

Datasheets

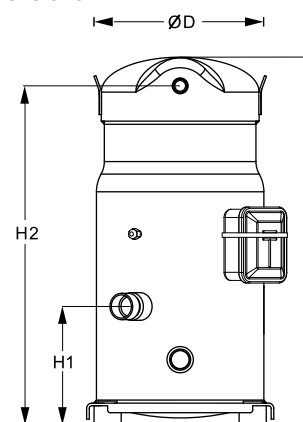
# Danfoss scroll compressors **SM / SY / SZ / SH / WSH**



**General Characteristics**

Model number (on compressor nameplate)		<b>SZ090S4VC</b>
Code number for Singlepack*		SZ090-4VI
Code number for Industrial pack**		SZ090-4VM
Drawing number		8552036b
Suction and discharge connections		Brazed
Suction connection		1-1/8" ODF
Discharge connection		3/4" ODF
Oil sight glass		Threaded
Oil equalisation connection		3/8" flare SAE
Oil drain connection		None
LP gauge port		Schrader
IPR valve		None
Swept volume		120,5 cm <sup>3</sup> /rev
Displacement @ Nominal speed		21.0 m <sup>3</sup> /h @ 2900 rpm - 25.3 m <sup>3</sup> /h @ 3500 rpm
Net weight		65 kg
Oil charge		3,25 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		8,5 kg
Approved refrigerants		R407C, R134a, R404A, R507A

**Dimensions**

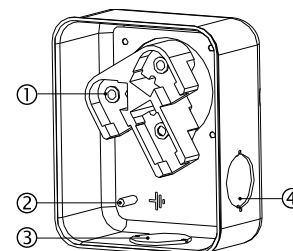


D=254 mm  
H=508 mm  
H1=141,9 mm  
H2=464,5 mm  
H3=- mm

**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	1.48 Ω
Rated Load Amps (RLA)	13.2 A
Maximum Continuous Current (MCC)	18.5 A
Locked Rotor Amps (LRA)	98 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	21 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

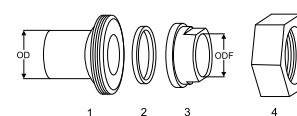
\*\*Industrial pack: 8 Unboxed compressors on pallet (order per multiples of 8)

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

Solder sleeve, 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
Gasket, 1-3/4"	8156132

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

Solder sleeve, P04 (1-1/4" Rotolock, 3/4" ODF)	8153008
Angle adapter, C04 (1-1/4" Rotolock, 3/4" ODF)	8168006
Rotolock valve, V04 (1-1/4" Rotolock, 3/4" ODF)	8168029
Gasket, 1-1/4"	8156131

**Solder sleeve adapter set**


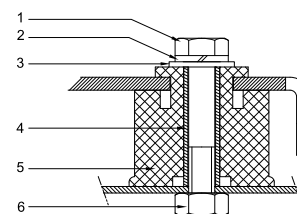
- 1: Rotolock adapter (Suc & Dis)
- 2: Gasket (Suc & Dis)
- 3: Solder sleeve (Suc & Dis)
- 4: Rotolock nut (Suc & Dis)

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

Solder sleeve adapter set (1-3/4" Rotolock, 1-1/8" ODF), (1-1/4" Rotolock, 3/4" ODF)	7765005
Angle adapter set, C02 (1-3/4"~1-1/8"), C04 (1-1/4"~3/4")	7703014
Valve set, V02 (1-3/4"~1-1/8"), V04 (1-1/4"~3/4")	7703009
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

**Mounting kit**


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

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

Surface sump heater + bottom insulation, 48 W, 24 V, CE mark, UL	120Z0361
Surface sump heater + bottom insulation, 48 W, 230 V, CE mark, UL	120Z0380
Surface sump heater + bottom insulation, 48 W, 400 V, CE mark, UL	120Z0381
Surface sump heater + bottom insulation, 48 W, 460 V, CE mark, UL	120Z0382
Belt type crankcase heater, 65 W, 460 V, CE mark, UL	120Z0466
Belt type crankcase heater, 65 W, 230 V, CE mark, UL	7773107
Belt type crankcase heater, 65 W, 400 V, CE mark, UL	7773117
Belt type crankcase heater, 65 W, 400 V, CE mark, UL	120Z0039

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

Electronic soft start kit, MCI 15 C	7705006
Acoustic hood for scroll compressor S084-S090-S100	7755011
Bottom insulation for scroll compressor	120Z0356
Discharge thermostat kit	7750009

