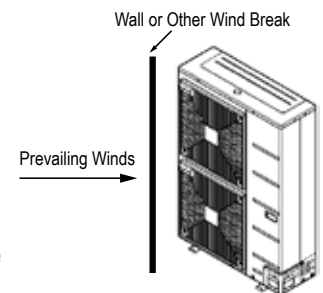


Figure 77: Leeward Side of the Building.



Figure 78: Wind Break.



Mounting Platform

The underlying structure or foundation must be designed to support the weight of the unit. Avoid placing the unit in a low lying area where water may accumulate.

Tie-Downs and Wind Restraints

The strength of the Multi V S frame 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 codes when designing a wind restraint system.

Dealing with Snow and Ice

In climates that experience snow buildup, place the unit on a raised platform to ensure proper condenser airflow. The raised support platform must be high enough to allow the unit to remain above possible snow drifts. Mount the unit on a field-provided snow stand at a minimum height that is equal to the average annual snowfall, plus 20 inches. Design the mounting base to prevent snow accumulation on the platform in front or back of the unit case. If necessary, provide a field fabricated hood to keep snow and ice and / or drifting snow from accumulating on the coil surfaces. Remove any snow that has accumulated 3-15/16 inches or more on the top of the outdoor unit. Use inlet and discharge duct or snow hoods to prevent snow or rain from accumulating on the fan inlet and outlet guards. Consider tie-down requirements in case of high winds or where required by local codes. When the system is commissioned, set the controller for "snow throw" operation. In all cases, connected duct work and accessories must provide a combined air pressure drop rating that does not exceed 0.16" WG.

⚠ CAUTION

Properly install and insulate any drain hoses to prevent the hose from freezing, cracking, leaking, and causing unsafe conditions from frozen condensate.

Note:

- When deciding on a location to place the outdoor unit, be sure to 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 causing unsafe conditions from frozen condensate.
- Position the outdoor unit so that its airflow fans are not buried by direct, heavy snowfall. If snow piles up and blocks the airflow, the system may malfunction.
- Snow throw mode does not prevent ice from forming on the fan blade or discharge grille.

Ambient Air Conditions

Avoid exposing the outdoor unit to steam, combustible gases, or other corrosive elements. Avoid exposing the unit to discharge from boiler stacks, chimneys, steam relief ports, other air conditioning units, kitchen vents, plumbing vents, and other sources of extreme temperature, gases, or substances that may degrade performance or cause damage to the unit. When installing multiple outdoor units, avoid placing the units where discharge of one outdoor unit will blow into the inlet side of an adjacent unit.

Handling Outdoor Unit Condensate

While operating in the Heating mode, the surface temperature of the outdoor coil may drop below the dew-point of the surrounding air. If the air temperature is above freezing, moisture will condense on the coil fins and drain from the bottom of the unit. In most installations, condensate is allowed to drain directly from the unit to the surrounding area. See "Dealing with Snow and Ice" above for more information.

Clearance Requirements—General

Proper airflow through the outdoor unit coil is critical for proper unit operation. Figures below and on the next page illustrate clearance requirements for various installation scenarios for the Multi V S outdoor unit. Use the hot isle / cold isle approach when placing multiple units in close proximity to each other. Outdoor unit fans draw air from the back of the unit and discharges out the front. Place units back to back and face to face.

Note:

- Installation clearances must comply with local building codes.
- All figures not to scale.
- Never place multiple units facing back to front or front to back as shown immediately below here or high and low system pressure problems may occur.

Legend

LR = Rear wall height

LF = Front wall height

H = Unit height

Figure 79: Improper Outdoor Unit Placement.

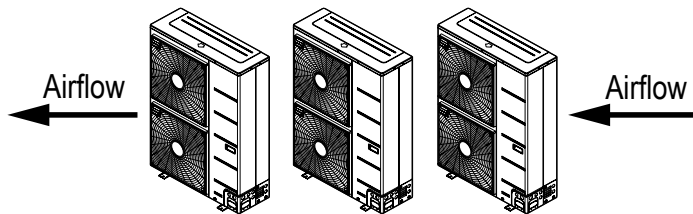
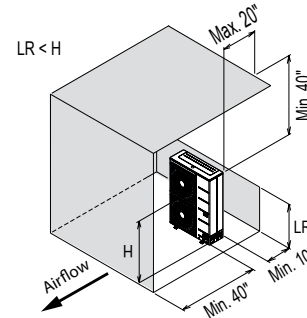


Figure 80: Proper Outdoor Unit Placement and Clearances.

Single Unit—High Front Wall with Building Overhang and No Side Walls



Single Unit—High Rear Wall and Low Front Wall with No Side Walls

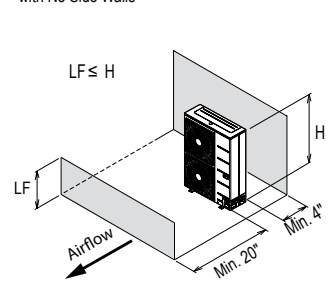
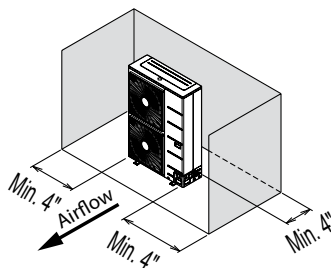
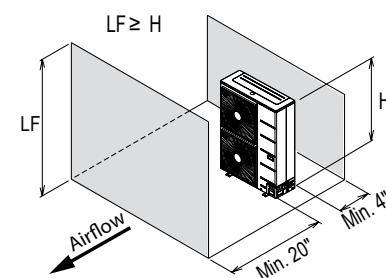


Figure 81: Proper Outdoor Unit Placement and Clearances, continued.

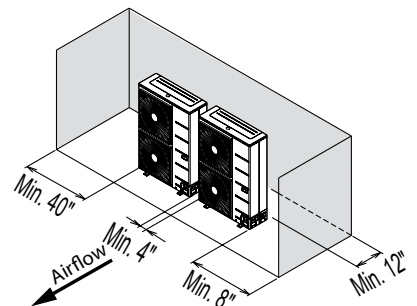
Single Unit—High Rear Wall with or without High Side Walls



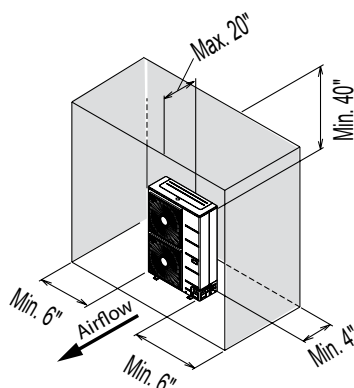
Single Unit—High Rear and Front Walls with No Side Walls



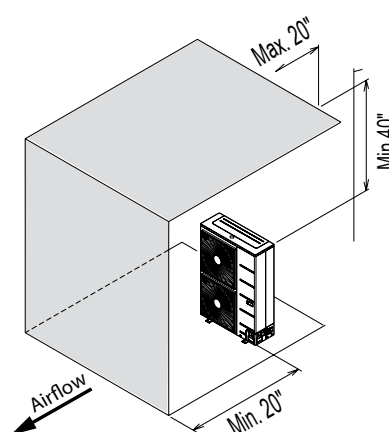
Side by Side—High Rear and Side Walls



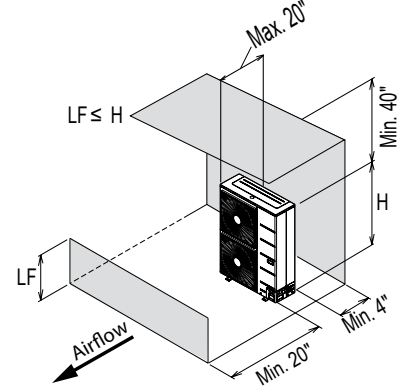
Single Unit—High Rear and Side Walls with Building Overhang



Single Unit—High Front and Rear Walls with Building Overhang and No Side Walls



Single Unit—High Rear Wall and Low Front Wall with Building Overhang and No Side Walls



PLACEMENT CONSIDERATIONS

Outdoor Units

Note:

- Installation clearances must comply with local building codes.
- All figures not to scale.

Legend

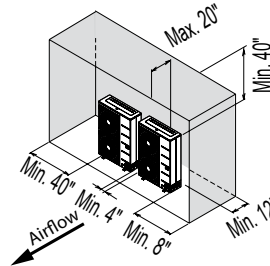
LR = Rear wall height

LF = Front wall height

H = Unit height

Figure 82: Proper Outdoor Unit Placement and Clearances, continued.

Side by Side—High Rear and Side Walls with Building Overhang



Side by Side—High Rear and Front Walls with Building Overhang

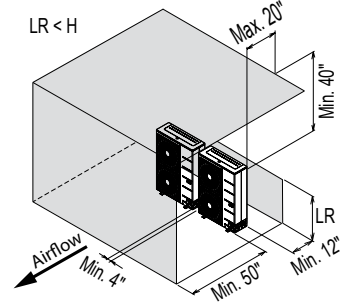
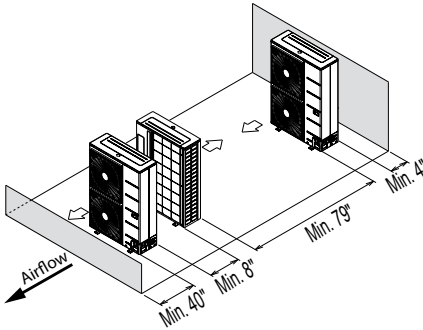
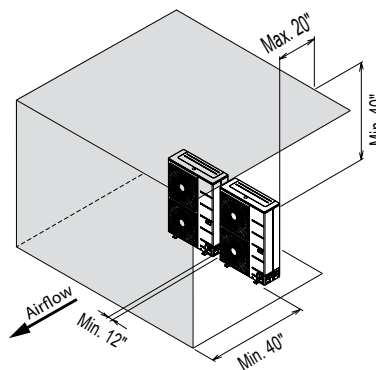


Figure 83: Proper Outdoor Unit Placement and Clearances, continued.

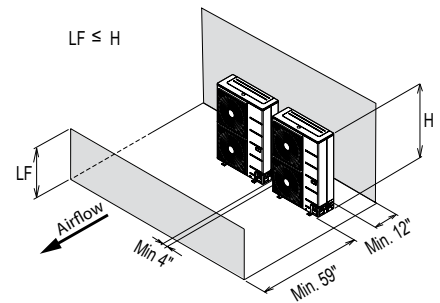
Single Row Units—High Rear Wall and Low Front Wall with No Side Walls or Overhang



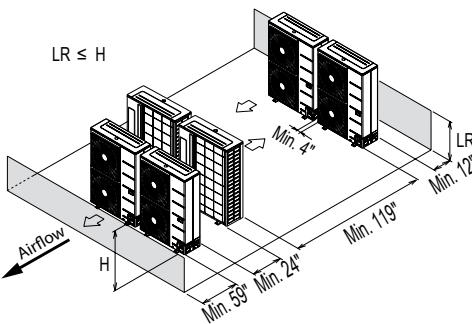
Side by Side—High Front Wall with Building Overhang and No Side or Rear Walls



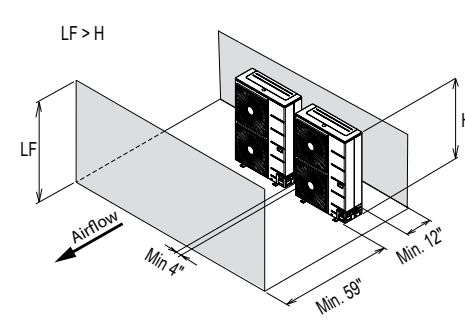
Side by Side—High Rear Wall and Low Front Wall with No Side Walls



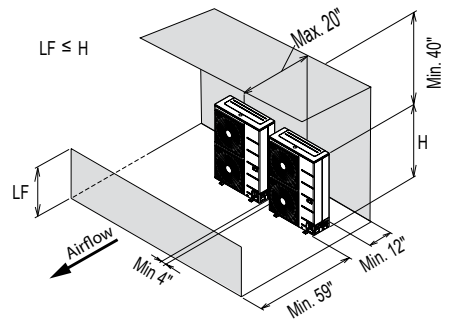
Double Row Units—Low Rear and Front Walls with No Side Walls or Overhang



Side by Side—High Front and Rear Walls with No Side Walls



Side by Side—High Rear Wall and Low Front Wall with Building Overhang and No Side Walls



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

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 should 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 should 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 should 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 should be designed to avoid weather related long periods of water entrainment and the potential for microbial growth.

