



**Warm climate and Medium temperature**

Model(s):	<b>CTC EcoHeat 412</b>		
Air-to-water heat pump:	<b>No</b>	Energy efficiency class:	-
Water-to-water heat pump:	<b>No</b>	Controller class:	<b>VII</b> -
Brine-to-water heat pump:	<b>Yes</b>	Controller contribution:	<b>3,5</b> %
Low-temperature heat pump:	<b>No</b>	Package efficiency:	<b>126</b> %
Equipped with a supplementary heater:	<b>Yes</b>	Package efficiency class:	-
Heat pump combination heater:	<b>Yes</b>		

Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
<b>Rated heat output (*)</b>	<i>P<sub>rated</sub></i>	<b>12</b>	kW	<b>Seasonal space heating energy efficiency</b>	$\eta_s$	<b>122</b>	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>			
T <sub>j</sub> = - 7 °C	<i>P<sub>dh</sub></i>	<b>na</b>	kW	T <sub>j</sub> = - 7 °C	<i>COP<sub>d</sub></i>	<b>na</b>	-
T <sub>j</sub> = + 2 °C	<i>P<sub>dh</sub></i>	<b>10,9</b>	kW	T <sub>j</sub> = +2 °C	<i>COP<sub>d</sub></i>	<b>2,81</b>	-
T <sub>j</sub> = + 7 °C	<i>P<sub>dh</sub></i>	<b>11,3</b>	kW	T <sub>j</sub> = +7 °C	<i>COP<sub>d</sub></i>	<b>3,14</b>	-
T <sub>j</sub> = + 12 °C	<i>P<sub>dh</sub></i>	<b>11,7</b>	kW	T <sub>j</sub> = +12 °C	<i>COP<sub>d</sub></i>	<b>3,72</b>	-
T <sub>j</sub> = bivalent temperature	<i>P<sub>dh</sub></i>	<b>11,0</b>	kW	T <sub>j</sub> = bivalent temperature	<i>COP<sub>d</sub></i>	<b>2,90</b>	-
T <sub>j</sub> = operation limit temperature	<i>P<sub>dh</sub></i>	<b>10,9</b>	kW	T <sub>j</sub> = operation limit temperature	<i>COP<sub>d</sub></i>	<b>2,81</b>	-
For air-to-water heat pumps: T <sub>j</sub> = - 15 °C (if TOL < - 20 °C)	<i>P<sub>dh</sub></i>	<b>na</b>	kW	For air-to-water heat pumps: T <sub>j</sub> = - 15 °C (if TOL < - 20 °C)	<i>COP<sub>d</sub></i>	<b>na</b>	-
Bivalent temperature	<i>T<sub>biv</sub></i>	<b>3</b>	°C	For air-to-water heat pumps: Operation limit temperature	<i>TOL</i>	<b>na</b>	°C
Cycling interval capacity for heating	<i>P<sub>cych</sub></i>	<b>na</b>	kW	Cycling interval efficiency	<i>COP<sub>cyc</sub></i>	<b>na</b>	-
Degradation co-efficient (**)	<i>C<sub>dh</sub></i>	<b>0,99</b>	-	Heating water operating limit temperature	<i>WTOL</i>	<b>65</b>	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	<i>P<sub>OFF</sub></i>	<b>0,018</b>	kW	Rated heat output (*)	<i>P<sub>sup</sub></i>	<b>1,3</b>	kW
Thermostat-off mode	<i>P<sub>TO</sub></i>	<b>0,034</b>	kW	Type of energy input	<b>Electric</b>		
Standby mode	<i>P<sub>SB</sub></i>	<b>0,018</b>	kW				
Crankcase heater mode	<i>P<sub>CK</sub></i>	<b>0,000</b>	kW				
Other items							
Capacity control	<b>Fixed</b>			For air-to-water heat pumps: Rated air flow rate, outdoors	-	<b>na</b>	m <sup>3</sup> /h
Sound power level, indoors/ outdoors	<i>L<sub>WA</sub></i>	<b>50/na</b>	dB	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	<b>2,1</b>	m <sup>3</sup> /h
Annual energy consumption	<i>Q<sub>HE</sub></i>	<b>4905</b>	kWh				

