SIERRA10-0982Y3
R134a / R513A / R1234yf
600 V DC
VARIABLE SPEED

MASTERFLUX

Brushless DC Variable Speed Compressor Technical Data Sheet

General Information

Compressor Part Number	SIERRA00072	#10 MIO Suction - #8 MIO Discharge
Compressor Drawing	DCMX07-002	
Compressor Part Number	SIERRA00233	1/2" ID Suction - 5/16" ID Discharge
Compressor Drawing	DCMX01-004	
Dual Compressor Part Number	SIERRA00114	#10 MIO Suction - #8 MIO Discharge
Dual Compressor Drawing	DCMX11-003	
Voltage Range:	480-740 V DC	
Controller Options	025F0195, 025F0405	
Wiring Diagram Drawing	DEMX0006	
Dual Compressor Controller Options	025F0248, 025F0406	
Dual Compressor Wiring Diagram	DEMX0041	

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

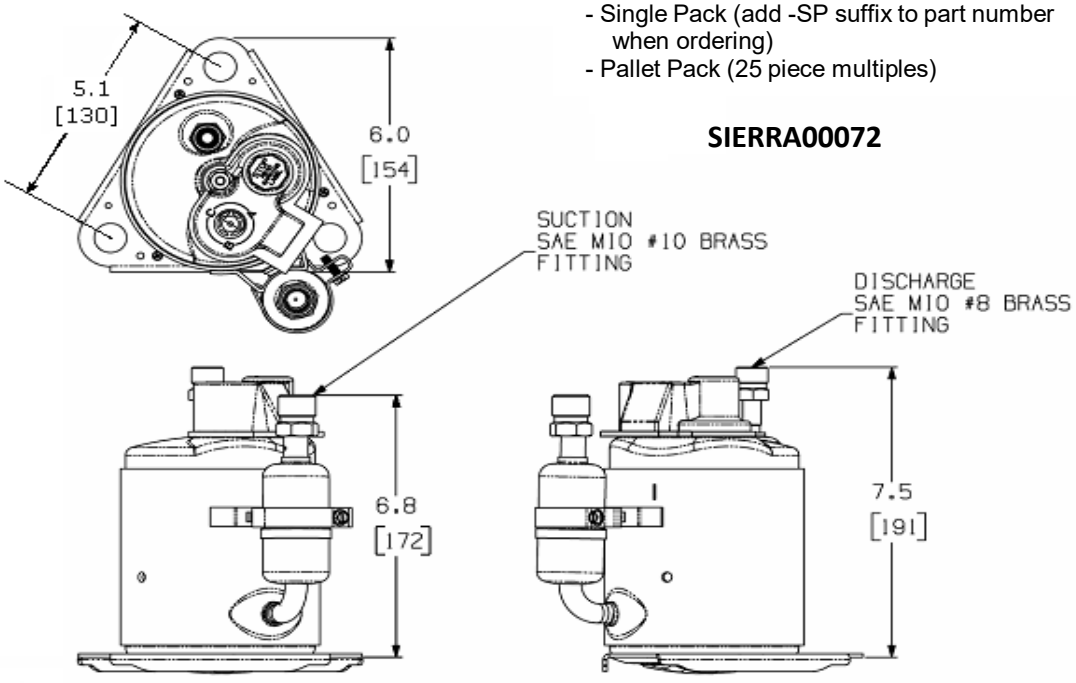
Displacement	16.1 cm^3 (0.982 in^3)
Oil Quantity	290 cc
Oil Quantity - Dual Compressor	390 cc
Oil Type	PVE 68cSt
Weight with Fittings	6.5 kg / 14.3 lb
Weight	6.4 kg / 14.1 lb
Dual Compressor Weight with Fittings	6.6 kg / 14.5 lb

Compressor Dimensions

Packaging Options

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

SIERRA00072



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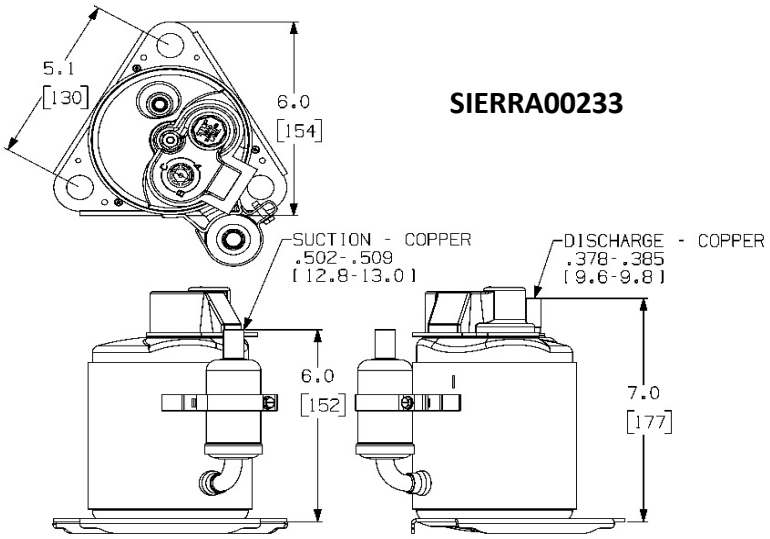
Compressor Dimensions



