

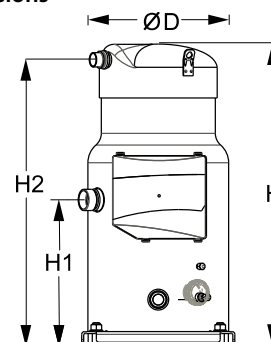
Datasheets

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



**General Characteristics**

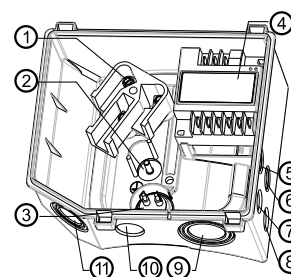
Model number (on compressor nameplate)		<b>SH240A4ABE</b>
Code number for Singlepack*		120H0299
Code number for Industrial pack**		120H0300
Drawing number		8556089c
Suction and discharge connections		Brazed
Suction connection		1-5/8" ODF
Discharge connection		1-1/8" ODF
Oil sight glass		Threaded
Oil 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	31,1 bar(g) / 45 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	340-440 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, 115/230 V

**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

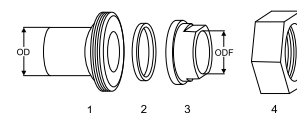
\*\*Industrial pack: 6 Unboxed compressors on pallet (order per multiples of 6)

**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)	12020432
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)	12020364
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	12020571

**Crankcase heaters**
**Code no.**

Surface sump heater + bottom insulation, 56 W, 24 V, CE mark, UL	12020360
Surface sump heater + bottom insulation, 56 W, 230 V, CE mark, UL	12020376
Surface sump heater + bottom insulation, 56 W, 400 V, CE mark, UL	12020377
Surface sump heater + bottom insulation, 56 W, 460 V, CE mark, UL	12020378
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	12020464

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

Electronic soft start kit, MCI 50 CM	7705009
Mounting kit for 1 scroll compressor including 4 grommets, 4 sleeves, 4 bolts, 4 washers	8156138
Acoustic hood for scroll compressor	12020022
Acoustic bottom insulation for scroll compressor	12020353
Discharge thermostat kit	7750009

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

Electronic motor protection module, 115/230 V	8169016
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	12020458
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

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	-	21 099	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	-	-	-	-	-	32 006	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	-	14 798	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	-	-	-	-	-	23 184	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	-	25.99	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	-	-	-	-	-	37.49	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	-	513	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	-	-	-	-	-	1 039	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	-	1.43	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	-	-	-	-	-	1.38	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	45	bar(g)
Minimum LP switch setting	1.5	bar(g)
LP pump down setting	2.3	bar(g)

Sound power data

Sound power level	82	dB(A)
With acoustic hood	76	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

R410A

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

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	-	23 300	29 275	36 101	43 906	52 816	62 957	74 456	87 439
50	-	-	27 120	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	-	-	-	-	-	38 227	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	-	14 798	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	-	-	-	-	-	23 184	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	-	25.99	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	-	-	-	-	-	37.49	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	-	510	631	768	923	1 099	1 296	1 519	1 768
50	-	-	619	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	-	-	-	-	-	1 032	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	-	1.57	1.96	2.41	2.92	3.51	4.17	4.90	5.70
50	-	-	1.63	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	-	-	-	-	-	1.65	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	45	bar(g)
Minimum LP switch setting	1.5	bar(g)
LP pump down setting	2.3	bar(g)

Sound power data

Sound power level	82	dB(A)
With acoustic hood	76	dB(A)

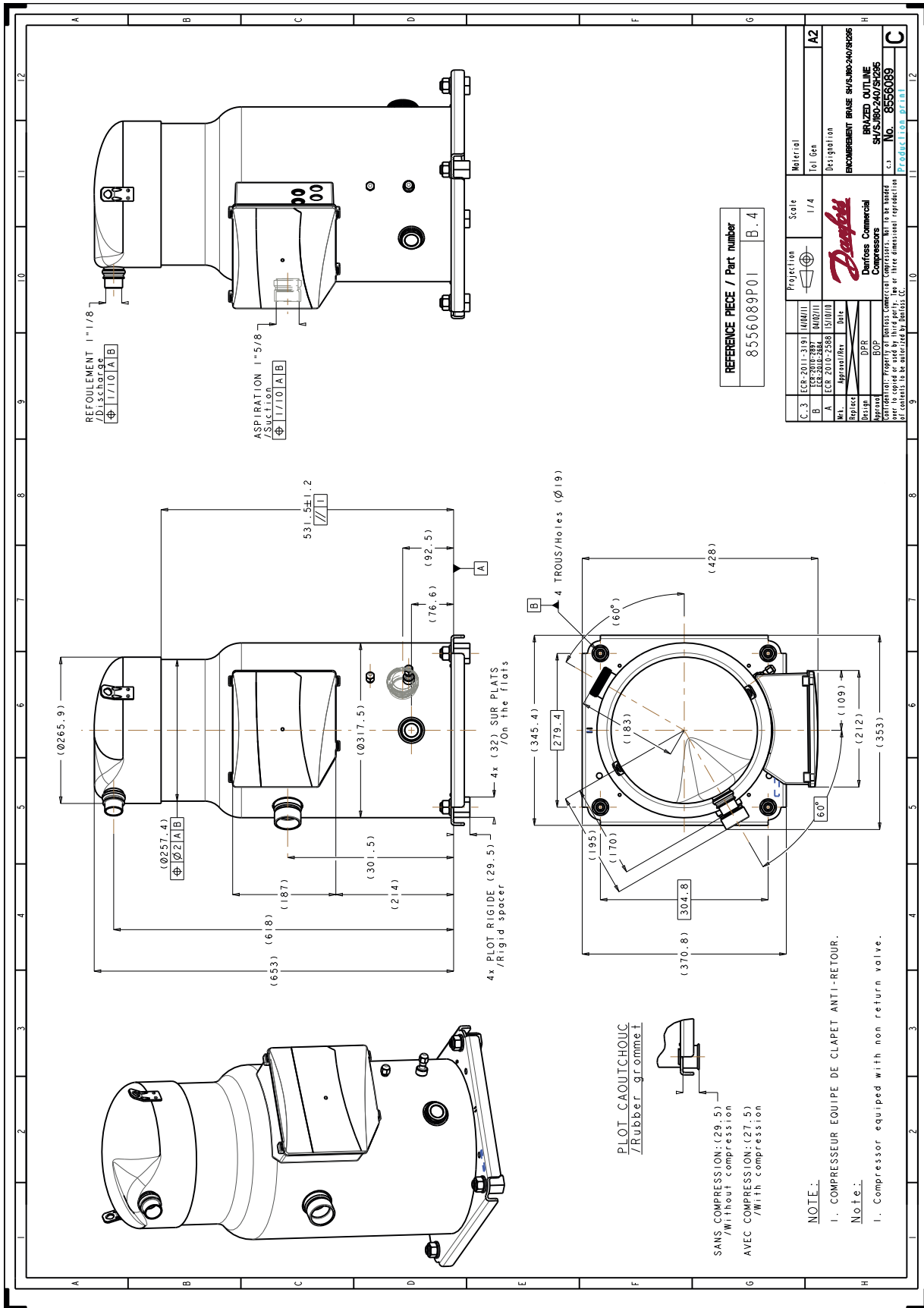
to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

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

All performance data +/- 5%

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