Daikin *ALTHERMA* 3 H HT
Engineering Manual

UPRA-DAVK

UPRA036DAVK

UPRA043DAVK

UTBX040EF6VJ

R32

Table of Contents
UPRA-DAVK

1. Features

- Single fan outdoor unit
- 3-in-1 solution for heating, cooling, and domestic hot water.
- High leaving water temperatures of up to 158°F (70°C).
- Guaranteed operation down to -18°F (-28°C).
- Ultra-low sound down to 35 dBA.
- Environmentally friendly with R-32.
- Cloud ready and compatible with the *SkyportHome* Mobile App.
- Compact wall-mounted indoor unit
- Inclusion of all hydraulic components within the wall-mounted indoor unit.
- Compact dimensions allows for small installation space.
- The unit's sleek design blends in with other household appliances.
- Combine with an optional stainless steel domestic hot water tank.
- Quick configuration in 9 steps in a high resolution color interface wizard.

2. Specifications

Technical Specifications						UPRA036DAVK	UPRA043DAVK
Casing	Color					Silver | Black	
	Material					Polyester painted galvanized steel plate	
Dimensions	Unit		Height		in	39.5	
			Width		in	50	
			Depth		in	21	
	Packed unit		Height		in	52.8	
			Width		in	56.7	
			Depth		in	27.2	
Weight	Unit				lb	321.9	
	Packed unit				lb	377	
Packing	Material					Carton |Wood (pallet) | PE (Straps)	
	Weight				lb	59.5	
Heat exchanger	Length				in	47.2	
	Rows		Quantity			3	
	Fin pitch				in	0.1	
	Passes		Quantity			10	
	Face area				ft^2	1280.9	
	Stages		Quantity			44	
	Tube type					ø7 Hi-XSL	
	Fin		Type			WF fin	
			Treatment			Anti-corrosion treatment (PE)	
Fan	Type					Propeller fan	
	Quantity					1	
	Air flow rate		Heating	Nom.	CFM	2306	2330.8
			Cooling	Nom.	CFM	3743.4	
	Discharge direction					Horizontal	
Fan motor	Quantity					1	
	Model					Brushless DC motor	
	Output				W	210	
	Drive					Direct drive	
	Speed	Steps				12	
		Heating	Nom.		rpm	470	475
		Cooling	Nom.		rpm	750	
Compressor	Quantity					1	
	Model					JT90KFDM@BP	
	Type					Hermetically sealed scroll compressor	
	Starting method					Inverter driven	
PED	Category					Category III	
Operation range	Heating	Min.			°FDB	-18.4	
		Max.			°FDB	95	
	Cooling	Min.			°FDB	50	
		Max.			°FDB	109.4	
	Domestic hot water	Min.			°FDB	-18.4	
		Max.			°FDB	95	
PED	Most critical part	Name				Compressor	
		Ps*V			psi*gal	816.1	
Piping connections	Water inlet heat exchanger diameter				in	NPT M 1" (male)	
	Water outlet heat exchanger diameter				in	NPT M 1" (male)	
Sound power level	Heating	Nom.			dB(A)	56 (1)	59 (1)
	Cooling	Nom.			dB(A)	65 (2)	
Sound pressure level	Heating	Nom.			dB(A)	43 (3)	48 (3)
	Cooling	Nom.			dB(A)	52 (4)	
Refrigerant	Type					R-32	
	GWP					675	
	Charge				tCO_2Eq	2.84	
					lb	9.3	
	Control					Expansion valve	
	Circuits	Quantity				1	
Refrigerant oil	Type					FW68DE	
	Charged volume				gal	0.5	
Piping connections	Piping length	OU-IU	Max.		ft	164	
	High pressure side	Design pressure			psig	812.2	
	Level difference	IU-OU	Max.		ft	32.8	
	Water circuit	Filter ball valve				Yes	

2. Specifications (cont.)

Technical Specifications			UPRA036DAVK	UPRA043DAVK
Defrost method			Reversed cycle	
Defrost control			Sensor for outdoor heat exchanger temperature	
Capacity control	Method		Inverter controlled	
Safety devices	Item	1	High pressure switch	
		2	Low pressure switch	
		3	Fuse	
		4	Compressor motor protection	
		5	Pressure relief valve	

Electrical Specifications					UPRA036DAVK	UPRA043DAVK
Power supply	Name				V3	
	Phase				1~	
	Frequency			Hz	60	
	Voltage			V	230	
	Voltage range	Min.		%	-10	
		Max.		%	10	
		cos phi	Nom.		0.9	0.95
			Max.		0.98	
	MOP			A	40	
	MCA			A	39.1	
Current	Minimum Ssc value			kVa	Equipment complying with EN / IEC 61000-3-12	
	Inverter modulation	Min.		%	40 (5)	37 (5)
Wiring connections	For power supply	Remark			See installation manual outdoor unit	
	For connection with indoor unit	Remark			See installation manual indoor unit	

1. Cooling Ta 95°F - LWE 64.4°F (DT = 9°F); Heating Ta DB/WB 44.6°F/42.8°F - LWC 95°F (DT = 9°F)
2. Cooling Ta 95°F - LWE 44.6°F (DT = 9°F); Heating Ta DB/WB 44.6°F/42.8°F - LWC 113°F (DT = 9°F)
3. The sound pressure level is measured via a microphone at a certain distance from the unit. It is a relative value depending on the distance and acoustic environment. Refer to sound spectrum drawing for more information. Condition: Ta DB/WB 44.6°F/42.8°F - LWC 95°F (DT = 9°F)
4. The sound pressure level is measured via a microphone at a certain distance from the unit. It is a relative value depending on the distance and acoustic environment. Refer to sound spectrum drawing for more information. Condition: Ta 95°F - LWE 44.6°F (DT = 9°F)
5. Percentage of heating capacity at Ta DB/WB 44.6°F/42.8°F - LWC 91.4°F (DT = 9°F)

Technical Specifications				UTBX040EF6VJ
Heater capacity	Step 1		kW	2
	Step 2		kW	2 or 4
Power input	Nom.		kW	0.21
Casing	Color			White + Black
	Material			Resin, sheet metal
Dimensions	Unit	Height	in	33.1
		Width	in	17.3
		Depth	in	15.4
	Packed unit	Height	in	17.7
		Width	in	25.6
		Depth	in	40
Weight	Unit		lb	83.8
	Packed unit		lb	92.6
Packing	Material			Carton|PP (Straps)|EPS
	Weight		lb	8.8
Pump	Type			Grundfos UPMXL GEO 25-125 130 PWM
	Nr of speeds			PWM
	Power input		W	179
Water side heat exchanger	Water flow rate	Min.	GPM	5.3 (1)
Expansion vessel	Volume		gal	2.6
	Max. water pressure		psi	43.5
	Pre pressure		psi	14.5
Water filter	Diameter perforations		in	0.0315
	Material			Stainless steel|Plastic
General	Supplier/Manufacturer details	Name or trademark		Daikin Europe N.V.
		Name and address		Daikin Europe N.V. - Zandvoordestraat 300, 8400 Oostende, Belgium
Water circuit	Piping connections diameter		in	NPT 1" (female)
	Piping material			Cu
	Internal piping diameter		in	1-1/4"
	Piping		in	1"
	Safety valve		psi	43.5

2. Specifications (cont.)

Technical Specifications					UTBX040EF6VJ
Water circuit	Manometer				Digital
	Drain valve / fill valve				No
	Shut off valve				Yes
	Flow switch				Yes
	Air purge valve				Yes
	Total water volume			gal	0.58 (2)
	Minimum water volume in the system for cooling			gal	5.28 (3)
	Minimum water volume in the system for heating			gal	5.28 (3)
Sound power level	Nom.			dB(A)	44 (4)
Sound pressure level	Nom.			dB(A)	30 (5)
Operation range	Heating	Ambient	Min.	°F	0 (6)
			Max.	°F	0 (6)
		Water side	Min.	°F	0 (6)
			Max.	°F	0 (6)
	Cooling	Ambient	Min.	°FDB	0 (6)
			Max.	°FDB	0 (6)
		Water side	Min.	°F	0 (6)
			Max.	°F	0 (6)
	Domestic hot water	Water side	Min.	°F	0 (6)
			Max.	°F	0 (6)
	Indoor installation	Ambient	Min.	°FDB	41
			Max.	°FDB	95 (7)
Safety devices	Item	1			Thermal cut out

Electrical Specifications					UTBX040EF6VJ
Power supply	Name				See note (8)
	Voltage range	Min.		%	-10
		Max.		%	10
IP class	IP				IP X0B
Electric heater	Power supply	Name			6V
		Phase			1~
		Frequency		Hz	60
		Voltage		V	208/230
		MOP		A	35
		MCA		A	33.9
	Current	Maximum running current		A	26
		Zmax		Ω	0.22
		Minimum Ssc value			Equipment complying with EN/IEC 61000-3-12
Wiring connections	Communication Cable	Quantity			3
		Remark			2.5 mm²
	Electric meter	Quantity			2
		Remark			Minimum 0.75 mm² (5VDC pulse detection)
	Preferential kWh rate power supply	Quantity			Power: 2
		Remark			Power 6.3A (Select diameter and type according to national and local regulations)
	Domestic hot water pump	Quantity			2
		Remark			Minimum 0.75 mm² (2A inrush, 1A continuous)
	For power supply back-up heater	Quantity			Pre-wired
		Remark			-
	For connection with R6T	Quantity			2
		Remark			Minimum 0.75 mm²
	For connection with A3P	Quantity			Depends on thermostat type, cf. installation manual
		Remark			Voltage: 230 V / Max. current: 100 mA / Min. 0.75 mm²
	For connection with M2S	Quantity			2
		Remark			Voltage: 230 V / Max. current: 100 mA / Min. 0.75 mm²
	For connection with optional FWXV* (demand input and output)	Quantity			4
		Remark			100 mA, minimum 0.75 mm²

1. Operation area is extended to lower flow rates only in case the unit operates with heat pump only. (Not in startup, no BUH operation, no defrost operation).
2. Including piping + back-up heater; excluding expansion vessel
3. Excluding the water in the unit. This minimum water volume is sufficient for most applications. During critical processes extra water may be required.
4. Measured with a pressure drop of 3.35 ft Hd in the heating system at an operating condition of leaving water 116.6-131°F in a room with an ambient of 68°F. DB/WB 44.6°F/42.8°F.
5. Value measured in an anechoic room at 3.28 ft distance from the unit. It is a relative value, depending on the distance and acoustic environment. The sound pressure level mentioned is measured with a pressure drop of 3.35 ft Hd in the heating system.
6. Refer to operation range of the unit.
7. Depends on operation mode, refer to installation manual.
8. Above mentioned power supply of the hydrobox is for the backup heater only. The switch box and the pump of the hydrobox are supplied via the outdoor unit. The optional domestic hot water tank has a separate power supply.

2. Specifications (cont.)

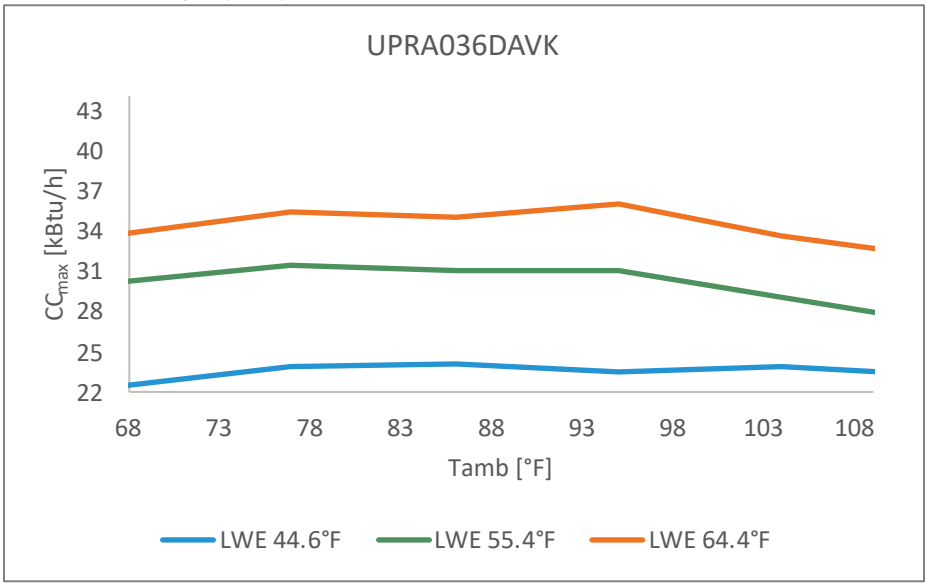
Technical Specifications					UPRA036DAVK + UTBX040EF6VJ	UPRA043DAVK + UTBX040EF6VJ
Heating capacity	Min.			Btu/h	12,625 (1)	15,013 (1)
	Nom.			Btu/h	19,415 (2)	30,709 (2)
	Max.			Btu/h	34,735 (1)	41,355 (1)
Cooling capacity	Nom.			Btu/h	36,179 (3) | 23,544 (4)	42,652 (3) | 30,232 (4)
Power input	Heating	Min.		kW	0.88 (5)	1.05 (5)
		Nom.		kW	1.22 (2)	1.80 (2)
		Max.		kW	2.09 (5)	2.49 (5)
	Cooling	Nom.		kW	2.55 (3) | 2.56 (4)	3.05 (3) | 3.31 (4)
COP				W/W	4.67 (2)	5.00 (2)
EER				Btu/Wh	14.08 (3) | 9.17 (4)	13.91 (3) | 9.17 (4)
Pump	Type				Grundfos UPMXL GEO 25-125 130 PWM	
	Nominal ESP unit	Heating		ft Hd	37.2 (6)	32.6 (6)
Water side heat exchanger	Water flow rate	Heating	Nom.	GPM	4.31 (2)	6.82 (2)
General	Supplier/Manufacturer details	Name and address			Daikin Europe N.V. - Zandvoordestraat 300, 8400 Oostende, Belgium	
		Name or trademark			Daikin Europe N.V.	
	Product description	Air-to-water heat pump			Yes	
		Brine-to-water heat pump			No	
		Heat pump combination heater			Yes	
		Low-temperature heat pump			No	
		Supplementary heater integrated			Yes	
		Water-to-water heat pump			No	
LW(A) Sound power level (according to EN14825)	Indoor			dB(A)	44	
	Outdoor			dB(A)	54	
Space heating general	Air to water unit	Rated airflow (outdoor)		ft^3/h	138,363	139,846
	Other	Capacity control			Inverter	
		Pck (Crankcase heater mode)		kW	0	
		Poff (Off mode)		kW	0.021	
		Psb (Standby mode)		kW	0.021	
		Pto (Thermostat off)		kW	0.041	
	Integrated supplementary heater	Psup		kW	6	
		Type of energy input			Electrical	

