

Application Guidelines

Compressor parallel assembly nomenclature

By default, tandems, trios and quadros are not factory-built. To complete an assembly in the field, you will need:

- Tubings, according to specific outline drawings indicated in the following sections.
- Manifolding accessory kit.
- Compressors.

Model	Composition	R22	R404A/ R507A	R407C	R134a	R513A	Oil management
Tandem	SM/SZ170 SM/SZ084 + SM/SZ084	○	○	○	○	-	Dynamic
	SM/SZ180 SM/SZ090 + SM/SZ090	○	○	○	○	-	Dynamic
	SM/SZ200 SM/SZ100 + SM/SZ100	○	○	○	○	-	Dynamic
	SM/SZ220 SM/SZ110 + SM/SZ110	○	○	○	○	-	Dynamic
	SM/SZ242 SM/SZ120 + SM/SZ120	○	○	○	○	-	Dynamic
	SM248 SM124 + SM124	○	-	-	-	-	Static
	SM/SZ268 SM/SZ120 + SM/SZ148	○	○	○	○	-	Dynamic
	SM/SZ271 SM/SZ110 + SM/SZ161	○	○	○	○	-	Dynamic
	SM272 SM124 + SM147	○	-	-	-	-	Static
	SM/SZ281 SM/SZ120 + SM/SZ161	○	○	○	○	-	Dynamic
	SM294 SM147 + SM147	○	-	-	-	-	Static
	SM/SZ296 SM/SZ148 + SM/SZ148	○	○	○	○	○	Dynamic
	SM/SZ322 SM/SZ161 + SM/SZ161	○	○	○	○	○	Dynamic
	SM/SZ350 SM/SZ175 + SM/SZ175	○	○	○	○	○	Dynamic
	S/SZ370 S/SZ185 + S/SZ185	○	○	○	○	○	Dynamic
	S425 S240 + S185	○	-	○	○	○	Dynamic
	S482 S240 + S240	○	-	○	○	○	Static
	S485 S300 + S185	○	-	○	○	○	Dynamic
	S540 S300 + S240	○	-	○	○	○	Static
	S600 S300 + S300	○	-	○	○	○	Static
	S620 S240 + S380	○	-	○	○	○	Static
	S680 S300 + S380	○	-	○	○	○	Static
	S760 S380 + S380	○	-	○	○	○	Static
Trio	SM/SZ444 3 x SM/SZ148	○	○	○	○	○	Static
	SM/SZ483 3 x SM/SZ161	○	○	○	○	○	Static
	SZ550 3 x SZ185	○	○	○	○	○	Dynamic
	S720 3 x S240	○	-	○	○	○	Static
	S900 3 x S300	○	-	○	○	○	Static
Quadro	S1140 3 x S380	○	-	○	○	○	Static
	SM/SZ740 4 x SY/SZ185	○	○	○	○	○	Dynamic

