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|                     |              |          |               |
|---------------------|--------------|----------|---------------|
| Summary of          | JAMA Star-30 | Reg. No. | 012-SC0669-18 |
| Certificate Holder  |              |          |               |
| Name                | Kaukora      |          |               |
| Address             | Tuotekatu 11 | Zip      | FI-21200      |
| City                | Raisio       | Country  | Finland       |
| Certification Body  | RISE CERT    |          |               |
| Subtype title       | JAMA Star-30 |          |               |
| Heat Pump Type      | Brine/Water  |          |               |
| Refrigerant         | R407c        |          |               |
| Mass of Refrigerant | 4 kg         |          |               |

## Model: Star-30

| Configure model                     |                       |
|-------------------------------------|-----------------------|
| Model name                          | Star-30               |
| Application                         | Heating (medium temp) |
| Units                               | Indoor                |
| Climate Zone                        | Colder Climate        |
| Reversibility                       | No                    |
| Cooling mode application (optional) | n/a                   |

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

### Heating

| EN 14511-4   |        |
|--|--------|
| Operating range outdoor exchanger/indoor exchanger lower limit/lower limit | passed |
| Operating range outdoor exchanger/indoor exchanger upper limit/upper limit | passed |
| Shutting off the heat transfer medium flow                                 | passed |
| Complete power supply failure  | passed |

| EN 14511-2  |                 |                    |
|-------------|-----------------|--------------------|
|             | Low temperature | Medium temperature |
| Heat output | 30.72 kW        | 29.40 kW           |
| El input    | 6.92 kW         | 10.20 kW           |
| COP         | 4.44            | 2.90               |

### Colder Climate

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### EN 12102-1

|                          | Low temperature | Medium temperature |
|--------------------------|-----------------|--------------------|
| Sound power level indoor | 47 dB(A)        | 47 dB(A)           |

### EN 14825

|               | Low temperature | Medium temperature |
|---------------|-----------------|--------------------|
| $\eta_s$      | 186 %           | 144 %              |
| Prated        | 35.00 kW        | 35.00 kW           |
| SCOP          | 4.85            | 3.80               |
| Tbiv          | -18 °C          | -16 °C             |
| TOL           | -22 °C          | -22 °C             |
| Pdh Tj = -7°C | 31.00 kW        | 30.10 kW           |
| COP Tj = -7°C | 4.75            | 3.55               |
| Pdh Tj = +2°C | 15.60 kW        | 15.30 kW           |
| COP Tj = +2°C | 5.06            | 4.04               |
| Pdh Tj = +7°C | 15.60 kW        | 15.40 kW           |
| COP Tj = +7°C | 5.14            | 4.39               |
| Pdh Tj = 12°C | 15.60 kW        | 15.50 kW           |
| COP Tj = 12°C | 4.86            | 4.55               |
| Pdh Tj = Tbiv | 30.80 kW        | 29.60 kW           |
| COP Tj = Tbiv | 4.55            | 3.24               |

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|   |             |             |
|---|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 30.80 kW    | 19.30 kW    |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 4.38        | 2.99        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 0.98        | 0.99        |
| WTOL  | 65 °C       | 65 °C       |
| Poff  | 2 W         | 2 W         |
| PTO   | 60 W        | 60 W        |
| PSB   | 7 W         | 7 W         |
| PCK   | 70 W        | 70 W        |
| Supplementary Heater: Type of energy input                              | Electricity | Electricity |
| Supplementary Heater: PSUP  | 4.20 kW     | 5.70 kW     |
| Annual energy consumption $Q_{he}$                                      | 17817 kWh   | 22770 kWh   |

## Average Climate

| <b>EN 12102-1</b>        |                        |                           |
|--------------------------|------------------------|---------------------------|
|                          | <b>Low temperature</b> | <b>Medium temperature</b> |
| Sound power level indoor | 47 dB(A)               | 47 dB(A)                  |

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
| $\eta_s$        | 178 %                  | 137 %                     |
| Prated          | 35.00 kW               | 35.00 kW                  |

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|   |          |          |
|---|----------|----------|
| SCOP  | 4.65     | 3.63     |
| Tbiv  | -7 °C    | -6 °C    |
| TOL   | -10 °C   | -10 °C   |
| Pdh Tj = -7°C                                       | 30.80 kW | 29.50 kW |
| COP Tj = -7°C                                       | 4.51     | 3.15     |
| Pdh Tj = +2°C                                       | 30.90 kW | 30.20 kW |
| COP Tj = +2°C                                       | 4.69     | 3.64     |
| Pdh Tj = +7°C                                       | 15.60 kW | 15.30 kW |
| COP Tj = +7°C                                       | 5.02     | 4.09     |
| Pdh Tj = 12°C                                       | 15.60 kW | 15.40 kW |
| COP Tj = 12°C                                       | 5.01     | 4.40     |
| Pdh Tj = Tbiv                                       | 30.80 kW | 29.60 kW |
| COP Tj = Tbiv                                       | 4.51     | 3.23     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 30.80 kW | 29.30 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.38     | 2.99     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 0.98     | 0.99     |
| WTOL  | 65 °C    | 65 °C    |
| Poff  | 2 W      | 2 W      |
| PTO   | 80 W     | 80 W     |
| PSB   | 7 W      | 7 W      |
| PCK   | 70 W     | 70 W     |

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|  |             |             |
|--|-------------|-------------|
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP                 | 4.20 kW     | 5.70 kW     |
| Annual energy consumption Q <sub>he</sub>  | 15539 kWh   | 19880 kWh   |