

(Effective March 15, 2024)

WAC 51-11C-403329 Tables C403.3.2(9) through C403.3.2(16)—HVAC equipment minimum efficiency requirements.

Table C403.3.2(9)

Electrically Operated Variable Refrigerant Flow Air-to-Air and Applied Heat Pumps—Minimum Efficiency Requirements^b

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^a
VRF Air Cooled (cooling mode)	< 65,000 Btu/h	All	VRF Multi-Split System	13.0 SEER	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System	11.0 EER 14.6 IEER	
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System with Heat Recovery	10.8 EER 14.4 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System	10.6 EER 13.9 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System with Heat Recovery	10.4 EER 13.7 IEER	
	≥ 240,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System	9.5 EER 12.7 IEER	
	≥ 240,000 Btu/h	Electric Resistance (or none)	VRF Multi-Split System with Heat Recovery	9.3 EER 12.5 IEER	
VRF Water Source (cooling mode)	< 65,000 Btu/h	All	VRF Multi-Split System 86°F entering water	12.0 EER 16.0 IEER	AHRI 1230
	< 65,000 Btu/h	All	VRF Multi-Split System with Heat Recovery 86°F entering water	11.8 EER 15.8 IEER	
	≥ 65,000 Btu/h and < 135,000 Btu/h	All	VRF Multi-Split System 86°F entering water	12.0 EER 16.0 IEER	
	≥ 65,000 Btu/h and < 135,000 Btu/h	All	VRF Multi-Split System with Heat Recovery 86°F entering water	11.8 EER 15.8 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	All	VRF Multi-Split System 86°F entering water	10.0 EER 14.0 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	All	VRF Multi-Split System with Heat Recovery 86°F entering water	9.8 EER 13.8 IEER	
	≥ 240,000 Btu/h	All	VRF Multi-Split System 86°F entering water	10.0 EER 12.0 IEER	
	≥ 240,000 Btu/h	All	VRF Multi-Split System with Heat Recovery 86°F entering water	9.8 EER 11.8 IEER	
	< 135,000 Btu/h	All	VRF Multi-Split System 59°F entering water	16.2 EER	
	< 135,000 Btu/h	All	VRF Multi-Split System with Heat Recovery 59°F entering water	16.0 EER	

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^a
VRF Groundwater Source (cooling mode)	≥ 135,000 Btu/h	All	VRF Multi-Split System 59°F entering water	13.8 EER	AHRI 1230
	≥ 135,000 Btu/h	All	VRF Multi-Split System with Heat Recovery 59°F entering water	13.6 EER	
VRF Ground Source (cooling mode)	< 135,000 Btu/h	All	VRF Multi-Split System 77°F entering water	13.4 EER	AHRI 1230
	< 135,000 Btu/h	All	VRF Multi-Split System with Heat Recovery 77°F entering water	13.2 EER	
	≥ 135,000 Btu/h	All	VRF Multi-Split System 77°F entering water	11.0 EER	
	≥ 135,000 Btu/h	All	VRF Multi-Split System with Heat Recovery 77°F entering water	10.8 EER	
VRF Air Cooled (heating mode)	< 65,000 Btu/h (cooling capacity)		VRF Multi-Split System	7.7 HSPF	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h (cooling capacity)		VRF Multi-Split System 47°F db/43°F wb outdoor air 17°F db/15°F wb outdoor air	3.3 COP 2.25 COP	
	≥ 135,000 Btu/h (cooling capacity)		VRF Multi-Split System 47°F db/43°F wb outdoor air 17°F db/15°F wb outdoor air	3.2 COP 2.05 COP	
VRF Water Source (heating mode)	< 65,000 Btu/h (cooling capacity)		VRF Multi-Split System 68°F entering water	4.3 COP	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h (cooling capacity)		VRF Multi-Split System 68°F entering water	4.3 COP	
	≥ 135,000 Btu/h and < 240,000 Btu/h (cooling capacity)		VRF Multi-Split System 68°F entering water	4.0 COP	
	≥ 240,000 Btu/h (cooling capacity)		VRF Multi-Split System 68°F entering water	3.9 COP	
VRF Groundwater Source (heating mode)	< 135,000 Btu/h (cooling capacity)		VRF Multi-Split System 50°F entering water	3.6 COP	AHRI 1230
	≥ 135,000 Btu/h (cooling capacity)		VRF Multi-Split System 50°F entering water	3.3 COP	
VRF Ground Source (heating mode)	< 135,000 Btu/h (cooling capacity)		VRF Multi-Split System 32°F entering water	3.1 COP	AHRI 1230
	≥ 135,000 Btu/h (cooling capacity)		VRF Multi-Split System 32°F entering water	2.8 COP	

