



FRIEDRICH

Friedrich Breeze™ Universal Heat Pumps



Breeze™ 208/230 VOLT

Outdoor Unit	WFPU17Z243C (24K), WFPU18Z363C (36K), WFPU18Z483C (48K) , WFPU17Z603C (60K)
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Indoor Unit	WFH24Z193C (24K), WFH36Z193C (36K), WFH48Z223C (48K), WFH60Z223C (60K)
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INTRODUCTION

Important Safety Information

The information in this manual is intended for use by a qualified technician who is familiar with the safety procedures required for installation and repair, and who is equipped with the proper tools and test instruments required to service this product.

Maintenance is the responsibility of the owner. Failure to properly maintain or repair equipment may result in personal injury and/or various types of property damage (fire, flood, etc.).

Installation or repairs made by unqualified persons can result in subjecting the unqualified person making such repairs as well as the persons being served by the equipment to hazards resulting in injury or electrical shock which can be serious or even fatal.

Safety warnings have been placed throughout this manual to alert you to potential hazards that may be encountered. If you install or perform service on equipment, it is your responsibility to read and obey these warnings to guard against any bodily injury or property damage which may result to you or others.

Due to continuing research in new energy-saving technology, all information in this manual is subject to change without notice.

Your safety and the safety of others is very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.

This is a safety Alert symbol.

This symbol alerts you to potential hazards that can kill or hurt you and others.



All safety messages will follow the safety alert symbol with the word "WARNING" or "CAUTION". These words mean:

WARNING

Indicates a hazard which, if not avoided, can result in severe personal injury or death and damage to product or other property.

CAUTION

Indicates a hazard which, if not avoided, can result in personal injury and damage to product or other property.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what will happen if the instructions are not followed.

NOTICE

Indicates property damage can occur if instructions are not followed.



WARNING



Refrigeration system under high pressure

Do not puncture, heat, expose to flame or incinerate.

Only certified refrigeration technicians should service this equipment.

R410A systems operate at higher pressures than R22 equipment. Appropriate safe service and handling practices must be used.

Only use gauge sets designed for use with R410A.

Do not use standard R22 gauge sets.

INTRODUCTION

Important Safety Information

CAUTION

DO NOT OPERATE EQUIPMENT DURING ACTIVE STAGES OF CONSTRUCTION

To ensure proper operation, Friedrich requires that all equipment is not operated during active construction phases. This includes active stages of completing framing, dry walling, spackling, sanding, painting, flooring, and moulding in the equipment's designated conditioning space. The use of this equipment during construction could result in premature failure of the components and/or system and is in violation of our standard warranty guidelines. The operation of newly installed equipment during construction will accelerate the commencement and/or termination of the warranty period.

⚠ WARNING

EXPLOSION HAZARD



Please read this manual thoroughly prior to equipment installation or operation. It is the installers responsibility to properly apply and install the equipment. Installation must be in conformance with the NFPA 70-2008 National Electric Code or current edition, International Mechanic code 2009 or current edition and any other applicable local or national codes.

⚠ WARNING

EXPLOSION HAZARD



Refrigeration system under high pressure. Do not puncture, heat, expose to flame or incinerate. Only certified refrigeration technicians should service this equipment. Appropriate safe service and handling practices must be used. Only use gauge sets designed for use with R410A. Failure to do so can result in property damage, personal injury, or death.

⚠ WARNING

ELECTRIC SHOCK HAZARD



Turn OFF electric power before service or installation. Unit must be properly grounded. Unit must have correct fuse or circuit breaker protection. Unit's supply circuit must have the correct wire conductor size. All electrical connections and wiring must be installed by a qualified electrician and conform to the National Electrical Code and all local codes which have jurisdiction. Failure to do so can result in property damage, personal injury and/or death.

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.



This is the safety Alert symbol. This symbol alerts you to potential hazards that can kill or hurt you and others. All safety messages will follow the safety alert symbol with the word "WARNING" or "CAUTION". These words mean:

Indicates a hazard which, if not avoided, can result in severe personal injury or death and damage to product or other property.

⚠ WARNING

Indicates a hazard which, if not avoided, can result in personal injury and damage to product or other property. All safety messages will tell you how to reduce the chance of injury, and tell you what will happen if the instructions are not followed.

CAUTION

Indicates property damage can occur if instructions are not followed.

NOTICE

Indicates property damage can occur if instructions are not followed.

INTRODUCTION

Personal Injury Or Death Hazards

SAFETY FIRST	⚠ WARNING	⚠ AVERTISSEMENT	⚠ ADVERTENCIA
	Do not remove, disable or bypass this unit's safety devices. Doing so may cause fire, injuries, or death.	Ne pas supprimer, désactiver ou contourner cette l'unité des dispositifs de sécurité, faire vous risqueriez de provoquer le feu, les blessures ou la mort.	No eliminar, desactivar o pasar por alto los dispositivos de seguridad de la unidad. Si lo hace podría producirse fuego, lesiones o muerte.



ELECTRICAL HAZARDS:

- Shutdown and/or disconnect all electrical power to the unit before performing inspections, maintenance, or service.
- Make sure to follow proper lockout/tag out procedures.
- Always work in the company of a qualified assistant if possible.
- Capacitors, even when disconnected from the electrical power source, retain an electrical charge potential capable of causing electric shock or electrocution. Wait a few minutes after shutdown to allow the capacitors to discharge the stored energy.
- Handle, discharge, and test capacitors according to safe, established, standards, and approved procedures.
- Extreme care, proper judgment, and safety procedures must be exercised if it becomes necessary to test or troubleshoot equipment with the power turned on to the unit.
- Do not spray water on the air conditioning unit while the power is on.
- Electrical component malfunction caused by water could result in electric shock or other electrically unsafe conditions when the power is restored and the unit is turned on, even after the exterior is dry.
- Use air conditioner on a single dedicated circuit within the specified amperage rating.
- Ensure that the unit is properly grounded.
- Follow all safety precautions and use approved protective safety equipment such as: gloves, goggles, and clothing. Ensure that properly insulated tools, and testing equipment are used as well to protect against equipment damage and reduce the risk of injury.
- Failure to follow proper safety procedures and these warnings can result in serious injury or possibly death.

INTRODUCTION

Personal Injury Or Death Hazards

- **REFRIGERATION SYSTEM REPAIR HAZARDS:**
- Use approved standard refrigerant recovering procedures and equipment to relieve high pressure before opening system for repair. Reference EPA regulations (40 CFR Part 82, Subpart F) Section 608.
- Do not allow liquid refrigerant to contact skin. Direct contact with liquid refrigerant can result in minor to moderate injury.
- Be extremely careful when using an oxy-acetylene torch. Direct contact with the torch's flame or hot surfaces can cause serious burns.
- Make certain to protect personal and surrounding property with fire proof materials and have a fire extinguisher at hand while using a torch.
- Provide adequate ventilation to vent off toxic fumes, and work with a qualified assistant whenever possible.
- Always use a pressure regulator when using dry nitrogen to test the sealed refrigeration system for leaks, flushing etc.
- **MECHANICAL HAZARDS:**
- Extreme care, proper judgment and all safety procedures must be followed when testing, troubleshooting, handling, or working around unit with moving and/or rotating parts.
- Be careful when, handling and working around exposed edges and corners of the sleeve, chassis, and other unit components especially the sharp fins of the indoor and outdoor coils.
- Use proper and adequate protective aids such as: gloves, clothing, safety glasses etc.
- Failure to follow proper safety procedures and/or these warnings can result in serious injury or death.
- **PROPERTY DAMAGE HAZARDS**
- **FIRE DAMAGE HAZARDS:**
- Read the Installation/Operation Manual for the air conditioning unit prior to operating.
- Use air conditioner on a single dedicated circuit within the specified amperage rating.
- Be extremely careful when using acetylene torch and protect surrounding property.
- Failure to follow these instructions can result in fire and minor to serious property damage.
- **WATER DAMAGE HAZARDS:**
- Improper installation, maintenance or servicing of the air conditioner unit can result in water damage to personal items or property.
- Insure that the unit has a sufficient pitch to the outside to allow water to drain from the unit.
- Do not drill holes in the bottom of the drain pan or the underside of the unit.
- Failure to follow these instructions can result in damage to the unit and/or minor to serious property damage.

