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# DWM COPELAND

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## Replacement Guidelines for DWM Compressors

D9R\* with D2S\* & D3S\*



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## 1 Introduction

Emerson Climate Technologies has successfully introduced many new semi-hermetic compressors in the market over the past years - in particular in the medium size range from 5 to 15 hp with the model families D2S and D3S - a result of continuous engineering effort leading to improved compressors for refrigeration applications. D2S and D3S DWM Copeland™ compressors are available for low, medium and high temperature applications.

The new line of compressors D2S, D3S was developed to give better performances than the former models and to provide larger application envelopes.

Completion of the D3S product familie puts Emerson Climate Technologies in a position to eliminate some of its older compressor models, making it easier for customers to manage stock and save costs. Benefits of the D3S family include the universal compressor models for medium and low temperature applications.

### Transition of semi-hermetic models from R to S product line

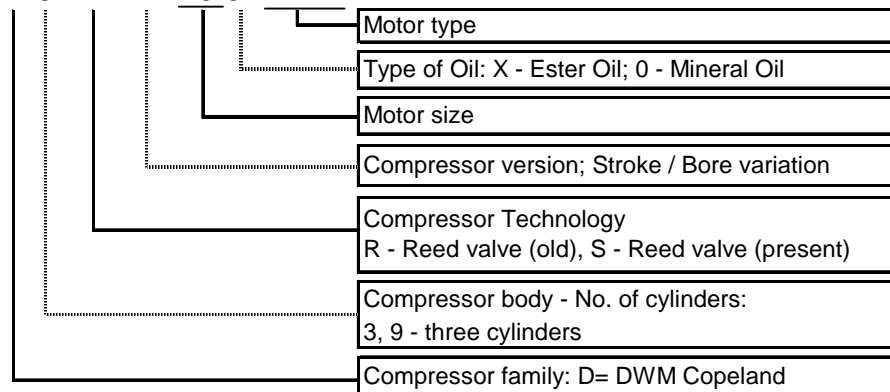
The table below lists existing products and their recommended replacements:

Old	Replacement
D9RA 500L AWM/D	D2SK 65X EWL/D
D9RA 750 AWM/D	D3SA 750 AWM/D
D9RC 750 AWM/D	D3SC 750 AWM/D
D9RC 750L AWM/D	D3SC 75X AWM/D
D9RC 1000 AWM/D	D3SC 1000 AWM/D
D9RS 1000 AWM/D	D3SS 1000 AWM/D
D9RS 1000L AWM/D	D3SS 100X AWM/D
D9RS 1500 AWD	D3SS 1500 AWM/D

Other replacements indicated must be considered as general recommendations. They may differ from the product which they are replacing in performance and mechanical details.

