



ENERG

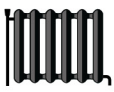
енергия · ενεργεια



10061502

alpha innotec

SWP 451



55 °C

35 °C



A⁺⁺

A⁺⁺⁺



56 dB



- dB

■ 41
■ **41**
■ 41
kW

■ 45
■ **45**
■ 45
kW





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ENERG

енергия · ενεργεια

Y

IJA

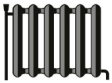
IE

IA

10061502

alpha innotec

SWP 451 + Luxtronik 2.05



A⁺⁺

A⁺⁺⁺

A⁺⁺

A⁺⁺

A⁺

A

B

C

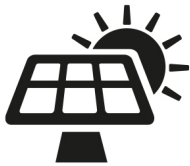
D

E

F

G

+



+



+



+



package (heat pumps and combination heater with heat pump) - SWP 451 + Luxtronik 2.05

Seasonal space heating energy efficiency of heat pump (η_s) ① 142 %

Rated heat output of the heat pump (P_{rated} kW) 41

Temperature control Class VII (Table 1) + ② 3,5 %

Supplementary boiler
package with hot water storage tank no P_{sup} kW (rated heat output of supplementary heater)

η_s % (σ_{π})
 $(\eta_s \% (sup) - ①) \times (\alpha_{WP}) = -$ ③

(α_{WE} : see Table 3) (α_{WE})

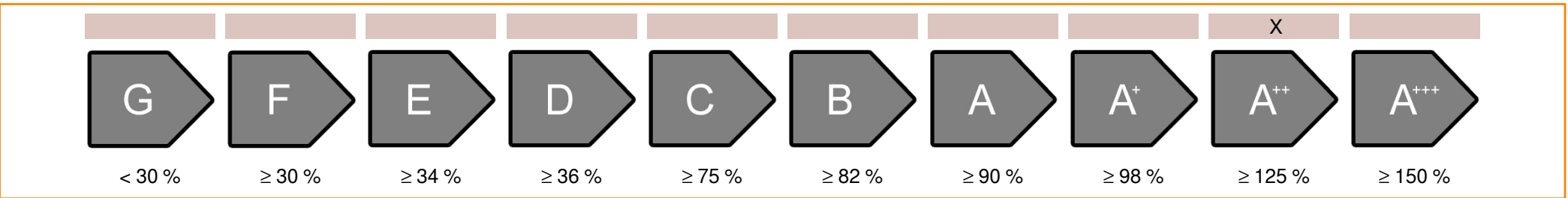
solar contribution $(A_{Koll} \text{ m}^2)$ $(\eta_{Koll} \%)$
 $(V_{Sp} \text{ m}^3)$ **(standstill heat loss of the hot water storage tank in W)**
 $(\eta_{Sp}: \text{Table 2})$

$((294/P_{rated} \times 11) \times (A_{Koll} \text{ m}^2) + (115/P_{rated} \times 11) \times (V_{Sp} \text{ m}^3)) \times 0,45 \times ((\eta_{Koll} \%) / 100) \times (\eta_{Sp}) = +$ ④

Seasonal space heating energy efficiency of package ⑤ 146 %

rounded to the nearest integer

Seasonal space heating energy efficiency class of package



Seasonal space heating energy efficiency under colder or warmer climate conditions

Seasonal space heating energy efficiency of the heat pump (η_s) under colder climate conditions 147 %

Seasonal space heating energy efficiency of the heat pump (η_s) under warmer climate conditions 144 %

colder ⑤ 146 -V -4 = 150 warmer ⑤ 146 +VI 2 = 148

heatpump datasheet:			
manufacturer:	alpha innotec		
model:	SWP 451		
Information concerning energy efficiency class and rated heat output:			
	average / low	average / medium	
energy efficiency class space heater:	A+++	A++	-
rated heat output:	45	41	kW
energy efficiency space heater:	202	142	%
annual final energy consumption space heater	17701	22619	kWh
sound power level indoors		56	dB
special precautions concerning assembly, installation or maintenance			
All instructional work in this manual may only be carried out by qualified specialist personnel in compliance with local regulations.			
additional information	low	medium	
rated heat output colder climate	45	41	kW
rated heat output warmer climate	45	41	kW
energy efficiency space heater colder climate	208	147	%
energy efficiency space heater warmer climate	205	144	%
annual energy consumption space heater colder climate	20528	26210	kWh
annual energy consumption space heater warmer climate	11311	14478	kWh
sound power level outdoors		-	dB

technical data of the temperature controller		
manufacturer:	alpha innotec	
model:	Luxtronik 2.05	
controller class	VII	-
contribution of the controller to the energy efficiency space heater	3,5	%