INTRODUCTION

Model Number Identification Guide

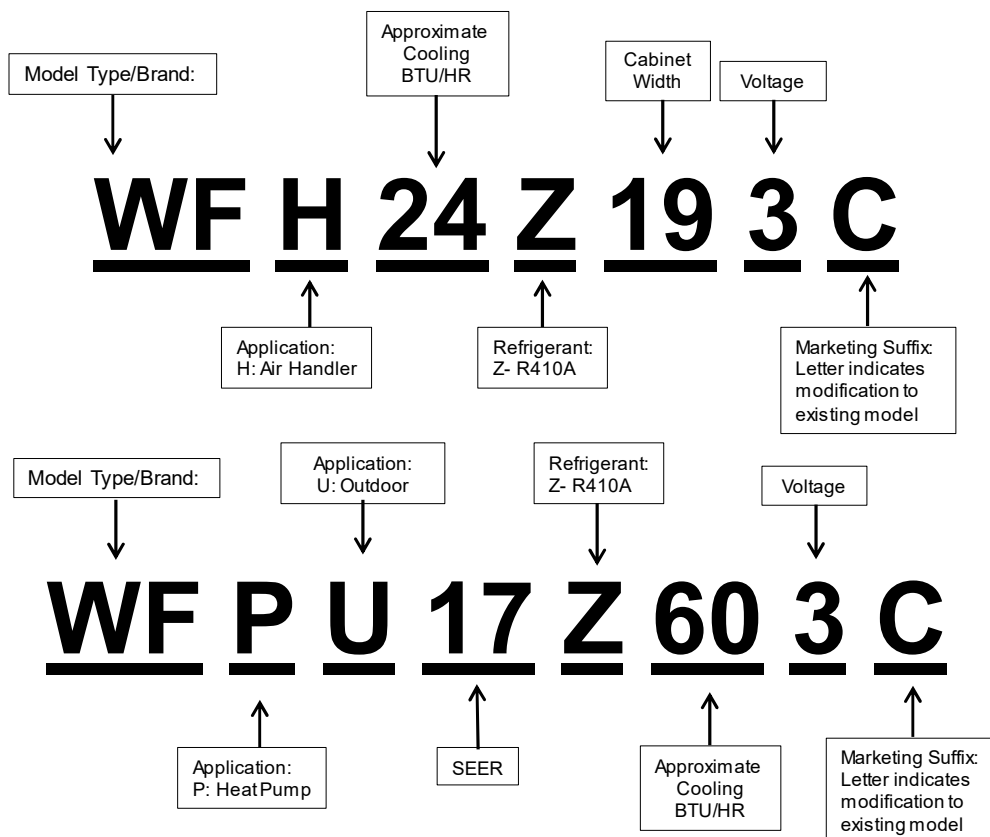


Figure 101

Serial Number Identification Guide

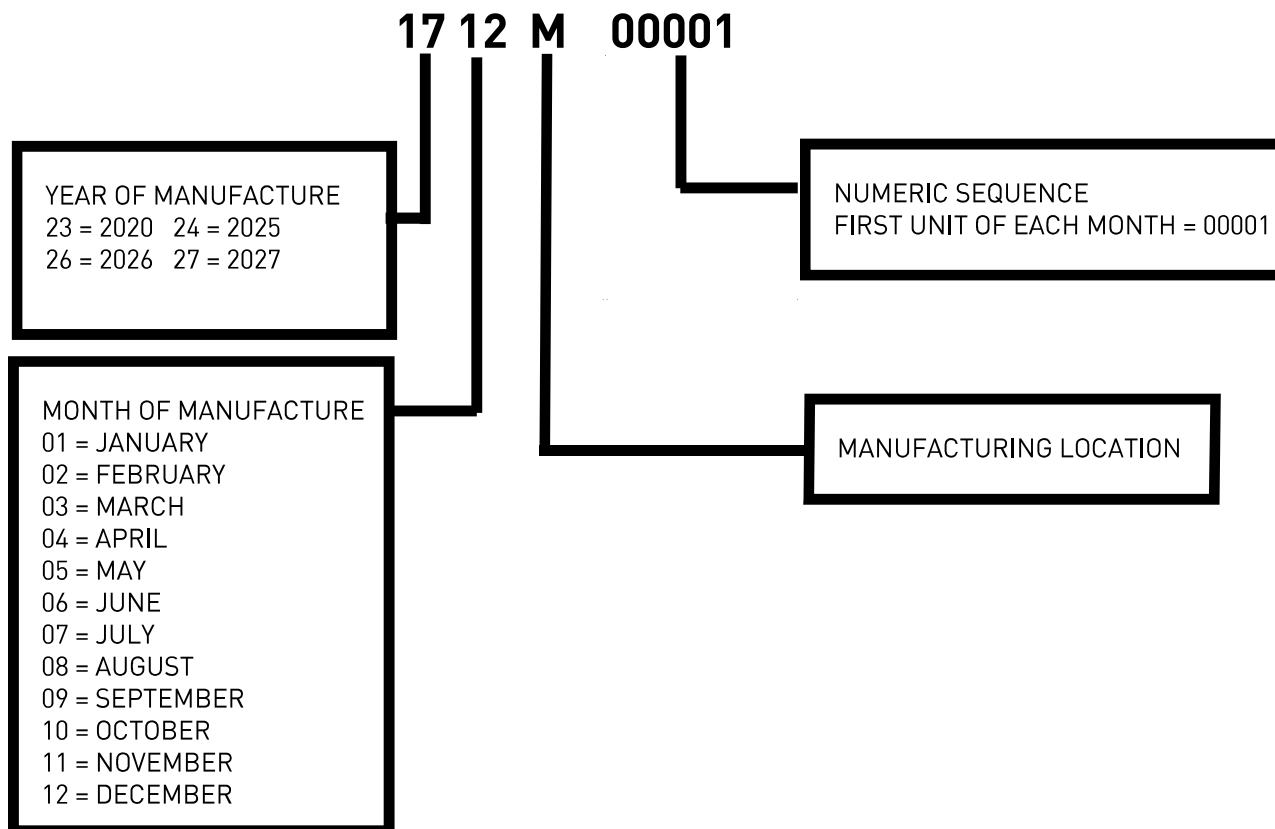


Figure 102

SPECIFICATIONS

Product Specifications (Outdoor Unit)

Outdoor model			24K	36K	48K	60K
Power supply		V/ph/Hz	208~230/1/60	208~230/1/60	208~230/1/60	208~230/1/60
Cooling	Capacity	Btu/h	22000	34000	48000	56000
	Capacity(min-max)	Btu/h	6700-26000	11800-36800	18300-52000	18300-59400
	Capacity(min-max)	W	2227-7327	2814-10697	5363-15240	5363-17409
	Input	W	2180	3370	4750	6780
	Current	A	10.0	15.4	21.8	31.0
	EER2	W/W	2.96	2.96	2.96	2.42
	SEER2	Btu/(W.h)	16.5	18.0	17.5	17.0
	EER2	Btu/(W.h)	10.10	10.10	10.10	8.25
Heating	Capacity	Btu/h	23000	35000	47000	56000
	Capacity(min-max)	Btu/h	6700-26000	8900-38200	17600-52000	17600-56600
	Capacity heating(Rated) @ 47°F	Btu/h	23000	35000	47000	56000
	Capacity heating(Rated) @ 17°F	Btu/h	15000	24000	31000	40000
	Maximum Heating Capacity@ 5F	Btu/h	16100	24600	33000	34000
	COP @ 5F (Under Maximum Capacity)	W/W	2.10	2.10	1.90	1.86
	Input	W	1980	2950	4170	5290
	Current	A	9.5	14.1	19.5	21.0
	HSPF2	Btu/(W.h)	9.0	9.5	8.5	8.5
	COP2	W/W	3.4	3.5	3.3	3.1
	COP2	Btu/(W.h)	11.60	11.94	11.26	10.58
	Min. Ampacity	A	15	23	35	35
	Max. td fuse/ breaker	A	25	35	50	50
Communication cable (SI Cord)		No. × AWG	5×18	5×18	5×18	5×18
Working Voltage		198V ~ 253V				
Voltage Imbalance		Within a 3% deviation from each voltage at the main terminal of outdoor unit.				
Starting Voltage		Higher than 85% of the Rated Voltage				
Outdoor fan motor	Type		DC	DC	DC	DC
	Model		ZWK511A805001	SIC-71FW-F8121-1	SIC-71FW-D8121-1/ SIC-71FW-D8121-2	SIC-71FW-D8121-1/ SIC-71FW-D8121-2
	Qty		1	1	2	2
	Output	W	60	121	121	121
	Speed (Hi)	r/min	880	810	850	850

Figure 201

SPECIFICATIONS

Product Specifications (Outdoor Unit)

