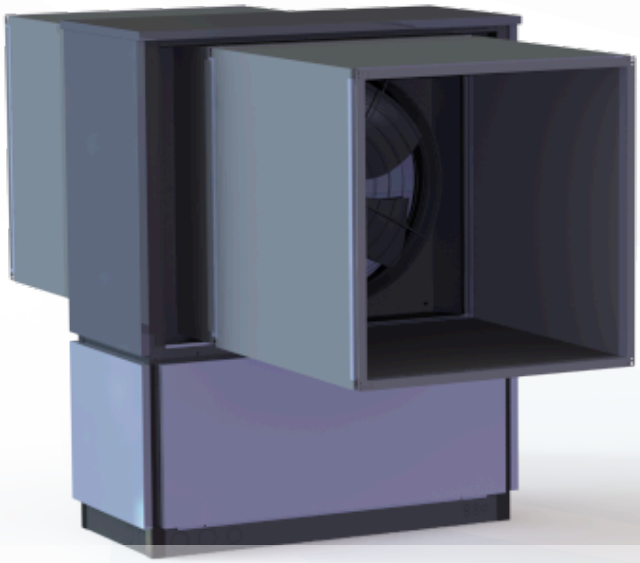
WAMAK

Heat pump



AiWa 23 EVI H-Twin In

WAMAK AiWa 23 EVI H-Twin In

Product description

Compact air-to-water heat pump for heating, cooling and domestic hot water with the possibility of installation either in the utility room or outdoors. A short closed refrigerant circuit with a silent scroll compressor at the bottom under the fan simplifies installation and helps for long-term stable operation.

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.

The twin compressors give the system robustness and the ability to distribute the heat output according to the actual load.

Indoor monoblock

Product features

- Scroll compressor
- EVI technology
- Asymetric plate heat exchanger
- Two-stage capacity control
- Active cooling
- Enhanced defrosting with APS system
- Heated drip tray
- High pressure switch
- Low pressure sensor - analogue
- Flow sensor consumer - analogue
- ECM speed circulator - condenser
- Direct heating/cooling circuit control - (with accessory)
- DHW circulation control - (with accessory)
- DHW temperature sensor - (with accessory)
- Cascade control - (with accessory)
- Solid frame structure
- Sylomer pads under compressor unit
- Electronic expansion valve
- Large air heat exchanger with APS system
- Multi-stage capacity control
- Reversible defrosting
- Speed - controlled EC fan
- 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 - (with accessory)
- Buffer temperature sensor - (with accessory)
- Modbus connection - (with accessory)

Basic performance data - WAMAK AiWa 23 EVI H-Twin In

Heating - EN 14511		
Heating capacity [kW]	A7 / W35	**24.4** (12.2 / 24.4)
	A2 / W35	**20.9** (10.4 / 20.9)
	A-7 / W34	**17.3** (8.6 / 17.3)
Electrical power input [kW]	A7 / W35	**5.1** (2.5 / 5.1)
	A2 / W35	**5.2** (2.5 / 5.2)
	A-7 / W34	**5.0** (2.4 / 5.0)
Heating efficiency faktor [COP]	A7 / W35	4.77
	A2 / W35	4.04
	A-7 / W34	3.43
Seasonal space heating energy efficiency - SCOP EN 14825		
Average Climate / Low Temperature [35°C]	SCOP	4.69
	η [%]	187.4
	Label	A+++
	Qhe [kWh]	40493.6
	Pdesignh [kW]	19.6
	Tbivalent [°C]	-7
Cooling		
Cooling capacity - [kW]	A35 / W23-18	23.0
	A25 / W23-18	24.7
	A35 / W12-7	17.1
	A25 / W12-7	17.1
Seasonal space cooling energy efficiency - SEER EN 14825		
[W 23 / 18°C]	SEER	4.66
	Qce [kWh]	10260.0
	ηc [%]	186.3
Sound EN 12102		
Acoustic power - Lw	dB(A)	67.5
Acoustic pressure - Lp	**1 m** dB(A)	59.5
	5 m dB(A)	45.5
	10 m dB(A)	39.5
Mechanical and operational information		
Compressor type (3~ 400/50)	SCROLL / 2 /	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		330 kg

Main technical data - WAMAK AiWa 23 EVI H-Twin In

Enclosure type		AiWa-I-1200
Basic dimensions	Height [mm]	1760
	Width [mm]	1420
	Length [mm]	660
Weight [kg]		330
Colour		Gray
Enclousure IP Class		IP44
Refrigeration cycle		
Compressor	Type	Scroll
	Number of stages	2
	On/Off	
	Power factor Cosϕ	0.79
	Winding resistance	3.20 Ohm
Refrigerant		R410A
	Volme	8.9 kg
	GWP	2088
	Safety class	A1
Refrigeration oil type	POE RL32-3MAF	
	Oil volume	2 x 1.25 L
Maximal pressure - refrigerant [bar]		45
	PED class	1
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]	12.30
	maximal [A]	21.00
	starting [A]	11.55
Softstart		-
Main safety		C32
Control System		

Main controller	SIEMENS	RVS 61	
Extension module	AVS75.3xx	AVS75.3xx	AVS75.372
Bus Clip-In			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	1.1/4 "
	Type	BPHE
	Count	1
	Material	AISI 316
Maximal operating pressure - refrigerant [bar]		45
Maximal operating pressure - Water [bar]		6
Testing pressure [bar]		70
Heat transfer medium		Water
Volume flow @ dT 5K (nom) - Water [m3/h]		2.11 ~ 4.21
Internal pressure drop - Water [kPa]		13
ECM speed circulator - condenser		UPMXL GEO 32-125
Flow sensor consumer - analogue		0..10V
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	Port size	1200mm x 1200mm "
	Type	Cu-coil /Al-fin
	Count	1
	Material	Cu/Al
Maximal operating pressure - refrigerant [bar]		28
Heat transfer medium		Air
Volume flow - Air [m3/h]		3850 ~ 7700
Internal pressure drop - Air [kPa]		0.031
Temperature difference - Air		7 K
Number of fans		1
Fan diameter [mm]		800

WAMAK AiWa 23 EVI H-Twin In

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

Model	**AiWa 23 EVI H-Twin In**
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	19.6	kW
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	Pdh	17.3	kW
Tj = +2 °C	Pdh	20.8	kW
Tj = +7 °C	Pdh	24.3	kW
Tj = +12 °C	Pdh	28.3	kW
Tj = bivalent temperature	Pdh	16.7	kW
Tj = operation limit temperature	Pdh	12.3	kW
Bivalent temperature	Tbiv	-7	°C
Power consumption in modes other than active mode			
Off mode	Poff	0.010	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		multi-stage	
Sound power level			
indoors	Lwa	68	dB
outdoors	Lwa	---	dB
Annual energy consumption	Q_{HE}	40493.6	kWh