Outdoor Units / Indoor Units

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 (see specification data tables).
- No obstructions should 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 should 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.lg-vrf.com.

Selecting the Best Location—Indoor Units

General Do's

- Place the unit where air circulation will not be blocked.
- Place the unit where drainage can be obtained easily and to minimize the length of the condensate drain piping.
- Place the unit where noise prevention is taken into consideration.
- Ensure there is sufficient supply air and maintenance space.
- Locate the indoor unit in a location where it can be easily connected to the outdoor unit.
- Follow the clearance and installation area weight requirements designated for each indoor unit type



General Don'ts

- *Avoid installing the unit near high-frequency generators.*
- *Do not install the unit near a doorway.*
- *The unit should not be installed near a heat or steam source, or where considerable amounts of oil, iron powder, or flour are used. (These materials may generate condensate, cause a reduction in heat exchanger efficiency, or the drain to malfunction. If this is a potential problem, install a ventilation fan large enough to vent out these materials.)*

Note:

For more detailed installation requirements for each specific indoor unit type, refer to the Indoor Unit Engineering and / or Installation Manuals.

Installing in an Area Exposed to Unconditioned Air

In some installation applications, areas (floors, walls) in some rooms may be exposed to unconditioned air (room may be above or next to an unheated garage or storeroom). To countermeasure:

- Verify that carpet is or will be installed (carpet may increase the temperature by three [3] degrees).
- Add insulation between the floor joists.
- Install radiant heat or another type of heating system to the floor.

WARNING

The unit should not be installed where sulfuric acid and flammable or corrosive gases are generated, vented into, or stored. There is risk of fire, explosion, and physical injury or death.

The unit may be damaged, may malfunction, and / or will not operate as designed if installed in any of the conditions listed.

Note:

If the unit is installed near a body of water, the installation parts are at risk of being corroded. Appropriate anti-corrosion methods should be taken for the unit and all installation parts.

REFRIGERANT PIPING DESIGN & LAYOUT BEST PRACTICES

Piping Design Guideline Summary on page 71

LG Engineered Y-branch Kits on page 75

LG Engineered Header Kits on page 76

LATS Calculated Refrigerant Charge on page 78

Selecting Field-Supplied Copper Tubing on page 81

General Information / Guidelines on page 84

Piping Design Guideline Summary

The proper design and installation of the refrigerant piping system is a critical element of a Multi V system. As detailed on page 56, LG provides engineers LG Air Conditioner Technical Solution (LATS) software to help design LG Multi V air conditioning systems.

The information represents how LATS Multi V Piping Design software works when designing the piping system for Multi V heat pump units. It should not replace the use of LG's LATS Multi V complimentary selection software, but should instead be used in conjunction with it. Contact your LG representative to obtain a copy of the software and the user's manual.

Refrigerant Piping System Quality Assurance

To ensure that the refrigerant piping design meets LG's quality standards, a LATS refrigerant piping design software report must be provided with every Multi V S order. Following the installation, if any changes or variations to the design were necessary, an "as-built" LATS piping design software report must be provided to LG prior to system commissioning.

Systems that are close to the standard application limits may be converted into a conditional application by field changes to pipe equivalent lengths. User should always check the LATS report actual pipe layout versus pipe limits. The user may want to increase pipe lengths when conditions close to the standard application limits are present, forcing increased pipe diameters seen in conditional applications to be used and avoiding pipe changes due to field installation variations.

Note:

*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 should be done with caution and **ALWAYS VERIFIED in LATS MULTI V SOFTWARE** before supplies are purchased or installed. Doing so ensures profitable installation, eliminates rework, and ensures easier system commissioning.*

Creating a Balanced Piping System

Unlike designing duct-work or chilled and hot water pipe systems where balancing dampers, ball valves, orifices, circuit setters, or other flow control devices can be installed to modify or balance the flow of cooling medium, these cannot be used in a VRF system. Therefore, variable refrigerant flow systems have to be designed to be "self balanced." Balanced liquid refrigerant distribution is solely dependent on the designer choosing the correct pipe size for each segment. Pipe sizing considerations include pipe length, pipe segment pressure drop relative to other pipe segments in the system, type and quantity of long radius elbows, bends present, fitting installation orientation, and end use device elevation differences.

Note:

It is imperative the designer avoids creating excessive pressure drop. When liquid refrigerant is subjected to excessive pressure drop, liquid refrigerant will change state and "flash" to vapor. Vapor present in a stream of liquid refrigerant before reaching the electronic expansion valve (EEV) results in a loss of system control and causes damage to the valve. The pipe system must be designed in a manner that avoids the creation of unwanted vapor.

Minimum number of connected and operating indoor units is 1.
Maximum number of indoor units on a system is:

- ARUN038 = 6
- ARUN048 = 8
- ARUN053 = 9

Table 40: Multi V S Liquid Piping Design Parameters.

Pipe Length	Longest total	984 ELF
	Longest distance from ODU to IDU	492 feet (Actual) 574 feet (Equivalent)
	Distance Between Fittings and IDUs	≥ 20" ELF
	Minimum distance between IDU to any Y-Branch	≤ 131 ELF
	Maximum distance between first Y-Branch to farthest IDU	131 feet
	Minimum distance from IDU to Y-Branch	3 feet
Elevation	If ODU is above IDU	164 feet
	If ODU is below IDU	131 feet
	Between any two IDUs	49 feet

IDU = Indoor Unit

ODU = Outdoor Unit

All elevation limitations are measured in actual feet

ELF = Equivalent length of pipe in feet

Figure 84: Multi V S Piping System Configuration Limitations.

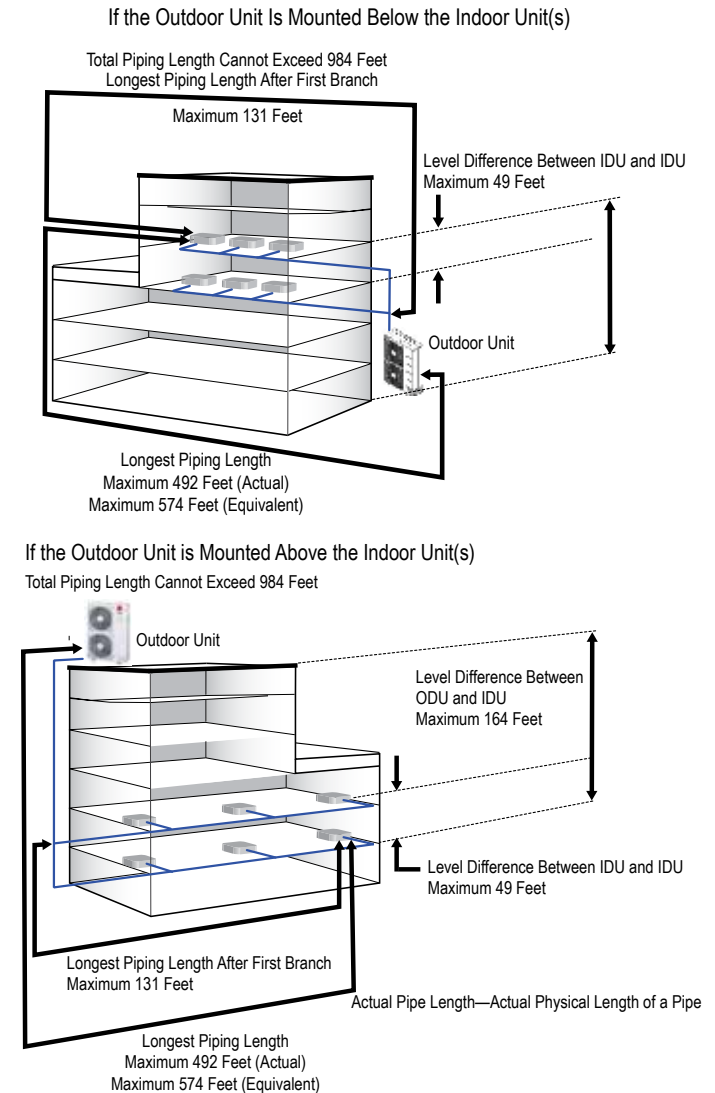


Table 39: Field-Supplied Refrigerant Fittings—Liquid Line Equivalent Pipe Length.

Copper Tubing Size (O.D.)	Equivalent Pipe Length*					
	3/8	1/2	5/8	3/4	7/8	1-1/8
Standard 90° Elbow	0.6	0.9	1.3	1.6	1.9	2.5
Long Radius 90° Elbow	0.4	0.6	0.8	1.0	1.3	1.7
Street 90° Elbow	1.0	1.6	2.1	2.6	3.1	4.2
Standard 45° Elbow	0.3	0.5	0.7	0.8	1.0	1.3
Street 45° Elbow	0.5	0.8	1.1	1.4	1.6	2.2
Y-Branch	1.6	1.6	1.6	1.6	1.6	1.6
Header	3.3	3.3	3.3	3.3	3.3	3.3
Ball Valve	The equivalent length of a FULL port ball valve is the physical length of the valve. In other words, treat as straight pipe. A full port ball has the same bore diameter as the connected pipe.					

*Equivalent pipe length—The sum of the actual pipe length plus allocations for pressure drop through elbows, valves, and other fittings in equivalent length.

Values calculated based on formula and factors from www.sporlanonline.com.

LG supplied Y-Branch and Header fittings must be used. Field-built Y-Branch and Header fittings are not permitted.

REFRIGERANT PIPING DESIGN

Piping Design Guideline Summary

Table 41: Pipe Segment Sizing— All Pipe Dimensions are Inches O.D.

Model	Main Pipe Segment ¹				Branch and Run-Outs ^{2,3}					
	<295 feet equivalent		≥ 295 feet equivalent		≤19.1 MBh downstream capacity		>19.1 MBh <54.6 MBh downstream capacity		≥54.6 MBh <68.9 MBh downstream capacity	
	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor
ARUN038GSS4	3/8	5/8	3/8	3/4	1/4	1/2	3/8	5/8	—	—
ARUN048GSS4	3/8	5/8	3/8	3/4	1/4	1/2	3/8	5/8	—	—
ARUN053GSS4	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4

¹Use the equivalent length of the longest pipe run between the outdoor unit and the furthest indoor unit.

²Capacity (MBh) = The sum of the nominal capacity of all connected indoor units served by the pipe segment.

³If the sum of the nominal cooling capacity of all connected indoor units served by a branch or run-out segment is greater than the capacity of the outdoor unit, size the pipe segment based on the outdoor unit nominal capacity.

Figure 85: Example of a Multi V S System Layout.