Outdoor model			24K	36K	48K	60K
Outdoor coil	Number of Rows		2	2	2	2
	Tube Pitch(a)	in	0.827	0.827	0.827	0.827
	Row Pitch(b)	in	0.852	0.852	0.852	0.852
	Fin Spacing	Fins Per in	18	19	17	18
	Coil Dimension (W×H×D)	in	"(35-5/8×34)×25-1/4×7/8	38-3/16×31-3/8×1-1/16"	38-3/16×53×1-7/16	38-3/16×53×1-11/16
	Fin Type		Hydrophilic aluminium	Hydrophilic aluminium	Hydrophilic aluminium	Hydrophilic aluminium
	Tube Outside Diameter and Type	mm	Φ7.94, innergroove tube	Φ7.94, innergroove tube	Φ7.0, innergroove tube	Φ7.94, innergroove tube
	Number of Circuits		6	5	6	6
Outdoor air flow		CFM	1825	2350	3525	3525
Outdoor noise level (sound pressure) Hi		dB(A)	54	57	59	60
Outdoor Metering Device			EEV	EEV	EEV	EEV
Compressor	Model		EATF250D22UMT	EATF250D22UMT	EATF400D64UMTA	EATF400D64UMTA
	Brand		GMCC	GMCC	GMCC	GMCC
Compressor	Type		Twin ROTARY	Twin ROTARY	Twin ROTARY	Twin ROTARY
	Capacity	Btu/h	26085	26085	41865	41865
	Input	W	2080	2080	3385	3385
	Rated current (RLA)	A	9.45	9.45	15.39	15.39
	Oil	oz	VG74 /22.7	VG74 /22.7	VG74 /33.9	VG74 /33.9
Refrigerant type/Quantity	Type		R-410A	R-410A	R-410A	R-410A
	Refrigerant charge	oz(kg)	70.5(2.0)	98.7(2.8)	142.9(4.05)	142.9(4.05)
	Factory pre-charge	Ft(m)	25(7.6)	25(7.6)	25(7.6)	25(7.6)
	Additional charge for each ft	oz/ft	0.38	0.38	0.6	0.6
Outdoor unit	Dimension(W×H×D)	inch	33-7/8×26-3/8×12-1/4	37-3/8×33×13-3/8	37-3/8×54-5/8×13-3/8	37-3/8×54-5/8×13-3/8"
	Packing(W×H×D)	inch	39×28-3/4×17-3/4	43-3/4×36-1/4×18-1/8	43-3/4×60-1/4×18-1/8	43-3/4×60-1/4×18-1/8
	Net weight	lbs	112.4	147.7	227.1	251.3
	Shipping Weight	lbs	121.3	158.7	253.5	277.5
Design pressure	H/L	PSIG	550/240	550/240	550/240	550/240
Refrigerant piping	Liquid side/ Gas side	inch	(3/8'5/8')	(3/8'3/4')	(3/8'7/8')	(3/8'7/8')
	Max. pipe length	ft	164	246	246	246
	Max. difference in level	ft	98	98	98	98
Operating temperature range	Cooling	°F	5-122	5-122	5-122	5-122
	Heating	°F	-13-75	-13-75	-13-75	-13-75

Figure 201

SPECIFICATIONS

Product Specifications (Outdoor Unit)

Outdoor model		24K	36K	48K	60K
Qty' per 20' /40' /40'HQ (Outdoor unit)	Set	90/186/186	52/106/106	26/53/53	26/53/53
NOTE: 1. Test conditions: 1.1 Rated capacity test conditions: Cooling: Indoor: DB 80.0°F /WB 67.0°F Outdoor: DB 95.0°F /WB 75.0°F Heating: Indoor: DB 70.0°F /WB 60.0°F Outdoor: DB 47°F /WB 43°F 1.2 SEER & HSPF test standard: AHRI 210/240. 2. The Sound Pressure Level is based on the following conditions: Outdoor unit. Measure the noise value of 3 points which are 1 meter in front of the three sides of the unit surface. (front/left/right) and 1/2 (unit height +1) meter high from floor level, and calculate the weighted average of the noise. 3. The above data was measured in an anechoic chamber. Please take into consideration the reflected sound of your specific application environment. 4. All specifications are subject to change by the manufacturer without prior notice. 5. Max. Running Current (A): REFER TO NAMEPLATE 6. Follow all National and local codes and regulations when selecting field wires, and all the above are the minimum wire size. 7. When transmitting cable (SI) is longer than 100 feet, a larger wire size should be selected. 8. Install main switch and circuit breaker for each system separately. Select a high response type circuit breaker that acts within 0.1 second.					

Figure 201

SPECIFICATIONS

Product Specifications (Indoor Unit)

Indoor model			24K	36K	48K	60K
Type			US Duct	US Duct	US Duct	US Duct
Power supply		V/ph/Hz	208~230/1/60	208~230/1/60	208~230/1/60	208~230/1/60
Moisture Removal	L/h		2.2	4.5	5.5	7.50
	Pts/h		4.64	9.5	11.6	15.80
Min. Ampacity	A		3.3	4.8	6.8	6.8
Max. td Fuse/ Breaker	A		10	10	15	15
	Nominal Sensitive Current (mA)		30	30	30	30
Communication Cable	No. × AWG		5×18	5×18/	5×18	5×18
Thermostat Cable	5×18 or 6×18 (when using Matched Air Handler)					
Indoor Fan Motor (Multi Speed ECM)	Qty		1	1	1	1
	Model		ZWK702B006073	ZWK702B500026	ZKSD-560-8-50-14	ZKSD-560-8-58
	Output	HP	1/3	1/2	3/4	3/4
	RLA	A	2.4~2.6	3.6~3.8	5.0~5.4	5.0~5.4
	Speed	r/min	350~1400	350~1400	350~1400	350~1400
Indoor Air Flow Rated		CFM	800	1120	1588	1706
Indoor Coil	Number of Rows		4	4	5	5
	Tube Pitch(a)	in	0.827	0.827	0.827	0.827
	Row Pitch(b)	in	0.535	0.535	0.535	0.535
	Fin Spacing	Fins Per in	18	18	17	17
	Fin Type		Hydrophilic Aluminium	Hydrophilic Aluminium	Hydrophilic Aluminium	Hydrophilic Aluminium
	Tube outside Diameter and Type	mm	Φ7, Innergroove Tube	Φ7, Innergroove Tube	Φ7, Innergroove Tube	Φ7, Innergroove Tube
	Coil	mm	2(444×420×54.4)	2(444×420×54.4)	2(509×546×68)	2(509×546×68)
	Dimension (W×H×D)	in	2(17-1/2×16-1/2×2-1/8)	2(17-1/2×16-1/2×2-1/8)	2(20×21-1/2×2-11/16)	2(20×21-1/2×2-11/16)
	Number of Circuits		8	8	12	12
ESP	Rated	In. W.C.	0.18	0.228	0.276	0.276
	Range	In. W.C.	0-0.8	0-0.8	0-0.8	0-0.8
Indoor Noise Level (Hi)		dB(A)	55	57	64	65
Throttle Type			TXV	TXV	TXV	TXV
	Dimension (W×H×D)	inch	19-5/8 × 46-1/8 × 21-5/8	19-5/8 × 46-1/8 × 21-5/8	22×53-7/8×24	22×53-7/8×24
	Packing (W×H×D)	inch	22-1/2×49-5/8×25-3/8	22-1/2×49-5/8×25-3/8	25-1/4×55-1/2×28	25-1/4×55-1/2×28
	Net Weight	lbs	135.5	140	187.2	187.2
	Shipping Weight	lbs	158.6	163.1	214	214
Drainage Water Pipe Diameter		inch	3/4"	3/4"	3/4"	3/4"
"Design Pressure"	H/L	PSIG	550/240	550/240	550/240	550/240

Figure 202

SPECIFICATIONS

Product Specifications (Indoor Unit)

Indoor model	24K	36K	48K	60K
NOTE: 1. Test Conditions: 1.1 Rated Capacity Test Conditions: Cooling: Indoor: DB 80.0°F /WB 67.0°F Outdoor: DB 95.0°F /WB 75.0°F Heating: Indoor: DB 70.0°F /WB 60.0°F Outdoor: DB 47°F/WB 43°F 1.2 SEER & HSPF Test Standard: AHRI 210/240. 2. The Sound Pressure Level is based on the following conditions: Indoor Unit Air Handler Unit Measure the noise value of the point 3.28 feet in front of the outlet of the wind tunnel and 3.28 feet high from the bottom of the unit. 3. The above data was measured in an anechoic chamber. Please take into consideration the reflected sound of your specific application environment. 4. All specifications are subject to change by the manufacturer without prior notice. 5. Max. Running Current (A): REFER TO NAMEPLATE 6. Follow local and National electrical codes and regulations when selecting field wires, and all the above are the minimum wire size. 2. When transmitting (SI) cable is longer than 100 feet, a larger wire size should be selected. 3. Install main switch and circuit breaker for each system separately. Select a high response type circuit breaker that acts within 0.1 second. 4. If an auxiliary heater is required and already installed on indoor unit, power source cable should be installed separately and the size should be selected in accordance with Local and National Electrical Codes. Refer to Figure 203(Electric Heater Kit Selection Table) for Specifications.				

