

**SIERRA03-0982U3
R290
24/48 V DC
VARIABLE SPEED**



Brushless DC Variable Speed Compressor Technical Data Sheet

General Information

Compressor Part Number	SIERRA00227	1/2" ID Suction - 5/16" ID Discharge
Compressor Drawing	DCMX33-002	#10-32 Threaded Terminal Connections
Compressor Part Number	SIERRA00139	1/2" ID Suction - 5/16" ID Discharge
Compressor Drawing	DCMX33-002	M5 Threaded Terminal Connections
Compressor Part Number with Fittings	SIERRA00226	#10 MIO Suction - #8 MIO Discharge
Compressor Drawing with Fittings	DCMX27-002	#10-32 Threaded Terminal Connections
Compressor Part Number with Fittings	SIERRA00142	#10 MIO Suction - #8 MIO Discharge
Compressor Drawing with Fittings	DCMX27-002	M5 Threaded Terminal Connections
Dual Compressor Part Number w/ Fittings	SIERRA00228	#10 MIO Suction - #8 MIO Discharge
Dual Compressor Drawing w/ Fittings	DCMX34-002	#10-32 Threaded Terminal Connections
Dual Compressor Part Number w/ Fittings	SIERRA00140	#10 MIO Suction - #8 MIO Discharge
Dual Compressor Drawing w/ Fittings	DCMX34-002	M5 Threaded Terminal Connections
Controller Options (24/48V)	025F0149, 025F0129	
Controller Options (48V)	025F0158, 025F0152	
Wiring Diagram Drawing	DEMXX0010	
Dual Comp. Controller Options (24/48V)	025F0216	
Dual Comp. Wiring Diagram Drawing	DEMXX0023	

Application Information

Application	HBP, A/C
Refrigerant	R290
Evaporator Temperature Range	-23.3°C to 12.8°C (-10°F to 55°F)
Condenser Temperature Range	26.7°C to 65.6°C (80°F to 150°F)
Maximum Discharge Temperature	130 °C (265 °F)
Maximum Compression Ratio	8:1
Minimum Airflow Over Compressor	425 cfm @ 6" from Outside Diameter of Housing

Design

Displacement	16.1 cm ³ (0.982 in ³)
Oil Quantity	290 cc
Dual Compressor Oil Quantity	390 cc
Oil Type	PVE 68cSt
Compressor Weight	6.4 kg / 14.1 lb
Compressor Weight with Fittings	6.6 kg / 14.5 lb
Dual Compressor Weight with Fittings	6.8 kg / 14.9 lb



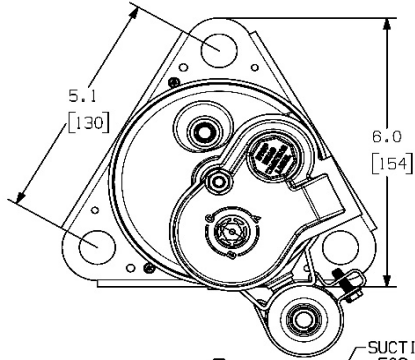
Packaging Options

- Single Pack (add -SP suffix to part number when ordering)
- Pallet Pack (25 piece multiples)