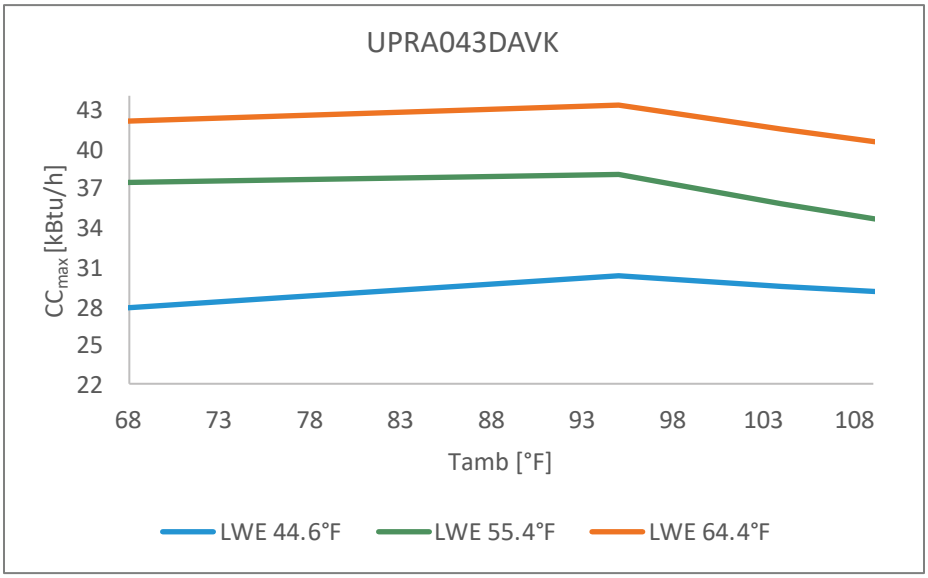
1. Capacity according to standard EN14511 and valid for heated water range dT = 5.4~14.4°F at Ta 44.6°F
2. Condition: Ta DB/WB 44.6°F/42.8°F - LWC 95°F (DT = 9°F)
3. Cooling: EW 73.4°F; LW 64.4°F; ambient conditions: 95°FDB
4. Cooling: EW 53.6°F; LW 44.6°F; ambient conditions: 95°FDB
5. Power input is total input of indoor and outdoor units, including the circulation pump; according to EN14511
6. DB/WB 44.6°F/42.8°F - LWC 95°F (dT=9°F) with pump at full speed

3. Capacity Graphs

3.1 Cooling Capacity Graphs

Maximum cooling capacity





Symbols:

CC_{max}	Cooling capacity at maximum operating frequency, measured according to EN 14511
LWE	Leaving water evaporator temperature [°F]
Tamb	Ambient temperature [°F DB]

Conditions:

Cooling capacity

Capacity according to standard EN 14511 and valid for chilled water range ΔT = 5.4~14.4°F.

Note:

The capacity and the power input are at maximum operation.

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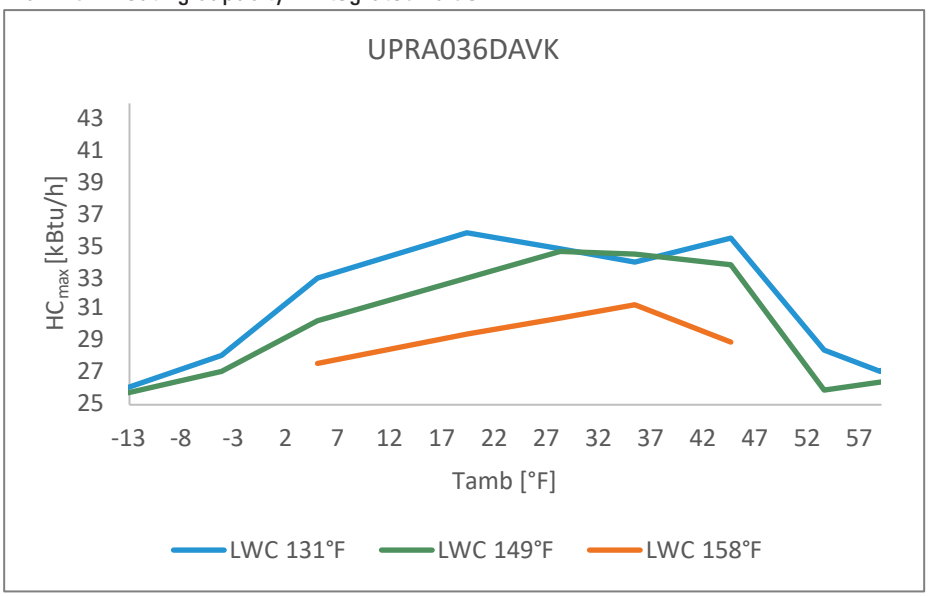
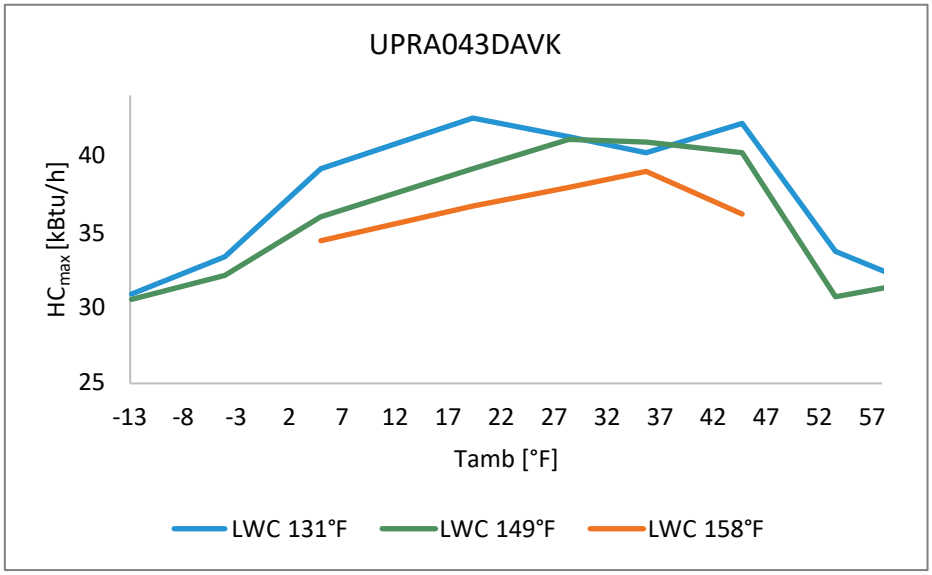
3.2 Heating Capacity Graphs

Maximum heating capacity – integrated value





Symbols:

HC_{max}	Heating capacity for maximum load, measured according to EN 14511
LWC	Leaving water condenser temperature [°F]
Tamb	Ambient temperature [°F DB]

Conditions:

Heating capacity

Capacity according to standard EN 14511 and valid for heated water range ΔT = 5.4~14.4°F.

Note:

The capacity and the power input are at maximum operation.

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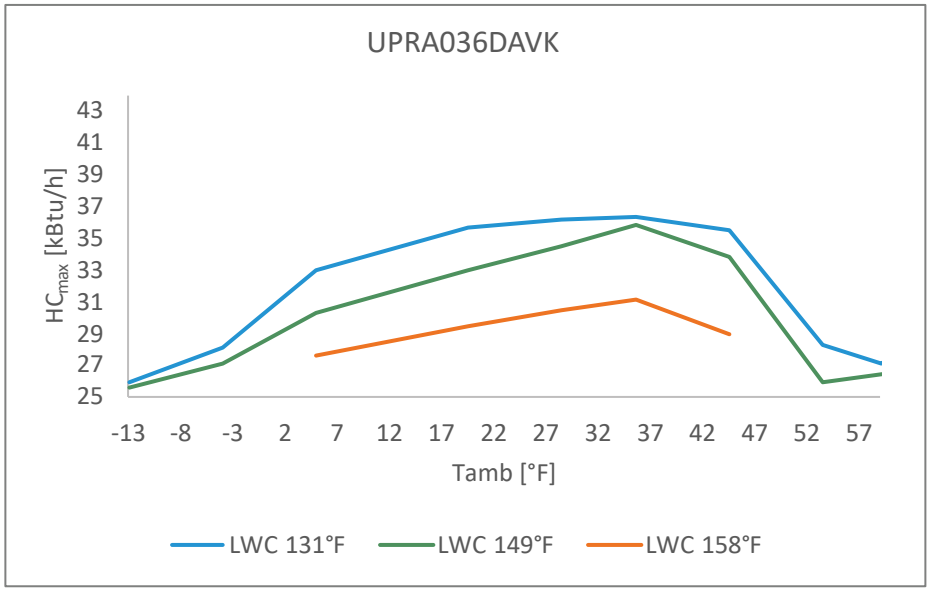
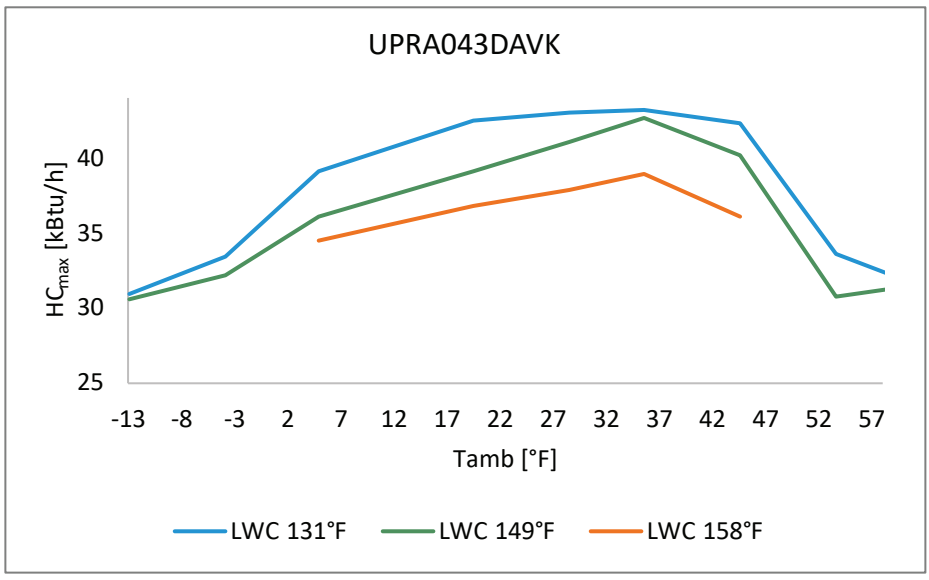
3.2 Heating Capacity Graphs

Maximum heating capacity - peak value





Symbols:

HC_{max}	Heating capacity for maximum load, measured according to EN 14511
LWE	Leaving water evaporator temperature [°F]
Tamb	Ambient temperature [°F DB]

Conditions:

Heating capacity

Capacity according to standard EN 14511 and valid for heated water range ΔT = 5.4~14.4°F.

Note:

The capacity and the power input are at maximum operation.

