

Datasheets

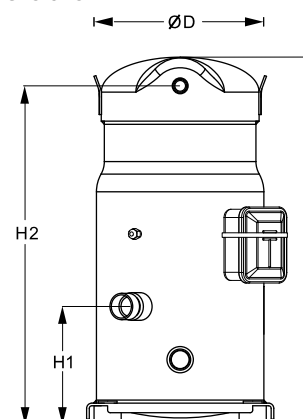
Danfoss scroll compressors **SM / SY / SZ / SH / WSH**



General Characteristics

| | | |
|---|--|---|
| Model number (on compressor nameplate) | | SM120S4VC |
| Code number for Singlepack* | | SM120-4V1 |
| Code number for Industrial pack** | | SM120-4VM |
| 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 | | 166,6 cm ³ /rev |
| Displacement @ Nominal speed | | 29.0 m ³ /h @ 2900 rpm - 35.0 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

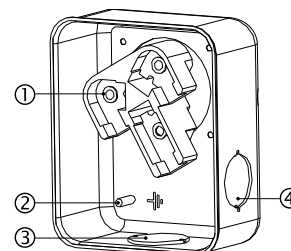


D=254 mm
H=558 mm
H1=178,4 mm
H2=514,5 mm
H3=- mm

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) | 20.7 A |
| Maximum Continuous Current (MCC) | 29 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 |

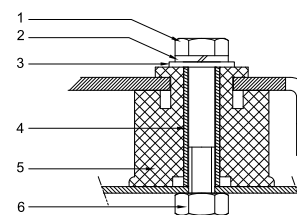
| Rotolock accessories, sets | Code no. |
|--|-----------------|
| Solder sleeve adapter set (1-3/4" Rotolock, 1-3/8" ODF), (1-1/4" Rotolock, 7/8" ODF) | 120Z0405 |
| Valve set, V10 (1-3/4"~1-3/8"), V05 (1-1/4"~7/8") | 7703392 |
| Gasket set, 1-1/4", 1-3/4", 2-1/4", OSG gaskets black & white | 8156013 |

| 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 25 C | 7705007 |
| 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 | 11 897 | 15 100 | 18 788 | 22 999 | 27 769 | 33 135 | 39 132 | 45 798 | - |
| 35 | 11 123 | 14 251 | 17 844 | 21 939 | 26 573 | 31 782 | 37 603 | 44 072 | - |
| 40 | 10 337 | 13 375 | 16 860 | 20 826 | 25 311 | 30 351 | 35 982 | 42 240 | - |
| 45 | - | 12 474 | 15 837 | 19 662 | 23 984 | 28 842 | 34 269 | 40 304 | - |
| 50 | - | - | 14 776 | 18 445 | 22 592 | 27 253 | 32 464 | 38 261 | - |
| 55 | - | - | - | 17 177 | 21 135 | 25 586 | 30 566 | 36 111 | - |
| 60 | - | - | - | - | 19 612 | 23 839 | 28 574 | 33 853 | - |
| 65 | - | - | - | - | 18 022 | 22 011 | 26 486 | 31 484 | - |

Power input in W

| | | | | | | | | | |
|----|-------|-------|-------|-------|--------|--------|--------|--------|---|
| 30 | 5 371 | 5 364 | 5 359 | 5 356 | 5 354 | 5 354 | 5 356 | 5 358 | - |
| 35 | 5 981 | 5 970 | 5 959 | 5 949 | 5 940 | 5 931 | 5 922 | 5 913 | - |
| 40 | 6 672 | 6 656 | 6 639 | 6 622 | 6 604 | 6 585 | 6 566 | 6 545 | - |
| 45 | - | 7 432 | 7 408 | 7 383 | 7 356 | 7 326 | 7 295 | 7 261 | - |
| 50 | - | - | 8 274 | 8 240 | 8 202 | 8 161 | 8 117 | 8 070 | - |
| 55 | - | - | - | 9 201 | 9 152 | 9 100 | 9 042 | 8 980 | - |
| 60 | - | - | - | - | 10 214 | 10 149 | 10 077 | 10 000 | - |
| 65 | - | - | - | - | 11 396 | 11 317 | 11 230 | 11 137 | - |