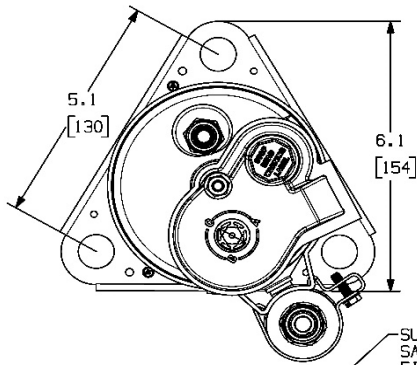
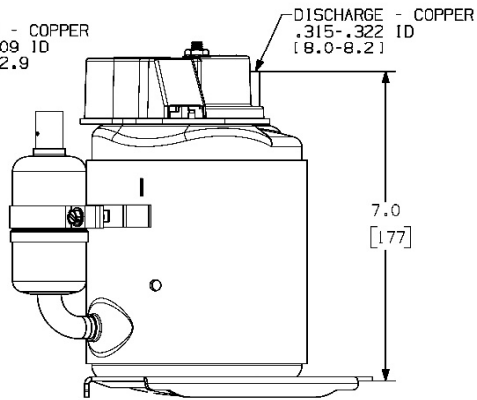
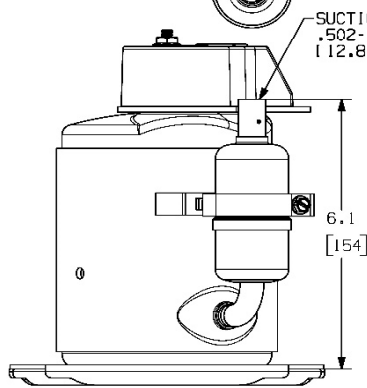
SIERRA03-0982U3



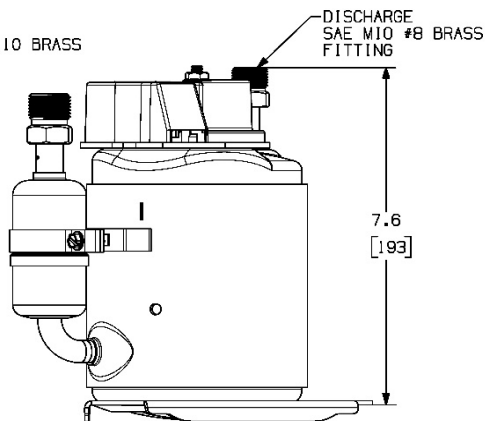
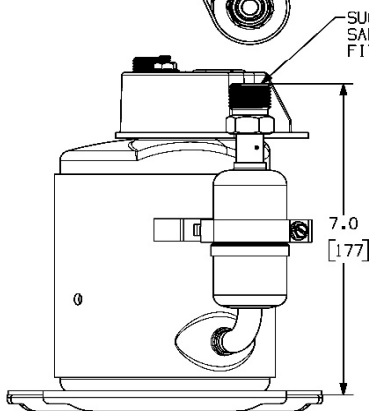
Compressor Dimensions