4. Capacity Tables

4.1 Cooling Capacity Tables

	Tamb [°F]												
		68		77		86		95		104		109.4	
	LWE [°F]	CC [kBtu/h]	PI [kW]	CC [kBtu/h]	PI [kW]	CC [kBtu/h]	PI [kW]	CC [kBtu/h]	PI [kW]	CC [kBtu/h]	PI [kW]	CC [kBtu/h]	PI [kW]
UPRA036DAVK	44.6	22.47	1.13	23.84	1.69	24.09	2.05	23.55	2.57	23.81	2.93	23.46	3.09
	50	26.37	1.2	27.59	1.69	27.52	2.09	27.91	2.67	26.39	2.89	25.71	3.04
	55.4	30.27	1.26	31.35	1.7	30.96	2.16	31.08	2.65	28.97	2.85	27.96	2.99
	59	31.73	1.22	32.95	1.69	32.62	2.13	32.83	2.61	30.81	2.83	29.86	2.98
	64.4	33.92	1.18	35.34	1.67	35.1	2.1	36	2.56	33.57	2.79	32.72	2.96
	71.6	36.84	1.18	38.54	1.65	38.42	2.05	38.95	2.47	37.24	2.75	36.53	2.94
UPRA043DAVK	44.6	27.85	1.4	28.65	2.03	29.44	2.51	30.24	3.3	29.5	3.63	29.06	3.83
	50	32.69	1.48	33.17	2.04	33.64	2.56	34.11	3.27	32.7	3.58	31.85	3.76
	55.4	37.53	1.57	37.68	2.04	37.83	2.64	37.99	3.23	35.89	3.53	34.64	3.7
	59	39.34	1.51	39.6	2.03	39.86	2.61	40.13	3.19	38.17	3.5	37	3.69
	64.4	42.05	1.46	42.48	2.01	42.9	2.56	43.33	3.11	41.59	3.46	40.54	3.67
	71.6	45.67	1.47	46.32	1.98	46.96	2.5	47.61	3.02	46.14	3.41	45.26	3.64

4.2 Heating Capacity Tables

	LWC [°F]																		
		77		86		95		104		113		122		131		149		158	
	Ta [°F]	HC [kBtu/h]	PI [kW]	HC [kBtu/h]	PI [kW]	HC [kBtu/h]	PI [kW]	HC [kBtu/h]	PI [kW]	HC [kBtu/h]	PI [kW]	HC [kBtu/h]	PI [kW]	HC [kBtu/h]	PI [kW]	HC [kBtu/h]	PI [kW]	HC [kBtu/h]	PI [kW]
UPRA036DAVK	-13	27.04	3.13	26.86	3.42	26.68	3.72	26.5	4.02	26.32	4.32	26.14	4.87	25.96	5.19	25.6	5.52		
	-4	27.01	3.05	27.35	3.31	27.55	3.63	27.75	3.95	28.17	4.58	28.58	5.21	28.05	5.56	26.98	5.39		
	5	29.91	2.94	30.15	3.2	31.35	3.68	31.75	4.06	32.14	4.43	32.53	4.81	32.92	5.19	30.27	5.49	27.57	5.38
	19.4	29.41	2.56	30.44	2.81	36.89	3.5	35.98	3.75	35.34	4.03	35.53	4.24	35.73	4.71	32.89	5.15	29.37	5
	28.4	27.63	2.17	28.4	2.45	29.16	2.73	29.92	3.02	30.68	3.32	33.17	3.77	34.72	4.2	34.52	4.94	30.36	4.75
	35.6	26.82	1.9	27.38	2.14	27.91	2.38	28.34	2.69	28.76	2.99	31.25	3.4	33.85	3.8	34.47	4.7	31.15	4.56
	44.6	33.67	1.6	34.2	1.85	34.73	2.09	34.82	2.43	35.03	2.77	35.27	3.09	35.5	3.42	33.81	4.37	28.88	4.25
	53.6	32.24	1.15	31.7	1.41	31.15	1.67	30.61	1.94	30.07	2.2	29.52	2.47	28.28	2.65	25.81	3		
	59	29.04	0.98	30.46	1.25	30.35	1.48	29.21	1.62	28.3	1.86	27.38	2.09	27.03	2.36	26.34	2.9		
	68	32.07	0.97	32.67	1.17	33.27	1.36	33.87	1.55	32.96	1.79	32.04	2.02	31.12	2.26	27.23	2.72		
UPRA043DAVK	-13	32.19	3.72	31.97	4.08	31.76	4.43	31.55	4.79	31.33	5.15	31.12	5.8	30.9	6.18	30.47	6.57		
	-4	32.15	3.63	32.56	3.94	32.8	4.32	33.04	4.7	33.53	5.45	34.03	6.2	33.39	6.62	32.11	6.42		
	5	35.61	3.49	35.89	3.81	37.33	4.38	37.79	4.83	38.26	5.28	38.73	5.73	39.2	6.18	36.04	6.54	34.46	6.72
	19.4	35.01	3.05	36.24	3.34	43.6	4.14	42.83	4.47	42.07	4.79	42.3	5.05	42.54	5.61	39.15	6.13	36.71	6.25
	28.4	32.89	2.59	33.8	2.92	34.71	3.25	35.62	3.6	36.52	3.95	39.48	4.49	41.33	5.01	41.09	5.88	37.95	5.94
	35.6	31.93	2.26	32.59	2.55	33.22	2.84	33.73	3.2	34.24	3.56	37.2	4.04	40.3	4.53	41.04	5.6	38.94	5.7
	44.6	40.09	1.91	40.72	2.2	41.35	2.49	41.45	2.9	41.7	3.3	41.98	3.68	42.27	4.07	40.25	5.21	36.11	5.31
	53.6	38.39	1.37	37.74	1.68	37.09	1.99	36.44	2.31	35.79	2.62	35.14	2.94	33.67	3.15	30.72	3.57		
	59	34.57	1.16	36.26	1.49	36.13	1.76	34.77	1.93	33.68	2.21	32.6	2.49	32.18	2.81	31.36	3.45		
	68	38.18	1.16	38.9	1.39	39.61	1.62	40.33	1.85	39.23	2.13	38.14	2.41	37.05	2.69	32.42	3.24		

Symbols:

CC Cooling capacity at maximum operating frequency, measured according to EN 14511
HC Heating capacity for maximum load, measured according to EN 14511
PI Power input is the total input of indoor and outdoor units, including the circulation pump; according to EN 14511
LWE Leaving water evaporator temperature [°F]
LWC Leaving water condenser temperature [°F]
Tamb Ambient temperature [°F DB]

Conditions:

Cooling capacity

Capacity according to standard EN 14511 and valid for chilled water range ΔT = ·5.4·~·14.4·°F.

Heating capacity

Capacity according to standard EN 14511 and valid for heated water range ΔT = 5.4~14.4°F.

Power input

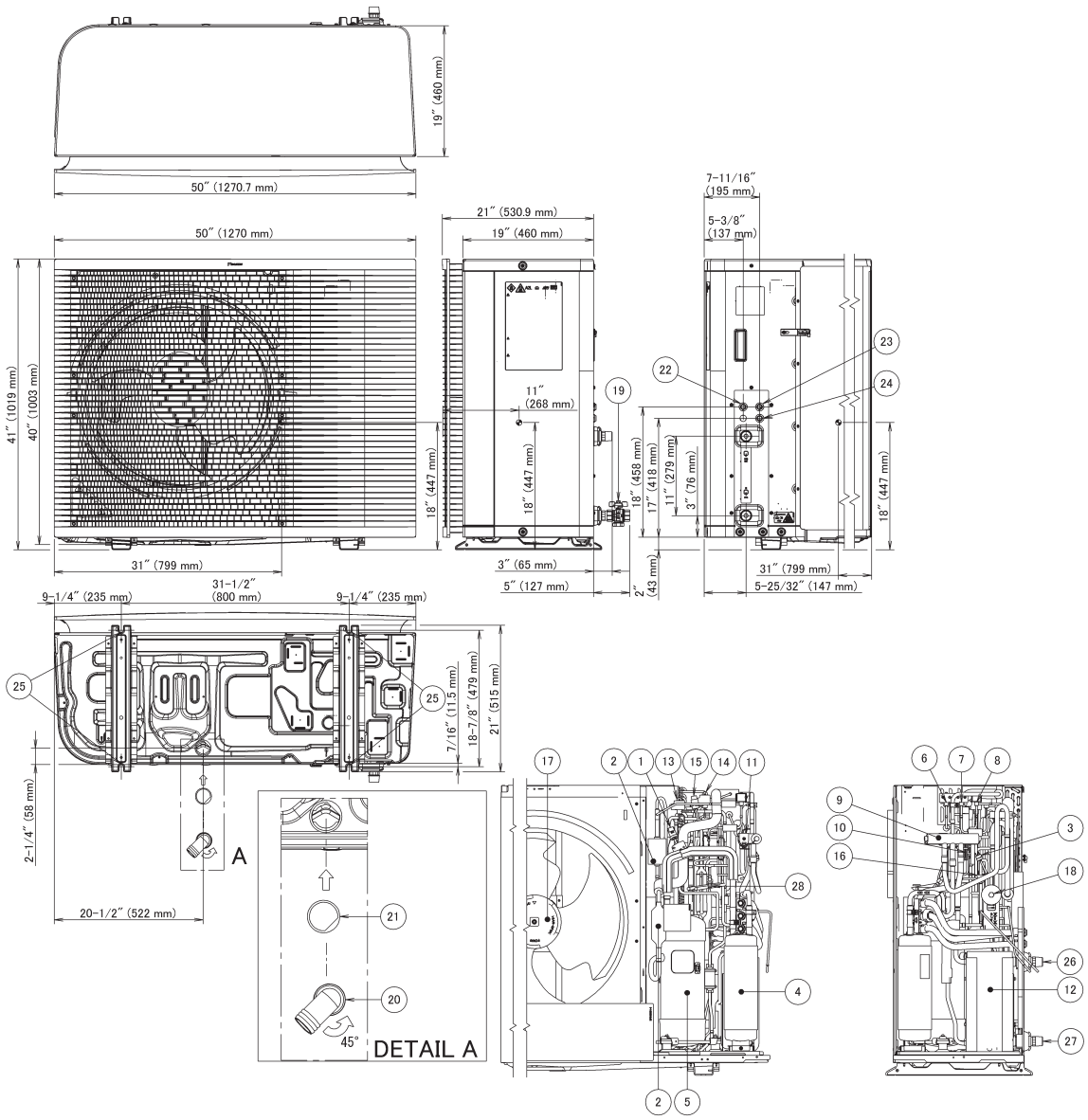
Power input is the total input of indoor and outdoor units, including the circulation pump; according to EN 14511.

Note:

The capacity and the power input are at maximum operation.

5. Dimensional Drawing

5.1 Dimensional Drawing: Outdoor Unit



① Low pressure switch
② Muffler
③ High pressure switch 604.8 psi (4.17 MPa)
④ Accumulator
⑤ Compressor
⑥ Solenoid valve (low pressure bypass)
⑦ Solenoid valve (hot gas bypass)
⑧ Solenoid valve (liquid)
⑨ 4-way valve
⑩ Capillary tube
⑪ 4-way valve Coil
⑫ Plate heat exchanger
⑬ Electronic expansion valve (main)
⑭ Electronic expansion valve (injection)
⑮ High pressure switch 812.2 psi (5.6 MPa)
⑯ Pressure sensor
⑰ Fan
⑱ Service port 5/16" flare
⑲ Shut-off valve / filter (included accessory)
⑳ Drain elbow (included accessory)
㉑ Sealing (included accessory)
㉒ Drain tube heater cable intake
㉓ Interconnection cable intake
㉔ Power supply cable intake
㉕ 4 holes for anchor bolts M12
㉖ Outlet 1" NPT
㉗ Inlet 1" NPT
㉘ Fusible plug