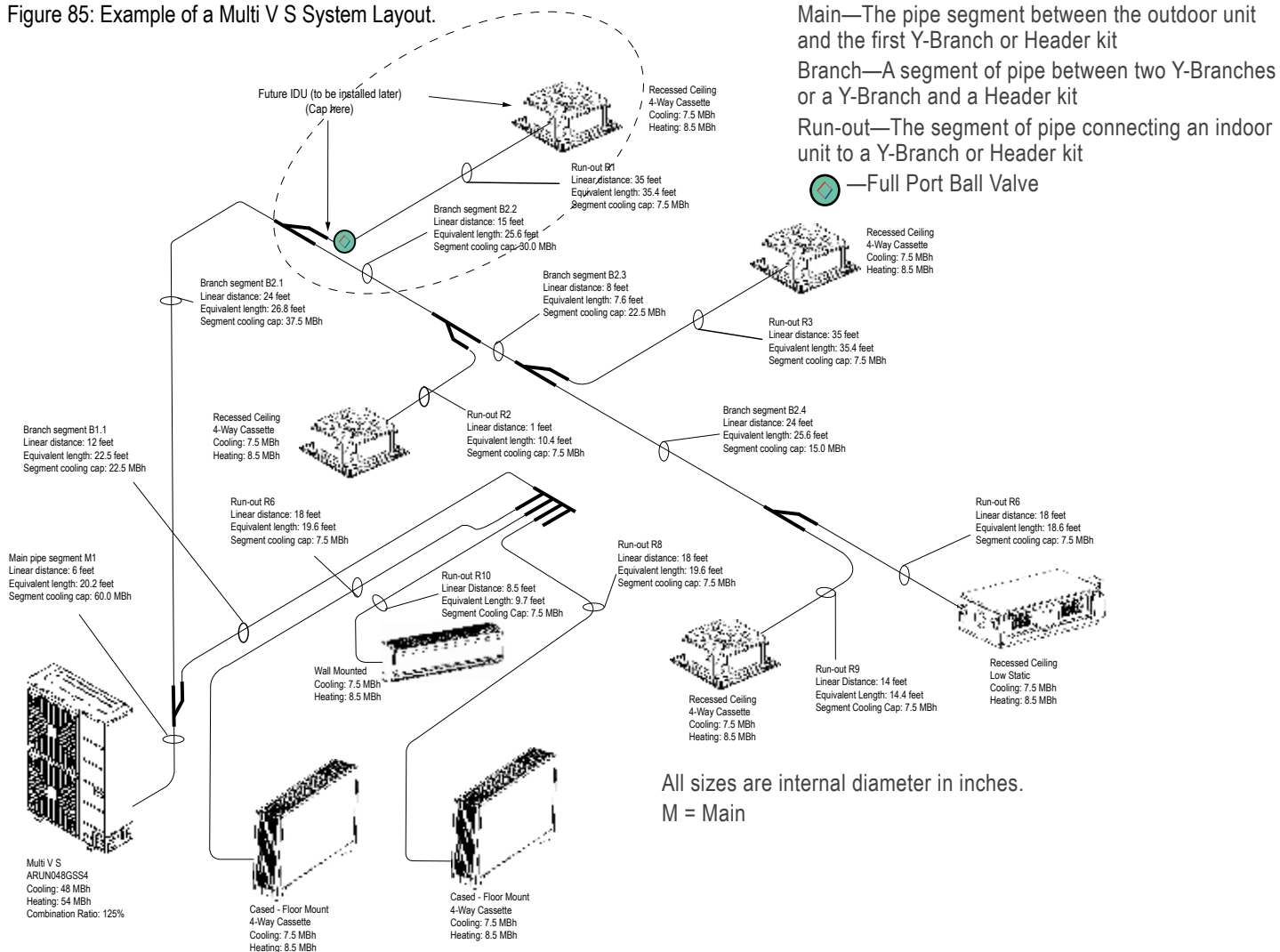


Table 42: Example System Pipe Segment Sizes.

Segment Tag	M1	B1.1	B2.1	B2.2	B2.3	B2.4	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
Liquid Line Dia. OD (in)	3/8	3/8	3/8	3/8	3/8	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Vapor Line Dia. OD (in)	3/4	5/8	5/8	5/8	5/8	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2

Note:

No Substitutions

Only LG supplied Y-branch fittings can be used to join one pipe segment to two or more segments. Third-party or field-fabricated Tee's, Y-fittings, Headers, or other branch fittings are not qualified for use with LG Multi V S systems. The only field-provided fittings allowed in a Multi V S piping system are 45° and 90° elbows.

Y-Branch Kits

LG Y-branch and kits are highly engineered devices designed to evenly divide the flow of refrigerant, and are used to join one pipe segment to two or more segments. There is only one type of Y-branch used in LG Multi S systems: Y-branches used with the indoor units in the refrigerant piping system at each transition. Field-supplied "T" fittings or "Y" branches will not be accepted. Do not install Y-branches backwards; refrigerant flow cannot make U-turns through Y-branches. The equivalent pipe length of each Y-branch (1.6') must be added to each pipe segment entered into LATS piping design software.

LG Y-Branch Kits Consist of:

- Y-branches: For heat pump systems - one liquid line and one vapor line (two [2] total).
- Reducer fittings as applicable.
- Molded clam-shell type peel and stick insulation covers.

Indoor Unit Y-Branches

Indoor unit Y-branches may be installed in horizontal or vertical configurations. When installed vertically, position the Y-branch so the straight-through leg is within $\pm 3^\circ$ of plumb. When installed horizontally, position the Y-branch so the take-off leg is level and shares the same horizontal plane as the straight-through leg within $\pm 5^\circ$ rotation.

Indoor unit Y-branches must always be installed with the single port end towards the outdoor unit, the two-port end towards the indoor units. The first indoor unit Y-branch kit must be located at least three (3) feet from the outdoor unit. Provide a minimum of twenty (20) inches between a Y-branch and any other fittings or indoor unit piped in series.

There is no limitation on the number of indoor unit Y-branches that can be installed, but there is a limitation on the number of indoor units connected to a single outdoor unit. It is recommended that when a Y-branch is located in a pipe chase or other concealed space, access doors should be provided for inspection access.

Figure 86: Y-branch Vertical Installation Alignment Specifications.

Vertical UP Configuration - For Indoor Unit Y-Branches. Vertical DOWN Configuration - For Indoor Unit Y-Branches.

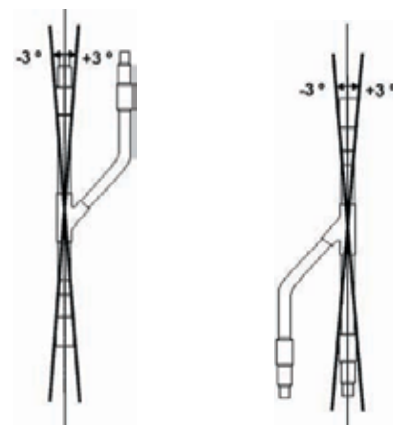


Figure 87: Horizontal Configuration.

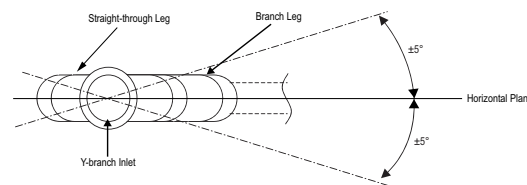
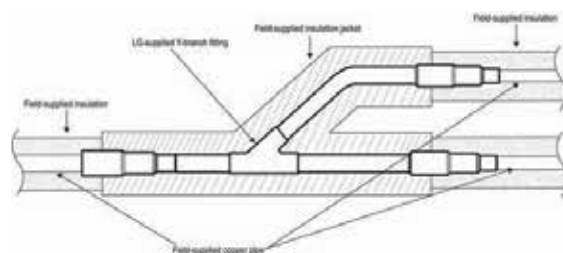


Figure 88: Y-branch Insulation and Pipe Detail.



LG Engineered Y-branch Kits and Header Kits

Note:

No Substitutions

Only LG supplied Y-branch and Header fittings can be used to join one pipe segment to two or more segments. Third-party or field-fabricated Tee's, Y-fittings, Headers, or other branch fittings are not qualified for use with LG Multi V S systems. The only field-provided fittings allowed in a Multi V S piping system are 45° and 90° long radius elbows.

Install Correctly

- Y-branches can be installed upstream between the Header and the outdoor unit, but a Y-branch cannot be installed between a header and an indoor unit.
- To avoid the potential of uneven refrigerant distribution through a header fitting, minimize the difference in equivalent pipe length between the header fitting and each connected indoor unit.

Header Kits

LG Header kits are highly engineered devices designed to evenly divide the flow of refrigerant, and are used to join one pipe segment to two or more segments. Header kits are intended for use where multiple indoor units are in the same vicinity and it would be better to "home-run" the run-out pipes back to a centralized location. If connecting multiple indoor units that are far apart, Y-branches may be more economical.

LG Header Kits Consist of:

- Two headers (one liquid line, one vapor line).
- Reducer fittings as applicable.
- Molded clam-shell type peel and stick insulation covers—one for the liquid line and one for the vapor line.

Y-branches can be installed upstream between the Header and the outdoor unit, but a Y-branch cannot be installed between a Header and an indoor unit. Headers must be installed in a horizontal and level position with the distribution ports of the fitting in the same horizontal plane as the straight-through branch.

When connecting indoor units to a Header, always connect the unit with the largest nominal capacity to the port closest to the outdoor unit. Then install the next largest indoor unit to the next port, working down to the smallest indoor unit. Do not skip ports.

All indoor units connected to a single Header fitting should be located with an elevation difference between indoor units that does not exceed 49 feet.

Figure 90: Header Kit—Horizontal Rotation Limit (Must be Installed Level with No Rotation).

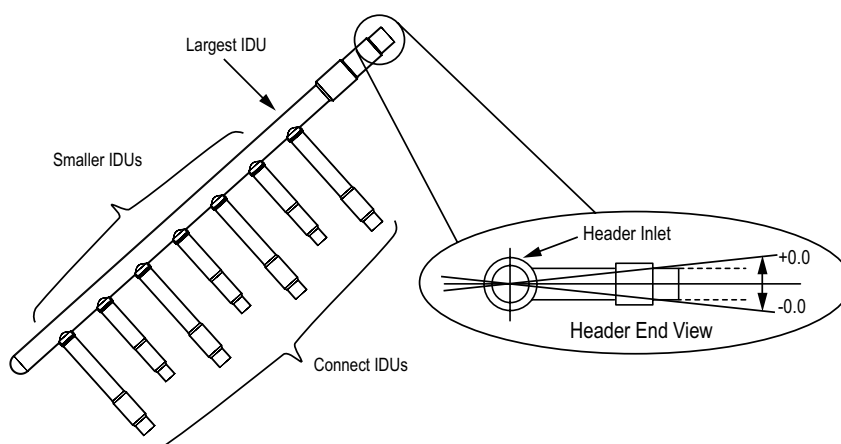


Figure 89: Header Insulation and Pipe Detail.

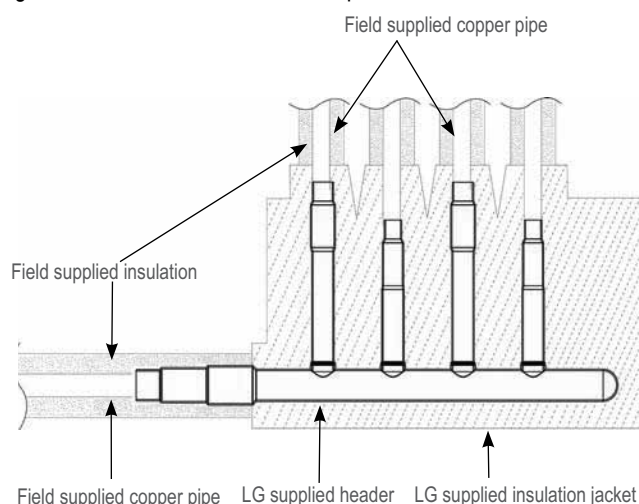


Table 43: Multi V S Y-Branches.

