

Datasheets

Danfoss scroll compressors **SM / SY / SZ / SH / WSH**



General Characteristics

Model number (on tandem nameplate)	SZ310-4
Code number for Singlepack*	SZ310-4
Drawing number	8551017g
Composition	SZ185S4RC + SZ125S4RC
Suction and discharge connections	Brazed
Suction connection	2-1/8" ODF
Discharge connection	1-3/8" ODF
Oil sight glass (per compressor)	Threaded
Oil equalisation connections	Interconnected
Oil drain connection (per compressor)	1/4" NPT
LP gauge port (per compressor)	Schrader
IPR valve (per compressor)	None
Swept volume	416,5 cm ³ /rev
Displacement @ Nominal speed	72.5 m ³ /h @ 2900 rpm - 87.5 m ³ /h @ 3500 rpm
Net weight	200 kg
Oil charge	10 litre, POE - 160SZ
Maximum system test pressure Low Side / High side	25 bar(g) / 32 bar(g)
Maximum differential test pressure	24 bar
Maximum number of starts per hour	12
Refrigerant charge limit	16,5 kg
Approved refrigerants	R407C, R134a

Electrical Characteristics

Nominal voltage	380-400V/3/50Hz - 460V/3/60Hz
Voltage range	340-440 V @ 50Hz - 414-506 V @ 60Hz
Winding resistance (between phases) +/- 7% at 25°C (per compressor)	0.77 + 1.16 Ω
Maximum Must Trip current (MMT) (per compressor)	35 + 25 A
Locked Rotor Amps (LRA) (per compressor)	175 + 120 A
Motor protection (per compressor)	Internal thermostat, ext. overload protector needed

Recommended Installation torques

Oil sight glass	50 Nm
Power connections / Earth connection	3 Nm / 2 Nm
Terminal box cover screws	2,3 Nm

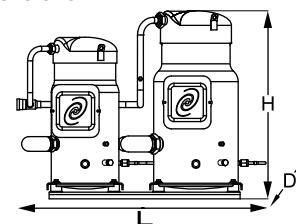
Parts shipped with tandem unit

Initial oil charge
Installation instructions

Approvals : Individual compressors CE certified, Individual compressors UL certified (file SA6873), -

*Singlepack: Compressor in cardboard box on pallet

Dimensions

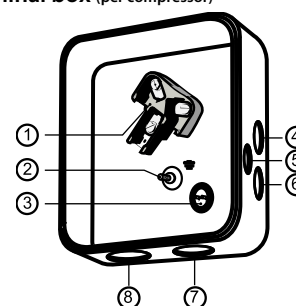


L = 924 mm

D = 480 mm

H = 705 mm

Terminal box (per compressor)



IP54 (with cable gland)

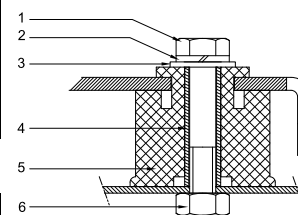
- 1: Power connection, 3 x 4.8 mm (3/16")
- 2: Earth M5
- 3: Thermostat connector
- 4: Knock-out Ø 22 mm (7/8") for 1/2" conduit
- 5: Knock-out Ø 16.5 mm (0.65")
- 6: Knock-out Ø 20.5 mm (0.81")
- 7: Double knock-out Ø 32.1 mm (1.26") & Ø 25.4 mm (1")
- 8: Double knock-out Ø 44 mm (1-3/4") for 1-1/4" conduit & Ø 34 mm (1-3/8") for 1" conduit

Oil / lubricants
Code no.

POE lubricant, 160SZ, 1 litre can	7754023
POE lubricant, 160SZ, 2.5 litre can	120Z0571

Crankcase heaters
Code no.

Surface sump heater + bottom insulation, 56 W, 24 V, CE mark, UL	120Z0360
Surface sump heater + bottom insulation, 48 W, 24 V, CE mark, UL	120Z0363
Surface sump heater + bottom insulation, 56 W, 230 V, CE mark, UL	120Z0376
Surface sump heater + bottom insulation, 48 W, 230 V, CE mark, UL	120Z0384
Surface sump heater + bottom insulation, 56 W, 400 V, CE mark, UL	120Z0377
Surface sump heater + bottom insulation, 56 W, 460 V, CE mark, UL	120Z0378
Surface sump heater + bottom insulation, 48 W, 400 V, CE mark, UL	120Z0385
Surface sump heater + bottom insulation, 48 W, 460 V, CE mark, UL	120Z0386
Belt type crankcase heater, 75 W, 400 V, CE mark, UL	7773118
Belt type crankcase heater, 75 W, 460 V, CE mark, UL	120Z0464
Belt type crankcase heater, 65 W, 460 V, CE mark, UL	120Z0466
Belt type crankcase heater, 65 W, 400 V, CE mark, UL	7773117