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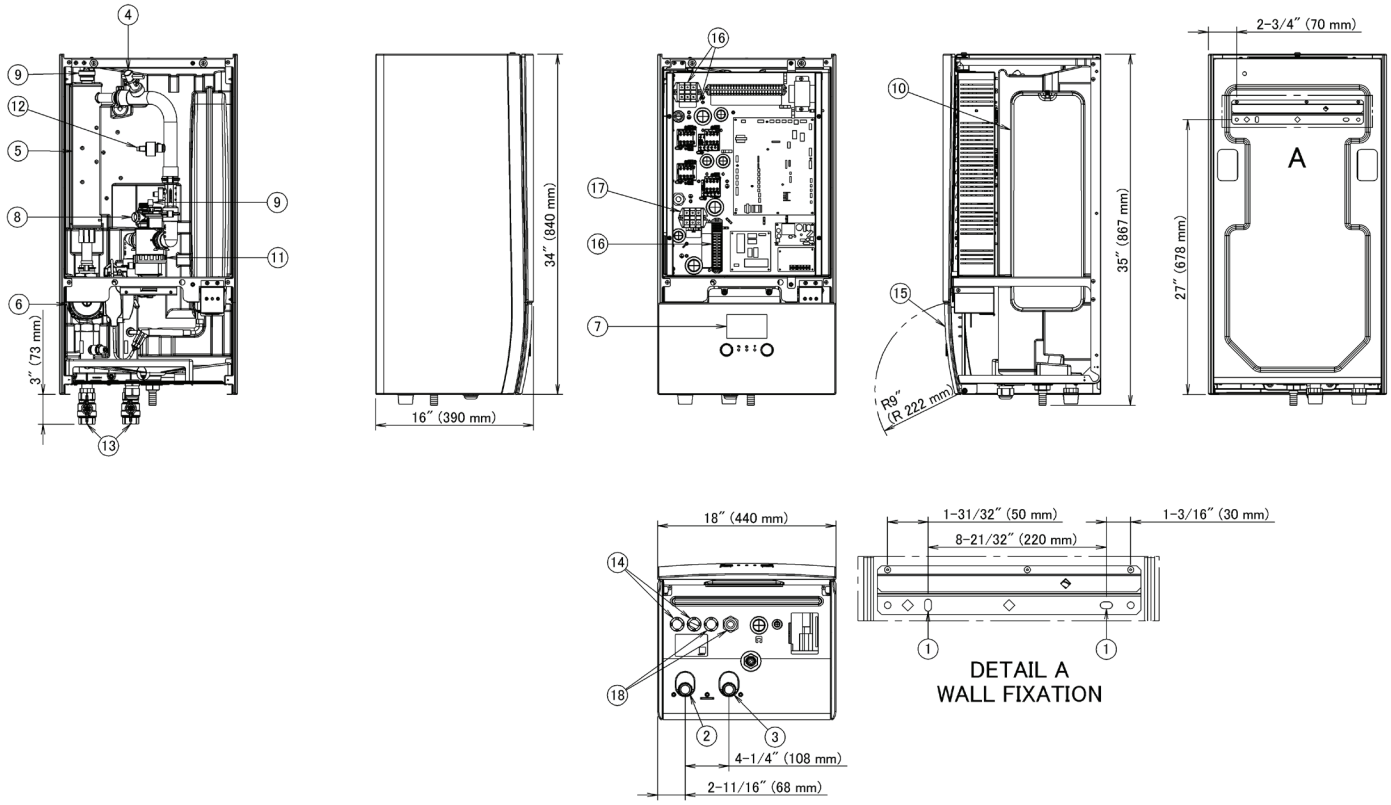
5.2 Dimensional Drawing: Indoor Unit



① Holes (Ø5/16"- Ø8.5 mm) for wall fixation
② Water out connection (1" M NPT)
③ Water in connection (1" M NPT)
④ Flow switch
⑤ Backup heater
⑥ Pump
⑦ User interface
⑧ Safety pressure valve
⑨ Air purge
⑩ Expansion vessel
⑪ Magnetic filter / dirt separator
⑫ Space heating water pressure sensor
⑬ Shut-off valves
⑭ Wire entrance of the power supply / communication wire
⑮ Service door
⑯ Switch box terminals
⑰ Switch box terminals for the domestic hot water tank (option)
⑱ Options

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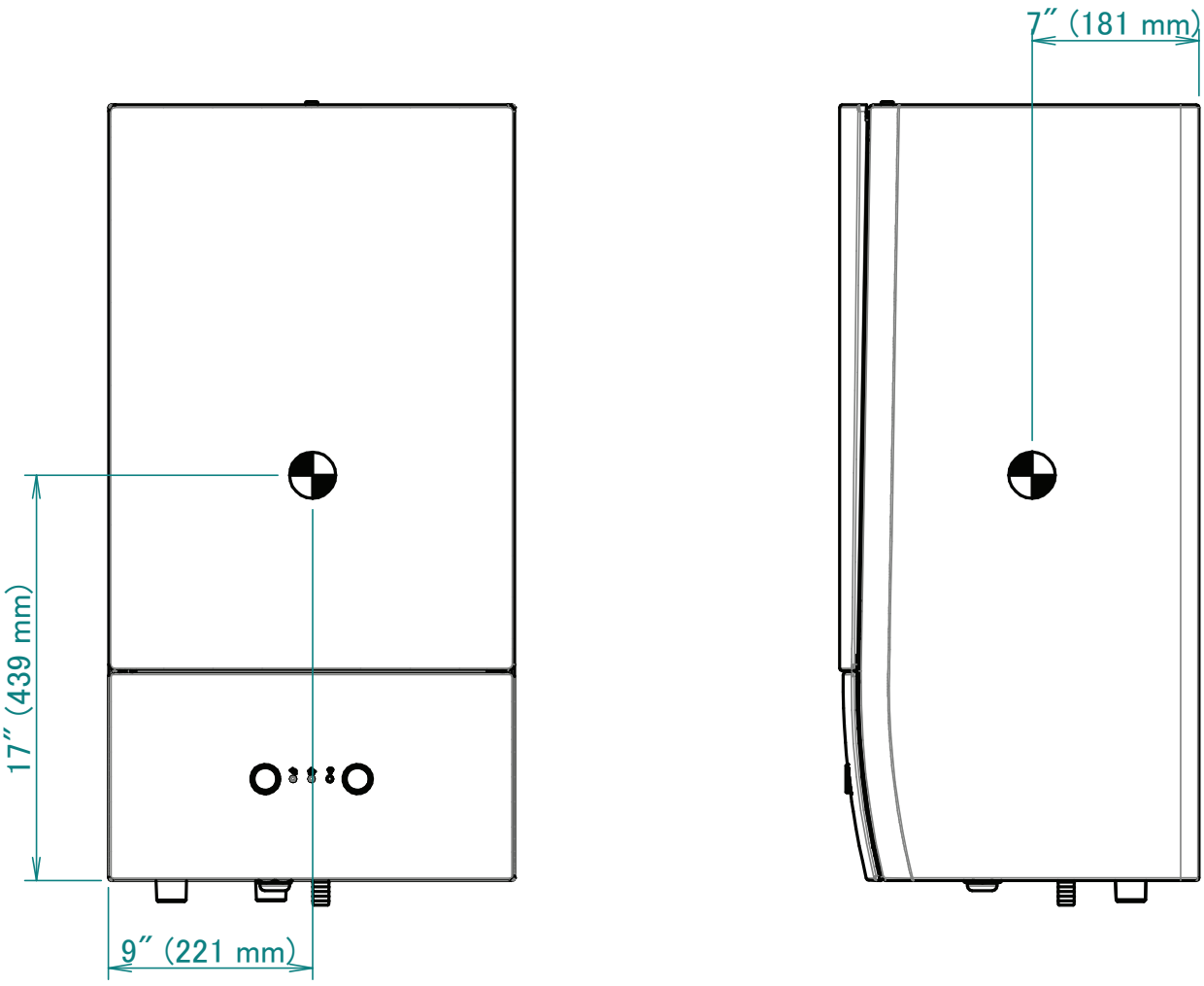
6. Center of Gravity



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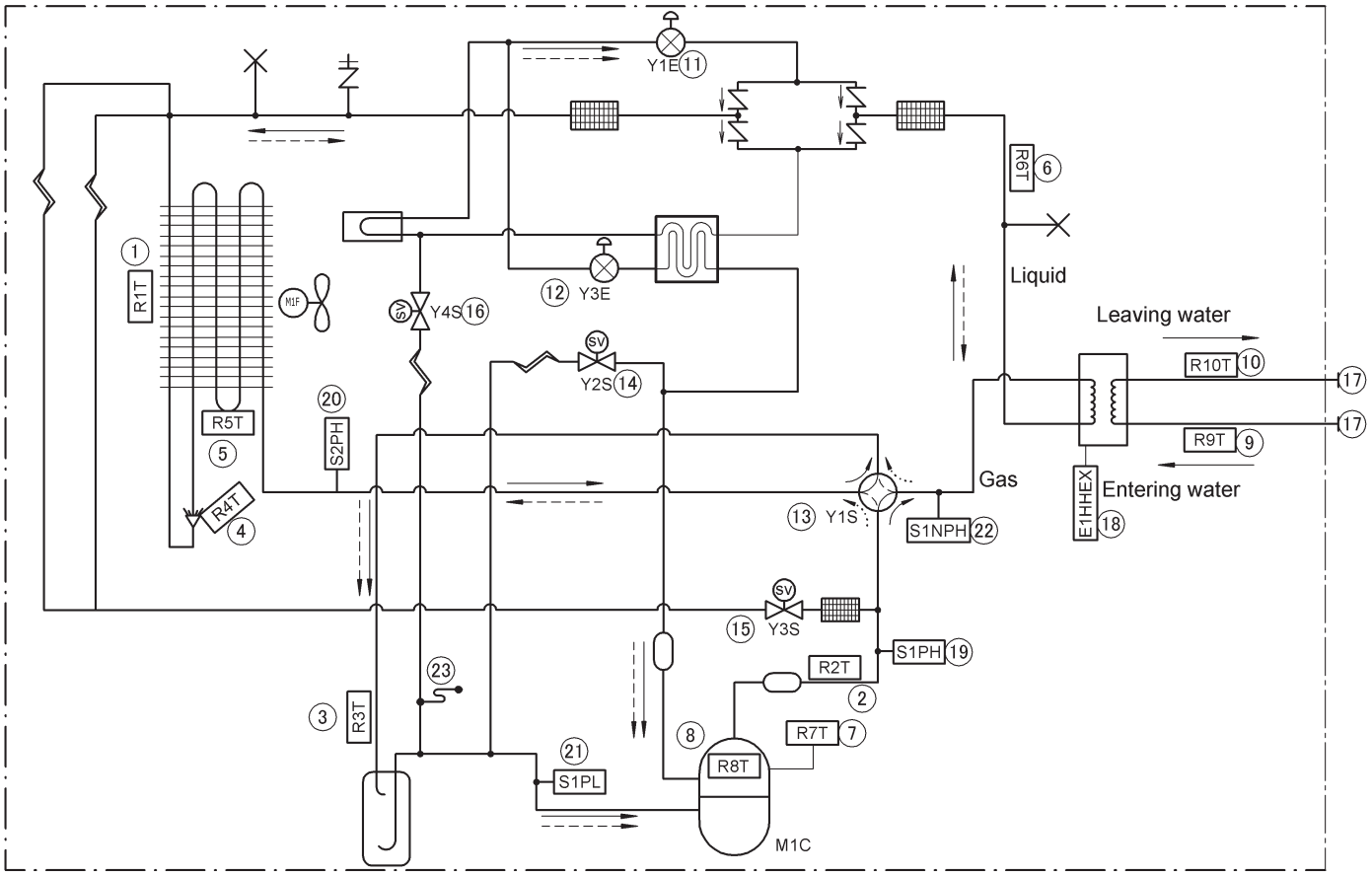
7. Piping Diagrams

7.1 Piping Diagrams: Outdoor Unit



① R1T Ambient thermistor
② R2T Thermistor (discharge)
③ R3T Thermistor (suction)
④ R4T Thermistor (heat exchanger, liquid pipe) Distributor
⑤ R5T Thermistor (heat exchanger middle)
⑥ R6T Thermistor (liquid)
⑦ R7T Thermistor (compressor shell)
⑧ R8T Thermistor (compressor port)
⑨ R9T Inlet water thermistor
⑩ R10T Outlet water thermistor
⑪ Y1E Electronic expansion valve (main)
⑫ Y3E Electronic expansion valve (injection)
⑬ Y1S Solenoid valve (4-way valve)
⑭ Y2S Solenoid valve (low pressure bypass)
⑮ Y3S Solenoid valve (hot gas bypass)
⑯ Y4S Solenoid valve (liquid injection)
⑰ Screw connection 1" NPT M
⑱ E1HHEX Plate heat exchanger Heater
⑲ S1PH High pressure switch 812 PSI (5.6 MPa)
⑳ S2PH High pressure switch 605 PSI (4.17 MPa)
㉑ S1 PL Low pressure switch
㉒ S1 NPH High pressure sensor
㉓ Fusible plug

Legend:

- Service port 5/16" flare
- Electronic expansion valve
- Economizer
- Plate heat exchanger
- Low pressure switch
- High pressure switch
- Solenoid valve
- Check valve
- Fan motor
- Pressure sensor
- Fusible plug
- Capillary tube
- Pinched pipe
- 4-way valve
- PCB Cooling
- Heating Cooling
- Compressor
- Accumulator
- Filter
- Muffler

