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|                     |                                                       |          |            |
|---------------------|-------------------------------------------------------|----------|------------|
| Summary of          | AQUATOP T22H                                          | Reg. No. | 011-1W0309 |
| Certificate Holder  |                                                       |          |            |
| Name                | ELCO GmbH                                             |          |            |
| Address             | Hohenzollernstrasse 31                                | Zip      | 72379      |
| City                | Hechingen                                             | Country  | Germany    |
| Certification Body  | DIN CERTCO Gesellschaft für Konformitätsbewertung mbH |          |            |
| Subtype title       | AQUATOP T22H                                          |          |            |
| Heat Pump Type      | Brine/Water and Water/Water                           |          |            |
| Refrigerant         | R407c                                                 |          |            |
| Mass of Refrigerant | 4.1 kg                                                |          |            |
| Certification Date  | 04.05.2019                                            |          |            |

## Model: AQUATOP T22H

| Configure model                     |                                 |
|-------------------------------------|---------------------------------|
| Model name                          | AQUATOP T22H                    |
| Application                         | Heating (medium temp)           |
| Units                               | Indoor                          |
| Climate Zone                        | Colder Climate + Warmer Climate |
| Reversibility                       | No                              |
| Cooling mode application (optional) | n/a                             |

| General Data |             |
|--------------|-------------|
| Power supply | 3x230V 50Hz |

Brine/Water Heat Pump

### Heating

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

| EN 14511-2  |                 |                    |
|-------------|-----------------|--------------------|
|             | Low temperature | Medium temperature |
| Heat output | 21.00 kW        | 20.40 kW           |
| El input    | 4.60 kW         | 7.00 kW            |
| COP         | 4.60            | 2.90               |

### Average Climate

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### EN 12102-1

|                          | Low temperature | Medium temperature |
|--------------------------|-----------------|--------------------|
| Sound power level indoor | 54 dB(A)        | 54 dB(A)           |

### EN 14825

|               | Low temperature | Medium temperature |
|---------------|-----------------|--------------------|
| $\eta_s$      | 201 %           | 167 %              |
| Prated        | 21.00 kW        | 20.00 kW           |
| SCOP          | 5.23            | 4.38               |
| Tbiv          | -10 °C          | -10 °C             |
| TOL           | -22 °C          | -22 °C             |
| Pdh Tj = -7°C | 21.21 kW        | 21.01 kW           |
| COP Tj = -7°C | 4.69            | 3.16               |
| Pdh Tj = +2°C | 21.84 kW        | 22.64 kW           |
| COP Tj = +2°C | 5.24            | 4.35               |
| Pdh Tj = +7°C | 22.26 kW        | 23.46 kW           |
| COP Tj = +7°C | 5.47            | 5.10               |
| Pdh Tj = 12°C | 22.68 kW        | 24.48 kW           |
| COP Tj = 12°C | 5.80            | 5.97               |
| Pdh Tj = Tbiv | 21.00 kW        | 20.40 kW           |
| COP Tj = Tbiv | 4.60            | 2.90               |

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|                                                                         |             |             |
|-------------------------------------------------------------------------|-------------|-------------|
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 21.00 kW    | 20.40 kW    |
| $COP T_j = TOL$ or $COP T_j = T_{designh}$ if $TOL < T_{designh}$       | 4.60        | 2.90        |
| $C_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 1.00        | 1.00        |
| WTOL                                                                    | 60 °C       | 60 °C       |
| Poff                                                                    | 0 W         | 0 W         |
| PTO                                                                     | 10 W        | 10 W        |
| PSB                                                                     | 10 W        | 10 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 $Q_{he}$                                      | 8297 kWh    | 9624 kWh    |

## Warmer Climate

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

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
| $\eta_s$        | 202 %                  | 169 %                     |
| Prated          | 21.00 kW               | 20.00 kW                  |