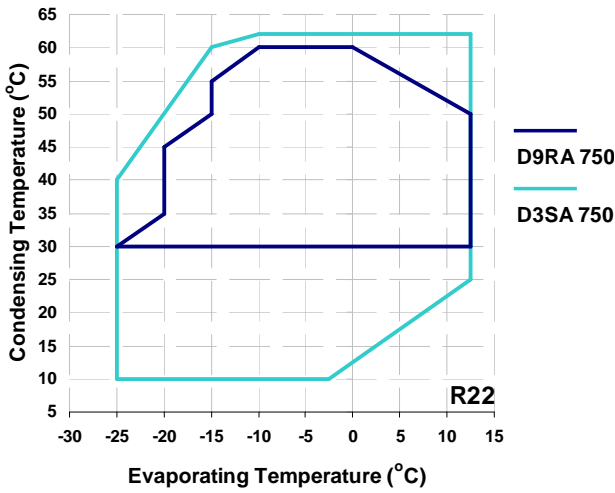
## 2 Nomenclature

**D 9 R A 750 AWM**

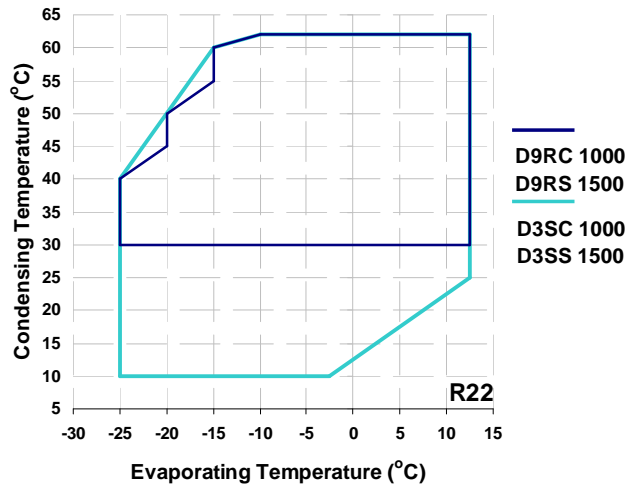


## 3 Application envelopes

D9RA 750 vs. D3SA 750



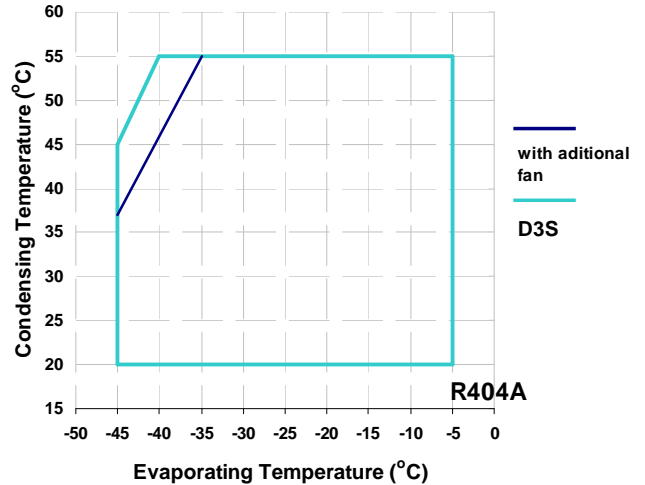
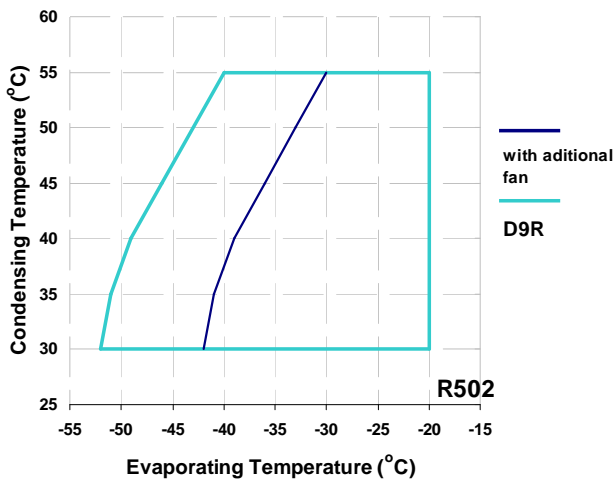
D9RC 1000 vs. D3SC 1000  
D9RS 1500 vs. D3SS 1500



D9RC 750L, D9RS 1000L

vs.

D3SC 75X, D3SS 100X



## 4 Cross reference tables

	D9RA 500L	D2SK-65X
R502 / R404A	-45°C ... -20°C	-45°C ... -5°C
Swept volume m3/h	32.1	Same
Mountings	381 X 305	295 X 279
Length	690	560
Width	335	330
Height	480	395
Disch. Valve Position H/L		Same
Suction Valve Ø	1 3/8"	1 1/8"
Vanne Ref Position H/L		+10 / +50
Disch. Valve Ø	7/8"	7/8"
R502 / R404A	-35°C/40°C	
Capacity [kW]	4.5	4.86
Power Input [kW]	3.9	3.98
COP	1.15	1.22
Current [A]	7.25	8.7
Mass Flow [g/s]		36.72

	D9RA 750	D3SA 750/X
R22	-20°C ... 12.5°C	-25°C ... 12.5°C
Swept volume m3/h	32.1	Same
Mountings	381 X 305	Same
Length	730	655
Width	335	370
Height	480	Same
Disch. Valve Position H/L		Same
Suction Valve Ø	1 3/8"	Same
Vanne Ref Position H/L		+10 / +50
Disch. Valve Ø	1 1/8"	1 1/8"
R22	-10°C/45°C	
Capacity [kW]	14.46	14.36
Power Input [kW]	6.06	6.42
COP	2.38	2.24
Current [A]	11.46	12.5
Mass Flow [g/s]	87	86.42

	D9RC 750L	D3SC 750/X
R502 / R404A	-45°C ... -20°C	-45°C ... -5°C
Swept volume m3/h	37.9	Same
Mountings	381 X 305	Same
Length	690	655
Width	335	370
Height	480	Same
Disch. Valve Position H/L		Same
Suction Valve Ø	1 3/8"	Same
Disch. Valve Position H/L		+10 / +50
Disch. Valve Ø	1 1/8"	Same

	-35°C/40°C	
R502 / R404A		
Capacity [kW]	5.35	5.5
Power Input [kW]	4.6	4.32
COP	1.16	1.27
Current [A]	9.45	9.99
Mass Flow [g/s]		41.55

