

## Subtype TTL 4.5 ICS, TTL 4.5 IKCS

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Certification Body	DIN CERTCO Gesellschaft für Konformitätsbewertung mbH
Subtype title	TTL 4.5 ICS, TTL 4.5 IKCS
Registration number	011-1W0225
Heat Pump Type	Outdoor Air/Water
Refrigerant	R410A
Mass of Refrigerant	2.2 kg
Certification Date	03.04.2018
Testing basis	HP KEYMARK certification scheme rules rev. no. 3

## Model TTL 4.5 IKCS

Model name	TTL 4.5 IKCS
Application	Heating (medium temp)
Units	Indoor
Climate zone (for heating)	Warmer Climate, Colder Climate
Cooling mode application (optional)	n/a
Any additional heat sources	n/a

## General data

Power supply	1x230V 50Hz
Off-peak product	n/a

## Outdoor Air/Water

### EN 14511-4 | Heating

Shutting off the heat transfer medium flow	passed
Complete power supply failure	passed
Starting and operating test	passed

### EN 12102-1 | Average Climate

	Low temperature	Medium temperature
Sound power level indoor	45 dB(A)	45 dB(A)

### EN 14825 | Average Climate

	Low temperature	Medium temperature
$\eta_s$	175 %	128 %
Prated	4.70 kW	4.50 kW
SCOP	4.46	3.28
Tbiv	-7 °C	-7 °C
TOL	-10 °C	-10 °C
Pdh Tj = -7°C	4.17 kW	3.94 kW
COP Tj = -7°C	3.09	2.22
Cdh Tj = -7 °C	0.90	0.90
Pdh Tj = +2°C	2.86 kW	2.54 kW
COP Tj = +2°C	4.29	3.10
Cdh Tj = +2 °C	0.90	0.90
Pdh Tj = +7°C	2.08 kW	2.04 kW
COP Tj = +7°C	6.24	4.53
Cdh Tj = +7 °C	0.90	0.90
Pdh Tj = 12°C	2.02 kW	1.97 kW
COP Tj = 12°C	8.31	6.44
Cdh Tj = +12 °C	0.90	0.90
Pdh Tj = Tbiv	4.17 kW	3.94 kW
COP Tj = Tbiv	3.09	2.22
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	4.06 kW	2.96 kW

COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	2.71	1.94
WTOL	60 °C	60 °C
Poff	56 W	56 W
PTO	21 W	21 W
PSB	56 W	56 W
PCK	26 W	26 W
Supplementary Heater: Type of energy input	Electricity	Electricity
Supplementary Heater: PSUP	0.64 kW	1.54 kW
Annual energy consumption Qhe	2187 kWh	2837 kWh

#### EN 14825 | Colder Climate

	Low temperature	Medium temperature
$\eta_s$	150 %	116 %
Prated	6.80 kW	6.70 kW
SCOP	3.83	2.98
Tbiv	-7 °C	-7 °C
TOL	-20 °C	-20 °C
Pdh Tj = -7°C	4.11 kW	4.05 kW
COP Tj = -7°C	3.37	2.57
Cdh Tj = -7 °C	0.90	0.90
Pdh Tj = +2°C	3.01 kW	2.60 kW
COP Tj = +2°C	5.17	3.55
Cdh Tj = +2 °C	0.90	0.90
Pdh Tj = +7°C	2.09 kW	2.07 kW
COP Tj = +7°C	7.26	5.31
Cdh Tj = +7 °C	0.90	0.90
Pdh Tj = 12°C	2.02 kW	1.99 kW
COP Tj = 12°C	8.96	7.11
Cdh Tj = +12 °C	0.90	0.90
Pdh Tj = Tbiv	4.11 kW	4.05 kW
COP Tj = Tbiv	3.37	2.57
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	2.35 kW	6.00 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	2.99	1.00
WTOL	60 °C	60 °C
Poff	56 W	56 W
PTO	21 W	21 W
PSB	56 W	56 W
PCK	26 W	26 W
Supplementary Heater: Type of energy input	Electricity	Electricity
Supplementary Heater: PSUP	3.45 kW	3.50 kW
Annual energy consumption Qhe	4382 kWh	5547 kWh
Pdh Tj = -15°C (if TOL	4.11	4.05

COP Tj = -15°C (if TOL	3.37	2.57
Cdh Tj = -15 °C	0.90	0.90

### EN 14825 | Warmer Climate

	Low temperature	Medium temperature
$\eta_s$	198 %	136 %
Prated	2.62 kW	2.40 kW
SCOP	5.01	3.47
Tbiv	2 °C	2 °C
TOL	2 °C	2 °C
Pdh Tj = +2°C	2.62 kW	2.37 kW
COP Tj = +2°C	3.76	2.28
Cdh Tj = +2 °C	0.90	0.90
Pdh Tj = +7°C	2.07 kW	1.84 kW
COP Tj = +7°C	5.19	3.35
Cdh Tj = +7 °C	0.90	0.90
Pdh Tj = 12°C	2.00 kW	1.94 kW
COP Tj = 12°C	7.92	5.39
Cdh Tj = +12 °C	0.90	0.90
Pdh Tj = Tbiv	2.62 kW	2.37 kW
COP Tj = Tbiv	3.76	2.28
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	2.62 kW	2.37 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	3.76	2.28
WTOL	60 °C	60 °C
Poff	56 W	56 W
PTO	21 W	21 W
PSB	56 W	56 W
PCK	26 W	26 W
Supplementary Heater: Type of energy input	Electricity	Electricity
Supplementary Heater: PSUP	0.00 kW	0.03 kW
Annual energy consumption Qhe	698 kWh	923 kWh