Figure 202

SPECIFICATIONS

Electric Heater Kit Selection Table

Electric Heat Kit Model	Air Handler Model	Electric Heat (kW)	MIN. Circuit Ampacity		MAX. Fuse or Breaker (HACR) Ampacity		Fan Speed Tap			
			230VAC	208VAC	230VAC	208VAC	2	3	4	5
AUX5KW	24k	5	28.3	25.9	30	30	0	0	0	0
AUX7KW		7.5	40.7	37.2	45	40	X	0	0	0
AUX10KW		10	53.2	48.5	60	50	X	X	0	0
AUX5KW	36k	5	29.8	27.4	30	30	0	0	0	0
AUX7KW		7.5	42.2	38.7	45	50	X	0	0	0
AUX10KW		10	54.7	49.9	60	50	X	X	0	0
AUX15KW		15	42.2+36.9	38.6+33.8	45+40	40+35	X	X	X	0
AUX5KW	48K/60K	5	31.8	29.4	35	30	0	0	0	0
AUX7KW		7.5	44.8	40.7	45	45	X	0	0	0
AUX10KW		10	56.7	51.9	60	55	X	X	0	0
AUX15KW		15	44.8+36.9	40.7+33.8	50+40	50+35	X	X	0	0
AUX20KW		20	56.7+49.9	51.9+45.2	60+50	60+50	X	X	X	0
							0 = Fan Speed tap may be used X= Fan speed tap may not be used See Blower Data(Indoor Units)			
NOTES: - When optional electric heater kit is installed, obtain power for AHU from load side of L1 and L2 of electric heater kit. - It is recommended that the electric heater kit should be installed in cold climate regions or when long piping is used. - Properly size the auxiliary heater per the table above. - Ampacities for MCA and Fuse/breaker include the blower motor. - Heat pump systems require a specified airflow. Each ton of cooling requires between 350 and 450 cubic feet of air per minute (CFM).										

Figure 203

SPECIFICATIONS

Sound Pressure Data (Outdoor Units)

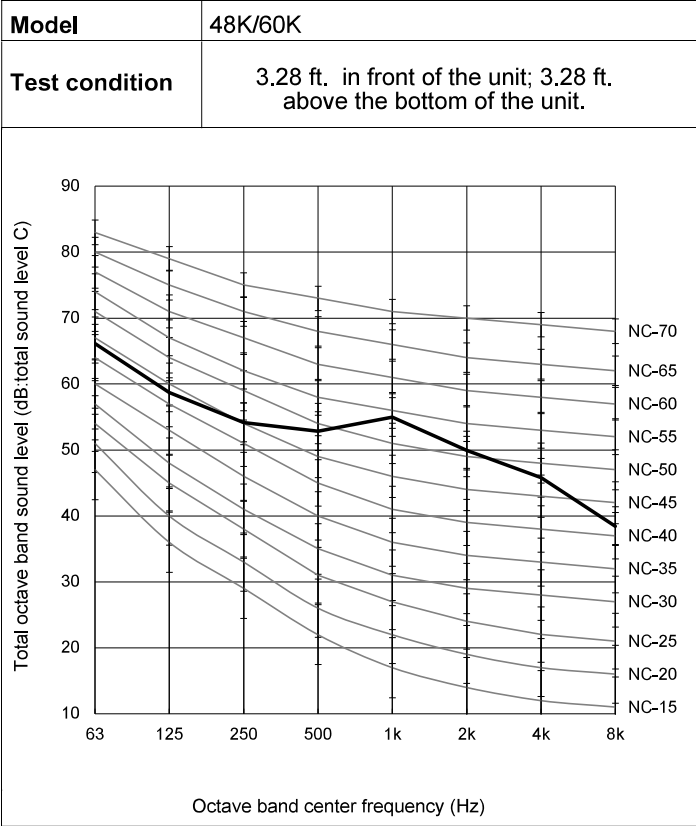
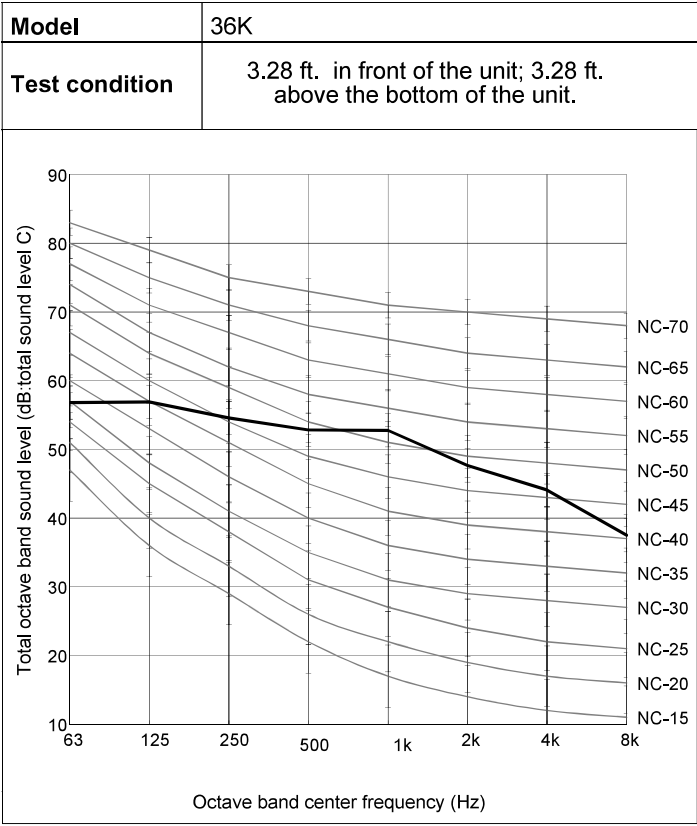
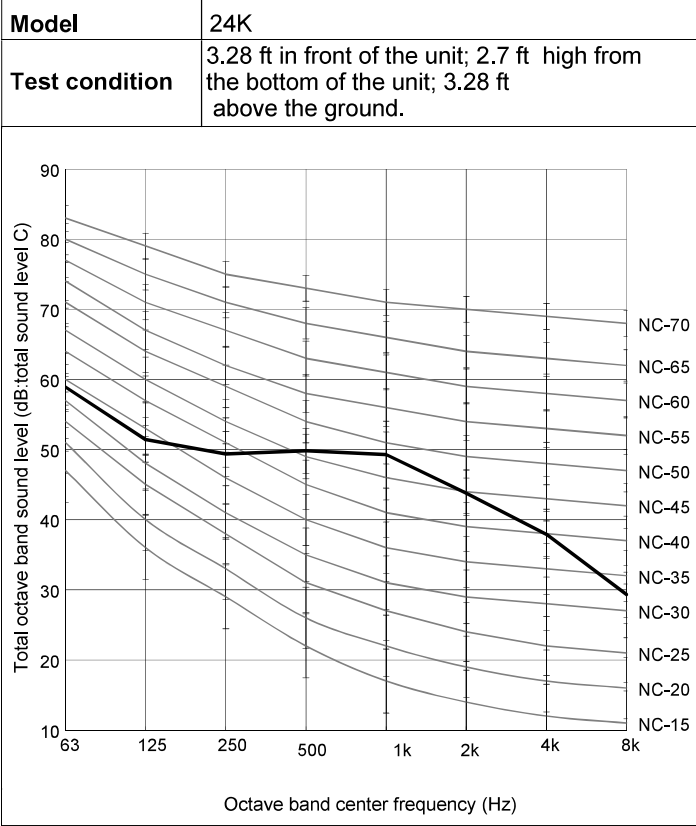


Figure 210

SPECIFICATIONS

Sound Pressure Data (Indoor Units)