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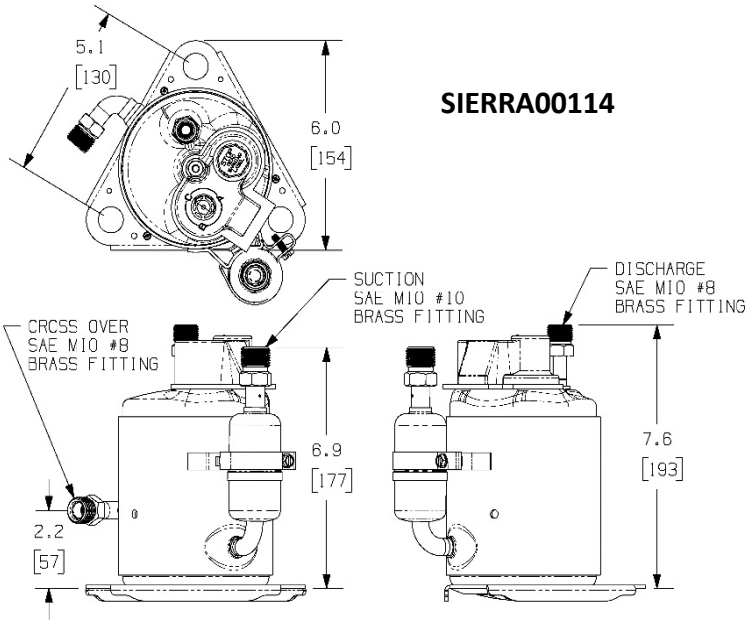
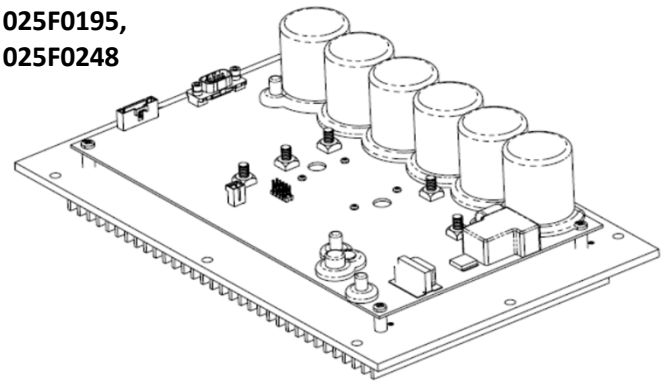


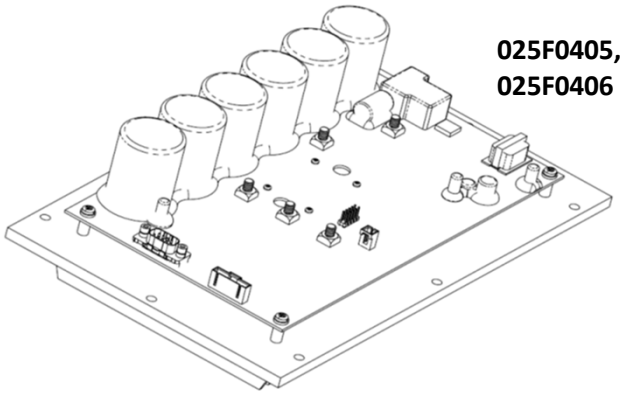
SIERRA00114

Controller Configuration

Custom controllers and configurations available

025F0195, 025F0248





025F0405, 025F0406

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Cooling Capacity (600V) - 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)
1800	1046	(306)	1955	(572)	2309	(676)	2725	(798)	3301	(967)	3680	(1078)	4678	(1370)
3000	2100	(615)	3545	(1038)	4270	(1250)	5127	(1501)	6213	(1819)	6872	(2012)	8484	(2484)
4200	2719	(796)	4707	(1378)	5808	(1701)	7109	(2082)	8709	(2550)	9651	(2826)	11880	(3479)
5400	3230	(946)	5770	(1690)	7251	(2123)	9001	(2636)	11119	(3256)	12346	(3615)	15196	(4450)
6500	3885	(1138)	6938	(2032)	8770	(2568)	10936	(3202)	13532	(3962)	15022	(4399)	18446	(5401)

