

COMPRESSOR DEFINITION

| | |
|---------------------------|-------------|
| Designation | EM 20HBR |
| Nominal Voltage/Frequency | 220 V 50 Hz |
| Engineering Number | 513307986 |

A - APPLICATION / LIMIT WORKING CONDITIONS

| | | | |
|------------------------------------|-----------------------------------|-----------------------------------|-----------|
| 1 Type | Hermetic reciprocating compressor | | |
| 2 Refrigerant | R-134a | | |
| 3 Nominal voltage and frequency | 220 / 50 | [V / Hz] | |
| 4 Application type | Midium-High Back Pressure | | |
| 4.1 Evaporating temperature range | -10°C to 15°C | (14°F to 59°F) | |
| 5 Motor type | RSIR/CSIR | | |
| 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) | - | - | - |
| 8.2 LBP (43°C Ambient temperature) | - | - | - |
| 8.3 HBP (32°C Ambient temperature) | Static/Fan | 187 to 242 V | - |
| 8.4 HBP (43°C Ambient temperature) | Static/Fan | 187 to 242 V | - |
| 9 Maximum condensing temperature | | | |
| 9.1 Operating | 14.2 | [kgf/cm ²] (202 psig) | / °C - °F |
| 9.2 Peak | 15.9 | [kgf/cm ²] (226 psig) | / °C - °F |
| 10 Maximum winding temperature | 130 | [°C] | |

B - MECHANICAL DATA

| | | |
|-------------------------------|---------------|--|
| 1 Commercial designation | 1/12 | [hp] |
| 2 Displacement | 2.27 | [cm ³] (0.139 cu.in) |
| 2.1 Bore [mm] | 19.000 | |
| 2.2 Stroke [mm] | 8.000 | |
| 3 Lubricant charge | 170 | [ml] (5.75 fl.oz.) |
| 3.1 Lubricants approved | | |
| 3.2 Lubricants type/viscosity | ESTER / ISO22 | |
| 4 Weight (with oil charge) | 6.82 | [kg] (15.04 lb.) |
| 5 Nitrogen charge | 0.2 to 0.3 | [kgf/cm ²] (2.84 to 4.27 psig) |

C - ELETRICAL DATA

| | | |
|--|--------------------------------|------------------------------------|
| 1 Nominal Voltage/Frequency/Number of Phases | 220 V 50 Hz 1 ~ (Single phase) | |
| 2 Starting device type | Current Relay | |
| 2.1 Starting device | 213514032/213515225 | |
| 3 Start capacitor | 72-88(150) | [µF(VAC minimum)] |
| 4 Run capacitor | - | [µF(VAC minimum)] |
| 5 Motor protection | 4TM189NFBYY-53 | |
| 6 Start winding resistance | 50.30 | [Ω at 25°C (77°F)] +/- 8% |
| 7 Run winding resistance | 31.80 | [Ω at 25°C (77°F)] +/- 8% |
| 8 LRA - Locked rotor amperage (50/60 Hz) | 6.50/6.00 | [A] - Measured according to UL 984 |
| 9 FLA - Full load amperage L/MBP (50/60 Hz) | 0.65/0.60 | [A] - Measured according to UL 984 |
| 10 FLA - Full Load Amperage HBP (50/60 Hz) | 0.75/0.70 | [A] - Measured according to UL 984 |
| 11 Approval boards certification | CE - IRAM - UKCA - UL | |

D - PERFORMANCE - CHECK POINT DATA

| | | | | | | | | | |
|-------------------------------|----------|-----|-----------------------------|-------------------------------|---|---------------------------|--------------------------------------|-------|--|
| TEST CONDITIONS: @220V50Hz | | | ASHRAEHBP32 Static | | Evaporating temperature (Condensing temperature) | | 7.2°C (44.96°F) 54.4°C (129.92°F) | | |
| Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] | |
| 855 | 215 | 251 | 99 | 0.64 | | 8.64 | 2.18 | 2.53 | |

| | | | | | | | | | |
|-------------------------------|----------|-----|-----------------------------|-------------------------------|---|---------------------------|--------------------------------------|-------|--|
| TEST CONDITIONS: @220V50Hz | | | ASHRAEHBP32 Fan | | Evaporating temperature (Condensing temperature) | | 7.2°C (44.96°F) 54.4°C (129.92°F) | | |
| Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] | |
| 855 | 215 | 251 | 99 | 0.64 | | 8.64 | 2.18 | 2.53 | |

| | | | | | | | | | |
|-------------------------------|----------|-----|-----------------------------|-------------------------------|---|---------------------------|--|-------|--|
| TEST CONDITIONS: @220V50Hz | | | ASHRAELBP32 Static | | Evaporating temperature (Condensing temperature) | | -23.3°C (-9.94°F) 54.4°C (129.92°F) | | |
| Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] | |
| 170 | 43 | 50 | 60 | 0.53 | 0.97 | 2.83 | 0.71 | 0.83 | |

| | | | | | | | | | |
|-------------------------------|----------|-----|-----------------------------|-------------------------------|---|---------------------------|--|-------|--|
| TEST CONDITIONS: @220V50Hz | | | ASHRAELBP32 Fan | | Evaporating temperature (Condensing temperature) | | -23.3°C (-9.94°F) 54.4°C (129.92°F) | | |
| Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | | |
| [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] | |
| 170 | 43 | 50 | 60 | 0.53 | 0.97 | 2.83 | 0.71 | 0.83 | |

