

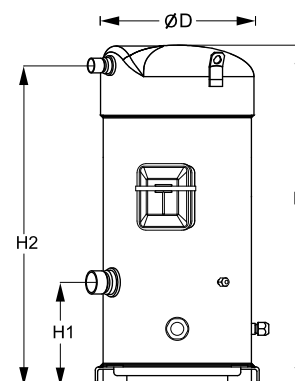
Datasheets

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



**General Characteristics**

Model number (on compressor nameplate)		<b>SM148T4VC</b>
Code number for Singlepack*		SM148-4VAI
Code number for Industrial pack**		SM148-4VAM
Drawing number		8551106b
Suction and discharge connections		Brazed
Suction connection		1-3/8" ODF
Discharge connection		7/8" 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	199 cm <sup>3</sup> /rev	
Displacement @ Nominal speed	34.6 m <sup>3</sup> /h @ 2900 rpm - 41.8 m <sup>3</sup> /h @ 3500 rpm	
Net weight	88 kg	
Oil charge	3,6 litre, Mineral - 160P	
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	12,5 kg	
Approved refrigerants	R22, R417A-160SZ	

**Dimensions**


D=266 mm

H=591 mm

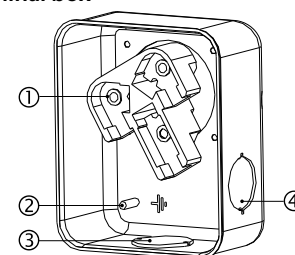
H1=180 mm

H2=556 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	0.94 Ω
Rated Load Amps (RLA)	22.9 A
Maximum Continuous Current (MCC)	32 A
Locked Rotor Amps (LRA)	145 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: 6 Unboxed compressors on pallet (order per multiples of 6)

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

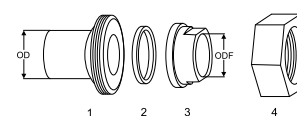
Solder sleeve, P10 (1-3/4" Rotolock, 1-3/8" ODF)	8153003
Rotolock valve, V10 (1-3/4" Rotolock, 1-3/8" ODF)	8168022
Gasket, 1-3/4"	8156132

**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)	7765006
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

**Solder sleeve adapter set**


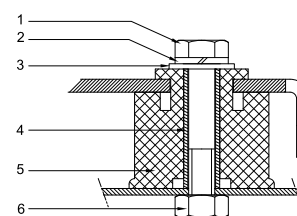
- 1: Rotolock adapter (Suc & Dis)
- 2: Gasket (Suc & Dis)
- 3: Solder sleeve (Suc & Dis)
- 4: Rotolock nut (Suc & Dis)

**Oil / lubricants**
**Code no.**

Mineral oil, 160P, 2 litre can	7754001
Mineral oil, 160P, 5 litre can	7754002

**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

**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 S148-S161 (except code 3)	7755017
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**
**R22**

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

**Cooling capacity in W**

30	14 712	18 318	22 513	27 367	32 949	39 327	46 571	54 748	-
35	13 921	17 429	21 501	26 207	31 615	37 794	44 813	52 741	-
40	13 093	16 489	20 425	24 968	30 189	36 155	42 935	50 598	-
45	-	15 508	19 292	23 659	28 678	34 417	40 944	48 330	-
50	-	-	18 111	22 288	27 091	32 588	38 849	45 943	-
55	-	-	-	20 863	25 436	30 678	36 658	43 446	-
60	-	-	-	-	23 721	28 694	34 379	40 846	-
65	-	-	-	-	21 954	26 643	32 020	38 153	-

**Power input in W**

30	6 291	6 334	6 382	6 430	6 476	6 516	6 547	6 564	-
35	7 006	7 041	7 083	7 129	7 176	7 221	7 259	7 288	-
40	7 816	7 837	7 870	7 910	7 953	7 998	8 039	8 075	-
45	-	8 741	8 759	8 788	8 824	8 864	8 904	8 941	-
50	-	-	9 766	9 780	9 804	9 835	9 870	9 905	-
55	-	-	-	10 902	10 910	10 928	10 952	10 981	-
60	-	-	-	-	12 158	12 158	12 169	12 186	-
65	-	-	-	-	13 565	13 543	13 535	13 536	-