Power Consumption (600V) - R134a/R513A — Watt

	Evaporator Temperature						
RPM	-10°F	10°F	20°F	30°F	40°F	45°F	55°F
1800	269	354	414	463	487	483	437
3000	520	548	599	653	695	706	697
4200	771	765	820	890	961	992	1033
5400	1044	1028	1097	1196	1308	1364	1467
6500	1331	1327	1420	1554	1715	1800	1969

Current (600V) - R134a/R513A — Amp

	Evaporator Temperature						
RPM	-10°F	10°F	20°F	30°F	40°F	45°F	55°F
1800	0.45	0.59	0.69	0.77	0.81	0.81	0.73
3000	0.87	0.91	1.00	1.09	1.16	1.18	1.16
4200	1.29	1.28	1.37	1.48	1.60	1.65	1.72
5400	1.74	1.71	1.83	1.99	2.18	2.27	2.44
6500	2.22	2.21	2.37	2.59	2.86	3.00	3.28

Efficiency (600V) - 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)
1800	3.89	(1.14)	5.52	(1.62)	5.58	(1.63)	5.88	(1.72)	6.78	(1.99)	7.61	(2.23)	10.70	(3.13)
3000	4.04	(1.18)	6.47	(1.89)	7.13	(2.09)	7.85	(2.30)	8.94	(2.62)	9.74	(2.85)	12.17	(3.56)
4200	3.53	(1.03)	6.15	(1.80)	7.09	(2.07)	7.99	(2.34)	9.06	(2.65)	9.73	(2.85)	11.50	(3.37)
5400	3.09	(0.91)	5.61	(1.64)	6.61	(1.94)	7.53	(2.20)	8.50	(2.49)	9.05	(2.65)	10.36	(3.03)
6500	2.92	(0.85)	5.23	(1.53)	6.18	(1.81)	7.04	(2.06)	7.89	(2.31)	8.35	(2.44)	9.37	(2.74)

*** 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 - ASHRAE HBP - R134a

Coefficient	Capacity (BTU/Hr)	Power (Watts)	Current (Amperes)	Mass Flow (Lbs/Hr)
C1	-1.416978E+04	-2.132987E+03	-3.554979E+00	-2.034164E+02
C2	2.918585E+00	5.534123E-01	9.223539E-04	2.796228E-02
C3	-3.031178E-04	-3.554188E-05	-5.923647E-08	-2.825652E-06
C4	3.168748E-08	2.122765E-09	3.537942E-12	2.498261E-10
C5	2.547616E+02	1.524858E+01	2.541431E-02	1.281964E+00
C6	-7.186143E-01	8.509425E-01	1.418237E-03	7.525860E-03
C7	1.620815E-02	-2.686184E-03	-4.476973E-06	1.188066E-04
C8	3.203621E+02	3.384953E+01	5.641588E-02	4.763349E+00
C9	-2.534614E+00	-1.156870E-01	-1.928117E-04	-3.839735E-02
C10	6.128652E-03	-1.652716E-04	-2.754526E-07	9.837328E-05
C11	1.517656E-03	1.781064E-05	2.968440E-08	1.433789E-05
C12	3.295947E-08	5.762628E-09	9.604380E-12	4.227007E-10
C13	-2.017177E-07	2.037489E-06	3.395816E-09	2.606284E-08
C14	-7.799236E-06	-6.180559E-07	-1.030093E-09	-7.249366E-08
C15	-4.387516E-02	3.794390E-03	6.323984E-06	-2.738471E-04
C16	-1.033664E-02	-6.508486E-03	-1.084748E-05	-7.651051E-05
C17	-4.463238E+00	-5.861861E-01	-9.769769E-04	-2.882155E-02
C18	-4.140785E-06	-3.419014E-07	-5.698357E-10	-5.668466E-08
C19	3.143432E-04	-2.095075E-04	-3.491792E-07	1.314290E-06
C20	-1.015077E-06	1.567356E-07	2.612260E-10	-3.070176E-09
C21	6.080003E-05	3.006902E-05	5.011503E-08	4.219426E-07
C22	-3.537261E-03	-6.460513E-03	-1.076752E-05	-1.108327E-04
C23	1.952243E-02	4.258259E-03	7.097098E-06	1.413719E-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)

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Cooling Capacity (600V) - 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)**
1800	982	(287)	1835	(537)	2167	(635)	2558	(749)	3099	(908)	3455	(1012)	4392	(1286)
3000	1972	(577)	3328	(974)	4008	(1174)	4813	(1409)	5832	(1708)	6451	(1889)	7964	(2332)
4200	2552	(747)	4419	(1294)	5452	(1596)	6674	(1954)	8176	(2394)	9060	(2653)	11153	(3266)
5400	3032	(888)	5417	(1586)	6806	(1993)	8450	(2474)	10438	(3056)	11589	(3394)	14266	(4177)
6500	3647	(1068)	6513	(1907)	8233	(2411)	10266	(3006)	12703	(3720)	14102	(4129)	17316	(5070)