SIERRA00227
SIERRA00139



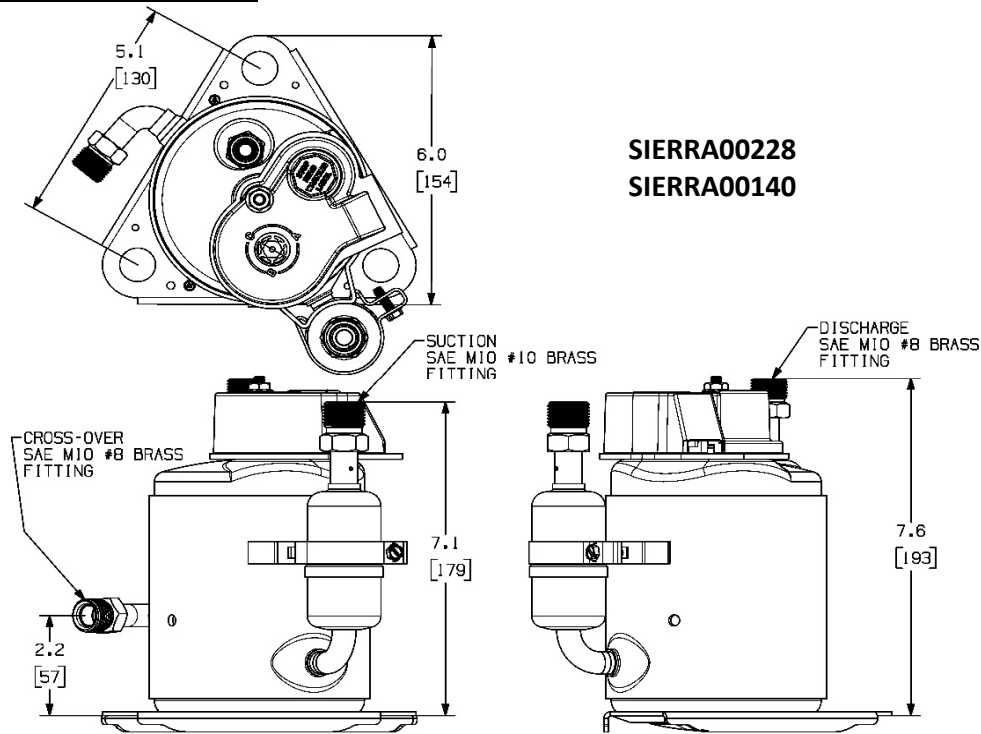
SIERRA00226
SIERRA00142



SIERRA03-0982U3

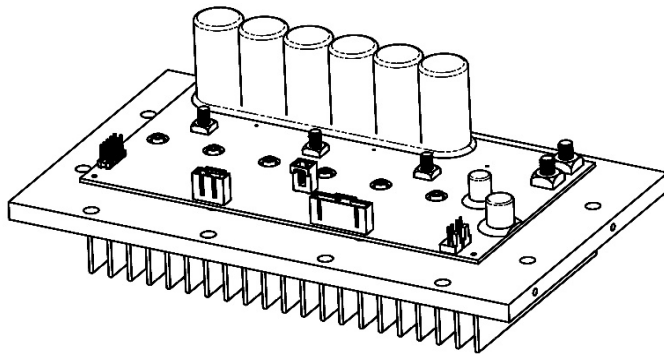


Compressor Dimensions

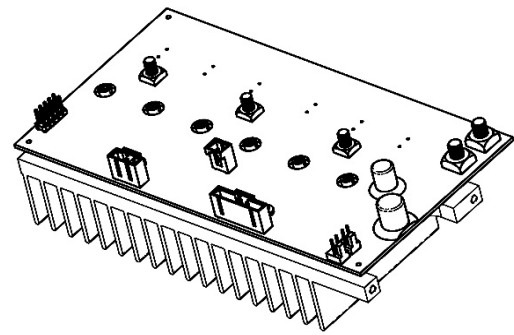


Controller Configurations

Custom controllers and configurations available



025F0149,
025F0158, &



025F0129 &
025F0152

Cooling Capacity (24V) - ARI HBP **BTU/hr (Watt)**

RPM	Evaporator Temperature													
	-10°F (-23°C)	10°F (-12°C)	20°F (-7°C)	30°F (-1°C)	40°F (4°C)	45°F (7°C)	55°F (13°C)							
1800	1371 (402)	2563 (751)	3027 (887)	3573 (1046)	4328 (1268)	4824 (1413)	6133 (1796)							
2400	2160 (633)	3702 (1084)	4409 (1291)	5243 (1535)	6332 (1854)	7011 (2053)	8721 (2554)							
3000	2753 (806)	4647 (1361)	5598 (1639)	6721 (1969)	8145 (2385)	9009 (2639)	11122 (3257)							
3600	3203 (938)	5452 (1597)	6648 (1947)	8063 (2361)	9822 (2877)	10872 (3184)	13388 (3921)							
4200	3564 (1044)	6171 (1807)	7614 (2230)	9320 (2730)	11417 (3344)	12652 (3706)	15575 (4561)							

