

## Model: MHA-V12W/D2N8-B+HBT-A160/240C\*\*\*\*GN8-B

| Configure model                     |  |
|-------------------------------------|--|
| Model name                          | MHA-V12W/D2N8-B+HBT-A160/240C****GN8-B |
| Application                         | Heating + DHW + low temp               |
| Units                               | Indoor + Outdoor                       |
| Climate Zone                        | Colder Climate + Warmer Climate        |
| Reversibility                       | Yes                                    |
| Cooling mode application (optional) | n/a                                    |

| General Data |             |
|--------------|-------------|
| Power supply | 1x230V 50Hz |

### Heating

| EN 14511-4                                 |        |
|--|--------|
| Shutting off the heat transfer medium flow | passed |
| Complete power supply failure              | passed |
| Defrost test                               | passed |
| Starting and operating test                | passed |

| EN 14511-2  |                 |                    |
|-------------|-----------------|--------------------|
|             | Low temperature | Medium temperature |
| Heat output | 12.10 kW        | 12.00 kW           |
| El input    | 2.44 kW         | 3.87 kW            |
| COP         | 4.95            | 3.10               |

### Average Climate

This information was generated by the HP KEYMARK database on 10 Dec 2021

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 43 dB(A)               | 43 dB(A)                  |
| Sound power level outdoor | 64 dB(A)               | 64 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
| $\eta_s$        | 189 %                  | 135 %                     |
| Prated          | 12.00 kW               | 11.58 kW                  |
| SCOP            | 4.81                   | 3.45                      |
| Tbiv            | -7 °C                  | -7 °C                     |
| TOL             | -10 °C                 | -10 °C                    |
| Pdh Tj = -7°C   | 10.61 kW               | 10.25 kW                  |
| COP Tj = -7°C   | 2.88                   | 2.01                      |
| Cdh Tj = -7 °C  | 0.90                   | 0.90                      |
| Pdh Tj = +2°C   | 6.69 kW                | 6.52 kW                   |
| COP Tj = +2°C   | 4.65                   | 3.44                      |
| Cdh Tj = +2 °C  | 0.90                   | 0.90                      |
| Pdh Tj = +7°C   | 4.44 kW                | 4.36 kW                   |
| COP Tj = +7°C   | 6.62                   | 4.59                      |
| Cdh Tj = +7 °C  | 0.90                   | 0.90                      |

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|   |             |             |
|---|-------------|-------------|
| Pdh Tj = 12°C                                       | 3.74 kW     | 3.30 kW     |
| COP Tj = 12°C                                       | 8.47        | 6.05        |
| Cdh Tj = +12 °C                                     | 0.90        | 0.90        |
| Pdh Tj = Tbiv                                       | 10.61 kW    | 10.25 kW    |
| COP Tj = Tbiv                                       | 2.88        | 2.01        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 10.75 kW    | 9.10 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.77        | 1.79        |
| WTOL  | 65 °C       | 65 °C       |
| Poff  | 14 W        | 14 W        |
| PTO   | 24 W        | 24 W        |
| PSB   | 14 W        | 14 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 1.26 kW     | 2.50 kW     |
| Annual energy consumption Qhe                       | 5152 kWh    | 6927 kWh    |

## Warmer Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 43 dB(A)               | 43 dB(A)                  |
| Sound power level outdoor | 64 dB(A)               | 64 dB(A)                  |

This information was generated by the HP KEYMARK database on 10 Dec 2021

**EN 14825**

|   | <b>Low temperature</b> | <b>Medium temperature</b> |
|---|------------------------|---------------------------|
| $\eta_s$  | 256 %                  | 174 %                     |
| Prated  | 11.11 kW               | 12.51 kW                  |
| SCOP  | 6.53                   | 4.43                      |
| Tbiv  | 7 °C                   | 7 °C                      |
| TOL   | 2 °C                   | 2 °C                      |
| Pdh Tj = +2°C                                       | 11.11 kW               | 12.08 kW                  |
| COP Tj = +2°C                                       | 3.59                   | 2.31                      |
| Cdh Tj = +2 °C                                      | 0.900                  | 0.900                     |
| Pdh Tj = +7°C                                       | 7.14 kW                | 8.04 kW                   |
| COP Tj = +7°C                                       | 5.87                   | 3.86                      |
| Cdh Tj = +7 °C                                      | 0.900                  | 0.900                     |
| Pdh Tj = 12°C                                       | 3.56 kW                | 3.75 kW                   |
| COP Tj = 12°C                                       | 7.94                   | 5.70                      |
| Cdh Tj = +12 °C                                     | 0.900                  | 0.900                     |
| Pdh Tj = Tbiv                                       | 7.14 kW                | 8.04 kW                   |
| COP Tj = Tbiv                                       | 5.87                   | 3.86                      |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 11.11 kW               | 12.08 kW                  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.59                   | 2.31                      |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh |                        |                           |