Current consumption in A

| | | | | | | | | | |
|----|-------|-------|-------|-------|-------|-------|-------|-------|---|
| 30 | 12.34 | 12.33 | 12.32 | 12.31 | 12.29 | 12.26 | 12.23 | 12.19 | - |
| 35 | 12.94 | 12.93 | 12.92 | 12.90 | 12.87 | 12.84 | 12.80 | 12.75 | - |
| 40 | 13.67 | 13.65 | 13.63 | 13.61 | 13.58 | 13.54 | 13.49 | 13.44 | - |
| 45 | - | 14.51 | 14.49 | 14.46 | 14.42 | 14.38 | 14.33 | 14.26 | - |
| 50 | - | - | 15.50 | 15.47 | 15.42 | 15.37 | 15.31 | 15.24 | - |
| 55 | - | - | - | 16.64 | 16.59 | 16.53 | 16.46 | 16.38 | - |
| 60 | - | - | - | - | 17.95 | 17.88 | 17.80 | 17.70 | - |
| 65 | - | - | - | - | 19.50 | 19.42 | 19.33 | 19.23 | - |

Mass flow in kg/h

| | | | | | | | | | |
|----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| 30 | 256 | 321 | 394 | 476 | 568 | 670 | 783 | 908 | - |
| 35 | 249 | 315 | 389 | 472 | 564 | 667 | 781 | 906 | - |
| 40 | 241 | 308 | 383 | 466 | 559 | 663 | 777 | 902 | - |
| 45 | - | 300 | 375 | 459 | 553 | 657 | 771 | 897 | - |
| 50 | - | - | 367 | 451 | 545 | 649 | 763 | 889 | - |
| 55 | - | - | - | 441 | 535 | 639 | 753 | 878 | - |
| 60 | - | - | - | - | 523 | 627 | 741 | 866 | - |
| 65 | - | - | - | - | 510 | 613 | 726 | 851 | - |

Coefficient of performance (C.O.P.)

| | | | | | | | | | |
|----|------|------|------|------|------|------|------|------|---|
| 30 | 2.21 | 2.81 | 3.51 | 4.29 | 5.19 | 6.19 | 7.31 | 8.55 | - |
| 35 | 1.86 | 2.39 | 2.99 | 3.69 | 4.47 | 5.36 | 6.35 | 7.45 | - |
| 40 | 1.55 | 2.01 | 2.54 | 3.14 | 3.83 | 4.61 | 5.48 | 6.45 | - |
| 45 | - | 1.68 | 2.14 | 2.66 | 3.26 | 3.94 | 4.70 | 5.55 | - |
| 50 | - | - | 1.79 | 2.24 | 2.75 | 3.34 | 4.00 | 4.74 | - |
| 55 | - | - | - | 1.87 | 2.31 | 2.81 | 3.38 | 4.02 | - |
| 60 | - | - | - | - | 1.92 | 2.35 | 2.84 | 3.39 | - |
| 65 | - | - | - | - | 1.58 | 1.94 | 2.36 | 2.83 | - |

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

| | | |
|---------------------|--------|------|
| Cooling capacity | 27 253 | W |
| Power input | 8 161 | W |
| Current consumption | 15.37 | A |
| Mass flow | 649 | 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 | 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 | 12 625 | 16 011 | 19 907 | 24 351 | 29 381 | 35 034 | 41 348 | 48 361 | - |
| 35 | 11 845 | 15 163 | 18 970 | 23 305 | 28 206 | 33 711 | 39 857 | 46 681 | - |
| 40 | 11 051 | 14 286 | 17 992 | 22 205 | 26 965 | 32 308 | 38 272 | 44 896 | - |
| 45 | - | 13 382 | 16 973 | 21 052 | 25 657 | 30 825 | 36 595 | 43 004 | - |
| 50 | - | - | 15 914 | 19 845 | 24 282 | 29 263 | 34 826 | 41 008 | - |
| 55 | - | - | - | 18 585 | 22 841 | 27 622 | 32 964 | 38 906 | - |
| 60 | - | - | - | - | 21 335 | 25 902 | 31 010 | 36 699 | - |
| 65 | - | - | - | - | 19 762 | 24 103 | 28 965 | 34 387 | - |