**Current consumption in A**

30	13.73	13.81	13.85	13.85	13.85	13.85	13.89	13.97	-
35	14.48	14.57	14.61	14.63	14.62	14.63	14.66	14.73	-
40	15.35	15.45	15.51	15.52	15.52	15.53	15.55	15.62	-
45	-	16.48	16.54	16.57	16.57	16.58	16.60	16.66	-
50	-	-	17.75	17.78	17.79	17.80	17.82	17.87	-
55	-	-	-	19.19	19.20	19.21	19.23	19.28	-
60	-	-	-	-	20.83	20.84	20.86	20.91	-
65	-	-	-	-	22.70	22.71	22.74	22.78	-

**Mass flow in kg/h**

30	316	388	471	566	673	794	931	1 083	-
35	311	384	467	562	670	792	929	1 082	-
40	305	378	462	557	665	787	925	1 078	-
45	-	372	456	551	659	781	918	1 072	-
50	-	-	448	543	651	773	910	1 064	-
55	-	-	-	534	642	763	900	1 053	-
60	-	-	-	-	630	752	888	1 041	-
65	-	-	-	-	617	738	874	1 026	-

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

30	2.34	2.89	3.53	4.26	5.09	6.04	7.11	8.34	-
35	1.99	2.48	3.04	3.68	4.41	5.23	6.17	7.24	-
40	1.68	2.10	2.60	3.16	3.80	4.52	5.34	6.27	-
45	-	1.77	2.20	2.69	3.25	3.88	4.60	5.41	-
50	-	-	1.85	2.28	2.76	3.31	3.94	4.64	-
55	-	-	-	1.91	2.33	2.81	3.35	3.96	-
60	-	-	-	-	1.95	2.36	2.83	3.35	-
65	-	-	-	-	1.62	1.97	2.37	2.82	-

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

Cooling capacity	32 588	W
Power input	9 835	W
Current consumption	17.80	A
Mass flow	773	kg/h
C.O.P.	3.31	

**Pressure switch settings**

Maximum HP switch setting	28	bar(g)
Minimum LP switch setting	0.5	bar(g)
LP pump down setting	1.3	bar(g)

**Sound power data**

Sound power level	79	dB(A)
With acoustic hood	71	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%

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.

**Performance data at 50 Hz, ARI rating conditions**
**R22**

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

**Cooling capacity in W**

30	15 613	19 423	23 854	28 976	34 861	41 582	49 208	57 812	-
35	14 825	18 544	22 858	27 839	33 558	40 088	47 499	55 863	-
40	13 998	17 612	21 796	26 622	32 161	38 485	45 668	53 779	-
45	-	16 637	20 676	25 332	30 677	36 784	43 723	51 569	-
50	-	-	19 507	23 980	29 117	34 991	41 675	49 241	-
55	-	-	-	22 573	27 489	33 119	39 534	46 808	-
60	-	-	-	-	25 805	31 176	37 310	44 280	-
65	-	-	-	-	24 074	29 175	35 017	41 671	-

**Power input in W**

30	6 291	6 334	6 382	6 430	6 476	6 516	6 547	6 564	-
35	7 006	7 041	7 083	7 129	7 176	7 221	7 259	7 288	-
40	7 816	7 837	7 870	7 910	7 953	7 998	8 039	8 075	-
45	-	8 741	8 759	8 788	8 824	8 864	8 904	8 941	-
50	-	-	9 766	9 780	9 804	9 835	9 870	9 905	-
55	-	-	-	10 902	10 910	10 928	10 952	10 981	-
60	-	-	-	-	12 158	12 158	12 169	12 186	-
65	-	-	-	-	13 565	13 543	13 535	13 536	-

**Current consumption in A**

30	13.73	13.81	13.85	13.85	13.85	13.85	13.89	13.97	-
35	14.48	14.57	14.61	14.63	14.62	14.63	14.66	14.73	-
40	15.35	15.45	15.51	15.52	15.52	15.53	15.55	15.62	-
45	-	16.48	16.54	16.57	16.57	16.58	16.60	16.66	-
50	-	-	17.75	17.78	17.79	17.80	17.82	17.87	-
55	-	-	-	19.19	19.20	19.21	19.23	19.28	-
60	-	-	-	-	20.83	20.84	20.86	20.91	-
65	-	-	-	-	22.70	22.71	22.74	22.78	-

**Mass flow in kg/h**

30	314	386	469	563	669	790	925	1 077	-
35	309	382	465	559	667	787	923	1 075	-
40	303	376	460	555	662	783	919	1 072	-
45	-	370	453	548	656	777	913	1 066	-
50	-	-	445	540	648	769	905	1 058	-
55	-	-	-	531	638	759	895	1 047	-
60	-	-	-	-	627	747	883	1 035	-
65	-	-	-	-	614	734	869	1 020	-