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	ηs	187.4	%
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	COPd	3.43	-
Tj = +2 °C	COPd	4.6	-
Tj = +7 °C	COPd	5.9	-
Tj = +12 °C	COPd	8.1	-
Tj = bivalent temperature	COPd	3.2	-
Tj = operation limit temperature	COPd	2.4	-
Tj = operation limit temperature	TOL	-22	°C
Heating water operating limit temperature	WTOL	65	°C
Supplementary heater			
Rated heat output	Psup	8.8	kW
Type of energy input		electricity	
For air-to-water heat pumps: Rated air flow rate, outdoors	-	3850 ~ 7700	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, Slovakia, info@wamak.sk

WAMAK AiWa 23 EVI H-Twin In

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

Model	**AiWa 23 EVI H-Twin In**
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	20.7	kW
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	Pdh	18.1	kW
Tj = +2 °C	Pdh	21.0	kW
Tj = +7 °C	Pdh	24.4	kW
Tj = +12 °C	Pdh	28.4	kW
Tj = bivalent temperature	Pdh	17.8	kW
Tj = operation limit temperature	Pdh	14.0	kW
Bivalent temperature	Tbiv	-7	°C
Power consumption in modes other than active mode			
Off mode	Poff	0.010	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		multi-stage	
Sound power level			
indoors	Lwa	68	dB
outdoors	Lwa	---	dB
Annual energy consumption	Q_{HE}	42766.2	kWh

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	ηs	141.3	%
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	COPd	2.29	-
Tj = +2 °C	COPd	3.4	-
Tj = +7 °C	COPd	4.6	-
Tj = +12 °C	COPd	6.6	-
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	8.8	kW
Type of energy input		electricity	
For air-to-water heat pumps: Rated air flow rate, outdoors	-	3850 ~ 7700	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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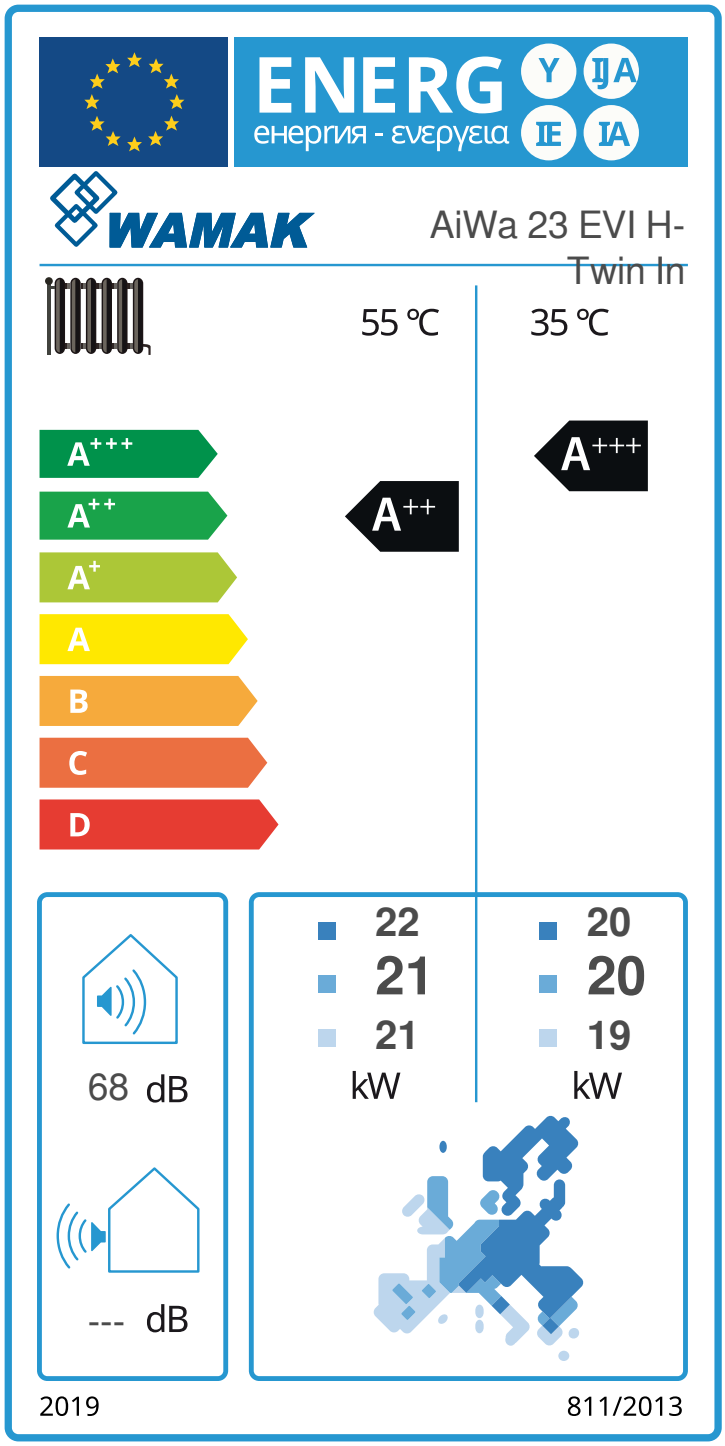


AiWa 23 EVI H-Twin In **ErP Data**

		55 °C	35 °C
Energy class		A++	A+++
η	[%]	141.3	187.4
P_{rated}	[kW]	21	20
Q_{HE}	[kWh/y]	42767	40494
SCOP	[-]	3.53	4.69
$T_{bivalent}$	[°C]	-7	-7

CONTROLER

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

Heating performance data

Version: v2024.004-AW

Average Climate / Low Temperature [35°C]

ZHI11K1P-TFM_R410A_2_AW

	Operating conditions	Qh	P	COP
1	A7 / W30-35	24.4	5.1	4.77
2	A2 / W35	20.9	5.2	4.04
3	A-22 / W35	12.3	5.1	2.42
A	A-7 / W34	17.3	5.0	3.43
B	A2 / W30	20.8	4.5	4.57
C	A7 / W27	24.3	4.1	5.94
D	A12 / W24	28.3	3.5	8.09
E	A-10 / W35	16.7	5.2	3.25
F	A-7 / W34	17.3	5.0	3.43

SCOP DATA EN 14825:2018	
Average Climate / Low Temperature [35°C]	
SCOPon	4.81
SCOPnet	4.86
SCOP	4.69
η [%]	187.40
Label	A+++
Qh [kWh]	40493.60
Pdesignh [kW]	19.6
Tbivalent [°C]	-7.00

Average Climate / Medium Temperature [55°C]

	Operating conditions	Qh	P	COP
1	A7 / W47-55	24.4	8.6	2.84
2	A2 / W55	21.4	8.6	2.49
3	A-22 / W55	14.0	7.9	1.64
A	A-7 / W52	18.1	7.9	2.29
B	A2 / W42	21.0	6.2	3.41
C	A7 / W36	24.4	5.2	4.65
D	A12 / W30	28.4	4.3	6.64
E	A-10 / W55	17.8	8.5	2.09
F	A-7 / W55	18.3	8.6	2.14

SCOP DATA EN 14825:2018	
Average Climate / Medium Temperature [55°C]	
SCOPon	3.60
SCOPnet	3.63
SCOP	3.53
η [%]	141.34
Label	A++
Qh [kWh]	42766.20
Pdesignh [kW]	20.7
Tbivalent [°C]	-7.00

