

SIERRA17-0434Y3
R134a / R513A / R1234yf
48V DC
VARIABLE SPEED



Brushless DC Variable Speed Compressor Technical Data Sheet

General Information

Compressor Part Number	SIERRA00185	3/8" ID Suction - 5/16" ID Discharge
Compressor Drawing	DCMX33-001	#10-32 Threaded Terminal Connections
Voltage Range:	37-60 VDC	
Controller Options (48V)	025F0158, 025F0152	
Wiring Diagram Drawing	DEM0010	

Application Information

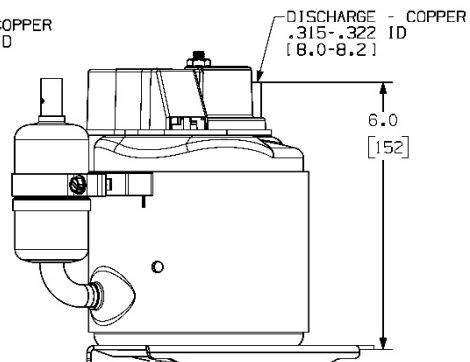
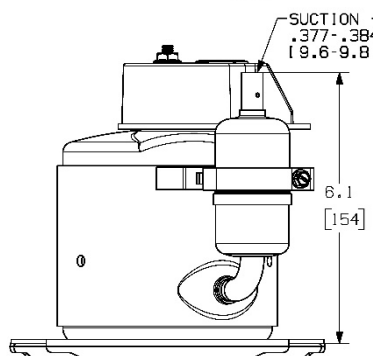
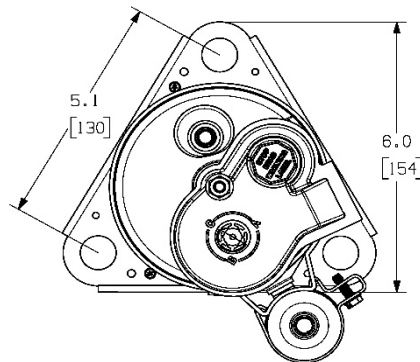
Application	HBP, A/C
Refrigerant	R134a, R513A, R1234yf
Evaporator Temperature Range	-23.3°C to 12.8°C (-10°F to 55°F)
Condenser Temperature Range	26.7°C to 65.6°C (80°F to 150°F)
Maximum Discharge Temperature	130 °C (265 °F)
Maximum Compression Ratio	8:1
Minimum Airflow Over Compressor	425 cfm @ 6" from 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



Compressor Dimensions



Packaging Options

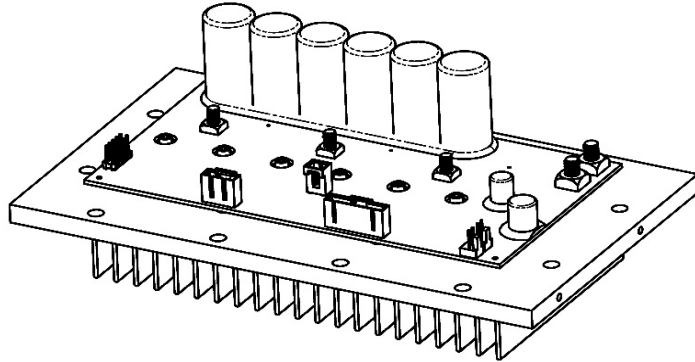
- Single Pack (add -SP suffix to part number when ordering)
- Pallet Pack (25 piece multiples)

the Sierra

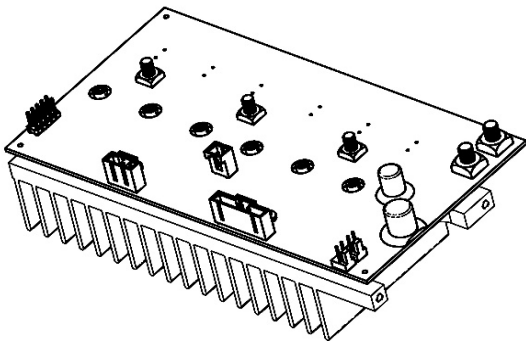
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Controller Configurations

