

SIERRA04-0434H3
R1234yf
48/100 V DC
VARIABLE SPEED



Brushless DC Variable Speed Compressor Technical Data Sheet

General Information

Compressor Part Number	SIERRA00127	3/8" Suction - 5/16" Discharge
Compressor Drawing with Fittings	DCMX33-001	#10-32 Threaded Terminal Connections
Compressor Part Number with Fittings	SIERRA00178	#10 MIO Suction - #8 MIO Discharge
Compressor Drawing with Fittings	DCMX27-001	#10-32 Threaded Terminal Connections
Controller Options (37-60V)	025F0158, 025F0152	
Controller Options (60-97V)	025F0139, 025F0164	
Controller Options (55-110V)	025F0140-04	
Controller Options (75-125V)	025F0140-05	
Controller Options (70-145V)	025F0140-07	
Wiring Diagram	See controller section on website	

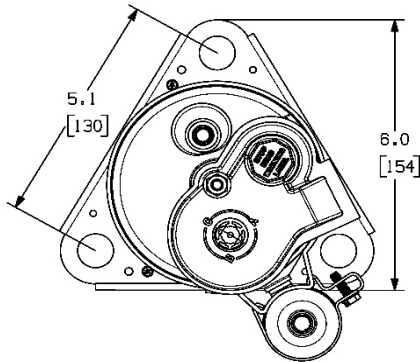
Application Information

Application	HBP, A/C
Refrigerant	R1234yf
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

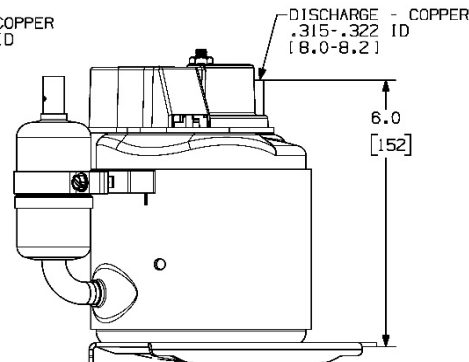
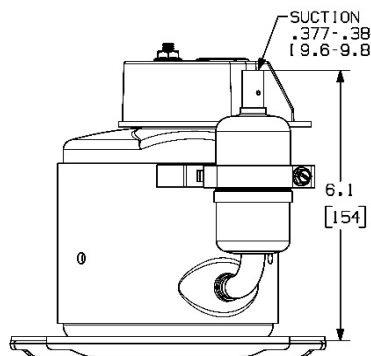
Displacement	7.1 cm ³ (0.434 in ³)
Oil Quantity	290 cc
Oil Type	PVE 68cSt
Weight	4.8 kg / 10.5 lb
Weight with Fittings	5.1 kg / 10.8 lb

