

Datasheets

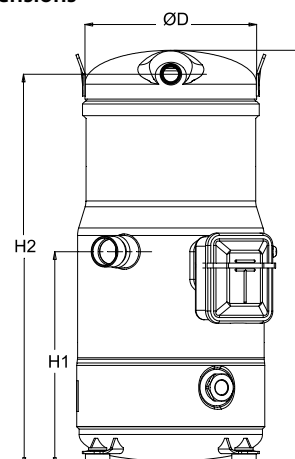
Danfoss scroll compressors **SM / SY / SZ / SH / WSH**



General Characteristics

Model number (on compressor nameplate)		SH120A4ALC
Code number for Singlepack*		120H0013
Code number for Industrial pack**		120H0014
Drawing number		8560003h
Suction and discharge connections		Brazed
Suction connection		1-3/8" ODF
Discharge connection		7/8" ODF
Oil sight glass		Threaded
Oil equalisation connection		1-3/4" Rotolock
Oil drain connection		None
LP gauge port		Schrader
IPR valve		None
Swept volume		116.9 cm ³ /rev
Displacement @ Nominal speed		20.3 m ³ /h @ 2900 rpm - 24.6 m ³ /h @ 3500 rpm
Net weight		64.2 kg
Oil charge		3.3 litre, POE - 160SZ
Maximum system test pressure Low Side / High side		33.3 bar(g) / 48.7 bar(g)
Maximum differential test pressure		37 bar
Maximum number of starts per hour		12
Refrigerant charge limit		7.9 kg
Approved refrigerants		R410A

Dimensions

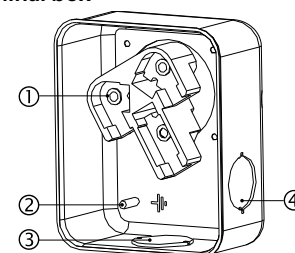


D=243 mm
H=540 mm
H1=278 mm
H2=509 mm
H3=- mm

Electrical Characteristics

Nominal voltage	380-400V/3/50Hz - 460V/3/60Hz
Voltage range	342-440 V @ 50Hz - 414-506 V @ 60Hz
Winding resistance (between phases) +/- 7% at 25°C	1.05 Ω
Rated Load Amps (RLA)	20.7 A
Maximum Continuous Current (MCC)	29 A
Locked Rotor Amps (LRA)	142 A
Motor protection	Internal overload protector

Terminal box



IP54 (with cable gland)
1: Power connection, 3 x 4.8 mm (3/16")
2: Earth M4-12
3: Knock-out Ø 29 mm (1.14")
4: Knock-out Ø 25.5 mm (1.00")

Recommended Installation torques

Oil sight glass	50 Nm
Power connections / Earth connection	3 Nm / 2 Nm
Mounting bolts	15 Nm

Parts shipped with compressor

Mounting kit with grommets, bolts, nuts, sleeves and washers
Initial oil charge
Installation instructions

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

*Singlepack: Compressor in cardboard box

**Industrial pack: 8 Unboxed compressors on pallet (order per multiples of 8)

Rotolock accessories, suction side
Code no.

Solder sleeve, P10 (1-3/4" Rotolock, 1-3/8" ODF)	8153003
Rotolock valve, V10 (1-3/4" Rotolock, 1-3/8" ODF)	8168022
Gasket, 1-3/4"	8156132

Rotolock accessories, discharge side
Code no.

Rotolock valve, V05 (1-1/4" Rotolock, 7/8" ODF)	8168030
Gasket, 1-3/4"	8156132

Rotolock accessories, sets
Code no.

Solder sleeve adapter set (1-3/4" Rotolock, 1-3/8" ODF), (1-1/4" Rotolock, 7/8" ODF)	120Z0405
Valve set, V10 (1-3/4"~1-3/8"), V05 (1-1/4"~7/8")	7703392
Gasket set, 1-1/4", 1-3/4", 2-1/4", OSG gaskets black & white	8156013

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, 80 W, 24 V, CE mark, UL	120Z0388
Surface sump heater, 80 W, 230 V, CE mark, UL	120Z0389
Surface sump heater, 80 W, 400 V, CE mark, UL	120Z0390
Surface sump heater, 80 W, 460 V, CE mark, UL	120Z0391

Miscellaneous accessories
Code no.

