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|                     |   |          |            |
|---------------------|---|----------|------------|
| Summary of          | Vitocal x5x-A z4                                      | Reg. No. | 011-1W0465 |
| Certificate Holder  |   |          |            |
| Name                | Viessmann Wärmepumpen GmbH                            |          |            |
| Address             | Viessmannstr. 1                                       | Zip      | 35107      |
| City                | Allendorf/Eder  | Country  | Germany    |
| Certification Body  | DIN CERTCO Gesellschaft für Konformitätsbewertung mbH |          |            |
| Subtype title       | Vitocal x5x-A z4                                      |          |            |
| Heat Pump Type      | Outdoor Air/Water                                     |          |            |
| Refrigerant         | R290  |          |            |
| Mass of Refrigerant | 2 kg  |          |            |
| Certification Date  | 15.12.2021  |          |            |
| Testing basis       | HP KEYMARK certification scheme rules rev. 9          |          |            |

# Model: Vitocal 250-A AWO-E-AC 251.A10

## Configure model

|                                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 250-A AWO-E-AC 251.A10  |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|                            | Low temperature | Medium temperature |
|----------------------------|-----------------|--------------------|
| $P_{designh}$              | 5.27 kW         | 4.65 kW            |
| $\eta_s$                   | 243 %           | 172 %              |
| $P_{rated}$                | 5.27 kW         | 4.65 kW            |
| SCOP                       | 6.14            | 4.37               |
| $T_{biv}$                  | 2 °C            | 2 °C               |
| TOL                        | 2 °C            | 2 °C               |
| $P_{dh} T_j = +2^{\circ}C$ | 5.30 kW         | 4.70 kW            |
| $COP T_j = +2^{\circ}C$    | 4.40            | 2.90               |
| $C_{dh} T_j = +2^{\circ}C$ | 1.000           | 1.000              |
| $P_{dh} T_j = +7^{\circ}C$ | 5.70 kW         | 5.20 kW            |
| $COP T_j = +7^{\circ}C$    | 5.60            | 3.80               |
| $C_{dh} T_j = +7^{\circ}C$ | 1.000           | 1.000              |
| $P_{dh} T_j = 12^{\circ}C$ | 5.80 kW         | 5.50 kW            |
| $COP T_j = 12^{\circ}C$    | 7.50            | 5.60               |

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|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh    | 4943 kWh    |



# Model: Vitocal 250-A AWO-E-AC 251.A13

| Configure model                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 250-A AWO-E-AC 251.A13  |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |

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|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 250-A AWO-E-AC-AF 251.A10

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 250-A AWO-E-AC-AF 251.A10 |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 250-A AWO-E-AC-AF 251.A13

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 250-A AWO-E-AC-AF 251.A13 |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |



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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 252-A AWOT-E-AC 251.A10

## Configure model

|                                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 252-A AWOT-E-AC 251.A10 |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|



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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 252-A AWOT-E-AC 251.A13

| Configure model                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 252-A AWOT-E-AC 251.A13 |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |



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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 252-A AWO-E-AC-AF 251.A10

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 252-A AWO-E-AC-AF 251.A10 |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |



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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 252-A AWO-E-AC-AF 251.A13

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 252-A AWO-E-AC-AF 251.A13 |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |



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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 250-A AWO-E-AC 251.A10 2C

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 250-A AWO-E-AC 251.A10 2C |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | <b>Low temperature</b> | <b>Medium temperature</b> |
|---|------------------------|---------------------------|
| P <sub>designh</sub>                              | 8.48 kW                | 7.98 kW                   |
| $\eta_s$  | 165 %                  | 131 %                     |
| P <sub>rated</sub>                                | 8.48 kW                | 7.98 kW                   |
| SCOP  | 4.19                   | 3.35                      |
| T <sub>biv</sub>                                  | -15 °C                 | -15 °C                    |
| TOL   | -20 °C                 | -20 °C                    |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW                | 8.40 kW                   |
| COP T <sub>j</sub> = -7°C                         | 3.40                   | 2.70                      |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000                  | 1.000                     |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW                | 5.20 kW                   |
| COP T <sub>j</sub> = +2°C                         | 5.30                   | 4.10                      |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000                  | 1.000                     |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW                | 5.70 kW                   |
| COP T <sub>j</sub> = +7°C                         | 6.50                   | 5.20                      |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000                  | 1.000                     |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW                | 5.70 kW                   |
| COP T <sub>j</sub> = 12°C                         | 7.70                   | 6.60                      |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000                  | 1.000                     |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW                | 6.50 kW                   |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh    | 4943 kWh    |



# Model: Vitocal 250-A AWO-E-AC 251.A13 2C

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 250-A AWO-E-AC 251.A13 2C |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 250-A AWO-E-AC-AF 251.A10 2C

| Configure model                     |                                      |
|-------------------------------------|--------------------------------------|
| Model name                          | Vitocal 250-A AWO-E-AC-AF 251.A10 2C |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 250-A AWO-E-AC-AF 251.A13 2C

| Configure model                     |                                      |
|-------------------------------------|--------------------------------------|
| Model name                          | Vitocal 250-A AWO-E-AC-AF 251.A13 2C |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |



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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 252-A AWO-E-AC 251.A10 2C

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 252-A AWO-E-AC 251.A10 2C |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|



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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 252-A AWO-E-AC 251.A13 2C

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 252-A AWO-E-AC 251.A13 2C |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |



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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 252-A AWO-E-AC-AF 251.A10 2C

| Configure model                     |                                      |
|-------------------------------------|--------------------------------------|
| Model name                          | Vitocal 252-A AWO-E-AC-AF 251.A10 2C |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |



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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 252-A AWO-E-AC-AF 251.A13 2C

| Configure model                     |                                      |
|-------------------------------------|--------------------------------------|
| Model name                          | Vitocal 252-A AWO-E-AC-AF 251.A13 2C |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |



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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80        | 2.20        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 150-A AWO-E-AC 151.A10

| Configure model                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 150-A AWO-E-AC 151.A10  |
| 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 | 7.30 kW         | 6.75 kW            |
| El input    | 1.46 kW         | 2.53 kW            |
| COP         | 5.00            | 2.67               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 239 %           | 168 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.04            | 4.27               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.20            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.30            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.40               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.20        | 2.70        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.20        | 2.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1165 kWh    | 1454 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | <b>Low temperature</b> | <b>Medium temperature</b> |
|---|------------------------|---------------------------|
| P <sub>designh</sub>                              | 8.48 kW                | 7.98 kW                   |
| $\eta_s$  | 160 %                  | 127 %                     |
| P <sub>rated</sub>                                | 8.48 kW                | 7.98 kW                   |
| SCOP  | 4.08                   | 3.25                      |
| T <sub>biv</sub>                                  | -15 °C                 | -15 °C                    |
| TOL   | -20 °C                 | -20 °C                    |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW                | 8.40 kW                   |
| COP T <sub>j</sub> = -7°C                         | 3.20                   | 2.60                      |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000                  | 1.000                     |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW                | 5.20 kW                   |
| COP T <sub>j</sub> = +2°C                         | 5.00                   | 4.00                      |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000                  | 1.000                     |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW                | 5.70 kW                   |
| COP T <sub>j</sub> = +7°C                         | 6.20                   | 5.00                      |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000                  | 1.000                     |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW                | 5.70 kW                   |
| COP T <sub>j</sub> = 12°C                         | 7.40                   | 6.30                      |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000                  | 1.000                     |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW                | 6.50 kW                   |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.70        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 5126 kWh    | 6050 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 190 %           | 145 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.83            | 3.70               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.10            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.80            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.00            | 4.60               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.00               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.10            | 2.40               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.90        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4129 kWh    | 5229 kWh    |



# Model: Vitocal 150-A AWO-E-AC 151.A13

| Configure model                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 150-A AWO-E-AC 151.A13  |
| 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 | 8.10 kW         | 7.56 kW            |
| El input    | 1.65 kW         | 2.47 kW            |
| COP         | 4.90            | 3.06               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 239 %           | 173 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.05            | 4.41               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 6.90            | 5.50               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1518 kWh    | 2007 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 144 %           | 118 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.67            | 3.03               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.20            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.50        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7252 kWh    | 8407 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 178 %           | 141 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.53            | 3.54               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.30               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.40               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 4.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 2.90            | 2.30               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.70        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.30 kW     | 2.30 kW     |
| Annual energy consumption $Q_{he}$                                      | 5672 kWh    | 6944 kWh    |