	+5°C/40°C	
R12/R134a		
Capacity [kW]	20.8	28.55
Power Input [kW]	7.41	8.3
COP	2.81	3.44
Current [A]	19.6	15.65
Mass Flow [g/s]		185.88

	D9RS 1000L	D3SS 1000/X
R502 / R404A	-45 ... -20°C	-45°C ... -5°C
Swept volume m3/h	49.9	Same
Mountings	381 X 305	Same
Length	690	680
Width	335	370
Height	480	Same
Suction Valve Position		Same
Suction Valve Ø	1 3/8"	Same
Disch. Valve Position H/L		+10 / +50
Disch. Valve Ø	1 1/8"	Same

	-35°C/40°C	
R502 / R404A		
Capacity [kW]	7	8.15
Power Input [kW]	5.75	6.17
COP	1.22	1.32
Current [A]	11.8	13.16
Mass Flow [g/s]		61.53

	+5°C/40°C	
R12/R134a		
Capacity [kW]	27.34	28.55
Power Input [kW]	7.41	8.3
COP	3.69	3.44
Current [A]	19.6	15.65
Mass Flow [g/s]		185.88

	D9RC 1000	D3SC 1000/X
R502 / R404A	-20°C ... 12.5°C	-25°C ... 12.5°C
Swept volume m3/h	37.9	Same
Mountings	381 X 305	Same
Length	690	655
Width	335	370
Height	480	Same
Disch. Valve Position H/L		Same
Suction Valve Ø	1 3/8"	Same
Disch. Valve Position H/L		+10 / +50
Disch. Valve Ø	1 1/8"	Same

	-25°C/40°C	
R502 / R404A		
Capacity [kW]	8.86	10.51
Power Input [kW]	5.8	6.09
COP	1.53	1.72
Current [A]	25.1	12.2
Mass Flow [g/s]		80.16

	-10°C/45°C	
R22		
Capacity [kW]	16.55	17.35
Power Input [kW]	7.13	7.83
COP	2.32	2.22
Current [A]	13.63	14.38
Mass Flow [g/s]	99.59	104.39

	D9RS 1500	D3SS 1500/X
R502 / R404A	-20°C ... 12.5°C	-25°C ... 12.5°C
Swept volume m3/h	49.9	Same
Mountings	381 X 305	Same
Length	730	680
Width	335	370
Height	480	Same
Suction Valve Position		Same
Suction Valve Ø	1 5/8"	Same
Disch. Valve Position H/L		+10 / +50
Disch. Valve Ø	1 1/8"	Same

	-25°C/40°C	
R502 / R404A		
Capacity [kW]	12.37	14.67
Power Input [kW]	7.23	8.73
COP	1.71	1.68
Current [A]	31.4	16.55
Mass Flow [g/s]		111.88

	-10°C/45°C	
R22		
Capacity [kW]	22.32	23.96
Power Input [kW]	9.39	10.82
COP	2.38	2.21
Current [A]	18.3	19.64
Mass Flow [g/s]	134.28	144.15

## 5 Motor version

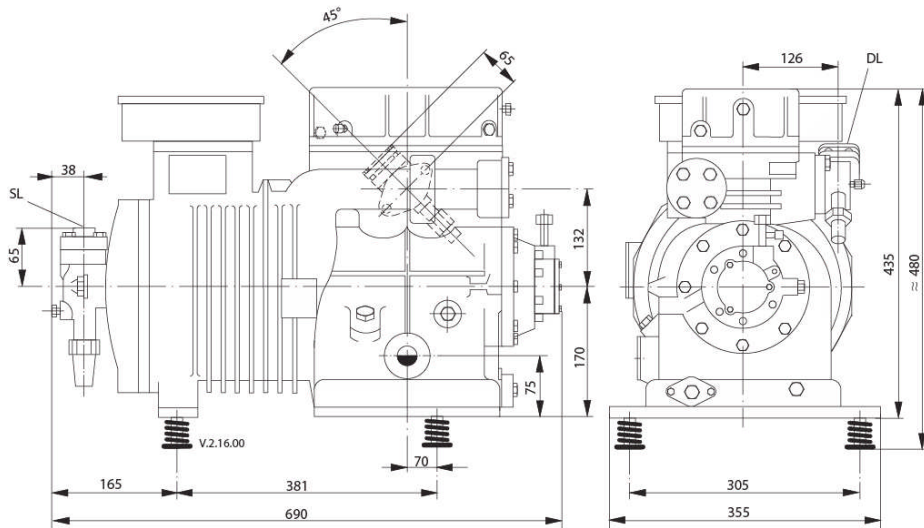
All DWM Copeland™ three-phase compressors can be started Direct-On-Line (DOL). The position of bridges for Direct-On-Line start depending on type of motor and/or mains voltage are shown in the wiring diagrams.