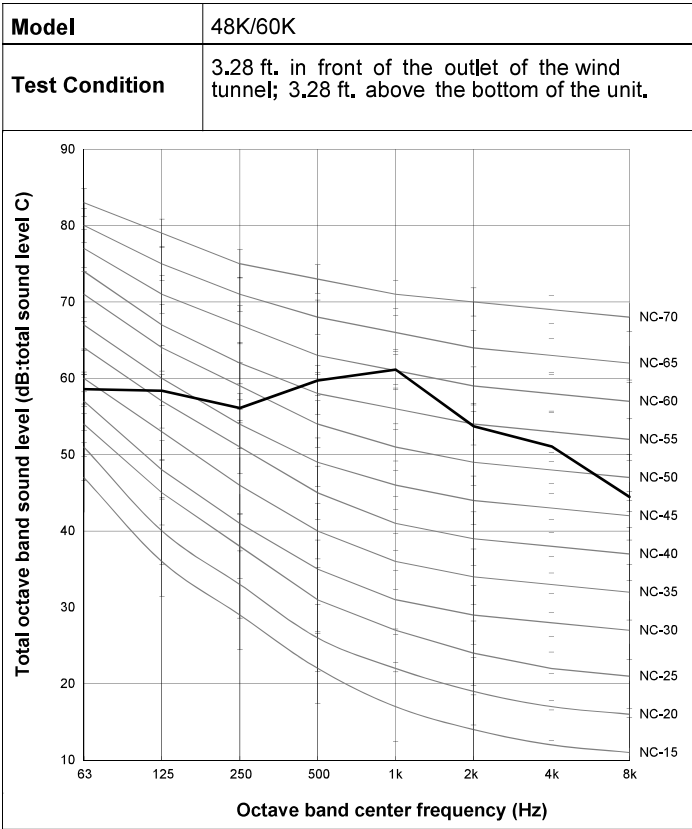
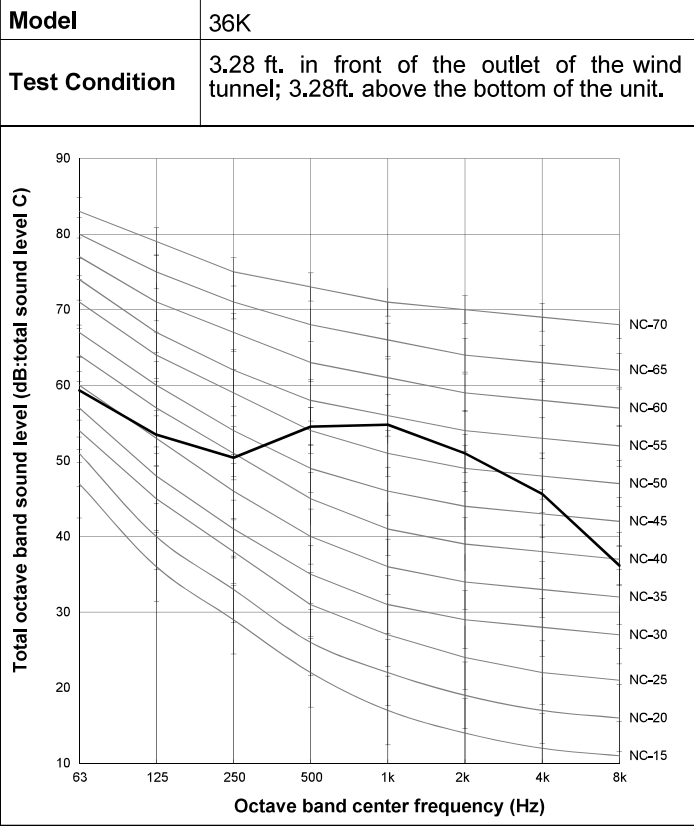
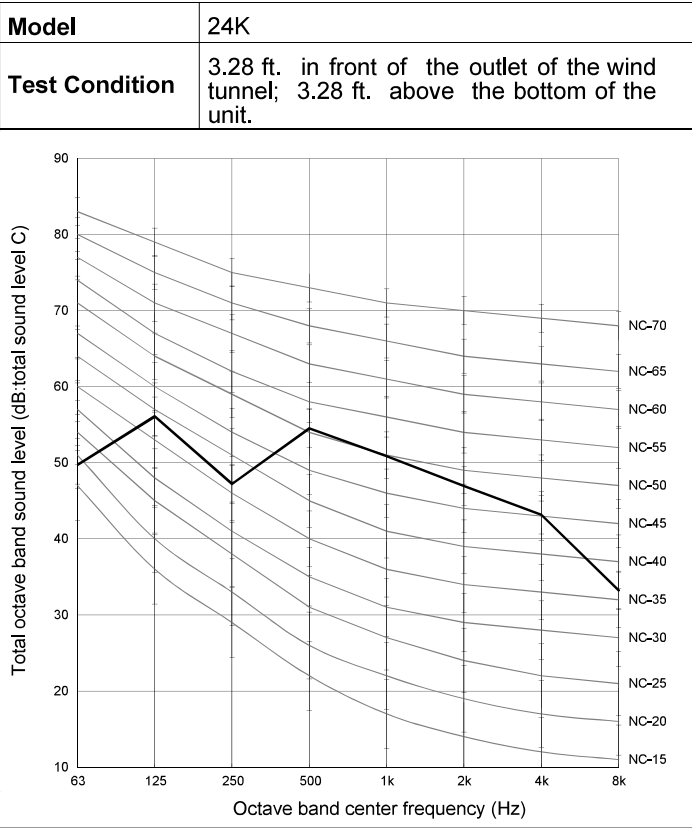


Figure 211

SPECIFICATIONS

Blower Data (Indoor Units)

Airflow performance data is based on cooling performance with a coil and no filter in place. Check the performance table for appropriate unit size selection. External static pressure should stay within the minimum and maximum limits shown in the table below to ensure proper cooling, heating, and electric heating operation.

NOTES:

- Required 350-450 CFM/Ton range.
- When there is an electric heater, set the fan speed based on the air volume that the electric heater needs (not less than 350 CFM/Ton).
- Airflow based upon air handler unit operates at 230 V with no electric heater kit and no filter. Airflow at 208 V is approximately the same as 230 V.

Incorporate your filter's pressure drop into static pressure calculations. Common pressure drops are:		
Merv	Material	Drop
4	Spunglass	0.1
8	Pleated	0.12
13	Pleated	0.25

• Model: WFH24Z193C

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	815	792	752	709	—	—	—	—	—
	w	94	102	110	123	—	—	—	—	—
Tap (3)	CFM	862	828	792	735	705	—	—	—	—
	w	106	114	125	137	145	—	—	—	—
Tap (4)	CFM	—	—	—	859	853	803	769	735	—
	w	—	—	—	178	185	193	203	213	—
Tap (5)	CFM	—	—	—	—	—	895	864	825	779
	w	—	—	—	—	—	241	251	258	267

Figure 211

SPECIFICATIONS

Blower Data (Indoor Units)

- Model: WFH36Z193C**

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,264	1,216	1,172	1,135	1,096	—	—	—	—
	w	215	222	233	238	244	—	—	—	—
Tap (3)	CFM	1,350	1,314	1,269	1,206	1,116	1,082	1,050	—	—
	w	257	264	274	282	292	297	302	—	—
Tap (4)	CFM	—	—	—	1,323	1,266	1,192	1,122	1,060	—
	w	—	—	—	304	313	323	333	340	—
Tap (5)	CFM	—	—	—	—	1,350	1,292	1,221	1,148	1,088
	w	—	—	—	—	371	381	394	401	406

- Model: WFH48Z223C**

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,756	1,701	1,626	1,579	1,520	1,468	1,425	—	—
	w	348	357	369	378	387	395	407	—	—
Tap (3)	CFM	1,799	1,746	1,678	1,634	1,571	1,522	1,449	1,402	—
	w	366	377	388	398	410	419	428	444	—
Tap (4)	CFM	—	1,794	1,749	1,719	1,670	1,633	1,589	1,553	1,510
	w	—	387	401	413	428	437	452	465	482
Tap (5)	CFM	—	—	—	1,782	1,735	1,701	1,665	1,626	1,585
	w	—	—	—	456	469	481	495	510	525

- Model: WFH60Z223C**

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,838	1,810	1,770	1,760	—	—	—	—	—
	w	376	387	401	413	—	—	—	—	—
Tap (3)	CFM	1,888	1,855	1,813	1,782	1,751	—	—	—	—
	w	415	428	445	456	469	—	—	—	—
Tap (4)	CFM	1,971	1,941	1,893	1,864	1,820	1,786	1,755	—	—
	w	472	485	501	513	530	540	558	—	—
Tap (5)	CFM	2,056	2,022	1,978	1,950	1,907	1,878	1,826	1,801	1,750
	w	533	545	562	575	592	603	495	631	638

Figure 212

SPECIFICATIONS

Product Dimensions (24k Outdoor Unit)

UNIT: INCHES.