# Model: Vitocal 150-A AWO-E-AC 151.A16

| Configure model                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 150-A AWO-E-AC 151.A16  |
| 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 | 9.10 kW         | 8.49 kW            |
| El input    | 1.86 kW         | 2.53 kW            |
| COP         | 4.90            | 3.35               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 7.54 kW         | 7.56 kW            |
| $\eta_s$                               | 239 %           | 175 %              |
| P <sub>rated</sub>                     | 7.54 kW         | 7.56 kW            |
| SCOP                                   | 6.06            | 4.46               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 7.50 kW         | 7.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 6.60 kW         | 6.10 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.60 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C              | 7.30            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 7.50 kW     | 7.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.50 kW     | 7.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1662 kWh    | 2266 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 11.83 kW        | 11.17 kW           |
| $\eta_s$  | 141 %           | 117 %              |
| P <sub>rated</sub>                                | 11.83 kW        | 11.17 kW           |
| SCOP  | 3.61            | 2.99               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.10 kW        | 11.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.80            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.60 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.50               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.40 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.50               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 9.70 kW         | 9.10 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.40        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.40 kW     | 7.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.20        | 1.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 11.83 kW    | 11.17 kW    |
| Annual energy consumption Qhe                       | 8080 kWh    | 10386 kWh   |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 13.67 kW        | 13.37 kW           |
| $\eta_s$  | 178 %           | 141 %              |
| P <sub>rated</sub>                                | 13.67 kW        | 13.37 kW           |
| SCOP  | 4.52            | 3.60               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.00 kW        | 11.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.90            | 2.30               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.40 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.40               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.50 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 4.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.30 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 12.10 kW        | 11.80 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 2.90            | 2.30               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 11.10 kW    | 10.70 kW    |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.60        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.60 kW     | 2.60 kW     |
| Annual energy consumption $Q_{he}$                                      | 6242 kWh    | 7670 kWh    |

# Model: Vitocal 150-A AWO-E-AC-AF 151.A10

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 150-A AWO-E-AC-AF 151.A10 |
| 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 | 7.30 kW         | 6.75 kW            |
| El input    | 1.46 kW         | 2.53 kW            |
| COP         | 5.00            | 2.67               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|                            | Low temperature | Medium temperature |
|----------------------------|-----------------|--------------------|
| $P_{designh}$              | 5.27 kW         | 4.65 kW            |
| $\eta_s$                   | 239 %           | 168 %              |
| $P_{rated}$                | 5.27 kW         | 4.65 kW            |
| SCOP                       | 6.04            | 4.27               |
| $T_{biv}$                  | 2 °C            | 2 °C               |
| TOL                        | 2 °C            | 2 °C               |
| $P_{dh} T_j = +2^{\circ}C$ | 5.30 kW         | 4.70 kW            |
| $COP T_j = +2^{\circ}C$    | 4.20            | 2.70               |
| $C_{dh} T_j = +2^{\circ}C$ | 1.000           | 1.000              |
| $P_{dh} T_j = +7^{\circ}C$ | 5.70 kW         | 5.20 kW            |
| $COP T_j = +7^{\circ}C$    | 5.30            | 3.60               |
| $C_{dh} T_j = +7^{\circ}C$ | 1.000           | 1.000              |
| $P_{dh} T_j = 12^{\circ}C$ | 5.80 kW         | 5.50 kW            |
| $COP T_j = 12^{\circ}C$    | 7.20            | 5.40               |



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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.20        | 2.70        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.20        | 2.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1165 kWh    | 1454 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 160 %           | 127 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.08            | 3.25               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.20            | 2.60               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 4.00               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.70        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 5126 kWh    | 6050 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 190 %           | 145 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.83            | 3.70               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.10            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.80            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.00            | 4.60               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.00               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.10            | 2.40               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.90        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4129 kWh    | 5229 kWh    |

# Model: Vitocal 150-A AWO-E-AC-AF 151.A13

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 150-A AWO-E-AC-AF 151.A13 |
| 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 | 8.10 kW         | 7.56 kW            |
| El input    | 1.65 kW         | 2.47 kW            |
| COP         | 4.90            | 3.06               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 239 %           | 173 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.05            | 4.41               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 6.90            | 5.50               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1518 kWh    | 2007 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|



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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 144 %           | 118 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.67            | 3.03               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.20            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.50        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7252 kWh    | 8407 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 178 %           | 141 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.53            | 3.54               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.30               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.40               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 4.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 2.90            | 2.30               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.70        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.30 kW     | 2.30 kW     |
| Annual energy consumption $Q_{he}$                                      | 5672 kWh    | 6944 kWh    |

# Model: Vitocal 150-A AWO-E-AC-AF 151.A16

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 150-A AWO-E-AC-AF 151.A16 |
| 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 | 9.10 kW         | 8.49 kW            |
| El input    | 1.86 kW         | 2.53 kW            |
| COP         | 4.90            | 3.35               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 7.54 kW         | 7.56 kW            |
| $\eta_s$                               | 239 %           | 175 %              |
| P <sub>rated</sub>                     | 7.54 kW         | 7.56 kW            |
| SCOP                                   | 6.06            | 4.46               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 7.50 kW         | 7.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 6.60 kW         | 6.10 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.60 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C              | 7.30            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 7.50 kW     | 7.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.50 kW     | 7.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1662 kWh    | 2266 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 11.83 kW        | 11.17 kW           |
| $\eta_s$  | 141 %           | 117 %              |
| P <sub>rated</sub>                                | 11.83 kW        | 11.17 kW           |
| SCOP  | 3.61            | 2.99               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.10 kW        | 11.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.80            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.60 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.50               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.40 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.50               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 9.70 kW         | 9.10 kW            |



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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.40        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.40 kW     | 7.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.20        | 1.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 11.83 kW    | 11.17 kW    |
| Annual energy consumption Qhe                       | 8080 kWh    | 10386 kWh   |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 13.67 kW        | 13.37 kW           |
| $\eta_s$  | 178 %           | 141 %              |
| P <sub>rated</sub>                                | 13.67 kW        | 13.37 kW           |
| SCOP  | 4.52            | 3.60               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.00 kW        | 11.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.90            | 2.30               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.40 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.40               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.50 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 4.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.30 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 12.10 kW        | 11.80 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 2.90            | 2.30               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 11.10 kW    | 10.70 kW    |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.60        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.60 kW     | 2.60 kW     |
| Annual energy consumption $Q_{he}$                                      | 6242 kWh    | 7670 kWh    |

# Model: Vitocal 151-A AWOT-E-AC 151.A10

## Configure model

|                                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 151-A AWOT-E-AC 151.A10 |
| 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 | 7.30 kW         | 6.75 kW            |
| El input    | 1.46 kW         | 2.53 kW            |
| COP         | 5.00            | 2.67               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 239 %           | 168 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.04            | 4.27               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.20            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.30            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.40               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.20        | 2.70        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.20        | 2.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1165 kWh    | 1454 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 160 %           | 127 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.08            | 3.25               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.20            | 2.60               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 4.00               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.70        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 5126 kWh    | 6050 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |



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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 190 %           | 145 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.83            | 3.70               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.10            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.80            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.00            | 4.60               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.00               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.10            | 2.40               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.90        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4129 kWh    | 5229 kWh    |

# Model: Vitocal 151-A AWOT-E-AC 151.A13

| Configure model                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 151-A AWOT-E-AC 151.A13 |
| 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 | 8.10 kW         | 7.56 kW            |
| El input    | 1.65 kW         | 2.47 kW            |
| COP         | 4.90            | 3.06               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 239 %           | 173 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.05            | 4.41               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 6.90            | 5.50               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1518 kWh    | 2007 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 144 %           | 118 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.67            | 3.03               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.20            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.50        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7252 kWh    | 8407 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 178 %           | 141 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.53            | 3.54               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.30               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.40               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 4.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 2.90            | 2.30               |



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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.70        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.30 kW     | 2.30 kW     |
| Annual energy consumption $Q_{he}$                                      | 5672 kWh    | 6944 kWh    |

# Model: Vitocal 151-A AWOT-E-AC 151.A16

| Configure model                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 151-A AWOT-E-AC 151.A16 |
| 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 | 9.10 kW         | 8.49 kW            |
| El input    | 1.86 kW         | 2.53 kW            |
| COP         | 4.90            | 3.35               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 7.54 kW         | 7.56 kW            |
| $\eta_s$                               | 239 %           | 175 %              |
| P <sub>rated</sub>                     | 7.54 kW         | 7.56 kW            |
| SCOP                                   | 6.06            | 4.46               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 7.50 kW         | 7.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 6.60 kW         | 6.10 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.60 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C              | 7.30            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 7.50 kW     | 7.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.50 kW     | 7.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1662 kWh    | 2266 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 11.83 kW        | 11.17 kW           |
| $\eta_s$  | 141 %           | 117 %              |
| P <sub>rated</sub>                                | 11.83 kW        | 11.17 kW           |
| SCOP  | 3.61            | 2.99               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.10 kW        | 11.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.80            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.60 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.50               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.40 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.50               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 9.70 kW         | 9.10 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.40        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.40 kW     | 7.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.20        | 1.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 11.83 kW    | 11.17 kW    |
| Annual energy consumption Qhe                       | 8080 kWh    | 10386 kWh   |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 13.67 kW        | 13.37 kW           |
| $\eta_s$  | 178 %           | 141 %              |
| P <sub>rated</sub>                                | 13.67 kW        | 13.37 kW           |
| SCOP  | 4.52            | 3.60               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.00 kW        | 11.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.90            | 2.30               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.40 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.40               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.50 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 4.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.30 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 12.10 kW        | 11.80 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 2.90            | 2.30               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 11.10 kW    | 10.70 kW    |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.60        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.60 kW     | 2.60 kW     |
| Annual energy consumption $Q_{he}$                                      | 6242 kWh    | 7670 kWh    |