For SI: °C = [(°F) - 32]/1.8, 1 British thermal unit per hour = 0.2931 W, db = dry bulb temperature, wb = wet bulb temperature.

^a Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

^b This table is a replica of ASHRAE 90.1 Table 6.8.1-9 Electrically Operated Variable-Refrigerant-Flow and Applied Heat Pumps—Minimum Efficiency Requirements.

Table C403.3.2(10)
Floor-Mounted Air Conditioners and Condensing Units Serving Computer Rooms—Minimum Efficiency Requirements^b

Equipment Type	Standard Model	Net Sensible Cooling Capacity	Minimum Net Sensible COP	Rating Conditions Return Air (dry bulb/dew point)	Test Procedure ^a
Air cooled	Downflow	< 80,000 Btu/h	2.70	85°F/52°F (Class 2)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.58		
		≥ 295,000 Btu/h	2.36		
	Upflow - Ducted	< 80,000 Btu/h	2.67		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.55		
		≥ 295,000 Btu/h	2.33		
	Upflow - Nonducted	> 65,000 Btu/h	2.16	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.04		
		≥ 240,000 Btu/h	1.89		
Horizontal	> 65,000 Btu/h	2.65	95°F/52°F (Class 3)		
	≥ 65,000 Btu/h and < 240,000 Btu/h	2.55			
	≥ 240,000 Btu/h	2.47			
Air cooled with fluid economizer	Downflow	< 80,000 Btu/h	2.70	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.58		
		≥ 295,000 Btu/h	2.36		
	Upflow - Ducted	< 80,000 Btu/h	2.67		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.55		
		≥ 295,000 Btu/h	2.33		
	Upflow - Nonducted	> 65,000 Btu/h	2.09	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	1.99		
		≥ 240,000 Btu/h	1.81		
Horizontal	> 65,000 Btu/h	2.65	95°F/52°F (Class 3)		
	≥ 65,000 Btu/h and < 240,000 Btu/h	2.55			
	≥ 240,000 Btu/h	2.47			
Water cooled	Downflow	< 80,000 Btu/h	2.82	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.73		
		≥ 295,000 Btu/h	2.67		
	Upflow - Ducted	< 80,000 Btu/h	2.79		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.70		
		≥ 295,000 Btu/h	2.64		
	Upflow - Nonducted	> 65,000 Btu/h	2.43	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.32		
		≥ 240,000 Btu/h	2.20		
Horizontal	> 65,000 Btu/h	2.79	95°F/52°F (Class 3)		
	≥ 65,000 Btu/h and < 240,000 Btu/h	2.68			
	≥ 240,000 Btu/h	2.60			

