



# ENERG

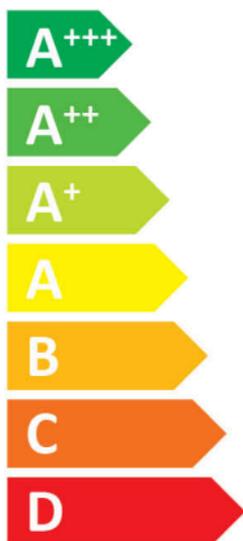
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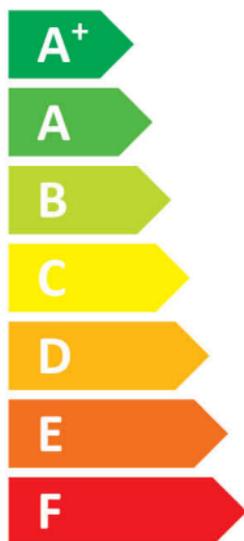
1038004101

NOVELAN

Polaris 4-1



A++



A

Two icons showing sound power levels. The top icon shows a speaker inside a house with the text "43 dB". The bottom icon shows a speaker outside a house with the text "41 dB".



Legend for power consumption in kW:

- Dark blue square: 5 kW
- Medium blue square: 4 kW
- Light blue square: 4 kW

Icon showing a clock and a coin with an arrow pointing to it, representing energy saving or cost reduction.

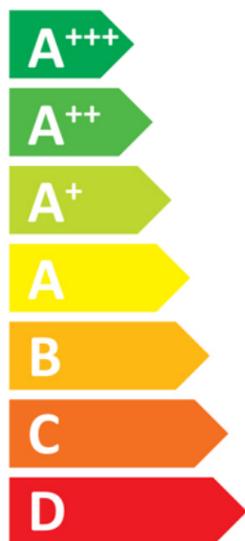


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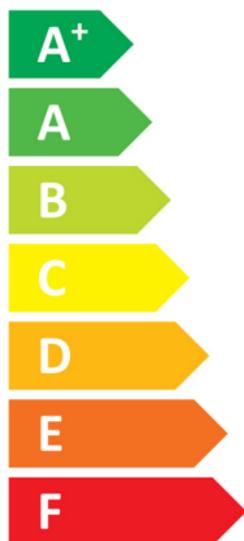
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NOVELAN

Polaris 4-1



A++



A



43 dB



41 dB



5 kW

4 kW

4 kW





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NOVELAN

Polaris 4-1 + Lux 2.1

Energy label for heating system showing a radiator icon, an A++ energy class arrow, and a radiator icon.

Energy label for hot water tap showing a tap icon, an A energy class arrow, and a tap icon with an 'L' label.

Energy scale for heating system with a radiator icon at the top. The scale shows energy classes from A+++ (green) to G (red). An A++ energy class arrow is shown on the right side.

Energy label for solar panel showing a plus sign, a solar panel icon, and an empty square box.

Energy label for hot water tank showing a plus sign, a hot water tank icon, and an empty square box.

Energy label for remote control showing a plus sign, a remote control icon, and a square box with an 'X' mark.

Energy label for boiler showing a plus sign, a boiler icon, and an empty square box.

Energy scale for hot water tap with a tap icon at the top. The scale shows energy classes from A+++ (green) to G (red). An A energy class arrow is shown on the right side.

package (heat pumps and combination heater with heat pump) Polaris 4-1 + Lux 2.1

Seasonal space heating energy efficiency of heat pump ( $\eta_s$ ) ① 138 %

**Rated heat output of the heat pump ( $P_{rated}$  kW)** 4

Temperature control Class II (Table 1) + ② 2 %

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

$\eta_s$  % ( $\sigma_{\pi}$ )  $(\eta_s \% (sup) - ①) \times (\alpha_{WP}) =$  - ③