Each compressor terminal box contains wiring diagrams. Always ensure the supply voltage, the phases and frequency match the nameplate prior to connecting the compressor to the system power supply.

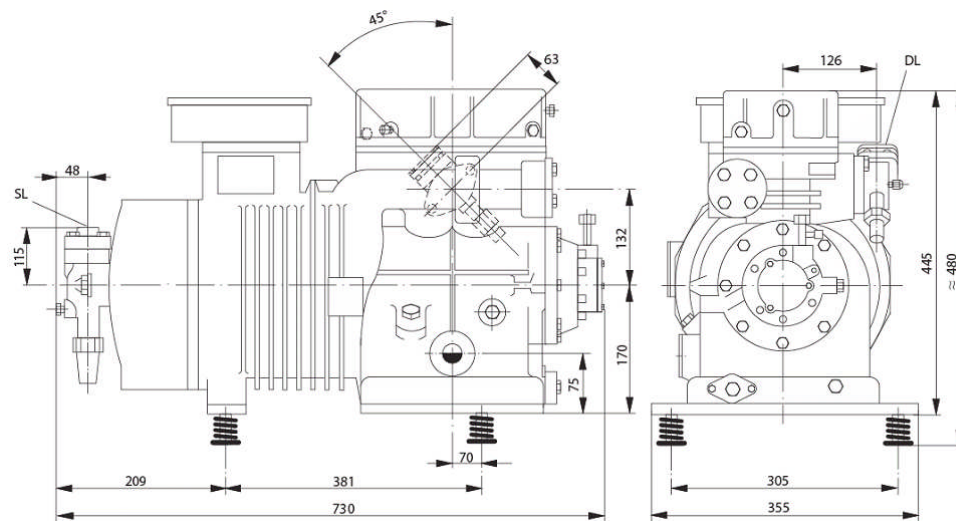
Motor Type		Motor Protection	Motor Voltages			
			V	Ph	Hz	
E	Three-phase motor, interchangeable for Y or $\Delta$ operation. Can be used D.O.L.	W	For three-phase motors, electronic motor protection with thermistors and release module KRIWAN in the terminal box	L	220-240/380-420	3 50
				M	380-420	3 50
R	220-240			3 50		
Y	500-550			3 50		
D	440-480			3 60		
C	208-230			3 60		
K	220-240/380-420			3 60		
X	380-420			3 60		
A	Three-phase part-winding or D.O.L. start motor, not interchangeable. For part-winding start the winding is divided 2/3 – 1/3.					
T	Three-phase motor, one voltage D.O.L. only, connections only to terminals U, V, W					