Unit: Inch

Models	Vapor pipe	Liquid pipe
ARBLN01621		
ARBLN03321		

Table 44: Multi V S Headers.

Unit: Inch

Models	Vapor pipe	Liquid pipe
4 branch ARBL054		
7 branch ARBL057		
4 branch ARBL104		
7 branch ARBL107		

REFRIGERANT PIPING DESIGN



LATS Calculated Refrigerant Charge Example

Note:

Consider refrigerant safety in all designs.

LG Multi V S outdoor units ship from the factory with a charge of R410A refrigerant. This charge serves as the base charge and will not be sufficient for the system to operate. A trim charge will need to be added after the system is installed that is based on system design. LATS Multi V piping design software will calculate the size of the refrigerant piping and calculate the refrigerant charge; this added trim refrigerant charge is shown on the LATS Multi V output.

The example LATS Multi V design software report below shows both the base charge and the calculated trim charge (Tables 45-50). The information used in the tables below are obtained from a LATS-generated report.

Project Name: Multi V S System No. 1

Table 45: Design Conditions.

Summer					Winter				
Indoor			Outdoor		Indoor			Outdoor	
DB (°F)	WB (°F)	RH (%)	DB (°F)	WB (°F)	DB (°F)	WB (°F)	RH (%)	DB (°F)	WB (°F)
80.6	67.1	50	93.9	73.9	68.0	56.8	50	17.1	16.2

Table 46: Outdoor Unit Specifications.

Model Name	Max. Indoor Unit Connectivity	Max. Total Over Load (kBtu/h/%)	Indoor Unit to Outdoor Unit Ratio	Product Charge ¹ (lbs.)	Additional Ref. Amount ² (lbs.)	Rated / Corrected Capacity (kBtu/h)		Rated / Corrected Power Input (kW)	
						Cooling	Heating	Cooling	Heating
ARUN053GSS4	9	69.0 (130%)	1.29:1	6.61	6.78	52.9 / 56.0	61.4 / 58.4	5.5 / 8.0	5.6 / 6.6

¹Product Charge = Factory charge of outdoor unit.

²Additional Ref Amount = Trim charge.

Table 47: Piping Specifications.

Index (from LATS selection)	Piping Dia. (Inches) Liquid : Vapor	Length (Feet) ¹
P0	1/4 : 1/2	59.1
P1	3/8 : 5/8	39.4
P2	3/8 : 3/4	19.7

¹It is imperative to know the "as-built" physical length of each segment of liquid line, to calculate the total refrigerant charge required. An accurate "as built" field-verified piping diagram is required to verify within LATS that piping is within limits, proper pipe sizing, and refrigerant charge.

Table 48: Branches / Headers / Common Pipes.

Model Name	Quantity
ARBLN01621	5
ARBLN03321	1

Table 49: Accessories.

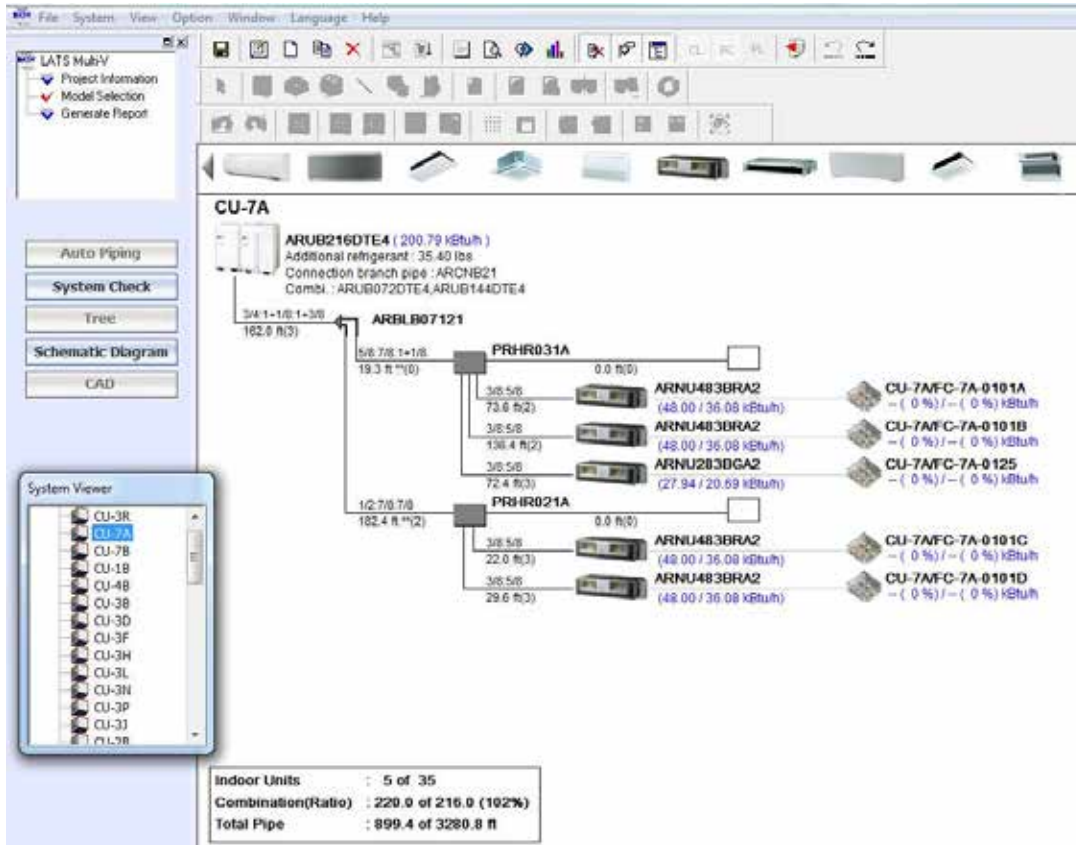
Index	Model Name	Quantity	Description
IDU	PT-UQC	1	Std. Grille - Four-way Cassette (TR, TQ)

Table 50: Indoor Units.

Model Name	Quantity	Description
ARNU093SBL4	1	Wall Mounted (9 MBh)
ARNU053TRC4	1	Ceiling Cassette - Four-Way (5 MBh)
ARNU183BGA4	1	Ceiling-Concealed Ducted - High Static (18 MBh)
ARNU123SBL4	2	Wall Mounted (12 MBh)
ARNU123SBR4	1	Art Cool Mirror (12 MBh)
Total	6	-



Figure 91: Example LATS Tree Diagram (Model Numbers Will Vary).



Determining the Total System Charge (Refer to Table 51)

- Using the LATS Tree diagram, document the linear feet of straight liquid piping and the quantity and type of each fitting by pipe diameter into System Refrigerant Charge Calculator.
- Calculate the total linear feet of liquid line piping in the system. It is imperative to know the "as-built" physical length of each segment of liquid line to calculate the total refrigerant charge required. An accurate "as built" field-verified piping diagram is required to verify within LATS that piping is within limits, proper pipe sizing, and refrigerant charge. Record the values on lines 1–7.
- Count the number of indoor units. Group them by model type and nominal capacity as indicated in the description field on lines 8–35. Record the quantity of units in each group, multiply each by their specific correction factor, and add the sum in the Total (lbs.) column.
- Sum the total values on lines 1-35 and place in the field labeled "Additional Refrigerant Charge Required" on line 36.
- Choose the outdoor unit frame included in the systems, and enter its refrigerant charge in line 37, 38, or 39.
- Add the Additional Refrigerant Charge Required to the Total Factory Refrigerant Charge. This is the Total System Charge. Record on line 40.

REFRIGERANT PIPING DESIGN



LATS Calculated Refrigerant Charge Example

Table 51: System Refrigerant Charge Calculator (lbs.).

System Tag or ID _____		Job Name _____				
		Project Manager _____				
		Date _____				
Line #	Description	Chassis I.D.	Size	Quantity	CF (Ref.) ¹	Total (lbs.)
1	Linear feet of 1/4" liquid line tubing ²	—	—		0.015	
2	Linear feet of 3/8" liquid line tubing ²	—	—		0.041	
3	Linear feet of 1/2" liquid line tubing ²	—	—		0.079	
4	Linear feet of 5/8" liquid line tubing ²	—	—		0.116	
5	Linear feet of 3/4" liquid line tubing ²	—	—		0.179	
6	Linear feet of 7/8" liquid line tubing ²	—	—		0.238	
7	Linear feet of 1" liquid line tubing ²	—	—		0.323	
8	Wall Mounted + Art Cool Mirror	SB	5k to 15k		0.53	
9	Wall Mounted + Art Cool Mirror	SC	18k to 24k		0.62	
10	1-Way Cassette	TU	7k to 12k		0.44	
11	1-Way Cassette	TT	18k to 24k		0.64	
12	2-Way Cassette	TL	18k to 24k		0.35	
13	4-Way 2' x 2' Cassette	TR	5k to 7k		0.40	
14	4-Way 2' x 2' Cassette	TR	9k to 12k		0.55	
15	4-Way 2' x 2' Cassette	TQ	15k to 18k		0.71	
16	4-Way 3' x 3' Cassette	TNA	7k to 24k		0.89	
17	4-Way 3' x 3' Cassette	TPC	24k to 28k		1.06	
18	4-Way 3' x 3' Cassette	TMA	24k to 36k		1.08	
19	4-Way 3' x 3' Cassette	TNC	36k		1.41	
20	4-Way 3' x 3' Cassette	TMC	42k to 48k		1.41	
21	High Static Ducted	BG	7k to 42k		0.97	
22	High Static Ducted	BR	28k to 54k		1.34	
23	High Static Ducted	B8	36k to 95k		2.20	
24	Low Static Ducted	L1	7k to 9k		0.31	
25	Low Static Ducted	L2	12k to 18k		0.42	
26	Low Static Ducted	L3	24k		0.55	
27	Low Static Ducted Bottom Return	B3	7k to 15k		0.37	
28	Low Static Ducted Bottom Return	B4	18k to 24k		0.82	
29	Vertical / Horizontal Air Handling Unit	NJ	12k to 30k		1.04	
30	Vertical / Horizontal Air Handling Unit	NJ	36k		1.57	
31	Vertical / Horizontal Air Handling Unit	NK	42k to 54k		2.00	
32	Ceiling Suspended	VJ	18k to 24k		0.77	
33	Convertible Surface Mount—Ceiling / Wall	VE	9k to 12k		0.22	
34	Floor Standing	CE (U)	7k to 15k		0.37	
35	Floor Standing	CF (U)	18k to 24k		0.82	
36	Additional Refrigerant Charge Required					
37	ARUN038GSS4 Outdoor Unit Factory Refrigerant Charge		38k		6.6	
38	ARUN048GSS4 Outdoor Unit Factory Refrigerant Charge		48k		6.6	
39	ARUN053GSS4 Outdoor Unit Factory Refrigerant Charge		53k		6.6	
40	Total System Charge: Sum of Additional Refrigerant Charge Required and Total Factory Refrigerant Charge⁴					

¹CF (Ref.) = Correction Factor for Refrigerant Charge.

²For refrigerant charge purposes, consider only the liquid line; ignore the vapor line(s).

³Maximum quantity of indoor units allowed: ARUN038 = 6, ARUN048 = 8, ARUN053 = 9.

⁴If trim charge is negative, remove refrigerant. If trim charge is positive, add refrigerant.



Type ACR copper is the only approved refrigerant pipe material for use with LG Multi V air conditioning products. ACR rated tubing is the only type that ships with yellow caps. Approved tubing for use with Multi V products will be marked "R410 RATED" along the length of the tube.