Model				SWP 451			
Air-to-water heat pump: (yes/no)				no			
Brine-to-water heat pump: (yes/no)				yes			
Water-to-water heat pump: (yes/no)				no			
Low-temperature heat pump: (yes/no)				no			
Equipped with supplementary heater: (yes/no)				yes			
combination heater with: (yes/no)				no			
application: (low/medium)				medium			
climate: (colder/average/warmer)				average			
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output	Prated	41	kW	Seasonal space heating energy efficiency	η_S	142,2	%
Declared coefficient of performance for part load at indoor temperature 20°C and outdoor temperature Tj				Declared coefficient of performance for part load at indoor temperature 20°C and outdoor temperature Tj			
Tj = -7°C	Pdh	41,6	kW	Tj = -7°C	COPd	3,05	-
Tj = +2°C	Pdh	43,1	kW	Tj = +2°C	COPd	3,69	-
Tj = +7°C	Pdh	44,1	kW	Tj = +7°C	COPd	4,19	-
Tj = +12°C	Pdh	45,1	kW	Tj = +12°C	COPd	4,79	-
Tj = bivalent temperature	Pdh	41,1	kW	Tj = bivalent temperature	COPd	2,90	-
Tj = operation limit temperature	Pdh	41,1	kW	Tj = operation limit temperature	COPd	2,90	-
For air-to-water heat pumps: Tj = -15°C (if TOL < -20°C)	Pdh	-	kW	For air-to-water heat pumps: Tj = -15°C (if TOL < -20°C)	COPd	-	-
Bivalent temperature	T _{biv}	-10	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-10	°C
Cycling interval capacity for heating	P _{cyh}	-	kW	Cycling interval efficiency	COP _{cyh}	-	-
Degradation co-efficient (**)	Cdh	1,0	-	Heating water operating limit temperature	WTOL	60	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	P _{OFF}	0,015	kW	Rated heat output	P _{sup}	-	kW
Thermostat-off mode	P _{TO}	0,015	kW	Type of energy input	electrical		
Standby mode	P _{SB}	0,015	kW				
Crankcase heater mode	P _{CK}	-	kW				
Other items							
Capacity control	fixed			For air-to-water heat pumps: Rated air flow rate, outdoors	-	-	m ³ /h
sound power level, indoors/outdoors	L _{WA}	56 / -	dB	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	16	m ³ /h
Emissions of nitrogen oxides	NO _x	-	mg/kWh				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	η_{wh}	-	%
Daily electricity consumption	Q _{elec}	-	kWh	Daily fuel consumption	Q _{fuel}	-	kWh
Contact details	ait deutschland GmbH Industriestr. 3 95359 Kasendorf Germany						
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.							

Model				SWP 451			
Air-to-water heat pump: (yes/no)				no			
Brine-to-water heat pump: (yes/no)				yes			
Water-to-water heat pump: (yes/no)				no			
Low-temperature heat pump: (yes/no)				no			
Equipped with supplementary heater: (yes/no)				yes			
combination heater with: (yes/no)				no			
application: (low/medium)				low			
climate: (colder/average/warmer)				average			
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output	Prated	45	kW	Seasonal space heating energy efficiency	η_S	202,1	%
Declared coefficient of performance for part load at indoor temperature 20°C and outdoor temperature Tj				Declared coefficient of performance for part load at indoor temperature 20°C and outdoor temperature Tj			
Tj = -7°C	Pdh	45,1	kW	Tj = -7°C	COPd	4,86	-
Tj = +2°C	Pdh	45,5	kW	Tj = +2°C	COPd	5,20	-
Tj = +7°C	Pdh	45,9	kW	Tj = +7°C	COPd	5,53	-
Tj = +12°C	Pdh	46,3	kW	Tj = +12°C	COPd	5,88	-
Tj = bivalent temperature	Pdh	45,0	kW	Tj = bivalent temperature	COPd	4,80	-
Tj = operation limit temperature	Pdh	45,0	kW	Tj = operation limit temperature	COPd	4,80	-
For air-to-water heat pumps: Tj = -15°C (if TOL < -20°C)	Pdh	-	kW	For air-to-water heat pumps: Tj = -15°C (if TOL < -20°C)	COPd	-	-
Bivalent temperature	T _{biv}	-10	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-10	°C
Cycling interval capacity for heating	P _{cyh}	-	kW	Cycling interval efficiency	COP _{cyh}	-	-
Degradation co-efficient (**)	Cdh	1,0	-	Heating water operating limit temperature	WTOL	60	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	P _{OFF}	0,015	kW	Rated heat output	P _{sup}	-	kW
Thermostat-off mode	P _{TO}	0,015	kW	Type of energy input	electrical		
Standby mode	P _{SB}	0,015	kW				
Crankcase heater mode	P _{CK}	-	kW				
Other items							
Capacity control	fixed			For air-to-water heat pumps: Rated air flow rate, outdoors	-	-	m ³ /h
sound power level, indoors/outdoors	L _{WA}	56 / -	dB	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	16	m ³ /h
Emissions of nitrogen oxides	NO _x	-	mg/kWh				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	η_{wh}	-	%
Daily electricity consumption	Q _{elec}	-	kWh	Daily fuel consumption	Q _{fuel}	-	kWh
Contact details	ait deutschland GmbH Industriestr. 3 95359 Kasendorf Germany						
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.							