This information was generated by the HP KEYMARK database on 10 Dec 2021

|  |             |             |
|--|-------------|-------------|
| WTOL                                       | 65 °C       | 65 °C       |
| Poff                                       | 14 W        | 14 W        |
| PTO  | 24 W        | 24 W        |
| PSB  | 14 W        | 14 W        |
| PCK  | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP                 | 0.00 kW     | 0.44 kW     |
| Annual energy consumption Qhe              | 2292 kWh    | 3776 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 43 dB(A)               | 43 dB(A)                  |
| Sound power level outdoor | 64 dB(A)               | 64 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
| $\eta_s$        | 160 %                  | 118 %                     |
| Prated          | 11.38 kW               | 10.32 kW                  |
| SCOP            | 4.08                   | 3.02                      |
| Tbiv            | -15 °C                 | -15 °C                    |

This information was generated by the HP KEYMARK database on 10 Dec 2021

|   |         |         |
|---|---------|---------|
| TOL   | -22 °C  | -22 °C  |
| Pdh Tj = -7°C                                       | 7.05 kW | 6.63 kW |
| COP Tj = -7°C                                       | 3.48    | 2.63    |
| Cdh Tj = -7 °C                                      | 0.90    | 0.90    |
| Pdh Tj = +2°C                                       | 4.68 kW | 4.07 kW |
| COP Tj = +2°C                                       | 4.96    | 3.60    |
| Cdh Tj = +2 °C                                      | 0.90    | 0.90    |
| Pdh Tj = +7°C                                       | 3.14 kW | 2.78 kW |
| COP Tj = +7°C                                       | 6.10    | 4.54    |
| Cdh Tj = +7 °C                                      | 0.90    | 0.90    |
| Pdh Tj = 12°C                                       | 3.57 kW | 3.33 kW |
| COP Tj = 12°C                                       | 7.87    | 6.25    |
| Cdh Tj = +12 °C                                     | 0.90    | 0.90    |
| Pdh Tj = Tbiv                                       | 9.28 kW | 8.42 kW |
| COP Tj = Tbiv                                       | 2.59    | 1.84    |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.01 kW | 4.20 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 1.98    | 1.13    |
| WTOL  | 65 °C   | 65 °C   |
| Poff  | 14 W    | 14 W    |
| PTO   | 24 W    | 24 W    |
| PSB   | 14 W    | 14 W    |

This information was generated by the HP KEYMARK database on 10 Dec 2021

|  |             |             |
|--|-------------|-------------|
| PCK  | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input   | Electricity | Electricity |
| Supplementary Heater: PSUP                   | 4.37 kW     | 6.12 kW     |
| Annual energy consumption Q <sub>he</sub>    | 6870 kWh    | 8419 kWh    |
| P <sub>dh Tj = -15°C (if TOL&lt;-20°C)</sub> | 9.28        | 8.42        |
| COP T <sub>j = -15°C (if TOL&lt;-20°C)</sub> | 2.59        | 1.84        |
| C <sub>dh Tj = -15 °C</sub>                  | 0.90        | 0.90        |

## Domestic Hot Water (DHW)

### Average Climate

| <b>EN 16147</b>                 |            |
|---------------------------------|------------|
| Declared load profile           | XL         |
| Efficiency $\eta_{DHW}$         | 123 %      |
| COP                             | 3.00       |
| Heating up time                 | 1:38 h:min |
| Standby power input             | 34.0 W     |
| Reference hot water temperature | 48.5 °C    |
| Mixed water at 40°C             | 280 l      |

### Warmer Climate

| <b>EN 16147</b>                 |            |
|---------------------------------|------------|
| Declared load profile           | XL         |
| Efficiency $\eta_{DHW}$         | 153 %      |
| COP                             | 3.73       |
| Heating up time                 | 1:33 h:min |
| Standby power input             | 30.0 W     |
| Reference hot water temperature | 48.5 °C    |
| Mixed water at 40°C             | 280 l      |

## Colder Climate

| <b>EN 16147</b>                 |            |
|---------------------------------|------------|
| Declared load profile           | XL         |
| Efficiency $\eta_{DHW}$         | 92 %       |
| COP                             | 2.24       |
| Heating up time                 | 2:06 h:min |
| Standby power input             | 36.0 W     |
| Reference hot water temperature | 48.5 °C    |
| Mixed water at 40°C             | 280 l      |