Equipment Type	Standard Model	Net Sensible Cooling Capacity	Minimum Net Sensible COP	Rating Conditions Return Air (dry bulb/dew point)	Test Procedure ^a
Water cooled with fluid economizer	Downflow	< 80,000 Btu/h	2.77	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.68		
		≥ 295,000 Btu/h	2.61		
	Upflow - Ducted	< 80,000 Btu/h	2.74		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.65		
		≥ 295,000 Btu/h	2.58		
	Upflow - Nonducted	> 65,000 Btu/h	2.35	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.24		
		≥ 240,000 Btu/h	2.12		
Horizontal	> 65,000 Btu/h	2.71	95°F/52°F (Class 3)		
	≥ 65,000 Btu/h and < 240,000 Btu/h	2.60			
	≥ 240,000 Btu/h	2.54			
Glycol cooled	Downflow	< 80,000 Btu/h	2.56	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.24		
		≥ 295,000 Btu/h	2.21		
	Upflow - Ducted	< 80,000 Btu/h	2.53		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.21		
		≥ 295,000 Btu/h	2.18		
	Upflow - Nonducted	> 65,000 Btu/h	2.08	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	1.90		
		≥ 240,000 Btu/h	1.81		
Horizontal	> 65,000 Btu/h	2.48	95°F/52°F (Class 3)		
	≥ 65,000 Btu/h and < 240,000 Btu/h	2.18			
	≥ 240,000 Btu/h	2.18			
Glycol cooled with fluid economizer	Downflow	< 80,000 Btu/h	2.51	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.19		
		≥ 295,000 Btu/h	2.15		
	Upflow - Ducted	< 80,000 Btu/h	2.48		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.16		
		≥ 295,000 Btu/h	2.12		
	Upflow - Nonducted	> 65,000 Btu/h	2.00	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	1.82		
		≥ 240,000 Btu/h	1.73		
Horizontal	> 65,000 Btu/h	2.44	95°F/52°F (Class 3)		
	≥ 65,000 Btu/h and < 240,000 Btu/h	2.10			
	≥ 240,000 Btu/h	2.10			

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) - 32]/1.8.

- ^a Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
- ^b This table is a replica of ASHRAE 90.1 Table 6.8.1-10 Floor-Mounted Air Conditioners and Condensing Units Serving Computer Rooms—Minimum Efficiency Requirements.

Table C403.3.2(11)
Vapor-Compression-Based Indoor Pool Dehumidifiers—Minimum Efficiency Requirements^b

Equipment Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^a
Single package indoor (with or without economizer)	Rating Conditions: A or C	3.5 MRE	AHRI 910
Single package indoor water cooled (with or without economizer)	Rating Conditions: A, B or C	3.5 MRE	
Single package indoor air cooled (with or without economizer)	Rating Conditions: A, B or C	3.5 MRE	
Split system indoor air cooled (with or without economizer)	Rating Conditions: A, B or C	3.5 MRE	

- ^a Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
- ^b This table is a replica of ASHRAE 90.1 Table 6.8.1-11 Vapor-Compressor-Based Indoor Pool Dehumidifiers—Minimum Efficiency Requirements.

Table C403.3.2(12)
Electrically Operated DX-DOAS Units, Single-Package and Remote Condenser, Without Energy Recovery—Minimum Efficiency Requirements^b

Equipment Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^a
Air cooled (dehumidification mode)		4.0 ISMRE	AHRI 920
Air source heat pumps (dehumidification mode)		4.0 ISMRE	AHRI 920
Water cooled (dehumidification mode)	Cooling tower condenser water	4.9 ISMRE	AHRI 920
	Chilled water	6.0 ISMRE	
Air source heat pump (heating mode)		2.7 ISCOP	AHRI 920
Water source heat pump (dehumidification mode)	Ground source, closed loop	4.8 ISMRE	AHRI 920
	Ground-water source	5.0 ISMRE	
	Water source	4.0 ISMRE	
Water source heat pump (heating mode)	Ground source, closed loop	2.0 ISCOP	AHRI 920
	Ground-water source	3.2 ISCOP	
	Water source	3.5 ISCOP	

- ^a Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
- ^b This table is a replica of ASHRAE 90.1 Table 6.8.1-13 Electrically Operated DX-DOAS Units, Single-Package and Remote Condenser, without Energy Recovery—Minimum Efficiency Requirements.