( $\alpha_{WE}$ : see Table 3)  $(\alpha_{WE})$

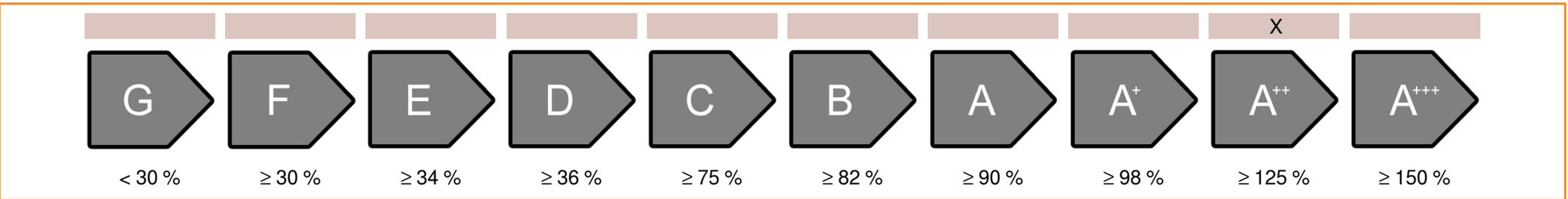
solar contribution  $(A_{Koll} m^2)$   $(\eta_{Koll} \%)$   
 $(V_{Sp} m^3)$  **(standstill heat loss of the hot water storage tank in W)**  
 $(\eta_{Sp}: Table 2)$

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

Seasonal space heating energy efficiency of package ⑤ 140 %

*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 ( $\eta_s$ ) under colder climate conditions** 111 %

**Seasonal space heating energy efficiency of the heat pump ( $\eta_s$ ) under warmer climate conditions** 164 %

colder ⑤ 140 -V 27 = 113 warmer ⑤ 140 +VI 26 = 166

<b>heatpump datasheet:</b>			
<b>manufacturer:</b>	<b>NOVELAN</b>		
<b>model:</b>	<b>Polaris 4-1</b>		
<b>Information concerning energy efficiency class and rated heat output:</b>			
load profile water heating	L		-
	average / low	average / medium	
energy efficiency class space heater:	A+++	A++	-
energy efficiency class waterheating	A		-
rated heat output:	5	4	kW
annual final energy consumption space heater	2257	2347	kWh
annual electricity consumption waterheating	977		kWh
energy efficiency space heater:	180	138	%
energy efficiency waterheating	105		%
sound power level indoors	43		dB
<b>special precautions concerning assembly, installation or maintenance</b>			
All instructional work in this manual may only be carried out by qualified specialist personnel in compliance with local regulations.			
<b>additional information</b>	low	medium	
rated heat output colder climate	5	5	kW
rated heat output warmer climate	4	4	kW
annual energy consumption space heater colder climate	3520	3899	kWh
annual energy consumption space heater warmer climate	947	1257	kWh
ann. Electricity consumption waterheating colder climate	1069		kWh
ann. Electricity consumption waterheating warmer climate	848		kWh
energy efficiency space heater colder climate	137	111	%
energy efficiency space heater warmer climate	215	164	%
energy efficiency waterheating colder climate	96		%
energy efficiency DHWarmer climate	121		%
sound power level outdoors	41		dB

<b>technical data of the temperature controller</b>		
<b>manufacturer:</b>	<b>NOVELAN</b>	
<b>model:</b>	<b>Lux 2.1</b>	
controller class	II	-
contribution of the controller to the energy efficiency space heater	2	%