- Drawn temper (rigid) ACR copper tubing is available in sizes 3/8 through 2-1/8 inches (ASTM B 280, clean, dry, and capped).

- Annealed temper (soft) ACR copper tubing is available in sizes 1/4 through 2-1/8 inches (ASTM B 280, clean, dry, and capped).

Tube wall thickness should meet local code requirements and be approved for a maximum operating pressure of 551 psi. When bending tubing, use the largest radii possible to reduce the equivalent length of installed pipe; also, bending radii greater than ten (10) pipe diameters can minimize pressure drop. Be sure no traps or sags are present when rolling out soft copper tubing coils.

Note:

LG recommends soft copper use to be limited to 1/2". Use hard drawn for larger sizes to avoid sags and kinks that lead to oil trapping.

Table 52: ACR Rated Copper Tubing Material.

Type	Seamless Phosphorous Deoxidized
Class	UNS C12200 DHP
Straight Lengths	H58 Temper
Coils	O60 Temper

Table 53: ACR Rated Piping Tube Thicknesses.

OD (in)	1/4	3/8	1/2	5/8	3/4	7/8	1-1/8	1-3/8	1-5/8
Material	Rigid or Soft ACR Rated for R410A			Rigid or Solid ACR Rated for R410A					
Min. Bend Radius (in)	.563	.9375	1.5	2.25	3.0	3.0	3.5	4.0	4.5
Min. Wall Thickness (in)	.03	.03	.03	.03	.03	.03	.03	.04	.05

Copper Expansion and Contraction

Under normal operating conditions, the vapor pipe temperature of a Multi V S system can vary as much as 180°F. With this large variance in pipe temperature, the designer must consider pipe expansion and contraction to avoid pipe and fitting fatigue failures.

Refrigerant pipe along with the insulation jacket form a cohesive unit that expands and contracts together. During system operation, thermal heat transfer occurs between the pipe and the surrounding insulation.

If the pipe is mounted in free air space, no natural restriction to movement is present if mounting clamps are properly spaced and installed. When the refrigerant pipe is mounted underground in a utility duct stacked among other pipes, natural restriction to linear movement is present. In extreme cases, the restrictive force of surface friction between insulating jackets could become so great that natural expansion ceases and the pipe is "fixed" in place. In this situation, opposing force caused by change in refrigerant fluid/vapor temperature can lead to pipe/fitting stress failure.

The refrigerant pipe support system must be engineered to allow free expansion to occur. When a segment of pipe is mounted between two fixed points, provisions must be provided to allow pipe expansion to naturally occur. The most common method is the inclusion of expansion Loop or U-bends mounted in the horizontal plane. When expansion loops are placed in a vertical riser, the loop is to be formed in a horizontal fashion resulting in a torsional movement during expansion and contraction. Each segment of pipe has a natural fixed point where no movement occurs. This fixed point is located at the center point of the segment assuming the entire pipe is insulated in a similar fashion. The natural fixed point of the pipe segment is typically where the expansion Loop or U-bend should be. Linear pipe expansion can be calculated using the following formula:

$$LE = C \times L \times (T_r - T_a) \times 12$$

LE	=	Anticipated linear tubing expansion (in.)
C	=	Constant (For copper = 9.2×10^{-6} in./in.°F)
L	=	Length of pipe (ft.)
T _r	=	Refrigerant pipe temperature (°F)
T _a	=	Ambient air temperature (°F)
12	=	Inches to feet conversion (12 in./ft.)

1. From Table 54, find the row corresponding with the actual length of the straight pipe segment.
2. Estimate the minimum and maximum temperature of the pipe typical pipe temperature change range: High Pressure Vapor: ambient temperature to 215°F; Low Pressure Vapor: ambient to 35°F; Liquid pipe: ambient, 80°F, 110°F. Choose the two most extreme. In the column showing the minimum pipe temperature, look up the anticipated expansion distance. Do the same for the maximum pipe temperature.
3. Calculate the difference in the two expansion distance values. The result will be the anticipated change in pipe length.

Example:

A Multi V S heat pump system is installed and the design shows that there is a 260 feet straight segment of tubing between a Y-branch and an indoor unit. The system operates 24 hours per day. In heating, this pipe transports hot gas vapor to the indoor units at 120°F. In cooling, the same tube is a suction line returning refrigerant vapor to the outdoor unit at 40°F. Look up the copper tubing expansion at each temperature and calculate the difference.

Vapor Line

Transporting Hot Vapor: 260 ft. pipe at 120°F = 3.64 in.
Transporting Suction Vapor: 260 ft. pipe at 40°F = 1.04 in.
Anticipated Change in Length: 3.64 in. – 1.04 in. = 2.60 in.

Liquid Line

The liquid temperature remains the same temperature; only the direction of flow will reverse. Therefore, no significant change in length of the liquid line is anticipated.

When creating an expansion joint, the joint depth should be a minimum of two times the joint width. Although different types of expansion arrangements are available, the data for correctly sizing an expansion loop is provided in Table 55. Use soft copper with long radius bends on longer runs or long radius elbows for shorter pipe segments. Using the anticipated linear expansion (LE) distance calculated, look up the Expansion Loop or U-bend minimum design dimensions. If other types of expansion joints are chosen, design per ASTM B-88 Standards.

Selecting Field-Supplied Copper Tubing

Table 54: Linear Thermal Expansion of Copper Tubing in Inches.

Pipe Length ¹	Fluid Temperature °F																			
	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	105°	110°	115°	120°	125°	130°
10	0.04	0.04	0.05	0.06	0.06	0.07	0.08	0.08	0.09	0.09	0.10	0.10	0.11	0.11	0.11	0.12	0.13	0.14	0.15	0.15
20	0.08	0.08	0.10	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.22	0.23	0.26	0.28	0.29	0.30
30	0.12	0.12	0.15	0.18	0.20	0.21	0.23	0.24	0.26	0.27	0.29	0.30	0.32	0.33	0.32	0.35	0.39	0.42	0.44	0.45
40	0.16	0.16	0.20	0.24	0.26	0.28	0.30	0.32	0.34	0.36	0.38	0.40	0.42	0.44	0.43	0.46	0.52	0.56	0.58	0.60
50	0.20	0.20	0.25	0.30	0.33	0.35	0.38	0.40	0.43	0.45	0.48	0.50	0.53	0.55	0.54	0.58	0.65	0.70	0.73	0.75
60	0.24	0.24	0.30	0.36	0.39	0.42	0.45	0.48	0.51	0.54	0.57	0.60	0.63	0.66	0.65	0.69	0.78	0.84	0.87	0.90
70	0.28	0.28	0.35	0.42	0.46	0.49	0.53	0.56	0.60	0.63	0.67	0.70	0.74	0.77	0.76	0.81	0.91	0.98	1.02	1.05
80	0.32	0.32	0.40	0.48	0.52	0.56	0.60	0.64	0.68	0.72	0.76	0.80	0.84	0.88	0.86	0.92	1.04	1.12	1.16	1.20
90	0.36	0.36	0.45	0.54	0.59	0.63	0.68	0.72	0.77	0.81	0.86	0.90	0.95	0.99	0.97	1.04	1.17	1.26	1.31	1.35
100	0.40	0.40	0.50	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00	1.05	1.10	1.08	1.15	1.30	1.40	1.45	1.50
120	0.48	0.48	0.60	0.72	0.78	0.84	0.90	0.96	1.02	1.08	1.14	1.20	1.26	1.32	1.30	1.38	1.56	1.68	1.74	1.80
140	0.56	0.56	0.70	0.84	0.91	0.98	1.05	1.12	1.19	1.26	1.33	1.40	1.47	1.54	1.51	1.61	1.82	1.96	2.03	2.10
160	0.64	0.64	0.80	0.96	1.04	1.12	1.20	1.28	1.36	1.44	1.52	1.60	1.68	1.76	1.73	1.84	2.08	2.24	2.32	2.40
180	0.72	0.72	0.90	1.08	1.17	1.26	1.35	1.44	1.53	1.62	1.71	1.80	1.89	1.98	1.94	2.07	2.34	2.52	2.61	2.70
200	0.80	0.80	1.00	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00	2.10	2.20	2.16	2.30	2.60	2.80	2.90	3.00
220	0.88	0.88	1.10	1.32	1.43	1.54	1.65	1.76	1.87	1.98	2.09	2.20	2.31	2.42	2.38	2.53	2.86	3.08	3.19	3.30
240	0.96	0.96	1.20	1.44	1.56	1.68	1.80	1.92	2.04	2.16	2.28	2.40	2.52	2.64	2.59	2.76	3.12	3.36	3.48	3.60
260	1.04	1.04	1.30	1.56	1.69	1.82	1.95	2.08	2.21	2.34	2.47	2.60	2.73	2.86	2.81	2.99	3.38	3.64	3.77	3.90
280	1.12	1.12	1.40	1.68	1.82	1.96	2.10	2.24	2.38	2.52	2.66	2.80	2.94	3.08	3.02	3.22	3.64	3.92	4.06	4.20
300	1.20	1.20	1.50	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	3.00	3.15	3.30	3.24	3.45	3.90	4.20	4.35	4.50
320	1.28	1.28	1.60	1.92	2.08	2.24	2.40	2.56	2.72	2.88	3.04	3.20	3.36	3.52	3.46	3.68	4.16	4.48	4.64	4.80
340	1.36	1.36	1.70	2.04	2.21	2.38	2.55	2.72	2.89	3.06	3.23	3.40	3.57	3.74	3.67	3.91	4.42	4.76	4.93	5.10
360	1.44	1.44	1.80	2.16	2.34	2.52	2.70	2.88	3.06	3.24	3.42	3.60	3.78	3.96	3.89	4.14	4.68	5.04	5.22	5.40
380	1.52	1.52	1.90	2.28	2.47	2.66	2.85	3.04	3.23	3.42	3.61	3.80	3.99	4.18	4.10	4.37	4.94	5.32	5.51	5.70
400	1.60	1.60	2.00	2.40	2.60	2.80	3.00	3.20	3.40	3.60	3.80	4.00	4.20	4.40	4.32	4.60	5.20	5.60	5.80	6.00
420	1.68	1.68	2.10	2.52	2.73	2.94	3.15	3.36	3.57	3.78	3.99	4.20	4.41	4.62	4.54	4.83	5.46	5.88	6.09	6.30
440	1.76	1.76	2.20	2.64	2.86	3.08	3.30	3.52	3.74	3.96	4.18	4.40	4.62	4.84	4.75	5.06	5.72	6.16	6.38	6.60
460	1.84	1.84	2.30	2.76	2.99	3.22	3.45	3.68	3.91	4.14	4.37	4.60	4.83	5.06	4.97	5.29	5.98	6.44	6.67	6.90
480	1.92	1.92	2.40	2.88	3.12	3.36	3.60	3.84	4.08	4.32	4.56	4.80	5.04	5.28	5.18	5.52	6.24	6.72	6.96	7.20
500	2.00	2.00	2.50	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.40	5.75	6.50	7.00	7.25	7.50

Figure 92: Coiled Expansion Loops and Offsets (Plan View).

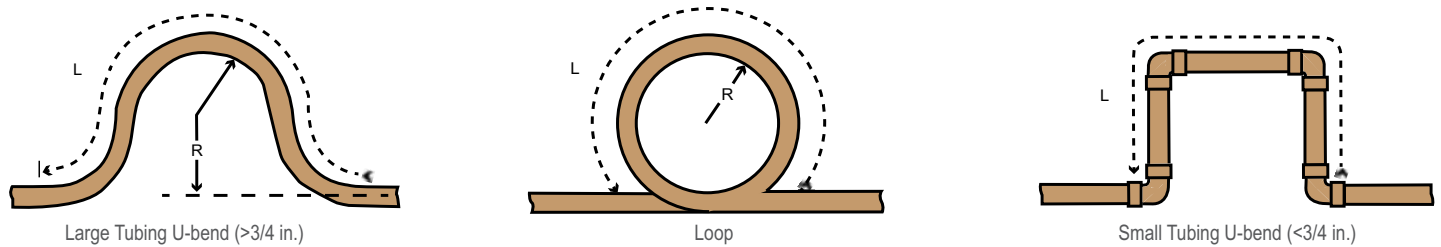


Table 55: Radii of Coiled Expansion Loops and Developed Lengths of Expansion Offsets.