Power Consumption (24V) - ARI HBP **Watt** **Current (24V) - ARI HBP** **Amp**

RPM	Evaporator Temperature							Evaporator Temperature						
	-10°F	10°F	20°F	30°F	40°F	45°F	55°F	-10°F	10°F	20°F	30°F	40°F	45°F	55°F
1800	266	350	409	458	481	478	432	11.08	14.58	17.04	19.08	20.05	19.92	18.01
2400	392	445	498	548	578	581	553	16.31	18.52	20.74	22.82	24.09	24.22	23.04
3000	514	542	592	646	687	698	689	21.43	22.59	24.69	26.92	28.62	29.07	28.73
3600	637	645	696	756	810	830	845	26.55	26.89	28.99	31.50	33.76	34.58	35.20
4200	763	757	810	880	950	981	1022	31.77	31.54	33.77	36.68	39.60	40.86	42.56

Efficiency (24V) - ARI HBP **BTU/hr/W (W/W)**

RPM	Evaporator Temperature													
	-10°F (-23°C)	10°F (-12°C)	20°F (-7°C)	30°F (-1°C)	40°F (4°C)	45°F (7°C)	55°F (13°C)							
1800	5.16 (1.51)	7.32 (2.14)	7.40 (2.17)	7.80 (2.28)	9.00 (2.63)	10.09 (2.96)	14.19 (4.15)							
2400	5.52 (1.62)	8.33 (2.44)	8.86 (2.59)	9.57 (2.80)	10.95 (3.21)	12.06 (3.53)	15.77 (4.62)							
3000	5.35 (1.57)	8.57 (2.51)	9.45 (2.77)	10.40 (3.05)	11.86 (3.47)	12.91 (3.78)	16.13 (4.72)							
3600	5.03 (1.47)	8.45 (2.47)	9.56 (2.80)	10.66 (3.12)	12.12 (3.55)	13.10 (3.84)	15.85 (4.64)							
4200	4.67 (1.37)	8.15 (2.39)	9.40 (2.75)	10.59 (3.10)	12.01 (3.52)	12.90 (3.78)	15.25 (4.46)							

* all points are at 35°C (95°F) ambient temperature, 18.33°C (65°F) suction, 8.33°C (15°F) subcooling, 54.4°C (130°F) condenser

* dual compressor performance values are approximately 2x capacity, power and current.

Performance Coefficients - ARI HBP

Coefficient	Capacity (BTU/Hr)	Power (Watts)	Current (Amperes)	Mass Flow (Lbs/Hr)
C1	-1.857657E+04	-2.109048E+03	-8.787699E+01	-1.053971E+02
C2	3.826262E+00	5.472012E-01	2.280005E-02	1.448823E-02
C3	-3.973870E-04	-3.514298E-05	-1.464291E-06	-1.464068E-06
C4	4.154225E-08	2.098940E-09	8.745585E-11	1.294436E-10
C5	3.339921E+02	1.507744E+01	6.282267E-01	6.642301E-01
C6	-9.421025E-01	8.413920E-01	3.505800E-02	3.899409E-03
C7	2.124886E-02	-2.656036E-03	-1.106682E-04	6.155782E-05
C8	4.199943E+02	3.346962E+01	1.394568E+00	2.468056E+00
C9	-3.322875E+00	-1.143886E-01	-4.766193E-03	-1.989500E-02
C10	8.034655E-03	-1.634166E-04	-6.809027E-06	5.097061E-05
C11	1.989645E-03	1.761075E-05	7.337811E-07	7.428959E-06
C12	4.320982E-08	5.697951E-09	2.374146E-10	2.190159E-10
C13	-2.644517E-07	2.014622E-06	8.394258E-08	1.350406E-08
C14	-1.022479E-05	-6.111192E-07	-2.546330E-08	-3.756148E-08
C15	-5.752029E-02	3.751804E-03	1.563252E-04	-1.418897E-04
C16	-1.355133E-02	-6.435439E-03	-2.681433E-04	-3.964275E-05
C17	-5.851299E+00	-5.796071E-01	-2.415030E-02	-1.493345E-02
C18	-5.428564E-06	-3.380641E-07	-1.408600E-08	-2.937029E-08
C19	4.121035E-04	-2.071562E-04	-8.631507E-06	6.809793E-07
C20	-1.330765E-06	1.549765E-07	6.457355E-09	-1.590765E-09
C21	7.970877E-05	2.973154E-05	1.238814E-06	2.186231E-07
C22	-4.637345E-03	-6.388004E-03	-2.661668E-04	-5.742627E-05
C23	2.559388E-02	4.210467E-03	1.754361E-04	7.324969E-05