○: Field assembly

- : Not available

Application Guidelines

Technical specifications 50 Hz data

Model		Nominal tons 60 Hz	Nominal cooling capacity		Power input	Efficiency		Sound power	Swept volume	Displacement	
		TR	W	Btu/h	kW	COP W/W	E.E.R. Btu/h/W	dB(A)	cm³/ rev	m³/h	
R22	Tandem	SM170	13.5	40 100	136 900	12.2	3.28	11.2	73.0	229.0	39.8
		SM180	15	42 900	146 400	13.1	3.28	11.2	73.0	241.0	41.9
		SM200	16	45 600	155 600	13.9	3.28	11.2	73.0	254.4	44.3
		SM220	18	51 100	174 400	15.6	3.27	11.2	78.0	288.4	50.2
		SM242	20	59 300	202 400	17.9	3.31	11.3	78.0	333.2	58.0
		SM248	20	62 300	212 600	17.5	3.56	12.2	76.0	339.0	59.0
		SM268	22	65 200	222 500	19.8	3.29	11.2	80.5	365.6	63.6
		SM271	22	64 000	218 400	19.4	3.30	11.3	80.8	360.8	62.8
		SM272	22	67 200	229 400	18.8	3.57	12.2	76.5	363.0	63.2
		SM281	23	68 100	232 400	20.5	3.31	11.3	80.8	383.2	66.7
		SM294	24	72 100	246 100	20.2	3.58	12.2	77.0	387.0	67.3
		SM296	24	71 100	242 700	21.6	3.29	11.2	82.0	398.0	69.3
		SM322	26	76 900	262 500	23.2	3.32	11.3	82.5	433.2	75.4
		SM350	28	82 700	282 300	24.9	3.32	11.3	83.0	466.0	81.1
		SY370	30	89 700	306 100	26.4	3.40	11.6	83.0	499.8	87.0
		SY425	35	105 100	358 700	31.5	3.34	11.4	84.1	597.7	104.0
		SY482	40	122 400	417 700	36.4	3.36	11.5	85.0	695.6	121.0
		SY485	40	121 900	416 000	36.1	3.38	11.5	84.1	687.4	119.6
		SY540	45	139 400	475 800	41.0	3.40	11.6	85.0	785.3	136.6
		SY600	50	156 500	534 100	45.7	3.43	11.7	85.0	875.0	152.3
	SY620	50	155 700	531 400	45.5	3.42	11.7	88.2	879.0	152.9	
	SY680	55	172 800	589 800	50.2	3.44	11.7	88.2	968.7	168.6	
	SY760	60	189 000	645 100	54.7	3.46	11.8	90.0	1 062.4	184.9	
	Trio	SM444	36	108 200	369 300	32.4	3.34	11.4	83.8	597.0	103.9
		SM483	39	117 100	399 700	34.8	3.37	11.5	84.3	649.8	113.1
		SY550	45	132 500	452 200	39.9	3.32	11.3	84.8	749.7	130.4
		SY720	60	183 500	626 300	54.6	3.36	11.5	86.8	1 043.4	181.6
		SY900	75	234 800	801 400	68.5	3.43	11.7	86.8	1 312.5	228.4
		SY1140	90	283 500	967 600	82.0	3.46	11.8	91.8	1 593.6	277.3
	Quadro	SM740	60	176 500	602 400	54.5	3.24	11.1	86.0	999.6	173.9
R407C	Tandem	SZ170	13.5	38 100	130 000	12.3	3.10	10.6	74.0	229.0	39.8
		SZ180	15	40 200	137 200	12.9	3.12	10.6	75.0	241.0	41.9
		SZ200	16	42 500	145 100	13.7	3.11	10.6	76.0	254.4	44.3
		SZ220	18	48 500	165 500	15.5	3.12	10.6	80.0	288.4	50.2
		SZ242	20	56 200	191 800	18.0	3.13	10.7	80.0	333.2	58.0
		SZ268	22	62 700	214 000	20.0	3.14	10.7	81.1	365.6	63.6
		SZ271	22	61 600	210 200	19.6	3.14	10.7	81.1	360.8	62.8
		SZ281	23	65 500	223 500	20.8	3.15	10.8	81.1	383.2	66.7
		SZ296	24	69 100	235 800	22.0	3.15	10.8	82.0	398.0	69.3
		SZ322	26	74 800	255 300	23.7	3.16	10.8	82.0	433.2	75.4
		SZ350	28	79 000	269 600	25.3	3.12	10.6	84.0	466.0	81.1
		SZ370	30	84 900	289 800	27.2	3.12	10.6	84.0	499.8	87.0
		SZ425	35	100 700	343 700	32.2	3.13	10.7	85.4	597.7	104.0
		SZ482	40	118 200	403 400	37.1	3.19	10.9	86.5	695.6	121.0
		SY485	40	114 100	389 400	36.4	3.13	10.7	85.8	687.4	119.6
		SZ540	45	131 800	449 800	41.3	3.19	10.9	86.8	785.3	136.6
		SZ600	50	145 500	496 600	45.5	3.20	10.9	87.0	875.0	152.3
		SZ620	50	148 700	507 500	46.1	3.22	11.0	89.0	879.0	152.9
		SZ680	55	162 300	553 900	50.3	3.23	11.0	89.1	968.7	168.6
		SZ760	60	179 100	611 300	55.2	3.25	11.1	90.5	1 062.4	184.9
	Trio	SZ444	36	105 300	359 400	33.0	3.19	10.9	83.8	597.0	103.9
		SZ483	39	114 000	389 100	35.5	3.21	11.0	83.8	649.8	113.1
		SZ550	45	125 400	428 000	40.9	3.07	10.5	85.8	749.7	130.4
		SZ720	60	177 300	605 100	55.7	3.19	10.9	88.3	1 043.4	181.6
		SZ900	75	218 200	744 700	68.2	3.20	10.9	88.8	1 312.5	228.4
		SZ1140	90	268 700	917 100	82.8	3.25	11.1	92.3	1 593.6	277.3
	Quadro	SZ740	60	167 200	570 600	54.5	3.07	10.5	87.0	999.6	173.9

