

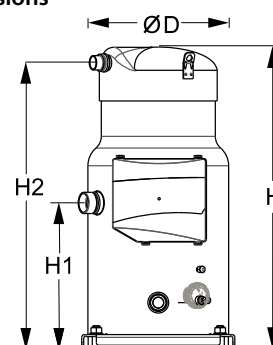
Datasheets

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



**General Characteristics**

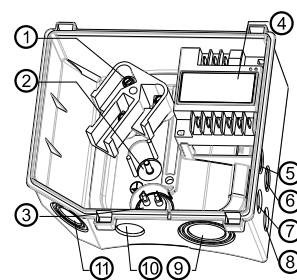
Model number (on compressor nameplate)		<b>SH240A4AAE</b>
Code number for Singlepack*		120H0291
Code number for Industrial pack**		120H0292
Drawing number		8556089g
Suction and discharge connections		Brazed
Suction connection		1-5/8" ODF
Discharge connection		1-1/8" ODF
Oil sight glass		Threaded
Oil equalisation connection		2-1/4" Rotolock
Oil drain connection		1/4" flare
LP gauge port		Schrader
IPR valve		None
Reverse rotation protection		Electronic module
Swept volume	227.6 cm <sup>3</sup> /rev	
Displacement @ Nominal speed	39.6 m <sup>3</sup> /h @ 2900 rpm - 47.8 m <sup>3</sup> /h @ 3500 rpm	
Net weight	108 kg	
Oil charge	6.7 litre, POE - 160SZ	
Maximum system test pressure Low Side / High side	34.3 bar(g) / 48.7 bar(g)	
Maximum differential test pressure	37 bar	
Maximum number of starts per hour	12	
Refrigerant charge limit	13.5 kg	
Approved refrigerants	R410A	

**Dimensions**


D=317.5 mm  
 H=682.5 mm  
 H1=331 mm  
 H2=647.5 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	0.616 Ω
Rated Load Amps (RLA)	36.4 A
Maximum Continuous Current (MCC)	51 A
Locked Rotor Amps (LRA)	215 A
Motor protection	Electronic protection module, 24 V AC

**Terminal box**

**IP54 (with cable gland)**

- 1: Power connection, 3 x 4.8 mm (3/16")
- 2: Earth M5
- 3: Thermistor connector
- 4: Electronic protection module
- 5: Double knock-out Ø 22.5 mm (7/8") & Ø 16.5 mm (0.65")
- 6: Double knock-out Ø 22.5 mm (7/8") & Ø 16.5 mm (0.65")
- 7: Knock-out Ø 20.7 mm (0.81")
- 8: Knock-out Ø 20.7 mm (0.81")
- 9: Triple knock-out Ø 50.8 mm (2") & Ø 43.7 mm (1.72") & Ø 34.5 mm (1.35")
- 10: Knock-out Ø 25.5 mm (1.00")
- 11: Triple knock-out Ø 40.5 mm (1.59") & Ø 32.2 mm (1.27") & Ø 25.5 mm (1")

**Recommended Installation torques**

Oil sight glass	50 Nm
Power connections / Earth connection	3 Nm / 2 Nm
Mounting bolts	21 Nm

**Parts shipped with compressor**

Mounting kit with rigid grommets, bolts, nuts, sleeves and washers
Electronic protection module mounted in terminal box
Initial oil charge
Installation instructions

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

\*Singlepack: Compressor in cardboard box

\*\*Industrial pack: 6 Unboxed compressors on pallet (order per multiples of 6)

**Rotolock accessories, suction side**
**Code no.**

Solder sleeve, P03 (2-1/4" Rotolock, 1-5/8" ODF)	8153006
Rotolock valve, V03 (2-1/4" Rotolock, 1-5/8" ODF)	8168026
Rotolock adapter (2"1/4 Rotolock, 1"5/8 ODF)	120Z0432
Gasket, 2-1/4"	8156133

**Rotolock accessories, discharge side**
**Code no.**

Solder sleeve, P02 (1-3/4" Rotolock, 1-1/8" ODF)	8153004
Angle adapter, C02 (1-3/4" Rotolock, 1-1/8" ODF)	8168005
Rotolock valve, V02 (1-3/4" Rotolock, 1-1/8" ODF)	8168028
Rotolock adapter (1-3/4" Rotolock, 1-1/8" ODF)	120Z0364
Gasket, 1-3/4"	8156132

