



ENERG

енергия · ενεργεια



10364701

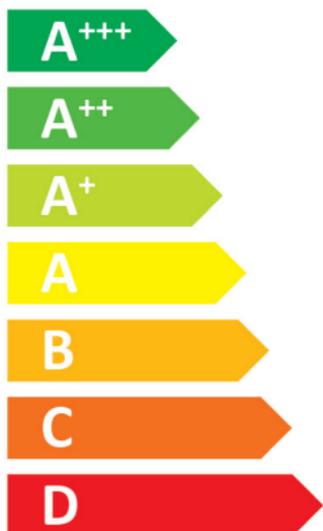
NOVELAN

LI 16.1HV



55 °C

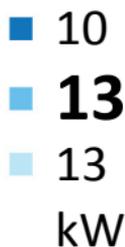
35 °C



50 dB



48 dB





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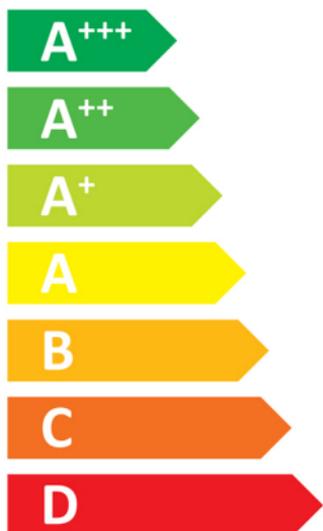
NOVELAN

LI 16.1HV



55 °C

35 °C



50 dB



48 dB

■ 12
■ **16**
■ 14
kW

■ 10
■ **13**
■ 13
kW





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Y

IJA

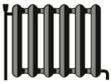
IE

IA

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NOVELAN

LI 16.1HV + WPR-Net 2.1



A⁺⁺

A⁺⁺⁺

A⁺⁺

A⁺⁺

A⁺

A

B

C

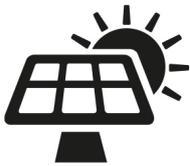
D

E

F

G

+



+



+



+



package (heat pumps and combination heater with heat pump) - LI 16.1HV + WPR-Net 2.1

Seasonal space heating energy efficiency of heat pump (η_s) ① 133 %

Rated heat output of the heat pump (P_{rated} kW) 16

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

(α_{WE} : see Table 3) (α_{WE})

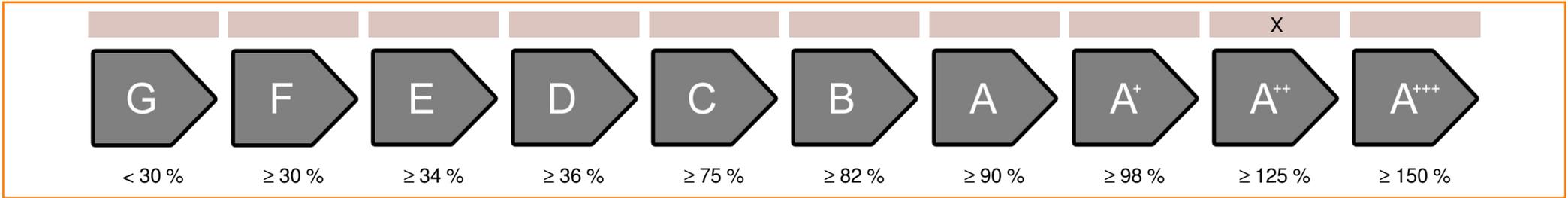
solar contribution $(A_{Koll} m^2)$ $(\eta_{Koll} \%)$
 $(V_{Sp} m^3)$ $(standstill\ heat\ loss\ of\ the\ hot\ water\ storage\ tank\ in\ W)$
 $(\eta_{Sp}: Table\ 2)$

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

Seasonal space heating energy efficiency of package ⑤ 137 %

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 112 %

Seasonal space heating energy efficiency of the heat pump (η_s) under warmer climate conditions 148 %

colder ⑤ 137 -V 21 = 116 warmer ⑤ 137 +VI 15 = 152

heatpump datasheet:			
manufacturer:	NOVELAN		
model:	LI 16.1HV		
Information concerning energy efficiency class and rated heat output:			
	average / low	average / medium	
energy efficiency class space heater:	A++	A++	-
rated heat output:	13	16	kW
energy efficiency space heater:	172	133	%
annual final energy consumption space heater	5905	9719	kWh
sound power level indoors		50	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	10	12	kW
rated heat output warmer climate	13	14	kW
energy efficiency space heater colder climate	132	112	%
energy efficiency space heater warmer climate	182	148	%
annual energy consumption space heater colder climate	7307	9890	kWh
annual energy consumption space heater warmer climate	3788	4987	kWh
sound power level outdoors		48	dB

technical data of the temperature controller		
manufacturer:	NOVELAN	
model:	WPR-Net 2.1	
controller class	VII	-
contribution of the controller to the energy efficiency space heater	3,5	%

Model				LI 16.1HV			
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)				no			
application: (low/medium)				medium			
climate: (colder/average/warmer)				average			
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output	Prated	16	kW	Seasonal space heating energy efficiency	η_S	133,0	%
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	14,1	kW	Tj = -7°C	COPd	2,47	-
Tj = +2°C	Pdh	8,6	kW	Tj = +2°C	COPd	3,31	-
Tj = +7°C	Pdh	5,6	kW	Tj = +7°C	COPd	4,10	-
Tj = +12°C	Pdh	5,5	kW	Tj = +12°C	COPd	5,54	-
Tj = bivalent temperature	Pdh	14,1	kW	Tj = bivalent temperature	COPd	2,47	-
Tj = operation limit temperature	Pdh	13,5	kW	Tj = operation limit temperature	COPd	2,28	-
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}	-7	°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}	0,024	kW	Rated heat output	P _{sup}	2,5	kW
Thermostat-off mode	P _{TO}	0,024	kW	Type of energy input	electrical		
Standby mode	P _{SB}	0,024	kW				
Crankcase heater mode	P _{CK}	-	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	4.400	m ³ /h
sound power level, indoors/outdoors	L _{WA}	50 / 48	dB	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	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				LI 16.1HV			
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)				no			
application: (low/medium)				low			
climate: (colder/average/warmer)				average			
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output	Prated	13	kW	Seasonal space heating energy efficiency	η_S	171,9	%
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	10,2	kW	Tj = -7°C	COPd	3,06	-
Tj = +2°C	Pdh	6,5	kW	Tj = +2°C	COPd	4,44	-
Tj = +7°C	Pdh	5,3	kW	Tj = +7°C	COPd	5,23	-
Tj = +12°C	Pdh	5,5	kW	Tj = +12°C	COPd	6,51	-
Tj = bivalent temperature	Pdh	10,2	kW	Tj = bivalent temperature	COPd	3,06	-
Tj = operation limit temperature	Pdh	11,7	kW	Tj = operation limit temperature	COPd	2,74	-
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}	-7	°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}	0,024	kW	Rated heat output	P _{sup}	-	kW
Thermostat-off mode	P _{TO}	0,024	kW	Type of energy input	electrical		
Standby mode	P _{SB}	0,024	kW				
Crankcase heater mode	P _{CK}	-	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	4.400	m ³ /h
sound power level, indoors/outdoors	L _{WA}	50 / 48	dB	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	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.							