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

30	2.48	3.07	3.74	4.51	5.38	6.38	7.52	8.81	-
35	2.12	2.63	3.23	3.90	4.68	5.55	6.54	7.67	-
40	1.79	2.25	2.77	3.37	4.04	4.81	5.68	6.66	-
45	-	1.90	2.36	2.88	3.48	4.15	4.91	5.77	-
50	-	-	2.00	2.45	2.97	3.56	4.22	4.97	-
55	-	-	-	2.07	2.52	3.03	3.61	4.26	-
60	-	-	-	-	2.12	2.56	3.07	3.63	-
65	-	-	-	-	1.77	2.15	2.59	3.08	-

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

Cooling capacity	36 083	W
Power input	10 800	W
Current consumption	19.04	A
Mass flow	818	kg/h
C.O.P.	3.34	

**Pressure switch settings**

Maximum HP switch setting	28	bar(g)
Minimum LP switch setting	0.5	bar(g)
LP pump down setting	1.3	bar(g)

**Sound power data**

Sound power level	79	dB(A)
With acoustic hood	71	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%

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.

**Performance data at 60 Hz, EN 12900 rating conditions**
**R22**

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

**Cooling capacity in W**

30	17 938	22 260	27 295	33 127	39 840	47 516	56 241	66 099	-
35	17 042	21 241	26 124	31 772	38 271	45 703	54 153	63 704	-
40	16 102	20 162	24 876	30 325	36 594	43 766	51 923	61 150	-
45	-	19 033	23 562	28 796	34 818	41 712	49 561	58 448	-
50	-	-	22 191	27 193	32 953	39 553	47 077	55 606	-
55	-	-	-	25 527	31 007	37 296	44 477	52 631	-
60	-	-	-	-	28 989	34 950	41 770	49 531	-
65	-	-	-	-	26 905	32 519	38 960	46 308	-

**Power input in W**

30	7 521	7 624	7 713	7 794	7 876	7 964	8 065	8 187	-
35	8 315	8 435	8 535	8 624	8 707	8 792	8 886	8 996	-
40	9 187	9 326	9 441	9 538	9 627	9 712	9 801	9 901	-
45	-	10 308	10 440	10 550	10 645	10 733	10 820	10 913	-
50	-	-	11 543	11 669	11 775	11 868	11 956	12 045	-
55	-	-	-	12 906	13 025	13 127	13 218	13 306	-
60	-	-	-	-	14 409	14 521	14 619	14 708	-
65	-	-	-	-	15 935	16 062	16 168	16 262	-

**Current consumption in A**

30	12.90	13.01	13.09	13.17	13.25	13.37	13.53	13.77	-
35	13.68	13.82	13.92	14.00	14.08	14.19	14.33	14.53	-
40	14.61	14.78	14.90	15.00	15.09	15.18	15.31	15.48	-
45	-	15.89	16.04	16.16	16.26	16.35	16.47	16.62	-
50	-	-	17.34	17.49	17.60	17.71	17.82	17.96	-
55	-	-	-	18.98	19.12	19.24	19.36	19.50	-
60	-	-	-	-	20.83	20.97	21.10	21.23	-
65	-	-	-	-	22.71	22.88	23.03	23.18	-

**Mass flow in kg/h**

30	385	472	571	685	814	960	1 124	1 308	-
35	381	468	568	682	811	958	1 122	1 307	-
40	375	463	563	677	807	953	1 118	1 303	-
45	-	456	557	671	800	947	1 112	1 296	-
50	-	-	549	663	792	939	1 103	1 287	-
55	-	-	-	653	782	928	1 092	1 276	-
60	-	-	-	-	770	915	1 079	1 262	-
65	-	-	-	-	757	901	1 063	1 246	-

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

30	2.39	2.92	3.54	4.25	5.06	5.97	6.97	8.07	-
35	2.05	2.52	3.06	3.68	4.40	5.20	6.09	7.08	-
40	1.75	2.16	2.64	3.18	3.80	4.51	5.30	6.18	-
45	-	1.85	2.26	2.73	3.27	3.89	4.58	5.36	-
50	-	-	1.92	2.33	2.80	3.33	3.94	4.62	-
55	-	-	-	1.98	2.38	2.84	3.36	3.96	-
60	-	-	-	-	2.01	2.41	2.86	3.37	-
65	-	-	-	-	1.69	2.02	2.41	2.85	-

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

Cooling capacity	39 553	W
Power input	11 868	W
Current consumption	17.71	A
Mass flow	939	kg/h
C.O.P.	3.33	

**Pressure switch settings**

Maximum HP switch setting	28	bar(g)
Minimum LP switch setting	0.5	bar(g)
LP pump down setting	1.3	bar(g)

**Sound power data**

Sound power level	83	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%

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.