**Solder sleeve adapter set**


- 1: Rotolock adapter (Suc & Dis)  
 2: Gasket (Suc & Dis)  
 3: Solder sleeve (Suc & Dis)  
 4: Rotolock nut (Suc & Dis)

**Rotolock accessories, sets**
**Code no.**

Solder sleeve adapter set, (2-1/4" Rotolock, 1-5/8" ODF), (1-3/4" Rotolock, 1"1/8 ODF)	7765028
Valve set, V03 (2-1/4"~1-5/8"), V02 (1-3/4"~1-1/8")	7703383
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 + bottom insulation, 56 W, 24 V, CE mark, UL	120Z0360
Surface sump heater + bottom insulation, 56 W, 230 V, CE mark, UL	120Z0376
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
Belt type crankcase heater, 75 W, 230 V, CE mark, UL	7773108
Belt type crankcase heater, 75 W, 400 V, CE mark, UL	7773118
Belt type crankcase heater, 75 W, 460 V, CE mark, UL	120Z0464

**Miscellaneous accessories**
**Code no.**

Electronic soft start kit, MCI 50 CM	037N0401
Mounting kit for 1 scroll compressor including 4 grommets, 4 sleeves, 4 bolts, 4 washers	8156138
Acoustic hood for scroll compressor	120Z0022
Acoustic bottom insulation for scroll compressor	120Z0353
Discharge thermostat kit	7750009

**Spare parts**
**Code no.**

Electronic motor protection module, 24 V AC	120Z0584
Mounting kit for 1 scroll compressor including 4 hexagon rigid grommets, 4 sleeves, 4 bolts, 4 washers	7777045
Oil sight glass with gaskets (black & white)	8156019
Gasket for oil sight glass (white teflon)	8156129
Terminal box 210 x 190 incl. cover	120Z0458
T block connector 60 x 75 mm	8173021

**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	15

**Cooling capacity in W**

30	20 781	26 184	32 446	39 685	48 018	57 563	68 436	80 754	94 635
35	19 353	24 579	30 600	37 535	45 501	54 614	64 993	76 753	90 012
40	-	22 890	28 641	35 242	42 810	51 462	61 316	72 488	85 096
45	-	-	26 550	32 787	39 927	48 088	57 387	67 941	79 867
50	-	-	24 309	30 151	36 834	44 474	53 188	63 094	74 308
55	-	-	-	27 317	33 512	40 601	48 700	57 927	68 400
60	-	-	-	-	29 943	36 451	43 905	52 424	62 125
65	-	-	-	-	-	-	38 785	46 566	55 465

**Power input in W**

30	10 663	10 738	10 789	10 833	10 888	10 971	11 099	11 291	11 563
35	11 856	11 954	12 018	12 064	12 110	12 174	12 274	12 426	12 648
40	-	13 302	13 383	13 437	13 480	13 531	13 607	13 725	13 903
45	-	-	14 902	14 969	15 015	15 058	15 116	15 205	15 344
50	-	-	16 590	16 675	16 730	16 770	16 815	16 882	16 988
55	-	-	-	18 573	18 641	18 685	18 723	18 772	18 849
60	-	-	-	-	20 765	20 817	20 853	20 890	20 946
65	-	-	-	-	-	-	23 224	23 254	23 292

**Current consumption in A**

30	20.99	21.17	21.27	21.32	21.37	21.44	21.57	21.81	22.19
35	22.36	22.58	22.70	22.77	22.81	22.87	22.97	23.17	23.49
40	-	24.17	24.33	24.41	24.46	24.51	24.60	24.76	25.03
45	-	-	26.19	26.30	26.36	26.41	26.49	26.62	26.85
50	-	-	28.33	28.48	28.56	28.62	28.69	28.80	28.99
55	-	-	-	30.99	31.10	31.17	31.24	31.34	31.50
60	-	-	-	-	34.02	34.11	34.19	34.28	34.42
65	-	-	-	-	-	-	37.58	37.67	37.80