Rating conditions:
R22: ARI standard conditions, 7.2 °C evap. temp., 54.4°C cond. temp., 8.3 K subcooling, 11.1 K superheat
R407C: ARI standard conditions, 7.2 °C (dew point) evap. temp., 54.4 °C (dew point) cond. temp., 8.3 K subcooling, 11.1 K superheat

Application Guidelines

Technical specifications 60 Hz data

Model			Nominal tons 60 Hz	Nominal cooling capacity		Power input	Efficiency		Sound power	Swept volume	Displacement
			TR	W	Btu/h	kW	COP W/W	E.E.R. Btu/h/W	dB(A)	cm³/rev	m³/h
R22	Tandem	SM170	13.5	48 500	165 500	14.7	3.29	11.2	77.0	229.0	48.1
		SM180	15	51 900	177 100	15.6	3.32	11.3	78.0	241.0	50.6
		SM200	16	54 300	185 300	16.3	3.33	11.4	78.0	254.4	53.4
		SM220	18	62 200	212 300	18.7	3.33	11.4	81.0	288.4	60.6
		SM242	20	72 300	246 800	21.6	3.35	11.4	81.0	333.2	70.0
		SM248	20	75 500	257 700	21.2	3.56	12.2	80.0	339.0	71.2
		SM268	22	79 300	270 600	23.8	3.33	11.4	84.2	365.6	76.8
		SM271	22	78 000	266 200	23.4	3.33	11.4	85.0	360.8	75.8
		SM272	22	81 300	277 500	22.8	3.57	12.2	80.5	363.0	76.2
		SM281	23	83 100	283 600	24.9	3.34	11.4	85.0	383.2	80.5
		SM294	24	87 100	297 300	24.4	3.58	12.2	81.0	387.0	81.3
		SM296	24	86 300	294 500	26.0	3.32	11.3	86.0	398.0	83.6
		SM322	26	93 800	320 100	28.1	3.34	11.4	87.0	433.2	91.0
		SM350	28	100 600	343 300	30.5	3.29	11.2	85.5	466.0	97.9
		SY370	30	109 000	372 000	32.4	3.36	11.5	85.5	499.8	105.0
		SY425	35	127 400	434 800	38.4	3.32	11.3	86.9	597.7	125.5
		SY482	40	148 100	505 500	44.3	3.35	11.4	88.0	695.6	146.1
		SY485	40	147 600	503 800	43.8	3.37	11.5	87.6	687.4	144.4
		SY540	45	168 600	575 400	49.7	3.39	11.6	88.5	785.3	164.9
		SY600	50	189 000	645 100	55.1	3.43	11.7	89.0	875.0	183.8
		SY620	50	189 400	646 400	55.5	3.41	11.6	92.8	879.0	184.6
		SY680	55	209 900	716 400	60.9	3.45	11.8	93.0	968.7	203.4
		SY760	60	230 700	787 400	66.7	3.46	11.8	95.0	1 062.4	223.1
	Trio	SM444	36	131 500	448 800	39.0	3.37	11.5	87.8	597.0	125.4
		SM483	39	142 900	487 700	42.2	3.39	11.6	88.8	649.8	136.5
		SY550	45	161 000	549 500	48.9	3.29	11.2	87.3	749.7	157.4
		SY720	60	222 200	758 400	66.4	3.35	11.4	89.8	1 043.4	219.1
		SY900	75	283 500	967 600	82.6	3.43	11.7	90.8	1 312.5	275.6
		SY1140	90	346 000	1 180 900	100.1	3.46	11.8	96.8	1 593.6	334.7