Compressor Dimensions - SIERRA00127



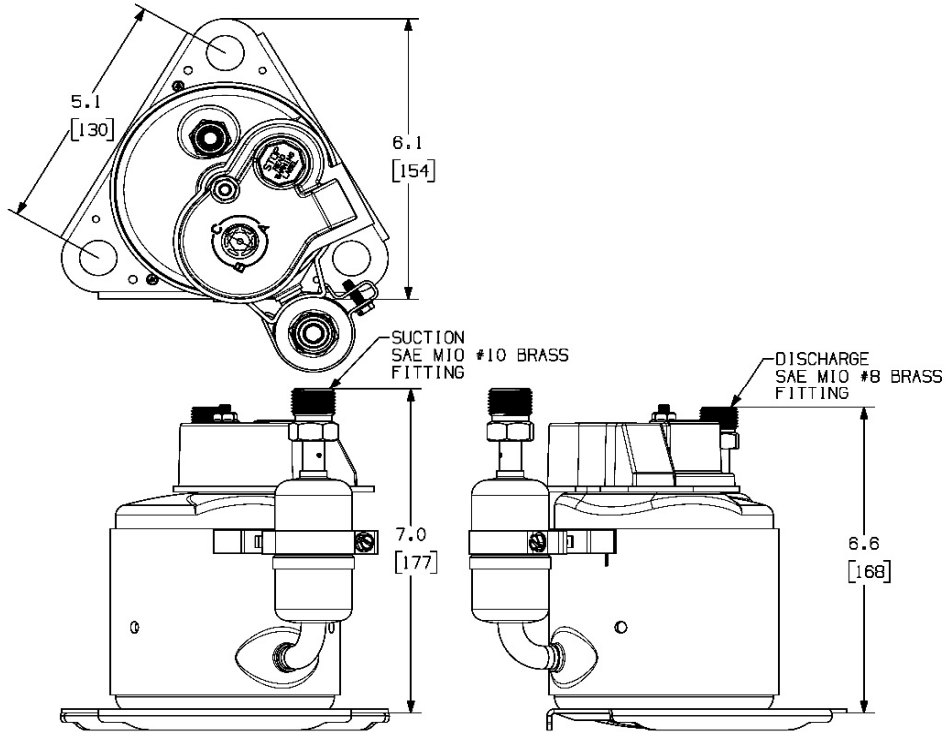
Packaging Options

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



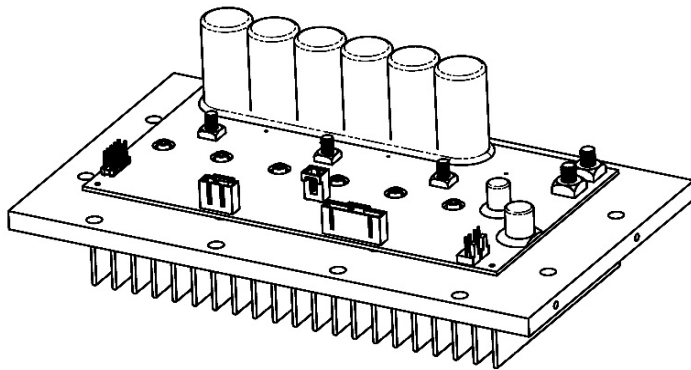
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Compressor Dimensions - SIERRA00178

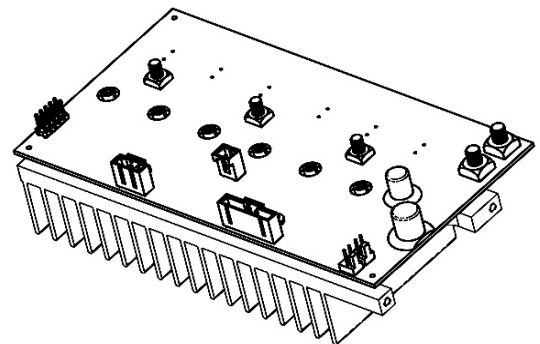


Controller Configurations (37-60V DC)

Custom controllers and configurations available



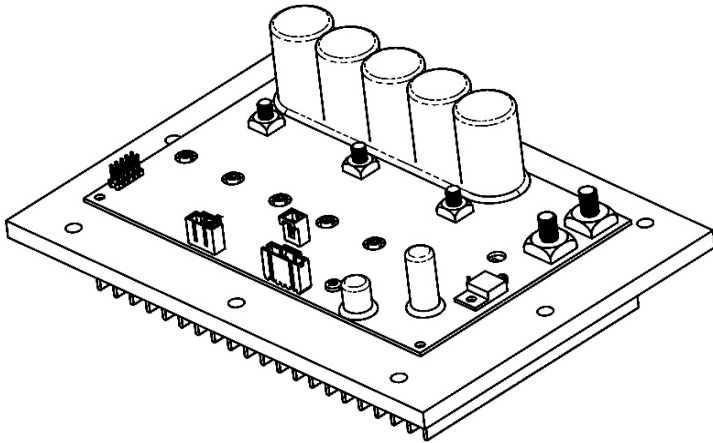
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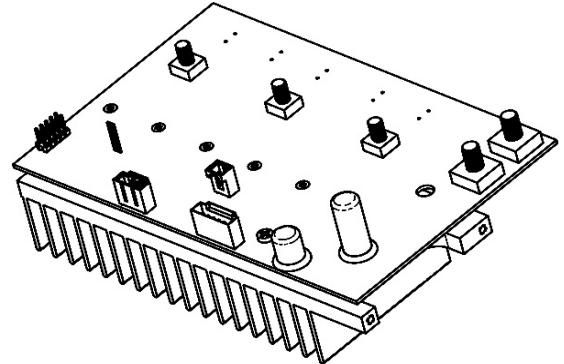
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Controller Configurations (60-97 V)

Custom controllers and configurations available



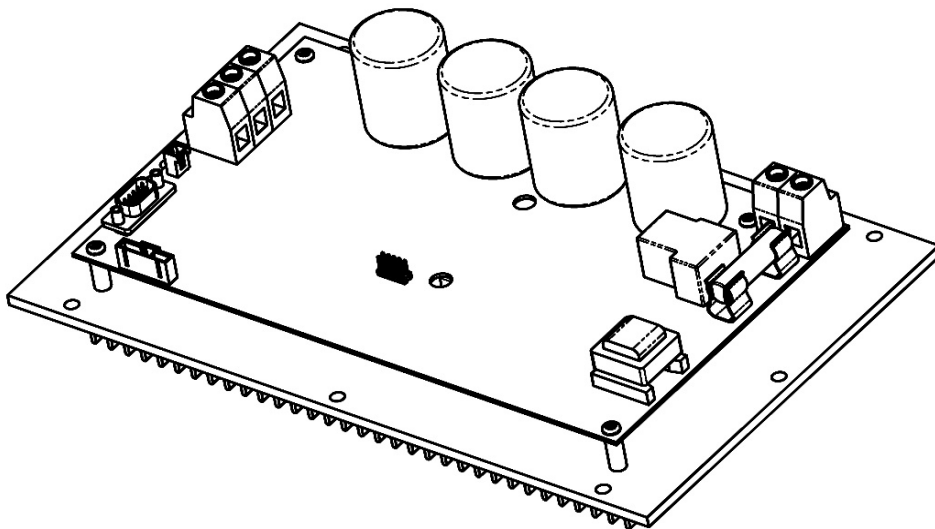
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025F0139