Table C403.3.2(13)
Electrically Operated DX-DOAS Units, Single-Package and Remote Condenser, with Energy Recovery—Minimum Efficiency Requirements^b

Equipment Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^a
Air cooled (dehumidification mode)		5.2 ISMRE	AHRI 920

Equipment Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^a
Air source heat pumps (dehumidification mode)		5.2 ISMRE	AHRI 920
Water cooled (dehumidification mode)	Cooling tower condenser water	5.3 ISMRE	AHRI 920
	Chilled water	6.6 ISMRE	
Air source heat pump (heating mode)		3.3 ISCOP	AHRI 920
Water source heat pump (dehumidification mode)	Ground source, closed loop	5.2 ISMRE	AHRI 920
	Ground-water source	5.8 ISMRE	
	Water source	4.8 ISMRE	
Water source heat pump (heating mode)	Ground source, closed loop	3.8 ISCOP	AHRI 920
	Ground-water source	4.0 ISCOP	
	Water source	4.8 ISCOP	

^a Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

^b This table is a replica of ASHRAE 90.1 Table 6.8.1-14 Electrically Operated DX-DOAS Units, Single-Package and Remote Condenser, with Energy Recovery—Minimum Efficiency Requirements.

Table C403.3.2 (14)

Electrically Water Source Heat Pumps—Minimum Efficiency Requirements^c

Equipment Type	Size Category ^b	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure ^a
Water to air, water loop (cooling mode)	< 17,000 Btu/h	All	86°F entering water	12.2 EER	ISO 13256-1
	≥ 17,000 Btu/h and < 65,000 Btu/h	All	86°F entering water	13.0 EER	
	≥ 65,000 Btu/h and < 135,000 Btu/h	All	86°F entering water	13.0 EER	
Water to air, ground water (cooling mode)	< 135,000 Btu/h	All	59°F entering water	18.0 EER	
Brine to air, ground loop (cooling mode)	< 135,000 Btu/h	All	77°F entering water	14.1 EER	
Water to water, water loop (cooling mode)	< 135,000 Btu/h	All	86°F entering water	10.6 EER	ISO 13256-2
Water to water, ground water (cooling mode)	< 135,000 Btu/h	All	59°F entering water	16.3 EER	
Brine to water, ground loop (cooling mode)	< 135,000 Btu/h	All	77°F entering fluid	12.1 EER	
Water to air, water loop (heating mode)	< 135,000 Btu/h (cooling capacity)		68°F entering water	4.3 COP _H	ISO 13256-1
Water to air, ground water (heating mode)	< 135,000 Btu/h (cooling capacity)		50°F entering water	3.7 COP _H	
Brine to air, ground loop (heating mode)	< 135,000 Btu/h (cooling capacity)		32°F entering fluid	3.2 COP _H	
Water to water, water loop (heating mode)	< 135,000 Btu/h (cooling capacity)		68°F entering water	3.7 COP _H	ISO 13256-1

Equipment Type	Size Category^b	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency	Test Procedure^a
Water to water, ground water (heating mode)	< 135,000 Btu/h (cooling capacity)		50°F entering water	3.1 COP _H	ISO 13256-2
Brine to water, ground loop (heating mode)	< 135,000 Btu/h (cooling capacity)		32°F entering fluid	2.5 COP _H	ISO 13256-2

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) - 32]/1.8.

- a Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
- b Single-phase, U.S. air-cooled heat pumps less than 19 kW are regulated as consumer products by DOE 10 C.F.R. 430. SCOPC, SCOP2C, SCOPH and SCOP2H values for single-phase products are set by the U.S. DOE.
- c This table is a replica of ASHRAE 90.1 Table 6.8.1-15 Electrically Operated Water-Source Heat Pumps—Minimum Efficiency Requirements.

Table C403.3.2 (15)
Heat-Pump and Heat Recovery Chiller Packages—Minimum Efficiency Requirements^{g, h, i, j, k}