## 6 Drawings

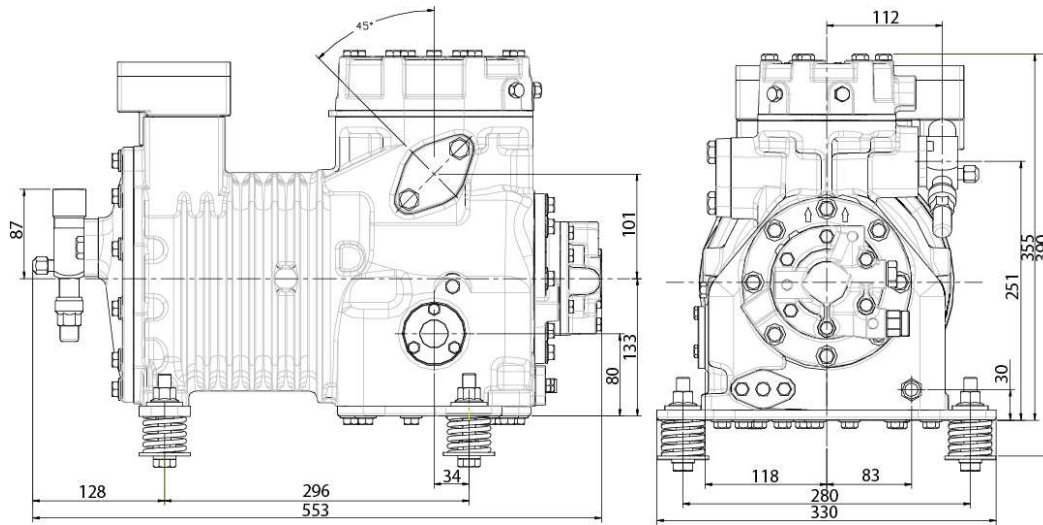
### 6.1 D9RA 500, D9RC 750, D9RS 1000



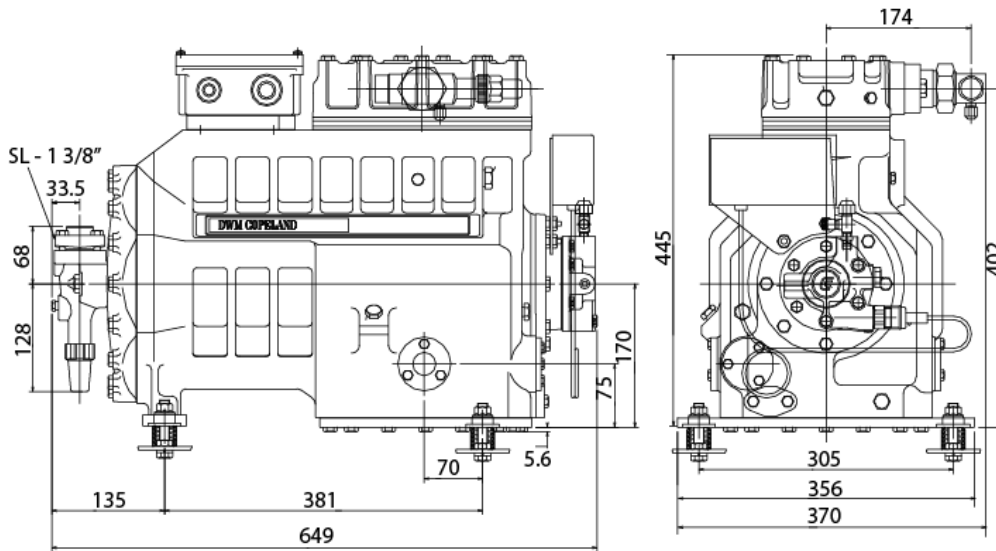
### 6.2 D9RA 750, D9RC 1000, D9RS 1500



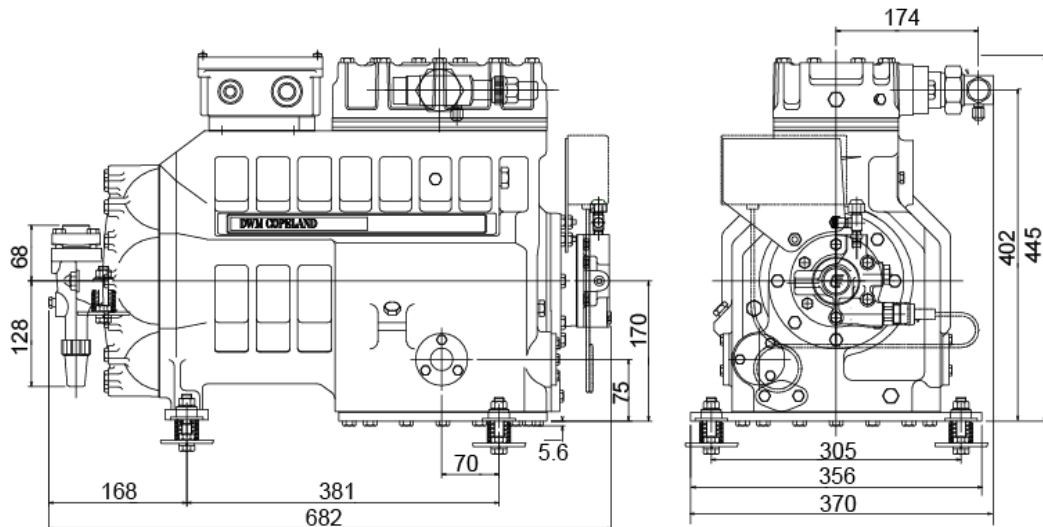
## 6.3 D2SK 65X



## 6.4 D3SC 750



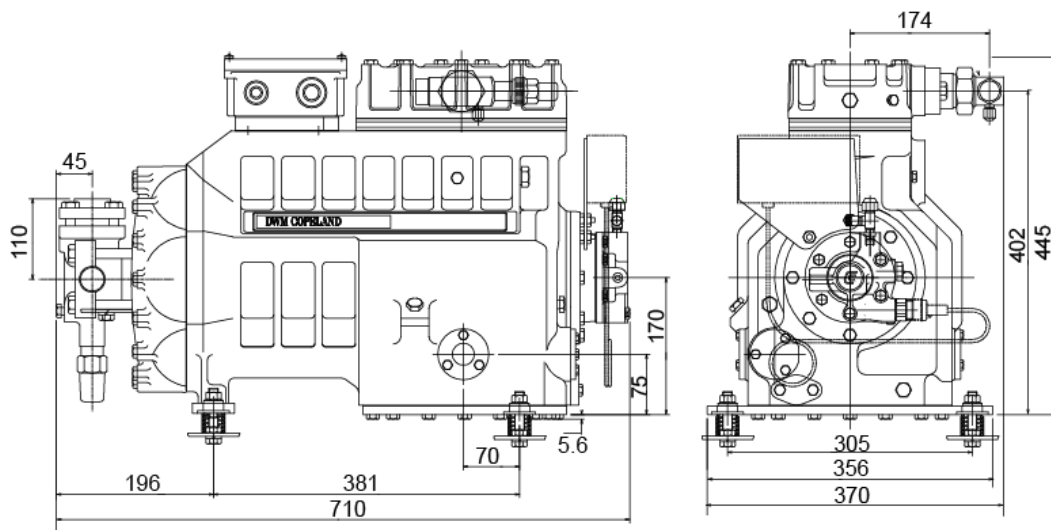
## 6.5 D3SA 750, D3SC 1000, D3SS 1000





# DWM COPELAND

## 6.6 D3SS 1500



## 7 Data sheets

### 7.1 D9RA 750 vs D3SA 750

Power Supply 380/420V - 3~ - 50Hz  
 Suction Superheat 10.0K  
 Liquid subcooling 0.0K

#### R22 - D9RA 750

	Cond. Temp.	Evaporating temperature									
		-25	-20	-15	-10	-5	0	5	7	10	12.5
Capacity kW	30	8.27	10.88	13.92	17.43	21.47	26.1	31.38	33.7	37.4	40.7
	35		10	12.94	16.35	20.26	24.75	29.88	32.12	35.7	38.9
	40		9.07	11.92	15.22	19.02	23.36	28.32	30.49	34	37.1
	45		8.1	10.86	14.05	17.72	21.92	26.71	28.81	32.2	35.2
	50			9.76	12.83	16.37	20.42	25.05	27.07	30.3	33.2
	55			8.61	11.57	14.97	18.87	23.32	25.27		
	60				10.26	13.53	17.27				

	Cond. Temp.	Evaporating temperature									
		-25	-20	-15	-10	-5	0	5	7	10	12.5
Power Input kW	30	3.75	4.2	4.61	4.96	5.24	5.43	5.52	5.52	5.48	5.41
	35		4.39	4.88	5.31	5.68	5.97	6.16	6.21	6.24	6.24
	40		4.53	5.11	5.63	6.09	6.48	6.78	6.87	6.98	7.03
	45		4.63	5.29	5.91	6.47	6.96	7.37	7.51	7.68	7.79
	50			5.42	6.14	6.8	7.4	7.92	8.1	8.35	8.52
	55			5.5	6.32	7.09	7.79	8.43	8.66		
	60				6.43	7.31	8.13				

