SIERRA04-0982Y3 High-Efficiency
R134a / R513A / R1234yf
72 VDC
VARIABLE SPEED

Brushless DC Variable Speed Compressor Technical Data Sheet

General Information

Compressor Part Number	SIERRA00218	1/2" ID Suction - 5/16" ID Discharge
Compressor Drawing	DCMX33-002	#10-32 Threaded Terminal Connections
Compressor Part Number	SIERRA00224	1/2" ID Suction - 5/16" ID Discharge
Compressor Drawing	DCMX33-002	M5 Threaded Terminal Connections
Compressor w/Fittings Part Number	SIERRA00219	#10 MIO Suction - #8 MIO Discharge
Compressor Drawing	DCMX27-002	#10-32 Threaded Terminal Connections
Compressor w/ Fittings Part Number	SIERRA00153	M24 Suction - M22 Discharge
Compressor Drawing	DCMX35-002	M5 Threaded Terminal Connections
Compressor w/Fittings (Low Oil) Part Number	SIERRA00198	M24 Suction - M22 Discharge
Compressor Drawing	DCMX35-002	M5 Threaded Terminal Connections
Dual Compressor w/ Fittings Part Number	SIERRA00223	#10 MIO Suction - #8 MIO Discharge
Compressor Drawing	DCMX34-002	#10-32 Threaded Terminal Connections
Controller Options	025F0164, 025F0139	
Wiring Diagram Drawing	DEMX0021	
Controller Option (dual)	025F0202	
Wiring Diagram Drawing (dual)	DEMX0032	

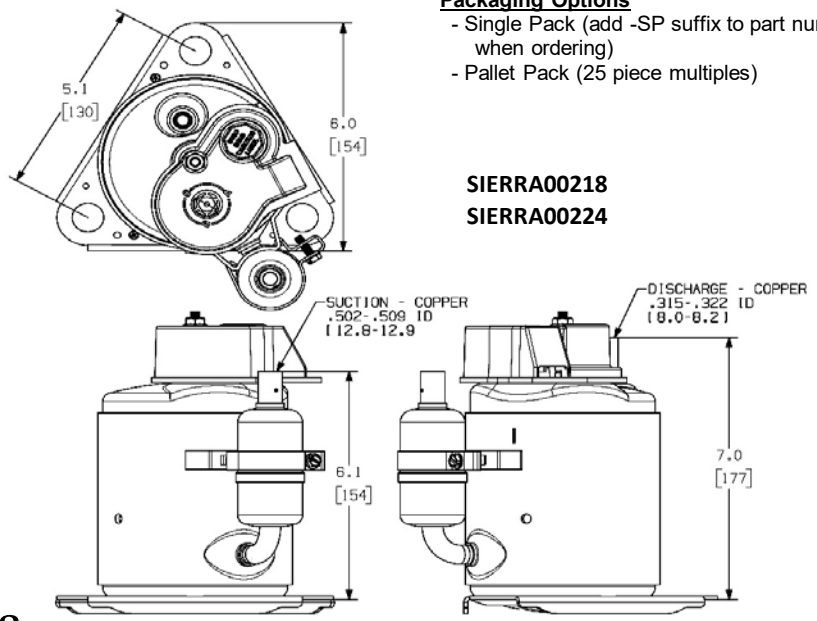
Application Information

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	16.1 cm^3 (0.982 in^3)
Oil Quantity	290 cc
Oil Quantity (Low Oil)	175 cc
Oil Quantity (Dual Compressor)	390 cc
Oil Type	PVE 68cSt
Compressor Weight	6.4 kg / 14.1 lb
Compressor Weight with Fittings	6.6 kg / 14.5 lb
Compressor Weight w/Fittings (Low Oil)	6.5 kg / 14.3 lb
Dual Compressor Weight w/Fittings	6.8 kg / 14.9 lb

