

## Subtype TTF 13 basic

Certificate Holder	tecalor GmbH
Address	Lüchtringer Weg 3
ZIP	37603
City	Holzminden
Country	DE
Certification Body	DIN CERTCO Gesellschaft für Konformitätsbewertung mbH
Subtype title	TTF 13 basic
Registration number	011-1W0047
Heat Pump Type	Brine/Water
Refrigerant	R410A
Mass of Refrigerant	2.5 kg
Certification Date	01.11.2016

### Model TTF 13 basic, all climates

Model name	TTF 13 basic, all climates
Application	Heating (low 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	3x400V 50Hz
Off-peak product	n/a

### Brine/Water

#### EN 14511-4 | Heating

Shutting off the heat transfer medium flow passed

Complete power supply failure	passed
Starting and operating test	passed

#### EN 14511-2 | Heating

	Low temperature	Medium temperature
Heat output	12.59 kW	
El input	2.85 kW	
COP	4.42	

#### EN 12102-1 | Average Climate

	Low temperature	Medium temperature
Sound power level indoor	53 dB(A)	

#### EN 14825 | Average Climate

	Low temperature	Medium temperature
$\eta_s$	189 %	
Prated	13.00 kW	
SCOP	4.92	
Tbiv	-10 °C	
TOL	-20 °C	
Pdh Tj = -7°C	12.60 kW	
COP Tj = -7°C	4.48	
Cdh Tj = -7 °C	0.90	
Pdh Tj = +2°C	12.70 kW	
COP Tj = +2°C	4.84	
Cdh Tj = +2 °C	0.90	
Pdh Tj = +7°C	12.80 kW	
COP Tj = +7°C	5.21	
Cdh Tj = +7 °C	0.90	

Pdh Tj = 12°C	12.90 kW
COP Tj = 12°C	5.63
Cdh Tj = +12 °C	0.90
Pdh Tj = Tbiv	12.60 kW
COP Tj = Tbiv	4.42
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	12.60 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	4.42
WTOL	60 °C
Poff	0 W
PTO	78 W
PSB	3 W
PCK	0 W
Supplementary Heater: Type of energy input	Electricity
Supplementary Heater: PSUP	0.00 kW
Annual energy consumption Qhe	5285 kWh

#### EN 14825 | Colder Climate

	Low temperature	Medium temperature
ηs	196 %	
Prated	16.00 kW	
SCOP	5.10	
Tbiv	-15 °C	
TOL	-22 °C	
Pdh Tj = -7°C	12.80 kW	
COP Tj = -7°C	5.02	
Cdh Tj = -7 °C	0.90	
Pdh Tj = +2°C	12.80 kW	
COP Tj = +2°C	5.31	
Cdh Tj = +2 °C	0.90	
Pdh Tj = +7°C	12.90 kW	
COP Tj = +7°C	5.56	
Cdh Tj = +7 °C	0.90	
Pdh Tj = 12°C	12.90 kW	
COP Tj = 12°C	5.60	
Cdh Tj = +12 °C	0.90	
Pdh Tj = Tbiv	12.70 kW	
COP Tj = Tbiv	4.90	
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	12.70 kW	
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	4.90	
WTOL	60 °C	
Poff	0 W	
PTO	78 W	

PSB	3 W
PCK	0 W
Supplementary Heater: Type of energy input	Electricity
Supplementary Heater: PSUP	3.02 kW
Annual energy consumption Q <sub>he</sub>	7542 kWh
P <sub>dh</sub> T <sub>j</sub> = -15°C (if TOL	12.70
COP T <sub>j</sub> = -15°C (if TOL	4.90
C <sub>dh</sub> T <sub>j</sub> = -15 °C	0.90

#### EN 14825 | Warmer Climate

	Low temperature	Medium temperature
η <sub>s</sub>	189 %	
Prated	13.00 kW	
SCOP	4.94	
T <sub>biv</sub>	2 °C	
TOL	0 °C	
P <sub>dh</sub> T <sub>j</sub> = +2°C	12.60 kW	
COP T <sub>j</sub> = +2°C	4.42	
C <sub>dh</sub> T <sub>j</sub> = +2 °C	0.90	
P <sub>dh</sub> T <sub>j</sub> = +7°C	12.70 kW	
COP T <sub>j</sub> = +7°C	4.76	
C <sub>dh</sub> T <sub>j</sub> = +7 °C	0.90	
P <sub>dh</sub> T <sub>j</sub> = 12°C	12.90 kW	
COP T <sub>j</sub> = 12°C	5.34	
C <sub>dh</sub> T <sub>j</sub> = +12 °C	0.90	
P <sub>dh</sub> T <sub>j</sub> = T <sub>biv</sub>	12.60 kW	
COP T <sub>j</sub> = T <sub>biv</sub>	4.42	
P <sub>dh</sub> T <sub>j</sub> = TOL or P <sub>dh</sub> T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub>	12.60 kW	
COP T <sub>j</sub> = TOL or COP T <sub>j</sub> = T <sub>designh</sub> if TOL < T <sub>designh</sub>	4.42	
WTOL	60 °C	
P <sub>off</sub>	0 W	
PTO	78 W	
PSB	3 W	
PCK	0 W	
Supplementary Heater: Type of energy input	Electricity	
Supplementary Heater: PSUP	0.00 kW	
Annual energy consumption Q <sub>he</sub>	3407 kWh	

### Model TTF 13 basic, average climates

Model name	TTF 13 basic, average climates
Application	Heating (medium temp)
Units	Indoor
Climate zone (for heating)	n/a
Cooling mode application (optional)	n/a
Any additional heat sources	n/a

### General data

Power supply	3x400V 50Hz
Off-peak product	n/a

### Brine/Water

#### EN 14511-4 | Heating

Shutting off the heat transfer medium flow passed

Complete power supply failure	passed
Starting and operating test	passed

#### EN 14511-2 | Heating

	Low temperature	Medium temperature
Heat output	12.59 kW	11.60 kW
El input	2.85 kW	4.52 kW
COP	4.42	2.57

#### EN 12102-1 | Average Climate

	Low temperature	Medium temperature
Sound power level indoor	53 dB(A)	53 dB(A)

#### EN 14825 | Average Climate

	Low temperature	Medium temperature
$\eta_s$	189 %	122 %
Prated	13.00 kW	12.00 kW
SCOP	4.92	3.26
Tbiv	-10 °C	-10 °C
TOL	-20 °C	-10 °C
Pdh Tj = -7°C	12.60 kW	11.70 kW
COP Tj = -7°C	4.48	2.69
Cdh Tj = -7 °C	0.90	0.90
Pdh Tj = +2°C	12.70 kW	12.00 kW
COP Tj = +2°C	4.84	3.20
Cdh Tj = +2 °C	0.90	0.90
Pdh Tj = +7°C	12.80 kW	12.30 kW
COP Tj = +7°C	5.21	3.60
Cdh Tj = +7 °C	0.90	0.90

Pdh Tj = 12°C	12.90 kW	12.50 kW
COP Tj = 12°C	5.63	4.09
Cdh Tj = +12 °C	0.90	0.90
Pdh Tj = Tbiv	12.60 kW	11.60 kW
COP Tj = Tbiv	4.42	2.57
Pdh Tj = TOL or Pdh Tj = Tdesignh if TOL < Tdesignh	12.60 kW	11.60 kW
COP Tj = TOL or COP Tj = Tdesignh if TOL < Tdesignh	4.42	2.57
WTOL	60 °C	60 °C
Poff	0 W	0 W
PTO	78 W	78 W
PSB	3 W	3 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	5285 kWh	7350 kWh