WAMAK

Heat pump

AWK 47 EVI

WAMAK AWK 47 EVI

Product description

Compact heat pump for heating, cooling and domestic hot water designed for outdoor installation. A short closed refrigerant circuit with a silent Scroll compressor located in front of the low-height fan simplifies installation and aids long-term stable operation. Features include a double V-shaped heat exchanger, full stainless steel enclosure and robust frame construction.

Use for multi-family dwellings, suburban mixed-use buildings or commercial operations. The Urban range is based on a robust construction quality steel for all parts. High quality, long proven heat pump circuit components extend the life of the heat pump.

The primary source is the heat energy from the ambient air, which is blown by a silent fan in the shape of an owl's wing through a heat exchanger made of copper and aluminium.

The EVI (Enhanced Vapour Injection) technology allows the heat pump to achieve higher header flow temperatures even at lower source temperatures. EVI also has a possitive impact on the compressor lifespan and overall system stability because the discharge gas temperature from the compressor is lower.

The APS (Active Process Subcooling) system simultaneously increases the stability and efficiency of operation by additional utilisation of the liquid refrigerant temperature after it has condensed.

Outdoor monoblock

Product features

- Scroll compressor
- EVI technology
- Asymetric plate heat exchanger
- Active cooling
- Enhanced defrosting with APS system
- Heated drip tray - (with accessory)
- Phase and rotation control
- High pressure sensor - analogue
- Flow switch consumer - on/off - (with accessory)
- Plate exchanger protection HG-BYPASS
- Mixed heating/cooling circuit control - (with accessory)
- DHW switching control - (with accessory)
- Outdoor temperature sensor
- Buffer temperature sensor
- Modbus connection - (with accessory)
- Solid frame structure
- Sylomer pads under compressor unit
- Electronic expansion valve
- Large air heat exchanger with APS system
- Reversible defrosting
- Speed - controlled EC fan
- Compressor soft starter
- High pressure switch
- Low pressure sensor - analogue
- Flow sensor consumer - analogue - (with accessory)
- ECM speed circulator - condenser
- Direct heating/cooling circuit control - (with accessory)
- DHW circulation control - (with accessory)
- DHW temperature sensor
- Cascade control - (with accessory)
- Body parts and frame made of fully stainless steel sheet

Basic performance data - WAMAK AWK 47 EVI

Heating - EN 14511		
Heating capacity [kW]	A7 / W35	49.1
	A2 / W35	41.7
	A-7 / W34	35.0
Electrical power input [kW]	A7 / W35	11.4
	A2 / W35	11.4
	A-7 / W34	11.0
Heating efficiency faktor [COP]	A7 / W35	4.31
	A2 / W35	3.67
	A-7 / W34	3.17
Seasonal space heating energy efficiency - SCOP EN 14825		
Average Climate / Low Temperature [35°C]	SCOP	4.17
	η [%]	166.9
	Label	A+++
	Qhe [kWh]	82020.2
	Pdesignh [kW]	39.7
	Tbivalent [°C]	-7
Cooling		
Cooling capacity - [kW]	A35 / W23-18	48.4
	A25 / W23-18	50.9
	A35 / W12-7	36.4
	A25 / W12-7	36.4
Seasonal space cooling energy efficiency - SEER EN 14825		
[W 23 / 18°C]	SEER	4.46
	Qce [kWh]	21840.0
	ηc [%]	178.6
Sound EN 12102		
Acoustic power - Lw	dB(A)	65
Acoustic pressure - Lp	**1 m** dB(A)	57
	5 m dB(A)	43
	10 m dB(A)	37
Mechanical and operational information		
Compressor type (3~ 400/50)	SCROLL / 1 /	On/Off
Refrigerant	R410A (GWP - 2088)	8.9 kg
Operating limit temperatures heating - (min / max) [°C]		25 / **65**
Operating limit temperatures source - (min / max) [°C]		**-22** / 40
Weight		590 kg

Main technical data - WAMAK AWK 47 EVI

Enclosure type		AWK-VOV900
Basic dimensions	Height [mm]	1250
	Width [mm]	1380
	Length [mm]	1780
Weight [kg]		590
Colour		Inox
Enclousure IP Class		IP44
Refrigeration cycle		
Compressor	Type	Scroll
	Number of stages	1
	On/Off	
	Power factor Cosϕ	0.64
	Winding resistance	0.76 Ohm
Refrigerant		R410A
	Volme	8.9 kg
	GWP	2088
	Safety class	A1
Refrigeration oil type	POE RL32-3MAF	
	Oil volume	3.38 L
Maximal pressure - refrigerant [bar]		50
	PED class	2
EVI - vapour injection with economizer		
APS System of liquid subcooling		
Reversible operation (cooling)		
Reverse defrosting with hot gas		
Plate exchanger protection HG-BYPASS		
Electrical connection data		
Line voltage [#~ V/Hz]		3~ 400/50
Current	nominal [A]	23.53
	maximal [A]	37.40
	starting [A]	57.2
Softstart		MCD201
Main safety		C40

Control System			
Main controller	SIEMENS	RVS 21 AVS 55.199	
Extension module	AVS75.3xx	AVS75.3xx	AVS75.372
Bus Clip-In		LPB OCI346	Modbus OCI352
Online connection		Web server OZW672	ToSyMo
Superheat controller			1 - EEV H/C

*** with accessory

Heat energy rejection side data		
Operating limit temperatures heating	MAX [°C]	65
	MIN [°C]	25
for more see operating limits diagram		
Condenser	Port size	2 "
	Type	BPHE
	Count	1
	Material	AISI 316
Maximal operating pressure - refrigerant [bar]		50
Maximal operating pressure - Water [bar]		3
Testing pressure [bar]		70
Heat transfer medium		Water
Volume flow - Water [m3/h]		8.45
Internal pressure drop - Water [kPa]		14
ECM speed circulator - condenser		MAGNA 1 32-120
Temperature difference	@ 35°C (nom)	5 K
	@ 55°C	8 K
	@ 65°C	10 K
Renewable energy extraction side data		
Operating limit temperatures source	MIN [°C]	-22
	MAX [°C]	40
for more see operating limits diagram		
Evaporator	Type	Cu-coil /Al-fin
	Count	1
	Material	Cu/Al
Maximal operating pressure - refrigerant [bar]		29
Heat transfer medium		Air
Volume flow - Air [m3/h]		14980
Internal pressure drop - Air [kPa]		0.032
Temperature difference - Air		7 K
Number of fans		1
Fan diameter [mm]		800

WAMAK AWK 47 EVI

ErP (EU) No 811/2013: Technical parameters for heat pump space heaters

Model	**AWK 47 EVI**
Air-to-water heat pump	yes
Brine-to-water heat pump	no
Water-to-water heat pump	no
Low-temperature heat pump	no
Equipped with a supplementary heater	no
Heat pump combination heater	no
Temperature application	low (35°C - 30°C)
Climate conditions	average

Item	Symbol	Value	Unit
Rated heat output at Tdesignh	Prated	39.7	kW
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	Pdh	35.0	kW
Tj = +2 °C	Pdh	41.2	kW
Tj = +7 °C	Pdh	48.6	kW
Tj = +12 °C	Pdh	57.4	kW
Tj = bivalent temperature	Pdh	34.4	kW
Tj = operation limit temperature	Pdh	25.1	kW
Bivalent temperature	Tbiv	-7	°C
Power consumption in modes other than active mode			
Off mode	Poff	0.040	kW
Thermostat-off mode	Pto	0.010	kW
Standby mode	Psb	0.010	kW
Crankcase heater mode	Pck	0.050	kW
Other items			
Capacity control		fixed	
Sound power level			
indoors	Lwa	---	dB
outdoors	Lwa	65	dB
Annual energy consumption	Q_{HE}	82020.2	kWh

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	ηs	166.9	%
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	COPd	3.17	-
Tj = +2 °C	COPd	4.1	-
Tj = +7 °C	COPd	5.1	-
Tj = +12 °C	COPd	6.4	-
Tj = bivalent temperature	COPd	3.1	-
Tj = operation limit temperature	COPd	2.3	-
Tj = operation limit temperature	TOL	-22	°C
Heating water operating limit temperature	WTOL	65	°C
Supplementary heater			
Rated heat output	Psup	17.6	kW
Type of energy input		electricity	
For air-to-water heat pumps: Rated air flow rate, outdoors	-	14980	m3/h
For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	---	m3/h