# Model: Vitocal 151-A AWOT-E-AC-AF 151.A10

| Configure model                     |                                    |
|-------------------------------------|------------------------------------|
| Model name                          | Vitocal 151-A AWOT-E-AC-AF 151.A10 |
| 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 | 7.30 kW         | 6.75 kW            |
| El input    | 1.46 kW         | 2.53 kW            |
| COP         | 5.00            | 2.67               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 239 %           | 168 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.04            | 4.27               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.20            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.30            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.40               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.20        | 2.70        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.20        | 2.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1165 kWh    | 1454 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 160 %           | 127 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.08            | 3.25               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.20            | 2.60               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 4.00               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.70        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 5126 kWh    | 6050 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 190 %           | 145 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.83            | 3.70               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.10            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.80            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.00            | 4.60               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.00               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.10            | 2.40               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW     | 7.50 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.90        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                      | 4129 kWh    | 5229 kWh    |

# Model: Vitocal 151-A AWOT-E-AC-AF 151.A13

| Configure model                     |                                    |
|-------------------------------------|------------------------------------|
| Model name                          | Vitocal 151-A AWOT-E-AC-AF 151.A13 |
| 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 | 8.10 kW         | 7.56 kW            |
| El input    | 1.65 kW         | 2.47 kW            |
| COP         | 4.90            | 3.06               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 239 %           | 173 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.05            | 4.41               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 6.90            | 5.50               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1518 kWh    | 2007 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 144 %           | 118 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.67            | 3.03               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.20            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.50        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7252 kWh    | 8407 kWh    |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 178 %           | 141 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.53            | 3.54               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.30               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.40               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 4.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 2.90            | 2.30               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW    | 9.70 kW     |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.70        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.30 kW     | 2.30 kW     |
| Annual energy consumption $Q_{he}$                                      | 5672 kWh    | 6944 kWh    |

# Model: Vitocal 151-A AWOT-E-AC-AF 151.A16

| Configure model                     |                                    |
|-------------------------------------|------------------------------------|
| Model name                          | Vitocal 151-A AWOT-E-AC-AF 151.A16 |
| 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 | 9.10 kW         | 8.49 kW            |
| El input    | 1.86 kW         | 2.53 kW            |
| COP         | 4.90            | 3.35               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 7.54 kW         | 7.56 kW            |
| $\eta_s$                               | 239 %           | 175 %              |
| P <sub>rated</sub>                     | 7.54 kW         | 7.56 kW            |
| SCOP                                   | 6.06            | 4.46               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 7.50 kW         | 7.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 6.60 kW         | 6.10 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.60 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C              | 7.30            | 5.60               |



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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 7.50 kW     | 7.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.50 kW     | 7.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1662 kWh    | 2266 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 11.83 kW        | 11.17 kW           |
| $\eta_s$  | 141 %           | 117 %              |
| P <sub>rated</sub>                                | 11.83 kW        | 11.17 kW           |
| SCOP  | 3.61            | 2.99               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.10 kW        | 11.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.80            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.60 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.50               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.40 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.50               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 9.70 kW         | 9.10 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.40        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.40 kW     | 7.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.20        | 1.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 11.83 kW    | 11.17 kW    |
| Annual energy consumption Qhe                       | 8080 kWh    | 10386 kWh   |
| Pdh Tj = -15°C (if TOL<-20°C)                       |             |             |
| COP Tj = -15°C (if TOL<-20°C)                       |             |             |
| Cdh Tj = -15 °C                                     |             |             |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 13.67 kW        | 13.37 kW           |
| $\eta_s$  | 178 %           | 141 %              |
| P <sub>rated</sub>                                | 13.67 kW        | 13.37 kW           |
| SCOP  | 4.52            | 3.60               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.00 kW        | 11.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.90            | 2.30               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.40 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.40               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.50 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 4.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.30 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 12.10 kW        | 11.80 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 2.90            | 2.30               |

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

|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 11.10 kW    | 10.70 kW    |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.60        | 2.10        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.60 kW     | 2.60 kW     |
| Annual energy consumption $Q_{he}$                                      | 6242 kWh    | 7670 kWh    |

# Model: Vitocal 250-AH HAWO-M-AC 252.A10

| Configure model                     |                                  |
|-------------------------------------|----------------------------------|
| Model name                          | Vitocal 250-AH HAWO-M-AC 252.A10 |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |          |          |
|---|----------|----------|
| Cdh Tj = +12 °C                                     | 1.000    | 1.000    |
| Pdh Tj = Tbiv                                       | 5.30 kW  | 4.70 kW  |
| COP Tj = Tbiv                                       | 4.40     | 2.90     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW  | 4.70 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40     | 2.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 1145 kWh | 1419 kWh |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|



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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |          |          |
|---|----------|----------|
| COP Tj = Tbiv                                       | 2.80     | 2.20     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW  | 5.50 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40     | 1.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 4988 kWh | 5868 kWh |
| Pdh Tj = -15°C (if TOL<-20°C)                       |          |          |
| COP Tj = -15°C (if TOL<-20°C)                       |          |          |
| Cdh Tj = -15 °C                                     |          |          |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |          |          |
|---|----------|----------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW  | 7.50 kW  |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00     | 2.20     |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input                              | n/a      | n/a      |
| Supplementary Heater: PSUP  | 0.00 kW  | 0.00 kW  |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh | 4943 kWh |

# Model: Vitocal 250-AH HAWO-M-AC 252.A13

| Configure model                     |                                  |
|-------------------------------------|----------------------------------|
| Model name                          | Vitocal 250-AH HAWO-M-AC 252.A13 |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |          |          |
|---|----------|----------|
| Cdh Tj = +12 °C                                     | 1.000    | 1.000    |
| Pdh Tj = Tbiv                                       | 6.70 kW  | 6.60 kW  |
| COP Tj = Tbiv                                       | 4.00     | 2.90     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW  | 6.60 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00     | 2.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 1478 kWh | 1942 kWh |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |



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

|   |          |          |
|---|----------|----------|
| COP Tj = Tbiv                                       | 2.60     | 2.10     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW  | 7.20 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30     | 1.80     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 7028 kWh | 8129 kWh |
| Pdh Tj = -15°C (if TOL<-20°C)                       |          |          |
| COP Tj = -15°C (if TOL<-20°C)                       |          |          |
| Cdh Tj = -15 °C                                     |          |          |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |

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

|   |          |          |
|---|----------|----------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW | 9.70 kW  |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80     | 2.20     |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input                              | n/a      | n/a      |
| Supplementary Heater: PSUP  | 0.00 kW  | 0.00 kW  |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh | 6662 kWh |

# Model: Vitocal 250-AH HAWO-AC 252.A10

## Configure model

|                                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 250-AH HAWO-AC 252.A10  |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |          |          |
|---|----------|----------|
| Cdh Tj = +12 °C                                     | 1.000    | 1.000    |
| Pdh Tj = Tbiv                                       | 5.30 kW  | 4.70 kW  |
| COP Tj = Tbiv                                       | 4.40     | 2.90     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW  | 4.70 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40     | 2.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 1145 kWh | 1419 kWh |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |          |          |
|---|----------|----------|
| COP Tj = Tbiv                                       | 2.80     | 2.20     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW  | 5.50 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40     | 1.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 4988 kWh | 5868 kWh |
| Pdh Tj = -15°C (if TOL<-20°C)                       |          |          |
| COP Tj = -15°C (if TOL<-20°C)                       |          |          |
| Cdh Tj = -15 °C                                     |          |          |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |



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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |          |          |
|---|----------|----------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW  | 7.50 kW  |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00     | 2.20     |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input                              | n/a      | n/a      |
| Supplementary Heater: PSUP  | 0.00 kW  | 0.00 kW  |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh | 4943 kWh |

# Model: Vitocal 250-AH HAWO-AC 252.A13

## Configure model

|                                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | Vitocal 250-AH HAWO-AC 252.A13  |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |          |          |
|---|----------|----------|
| Cdh Tj = +12 °C                                     | 1.000    | 1.000    |
| Pdh Tj = Tbiv                                       | 6.70 kW  | 6.60 kW  |
| COP Tj = Tbiv                                       | 4.00     | 2.90     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW  | 6.60 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00     | 2.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 1478 kWh | 1942 kWh |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |          |          |
|---|----------|----------|
| COP Tj = Tbiv                                       | 2.60     | 2.10     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW  | 7.20 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30     | 1.80     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 7028 kWh | 8129 kWh |
| Pdh Tj = -15°C (if TOL<-20°C)                       |          |          |
| COP Tj = -15°C (if TOL<-20°C)                       |          |          |
| Cdh Tj = -15 °C                                     |          |          |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |



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

|   |          |          |
|---|----------|----------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW | 9.70 kW  |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80     | 2.20     |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input                              | n/a      | n/a      |
| Supplementary Heater: PSUP  | 0.00 kW  | 0.00 kW  |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh | 6662 kWh |