**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
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

R407C

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

Cooling capacity in W

30	7 599	9 725	12 286	15 332	18 911	23 071	27 861	33 332	-
35	7 086	9 146	11 618	14 552	17 995	21 997	26 606	31 871	-
40	6 562	8 539	10 907	13 713	17 007	20 835	25 247	30 291	-
45	-	7 905	10 154	12 818	15 945	19 584	23 784	28 592	-
50	-	-	9 358	11 864	14 811	18 246	22 217	26 773	-
55	-	-	-	10 854	13 604	16 820	20 547	24 834	-
60	-	-	-	-	12 325	15 304	18 771	22 773	-
65	-	-	-	-	10 972	13 699	16 889	20 588	-

Power input in W

30	3 679	3 721	3 754	3 776	3 782	3 771	3 738	3 681	-
35	4 095	4 139	4 175	4 200	4 210	4 202	4 175	4 124	-
40	4 563	4 609	4 648	4 676	4 690	4 688	4 666	4 620	-
45	-	5 138	5 180	5 212	5 231	5 234	5 217	5 179	-
50	-	-	5 777	5 814	5 838	5 846	5 836	5 804	-
55	-	-	-	6 487	6 517	6 531	6 528	6 504	-
60	-	-	-	-	7 275	7 296	7 300	7 284	-
65	-	-	-	-	8 119	8 147	8 159	8 150	-

Current consumption in A

30	8.65	8.70	8.74	8.76	8.75	8.70	8.62	8.49	-
35	9.04	9.10	9.15	9.17	9.17	9.13	9.06	8.95	-
40	9.52	9.58	9.64	9.67	9.67	9.65	9.59	9.49	-
45	-	10.16	10.22	10.26	10.28	10.27	10.22	10.14	-
50	-	-	10.92	10.97	11.00	11.00	10.97	10.90	-
55	-	-	-	11.80	11.84	11.85	11.84	11.79	-
60	-	-	-	-	12.81	12.84	12.84	12.81	-
65	-	-	-	-	13.93	13.98	14.00	13.98	-

Mass flow in kg/h

30	159	199	247	303	367	441	524	619	-
35	155	196	245	301	365	440	524	619	-
40	151	193	242	298	363	437	522	617	-
45	-	189	238	294	359	434	518	614	-
50	-	-	233	290	355	429	513	608	-
55	-	-	-	284	348	422	506	600	-
60	-	-	-	-	340	413	497	590	-
65	-	-	-	-	331	403	485	578	-

Coefficient of performance (C.O.P.)

30	2.07	2.61	3.27	4.06	5.00	6.12	7.45	9.05	-
35	1.73	2.21	2.78	3.47	4.27	5.23	6.37	7.73	-
40	1.44	1.85	2.35	2.93	3.63	4.44	5.41	6.56	-
45	-	1.54	1.96	2.46	3.05	3.74	4.56	5.52	-
50	-	-	1.62	2.04	2.54	3.12	3.81	4.61	-
55	-	-	-	1.67	2.09	2.58	3.15	3.82	-
60	-	-	-	-	1.69	2.10	2.57	3.13	-
65	-	-	-	-	1.35	1.68	2.07	2.53	-

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

Cooling capacity	18 246	W
Power input	5 846	W
Current consumption	11.00	A
Mass flow	429	kg/h
C.O.P.	3.12	



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	72	dB(A)
With acoustic hood	64	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**
**R407C**

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

**Cooling capacity in W**

30	8 150	10 418	13 147	16 389	20 194	24 612	29 694	35 491	-
35	7 637	9 844	12 490	15 625	19 300	23 567	28 475	34 076	-
40	7 112	9 242	11 788	14 801	18 332	22 432	27 151	32 540	-
45	-	8 610	11 042	13 918	17 289	21 207	25 721	30 882	-
50	-	-	10 251	12 975	16 171	19 891	24 185	29 104	-
55	-	-	-	11 971	14 978	18 485	22 543	27 204	-
60	-	-	-	-	13 709	16 988	20 796	25 184	-
65	-	-	-	-	12 364	15 400	18 942	23 041	-

