

### COMPRESSOR DEFINITION

|                           |                    |
|---------------------------|--------------------|
| Designation               | EM 20HHR           |
| Nominal Voltage/Frequency | 220-240 V 50-60 Hz |
| Engineering Number        | 513307125          |

### A - APPLICATION / LIMIT WORKING CONDITIONS

|                                    |                                   |                                   |              |
|------------------------------------|-----------------------------------|-----------------------------------|--------------|
| 1 Type                             | Hermetic reciprocating compressor |                                   |              |
| 2 Refrigerant                      | R-134a                            |                                   |              |
| 3 Nominal voltage and frequency    | 220-240 / 50-60                   | [ V / Hz ]                        |              |
| 4 Application type                 | Low-Medium-High Back Pressure     |                                   |              |
| 4.1 Evaporating temperature range  | -35°C to 15°C                     | (-31°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) | Static                            | 187 to 255 V                      | 187 to 242 V |
| 8.2 LBP (43°C Ambient temperature) | Static                            | 187 to 255 V                      | 187 to 242 V |
| 8.3 HBP (32°C Ambient temperature) | Fan                               | 187 to 255 V                      | 187 to 242 V |
| 8.4 HBP (43°C Ambient temperature) | Fan                               | 187 to 255 V                      | 187 to 242 V |
| 9 Maximum condensing temperature   |                                   |                                   |              |
| 9.1 Operating                      | 14.2                              | [kgf/cm <sup>2</sup> ] (202 psig) | / °C - °F    |
| 9.2 Peak                           | 15.9                              | [kgf/cm <sup>2</sup> ] (226 psig) | / °C - °F    |
| 10 Maximum winding temperature     | 130                               | [ °C ]                            |              |

### B - MECHANICAL DATA

|                               |               |  |
|-------------------------------|---------------|--|
| 1 Commercial designation      | 1/12          | [hp]                                       |
| 2 Displacement                | 2.27          | [cm <sup>3</sup> ] (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 <sup>2</sup> ] (2.84 to 4.27 psig) |

### C - ELETRICAL DATA

|  |  |                                    |
|--|--|------------------------------------|
| 1 Nominal Voltage/Frequency/Number of Phases | 220-240 V 50-60 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             | CCC - CE - IRAM - ISI - TUV - UKCA - VDE |                                    |

### D - PERFORMANCE - CHECK POINT DATA

| TEST CONDITIONS:<br>@220V50Hz |          |     | CECOMAFHBP<br>Fan              |                                  | Evaporating temperature<br>(Condensing temperature |                           | 5°C (41°F)<br>55°C (131°F) |       |
|-------------------------------|----------|-----|--------------------------------|----------------------------------|--|---------------------------|----------------------------|-------|
| Cooling capacity<br>+/- 5%    |          |     | Power<br>consumption<br>+/- 5% | Current<br>consumption<br>+/- 5% | Gas flow<br>rate<br>+/- 5%                         | EFFICIENCY RATE<br>+/- 7% |                            |       |
| [Btu/h]                       | [kcal/h] | [W] | [W]                            | [A]                              | [kg/h]   | [Btu/Wh]                  | [kcal/Wh]                  | [W/W] |
| 840                           | 212      | 246 | 98                             | 0.62                             | 6.05   | 8.57                      | 2.16                       | 2.51  |

| TEST CONDITIONS:<br>@220V50Hz |          |     | CECOMAFLBP<br>Fan              |                                  | Evaporating temperature<br>(Condensing temperature |                           | -25°C (-13°F)<br>55°C (131°F) |       |
|-------------------------------|----------|-----|--------------------------------|----------------------------------|--|---------------------------|-------------------------------|-------|
| Cooling capacity<br>+/- 5%    |          |     | Power<br>consumption<br>+/- 5% | Current<br>consumption<br>+/- 5% | Gas flow<br>rate<br>+/- 5%                         | EFFICIENCY RATE<br>+/- 7% |                               |       |
| [Btu/h]                       | [kcal/h] | [W] | [W]                            | [A]                              | [kg/h]   | [Btu/Wh]                  | [kcal/Wh]                     | [W/W] |
| 172                           | 43       | 50  | 59                             | 0.50                             | 1.20   | 2.92                      | 0.74                          | 0.86  |