Anticipated Linear Expansion (LE) (inches)		Nominal Tube Size (OD) inches						
		1/4	3/8	1/2	3/4	1	1-1/4	1-1/2
1/2	R ¹	6	7	8	9	11	12	13
	L ²	38	44	50	59	67	74	80
1	R ¹	9	10	11	13	15	17	18
	L ²	54	63	70	83	94	104	113
1-1/2	R ¹	11	12	14	16	18	20	22
	L ²	66	77	86	101	115	127	138
2	R ¹	12	14	16	19	21	23	25
	L ²	77	89	99	117	133	147	160
2-1/2	R ¹	14	16	18	21	24	26	29
	L ²	86	99	111	131	149	165	179
3	R ¹	15	17	19	23	26	29	31
	L ²	94	109	122	143	163	180	196
3-1/2	R ¹	16	19	21	25	28	31	34
	L ²	102	117	131	155	176	195	212
4	R ¹	17	20	22	26	30	33	36
	L ²	109	126	140	166	188	208	226

¹R = Centerline Length of Pipe.
²L = Centerline Minimum Radius (inches).

Note:
All expansion Loops and Offsets should be installed in the horizontal plane to prevent the possibility of trapping oil. Loops and Offsets in vertical risers should also be installed in a horizontal plane.

Note:

LG Electronics U.S.A., Inc., is not responsible for any piping calculations, refrigerant leaks, degradation of performance, or any other potential problems or damages as a result of interconnecting piping, their joint connections, isolation valves, introduced debris inside the piping system, or other problems caused by the interconnecting piping system.

Definitions

Main: The piping segment between the outdoor unit and the first Y-branch.

Branch: A segment of pipe between two Y-branches.

Run-out: The segment of pipe connecting an indoor unit to a Y-branch.

Physical Pipe Length: Actual length of straight segment(s) of pipe.

Equivalent Pipe Length: Actual length of pipe plus equivalent lengths of elbows, Y-branches, and valves.

Layout Procedure

1. Draft a one-line diagram of the proposed piping system connecting outdoor unit to the indoor units. Follow the pipe limitations listed on pages 73 and 74.
2. Calculate the physical length of each pipe segment and note it on the drawing.
3. Calculate the equivalent pipe length of each pipe segment.
4. Input the pipe lengths into the LATS software and perform "Auto Pipe Sizing" check and "System Check". LATS will automatically calculate pipe sizes.

Using Elbows

Field-supplied elbows are allowed as long as they are long radius and designed for use with R410A refrigerant. The designer, however, should be cautious with the quantity and size of fittings used, and must account for the additional pressure losses in equivalent pipe length calculation for each branch. The equivalent pipe length of each elbow must be added to each pipe segment in the LATS program. See page 73.

Field-Provided Isolation Ball Valves

LG maintains a neutral position on using isolation valves in VRF refrigerant piping systems. LG does not endorse any manufacturer of isolation valves. It is recognized that installing isolation valves may simplify future maintenance requirements, and, if used, considerations should be taken including, but not limited to, the following:

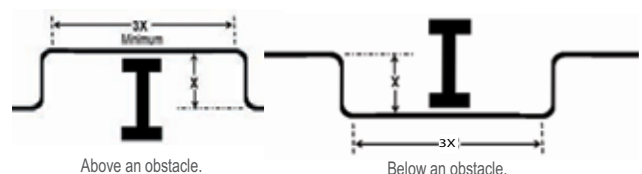
- Pressure drops for any component used, including isolation valves, must be known in equivalent pipe length and calculated into the total and segment equivalent piping lengths and compared to product design limitations.
- In all cases, materials must be suitable for the application and any applicable codes, including, but not limited to, diameter and wall thickness continuity per ACR standards.

Failure to do so may cause significant performance degradation. Proper leak checks must be performed. Using isolation valves does not automatically void any LG product warranty, however, a limited warranty may be voided in whole or part should any field supplied accessory fail in any way that causes product failure.

Obstacles

When an obstacle, such as an I-beam or concrete T, is in the path of the planned refrigerant pipe run, it is best practice to route the pipe over the obstacle. If adequate space is not available to route the insulated pipe over the obstacle, then route the pipe under the obstacle. In either case, it is imperative the horizontal section of pipe above or below the obstacle be a minimum of three (3) times greater than the longest vertical rise (or fall) distance.

Figure 93: Installing Piping Above and Below an Obstacle.



In-line Refrigeration Components

Components such as oil traps, solenoid valves, filter-dryers, sight glasses, tee fittings, and other after-market accessories are not permitted on the refrigerant piping system between the outdoor units and the indoor units. Multi V S air-source systems are provided with redundant systems that assure oil is properly returned to the compressor. Sight-glasses and solenoid valves may cause vapor to form in the liquid stream. Over time, dryers may deteriorate and introduce debris into the system. The designer and installer should verify the refrigerant piping system is free of traps, sagging pipes, sight glasses, filter dryers, etc.

Refrigerant Pipe Connections

Note:

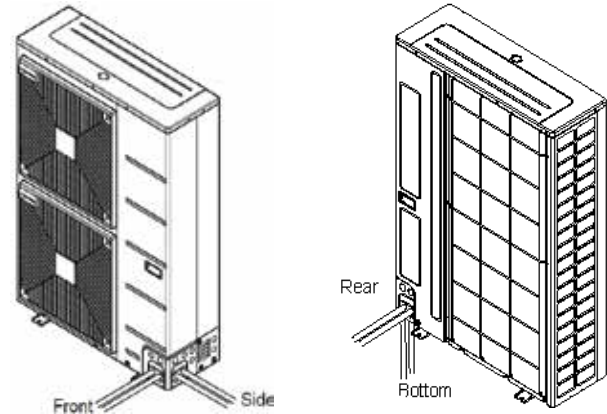
Avoid Pipe Damage

- When routing field-installed piping inside the outdoor unit frame, take care to avoid causing damage to the piping from vibration. Mount the piping so it does not make contact with the compressor, unit frame, terminal cover, or mounting bolts. Allow room for field installation.
- Properly insulate the liquid and vapor lines separately inside the confines of the unit casing.
- Refer to the figure for unit pipe routing options and the table for outdoor unit connection types.

Table 56: Outdoor Unit Refrigerant Piping Connections.

Model	Liquid Conn. (in.)	Type	Vapor Conn. (in.)	Type
ARUN038GSS4	3/8	Brazed	5/8	Brazed
ARUN048GSS4	3/8	Brazed	5/8	Brazed
ARUN053GSS4	3/8	Brazed	3/4	Brazed

Figure 94: Outdoor Unit Refrigerant Piping Connection Options.



Routing / Protecting Refrigerant Piping and Power Wiring / Communications Cable

Note:

Possible Malfunction

Power cables and low voltage control wiring should be separated a minimum of two inches to avoid electromagnetic field (EMF) effects on communications.

When placing multiple outdoor units in the same vicinity, a multiple tier pipe / cable tray similar to the one shown in the figure may be the best solution. Position refrigerant piping, power cables, and communication cables so they do not impede walking access to the unit or the removal of service access panels. Best practice dictates that insulated piping and cables should be properly supported and protected from natural elements to prevent deterioration. Place pipes, cables, and wires in a cable / pipe tray equipped with a removable weather tight cover.

The minimum size wall sleeve or utility conduit should be sized using the data in Table 58, local codes, and NEC regulations. Size using the data that is most conservative.

Figure 95: Single Outdoor Unit—Suggested Arrangement of Refrigerant Piping and Power Wiring / Communications Cable.

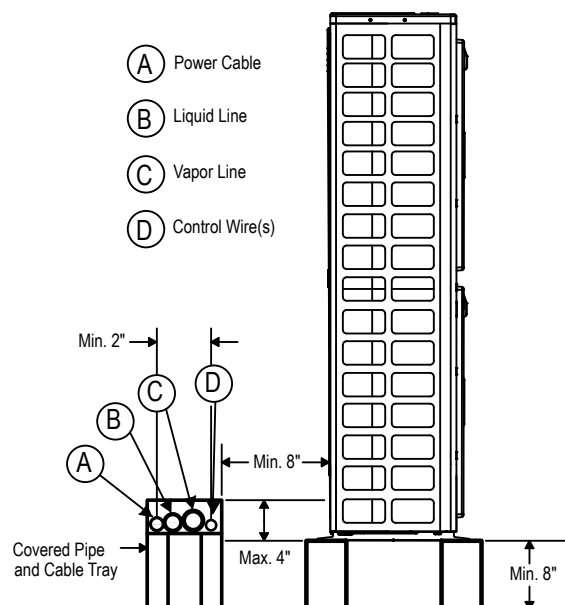
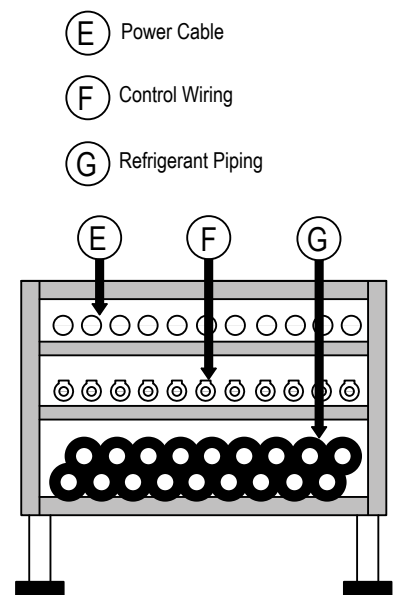


Figure 96: Multiple Outdoor Unit Installation—Suggested Arrangement of Refrigerant Piping and Power Wiring / Communications Cables Using a Multi-Tier Tray System



No Pipe Size Substitutions

Use only the pipe size selected by the LATS Multi V pipe system design software. Using a different size is prohibited and may result in a system malfunction or failure to work at all.

Pipe Supports

A properly installed pipe system should be adequately supported to avoid pipe sagging. Sagging pipes become oil traps that lead to equipment malfunction.

Pipe supports should never touch the pipe wall; supports shall be installed outside (around) the primary pipe insulation jacket. Insulate the pipe first because pipe supports shall be installed outside (around) the primary pipe insulation jacket. Clevis hangers should be used with shields between the hangers and insulation. Field provided pipe supports should be designed to meet local codes. If allowed by code, use fiber straps or split-ring hangers suspended from the ceiling on all-thread rods (fiber straps or split ring hangers can be used as long as they do not compress the pipe insulation). Place a second layer of insulation over the pipe insulation jacket to prevent chafing and compression of the primary insulation within the confines of the support pipe clamp.

A properly installed pipe system will have sufficient supports to avoid pipes from sagging during the life of the system. As necessary, place supports closer for segments where potential sagging could occur. Maximum spacing of pipe supports shall meet local codes. If local codes do not specify pipe support spacing, pipe shall be supported:

- Maximum of five feet (5') on center for straight segments of pipe up to 3/4" outside diameter size.
- Maximum of six feet (6') on center for pipe up to one inch (1") outside diameter size.
- Maximum of eight feet (8') on center for pipe up to two inches (2") outside diameter size.