**Power input in W**

30	3 679	3 721	3 754	3 776	3 782	3 771	3 738	3 681	-
35	4 095	4 139	4 175	4 200	4 210	4 202	4 175	4 124	-
40	4 563	4 609	4 648	4 676	4 690	4 688	4 666	4 620	-
45	-	5 138	5 180	5 212	5 231	5 234	5 217	5 179	-
50	-	-	5 777	5 814	5 838	5 846	5 836	5 804	-
55	-	-	-	6 487	6 517	6 531	6 528	6 504	-
60	-	-	-	-	7 275	7 296	7 300	7 284	-
65	-	-	-	-	8 119	8 147	8 159	8 150	-

**Current consumption in A**

30	8.65	8.70	8.74	8.76	8.75	8.70	8.62	8.49	-
35	9.04	9.10	9.15	9.17	9.17	9.13	9.06	8.95	-
40	9.52	9.58	9.64	9.67	9.67	9.65	9.59	9.49	-
45	-	10.16	10.22	10.26	10.28	10.27	10.22	10.14	-
50	-	-	10.92	10.97	11.00	11.00	10.97	10.90	-
55	-	-	-	11.80	11.84	11.85	11.84	11.79	-
60	-	-	-	-	12.81	12.84	12.84	12.81	-
65	-	-	-	-	13.93	13.98	14.00	13.98	-

**Mass flow in kg/h**

30	158	198	246	301	365	438	521	616	-
35	154	195	243	299	363	437	521	615	-
40	150	192	240	296	361	435	519	614	-
45	-	188	237	293	357	431	515	610	-
50	-	-	232	288	353	426	510	604	-
55	-	-	-	282	346	420	503	597	-
60	-	-	-	-	338	411	494	587	-
65	-	-	-	-	329	401	482	575	-

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

30	2.22	2.80	3.50	4.34	5.34	6.53	7.94	9.64	-
35	1.87	2.38	2.99	3.72	4.58	5.61	6.82	8.26	-
40	1.56	2.00	2.54	3.17	3.91	4.79	5.82	7.04	-
45	-	1.68	2.13	2.67	3.31	4.05	4.93	5.96	-
50	-	-	1.77	2.23	2.77	3.40	4.14	5.01	-
55	-	-	-	1.85	2.30	2.83	3.45	4.18	-
60	-	-	-	-	1.88	2.33	2.85	3.46	-
65	-	-	-	-	1.52	1.89	2.32	2.83	-

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

Cooling capacity	20 386	W
Power input	6 446	W
Current consumption	11.74	A
Mass flow	456	kg/h
C.O.P.	3.16	

**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	72	dB(A)
With acoustic hood	64	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	6 213	7 984	10 059	12 467	15 239	18 404	21 991	-	-
40	5 818	7 525	9 522	11 838	14 503	17 546	20 997	-	-
45	5 403	7 037	8 947	11 162	13 711	16 624	19 931	-	-
50	4 970	6 523	8 337	10 442	12 867	15 640	18 793	-	-
55	-	5 984	7 694	9 680	11 971	14 597	17 586	-	-
60	-	-	7 020	8 878	11 027	13 495	16 312	-	-
65	-	-	-	8 039	10 036	12 338	14 973	-	-
70	-	-	-	7 164	9 000	11 126	13 569	-	-

**Power input in W**

35	2 933	2 946	2 951	2 945	2 926	2 891	2 838	-	-
40	3 263	3 278	3 286	3 283	3 267	3 236	3 187	-	-
45	3 634	3 652	3 662	3 662	3 650	3 623	3 580	-	-
50	4 050	4 070	4 084	4 088	4 079	4 057	4 019	-	-
55	-	4 537	4 554	4 562	4 558	4 541	4 507	-	-
60	-	-	5 076	5 088	5 089	5 077	5 049	-	-
65	-	-	-	5 670	5 676	5 669	5 648	-	-
70	-	-	-	6 310	6 322	6 321	6 306	-	-

**Current consumption in A**

35	7.82	7.86	7.89	7.90	7.89	7.85	7.77	-	-
40	8.10	8.15	8.18	8.19	8.18	8.15	8.08	-	-
45	8.45	8.50	8.53	8.55	8.54	8.51	8.45	-	-
50	8.86	8.91	8.95	8.97	8.97	8.95	8.89	-	-
55	-	9.40	9.45	9.47	9.48	9.46	9.41	-	-
60	-	-	10.03	10.06	10.07	10.05	10.01	-	-
65	-	-	-	10.73	10.75	10.74	10.70	-	-
70	-	-	-	11.50	11.52	11.52	11.49	-	-