Mounting kit


- 1: Bolt (4x)
- 2: Lock washer (4x)
- 3: Flat washer (4x)
- 4: Sleeve (4x)
- 5: Grommet (4x)
- 6: Nut (4x)

Miscellaneous accessories
Code no.

Electronic soft start kit, MCI 25 C	7705007
Acoustic hood for scroll compressor S175-S185	7755007
Acoustic hood for scroll compressor S115-S125	7755009
Discharge thermostat kit	7750009
Suction header restrictor for SM/SZ285-290-310	7765014
Restrictor + suction/discharge Tees for SM/SZ285-290-310	7703311

Spare parts
Code no.

Mounting kit for 1 scroll compressor including 4 grommets, 4 sleeves, 4 bolts, 4 washers	8156138
Oil sight glass with gaskets (black & white)	8156019
Gasket for oil sight glass (white teflon)	8156129
Terminal box 186 x 198 mm, incl cover	8156139
T block connector 60 x 75 mm	8173021

Performance data at 50 Hz, EN 12900 rating conditions
R407C

Cond. temp. in °C (tc)	Evaporating temperature in °C (to)							
	-20	-15	-10	-5	0	5	10	15

Cooling capacity in W

30	26 823	34 266	43 133	53 573	65 732	79 758	95 799	114 004	-
35	25 042	32 264	40 838	50 910	62 626	76 135	91 582	109 116	-
40	23 188	30 141	38 372	48 027	59 251	72 191	86 994	103 807	-
45	-	27 889	35 728	44 916	55 598	67 920	82 028	98 069	-
50	-	-	32 899	41 570	51 660	63 314	76 676	91 893	-
55	-	-	-	37 984	47 432	58 366	70 931	85 271	-
60	-	-	-	-	42 906	53 068	64 781	78 189	-
65	-	-	-	-	38 073	47 408	58 214	70 632	-

Power input in W

30	12 781	12 892	12 987	13 058	13 100	13 105	13 066	12 976	-
35	14 249	14 359	14 454	14 526	14 568	14 573	14 534	14 444	-
40	15 932	16 043	16 138	16 210	16 252	16 257	16 219	16 129	-
45	-	17 971	18 067	18 139	18 181	18 187	18 148	18 059	-
50	-	-	20 270	20 343	20 385	20 391	20 353	20 264	-
55	-	-	-	22 851	22 894	22 900	22 862	22 773	-
60	-	-	-	-	25 736	25 742	25 705	25 616	-
65	-	-	-	-	28 941	28 948	28 910	28 822	-

Current consumption in A

30	27.36	27.53	27.67	27.78	27.84	27.84	27.77	27.62	-
35	29.04	29.21	29.36	29.47	29.53	29.54	29.47	29.33	-
40	31.08	31.25	31.39	31.51	31.57	31.58	31.52	31.38	-
45	-	33.68	33.83	33.94	34.01	34.02	33.97	33.83	-
50	-	-	36.72	36.84	36.91	36.92	36.87	36.74	-
55	-	-	-	40.24	40.32	40.33	40.29	40.16	-
60	-	-	-	-	44.29	44.31	44.27	44.14	-
65	-	-	-	-	48.87	48.90	48.86	48.75	-

Mass flow in kg/h

30	559	701	867	1 057	1 275	1 524	1 804	2 119	-
35	548	692	859	1 052	1 272	1 521	1 803	2 120	-
40	535	681	850	1 044	1 265	1 515	1 798	2 115	-
45	-	667	837	1 032	1 253	1 504	1 787	2 104	-
50	-	-	820	1 015	1 237	1 488	1 770	2 087	-
55	-	-	-	993	1 214	1 465	1 746	2 061	-
60	-	-	-	-	1 185	1 434	1 714	2 028	-
65	-	-	-	-	1 147	1 394	1 673	1 984	-

Coefficient of performance (C.O.P.)