Power Consumption (600V) - R1234yf — **Watt**

	Evaporator Temperature						
RPM	**-10°F**	**10°F**	**20°F**	**30°F**	**40°F**	**45°F**	**55°F**
1800	281	370	433	484	509	506	457
3000	544	573	627	683	727	738	729
4200	806	801	857	931	1005	1037	1080
5400	1092	1075	1147	1250	1368	1427	1534
6500	1392	1387	1485	1625	1793	1882	2059

Current (600V) - R1234yf — **Amp**

	Evaporator Temperature						
RPM	**-10°F**	**10°F**	**20°F**	**30°F**	**40°F**	**45°F**	**55°F**
1800	0.47	0.62	0.72	0.81	0.85	0.84	0.76
3000	0.91	0.96	1.04	1.14	1.21	1.23	1.22
4200	1.34	1.33	1.43	1.55	1.68	1.73	1.80
5400	1.82	1.79	1.91	2.08	2.28	2.38	2.56
6500	2.32	2.31	2.47	2.71	2.99	3.14	3.43

Efficiency (600V) - 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)**
1800	3.49	(1.02)	4.96	(1.45)	5.01	(1.47)	5.28	(1.55)	6.09	(1.78)	6.83	(2.00)	9.60	(2.81)
3000	3.62	(1.06)	5.80	(1.70)	6.40	(1.87)	7.04	(2.06)	8.03	(2.35)	8.74	(2.56)	10.92	(3.20)
4200	3.16	(0.93)	5.52	(1.62)	6.36	(1.86)	7.17	(2.10)	8.13	(2.38)	8.74	(2.56)	10.32	(3.02)
5400	2.78	(0.81)	5.04	(1.48)	5.93	(1.74)	6.76	(1.98)	7.63	(2.23)	8.12	(2.38)	9.30	(2.72)
6500	2.62	(0.77)	4.69	(1.37)	5.55	(1.62)	6.32	(1.85)	7.08	(2.07)	7.49	(2.19)	8.41	(2.46)

*** 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 - ASHRAE HBP - R1234yf

Coefficient	Capacity (BTU/Hr)	Power (Watts)	Current (Amperes)	Mass Flow (Lbs/Hr)
C1	-1.330191E+04	-2.230539E+03	-3.717566E+00	-2.471842E+02
C2	2.739828E+00	5.787227E-01	9.645378E-04	3.397874E-02
C3	-2.845525E-04	-3.716739E-05	-6.194566E-08	-3.433629E-06
C4	2.974669E-08	2.219850E-09	3.699750E-12	3.035795E-10
C5	2.391580E+02	1.594598E+01	2.657663E-02	1.557796E+00
C6	-6.746008E-01	8.898604E-01	1.483101E-03	9.145150E-03
C7	1.521543E-02	-2.809037E-03	-4.681728E-06	1.443694E-04
C8	3.007406E+02	3.539764E+01	5.899607E-02	5.788247E+00
C9	-2.379374E+00	-1.209780E-01	-2.016300E-04	-4.665905E-02
C10	5.753285E-03	-1.728303E-04	-2.880504E-07	1.195396E-04
C11	1.424703E-03	1.862521E-05	3.104202E-08	1.742288E-05
C12	3.094077E-08	6.026182E-09	1.004364E-11	5.136504E-10
C13	-1.893629E-07	2.130674E-06	3.551124E-09	3.167061E-08
C14	-7.321550E-06	-6.463227E-07	-1.077204E-09	-8.809164E-08
C15	-4.118791E-02	3.967927E-03	6.613212E-06	-3.327690E-04
C16	-9.703546E-03	-6.806152E-03	-1.134359E-05	-9.297277E-05
C17	-4.189874E+00	-6.129954E-01	-1.021659E-03	-3.502289E-02
C18	-3.887171E-06	-3.575383E-07	-5.958971E-10	-6.888112E-08
C19	2.950903E-04	-2.190894E-04	-3.651490E-07	1.597077E-06
C20	-9.529061E-07	1.639039E-07	2.731732E-10	-3.730766E-09
C21	5.707616E-05	3.144423E-05	5.240705E-08	5.127292E-07
C22	-3.320612E-03	-6.755985E-03	-1.125998E-05	-1.346798E-04
C23	1.832672E-02	4.453011E-03	7.421685E-06	1.717900E-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)