Compressor Dimensions



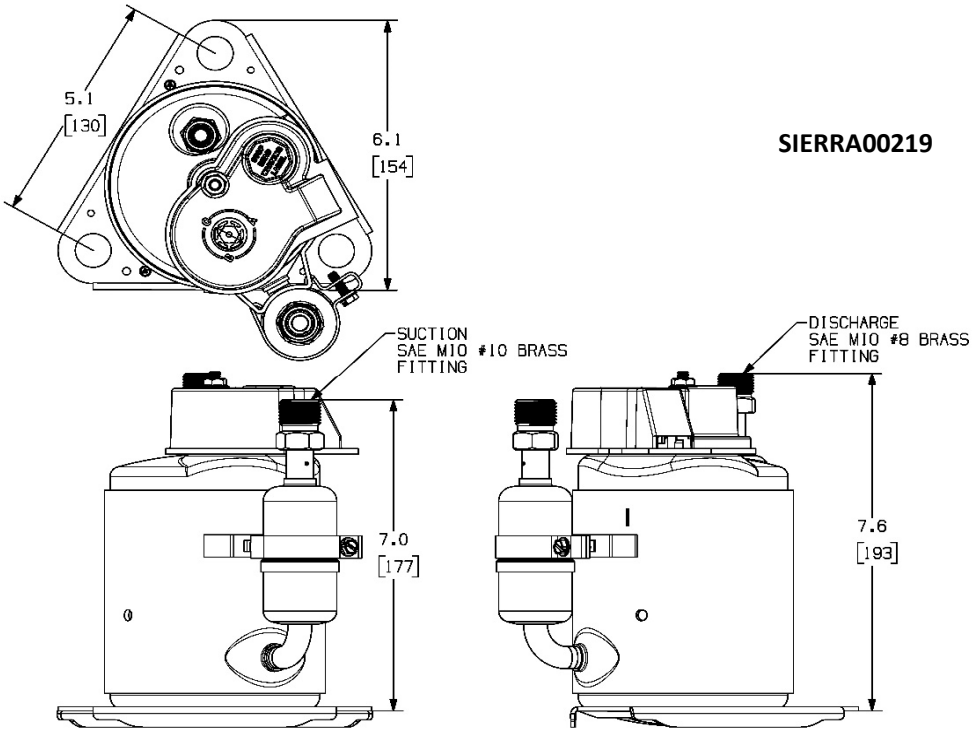
Packaging Options

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

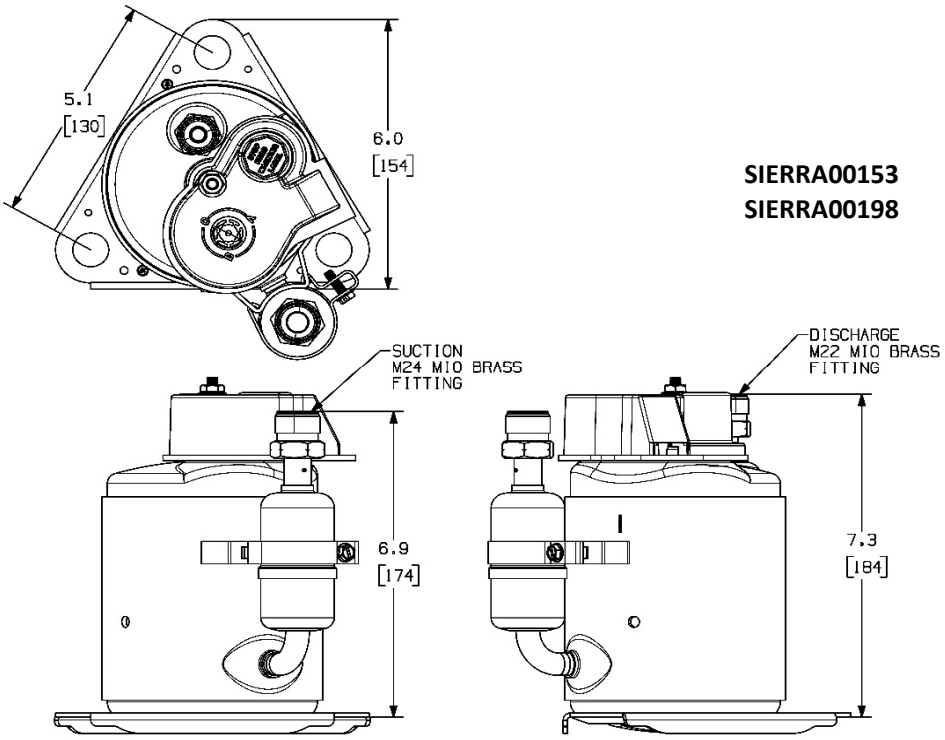
SIERRA00218
SIERRA00224

the Sierra

Compressor Dimensions