30	2.10	2.66	3.32	4.10	5.02	6.09	7.33	8.79	-
35	1.76	2.25	2.83	3.50	4.30	5.22	6.30	7.55	-
40	1.46	1.88	2.38	2.96	3.65	4.44	5.36	6.44	-
45	-	1.55	1.98	2.48	3.06	3.73	4.52	5.43	-
50	-	-	1.62	2.04	2.53	3.10	3.77	4.53	-
55	-	-	-	1.66	2.07	2.55	3.10	3.74	-
60	-	-	-	-	1.67	2.06	2.52	3.05	-
65	-	-	-	-	1.32	1.64	2.01	2.45	-

Nominal performance at to = 5 °C, tc = 50 °C

Cooling capacity	63 314	W
Power input	20 391	W
Current consumption	36.92	A
Mass flow	1 488	kg/h
C.O.P.	3.10	

Pressure switch settings

Maximum HP switch setting	29.5	bar(g)
Minimum LP switch setting	0.5	bar(g)
LP pump down setting	1	bar(g)

Sound power data

Sound power level	84	dB(A)
With acoustic hood	75	dB(A)

to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

Rating conditions : Superheat = 10 K , Subcooling = 0 K

All performance data +/- 5%

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Datasheet, performance data

Danfoss tandem scroll compressor. SZ310-4

Performance data at 50 Hz, ARI rating conditions

R407C

Cond. temp. in °C (tc)	Evaporating temperature in °C (to)							
	-20	-15	-10	-5	0	5	10	15

Cooling capacity in W

30	28 769	36 708	46 157	57 267	70 192	85 086	102 101	121 391	-
35	26 989	34 728	43 903	54 665	67 170	81 569	98 017	116 665	-
40	25 131	32 620	41 471	51 836	63 870	77 725	93 555	111 513	-
45	-	30 375	38 852	48 771	60 284	73 546	88 709	105 926	-
50	-	-	36 038	45 460	56 404	69 022	83 468	99 895	-
55	-	-	-	41 896	52 219	64 144	77 824	93 410	-
60	-	-	-	-	47 722	58 904	71 767	86 464	-
65	-	-	-	-	42 904	53 293	65 290	79 048	-

Power input in W

30	12 781	12 892	12 987	13 058	13 100	13 105	13 066	12 976	-
35	14 249	14 359	14 454	14 526	14 568	14 573	14 534	14 444	-
40	15 932	16 043	16 138	16 210	16 252	16 257	16 219	16 129	-
45	-	17 971	18 067	18 139	18 181	18 187	18 148	18 059	-
50	-	-	20 270	20 343	20 385	20 391	20 353	20 264	-
55	-	-	-	22 851	22 894	22 900	22 862	22 773	-
60	-	-	-	-	25 736	25 742	25 705	25 616	-
65	-	-	-	-	28 941	28 948	28 910	28 822	-

Current consumption in A

30	27.36	27.53	27.67	27.78	27.84	27.84	27.77	27.62	-
35	29.04	29.21	29.36	29.47	29.53	29.54	29.47	29.33	-
40	31.08	31.25	31.39	31.51	31.57	31.58	31.52	31.38	-
45	-	33.68	33.83	33.94	34.01	34.02	33.97	33.83	-
50	-	-	36.72	36.84	36.91	36.92	36.87	36.74	-
55	-	-	-	40.24	40.32	40.33	40.29	40.16	-
60	-	-	-	-	44.29	44.31	44.27	44.14	-
65	-	-	-	-	48.87	48.90	48.86	48.75	-

Mass flow in kg/h

30	556	698	862	1 051	1 268	1 515	1 794	2 107	-
35	545	688	855	1 046	1 265	1 513	1 793	2 107	-
40	532	677	845	1 038	1 258	1 507	1 787	2 102	-
45	-	664	833	1 026	1 246	1 496	1 777	2 091	-
50	-	-	816	1 010	1 230	1 479	1 760	2 074	-
55	-	-	-	988	1 207	1 456	1 736	2 049	-
60	-	-	-	-	1 178	1 426	1 704	2 015	-
65	-	-	-	-	1 141	1 386	1 663	1 972	-

Coefficient of performance (C.O.P.)

