

Datasheets

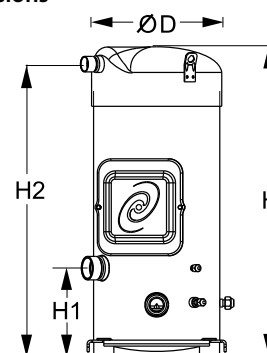
# Danfoss scroll compressors **SM / SY / SZ / SH / WSH**



**General Characteristics**

Model number (on compressor nameplate)	SM160T4RC	SM160T4CC
Code number for Singlepack*	SM160-4RAI	SM160-4CBI
Code number for Industrial pack**	SM160-4RAM	SM160-4CBM
Drawing number	8551120b	8551055c
Suction and discharge connections	Rotolock	Brazed
Suction connection	2-1/4" Rotolock	1-5/8" ODF
Discharge connection	1-3/4" Rotolock	1-1/8" ODF
Suction connection with supplied sleeve	1-3/8" ODF	
Discharge connection with supplied sleeve	7/8" ODF	
Oil sight glass	Threaded	Threaded
Oil equalisation connection	3/8" flare SAE	3/8" flare SAE
Oil drain connection	1/4" flare	1/4" flare
LP gauge port	Schrader	Schrader
IPR valve	None	None
Swept volume	216.6 cm <sup>3</sup> /rev	
Displacement @ Nominal speed	37.7 m <sup>3</sup> /h @ 2900 rpm - 45.5 m <sup>3</sup> /h @ 3500 rpm	
Net weight	90 kg	
Oil charge	4 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**

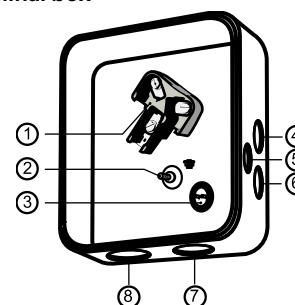


D=266 mm  
H=631 mm  
H1=180 mm  
H2=596 mm  
H3=- mm

**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
Maximum Must Trip current (MMT)	29 A
Locked Rotor Amps (LRA)	150 A
Motor protection	Internal thermostat, ext. overload protector needed

**Terminal box**



- IP54 (with cable gland)
- 1: Power connection, 3 x 4.8 mm (3/16")
  - 2: Earth M5
  - 3: Thermostat connector
  - 4: Knock-out Ø 22 mm (7/8") for 1/2" conduit
  - 5: Knock-out Ø 16.5 mm (0.65")
  - 6: Knock-out Ø 20.5 mm (0.81")
  - 7: Double knock-out Ø 32.1 mm (1.26") & Ø 25.4 mm (1")
  - 8: Double knock-out Ø 44 mm (1-3/4") for 1-1/4" conduit & Ø 34 mm (1-3/8") for 1" conduit

**Recommended Installation torques**

Suction Rotolock nut or valve	130 Nm
Discharge Rotolock nut or valve	110 Nm
Oil sight glass	50 Nm
Power connections / Earth connection	3 Nm / 2 Nm
Terminal box cover screws	2.3 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

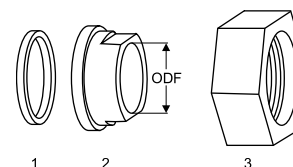
\*\*Industrial pack: 6 Unboxed compressors on pallet (order per multiples of 6)

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

Solder sleeve, P08 (2-1/4" Rotolock, 1-3/8" ODF)	8153005
Solder sleeve, P03 (2-1/4" Rotolock, 1-5/8" ODF)	8153006
Rotolock valve, V08 (2-1/4" Rotolock, 1-3/8" ODF)	8168025
Rotolock valve, V03 (2-1/4" Rotolock, 1-5/8" ODF)	8168026
Gasket, 2-1/4"	8156133

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

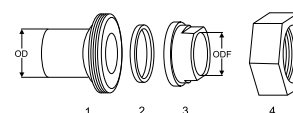
Solder sleeve, P07 (1-3/4" Rotolock, 7/8" ODF)	8153013
Solder sleeve, P02 (1-3/4" Rotolock, 1-1/8" ODF)	8153004
Angle adapter, C07 (1-3/4" Rotolock, 7/8" ODF)	8168008
Angle adapter, C02 (1-3/4" Rotolock, 1-1/8" ODF)	8168005
Rotolock valve, V07 (1-3/4" Rotolock, 7/8" ODF)	8168032
Rotolock valve, V02 (1-3/4" Rotolock, 1-1/8" ODF)	8168028
Gasket, 1-3/4"	8156132