For heat pump combination heater:

<b>Declared load profile / Energy efficiency class</b>	<b>L / A</b>			<b>Water heating energy efficiency</b>	$\eta_{wh}$	<b>86</b>	%
Daily electricity consumption	<i>Q<sub>elec</sub></i>	<b>5,434</b>	kWh	Daily fuel consumption	<i>Q<sub>fuel</sub></i>	<b>na</b>	kWh
Annual electricity consumption	<i>AEC</i>	<b>1195</b>	kWh	Annual fuel consumption	<i>AFC</i>	<b>na</b>	GJ
Contact details	Enertech AB, Box 309, SE-341 26 Ljungby Tel +46 372 88000			www.ctc.se			

(\*) For heat pump space heaters and heat pump combination heaters, the rated heat output *P<sub>rated</sub>* is equal to the design load for heating *P<sub>designh</sub>*, and the rated heat output of a supplementary heater *P<sub>sup</sub>* is equal to the supplementary capacity for heating *sup(T<sub>j</sub>)*. (\*\*) If *C<sub>dh</sub>* is not determined by measurement then the default degradation coefficient is *C<sub>dh</sub>* = 0,9.



**Warm climate and Low temperature**

Model(s):	CTC EcoHeat 412		
Air-to-water heat pump:	No	Energy efficiency class:	-
Water-to-water heat pump:	No	Controller class:	VII -
Brine-to-water heat pump:	Yes	Controller contribution:	3,5 %
Low-temperature heat pump:	No	Package efficiency:	154 %
Equipped with a supplementary heater:	Yes	Package efficiency class:	-
Heat pump combination heater:	Yes		

Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
<b>Rated heat output (*)</b>	<i>P<sub>rated</sub></i>	<b>13</b>	kW	<b>Seasonal space heating energy efficiency</b>	$\eta_s$	<b>150</b>	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>			
T <sub>j</sub> = - 7 °C	<i>P<sub>dh</sub></i>	na	kW	T <sub>j</sub> = - 7 °C	<i>COP<sub>d</sub></i>	na	-
T <sub>j</sub> = + 2 °C	<i>P<sub>dh</sub></i>	11,9	kW	T <sub>j</sub> = +2 °C	<i>COP<sub>d</sub></i>	4,11	-
T <sub>j</sub> = + 7 °C	<i>P<sub>dh</sub></i>	12,0	kW	T <sub>j</sub> = +7 °C	<i>COP<sub>d</sub></i>	4,30	-
T <sub>j</sub> = + 12 °C	<i>P<sub>dh</sub></i>	12,1	kW	T <sub>j</sub> = +12 °C	<i>COP<sub>d</sub></i>	4,54	-
T <sub>j</sub> = bivalent temperature	<i>P<sub>dh</sub></i>	11,9	kW	T <sub>j</sub> = bivalent temperature	<i>COP<sub>d</sub></i>	4,17	-
T <sub>j</sub> = operation limit temperature	<i>P<sub>dh</sub></i>	11,9	kW	T <sub>j</sub> = operation limit temperature	<i>COP<sub>d</sub></i>	4,11	-
For air-to-water heat pumps: T <sub>j</sub> = - 15 °C (if TOL < - 20 °C)	<i>P<sub>dh</sub></i>	na	kW	For air-to-water heat pumps: T <sub>j</sub> = - 15 °C (if TOL < - 20 °C)	<i>COP<sub>d</sub></i>	na	-
Bivalent temperature	<i>T<sub>biv</sub></i>	3	°C	For air-to-water heat pumps: Operation limit temperature	<i>TOL</i>	na	°C
Cycling interval capacity for heating	<i>P<sub>cych</sub></i>	na	kW	Cycling interval efficiency	<i>COP<sub>cyc</sub></i>	na	-
Degradation co-efficient (**)	<i>C<sub>dh</sub></i>	0,95	-	Heating water operating limit temperature	<i>WTOL</i>	65	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	<i>P<sub>OFF</sub></i>	0,018	kW	Rated heat output (*)	<i>P<sub>sup</sub></i>	0,9	kW
Thermostat-off mode	<i>P<sub>TO</sub></i>	0,110	kW	Type of energy input	Electric		
Standby mode	<i>P<sub>SB</sub></i>	0,018	kW				
Crankcase heater mode	<i>P<sub>CK</sub></i>	0,000	kW				
Other items							
Capacity control	Fixed						
Sound power level, indoors/ outdoors	<i>L<sub>WA</sub></i>	50/na	dB	For air-to-water heat pumps: Rated air flow rate, outdoors	-	na	m <sup>3</sup> /h
Annual energy consumption	<i>Q<sub>HE</sub></i>	4331	kWh	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	2,6	m <sup>3</sup> /h