HEATING OPERATION										Test Procedure ^a						
Equipment Type	Size Category, tonR	Cooling-Only Operation Cooling Efficiency ^c : Air-Source EER (FL/PLV), Btu/W-h Water-Source Power Input per Capacity (FL/PLV), kW/tonR		Heating Source Conditions (entering/leaving water) or OAT (db/wb), °F	Heat-Pump Heating Full-Load Efficiency (COP _h) ^b , W/W			Heat Recovery Chiller Full-Load Efficiency (COP _h) ^{b,d} , W/W Simultaneous Cooling and Heating Full-Load Efficiency (COP _h) ^{b,e} , W/W								
		Path A	Path B		Low	Medium	High	Low	Medium		High	Boost				
Air source	All sizes	≥9.595 FL	≥9.215 FL	47 db	105°F	120°F	140°F	105°F	120°F	140°F	NA	NA	NA	AHRI 550/590		
		≥13.02 IPLV/IP	≥15.01 IPLV/IP	43 wb ^g	≥3.290	≥2.770	≥2.310	NA	NA	NA	140°F	140°F	NA			
	≥9.595 FL	≥9.215 FL	17 db	≥2.230	≥1.950	≥1.630	NA	NA	NA	NA	NA	NA	NA			
	≥13.30 IPLV/IP	≥15.30 IPLV/IP	15 wb ^g	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	NA	NA			
	≥0.7885 FL	≥0.7875 FL	54/44 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	
	≥0.6316 IPLV/IP	≥0.5145 IPLV/IP	75/65 ^f	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	NA	NA		NA	
	≥75 and < 150	≥0.7579 FL	≥0.7140 FL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA
	≥0.5895 IPLV/IP	≥0.4620 IPLV/IP	75/65 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA
	≥150 and < 300	≥0.6947 FL	≥0.7140 FL	54/44 ^f	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	NA		NA	NA
	≥0.5684 IPLV/IP	≥0.4620 IPLV/IP	75/65 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA
≥300 and < 600	≥0.6421 FL	≥0.6563 FL	54/44 ^f	≥4.930	≥3.960	≥2.970	NA	≥8.900	≥6.980	≥5.000	NA	NA	NA	NA		
≥0.5474 IPLV/IP	≥0.4305 IPLV/IP	75/65 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
≥600	≥0.5895 FL	≥0.6143 FL	75/65 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
≥0.5263 IPLV/IP	≥0.3990 IPLV/IP	75/65 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
< 75	≥0.6421 FL	≥0.7316 FL	54/44 ^f	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	NA	NA	NA		
≥0.5789 IPLV/IP	≥0.4632 IPLV/IP	75/65 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
≥75 and < 150	≥0.5895 FL	≥0.6684 FL	54/44 ^f	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	NA	NA	NA		
≥0.5474 IPLV/IP	≥0.4211 IPLV/IP	75/65 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
≥150 and < 300	≥0.5895 FL	≥0.6263 FL	54/44 ^f	≥4.640	≥3.680	≥2.680	NA	≥8.330	≥6.410	≥4.420	NA	NA	NA	NA		
≥0.5263 IPLV/IP	≥0.4105 IPLV/IP	75/65 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
≥300 and < 600	≥0.5895 FL	≥0.6158 FL	54/44 ^f	≥4.640	≥3.680	≥2.680	NA	≥8.900	≥6.980	≥5.000	NA	NA	NA	NA		
≥0.5263 IPLV/IP	≥0.4000 IPLV/IP	75/65 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
≥600	≥0.5895 FL	≥0.6158 FL	54/44 ^f	≥4.640	≥3.680	≥2.680	NA	≥8.900	≥6.980	≥5.000	NA	NA	NA	NA		
≥0.5263 IPLV/IP	≥0.4000 IPLV/IP	75/65 ^f	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		

For SI: °C = [(°F) - 32]/1.8.

- a Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
- b Cooling-only rating conditions are standard rating conditions defined in AHRI 550/590, Table 1.
- c Heating full-load rating conditions are at rating conditions defined in AHRI 550/590, Table 1.
- d For water-cooled heat recovery chillers that have capabilities for heat rejection to a heat recovery condenser and a tower condenser, the COPHR applies to operation at full load with 100 percent heat recovery (no tower rejection). Units that only have capabilities for partial heat recovery shall meet the requirements of Table C403.3.2(3).
- e Outdoor air entering dry-bulb (db) temperature and wet-bulb (wb) temperature.
- f Source-water entering and leaving water temperature.
- g This table is a replica of ASHRAE 90.1 Table 6.8.1-16 Heat-Pump and Heat Recovery Chiller Packages—Minimum Efficiency Requirements.
- h AHRI ratings are not required for equipment sizes larger than those covered by the test standard.
- i Air-to-water heat pumps that are configured to operate only in heating and not in cooling only need to comply with the minimum heating efficiencies.