Performance Equation

$$Y = C_1 + C_2 X_1 + C_3 X_1^2 + C_4 X_1^3 + C_5 X_2 + C_6 X_2^2 + C_7 X_2^3 + C_8 X_3 + C_9 X_3^2 + C_{10} X_3^3 + C_{11} X_1 X_2 X_3 + C_{12} X_1^2 X_2 X_3 + C_{13} X_1 X_2^2 X_3 + C_{14} X_1 X_2 X_3^2 + C_{15} X_1 X_2^2 X_3 + C_{16} X_1 X_3 + C_{17} X_2 X_3 + C_{18} X_1^2 X_2 + C_{19} X_1 X_2^2 + C_{20} X_1^2 X_3 + C_{21} X_1 X_3^2 + C_{22} X_2^2 X_3 + C_{23} X_2 X_3^2$$

X₁ = RPM
 X₂ = E_t (°F)
 X₃ = C_t (°F)

Cooling Capacity (48V) - ARI HBP **BTU/hr (Watt)**

RPM	Evaporator Temperature												
	-10°F (-23°C)	10°F (-12°C)	20°F (-7°C)	30°F (-1°C)	40°F (4°C)	45°F (7°C)	55°F (13°C)						
3600	3203 (938)	5452 (1597)	6648 (1947)	8063 (2361)	9822 (2877)	10872 (3184)	13388 (3921)						
4500	3728 (1092)	6515 (1908)	8082 (2367)	9935 (2910)	12201 (3573)	13529 (3962)	16655 (4878)						
5500	4298 (1259)	7688 (2252)	9671 (2832)	12015 (3519)	14848 (4349)	16488 (4829)	20293 (5943)						
6500	5093 (1492)	9096 (2664)	11498 (3367)	14337 (4199)	17740 (5196)	19694 (5768)	24183 (7083)						

Power Consumption (48V) - ARI HBP **Watt** **Current (48V) - ARI HBP** **Amp**

RPM	Evaporator Temperature							Evaporator Temperature						
	-10°F	10°F	20°F	30°F	40°F	45°F	55°F	-10°F	10°F	20°F	30°F	40°F	45°F	55°F
3600	658	666	719	781	837	857	872	13.71	13.88	14.97	16.27	17.43	17.85	18.17
4500	854	843	901	979	1061	1099	1155	17.79	17.57	18.78	20.41	22.11	22.89	24.07
5500	1091	1075	1147	1251	1369	1429	1540	22.72	22.39	23.89	26.05	28.53	29.78	32.08
6500	1360	1355	1450	1587	1751	1838	2011	28.32	28.22	30.20	33.07	36.48	38.29	41.89

Efficiency (48V) - ARI HBP **BTU/hr/W (W/W)**

RPM	Evaporator Temperature												
	-10°F (-23°C)	10°F (-12°C)	20°F (-7°C)	30°F (-1°C)	40°F (4°C)	45°F (7°C)	55°F (13°C)						
3600	4.87 (1.43)	8.18 (2.40)	9.25 (2.71)	10.33 (3.02)	11.74 (3.44)	12.69 (3.71)	15.35 (4.49)						
4500	4.37 (1.28)	7.72 (2.26)	8.97 (2.63)	10.14 (2.97)	11.50 (3.37)	12.31 (3.61)	14.42 (4.22)						
5500	3.94 (1.15)	7.15 (2.09)	8.43 (2.47)	9.61 (2.81)	10.84 (3.17)	11.54 (3.38)	13.18 (3.86)						
6500	3.75 (1.10)	6.71 (1.97)	7.93 (2.32)	9.03 (2.64)	10.13 (2.97)	10.72 (3.14)	12.03 (3.52)						

* all points are at 35°C (95°F) ambient temperature, 18.33°C (65°F) suction, 8.33°C (15°F) subcooling, 54.4°C (130°F) condenser
 * dual compressor performance values are approximately 2x capacity, power and current.