Power input in W

| | | | | | | | | | |
|----|-------|-------|-------|-------|--------|--------|--------|--------|---|
| 30 | 5 371 | 5 364 | 5 359 | 5 356 | 5 354 | 5 354 | 5 356 | 5 358 | - |
| 35 | 5 981 | 5 970 | 5 959 | 5 949 | 5 940 | 5 931 | 5 922 | 5 913 | - |
| 40 | 6 672 | 6 656 | 6 639 | 6 622 | 6 604 | 6 585 | 6 566 | 6 545 | - |
| 45 | - | 7 432 | 7 408 | 7 383 | 7 356 | 7 326 | 7 295 | 7 261 | - |
| 50 | - | - | 8 274 | 8 240 | 8 202 | 8 161 | 8 117 | 8 070 | - |
| 55 | - | - | - | 9 201 | 9 152 | 9 100 | 9 042 | 8 980 | - |
| 60 | - | - | - | - | 10 214 | 10 149 | 10 077 | 10 000 | - |
| 65 | - | - | - | - | 11 396 | 11 317 | 11 230 | 11 137 | - |

Current consumption in A

| | | | | | | | | | |
|----|-------|-------|-------|-------|-------|-------|-------|-------|---|
| 30 | 12.34 | 12.33 | 12.32 | 12.31 | 12.29 | 12.26 | 12.23 | 12.19 | - |
| 35 | 12.94 | 12.93 | 12.92 | 12.90 | 12.87 | 12.84 | 12.80 | 12.75 | - |
| 40 | 13.67 | 13.65 | 13.63 | 13.61 | 13.58 | 13.54 | 13.49 | 13.44 | - |
| 45 | - | 14.51 | 14.49 | 14.46 | 14.42 | 14.38 | 14.33 | 14.26 | - |
| 50 | - | - | 15.50 | 15.47 | 15.42 | 15.37 | 15.31 | 15.24 | - |
| 55 | - | - | - | 16.64 | 16.59 | 16.53 | 16.46 | 16.38 | - |
| 60 | - | - | - | - | 17.95 | 17.88 | 17.80 | 17.70 | - |
| 65 | - | - | - | - | 19.50 | 19.42 | 19.33 | 19.23 | - |

Mass flow in kg/h

| | | | | | | | | | |
|----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| 30 | 255 | 319 | 392 | 474 | 565 | 666 | 779 | 902 | - |
| 35 | 248 | 313 | 387 | 469 | 561 | 663 | 776 | 901 | - |
| 40 | 240 | 306 | 381 | 464 | 556 | 659 | 772 | 897 | - |
| 45 | - | 298 | 373 | 457 | 550 | 653 | 767 | 891 | - |
| 50 | - | - | 365 | 449 | 542 | 645 | 759 | 883 | - |
| 55 | - | - | - | 439 | 532 | 635 | 749 | 873 | - |
| 60 | - | - | - | - | 520 | 623 | 737 | 861 | - |
| 65 | - | - | - | - | 507 | 609 | 722 | 846 | - |

Coefficient of performance (C.O.P.)

| | | | | | | | | | |
|----|------|------|------|------|------|------|------|------|---|
| 30 | 2.35 | 2.98 | 3.71 | 4.55 | 5.49 | 6.54 | 7.72 | 9.03 | - |
| 35 | 1.98 | 2.54 | 3.18 | 3.92 | 4.75 | 5.68 | 6.73 | 7.89 | - |
| 40 | 1.66 | 2.15 | 2.71 | 3.35 | 4.08 | 4.91 | 5.83 | 6.86 | - |
| 45 | - | 1.80 | 2.29 | 2.85 | 3.49 | 4.21 | 5.02 | 5.92 | - |
| 50 | - | - | 1.92 | 2.41 | 2.96 | 3.59 | 4.29 | 5.08 | - |
| 55 | - | - | - | 2.02 | 2.50 | 3.04 | 3.65 | 4.33 | - |
| 60 | - | - | - | - | 2.09 | 2.55 | 3.08 | 3.67 | - |
| 65 | - | - | - | - | 1.73 | 2.13 | 2.58 | 3.09 | - |

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

| | | |
|---------------------|--------|------|
| Cooling capacity | 30 114 | W |
| Power input | 8 957 | W |
| Current consumption | 16.36 | A |
| Mass flow | 685 | kg/h |
| C.O.P. | 3.36 | |