	Quadro	SM740	60	210 700	719 100	64.9	3.25	11.1	88.5	999.6	209.9
R407C	Tandem	SZ170	13.5	44 400	151 500	14.1	3.15	10.8	77.0	229.0	48.1
		SZ180	15	48 100	164 200	15.3	3.15	10.8	80.0	241.0	50.6
		SZ200	16	52 200	178 200	16.4	3.19	10.9	80.0	254.4	53.4
		SZ220	18	59 300	202 400	18.6	3.19	10.9	84.0	288.4	60.6
		SZ242	20	68 600	234 100	21.5	3.20	10.9	84.0	333.2	70.0
		SZ268	22	76 300	260 400	24.1	3.17	10.8	85.1	365.6	76.8
		SZ271	22	74 900	255 600	23.6	3.17	10.8	85.1	360.8	75.8
		SZ281	23	79 600	271 700	25.1	3.17	10.8	85.1	383.2	80.5
		SZ296	24	83 900	286 300	26.7	3.15	10.8	86.0	398.0	83.6
		SZ322	26	90 500	308 900	28.6	3.16	10.8	86.0	433.2	91.0
		SZ350	28	95 900	327 300	30.5	3.14	10.7	87.0	466.0	97.9
		SZ370	30	102 000	348 100	32.8	3.11	10.6	87.0	499.8	105.0
		SZ425	35	121 100	413 300	39.1	3.10	10.6	88.8	597.7	125.5
		SZ482	40	142 300	485 700	45.3	3.14	10.7	90.0	695.6	146.1
		SZ485	40	137 600	469 600	43.9	3.13	10.7	89.1	687.4	144.4
		SZ540	45	159 000	542 700	50.2	3.17	10.8	90.3	785.3	164.9
		SZ600	50	175 800	600 000	55.0	3.20	10.9	90.5	875.0	183.8
		SZ620	50	178 400	608 900	56.2	3.18	10.9	92.5	879.0	184.6
		SZ680	55	195 200	666 200	61.0	3.20	10.9	92.6	968.7	203.4
		SZ760	60	214 600	732 400	67.0	3.20	10.9	94.0	1 062.4	223.1
	Trio	SZ444	36	127 800	436 200	40.1	3.19	10.9	87.8	597.0	125.4
		SZ483	39	137 900	470 600	43.0	3.21	11.0	87.8	649.8	136.5
		SZ550	45	150 700	514 300	49.3	3.06	10.4	88.8	749.7	157.4
		SZ720	60	213 400	728 300	68.0	3.14	10.7	91.8	1 043.4	219.1
		SZ900	75	263 600	899 700	82.5	3.20	10.9	92.3	1 312.5	275.6
		SZ1140	90	321 900	1 098 600	100.5	3.20	10.9	95.8	1 593.6	334.7
	Quadro	SZ740	60	200 900	685 700	65.7	3.06	10.4	90.0	999.6	209.9

Rating conditions:
SM compressors - R22: ARI standard conditions, 7.2 °C evap. temp., 54.4°C cond. temp., 8.3 K subcooling, 11.1 K superheat
SZ/SY compressors - R407C: ARI standard conditions, 7.2 °C (dew point) evap. temp., 54.4 °C (dew point) cond. temp., 8.3 K subcooling, 11.1 K superheat

Application Guidelines

Operating conditions

The scroll compressor application range is influenced by several parameters which need to be monitored for a safe and reliable operation. These parameters and the main recommendations for good practice and safety devices are explained hereunder.