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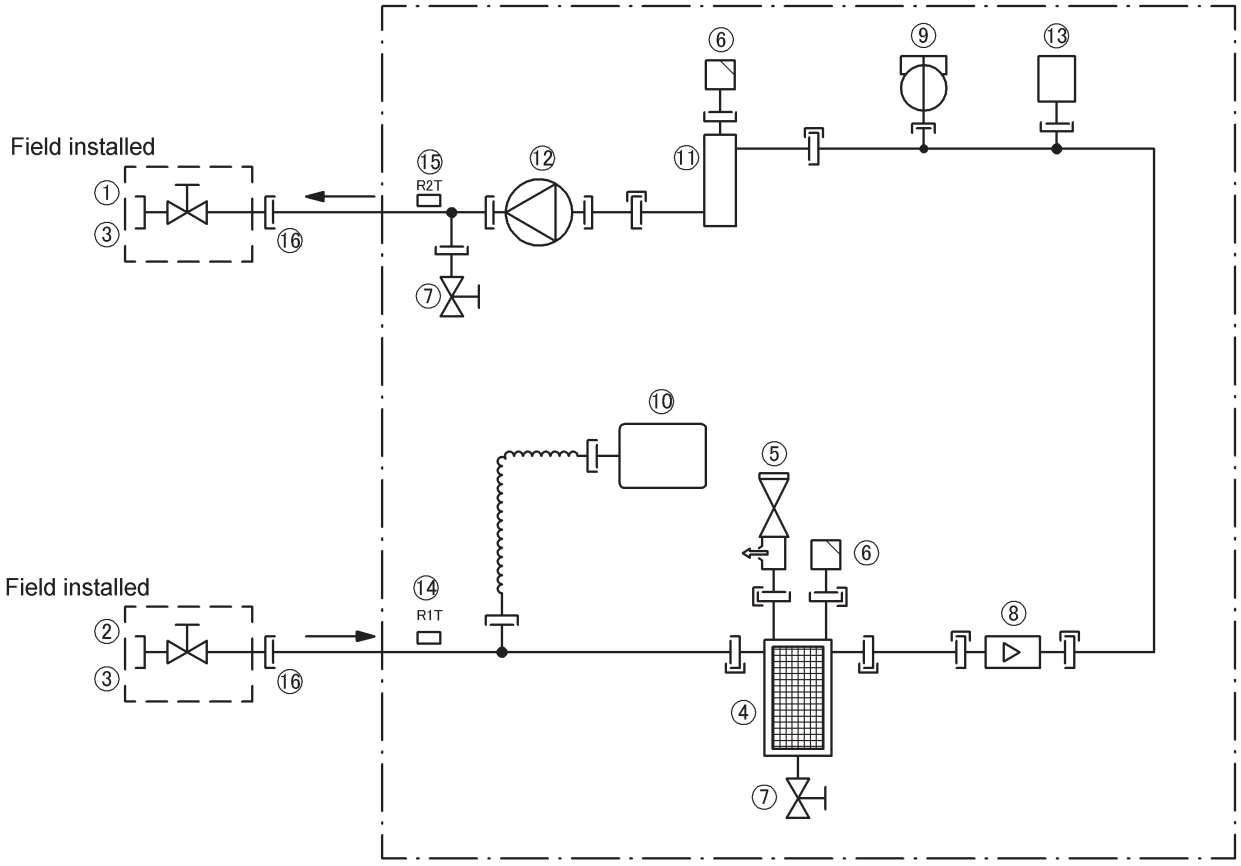
7.2 Piping Diagrams: Indoor Unit



Field piping connections

① Space heating – water OUT
② Water in connection 1" NPT
③ Shut-off valve 1" NPT (female–female)
④ Magnetic filter / dirt separator
⑤ Safety valve
⑥ Air purge
⑦ Drain valve
⑧ Flow sensor
⑨ Flow switch
⑩ Expansion vessel
⑪ Backup heater
⑫ Pump
⑬ Space heating water pressure sensor
⑭ R1T – Inlet water thermistor
⑮ R2T – Outlet water backup heater thermistor
⑯ Screw connection 1" NPT

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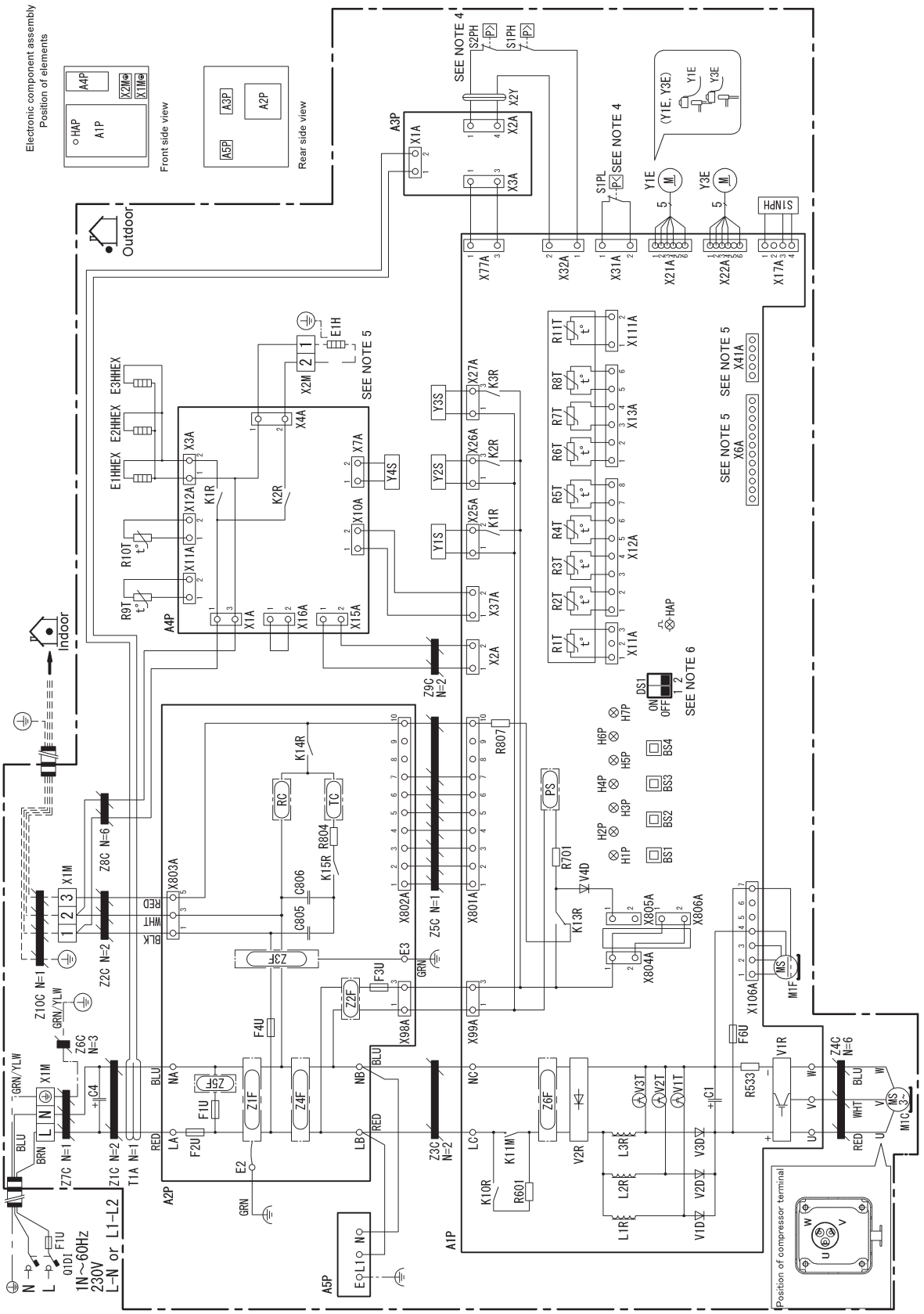
8. Wiring Diagrams

8.1 Wiring Diagrams: Outdoor Unit



Notes:

1	**Symbols:**	
	L	Live
	N	Neutral
		Protective earth
		Noiseless earth
		Field wiring
		Option
		Terminal strip
		Terminal
		Connector
		Connection
2	**Colors:**	
	BLK	Black
	RED	Red
	BLU	Blue
	WHT	White
	GRN	Green
	YLW	Yellow
	PNK	Pink
	ORG	Orange
	GRY	Gray
	BRN	Brown
3	This wiring diagram applies only to the outdoor unit.	
4	When operating, do not short-circuit protection devices S1PH, S2PH and S1PL.	
5	Refer to the combination table and the option manual for how to connect the wiring to X6A, X41A and X2M.	
6	The factory setting of all switches is OFF. Do not change the setting of the selector switch (DS1).	

Legend:

A1P	Printed circuit board (main)
A2P	Printed circuit board (noise filter)
A3P	Printed circuit board (leakage current)
A4P	Printed circuit board (ACS)
A5P	Printed circuit board (flash)
BS1~BS4 (A1P)	Push button switch
C1~C806 (A1P, A2P)	Capacitor
DS1 (A1P)	DIP switch
E1H	Drain tube heater (field supplied)
E1HHEX~E3HHEX	Plate heat exchanger heaters
F1U	Field fuse (field supplied)
F1U~F4U (A2P)	Fuse
F6U (A1P)	Fuse (T 5.0 A / 250 V)
H1P~H7P (A1P)	Light-emitting diode (service monitor is orange)
HAP (A1P)	Light-emitting diode (service monitor is green)
K1R (A1P)	Magnetic relay (Y1S)
K1R (A4P)	Magnetic relay (E1HHEX~E3HHEX)
K2R (A1P)	Magnetic relay (Y2S)
K2R (A4P)	Magnetic relay (E1H)
K3R (A1P)	Magnetic relay (Y3S)
K10R (A1P)	Magnetic relay
K11M (A1P)	Magnetic contactor
K13R~K15R (A1P, A2P)	Magnetic relay
L1R~L3R (A1P)	Reactor
M1C	Compressor motor
M1F	Fan motor
PS (A1P)	Switching power supply
Q1DI	Ground leakage circuit breaker (30 mA) (field supplied)
R533~R807 (A1P, A2P)	Resistor
R1T	Thermistor (outdoor air)
R2T	Thermistor (compressor discharge)
R3T	Thermistor (compressor suction)
R4T	Thermistor (air heat exchanger, distributor)
R5T	Thermistor (air heat exchanger, middle)
R6T	Thermistor (refrigerant liquid)
R7T	Thermistor (compressor shell)
R8T	Thermistor (compressor port)
R9T	Thermistor (entering water)
R10T	Thermistor (leaving water)
R11T	Thermistor (fin)
RC (A2P)	Signal receiver circuit
S1NPH	High pressure sensor
S1PH, S2PH	High pressure switch
S1PL	Low pressure switch
T1A	Current transformer
TC (A2P)	Signal transmission circuit
V1D~V4D (A1P)	Diode
V1R (A1P)	IGBT power module
V2R (A1P)	Diode module
V1T~V3T (A1P)	Insulated Gate Bipolar Transistor (IGBT)
X1M, X2M	Terminal strip
Y1E	Electronic expansion valve (main)
Y3E	Electronic expansion valve (injection)
Y1S	Solenoid valve (4-way valve)
Y2S	Solenoid valve (low pressure bypass)
Y3S	Solenoid valve (hot gas bypass)
Y4S	Solenoid valve (liquid injection)
Z1C~Z10C	Noise filter (ferrite core)
Z1F~Z6F (A1P, A2P)	Noise filter

8.2 Wiring Diagrams: Indoor Unit

NOTES to go through before starting the unit

X1M	: Main Terminal	X6M	: BUH Power Supply Terminal
X2M	: Field Wiring for AC	X7M, X8M	: BSH Power Supply Terminal
X5M	: Field Wiring for DC		

: Earth wiring

: Field supply

(1) : Several wiring possibilities

: Option

: Not mounted in switch box

: Wiring depending on model

: PCB

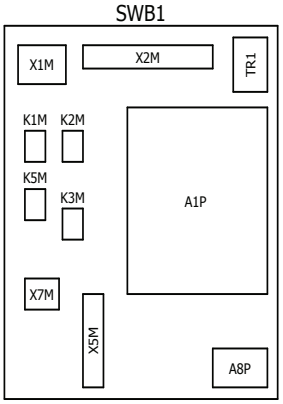
Note 1 : Connection point of the power supply for the BUH/BSH should be foreseen outside the unit.

Backup heater power supply
- ☐ 6kW (1/N~, 208V - 230V)

User installed options:
- ☐ Safety thermostat
- ☐ Demand PCB
- ☐ W-LAN Cartridge
- ☐ Domestic Hot Water Tank

Main LWT:
- ☐ On/OFF thermostat (wired)
- ☐ Heat pump convector

POSITION IN SWITCH BOX



LEGEND

Translation can be found in the installation manual.