For heat pump combination heater:

<b>Declared load profile / Energy efficiency class</b>	L / A			<b>Water heating energy efficiency</b>	$\eta_{wh}$	86	%
Daily electricity consumption	<i>Q<sub>elec</sub></i>	5,434	kWh	Daily fuel consumption	<i>Q<sub>fuel</sub></i>	na	kWh
Annual electricity consumption	<i>AEC</i>	1195	kWh	Annual fuel consumption	<i>AFC</i>	na	GJ
Contact details	Enertech AB, Box 309, SE-341 26 Ljungby Tel +46 372 88000			www.ctc.se			

(\*) For heat pump space heaters and heat pump combination heaters, the rated heat output *P<sub>rated</sub>* is equal to the design load for heating *P<sub>designh</sub>*, and the rated heat output of a supplementary heater *P<sub>sup</sub>* is equal to the supplementary capacity for heating *sup(T<sub>j</sub>)*. (\*\*) If *C<sub>dh</sub>* is not determined by measurement then the default degradation coefficient is *C<sub>dh</sub>* = 0,9.

**Average climate and Medium temperature**

Model(s):	<b>CTC EcoHeat 412</b>		
Air-to-water heat pump:	<b>No</b>	Energy efficiency class:	<b>A+</b> -
Water-to-water heat pump:	<b>No</b>	Controller class:	<b>VII</b> -
Brine-to-water heat pump:	<b>Yes</b>	Controller contribution:	<b>3,5</b> %
Low-temperature heat pump:	<b>No</b>	Package efficiency:	<b>127</b> %
Equipped with a supplementary heater:	<b>Yes</b>	Package efficiency class:	<b>A++</b> -
Heat pump combination heater:	<b>Yes</b>		

Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
<b>Rated heat output (*)</b>	<i>P<sub>rated</sub></i>	<b>13</b>	kW	<b>Seasonal space heating energy efficiency</b>	$\eta_s$	<b>123</b>	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>			
T <sub>j</sub> = -7 °C	<i>P<sub>dh</sub></i>	<b>11,1</b>	kW	T <sub>j</sub> = -7 °C	<i>COP<sub>d</sub></i>	<b>2,97</b>	-
T <sub>j</sub> = +2 °C	<i>P<sub>dh</sub></i>	<b>11,5</b>	kW	T <sub>j</sub> = +2 °C	<i>COP<sub>d</sub></i>	<b>3,32</b>	-
T <sub>j</sub> = +7 °C	<i>P<sub>dh</sub></i>	<b>11,6</b>	kW	T <sub>j</sub> = +7 °C	<i>COP<sub>d</sub></i>	<b>3,63</b>	-
T <sub>j</sub> = +12 °C	<i>P<sub>dh</sub></i>	<b>11,8</b>	kW	T <sub>j</sub> = +12 °C	<i>COP<sub>d</sub></i>	<b>3,94</b>	-
T <sub>j</sub> = bivalent temperature	<i>P<sub>dh</sub></i>	<b>11,2</b>	kW	T <sub>j</sub> = bivalent temperature	<i>COP<sub>d</sub></i>	<b>3,02</b>	-
T <sub>j</sub> = operation limit temperature	<i>P<sub>dh</sub></i>	<b>10,9</b>	kW	T <sub>j</sub> = operation limit temperature	<i>COP<sub>d</sub></i>	<b>2,81</b>	-
For air-to-water heat pumps: T <sub>j</sub> = -15 °C (if TOL < -20 °C)	<i>P<sub>dh</sub></i>	<b>na</b>	kW	For air-to-water heat pumps: T <sub>j</sub> = -15 °C (if TOL < -20 °C)	<i>COP<sub>d</sub></i>	<b>na</b>	-
Bivalent temperature	<i>T<sub>biv</sub></i>	<b>-6</b>	°C	For air-to-water heat pumps: Operation limit temperature	<i>TOL</i>	<b>na</b>	°C
Cycling interval capacity for heating	<i>P<sub>cych</sub></i>	<b>na</b>	kW	Cycling interval efficiency	<i>COP<sub>cyc</sub></i>	<b>na</b>	-
Degradation co-efficient (**)	<i>C<sub>dh</sub></i>	<b>0,99</b>	-	Heating water operating limit temperature	<i>WTOL</i>	<b>65</b>	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	<i>P<sub>OFF</sub></i>	<b>0,018</b>	kW	Rated heat output (*)	<i>P<sub>sup</sub></i>	<b>2,2</b>	kW
Thermostat-off mode	<i>P<sub>TO</sub></i>	<b>0,034</b>	kW	Type of energy input	<b>Electric</b>		
Standby mode	<i>P<sub>SB</sub></i>	<b>0,018</b>	kW				
Crankcase heater mode	<i>P<sub>CK</sub></i>	<b>0,000</b>	kW				
Other items							
Capacity control	<b>Fixed</b>			For air-to-water heat pumps: Rated air flow rate, outdoors	-	<b>na</b>	m <sup>3</sup> /h
Sound power level, indoors/ outdoors	<i>L<sub>WA</sub></i>	<b>50/na</b>	dB	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	<b>2,1</b>	m <sup>3</sup> /h
Annual energy consumption	<i>Q<sub>HE</sub></i>	<b>8476</b>	kWh				
For heat pump combination heater:							
<b>Declared load profile / Energy efficiency class</b>	<b>L / A</b>			<b>Water heating energy efficiency</b>	$\eta_{wh}$	<b>86</b>	%
Daily electricity consumption	<i>Q<sub>elec</sub></i>	<b>5,434</b>	kWh	Daily fuel consumption	<i>Q<sub>fuel</sub></i>	<b>na</b>	kWh
Annual electricity consumption	<i>AEC</i>	<b>1195</b>	kWh	Annual fuel consumption	<i>AFC</i>	<b>na</b>	GJ
Contact details	Enertech AB, Box 309, SE-341 26 Ljungby Tel +46 372 88000			www.ctc.se			

(\*) For heat pump space heaters and heat pump combination heaters, the rated heat output *P<sub>rated</sub>* is equal to the design load for heating *P<sub>designh</sub>*, and the rated heat output of a supplementary heater *P<sub>sup</sub>* is equal to the supplementary capacity for heating *sup(T<sub>j</sub>)*. (\*\*) If *C<sub>dh</sub>* is not determined by measurement then the default degradation coefficient is *C<sub>dh</sub>* = 0,9.