**Gaskets, sleeves and nuts**


- 1: Gasket
- 2: Solder sleeve
- 3: Rotolock nut

**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, V08 (2-1/4"~1-3/8"), V07 (1-3/4"~7/8")	7703010
Gasket set, 1-1/4", 1-3/4", 2-1/4", OSG gaskets black & white	8156013

**Solder sleeve adapter set**

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

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

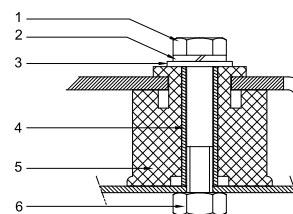
**Crankcase heaters**
**Code no.**

Surface sump heater + bottom insulation, 48 W, 24 V, CE mark, UL	120Z0363
Surface sump heater + bottom insulation, 48 W, 230 V, CE mark, UL	120Z0384
Surface sump heater + bottom insulation, 48 W, 400 V, CE mark, UL	120Z0385
Surface sump heater + bottom insulation, 48 W, 460 V, CE mark, UL	120Z0386
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

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

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

Electronic soft start kit, MCI 25 C	7705007
Acoustic hood for scroll compressor S160	7755008
Bottom insulation for scroll compressor	120Z0357
Discharge thermostat kit	7750009

**Mounting kit**

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

Mounting kit for 1 scroll compressor including 4 grommets, 4 sleeves, 4 bolts, 4 washers	8156138
Mounting kit for 1 scroll compressor including 4 grommets, 4 sleeves, 4 bolts, 4 washers, 2 rotolock nuts, 2 solder sleeves, 2 gaskets	8156147
Oil sight glass with gaskets (black & white)	8156019
Gasket for oil sight glass (white teflon)	8156129
Terminal box 186 x 198 mm, incl cover	8156139
T block connector 60 x 75 mm	8173021

- 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	15 338	19 243	23 794	29 048	35 065	41 902	49 619	58 275	-
35	14 593	18 420	22 868	27 997	33 864	40 529	48 049	56 483	-
40	13 756	17 489	21 820	26 807	32 510	38 985	46 293	54 490	-
45	-	16 435	20 633	25 464	30 986	37 257	44 335	52 279	-
50	-	-	19 294	23 952	29 277	35 327	42 160	49 834	-
55	-	-	-	22 258	27 370	33 183	39 753	47 140	-
60	-	-	-	-	25 250	30 808	37 099	44 180	-
65	-	-	-	-	22 904	28 189	34 181	40 939	-

**Power input in W**

30	6 945	7 025	7 111	7 203	7 299	7 398	7 500	7 604	-
35	7 619	7 697	7 780	7 868	7 959	8 053	8 150	8 247	-
40	8 389	8 464	8 544	8 628	8 714	8 803	8 892	8 983	-
45	-	9 338	9 413	9 492	9 573	9 655	9 738	9 821	-
50	-	-	10 398	10 471	10 546	10 622	10 697	10 772	-
55	-	-	-	11 575	11 643	11 711	11 779	11 845	-
60	-	-	-	-	12 874	12 935	12 994	13 050	-
65	-	-	-	-	14 249	14 301	14 351	14 398	-

**Current consumption in A**

30	13.79	13.88	13.97	14.07	14.16	14.24	14.32	14.39	-
35	14.62	14.71	14.80	14.90	14.99	15.07	15.15	15.22	-
40	15.59	15.68	15.77	15.87	15.96	16.04	16.12	16.18	-
45	-	16.81	16.90	16.99	17.08	17.16	17.24	17.31	-
50	-	-	18.21	18.30	18.38	18.46	18.54	18.60	-
55	-	-	-	19.79	19.87	19.95	20.02	20.09	-
60	-	-	-	-	21.57	21.64	21.71	21.78	-
65	-	-	-	-	23.48	23.56	23.62	23.68	-

