

This information was generated by the HP KEYMARK database on 23 Jun 2022

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| | | | |
|---------------------|--------------------------------|----------|-------------|
| Summary of | MA(M/B) 12-14-16 v10 | Reg. No. | 041-K012-07 |
| Certificate Holder | | | |
| Name | Salvador Escoda S.A. | | |
| Address | Carrer Nàpols 249 Pl.1 | Zip | 08013 |
| City | Barcelona | Country | Spain |
| Certification Body | BRE Global Limited | | |
| Subtype title | MA(M/B) 12-14-16 v10 | | |
| Heat Pump Type | Outdoor Air/Water | | |
| Refrigerant | R32 | | |
| Mass of Refrigerant | 1.84 kg | | |
| Certification Date | 21.05.2021 | | |
| Testing basis | HP Keymark Scheme Rules Rev 08 | | |

Model: MAB-12-V10M + HR-12-14-16-V10M

| Configure model | |
|-------------------------------------|---------------------------------|
| Model name | MAB-12-V10M + HR-12-14-16-V10M |
| Application | Heating (medium 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 14511-2 | | |
|-------------|-----------------|--------------------|
| | 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 |

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

Warmer Climate

This information was generated by the HP KEYMARK database on 23 Jun 2022

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 64 dB(A) | 64 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_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 |

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| | | |
|---|-------------|-------------|
| 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 | | |
| 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

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

| EN 14825 |
|-----------------|
|-----------------|

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | Low temperature | Medium temperature |
|---|------------------------|---------------------------|
| η_s | 160 % | 118 % |
| Prated | 11.38 kW | 10.32 kW |
| SCOP | 4.08 | 3.02 |
| Tbiv | -15 °C | -15 °C |
| 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 |

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| | | |
|---|-------------|-------------|
| 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 |
| 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 Qhe | 6870 kWh | 8419 kWh |
| Pdh Tj = -15°C (if TOL<-20°C) | 9.28 | 8.42 |
| COP Tj = -15°C (if TOL<-20°C) | 2.59 | 1.84 |
| Cdh Tj = -15 °C | 0.90 | 0.90 |

Average Climate

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

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| η_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 |
| 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 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| 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 |

Model: MAB-16-V10M + HR-12-14-16-V10M

| Configure model | |
|-------------------------------------|---------------------------------|
| Model name | MAB-16-V10M + HR-12-14-16-V10M |
| Application | Heating (medium 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 14511-2 | | |
|-------------|-----------------|--------------------|
| | Low temperature | Medium temperature |
| Heat output | 16.00 kW | 16.00 kW |
| El input | 3.56 kW | 5.52 kW |
| COP | 4.50 | 2.90 |

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

Warmer Climate

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 249 % | 176 % |
| Prated | 13.09 kW | 13.78 kW |
| SCOP | 6.33 | 4.48 |
| Tbiv | 7 °C | 7 °C |
| TOL | 2 °C | 2 °C |
| Pdh Tj = +2°C | 13.09 kW | 13.38 kW |
| COP Tj = +2°C | 3.35 | 2.29 |
| Cdh Tj = +2 °C | 0.900 | 0.900 |
| Pdh Tj = +7°C | 8.42 kW | 8.86 kW |
| COP Tj = +7°C | 5.36 | 3.84 |
| Cdh Tj = +7 °C | 0.900 | 0.900 |
| Pdh Tj = 12°C | 3.88 kW | 4.06 kW |
| COP Tj = 12°C | 8.11 | 5.86 |
| Cdh Tj = +12 °C | 0.900 | 0.900 |

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| | | |
|---|-------------|-------------|
| Pdh Tj = Tbiv | 8.42 kW | 8.86 kW |
| COP Tj = Tbiv | 5.36 | 3.84 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 13.09 kW | 13.38 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.35 | 2.29 |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | | |
| 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 | 0.40 kW |
| Annual energy consumption Qhe | 2781 kWh | 4112 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