- Refrigerant and lubricants refer to **FRCC.PC.003**
- Motor supply
- Compressor ambient temperature
- Application envelope (evaporating temperature, condensing temperature, return gas temperature).

Motor supply

SM / SY / SZ scroll compressors can be operated at nominal voltages as indicated below. Under-voltage and over-voltage operation is allowed

within the indicated voltage ranges. In case of risk of under-voltage operation, special attention must be paid to current draw.

		Motor voltage code 3	Motor voltage code 4	Motor voltage code 6	Motor voltage code 7	Motor voltage code 9
Nominal voltage	50 Hz	-	380-400 V - 3 ph	230 V - 3 ph	500 V - 3 ph	-
Voltage range	50 Hz	-	342-440 V	207 - 253 V	450 - 550 V	-
Nominal voltage	60 Hz	200-230 V - 3 ph	460 V - 3 ph	-	575 V - 3 ph	380 V - 3 ph
Voltage range	60 Hz	180 - 253 V	414 - 506 V	-	517 - 632 V	342 - 418 V

Compressor ambient temperature

SM / SY / SZ compressors can be applied from -35°C to +63°C (for SM/SZ084 to 185) and +53°C (for S240 to 380) ambient temperature. The compressors are designed as 100 % suction gas

cooled without need for additional fan cooling. Ambient temperature has very little effect on the compressors performance.

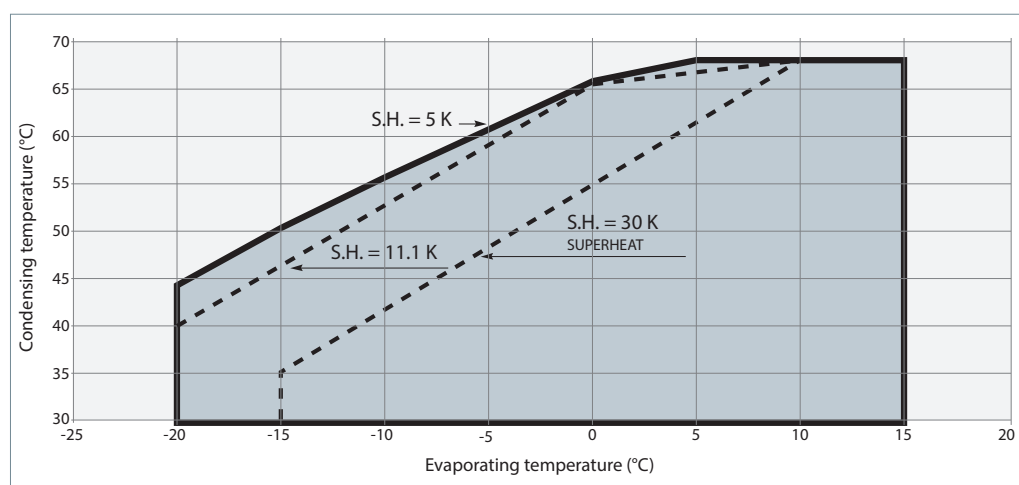
Application envelope

The parallel assemblies recommended design from Danfoss Commercial Compressors have been qualified to ensure there is no impact on the compressor operating envelopes. Consequently, the Danfoss scroll tandem, trio and quadro assemblies have the operating limits as shown below.

