

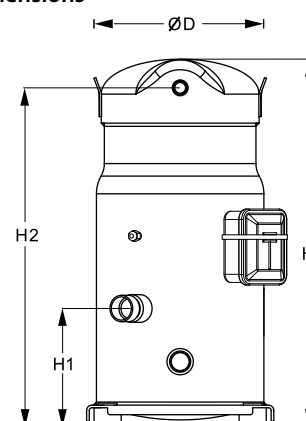
Datasheets

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



General Characteristics

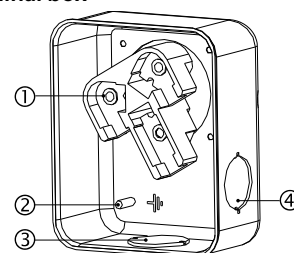
Model number (on compressor nameplate)		SM110S4VC
Code number for Singlepack*		SM110-4V1
Code number for Industrial pack**		SM110-4VM
Drawing number		8552037b
Suction and discharge connections		Brazed
Suction connection		1-3/8" ODF
Discharge connection		7/8" ODF
Oil sight glass		Threaded
Oil equalisation connection		3/8" flare SAE
Oil drain connection		None
LP gauge port		Schrader
IPR valve		None
Swept volume		144,2 cm ³ /rev
Displacement @ Nominal speed		25.1 m ³ /h @ 2900 rpm - 30.3 m ³ /h @ 3500 rpm
Net weight		73 kg
Oil charge		3,25 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		10 kg
Approved refrigerants		R22, R417A-160SZ

Dimensions


D=254 mm
H=558 mm
H1=178,4 mm
H2=514,5 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	1.05 Ω
Rated Load Amps (RLA)	15.7 A
Maximum Continuous Current (MCC)	22 A
Locked Rotor Amps (LRA)	130 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, 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.

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

Crankcase heaters
Code no.

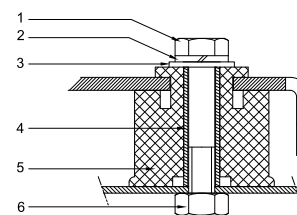
Surface sump heater + bottom insulation, 48 W, 24 V, CE mark, UL	120Z0361
Surface sump heater + bottom insulation, 48 W, 230 V, CE mark, UL	120Z0380
Surface sump heater + bottom insulation, 48 W, 400 V, CE mark, UL	120Z0381
Surface sump heater + bottom insulation, 48 W, 460 V, CE mark, UL	120Z0382
Belt 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

Miscellaneous accessories
Code no.

Electronic soft start kit, MCI 15 C	7705006
Soft start kit with statoric resistors, prewired box, SCR03	7705001
Acoustic hood for scroll compressor S110-S120	7755010
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

Mounting kit


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

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	10 153	12 873	16 029	19 655	23 787	28 462	33 715	39 582	-
35	9 535	12 189	15 260	18 784	22 797	27 333	32 430	38 123	-
40	8 892	11 469	14 444	17 855	21 735	26 122	31 051	36 557	-
45	-	10 715	13 583	16 868	20 605	24 831	29 579	34 887	-
50	-	-	12 678	15 826	19 409	23 460	28 017	33 114	-
55	-	-	-	14 732	18 147	22 013	26 365	31 240	-
60	-	-	-	-	16 821	20 489	24 625	29 263	-
65	-	-	-	-	15 433	18 890	22 796	27 185	-

Power input in W

30	4 672	4 686	4 700	4 713	4 725	4 734	4 740	4 743	-
35	5 200	5 209	5 218	5 225	5 228	5 229	5 225	5 215	-
40	5 798	5 803	5 805	5 804	5 799	5 790	5 774	5 752	-
45	-	6 473	6 468	6 459	6 444	6 424	6 397	6 361	-
50	-	-	7 214	7 196	7 172	7 140	7 100	7 050	-
55	-	-	-	8 024	7 988	7 944	7 890	7 826	-
60	-	-	-	-	8 902	8 844	8 776	8 697	-
65	-	-	-	-	9 919	9 848	9 765	9 669	-

