

COMPRESSOR DEFINITION

| | |
|---------------------------|-----------------|
| Designation | VES D13C |
| Nominal Voltage/Frequency | 230 V 43-150 Hz |
| Engineering Number | 513907498 |

A - APPLICATION / LIMIT WORKING CONDITIONS

| | | | |
|------------------------------------|-----------------------------------|-----------------------------------|-----------|
| 1 Type | Hermetic reciprocating compressor | | |
| 2 Refrigerant | R-600a | | |
| 3 Nominal voltage and frequency | 230 / 43-150 | [V / Hz] | |
| 4 Application type | Low Back Pressure | | |
| 4.1 Evaporating temperature range | -35°C to -10°C | (-31°F to 14°F) | |
| 5 Motor type | BPM | | |
| 6 Starting torque | LST - Low Starting Torque | | |
| 7 Expansion device | Capillary tube | | |
| 8 Compressor cooling | | Operating voltage range | |
| | | 50 Hz | 60 Hz |
| 8.1 LBP (32°C Ambient temperature) | Static | - | - |
| 8.2 LBP (43°C Ambient temperature) | - | - | - |
| 8.3 HBP (32°C Ambient temperature) | - | - | - |
| 8.4 HBP (43°C Ambient temperature) | - | - | - |
| 9 Maximum condensing temperature | | | |
| 9.1 Operating | 6.9 | [kgf/cm ²] (98 psig) | / °C - °F |
| 9.2 Peak | 7.8 | [kgf/cm ²] (111 psig) | / °C - °F |
| 10 Maximum winding temperature | 130 | [°C] | |

B - MECHANICAL DATA

| | | |
|-------------------------------|----------------|----------------------------------|
| 1 Commercial designation | 1/4 | [hp] |
| 2 Displacement | 13.27 | [cm ³] (0.810 cu.in) |
| 2.1 Bore [mm] | 26.000 | |
| 2.2 Stroke [mm] | 25.000 | |
| 3 Lubricant charge | 190 | [ml] (6.42 fl.oz.) |
| 3.1 Lubricants approved | | |
| 3.2 Lubricants type/viscosity | ALQUILB / ISO5 | |
| 4 Weight (with oil charge) | 6.75 | [kg] (14.88 lb.) |
| 5 Nitrogen charge | - | [kgf/cm ²] |

C - ELECTRICAL DATA

| | | |
|--|--|------------------------------------|
| 1 Nominal Voltage/Frequency/Number of Phases | 230V 43-150 Hz 3~ (Three phase) | |
| 2 Starting device type | Inverter | |
| 2.1 Starting device | CF02B11 L XX XX/CF02B11 M XX XX/VCC31156UXXX | |
| 3 Start capacitor | - | [µF(VAC minimum)] |
| 4 Run capacitor | - | [µF(VAC minimum)] |
| 5 Motor protection | VCC31156XXXXX | |
| 6 Start winding resistance | 7.29 | [Ω at 25°C (77°F)] +/- 8% |
| 7 Run winding resistance | 7.29 | [Ω at 25°C (77°F)] +/- 8% |
| 8 LRA - Locked rotor amperage (40/150 Hz) | 2.90 | [A] - Measured according to UL 984 |
| 9 FLA - Full load amperage L/MBP (40/150 Hz) | - | [A] - Measured according to UL 984 |
| 10 FLA - Full Load Amperage HBP (40/150 Hz) | - | [A] - Measured according to UL 984 |
| 11 Approval boards certification | UL - VDE | |

D - PERFORMANCE - CHECK POINT DATA

| | | | | | | | | |
|---|----------|-----|-------------------------------------|----------------------------|---|--------------------------------|--|-------|
| TEST CONDITIONS: @115V1300RPM | | | ASHRAELBP32 Static | | Evaporating temperature (Condensing temperature) | | -23.3°C (-9.94°F) 54.4°C (129.92°F) | |
| Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 348 | 88 | 102 | 54 | 0.78 | 1.09 | 6.44 | 1.62 | 1.89 |

| | | | | | | | | |
|---|----------|-----|-------------------------------------|----------------------------|---|--------------------------------|--|-------|
| TEST CONDITIONS: @115V1600RPM | | | ASHRAELBP32 Static | | Evaporating temperature (Condensing temperature) | | -23.3°C (-9.94°F) 54.4°C (129.92°F) | |
| Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 423 | 107 | 124 | 64 | 0.93 | 1.33 | 6.57 | 1.66 | 1.93 |