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|                                                     |             |             |
|-----------------------------------------------------|-------------|-------------|
| SCOP                                                | 5.25        | 4.42        |
| Tbiv                                                | 2 °C        | 2 °C        |
| TOL                                                 | -22 °C      | -22 °C      |
| Pdh Tj = +2°C                                       | 21.00 kW    | 20.40 kW    |
| COP Tj = +2°C                                       | 4.60        | 2.90        |
| Pdh Tj = +7°C                                       | 21.63 kW    | 21.83 kW    |
| COP Tj = +7°C                                       | 5.06        | 3.86        |
| Pdh Tj = 12°C                                       | 22.26 kW    | 23.87 kW    |
| COP Tj = 12°C                                       | 5.57        | 5.37        |
| Pdh Tj = Tbiv                                       | 21.00 kW    | 20.40 kW    |
| COP Tj = Tbiv                                       | 4.60        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 21.00 kW    | 20.40 kW    |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.60        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.00        | 1.00        |
| WTOL                                                | 60 °C       | 60 °C       |
| Poff                                                | 0 W         | 0 W         |
| PTO                                                 | 10 W        | 10 W        |
| PSB                                                 | 10 W        | 10 W        |
| PCK                                                 | 0 W         | 0 W         |
| Supplementary Heater: Type of energy input          | Electricity | Electricity |
| Supplementary Heater: PSUP                          | 0.00 kW     | 0.00 kW     |

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|                                           |          |          |
|-------------------------------------------|----------|----------|
| Annual energy consumption Q <sub>he</sub> | 5341 kWh | 6160 kWh |
|-------------------------------------------|----------|----------|

## Colder Climate

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

| <b>EN 14825</b>                       |                        |                           |
|---------------------------------------|------------------------|---------------------------|
|                                       | <b>Low temperature</b> | <b>Medium temperature</b> |
| $\eta_s$                              | 206 %                  | 174 %                     |
| Prated                                | 21.00 kW               | 20.00 kW                  |
| SCOP                                  | 5.35                   | 4.54                      |
| T <sub>biv</sub>                      | -22 °C                 | -22 °C                    |
| TOL                                   | -22 °C                 | -22 °C                    |
| P <sub>dh</sub> T <sub>j</sub> = -7°C | 21.84 kW               | 22.24 kW                  |
| COP T <sub>j</sub> = -7°C             | 5.24                   | 4.09                      |
| P <sub>dh</sub> T <sub>j</sub> = +2°C | 22.26 kW               | 23.46 kW                  |
| COP T <sub>j</sub> = +2°C             | 5.47                   | 4.96                      |
| P <sub>dh</sub> T <sub>j</sub> = +7°C | 22.47 kW               | 24.28 kW                  |
| COP T <sub>j</sub> = +7°C             | 5.70                   | 5.63                      |
| P <sub>dh</sub> T <sub>j</sub> = 12°C | 22.68 kW               | 24.89 kW                  |

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|                                                     |             |             |
|-----------------------------------------------------|-------------|-------------|
| COP Tj = 12°C                                       | 5.80        | 6.09        |
| Pdh Tj = Tbiv                                       | 21.00 kW    | 20.40 kW    |
| COP Tj = Tbiv                                       | 4.60        | 2.90        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 21.00 kW    | 20.40 kW    |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 4.60        | 2.90        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.00        | 1.00        |
| WTOL                                                | 60 °C       | 60 °C       |
| Poff                                                | 0 W         | 0 W         |
| PTO                                                 | 10 W        | 10 W        |
| PSB                                                 | 10 W        | 10 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                       | 9677 kWh    | 11077 kWh   |

Water/Water Heat Pump

## Heating

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

| <b>EN 14511-2</b> |                        |                           |
|-------------------|------------------------|---------------------------|
|                   | <b>Low temperature</b> | <b>Medium temperature</b> |
| Heat output       | 25.90 kW               | 25.60 kW                  |
| El input          | 4.70 kW                | 7.30 kW                   |
| COP               | 5.50                   | 3.90                      |

## Average Climate

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

| <b>EN 14825</b> |                        |                           |
|-----------------|------------------------|---------------------------|
|                 | <b>Low temperature</b> | <b>Medium temperature</b> |
| $\eta_s$        | 240 %                  | 193 %                     |
| Prated          | 26.00 kW               | 26.00 kW                  |



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|                                                     |          |          |
|-----------------------------------------------------|----------|----------|
| SCOP                                                | 6.20     | 5.03     |
| Tbiv                                                | -10 °C   | -10 °C   |
| TOL                                                 | -22 °C   | -22 °C   |
| Pdh Tj = -7°C                                       | 26.11 kW | 26.17 kW |
| COP Tj = -7°C                                       | 5.64     | 3.78     |
| Pdh Tj = +2°C                                       | 26.74 kW | 27.80 kW |
| COP Tj = +2°C                                       | 6.19     | 4.97     |
| Pdh Tj = +7°C                                       | 27.16 kW | 28.62 kW |
| COP Tj = +7°C                                       | 6.42     | 5.72     |
| Pdh Tj = 12°C                                       | 27.58 kW | 29.64 kW |
| COP Tj = 12°C                                       | 6.74     | 6.59     |
| Pdh Tj = Tbiv                                       | 25.90 kW | 25.56 kW |
| COP Tj = Tbiv                                       | 5.55     | 3.52     |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 25.90 kW | 25.56 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 5.55     | 3.53     |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.00     | 1.00     |
| WTOL                                                | 60 °C    | 60 °C    |
| Poff                                                | 0 W      | 0 W      |
| PTO                                                 | 10 W     | 10 W     |
| PSB                                                 | 10 W     | 10 W     |
| PCK                                                 | 0 W      | 0 W      |