Current consumption in A

30	10.69	10.71	10.74	10.75	10.76	10.77	10.76	10.74	-
35	11.23	11.25	11.27	11.27	11.28	11.27	11.25	11.21	-
40	11.88	11.90	11.90	11.90	11.89	11.87	11.84	11.79	-
45	-	12.67	12.66	12.65	12.63	12.60	12.55	12.48	-
50	-	-	13.56	13.54	13.50	13.45	13.39	13.30	-
55	-	-	-	14.57	14.52	14.45	14.37	14.27	-
60	-	-	-	-	15.69	15.61	15.51	15.39	-
65	-	-	-	-	17.04	16.95	16.82	16.68	-

Mass flow in kg/h

30	219	274	336	407	487	576	675	785	-
35	213	269	332	404	484	574	673	784	-
40	207	264	328	399	480	570	670	781	-
45	-	257	322	394	475	565	665	776	-
50	-	-	314	387	468	558	658	769	-
55	-	-	-	378	459	550	650	760	-
60	-	-	-	-	449	539	639	749	-
65	-	-	-	-	437	526	625	735	-

Coefficient of performance (C.O.P.)

30	2.17	2.75	3.41	4.17	5.03	6.01	7.11	8.35	-
35	1.83	2.34	2.92	3.60	4.36	5.23	6.21	7.31	-
40	1.53	1.98	2.49	3.08	3.75	4.51	5.38	6.36	-
45	-	1.66	2.10	2.61	3.20	3.87	4.62	5.48	-
50	-	-	1.76	2.20	2.71	3.29	3.95	4.70	-
55	-	-	-	1.84	2.27	2.77	3.34	3.99	-
60	-	-	-	-	1.89	2.32	2.81	3.36	-
65	-	-	-	-	1.56	1.92	2.33	2.81	-

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

Cooling capacity	23 460	W
Power input	7 140	W
Current consumption	13.45	A
Mass flow	558	kg/h
C.O.P.	3.29	

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	75	dB(A)
With acoustic hood	67	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

R22

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

Cooling capacity in W

30	10 774	13 651	16 984	20 811	25 168	30 094	35 624	41 797	-
35	10 154	12 969	16 224	19 954	24 198	28 992	34 374	40 380	-
40	9 507	12 250	15 414	19 037	23 155	27 806	33 027	38 855	-
45	-	11 495	14 557	18 061	22 042	26 538	31 587	37 225	-
50	-	-	13 655	17 028	20 860	25 190	30 055	35 492	-
55	-	-	-	15 939	19 612	23 764	28 434	33 657	-
60	-	-	-	-	18 299	22 262	26 724	31 723	-
65	-	-	-	-	16 923	20 685	24 929	29 692	-

Power input in W

30	4 672	4 686	4 700	4 713	4 725	4 734	4 740	4 743	-
35	5 200	5 209	5 218	5 225	5 228	5 229	5 225	5 215	-
40	5 798	5 803	5 805	5 804	5 799	5 790	5 774	5 752	-
45	-	6 473	6 468	6 459	6 444	6 424	6 397	6 361	-
50	-	-	7 214	7 196	7 172	7 140	7 100	7 050	-
55	-	-	-	8 024	7 988	7 944	7 890	7 826	-
60	-	-	-	-	8 902	8 844	8 776	8 697	-
65	-	-	-	-	9 919	9 848	9 765	9 669	-

Current consumption in A

30	10.69	10.71	10.74	10.75	10.76	10.77	10.76	10.74	-
35	11.23	11.25	11.27	11.27	11.28	11.27	11.25	11.21	-
40	11.88	11.90	11.90	11.90	11.89	11.87	11.84	11.79	-
45	-	12.67	12.66	12.65	12.63	12.60	12.55	12.48	-
50	-	-	13.56	13.54	13.50	13.45	13.39	13.30	-
55	-	-	-	14.57	14.52	14.45	14.37	14.27	-
60	-	-	-	-	15.69	15.61	15.51	15.39	-
65	-	-	-	-	17.04	16.95	16.82	16.68	-

Mass flow in kg/h

30	218	273	335	405	484	573	671	780	-
35	212	268	331	402	481	570	670	779	-
40	206	262	326	397	478	567	666	776	-
45	-	256	320	392	472	562	661	771	-
50	-	-	313	385	465	555	655	765	-
55	-	-	-	376	457	547	646	756	-
60	-	-	-	-	447	536	635	744	-
65	-	-	-	-	434	523	622	730	-

Coefficient of performance (C.O.P.)