**Mass flow in kg/h**

30	330	409	499	602	718	848	993	1 155	-
35	326	407	498	602	719	850	997	1 161	-
40	321	402	495	600	718	851	999	1 163	-
45	-	395	489	595	714	848	997	1 163	-
50	-	-	479	586	706	841	991	1 158	-
55	-	-	-	572	693	829	980	1 147	-
60	-	-	-	-	674	810	962	1 131	-
65	-	-	-	-	647	785	937	1 106	-

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

30	2.21	2.74	3.35	4.03	4.80	5.66	6.62	7.66	-
35	1.92	2.39	2.94	3.56	4.25	5.03	5.90	6.85	-
40	1.64	2.07	2.55	3.11	3.73	4.43	5.21	6.07	-
45	-	1.76	2.19	2.68	3.24	3.86	4.55	5.32	-
50	-	-	1.86	2.29	2.78	3.33	3.94	4.63	-
55	-	-	-	1.92	2.35	2.83	3.37	3.98	-
60	-	-	-	-	1.96	2.38	2.86	3.39	-
65	-	-	-	-	1.61	1.97	2.38	2.84	-

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

Cooling capacity	35 327	W
Power input	10 622	W
Current consumption	18.46	A
Mass flow	841	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	79.5	dB(A)
With acoustic hood	72	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	16 276	20 405	25 211	30 756	37 100	44 304	52 429	61 535	-
35	15 541	19 599	24 312	29 741	35 946	42 988	50 928	59 827	-
40	14 707	18 680	23 285	28 582	34 633	41 499	49 239	57 915	-
45	-	17 632	22 113	27 264	33 146	39 819	47 344	55 782	-
50	-	-	20 781	25 770	31 467	37 932	45 227	53 412	-
55	-	-	-	24 083	29 580	35 823	42 872	50 788	-
60	-	-	-	-	27 469	33 473	40 262	47 894	-
65	-	-	-	-	25 116	30 868	37 380	44 714	-

Power input in W

30	6 945	7 025	7 111	7 203	7 299	7 398	7 500	7 604	-
35	7 619	7 697	7 780	7 868	7 959	8 053	8 150	8 247	-
40	8 389	8 464	8 544	8 628	8 714	8 803	8 892	8 983	-
45	-	9 338	9 413	9 492	9 573	9 655	9 738	9 821	-
50	-	-	10 398	10 471	10 546	10 622	10 697	10 772	-
55	-	-	-	11 575	11 643	11 711	11 779	11 845	-
60	-	-	-	-	12 874	12 935	12 994	13 050	-
65	-	-	-	-	14 249	14 301	14 351	14 398	-

Current consumption in A

30	13.79	13.88	13.97	14.07	14.16	14.24	14.32	14.39	-
35	14.62	14.71	14.80	14.90	14.99	15.07	15.15	15.22	-
40	15.59	15.68	15.77	15.87	15.96	16.04	16.12	16.18	-
45	-	16.81	16.90	16.99	17.08	17.16	17.24	17.31	-
50	-	-	18.21	18.30	18.38	18.46	18.54	18.60	-
55	-	-	-	19.79	19.87	19.95	20.02	20.09	-
60	-	-	-	-	21.57	21.64	21.71	21.78	-
65	-	-	-	-	23.48	23.56	23.62	23.68	-

Mass flow in kg/h

30	328	407	497	599	714	843	988	1 149	-
35	325	404	495	599	715	846	992	1 154	-
40	319	400	492	597	714	846	993	1 157	-
45	-	393	486	592	710	843	991	1 156	-
50	-	-	476	583	702	836	985	1 151	-
55	-	-	-	569	689	824	974	1 141	-
60	-	-	-	-	670	806	957	1 124	-
65	-	-	-	-	644	780	932	1 100	-

Coefficient of performance (C.O.P.)