**Performance data at 60 Hz, ARI rating conditions**
**R22**

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

**Cooling capacity in W**

30	19 036	23 604	28 921	35 075	42 152	50 240	59 426	69 798	-
35	18 149	22 601	27 773	33 751	40 624	48 477	57 398	67 475	-
40	17 215	21 536	26 546	32 333	38 985	46 587	55 228	64 994	-
45	-	20 419	25 252	30 832	37 246	44 581	52 925	62 365	-
50	-	-	23 901	29 257	35 418	42 470	50 501	59 598	-
55	-	-	-	27 619	33 511	40 264	47 966	56 705	-
60	-	-	-	-	31 536	37 974	45 331	53 694	-
65	-	-	-	-	29 503	35 610	42 606	50 578	-

**Power input in W**

30	7 521	7 624	7 713	7 794	7 876	7 964	8 065	8 187	-
35	8 315	8 435	8 535	8 624	8 707	8 792	8 886	8 996	-
40	9 187	9 326	9 441	9 538	9 627	9 712	9 801	9 901	-
45	-	10 308	10 440	10 550	10 645	10 733	10 820	10 913	-
50	-	-	11 543	11 669	11 775	11 868	11 956	12 045	-
55	-	-	-	12 906	13 025	13 127	13 218	13 306	-
60	-	-	-	-	14 409	14 521	14 619	14 708	-
65	-	-	-	-	15 935	16 062	16 168	16 262	-

**Current consumption in A**

30	12.90	13.01	13.09	13.17	13.25	13.37	13.53	13.77	-
35	13.68	13.82	13.92	14.00	14.08	14.19	14.33	14.53	-
40	14.61	14.78	14.90	15.00	15.09	15.18	15.31	15.48	-
45	-	15.89	16.04	16.16	16.26	16.35	16.47	16.62	-
50	-	-	17.34	17.49	17.60	17.71	17.82	17.96	-
55	-	-	-	18.98	19.12	19.24	19.36	19.50	-
60	-	-	-	-	20.83	20.97	21.10	21.23	-
65	-	-	-	-	22.71	22.88	23.03	23.18	-

**Mass flow in kg/h**

30	383	470	569	681	810	955	1 118	1 300	-
35	379	466	565	678	807	952	1 116	1 299	-
40	373	460	560	674	803	948	1 112	1 295	-
45	-	454	554	667	796	942	1 106	1 289	-
50	-	-	546	659	788	933	1 097	1 280	-
55	-	-	-	650	778	923	1 086	1 269	-
60	-	-	-	-	766	910	1 073	1 255	-
65	-	-	-	-	753	896	1 057	1 238	-

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

30	2.53	3.10	3.75	4.50	5.35	6.31	7.37	8.52	-
35	2.18	2.68	3.25	3.91	4.67	5.51	6.46	7.50	-
40	1.87	2.31	2.81	3.39	4.05	4.80	5.64	6.56	-
45	-	1.98	2.42	2.92	3.50	4.15	4.89	5.71	-
50	-	-	2.07	2.51	3.01	3.58	4.22	4.95	-
55	-	-	-	2.14	2.57	3.07	3.63	4.26	-
60	-	-	-	-	2.19	2.62	3.10	3.65	-
65	-	-	-	-	1.85	2.22	2.64	3.11	-

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

Cooling capacity	43 818	W
Power input	13 010	W
Current consumption	19.10	A
Mass flow	994	kg/h
C.O.P.	3.37	

**Pressure switch settings**

Maximum HP switch setting	28	bar(g)
Minimum LP switch setting	0.5	bar(g)
LP pump down setting	1.3	bar(g)

**Sound power data**

Sound power level	83	dB(A)
With acoustic hood	75	dB(A)

