

|                        |                     |                |
|------------------------|---------------------|----------------|
| <b>Heat pump model</b> | <b>Master Therm</b> | <b>AQ60I-1</b> |
|------------------------|---------------------|----------------|

|                              |             |
|------------------------------|-------------|
| Heat pump type               | Water/Water |
| Supplementary heater         | No          |
| Heat pump combination heater | No          |

|                                |                                  |                   |                  |                         |
|--------------------------------|----------------------------------|-------------------|------------------|-------------------------|
| Reference heating season       |                                  | <b>Average</b>    |                  |                         |
| Reference water temperature    |                                  | <b>LOW, 35°C</b>  |                  |                         |
| Full load heating              | <b>Prated [kW]</b>               | <b>33</b>         |                  |                         |
| Seasonal efficiency            | <b><math>\eta_s</math> [%]</b>   | <b>195</b>        |                  |                         |
| Annual electricity consumption | <b><math>Q_{HE}</math> [kWh]</b> | <b>13348</b>      |                  |                         |
| <b>Average 35°C</b>            | Outdoor heat exchanger           | Declared capacity | COP at part load | Degradation Coefficient |
|                                | Outdoor air                      |                   |                  |                         |
|                                | $T_j$ [°C]                       | Pdh [kW]          | COPd (-)         | Cdh (-)                 |
| A                              | -7                               | 29.51             | 3.77             | 0.900                   |
| B                              | 2                                | 18.63             | 5.10             | 0.900                   |
| C                              | 7                                | 12.14             | 5.79             | 0.900                   |
| D                              | 12                               | 6.97              | 5.96             | 0.978                   |
| TOL (E)                        | -10                              | 32.71             | 3.70             | 0.900                   |
| Tbivalent (F)                  | -10                              | 32.71             | 3.70             | 0.900                   |

|                                |                                  |                   |                  |                         |
|--------------------------------|----------------------------------|-------------------|------------------|-------------------------|
| Reference heating season       |                                  | <b>Average</b>    |                  |                         |
| Reference water temperature    |                                  | <b>High, 55°C</b> |                  |                         |
| Full load heating              | <b>Prated [kW]</b>               | <b>32.90</b>      |                  |                         |
| Seasonal efficiency            | <b><math>\eta_s</math> [%]</b>   | <b>151</b>        |                  |                         |
| Annual electricity consumption | <b><math>Q_{HE}</math> [kWh]</b> | <b>17049</b>      |                  |                         |
| <b>Average 55°C</b>            | Outdoor heat exchanger           | Declared capacity | COP at part load | Degradation Coefficient |
|                                | Outdoor air                      |                   |                  |                         |
|                                | $T_j$ [°C]                       | Pdh [kW]          | COPd (-)         | Cdh (-)                 |
| A                              | -7                               | 29.91             | 2.90             | 0.900                   |
| B                              | 2                                | 17.01             | 4.01             | 0.900                   |
| C                              | 7                                | 11.21             | 4.64             | 0.900                   |
| D                              | 12                               | 6.80              | 4.77             | 0.982                   |
| TOL (E)                        | -10                              | 32.90             | 2.73             | 0.900                   |
| Tbivalent (F)                  | -10                              | 32.90             | 2.73             | 0.900                   |

|                                |                                  |                   |                  |                         |
|--------------------------------|----------------------------------|-------------------|------------------|-------------------------|
| Reference heating season       |                                  | <b>Warmer</b>     |                  |                         |
| Reference water temperature    |                                  | <b>Low, 35°C</b>  |                  |                         |
| Full load heating              | <b>Prated [kW]</b>               | <b>32.71</b>      |                  |                         |
| Seasonal efficiency            | <b><math>\eta_s</math> [%]</b>   | <b>204</b>        |                  |                         |
| Annual electricity consumption | <b><math>Q_{HE}</math> [kWh]</b> | <b>8234</b>       |                  |                         |
| <b>Warmer 35°C</b>             | Outdoor heat exchanger           | Declared capacity | COP at part load | Degradation Coefficient |
|                                | Outdoor air                      |                   |                  |                         |
|                                | $T_j$ [°C]                       | Pdh [kW]          | COPd (-)         | Cdh (-)                 |
| B                              | 2                                | 32.71             | 3.70             | 0.900                   |
| C                              | 7                                | 21.15             | 4.79             | 0.900                   |
| D                              | 12                               | 9.44              | 6.13             | 0.900                   |
| TOL (E)                        | 2                                | 32.71             | 3.70             | 0.900                   |
| Tbivalent (F)                  | 2                                | 32.71             | 3.70             | 0.900                   |