Wherever the pipe changes direction, place a hanger within twelve (12) inches on one side and within twelve to nineteen (12 to 19) inches of the bend on the other side. Support piping at indoor units as shown. Support Y-Branch and Header fittings as shown.

Figure 100: Pipe Support at Y-branch Fitting.

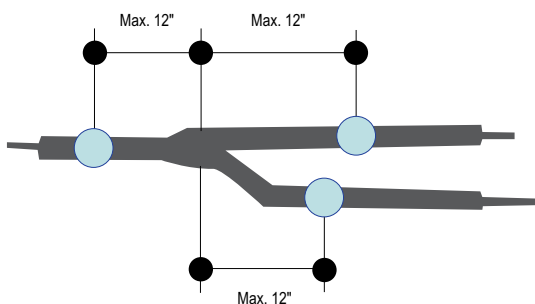
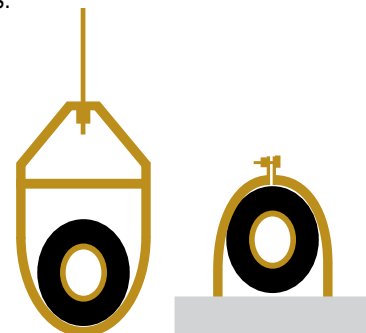


Figure 97: Pipe Hanger Details.



Note:

Use a 4" + long sheet curved sheet metal saddles between hanger bracket and insulation to promote linear expansion/contraction.

Figure 98: Typical Pipe Support Location—Change in Pipe Direction.

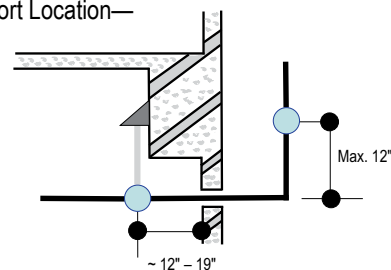


Figure 99: Pipe Support at Indoor Unit.

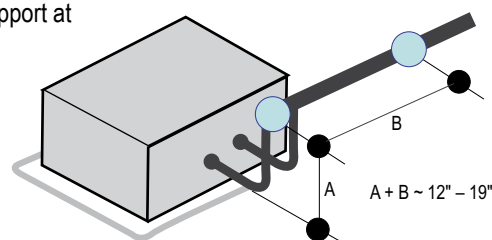
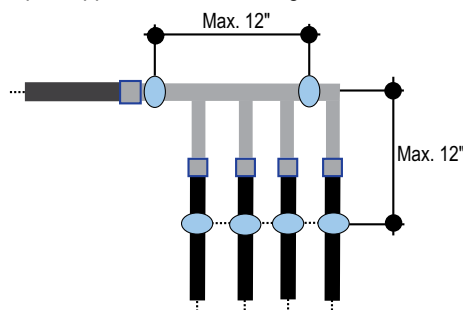


Figure 101: Pipe Support at Header Fitting.



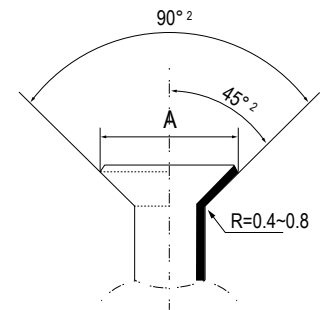
Refrigerant Piping Installation

Proper system operation depends on the installer using best practices and utmost care while assembling the piping system as one of the main causes of refrigerant leaks is defective connections. For VRF systems, the installer needs to know how perform both flared and brazed connections successfully.

Flaring Practices

Flared fittings are used to connect the indoor units and heat recovery units to the refrigerant piping system. Always use the proper size tool to finish the flare, creating a 45° flare (see table and diagram). When connecting the flare nuts, coat the inside and outside with PVE refrigeration oil only. Hand tighten the nuts at first, then, use a torque wrench and a backup wrench to finish. Avoid overtightening the flare nuts.

Figure 102: Dimensions of the Flare.



Brazing Practices

Refrigerant piping system joints are brazed in the field. Multi V S refrigeration system components contain very small capillary tubes, small orifices, electronic expansion valves, oil separators, and heat exchangers that can easily become blocked.

- Use adapters to assemble different sizes of pipe.
- Do not use flux, soft solder, or anti-oxidant agents; use a 15% silver phosphorous copper brazing alloy.
- Protect isolation valves, electronic expansion valves, and other heat-sensitive control components from excessive heat with a wet rag or a heat barrier spray product

Note:

During installation, it is imperative to keep the piping system free of contaminants and debris such as copper burrs, slag, or carbon dust.

Table 57: Flared Connection Dimensions.

Indoor Unit (Btu/h)	Pipe		“A”	
	Vapor (in. O.D.)	Liquid (in. O.D.)	Vapor (in.)	Liquid (in.)
≤19,100	1/2	1/4	5/8 ~ 11/16	7/16 ~ 1/2
<54,600	5/8	3/8	5/8 ~ 11/16	5/8 ~ 11/16
≤76,400	3/4	3/8	3/4 ~ 13/16	5/8 ~ 11/16

Refrigerant Safety Standards

ASHRAE Standards 15-2010 and 34-2010 address refrigerant safety and the maximum allowable concentration of refrigerant in an occupied space. Refrigerant will dissipate into the atmosphere, but a certain volume of air is required to safely dissipate the refrigerant. For R410A refrigerant, the maximum allowable concentration of refrigerant is 26 lbs. / 1,000 cubic feet (Addendum L modified the RCL to 26) of occupied spaces. Buildings with 24-hour occupancy allow half of that concentration.

If a VRF system develops a refrigerant leak, the entire refrigerant charge of the system will dump into the area where the leak occurs. To meet ASHRAE Standards 15 and 34, the smallest room volume on the system must be calculated and compared to the maximum allowable concentration. If the concentration level is higher than allowed, the following are some design suggestions to eliminate the problem:

- Split dual-frame and triple-frame systems into single-frame systems that have lower refrigerant charges.
- Add transfer grilles in the ceiling or walls of the smaller rooms to increase the volume of the room.
- Remove the smallest space from the system and serve it with a smaller mini-split system.

Refrigerant Piping System Insulation

All refrigerant piping from the outdoor unit to the indoor units must be insulated correctly for safety and usage. Y-branch connections, header branch connections, refrigerant piping, field-provided isolation ball valves (if present), service valves, and elbows must be properly and completely insulated using closed cell pipe insulation (up to the indoor unit piping connections). To prevent heat loss / heat gain through the refrigerant piping, all refrigerant piping including liquid lines and vapor lines shall be insulated separately. Insulation shall be a minimum 1/2" thick, and thickness may need to be increased based on ambient conditions and local codes. Table below lists minimum wall thickness requirements for Ethylene Propylene Diene Methylene (EPDM) insulation.

Inside the outdoor unit, maximum pipe temperature is 248°F and minimum pipe temperature is -40°F. For field insulation of refrigerant piping between outdoor units and indoor units, consider the following pipe temperature ranges for an operating heat pump system:

- Heating mode refrigerant temperature ranges: Liquid 75-118°F; High Pressure Vapor 95-220°F
- Cooling mode refrigerant temperature ranges: Liquid 75-118°F; Low Pressure Vapor 40-90°F

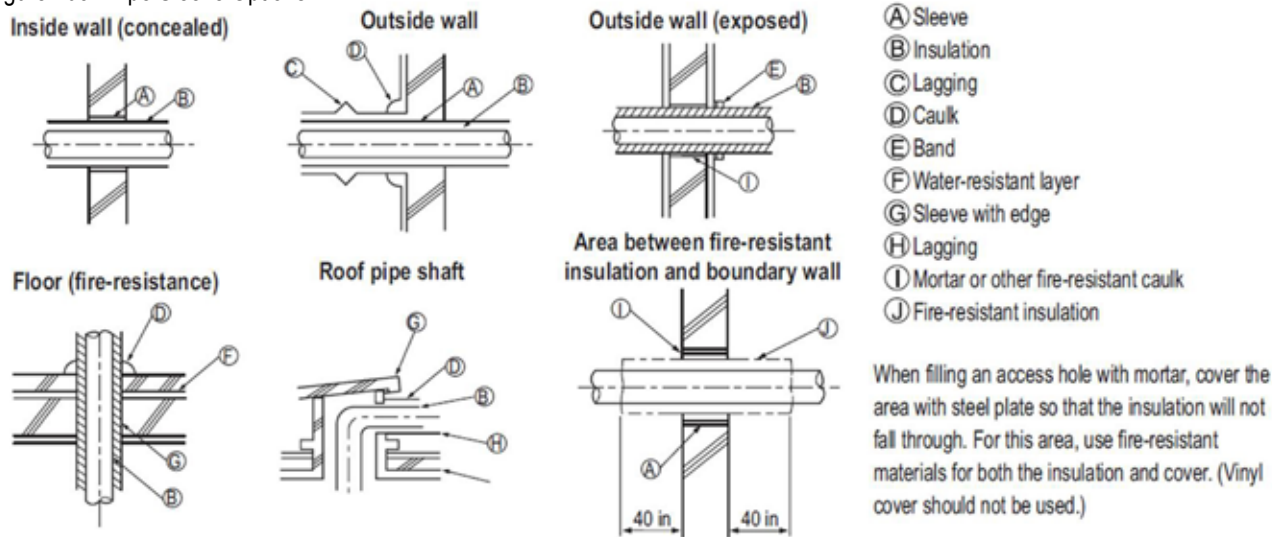
LAYOUT BEST PRACTICES

General Information / Guidelines

Pipe Sleeves at Penetrations

LG requires that all pipe penetrations through walls, floors, and pipes buried underground be properly insulated and routed through an appropriate wall sleeve of sufficient size to prevent compression of refrigerant pipe insulation and promote free movement of the pipe within the sleeve. Use 4"+ curved sheet metal saddles between the bottom surface of the pipe and the bottom surface of the penetration. Underground refrigerant pipe shall be routed inside a protective sleeve to prevent insulation deterioration.

Figure 103: Pipe Sleeve Options.



Note:

Diameter of penetrations shall be determined by pipe diameter plus the thickness of the insulation.

Underground Refrigerant Piping

Refrigerant pipe installed underground should be routed inside a vapor tight protective sleeve to prevent insulation deterioration and water infiltration. Refrigerant pipe installed inside underground casing must be continuous without any joints. Underground refrigerant pipe must be located at a level **below the frost line**.

Note:

Provide expansion joints in long pipe segments and place in an accessible conduit box for inspection. Use galvanized curved sheet metal saddles at all mounting points. Pipe should be allowed to move freely linearly.

Figure 104: Typical Arrangement of Refrigerant Pipe and Cable(s) in a Utility Conduit.

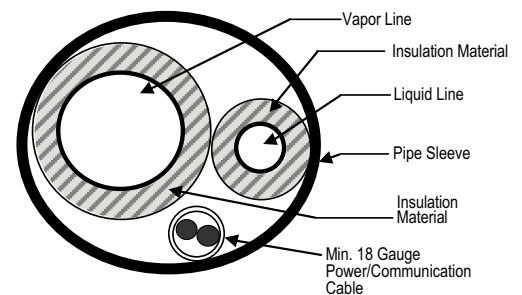


Table 58: Utility Conduit Sizes.

Liquid Pipe ¹	Vapor Pipe ¹		
	1/2 (2.0 ^{2,5})	5/8 (2-1/8 ^{2,5})	3/4 (2-1/4 ^{2,5})
1/4 (1.0) ³	4	4	4
3/8 (1-1/8) ³	4	4	5
1/2 (1-1/2) ⁴	5	5	5
5/8 (1-5/8) ⁴	5	5	5
3/4 (1-3/4) ⁴	5	5	5

¹OD pipe diameter in inches; Values in parenthesis () indicate OD of pipe with insulation jacket.