**Mass flow in kg/h**

30	434	540	660	796	952	1 128	1 329	1 554	1 808
35	426	533	654	791	947	1 124	1 324	1 549	1 803
40	-	524	645	783	939	1 116	1 316	1 541	1 794
45	-	-	635	773	929	1 106	1 305	1 530	1 782
50	-	-	623	761	917	1 093	1 292	1 516	1 767
55	-	-	-	746	902	1 078	1 276	1 499	1 748
60	-	-	-	-	885	1 060	1 257	1 478	1 727
65	-	-	-	-	-	-	1 235	1 455	1 702

**Coefficient of performance (C.O.P.)**

30	1.95	2.44	3.01	3.66	4.41	5.25	6.17	7.15	8.18
35	1.63	2.06	2.55	3.11	3.76	4.49	5.30	6.18	7.12
40	-	1.72	2.14	2.62	3.18	3.80	4.51	5.28	6.12
45	-	-	1.78	2.19	2.66	3.19	3.80	4.47	5.20
50	-	-	1.47	1.81	2.20	2.65	3.16	3.74	4.37
55	-	-	-	1.47	1.80	2.17	2.60	3.09	3.63
60	-	-	-	-	1.44	1.75	2.11	2.51	2.97
65	-	-	-	-	-	-	1.67	2.00	2.38

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

Cooling capacity	53 188	W
Power input	16 815	W
Current consumption	28.69	A
Mass flow	1 292	kg/h
C.O.P.	3.16	

**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	82	dB(A)
With accoustic hood	76	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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# Datasheet, performance data

# Danfoss scroll compressor. SH240-4

## 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	15

### Cooling capacity in W

30	22 442	28 247	34 967	42 728	51 654	61 868	73 493	86 655	101 475
35	21 036	26 684	33 184	40 661	49 240	59 046	70 204	82 836	97 069
40	-	25 041	31 292	38 457	46 662	56 033	66 695	78 773	92 392
45	-	-	29 275	36 101	43 906	52 816	62 957	74 456	87 439
50	-	-	-	33 583	40 963	49 389	58 988	69 888	82 217
55	-	-	-	30 901	37 838	45 763	54 805	65 095	76 761
60	-	-	-	-	34 567	41 988	50 475	60 159	71 174
65	-	-	-	-	-	-	46 199	55 331	65 761

### Power input in W

30	10 663	10 738	10 789	10 833	10 888	10 971	11 099	11 291	11 563
35	11 856	11 954	12 018	12 064	12 110	12 174	12 274	12 426	12 648
40	-	13 302	13 383	13 437	13 480	13 531	13 607	13 725	13 903
45	-	-	14 902	14 969	15 015	15 058	15 116	15 205	15 344
50	-	-	-	16 675	16 730	16 770	16 815	16 882	16 988
55	-	-	-	18 573	18 641	18 685	18 723	18 772	18 849
60	-	-	-	-	20 765	20 817	20 853	20 890	20 946
65	-	-	-	-	-	-	23 224	23 254	23 292

### Current consumption in A

30	20.99	21.17	21.27	21.32	21.37	21.44	21.57	21.81	22.19
35	22.36	22.58	22.70	22.77	22.81	22.87	22.97	23.17	23.49
40	-	24.17	24.33	24.41	24.46	24.51	24.60	24.76	25.03
45	-	-	26.19	26.30	26.36	26.41	26.49	26.62	26.85
50	-	-	-	28.48	28.56	28.62	28.69	28.80	28.99
55	-	-	-	30.99	31.10	31.17	31.24	31.34	31.50
60	-	-	-	-	34.02	34.11	34.19	34.28	34.42
65	-	-	-	-	-	-	37.58	37.67	37.80

### Mass flow in kg/h

30	431	536	656	791	946	1 121	1 319	1 543	1 795
35	423	529	650	786	941	1 116	1 314	1 538	1 789
40	-	521	641	778	933	1 109	1 307	1 530	1 780
45	-	-	631	768	923	1 099	1 296	1 519	1 768
50	-	-	-	756	911	1 086	1 283	1 505	1 753
55	-	-	-	742	896	1 071	1 267	1 488	1 735
60	-	-	-	-	879	1 053	1 248	1 468	1 714
65	-	-	-	-	-	-	1 226	1 445	1 689