E - PERFORMANCE - CURVES

| | | | | | | | | | | |
|-------------------------------|----------------------------|--------------------|---------|-----------------------------|-------------------------------|-------------------------|--|--------|----------|-----------|
| TEST CONDITIONS: @220V50Hz | | ASHRAE32 Static | | | | | (Condensing temperature 45°C (+113°F)) | | | |
| Evaporating temperature | Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | | |
| | °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] |
| -10 | (+14) | 445 | 112 | 130 | 72 | 0.55 | 2.57 | 6.18 | 1.56 | 1.81 |
| -5 | (+23) | 535 | 135 | 157 | 78 | 0.57 | 3.08 | 6.85 | 1.73 | 2.01 |
| 0 | (+32) | 656 | 165 | 192 | 83 | 0.59 | 3.79 | 7.89 | 1.99 | 2.31 |
| +5 | (+41) | 810 | 204 | 237 | 87 | 0.60 | 4.71 | 9.32 | 2.35 | 2.73 |
| +10 | (+50) | 995 | 251 | 291 | 90 | 0.61 | 5.83 | 11.13 | 2.80 | 3.26 |
| +15 | (+59) | 1212 | 305 | 355 | 91 | 0.61 | 7.15 | 13.31 | 3.35 | 3.90 |

E - PERFORMANCE - CURVES

| TEST CONDITIONS: @220V50Hz | | ASHRAE32 Static | | | (Condensing temperature 55°C (+131°F)) | | | | | |
|-------------------------------|-------|----------------------------|----------|-----|---|-------------------------------|-------------------------|---------------------------|-----------|-------|
| Evaporating temperature | | Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -10 | (+14) | 367 | 92 | 108 | 75 | 0.57 | 2.12 | 4.95 | 1.25 | 1.45 |
| -5 | (+23) | 474 | 119 | 139 | 83 | 0.59 | 2.72 | 5.72 | 1.44 | 1.68 |
| 0 | (+32) | 606 | 153 | 178 | 90 | 0.61 | 3.50 | 6.72 | 1.69 | 1.97 |
| +5 | (+41) | 764 | 192 | 224 | 96 | 0.63 | 4.44 | 7.93 | 2.00 | 2.32 |
| +10 | (+50) | 947 | 239 | 277 | 101 | 0.65 | 5.55 | 9.36 | 2.36 | 2.74 |
| +15 | (+59) | 1156 | 291 | 339 | 105 | 0.66 | 6.82 | 11.02 | 2.78 | 3.23 |

| TEST CONDITIONS: @220V50Hz | | ASHRAE32 Static | | | (Condensing temperature 65°C (+149°F)) | | | | | |
|-------------------------------|-------|----------------------------|----------|-----|---|-------------------------------|-------------------------|---------------------------|-----------|-------|
| Evaporating temperature | | Cooling capacity +/- 5% | | | Power consumption +/- 5% | Current consumption +/- 5% | Gas flow rate +/- 5% | EFFICIENCY RATE +/- 7% | | |
| °C | (°F) | [Btu/h] | [kcal/h] | [W] | [W] | [A] | [kg/h] | [Btu/Wh] | [kcal/Wh] | [W/W] |
| -10 | (+14) | 296 | 74 | 87 | 76 | 0.57 | 1.71 | 3.88 | 0.98 | 1.14 |
| -5 | (+23) | 411 | 103 | 120 | 86 | 0.60 | 2.36 | 4.77 | 1.20 | 1.40 |
| 0 | (+32) | 545 | 137 | 160 | 95 | 0.63 | 3.15 | 5.72 | 1.44 | 1.68 |
| +5 | (+41) | 699 | 176 | 205 | 104 | 0.66 | 4.06 | 6.73 | 1.70 | 1.97 |
| +10 | (+50) | 872 | 220 | 255 | 112 | 0.69 | 5.11 | 7.80 | 1.97 | 2.29 |
| +15 | (+59) | 1064 | 268 | 312 | 119 | 0.72 | 6.28 | 8.93 | 2.25 | 2.62 |

F - EXTERNAL CHARACTERISTICS

| | | | |
|-------------------------|-------------------------------|------|--------------------------|
| 1 Base plate | Universal EG/F/AMEM version 2 | | |
| 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 | Straight | | |
| 3.2 DISCHARGE | 4.94 +0.08/-0.08 | [mm] | (0.194" +0.003"/-0.003") |
| 3.2.1 Material | Copper | | |
| 3.2.2 Shape | Slanted | | |
| 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 | Straight | | |
| 3.4 Oil cooler (Copper) | No | [mm] | |
| 3.5 Connector sealing | Rubber Plugs | | |