

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

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|---------------------|-------------------------------------------------------|----------|------------|
| Summary of | TTL 9.5/12.5 AC | Reg. No. | 011-1W0441 |
| Certificate Holder | | | |
| Name | tecalor GmbH | | |
| Address | Fürstenbergerstr. 77 | Zip | 37603 |
| City | Holzminden | Country | Germany |
| Certification Body | DIN CERTCO Gesellschaft für Konformitätsbewertung mbH | | |
| Subtype title | TTL 9.5/12.5 AC | | |
| Heat Pump Type | Outdoor Air/Water | | |
| Refrigerant | R410A | | |
| Mass of Refrigerant | 5.5 kg | | |
| Certification Date | 14.10.2021 | | |
| Testing basis | HP KEYMARK certification scheme rules rev. 8 | | |

Model: TTL 9.5 AC

| Configure model | |
|-------------------------------------|---------------------------------|
| Model name | TTL 9.5 AC |
| Application | Heating (medium temp) |
| Units | Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

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

Heating

| EN 14511-2 | | |
|-------------|-----------------|--------------------|
| | Low temperature | Medium temperature |
| Heat output | 8.66 kW | 7.90 kW |
| El input | 1.88 kW | 2.75 kW |
| COP | 4.61 | 2.87 |

| 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

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EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level outdoor | 55 dB(A) | 55 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 187 % | 128 % |
| Prated | 7.90 kW | 8.14 kW |
| SCOP | 4.76 | 3.28 |
| Tbiv | 2 °C | 2 °C |
| TOL | 2 °C | 2 °C |
| Pdh Tj = +2°C | 7.90 kW | 8.14 kW |
| COP Tj = +2°C | 3.75 | 2.78 |
| Cdh Tj = +2 °C | 0.900 | 0.900 |
| Pdh Tj = +7°C | 8.76 kW | 8.04 kW |
| COP Tj = +7°C | 4.77 | 3.40 |
| Cdh Tj = +7 °C | 0.990 | 0.900 |
| Pdh Tj = 12°C | 9.09 kW | 9.03 kW |
| COP Tj = 12°C | 5.41 | 4.48 |
| Cdh Tj = +12 °C | 0.980 | 0.900 |
| Pdh Tj = Tbiv | 7.90 kW | 8.14 kW |

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| | | |
|-------------------------------------------------------------------------|-------------|-------------|
| COP $T_j = T_{biv}$ | 3.75 | 2.78 |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 7.90 kW | 8.14 kW |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 3.75 | 2.78 |
| WTOL | 65 °C | 65 °C |
| Poff | 10 W | 10 W |
| PTO | 10 W | 10 W |
| PSB | 10 W | 10 W |
| PCK | 38 W | 38 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 0.00 kW | 0.00 kW |
| Annual energy consumption Q_{he} | 2218 kWh | 3314 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 55 dB(A) | 55 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 133 % | 112 % |
| Prated | 14.53 kW | 15.94 kW |

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| | | |
|-----------------------------------------------------|---------|---------|
| SCOP | 3.40 | 2.88 |
| Tbiv | -7 °C | -7 °C |
| TOL | -20 °C | -20 °C |
| Pdh Tj = -7°C | 8.80 kW | 9.65 kW |
| COP Tj = -7°C | 3.27 | 2.82 |
| Cdh Tj = -7 °C | 0.900 | 0.900 |
| Pdh Tj = +2°C | 7.19 kW | 7.58 kW |
| COP Tj = +2°C | 4.08 | 3.55 |
| Cdh Tj = +2 °C | 0.980 | 0.900 |
| Pdh Tj = +7°C | 9.02 kW | 8.57 kW |
| COP Tj = +7°C | 5.21 | 4.46 |
| Cdh Tj = +7 °C | 0.980 | 0.900 |
| Pdh Tj = 12°C | 9.10 kW | 9.06 kW |
| COP Tj = 12°C | 5.53 | 4.88 |
| Cdh Tj = +12 °C | 0.980 | 0.900 |
| Pdh Tj = Tbiv | 8.80 kW | 9.65 kW |
| COP Tj = Tbiv | 3.27 | 2.82 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 7.38 kW | 7.53 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.54 | 1.85 |
| WTOL | 65 °C | 65 °C |
| Poff | 10 W | 10 W |
| | | |