**Average climate and Low temperature**

Model(s):	<b>CTC EcoHeat 412</b>		
Air-to-water heat pump:	<b>No</b>	Energy efficiency class:	<b>A++</b> -
Water-to-water heat pump:	<b>No</b>	Controller class:	<b>VII</b> -
Brine-to-water heat pump:	<b>Yes</b>	Controller contribution:	<b>3,5</b> %
Low-temperature heat pump:	<b>No</b>	Package efficiency:	<b>159</b> %
Equipped with a supplementary heater:	<b>Yes</b>	Package efficiency class:	<b>A++</b> -
Heat pump combination heater:	<b>Yes</b>		

Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
<b>Rated heat output (*)</b>	<i>P<sub>rated</sub></i>	<b>14</b>	kW	<b>Seasonal space heating energy efficiency</b>	$\eta_s$	<b>155</b>	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>			
T <sub>j</sub> = - 7 °C	<i>P<sub>dh</sub></i>	<b>11,9</b>	kW	T <sub>j</sub> = - 7 °C	<i>COP<sub>d</sub></i>	<b>4,19</b>	-
T <sub>j</sub> = + 2 °C	<i>P<sub>dh</sub></i>	<b>12,0</b>	kW	T <sub>j</sub> = +2 °C	<i>COP<sub>d</sub></i>	<b>4,36</b>	-
T <sub>j</sub> = + 7 °C	<i>P<sub>dh</sub></i>	<b>12,1</b>	kW	T <sub>j</sub> = +7 °C	<i>COP<sub>d</sub></i>	<b>4,50</b>	-
T <sub>j</sub> = + 12 °C	<i>P<sub>dh</sub></i>	<b>12,2</b>	kW	T <sub>j</sub> = +12 °C	<i>COP<sub>d</sub></i>	<b>4,64</b>	-
T <sub>j</sub> = bivalent temperature	<i>P<sub>dh</sub></i>	<b>11,9</b>	kW	T <sub>j</sub> = bivalent temperature	<i>COP<sub>d</sub></i>	<b>4,21</b>	-
T <sub>j</sub> = operation limit temperature	<i>P<sub>dh</sub></i>	<b>11,9</b>	kW	T <sub>j</sub> = operation limit temperature	<i>COP<sub>d</sub></i>	<b>4,11</b>	-
For air-to-water heat pumps: T <sub>j</sub> = - 15 °C (if TOL < - 20 °C)	<i>P<sub>dh</sub></i>	<b>na</b>	kW	For air-to-water heat pumps: T <sub>j</sub> = - 15 °C (if TOL < - 20 °C)	<i>COP<sub>d</sub></i>	<b>na</b>	-
Bivalent temperature	<i>T<sub>biv</sub></i>	<b>-6</b>	°C	For air-to-water heat pumps: Operation limit temperature	<i>TOL</i>	<b>na</b>	°C
Cycling interval capacity for heating	<i>P<sub>cych</sub></i>	<b>na</b>	kW	Cycling interval efficiency	<i>COP<sub>cyc</sub></i>	<b>na</b>	-
Degradation co-efficient (**)	<i>C<sub>dh</sub></i>	<b>0,95</b>	-	Heating water operating limit temperature	<i>WTOL</i>	<b>65</b>	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	<i>P<sub>OFF</sub></i>	<b>0,018</b>	kW	Rated heat output (*)	<i>P<sub>sup</sub></i>	<b>2,2</b>	kW
Thermostat-off mode	<i>P<sub>TO</sub></i>	<b>0,110</b>	kW	Type of energy input	<b>Electric</b>		
Standby mode	<i>P<sub>SB</sub></i>	<b>0,018</b>	kW	For air-to-water heat pumps: Rated air flow rate, outdoors			
Crankcase heater mode	<i>P<sub>CK</sub></i>	<b>0,000</b>	kW				
Other items				For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger			
Capacity control	<b>Fixed</b>			-	<b>na</b>	<i>m<sup>3</sup>/h</i>	
Sound power level, indoors/ outdoors	<i>L<sub>WA</sub></i>	<b>50/na</b>	<i>dB</i>	-	<b>2,6</b>	<i>m<sup>3</sup>/h</i>	
Annual energy consumption	<i>Q<sub>HE</sub></i>	<b>7153</b>	<i>kWh</i>				