# Model: Vitocal 250-AH HAWO-M-AC-AF 252.A10

| Configure model                     |                                     |
|-------------------------------------|-------------------------------------|
| Model name                          | Vitocal 250-AH HAWO-M-AC-AF 252.A10 |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|                            | Low temperature | Medium temperature |
|----------------------------|-----------------|--------------------|
| $P_{designh}$              | 5.27 kW         | 4.65 kW            |
| $\eta_s$                   | 243 %           | 172 %              |
| $P_{rated}$                | 5.27 kW         | 4.65 kW            |
| SCOP                       | 6.14            | 4.37               |
| $T_{biv}$                  | 2 °C            | 2 °C               |
| TOL                        | 2 °C            | 2 °C               |
| $P_{dh} T_j = +2^{\circ}C$ | 5.30 kW         | 4.70 kW            |
| $COP T_j = +2^{\circ}C$    | 4.40            | 2.90               |
| $C_{dh} T_j = +2^{\circ}C$ | 1.000           | 1.000              |
| $P_{dh} T_j = +7^{\circ}C$ | 5.70 kW         | 5.20 kW            |
| $COP T_j = +7^{\circ}C$    | 5.60            | 3.80               |
| $C_{dh} T_j = +7^{\circ}C$ | 1.000           | 1.000              |
| $P_{dh} T_j = 12^{\circ}C$ | 5.80 kW         | 5.50 kW            |
| $COP T_j = 12^{\circ}C$    | 7.50            | 5.60               |

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

|   |          |          |
|---|----------|----------|
| Cdh Tj = +12 °C                                     | 1.000    | 1.000    |
| Pdh Tj = Tbiv                                       | 5.30 kW  | 4.70 kW  |
| COP Tj = Tbiv                                       | 4.40     | 2.90     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW  | 4.70 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40     | 2.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 1145 kWh | 1419 kWh |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |          |          |
|---|----------|----------|
| COP Tj = Tbiv                                       | 2.80     | 2.20     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW  | 5.50 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40     | 1.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 4988 kWh | 5868 kWh |
| Pdh Tj = -15°C (if TOL<-20°C)                       |          |          |
| COP Tj = -15°C (if TOL<-20°C)                       |          |          |
| Cdh Tj = -15 °C                                     |          |          |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |          |          |
|---|----------|----------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW  | 7.50 kW  |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00     | 2.20     |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input                              | n/a      | n/a      |
| Supplementary Heater: PSUP  | 0.00 kW  | 0.00 kW  |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh | 4943 kWh |



# Model: Vitocal 250-AH HAWO-M-AC-AF 252.A13

| Configure model                     |                                     |
|-------------------------------------|-------------------------------------|
| Model name                          | Vitocal 250-AH HAWO-M-AC-AF 252.A13 |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |          |          |
|---|----------|----------|
| Cdh Tj = +12 °C                                     | 1.000    | 1.000    |
| Pdh Tj = Tbiv                                       | 6.70 kW  | 6.60 kW  |
| COP Tj = Tbiv                                       | 4.00     | 2.90     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW  | 6.60 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00     | 2.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 1478 kWh | 1942 kWh |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |          |          |
|---|----------|----------|
| COP Tj = Tbiv                                       | 2.60     | 2.10     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW  | 7.20 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30     | 1.80     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 7028 kWh | 8129 kWh |
| Pdh Tj = -15°C (if TOL<-20°C)                       |          |          |
| COP Tj = -15°C (if TOL<-20°C)                       |          |          |
| Cdh Tj = -15 °C                                     |          |          |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |

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

|   |          |          |
|---|----------|----------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW | 9.70 kW  |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80     | 2.20     |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input                              | n/a      | n/a      |
| Supplementary Heater: PSUP  | 0.00 kW  | 0.00 kW  |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh | 6662 kWh |

# Model: Vitocal 250-AH HAWO-AC-AF 252.A10

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 250-AH HAWO-AC-AF 252.A10 |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |          |          |
|---|----------|----------|
| Cdh Tj = +12 °C                                     | 1.000    | 1.000    |
| Pdh Tj = Tbiv                                       | 5.30 kW  | 4.70 kW  |
| COP Tj = Tbiv                                       | 4.40     | 2.90     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW  | 4.70 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40     | 2.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 1145 kWh | 1419 kWh |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |          |          |
|---|----------|----------|
| COP Tj = Tbiv                                       | 2.80     | 2.20     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW  | 5.50 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40     | 1.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 4988 kWh | 5868 kWh |
| Pdh Tj = -15°C (if TOL<-20°C)                       |          |          |
| COP Tj = -15°C (if TOL<-20°C)                       |          |          |
| Cdh Tj = -15 °C                                     |          |          |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 9.80 kW         | 9.37 kW            |
| $\eta_s$  | 197 %           | 154 %              |
| P <sub>rated</sub>                                | 9.80 kW         | 9.37 kW            |
| SCOP  | 4.99            | 3.91               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.30            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.40 kW         | 5.10 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.80 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 4.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.60            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.70 kW         | 8.30 kW            |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.30            | 2.50               |

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

|   |          |          |
|---|----------|----------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW  | 7.50 kW  |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 3.00     | 2.20     |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input                              | n/a      | n/a      |
| Supplementary Heater: PSUP  | 0.00 kW  | 0.00 kW  |
| Annual energy consumption $Q_{he}$                                      | 4055 kWh | 4943 kWh |

# Model: Vitocal 250-AH HAWO-AC-AF 252.A13

| Configure model                     |                                   |
|-------------------------------------|-----------------------------------|
| Model name                          | Vitocal 250-AH HAWO-AC-AF 252.A13 |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |



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

|   |          |          |
|---|----------|----------|
| Cdh Tj = +12 °C                                     | 1.000    | 1.000    |
| Pdh Tj = Tbiv                                       | 6.70 kW  | 6.60 kW  |
| COP Tj = Tbiv                                       | 4.00     | 2.90     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW  | 6.60 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00     | 2.90     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 1478 kWh | 1942 kWh |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |          |          |
|---|----------|----------|
| COP Tj = Tbiv                                       | 2.60     | 2.10     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW  | 7.20 kW  |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30     | 1.80     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input          | n/a      | n/a      |
| Supplementary Heater: PSUP                          | 0.00 kW  | 0.00 kW  |
| Annual energy consumption Qhe                       | 7028 kWh | 8129 kWh |
| Pdh Tj = -15°C (if TOL<-20°C)                       |          |          |
| COP Tj = -15°C (if TOL<-20°C)                       |          |          |
| Cdh Tj = -15 °C                                     |          |          |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

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

**EN 14825**

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 12.42 kW        | 12.10 kW           |
| $\eta_s$  | 181 %           | 147 %              |
| P <sub>rated</sub>                                | 12.42 kW        | 12.10 kW           |
| SCOP  | 4.60            | 3.75               |
| T <sub>biv</sub>                                  | -7 °C           | -7 °C              |
| TOL   | -10 °C          | -10 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.50 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 11.00 kW        | 10.70 kW           |
| COP T <sub>j</sub> = T <sub>biv</sub>             | 3.00            | 2.40               |

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

|   |          |          |
|---|----------|----------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 10.10 kW | 9.70 kW  |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.80     | 2.20     |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000    | 1.000    |
| WTOL  | 70 °C    | 70 °C    |
| Poff  | 0 W      | 0 W      |
| PTO   | 14 W     | 14 W     |
| PSB   | 16 W     | 16 W     |
| PCK   | 0 W      | 0 W      |
| Supplementary Heater: Type of energy input                              | n/a      | n/a      |
| Supplementary Heater: PSUP  | 0.00 kW  | 0.00 kW  |
| Annual energy consumption $Q_{he}$                                      | 5573 kWh | 6662 kWh |

# Model: Vitocal 250-A AWO-M-E-AC 251.A10 (SP)

| Configure model                     |                                       |
|-------------------------------------|---------------------------------------|
| Model name                          | Vitocal 250-A AWO-M-E-AC 251.A10 (SP) |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|



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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = T_{biv}$   | 2.80        | 2.20        |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 6.00 kW     | 5.50 kW     |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.40        | 1.90        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 8.48 kW     | 7.98 kW     |
| Annual energy consumption $Q_{he}$                                      | 4988 kWh    | 5868 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 197 %   | 154 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.99    | 3.91    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.30    | 2.50    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.10 kW |
| COP T <sub>j</sub> = +2°C   | 5.00    | 3.90    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.60 kW |
| COP T <sub>j</sub> = +7°C   | 6.20    | 4.90    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.60 kW |
| COP T <sub>j</sub> = 12°C   | 7.60    | 6.30    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.30    | 2.50    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.00        | 2.20        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Qhe                       | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 250-A AWO-M-E-AC 251.A13 (SP)

| Configure model                     |                                       |
|-------------------------------------|---------------------------------------|
| Model name                          | Vitocal 250-A AWO-M-E-AC 251.A13 (SP) |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |



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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 181 %    | 147 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.60     | 3.75     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.40     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.40     | 3.60     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.60 kW  |
| COP T <sub>j</sub> = +7°C   | 6.20     | 5.00     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.50     | 6.60     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.00     | 2.40     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.80        | 2.20        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 250-A AWO-M-E-AC-AF 251.A10 (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 250-A AWO-M-E-AC-AF 251.A10 (SP) |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |



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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 197 %   | 154 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.99    | 3.91    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.30    | 2.50    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.10 kW |
| COP T <sub>j</sub> = +2°C   | 5.00    | 3.90    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.60 kW |
| COP T <sub>j</sub> = +7°C   | 6.20    | 4.90    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.60 kW |
| COP T <sub>j</sub> = 12°C   | 7.60    | 6.30    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.30    | 2.50    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 3.00        | 2.20        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption $Q_{he}$                                | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 250-A AWO-M-E-AC-AF 251.A13 (SP)

| Configure model                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 250-A AWO-M-E-AC-AF 251.A13 (SP) |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 181 %    | 147 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.60     | 3.75     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.40     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.40     | 3.60     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.60 kW  |
| COP T <sub>j</sub> = +7°C   | 6.20     | 5.00     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.50     | 6.60     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.00     | 2.40     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |



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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.80        | 2.20        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| P <sub>off</sub>  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption Q <sub>he</sub>                         | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 252-A AWOT-M-E-AC 251.A10 (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 252-A AWOT-M-E-AC 251.A10 (SP) |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 197 %   | 154 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.99    | 3.91    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.30    | 2.50    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.10 kW |
| COP T <sub>j</sub> = +2°C   | 5.00    | 3.90    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.60 kW |
| COP T <sub>j</sub> = +7°C   | 6.20    | 4.90    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.60 kW |
| COP T <sub>j</sub> = 12°C   | 7.60    | 6.30    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.30    | 2.50    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.00        | 2.20        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Qhe                       | 4055 kWh    | 4943 kWh    |



# Model: Vitocal 252-A AWOT-M-E-AC 251.A13 (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 252-A AWOT-M-E-AC 251.A13 (SP) |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 181 %    | 147 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.60     | 3.75     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.40     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.40     | 3.60     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.60 kW  |
| COP T <sub>j</sub> = +7°C   | 6.20     | 5.00     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.50     | 6.60     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.00     | 2.40     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.80        | 2.20        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption Qhe                                     | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 252-A AWO-M-E-AC-AF 251.A10 (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 252-A AWO-M-E-AC-AF 251.A10 (SP) |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 197 %   | 154 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.99    | 3.91    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.30    | 2.50    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.10 kW |
| COP T <sub>j</sub> = +2°C   | 5.00    | 3.90    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.60 kW |
| COP T <sub>j</sub> = +7°C   | 6.20    | 4.90    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.60 kW |
| COP T <sub>j</sub> = 12°C   | 7.60    | 6.30    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.30    | 2.50    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.00        | 2.20        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Qhe                       | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 252-A AWO-M-E-AC-AF 251.A13 (SP)

| Configure model                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 252-A AWO-M-E-AC-AF 251.A13 (SP) |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |



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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.60        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7028 kWh    | 8129 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 181 %    | 147 %    |
| P <sub>rated</sub>  | 12.42 kW | 12.10 kW |
| SCOP  | 4.60     | 3.75     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.40     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.40     | 3.60     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.60 kW  |
| COP T <sub>j</sub> = +7°C   | 6.20     | 5.00     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.50     | 6.60     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.00     | 2.40     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.80        | 2.20        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption Qhe                                     | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 250-A AWO-M-E-AC 251.A10 2C (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 250-A AWO-M-E-AC 251.A10 2C (SP) |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|



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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = T_{biv}$   | 2.80        | 2.20        |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 6.00 kW     | 5.50 kW     |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.40        | 1.90        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 8.48 kW     | 7.98 kW     |
| Annual energy consumption $Q_{he}$                                      | 4988 kWh    | 5868 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 197 %   | 154 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.99    | 3.91    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.30    | 2.50    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.10 kW |
| COP T <sub>j</sub> = +2°C   | 5.00    | 3.90    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.60 kW |
| COP T <sub>j</sub> = +7°C   | 6.20    | 4.90    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.60 kW |
| COP T <sub>j</sub> = 12°C   | 7.60    | 6.30    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.30    | 2.50    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.00        | 2.20        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Qhe                       | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 250-A AWO-M-E-AC 251.A13 2C (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 250-A AWO-M-E-AC 251.A13 2C (SP) |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |



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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = T_{biv}$   | 2.60        | 2.10        |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.70 kW     | 7.20 kW     |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.30        | 1.80        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 10.80 kW    | 10.35 kW    |
| Annual energy consumption $Q_{he}$                                      | 7028 kWh    | 8129 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 181 %    | 147 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.60     | 3.75     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.40     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.40     | 3.60     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.60 kW  |
| COP T <sub>j</sub> = +7°C   | 6.20     | 5.00     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.50     | 6.60     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.00     | 2.40     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.80        | 2.20        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 2.40 kW     | 2.40 kW     |
| Annual energy consumption Qhe                       | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 250-A AWO-M-E-AC-AF 251.A10 2C (SP)

## Configure model

|                                     |   |
|-------------------------------------|---|
| Model name                          | Vitocal 250-A AWO-M-E-AC-AF 251.A10 2C (SP) |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |



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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 197 %   | 154 %   |
| Prated  | 9.80 kW | 9.37 kW |
| SCOP  | 4.99    | 3.91    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.30    | 2.50    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.10 kW |
| COP T <sub>j</sub> = +2°C   | 5.00    | 3.90    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.60 kW |
| COP T <sub>j</sub> = +7°C   | 6.20    | 4.90    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.60 kW |
| COP T <sub>j</sub> = 12°C   | 7.60    | 6.30    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.30    | 2.50    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.00        | 2.20        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Qhe                       | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 250-A AWO-M-E-AC-AF 251.A13 2C (SP)

| Configure model                     |   |
|-------------------------------------|---|
| Model name                          | Vitocal 250-A AWO-M-E-AC-AF 251.A13 2C (SP) |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = T_{biv}$   | 2.60        | 2.10        |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.70 kW     | 7.20 kW     |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.30        | 1.80        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 10.80 kW    | 10.35 kW    |
| Annual energy consumption $Q_{he}$                                      | 7028 kWh    | 8129 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 181 %    | 147 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.60     | 3.75     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.40     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.40     | 3.60     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.60 kW  |
| COP T <sub>j</sub> = +7°C   | 6.20     | 5.00     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.50     | 6.60     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.00     | 2.40     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |



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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.80        | 2.20        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 252-A AWO-M-E-AC 251.A10 2C (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 252-A AWO-M-E-AC 251.A10 2C (SP) |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 197 %   | 154 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.99    | 3.91    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.30    | 2.50    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.10 kW |
| COP T <sub>j</sub> = +2°C   | 5.00    | 3.90    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.60 kW |
| COP T <sub>j</sub> = +7°C   | 6.20    | 4.90    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.60 kW |
| COP T <sub>j</sub> = 12°C   | 7.60    | 6.30    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.30    | 2.50    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.00        | 2.20        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Qhe                       | 4055 kWh    | 4943 kWh    |



# Model: Vitocal 252-A AWO-M-E-AC 251.A13 2C (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 252-A AWO-M-E-AC 251.A13 2C (SP) |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = T_{biv}$   | 2.60        | 2.10        |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.70 kW     | 7.20 kW     |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.30        | 1.80        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 10.80 kW    | 10.35 kW    |
| Annual energy consumption $Q_{he}$                                      | 7028 kWh    | 8129 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 181 %    | 147 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.60     | 3.75     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.40     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.40     | 3.60     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.60 kW  |
| COP T <sub>j</sub> = +7°C   | 6.20     | 5.00     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.50     | 6.60     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.00     | 2.40     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.80        | 2.20        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.40 kW     | 2.40 kW     |
| Annual energy consumption $Q_{he}$                                | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 252-A AWO-M-E-AC-AF 251.A10 2C (SP)

## Configure model

|                                     |   |
|-------------------------------------|---|
| Model name                          | Vitocal 252-A AWO-M-E-AC-AF 251.A10 2C (SP) |
| 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 | 7.31 kW         | 6.75 kW            |
| El input    | 1.38 kW         | 2.27 kW            |
| COP         | 5.31            | 2.97               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 243 %           | 172 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.14            | 4.37               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.40            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.50            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.40        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.40        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1145 kWh    | 1419 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 165 %           | 131 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.19            | 3.35               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.40            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.30            | 4.10               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.20               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.70            | 6.60               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.80        | 2.20        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.40        | 1.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 4988 kWh    | 5868 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 197 %   | 154 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.99    | 3.91    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.30    | 2.50    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.10 kW |
| COP T <sub>j</sub> = +2°C   | 5.00    | 3.90    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.60 kW |
| COP T <sub>j</sub> = +7°C   | 6.20    | 4.90    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.60 kW |
| COP T <sub>j</sub> = 12°C   | 7.60    | 6.30    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.30    | 2.50    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.00        | 2.20        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Qhe                       | 4055 kWh    | 4943 kWh    |