Cooling performance data

Low temperature cooling W 12 / 7°C

	Operating conditions	Qc	P	EER
A	A35 / W12-7	17.1	6.3	2.71
B	A30 / W12-7	17.7	5.6	3.19
C	A25 / W12-7	18.3	4.9	3.75
D	A20 / W12-7	18.8	4.3	4.40

SEER DATA EN 14825:2018 [W 12 / 7°C]	
SEERon	3.64
SEER	3.51
Qc [kWh]	10260.00
η [%]	140.20

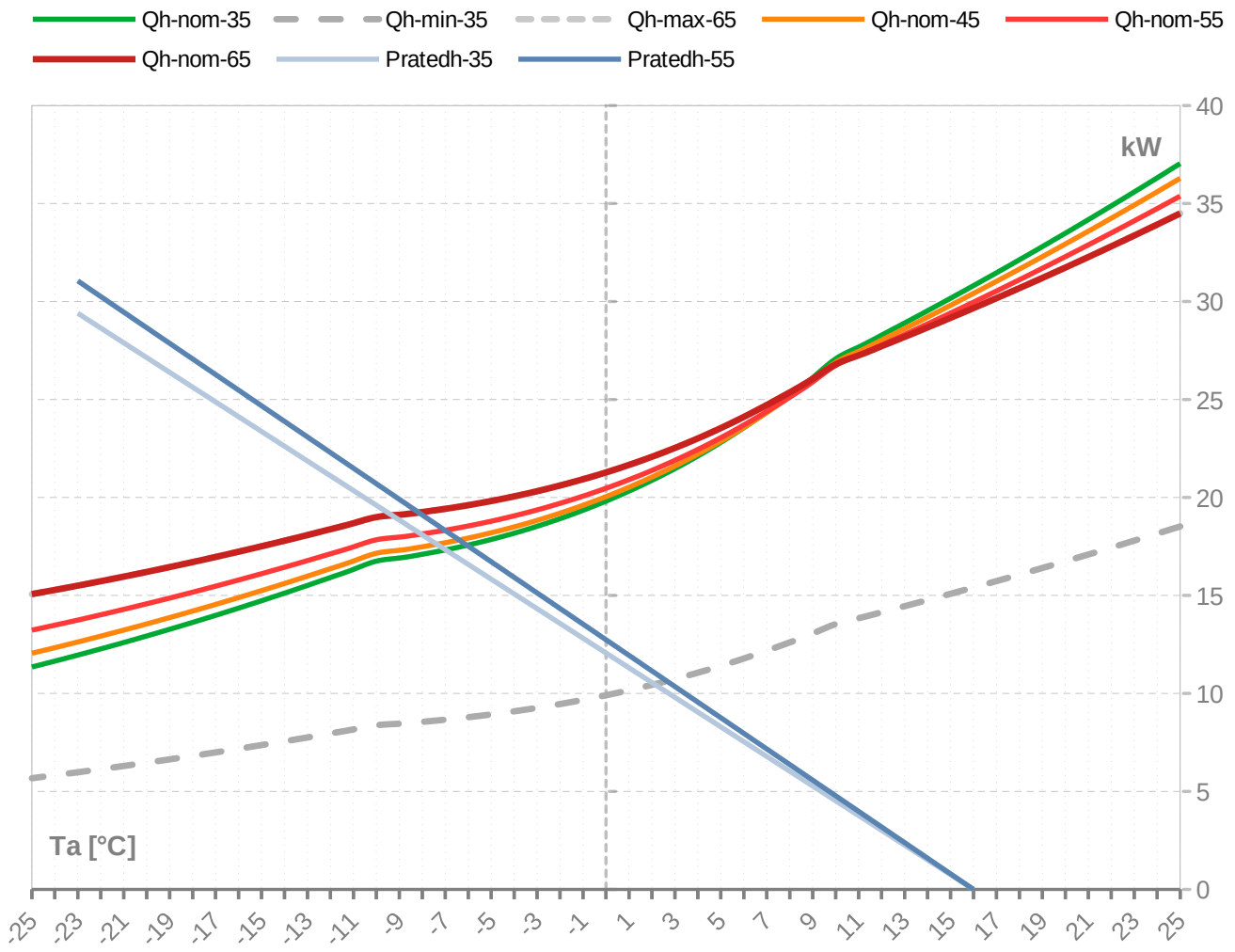
Radiant cooling W 23 / 18°C

	Operating conditions	Qc	P	EER
A	A35 / W23-18	23.0	6.3	3.65
B	A30 / W23-18	23.9	5.0	4.30
C	A25 / W23-18	24.7	4.3	5.05
D	A20 / W23-18	25.3	3.7	5.92

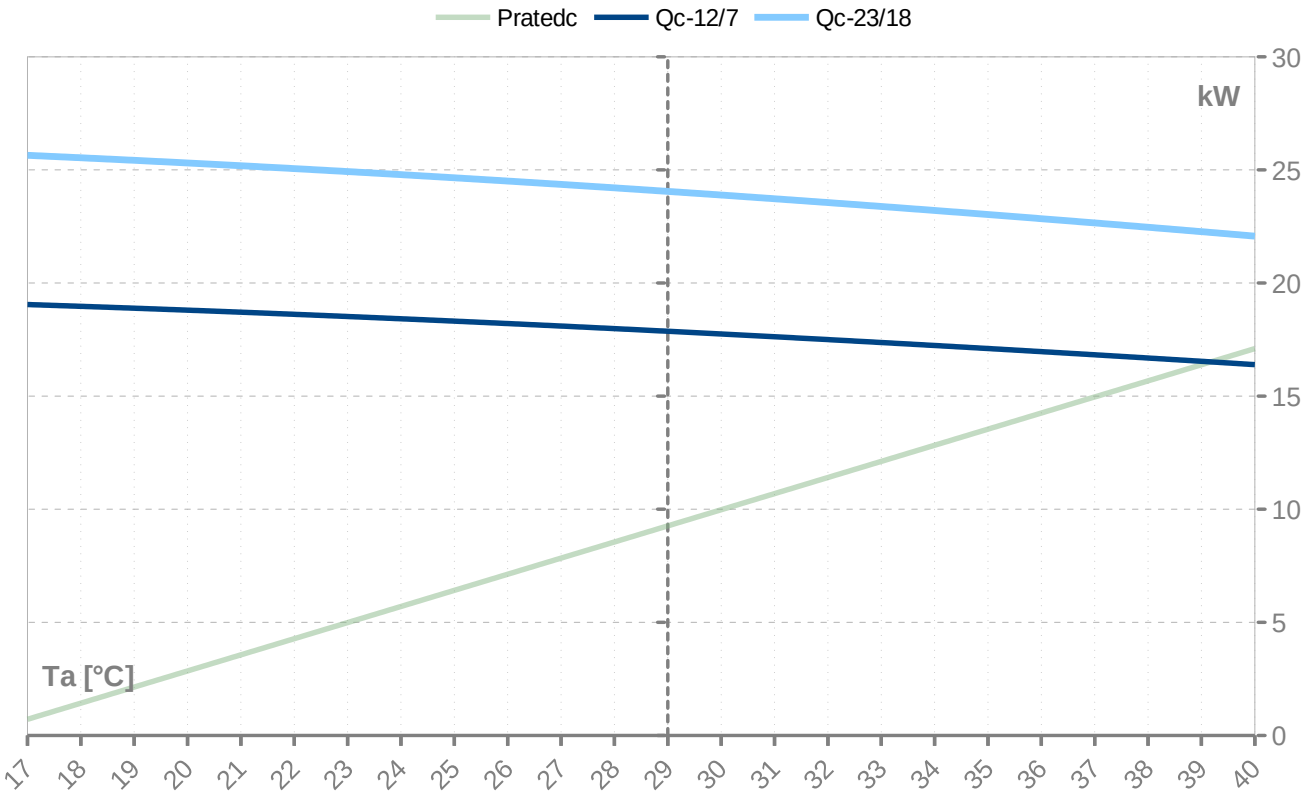
SEER DATA EN 14825:2018 [W 23 / 18°C]	
SEERon	4.90
SEER	4.66
Qc [kWh]	10260.00
η [%]	186.33