Custom controllers and configurations available



025F0158



025F0152

SIERRA17-0434Y3



Cooling Capacity (48V) - ARI HBP - R134a / R513A 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	462 (135)	864 (253)	1020 (299)	1204 (353)	1459 (427)	1626 (476)	2068 (606)							
2400	728 (213)	1248 (366)	1486 (435)	1767 (518)	2134 (625)	2364 (692)	2940 (861)							
3000	928 (272)	1567 (459)	1887 (553)	2266 (664)	2746 (804)	3037 (889)	3749 (1098)							
3600	1080 (316)	1838 (538)	2241 (656)	2718 (796)	3311 (970)	3665 (1073)	4513 (1322)							

Power Consumption (48V) - ARI HBP - R134a / R513A Watt Current (48V) - ARI HBP - R134a / R513A 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	120	158	185	207	217	216	195	2.50	3.29	3.85	4.31	4.53	4.50	4.07
2400	177	201	225	247	261	263	250	3.69	4.18	4.69	5.16	5.44	5.47	5.20
3000	232	245	268	292	310	315	311	4.84	5.10	5.58	6.08	6.47	6.57	6.49
3600	288	292	314	342	366	375	382	6.00	6.07	6.55	7.12	7.63	7.81	7.95

Efficiency (48V) - ARI HBP - R134a / R513A 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	3.85 (1.13)	5.46 (1.60)	5.52 (1.62)	5.82 (1.70)	6.71 (1.97)	7.53 (2.21)	10.58 (3.10)							
2400	4.12 (1.21)	6.21 (1.82)	6.61 (1.93)	7.14 (2.09)	8.17 (2.39)	9.00 (2.64)	11.77 (3.45)							
3000	3.99 (1.17)	6.40 (1.87)	7.05 (2.06)	7.76 (2.27)	8.85 (2.59)	9.64 (2.82)	12.04 (3.52)							
3600	3.75 (1.10)	6.30 (1.85)	7.13 (2.09)	7.96 (2.33)	9.05 (2.65)	9.77 (2.86)	11.83 (3.46)							

* 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

Performance Coefficients (48V) - ARI HBP - R134a / R513A

Coefficient	Capacity (BTU/Hr)	Power (Watts)	Current (Amperes)	Mass Flow (Lbs/Hr)
C1	-6.262409E+03	-9.528699E+02	-1.985146E+01	-8.990093E+01
C2	1.289884E+00	2.472260E-01	5.150542E-03	1.235807E-02
C3	-1.339645E-04	-1.587763E-05	-3.307841E-07	-1.248812E-06
C4	1.400445E-08	9.483034E-10	1.975632E-11	1.104119E-10
C5	1.125932E+02	6.812003E+00	1.419167E-01	5.665706E-01
C6	-3.175953E-01	3.801418E-01	7.919620E-03	3.326093E-03
C7	7.163275E-03	-1.200000E-03	-2.499999E-05	5.250719E-05
C8	1.415857E+02	1.512161E+01	3.150335E-01	2.105187E+00
C9	-1.120186E+00	-5.168089E-02	-1.076685E-03	-1.696991E-02
C10	2.708589E-03	-7.383180E-05	-1.538163E-06	4.347658E-05
C11	6.707360E-04	7.956553E-06	1.657615E-07	6.336705E-06
C12	1.456661E-08	2.574340E-09	5.363209E-11	1.868148E-10
C13	-8.915019E-08	9.102082E-07	1.896267E-08	1.151861E-08
C14	-3.446913E-06	-2.761043E-07	-5.752172E-09	-3.203895E-08
C15	-1.939086E-02	1.695069E-03	3.531394E-05	-1.210281E-04
C16	-4.568333E-03	-2.907538E-03	-6.057370E-05	-3.381422E-05
C17	-1.972551E+00	-2.618671E-01	-5.455564E-03	-1.273783E-02
C18	-1.830042E-06	-1.527377E-07	-3.182035E-09	-2.505208E-08
C19	1.389256E-04	-9.359336E-05	-1.949862E-06	5.808573E-07
C20	-4.486187E-07	7.001855E-08	1.458720E-09	-1.356880E-09
C21	2.687089E-05	1.343274E-05	2.798488E-07	1.864797E-07
C22	-1.563311E-03	-2.886107E-03	-6.012722E-05	-4.898309E-05
C23	8.628039E-03	1.902293E-03	3.963111E-05	6.248005E-05