| | | | | | | | | |
|---|----------|-----|-------------------------------------|----------------------------|---|--------------------------------|--|-------|
| TEST CONDITIONS: @115V2000RPM | | | ASHRAELBP32 Static | | Evaporating temperature (Condensing temperature) | | -23.3°C (-9.94°F) 54.4°C (129.92°F) | |
| Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 539 | 136 | 158 | 82 | 1.14 | 1.69 | 6.58 | 1.66 | 1.93 |

| | | | | | | | | |
|---|----------|-----|-------------------------------------|----------------------------|---|--------------------------------|--|-------|
| TEST CONDITIONS: @115V3000RPM | | | ASHRAELBP32 Static | | Evaporating temperature (Condensing temperature) | | -23.3°C (-9.94°F) 54.4°C (129.92°F) | |
| Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 795 | 200 | 233 | 127 | 1.68 | 2.50 | 6.28 | 1.58 | 1.84 |

| | | | | | | | | |
|---|----------|-----|-------------------------------------|----------------------------|---|--------------------------------|--|-------|
| TEST CONDITIONS: @115V4500RPM | | | ASHRAELBP32 Static | | Evaporating temperature (Condensing temperature) | | -23.3°C (-9.94°F) 54.4°C (129.92°F) | |
| Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| 1109 | 279 | 325 | 197 | 2.45 | 3.48 | 5.63 | 1.42 | 1.65 |

E - PERFORMANCE - CURVES

| TEST CONDITIONS: @115V2000RPM | | ASHRAE32 Static | | | (Condensing temperature 35°C (+95°F)) | | | | | |
|----------------------------------|---------------------------------|--------------------|---------|----------------------------|---------------------------------------|--------------------------|--------------------------------|-------|----------|-----------|
| Evaporating temperature | Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | | |
| | °C | (°F) | [Btu/h] | | | | [kcal/h] | [W] | [Btu/Wh] | [kcal/Wh] |
| -35 | (-31) | 302 | 76 | 89 | 49 | 0.75 | 0.95 | 6.31 | 1.59 | 1.85 |
| -30 | (-22) | 429 | 108 | 126 | 59 | 0.89 | 1.34 | 7.17 | 1.81 | 2.10 |
| -25 | (-13) | 605 | 152 | 177 | 72 | 1.03 | 1.90 | 8.24 | 2.08 | 2.42 |
| -20 | (- 4) | 810 | 204 | 237 | 84 | 1.17 | 2.55 | 9.43 | 2.38 | 2.76 |
| -15 | (+ 5) | 1026 | 258 | 301 | 96 | 1.34 | 3.23 | 10.62 | 2.68 | 3.11 |
| -10 | (+14) | 1232 | 310 | 361 | 106 | 1.55 | 3.88 | 11.74 | 2.96 | 3.44 |

| TEST CONDITIONS: @115V2000RPM | | ASHRAE32 Static | | | (Condensing temperature 45°C (+113°F)) | | | | | |
|----------------------------------|---------------------------------|--------------------|---------|----------------------------|--|--------------------------|--------------------------------|------|----------|-----------|
| Evaporating temperature | Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | | |
| | °C | (°F) | [Btu/h] | | | | [kcal/h] | [W] | [Btu/Wh] | [kcal/Wh] |
| -35 | (-31) | 284 | 72 | 83 | 51 | 0.77 | 0.89 | 5.65 | 1.42 | 1.66 |
| -30 | (-22) | 360 | 91 | 106 | 60 | 0.90 | 1.13 | 6.23 | 1.57 | 1.82 |
| -25 | (-13) | 501 | 126 | 147 | 72 | 1.04 | 1.57 | 7.04 | 1.77 | 2.06 |
| -20 | (- 4) | 686 | 173 | 201 | 85 | 1.19 | 2.16 | 8.00 | 2.02 | 2.35 |
| -15 | (+ 5) | 897 | 226 | 263 | 99 | 1.38 | 2.82 | 9.02 | 2.27 | 2.64 |
| -10 | (+14) | 1114 | 281 | 326 | 111 | 1.62 | 3.51 | 9.99 | 2.52 | 2.93 |