Performance lines - heating

ZHI11K1P-TFM_R410A_2_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	**31.5**	15.7		**4.8**	2.3		**6.58**	8.3	4.1	
24	**31.5**	15.7		**4.8**	2.3		**6.58**	8.3	4.1	
23	**31.5**	15.7		**4.8**	2.3		**6.58**	8.3	4.1	
22	**31.5**	15.7		**4.8**	2.3		**6.58**	8.3	4.1	
21	**31.5**	15.7		**4.8**	2.3		**6.58**	8.3	4.1	
20	**31.5**	15.7		**4.8**	2.3		**6.58**	8.3	4.1	
19	**31.5**	15.7		**4.8**	2.3		**6.58**	8.3	4.1	
18	**31.5**	15.7		**4.8**	2.3		**6.58**	8.3	4.1	
17	**31.5**	15.7		**4.8**	2.3		**6.58**	8.3	4.1	
16	**30.8**	15.4	30.8	**4.8**	2.3	4.8	**6.39**	8.3	4.2	8.3
15	**30.2**	15.1	30.2	**4.9**	2.3	4.9	**6.20**	8.4	4.2	8.4
14	**29.5**	14.8	29.5	**4.9**	2.4	4.9	**6.03**	8.4	4.2	8.4
13	**28.9**	14.5	28.9	**4.9**	2.4	4.9	**5.86**	8.5	4.2	8.5
12	**28.3**	14.1	28.3	**5.0**	2.4	5.0	**5.70**	8.5	4.2	8.5
11	**27.7**	13.8	27.7	**5.0**	2.4	5.0	**5.55**	8.5	4.3	8.5
10	**27.1**	13.5	27.1	**5.0**	2.4	5.0	**5.40**	8.6	4.3	8.6
9	**26.1**	13.1	26.1	**5.1**	2.4	5.1	**5.17**	8.6	4.3	8.6
8	**25.2**	12.6	25.2	**5.1**	2.4	5.1	**4.96**	8.6	4.3	8.6
7	**24.4**	12.2	24.4	**5.1**	2.5	5.1	**4.77**	8.7	4.3	8.7
6	**23.6**	11.8	23.6	**5.1**	2.5	5.1	**4.60**	8.7	4.3	8.7
5	**22.8**	11.4	22.8	**5.1**	2.5	5.1	**4.44**	8.7	4.3	8.7
4	**22.1**	11.1	22.1	**5.2**	2.5	5.2	**4.29**	8.7	4.4	8.7
3	**21.5**	10.7	21.5	**5.2**	2.5	5.2	**4.16**	8.7	4.4	8.7
2	**20.9**	10.4	20.9	**5.2**	2.5	5.2	**4.04**	8.7	4.4	8.7
1	**20.3**	10.2	20.3	**5.2**	2.5	5.2	**3.93**	8.7	4.4	8.7
0	**19.8**	9.9	19.8	**5.2**	2.5	5.2	**3.83**	8.7	4.4	8.7
-1	**19.3**	9.7	19.3	**5.2**	2.5	5.2	**3.74**	8.7	4.4	8.7
-2	**18.9**	9.5	18.9	**5.2**	2.5	5.2	**3.66**	8.7	4.4	8.7
-3	**18.5**	9.3	18.5	**5.2**	2.5	5.2	**3.58**	8.7	4.4	8.7
-4	**18.2**	9.1	18.2	**5.2**	2.5	5.2	**3.52**	8.7	4.4	8.7
-5	**17.9**	8.9	17.9	**5.2**	2.5	5.2	**3.46**	8.7	4.4	8.7
-6	**17.6**	8.8	17.6	**5.2**	2.5	5.2	**3.40**	8.7	4.4	8.7
-7	**17.3**	8.7	17.3	**5.2**	2.5	5.2	**3.35**	8.7	4.4	8.7
-8	**17.1**	8.5	17.1	**5.2**	2.5	5.2	**3.31**	8.7	4.4	8.7
-9	**16.9**	8.5	16.9	**5.2**	2.5	5.2	**3.28**	8.7	4.4	8.7
-10	**16.7**	8.4	16.7	**5.2**	2.5	5.2	**3.25**	8.7	4.4	8.7
-11	**16.3**	8.2	16.3	**5.2**	2.5	5.2	**3.17**	8.7	4.4	8.7
-12	**15.9**	8.0	15.9	**5.1**	2.5	5.1	**3.09**	8.7	4.4	8.7
-13	**15.5**	7.8	15.5	**5.1**	2.5	5.1	**3.02**	8.7	4.3	8.7
-14	**15.1**	7.6	15.1	**5.1**	2.5	5.1	**2.94**	8.7	4.3	8.7
-15	**14.7**	7.4	14.7	**5.1**	2.5	5.1	**2.87**	8.7	4.3	8.7
-16	**14.4**	7.2	14.4	**5.1**	2.5	5.1	**2.80**	8.7	4.3	8.7
-17	**14.0**	7.0	14.0	**5.1**	2.5	5.1	**2.74**	8.7	4.3	8.7
-18	**13.6**	6.8	13.6	**5.1**	2.5	5.1	**2.67**	8.7	4.3	8.7
-19	**13.3**	6.6	13.3	**5.1**	2.5	5.1	**2.60**	8.7	4.3	8.7
-20	**12.9**	6.5	12.9	**5.1**	2.5	5.1	**2.54**	8.7	4.3	8.7
-21	**12.6**	6.3	12.6	**5.1**	2.5	5.1	**2.48**	8.6	4.3	8.6
-22	**12.3**	6.1	12.3	**5.1**	2.4	5.1	**2.42**	8.6	4.3	8.6
-23	**12.0**	6.0	12.0	**5.1**	2.4	5.1	**2.36**	8.6	4.3	8.6
-24	**11.6**	5.8	11.6	**5.1**	2.4	5.1	**2.30**	8.6	4.3	8.6
-25	**11.3**	5.7	11.3	**5.1**	2.4	5.1	**2.24**	8.6	4.3	8.6