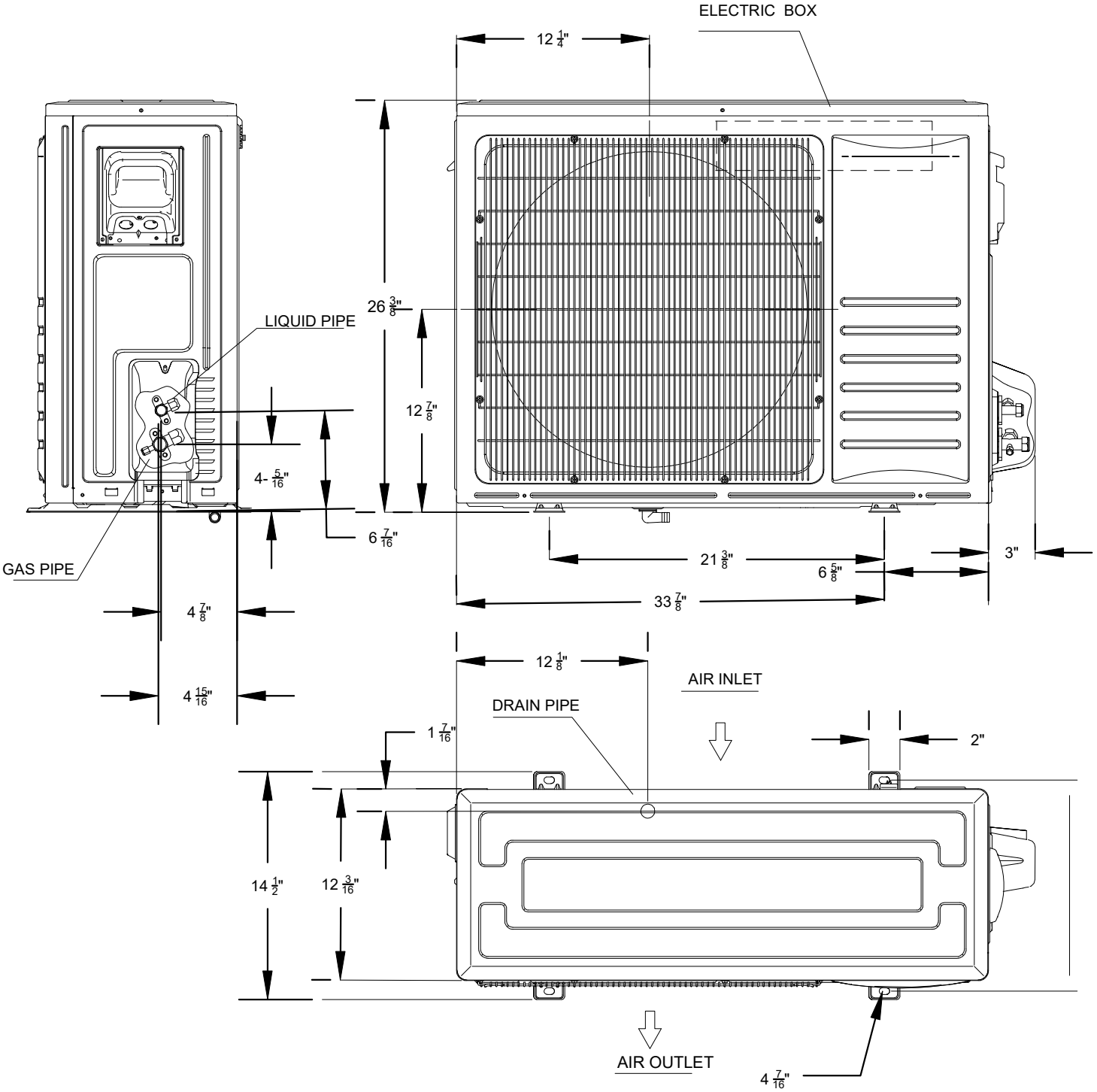


Figure 204

SPECIFICATIONS

Product Dimensions (36k Outdoor Unit)

Unit : inches

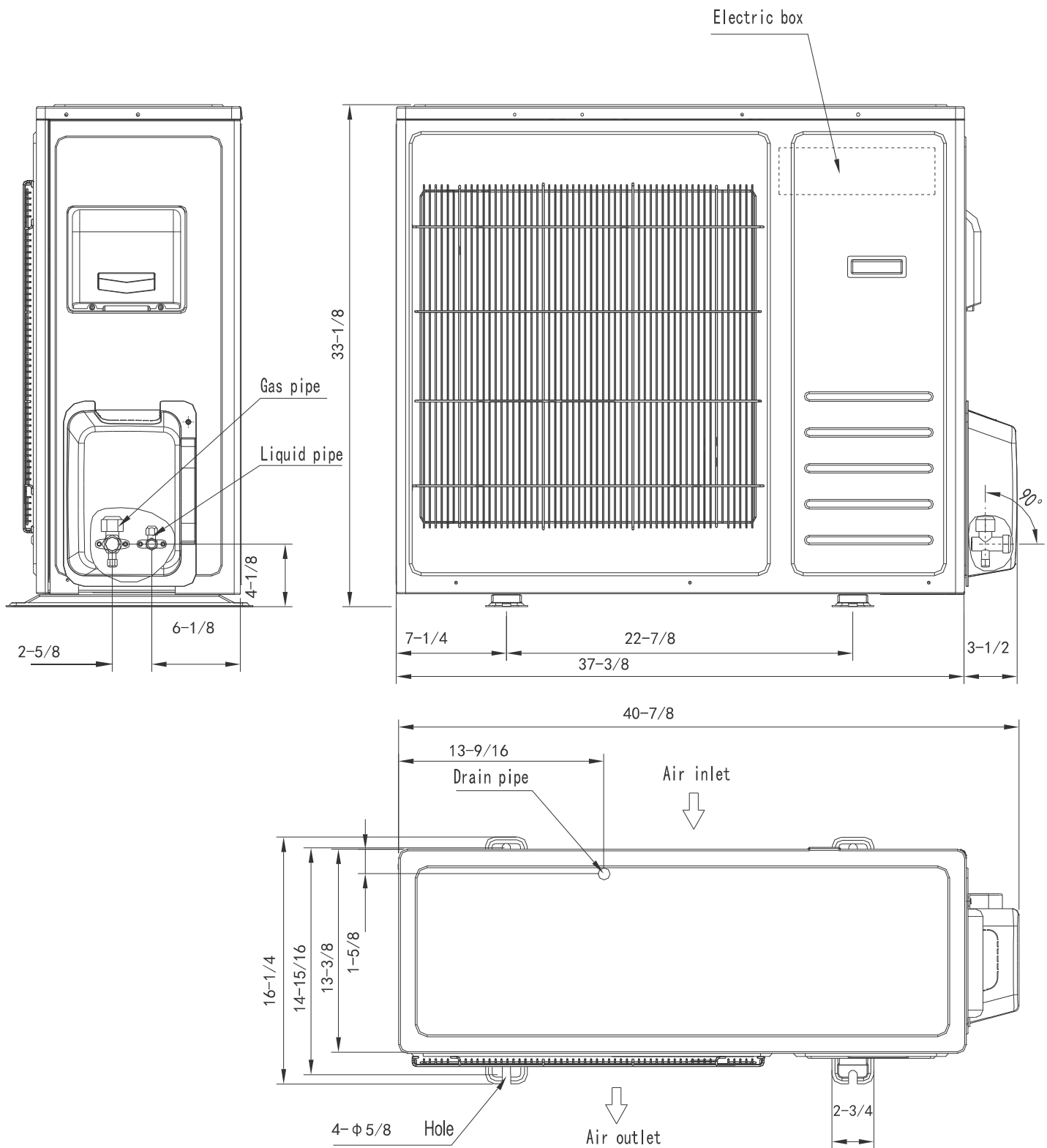


Figure 205

SPECIFICATIONS

Product Dimensions (48-60k Outdoor Unit)