| EN 14825 |
|-----------------|
|-----------------|

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | Low temperature | Medium temperature |
|---|------------------------|---------------------------|
| η_s | 158 % | 122 % |
| Prated | 13.76 kW | 11.79 kW |
| SCOP | 4.02 | 3.12 |
| Tbiv | -15 °C | -15 °C |
| TOL | -22 °C | -22 °C |
| Pdh Tj = -7°C | 8.31 kW | 7.64 kW |
| COP Tj = -7°C | 3.37 | 2.65 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 5.27 kW | 4.43 kW |
| COP Tj = +2°C | 4.86 | 3.79 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 3.62 kW | 2.98 kW |
| COP Tj = +7°C | 6.49 | 4.81 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.35 kW | 3.43 kW |
| COP Tj = 12°C | 7.40 | 6.29 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 11.22 kW | 9.62 kW |
| COP Tj = Tbiv | 2.43 | 1.86 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.89 kW | 5.22 kW |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 1.97 | 1.23 |
| 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 | 4.87 kW | 6.57 kW |
| Annual energy consumption Qhe | 8431 kWh | 9309 kWh |
| Pdh Tj = -15°C (if TOL<-20°C) | 11.22 | 9.62 |
| COP Tj = -15°C (if TOL<-20°C) | 2.43 | 1.86 |
| Cdh Tj = -15 °C | 0.90 | 0.90 |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| η_s | 182 % | 133 % |
| Prated | 15.21 kW | 13.02 kW |
| SCOP | 4.62 | 3.41 |
| Tbiv | -7 °C | -7 °C |
| TOL | -10 °C | -10 °C |
| Pdh Tj = -7°C | 13.45 kW | 11.52 kW |
| COP Tj = -7°C | 2.72 | 1.99 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 8.57 kW | 7.18 kW |
| COP Tj = +2°C | 4.41 | 3.34 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 5.70 kW | 4.68 kW |
| COP Tj = +7°C | 6.56 | 4.61 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.78 kW | 3.32 kW |
| COP Tj = 12°C | 8.51 | 6.07 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 13.45 kW | 11.52 kW |
| COP Tj = Tbiv | 2.72 | 1.99 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 12.52 kW | 10.33 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.48 | 1.80 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| 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 | 2.68 kW | 2.67 kW |
| Annual energy consumption Qhe | 6804 kWh | 7895 kWh |

Model: MAM-12-V10M

Configure model

| | |
|-------------------------------------|---------------------------------|
| Model name | MAM-12-V10M |
| Application | Heating (medium temp) |
| Units | Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

General Data

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

Heating

EN 14511-2

| | Low temperature | Medium temperature |
|-------------|-----------------|--------------------|
| Heat output | 12.10 kW | 11.90 kW |
| El input | 2.44 kW | 3.90 kW |
| COP | 4.95 | 3.05 |

EN 14511-4

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

Warmer Climate

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_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 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| 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 | | |
| 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

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 160 % | 118 % |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| Prated | 11.38 kW | 10.32 kW |
| SCOP | 4.08 | 3.02 |
| Tbiv | -15 °C | -15 °C |
| 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 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| 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 | 4.37 kW | 6.12 kW |
| Annual energy consumption Qhe | 6870 kWh | 8419 kWh |
| Pdh Tj = -15°C (if TOL<-20°C) | 9.28 | 8.42 |
| COP Tj = -15°C (if TOL<-20°C) | 2.59 | 1.84 |
| Cdh Tj = -15 °C | 0.90 | 0.90 |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 189 % | 135 % |
| Prated | 12.00 kW | 11.58 kW |
| SCOP | 4.81 | 3.45 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| 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 |
| 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 |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| 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 Q _{he} | 5152 kWh | 6927 kWh |

Model: MAM-14-V10M

Configure model

| | |
|-------------------------------------|---------------------------------|
| Model name | MAM-14-V10M |
| Application | Heating (medium temp) |
| Units | Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

General Data

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

Heating

EN 14511-2

| | Low temperature | Medium temperature |
|-------------|-----------------|--------------------|
| Heat output | 14.50 kW | 13.80 kW |
| El input | 3.15 kW | 4.68 kW |
| COP | 4.60 | 2.95 |

EN 14511-4

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

Warmer Climate

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 260 % | 177 % |
| Prated | 12.11 kW | 13.74 kW |
| SCOP | 6.63 | 4.49 |
| Tbiv | 7 °C | 7 °C |
| TOL | 2 °C | 2 °C |
| Pdh Tj = +2°C | 12.04 kW | 13.05 kW |
| COP Tj = +2°C | 3.44 | 2.20 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 7.78 kW | 8.83 kW |
| COP Tj = +7°C | 5.84 | 3.91 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.75 kW | 4.09 kW |
| COP Tj = 12°C | 8.25 | 5.90 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 7.78 kW | 8.83 kW |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| COP $T_j = T_{biv}$ | 5.84 | 3.91 |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 12.04 kW | 13.05 kW |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 3.44 | 2.20 |
| 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 | 0.07 kW | 0.69 kW |
| Annual energy consumption Q_{he} | 2457 kWh | 4088 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 160 % | 119 % |
| Prated | 12.64 kW | 10.97 kW |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|---------|
| SCOP | 4.07 | 3.05 |
| Tbiv | -15 °C | -15 °C |
| TOL | -22 °C | -22 °C |
| Pdh Tj = -7°C | 7.97 kW | 6.89 kW |
| COP Tj = -7°C | 3.44 | 2.66 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 5.05 kW | 4.32 kW |
| COP Tj = +2°C | 4.92 | 3.66 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 3.16 kW | 3.06 kW |
| COP Tj = +7°C | 6.11 | 4.72 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.58 kW | 3.33 kW |
| COP Tj = 12°C | 7.82 | 6.25 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 10.31 kW | 8.95 kW |
| COP Tj = Tbiv | 2.53 | 1.79 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.57 kW | 4.20 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 1.92 | 1.13 |
| WTOL | 65 °C | 65 °C |
| Poff | 14 W | 14 W |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| 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 | 5.07 kW | 6.77 kW |
| Annual energy consumption Q _{he} | 7667 kWh | 8866 kWh |
| P _{dh} T _j = -15°C (if TOL<-20°C) | 10.31 | 8.95 |
| COP T _j = -15°C (if TOL<-20°C) | 2.53 | 1.79 |
| C _{dh} T _j = -15 °C | 0.90 | 0.90 |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 186 % | 136 % |
| Prated | 13.73 kW | 12.08 kW |
| SCOP | 4.72 | 3.47 |
| T _{biv} | -7 °C | -7 °C |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| TOL | -10 °C | -10 °C |
| Pdh Tj = -7°C | 12.14 kW | 10.69 kW |
| COP Tj = -7°C | 2.79 | 2.01 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 7.95 kW | 6.86 kW |
| COP Tj = +2°C | 4.52 | 3.43 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 5.20 kW | 4.64 kW |
| COP Tj = +7°C | 6.68 | 4.66 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.76 kW | 3.32 kW |
| COP Tj = 12°C | 8.52 | 6.13 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 12.14 kW | 10.69 kW |
| COP Tj = Tbiv | 2.79 | 2.01 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 11.48 kW | 9.19 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.59 | 1.76 |
| 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 23 Jun 2022