* 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	**36.3**	18.1	36.3	**6.1**	2.9	6.1	**5.93**	9.8	4.9	9.8
24	**35.6**	17.8	35.6	**6.2**	3.0	6.2	**5.77**	9.9	4.9	9.9
23	**34.9**	17.5	34.9	**6.2**	3.0	6.2	**5.62**	9.9	5.0	9.9
22	**34.2**	17.1	34.2	**6.3**	3.0	6.3	**5.48**	10.0	5.0	10.0
21	**33.6**	16.8	33.6	**6.3**	3.0	6.3	**5.33**	10.0	5.0	10.0
20	**32.9**	16.5	32.9	**6.3**	3.1	6.3	**5.20**	10.1	5.0	10.1
19	**32.3**	16.1	32.3	**6.4**	3.1	6.4	**5.07**	10.1	5.1	10.1
18	**31.7**	15.8	31.7	**6.4**	3.1	6.4	**4.94**	10.2	5.1	10.2
17	**31.0**	15.5	31.0	**6.4**	3.1	6.4	**4.82**	10.2	5.1	10.2
16	**30.4**	15.2	30.4	**6.5**	3.1	6.5	**4.71**	10.2	5.1	10.2
15	**29.8**	14.9	29.8	**6.5**	3.1	6.5	**4.60**	10.3	5.1	10.3
14	**29.2**	14.6	29.2	**6.5**	3.1	6.5	**4.49**	10.3	5.1	10.3
13	**28.6**	14.3	28.6	**6.5**	3.1	6.5	**4.38**	10.3	5.2	10.3
12	**28.0**	14.0	28.0	**6.5**	3.2	6.5	**4.28**	10.3	5.2	10.3
11	**27.5**	13.7	27.5	**6.6**	3.2	6.6	**4.18**	10.4	5.2	10.4
10	**26.9**	13.4	26.9	**6.6**	3.2	6.6	**4.09**	10.4	5.2	10.4
9	**26.0**	13.0	26.0	**6.6**	3.2	6.6	**3.93**	10.4	5.2	10.4
8	**25.1**	12.6	25.1	**6.6**	3.2	6.6	**3.80**	10.4	5.2	10.4
7	**24.3**	12.2	24.3	**6.6**	3.2	6.6	**3.67**	10.4	5.2	10.4
6	**23.6**	11.8	23.6	**6.6**	3.2	6.6	**3.55**	10.5	5.2	10.5
5	**22.9**	11.4	22.9	**6.6**	3.2	6.6	**3.44**	10.5	5.2	10.5
4	**22.2**	11.1	22.2	**6.6**	3.2	6.6	**3.34**	10.5	5.2	10.5
3	**21.6**	10.8	21.6	**6.6**	3.2	6.6	**3.25**	10.5	5.2	10.5
2	**21.0**	10.5	21.0	**6.6**	3.2	6.6	**3.17**	10.5	5.2	10.5
1	**20.5**	10.3	20.5	**6.6**	3.2	6.6	**3.09**	10.5	5.2	10.5
0	**20.0**	10.0	20.0	**6.6**	3.2	6.6	**3.02**	10.5	5.2	10.5
-1	**19.6**	9.8	19.6	**6.6**	3.2	6.6	**2.95**	10.5	5.2	10.5
-2	**19.2**	9.6	19.2	**6.6**	3.2	6.6	**2.89**	10.5	5.2	10.5
-3	**18.8**	9.4	18.8	**6.6**	3.2	6.6	**2.84**	10.5	5.2	10.5
-4	**18.5**	9.2	18.5	**6.6**	3.2	6.6	**2.79**	10.4	5.2	10.4
-5	**18.2**	9.1	18.2	**6.6**	3.2	6.6	**2.75**	10.4	5.2	10.4
-6	**17.9**	9.0	17.9	**6.6**	3.2	6.6	**2.71**	10.4	5.2	10.4
-7	**17.7**	8.8	17.7	**6.6**	3.2	6.6	**2.67**	10.4	5.2	10.4
-8	**17.5**	8.7	17.5	**6.6**	3.2	6.6	**2.64**	10.4	5.2	10.4
-9	**17.3**	8.7	17.3	**6.6**	3.2	6.6	**2.62**	10.4	5.2	10.4
-10	**17.2**	8.6	17.2	**6.6**	3.2	6.6	**2.60**	10.4	5.2	10.4
-11	**16.8**	8.4	16.8	**6.6**	3.2	6.6	**2.54**	10.4	5.2	10.4
-12	**16.4**	8.2	16.4	**6.6**	3.2	6.6	**2.48**	10.4	5.2	10.4
-13	**16.0**	8.0	16.0	**6.6**	3.2	6.6	**2.42**	10.4	5.2	10.4
-14	**15.6**	7.8	15.6	**6.6**	3.2	6.6	**2.37**	10.4	5.2	10.4
-15	**15.2**	7.6	15.2	**6.6**	3.2	6.6	**2.32**	10.4	5.2	10.4
-16	**14.9**	7.4	14.9	**6.6**	3.2	6.6	**2.26**	10.4	5.2	10.4
-17	**14.5**	7.3	14.5	**6.6**	3.2	6.6	**2.21**	10.4	5.2	10.4
-18	**14.2**	7.1	14.2	**6.6**	3.2	6.6	**2.16**	10.4	5.2	10.4
-19	**13.9**	6.9	13.9	**6.6**	3.2	6.6	**2.11**	10.4	5.2	10.4
-20	**13.5**	6.8	13.5	**6.6**	3.2	6.6	**2.07**	10.4	5.2	10.4
-21	**13.2**	6.6	13.2	**6.6**	3.2	6.6	**2.02**	10.4	5.2	10.4
-22	**12.9**	6.5	12.9	**6.6**	3.2	6.6	**1.97**	10.4	5.2	10.4
-23	**12.6**	6.3	12.6	**6.6**	3.2	6.6	**1.93**	10.4	5.2	10.4
-24	**12.3**	6.2	12.3	**6.6**	3.2	6.6	**1.88**	10.4	5.2	10.4
-25	**12.1**	6.0	12.1	**6.6**	3.2	6.6	**1.84**	10.4	5.2	10.4