Contact details: WAMAK, s.r.o., Orovnica 252, 96652, Orovnica, Slovensko, info@wamak.sk

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ErP (EU) No 811/2013: Technical parameters for heat pump space heaters

Model	**AWK 47 EVI**
Air-to-water heat pump	yes
Brine-to-water heat pump	no
Water-to-water heat pump	no
Low-temperature heat pump	no
Equipped with a supplementary heater	no
Heat pump combination heater	no
Temperature application	middle (55°C - 47°C)
Climate conditions	average

Item	Symbol	Value	Unit
Rated heat output at Tdesignh	Prated	41.6	kW
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	Pdh	36.6	kW
Tj = +2 °C	Pdh	42.3	kW
Tj = +7 °C	Pdh	49.1	kW
Tj = +12 °C	Pdh	57.6	kW
Tj = bivalent temperature	Pdh	36.1	kW
Tj = operation limit temperature	Pdh	26.4	kW
Bivalent temperature	Tbiv	-7	°C
Power consumption in modes other than active mode			
Off mode	Poff	0.040	kW
Thermostat-off mode	Pto	0.010	kW
Standby mode	Psb	0.010	kW
Crankcase heater mode	Pck	0.050	kW
Other items			
Capacity control		fixed	
Sound power level			
indoors	Lwa	---	dB
outdoors	Lwa	65	dB
Annual energy consumption	Q_{HE}	85945.6	kWh

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	ηs	131.1	%
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	COPd	2.24	-
Tj = +2 °C	COPd	3.2	-
Tj = +7 °C	COPd	4.2	-
Tj = +12 °C	COPd	5.6	-
Tj = bivalent temperature	COPd	2.1	-
Tj = operation limit temperature	COPd	1.6	-
Tj = operation limit temperature	TOL	-22	°C
Heating water operating limit temperature	WTOL	65	°C
Supplementary heater			
Rated heat output	Psup	17.6	kW
Type of energy input		electricity	
For air-to-water heat pumps: Rated air flow rate, outdoors	-	14980	m3/h
For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	---	m3/h

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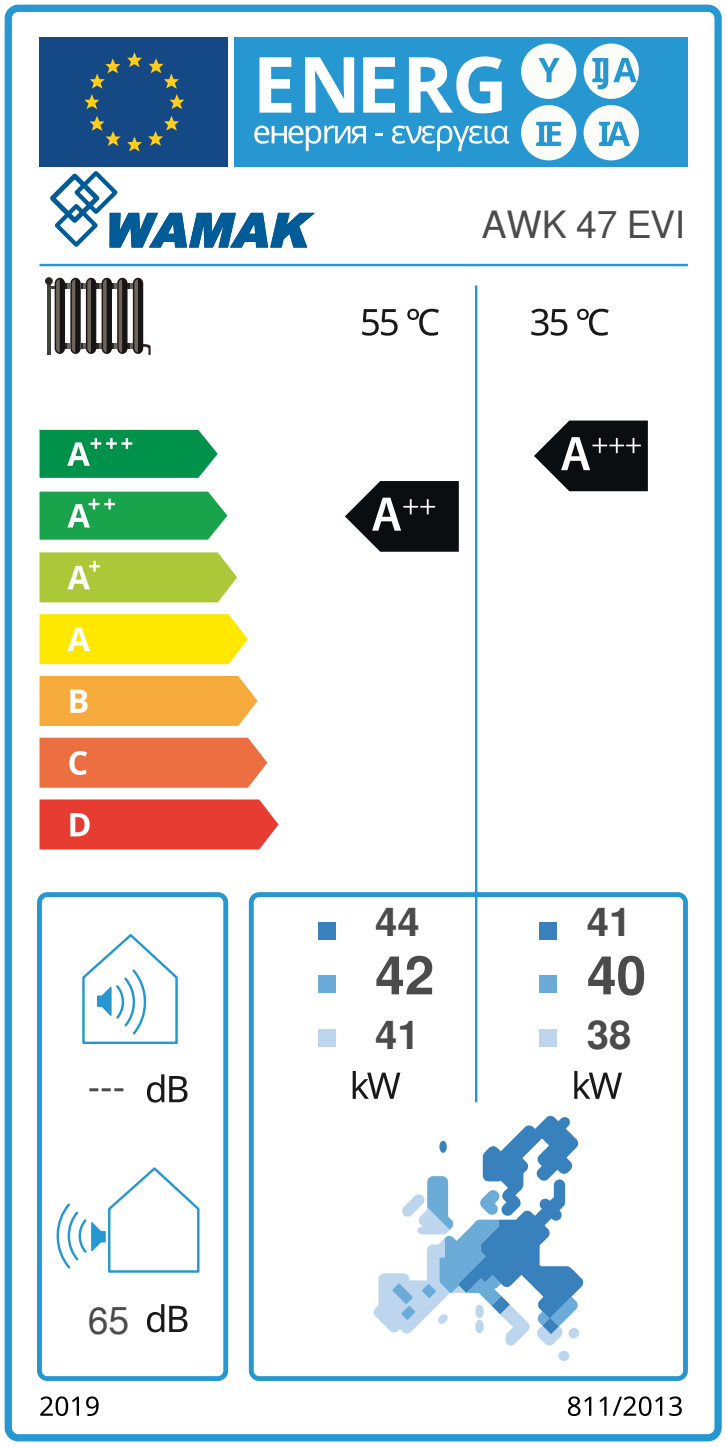


AWK 47 EVI **ErP Data**

		55 °C	35 °C
Energy class		A++	A+++
η	[%]	131.1	166.9
P_{rated}	[kW]	42	40
Q_{HE}	[kWh/y]	85946	82021
SCOP	[-]	3.28	4.17
$T_{bivalent}$	[°C]	-7	-7

CONTROLER

+ QAA55/75	class **VII**	3.5% ↓
- QAA55/75	class **III**	1.5% ↓

Heating performance data

Version: v202223.006-AW

Average Climate / Low Temperature [35°C]

ZHI46K1P-TWD_R410A_1_AW

	Operating conditions	Qh	P	COP
1	A7 / W30-35	49.1	11.4	4.31
2	A2 / W35	41.7	11.4	3.67
3	A-22 / W35	25.1	10.8	2.31
A	A-7 / W34	35.0	11.0	3.17
B	A2 / W30	41.2	10.2	4.06
C	A7 / W27	48.6	9.5	5.11
D	A12 / W24	57.4	9.0	6.41
E	A-10 / W35	34.4	11.3	3.05
F	A-7 / W34	35.0	11.0	3.17

SCOP DATA EN 14825:2018	
Average Climate / Low Temperature [35°C]	
SCOPon	4.25
SCOPnet	4.29
SCOP	4.17
η [%]	166.90
Label	A+++
Qh [kWh]	82020.20
Pdesignh [kW]	39.7
Tbivalent [°C]	-7.00

Average Climate / Medium Temperature [55°C]

	Operating conditions	Qh	P	COP
1	A7 / W47-55	50.1	17.8	2.81
2	A2 / W55	43.2	17.7	2.44
3	A-22 / W55	26.4	15.2	1.62
A	A-7 / W52	36.6	16.3	2.24
B	A2 / W42	42.3	13.3	3.18
C	A7 / W36	49.1	11.6	4.22
D	A12 / W30	57.6	10.2	5.64
E	A-10 / W55	36.1	17.4	2.08
F	A-7 / W55	36.8	17.4	2.11

SCOP DATA EN 14825:2018	
Average Climate / Medium Temperature [55°C]	
SCOPon	3.32
SCOPnet	3.34
SCOP	3.28
η [%]	131.06
Label	A++
Qh [kWh]	85945.60
Pdesignh [kW]	41.6
Tbivalent [°C]	-7.00