### E - PERFORMANCE - CURVES

| TEST CONDITIONS:<br>@220V50Hz |       | CECOMAF<br>Fan             |          |     | (Condensing temperature 45°C (+113°F)) |                                  |                            |                           |           |       |
|-------------------------------|-------|----------------------------|----------|-----|--|----------------------------------|----------------------------|---------------------------|-----------|-------|
| Evaporating<br>temperature    |       | Cooling capacity<br>+/- 5% |          |     | Power<br>consumption<br>+/- 5%         | Current<br>consumption<br>+/- 5% | Gas flow<br>rate<br>+/- 5% | EFFICIENCY RATE<br>+/- 7% |           |       |
| °C                            | (°F)  | [Btu/h]                    | [kcal/h] | [W] | [W]                                    | [A]                              | [kg/h]                     | [Btu/Wh]                  | [kcal/Wh] | [W/W] |
| -35                           | (-31) | 78                         | 20       | 23  | 48                                     | 0.48                             | 0.48                       | 1.66                      | 0.42      | 0.49  |
| -30                           | (-22) | 126                        | 32       | 37  | 51                                     | 0.49                             | 0.81                       | 2.45                      | 0.62      | 0.72  |
| -25                           | (-13) | 182                        | 46       | 53  | 56                                     | 0.50                             | 1.17                       | 3.20                      | 0.81      | 0.94  |
| -20                           | (- 4) | 248                        | 62       | 73  | 62                                     | 0.51                             | 1.59                       | 3.94                      | 0.99      | 1.16  |
| -15                           | (+ 5) | 326                        | 82       | 95  | 68                                     | 0.53                             | 2.09                       | 4.74                      | 1.19      | 1.39  |
| -10                           | (+14) | 417                        | 105      | 122 | 74                                     | 0.54                             | 2.67                       | 5.63                      | 1.42      | 1.65  |
| -5                            | (+23) | 524                        | 132      | 154 | 79                                     | 0.56                             | 3.36                       | 6.68                      | 1.68      | 1.96  |
| 0                             | (+32) | 650                        | 164      | 190 | 83                                     | 0.57                             | 4.19                       | 7.92                      | 2.00      | 2.32  |
| +5                            | (+41) | 795                        | 200      | 233 | 86                                     | 0.58                             | 5.17                       | 9.42                      | 2.37      | 2.76  |
| +10                           | (+50) | 963                        | 243      | 282 | 87                                     | 0.60                             | 6.31                       | 11.22                     | 2.83      | 3.29  |
| +15                           | (+59) | 1154                       | 291      | 338 | 86                                     | 0.61                             | 7.65                       | 13.37                     | 3.37      | 3.92  |

| TEST CONDITIONS:<br>@220V50Hz |       | CECOMAF<br>Fan             |          |     | (Condensing temperature 55°C (+131°F)) |                                  |                            |                           |           |       |
|-------------------------------|-------|----------------------------|----------|-----|--|----------------------------------|----------------------------|---------------------------|-----------|-------|
| Evaporating<br>temperature    |       | Cooling capacity<br>+/- 5% |          |     | Power<br>consumption<br>+/- 5%         | Current<br>consumption<br>+/- 5% | Gas flow<br>rate<br>+/- 5% | EFFICIENCY RATE<br>+/- 7% |           |       |
| °C                            | (°F)  | [Btu/h]                    | [kcal/h] | [W] | [W]                                    | [A]                              | [kg/h]                     | [Btu/Wh]                  | [kcal/Wh] | [W/W] |
| -35                           | (-31) | 56                         | 14       | 16  | 44                                     | 0.48                             | 0.40                       | 1.34                      | 0.34      | 0.39  |
| -30                           | (-22) | 94                         | 24       | 28  | 49                                     | 0.49                             | 0.67                       | 2.00                      | 0.50      | 0.59  |
| -25                           | (-13) | 141                        | 36       | 41  | 55                                     | 0.50                             | 0.99                       | 2.60                      | 0.66      | 0.76  |
| -20                           | (- 4) | 199                        | 50       | 58  | 62                                     | 0.52                             | 1.39                       | 3.19                      | 0.80      | 0.94  |
| -15                           | (+ 5) | 269                        | 68       | 79  | 69                                     | 0.53                             | 1.88                       | 3.82                      | 0.96      | 1.12  |
| -10                           | (+14) | 354                        | 89       | 104 | 76                                     | 0.55                             | 2.48                       | 4.54                      | 1.14      | 1.33  |
| -5                            | (+23) | 456                        | 115      | 133 | 83                                     | 0.57                             | 3.22                       | 5.40                      | 1.36      | 1.58  |
| 0                             | (+32) | 576                        | 145      | 169 | 89                                     | 0.59                             | 4.11                       | 6.46                      | 1.63      | 1.89  |
| +5                            | (+41) | 717                        | 181      | 210 | 93                                     | 0.61                             | 5.16                       | 7.75                      | 1.95      | 2.27  |
| +10                           | (+50) | 882                        | 222      | 258 | 95                                     | 0.63                             | 6.41                       | 9.34                      | 2.35      | 2.74  |
| +15                           | (+59) | 1071                       | 270      | 314 | 95                                     | 0.66                             | 7.87                       | 11.26                     | 2.84      | 3.30  |