* 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	**35.4**	17.7	35.4	**8.2**	4.0	8.2	**4.29**	12.5	6.2	12.5
24	**34.7**	17.4	34.7	**8.3**	4.0	8.3	**4.20**	12.5	6.2	12.5
23	**34.1**	17.1	34.1	**8.3**	4.0	8.3	**4.11**	12.5	6.3	12.5
22	**33.5**	16.7	33.5	**8.3**	4.0	8.3	**4.02**	12.6	6.3	12.6
21	**32.9**	16.4	32.9	**8.4**	4.0	8.4	**3.93**	12.6	6.3	12.6
20	**32.3**	16.1	32.3	**8.4**	4.0	8.4	**3.85**	12.7	6.3	12.7
19	**31.7**	15.8	31.7	**8.4**	4.1	8.4	**3.76**	12.7	6.3	12.7
18	**31.1**	15.6	31.1	**8.4**	4.1	8.4	**3.68**	12.7	6.4	12.7
17	**30.5**	15.3	30.5	**8.5**	4.1	8.5	**3.61**	12.7	6.4	12.7
16	**30.0**	15.0	30.0	**8.5**	4.1	8.5	**3.53**	12.8	6.4	12.8
15	**29.4**	14.7	29.4	**8.5**	4.1	8.5	**3.46**	12.8	6.4	12.8
14	**28.9**	14.4	28.9	**8.5**	4.1	8.5	**3.39**	12.8	6.4	12.8
13	**28.3**	14.2	28.3	**8.5**	4.1	8.5	**3.32**	12.8	6.4	12.8
12	**27.8**	13.9	27.8	**8.5**	4.1	8.5	**3.25**	12.8	6.4	12.8
11	**27.3**	13.6	27.3	**8.5**	4.1	8.5	**3.19**	12.9	6.4	12.9
10	**26.7**	13.4	26.7	**8.6**	4.1	8.6	**3.12**	12.9	6.4	12.9
9	**25.9**	12.9	25.9	**8.6**	4.1	8.6	**3.02**	12.9	6.4	12.9
8	**25.1**	12.6	25.1	**8.6**	4.1	8.6	**2.93**	12.9	6.4	12.9
7	**24.4**	12.2	24.4	**8.6**	4.1	8.6	**2.84**	12.9	6.5	12.9
6	**23.7**	11.8	23.7	**8.6**	4.1	8.6	**2.76**	12.9	6.5	12.9
5	**23.1**	11.5	23.1	**8.6**	4.1	8.6	**2.69**	12.9	6.5	12.9
4	**22.5**	11.2	22.5	**8.6**	4.1	8.6	**2.62**	12.9	6.5	12.9
3	**21.9**	10.9	21.9	**8.6**	4.1	8.6	**2.55**	12.9	6.5	12.9
2	**21.4**	10.7	21.4	**8.6**	4.1	8.6	**2.49**	12.9	6.5	12.9
1	**20.9**	10.5	20.9	**8.6**	4.1	8.6	**2.44**	12.9	6.4	12.9
0	**20.5**	10.2	20.5	**8.6**	4.1	8.6	**2.39**	12.9	6.4	12.9
-1	**20.1**	10.0	20.1	**8.6**	4.1	8.6	**2.34**	12.9	6.4	12.9
-2	**19.7**	9.8	19.7	**8.6**	4.1	8.6	**2.30**	12.9	6.4	12.9
-3	**19.4**	9.7	19.4	**8.6**	4.1	8.6	**2.26**	12.9	6.4	12.9
-4	**19.1**	9.5	19.1	**8.6**	4.1	8.6	**2.23**	12.9	6.4	12.9
-5	**18.8**	9.4	18.8	**8.6**	4.1	8.6	**2.20**	12.9	6.4	12.9
-6	**18.5**	9.3	18.5	**8.6**	4.1	8.6	**2.17**	12.9	6.4	12.9
-7	**18.3**	9.2	18.3	**8.6**	4.1	8.6	**2.14**	12.9	6.4	12.9
-8	**18.1**	9.1	18.1	**8.5**	4.1	8.5	**2.12**	12.9	6.4	12.9
-9	**18.0**	9.0	18.0	**8.5**	4.1	8.5	**2.10**	12.9	6.4	12.9
-10	**17.8**	8.9	17.8	**8.5**	4.1	8.5	**2.09**	12.9	6.4	12.9
-11	**17.5**	8.7	17.5	**8.5**	4.1	8.5	**2.05**	12.9	6.4	12.9
-12	**17.1**	8.6	17.1	**8.5**	4.1	8.5	**2.00**	12.8	6.4	12.8
-13	**16.8**	8.4	16.8	**8.5**	4.1	8.5	**1.96**	12.8	6.4	12.8
-14	**16.4**	8.2	16.4	**8.5**	4.1	8.5	**1.93**	12.8	6.4	12.8
-15	**16.1**	8.1	16.1	**8.5**	4.1	8.5	**1.89**	12.8	6.4	12.8
-16	**15.8**	7.9	15.8	**8.5**	4.1	8.5	**1.85**	12.8	6.4	12.8
-17	**15.5**	7.7	15.5	**8.5**	4.1	8.5	**1.81**	12.8	6.4	12.8
-18	**15.2**	7.6	15.2	**8.5**	4.1	8.5	**1.78**	12.8	6.4	12.8
-19	**14.9**	7.4	14.9	**8.5**	4.1	8.5	**1.74**	12.8	6.4	12.8
-20	**14.6**	7.3	14.6	**8.5**	4.1	8.5	**1.71**	12.8	6.4	12.8
-21	**14.3**	7.1	14.3	**8.6**	4.1	8.6	**1.67**	12.8	6.4	12.8
-22	**14.0**	7.0	14.0	**8.6**	4.1	8.6	**1.64**	12.8	6.4	12.8
-23	**13.7**	6.9	13.7	**8.6**	4.1	8.6	**1.60**	12.8	6.4	12.8
-24	**13.5**	6.7	13.5	**8.6**	4.1	8.6	**1.57**	12.8	6.4	12.8
-25	**13.2**	6.6	13.2	**8.6**	4.1	8.6	**1.54**	12.9	6.4	12.9