Cooling performance data

Low temperature cooling W 12 / 7°C

	Operating conditions	Qc	P	EER
A	A35 / W12-7	36.4	13.6	2.68
B	A30 / W12-7	37.4	12.2	3.07
C	A25 / W12-7	38.2	10.9	3.51
D	A20 / W12-7	38.9	9.7	4.00

SEER DATA EN 14825:2018 [W 12 / 7°C]	
SEERon	3.43
SEER	3.37
Qc [kWh]	21840.00
η [%]	134.85

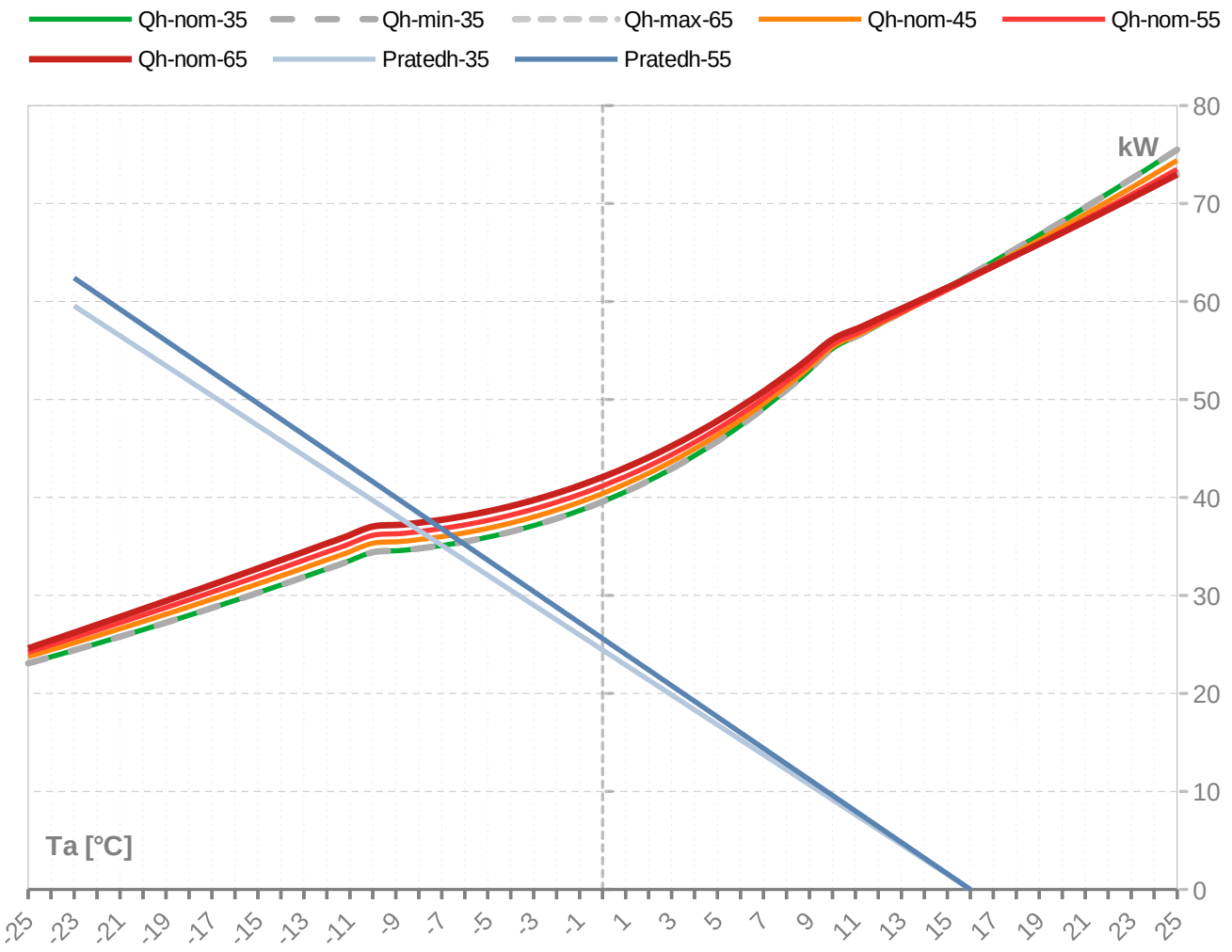
Radiant cooling W 23 / 18°C

	Operating conditions	Qc	P	EER
A	A35 / W23-18	48.4	13.6	3.56
B	A30 / W23-18	49.7	11.3	4.09
C	A25 / W23-18	50.9	10.1	4.67
D	A20 / W23-18	51.9	9.1	5.34

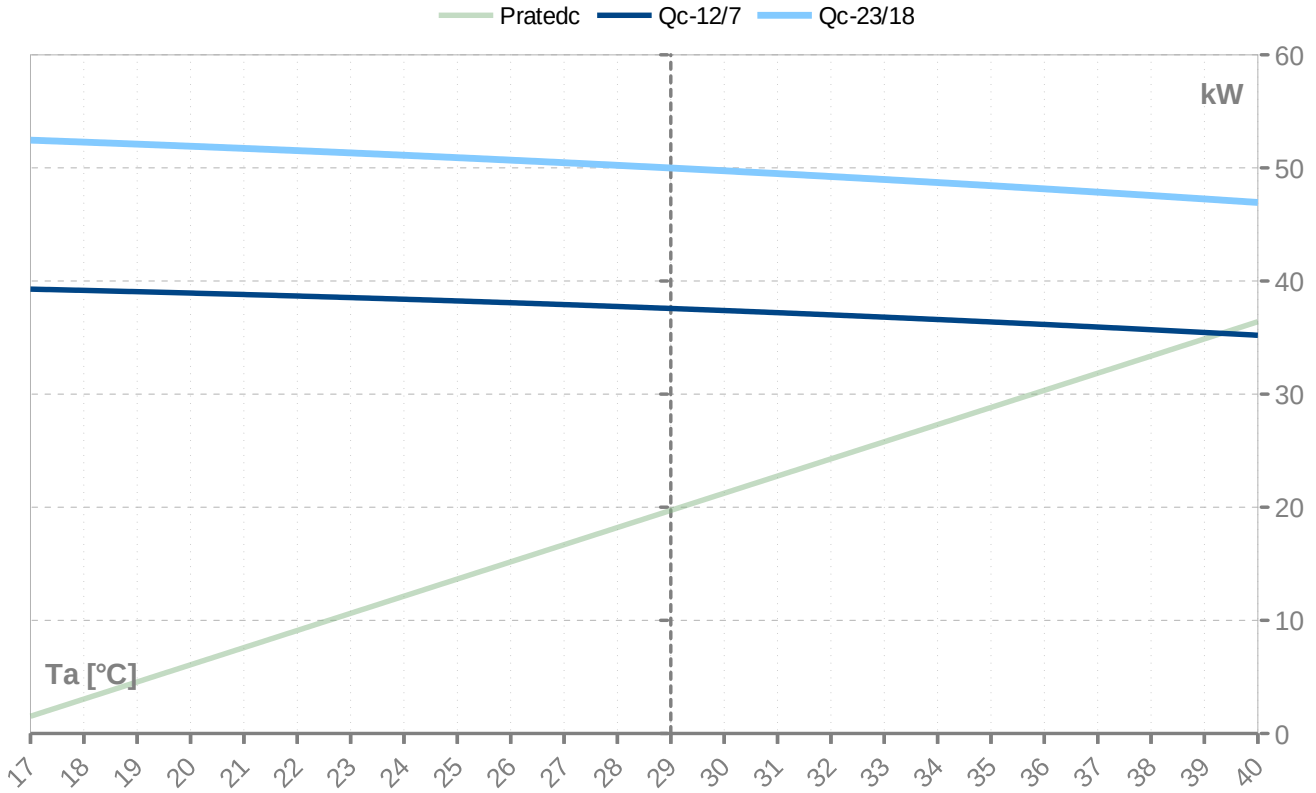
SEER DATA EN 14825:2018 [W 23 / 18°C]	
SEERon	4.57
SEER	4.46
Qc [kWh]	21840.00
η [%]	178.56