More details can be found in the Application Guidelines for Danfoss scroll compressors (FRCC.PC.003).

R22

Tandem: SM170 to 370
 SY425 to 760
 Trio: SM444 to 1140
 Quadro: SM740



Application Guidelines

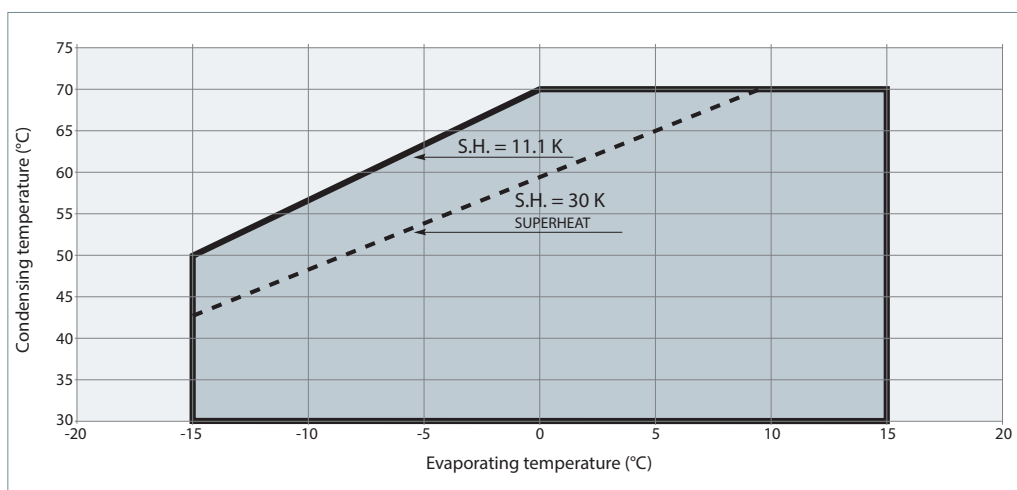
Operating conditions

R134a

Tandem: SZ170 to 370

Trio: SZ444 to 550