# Model: Vitocal 252-A AWO-M-E-AC-AF 251.A13 2C (SP)

## Configure model

|                                     |   |
|-------------------------------------|---|
| Model name                          | Vitocal 252-A AWO-M-E-AC-AF 251.A13 2C (SP) |
| 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 | 8.13 kW         | 7.56 kW            |
| El input    | 1.56 kW         | 2.23 kW            |
| COP         | 5.21            | 3.40               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 238 %           | 179 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.03            | 4.55               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 4.00            | 2.90               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.60            | 3.90               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.80               |



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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 4.00        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.00        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1478 kWh    | 1942 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 148 %           | 122 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.79            | 3.14               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.50            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.50            | 5.30               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.50            | 6.80               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = T_{biv}$   | 2.60        | 2.10        |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.70 kW     | 7.20 kW     |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$       | 2.30        | 1.80        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 10.80 kW    | 10.35 kW    |
| Annual energy consumption $Q_{he}$                                      | 7028 kWh    | 8129 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 54 dB(A)               | 54 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 181 %    | 147 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.60     | 3.75     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.40     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.40     | 3.60     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.60 kW  |
| COP T <sub>j</sub> = +7°C   | 6.20     | 5.00     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.50     | 6.60     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.00     | 2.40     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.80        | 2.20        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 2.40 kW     | 2.40 kW     |
| Annual energy consumption Qhe                       | 5573 kWh    | 6662 kWh    |

# Model: Vitocal 150-A AWO-M-E-AC 151.A10 (SP)

| Configure model                     |                                       |
|-------------------------------------|---------------------------------------|
| Model name                          | Vitocal 150-A AWO-M-E-AC 151.A10 (SP) |
| 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 | 7.30 kW         | 6.75 kW            |
| El input    | 1.46 kW         | 2.53 kW            |
| COP         | 5.00            | 2.67               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|                            | Low temperature | Medium temperature |
|----------------------------|-----------------|--------------------|
| $P_{designh}$              | 5.27 kW         | 4.65 kW            |
| $\eta_s$                   | 239 %           | 168 %              |
| $P_{rated}$                | 5.27 kW         | 4.65 kW            |
| SCOP                       | 6.04            | 4.27               |
| $T_{biv}$                  | 2 °C            | 2 °C               |
| TOL                        | 2 °C            | 2 °C               |
| $P_{dh} T_j = +2^{\circ}C$ | 5.30 kW         | 4.70 kW            |
| $COP T_j = +2^{\circ}C$    | 4.20            | 2.70               |
| $C_{dh} T_j = +2^{\circ}C$ | 1.000           | 1.000              |
| $P_{dh} T_j = +7^{\circ}C$ | 5.70 kW         | 5.20 kW            |
| $COP T_j = +7^{\circ}C$    | 5.30            | 3.60               |
| $C_{dh} T_j = +7^{\circ}C$ | 1.000           | 1.000              |
| $P_{dh} T_j = 12^{\circ}C$ | 5.80 kW         | 5.50 kW            |
| $COP T_j = 12^{\circ}C$    | 7.20            | 5.40               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.20        | 2.70        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.20        | 2.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1165 kWh    | 1454 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|



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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 160 %           | 127 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.08            | 3.25               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.20            | 2.60               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 4.00               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.70        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 5126 kWh    | 6050 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 190 %   | 145 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.83    | 3.70    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.10    | 2.40    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.20 kW |
| COP T <sub>j</sub> = +2°C   | 4.80    | 3.70    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.70 kW |
| COP T <sub>j</sub> = +7°C   | 6.00    | 4.60    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.70 kW |
| COP T <sub>j</sub> = 12°C   | 7.30    | 6.00    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.10    | 2.40    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.90        | 2.10        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Qhe                       | 4129 kWh    | 5229 kWh    |

# Model: Vitocal 150-A AWO-M-E-AC 151.A13 (SP)

| Configure model                     |                                       |
|-------------------------------------|---------------------------------------|
| Model name                          | Vitocal 150-A AWO-M-E-AC 151.A13 (SP) |
| 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 | 8.10 kW         | 7.56 kW            |
| El input    | 1.65 kW         | 2.47 kW            |
| COP         | 4.90            | 3.06               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 239 %           | 173 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.05            | 4.41               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 6.90            | 5.50               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1518 kWh    | 2007 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 144 %           | 118 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.67            | 3.03               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.20            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |



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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.50        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7252 kWh    | 8407 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 178 %    | 141 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.53     | 3.54     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.30     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.30     | 3.40     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.70 kW  |
| COP T <sub>j</sub> = +7°C   | 6.10     | 4.80     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.40     | 6.30     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 2.90     | 2.30     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.70        | 2.10        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 2.30 kW     | 2.30 kW     |
| Annual energy consumption Qhe                       | 5672 kWh    | 6944 kWh    |

# Model: Vitocal 150-A AWO-M-E-AC 151.A16 (SP)

| Configure model                     |                                       |
|-------------------------------------|---------------------------------------|
| Model name                          | Vitocal 150-A AWO-M-E-AC 151.A16 (SP) |
| 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 | 9.10 kW         | 8.49 kW            |
| El input    | 1.86 kW         | 2.53 kW            |
| COP         | 4.90            | 3.35               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 7.54 kW         | 7.56 kW            |
| $\eta_s$                               | 239 %           | 175 %              |
| P <sub>rated</sub>                     | 7.54 kW         | 7.56 kW            |
| SCOP                                   | 6.06            | 4.46               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 7.50 kW         | 7.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 6.60 kW         | 6.10 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.60 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C              | 7.30            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 7.50 kW     | 7.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.50 kW     | 7.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1662 kWh    | 2266 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 11.83 kW        | 11.17 kW           |
| $\eta_s$  | 141 %           | 117 %              |
| P <sub>rated</sub>                                | 11.83 kW        | 11.17 kW           |
| SCOP  | 3.61            | 2.99               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.10 kW        | 11.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.80            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.60 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.50               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.40 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.50               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 9.70 kW         | 9.10 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.40        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.40 kW     | 7.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.20        | 1.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 11.83 kW    | 11.17 kW    |
| Annual energy consumption Qhe                       | 8080 kWh    | 10386 kWh   |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |



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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 13.67 kW | 13.37 kW |
| $\eta_s$  | 178 %    | 141 %    |
| P <sub>rated</sub>  | 13.67 kW | 13.37 kW |
| SCOP  | 4.52     | 3.60     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 12.00 kW | 11.80 kW |
| COP T <sub>j</sub> = -7°C   | 2.90     | 2.30     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 7.40 kW  | 7.50 kW  |
| COP T <sub>j</sub> = +2°C   | 4.30     | 3.40     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 6.70 kW  | 6.50 kW  |
| COP T <sub>j</sub> = +7°C   | 6.10     | 4.80     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.30 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.30     | 6.30     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 12.10 kW | 11.80 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 2.90     | 2.30     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 11.10 kW | 10.70 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.60        | 2.10        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.60 kW     | 2.60 kW     |
| Annual energy consumption Qhe                                     | 6242 kWh    | 7670 kWh    |

# Model: Vitocal 150-A AWO-M-E-AC-AF 151.A10 (SP)

| Configure model                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 150-A AWO-M-E-AC-AF 151.A10 (SP) |
| 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 | 7.30 kW         | 6.75 kW            |
| El input    | 1.46 kW         | 2.53 kW            |
| COP         | 5.00            | 2.67               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 239 %           | 168 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.04            | 4.27               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.20            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.30            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.40               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.20        | 2.70        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.20        | 2.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1165 kWh    | 1454 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 160 %           | 127 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.08            | 3.25               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.20            | 2.60               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 4.00               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.70        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 5126 kWh    | 6050 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 190 %   | 145 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.83    | 3.70    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.10    | 2.40    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.20 kW |
| COP T <sub>j</sub> = +2°C   | 4.80    | 3.70    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.70 kW |
| COP T <sub>j</sub> = +7°C   | 6.00    | 4.60    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.70 kW |
| COP T <sub>j</sub> = 12°C   | 7.30    | 6.00    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.10    | 2.40    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |



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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.90        | 2.10        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Qhe                                     | 4129 kWh    | 5229 kWh    |

# Model: Vitocal 150-A AWO-M-E-AC-AF 151.A13 (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 150-A AWO-M-E-AC-AF 151.A13 (SP) |
| 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 | 8.10 kW         | 7.56 kW            |
| El input    | 1.65 kW         | 2.47 kW            |
| COP         | 4.90            | 3.06               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 239 %           | 173 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.05            | 4.41               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 6.90            | 5.50               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1518 kWh    | 2007 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 144 %           | 118 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.67            | 3.03               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.20            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.50        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7252 kWh    | 8407 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 178 %    | 141 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.53     | 3.54     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.30     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.30     | 3.40     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.70 kW  |
| COP T <sub>j</sub> = +7°C   | 6.10     | 4.80     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.40     | 6.30     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 2.90     | 2.30     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.70        | 2.10        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 2.30 kW     | 2.30 kW     |
| Annual energy consumption Qhe                       | 5672 kWh    | 6944 kWh    |