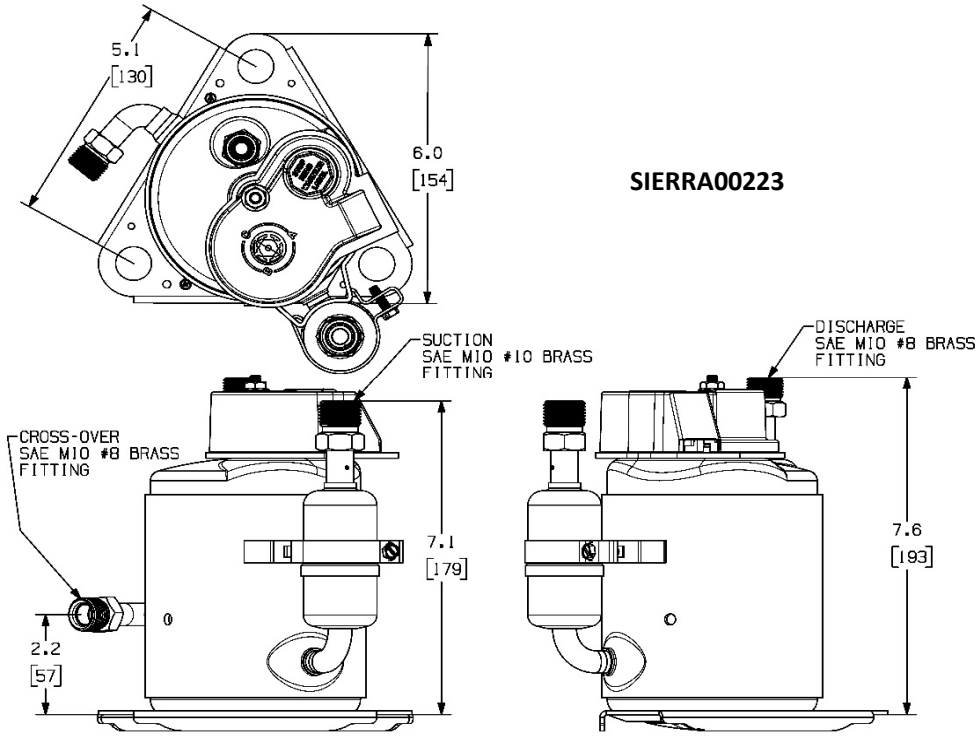
SIERRA00219



SIERRA00153
SIERRA00198

SIERRA04-0982Y3 High-Efficiency

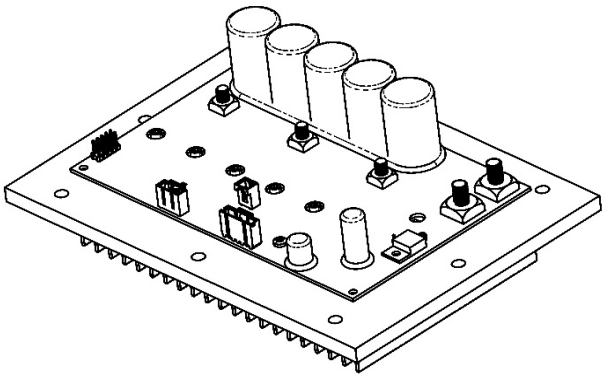
Compressor Dimensions



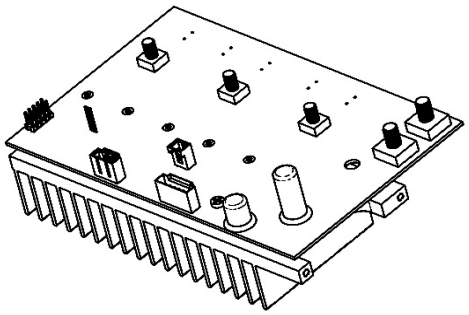
SIERRA00223

Controller Options:

Custom Controller options are also available



025F0164



025F0139
025F0202

SIERRA04-0982Y3 High-Efficiency

MASTERFLUX

Cooling Capacity (72V) - ARI HBP - R134a / R513A														BTU/hr (Watt)
	Evaporator Temperature													
RPM	-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)
3200	1553	(455)	3502	(1026)	4271	(1251)	5117	(1499)	6200	(1816)	6880	(2015)	8619	(2524)
4000	1960	(574)	4335	(1270)	5356	(1569)	6479	(1898)	7865	(2304)	8707	(2550)	10788	(3160)
4800	2422	(709)	5223	(1530)	6495	(1902)	7896	(2312)	9585	(2807)	10588	(3101)	13011	(3811)
5700	3350	(981)	6630	(1942)	8186	(2397)	9898	(2899)	11929	(3494)	13114	(3841)	15922	(4663)

Power Consumption (72V) - ARI HBP - R134a / R513A							Watt
	Evaporator Temperature						
RPM	-10°F	10°F	20°F	30°F	40°F	45°F	55°F
3200	431	521	562	603	643	664	705
4000	550	669	726	781	836	864	920
4800	670	825	899	973	1046	1083	1158
5700	855	1058	1157	1255	1353	1402	1502

Current (72V) - ARI HBP - R134a / R513A							Amp
	Evaporator Temperature						
-10°F	10°F	20°F	30°F	40°F	45°F	55°F	
5.98	7.23	7.81	8.38	8.94	9.22	9.79	
7.64	9.30	10.08	10.85	11.62	12.00	12.78	
9.30	11.46	12.49	13.51	14.53	15.04	16.08	
11.87	14.70	16.07	17.43	18.79	19.48	20.85	

Efficiency (72V) - ARI HBP - R134a / R513A														BTU/hr/W (W/W)
	Evaporator Temperature													
RPM	-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)
3200	3.61	(1.06)	6.73	(1.97)	7.59	(2.22)	8.48	(2.48)	9.64	(2.82)	10.37	(3.04)	12.23	(3.58)
4000	3.56	(1.04)	6.48	(1.90)	7.38	(2.16)	8.29	(2.43)	9.40	(2.75)	10.08	(2.95)	11.72	(3.43)
4800	3.62	(1.06)	6.33	(1.85)	7.22	(2.11)	8.12	(2.38)	9.16	(2.68)	9.78	(2.86)	11.24	(3.29)
5700	3.92	(1.15)	6.27	(1.83)	7.07	(2.07)	7.89	(2.31)	8.82	(2.58)	9.35	(2.74)	10.60	(3.10)