* 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	**34.5**	17.2	34.5	**10.9**	5.2	10.9	**3.18**	15.9	8.0	15.9
24	**33.9**	17.0	33.9	**10.9**	5.2	10.9	**3.12**	16.0	8.0	16.0
23	**33.4**	16.7	33.4	**10.9**	5.3	10.9	**3.06**	16.0	8.0	16.0
22	**32.8**	16.4	32.8	**10.9**	5.3	10.9	**3.00**	16.0	8.0	16.0
21	**32.3**	16.1	32.3	**11.0**	5.3	11.0	**2.94**	16.1	8.0	16.1
20	**31.7**	15.9	31.7	**11.0**	5.3	11.0	**2.89**	16.1	8.0	16.1
19	**31.2**	15.6	31.2	**11.0**	5.3	11.0	**2.84**	16.1	8.1	16.1
18	**30.7**	15.3	30.7	**11.0**	5.3	11.0	**2.79**	16.1	8.1	16.1
17	**30.2**	15.1	30.2	**11.0**	5.3	11.0	**2.74**	16.2	8.1	16.2
16	**29.7**	14.8	29.7	**11.0**	5.3	11.0	**2.69**	16.2	8.1	16.2
15	**29.2**	14.6	29.2	**11.1**	5.3	11.1	**2.64**	16.2	8.1	16.2
14	**28.7**	14.3	28.7	**11.1**	5.3	11.1	**2.59**	16.2	8.1	16.2
13	**28.2**	14.1	28.2	**11.1**	5.3	11.1	**2.55**	16.2	8.1	16.2
12	**27.7**	13.9	27.7	**11.1**	5.3	11.1	**2.50**	16.2	8.1	16.2
11	**27.3**	13.6	27.3	**11.1**	5.3	11.1	**2.46**	16.2	8.1	16.2
10	**26.8**	13.4	26.8	**11.1**	5.3	11.1	**2.42**	16.3	8.1	16.3
9	**26.1**	13.0	26.1	**11.1**	5.3	11.1	**2.35**	16.3	8.1	16.3
8	**25.4**	12.7	25.4	**11.1**	5.3	11.1	**2.28**	16.3	8.1	16.3
7	**24.7**	12.4	24.7	**11.1**	5.4	11.1	**2.23**	16.3	8.1	16.3
6	**24.1**	12.1	24.1	**11.1**	5.4	11.1	**2.17**	16.3	8.1	16.3
5	**23.5**	11.8	23.5	**11.1**	5.4	11.1	**2.12**	16.3	8.1	16.3
4	**23.0**	11.5	23.0	**11.1**	5.4	11.1	**2.07**	16.3	8.1	16.3
3	**22.5**	11.3	22.5	**11.1**	5.4	11.1	**2.03**	16.3	8.1	16.3
2	**22.1**	11.0	22.1	**11.1**	5.4	11.1	**1.99**	16.3	8.1	16.3
1	**21.7**	10.8	21.7	**11.1**	5.4	11.1	**1.95**	16.3	8.1	16.3
0	**21.3**	10.6	21.3	**11.1**	5.4	11.1	**1.92**	16.3	8.1	16.3
-1	**20.9**	10.5	20.9	**11.1**	5.4	11.1	**1.88**	16.3	8.1	16.3
-2	**20.6**	10.3	20.6	**11.1**	5.4	11.1	**1.86**	16.3	8.1	16.3
-3	**20.3**	10.2	20.3	**11.1**	5.4	11.1	**1.83**	16.3	8.1	16.3
-4	**20.1**	10.0	20.1	**11.1**	5.4	11.1	**1.81**	16.3	8.1	16.3
-5	**19.8**	9.9	19.8	**11.1**	5.4	11.1	**1.78**	16.3	8.1	16.3
-6	**19.6**	9.8	19.6	**11.1**	5.4	11.1	**1.76**	16.3	8.1	16.3
-7	**19.4**	9.7	19.4	**11.1**	5.4	11.1	**1.75**	16.3	8.1	16.3
-8	**19.3**	9.6	19.3	**11.1**	5.4	11.1	**1.73**	16.3	8.1	16.3
-9	**19.1**	9.6	19.1	**11.1**	5.4	11.1	**1.72**	16.3	8.1	16.3
-10	**19.0**	9.5	19.0	**11.1**	5.4	11.1	**1.71**	16.3	8.1	16.3
-11	**18.7**	9.3	18.7	**11.1**	5.4	11.1	**1.68**	16.3	8.1	16.3
-12	**18.4**	9.2	18.4	**11.1**	5.4	11.1	**1.65**	16.3	8.1	16.3
-13	**18.1**	9.0	18.1	**11.1**	5.4	11.1	**1.62**	16.3	8.1	16.3
-14	**17.8**	8.9	17.8	**11.1**	5.4	11.1	**1.60**	16.3	8.1	16.3
-15	**17.5**	8.8	17.5	**11.1**	5.4	11.1	**1.57**	16.3	8.1	16.3
-16										
-17										
-18										
-19										
-20										
-21										
-22										
-23										
-24										
-25										

* attention: operating limits not reflected in performance table

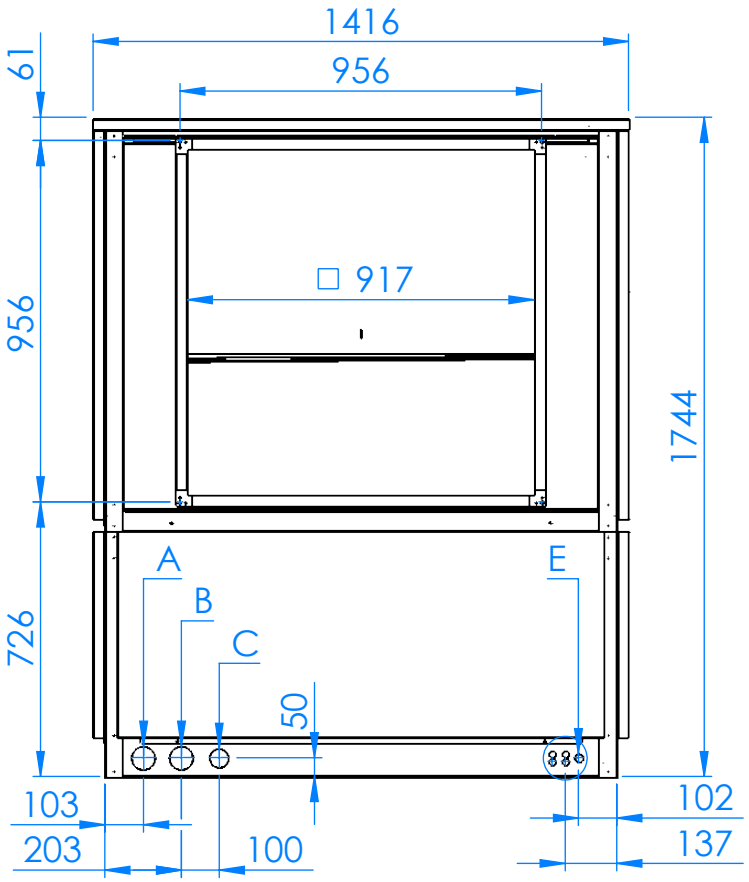
Tc [°C]	**W 12 / 7 °C**									
	Qc nom	**Qc min**	**Qc max**	**Pin**	**Pin min**	**Pin max**	**EER**	**I nom**	**I min**	**I max**
Ta [°C]	**[kW]**	[kW]	[kW]	**[kW]**	[kW]	[kW]	**kW / kW**	[A]	[A]	[A]
40	**16.4**	16.4	16.4	**7.2**	6.9	7.2	**2.29**	11.1	11.1	11.1
39	**16.5**	16.5	16.5	**7.0**	6.7	7.0	**2.37**	10.9	10.9	10.9
38	**16.7**	16.7	16.7	**6.8**	6.6	6.8	**2.45**	10.7	10.7	10.7
37	**16.8**	16.8	16.8	**6.6**	6.4	6.6	**2.53**	10.5	10.5	10.5
36	**17.0**	17.0	17.0	**6.5**	6.2	6.5	**2.62**	10.3	10.3	10.3
35	**17.1**	17.1	17.1	**6.3**	6.1	6.3	**2.71**	10.1	10.1	10.1
34	**17.2**	17.2	17.2	**6.2**	5.9	6.2	**2.80**	9.9	9.9	9.9
33	**17.4**	17.4	17.4	**6.0**	5.8	6.0	**2.90**	9.7	9.7	9.7
32	**17.5**	17.5	17.5	**5.8**	5.6	5.8	**2.99**	9.5	9.5	9.5
31	**17.6**	17.6	17.6	**5.7**	5.5	5.7	**3.09**	9.3	9.3	9.3
30	**17.7**	17.7	17.7	**5.6**	5.4	5.6	**3.19**	9.2	9.2	9.2
29	**17.9**	17.9	17.9	**5.4**	5.2	5.4	**3.30**	9.0	9.0	9.0
28	**18.0**	18.0	18.0	**5.3**	5.1	5.3	**3.41**	8.9	8.9	8.9
27	**18.1**	18.1	18.1	**5.1**	5.0	5.1	**3.52**	8.7	8.7	8.7
26	**18.2**	18.2	18.2	**5.0**	4.8	5.0	**3.63**	8.5	8.5	8.5
25	**18.3**	18.3	18.3	**4.9**	4.7	4.9	**3.75**	8.4	8.4	8.4
24	**18.4**	18.4	18.4	**4.8**	4.6	4.8	**3.87**	8.3	8.3	8.3
23	**18.5**	18.5	18.5	**4.6**	4.5	4.6	**4.00**	8.1	8.1	8.1
22	**18.6**	18.6	18.6	**4.5**	4.3	4.5	**4.13**	8.0	8.0	8.0
21	**18.7**	18.7	18.7	**4.4**	4.2	4.4	**4.26**	7.9	7.9	7.9
20	**18.8**	18.8	18.8	**4.3**	4.1	4.3	**4.40**	7.7	7.7	7.7
19	**18.9**	18.9	18.9	**4.2**	4.0	4.2	**4.54**	7.6	7.6	7.6
18	**19.0**	19.0	19.0	**4.0**	3.9	4.0	**4.69**	7.5	7.5	7.5
17	**19.0**	19.0	19.0	**3.9**	3.8	3.9	**4.84**	7.4	7.4	7.4

