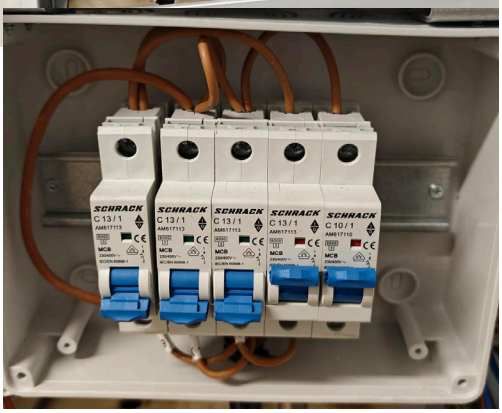
Vesttherm A/S

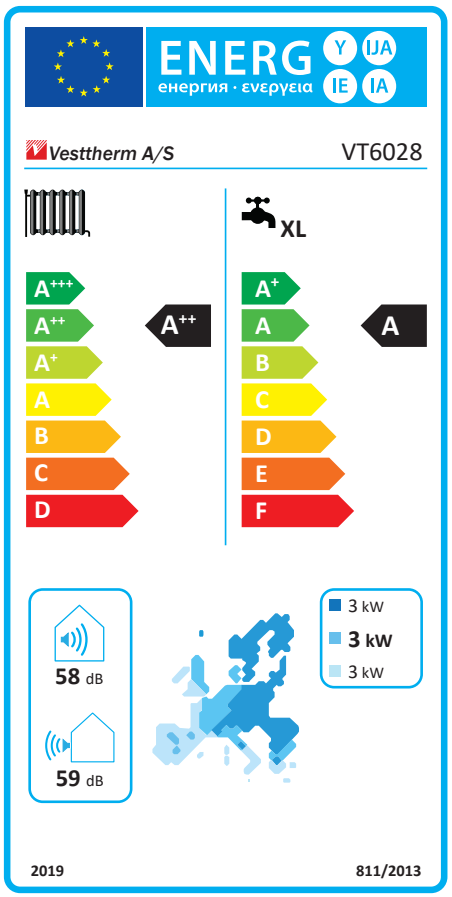


Vesttherm A/S

VT6028 (Exhaust Air Heat Pump)

Hot water production

Consumer profile, water heater	XL (Extra Large)
Energy efficiency class	A
Energy efficiency for water heating - average climate	108 %
Annual electricity consumption - average climate	1557 kWh/annum
Temperature settings on the thermostat	10 - 65 °C
Sound power level L_{WA}	58 dB(A)
The water heater can function outside peak load periods (Smart-grid)	Yes
Guidelines for assembly, installation and maintenance	See installation instructions
Energy efficiency for water heating - cold climate	108%
Energy efficiency for water heating - warm climate	108%
Daily electrical consumption (average climate conditions) (Qelec):	7.21 kWh
Annual electricity consumption (average climate conditions):	1557 kWh



Notes:

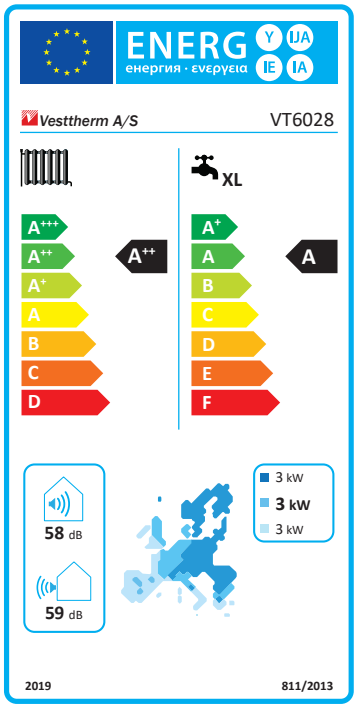
Coefficient of performance (COP DHW):	2.64
Standby power (Pes):	28W
Standby heat loss:	0.672 KWh/day
P Rated *	1.4 KW
Reference hot water temperature (θ'WH):	50 °C

Vesttherm A/S

VT6028 (Average Climate, Mean water temperature application: 55°C)

Heat pump for space heating

Model	VGU180EK
Air-to-water heat pump	Yes
Water-to-water heat pump	No
Brine-to-water heat pump	No
Low-temperature heat pump	No
Equipped with a supplementary heater	Yes
Heat pump combination heater	Yes
Temperature control:	Yes
Model	CTS602-HMI
Class	2
Contribution to seasonal space heating energy efficiency	2%