Acoustic hood for scroll compressor SH105-161 & SM124, SM147	120Z0035
Gasket, 1-3/4"	8156132
Discharge thermostat kit	7750009

Spare parts
Code no.

Mounting kit for 1 scroll compressor including 4 grommets, 4 sleeves, 4 bolts, 4 washers	120Z0066
Oil sight glass with gaskets (black & white)	8156019
Service kit for terminal box 96 x 115 mm, including 1 cover, 1 clamp	8156135
T block connector 52 x 57 mm	8173230

Performance data at 50 Hz, EN 12900 rating conditions
R410A

Cond. temp. in °C (tc)	Evaporating temperature in °C (to)							
	-25	-20	-15	-10	-5	0	5	10

Cooling capacity in W

30	10 254	12 898	16 019	19 679	23 940	28 863	34 512	40 948	48 232
35	9 479	12 038	15 040	18 546	22 618	27 318	32 708	38 851	45 807
40	-	11 176	14 040	17 373	21 237	25 695	30 807	36 637	43 246
45	-	-	13 003	16 144	19 781	23 977	28 793	34 291	40 534
50	-	-	11 911	14 841	18 233	22 148	26 649	31 797	37 654
55	-	-	-	13 450	16 577	20 192	24 359	29 137	34 590
60	-	-	-	-	14 796	18 093	21 906	26 296	31 326
65	-	-	-	-	-	-	19 274	23 257	27 845

Power input in W

30	5 264	5 365	5 466	5 564	5 655	5 737	5 807	5 862	5 900
35	5 845	5 945	6 046	6 146	6 242	6 331	6 409	6 476	6 526
40	-	6 601	6 698	6 796	6 892	6 983	7 066	7 139	7 198
45	-	-	7 441	7 533	7 624	7 713	7 796	7 871	7 935
50	-	-	8 294	8 374	8 457	8 539	8 618	8 691	8 754
55	-	-	-	9 339	9 408	9 480	9 550	9 616	9 675
60	-	-	-	-	10 497	10 553	10 610	10 664	10 714
65	-	-	-	-	-	-	11 816	11 855	11 892

Current consumption in A

30	12.29	12.35	12.42	12.49	12.56	12.63	12.69	12.75	12.81
35	12.87	12.95	13.02	13.10	13.18	13.26	13.33	13.40	13.46
40	-	13.64	13.72	13.81	13.90	13.98	14.06	14.13	14.20
45	-	-	14.54	14.64	14.73	14.82	14.91	14.99	15.06
50	-	-	15.51	15.61	15.71	15.80	15.89	15.98	16.05
55	-	-	-	16.75	16.85	16.95	17.04	17.13	17.21
60	-	-	-	-	18.19	18.29	18.38	18.47	18.55
65	-	-	-	-	-	-	19.94	20.02	20.10

Mass flow in kg/h

30	212	265	326	395	475	566	670	788	921
35	208	261	322	391	471	562	666	784	917
40	-	256	317	387	466	557	661	779	911
45	-	-	311	381	460	551	655	772	904
50	-	-	305	374	453	544	647	764	895
55	-	-	-	367	445	535	638	754	885
60	-	-	-	-	436	526	627	743	873
65	-	-	-	-	-	-	616	730	859

Coefficient of performance (C.O.P.)