| | | |
|--|-------------|-------------|
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 2.23 kW | 2.91 kW |
| Annual energy consumption Q _{he} | 6012 kWh | 7202 kWh |

Model: MAM-16-V10M

Configure model

| | |
|-------------------------------------|---------------------------------|
| Model name | MAM-16-V10M |
| Application | Heating (medium temp) |
| Units | Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

General Data

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

Heating

EN 14511-2

| | Low temperature | Medium temperature |
|-------------|-----------------|--------------------|
| Heat output | 15.90 kW | 16.00 kW |
| El input | 3.53 kW | 5.61 kW |
| COP | 4.50 | 2.85 |

EN 14511-4

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

Warmer Climate

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 249 % | 176 % |
| Prated | 13.09 kW | 13.78 kW |
| SCOP | 6.33 | 4.48 |
| Tbiv | 7 °C | 7 °C |
| TOL | 2 °C | 2 °C |
| Pdh Tj = +2°C | 13.09 kW | 13.38 kW |
| COP Tj = +2°C | 3.35 | 2.29 |
| Cdh Tj = +2 °C | 0.900 | 0.900 |
| Pdh Tj = +7°C | 8.42 kW | 8.86 kW |
| COP Tj = +7°C | 5.36 | 3.84 |
| Cdh Tj = +7 °C | 0.900 | 0.900 |
| Pdh Tj = 12°C | 3.88 kW | 4.06 kW |
| COP Tj = 12°C | 8.11 | 5.86 |
| Cdh Tj = +12 °C | 0.900 | 0.900 |
| Pdh Tj = Tbiv | 8.42 kW | 8.86 kW |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| COP $T_j = T_{biv}$ | 5.36 | 3.84 |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 13.09 kW | 13.38 kW |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 3.35 | 2.29 |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | | |
| 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 | 0.40 kW |
| Annual energy consumption Q_{he} | 2781 kWh | 4112 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 158 % | 122 % |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| Prated | 13.76 kW | 11.79 kW |
| SCOP | 4.02 | 3.12 |
| Tbiv | -15 °C | -15 °C |
| TOL | -22 °C | -22 °C |
| Pdh Tj = -7°C | 8.31 kW | 7.64 kW |
| COP Tj = -7°C | 3.37 | 2.65 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 5.27 kW | 4.43 kW |
| COP Tj = +2°C | 4.86 | 3.79 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 3.62 kW | 2.98 kW |
| COP Tj = +7°C | 6.49 | 4.81 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.35 kW | 3.43 kW |
| COP Tj = 12°C | 7.40 | 6.29 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 11.22 kW | 9.62 kW |
| COP Tj = Tbiv | 2.43 | 1.86 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.89 kW | 5.22 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 1.97 | 1.23 |
| WTOL | 65 °C | 65 °C |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| 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 | 4.87 kW | 6.57 kW |
| Annual energy consumption Q _{he} | 8431 kWh | 9309 kWh |
| P _{dh} T _j = -15°C (if TOL<-20°C) | 11.22 | 9.62 |
| COP T _j = -15°C (if TOL<-20°C) | 2.43 | 1.86 |
| C _{dh} T _j = -15 °C | 0.90 | 0.90 |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 182 % | 133 % |
| Prated | 15.21 kW | 13.02 kW |
| SCOP | 4.62 | 3.41 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| Tbiv | -7 °C | -7 °C |
| TOL | -10 °C | -10 °C |
| Pdh Tj = -7°C | 13.45 kW | 11.52 kW |
| COP Tj = -7°C | 2.72 | 1.99 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 8.57 kW | 7.18 kW |
| COP Tj = +2°C | 4.41 | 3.34 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 5.70 kW | 4.68 kW |
| COP Tj = +7°C | 6.56 | 4.61 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.78 kW | 3.32 kW |
| COP Tj = 12°C | 8.51 | 6.07 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 13.45 kW | 11.52 kW |
| COP Tj = Tbiv | 2.72 | 1.99 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 12.52 kW | 10.33 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.48 | 1.80 |
| WTOL | 65 °C | 65 °C |
| Poff | 14 W | 14 W |
| PTO | 24 W | 24 W |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| PSB | 14 W | 14 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 2.68 kW | 2.67 kW |
| Annual energy consumption Q _{he} | 6804 kWh | 7895 kWh |