Performance Equation

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

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

SIERRA17-0434Y3



Cooling Capacity (48V) - ARI HBP - R1234yf 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	492 (144)	920 (270)	1087 (318)	1283 (376)	1554 (455)	1732 (507)	2202 (645)					
2400	776 (227)	1329 (389)	1583 (464)	1883 (551)	2274 (666)	2518 (737)	3132 (917)					
3000	989 (290)	1669 (489)	2010 (589)	2414 (707)	2925 (857)	3235 (948)	3994 (1170)					
3600	1150 (337)	1958 (573)	2387 (699)	2895 (848)	3527 (1033)	3904 (1143)	4808 (1408)					

Power Consumption (48V) - ARI HBP - R1234yf Watt Current (48V) - ARI HBP - R1234yf 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	115	151	177	198	208	207	187	2.39	3.15	3.68	4.12	4.33	4.30	3.89
2400	169	192	215	237	250	251	239	3.52	4.00	4.48	4.93	5.20	5.23	4.98
3000	222	234	256	279	297	301	298	4.63	4.88	5.33	5.82	6.18	6.28	6.21
3600	275	279	301	327	350	359	365	5.73	5.81	6.26	6.81	7.29	7.47	7.60

Efficiency (48V) - ARI HBP - R1234yf 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	4.29 (1.26)	6.09 (1.78)	6.15 (1.80)	6.48 (1.90)	7.48 (2.19)	8.39 (2.46)	11.79 (3.45)					
2400	4.59 (1.34)	6.92 (2.03)	7.36 (2.16)	7.96 (2.33)	9.10 (2.67)	10.03 (2.94)	13.11 (3.84)					
3000	4.45 (1.30)	7.13 (2.09)	7.85 (2.30)	8.65 (2.53)	9.85 (2.89)	10.73 (3.14)	13.41 (3.93)					
3600	4.18 (1.22)	7.02 (2.06)	7.94 (2.33)	8.86 (2.60)	10.08 (2.95)	10.89 (3.19)	13.17 (3.86)					

* 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 (48V) - ARI HBP - R1234yf

Coefficient	Capacity (BTU/Hr)	Power (Watts)	Current (Amperes)	Mass Flow (Lbs/Hr)
C1	-6.670993E+03	-9.111963E+02	-1.898326E+01	-7.398259E+01
C2	1.374041E+00	2.364136E-01	4.925284E-03	1.016989E-02
C3	-1.427048E-04	-1.518323E-05	-3.163173E-07	-1.027690E-06
C4	1.491815E-08	9.068295E-10	1.889228E-11	9.086181E-11
C5	1.199392E+02	6.514081E+00	1.357100E-01	4.662506E-01
C6	-3.383165E-01	3.635163E-01	7.573256E-03	2.737157E-03
C7	7.630635E-03	-1.147518E-03	-2.390662E-05	4.320999E-05
C8	1.508233E+02	1.446027E+01	3.012556E-01	1.732431E+00
C9	-1.193271E+00	-4.942064E-02	-1.029597E-03	-1.396512E-02
C10	2.885308E-03	-7.060278E-05	-1.470891E-06	3.577838E-05
C11	7.144975E-04	7.608574E-06	1.585120E-07	5.214694E-06
C12	1.551699E-08	2.461752E-09	5.128649E-11	1.537363E-10
C13	-9.496669E-08	8.704004E-07	1.813334E-08	9.479061E-09
C14	-3.671803E-06	-2.640289E-07	-5.500602E-09	-2.636596E-08
C15	-2.065599E-02	1.620935E-03	3.376949E-05	-9.959825E-05
C16	-4.866389E-03	-2.780377E-03	-5.792452E-05	-2.782689E-05
C17	-2.101248E+00	-2.504144E-01	-5.216966E-03	-1.048240E-02
C18	-1.949441E-06	-1.460577E-07	-3.042869E-09	-2.061622E-08
C19	1.479896E-04	-8.950007E-05	-1.864585E-06	4.780076E-07
C20	-4.778884E-07	6.695630E-08	1.394923E-09	-1.116624E-09
C21	2.862405E-05	1.284526E-05	2.676096E-07	1.534606E-07
C22	-1.665307E-03	-2.759883E-03	-5.749757E-05	-4.030988E-05
C23	9.190966E-03	1.819097E-03	3.789785E-05	5.141699E-05

Performance Equation

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

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