30	1.95	2.40	2.93	3.54	4.23	5.03	5.94	6.98	8.18
35	1.62	2.02	2.49	3.02	3.62	4.32	5.10	6.00	7.02
40	-	1.69	2.10	2.56	3.08	3.68	4.36	5.13	6.01
45	-	-	1.75	2.14	2.59	3.11	3.69	4.36	5.11
50	-	-	1.44	1.77	2.16	2.59	3.09	3.66	4.30
55	-	-	-	1.44	1.76	2.13	2.55	3.03	3.58
60	-	-	-	-	1.41	1.71	2.06	2.47	2.92
65	-	-	-	-	-	-	1.63	1.96	2.34

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

Cooling capacity	26 649	W
Power input	8 618	W
Current consumption	15.89	A
Mass flow	647	kg/h
C.O.P.	3.09	


Pressure switch settings

Maximum HP switch setting	46.1	bar(g)
Minimum LP switch setting	1.5	bar(g)
LP pump down setting	1.7	bar(g)

Sound power data

Sound power level	72.5	dB(A)
With acoustic hood	66.5	dB(A)

to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

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

Tolerance according EN12900

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Performance data at 50 Hz, ARI rating conditions
R410A

Cond. temp. in °C (tc)	Evaporating temperature in °C (to)							
	-25	-20	-15	-10	-5	0	5	10

Cooling capacity in W

30	11 074	13 914	17 264	21 188	25 752	31 022	37 063	43 940	51 718
35	10 303	13 069	16 310	20 090	24 477	29 535	35 331	41 930	49 398
40	-	12 227	15 339	18 958	23 148	27 977	33 510	39 814	46 954
45	-	-	14 337	17 776	21 752	26 334	31 588	37 580	44 377
50	-	-	-	16 531	20 277	24 596	29 555	35 221	41 662
55	-	-	-	15 214	18 717	22 760	27 412	32 742	38 818
60	-	-	-	-	17 081	20 842	25 183	30 176	35 889
65	-	-	-	-	-	-	22 958	27 635	33 013

Power input in W

30	5 264	5 365	5 466	5 564	5 655	5 737	5 807	5 862	5 900
35	5 845	5 945	6 046	6 146	6 242	6 331	6 409	6 476	6 526
40	-	6 601	6 698	6 796	6 892	6 983	7 066	7 139	7 198
45	-	-	7 441	7 533	7 624	7 713	7 796	7 871	7 935
50	-	-	-	8 374	8 457	8 539	8 618	8 691	8 754
55	-	-	-	9 339	9 408	9 480	9 550	9 616	9 675
60	-	-	-	-	10 497	10 553	10 610	10 664	10 714
65	-	-	-	-	-	-	11 816	11 855	11 892

Current consumption in A

30	12.29	12.35	12.42	12.49	12.56	12.63	12.69	12.75	12.81
35	12.87	12.95	13.02	13.10	13.18	13.26	13.33	13.40	13.46
40	-	13.64	13.72	13.81	13.90	13.98	14.06	14.13	14.20
45	-	-	14.54	14.64	14.73	14.82	14.91	14.99	15.06
50	-	-	-	15.61	15.71	15.80	15.89	15.98	16.05
55	-	-	-	16.75	16.85	16.95	17.04	17.13	17.21
60	-	-	-	-	18.19	18.29	18.38	18.47	18.55
65	-	-	-	-	-	-	19.94	20.02	20.10

Mass flow in kg/h

30	211	264	324	393	472	562	665	782	914
35	207	259	320	389	468	559	662	778	910
40	-	255	315	384	463	554	657	773	904
45	-	-	310	379	457	548	650	766	897
50	-	-	-	372	451	540	642	758	888
55	-	-	-	364	443	532	633	748	878
60	-	-	-	-	434	522	623	737	866
65	-	-	-	-	-	-	612	725	853

Coefficient of performance (C.O.P.)

30	2.10	2.59	3.16	3.81	4.55	5.41	6.38	7.50	8.77
35	1.76	2.20	2.70	3.27	3.92	4.67	5.51	6.48	7.57
40	-	1.85	2.29	2.79	3.36	4.01	4.74	5.58	6.52
45	-	-	1.93	2.36	2.85	3.41	4.05	4.77	5.59
50	-	-	-	1.97	2.40	2.88	3.43	4.05	4.76
55	-	-	-	1.63	1.99	2.40	2.87	3.41	4.01
60	-	-	-	-	1.63	1.97	2.37	2.83	3.35
65	-	-	-	-	-	-	1.94	2.33	2.78

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

Cooling capacity	29 950	W
Power input	9 462	W
Current consumption	16.93	A
Mass flow	684	kg/h
C.O.P.	3.17	