*** 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 (72V) - ARI HBP - R134a / R513A

Coefficient	Capacity (BTU/Hr)	Power (Watts)	Current (Amperes)	Mass Flow (Lbs/Hr)
C1	1.140518E+04	-2.015925E+03	-2.799895E+01	-1.543341E+01
C2	5.965697E+00	6.865657E-01	9.535635E-03	3.315062E-02
C3	-9.592846E-04	-1.310048E-04	-1.819512E-06	-5.081177E-06
C4	9.009947E-08	1.316817E-08	1.828912E-10	8.132811E-10
C5	-4.019977E+02	-1.341039E+01	-1.862555E-01	-9.643178E+00
C6	-1.037918E+00	-1.975286E-02	-2.743453E-04	4.316687E-03
C7	2.671929E-02	1.272309E-04	1.767096E-06	2.402556E-04
C8	-4.747801E+02	3.486094E+01	4.841797E-01	-1.711205E-01
C9	4.604004E+00	-2.933382E-01	-4.074141E-03	1.205062E-03
C10	-1.468673E-02	7.315007E-04	1.015973E-05	-1.597854E-05
C11	-1.227511E-03	-1.298793E-05	-1.803879E-07	-3.027719E-05
C12	1.354330E-07	7.680608E-09	1.066751E-10	3.228039E-09
C13	-4.509764E-06	2.014849E-07	2.798402E-09	-2.958818E-09
C14	3.833090E-07	-1.885172E-07	-2.618295E-09	1.766610E-08
C15	1.797201E-01	4.790884E-03	6.654006E-05	3.768045E-03
C16	-2.121274E-02	-1.707334E-03	-2.371297E-05	-2.870829E-05
C17	4.084848E+00	9.398595E-02	1.305360E-03	1.086887E-01
C18	-1.760643E-05	-7.343792E-07	-1.019971E-08	-3.875567E-07
C19	7.475811E-04	-2.560292E-05	-3.555961E-07	4.037781E-06
C20	-6.129555E-07	-1.873690E-07	-2.602347E-09	-3.690946E-08
C21	8.960189E-05	1.819563E-05	2.527171E-07	1.288354E-06
C22	-5.366697E-03	3.484980E-05	4.840249E-07	-1.318685E-04
C23	-7.067377E-03	1.918953E-04	2.665213E-06	-2.426728E-04

Performance Equation

$$Y=C_1+C_2x_1+C_3x_1^2+C_4x_1^3+C_5x_2+C_6x_2^2+C_7x_2^3+C_8x_3+C_9x_3^2+C_{10}x_3^3+C_{11}x_1x_2x_3+C_{12}x_1^2x_2x_3+C_{13}x_1x_2^2x_3+C_{14}x_1x_2x_3^2+C_{15}x_1x_2+C_{16}x_1x_3+C_{17}x_2x_3+C_{18}x_1^2x_2+C_{19}x_1x_2^2+C_{20}x_1^2x_3+C_{21}x_1x_3^2+C_{22}x_2^2x_3+C_{23}x_2x_3^2$$

x_1 = RPM
x_2 = E_t (°F)
x_3 = C_t (°F)

SIERRA04-0982Y3 High-Efficiency

MASTERFLUX

Cooling Capacity (72V) - ARI HBP - R1234yf														BTU/hr (Watt)
	Evaporator Temperature													
RPM	-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)
3200	1458	(427)	3288	(963)	4009	(1174)	4803	(1407)	5820	(1705)	6459	(1892)	8091	(2370)
4000	1840	(539)	4070	(1192)	5028	(1473)	6082	(1781)	7384	(2162)	8174	(2394)	10127	(2966)
4800	2273	(666)	4903	(1436)	6097	(1786)	7412	(2171)	8998	(2635)	9940	(2911)	12214	(3577)
5700	3145	(921)	6224	(1823)	7684	(2251)	9292	(2721)	11198	(3280)	12311	(3605)	14946	(4377)

Power Consumption (72V) - ARI HBP - R1234yf							Watt
	Evaporator Temperature						
RPM	-10°F	10°F	20°F	30°F	40°F	45°F	55°F
3200	450	545	588	631	673	694	737
4000	575	700	759	817	875	904	962
4800	701	863	940	1017	1094	1133	1211
5700	894	1107	1210	1313	1415	1466	1570

Current (72V) - ARI HBP - R1234yf							Amp
	Evaporator Temperature						
-10°F	10°F	20°F	30°F	40°F	45°F	55°F	
6.26	7.56	8.17	8.76	9.34	9.64	10.24	
7.99	9.72	10.54	11.35	12.15	12.55	13.37	
9.73	11.98	13.06	14.13	15.20	15.73	16.81	
12.42	15.37	16.81	18.23	19.65	20.37	21.81	