30	2.25	2.85	3.55	4.39	5.36	6.49	7.81	9.36	-
35	1.89	2.42	3.04	3.76	4.61	5.60	6.74	8.08	-
40	1.58	2.03	2.57	3.20	3.93	4.78	5.77	6.91	-
45	-	1.69	2.15	2.69	3.32	4.04	4.89	5.87	-
50	-	-	1.78	2.23	2.77	3.38	4.10	4.93	-
55	-	-	-	1.83	2.28	2.80	3.40	4.10	-
60	-	-	-	-	1.85	2.29	2.79	3.38	-
65	-	-	-	-	1.48	1.84	2.26	2.74	-

Nominal performance at to = 7.2 °C, tc = 54.4 °C

Cooling capacity	70 583	W
Power input	22 571	W
Current consumption	39.88	A
Mass flow	1 578	kg/h
C.O.P.	3.13	

Pressure switch settings

Maximum HP switch setting	29.5	bar(g)
Minimum LP switch setting	0.5	bar(g)
LP pump down setting	1	bar(g)

Sound power data

Sound power level	84	dB(A)
With acoustic hood	75	dB(A)

to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

Rating conditions : Superheat = 11.1 K , Subcooling = 8.3 K

All performance data +/- 5%

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Performance data at 50 Hz, EN 12900 rating conditions
R134a

Cond. temp. in °C (tc)	Evaporating temperature in °C (to)							
	-15	-10	-5	0	5	10	15	

Cooling capacity in W

35	21 506	27 588	34 713	42 984	52 504	63 376	75 703	-	-
40	20 095	25 970	32 843	40 815	49 990	60 471	72 360	-	-
45	18 642	24 282	30 874	38 520	47 322	57 382	68 804	-	-
50	17 151	22 529	28 812	36 103	44 503	54 115	65 041	-	-
55	-	20 716	26 662	33 569	41 539	50 673	61 073	-	-
60	-	-	24 428	30 923	38 433	47 059	56 904	-	-
65	-	-	-	28 168	35 189	43 277	52 534	-	-
70	-	-	-	25 308	31 808	39 326	47 963	-	-

Power input in W

35	10 117	10 201	10 263	10 295	10 290	10 242	10 143	-	-
40	11 185	11 276	11 345	11 387	11 393	11 358	11 273	-	-
45	12 389	12 488	12 566	12 618	12 637	12 615	12 546	-	-
50	13 741	13 848	13 937	14 001	14 032	14 025	13 972	-	-
55	-	15 368	15 468	15 544	15 590	15 598	15 563	-	-
60	-	-	17 170	17 260	17 321	17 346	17 328	-	-
65	-	-	-	19 159	19 236	19 278	19 280	-	-
70	-	-	-	21 251	21 346	21 407	21 429	-	-

Current consumption in A

35	24.25	24.37	24.46	24.49	24.46	24.36	24.18	-	-
40	25.30	25.44	25.53	25.58	25.57	25.49	25.33	-	-
45	26.57	26.71	26.82	26.89	26.90	26.83	26.70	-	-
50	28.08	28.23	28.36	28.44	28.47	28.43	28.31	-	-
55	-	30.02	30.16	30.26	30.30	30.29	30.20	-	-
60	-	-	32.25	32.37	32.44	32.45	32.38	-	-
65	-	-	-	34.79	34.89	34.92	34.89	-	-
70	-	-	-	37.56	37.68	37.74	37.73	-	-

Mass flow in kg/h

35	521	654	806	977	1 171	1 387	1 629	-	-
40	512	647	800	973	1 168	1 386	1 628	-	-
45	502	638	792	967	1 162	1 381	1 624	-	-
50	490	627	783	958	1 154	1 373	1 616	-	-
55	-	614	771	946	1 143	1 362	1 605	-	-
60	-	-	756	932	1 129	1 348	1 591	-	-
65	-	-	-	915	1 111	1 330	1 572	-	-
70	-	-	-	895	1 091	1 308	1 549	-	-

Coefficient of performance (C.O.P.)

35	2.13	2.70	3.38	4.18	5.10	6.19	7.46	-	-
40	1.80	2.30	2.89	3.58	4.39	5.32	6.42	-	-
45	1.50	1.94	2.46	3.05	3.74	4.55	5.48	-	-
50	1.25	1.63	2.07	2.58	3.17	3.86	4.65	-	-
55	-	1.35	1.72	2.16	2.66	3.25	3.92	-	-
60	-	-	1.42	1.79	2.22	2.71	3.28	-	-
65	-	-	-	1.47	1.83	2.24	2.72	-	-
70	-	-	-	1.19	1.49	1.84	2.24	-	-

Nominal performance at to = 5 °C, tc = 50 °C

Cooling capacity	44 503	W
Power input	14 032	W
Current consumption	28.47	A
Mass flow	1 154	kg/h
C.O.P.	3.17	