Performance lines - heating

ZHI46K1P-TWD_R410A_1_AW



Performance lines - cooling



Th [°C]	**35 °C**									
Ta [°C]	**Qh nom [kW]**	**Qh min** [kW]	**Qh max** [kW]	**Pin nom [kW]**	**Pin-min** [kW]	**Pin-max** [kW]	**COP kW / kW**	**I nom** [A]	**I min** [A]	**I max** [A]
25	**64.1**	64.1		**11.4**	11.4		**5.62**	23.3	23.3	
24	**64.1**	64.1		**11.4**	11.4		**5.62**	23.3	23.3	
23	**64.1**	64.1		**11.4**	11.4		**5.62**	23.3	23.3	
22	**64.1**	64.1		**11.4**	11.4		**5.62**	23.3	23.3	
21	**64.1**	64.1		**11.4**	11.4		**5.62**	23.3	23.3	
20	**64.1**	64.1		**11.4**	11.4		**5.62**	23.3	23.3	
19	**64.1**	64.1		**11.4**	11.4		**5.62**	23.3	23.3	
18	**64.1**	64.1		**11.4**	11.4		**5.62**	23.3	23.3	
17	**64.1**	64.1		**11.4**	11.4		**5.62**	23.3	23.3	
16	**62.7**	62.7	62.7	**11.4**	11.4	11.4	**5.51**	23.3	23.3	23.3
15	**61.4**	61.4	61.4	**11.4**	11.4	11.4	**5.40**	23.3	23.3	23.3
14	**60.1**	60.1	60.1	**11.4**	11.4	11.4	**5.28**	23.3	23.3	23.3
13	**58.9**	58.9	58.9	**11.4**	11.4	11.4	**5.17**	23.4	23.4	23.4
12	**57.6**	57.6	57.6	**11.4**	11.4	11.4	**5.06**	23.4	23.4	23.4
11	**56.4**	56.4	56.4	**11.4**	11.4	11.4	**4.96**	23.4	23.4	23.4
10	**55.2**	55.2	55.2	**11.4**	11.4	11.4	**4.85**	23.4	23.4	23.4
9	**53.0**	53.0	53.0	**11.4**	11.4	11.4	**4.66**	23.5	23.5	23.5
8	**51.0**	51.0	51.0	**11.4**	11.4	11.4	**4.48**	23.5	23.5	23.5
7	**49.1**	49.1	49.1	**11.4**	11.4	11.4	**4.31**	23.6	23.6	23.6
6	**47.3**	47.3	47.3	**11.4**	11.4	11.4	**4.16**	23.6	23.6	23.6
5	**45.7**	45.7	45.7	**11.4**	11.4	11.4	**4.02**	23.7	23.7	23.7
4	**44.3**	44.3	44.3	**11.4**	11.4	11.4	**3.89**	23.7	23.7	23.7
3	**42.9**	42.9	42.9	**11.4**	11.4	11.4	**3.77**	23.7	23.7	23.7
2	**41.7**	41.7	41.7	**11.4**	11.4	11.4	**3.67**	23.7	23.7	23.7
1	**40.6**	40.6	40.6	**11.4**	11.4	11.4	**3.57**	23.7	23.7	23.7
0	**39.6**	39.6	39.6	**11.4**	11.4	11.4	**3.49**	23.7	23.7	23.7
-1	**38.7**	38.7	38.7	**11.3**	11.3	11.3	**3.41**	23.7	23.7	23.7
-2	**37.9**	37.9	37.9	**11.3**	11.3	11.3	**3.34**	23.7	23.7	23.7
-3	**37.1**	37.1	37.1	**11.3**	11.3	11.3	**3.28**	23.7	23.7	23.7
-4	**36.5**	36.5	36.5	**11.3**	11.3	11.3	**3.22**	23.7	23.7	23.7
-5	**35.9**	35.9	35.9	**11.3**	11.3	11.3	**3.18**	23.7	23.7	23.7
-6	**35.5**	35.5	35.5	**11.3**	11.3	11.3	**3.14**	23.7	23.7	23.7
-7	**35.1**	35.1	35.1	**11.3**	11.3	11.3	**3.11**	23.7	23.7	23.7
-8	**34.8**	34.8	34.8	**11.3**	11.3	11.3	**3.08**	23.7	23.7	23.7
-9	**34.6**	34.6	34.6	**11.3**	11.3	11.3	**3.06**	23.7	23.7	23.7
-10	**34.4**	34.4	34.4	**11.3**	11.3	11.3	**3.05**	23.7	23.7	23.7
-11	**33.5**	33.5	33.5	**11.3**	11.3	11.3	**2.98**	23.7	23.7	23.7
-12	**32.7**	32.7	32.7	**11.2**	11.2	11.2	**2.91**	23.7	23.7	23.7
-13	**31.9**	31.9	31.9	**11.2**	11.2	11.2	**2.84**	23.6	23.6	23.6
-14	**31.1**	31.1	31.1	**11.2**	11.2	11.2	**2.78**	23.6	23.6	23.6
-15	**30.3**	30.3	30.3	**11.1**	11.1	11.1	**2.72**	23.5	23.5	23.5
-16	**29.5**	29.5	29.5	**11.1**	11.1	11.1	**2.65**	23.5	23.5	23.5
-17	**28.7**	28.7	28.7	**11.1**	11.1	11.1	**2.59**	23.4	23.4	23.4
-18	**28.0**	28.0	28.0	**11.0**	11.0	11.0	**2.53**	23.3	23.3	23.3
-19	**27.2**	27.2	27.2	**11.0**	11.0	11.0	**2.48**	23.3	23.3	23.3
-20	**26.5**	26.5	26.5	**10.9**	10.9	10.9	**2.42**	23.2	23.2	23.2
-21	**25.8**	25.8	25.8	**10.9**	10.9	10.9	**2.37**	23.1	23.1	23.1
-22	**25.1**	25.1	25.1	**10.8**	10.8	10.8	**2.31**	23.0	23.0	23.0
-23	**24.4**	24.4	24.4	**10.8**	10.8	10.8	**2.26**	22.9	22.9	22.9
-24	**23.7**	23.7	23.7	**10.7**	10.7	10.7	**2.21**	22.8	22.8	22.8
-25	**23.1**	23.1	23.1	**10.7**	10.7	10.7	**2.17**	22.6	22.6	22.6