### E - PERFORMANCE - CURVES

| TEST CONDITIONS:<br>@220V50Hz |       | CECOMAF<br>Fan             |          |     | (Condensing temperature 65°C (+149°F) ) |                               |                         |                           |           |       |
|-------------------------------|-------|----------------------------|----------|-----|---|-------------------------------|-------------------------|---------------------------|-----------|-------|
| Evaporating temperature       |       | Cooling capacity<br>+/- 5% |          |     | Power consumption<br>+/- 5%             | Current consumption<br>+/- 5% | Gas flow rate<br>+/- 5% | EFFICIENCY RATE<br>+/- 7% |           |       |
| °C                            | (°F)  | [Btu/h]                    | [kcal/h] | [W] | [W]                                     | [A]                           | [kg/h]                  | [Btu/Wh]                  | [kcal/Wh] | [W/W] |
| -35                           | (-31) | 34                         | 9        | 10  | 43                                      | 0.48                          | 0.27                    | 0.73                      | 0.18      | 0.21  |
| -30                           | (-22) | 63                         | 16       | 19  | 48                                      | 0.49                          | 0.49                    | 1.37                      | 0.35      | 0.40  |
| -25                           | (-13) | 102                        | 26       | 30  | 55                                      | 0.50                          | 0.79                    | 1.95                      | 0.49      | 0.57  |
| -20                           | (- 4) | 152                        | 38       | 44  | 62                                      | 0.51                          | 1.19                    | 2.50                      | 0.63      | 0.73  |
| -15                           | (+ 5) | 215                        | 54       | 63  | 70                                      | 0.53                          | 1.69                    | 3.09                      | 0.78      | 0.91  |
| -10                           | (+14) | 294                        | 74       | 86  | 78                                      | 0.55                          | 2.33                    | 3.75                      | 0.95      | 1.10  |
| -5                            | (+23) | 391                        | 98       | 114 | 85                                      | 0.57                          | 3.12                    | 4.55                      | 1.15      | 1.33  |
| 0                             | (+32) | 507                        | 128      | 148 | 91                                      | 0.59                          | 4.09                    | 5.53                      | 1.39      | 1.62  |
| +5                            | (+41) | 645                        | 162      | 189 | 96                                      | 0.62                          | 5.24                    | 6.74                      | 1.70      | 1.97  |
| +10                           | (+50) | 806                        | 203      | 236 | 99                                      | 0.64                          | 6.61                    | 8.23                      | 2.07      | 2.41  |
| +15                           | (+59) | 994                        | 250      | 291 | 99                                      | 0.67                          | 8.20                    | 10.06                     | 2.53      | 2.95  |

### 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 plated steel           |      |                          |
| 3.1.2 Shape             | Straight                      |      |                          |
| 3.2 DISCHARGE           | 6.5 +0.12/-0.08               | [mm] | (0.256" +0.005"/-0.003") |
| 3.2.1 Material          | Copper plated steel           |      |                          |
| 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 plated steel           |      |                          |
| 3.3.2 Shape             | Straight                      |      |                          |
| 3.4 Oil cooler (Copper) | No                            | [mm] |                          |
| 3.5 Connector sealing   | Rubber Plugs                  |      |                          |