**Mass flow in kg/h**

35	151	189	233	283	340	403	473	-	-
40	148	187	232	282	339	402	472	-	-
45	145	185	230	280	337	400	470	-	-
50	142	182	226	277	334	397	467	-	-
55	-	178	223	273	329	392	462	-	-
60	-	-	218	268	324	387	456	-	-
65	-	-	-	261	317	379	448	-	-
70	-	-	-	253	309	370	438	-	-

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

35	2.12	2.71	3.41	4.23	5.21	6.37	7.75	-	-
40	1.78	2.30	2.90	3.61	4.44	5.42	6.59	-	-
45	1.49	1.93	2.44	3.05	3.76	4.59	5.57	-	-
50	1.23	1.60	2.04	2.55	3.15	3.85	4.68	-	-
55	-	1.32	1.69	2.12	2.63	3.21	3.90	-	-
60	-	-	1.38	1.74	2.17	2.66	3.23	-	-
65	-	-	-	1.42	1.77	2.18	2.65	-	-
70	-	-	-	1.14	1.42	1.76	2.15	-	-

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

Cooling capacity	12 867	W
Power input	4 079	W
Current consumption	8.97	A
Mass flow	334	kg/h
C.O.P.	3.15	

**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	6 729	8 632	10 858	13 437	16 401	19 778	23 601	-	-
40	6 336	8 179	10 331	12 821	15 682	18 943	22 634	-	-
45	5 920	7 695	9 763	12 157	14 906	18 041	21 592	-	-
50	5 485	7 181	9 158	11 445	14 073	17 074	20 476	-	-
55	-	6 642	8 517	10 689	13 188	16 044	19 289	-	-
60	-	-	7 843	9 890	12 251	14 955	18 033	-	-
65	-	-	-	9 052	11 265	13 807	16 709	-	-
70	-	-	-	8 175	10 232	12 604	15 321	-	-

Power input in W

35	2 933	2 946	2 951	2 945	2 926	2 891	2 838	-	-
40	3 263	3 278	3 286	3 283	3 267	3 236	3 187	-	-
45	3 634	3 652	3 662	3 662	3 650	3 623	3 580	-	-
50	4 050	4 070	4 084	4 088	4 079	4 057	4 019	-	-
55	-	4 537	4 554	4 562	4 558	4 541	4 507	-	-
60	-	-	5 076	5 088	5 089	5 077	5 049	-	-
65	-	-	-	5 670	5 676	5 669	5 648	-	-
70	-	-	-	6 310	6 322	6 321	6 306	-	-

Current consumption in A

35	7.82	7.86	7.89	7.90	7.89	7.85	7.77	-	-
40	8.10	8.15	8.18	8.19	8.18	8.15	8.08	-	-
45	8.45	8.50	8.53	8.55	8.54	8.51	8.45	-	-
50	8.86	8.91	8.95	8.97	8.97	8.95	8.89	-	-
55	-	9.40	9.45	9.47	9.48	9.46	9.41	-	-
60	-	-	10.03	10.06	10.07	10.05	10.01	-	-
65	-	-	-	10.73	10.75	10.74	10.70	-	-
70	-	-	-	11.50	11.52	11.52	11.49	-	-

Mass flow in kg/h

35	150	188	232	282	338	401	470	-	-
40	147	186	231	281	337	400	470	-	-
45	145	184	228	279	335	398	468	-	-
50	141	181	225	276	332	395	464	-	-
55	-	177	221	272	328	390	460	-	-
60	-	-	216	266	322	384	453	-	-
65	-	-	-	260	315	377	446	-	-
70	-	-	-	252	307	368	436	-	-

Coefficient of performance (C.O.P.)

35	2.29	2.93	3.68	4.56	5.61	6.84	8.32	-	-
40	1.94	2.49	3.14	3.91	4.80	5.85	7.10	-	-
45	1.63	2.11	2.67	3.32	4.08	4.98	6.03	-	-
50	1.35	1.76	2.24	2.80	3.45	4.21	5.10	-	-
55	-	1.46	1.87	2.34	2.89	3.53	4.28	-	-
60	-	-	1.55	1.94	2.41	2.95	3.57	-	-
65	-	-	-	1.60	1.98	2.44	2.96	-	-
70	-	-	-	1.30	1.62	1.99	2.43	-	-

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

Cooling capacity	14 515	W
Power input	4 492	W
Current consumption	9.41	A
Mass flow	355	kg/h
C.O.P.	3.23	

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)