Item	Symbol	Value	Unit
Rated heat output (*)	*Prated*	3.0	kW
*Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature of T_j			
T_j = -7 °C	*Pdh*	2.898	kW
T_j = +2 °C	*Pdh*	2.412	kW
T_j = +7 °C	*Pdh*	2.177	kW
T_j = +12 °C	*Pdh*	1.779	kW
T_j = bivalent temperature	*Pdh*	2.894	kW
T_j = operation limit temperature	*Pdh*	3.015	kW
Operation limit temperature Tj = -15 °C (if TOL < -20 °C)	*Pdh*		kW
Bivalent temperature	T_{biv}	-6	°C
Cycling interval capacity for heating	*Pcych*		kW
Degradation co-efficient	*Cdh*	0.9	
Power consumption in modes other than active mode			
Off mode	P_{OFF}	0.009	kW
Thermostat off-mode	P_{TO}	0.025	kW
Standby mode	P_{SB}	0.009	kW
Crankcase heater mode	P_{CK}	0	kW
Other items			
Capacity control:	Variable compressor Variable indoor temperature adjustment		
	Permanent indoor water flow Permanent outdoor water flow		
Sound power level, indoor	L_{WA}	58.2	dB
Annual energy consumption	Q_{HE}	1685	kWh

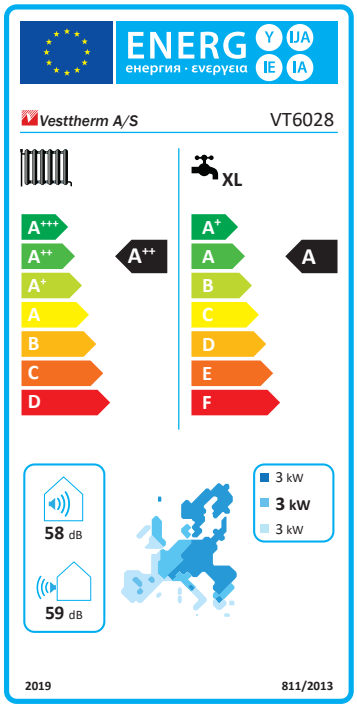
Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	η_s	145	%
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
T_j = -7 °C	*COPd*	4.65	
T_j = +2 °C	*COPd*	4.40	
T_j = +7 °C	*COPd*	4.21	
T_j = +12 °C	*COPd*	3.75	
T_j = bivalent temperature	*COPd*	4.74	
T_j = operation limit temperature	*COPd*	4.77	
For air-to-water heat pumps Tj = -15 °C (if TOL < -20 °C)	*COPd*		
For air-to-water heat pumps: Operation limit temperature	*TOL*	-10	°C
Cycling interval capacity for heating	*COPcyc*		
Heating water operating limit temperature	*WTOL*	55	°C
Supplementary heater			
Rated heat output	*Psup*	6	kW
Type of energy input	Elektrisk		
For air-to-water heat pumps: Rated air flow rate, outdoors		150	m³/h
For water-/ brine-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger			m³/h

Vesttherm A/S

VT6028 (Average Climate, Low water temperature application: 35°C)

Heat pump for space heating

Model	VGU180EK
Air-to-water heat pump	Yes
Water-to-water heat pump	No
Brine-to-water heat pump	No
Low-temperature heat pump	No
Equipped with a supplementary heater	Yes
Heat pump combination heater	Yes
Temperature control:	Yes
Model	CTS602-HMI
Class	2
Contribution to seasonal space heating energy efficiency	2%



Item	Symbol	Value	Unit
Rated heat output (*)	*Prated*	2.6	kW
*Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature of T_j			
T_j = -7 °C	*Pdh*	2.425	kW
T_j = +2 °C	*Pdh*	2.110	kW
T_j = +7 °C	*Pdh*	1.924	kW
T_j = +12 °C	*Pdh*	1.688	kW
T_j = bivalent temperature	*Pdh*	2.425	kW
T_j = operation limit temperature	*Pdh*	2.607	kW
Operation limit temperature Tj = -15 °C (if TOL < -20 °C)	*Pdh*		kW
Bivalent temperature	T_{biv}	-6	°C
Cycling interval capacity for heating	*Pcych*		kW
Degradation co-efficient	*Cdh*	0.9	
Power consumption in modes other than active mode			
Off mode	P_{OFF}	0.009	kW
Thermostat off-mode	P_{TO}	0.025	kW
Standby mode	P_{SB}	0.009	kW
Crankcase heater mode	P_{CK}	0	kW
Other items			
Capacity control:	Variable compressor Variable indoor temperature adjustment		
	Permanent indoor water flow Permanent outdoor water flow		
Sound power level, indoor	L_{WA}	58.2	dB
Annual energy consumption	Q_{HE}	1485	kWh

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	η_s	142	%
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
T_j = -7 °C	*COPd*	4.77	
T_j = +2 °C	*COPd*	4.37	
T_j = +7 °C	*COPd*	4.02	
T_j = +12 °C	*COPd*	3.68	
T_j = bivalent temperature	*COPd*	4.77	
T_j = operation limit temperature	*COPd*	5.03	
For air-to-water heat pumps Tj = -15 °C (if TOL < -20 °C)	*COPd*		
For air-to-water heat pumps: Operation limit temperature	*TOL*	-10	°C
Cycling interval capacity for heating	*COPcyc*		
Heating water operating limit temperature	*WTOL*	35	°C
Supplementary heater			
Rated heat output	*Psup*	6	kW
Type of energy input	Elektrisk		
For air-to-water heat pumps: Rated air flow rate, outdoors		150	m^3/h
For water-/ brine-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger			m^3/h