Model: MAB-12-V10T + HR-12-14-16-V10M

| Configure model | |
|-------------------------------------|---------------------------------|
| Model name | MAB-12-V10T + HR-12-14-16-V10M |
| Application | Heating (medium temp) |
| Units | Indoor + Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

| General Data | |
|--------------|-------------|
| Power supply | 3x400V 50Hz |

Heating

| 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 |

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

Warmer Climate

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 64 dB(A) | 64 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 256 % | 174 % |
| Prated | 11.11 kW | 12.51 kW |
| SCOP | 6.53 | 4.42 |
| 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 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| 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 | | |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 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 | 2296 kWh | 3780 kWh |

Colder Climate

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

| EN 14825 |
|-----------------|
|-----------------|

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | Low temperature | Medium temperature |
|---|------------------------|---------------------------|
| η_s | 160 % | 118 % |
| Prated | 11.38 kW | 10.32 kW |
| SCOP | 4.08 | 3.02 |
| Tbiv | -15 °C | -15 °C |
| 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 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 1.98 | 1.13 |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| 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 Qhe | 6871 kWh | 8420 kWh |
| Pdh Tj = -15°C (if TOL<-20°C) | 9.28 | 8.42 |
| COP Tj = -15°C (if TOL<-20°C) | 2.59 | 1.84 |
| Cdh Tj = -15 °C | 0.90 | 0.90 |

Average Climate

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

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| η_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 |
| 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 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 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 | 5153 kWh | 6928 kWh |

Model: MAB-14-V10T + HR-12-14-16-V10M

| Configure model | |
|-------------------------------------|---------------------------------|
| Model name | MAB-14-V10T + HR-12-14-16-V10M |
| Application | Heating (medium temp) |
| Units | Indoor + Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

| General Data | |
|--------------|-------------|
| Power supply | 3x400V 50Hz |

Heating

| EN 14511-2 | | |
|-------------|-----------------|--------------------|
| | Low temperature | Medium temperature |
| Heat output | 14.50 kW | 13.80 kW |
| El input | 3.09 kW | 4.60 kW |
| COP | 4.70 | 3.00 |

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

Warmer Climate

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 260 % | 176 % |
| Prated | 12.11 kW | 13.74 kW |
| SCOP | 6.63 | 4.48 |
| Tbiv | 7 °C | 7 °C |
| TOL | 2 °C | 2 °C |
| Pdh Tj = +2°C | 12.04 kW | 13.05 kW |
| COP Tj = +2°C | 3.44 | 2.20 |
| Cdh Tj = +2 °C | 0.900 | 0.900 |
| Pdh Tj = +7°C | 7.78 kW | 8.83 kW |
| COP Tj = +7°C | 5.84 | 3.91 |
| Cdh Tj = +7 °C | 0.900 | 0.900 |
| Pdh Tj = 12°C | 3.75 kW | 4.09 kW |
| COP Tj = 12°C | 8.25 | 5.90 |
| Cdh Tj = +12 °C | 0.900 | 0.900 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| Pdh Tj = Tbiv | 7.78 kW | 8.83 kW |
| COP Tj = Tbiv | 5.84 | 3.91 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 12.04 kW | 13.05 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.44 | 2.20 |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | | |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 0.07 kW | 0.69 kW |
| Annual energy consumption Qhe | 2462 kWh | 4092 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 |
|-----------------|
|-----------------|