Controller Configurations (55-110V, 75-125V, & 70-145V)

Custom controllers and configurations available



025F0140-04,
025F0140-05,
& 025F0140-07

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)
1800	522	(153)	916	(268)	1063	(311)	1229	(360)	1456	(426)	1605	(470)	1999	(585)
2400	812	(238)	1320	(387)	1542	(452)	1797	(526)	2125	(622)	2329	(682)	2843	(833)
3000	1036	(303)	1659	(486)	1958	(574)	2302	(674)	2733	(800)	2992	(876)	3627	(1062)
3600	1211	(355)	1952	(572)	2328	(682)	2763	(809)	3296	(965)	3612	(1058)	4368	(1279)

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
1800	125	163	189	209	218	215	190	2.61	3.40	3.93	4.36	4.53	4.47	3.97
2400	183	207	230	250	261	261	244	3.82	4.31	4.79	5.21	5.44	5.43	5.07
3000	241	252	274	295	310	313	304	5.01	5.26	5.70	6.15	6.46	6.52	6.33
3600	298	301	321	346	366	372	373	6.21	6.26	6.70	7.20	7.62	7.75	7.77

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)
1800	4.17	(1.22)	5.62	(1.65)	5.63	(1.65)	5.87	(1.72)	6.69	(1.96)	7.48	(2.19)	10.50	(3.07)
2400	4.43	(1.30)	6.38	(1.87)	6.71	(1.97)	7.18	(2.10)	8.14	(2.38)	8.93	(2.62)	11.67	(3.42)
3000	4.30	(1.26)	6.58	(1.93)	7.16	(2.10)	7.80	(2.28)	8.81	(2.58)	9.56	(2.80)	11.93	(3.49)
3600	4.06	(1.19)	6.49	(1.90)	7.25	(2.12)	8.00	(2.34)	9.01	(2.64)	9.70	(2.84)	11.72	(3.43)

* 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

Performance Coefficients - ARI HBP - 48VDC

Coefficient	Capacity (BTU/Hr)	Power (Watts)	Current (Amperes)	Mass Flow (Lbs/Hr)
C1	-6.301343E+03	-9.394002E+02	-1.957084E+01	-1.165521E+02
C2	1.310578E+00	2.564249E-01	5.342186E-03	1.602163E-02
C3	-1.206881E-04	-1.591743E-05	-3.316132E-07	-1.619022E-06
C4	1.337793E-08	9.162370E-10	1.908827E-11	1.431436E-10
C5	1.156555E+02	7.798792E+00	1.624748E-01	7.345305E-01
C6	-3.045512E-01	3.929986E-01	8.187471E-03	4.312113E-03
C7	6.742903E-03	-1.213795E-03	-2.528740E-05	6.807295E-05
C8	1.427033E+02	1.446406E+01	3.013346E-01	2.729269E+00
C9	-1.122185E+00	-4.308254E-02	-8.975530E-04	-2.200064E-02
C10	2.677151E-03	-1.055596E-04	-2.199158E-06	5.636521E-05
C11	6.666571E-04	1.419408E-05	2.957100E-07	8.215221E-06
C12	1.568755E-08	2.409803E-09	5.020424E-11	2.421960E-10
C13	2.481606E-08	9.246311E-07	1.926315E-08	1.493330E-08
C14	-3.464795E-06	-3.043143E-07	-6.339880E-09	-4.153690E-08
C15	-1.908298E-02	1.373851E-03	2.862189E-05	-1.569069E-04
C16	-4.833450E-03	-3.054755E-03	-6.364072E-05	-4.383844E-05
C17	-2.033910E+00	-2.838204E-01	-5.912924E-03	-1.651396E-02
C18	-1.925228E-06	-1.394287E-07	-2.904764E-09	-3.247877E-08
C19	1.017101E-04	-9.651782E-05	-2.010788E-06	7.530524E-07
C20	-5.056611E-07	7.543168E-08	1.571493E-09	-1.759127E-09
C21	2.895978E-05	1.401109E-05	2.918976E-07	2.417616E-07
C22	-1.447846E-03	-2.989813E-03	-6.228776E-05	-6.350412E-05
C23	8.944136E-03	2.012639E-03	4.192999E-05	8.100225E-05