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) |

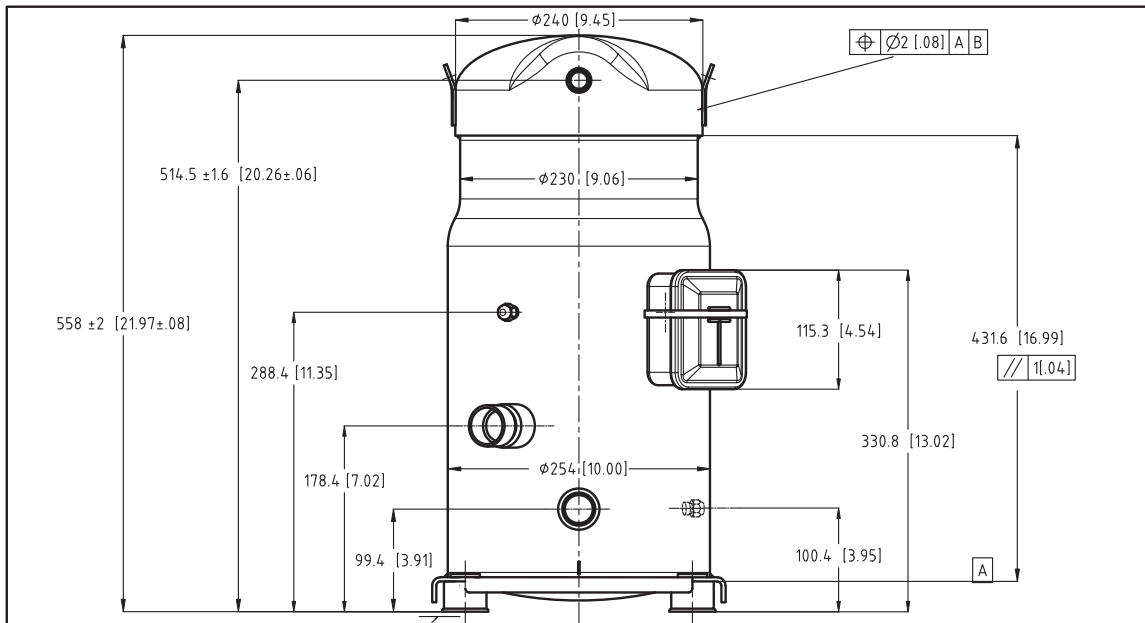
to: Evaporating temperature at dew point

tc: Condensing temperature at dew point

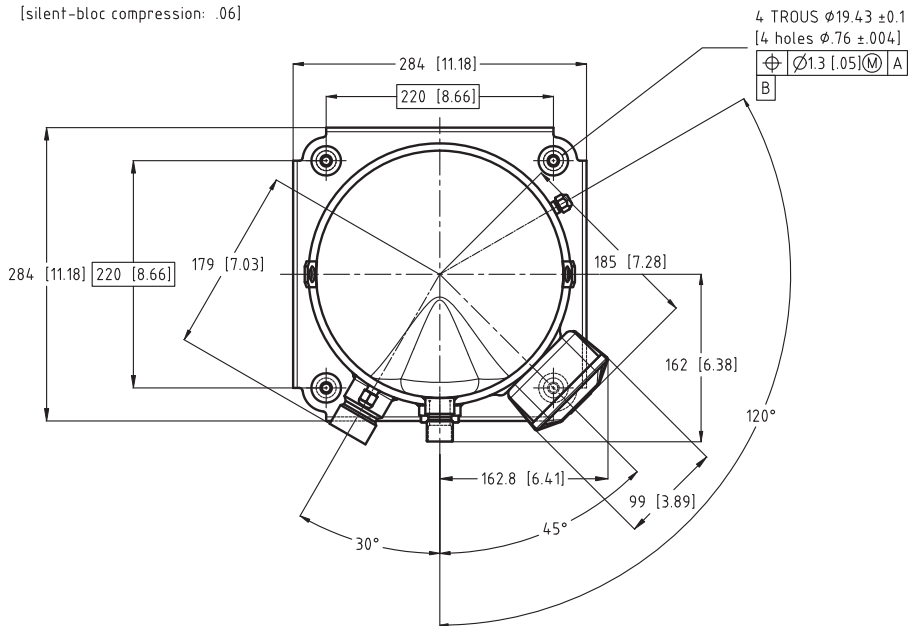
Rating conditions : Superheat = 11.1 K , Subcooling = 8.3 K

All performance data +/- 5%

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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 | OBSERVATIONS |
| MATERIE: | | | | | |
| Ech: | 1/4 | Tol.gén.: | ± 0.8 [± .03] ± 2° | | |
| ENCOMBREMENT S110/120 - V | | | | | |
| S110/120 - V OUTLINE | | | | | |
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