* attention: operating limits not reflected in performance table

Th [°C]	**45 °C**									
Ta [°C]	**Qh nom [kW]**	**Qh min** [kW]	**Qh max** [kW]	**Pin nom [kW]**	**Pin-min** [kW]	**Pin-max** [kW]	**COP kW / kW**	**I nom** [A]	**I min** [A]	**I max** [A]
25	**74.4**	74.4	74.4	**14.1**	14.1	14.1	**5.27**	26.5	26.5	26.5
24	**73.0**	73.0	73.0	**14.1**	14.1	14.1	**5.17**	26.5	26.5	26.5
23	**71.6**	71.6	71.6	**14.1**	14.1	14.1	**5.07**	26.5	26.5	26.5
22	**70.2**	70.2	70.2	**14.1**	14.1	14.1	**4.98**	26.5	26.5	26.5
21	**68.9**	68.9	68.9	**14.1**	14.1	14.1	**4.88**	26.5	26.5	26.5
20	**67.6**	67.6	67.6	**14.1**	14.1	14.1	**4.78**	26.5	26.5	26.5
19	**66.3**	66.3	66.3	**14.1**	14.1	14.1	**4.69**	26.5	26.5	26.5
18	**65.0**	65.0	65.0	**14.1**	14.1	14.1	**4.60**	26.5	26.5	26.5
17	**63.7**	63.7	63.7	**14.1**	14.1	14.1	**4.50**	26.6	26.6	26.6
16	**62.5**	62.5	62.5	**14.2**	14.2	14.2	**4.41**	26.6	26.6	26.6
15	**61.2**	61.2	61.2	**14.2**	14.2	14.2	**4.32**	26.6	26.6	26.6
14	**60.0**	60.0	60.0	**14.2**	14.2	14.2	**4.24**	26.6	26.6	26.6
13	**58.8**	58.8	58.8	**14.2**	14.2	14.2	**4.15**	26.6	26.6	26.6
12	**57.7**	57.7	57.7	**14.2**	14.2	14.2	**4.07**	26.6	26.6	26.6
11	**56.5**	56.5	56.5	**14.2**	14.2	14.2	**3.98**	26.6	26.6	26.6
10	**55.4**	55.4	55.4	**14.2**	14.2	14.2	**3.90**	26.6	26.6	26.6
9	**53.3**	53.3	53.3	**14.2**	14.2	14.2	**3.75**	26.6	26.6	26.6
8	**51.4**	51.4	51.4	**14.2**	14.2	14.2	**3.62**	26.7	26.7	26.7
7	**49.6**	49.6	49.6	**14.2**	14.2	14.2	**3.49**	26.7	26.7	26.7
6	**47.9**	47.9	47.9	**14.2**	14.2	14.2	**3.37**	26.7	26.7	26.7
5	**46.4**	46.4	46.4	**14.2**	14.2	14.2	**3.26**	26.6	26.6	26.6
4	**45.0**	45.0	45.0	**14.2**	14.2	14.2	**3.17**	26.6	26.6	26.6
3	**43.7**	43.7	43.7	**14.2**	14.2	14.2	**3.08**	26.6	26.6	26.6
2	**42.5**	42.5	42.5	**14.2**	14.2	14.2	**3.00**	26.6	26.6	26.6
1	**41.4**	41.4	41.4	**14.2**	14.2	14.2	**2.92**	26.5	26.5	26.5
0	**40.4**	40.4	40.4	**14.1**	14.1	14.1	**2.86**	26.5	26.5	26.5
-1	**39.5**	39.5	39.5	**14.1**	14.1	14.1	**2.80**	26.5	26.5	26.5
-2	**38.7**	38.7	38.7	**14.1**	14.1	14.1	**2.74**	26.4	26.4	26.4
-3	**38.0**	38.0	38.0	**14.1**	14.1	14.1	**2.70**	26.4	26.4	26.4
-4	**37.4**	37.4	37.4	**14.1**	14.1	14.1	**2.66**	26.4	26.4	26.4
-5	**36.8**	36.8	36.8	**14.1**	14.1	14.1	**2.62**	26.3	26.3	26.3
-6	**36.4**	36.4	36.4	**14.0**	14.0	14.0	**2.59**	26.3	26.3	26.3
-7	**36.0**	36.0	36.0	**14.0**	14.0	14.0	**2.57**	26.3	26.3	26.3
-8	**35.7**	35.7	35.7	**14.0**	14.0	14.0	**2.55**	26.2	26.2	26.2
-9	**35.5**	35.5	35.5	**14.0**	14.0	14.0	**2.53**	26.2	26.2	26.2
-10	**35.3**	35.3	35.3	**14.0**	14.0	14.0	**2.52**	26.2	26.2	26.2
-11	**34.5**	34.5	34.5	**14.0**	14.0	14.0	**2.47**	26.1	26.1	26.1
-12	**33.6**	33.6	33.6	**13.9**	13.9	13.9	**2.42**	26.0	26.0	26.0
-13	**32.8**	32.8	32.8	**13.9**	13.9	13.9	**2.36**	25.9	25.9	25.9
-14	**32.0**	32.0	32.0	**13.8**	13.8	13.8	**2.31**	25.8	25.8	25.8
-15	**31.2**	31.2	31.2	**13.8**	13.8	13.8	**2.26**	25.7	25.7	25.7
-16	**30.4**	30.4	30.4	**13.7**	13.7	13.7	**2.21**	25.6	25.6	25.6
-17	**29.6**	29.6	29.6	**13.7**	13.7	13.7	**2.17**	25.5	25.5	25.5
-18	**28.8**	28.8	28.8	**13.6**	13.6	13.6	**2.12**	25.4	25.4	25.4
-19	**28.1**	28.1	28.1	**13.5**	13.5	13.5	**2.07**	25.2	25.2	25.2
-20	**27.3**	27.3	27.3	**13.5**	13.5	13.5	**2.03**	25.1	25.1	25.1
-21	**26.6**	26.6	26.6	**13.4**	13.4	13.4	**1.99**	24.9	24.9	24.9
-22	**25.9**	25.9	25.9	**13.3**	13.3	13.3	**1.94**	24.7	24.7	24.7
-23	**25.2**	25.2	25.2	**13.2**	13.2	13.2	**1.90**	24.5	24.5	24.5
-24	**24.4**	24.4	24.4	**13.1**	13.1	13.1	**1.86**	24.3	24.3	24.3
-25	**23.7**	23.7	23.7	**13.0**	13.0	13.0	**1.82**	24.1	24.1	24.1

* attention: operating limits not reflected in performance table

Th [°C]	**55 °C**									
	Qh nom	**Qh min**	**Qh max**	**Pin nom**	**Pin-min**	**Pin-max**	**COP**	**I nom**	**I min**	**I max**
Ta [°C]	**[kW]**	[kW]	[kW]	**[kW]**	[kW]	[kW]	**kW / kW**	[A]	[A]	[A]
25	**73.5**	73.5	73.5	**17.7**	17.7	17.7	**4.15**	30.7	30.7	30.7
24	**72.2**	72.2	72.2	**17.7**	17.7	17.7	**4.07**	30.7	30.7	30.7
23	**70.9**	70.9	70.9	**17.7**	17.7	17.7	**3.99**	30.7	30.7	30.7
22	**69.6**	69.6	69.6	**17.8**	17.8	17.8	**3.92**	30.7	30.7	30.7
21	**68.4**	68.4	68.4	**17.8**	17.8	17.8	**3.85**	30.7	30.7	30.7
20	**67.1**	67.1	67.1	**17.8**	17.8	17.8	**3.77**	30.7	30.7	30.7
19	**65.9**	65.9	65.9	**17.8**	17.8	17.8	**3.70**	30.7	30.7	30.7
18	**64.7**	64.7	64.7	**17.8**	17.8	17.8	**3.63**	30.7	30.7	30.7
17	**63.5**	63.5	63.5	**17.8**	17.8	17.8	**3.56**	30.7	30.7	30.7
16	**62.3**	62.3	62.3	**17.8**	17.8	17.8	**3.50**	30.7	30.7	30.7
15	**61.2**	61.2	61.2	**17.8**	17.8	17.8	**3.43**	30.8	30.8	30.8
14	**60.0**	60.0	60.0	**17.8**	17.8	17.8	**3.36**	30.8	30.8	30.8
13	**58.9**	58.9	58.9	**17.9**	17.9	17.9	**3.30**	30.8	30.8	30.8
12	**57.8**	57.8	57.8	**17.9**	17.9	17.9	**3.24**	30.8	30.8	30.8
11	**56.7**	56.7	56.7	**17.9**	17.9	17.9	**3.17**	30.8	30.8	30.8
10	**55.6**	55.6	55.6	**17.9**	17.9	17.9	**3.11**	30.8	30.8	30.8
9	**53.7**	53.7	53.7	**17.9**	17.9	17.9	**3.00**	30.8	30.8	30.8
8	**51.8**	51.8	51.8	**17.9**	17.9	17.9	**2.90**	30.7	30.7	30.7
7	**50.1**	50.1	50.1	**17.8**	17.8	17.8	**2.81**	30.7	30.7	30.7
6	**48.5**	48.5	48.5	**17.8**	17.8	17.8	**2.72**	30.7	30.7	30.7
5	**47.0**	47.0	47.0	**17.8**	17.8	17.8	**2.64**	30.6	30.6	30.6
4	**45.6**	45.6	45.6	**17.8**	17.8	17.8	**2.57**	30.6	30.6	30.6
3	**44.4**	44.4	44.4	**17.8**	17.8	17.8	**2.50**	30.5	30.5	30.5
2	**43.2**	43.2	43.2	**17.7**	17.7	17.7	**2.44**	30.5	30.5	30.5
1	**42.1**	42.1	42.1	**17.7**	17.7	17.7	**2.38**	30.4	30.4	30.4
0	**41.2**	41.2	41.2	**17.7**	17.7	17.7	**2.33**	30.3	30.3	30.3
-1	**40.3**	40.3	40.3	**17.6**	17.6	17.6	**2.29**	30.2	30.2	30.2
-2	**39.5**	39.5	39.5	**17.6**	17.6	17.6	**2.25**	30.2	30.2	30.2
-3	**38.8**	38.8	38.8	**17.6**	17.6	17.6	**2.21**	30.1	30.1	30.1
-4	**38.2**	38.2	38.2	**17.5**	17.5	17.5	**2.18**	30.0	30.0	30.0
-5	**37.7**	37.7	37.7	**17.5**	17.5	17.5	**2.15**	30.0	30.0	30.0
-6	**37.2**	37.2	37.2	**17.5**	17.5	17.5	**2.13**	29.9	29.9	29.9
-7	**36.8**	36.8	36.8	**17.4**	17.4	17.4	**2.11**	29.9	29.9	29.9
-8	**36.5**	36.5	36.5	**17.4**	17.4	17.4	**2.10**	29.8	29.8	29.8
-9	**36.3**	36.3	36.3	**17.4**	17.4	17.4	**2.09**	29.8	29.8	29.8
-10	**36.1**	36.1	36.1	**17.4**	17.4	17.4	**2.08**	29.8	29.8	29.8
-11	**35.3**	35.3	35.3	**17.3**	17.3	17.3	**2.04**	29.7	29.7	29.7
-12	**34.4**	34.4	34.4	**17.3**	17.3	17.3	**1.99**	29.5	29.5	29.5
-13	**33.6**	33.6	33.6	**17.2**	17.2	17.2	**1.95**	29.4	29.4	29.4
-14	**32.8**	32.8	32.8	**17.1**	17.1	17.1	**1.91**	29.2	29.2	29.2
-15	**31.9**	31.9	31.9	**17.0**	17.0	17.0	**1.87**	29.1	29.1	29.1
-16	**31.1**	31.1	31.1	**17.0**	17.0	17.0	**1.84**	28.9	28.9	28.9
-17	**30.3**	30.3	30.3	**16.9**	16.9	16.9	**1.80**	28.7	28.7	28.7
-18	**29.5**	29.5	29.5	**16.8**	16.8	16.8	**1.76**	28.5	28.5	28.5
-19	**28.8**	28.8	28.8	**16.7**	16.7	16.7	**1.72**	28.3	28.3	28.3
-20	**28.0**	28.0	28.0	**16.6**	16.6	16.6	**1.69**	28.1	28.1	28.1
-21	**27.2**	27.2	27.2	**16.5**	16.5	16.5	**1.65**	27.9	27.9	27.9
-22	**26.4**	26.4	26.4	**16.3**	16.3	16.3	**1.62**	27.6	27.6	27.6
-23	**25.7**	25.7	25.7	**16.2**	16.2	16.2	**1.58**	27.4	27.4	27.4
-24	**24.9**	24.9	24.9	**16.1**	16.1	16.1	**1.55**	27.1	27.1	27.1
-25	**24.2**	24.2	24.2	**16.0**	16.0	16.0	**1.52**	26.8	26.8	26.8