30	2.34	2.90	3.55	4.27	5.08	5.99	6.99	8.09	-
35	2.04	2.55	3.12	3.78	4.52	5.34	6.25	7.25	-
40	1.75	2.21	2.73	3.31	3.97	4.71	5.54	6.45	-
45	-	1.89	2.35	2.87	3.46	4.12	4.86	5.68	-
50	-	-	2.00	2.46	2.98	3.57	4.23	4.96	-
55	-	-	-	2.08	2.54	3.06	3.64	4.29	-
60	-	-	-	-	2.13	2.59	3.10	3.67	-
65	-	-	-	-	1.76	2.16	2.60	3.11	-

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

Cooling capacity	39 100	W
Power input	11 604	W
Current consumption	19.80	A
Mass flow	890	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	79.5	dB(A)
With acoustic hood	72	dB(A)

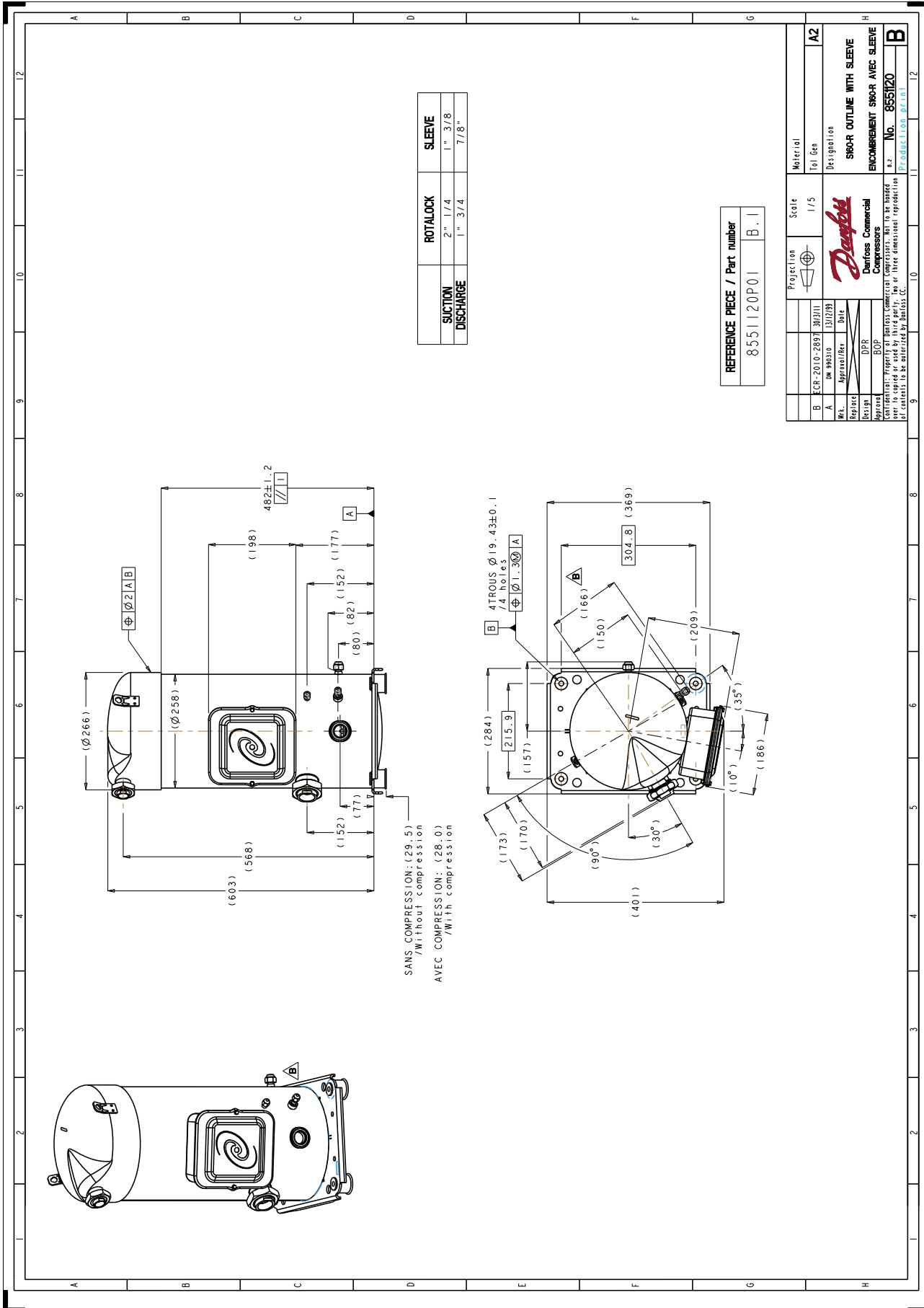
to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