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | Low temperature | Medium temperature |
|---|------------------------|---------------------------|
| η_s | 160 % | 119 % |
| Prated | 12.64 kW | 10.97 kW |
| SCOP | 4.06 | 3.05 |
| Tbiv | -15 °C | -15 °C |
| TOL | -22 °C | -22 °C |
| Pdh Tj = -7°C | 7.97 kW | 6.89 kW |
| COP Tj = -7°C | 3.44 | 2.66 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 5.05 kW | 4.32 kW |
| COP Tj = +2°C | 4.92 | 3.66 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 3.16 kW | 3.06 kW |
| COP Tj = +7°C | 6.11 | 4.72 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.58 kW | 3.33 kW |
| COP Tj = 12°C | 7.82 | 6.25 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 10.31 kW | 8.95 kW |
| COP Tj = Tbiv | 2.53 | 1.79 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.57 kW | 4.20 kW |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 1.92 | 1.13 |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 5.07 kW | 6.77 kW |
| Annual energy consumption Qhe | 7667 kWh | 8867 kWh |
| Pdh Tj = -15°C (if TOL<-20°C) | 10.31 | 8.95 |
| COP Tj = -15°C (if TOL<-20°C) | 2.53 | 1.79 |
| Cdh Tj = -15 °C | 0.90 | 0.90 |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| η_s | 186 % | 136 % |
| Prated | 13.73 kW | 12.08 kW |
| SCOP | 4.72 | 3.47 |
| Tbiv | -7 °C | -7 °C |
| TOL | -10 °C | -10 °C |
| Pdh Tj = -7°C | 12.14 kW | 10.69 kW |
| COP Tj = -7°C | 2.79 | 2.01 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 7.95 kW | 6.86 kW |
| COP Tj = +2°C | 4.52 | 3.43 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 5.20 kW | 4.64 kW |
| COP Tj = +7°C | 6.68 | 4.66 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.76 kW | 3.32 kW |
| COP Tj = 12°C | 8.52 | 6.13 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 12.14 kW | 10.69 kW |
| COP Tj = Tbiv | 2.79 | 2.01 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 11.48 kW | 9.19 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.59 | 1.76 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 2.23 kW | 2.91 kW |
| Annual energy consumption Qhe | 6013 kWh | 7203 kWh |

Model: MAB-16-V10T + HR-12-14-16-V10M

| Configure model | |
|-------------------------------------|---------------------------------|
| Model name | MAB-16-V10T + HR-12-14-16-V10M |
| Application | Heating (medium temp) |
| Units | Indoor + Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

| General Data | |
|--------------|-------------|
| Power supply | 3x400V 50Hz |

Heating

| EN 14511-2 | | |
|-------------|-----------------|--------------------|
| | Low temperature | Medium temperature |
| Heat output | 16.00 kW | 16.00 kW |
| El input | 3.56 kW | 5.52 kW |
| COP | 4.50 | 2.90 |

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

Warmer Climate

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 248 % | 176 % |
| Prated | 13.09 kW | 13.78 kW |
| SCOP | 6.33 | 4.47 |
| Tbiv | 7 °C | 7 °C |
| TOL | 2 °C | 2 °C |
| Pdh Tj = +2°C | 13.09 kW | 13.38 kW |
| COP Tj = +2°C | 3.35 | 2.29 |
| Cdh Tj = +2 °C | 0.900 | 0.900 |
| Pdh Tj = +7°C | 8.42 kW | 8.86 kW |
| COP Tj = +7°C | 5.36 | 3.84 |
| Cdh Tj = +7 °C | 0.900 | 0.900 |
| Pdh Tj = 12°C | 3.88 kW | 4.06 kW |
| COP Tj = 12°C | 8.11 | 5.86 |
| Cdh Tj = +12 °C | 0.900 | 0.900 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| Pdh Tj = Tbiv | 8.42 kW | 8.86 kW |
| COP Tj = Tbiv | 5.36 | 3.84 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 13.09 kW | 13.38 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.35 | 2.29 |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | | |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 0.00 kW | 0.40 kW |
| Annual energy consumption Qhe | 2786 kWh | 4116 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

| EN 14825 |
|-----------------|
|-----------------|

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | Low temperature | Medium temperature |
|---|------------------------|---------------------------|
| η_s | 158 % | 122 % |
| Prated | 13.76 kW | 11.79 kW |
| SCOP | 4.02 | 3.12 |
| Tbiv | -15 °C | -15 °C |
| TOL | -22 °C | -22 °C |
| Pdh Tj = -7°C | 8.31 kW | 7.64 kW |
| COP Tj = -7°C | 3.37 | 2.65 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 5.27 kW | 4.43 kW |
| COP Tj = +2°C | 4.86 | 3.79 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 3.62 kW | 2.98 kW |
| COP Tj = +7°C | 6.49 | 4.81 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.35 kW | 3.43 kW |
| COP Tj = 12°C | 7.40 | 6.29 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 11.22 kW | 9.62 kW |
| COP Tj = Tbiv | 2.43 | 1.86 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.89 kW | 5.22 kW |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 1.97 | 1.23 |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 4.87 kW | 6.57 kW |
| Annual energy consumption Qhe | 8431 kWh | 9310 kWh |
| Pdh Tj = -15°C (if TOL<-20°C) | 11.22 | 9.62 |
| COP Tj = -15°C (if TOL<-20°C) | 2.43 | 1.86 |
| Cdh Tj = -15 °C | 0.90 | 0.90 |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| η_s | 182 % | 133 % |
| Prated | 15.21 kW | 13.02 kW |
| SCOP | 4.62 | 3.41 |
| Tbiv | -7 °C | -7 °C |
| TOL | -10 °C | -10 °C |
| Pdh Tj = -7°C | 13.45 kW | 11.52 kW |
| COP Tj = -7°C | 2.72 | 1.99 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 8.57 kW | 7.18 kW |
| COP Tj = +2°C | 4.41 | 3.34 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 5.70 kW | 4.68 kW |
| COP Tj = +7°C | 6.56 | 4.61 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.78 kW | 3.32 kW |
| COP Tj = 12°C | 8.51 | 6.07 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 13.45 kW | 11.52 kW |
| COP Tj = Tbiv | 2.72 | 1.99 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 12.52 kW | 10.33 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.48 | 1.80 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 2.68 kW | 2.67 kW |
| Annual energy consumption Qhe | 6805 kWh | 7896 kWh |