#### R22 - D3SA 750

	Cond. Temp.	Evaporating temperature									
		-25	-20	-15	-10	-5	0	5	7	10	12.5
Capacity kW	10	11.29	14.5	18.33	22.82	28.04					
	15	10.44	13.51	17.17	21.48	26.5	32.28				
	20	9.61	12.54	16.03	20.16	24.96	30.51	36.87	39.64		
	25	8.8	11.59	14.92	18.86	23.45	28.77	34.86	37.53	41.8	45.6
	30	8.03	10.67	13.84	17.58	21.96	27.04	32.88	35.44	39.5	43.2
	35	7.3	9.79	12.78	16.33	20.5	25.34	30.91	33.36	37.3	40.8
	40	6.6	8.94	11.76	15.12	19.06	23.66	28.98	31.31	35.1	38.4
	45		8.14	10.78	13.94	17.67	22.02	27.07	29.3	32.9	36.1
	50		7.38	9.85	12.8	16.31	20.42	25.2	27.31	30.7	33.8
	55			8.96	11.71	14.99	18.86	23.37	25.36	28.6	31.5
	60			8.12	10.67	13.72	17.34	21.58	23.46	26.5	29.2
62				10.27	13.23	16.75	20.87	22.71	25.7	28.3	

	Cond. Temp.	Evaporating temperature									
		-25	-20	-15	-10	-5	0	5	7	10	12.5
Power Input kW	10	3.74	3.9	3.95	3.9	3.72					
	15	3.94	4.16	4.3	4.35	4.27	4.06				
	20	4.11	4.4	4.62	4.76	4.79	4.69	4.46	4.32		
	25	4.25	4.61	4.91	5.14	5.27	5.29	5.19	5.1	4.93	4.75
	30	4.37	4.79	5.17	5.49	5.73	5.86	5.88	5.86	5.77	5.66
	35	4.46	4.96	5.42	5.82	6.16	6.41	6.56	6.58	6.58	6.54
	40	4.54	5.1	5.64	6.13	6.57	6.93	7.2	7.28	7.36	7.4
	45		5.22	5.84	6.42	6.96	7.44	7.83	7.96	8.13	8.23
	50		5.34	6.03	6.7	7.34	7.92	8.44	8.62	8.87	9.05
	55			6.2	6.96	7.7	8.39	9.03	9.27	9.6	9.84
	60			6.37	7.21	8.05	8.85	9.61	9.9	10.3	10.6
62				7.31	8.18	9.03	9.84	10.15	10.6	10.9	