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|                                            |             |             |
|--------------------------------------------|-------------|-------------|
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP                 | 0.00 kW     | 0.00 kW     |
| Annual energy consumption Q <sub>he</sub>  | 8634 kWh    | 10501 kWh   |

## Warmer Climate

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

| <b>EN 14825</b>                       |                        |                           |
|---------------------------------------|------------------------|---------------------------|
|                                       | <b>Low temperature</b> | <b>Medium temperature</b> |
| $\eta_s$                              | 241 %                  | 195 %                     |
| Prated                                | 26.00 kW               | 26.00 kW                  |
| SCOP                                  | 6.22                   | 5.08                      |
| T <sub>biv</sub>                      | 2 °C                   | 2 °C                      |
| TOL                                   | -22 °C                 | -22 °C                    |
| P <sub>dh</sub> T <sub>j</sub> = +2°C | 25.90 kW               | 25.56 kW                  |
| COP T <sub>j</sub> = +2°C             | 5.55                   | 3.52                      |
| P <sub>dh</sub> T <sub>j</sub> = +7°C | 26.53 kW               | 26.99 kW                  |
| COP T <sub>j</sub> = +7°C             | 6.00                   | 4.48                      |
| P <sub>dh</sub> T <sub>j</sub> = 12°C | 27.16 kW               | 29.03 kW                  |

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|                                                     |             |             |
|-----------------------------------------------------|-------------|-------------|
| COP Tj = 12°C                                       | 6.51        | 5.99        |
| Pdh Tj = Tbiv                                       | 25.90 kW    | 25.56 kW    |
| COP Tj = Tbiv                                       | 5.55        | 3.52        |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 25.90 kW    | 25.56 kW    |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 5.55        | 3.52        |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.00        | 1.00        |
| WTOL                                                | 60 °C       | 60 °C       |
| Poff                                                | 0 W         | 0 W         |
| PTO                                                 | 10 W        | 10 W        |
| PSB                                                 | 10 W        | 10 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                       | 5566 kWh    | 6720 kWh    |

## Colder Climate

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

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

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|                                                     | Low temperature | Medium temperature |
|-----------------------------------------------------|-----------------|--------------------|
| $\eta_s$                                            | 244 %           | 197 %              |
| Prated                                              | 26.00 kW        | 26.00 kW           |
| SCOP                                                | 6.29            | 5.12               |
| Tbiv                                                | -22 °C          | -22 °C             |
| TOL                                                 | -22 °C          | -22 °C             |
| Pdh Tj = -7°C                                       | 26.74 kW        | 27.40 kW           |
| COP Tj = -7°C                                       | 6.19            | 4.71               |
| Pdh Tj = +2°C                                       | 27.16 kW        | 28.62 kW           |
| COP Tj = +2°C                                       | 6.42            | 5.58               |
| Pdh Tj = +7°C                                       | 27.37 kW        | 29.44 kW           |
| COP Tj = +7°C                                       | 6.64            | 6.25               |
| Pdh Tj = 12°C                                       | 27.58 kW        | 30.05 kW           |
| COP Tj = 12°C                                       | 6.74            | 6.71               |
| Pdh Tj = Tbiv                                       | 25.90 kW        | 25.56 kW           |
| COP Tj = Tbiv                                       | 5.55            | 3.52               |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 25.90 kW        | 25.56 kW           |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 5.55            | 3.52               |
| Cdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 1.00            | 1.00               |
| WTOL                                                | 60 °C           | 60 °C              |
| Poff                                                | 0 W             | 0 W                |

This information was generated by the HP KEYMARK database on 13 Apr 2022

|                                            |             |             |
|--------------------------------------------|-------------|-------------|
| PTO                                        | 10 W        | 10 W        |
| PSB                                        | 10 W        | 10 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 Q <sub>he</sub>  | 10151 kWh   | 12316 kWh   |