# Model: Vitocal 150-A AWO-M-E-AC-AF 151.A16 (SP)

| Configure model                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 150-A AWO-M-E-AC-AF 151.A16 (SP) |
| 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 | 9.10 kW         | 8.49 kW            |
| El input    | 1.86 kW         | 2.53 kW            |
| COP         | 4.90            | 3.35               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 7.54 kW         | 7.56 kW            |
| $\eta_s$                               | 239 %           | 175 %              |
| P <sub>rated</sub>                     | 7.54 kW         | 7.56 kW            |
| SCOP                                   | 6.06            | 4.46               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 7.50 kW         | 7.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 6.60 kW         | 6.10 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.60 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C              | 7.30            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 7.50 kW     | 7.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.50 kW     | 7.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1662 kWh    | 2266 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 11.83 kW        | 11.17 kW           |
| $\eta_s$  | 141 %           | 117 %              |
| P <sub>rated</sub>                                | 11.83 kW        | 11.17 kW           |
| SCOP  | 3.61            | 2.99               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.10 kW        | 11.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.80            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.60 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.50               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.40 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.50               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 9.70 kW         | 9.10 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.40        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.40 kW     | 7.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.20        | 1.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 11.83 kW    | 11.17 kW    |
| Annual energy consumption Qhe                       | 8080 kWh    | 10386 kWh   |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 13.67 kW | 13.37 kW |
| $\eta_s$  | 178 %    | 141 %    |
| P <sub>rated</sub>  | 13.67 kW | 13.37 kW |
| SCOP  | 4.52     | 3.60     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 12.00 kW | 11.80 kW |
| COP T <sub>j</sub> = -7°C   | 2.90     | 2.30     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 7.40 kW  | 7.50 kW  |
| COP T <sub>j</sub> = +2°C   | 4.30     | 3.40     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 6.70 kW  | 6.50 kW  |
| COP T <sub>j</sub> = +7°C   | 6.10     | 4.80     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.30 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.30     | 6.30     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 12.10 kW | 11.80 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 2.90     | 2.30     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 11.10 kW | 10.70 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.60        | 2.10        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 2.60 kW     | 2.60 kW     |
| Annual energy consumption Qhe                       | 6242 kWh    | 7670 kWh    |

# Model: Vitocal 151-A AWOT-M-E-AC 151.A10 (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 151-A AWOT-M-E-AC 151.A10 (SP) |
| 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 | 7.30 kW         | 6.75 kW            |
| El input    | 1.46 kW         | 2.53 kW            |
| COP         | 5.00            | 2.67               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 239 %           | 168 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.04            | 4.27               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.20            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.30            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.40               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.20        | 2.70        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.20        | 2.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1165 kWh    | 1454 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 160 %           | 127 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.08            | 3.25               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.20            | 2.60               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 4.00               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.70        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 5126 kWh    | 6050 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 190 %   | 145 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.83    | 3.70    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.10    | 2.40    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.20 kW |
| COP T <sub>j</sub> = +2°C   | 4.80    | 3.70    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.70 kW |
| COP T <sub>j</sub> = +7°C   | 6.00    | 4.60    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.70 kW |
| COP T <sub>j</sub> = 12°C   | 7.30    | 6.00    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.10    | 2.40    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.90        | 2.10        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Qhe                       | 4129 kWh    | 5229 kWh    |

# Model: Vitocal 151-A AWOT-M-E-AC 151.A13 (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 151-A AWOT-M-E-AC 151.A13 (SP) |
| 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 | 8.10 kW         | 7.56 kW            |
| El input    | 1.65 kW         | 2.47 kW            |
| COP         | 4.90            | 3.06               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 239 %           | 173 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.05            | 4.41               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 6.90            | 5.50               |



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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1518 kWh    | 2007 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 144 %           | 118 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.67            | 3.03               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.20            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.50        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7252 kWh    | 8407 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 178 %    | 141 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.53     | 3.54     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.30     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.30     | 3.40     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.70 kW  |
| COP T <sub>j</sub> = +7°C   | 6.10     | 4.80     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.40     | 6.30     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 2.90     | 2.30     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.70        | 2.10        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.30 kW     | 2.30 kW     |
| Annual energy consumption $Q_{he}$                                | 5672 kWh    | 6944 kWh    |

# Model: Vitocal 151-A AWOT-M-E-AC 151.A16 (SP)

## Configure model

|                                     |  |
|-------------------------------------|--|
| Model name                          | Vitocal 151-A AWOT-M-E-AC 151.A16 (SP) |
| 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 | 9.10 kW         | 8.49 kW            |
| El input    | 1.86 kW         | 2.53 kW            |
| COP         | 4.90            | 3.35               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 7.54 kW         | 7.56 kW            |
| $\eta_s$                               | 239 %           | 175 %              |
| P <sub>rated</sub>                     | 7.54 kW         | 7.56 kW            |
| SCOP                                   | 6.06            | 4.46               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 7.50 kW         | 7.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 6.60 kW         | 6.10 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.60 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C              | 7.30            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 7.50 kW     | 7.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.50 kW     | 7.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1662 kWh    | 2266 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|



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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 11.83 kW        | 11.17 kW           |
| $\eta_s$  | 141 %           | 117 %              |
| P <sub>rated</sub>                                | 11.83 kW        | 11.17 kW           |
| SCOP  | 3.61            | 2.99               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.10 kW        | 11.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.80            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.60 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.50               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.40 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.50               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 9.70 kW         | 9.10 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.40        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.40 kW     | 7.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.20        | 1.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 11.83 kW    | 11.17 kW    |
| Annual energy consumption Qhe                       | 8080 kWh    | 10386 kWh   |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 13.67 kW | 13.37 kW |
| $\eta_s$  | 178 %    | 141 %    |
| Prated  | 13.67 kW | 13.37 kW |
| SCOP  | 4.52     | 3.60     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 12.00 kW | 11.80 kW |
| COP T <sub>j</sub> = -7°C   | 2.90     | 2.30     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 7.40 kW  | 7.50 kW  |
| COP T <sub>j</sub> = +2°C   | 4.30     | 3.40     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 6.70 kW  | 6.50 kW  |
| COP T <sub>j</sub> = +7°C   | 6.10     | 4.80     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.30 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.30     | 6.30     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 12.10 kW | 11.80 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 2.90     | 2.30     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 11.10 kW | 10.70 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.60        | 2.10        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 2.60 kW     | 2.60 kW     |
| Annual energy consumption Qhe                       | 6242 kWh    | 7670 kWh    |

# Model: Vitocal 151-A AWOT-M-E-AC-AF 151.A10 (SP)

## Configure model

|                                     |   |
|-------------------------------------|---|
| Model name                          | Vitocal 151-A AWOT-M-E-AC-AF 151.A10 (SP) |
| 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 | 7.30 kW         | 6.75 kW            |
| El input    | 1.46 kW         | 2.53 kW            |
| COP         | 5.00            | 2.67               |

### 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 5.27 kW         | 4.65 kW            |
| $\eta_s$                               | 239 %           | 168 %              |
| P <sub>rated</sub>                     | 5.27 kW         | 4.65 kW            |
| SCOP                                   | 6.04            | 4.27               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 5.30 kW         | 4.70 kW            |
| COP T <sub>j</sub> = +2°C              | 4.20            | 2.70               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.30            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.80 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 7.20            | 5.40               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 5.30 kW     | 4.70 kW     |
| COP Tj = Tbiv                                       | 4.20        | 2.70        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 5.30 kW     | 4.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.20        | 2.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1165 kWh    | 1454 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 8.48 kW         | 7.98 kW            |
| $\eta_s$  | 160 %           | 127 %              |
| P <sub>rated</sub>                                | 8.48 kW         | 7.98 kW            |
| SCOP  | 4.08            | 3.25               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 8.70 kW         | 8.40 kW            |
| COP T <sub>j</sub> = -7°C                         | 3.20            | 2.60               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 5.50 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +2°C                         | 5.00            | 4.00               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.40            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 6.90 kW         | 6.50 kW            |



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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.70        | 2.10        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.00 kW     | 5.50 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 8.48 kW     | 7.98 kW     |
| Annual energy consumption Qhe                       | 5126 kWh    | 6050 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |         |         |
|---|---------|---------|
| P <sub>designh</sub>  | 9.80 kW | 9.37 kW |
| $\eta_s$  | 190 %   | 145 %   |
| P <sub>rated</sub>  | 9.80 kW | 9.37 kW |
| SCOP  | 4.83    | 3.70    |
| T <sub>biv</sub>  | -7 °C   | -7 °C   |
| TOL   | -10 °C  | -10 °C  |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = -7°C   | 3.10    | 2.40    |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 5.40 kW | 5.20 kW |
| COP T <sub>j</sub> = +2°C   | 4.80    | 3.70    |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.80 kW | 5.70 kW |
| COP T <sub>j</sub> = +7°C   | 6.00    | 4.60    |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW | 5.70 kW |
| COP T <sub>j</sub> = 12°C   | 7.30    | 6.00    |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000   | 1.000   |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 8.70 kW | 8.30 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 3.10    | 2.40    |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 7.90 kW | 7.50 kW |