| Heat pump model                |                        | Master Therm      |                  | AQ60I-1                 |  |
|--------------------------------|------------------------|-------------------|------------------|-------------------------|--|
| Reference heating season       |                        |                   | Warmer           |                         |  |
| Reference water temperature    |                        |                   | High, 55°C       |                         |  |
| Full load heating              |                        | Prated [kW]       | 32.90            |                         |  |
| Seasonal efficiency            |                        | $\eta_s$ [%]      | 149              |                         |  |
| Annual electricity consumption |                        | $Q_{HE}$ [kWh]    | 11183            |                         |  |
| Warmer 55°C                    | Outdoor heat exchanger | Declared capacity | COP at part load | Degradation Coefficient |  |
|                                | Outdoor air            |                   |                  |                         |  |
|                                | Tj [°C]                | Pdh [kW]          | COPd (-)         | Cdh (-)                 |  |
| B                              | 2                      | 32.90             | 2.73             | 0.900                   |  |
| C                              | 7                      | 21.27             | 3.46             | 0.900                   |  |
| D                              | 12                     | 9.49              | 4.65             | 0.900                   |  |
| TOL (E)                        | 2                      | 32.90             | 2.73             | 0.900                   |  |
| Tbivalent (F)                  | 2                      | 32.90             | 2.73             | 0.900                   |  |
| Reference heating season       |                        |                   | Colder           |                         |  |
| Reference water temperature    |                        |                   | Low, 35°C        |                         |  |
| Full load heating              |                        | Prated [kW]       | 32.71            |                         |  |
| Seasonal efficiency            |                        | $\eta_s$ [%]      | 206              |                         |  |
| Annual electricity consumption |                        | $Q_{HE}$ [kWh]    | 15061            |                         |  |
| Colder 35°C                    | Outdoor heat exchanger | Declared capacity | COP at part load | Degradation Coefficient |  |
|                                | Outdoor air            |                   |                  |                         |  |
|                                | Tj [°C]                | Pdh [kW]          | COPd (-)         | Cdh (-)                 |  |
| A                              | -7                     | 20.28             | 5.06             | 0.900                   |  |
| B                              | 2                      | 12.14             | 5.79             | 0.900                   |  |
| C                              | 7                      | 8.04              | 6.13             | 0.900                   |  |
| D                              | 12                     | 6.97              | 5.96             | 0.978                   |  |
| TOL (E)                        | -22                    | 32.71             | 3.70             | 0.900                   |  |
| Tbivalent (F)                  | -22                    | 32.71             | 3.70             | 0.900                   |  |
| G                              | -15                    | 27.11             | 4.06             | 0.900                   |  |
| Reference heating season       |                        |                   | Colder           |                         |  |
| Reference water temperature    |                        |                   | High, 55°C       |                         |  |
| Full load heating              |                        | Prated [kW]       | 32.90            |                         |  |
| Seasonal efficiency            |                        | $\eta_s$ [%]      | 158              |                         |  |
| Annual electricity consumption |                        | $Q_{HE}$ [kWh]    | 19553            |                         |  |
| Colder 55°C                    | Outdoor heat exchanger | Declared capacity | COP at part load | Degradation Coefficient |  |
|                                | Outdoor air            |                   |                  |                         |  |
|                                | Tj [°C]                | Pdh [kW]          | COPd (-)         | Cdh (-)                 |  |
| A                              | -7                     | 20.21             | 3.81             | 0.900                   |  |
| B                              | 2                      | 12.55             | 4.51             | 0.900                   |  |
| C                              | 7                      | 7.87              | 5.05             | 0.900                   |  |
| D                              | 12                     | 6.85              | 5.05             | 0.981                   |  |
| TOL (E)                        | -22                    | 32.90             | 2.73             | 0.900                   |  |
| Tbivalent (F)                  | -22                    | 32.90             | 2.73             | 0.900                   |  |
| G                              | -15                    | 27.26             | 3.09             | 0.900                   |  |