Pressure switch settings

Maximum HP switch setting	46.1	bar(g)
Minimum LP switch setting	1.5	bar(g)
LP pump down setting	1.7	bar(g)

Sound power data

Sound power level	72.5	dB(A)
With acoustic hood	66.5	dB(A)

to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

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

Tolerance according EN12900

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Performance data at 60 Hz, EN 12900 rating conditions
R410A

Cond. temp. in °C (tc)	Evaporating temperature in °C (to)							
	-25	-20	-15	-10	-5	0	5	10

Cooling capacity in W

30	12 472	15 680	19 449	23 856	28 975	34 884	41 657	49 370	58 101
35	11 632	14 743	18 376	22 604	27 503	33 149	39 618	46 984	55 324
40	-	13 744	17 224	21 259	25 924	31 293	37 442	44 445	52 377
45	-	-	15 986	19 812	24 227	29 303	35 115	41 738	49 246
50	-	-	14 649	18 250	22 397	27 162	32 620	38 843	45 905
55	-	-	-	16 555	20 413	24 846	29 927	35 726	42 318
60	-	-	-	-	18 239	22 311	26 983	32 325	38 410
65	-	-	-	-	-	-	23 669	28 497	34 010

Power input in W

30	6 367	6 476	6 589	6 713	6 852	7 012	7 198	7 417	7 673
35	7 047	7 151	7 259	7 378	7 511	7 666	7 847	8 060	8 310
40	-	7 918	8 016	8 124	8 247	8 390	8 560	8 762	9 001
45	-	-	8 883	8 975	9 081	9 209	9 362	9 547	9 770
50	-	-	9 882	9 953	10 038	10 144	10 275	10 439	10 639
55	-	-	-	11 081	11 139	11 218	11 323	11 458	11 631
60	-	-	-	-	12 409	12 455	12 527	12 630	12 770
65	-	-	-	-	-	-	13 911	13 976	14 077

Current consumption in A

30	11.58	11.76	11.90	12.01	12.10	12.19	12.30	12.44	12.63
35	12.23	12.42	12.57	12.69	12.80	12.91	13.05	13.22	13.44
40	-	13.20	13.34	13.46	13.58	13.70	13.85	14.04	14.29
45	-	-	14.25	14.36	14.47	14.59	14.74	14.94	15.20
50	-	-	15.35	15.44	15.52	15.63	15.77	15.96	16.21
55	-	-	-	16.72	16.78	16.86	16.97	17.14	17.38
60	-	-	-	-	18.27	18.31	18.39	18.53	18.74
65	-	-	-	-	-	-	20.07	20.16	20.33

Mass flow in kg/h

30	259	323	395	479	575	684	809	950	1 110
35	255	319	393	477	573	682	807	948	1 108
40	-	315	389	473	569	679	804	945	1 104
45	-	-	383	468	564	674	799	940	1 098
50	-	-	376	461	558	668	792	933	1 091
55	-	-	-	452	549	659	783	923	1 081
60	-	-	-	-	537	647	772	912	1 069
65	-	-	-	-	-	-	757	897	1 054

Coefficient of performance (C.O.P.)

30	1.96	2.42	2.95	3.55	4.23	4.97	5.79	6.66	7.57
35	1.65	2.06	2.53	3.06	3.66	4.32	5.05	5.83	6.66
40	-	1.74	2.15	2.62	3.14	3.73	4.37	5.07	5.82
45	-	-	1.80	2.21	2.67	3.18	3.75	4.37	5.04
50	-	-	1.48	1.83	2.23	2.68	3.17	3.72	4.31
55	-	-	-	1.49	1.83	2.21	2.64	3.12	3.64
60	-	-	-	-	1.47	1.79	2.15	2.56	3.01
65	-	-	-	-	-	-	1.70	2.04	2.42

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

Cooling capacity	32 620	W
Power input	10 275	W
Current consumption	15.77	A
Mass flow	792	kg/h
C.O.P.	3.17	

Pressure switch settings

Maximum HP switch setting	46.1	bar(g)
Minimum LP switch setting	1.5	bar(g)
LP pump down setting	1.7	bar(g)