Model: MAM-12-V10T

| Configure model | |
|-------------------------------------|---------------------------------|
| Model name | MAM-12-V10T |
| Application | Heating (medium temp) |
| Units | Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

| General Data | |
|--------------|-------------|
| Power supply | 3x400V 50Hz |

Heating

| EN 14511-2 | | |
|-------------|-----------------|--------------------|
| | Low temperature | Medium temperature |
| Heat output | 12.10 kW | 11.90 kW |
| El input | 2.44 kW | 3.90 kW |
| COP | 4.95 | 3.05 |

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

Warmer Climate

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 256 % | 174 % |
| Prated | 11.11 kW | 12.51 kW |
| SCOP | 6.53 | 4.42 |
| 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 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| COP $T_j = T_{biv}$ | 5.87 | 3.86 |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 11.11 kW | 12.08 kW |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 3.59 | 2.31 |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | | |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 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 Q_{he} | 2296 kWh | 3780 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 160 % | 118 % |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| Prated | 11.38 kW | 10.32 kW |
| SCOP | 4.08 | 3.02 |
| Tbiv | -15 °C | -15 °C |
| 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 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| Poff | 14 W | 14 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| 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 Qhe | 6871 kWh | 8420 kWh |
| Pdh Tj = -15°C (if TOL<-20°C) | 9.28 | 8.42 |
| COP Tj = -15°C (if TOL<-20°C) | 2.59 | 1.84 |
| Cdh Tj = -15 °C | 0.90 | 0.90 |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 189 % | 135 % |
| Prated | 12.00 kW | 11.58 kW |
| SCOP | 4.81 | 3.45 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| 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 |
| 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 | 20 W | 20 W |
| PTO | 30 W | 30 W |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| PSB | 20 W | 20 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 Q _{he} | 5153 kWh | 6928 kWh |

Model: MAM-14-V10T

| Configure model | |
|-------------------------------------|---------------------------------|
| Model name | MAM-14-V10T |
| Application | Heating (medium temp) |
| Units | Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

| General Data | |
|--------------|-------------|
| Power supply | 3x400V 50Hz |

Heating

| EN 14511-2 | | |
|-------------|-----------------|--------------------|
| | Low temperature | Medium temperature |
| Heat output | 14.50 kW | 13.80 kW |
| El input | 3.15 kW | 4.68 kW |
| COP | 4.60 | 2.95 |

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

Warmer Climate

This information was generated by the HP KEYMARK database on 23 Jun 2022

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 260 % | 176 % |
| Prated | 12.11 kW | 13.74 kW |
| SCOP | 6.63 | 4.48 |
| Tbiv | 7 °C | 7 °C |
| TOL | 2 °C | 2 °C |
| Pdh Tj = +2°C | 12.04 kW | 13.05 kW |
| COP Tj = +2°C | 3.44 | 2.20 |
| Cdh Tj = +2 °C | 0.900 | 0.900 |
| Pdh Tj = +7°C | 7.78 kW | 8.83 kW |
| COP Tj = +7°C | 5.84 | 3.91 |
| Cdh Tj = +7 °C | 0.900 | 0.900 |
| Pdh Tj = 12°C | 3.75 kW | 4.09 kW |
| COP Tj = 12°C | 8.25 | 5.90 |
| Cdh Tj = +12 °C | 0.900 | 0.900 |
| Pdh Tj = Tbiv | 7.78 kW | 8.83 kW |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| COP $T_j = T_{biv}$ | 5.84 | 3.91 |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 12.04 kW | 13.05 kW |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 3.44 | 2.20 |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | | |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 0.07 kW | 0.69 kW |
| Annual energy consumption Q_{he} | 2462 kWh | 4092 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 160 % | 119 % |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| Prated | 12.64 kW | 10.97 kW |
| SCOP | 4.06 | 3.05 |
| Tbiv | -15 °C | -15 °C |
| TOL | -22 °C | -22 °C |
| Pdh Tj = -7°C | 7.97 kW | 6.89 kW |
| COP Tj = -7°C | 3.44 | 2.66 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 5.05 kW | 4.32 kW |
| COP Tj = +2°C | 4.92 | 3.66 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 3.16 kW | 3.06 kW |
| COP Tj = +7°C | 6.11 | 4.72 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.58 kW | 3.33 kW |
| COP Tj = 12°C | 7.82 | 6.25 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 10.31 kW | 8.95 kW |
| COP Tj = Tbiv | 2.53 | 1.79 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.57 kW | 4.20 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 1.92 | 1.13 |
| WTOL | 65 °C | 65 °C |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 5.07 kW | 6.77 kW |
| Annual energy consumption Qhe | 7667 kWh | 8867 kWh |
| Pdh Tj = -15°C (if TOL<-20°C) | 10.31 | 8.95 |
| COP Tj = -15°C (if TOL<-20°C) | 2.53 | 1.79 |
| Cdh Tj = -15 °C | 0.90 | 0.90 |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 186 % | 136 % |
| Prated | 13.73 kW | 12.08 kW |
| SCOP | 4.72 | 3.47 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| Tbiv | -7 °C | -7 °C |
| TOL | -10 °C | -10 °C |
| Pdh Tj = -7°C | 12.14 kW | 10.69 kW |
| COP Tj = -7°C | 2.79 | 2.01 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 7.95 kW | 6.86 kW |
| COP Tj = +2°C | 4.52 | 3.43 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 5.20 kW | 4.64 kW |
| COP Tj = +7°C | 6.68 | 4.66 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.76 kW | 3.32 kW |
| COP Tj = 12°C | 8.52 | 6.13 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 12.14 kW | 10.69 kW |
| COP Tj = Tbiv | 2.79 | 2.01 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 11.48 kW | 9.19 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.59 | 1.76 |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 2.23 kW | 2.91 kW |
| Annual energy consumption Q _{he} | 6013 kWh | 7203 kWh |