| Heat pump model                                     | Master Therm                                       | AQ60I-1     |
|---|--|-------------|
| Power consumption in modes other than "active mode" |  |             |
| Off mode  | $P_{OFF}$ [kW]                                     | 0.000       |
| Thermostat off mode                                 | $P_{TO}$ [kW]                                      | 0.026       |
| Standby mode  | $P_{SB}$ [kW]                                      | 0.026       |
| Crankcaseheater mode                                | $P_{CK}$ [kW]                                      | -           |
| Supplementary heater capacity                       |  |             |
| Supplementary heater capacity                       | $P_{sup}$ [kW]                                     | -           |
| Supplementary heater type                           | [-]  | electricity |
| Capacity control                                    |  |             |
| Capacity control                                    |  | Variable    |
| Sound power level Indoor                            | $L_{WA}$ [dBA]                                     | 55          |
| Sound power level Outdoor                           | $L_{WA}$ [dBA]                                     | -           |
| Rated water flow                                    | [m <sup>3</sup> /h]                                | 8.02        |
| Temperature controller                              |  |             |
| Type  | Carel pCO5/pCO5+/uPC, Master Therm custom SW       |             |
| Class   | II   |             |
| Contribution  | %  | 2.0         |
| Temperature controller + Room Terminal              |  |             |
| Type  | Carel pCO5/pCO5+/uPC + pAD, Master Therm custom SW |             |
| Class   | VI   |             |
| Contribution  | %  | 4.0         |

|                        |                     |                |
|------------------------|---------------------|----------------|
| <b>Heat pump model</b> | <b>Master Therm</b> | <b>AQ60I-1</b> |
|------------------------|---------------------|----------------|

| <b>Information sheet</b>                                  |     |                  |                   |
|---|-----|------------------|-------------------|
| Temperature application                                   |     | <b>Low, 35°C</b> | <b>High, 55°C</b> |
| Space heating energy efficiency class, Average climate    | -   | A+++             | A+++              |
| Nominal heating capacity Pdesign, Average climate         | kW  | 33               | 33                |
| Space heating seasonal efficiency, Average climate        | %   | 195              | 151               |
| Space heating annual electricity consumption, Average cl. | kWh | 13348            | 17049             |
|   |     |                  |                   |
| Nominal heating capacity Pdesign, Colder climate          | kW  | 33               | 33                |
| Space heating seasonal efficiency, Colder climate         | %   | 206              | 158               |
| Space heating annual electricity consumption, Colder cl.  | kWh | 15061            | 19553             |
|   |     |                  |                   |
| Nominal heating capacity Pdesign, Warmer climate          | kW  | 33               | 33                |
| Space heating seasonal efficiency, Warmer climate         | %   | 204              | 149               |
| Space heating annual electricity consumption, Warmer cl.  | kWh | 8234             | 11183             |
|   |     |                  |                   |
| Sound power level Lwa                                     | dBA | 55               |                   |

| <b>Information sheet for energy efficiency Set with Temperature controller</b> |   |                  |                   |
|--|---|------------------|-------------------|
| Temperature application  |   | <b>Low, 35°C</b> | <b>High, 55°C</b> |
| Controller Carel pCO5/pCO5+/uPC, Class   | - | II               | II                |
| Controller Carel pCO5/pCO5+/uPC, Contribution                                  | % | 2.0              | 2.0               |
| Set Space heating seasonal efficiency, Average climate                         | % | 197              | 153               |
| Set Space heating energy efficiency class, Average climate                     | - | A+++             | A+++              |
| Set Space heating seasonal efficiency, Colder climate                          | % | 208              | 160               |
| Set Space heating seasonal efficiency, Warmer climate                          | % | 206              | 151               |

| <b>Information sheet for energy efficiency Set with Temperature controller + Room Terminal</b> |   |                  |                   |
|--|---|------------------|-------------------|
| Temperature application  |   | <b>Low, 35°C</b> | <b>High, 55°C</b> |
| Controller Carel pCO5/pCO5+/uPC + pAD, Class   | - | VI               | VI                |
| Controller Carel pCO5/pCO5+/uPC, +pAD, Contribution  | % | 4.0              | 4.0               |
| Set Space heating seasonal efficiency, Average climate   | % | 199              | 155               |
| Set Space heating energy efficiency class, Average climate                                     | - | A+++             | A+++              |
| Set Space heating seasonal efficiency, Colder climate  | % | 210              | 162               |
| Set Space heating seasonal efficiency, Warmer climate  | % | 208              | 153               |