### Coefficient of performance (C.O.P.)

30	2.10	2.63	3.24	3.94	4.74	5.64	6.62	7.67	8.78
35	1.77	2.23	2.76	3.37	4.07	4.85	5.72	6.67	7.67
40	-	1.88	2.34	2.86	3.46	4.14	4.90	5.74	6.65
45	-	-	1.96	2.41	2.92	3.51	4.17	4.90	5.70
50	-	-	-	2.01	2.45	2.95	3.51	4.14	4.84
55	-	-	-	1.66	2.03	2.45	2.93	3.47	4.07
60	-	-	-	-	1.66	2.02	2.42	2.88	3.40
65	-	-	-	-	-	-	1.99	2.38	2.82

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

Cooling capacity	59 715	W
Power input	18 502	W
Current consumption	30.95	A
Mass flow	1 363	kg/h
C.O.P.	3.23	

### 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	82	dB(A)
With accoustic hood	76	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	15

**Cooling capacity in W**

30	25 852	32 142	39 492	48 054	57 982	69 427	82 545	97 487	114 408
35	24 151	30 201	37 243	45 427	54 905	65 829	78 352	92 626	108 805
40	-	28 190	34 888	42 658	51 650	62 017	73 908	87 476	102 872
45	-	-	32 421	39 740	48 210	57 980	69 201	82 022	96 593
50	-	-	29 832	36 663	44 570	53 703	64 209	76 239	89 939
55	-	-	-	33 400	40 700	49 148	58 891	70 075	82 847
60	-	-	-	-	36 534	44 237	53 151	63 419	75 185
65	-	-	-	-	-	-	46 763	56 000	66 631

**Power input in W**

30	12 825	12 921	12 989	13 061	13 167	13 338	13 604	13 996	14 544
35	14 189	14 323	14 410	14 479	14 563	14 691	14 894	15 202	15 646
40	-	15 858	15 980	16 065	16 143	16 246	16 402	16 644	17 001
45	-	-	17 708	17 826	17 916	18 010	18 137	18 330	18 617
50	-	-	19 602	19 769	19 888	19 991	20 107	20 267	20 502
55	-	-	-	21 902	22 068	22 197	22 319	22 464	22 664
60	-	-	-	-	24 464	24 636	24 780	24 928	25 110
65	-	-	-	-	-	-	27 500	27 667	27 848

**Current consumption in A**

30	19.99	20.28	20.45	20.56	20.67	20.83	21.11	21.56	22.24
35	21.50	21.86	22.07	22.19	22.28	22.40	22.60	22.95	23.50
40	-	23.60	23.87	24.02	24.12	24.21	24.36	24.62	25.07
45	-	-	25.87	26.08	26.20	26.29	26.41	26.62	26.97
50	-	-	28.09	28.38	28.55	28.67	28.78	28.96	29.25
55	-	-	-	30.97	31.21	31.37	31.50	31.67	31.92
60	-	-	-	-	34.20	34.43	34.60	34.77	35.01
65	-	-	-	-	-	-	38.10	38.31	38.55

**Mass flow in kg/h**

30	537	661	802	964	1 149	1 361	1 602	1 876	2 185
35	529	654	796	958	1 143	1 355	1 596	1 870	2 179
40	-	646	787	949	1 134	1 346	1 587	1 860	2 169
45	-	-	777	938	1 123	1 334	1 574	1 847	2 155
50	-	-	765	926	1 110	1 320	1 559	1 831	2 138
55	-	-	-	911	1 094	1 303	1 541	1 811	2 117
60	-	-	-	-	1 076	1 283	1 520	1 789	2 093
65	-	-	-	-	-	-	1 496	1 763	2 065

**Coefficient of performance (C.O.P.)**

30	2.02	2.49	3.04	3.68	4.40	5.21	6.07	6.97	7.87
35	1.70	2.11	2.58	3.14	3.77	4.48	5.26	6.09	6.95
40	-	1.78	2.18	2.66	3.20	3.82	4.51	5.26	6.05
45	-	-	1.83	2.23	2.69	3.22	3.82	4.47	5.19
50	-	-	1.52	1.85	2.24	2.69	3.19	3.76	4.39
55	-	-	-	1.52	1.84	2.21	2.64	3.12	3.66
60	-	-	-	-	1.49	1.80	2.14	2.54	2.99
65	-	-	-	-	-	-	1.70	2.02	2.39