## 7.2 D9RC 1000 vs D3SC 1000

### R22 - D9RC1000

	Cond. Temp.	Evaporating temperature									
		-25	-20	-15	-10	-5	0	5	7	10	12.5
Capacity kW	30	9.16	12.43		20.58	25.58	31.31	37.84	40.7	45.3	49.3
	35	8.12	11.24	14.85	19.02	23.81	29.28	35.52	38.25	42.6	46.5
	40	7.13	10.09	13.53	17.49	22.05	27.27	33.21	35.81	40	43.7
	45		8.99	12.25	16	20.33	25.27	30.92	33.39	37.3	40.9
	50		7.97	11.03	14.57	18.65	23.32	28.66	31	34.7	38.1
	55			9.89	13.21	17.04	21.43	26.45	28.65	32.2	35.3
	60			8.85	11.94	15.5	19.61	24.3	26.36	29.7	32.6
	62			8.85	11.46	14.92	18.9	23.46	25.46	28.7	31.5

	Cond. Temp.	Evaporating temperature									
		-25	-20	-15	-10	-5	0	5	7	10	12.5
Power Input kW	30	-21.39	-20.87		-20.1	-19.87	-19.78	-19.84	-19.91	-20.1	-20.3
	35	-21.33	-20.74	-20.21	-19.77	-19.44	-19.23	-19.16	-19.18	-19.3	-19.4
	40	-21.31	-20.63	-20.02	-19.49	-19.05	-18.73	-18.54	-18.5	-18.5	-18.6
	45		-20.56	-19.86	-19.24	-18.71	-18.28	-17.97	-17.89	-17.8	-17.8
	50		-20.5	-19.73	-19.03	-18.4	-17.87	-17.45	-17.32	-17.2	-17.1
	55			-19.62	-18.84	-18.13	-17.51	-16.98	-16.8	-16.6	-16.4
	60			-19.51	-18.67	-17.88	-17.17	-16.55	-16.33	-16	-15.8
	62				-18.6	-17.78	-17.04	-16.38	-16.15	-15.8	-15.6

### R22 - D3SC 1000

	Cond. Temp.	Evaporating temperature									
		-25	-20	-15	-10	-5	0	5	7	10	12.5
Capacity kW	10	13.61	17.41	21.96	27.34	33.61					
	15	12.63	16.24	20.57	25.69	31.68	38.61				
	20	11.69	15.11	19.22	24.09	29.79	36.41	44.01	47.34		
	25	10.81	14.03	17.92	22.54	27.96	34.26	41.51	44.7	49.8	54.3
	30	9.97	13.01	16.67	21.04	26.18	32.17	39.08	42.12	47	51.3
	35	9.18	12.03	15.48	19.6	24.46	30.14	36.71	39.6	44.2	48.4
	40	8.45	11.12	14.35	18.22	22.8	28.17	34.39	37.14	41.6	45.5
	45		10.25	13.27	16.89	21.2	26.25	32.14	34.74	38.9	42.7
	50		9.45	12.25	15.63	19.66	24.41	29.95	32.41	36.4	39.9
	55			11.29	14.43	18.18	22.62	27.83	30.14	33.9	37.2
	60			10.4	13.29	16.76	20.9	25.77	27.94	31.4	34.6
	62				12.85	16.22	20.23	24.97	27.08	30.5	33.6

	Cond. Temp.	Evaporating temperature									
		-25	-20	-15	-10	-5	0	5	7	10	12.5
Power Input kW	10	4.16	4.32	4.38	4.34	4.17					
	15	4.49	4.73	4.88	4.93	4.86	4.67				
	20	4.79	5.1	5.34	5.49	5.52	5.44	5.22	5.1		
	25	5.05	5.44	5.77	6.01	6.15	6.18	6.09	6.01	5.85	5.68
	30	5.27	5.75	6.17	6.51	6.76	6.9	6.93	6.91	6.83	6.72
	35	5.46	6.02	6.53	6.97	7.33	7.59	7.75	7.78	7.78	7.75
	40	5.62	6.27	6.87	7.41	7.88	8.27	8.55	8.63	8.72	8.76
	45		6.48	7.18	7.83	8.41	8.92	9.33	9.47	9.64	9.75
	50		6.67	7.47	8.22	8.92	9.55	10.1	10.29	10.5	10.7
	55			7.73	8.59	9.41	10.17	10.85	11.09	11.4	11.7
	60			7.97	8.95	9.88	10.77	11.58	11.89	12.3	12.7
	62				9.08	10.07	11	11.87	12.2	12.7	13