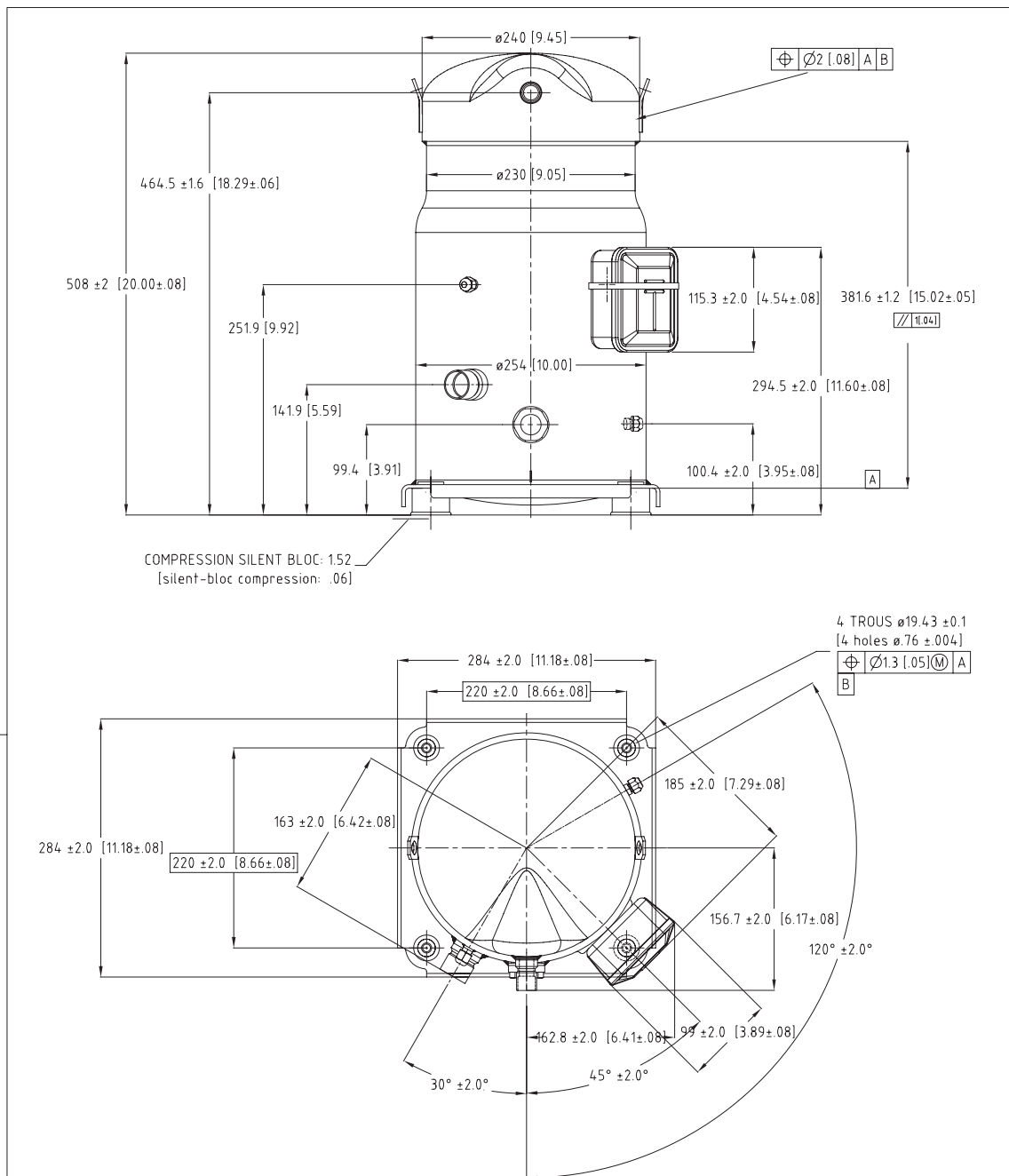
to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

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

All performance data +/- 5%

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B	PEP	13/06/00	MAP	DM 980927
A	PEP	22/09/99	SOP	CREATION DM990234
IND	RT	PAR	DATE	APPROBATIONS
				OBSERVATIONS
MATERIE:				
Ech.: 1/4	Tol.gén.: ±0.8 [ ± .03 ] ± 2°			
<b>ENCOMBREMENT S084/090/100 - V</b>				<b>Danfoss Maneurop S.A.</b> Z.I. de REYRIEUX - B.P. 331F 01603 TREVOUX - FRANCE
<b>S084/090/100 - V OUTLINE</b>				
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