Unit : inches

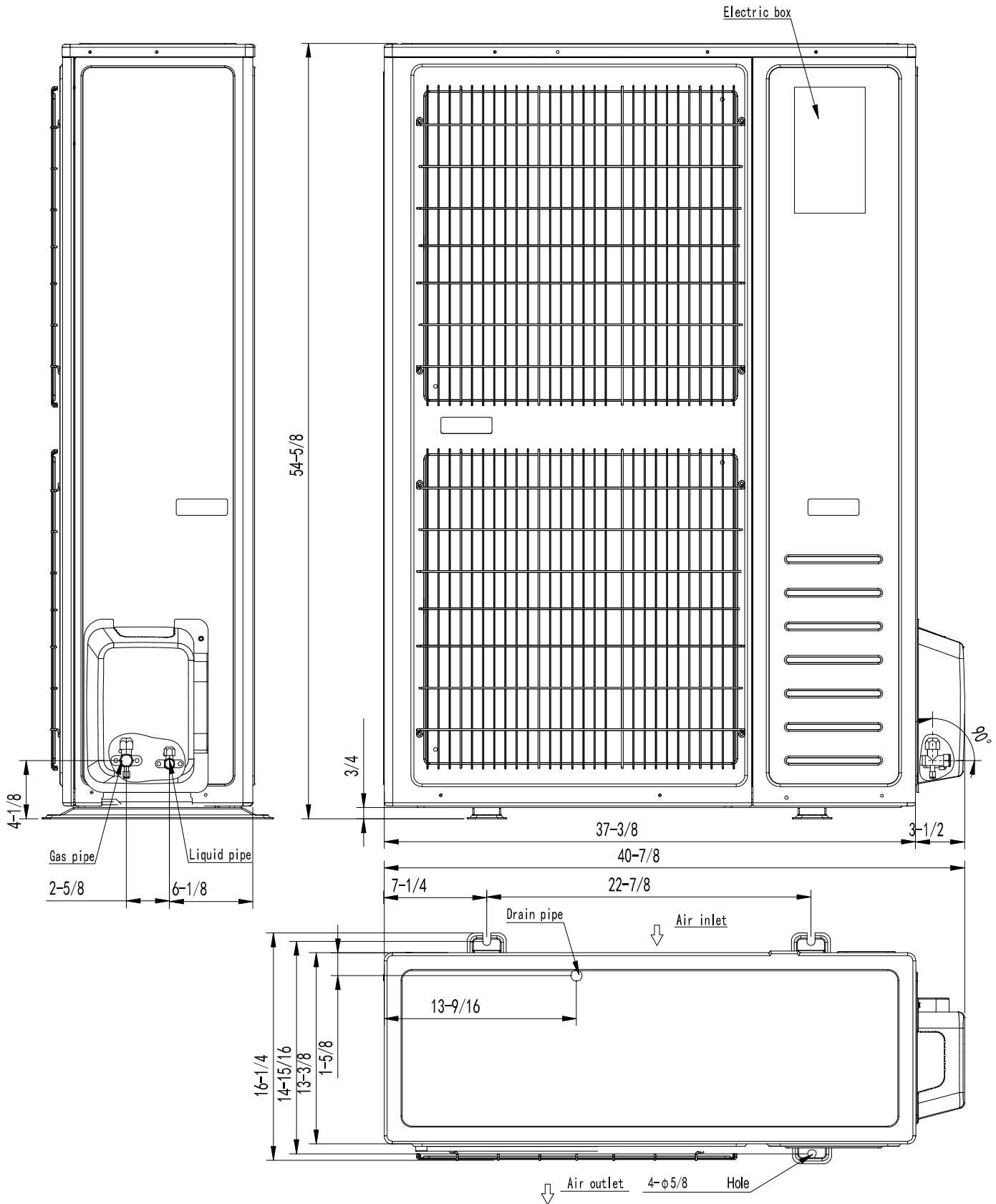


Figure 206

SPECIFICATIONS

Product Dimensions (24-36k Indoor Unit)

Unit: Inches

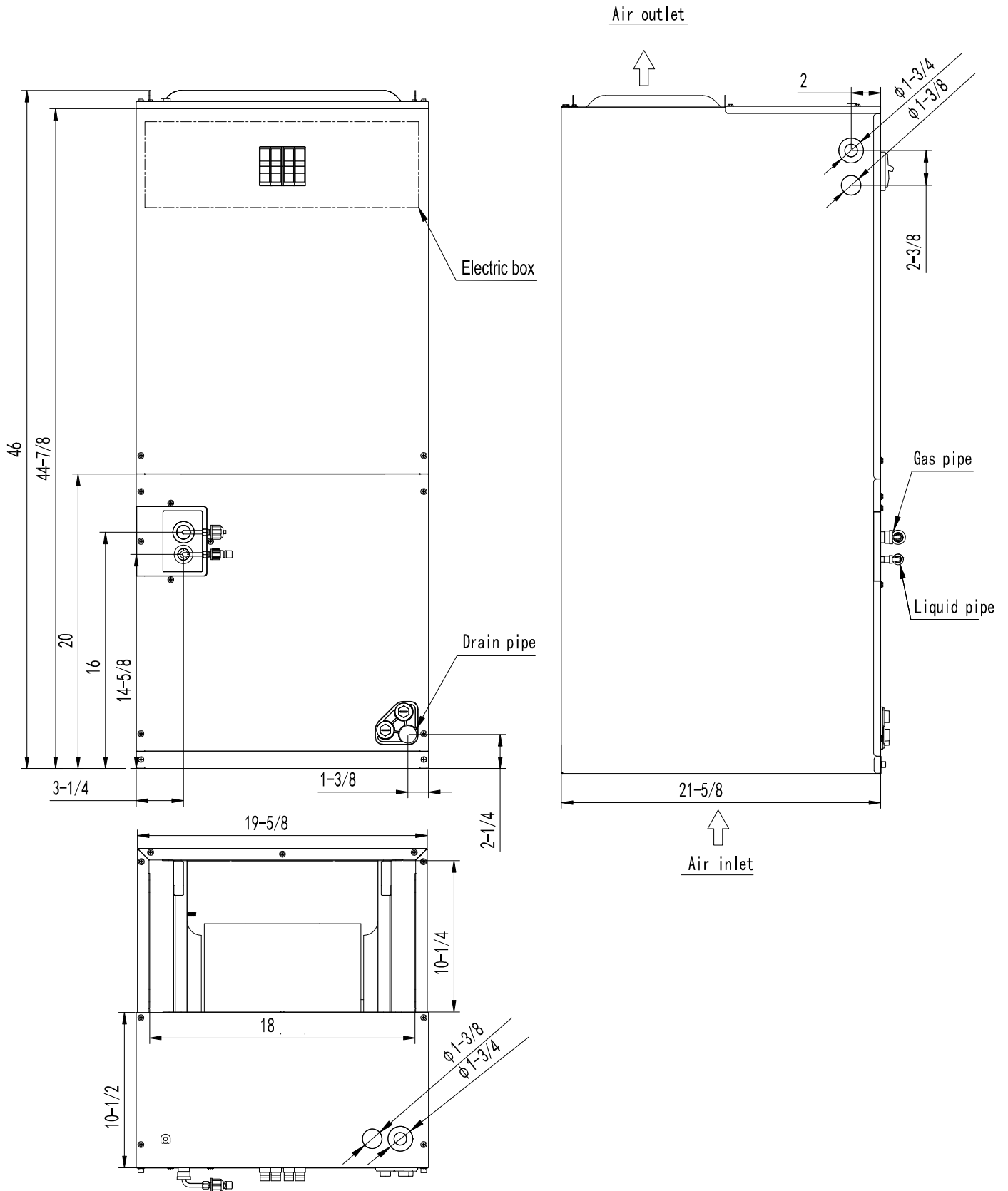


Figure 207

SPECIFICATIONS

Product Dimensions (48-60k Indoor Unit)