* attention: operating limits not reflected in performance table

Th [°C]	**T-Max @ 65 °C**									
	Qh nom	**Qh min**	**Qh max**	**Pin nom**	**Pin-min**	**Pin-max**	**COP**	**I nom**	**I min**	**I max**
Ta [°C]	**[kW]**	[kW]	[kW]	**[kW]**	[kW]	[kW]	**kW / kW**	[A]	[A]	[A]
25	**73.0**	73.0	73.0	**22.6**	22.6	22.6	**3.23**	36.1	36.1	36.1
24	**71.8**	71.8	71.8	**22.6**	22.6	22.6	**3.17**	36.2	36.2	36.2
23	**70.5**	70.5	70.5	**22.6**	22.6	22.6	**3.12**	36.2	36.2	36.2
22	**69.4**	69.4	69.4	**22.6**	22.6	22.6	**3.06**	36.2	36.2	36.2
21	**68.2**	68.2	68.2	**22.6**	22.6	22.6	**3.01**	36.2	36.2	36.2
20	**67.0**	67.0	67.0	**22.7**	22.7	22.7	**2.96**	36.3	36.3	36.3
19	**65.9**	65.9	65.9	**22.7**	22.7	22.7	**2.91**	36.3	36.3	36.3
18	**64.7**	64.7	64.7	**22.7**	22.7	22.7	**2.86**	36.3	36.3	36.3
17	**63.6**	63.6	63.6	**22.7**	22.7	22.7	**2.81**	36.3	36.3	36.3
16	**62.5**	62.5	62.5	**22.7**	22.7	22.7	**2.76**	36.3	36.3	36.3
15	**61.4**	61.4	61.4	**22.7**	22.7	22.7	**2.71**	36.4	36.4	36.4
14	**60.3**	60.3	60.3	**22.7**	22.7	22.7	**2.66**	36.4	36.4	36.4
13	**59.3**	59.3	59.3	**22.7**	22.7	22.7	**2.61**	36.4	36.4	36.4
12	**58.2**	58.2	58.2	**22.7**	22.7	22.7	**2.57**	36.4	36.4	36.4
11	**57.2**	57.2	57.2	**22.7**	22.7	22.7	**2.52**	36.4	36.4	36.4
10	**56.1**	56.1	56.1	**22.7**	22.7	22.7	**2.48**	36.4	36.4	36.4
9	**54.2**	54.2	54.2	**22.6**	22.6	22.6	**2.40**	36.4	36.4	36.4
8	**52.5**	52.5	52.5	**22.6**	22.6	22.6	**2.32**	36.3	36.3	36.3
7	**50.8**	50.8	50.8	**22.6**	22.6	22.6	**2.25**	36.3	36.3	36.3
6	**49.3**	49.3	49.3	**22.5**	22.5	22.5	**2.19**	36.2	36.2	36.2
5	**47.8**	47.8	47.8	**22.5**	22.5	22.5	**2.13**	36.2	36.2	36.2
4	**46.5**	46.5	46.5	**22.4**	22.4	22.4	**2.07**	36.1	36.1	36.1
3	**45.2**	45.2	45.2	**22.4**	22.4	22.4	**2.02**	36.0	36.0	36.0
2	**44.1**	44.1	44.1	**22.3**	22.3	22.3	**1.98**	35.9	35.9	35.9
1	**43.0**	43.0	43.0	**22.2**	22.2	22.2	**1.94**	35.8	35.8	35.8
0	**42.1**	42.1	42.1	**22.2**	22.2	22.2	**1.90**	35.7	35.7	35.7
-1	**41.2**	41.2	41.2	**22.1**	22.1	22.1	**1.86**	35.6	35.6	35.6
-2	**40.4**	40.4	40.4	**22.1**	22.1	22.1	**1.83**	35.5	35.5	35.5
-3	**39.7**	39.7	39.7	**22.0**	22.0	22.0	**1.81**	35.4	35.4	35.4
-4	**39.1**	39.1	39.1	**21.9**	21.9	21.9	**1.78**	35.3	35.3	35.3
-5	**38.6**	38.6	38.6	**21.9**	21.9	21.9	**1.76**	35.2	35.2	35.2
-6	**38.1**	38.1	38.1	**21.9**	21.9	21.9	**1.74**	35.1	35.1	35.1
-7	**37.7**	37.7	37.7	**21.8**	21.8	21.8	**1.73**	35.1	35.1	35.1
-8	**37.4**	37.4	37.4	**21.8**	21.8	21.8	**1.72**	35.0	35.0	35.0
-9	**37.2**	37.2	37.2	**21.8**	21.8	21.8	**1.71**	35.0	35.0	35.0
-10	**37.0**	37.0	37.0	**21.8**	21.8	21.8	**1.70**	35.0	35.0	35.0
-11	**36.2**	36.2	36.2	**21.7**	21.7	21.7	**1.67**	34.8	34.8	34.8
-12	**35.3**	35.3	35.3	**21.6**	21.6	21.6	**1.64**	34.6	34.6	34.6
-13	**34.4**	34.4	34.4	**21.5**	21.5	21.5	**1.61**	34.4	34.4	34.4
-14	**33.6**	33.6	33.6	**21.3**	21.3	21.3	**1.57**	34.2	34.2	34.2
-15	**32.8**	32.8	32.8	**21.2**	21.2	21.2	**1.54**	34.0	34.0	34.0
-16										
-17										
-18										
-19										
-20										
-21										
-22										
-23										
-24										
-25										