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| | | |
|--------------------------------------------|-------------|-------------|
| PTO | 10 W | 10 W |
| PSB | 10 W | 10 W |
| PCK | 38 W | 38 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 14.53 kW | 15.94 kW |
| Annual energy consumption Q _{he} | 10540 kWh | 13625 kWh |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 55 dB(A) | 55 dB(A) |

| EN 14825 | | |
|---------------------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 159 % | 125 % |
| Prated | 10.29 kW | 11.45 kW |
| SCOP | 4.04 | 3.21 |
| T _{biv} | -7 °C | -7 °C |
| TOL | -10 °C | -10 °C |
| P _{dh} T _j = -7°C | 9.10 kW | 10.13 kW |
| COP T _j = -7°C | 3.11 | 2.56 |

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| | | |
|-----------------------------------------------------|-------------|-------------|
| Cdh Tj = -7 °C | 0.900 | 0.900 |
| Pdh Tj = +2°C | 7.30 kW | 7.75 kW |
| COP Tj = +2°C | 3.93 | 3.31 |
| Cdh Tj = +2 °C | 0.990 | 0.900 |
| Pdh Tj = +7°C | 8.92 kW | 8.38 kW |
| COP Tj = +7°C | 5.04 | 4.14 |
| Cdh Tj = +7 °C | 0.980 | 0.900 |
| Pdh Tj = 12°C | 9.10 kW | 9.05 kW |
| COP Tj = 12°C | 5.53 | 4.74 |
| Cdh Tj = +12 °C | 0.980 | 0.900 |
| Pdh Tj = Tbiv | 9.10 kW | 10.13 kW |
| COP Tj = Tbiv | 3.11 | 2.56 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 8.52 kW | 9.40 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.94 | 2.26 |
| WTOL | 65 °C | 65 °C |
| Poff | 10 W | 10 W |
| PTO | 10 W | 10 W |
| PSB | 10 W | 10 W |
| PCK | 38 W | 38 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 1.77 kW | 2.05 kW |
| | | |

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| | | |
|-------------------------------------------|----------|----------|
| Annual energy consumption Q _{he} | 5265 kWh | 7377 kWh |
|-------------------------------------------|----------|----------|

Model: TTL 12.5 AC

| Configure model | |
|-------------------------------------|---------------------------------|
| Model name | TTL 12.5 AC |
| Application | Heating (medium temp) |
| Units | Outdoor |
| Climate Zone | Colder Climate + Warmer Climate |
| Reversibility | Yes |
| Cooling mode application (optional) | n/a |

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

Heating

| EN 14511-2 | | |
|-------------|-----------------|--------------------|
| | Low temperature | Medium temperature |
| Heat output | 8.66 kW | 7.90 kW |
| El input | 1.88 kW | 2.75 kW |
| COP | 4.61 | 2.87 |

| 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

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EN 12102-1

| | Low temperature | Medium temperature |
|---------------------------|-----------------|--------------------|
| Sound power level outdoor | 55 dB(A) | 55 dB(A) |

EN 14825

| | Low temperature | Medium temperature |
|-----------------|-----------------|--------------------|
| η_s | 188 % | 128 % |
| Prated | 8.10 kW | 8.14 kW |
| SCOP | 4.77 | 3.28 |
| Tbiv | 2 °C | 2 °C |
| TOL | 2 °C | 2 °C |
| Pdh Tj = +2°C | 8.10 kW | 8.14 kW |
| COP Tj = +2°C | 3.74 | 2.78 |
| Cdh Tj = +2 °C | 0.900 | 0.900 |
| Pdh Tj = +7°C | 8.76 kW | 8.04 kW |
| COP Tj = +7°C | 4.77 | 3.40 |
| Cdh Tj = +7 °C | 0.990 | 0.900 |
| Pdh Tj = 12°C | 9.09 kW | 9.03 kW |
| COP Tj = 12°C | 5.41 | 4.48 |
| Cdh Tj = +12 °C | 0.980 | 0.900 |
| Pdh Tj = Tbiv | 8.10 kW | 8.41 kW |

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| | | |
|-------------------------------------------------------------------------|-------------|-------------|
| COP $T_j = T_{biv}$ | 3.74 | 2.78 |
| $P_{dh} T_j = TOL$ or $P_{dh} T_j = T_{designh}$ if $TOL < T_{designh}$ | 8.10 kW | 8.14 kW |
| COP $T_j = TOL$ or COP $T_j = T_{designh}$ if $TOL < T_{designh}$ | 3.74 | 2.78 |
| WTOL | 65 °C | 65 °C |
| P _{off} | 10 W | 10 W |
| PTO | 10 W | 10 W |
| PSB | 10 W | 10 W |
| PCK | 38 W | 38 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 0.00 kW | 0.00 kW |
| Annual energy consumption Q _{he} | 2271 kWh | 3314 kWh |