30	2.31	2.91	3.61	4.42	5.33	6.36	7.51	8.81	-
35	1.95	2.49	3.11	3.82	4.63	5.54	6.58	7.74	-
40	1.64	2.11	2.66	3.28	3.99	4.80	5.72	6.75	-
45	-	1.78	2.25	2.80	3.42	4.13	4.94	5.85	-
50	-	-	1.89	2.37	2.91	3.53	4.23	5.03	-
55	-	-	-	1.99	2.46	2.99	3.60	4.30	-
60	-	-	-	-	2.06	2.52	3.05	3.65	-
65	-	-	-	-	1.71	2.10	2.55	3.07	-

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

Cooling capacity	25 939	W
Power input	7 821	W
Current consumption	14.29	A
Mass flow	590	kg/h
C.O.P.	3.32	

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	75	dB(A)
With acoustic hood	67	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 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	12 777	15 981	19 713	24 019	28 945	34 534	40 833	47 887	-
35	12 056	15 176	18 802	22 979	27 752	33 166	39 267	46 099	-
40	11 325	14 346	17 851	21 884	26 490	31 715	37 602	44 198	-
45	-	13 493	16 862	20 736	25 161	30 181	35 840	42 185	-
50	-	-	15 835	19 537	23 765	28 565	33 981	40 059	-
55	-	-	-	18 286	22 303	26 868	32 026	37 821	-
60	-	-	-	-	20 774	25 089	29 973	35 470	-
65	-	-	-	-	19 179	23 228	27 822	33 004	-

Power input in W

30	5 579	5 624	5 671	5 717	5 762	5 805	5 845	5 881	-
35	6 173	6 215	6 256	6 297	6 336	6 371	6 402	6 428	-
40	6 846	6 883	6 920	6 954	6 986	7 013	7 035	7 050	-
45	-	7 638	7 668	7 696	7 720	7 738	7 750	7 754	-
50	-	-	8 509	8 530	8 544	8 553	8 554	8 547	-
55	-	-	-	9 462	9 468	9 466	9 456	9 436	-
60	-	-	-	-	10 496	10 484	10 462	10 429	-
65	-	-	-	-	11 638	11 614	11 579	11 533	-

Current consumption in A

30	9.82	9.89	9.96	10.03	10.09	10.15	10.21	10.25	-
35	10.42	10.49	10.55	10.62	10.67	10.72	10.77	10.80	-
40	11.14	11.20	11.26	11.32	11.36	11.41	11.44	11.45	-
45	-	12.04	12.09	12.14	12.18	12.21	12.22	12.23	-
50	-	-	13.06	13.09	13.12	13.14	13.14	13.14	-
55	-	-	-	14.19	14.21	14.22	14.21	14.18	-
60	-	-	-	-	15.45	15.45	15.42	15.38	-
65	-	-	-	-	16.86	16.84	16.80	16.75	-

Mass flow in kg/h

30	275	340	413	497	592	698	817	949	-
35	270	335	410	494	589	696	815	948	-
40	264	330	405	490	585	692	812	944	-
45	-	324	399	484	580	687	806	939	-
50	-	-	393	478	573	680	799	930	-
55	-	-	-	470	564	671	789	920	-
60	-	-	-	-	554	660	777	907	-
65	-	-	-	-	542	647	763	892	-

Coefficient of performance (C.O.P.)

30	2.29	2.84	3.48	4.20	5.02	5.95	6.99	8.14	-
35	1.95	2.44	3.01	3.65	4.38	5.21	6.13	7.17	-
40	1.65	2.08	2.58	3.15	3.79	4.52	5.35	6.27	-
45	-	1.77	2.20	2.69	3.26	3.90	4.62	5.44	-
50	-	-	1.86	2.29	2.78	3.34	3.97	4.69	-
55	-	-	-	1.93	2.36	2.84	3.39	4.01	-
60	-	-	-	-	1.98	2.39	2.86	3.40	-
65	-	-	-	-	1.65	2.00	2.40	2.86	-