Model				Polaris 4-1			
Air-to-water heat pump: (yes/no)				yes			
Brine-to-water heat pump: (yes/no)				no			
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)				yes			
application: (low/medium)				medium			
climate: (colder/average/warmer)				average			
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output	Prated	4	kW	Seasonal space heating energy efficiency	$\eta_S$	137,8	%
<b>Declared coefficient of performance for part load at indoor temperature 20°C and outdoor temperature Tj</b>				<b>Declared coefficient of performance for part load at indoor temperature 20°C and outdoor temperature Tj</b>			
Tj = -7°C	Pdh	3,8	kW	Tj = -7°C	COPd	2,01	-
Tj = +2°C	Pdh	2,3	kW	Tj = +2°C	COPd	3,64	-
Tj = +7°C	Pdh	2,2	kW	Tj = +7°C	COPd	4,56	-
Tj = +12°C	Pdh	2,3	kW	Tj = +12°C	COPd	5,24	-
Tj = bivalent temperature	Pdh	3,8	kW	Tj = bivalent temperature	COPd	2,01	-
Tj = operation limit temperature	Pdh	2,9	kW	Tj = operation limit temperature	COPd	2,04	-
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 <sub>biv</sub>	-7	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-10	°C
Cycling interval capacity for heating	Pcych	-	kW	Cycling interval efficiency	COPcyc	-	-
Degradation co-efficient (**)	Cdh	1,0	-	Heating water operating limit temperature	WTOL	65	°C
<b>Power consumption in modes other than active mode</b>				<b>Supplementary heater</b>			
Off mode	P <sub>OFF</sub>	0,011	kW	Rated heat output	P <sub>sup</sub>	1,1	kW
Thermostat-off mode	P <sub>TO</sub>	-	kW	Type of energy input	electrical		
Standby mode	P <sub>SB</sub>	0,011	kW				
Crankcase heater mode	P <sub>CK</sub>	-	kW				
<b>Other items</b>							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	1.200	m <sup>3</sup> /h
sound power level, indoors/outdoors	L <sub>WA</sub>	43 / 41	dB	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m <sup>3</sup> /h
Emissions of nitrogen oxides	NO <sub>x</sub>	-	mg/kWh				
<b>For heat pump combination heater:</b>							
Declared load profile	L			Water heating energy efficiency	$\eta_{wh}$	105	%
Daily electricity consumption	Q <sub>elec</sub>	4,690	kWh	Daily fuel consumption	Q <sub>fuel</sub>	-	kWh
<b>Contact details</b>	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.							

<b>Model</b>				<b>Polaris 4-1</b>			
Air-to-water heat pump: (yes/no)				yes			
Brine-to-water heat pump: (yes/no)				no			
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)				yes			
application: (low/medium)				low			
climate: (colder/average/warmer)				average			
<b>Item</b>	<b>Symbol</b>	<b>Value</b>	<b>Unit</b>	<b>Item</b>	<b>Symbol</b>	<b>Value</b>	<b>Unit</b>
<b>Rated heat output</b>	Prated	5	kW	<b>Seasonal space heating energy efficiency</b>	$\eta_S$	180,1	%
<b>Declared coefficient of performance for part load at indoor temperature 20°C and outdoor temperature Tj</b>				<b>Declared coefficient of performance for part load at indoor temperature 20°C and outdoor temperature Tj</b>			
Tj = -7°C	Pdh	4,1	kW	Tj = -7°C	COPd	2,47	-
Tj = +2°C	Pdh	2,8	kW	Tj = +2°C	COPd	4,80	-
Tj = +7°C	Pdh	2,4	kW	Tj = +7°C	COPd	6,07	-
Tj = +12°C	Pdh	2,4	kW	Tj = +12°C	COPd	6,79	-
Tj = bivalent temperature	Pdh	4,1	kW	Tj = bivalent temperature	COPd	2,47	-
Tj = operation limit temperature	Pdh	4,1	kW	Tj = operation limit temperature	COPd	2,27	-
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 <sub>biv</sub>	-7	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-10	°C
Cycling interval capacity for heating	Pcyc	-	kW	Cycling interval efficiency	COPcyc	-	-
Degradation co-efficient (**)	Cdh	1,0	-	Heating water operating limit temperature	WTOL	65	°C
<b>Power consumption in modes other than active mode</b>				<b>Supplementary heater</b>			
Off mode	P <sub>OFF</sub>	0,011	kW	Rated heat output	P <sub>sup</sub>	0,9	kW
Thermostat-off mode	P <sub>TO</sub>	-	kW	Type of energy input	electrical		
Standby mode	P <sub>SB</sub>	0,011	kW				
Crankcase heater mode	P <sub>CK</sub>	-	kW				
<b>Other items</b>							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	1.200	m <sup>3</sup> /h
sound power level, indoors/outdoors	L <sub>WA</sub>	43 / 41	dB	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m <sup>3</sup> /h
Emissions of nitrogen oxides	NO <sub>x</sub>	-	mg/kWh				
<b>For heat pump combination heater:</b>							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Q <sub>elec</sub>	-	kWh	Daily fuel consumption	Q <sub>fuel</sub>	-	kWh
<b>Contact details</b>	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.							