| TEST CONDITIONS: @115V2000RPM | | ASHRAE32 Static | | | (Condensing temperature 55°C (+131°F)) | | | | | |
|----------------------------------|---------------------------------|--------------------|---------|----------------------------|--|--------------------------|--------------------------------|------|----------|-----------|
| Evaporating temperature | Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | | |
| | °C | (°F) | [Btu/h] | | | | [kcal/h] | [W] | [Btu/Wh] | [kcal/Wh] |
| -35 | (-31) | 285 | 72 | 84 | 53 | 0.78 | 0.89 | 5.20 | 1.31 | 1.52 |
| -30 | (-22) | 322 | 81 | 94 | 61 | 0.92 | 1.01 | 5.53 | 1.39 | 1.62 |
| -25 | (-13) | 439 | 111 | 129 | 74 | 1.08 | 1.38 | 6.14 | 1.55 | 1.80 |
| -20 | (- 4) | 615 | 155 | 180 | 89 | 1.26 | 1.93 | 6.93 | 1.75 | 2.03 |
| -15 | (+ 5) | 832 | 210 | 244 | 106 | 1.50 | 2.62 | 7.81 | 1.97 | 2.29 |
| -10 | (+14) | 1070 | 270 | 314 | 123 | 1.79 | 3.38 | 8.69 | 2.19 | 2.55 |

| TEST CONDITIONS: @115V3000RPM | | ASHRAE32 Static | | | (Condensing temperature 35°C (+95°F)) | | | | | |
|----------------------------------|---------------------------------|--------------------|---------|----------------------------|---------------------------------------|--------------------------|--------------------------------|------|----------|-----------|
| Evaporating temperature | Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | | |
| | °C | (°F) | [Btu/h] | | | | [kcal/h] | [W] | [Btu/Wh] | [kcal/Wh] |
| -35 | (-31) | 463 | 117 | 136 | 77 | 1.15 | 1.45 | 5.98 | 1.51 | 1.75 |
| -30 | (-22) | 609 | 153 | 178 | 91 | 1.29 | 1.91 | 6.69 | 1.69 | 1.96 |
| -25 | (-13) | 794 | 200 | 233 | 106 | 1.47 | 2.49 | 7.50 | 1.89 | 2.20 |
| -20 | (- 4) | 1019 | 257 | 299 | 122 | 1.69 | 3.20 | 8.35 | 2.10 | 2.45 |
| -15 | (+ 5) | 1285 | 324 | 377 | 140 | 1.93 | 4.04 | 9.19 | 2.32 | 2.69 |
| -10 | (+14) | 1594 | 402 | 467 | 160 | 2.21 | 5.03 | 9.98 | 2.51 | 2.92 |

E - PERFORMANCE - CURVES

| TEST CONDITIONS: @115V3000RPM | | ASHRAE32 Static | | | (Condensing temperature 45°C (+113°F)) | | | | | |
|----------------------------------|-------|---------------------------------|----------|-----|--|----------------------------|--------------------------|--------------------------------|-----------|-------|
| Evaporating temperature | | Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 429 | 108 | 126 | 79 | 1.12 | 1.34 | 5.47 | 1.38 | 1.60 |
| -30 | (-22) | 573 | 144 | 168 | 95 | 1.30 | 1.80 | 6.07 | 1.53 | 1.78 |
| -25 | (-13) | 756 | 191 | 222 | 112 | 1.51 | 2.37 | 6.78 | 1.71 | 1.99 |
| -20 | (- 4) | 979 | 247 | 287 | 130 | 1.76 | 3.08 | 7.55 | 1.90 | 2.21 |
| -15 | (+ 5) | 1243 | 313 | 364 | 149 | 2.04 | 3.91 | 8.34 | 2.10 | 2.44 |
| -10 | (+14) | 1550 | 391 | 454 | 171 | 2.35 | 4.89 | 9.09 | 2.29 | 2.66 |

| TEST CONDITIONS: @115V3000RPM | | ASHRAE32 Static | | | (Condensing temperature 55°C (+131°F)) | | | | | |
|----------------------------------|-------|---------------------------------|----------|-----|--|----------------------------|--------------------------|--------------------------------|-----------|-------|
| Evaporating temperature | | Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 393 | 99 | 115 | 79 | 1.13 | 1.23 | 4.96 | 1.25 | 1.45 |
| -30 | (-22) | 532 | 134 | 156 | 98 | 1.34 | 1.67 | 5.43 | 1.37 | 1.59 |
| -25 | (-13) | 709 | 179 | 208 | 117 | 1.60 | 2.23 | 6.04 | 1.52 | 1.77 |
| -20 | (- 4) | 926 | 233 | 271 | 138 | 1.88 | 2.91 | 6.73 | 1.70 | 1.97 |
| -15 | (+ 5) | 1185 | 299 | 347 | 159 | 2.20 | 3.73 | 7.46 | 1.88 | 2.18 |
| -10 | (+14) | 1487 | 375 | 436 | 182 | 2.54 | 4.69 | 8.17 | 2.06 | 2.39 |