²Diameter of pipe with insulation. Thickness of pipe insulation is typical. Actual required thickness may vary based on surrounding ambient conditions and should be calculated and specified by the design engineer.

³Insulation thickness (value in parenthesis) = 3/8 inch.

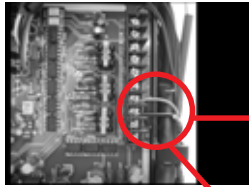
⁴Insulation thickness (value in parenthesis) = 1 inch.

⁵Insulation thickness (value in parenthesis) = 3/4 inch.

ELECTRICAL CONNECTIONS

Figure 105: Multi V S Outdoor Unit Power Wiring / Communications Cable Connections.

System Control Board

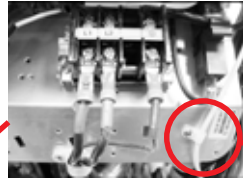


Communication / Ground Terminals¹



Power Wire Terminations

L1 = Left
L2 = Center
Ground = Right



Power Wiring

- Route control wiring and power wiring in separate conduits.
- All wiring must conform to NEC and local codes.
- Unit disconnect and wiring is field supplied.

Communication Cable Separated from Power Wiring

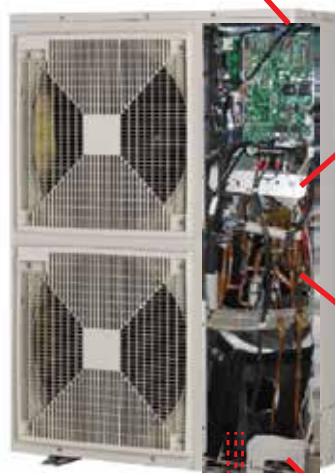


Communication Cables

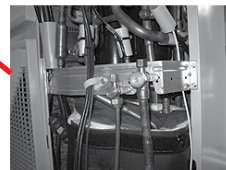
See next page for all communication cable terminal details.

Lightning Protection

Field-supplied where applicable; installed per local code.



Refrigerant Piping Connection Point²



Refrigerant Piping and Electrical Knockouts



Fused Disconnect (Field Supplied)



Note:

1. Refer to the Product Data section for dimensional drawings, wiring, and refrigerant piping diagrams for the exact locations of the piping and electrical connection locations.
2. Minimum 18 AWG, shielded, stranded, two-conductor wiring or size per local code.
3. Refer to electrical data table for full load ampere ratings. Size all wiring and field provided components per local codes.

- For power wiring, use solid or stranded that must comply with all local and national electrical codes.
- Connect the communications cable between indoor units using a daisy chain configuration only. "Star" or "home run" control wiring connections involving soldering or wire caps are not permitted.
- For communications cable, use 18 AWG, two-conductor, stranded, shielded or unshielded. If shielded, must be grounded to the chassis at the outdoor unit only.
- Provide separate conduits for control wiring and power wiring.
- Power and communications cables must not be routed in the same conduit and must be routed in a manner that keeps them a minimum of two (2) inches apart.
- Connect outdoor unit terminal IDU-A to the odd numbered indoor unit terminal. Terminal "A" on the indoor units may be tagged 3(A) or 5(A).
- Connect outdoor unit terminal IDU-B to indoor unit terminal "B". Terminal "B" on the indoor units may be tagged 3(B) or 5(B).
- Maximum allowed length of indoor unit communication cable is 984 feet.

Figure 106: Communications Wiring Terminals.

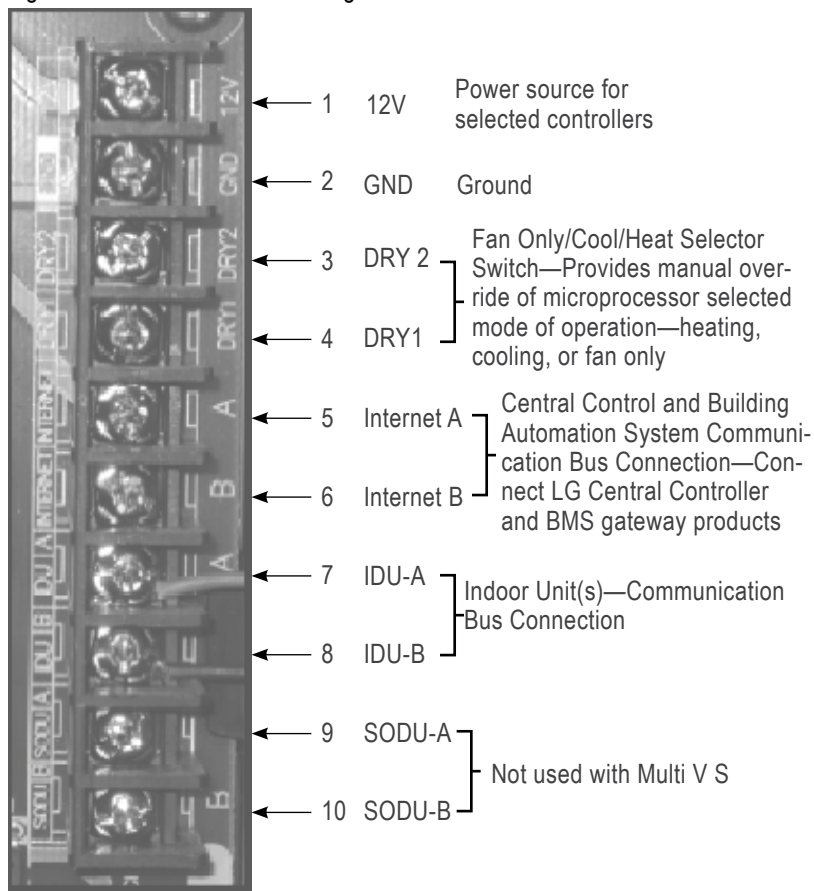
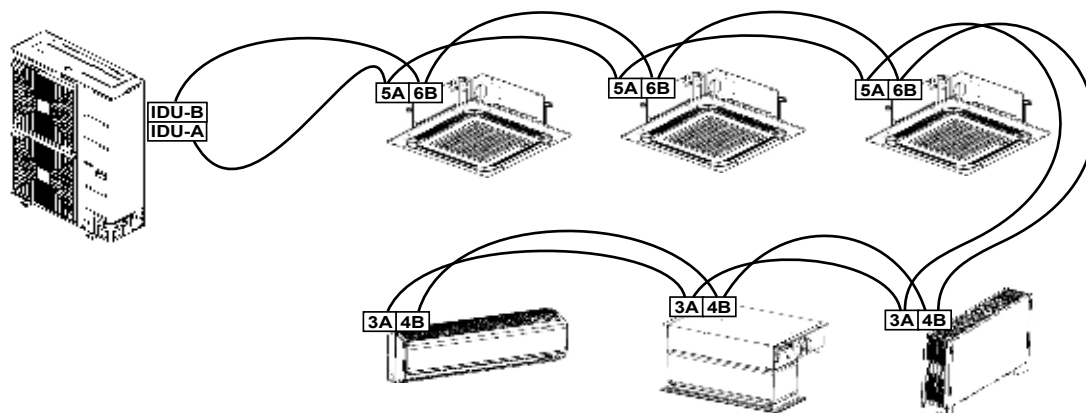


Figure 107: Multi V S System Daisy-Chain Power Wiring / Communications Cable Example.



Note:

1. Communications cables are shielded, grounded at the outdoor unit only.
2. Maintain polarity throughout the communication network.

DIP SWITCH SETTINGS FOR GEN4 EQUIPMENT

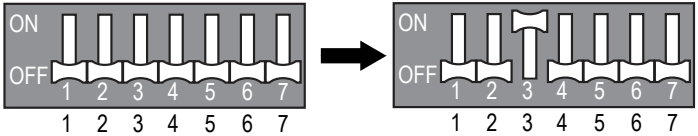
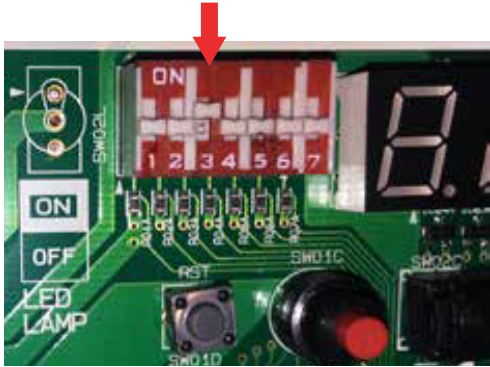
Generation 4 Equipment

The latest versions of LG's indoor units and outdoor (air / water source) units are designated Generation 4 (Gen 4). For Gen 4 units to operate with Gen 4 features, the air conditioning system must meet the following requirements:

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

Figure 108: Location and Setting of ODU DIP Switch 3.

Air/Water Source Unit DIP Switch No. 3



The figure at right shows the ODU DIP switch. The "System Component Combinations and Operation Status" table lists how combining different components will affect system operation. The "Serial Numbers or Air / Water Source Units with Gen 4 Software" table lists the serial numbers of air and water source units that have Gen 4 software. All air and water source units, indoor units, heat recovery units, and controllers in a system must be Gen 4 compatible or the system will not operate with Gen 4 features.

Table 59: System Component Combinations and Operation Status.

Air / Water Source Units*	Indoor Unit(s)**	Heat Recovery Unit(s)	Outdoor Unit DIP Switch No. 3	Operation Status
Gen 4	Gen 4 ONLY	Model 2A ONLY	Must be ON	System will operate WITH Gen. 4 features.
Gen 4	Gen 4 ONLY	Model 2A ONLY	OFF	System will operate but WITHOUT Gen. 4 features.
Gen 4	Gen 4 ONLY	Any combination of Models 0A, 1A, 2A	Must be OFF (factory default)	Does NOT include Gen. 4 features. System will not operate if DIP Switch No. 3 is ON, and an error code will be generated.
Gen 4	Any combination of Gen 2 and Gen 4	Model 2A ONLY	Must be OFF (factory default)	
Gen 4	Any combination of Gen 2 and Gen 4	Any combination of Models 0A, 1A, 2A	Must be OFF (factory default)	
Gen 2	Any combination of Gen 2 and Gen 4	Any combination of Models 0A, 1A, 2A	N/A***	Does not include Gen. 4 features.

*Gen 4 Air / Water Source Units = Multi V IV or Multi V Water IV with Gen 4 software (see table below for Gen 4 serial numbers) or Multi V S. Gen 2 Air / Water Source Units = Multi V II, Multi V III, Multi V IV without Gen. 4 software, Multi V Water II, Multi V Water IV without Gen. 4 software, Multi V Mini, Multi V Water Mini, or Multi V Space II.

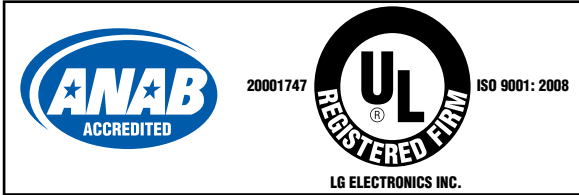
**Gen 4 Indoor Units model numbers end in "4"; Gen 2 Indoor Units model numbers end in "2" or an "A", including Hydro Kit.

***DIP Switch No. 3 on Gen 2 air/water source units is not related to Gen 4 features as it is with Gen 4 air/water source units.

Table 60: Serial Numbers of Air / Water Source Units with Gen 4 Software.

Air / Water Source Unit Model Type	Multi V IV Air Source Heat Pump	Multi V Air Source Heat Recovery	Multi V IV Water Source Heat Pump	Multi V IV Water Source Heat Recovery
Serial Number of Air / Water Source Units with Gen 4 Software	502***** and Higher	503***** and Higher	504***** and Higher	

Inverter



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