Colder Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 55 dB(A) | 55 dB(A) |

| EN 14825 | | |
|-----------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 133 % | 115 % |
| Prated | 18.44 kW | 19.19 kW |

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| | | |
|-----------------------------------------------------|----------|----------|
| SCOP | 3.39 | 2.94 |
| Tbiv | -7 °C | -7 °C |
| TOL | -20 °C | -20 °C |
| Pdh Tj = -7°C | 11.16 kW | 11.61 kW |
| COP Tj = -7°C | 3.15 | 2.69 |
| Cdh Tj = -7 °C | 0.900 | 0.900 |
| Pdh Tj = +2°C | 7.13 kW | 7.49 kW |
| COP Tj = +2°C | 4.16 | 3.66 |
| Cdh Tj = +2 °C | 0.900 | 0.900 |
| Pdh Tj = +7°C | 9.05 kW | 8.61 kW |
| COP Tj = +7°C | 5.25 | 4.53 |
| Cdh Tj = +7 °C | 0.980 | 0.900 |
| Pdh Tj = 12°C | 9.10 kW | 9.06 kW |
| COP Tj = 12°C | 5.55 | 4.91 |
| Cdh Tj = +12 °C | 0.980 | 0.900 |
| Pdh Tj = Tbiv | 11.16 kW | 11.61 kW |
| COP Tj = Tbiv | 3.15 | 2.69 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 9.29 kW | 9.65 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.47 | 1.85 |
| WTOL | 65 °C | 65 °C |
| Poff | 10 W | 10 W |
| | | |

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| | | |
|--------------------------------------------|-------------|-------------|
| PTO | 10 W | 10 W |
| PSB | 10 W | 10 W |
| PCK | 38 W | 38 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 18.44 kW | 19.19 kW |
| Annual energy consumption Q _{he} | 13397 kWh | 16099 kWh |

Average Climate

| EN 12102-1 | | |
|---------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| Sound power level outdoor | 55 dB(A) | 55 dB(A) |

| EN 14825 | | |
|---------------------------------------|------------------------|---------------------------|
| | Low temperature | Medium temperature |
| η_s | 159 % | 130 % |
| Prated | 12.80 kW | 13.42 kW |
| SCOP | 4.05 | 3.32 |
| T _{biv} | -7 °C | -7 °C |
| TOL | -10 °C | -10 °C |
| P _{dh} T _j = -7°C | 11.30 kW | 11.87 kW |
| COP T _j = -7°C | 2.84 | 2.43 |

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|-----------------------------------------------------|-------------|-------------|
| Cdh Tj = -7 °C | 0.900 | 0.900 |
| Pdh Tj = +2°C | 7.24 kW | 7.67 kW |
| COP Tj = +2°C | 4.01 | 3.42 |
| Cdh Tj = +2 °C | 0.900 | 0.900 |
| Pdh Tj = +7°C | 8.94 kW | 8.41 kW |
| COP Tj = +7°C | 5.08 | 4.19 |
| Cdh Tj = +7 °C | 0.980 | 0.900 |
| Pdh Tj = 12°C | 9.10 kW | 9.05 kW |
| COP Tj = 12°C | 5.55 | 4.76 |
| Cdh Tj = +12 °C | 0.980 | 0.900 |
| Pdh Tj = Tbiv | 11.32 kW | 11.87 kW |
| COP Tj = Tbiv | 2.84 | 2.43 |
| Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh | 10.58 kW | 11.10 kW |
| COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh | 2.83 | 2.16 |
| WTOL | 65 °C | 65 °C |
| Poff | 10 W | 10 W |
| PTO | 10 W | 10 W |
| PSB | 10 W | 10 W |
| PCK | 38 W | 38 W |
| Supplementary Heater: Type of energy input | Electricity | Electricity |
| Supplementary Heater: PSUP | 2.22 kW | 2.32 kW |
| | | |

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| | | |
|-------------------------------------------|----------|----------|
| Annual energy consumption Q _{he} | 6537 kWh | 8358 kWh |
|-------------------------------------------|----------|----------|