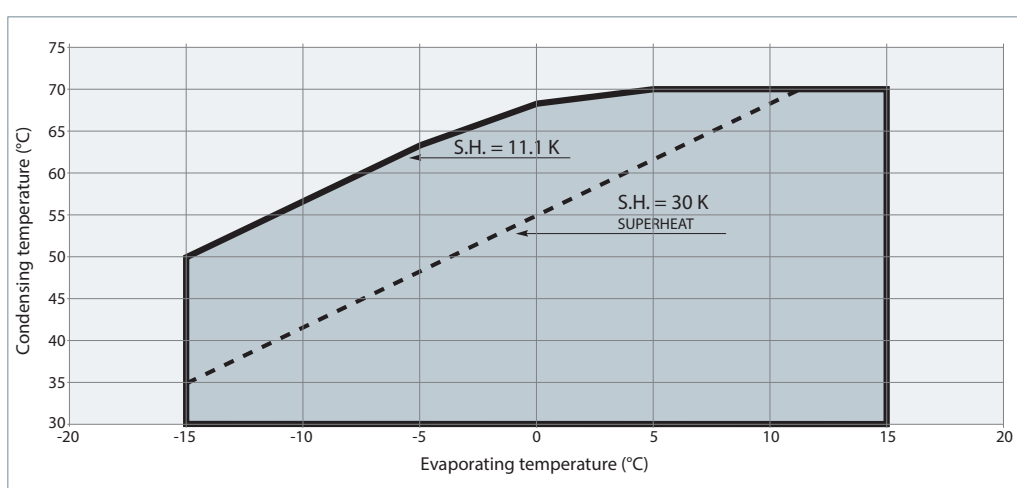
Quadro: SZ740



R134a

Tandem: SZ425 to 760

Trio: SZ720 to 1140



R407C

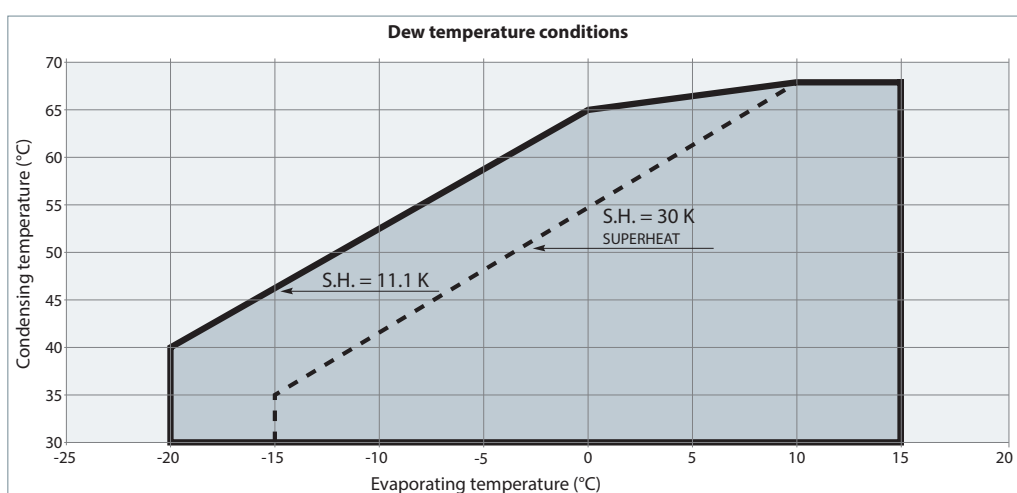
At DEW temperature

Tandem: SZ170 to 370

SZ425 - 485

Trio: SZ444 to 550

Quadro: SZ740



Application Guidelines

Operating conditions

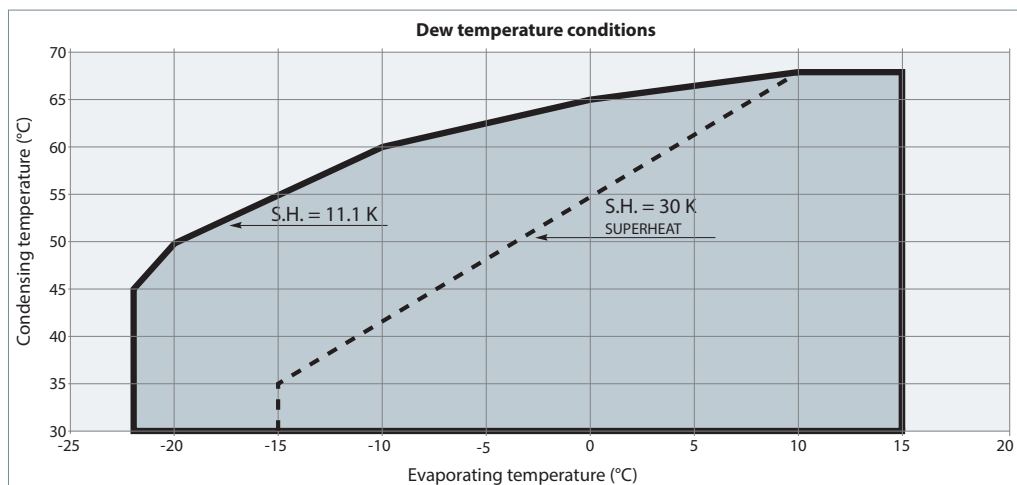
R407C