Model: MAM-16-V10T

Configure model

| | |
|-------------------------------------|---------------------------------|
| Model name | MAM-16-V10T |
| Application | Heating (medium temp) |
| Units | Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

General Data

| | |
|--------------|-------------|
| Power supply | 3x400V 50Hz |
|--------------|-------------|

Heating

EN 14511-2

| | Low temperature | Medium temperature |
|-------------|-----------------|--------------------|
| Heat output | 15.90 kW | 16.00 kW |
| El input | 3.53 kW | 5.61 kW |
| COP | 4.50 | 2.85 |

EN 14511-4

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

Warmer Climate

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 248 % | 176 % |
| Prated | 13.09 kW | 13.78 kW |
| SCOP | 6.33 | 4.47 |
| Tbiv | 7 °C | 7 °C |
| TOL | 2 °C | 2 °C |
| Pdh Tj = +2°C | 13.09 kW | 13.38 kW |
| COP Tj = +2°C | 3.35 | 2.29 |
| Cdh Tj = +2 °C | 0.900 | 0.900 |
| Pdh Tj = +7°C | 8.42 kW | 8.86 kW |
| COP Tj = +7°C | 5.36 | 3.84 |
| Cdh Tj = +7 °C | 0.900 | 0.900 |
| Pdh Tj = 12°C | 3.88 kW | 4.06 kW |
| COP Tj = 12°C | 8.11 | 5.86 |
| Cdh Tj = +12 °C | 0.900 | 0.900 |
| Pdh Tj = Tbiv | 8.42 kW | 8.86 kW |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| COP Tj = Tbiv | 5.36 | 3.84 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 13.09 kW | 13.38 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.35 | 2.29 |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | | |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 0.00 kW | 0.40 kW |
| Annual energy consumption Qhe | 2786 kWh | 4116 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 158 % | 122 % |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| Prated | 13.76 kW | 11.79 kW |
| SCOP | 4.02 | 3.12 |
| Tbiv | -15 °C | -15 °C |
| TOL | -22 °C | -22 °C |
| Pdh Tj = -7°C | 8.31 kW | 7.64 kW |
| COP Tj = -7°C | 3.37 | 2.65 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 5.27 kW | 4.43 kW |
| COP Tj = +2°C | 4.86 | 3.79 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 3.62 kW | 2.98 kW |
| COP Tj = +7°C | 6.49 | 4.81 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.35 kW | 3.43 kW |
| COP Tj = 12°C | 7.40 | 6.29 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 11.22 kW | 9.62 kW |
| COP Tj = Tbiv | 2.43 | 1.86 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.89 kW | 5.22 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 1.97 | 1.23 |
| WTOL | 65 °C | 65 °C |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 4.87 kW | 6.57 kW |
| Annual energy consumption Qhe | 8431 kWh | 9310 kWh |
| Pdh Tj = -15°C (if TOL<-20°C) | 11.22 | 9.62 |
| COP Tj = -15°C (if TOL<-20°C) | 2.43 | 1.86 |
| Cdh Tj = -15 °C | 0.90 | 0.90 |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 68 dB(A) | 68 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 182 % | 133 % |
| Prated | 15.21 kW | 13.02 kW |
| SCOP | 4.62 | 3.41 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| Tbiv | -7 °C | -7 °C |
| TOL | -10 °C | -10 °C |
| Pdh Tj = -7°C | 13.45 kW | 11.52 kW |
| COP Tj = -7°C | 2.72 | 1.99 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 8.57 kW | 7.18 kW |
| COP Tj = +2°C | 4.41 | 3.34 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 5.70 kW | 4.68 kW |
| COP Tj = +7°C | 6.56 | 4.61 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.78 kW | 3.32 kW |
| COP Tj = 12°C | 8.51 | 6.07 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 13.45 kW | 11.52 kW |
| COP Tj = Tbiv | 2.72 | 1.99 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 12.52 kW | 10.33 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.48 | 1.80 |
| WTOL | 65 °C | 65 °C |
| Poff | 20 W | 20 W |
| PTO | 30 W | 30 W |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| PSB | 20 W | 20 W |
| PCK | 0 W | 0 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 2.68 kW | 2.67 kW |
| Annual energy consumption Q _{he} | 6805 kWh | 7896 kWh |