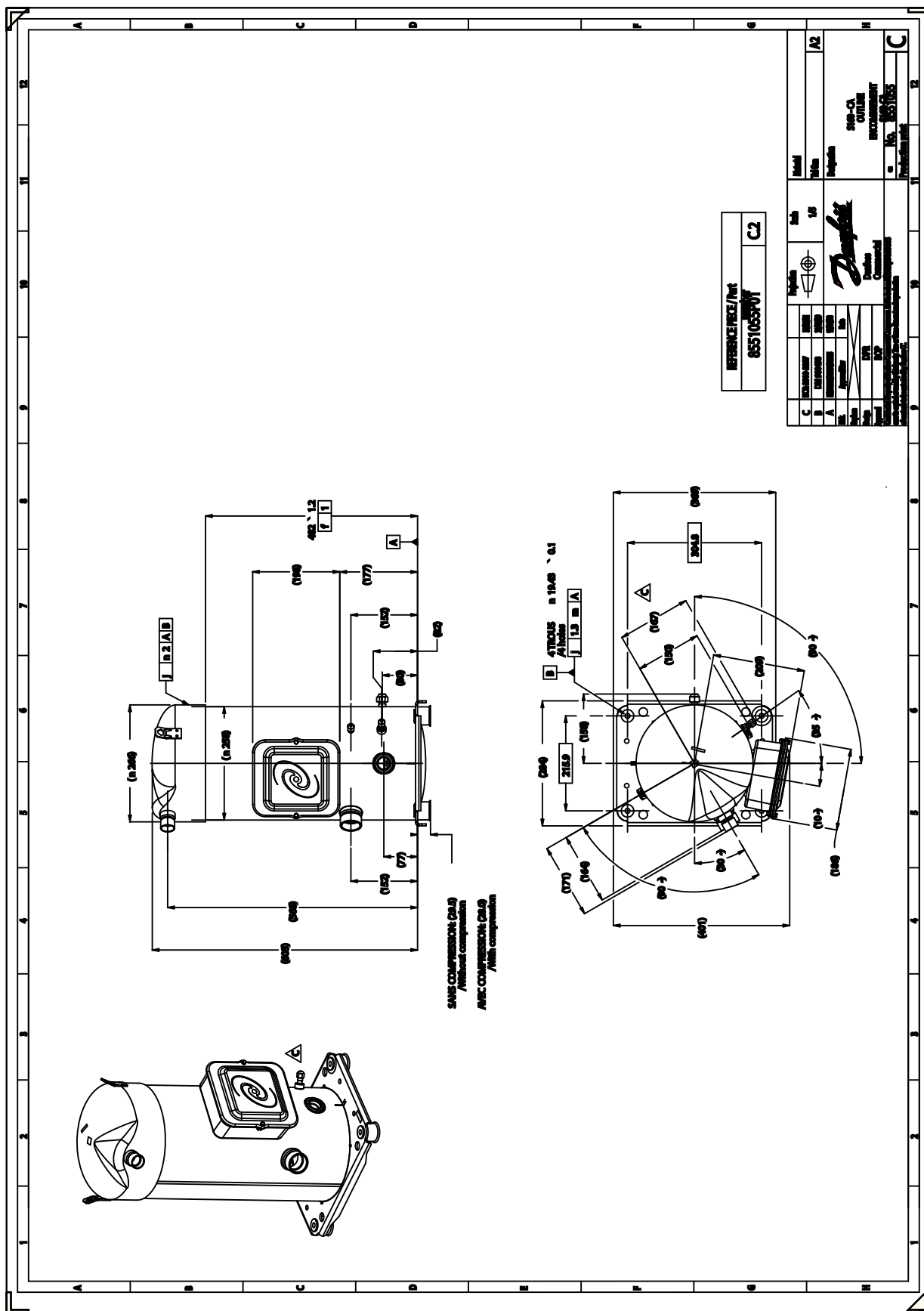
Rating conditions : Superheat = 11.1 K , Subcooling = 8.3 K

All performance data +/- 5%

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