Pressure switch settings

Maximum HP switch setting	20.5	bar(g)
Minimum LP switch setting	0.5	bar(g)
LP pump down setting	0.5	bar(g)

Sound power data

Sound power level	0	dB(A)
With acoustic hood	0	dB(A)

to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

Rating conditions : Superheat = 10 K , Subcooling = 0 K

All performance data +/- 5%

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Performance data at 50 Hz, ARI rating conditions
R134a

Cond. temp. in °C (tc)	Evaporating temperature in °C (to)							
	-15	-10	-5	0	5	10	15	

Cooling capacity in W

35	23 293	29 830	37 473	46 330	56 506	68 109	81 245	-	-
40	21 883	28 228	35 634	44 207	54 055	65 284	78 001	-	-
45	20 427	26 551	33 690	41 953	51 444	62 271	74 540	-	-
50	18 929	24 804	31 649	39 571	48 677	59 074	70 867	-	-
55	-	22 992	29 515	37 068	45 761	55 698	66 987	-	-
60	-	-	27 292	34 449	42 699	52 149	62 905	-	-
65	-	-	-	31 718	39 497	48 431	58 626	-	-
70	-	-	-	28 881	36 161	44 550	54 156	-	-

Power input in W

35	10 117	10 201	10 263	10 295	10 290	10 242	10 143	-	-
40	11 185	11 276	11 345	11 387	11 393	11 358	11 273	-	-
45	12 389	12 488	12 566	12 618	12 637	12 615	12 546	-	-
50	13 741	13 848	13 937	14 001	14 032	14 025	13 972	-	-
55	-	15 368	15 468	15 544	15 590	15 598	15 563	-	-
60	-	-	17 170	17 260	17 321	17 346	17 328	-	-
65	-	-	-	19 159	19 236	19 278	19 280	-	-
70	-	-	-	21 251	21 346	21 407	21 429	-	-

Current consumption in A

35	24.25	24.37	24.46	24.49	24.46	24.36	24.18	-	-
40	25.30	25.44	25.53	25.58	25.57	25.49	25.33	-	-
45	26.57	26.71	26.82	26.89	26.90	26.83	26.70	-	-
50	28.08	28.23	28.36	28.44	28.47	28.43	28.31	-	-
55	-	30.02	30.16	30.26	30.30	30.29	30.20	-	-
60	-	-	32.25	32.37	32.44	32.45	32.38	-	-
65	-	-	-	34.79	34.89	34.92	34.89	-	-
70	-	-	-	37.56	37.68	37.74	37.73	-	-

Mass flow in kg/h

35	519	651	802	972	1 165	1 380	1 620	-	-
40	510	644	796	968	1 162	1 378	1 619	-	-
45	499	635	788	962	1 156	1 373	1 615	-	-
50	487	624	779	953	1 148	1 366	1 607	-	-
55	-	611	767	941	1 137	1 355	1 596	-	-
60	-	-	753	927	1 123	1 340	1 582	-	-
65	-	-	-	910	1 106	1 323	1 563	-	-
70	-	-	-	891	1 085	1 301	1 541	-	-

Coefficient of performance (C.O.P.)

35	2.30	2.92	3.65	4.50	5.49	6.65	8.01	-	-
40	1.96	2.50	3.14	3.88	4.74	5.75	6.92	-	-
45	1.65	2.13	2.68	3.32	4.07	4.94	5.94	-	-
50	1.38	1.79	2.27	2.83	3.47	4.21	5.07	-	-
55	-	1.50	1.91	2.38	2.94	3.57	4.30	-	-
60	-	-	1.59	2.00	2.47	3.01	3.63	-	-
65	-	-	-	1.66	2.05	2.51	3.04	-	-
70	-	-	-	1.36	1.69	2.08	2.53	-	-

Nominal performance at to = 7.2 °C, tc = 54.4 °C

Cooling capacity	50 355	W
Power input	15 402	W
Current consumption	30.07	A
Mass flow	1 231	kg/h
C.O.P.	3.27	

Pressure switch settings

Maximum HP switch setting	20.5	bar(g)
Minimum LP switch setting	0.5	bar(g)
LP pump down setting	0.5	bar(g)

Sound power data

Sound power level	0	dB(A)
With acoustic hood	0	dB(A)

to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

Rating conditions : Superheat = 11.1 K , Subcooling = 8.3 K

All performance data +/- 5%

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