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

Cooling capacity	28 565	W
Power input	8 553	W
Current consumption	13.14	A
Mass flow	680	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	78	dB(A)
With acoustic hood	70	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 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	13 559	16 946	20 888	25 432	30 625	36 513	43 145	50 567	-
35	12 839	16 147	19 989	24 410	29 457	35 179	41 620	48 829	-
40	12 107	15 323	19 050	23 333	28 221	33 759	39 995	46 976	-
45	-	14 475	18 072	22 203	26 915	32 256	38 273	45 012	-
50	-	-	17 055	21 019	25 542	30 671	36 453	42 935	-
55	-	-	-	19 785	24 103	29 006	34 538	40 748	-
60	-	-	-	-	22 599	27 260	32 529	38 452	-
65	-	-	-	-	21 031	25 435	30 425	36 048	-

Power input in W

30	5 579	5 624	5 671	5 717	5 762	5 805	5 845	5 881	-
35	6 173	6 215	6 256	6 297	6 336	6 371	6 402	6 428	-
40	6 846	6 883	6 920	6 954	6 986	7 013	7 035	7 050	-
45	-	7 638	7 668	7 696	7 720	7 738	7 750	7 754	-
50	-	-	8 509	8 530	8 544	8 553	8 554	8 547	-
55	-	-	-	9 462	9 468	9 466	9 456	9 436	-
60	-	-	-	-	10 496	10 484	10 462	10 429	-
65	-	-	-	-	11 638	11 614	11 579	11 533	-

Current consumption in A

30	9.82	9.89	9.96	10.03	10.09	10.15	10.21	10.25	-
35	10.42	10.49	10.55	10.62	10.67	10.72	10.77	10.80	-
40	11.14	11.20	11.26	11.32	11.36	11.41	11.44	11.45	-
45	-	12.04	12.09	12.14	12.18	12.21	12.22	12.23	-
50	-	-	13.06	13.09	13.12	13.14	13.14	13.14	-
55	-	-	-	14.19	14.21	14.22	14.21	14.18	-
60	-	-	-	-	15.45	15.45	15.42	15.38	-
65	-	-	-	-	16.86	16.84	16.80	16.75	-

Mass flow in kg/h

30	274	338	411	494	589	694	812	943	-
35	269	334	408	491	586	692	811	942	-
40	263	328	403	487	582	689	807	939	-
45	-	323	397	482	577	683	802	933	-
50	-	-	391	475	570	676	794	925	-
55	-	-	-	467	561	667	784	915	-
60	-	-	-	-	551	656	773	902	-
65	-	-	-	-	539	643	759	887	-

Coefficient of performance (C.O.P.)

30	2.43	3.01	3.68	4.45	5.31	6.29	7.38	8.60	-
35	2.08	2.60	3.20	3.88	4.65	5.52	6.50	7.60	-
40	1.77	2.23	2.75	3.36	4.04	4.81	5.69	6.66	-
45	-	1.90	2.36	2.88	3.49	4.17	4.94	5.80	-
50	-	-	2.00	2.46	2.99	3.59	4.26	5.02	-
55	-	-	-	2.09	2.55	3.06	3.65	4.32	-
60	-	-	-	-	2.15	2.60	3.11	3.69	-
65	-	-	-	-	1.81	2.19	2.63	3.13	-

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

Cooling capacity	31 577	W
Power input	9 348	W
Current consumption	14.08	A
Mass flow	718	kg/h
C.O.P.	3.38	

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	78	dB(A)
With acoustic hood	70	dB(A)