Efficiency (72V) - ARI HBP - R1234yf														BTU/hr/W (W/W)
	Evaporator Temperature													
RPM	-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)
3200	3.24	(0.95)	6.04	(1.77)	6.82	(2.00)	7.62	(2.23)	8.65	(2.53)	9.31	(2.73)	10.98	(3.21)
4000	3.20	(0.94)	5.81	(1.70)	6.62	(1.94)	7.44	(2.18)	8.44	(2.47)	9.05	(2.65)	10.52	(3.08)
4800	3.25	(0.95)	5.68	(1.66)	6.48	(1.90)	7.29	(2.13)	8.22	(2.41)	8.78	(2.57)	10.09	(2.95)
5700	3.52	(1.03)	5.62	(1.65)	6.35	(1.86)	7.08	(2.07)	7.91	(2.32)	8.40	(2.46)	9.52	(2.79)

*** 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 (72V) - ARI HBP - R1234yf

Coefficient	Capacity (BTU/Hr)	Power (Watts)	Current (Amperes)	Mass Flow (Lbs/Hr)
C1	1.070664E+04	-2.108123E+03	-2.927949E+01	-1.875411E+01
C2	5.600311E+00	7.179658E-01	9.971748E-03	4.028343E-02
C3	-9.005305E-04	-1.369964E-04	-1.902727E-06	-6.174460E-06
C4	8.458107E-08	1.377041E-08	1.912558E-10	9.882694E-10
C5	-3.773762E+02	-1.402372E+01	-1.947739E-01	-1.171804E+01
C6	-9.743476E-01	-2.065626E-02	-2.868925E-04	5.245480E-03
C7	2.508279E-02	1.330498E-04	1.847914E-06	2.919498E-04
C8	-4.457008E+02	3.645531E+01	5.063237E-01	-2.079394E-01
C9	4.322019E+00	-3.067540E-01	-4.260472E-03	1.464347E-03
C10	-1.378720E-02	7.649559E-04	1.062439E-05	-1.941653E-05
C11	-1.152328E-03	-1.358193E-05	-1.886380E-07	-3.679174E-05
C12	1.271380E-07	8.031881E-09	1.115539E-10	3.922595E-09
C13	-4.233551E-06	2.106998E-07	2.926387E-09	-3.595447E-09
C14	3.598322E-07	-1.971391E-07	-2.738042E-09	2.146720E-08
C15	1.687126E-01	5.009996E-03	6.958327E-05	4.578790E-03
C16	-1.991350E-02	-1.785419E-03	-2.479748E-05	-3.488526E-05
C17	3.834660E+00	9.828440E-02	1.365061E-03	1.320745E-01
C18	-1.652807E-05	-7.679661E-07	-1.066620E-08	-4.709448E-07
C19	7.017934E-04	-2.677387E-05	-3.718593E-07	4.906564E-06
C20	-5.754133E-07	-1.959383E-07	-2.721365E-09	-4.485103E-08
C21	8.411397E-05	1.902781E-05	2.642752E-07	1.565560E-06
C22	-5.037998E-03	3.644365E-05	5.061619E-07	-1.602418E-04
C23	-6.634515E-03	2.006717E-04	2.787107E-06	-2.948871E-04

Performance Equation

$$Y=C_1+C_2x_1+C_3x_1^2+C_4x_1^3+C_5x_2+C_6x_2^2+C_7x_2^3+C_8x_3+C_9x_3^2+C_{10}x_3^3+C_{11}x_1x_2x_3+C_{12}x_1^2x_2x_3+C_{13}x_1x_2^2x_3+C_{14}x_1x_2x_3^2+C_{15}x_1x_2+C_{16}x_1x_3+C_{17}x_2x_3+C_{18}x_1^2x_2+C_{19}x_1x_2^2+C_{20}x_1^2x_3+C_{21}x_1x_3^2+C_{22}x_2^2x_3+C_{23}x_2x_3^2$$

x_1 = RPM
x_2 = E_t (°F)
x_3 = C_t (°F)