For heat pump combination heater:

<b>Declared load profile / Energy efficiency class</b>	<b>L / A</b>			<b>Water heating energy efficiency</b>	$\eta_{wh}$	<b>86</b>	%
Daily electricity consumption	<i>Q<sub>elec</sub></i>	<b>5,434</b>	kWh	Daily fuel consumption	<i>Q<sub>fuel</sub></i>	<b>na</b>	kWh
Annual electricity consumption	<i>AEC</i>	<b>1195</b>	kWh	Annual fuel consumption	<i>AFC</i>	<b>na</b>	GJ
Contact details	Enertech AB, Box 309, SE-341 26 Ljungby Tel +46 372 88000			www.ctc.se	160406		

(\*) For heat pump space heaters and heat pump combination heaters, the rated heat output *P<sub>rated</sub>* is equal to the design load for heating *P<sub>design,h</sub>*, and the rated heat output of a supplementary heater *P<sub>sup</sub>* is equal to the supplementary capacity for heating *sup(T<sub>j</sub>)*. (\*\*) If *C<sub>dh</sub>* is not determined by measurement then the default degradation coefficient is *C<sub>dh</sub>* = 0,9.

**Cold climate and Medium temperature**

Model(s):	<b>CTC EcoHeat 412</b>		
Air-to-water heat pump:	<b>No</b>	Energy efficiency class:	-
Water-to-water heat pump:	<b>No</b>	Controller class:	<b>VII</b> -
Brine-to-water heat pump:	<b>Yes</b>	Controller contribution:	<b>3,5</b> %
Low-temperature heat pump:	<b>No</b>	Package efficiency:	<b>129</b> %
Equipped with a supplementary heater:	<b>Yes</b>	Package efficiency class:	-
Heat pump combination heater:	<b>Yes</b>		

Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
<b>Rated heat output (*)</b>	<i>P<sub>rated</sub></i>	<b>13</b>	kW	<b>Seasonal space heating energy efficiency</b>	$\eta_s$	<b>125</b>	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>			
T <sub>j</sub> = -7 °C	<i>P<sub>dh</sub></i>	<b>11,4</b>	kW	T <sub>j</sub> = -7 °C	<i>COP<sub>d</sub></i>	<b>3,24</b>	-
T <sub>j</sub> = +2 °C	<i>P<sub>dh</sub></i>	<b>11,6</b>	kW	T <sub>j</sub> = +2 °C	<i>COP<sub>d</sub></i>	<b>3,56</b>	-
T <sub>j</sub> = +7 °C	<i>P<sub>dh</sub></i>	<b>11,8</b>	kW	T <sub>j</sub> = +7 °C	<i>COP<sub>d</sub></i>	<b>3,85</b>	-
T <sub>j</sub> = +12 °C	<i>P<sub>dh</sub></i>	<b>11,9</b>	kW	T <sub>j</sub> = +12 °C	<i>COP<sub>d</sub></i>	<b>4,06</b>	-
T <sub>j</sub> = bivalent temperature	<i>P<sub>dh</sub></i>	<b>11,1</b>	kW	T <sub>j</sub> = bivalent temperature	<i>COP<sub>d</sub></i>	<b>3,00</b>	-
T <sub>j</sub> = operation limit temperature	<i>P<sub>dh</sub></i>	<b>10,9</b>	kW	T <sub>j</sub> = operation limit temperature	<i>COP<sub>d</sub></i>	<b>2,81</b>	-
For air-to-water heat pumps: T <sub>j</sub> = -15 °C (if TOL < -20 °C)	<i>P<sub>dh</sub></i>	<b>na</b>	kW	For air-to-water heat pumps: T <sub>j</sub> = -15 °C (if TOL < -20 °C)	<i>COP<sub>d</sub></i>	<b>na</b>	-
Bivalent temperature	<i>T<sub>biv</sub></i>	<b>-17</b>	°C	For air-to-water heat pumps: Operation limit temperature	<i>TOL</i>	<b>na</b>	°C
Cycling interval capacity for heating	<i>P<sub>cych</sub></i>	<b>na</b>	kW	Cycling interval efficiency	<i>COP<sub>cyc</sub></i>	<b>na</b>	-
Degradation co-efficient (**)	<i>C<sub>dh</sub></i>	<b>0,98</b>	-	Heating water operating limit temperature	<i>WTOL</i>	<b>65</b>	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	<i>P<sub>OFF</sub></i>	<b>0,018</b>	kW	Rated heat output (*)	<i>P<sub>sup</sub></i>	<b>1,9</b>	kW
Thermostat-off mode	<i>P<sub>TO</sub></i>	<b>0,034</b>	kW	Type of energy input	<b>Electric</b>		
Standby mode	<i>P<sub>SB</sub></i>	<b>0,018</b>	kW				
Crankcase heater mode	<i>P<sub>CK</sub></i>	<b>0,000</b>	kW				
Other items							
Capacity control	<b>Fixed</b>			For air-to-water heat pumps: Rated air flow rate, outdoors	-	<b>na</b>	m <sup>3</sup> /h
Sound power level, indoors/ outdoors	<i>L<sub>WA</sub></i>	<b>50/na</b>	dB	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	<b>2,1</b>	m <sup>3</sup> /h
Annual energy consumption	<i>Q<sub>HE</sub></i>	<b>9526</b>	kWh				