* : Optional
\# : Field supply

Part n°		Description
A1P		Hydro PCB
A2P	*	On/OFF thermostat (PC=power circuit)
A3P	*	Heat Pump Convector
A8P	*	Demand PCB
A9P		Status Indicator
A11P		MMI Main PCB
B2L		Flow sensor
B1PW		Water pressure sensor
DS1 (A8P)	*	Dipswitch
E1H		Backup heater element
E2H		Backup heater element
E4H		Backup heater element
E*P(A9P)		Indication LED
F1B	#	Overcurrent fuse Backup Heater
F2B	#	Overcurrent fuse Booster Heater
F3B	#	Overcurrent fuse Main
F1T		Thermal Fuse backup heater
FU1 (A1P)		Fuse T 5 A 250 V for PCB
K1M, K2M		Contactor Backup Heater
K3M	*	Contactor booster heater
K5M		Safety Contactor BUH
K*R (A*P)		Relay on PCB
M1P		Main Supply Pump
M2S	#	2-Way valve for cooling mode
M3S	*	3-Way Valve for Floorheating /Domestic Hot Water
P1M		MMI Display

Part n°		Description
Q1L	#	Thermal protector backup heater
Q2L	#	Thermal protector booster heater
Q4L	#	Safety thermostat
Q*DI	#	Earth Leakage Circuit Breaker
R1T (A1P)		Inlet Water Thermistor
R1T (A2P)	*	Ambient sensor On/OFF thermostat
R2T (A1P)		Outlet backup heater thermistor
R5T (A1P)	*	Domestic hot water thermistor
S1L		Flow Switch
S1S	#	Preferential kWh rate PS contact
S2S	#	Electrical meter pulse input 1
S3S	#	Electrical meter pulse input 2
S4S	#	Smartgrid feed-in
S6S-S9S	*	Digital Power Limitation Inputs
S10S-S11S	#	Low voltage smartgrid contact
SW 1~2 (A11P)		Turn Buttons
SW 1~2 (A11P)		Push Buttons
TR1		Power Supply Transformer
X6M		BUH Power Supply Terminal Strip
X6M		BSH Power Supply Connector
X7M, X8M		BSH Power Supply Terminal Strip
X*A, X*B, X*Y, X*Y*, X*H, X*H*		Connector
X*M		Terminal strip

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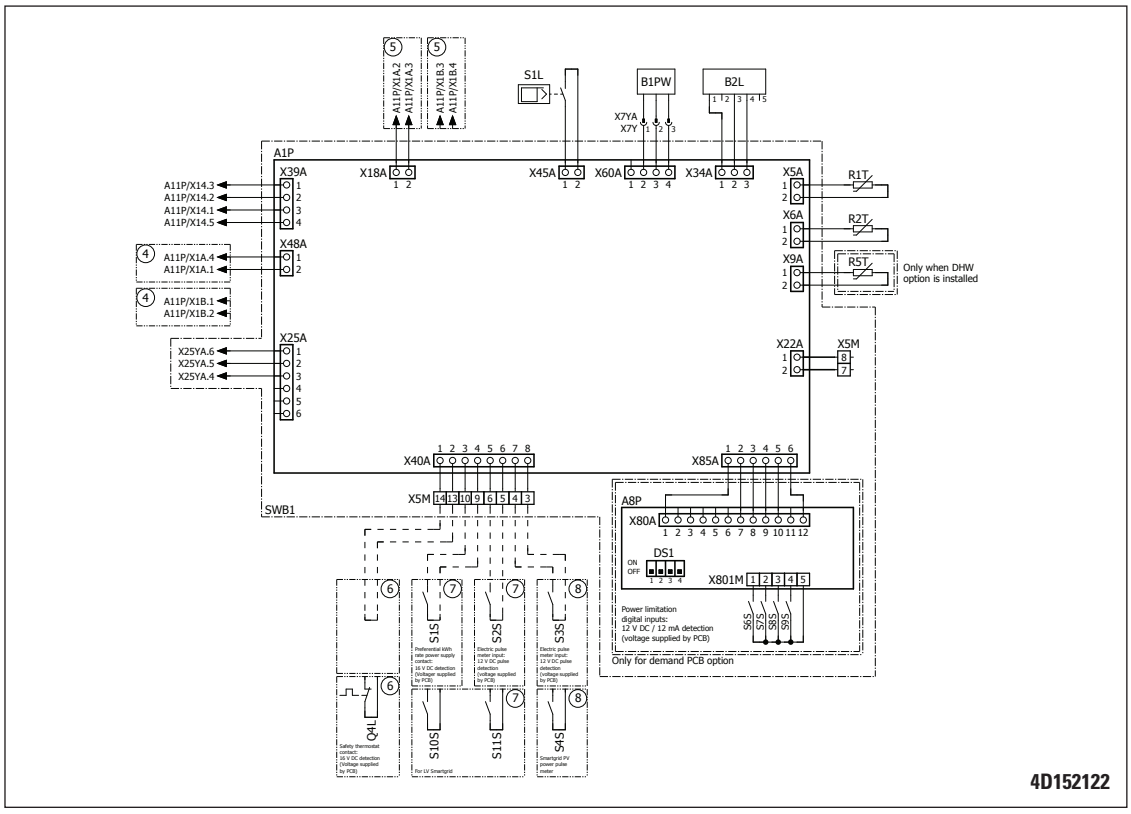
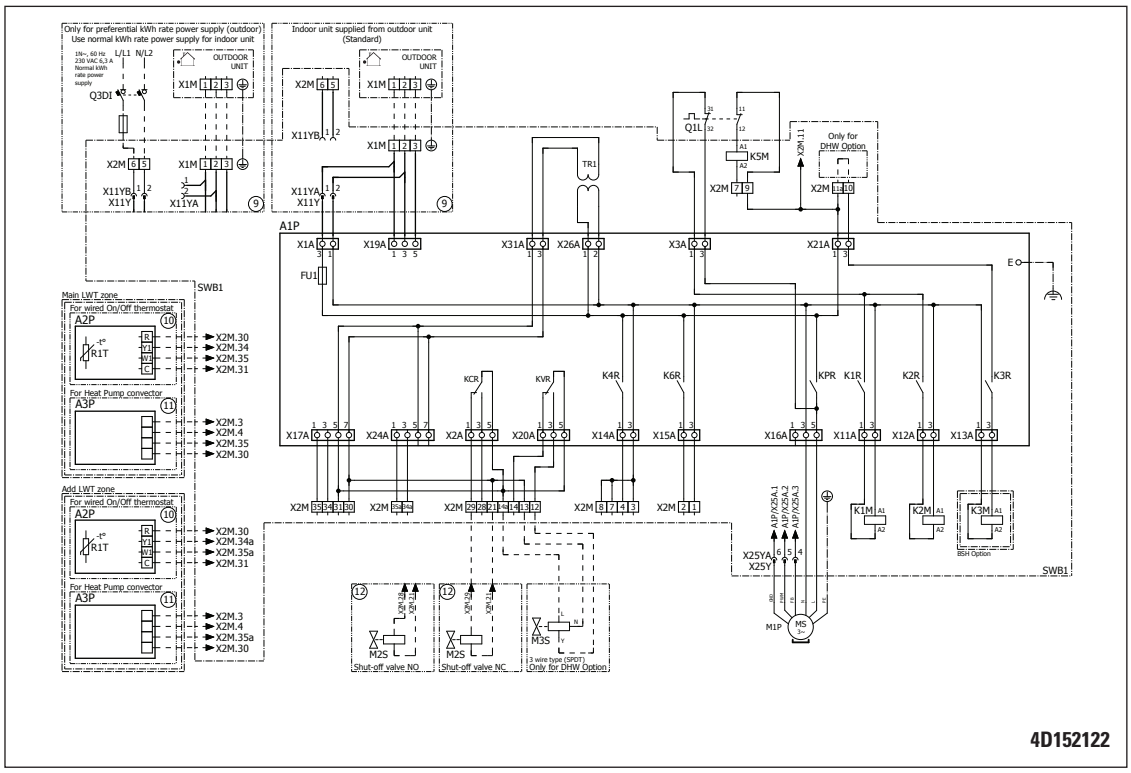
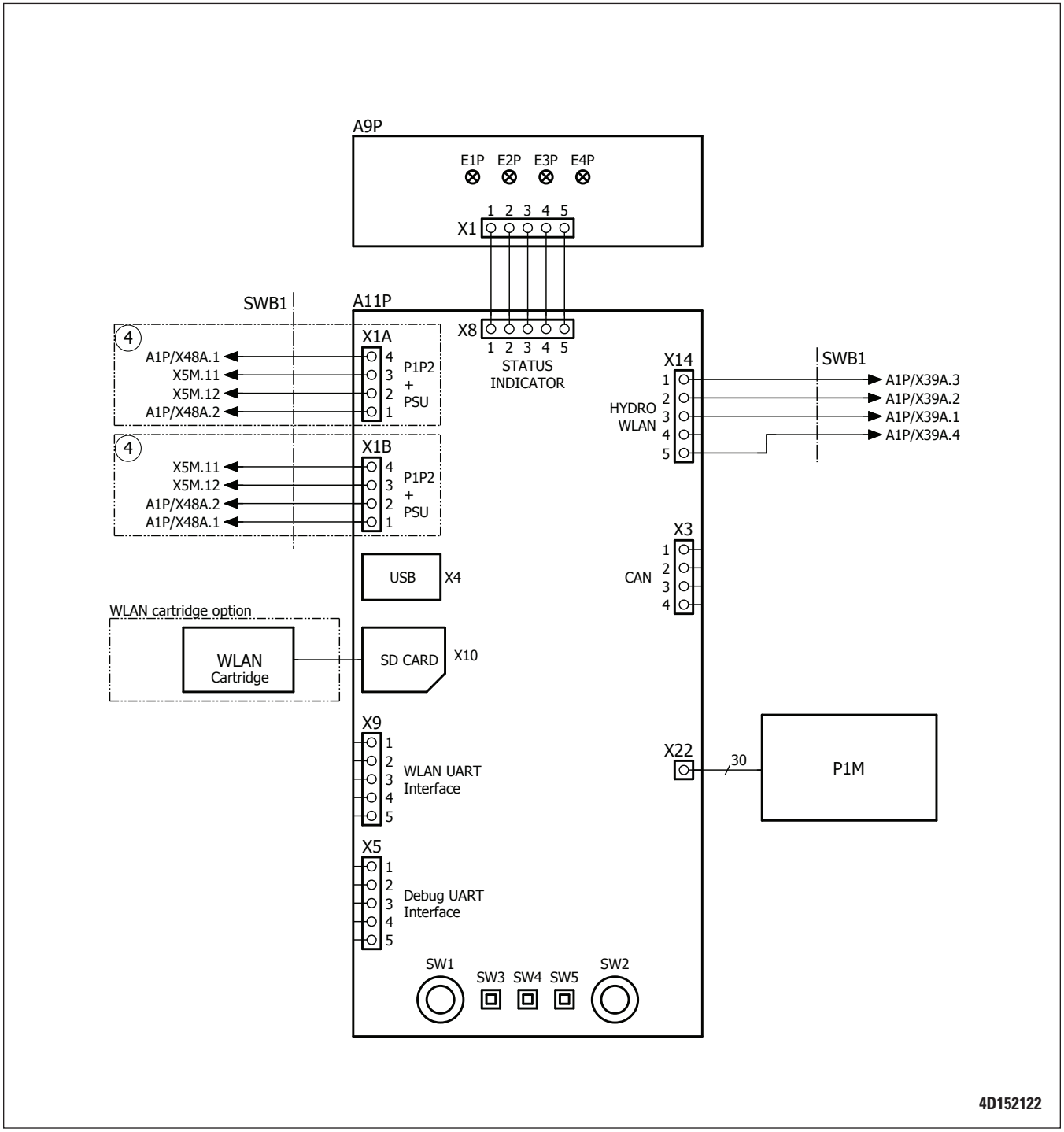
8.2 Wiring Diagrams: Indoor Unit (cont.)