Sound power data

Sound power level	75	dB(A)
With acoustic hood	69	dB(A)

to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

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

Tolerance according EN12900

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Performance data at 60 Hz, ARI rating conditions
R410A

Cond. temp. in °C (tc)	Evaporating temperature in °C (to)							
	-25	-20	-15	-10	-5	0	5	10

Cooling capacity in W

30	13 468	16 915	20 961	25 685	31 169	37 492	44 735	52 978	62 301
35	12 644	16 006	19 927	24 486	29 763	35 839	42 794	50 708	59 661
40	-	15 035	18 819	23 199	28 257	34 073	40 726	48 298	56 868
45	-	-	17 627	21 815	26 641	32 184	38 523	45 740	53 914
50	-	-	-	20 327	24 908	30 164	36 177	43 026	50 791
55	-	-	-	18 727	23 049	28 006	33 679	40 147	47 491
60	-	-	-	-	21 055	25 700	31 020	37 095	44 004
65	-	-	-	-	-	-	28 194	33 861	40 323

Power input in W

30	6 367	6 476	6 589	6 713	6 852	7 012	7 198	7 417	7 673
35	7 047	7 151	7 259	7 378	7 511	7 666	7 847	8 060	8 310
40	-	7 918	8 016	8 124	8 247	8 390	8 560	8 762	9 001
45	-	-	8 883	8 975	9 081	9 209	9 362	9 547	9 770
50	-	-	-	9 953	10 038	10 144	10 275	10 439	10 639
55	-	-	-	11 081	11 139	11 218	11 323	11 458	11 631
60	-	-	-	-	12 409	12 455	12 527	12 630	12 770
65	-	-	-	-	-	-	13 911	13 976	14 077

Current consumption in A

30	11.58	11.76	11.90	12.01	12.10	12.19	12.30	12.44	12.63
35	12.23	12.42	12.57	12.69	12.80	12.91	13.05	13.22	13.44
40	-	13.20	13.34	13.46	13.58	13.70	13.85	14.04	14.29
45	-	-	14.25	14.36	14.47	14.59	14.74	14.94	15.20
50	-	-	-	15.44	15.52	15.63	15.77	15.96	16.21
55	-	-	-	16.72	16.78	16.86	16.97	17.14	17.38
60	-	-	-	-	18.27	18.31	18.39	18.53	18.74
65	-	-	-	-	-	-	20.07	20.16	20.33

Mass flow in kg/h

30	258	321	393	476	571	680	803	943	1 102
35	254	317	390	474	569	678	801	941	1 099
40	-	313	386	470	566	675	798	938	1 095
45	-	-	381	465	561	670	793	933	1 090
50	-	-	-	458	554	663	787	926	1 083
55	-	-	-	449	545	654	778	917	1 073
60	-	-	-	-	534	643	766	905	1 061
65	-	-	-	-	-	-	752	891	1 046

Coefficient of performance (C.O.P.)

30	2.12	2.61	3.18	3.83	4.55	5.35	6.21	7.14	8.12
35	1.79	2.24	2.75	3.32	3.96	4.68	5.45	6.29	7.18
40	-	1.90	2.35	2.86	3.43	4.06	4.76	5.51	6.32
45	-	-	1.98	2.43	2.93	3.49	4.11	4.79	5.52
50	-	-	-	2.04	2.48	2.97	3.52	4.12	4.77
55	-	-	-	1.69	2.07	2.50	2.97	3.50	4.08
60	-	-	-	-	1.70	2.06	2.48	2.94	3.45
65	-	-	-	-	-	-	2.03	2.42	2.86

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

Cooling capacity	36 750	W
Power input	11 246	W
Current consumption	16.88	A
Mass flow	838	kg/h
C.O.P.	3.27	

Pressure switch settings

Maximum HP switch setting	46.1	bar(g)
Minimum LP switch setting	1.5	bar(g)
LP pump down setting	1.7	bar(g)

Sound power data

Sound power level	75	dB(A)
With acoustic hood	69	dB(A)

to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

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

Tolerance according EN12900

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