For heat pump combination heater:

Declared load profile / Energy efficiency class	<b>L / A</b>			Water heating energy efficiency	$\eta_{wh}$	<b>86</b>	%
Daily electricity consumption	<i>Q<sub>elec</sub></i>	<b>5,434</b>	kWh	Daily fuel consumption	<i>Q<sub>fuel</sub></i>	<b>na</b>	kWh
Annual electricity consumption	<i>AEC</i>	<b>1195</b>	kWh	Annual fuel consumption	<i>AFC</i>	<b>na</b>	GJ
Contact details	<b>Enertech AB, Box 309, SE-341 26 Ljungby Tel +46 372 88000</b>			<b>www.ctc.se</b>			

(\*) For heat pump space heaters and heat pump combination heaters, the rated heat output *P<sub>rated</sub>* is equal to the design load for heating *P<sub>designh</sub>*, and the rated heat output of a supplementary heater *P<sub>sup</sub>* is equal to the supplementary capacity for heating *sup(T<sub>j</sub>)*. (\*\*) If *C<sub>dh</sub>* is not determined by measurement then the default degradation coefficient is *C<sub>dh</sub>* = 0,9.



**Cold climate and Low temperature**

Model(s):	<b>CTC EcoHeat 412</b>		
Air-to-water heat pump:	<b>No</b>	Energy efficiency class:	-
Water-to-water heat pump:	<b>No</b>	Controller class:	<b>VII</b> -
Brine-to-water heat pump:	<b>Yes</b>	Controller contribution:	<b>3,5</b> %
Low-temperature heat pump:	<b>No</b>	Package efficiency:	<b>159</b> %
Equipped with a supplementary heater:	<b>Yes</b>	Package efficiency class:	-
Heat pump combination heater:	<b>Yes</b>		

Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
<b>Rated heat output (*)</b>	<i>P<sub>rated</sub></i>	<b>13</b>	kW	<b>Seasonal space heating energy efficiency</b>	$\eta_s$	<b>156</b>	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>			
T <sub>j</sub> = - 7 °C	<i>P<sub>dh</sub></i>	<b>12,0</b>	kW	T <sub>j</sub> = - 7 °C	<i>COP<sub>d</sub></i>	<b>4,37</b>	-
T <sub>j</sub> = + 2 °C	<i>P<sub>dh</sub></i>	<b>12,1</b>	kW	T <sub>j</sub> = + 2 °C	<i>COP<sub>d</sub></i>	<b>4,50</b>	-
T <sub>j</sub> = + 7 °C	<i>P<sub>dh</sub></i>	<b>12,1</b>	kW	T <sub>j</sub> = + 7 °C	<i>COP<sub>d</sub></i>	<b>4,60</b>	-
T <sub>j</sub> = + 12 °C	<i>P<sub>dh</sub></i>	<b>12,2</b>	kW	T <sub>j</sub> = + 12 °C	<i>COP<sub>d</sub></i>	<b>4,62</b>	-
T <sub>j</sub> = bivalent temperature	<i>P<sub>dh</sub></i>	<b>11,9</b>	kW	T <sub>j</sub> = bivalent temperature	<i>COP<sub>d</sub></i>	<b>4,21</b>	-
T <sub>j</sub> = operation limit temperature	<i>P<sub>dh</sub></i>	<b>11,9</b>	kW	T <sub>j</sub> = operation limit temperature	<i>COP<sub>d</sub></i>	<b>4,11</b>	-
For air-to-water heat pumps: T <sub>j</sub> = - 15 °C (if TOL < - 20 °C)	<i>P<sub>dh</sub></i>	<b>na</b>	kW	For air-to-water heat pumps: T <sub>j</sub> = - 15 °C (if TOL < - 20 °C)	<i>COP<sub>d</sub></i>	<b>na</b>	-
Bivalent temperature	<i>T<sub>biv</sub></i>	<b>-18</b>	°C	For air-to-water heat pumps: Operation limit temperature	<i>TOL</i>	<b>na</b>	°C
Cycling interval capacity for heating	<i>P<sub>cych</sub></i>	<b>na</b>	kW	Cycling interval efficiency	<i>COP<sub>cy</sub></i>	<b>na</b>	-
Degradation co-efficient (**)	<i>C<sub>dh</sub></i>	<b>0,95</b>	-	Heating water operating limit temperature	<i>WTOL</i>	<b>65</b>	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	<i>P<sub>OFF</sub></i>	<b>0,018</b>	kW	Rated heat output (*)	<i>P<sub>sup</sub></i>	<b>1,5</b>	kW
Thermostat-off mode	<i>P<sub>TO</sub></i>	<b>0,110</b>	kW	Type of energy input	<b>Electric</b>		
Standby mode	<i>P<sub>SB</sub></i>	<b>0,018</b>	kW	For air-to-water heat pumps: Rated air flow rate, outdoors			
Crankcase heater mode	<i>P<sub>CK</sub></i>	<b>0,000</b>	kW				
Other items				For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger			
Capacity control	<b>Fixed</b>			-			
Sound power level, indoors/ outdoors	<i>L<sub>WA</sub></i>	<b>50/na</b>	dB	-			
Annual energy consumption	<i>Q<sub>HE</sub></i>	<b>8028</b>	kWh	-			

For heat pump combination heater:

<b>Declared load profile / Energy efficiency class</b>	<b>L / A</b>			<b>Water heating energy efficiency</b>	$\eta_{wh}$	<b>86</b>	%
Daily electricity consumption	<i>Q<sub>elec</sub></i>	<b>5,434</b>	kWh	Daily fuel consumption	<i>Q<sub>fuel</sub></i>	<b>na</b>	kWh
Annual electricity consumption	<i>AEC</i>	<b>1195</b>	kWh	Annual fuel consumption	<i>AFC</i>	<b>na</b>	GJ
Contact details	Enertech AB, Box 309, SE-341 26 Ljungby Tel +46 372 88000			www.ctc.se			

(\*) For heat pump space heaters and heat pump combination heaters, the rated heat output *P<sub>rated</sub>* is equal to the design load for heating *P<sub>designh</sub>*, and the rated heat output of a supplementary heater *P<sub>sup</sub>* is equal to the supplementary capacity for heating *sup(T<sub>j</sub>)*. (\*\*) If *C<sub>dh</sub>* is not determined by measurement then the default degradation coefficient is *C<sub>dh</sub>* = 0,9.