j Units that are both an air-to-water heat pump and a heat recovery chiller are required to comply with either the applicable air source efficiency requirements or the heat recovery chiller requirements but not both.

k Heat pumps and heat recovery chillers are only required to comply with one of the four leaving heating water temperature criteria. The leaving heater water temperature criteria that are closest to the design leaving water temperature shall be utilized.

Table C403.3.2(16)
Ceiling-Mounted Computer-Room Air Conditioners—Minimum Efficiency Requirements^b

Equipment Type	Standard Model	Net Sensible Cooling Capacity	Minimum Net Sensible COP	Rating Conditions Return Air (dry-bulb/dew point)	Test Procedure ^a
Air cooled with free air discharge condenser	Ducted	< 29,000 Btu/h	2.05	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.02		
		≥ 65,000 Btu/h	1.92		
	Nonducted	< 29,000 Btu/h	2.08		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.05		
		≥ 65,000 Btu/h	1.94		
Air cooled with free air discharge condenser with fluid economizer	Ducted	< 29,000 Btu/h	2.01	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.97		
		≥ 65,000 Btu/h	1.87		
	Nonducted	< 29,000 Btu/h	2.04		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.00		
		≥ 65,000 Btu/h	1.89		
Air cooled with ducted condenser	Ducted	< 29,000 Btu/h	1.86	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.83		
		≥ 65,000 Btu/h	1.73		
	Nonducted	< 29,000 Btu/h	1.89		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.86		
		≥ 65,000 Btu/h	1.75		
Air cooled with fluid economizer and ducted condenser	Ducted	< 29,000 Btu/h	1.82	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.78		
		≥ 65,000 Btu/h	1.68		
	Nonducted	< 29,000 Btu/h	1.85		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.81		
		≥ 65,000 Btu/h	1.70		
Water cooled	Ducted	< 29,000 Btu/h	2.38	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.28		
		≥ 65,000 Btu/h	2.18		
	Nonducted	< 29,000 Btu/h	2.41		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.31		
		≥ 65,000 Btu/h	2.20		

Equipment Type	Standard Model	Net Sensible Cooling Capacity	Minimum Net Sensible COP	Rating Conditions Return Air (dry-bulb/dew point)	Test Procedure ^a
Water cooled with fluid economizer	Ducted	< 29,000 Btu/h	2.33	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.23		
		≥ 65,000 Btu/h	2.13		
	Nonducted	< 29,000 Btu/h	2.36		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.26		
		≥ 65,000 Btu/h	2.16		
Glycol cooled	Ducted	< 29,000 Btu/h	1.97	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.93		
		≥ 65,000 Btu/h	1.78		
	Nonducted	< 29,000 Btu/h	2.00		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.98		
		≥ 65,000 Btu/h	1.81		
Glycol cooled with fluid economizer	Ducted	< 29,000 Btu/h	1.92	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.88		
		≥ 65,000 Btu/h	1.73		
	Nonducted	< 29,000 Btu/h	1.95		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.93		
		≥ 65,000 Btu/h	1.76		

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) - 32]/1.8, COP = (Btu/h × hp)(2,550.7).

^a Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

^b This table is a replica of ASHRAE 90.1 Table 6.8.1-17 Ceiling-Mounted Computer-Room Air Conditioners—Minimum Efficiency Requirements.

[Statutory Authority: RCW 19.27A.020, 19.27A.025, 19.27A.160 and chapters 19.27A and 19.27 RCW. WSR 22-14-091, 23-12-101, and 23-20-021, § 51-11C-403329, filed 7/1/22, 6/7/23, and 9/25/23, effective 3/15/24.]