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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.90        | 2.10        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| P <sub>off</sub>  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 1.90 kW     | 1.90 kW     |
| Annual energy consumption Q <sub>he</sub>                         | 4129 kWh    | 5229 kWh    |

# Model: Vitocal 151-A AWOT-M-E-AC-AF 151.A13 (SP)

| Configure model                     |   |
|-------------------------------------|---|
| Model name                          | Vitocal 151-A AWOT-M-E-AC-AF 151.A13 (SP) |
| 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 | 8.10 kW         | 7.56 kW            |
| El input    | 1.65 kW         | 2.47 kW            |
| COP         | 4.90            | 3.06               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 6.68 kW         | 6.62 kW            |
| $\eta_s$                               | 239 %           | 173 %              |
| P <sub>rated</sub>                     | 6.68 kW         | 6.62 kW            |
| SCOP                                   | 6.05            | 4.41               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 5.70 kW         | 5.20 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.70               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.70 kW         | 5.50 kW            |
| COP T <sub>j</sub> = 12°C              | 6.90            | 5.50               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 6.70 kW     | 6.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 6.70 kW     | 6.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1518 kWh    | 2007 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 10.80 kW        | 10.35 kW           |
| $\eta_s$  | 144 %           | 118 %              |
| P <sub>rated</sub>                                | 10.80 kW        | 10.35 kW           |
| SCOP  | 3.67            | 3.03               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 11.00 kW        | 10.80 kW           |
| COP T <sub>j</sub> = -7°C                         | 3.00            | 2.50               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 6.80 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.40            | 3.60               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 5.90 kW         | 5.70 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.20            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.60 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.20            | 6.30               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 8.80 kW         | 8.40 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.50        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.70 kW     | 7.20 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.30        | 1.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 10.80 kW    | 10.35 kW    |
| Annual energy consumption Qhe                       | 7252 kWh    | 8407 kWh    |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |



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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 12.42 kW | 12.10 kW |
| $\eta_s$  | 178 %    | 141 %    |
| Prated  | 12.42 kW | 12.10 kW |
| SCOP  | 4.53     | 3.54     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = -7°C   | 3.00     | 2.30     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 6.80 kW  | 6.60 kW  |
| COP T <sub>j</sub> = +2°C   | 4.30     | 3.40     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 5.90 kW  | 5.70 kW  |
| COP T <sub>j</sub> = +7°C   | 6.10     | 4.80     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.50 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.40     | 6.30     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 11.00 kW | 10.70 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 2.90     | 2.30     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 10.10 kW | 9.70 kW  |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.70        | 2.10        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 2.30 kW     | 2.30 kW     |
| Annual energy consumption Qhe                       | 5672 kWh    | 6944 kWh    |

# Model: Vitocal 151-A AWOT-M-E-AC-AF 151.A16 (SP)

| Configure model                     |   |
|-------------------------------------|---|
| Model name                          | Vitocal 151-A AWOT-M-E-AC-AF 151.A16 (SP) |
| 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 | 9.10 kW         | 8.49 kW            |
| El input    | 1.86 kW         | 2.53 kW            |
| COP         | 4.90            | 3.35               |

| 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  | 40 dB(A)        | 40 dB(A)           |
| Sound power level outdoor | 56 dB(A)        | 56 dB(A)           |

### EN 14825

|  | Low temperature | Medium temperature |
|--|-----------------|--------------------|
| P <sub>designh</sub>                   | 7.54 kW         | 7.56 kW            |
| $\eta_s$                               | 239 %           | 175 %              |
| P <sub>rated</sub>                     | 7.54 kW         | 7.56 kW            |
| SCOP                                   | 6.06            | 4.46               |
| T <sub>biv</sub>                       | 2 °C            | 2 °C               |
| TOL                                    | 2 °C            | 2 °C               |
| P <sub>dh</sub> T <sub>j</sub> = +2°C  | 7.50 kW         | 7.60 kW            |
| COP T <sub>j</sub> = +2°C              | 3.80            | 2.80               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C  | 6.60 kW         | 6.10 kW            |
| COP T <sub>j</sub> = +7°C              | 5.40            | 3.80               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C  | 5.60 kW         | 5.60 kW            |
| COP T <sub>j</sub> = 12°C              | 7.30            | 5.60               |

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

|   |             |             |
|---|-------------|-------------|
| Cdh Tj = +12 °C                                     | 1.000       | 1.000       |
| Pdh Tj = Tbiv                                       | 7.50 kW     | 7.60 kW     |
| COP Tj = Tbiv                                       | 3.80        | 2.80        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.50 kW     | 7.60 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 3.80        | 2.80        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Qhe                       | 1662 kWh    | 2266 kWh    |

## Colder Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |
|-----------------|
|-----------------|

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

|   | Low temperature | Medium temperature |
|---|-----------------|--------------------|
| P <sub>designh</sub>                              | 11.83 kW        | 11.17 kW           |
| $\eta_s$  | 141 %           | 117 %              |
| P <sub>rated</sub>                                | 11.83 kW        | 11.17 kW           |
| SCOP  | 3.61            | 2.99               |
| T <sub>biv</sub>                                  | -15 °C          | -15 °C             |
| TOL   | -20 °C          | -20 °C             |
| P <sub>dh</sub> T <sub>j</sub> = -7°C             | 12.10 kW        | 11.70 kW           |
| COP T <sub>j</sub> = -7°C                         | 2.80            | 2.40               |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +2°C             | 7.60 kW         | 7.50 kW            |
| COP T <sub>j</sub> = +2°C                         | 4.30            | 3.50               |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = +7°C             | 6.70 kW         | 6.60 kW            |
| COP T <sub>j</sub> = +7°C                         | 6.10            | 5.00               |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C            | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = 12°C             | 5.40 kW         | 5.70 kW            |
| COP T <sub>j</sub> = 12°C                         | 7.30            | 6.50               |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C           | 1.000           | 1.000              |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub> | 9.70 kW         | 9.10 kW            |

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

|   |             |             |
|---|-------------|-------------|
| COP Tj = Tbiv                                       | 2.40        | 2.00        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.40 kW     | 7.70 kW     |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.20        | 1.70        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 11.83 kW    | 11.17 kW    |
| Annual energy consumption Qhe                       | 8080 kWh    | 10386 kWh   |

## Average Climate

| <b>EN 12102-1</b>         |                        |                           |
|---------------------------|------------------------|---------------------------|
|                           | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor  | 40 dB(A)               | 40 dB(A)                  |
| Sound power level outdoor | 56 dB(A)               | 56 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
|                 |                        |                           |

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

|   |          |          |
|---|----------|----------|
| P <sub>designh</sub>  | 13.67 kW | 13.37 kW |
| $\eta_s$  | 178 %    | 141 %    |
| P <sub>rated</sub>  | 13.67 kW | 13.37 kW |
| SCOP  | 4.52     | 3.60     |
| T <sub>biv</sub>  | -7 °C    | -7 °C    |
| TOL   | -10 °C   | -10 °C   |
| P <sub>dh</sub> T <sub>j</sub> = -7°C   | 12.00 kW | 11.80 kW |
| COP T <sub>j</sub> = -7°C   | 2.90     | 2.30     |
| C <sub>dh</sub> T <sub>j</sub> = -7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C   | 7.40 kW  | 7.50 kW  |
| COP T <sub>j</sub> = +2°C   | 4.30     | 3.40     |
| C <sub>dh</sub> T <sub>j</sub> = +2 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = +7°C   | 6.70 kW  | 6.50 kW  |
| COP T <sub>j</sub> = +7°C   | 6.10     | 4.80     |
| C <sub>dh</sub> T <sub>j</sub> = +7 °C  | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = 12°C   | 5.30 kW  | 5.70 kW  |
| COP T <sub>j</sub> = 12°C   | 7.30     | 6.30     |
| C <sub>dh</sub> T <sub>j</sub> = +12 °C   | 1.000    | 1.000    |
| P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>   | 12.10 kW | 11.80 kW |
| COP T <sub>j</sub> = T <sub>biv</sub>   | 2.90     | 2.30     |
| P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub> | 11.10 kW | 10.70 kW |



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

|   |             |             |
|---|-------------|-------------|
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 2.60        | 2.10        |
| Cdh $T_j = TOL$ or Pdh $T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.000       | 1.000       |
| WTOL  | 70 °C       | 70 °C       |
| Poff  | 0 W         | 0 W         |
| PTO   | 14 W        | 14 W        |
| PSB   | 16 W        | 16 W        |
| PCK   | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input                        | Electricity | Electricity |
| Supplementary Heater: PSUP  | 2.60 kW     | 2.60 kW     |
| Annual energy consumption $Q_{he}$                                | 6242 kWh    | 7670 kWh    |