Performance Coefficients - ARI HBP

Coefficient	Capacity (BTU/Hr)	Power (Watts)	Current (Amperes)	Mass Flow (Lbs/Hr)
C1	-1.857657E+04	-2.177957E+03	-4.537410E+01	-1.053971E+02
C2	3.826262E+00	5.650800E-01	1.177250E-02	1.448823E-02
C3	-3.973870E-04	-3.629121E-05	-7.560670E-07	-1.464068E-06
C4	4.154225E-08	2.167519E-09	4.515665E-11	1.294436E-10
C5	3.339921E+02	1.557007E+01	3.243764E-01	6.642301E-01
C6	-9.421025E-01	8.688829E-01	1.810173E-02	3.899409E-03
C7	2.124886E-02	-2.742817E-03	-5.714202E-05	6.155782E-05
C8	4.199943E+02	3.456318E+01	7.200663E-01	2.468056E+00
C9	-3.322875E+00	-1.181261E-01	-2.460960E-03	-1.989500E-02
C10	8.034655E-03	-1.687560E-04	-3.515750E-06	5.097061E-05
C11	1.989645E-03	1.818614E-05	3.788780E-07	7.428959E-06
C12	4.320982E-08	5.884121E-09	1.225859E-10	2.190159E-10
C13	-2.644517E-07	2.080446E-06	4.334262E-08	1.350406E-08
C14	-1.022479E-05	-6.310864E-07	-1.314763E-08	-3.756148E-08
C15	-5.752029E-02	3.874388E-03	8.071641E-05	-1.418897E-04
C16	-1.355133E-02	-6.645705E-03	-1.384522E-04	-3.964275E-05
C17	-5.851299E+00	-5.985447E-01	-1.246968E-02	-1.493345E-02
C18	-5.428564E-06	-3.491097E-07	-7.273119E-09	-2.937029E-08
C19	4.121035E-04	-2.139246E-04	-4.456763E-06	6.809793E-07
C20	-1.330765E-06	1.600401E-07	3.334169E-09	-1.590765E-09
C21	7.970877E-05	3.070297E-05	6.396451E-07	2.186231E-07
C22	-4.637345E-03	-6.596720E-03	-1.374317E-04	-5.742627E-05
C23	2.559388E-02	4.348036E-03	9.058409E-05	7.324969E-05

Performance Equation

$$Y = C_1 + C_2 X_1 + C_3 X_1^2 + C_4 X_1^3 + C_5 X_2 + C_6 X_2^2 + C_7 X_2^3 + C_8 X_3 + C_9 X_3^2 + C_{10} X_3^3 + C_{11} X_1 X_2 X_3 + C_{12} X_1^2 X_2 X_3 + C_{13} X_1 X_2^2 X_3 + C_{14} X_1 X_2 X_3^2 + C_{15} X_1^2 X_2 X_3 + C_{16} X_1 X_2^2 X_3 + C_{17} X_1 X_2 X_3^2 + C_{18} X_1^2 X_2^2 X_3 + C_{19} X_1 X_2^2 X_3^2 + C_{20} X_1^2 X_3 + C_{21} X_1 X_3^2 + C_{22} X_2^2 X_3 + C_{23} X_2 X_3^2$$

X₁ = RPM
 X₂ = E_t (°F)
 X₃ = C_t (°F)