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

Cooling capacity	64 209	W
Power input	20 107	W
Current consumption	28.78	A
Mass flow	1 559	kg/h
C.O.P.	3.19	

**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	86	dB(A)
With accoustic hood	82	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	15

**Cooling capacity in W**

30	27 919	34 674	42 561	51 739	62 371	74 619	88 645	104 611	122 678
35	26 251	32 788	40 387	49 210	59 417	71 171	84 634	99 968	117 334
40	-	30 838	38 117	46 549	56 298	67 525	80 392	95 060	111 692
45	-	-	35 748	43 758	53 015	63 681	75 917	89 887	105 751
50	-	-	-	40 836	49 567	59 638	71 211	84 449	99 512
55	-	-	-	37 782	45 954	55 397	66 274	78 745	92 973
60	-	-	-	-	42 176	50 958	61 104	72 776	86 136
65	-	-	-	-	-	-	55 702	66 541	78 999

**Power input in W**

30	12 825	12 921	12 989	13 061	13 167	13 338	13 604	13 996	14 544
35	14 189	14 323	14 410	14 479	14 563	14 691	14 894	15 202	15 646
40	-	15 858	15 980	16 065	16 143	16 246	16 402	16 644	17 001
45	-	-	17 708	17 826	17 916	18 010	18 137	18 330	18 617
50	-	-	-	19 769	19 888	19 991	20 107	20 267	20 502
55	-	-	-	21 902	22 068	22 197	22 319	22 464	22 664
60	-	-	-	-	24 464	24 636	24 780	24 928	25 110
65	-	-	-	-	-	-	27 500	27 667	27 848

**Current consumption in A**

30	19.99	20.28	20.45	20.56	20.67	20.83	21.11	21.56	22.24
35	21.50	21.86	22.07	22.19	22.28	22.40	22.60	22.95	23.50
40	-	23.60	23.87	24.02	24.12	24.21	24.36	24.62	25.07
45	-	-	25.87	26.08	26.20	26.29	26.41	26.62	26.97
50	-	-	-	28.38	28.55	28.67	28.78	28.96	29.25
55	-	-	-	30.97	31.21	31.37	31.50	31.67	31.92
60	-	-	-	-	34.20	34.43	34.60	34.77	35.01
65	-	-	-	-	-	-	38.10	38.31	38.55

**Mass flow in kg/h**

30	534	657	797	958	1 142	1 352	1 591	1 863	2 169
35	526	650	791	952	1 136	1 346	1 585	1 856	2 162
40	-	642	782	943	1 127	1 337	1 576	1 846	2 152
45	-	-	772	933	1 116	1 325	1 563	1 834	2 139
50	-	-	-	920	1 103	1 311	1 548	1 818	2 122
55	-	-	-	906	1 087	1 294	1 530	1 798	2 101
60	-	-	-	-	1 069	1 275	1 510	1 776	2 077
65	-	-	-	-	-	-	1 486	1 750	2 050

**Coefficient of performance (C.O.P.)**

30	2.18	2.68	3.28	3.96	4.74	5.59	6.52	7.47	8.43
35	1.85	2.29	2.80	3.40	4.08	4.84	5.68	6.58	7.50
40	-	1.94	2.39	2.90	3.49	4.16	4.90	5.71	6.57
45	-	-	2.02	2.45	2.96	3.54	4.19	4.90	5.68
50	-	-	-	2.07	2.49	2.98	3.54	4.17	4.85
55	-	-	-	1.72	2.08	2.50	2.97	3.51	4.10
60	-	-	-	-	1.72	2.07	2.47	2.92	3.43
65	-	-	-	-	-	-	2.03	2.41	2.84

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

Cooling capacity	72 200	W
Power input	22 099	W
Current consumption	31.22	A
Mass flow	1 647	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	86	dB(A)
With acoustic hood	82	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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