Model: MAB-14-V10M + HR-12-14-16-V10M

| Configure model | |
|-------------------------------------|---------------------------------|
| Model name | MAB-14-V10M + HR-12-14-16-V10M |
| Application | Heating (medium 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 14511-2 | | |
|-------------|-----------------|--------------------|
| | Low temperature | Medium temperature |
| Heat output | 14.50 kW | 13.80 kW |
| El input | 3.09 kW | 4.60 kW |
| COP | 4.70 | 3.00 |

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

Warmer Climate

EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 260 % | 177 % |
| Prated | 12.11 kW | 13.74 kW |
| SCOP | 6.63 | 4.49 |
| Tbiv | 7 °C | 7 °C |
| TOL | 2 °C | 2 °C |
| Pdh Tj = +2°C | 12.04 kW | 13.05 kW |
| COP Tj = +2°C | 3.44 | 2.20 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 7.78 kW | 8.83 kW |
| COP Tj = +7°C | 5.84 | 3.91 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.75 kW | 4.09 kW |
| COP Tj = 12°C | 8.25 | 5.90 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|-------------|-------------|
| Pdh Tj = Tbiv | 7.78 kW | 8.83 kW |
| COP Tj = Tbiv | 5.84 | 3.91 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 12.04 kW | 13.05 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.44 | 2.20 |
| 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 | 0.07 kW | 0.69 kW |
| Annual energy consumption Qhe | 2457 kWh | 4088 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| | | |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| η_s | 160 % | 119 % |
| Prated | 12.64 kW | 10.97 kW |
| SCOP | 4.07 | 3.05 |
| Tbiv | -15 °C | -15 °C |
| TOL | -22 °C | -22 °C |
| Pdh Tj = -7°C | 7.97 kW | 6.89 kW |
| COP Tj = -7°C | 3.44 | 2.66 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 5.05 kW | 4.32 kW |
| COP Tj = +2°C | 4.92 | 3.66 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 3.16 kW | 3.06 kW |
| COP Tj = +7°C | 6.11 | 4.72 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.58 kW | 3.33 kW |
| COP Tj = 12°C | 7.82 | 6.25 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 10.31 kW | 8.95 kW |
| COP Tj = Tbiv | 2.53 | 1.79 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.57 kW | 4.20 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 1.92 | 1.13 |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| 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 | 5.07 kW | 6.77 kW |
| Annual energy consumption Qhe | 7667 kWh | 8866 kWh |
| Pdh Tj = -15°C (if TOL<-20°C) | 10.31 | 8.95 |
| COP Tj = -15°C (if TOL<-20°C) | 2.53 | 1.79 |
| Cdh Tj = -15 °C | 0.90 | 0.90 |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level indoor | 43 dB(A) | 43 dB(A) |
| Sound power level outdoor | 65 dB(A) | 65 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 186 % | 136 % |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|---|----------|----------|
| Prated | 13.73 kW | 12.08 kW |
| SCOP | 4.72 | 3.47 |
| Tbiv | -7 °C | -7 °C |
| TOL | -10 °C | -10 °C |
| Pdh Tj = -7°C | 12.14 kW | 10.69 kW |
| COP Tj = -7°C | 2.79 | 2.01 |
| Cdh Tj = -7 °C | 0.90 | 0.90 |
| Pdh Tj = +2°C | 7.95 kW | 6.86 kW |
| COP Tj = +2°C | 4.52 | 3.43 |
| Cdh Tj = +2 °C | 0.90 | 0.90 |
| Pdh Tj = +7°C | 5.20 kW | 4.64 kW |
| COP Tj = +7°C | 6.68 | 4.66 |
| Cdh Tj = +7 °C | 0.90 | 0.90 |
| Pdh Tj = 12°C | 3.76 kW | 3.32 kW |
| COP Tj = 12°C | 8.52 | 6.13 |
| Cdh Tj = +12 °C | 0.90 | 0.90 |
| Pdh Tj = Tbiv | 12.14 kW | 10.69 kW |
| COP Tj = Tbiv | 2.79 | 2.01 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 11.48 kW | 9.19 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.59 | 1.76 |
| WTOL | 65 °C | 65 °C |

This information was generated by the HP KEYMARK database on 23 Jun 2022

| | | |
|--|-------------|-------------|
| 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 | 2.23 kW | 2.91 kW |
| Annual energy consumption Qhe | 6012 kWh | 7202 kWh |