| TEST CONDITIONS: @115V4500RPM | | ASHRAE32 Static | | | (Condensing temperature 35°C (+95°F)) | | | | | |
|----------------------------------|-------|---------------------------------|----------|-----|---------------------------------------|----------------------------|--------------------------|--------------------------------|-----------|-------|
| Evaporating temperature | | Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 594 | 150 | 174 | 114 | 1.56 | 1.86 | 5.21 | 1.31 | 1.53 |
| -30 | (-22) | 768 | 194 | 225 | 136 | 1.90 | 2.41 | 5.70 | 1.44 | 1.67 |
| -25 | (-13) | 1055 | 266 | 309 | 168 | 2.31 | 3.31 | 6.26 | 1.58 | 1.84 |
| -20 | (- 4) | 1406 | 354 | 412 | 201 | 2.72 | 4.42 | 6.94 | 1.75 | 2.03 |
| -15 | (+ 5) | 1777 | 448 | 521 | 229 | 3.04 | 5.59 | 7.78 | 1.96 | 2.28 |
| -10 | (+14) | 2118 | 534 | 621 | 243 | 3.21 | 6.68 | 8.83 | 2.22 | 2.59 |

| TEST CONDITIONS: @115V4500RPM | | ASHRAE32 Static | | | (Condensing temperature 45°C (+113°F)) | | | | | |
|----------------------------------|-------|---------------------------------|----------|-----|--|----------------------------|--------------------------|--------------------------------|-----------|-------|
| Evaporating temperature | | Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 572 | 144 | 168 | 115 | 1.57 | 1.79 | 4.98 | 1.25 | 1.46 |
| -30 | (-22) | 745 | 188 | 218 | 138 | 1.91 | 2.33 | 5.46 | 1.38 | 1.60 |
| -25 | (-13) | 1021 | 257 | 299 | 171 | 2.33 | 3.20 | 5.97 | 1.50 | 1.75 |
| -20 | (- 4) | 1352 | 341 | 396 | 206 | 2.74 | 4.25 | 6.54 | 1.65 | 1.92 |
| -15 | (+ 5) | 1692 | 426 | 496 | 235 | 3.06 | 5.33 | 7.22 | 1.82 | 2.11 |
| -10 | (+14) | 1994 | 503 | 584 | 250 | 3.24 | 6.29 | 8.05 | 2.03 | 2.36 |

E - PERFORMANCE - CURVES

| TEST CONDITIONS: @115V4500RPM | | ASHRAE32 Static | | | (Condensing temperature 55°C (+131°F)) | | | | | |
|----------------------------------|-------|---------------------------------|----------|-----|--|----------------------------|--------------------------|--------------------------------|-----------|-------|
| Evaporating temperature | | Cooling capacity (Qe) +/- 5% | | | Input power (We) +/- 5% | Electric current +/- 5% | Mass flow rate +/- 5% | Efficiency EER & COP +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -35 | (-31) | 497 | 125 | 146 | 114 | 1.58 | 1.56 | 4.39 | 1.11 | 1.29 |
| -30 | (-22) | 682 | 172 | 200 | 139 | 1.93 | 2.14 | 4.97 | 1.25 | 1.46 |
| -25 | (-13) | 961 | 242 | 282 | 174 | 2.35 | 3.02 | 5.51 | 1.39 | 1.62 |
| -20 | (- 4) | 1286 | 324 | 377 | 211 | 2.77 | 4.04 | 6.07 | 1.53 | 1.78 |
| -15 | (+ 5) | 1610 | 406 | 472 | 241 | 3.11 | 5.07 | 6.68 | 1.68 | 1.96 |
| -10 | (+14) | 1886 | 475 | 553 | 257 | 3.29 | 5.95 | 7.39 | 1.86 | 2.17 |

F - EXTERNAL CHARACTERISTICS

| | |
|-------------------------|---|
| 1 Base plate | Universal VES |
| 2 Tray holder | No |
| 3 Connectors | |
| 3.1 SUCTION | 6.5 +0.12/-0.08 [mm] (0.256" +0.005"/-0.003") |
| 3.1.1 Material | Copper |
| 3.1.2 Shape | Slanted 45° up + 49° to Back |
| 3.2 DISCHARGE | 4.9 +0.10/-0.05 [mm] (0.193" +0.004"/-0.002") |
| 3.2.1 Material | Copper |
| 3.2.2 Shape | Slanted 10° up + 24° to Back |
| 3.3 PROCESS | 6.5 +0.12/-0.08 [mm] (0.256" +0.005"/-0.003") |
| 3.3.1 Material | Copper |
| 3.3.2 Shape | Slanted 47° up + 59° to Back |
| 3.4 Oil cooler (Copper) | No [mm] |
| 3.5 Connector sealing | Rubber Plugs |