## Model TTL 4.5 ICS

Model name	TTL 4.5 ICS
Application	Heating (medium temp)
Units	Indoor
Climate zone (for heating)	Warmer Climate, Colder Climate
Cooling mode application (optional)	n/a
Any additional heat sources	n/a

## General data

Power supply	1x230V 50Hz
Off-peak product	n/a

## Outdoor Air/Water

### EN 14511-4 | Heating

Shutting off the heat transfer medium flow	passed
Complete power supply failure	passed
Starting and operating test	passed

### EN 12102-1 | Average Climate

	Low temperature	Medium temperature
Sound power level indoor	45 dB(A)	45 dB(A)

### EN 14825 | Average Climate

	Low temperature	Medium temperature
$\eta_s$	178 %	130 %
Prated	4.80 kW	4.50 kW
SCOP	4.53	3.32
Tbiv	-7 °C	-7 °C
TOL	-10 °C	-10 °C
Pdh Tj = -7°C	4.22 kW	3.98 kW
COP Tj = -7°C	3.22	2.27
Cdh Tj = -7 °C	0.90	0.90
Pdh Tj = +2°C	2.88 kW	2.55 kW
COP Tj = +2°C	4.33	3.16
Cdh Tj = +2 °C	0.90	0.90
Pdh Tj = +7°C	2.08 kW	2.04 kW
COP Tj = +7°C	6.28	4.53
Cdh Tj = +7 °C	0.90	0.90
Pdh Tj = 12°C	2.02 kW	1.97 kW
COP Tj = 12°C	8.35	6.44
Cdh Tj = +12 °C	0.90	0.90
Pdh Tj = Tbiv	4.22 kW	3.98 kW
COP Tj = Tbiv	3.22	2.27
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	4.11 kW	3.79 kW

COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	2.84	1.85
WTOL	60 °C	60 °C
Poff	56 W	56 W
PTO	21 W	21 W
PSB	56 W	56 W
PCK	26 W	26 W
Supplementary Heater: Type of energy input	Electricity	Electricity
Supplementary Heater: PSUP	0.69 kW	0.71 kW
Annual energy consumption Qhe	2187 kWh	2804 kWh

#### EN 14825 | Colder Climate

	Low temperature	Medium temperature
$\eta_s$	155 %	119 %
Prated	6.90 kW	6.80 kW
SCOP	3.94	3.04
Tbiv	-7 °C	-7 °C
TOL	-20 °C	-20 °C
Pdh Tj = -7°C	4.16 kW	4.10 kW
COP Tj = -7°C	3.48	2.63
Cdh Tj = -7 °C	0.90	0.90
Pdh Tj = +2°C	3.03 kW	2.62 kW
COP Tj = +2°C	5.34	3.64
Cdh Tj = +2 °C	0.90	0.90
Pdh Tj = +7°C	2.09 kW	2.07 kW
COP Tj = +7°C	7.26	5.31
Cdh Tj = +7 °C	0.90	0.90
Pdh Tj = 12°C	2.02 kW	1.99 kW
COP Tj = 12°C	8.96	7.11
Cdh Tj = +12 °C	0.90	0.90
Pdh Tj = Tbiv	4.16 kW	4.10 kW
COP Tj = Tbiv	3.48	2.63
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	5.00 kW	3.16 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	1.00	2.50
WTOL	60 °C	60 °C
Poff	56 W	56 W
PTO	21 W	21 W
PSB	56 W	56 W
PCK	26 W	26 W
Supplementary Heater: Type of energy input	Electricity	Electricity
Supplementary Heater: PSUP	1.54 kW	3.28 kW
Annual energy consumption Qhe	4321 kWh	5515 kWh
Pdh Tj = -15°C (if TOL	4.16	4.10

COP Tj = -15°C (if TOL	3.48	2.63
Cdh Tj = -15 °C	0.90	0.90

# EN 14825 | Warmer Climate

	Low temperature	Medium temperature
$\eta_s$	198 %	136 %
Prated	2.64 kW	2.40 kW
SCOP	5.03	3.48
Tbiv	2 °C	2 °C
TOL	2 °C	2 °C
Pdh Tj = +2°C	2.64 kW	2.39 kW
COP Tj = +2°C	3.83	2.33
Cdh Tj = +2 °C	0.90	0.90
Pdh Tj = +7°C	2.07 kW	1.84 kW
COP Tj = +7°C	5.19	3.35
Cdh Tj = +7 °C	0.90	0.90
Pdh Tj = 12°C	2.00 kW	1.94 kW
COP Tj = 12°C	7.92	5.39
Cdh Tj = +12 °C	0.90	0.90
Pdh Tj = Tbiv	2.64 kW	2.39 kW
COP Tj = Tbiv	3.83	2.33
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	2.64 kW	2.39 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	3.83	2.33
WTOL	60 °C	60 °C
Poff	56 W	56 W
PTO	21 W	21 W
PSB	56 W	56 W
PCK	26 W	26 W
Supplementary Heater: Type of energy input	Electricity	Electricity
Supplementary Heater: PSUP	0.00 kW	0.01 kW
Annual energy consumption Qhe	70 kWh	921 kWh