At DEW temperature

Tandem: SZ482

SZ540 to 760

Trio: SZ720 to 1140

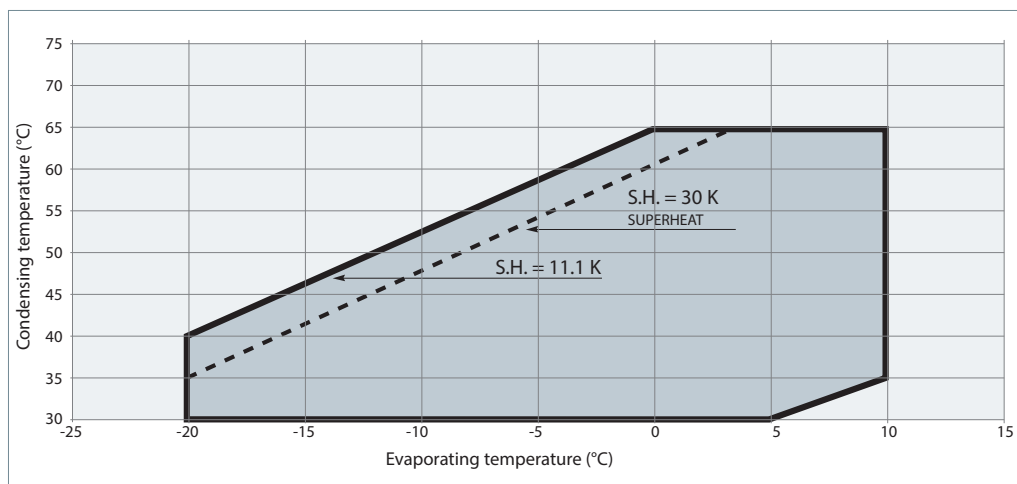


R404A/R507A

Tandem: SZ170 to 370

Trio: SZ444 to 550

Quadro: SZ740

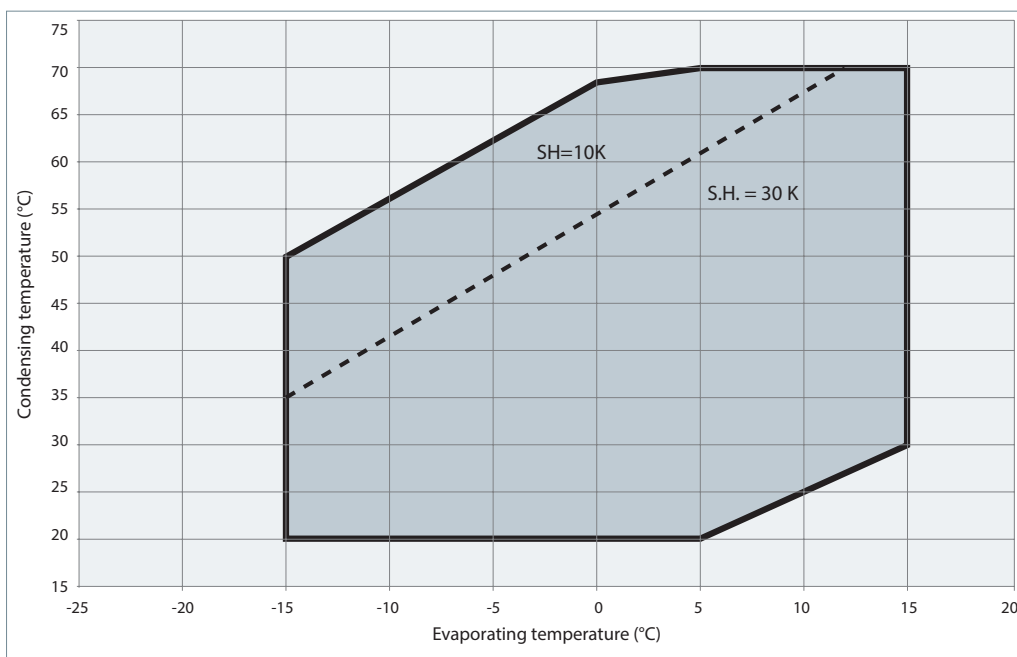


R513A

Tandem: SZ482

SZ540 to 760

Trio: SZ720 to 1140



R513A

Tandem: SZ296 to 370

SZ425

Trio: SZ444 to 550