Performance Equation

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

$X_1 = \text{RPM}$
 $X_2 = E_t \text{ (°F)}$
 $X_3 = C_t \text{ (°F)}$

Cooling Capacity (100V) - 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	1211 (355)	1952 (572)	2328 (682)	2763 (809)	3296 (965)	3612 (1058)	4368 (1279)					
4500	1421 (416)	2341 (686)	2836 (831)	3407 (998)	4095 (1199)	4496 (1317)	5437 (1592)					
5500	1644 (481)	2768 (811)	3395 (994)	4121 (1207)	4984 (1460)	5480 (1605)	6627 (1941)					
6500	1933 (566)	3265 (956)	4028 (1180)	4910 (1438)	5951 (1743)	6544 (1916)	7899 (2314)					

Power Consumption (100V) - ARI HBP **Watt** **Current (100V) - 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	300	303	324	348	368	375	376	3.00	3.03	3.24	3.48	3.68	3.75	3.76
4500	390	384	406	437	467	481	498	3.90	3.84	4.06	4.37	4.67	4.81	4.98
5500	499	489	517	557	603	625	665	4.99	4.89	5.17	5.57	6.03	6.25	6.65
6500	623	616	652	706	770	804	869	6.23	6.16	6.52	7.06	7.70	8.04	8.69

Efficiency (100V) - 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	4.03 (1.18)	6.45 (1.89)	7.19 (2.11)	7.94 (2.32)	8.94 (2.62)	9.63 (2.82)	11.63 (3.41)					
4500	3.64 (1.07)	6.10 (1.79)	6.98 (2.04)	7.80 (2.28)	8.76 (2.57)	9.36 (2.74)	10.92 (3.20)					
5500	3.29 (0.96)	5.66 (1.66)	6.57 (1.92)	7.39 (2.17)	8.27 (2.42)	8.77 (2.57)	9.97 (2.92)					
6500	3.10 (0.91)	5.30 (1.55)	6.17 (1.81)	6.95 (2.04)	7.72 (2.26)	8.14 (2.38)	9.09 (2.66)					

* 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

Performance Coefficients - ARI HBP - 100VDC

Coefficient	Capacity (BTU/Hr)	Power (Watts)	Current (Amperes)	Mass Flow (Lbs/Hr)
C1	-6.301343E+03	-9.462759E+02	-9.462759E+00	-1.165521E+02
C2	1.310578E+00	2.583018E-01	2.583018E-03	1.602163E-02
C3	-1.206881E-04	-1.603394E-05	-1.603394E-07	-1.619022E-06
C4	1.337793E-08	9.229432E-10	9.229432E-12	1.431436E-10
C5	1.156555E+02	7.855874E+00	7.855874E-02	7.345305E-01
C6	-3.045512E-01	3.958751E-01	3.958751E-03	4.312113E-03
C7	6.742903E-03	-1.222679E-03	-1.222679E-05	6.807295E-05
C8	1.427033E+02	1.456993E+01	1.456993E-01	2.729269E+00
C9	-1.122185E+00	-4.339788E-02	-4.339788E-04	-2.200064E-02
C10	2.677151E-03	-1.063322E-04	-1.063322E-06	5.636521E-05
C11	6.666571E-04	1.429797E-05	1.429797E-07	8.215221E-06
C12	1.568755E-08	2.427441E-09	2.427441E-11	2.421960E-10
C13	2.481606E-08	9.313988E-07	9.313988E-09	1.493330E-08
C14	-3.464795E-06	-3.065416E-07	-3.065416E-09	-4.153690E-08
C15	-1.908298E-02	1.383906E-03	1.383906E-05	-1.569069E-04
C16	-4.833450E-03	-3.077113E-03	-3.077113E-05	-4.383844E-05
C17	-2.033910E+00	-2.858977E-01	-2.858977E-03	-1.651396E-02
C18	-1.925228E-06	-1.404492E-07	-1.404492E-09	-3.247877E-08
C19	1.017101E-04	-9.722426E-05	-9.722426E-07	7.530524E-07
C20	-5.056611E-07	7.598378E-08	7.598378E-10	-1.759127E-09
C21	2.895978E-05	1.411364E-05	1.411364E-07	2.417616E-07
C22	-1.447846E-03	-3.011696E-03	-3.011696E-05	-6.350412E-05
C23	8.944136E-03	2.027370E-03	2.027370E-05	8.100225E-05

Performance Equation

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

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