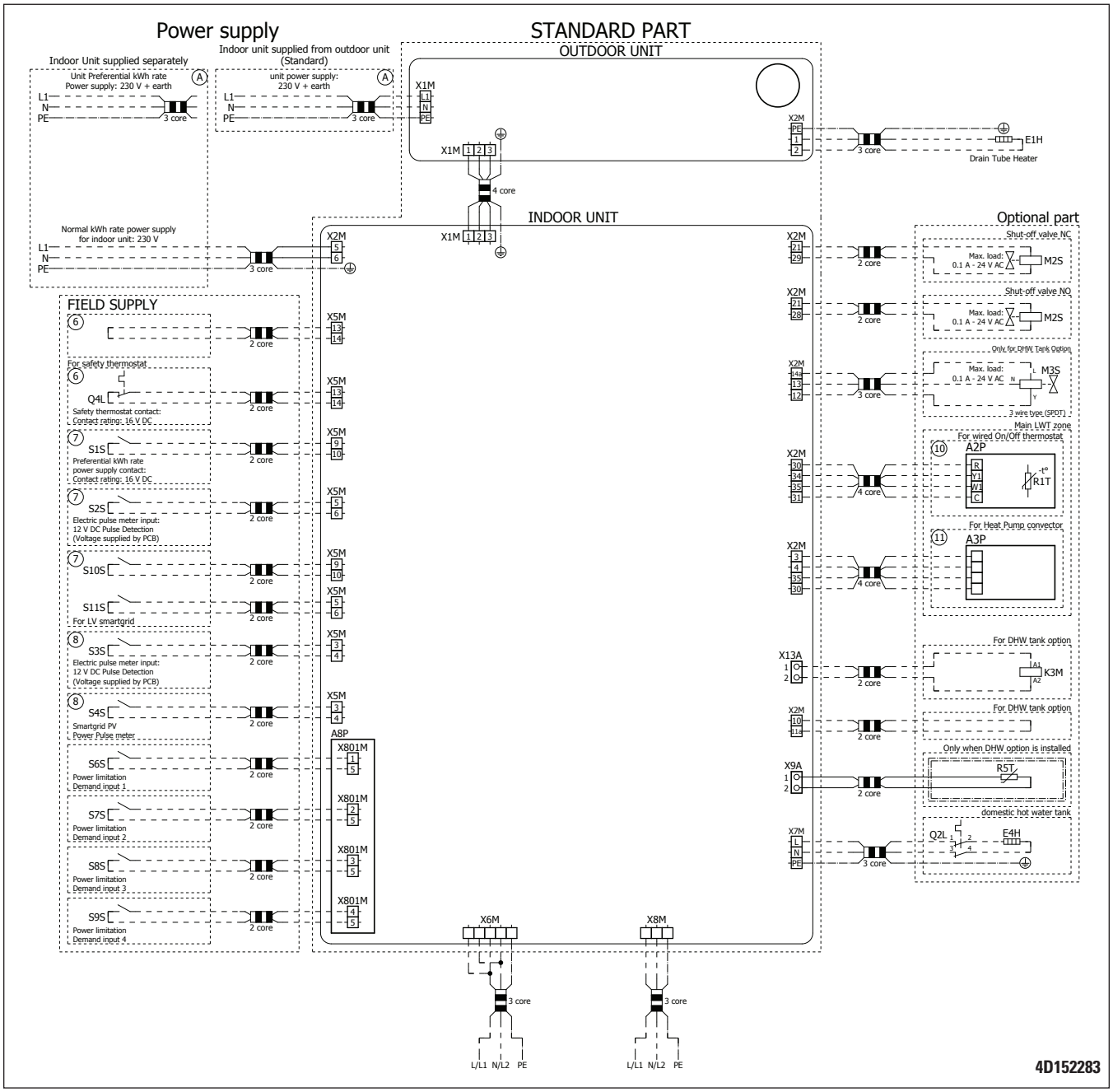




8.2 Wiring Diagrams: Indoor Unit



9. External Connection Diagrams



Notes

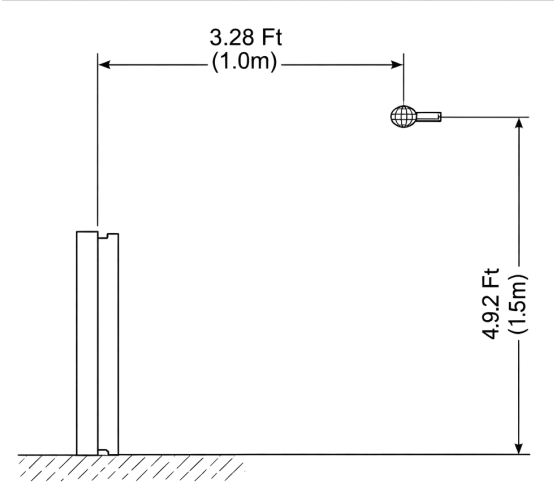
- In case of signal cable: keep minimum distance to power cables > 5 cm

10. Sound Data

Sound data	Ta	EW	LW	Capacity	Model name	Sound pressure level SPL (dBA)	Sound power level SPW (dBA)
Nominal heating	44.6°F (7°C)	86°F (30°C)	95°F (35°C)	19.4 kBtu/h (5.69 kW)	UPRA036DAVK	43	56
	44.6°F (7°C)	86°F (30°C)	95°F (35°C)	30.7 kBtu/h (9 kW)	UPRA043DAVK	48	59
Nominal cooling	95°F (35°C)	53.6°F (12°C)	44.6°F (7°C)	23.5 kBtu/h (6.9 kW)	UPRA036DAVK	52	65
	95°F (35°C)	53.6°F (12°C)	44.6°F (7°C)	30.2 kBtu/h (8.86 kW)	UPRA043DAVK	52	65

Notes

1. Data is valid at free field condition. Measured in a semi-anechoic chamber.
2. dBA = A-weighted sound pressure level (A scale according to IEC).
3. Reference acoustic pressure 0 dB = 20 µPa
4. If the sound is measured under actual installation conditions,the measured value will be higher due to environmental noise and sound reflections.
5. The SPL and SPW can vary depending on the actual operating condition.



Measuring location (discharge side)

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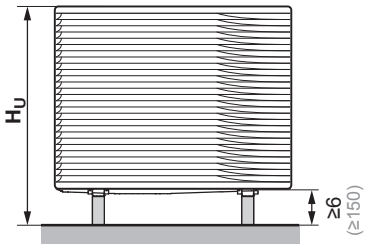
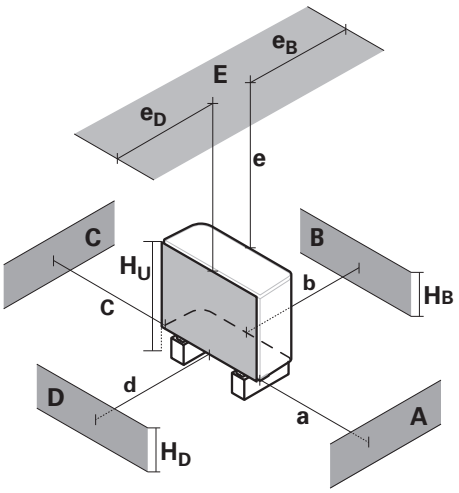
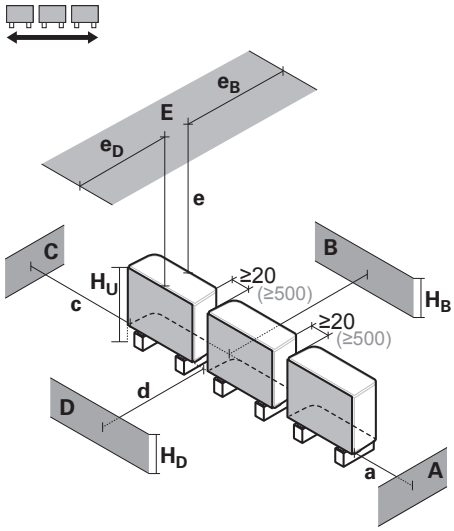
11. Installation Method

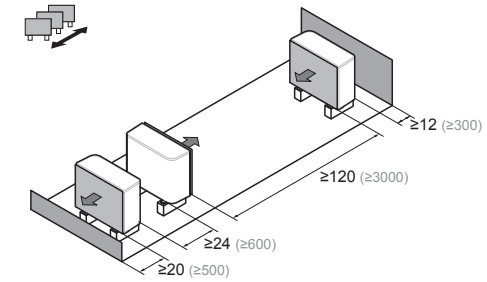
11.1 Installation Method: Outdoor unit







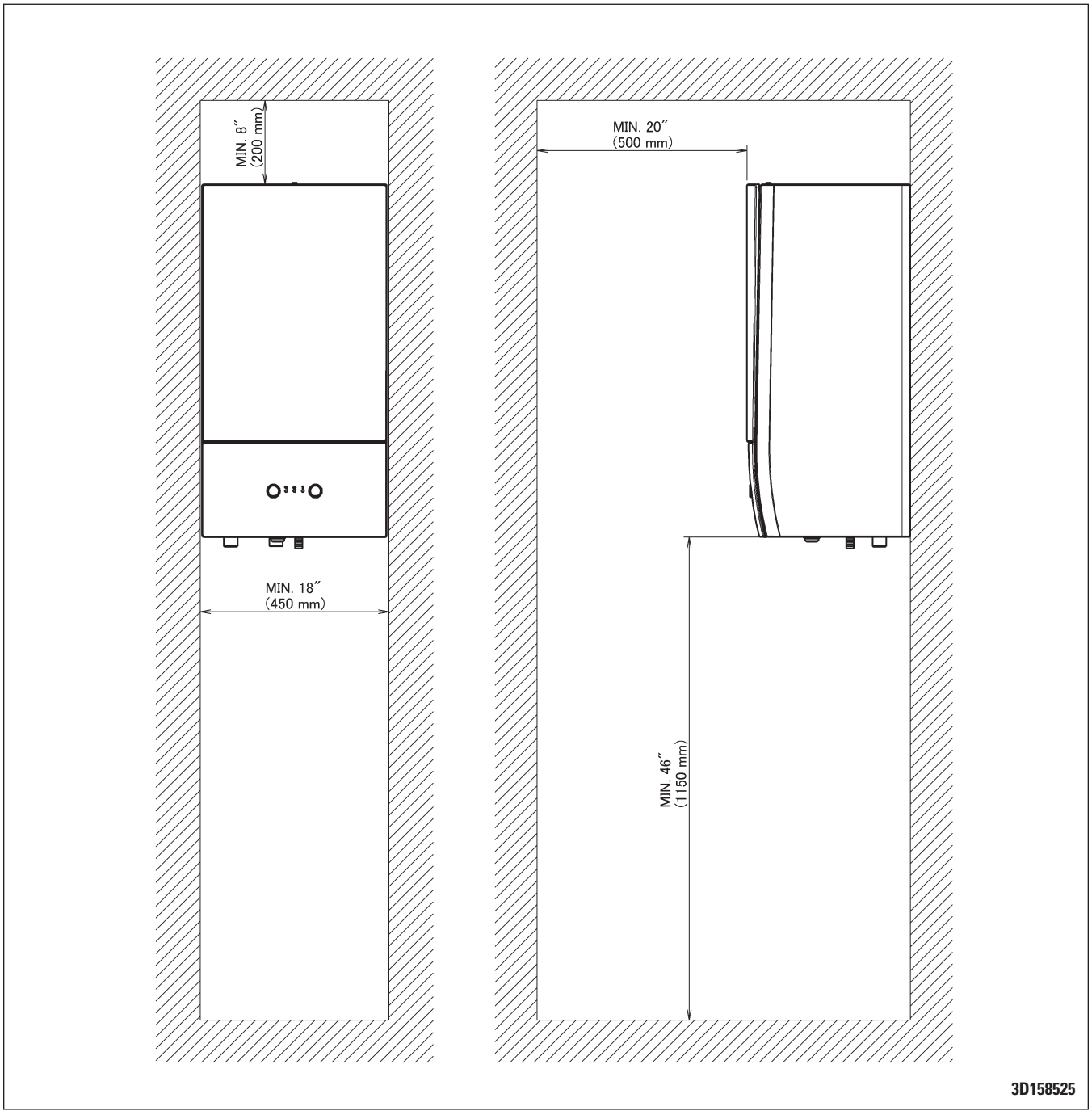
A-E	H_B H_D H_U		inch (mm) a	b	c	d	e	e_B	e_D
B	—			≥12 (≥300)					
A, B, C	—		≥20 (≥500)	≥12 (≥300)	≥4 (≥100)				
B, E	—			≥12 (≥300)			≥40 (≥1000)		≤20 (≤500)
A, B, C, E	—		≥20 (≥500)	≥12 (≥300)	≥6 (≥150)		≥40 (≥1000)		≤20 (≤500)
D	—					≥20 (≥500)			
D, E	—					≥20 (≥500)	≥40 (≥1000)	≤20 (≤500)	
A, C	—		≥20 (≥500)		≥4 (≥100)				
B, D	$(H_B$ or $H_D) \le H_U$			≥12 (≥300)		≥20 (≥500)			
	$(H_B$ and $H_D) > H_U$		X						
B, D, E	$(H_B$ or $H_D) \le H_U$	$H_B > H_D$		≥12 (≥300)		≥40 (≥1000)	≥40 (≥1000)		≤20 (≤500)
		$H_B < H_D$		≥12 (≥300)		≥40 (≥1000)	≥40 (≥1000)	≤20 (≤500)	
	$(H_B$ and $H_D) > H_U$		X						
A, C, D, E	—		≥20 (≥500)		≥6 (≥150)	≥20 (≥500)	≥40 (≥1000)	≤20 (≤500)	
A, B, C, D, E	$(H_B$ or $H_D) \le H_U$	$H_B > H_D$	≥20 (≥500)	≥12 (≥300)	≥6 (≥150)	≥40 (≥1000)	≥40 (≥1000)		≤20 (≤500)
		$H_B < H_D$	≥20 (≥500)	≥12 (≥300)	≥6 (≥150)	≥40 (≥1000)	≥40 (≥1000)	≤20 (≤500)	
	$(H_B$ and $H_D) > H_U$		X						
B	—			≥12 (≥300)					
A, B, C	—		≥20 (≥500)	≥12 (≥300)	≥20 (≥500)				
B, E	—			≥12 (≥300)			≥40 (≥1000)		≤20 (≤500)
A, B, C, E	—		≥20 (≥500)	≥12 (≥300)	≥20 (≥500)		≥40 (≥1000)		≤20 (≤500)
D	—					≥20 (≥500)			
D, E	—					≥20 (≥500)	≥40 (≥1000)	≤20 (≤500)	
A, C	—		≥20 (≥500)		≥20 (≥500)				
B, D	$(H_B$ or $H_D) \le H_U$			≥12 (≥300)		≥20 (≥500)			
	$(H_B$ and $H_D) > H_U$		X						
B, D, E	$(H_B$ or $H_D) \le H_U$	$H_B > H_D$		≥12 (≥300)		≥40 (≥1000)	≥40 (≥1000)		≤20 (≤500)
		$H_B < H_D$		≥12 (≥300)		≥40 (≥1000)	≥40 (≥1000)	≤20 (≤500)	
	$(H_B$ and $H_D) > H_U$		X						
A, C, D, E	—		≥20 (≥500)		≥20 (≥500)	≥20 (≥500)	≥40 (≥1000)	≤20 (≤500)	
A, B, C, D, E	$(H_B$ or $H_D) \le H_U$	$H_B > H_D$	≥20 (≥500)	≥12 (≥300)	≥20 (≥500)	≥40 (≥1000)	≥40 (≥1000)		≤20 (≤500)
		$H_B < H_D$	≥20 (≥500)	≥12 (≥300)	≥20 (≥500)	≥40 (≥1000)	≥40 (≥1000)	≤20 (≤500)	
	$(H_B$ and $H_D) > H_U$		X						