## 7.3 D9RS 1500 vs D3SS 1500

### R22 - D9RS1500

Capacity kW	Cond.	Evaporating temperature									
	Temp.	-25	-20	-15	-10	-5	0	5	7	10	12.5
30	12.54	16.7	21.52	27.08	33.48	40.81	49.17	52.83	58.7	63.9	
35	11.28	15.28	19.93	25.29	31.45	38.51	46.56	50.09	55.7	60.8	
40	10.03	13.87	18.33	23.48	29.4	36.18	43.92	47.31	52.7	57.6	
45		12.46	16.73	21.67	27.34	33.84	41.26	44.5	49.7	54.3	
50		11.08	15.15	19.86	25.28	31.49	38.58	41.68	46.6	51.1	
55			13.59	18.06	23.22	29.13	35.88	38.84	43.6	47.8	
60			12.06	16.29	21.17	26.78	33.18	35.98	40.5	44.5	
62				15.59	20.36	25.84	32.1	34.84	39.2	43.2	

Power Input kW	Cond.	Evaporating temperature									
	Temp.	-25	-20	-15	-10	-5	0	5	7	10	12.5
30	5.61	6.41	7.14	7.78	8.32	8.73	8.98	9.04	9.06	9.02	
35	5.74	6.65	7.51	8.28	8.97	9.53	9.96	10.09	10.2	10.3	
40	5.81	6.84	7.82	8.74	9.57	10.29	10.89	11.09	11.3	11.5	
45		6.98	8.09	9.14	10.12	11	11.77	12.04	12.4	12.7	
50		7.07	8.31	9.49	10.62	11.65	12.59	12.93	13.4	13.8	
55			8.48	9.8	11.06	12.26	13.36	13.78	14.4	14.8	
60			8.59	10.05	11.46	12.81	14.08	14.57	15.3	15.8	
62				10.14	11.61	13.02	14.36	14.87	15.6	16.2	

### R22 - D3SS 1500

Capacity kW	Cond.	Evaporating temperature									
	Temp.	-25	-20	-15	-10	-5	0	5	7	10	12.5
10	19.36	24.28	30.13	37	44.99						
15	18.04	22.74	28.34	34.91	42.55	51.34					
20	16.77	21.26	26.59	32.87	40.17	48.58	58.19	62.39			
25	15.56	19.82	24.9	30.88	37.84	45.88	55.06	59.08	65.5	71.2	
30	14.39	18.45	23.27	28.95	35.57	43.22	51.99	55.82	62	67.4	
35	13.28	17.12	21.69	27.07	33.36	40.63	48.97	52.62	58.5	63.7	
40	12.23	15.85	20.16	25.25	31.19	38.08	46	49.48	55	60	
45		14.64	18.69	23.48	29.09	35.6	43.1	46.39	51.7	56.4	
50		13.48	17.28	21.77	27.04	33.17	40.25	43.37	48.4	52.8	
55			15.93	20.12	25.05	30.8	37.46	40.4	45.1	49.3	
60			14.63	18.53	23.12	28.49	34.73	37.49	41.9	45.9	
62				17.91	22.37	27.59	33.66	36.34	40.7	44.5	

Power Input kW	Cond.	Evaporating temperature									
	Temp.	-25	-20	-15	-10	-5	0	5	7	10	12.5
10	5.91	6.21	6.4	6.47	6.39						
15	6.39	6.79	7.1	7.28	7.34	7.24					
20	6.78	7.28	7.7	8.01	8.2	8.26	8.15	8.06			
25	7.1	7.7	8.22	8.66	8.99	9.2	9.25	9.23	9.15	9.03	
30	7.35	8.05	8.69	9.26	9.72	10.08	10.3	10.35	10.4	10.3	
35	7.56	8.36	9.11	9.8	10.41	10.92	11.3	11.42	11.6	11.6	
40	7.74	8.64	9.5	10.32	11.06	11.72	12.28	12.46	12.7	12.9	
45		8.89	9.87	10.82	11.7	12.51	13.23	13.49	13.8	14.1	
50		9.15	10.24	11.31	12.34	13.3	14.19	14.52	15	15.3	
55			10.62	11.82	12.99	14.11	15.16	15.55	16.1	16.6	
60			11.03	12.36	13.66	14.94	16.15	16.62	17.3	17.8	
62				12.58	13.94	15.28	16.56	17.06	17.8	18.4	

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