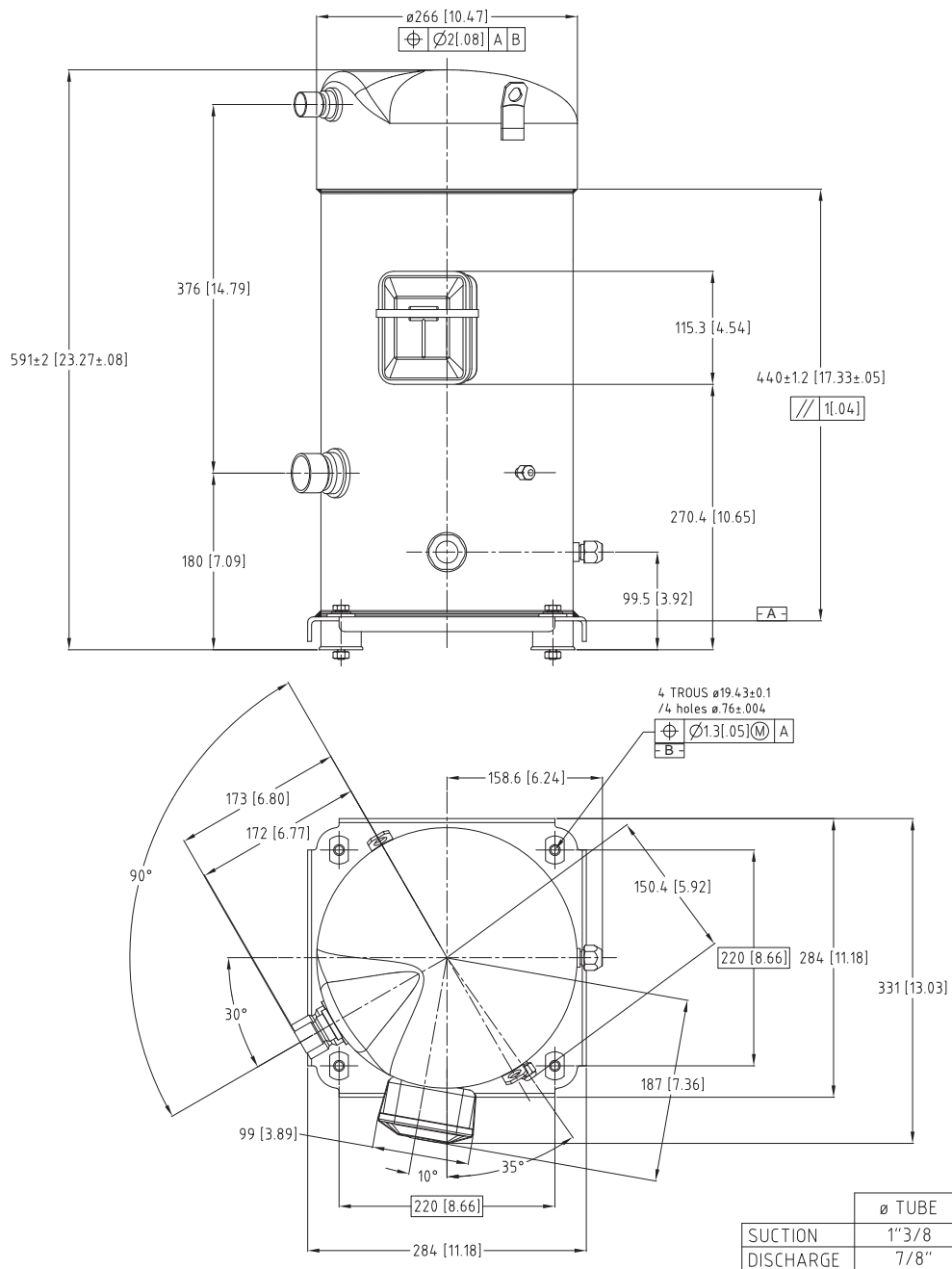
to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

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

All performance data +/- 5%

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.



	Ø TUBE
SUCTION	1"3/8
DISCHARGE	7/8"

B	JAP	19/11/02	DOM	DC 1020770
A	PEP	02/06/99	MAP	CREATION PLAN SERIE
IND	RT	PAR	DATE	APPROBATION
MODIFICATIONS				
MATIERE:				
Ech.: 1/4	Tol.gén.: ± 0.8 [ ± .03 ] ± 2°			
<b>ENCOMBREMENT S148/161-4V</b>				<b>Danfoss Maneurop S.A.</b>
<b>S148/161-4V OUTLINE</b>				Z.I. de REYRIEUX - B.P. 331F 01603 TREVOUX - FRANCE
Ce plan est la propriété de Danfoss Maneurop S.A. toute copie ou communication à des tiers est interdite sans autorisation. This drawing is proprietary and shall not be copied or its contents disclosed to outside parties without the written consent of Danfoss Maneurop S.A.				<b>85 51 106</b>