Unit: Inches

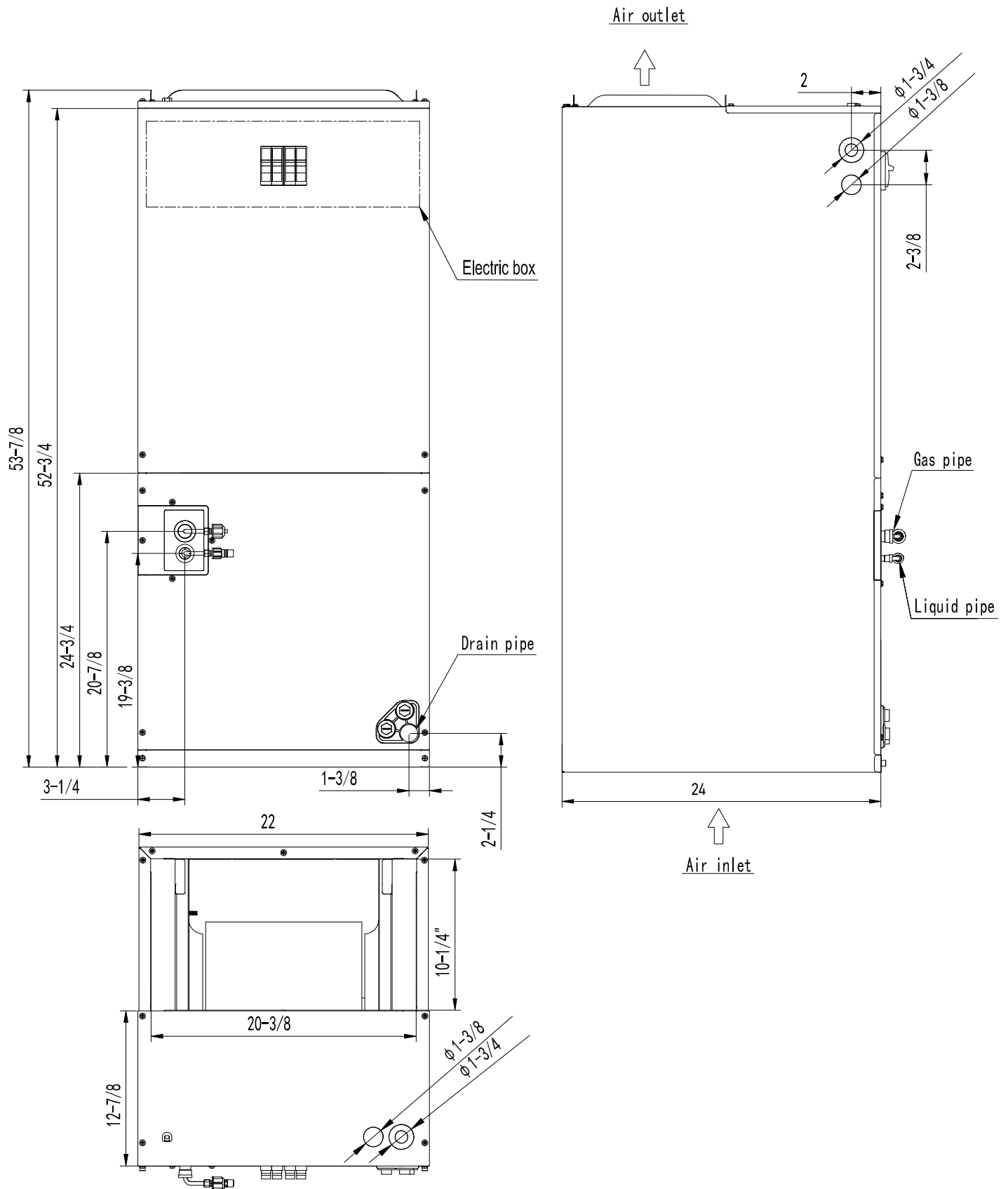


Figure 208

SPECIFICATIONS

Capacities and Selection Data

Capacity characteristic charts

The following charts show the characteristics of outdoor unit capacity, which corresponds with the operating ambient temperature of outdoor unit. This data is obtained with Free-Spin of the Condenser and not in a testing mode Conditions:

1. Pipe length / height difference : 25 ft. / 0 ft.
2. Compressor at rated inverter frequency
3. Indoor fan speed at high fan speed
4. Capacity loss due to frost accumulation and defrost operation is not included.

Remarks:

TC: Total Capacity (Gross) (kBtu/h)

SHR: Sensible Heat Ratio

kW(PI): Power Input (including the compressor & cond. fan motor) (kW) DB: Dry Bulb Temperature

WB: Wet Bulb Temperature

IDB: Indoor Dry Bulb Temperature

IWB: Indoor Wet Bulb Temperature

SPECIFICATIONS

Capacities and Selection Data

Performance data (Cooling operation at rated frequency)

24K outdoor unit matches 18K indoor unit

Airflow (CMF)	Outdoor DB(°F)	IWB (°F)	59				63				67				71			
		IDB (°F)	70	75	80	85	70	75	80	85	70	75	80	85	70	75	80	85
450	5	TC	14.0	14.1	14.4	14.6	14.4	14.6	14.7	14.9	15.4	15.5	15.7	15.8	\	18.8	18.9	19.0
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.72	0.73	0.73	0.73	0.73	0.74	0.75	0.76	0.76	0.76	0.77	0.78	\	0.95	0.96	0.97
	30	TC	14.6	14.7	15.0	15.2	15.0	15.2	15.4	15.5	16.1	16.2	16.4	16.5	\	19.6	19.7	19.9
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.80	0.81	0.81	0.81	0.81	0.82	0.83	0.84	0.84	0.84	0.85	0.87	\	1.06	1.07	1.08
	65	TC	15.3	15.5	15.8	16.0	15.8	16.0	16.2	16.3	16.9	17.1	17.2	17.3	\	20.6	20.8	20.9
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.89	0.90	0.90	0.90	0.90	0.92	0.92	0.93	0.93	0.94	0.95	0.96	\	1.17	1.19	1.20
	75	TC	15.3	15.5	15.9	16.0	15.9	16.0	16.2	16.4	17.0	17.1	17.3	17.4	\	20.4	20.6	20.7
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	0.98	1.00	1.01	1.01	1.01	1.02	1.03	1.04	1.03	1.05	1.06	1.07	\	1.29	1.31	1.32
	85	TC	15.1	15.3	15.6	15.8	15.6	15.8	16.0	16.1	16.7	16.9	17.0	17.1	\	20.0	20.2	20.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	1.11	1.12	1.13	1.13	1.13	1.15	1.16	1.17	1.17	1.18	1.19	1.20	\	1.47	1.48	1.50
	95	TC	14.9	15.0	15.3	15.5	15.3	15.5	15.7	15.9	16.4	16.6	16.7	16.9	\	19.6	19.7	19.8
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	1.34	1.35	1.36	1.36	1.36	1.38	1.39	1.40	1.41	1.42	1.43	1.45	\	1.75	1.76	1.78
	105	TC	14.6	14.8	15.1	15.2	15.1	15.2	15.4	15.5	16.1	16.3	16.4	16.5	\	18.9	18.9	19.0
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	1.59	1.61	1.62	1.62	1.62	1.64	1.66	1.67	1.67	1.69	1.70	1.72	\	2.03	2.03	2.04
	115	TC	13.0	13.2	13.5	13.6	13.5	13.6	13.8	13.9	14.5	14.6	14.7	14.8	\	15.7	15.8	15.9
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.62	1.63	1.65	1.65	1.65	1.67	1.69	1.71	1.72	1.73	1.74	1.75	\	1.80	1.81	1.82
	122	TC	11.1	11.2	11.5	11.6	11.5	11.6	11.7	11.8	12.3	12.4	12.5	12.6	\	13.3	13.4	13.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.67	1.68	1.70	1.70	1.70	1.73	1.74	1.76	1.77	1.78	1.80	1.80	\	1.86	1.87	1.87
600	5	TC	15.0	15.1	15.5	15.7	15.5	15.7	15.9	16.0	16.6	16.7	16.9	17.0	\	20.0	20.2	20.3
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.84	0.85	0.86	0.86	0.86	0.87	0.88	0.89	0.88	0.90	0.90	0.91	\	1.09	1.10	1.11
	30	TC	15.7	15.8	16.2	16.4	16.2	16.4	16.6	16.7	17.3	17.4	17.6	17.7	\	20.9	21.1	21.2
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	0.93	0.94	0.95	0.95	0.95	0.96	0.97	0.98	0.98	0.99	1.00	1.02	\	1.21	1.23	1.24
	65	TC	16.5	16.6	17.1	17.2	17.1	17.2	17.4	17.6	18.3	18.4	18.5	18.7	\	22.0	22.2	22.3
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.04	1.05	1.06	1.06	1.06	1.07	1.08	1.09	1.09	1.11	1.12	1.13	\	1.35	1.36	1.38
	75	TC	16.5	16.7	17.1	17.2	17.1	17.2	17.4	17.6	18.3	18.4	18.5	18.7	\	21.9	22.0	22.2
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.13	1.15	1.16	1.16	1.16	1.17	1.18	1.19	1.19	1.20	1.22	1.23	\	1.42	1.43	1.44
	85	TC	16.2	16.4	16.7	17.0	16.7	17.0	17.1	17.3	17.9	18.1	18.2	18.4	\	21.3	21.4	21.6
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	1.25	1.26	1.28	1.28	1.28	1.29	1.30	1.32	1.32	1.33	1.34	1.36	\	1.63	1.65	1.66
	95	TC	16.0	16.2	16.6	16.7	16.6	16.7	16.9	17.1	17.6	17.8	18.0	18.1	\	20.8	20.9	21.0
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	1.48	1.50	1.52	1.52	1.52	1.53	1.55	1.57	1.57	1.58	1.60	1.61	\	1.92	1.94	1.95
	105	TC	15.6	15.8	16.2	16.3	16.2	16.3	16.5	16.7	17.2	17.4	17.5	17.7	\	19.3	19.3	19.4
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	1.76	1.77	1.79	1.79	1.79	1.81	1.83	1.85	1.85	1.87	1.89	1.90	\	2.08	2.07	2.08
	115	TC	12.9	13.1	13.4	13.5	13.4	13.5	13.7	13.8	14.7	14.8	14.6	14.6	\	15.2	15.2	15.3
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	1.65	1.66	1.68	1.68	1.68	1.70	1.72	1.73	1.76	1.77	1.77	1.78	\	1.80	1.80	1.81
	122	TC	11.0	11.1	11.4	11.5	11.4	11.5	11.6	11.8	12.5	12.6	12.4	12.4	\	12.9	12.9	13.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	1.70	1.71	1.73	1.73	1.73	1.75	1.77	1.78	1.81	1.83	1.82	1.83	\	1.85	1.86	1.86