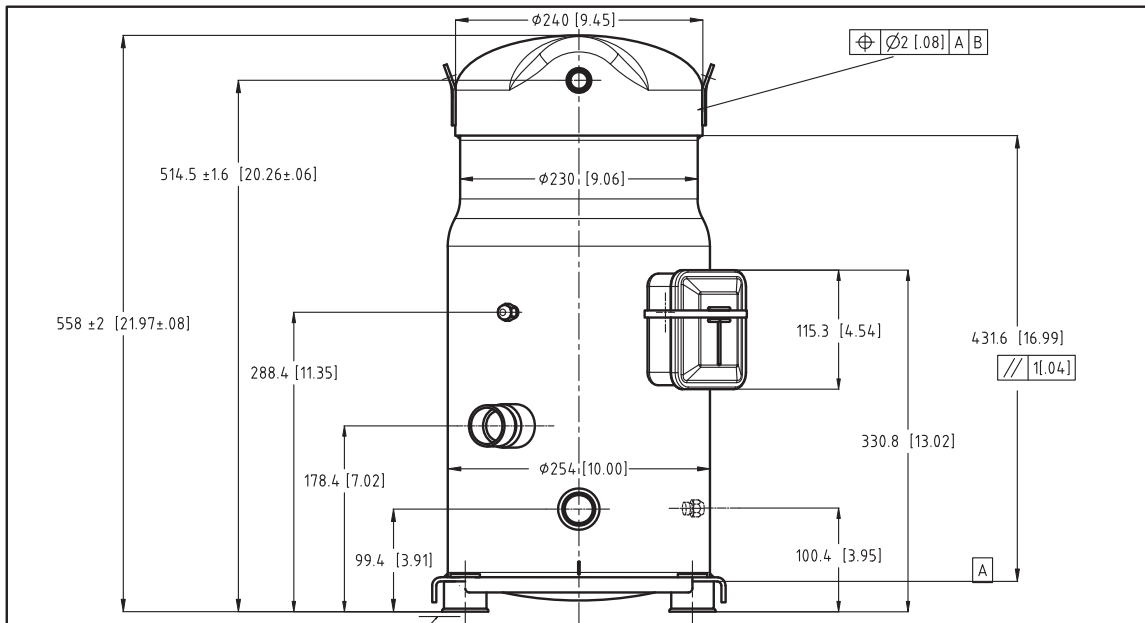
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tc: Condensing temperature at dew point

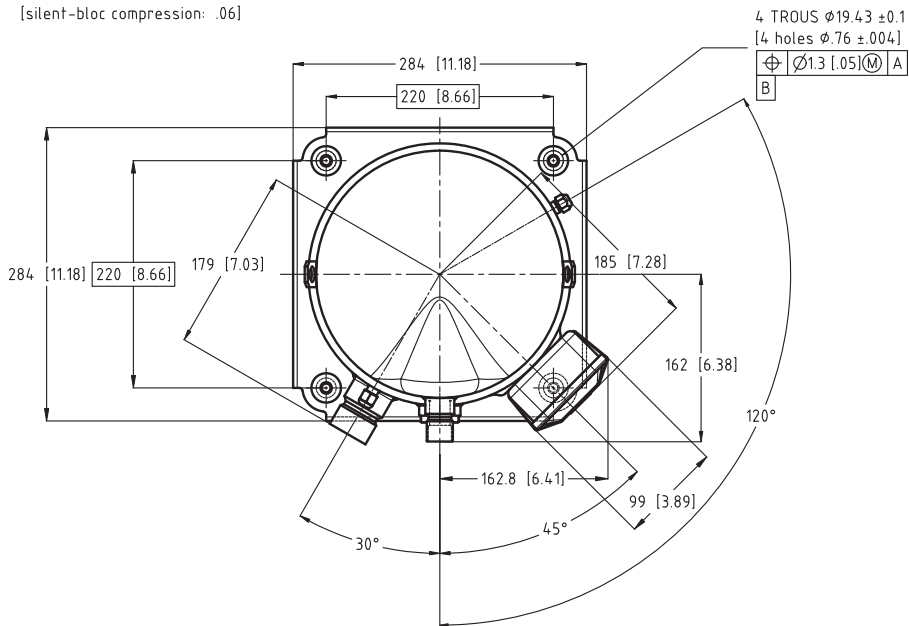
Rating conditions : Superheat = 11.1 K , Subcooling = 8.3 K

All performance data +/- 5%

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COMPRESSION SILENT BLOC: 152
[silent-bloc compression: .06]



B	PEP	13/06/00	MAP	DM 980927
A	PEP	22/09/99	SOP	CREATION DM 990234
IND	RT	PAR	DATE	APPROBATIONS
MATERIE:				OBSERVATIONS
Ech:	1/4	Tol.gén.:	± 0.8 [± .03] ± 2°	
ENCOMBREMENT S110/120 - V				Danfoss Maneurop S.A. Z.I. de REYRIEUX - B.P. 331F 01603 TREVOUX - FRANCE
S110/120 - V OUTLINE				
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