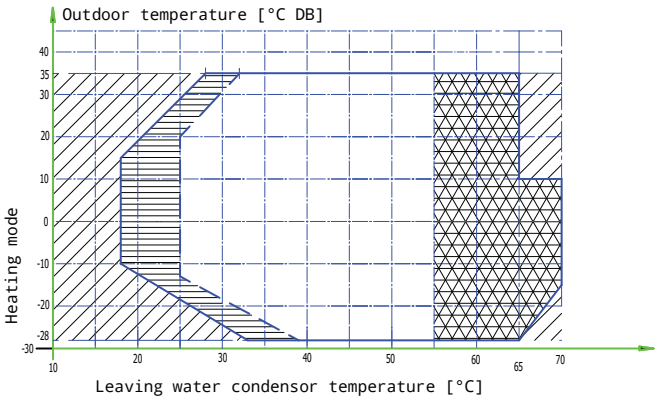
Installation requirements for UPRA-DAVK units

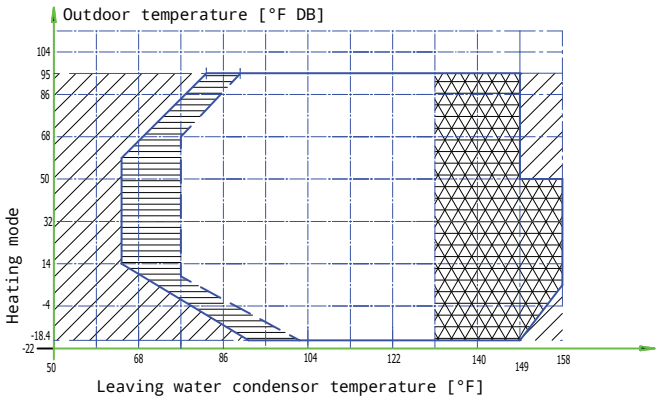
Legend	Symbols
A, C	Obstacles (walls/baffle plates)
B	Obstacles on the suction side
D	Obstacles on the discharge side
E	Obstacle (roof)
a,b,c,d,e	Minimum service space between the unit and obstacles A, B, C, D and E
e_B	Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle B
e_D	Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle D
H_U	Height of the unit
H_B, H_D	Height of obstacles B and D
X	Not allowed

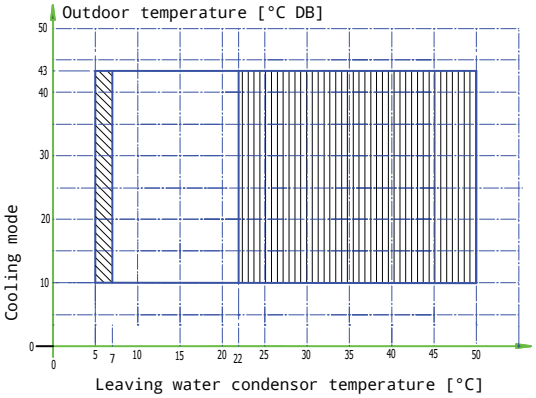
11.2 Installation Method: Indoor Unit

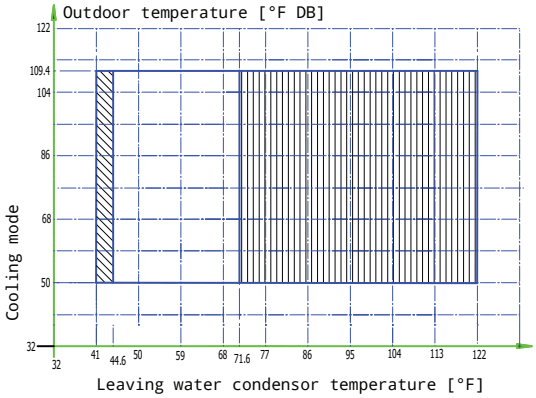


12. Operation Range









Legend:

Backup heater operation only (no outdoor unit operation)

Outdoor unit operation if controller setpoint is regulated to minimal leaving water temperature request.

Pull-down area

Outdoor unit operation if setpoint >130°F / 55°C and ΔT = 18°F / 10°C (ΔT = outlet – inlet temperature)

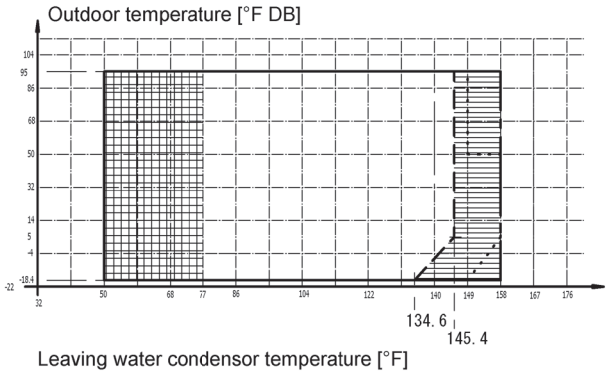
In case anti-freeze valve is part of the system, then the minimum setpoint is 44°F / 7°C.

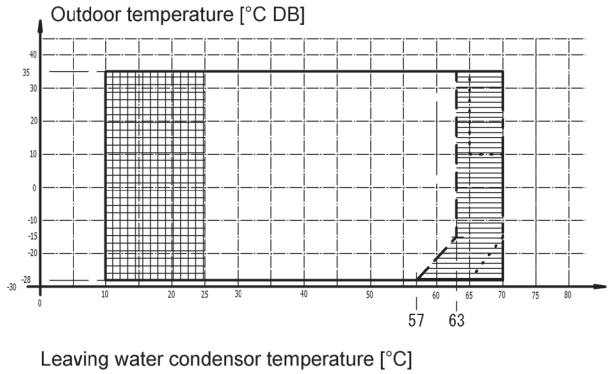
Remark:

In restricted power supply mode, the outdoor unit, booster heater and backup heater can only operate separately.

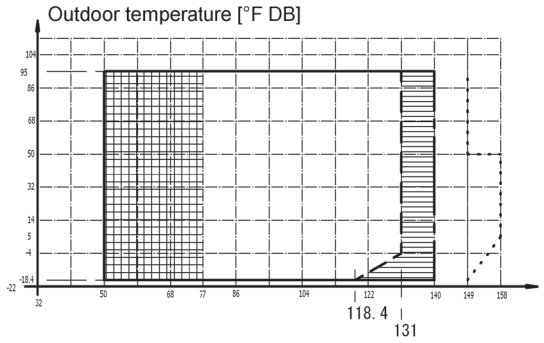
Domestic hot water heating mode

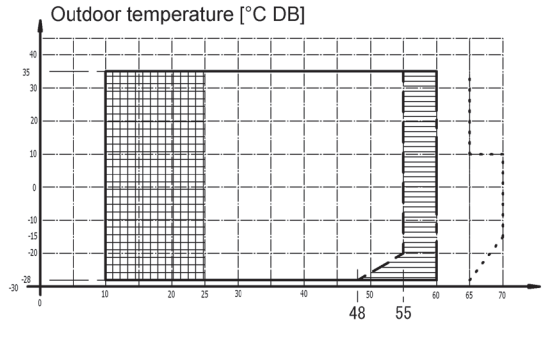
UHWS*50*
UHWS*80* + Third-party with identical specifications as ·UHWS*50*·





UHWS*40* + Third-party with identical specifications as ·UHWS*40*·





Legend:

— — Setpoint [°C/°F]

· · · · Domestic hot water leaving water temperature [°C/°F]

— - — Maximum leaving water temperature [°C/°F]

Pull-up area

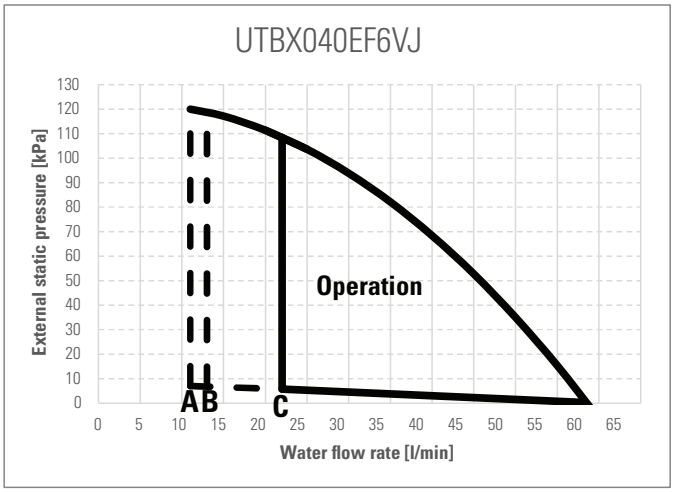
Booster heater only operation (if a booster heater is a part of the system)

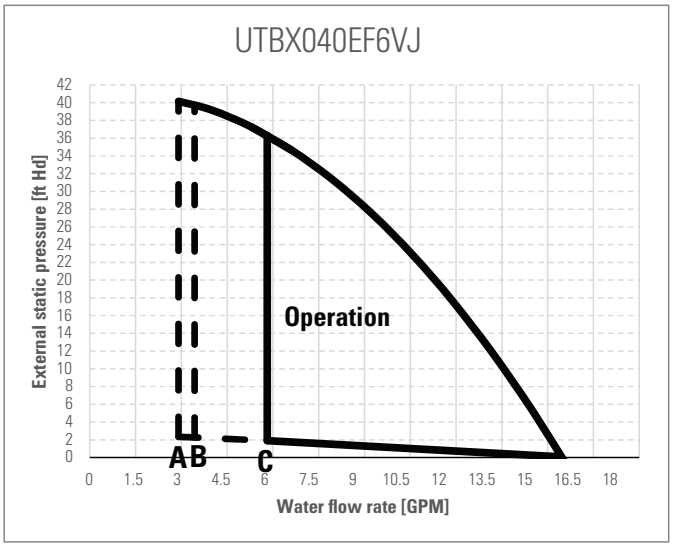
Remark:

1. In restricted power supply mode (UHWS* only), the outdoor unit, booster heater and backup heater can only operate separately.
2. Third-party with identical specifications as UHWS*40*. Coil surface > 11.3 ft² (1.05 m²)
   Tank thermistor: top part of heat pump coil. Small overlap.
3. Third-party with identical specifications as UHWS*50*. Coil surface > 19.3 ft² (1.80 m²)
   Tank thermistor: top part of heat pump coil. Small overlap.

13. Hydraulic Performance

13.1 Static Pressure Drop Unit





A Minimum water flow rate during normal operation
B Minimum water flow rate during backup heater operation
C Minimum water flow rate during defrost operation

Operation area is extended to lower flow rates only in case the unit operates with heat pump only.
(Not in startup, no BUH operation, no defrost operation.)

See dashed lines

Notes:

1. Selecting a flow outside the operating area can damage the unit or cause the unit to malfunction.
2. See also the minimum and maximum allowed water flow range in the technical specifications.
3. Water quality must comply with the applicable local standard.

Warning

- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorised parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Read the user's manual carefully before using this product. The user's manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

If you have any enquiries, please contact your local importer, distributor and/or retailer.

CAUTIONS ON PRODUCT CORROSION

1. Heat Pumps should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the outdoor unit close to the sea shore, contact your local distributor.

Notes

Notes