* attention: operating limits not reflected in performance table

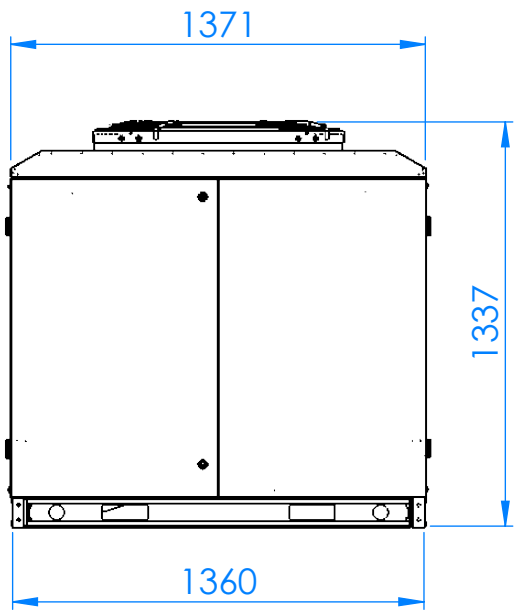
Tc [°C]	**W 12 / 7 °C**									
	Qc nom	**Qc min**	**Qc max**	**Pin**	**Pin min**	**Pin max**	**EER**	**I nom**	**I min**	**I max**
Ta [°C]	**[kW]**	[kW]	[kW]	**[kW]**	[kW]	[kW]	**kW / kW**	[A]	[A]	[A]
40	**35.2**	35.2	35.2	**15.2**	15.2	15.2	**2.32**	27.7	27.7	27.7
39	**35.5**	35.5	35.5	**14.9**	14.9	14.9	**2.38**	27.4	27.4	27.4
38	**35.7**	35.7	35.7	**14.5**	14.5	14.5	**2.46**	27.0	27.0	27.0
37	**35.9**	35.9	35.9	**14.2**	14.2	14.2	**2.53**	26.7	26.7	26.7
36	**36.2**	36.2	36.2	**13.9**	13.9	13.9	**2.60**	26.3	26.3	26.3
35	**36.4**	36.4	36.4	**13.6**	13.6	13.6	**2.68**	26.0	26.0	26.0
34	**36.6**	36.6	36.6	**13.3**	13.3	13.3	**2.75**	25.7	25.7	25.7
33	**36.8**	36.8	36.8	**13.0**	13.0	13.0	**2.83**	25.3	25.3	25.3
32	**37.0**	37.0	37.0	**12.7**	12.7	12.7	**2.91**	25.0	25.0	25.0
31	**37.2**	37.2	37.2	**12.4**	12.4	12.4	**2.99**	24.7	24.7	24.7
30	**37.4**	37.4	37.4	**12.2**	12.2	12.2	**3.07**	24.4	24.4	24.4
29	**37.6**	37.6	37.6	**11.9**	11.9	11.9	**3.16**	24.2	24.2	24.2
28	**37.7**	37.7	37.7	**11.6**	11.6	11.6	**3.24**	23.9	23.9	23.9
27	**37.9**	37.9	37.9	**11.4**	11.4	11.4	**3.33**	23.6	23.6	23.6
26	**38.1**	38.1	38.1	**11.1**	11.1	11.1	**3.42**	23.3	23.3	23.3
25	**38.2**	38.2	38.2	**10.9**	10.9	10.9	**3.51**	23.1	23.1	23.1
24	**38.4**	38.4	38.4	**10.6**	10.6	10.6	**3.60**	22.8	22.8	22.8
23	**38.5**	38.5	38.5	**10.4**	10.4	10.4	**3.70**	22.5	22.5	22.5
22	**38.7**	38.7	38.7	**10.2**	10.2	10.2	**3.80**	22.3	22.3	22.3
21	**38.8**	38.8	38.8	**10.0**	10.0	10.0	**3.90**	22.0	22.0	22.0
20	**38.9**	38.9	38.9	**9.7**	9.7	9.7	**4.00**	21.8	21.8	21.8
19	**39.1**	39.1	39.1	**9.5**	9.5	9.5	**4.11**	21.5	21.5	21.5
18	**39.2**	39.2	39.2	**9.3**	9.3	9.3	**4.22**	21.3	21.3	21.3
17	**39.3**	39.3	39.3	**9.1**	9.1	9.1	**4.33**	21.0	21.0	21.0

Tc [°C]	**W 23 / 18 °C**									
	Qc	**Qh-min**	**Qh-max**	**Pin**	**Pin-min**	**Pin-max**	**EER**	**I**	**I-min**	**I-max**
Ta [°C]	**[kW]**	[kW]	[kW]	**[kW]**	[kW]	[kW]	**kW / kW**	[A]	[A]	[A]
40	**46.9**	46.9	46.9	**15.2**	15.2	15.2	**3.09**	27.7	27.7	27.7
39	**47.3**	47.3	47.3	**14.9**	14.9	14.9	**3.18**	27.3	27.3	27.3
38	**47.6**	47.6	47.6	**14.5**	14.5	14.5	**3.27**	26.9	26.9	26.9
37	**47.9**	47.9	47.9	**14.2**	14.2	14.2	**3.37**	26.6	26.6	26.6
36	**48.1**	48.1	48.1	**13.9**	13.9	13.9	**3.46**	26.2	26.2	26.2
35	**48.4**	48.4	48.4	**13.6**	13.6	13.6	**3.56**	25.9	25.9	25.9
34	**48.7**	48.7	48.7	**13.3**	13.3	13.3	**3.66**	25.5	25.5	25.5
33	**49.0**	49.0	49.0	**13.0**	13.0	13.0	**3.77**	25.2	25.2	25.2
32	**49.2**	49.2	49.2	**12.7**	12.7	12.7	**3.87**	24.9	24.9	24.9
31	**49.5**	49.5	49.5	**12.4**	12.4	12.4	**3.98**	24.5	24.5	24.5
30	**49.7**	49.7	49.7	**12.2**	12.2	12.2	**4.09**	24.2	24.2	24.2
29	**50.0**	50.0	50.0	**11.9**	11.9	11.9	**4.20**	23.9	23.9	23.9
28	**50.2**	50.2	50.2	**11.6**	11.6	11.6	**4.32**	23.6	23.6	23.6
27	**50.5**	50.5	50.5	**11.4**	11.4	11.4	**4.43**	23.3	23.3	23.3
26	**50.7**	50.7	50.7	**11.1**	11.1	11.1	**4.55**	23.0	23.0	23.0
25	**50.9**	50.9	50.9	**10.9**	10.9	10.9	**4.67**	22.7	22.7	22.7
24	**51.1**	51.1	51.1	**10.6**	10.6	10.6	**4.80**	22.4	22.4	22.4
23	**51.3**	51.3	51.3	**10.4**	10.4	10.4	**4.93**	22.2	22.2	22.2
22	**51.5**	51.5	51.5	**10.2**	10.2	10.2	**5.06**	21.9	21.9	21.9
21	**51.7**	51.7	51.7	**10.0**	10.0	10.0	**5.20**	21.6	21.6	21.6
20	**51.9**	51.9	51.9	**9.7**	9.7	9.7	**5.34**	21.3	21.3	21.3
19	**52.1**	52.1	52.1	**9.5**	9.5	9.5	**5.48**	21.0	21.0	21.0
18	**52.3**	52.3	52.3	**9.3**	9.3	9.3	**5.63**	20.8	20.8	20.8
17	**52.5**	52.5	52.5	**9.1**	9.1	9.1	**5.78**	20.5	20.5	20.5

* attention: operating limits not reflected in performance table

LEGENDE:

Ts-IN: Temperature renewable source - inlet [°C]
Th-OU: Temperature heating - outlet (flow) [°C]
Tc-OU: Temperature cooling - outlet (flow) [°C]
Qh nom: Heating capacity nominal
Qh min: Heating capacity minimal
Qh max: Heating capacity maximal
Pin nom: Power input at nominal heating capacity
Pin min: Power input at minimal heating capacity
Pin max: Power input at maximal heating capacity
COP nom: coefficient of performance at nominal heating capacity
Qc nom: cooling / heat extraction capacity at nominal heating capacity
Qc min: cooling / heat extraction at minimal heating capacity
Qc max: cooling / heat extraction at maximal heating capacity
I nom: Current at nominal heating capacity
EER: energy efficiency ratio at nominal cooling capacity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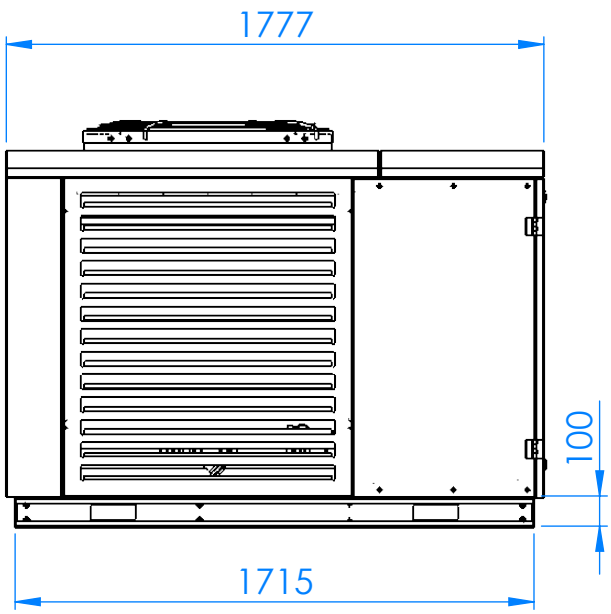
1360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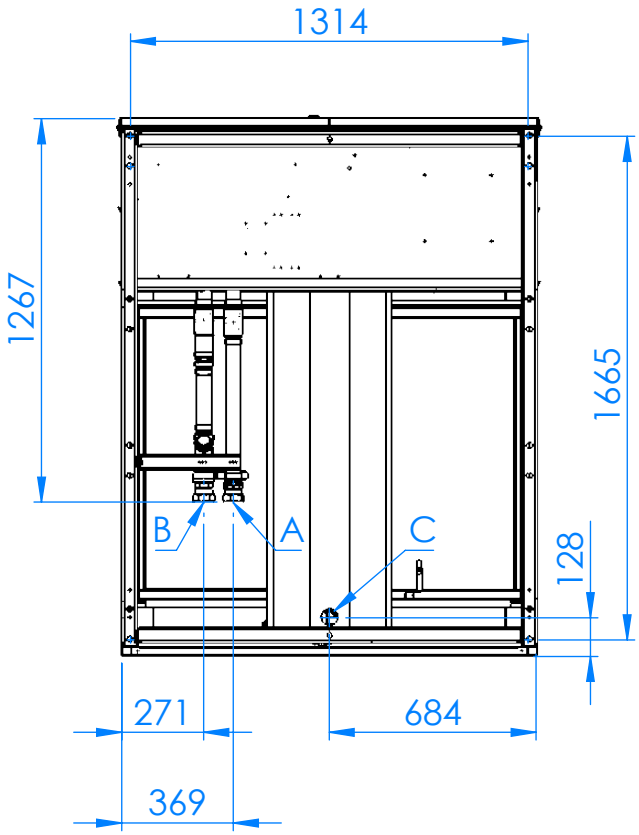
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B
A
C
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271
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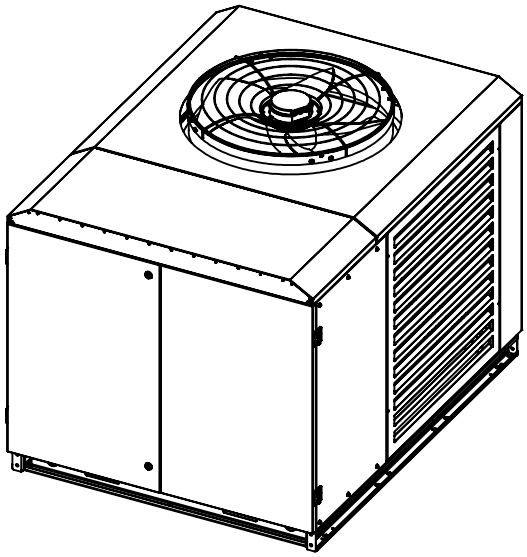
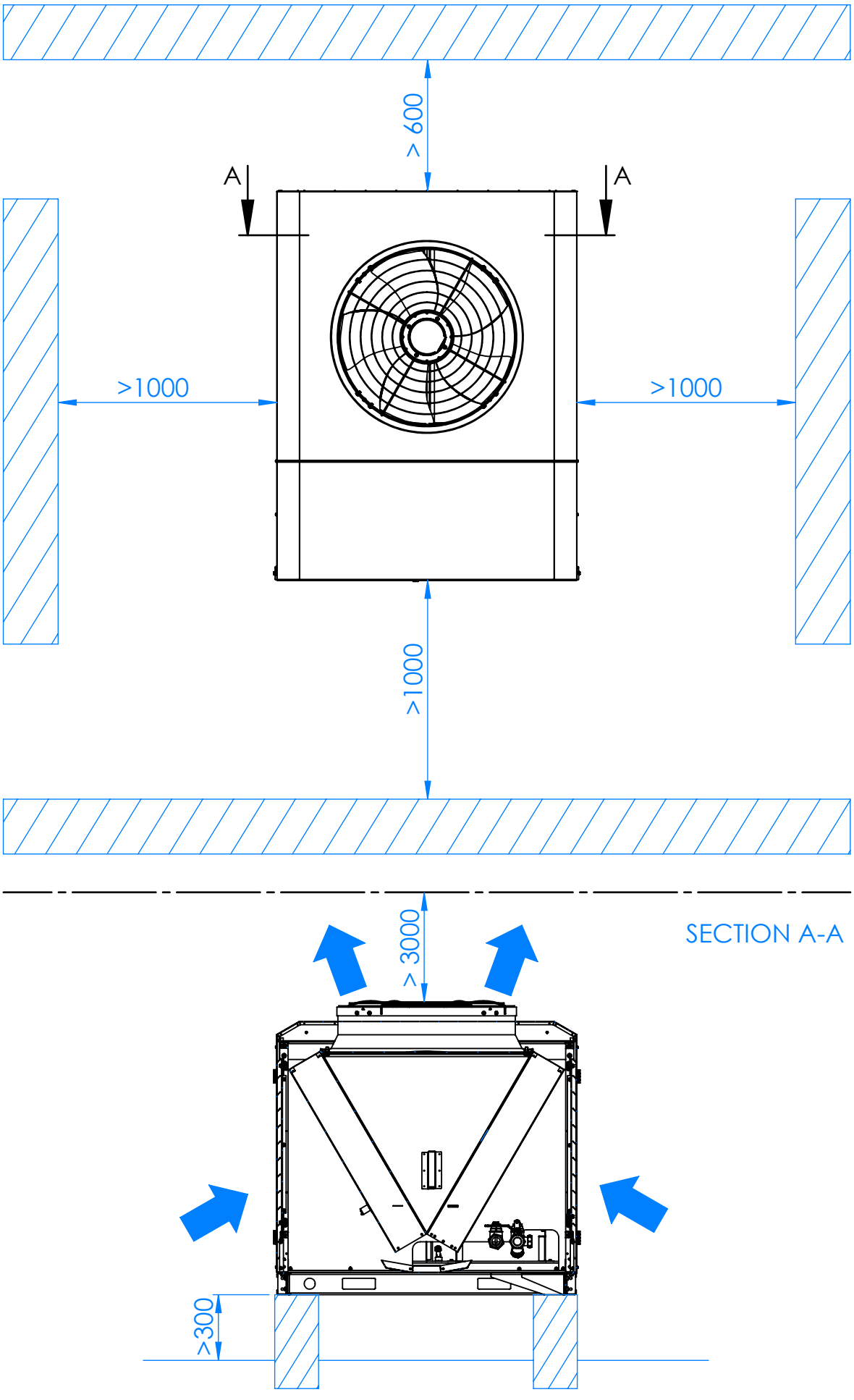


A -

B -

C - Condens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