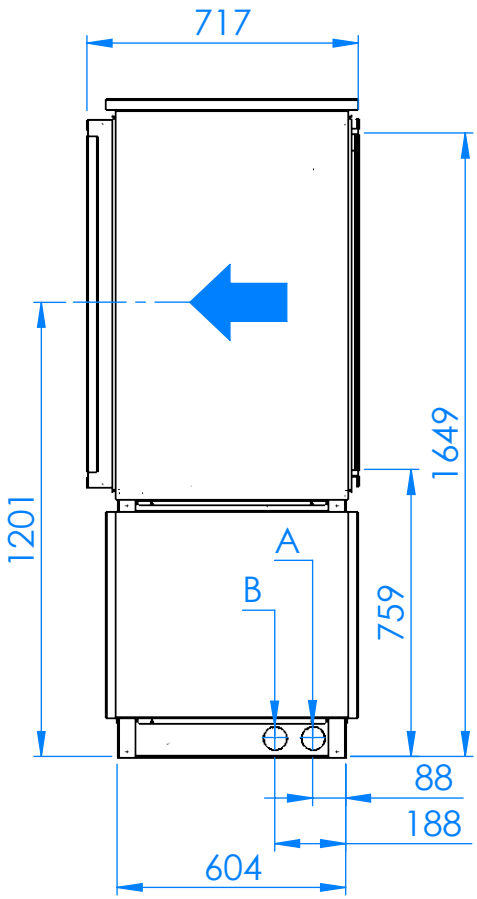
Tc [°C]	**W 23 / 18 °C**									
	Qc	**Qh-min**	**Qh-max**	**Pin**	**Pin-min**	**Pin-max**	**EER**	**I**	**I-min**	**I-max**
Ta [°C]	**[kW]**	[kW]	[kW]	**[kW]**	[kW]	[kW]	**kW / kW**	[A]	[A]	[A]
40	**22.1**	22.1	22.1	**7.2**	6.9	7.2	**3.08**	11.0	11.0	11.0
39	**22.3**	22.3	22.3	**7.0**	6.7	7.0	**3.19**	10.8	10.8	10.8
38	**22.5**	22.5	22.5	**6.8**	6.6	6.8	**3.30**	10.5	10.5	10.5
37	**22.7**	22.7	22.7	**6.6**	6.4	6.6	**3.41**	10.3	10.3	10.3
36	**22.8**	22.8	22.8	**6.5**	6.2	6.5	**3.53**	10.1	10.1	10.1
35	**23.0**	23.0	23.0	**6.3**	6.1	6.3	**3.65**	9.9	9.9	9.9
34	**23.2**	23.2	23.2	**6.2**	5.9	6.2	**3.77**	9.7	9.7	9.7
33	**23.4**	23.4	23.4	**6.0**	5.8	6.0	**3.90**	9.5	9.5	9.5
32	**23.6**	23.6	23.6	**5.8**	5.6	5.8	**4.03**	9.3	9.3	9.3
31	**23.7**	23.7	23.7	**5.7**	5.5	5.7	**4.16**	9.1	9.1	9.1
30	**23.9**	23.9	23.9	**5.6**	5.4	5.6	**4.30**	9.0	9.0	9.0
29	**24.0**	24.0	24.0	**5.4**	5.2	5.4	**4.44**	8.8	8.8	8.8
28	**24.2**	24.2	24.2	**5.3**	5.1	5.3	**4.59**	8.6	8.6	8.6
27	**24.4**	24.4	24.4	**5.1**	5.0	5.1	**4.74**	8.5	8.5	8.5
26	**24.5**	24.5	24.5	**5.0**	4.8	5.0	**4.89**	8.3	8.3	8.3
25	**24.7**	24.7	24.7	**4.9**	4.7	4.9	**5.05**	8.2	8.2	8.2
24	**24.8**	24.8	24.8	**4.8**	4.6	4.8	**5.21**	8.0	8.0	8.0
23	**24.9**	24.9	24.9	**4.6**	4.5	4.6	**5.38**	7.8	7.8	7.8
22	**25.1**	25.1	25.1	**4.5**	4.3	4.5	**5.55**	7.7	7.7	7.7
21	**25.2**	25.2	25.2	**4.4**	4.2	4.4	**5.73**	7.6	7.6	7.6
20	**25.3**	25.3	25.3	**4.3**	4.1	4.3	**5.92**	7.4	7.4	7.4
19	**25.4**	25.4	25.4	**4.2**	4.0	4.2	**6.11**	7.3	7.3	7.3
18	**25.5**	25.5	25.5	**4.0**	3.9	4.0	**6.31**	7.1	7.1	7.1
17	**25.6**	25.6	25.6	**3.9**	3.8	3.9	**6.52**	7.0	7.0	7.0

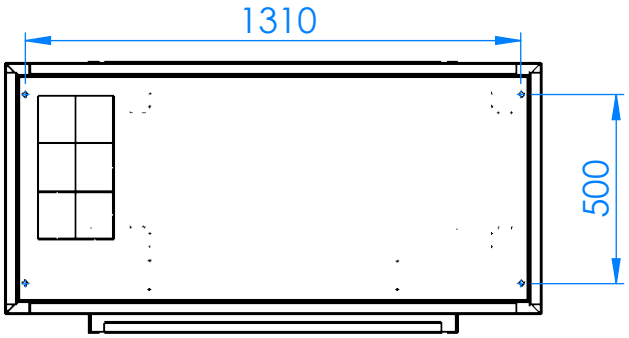
* attention: operating limits not reflected in performance table

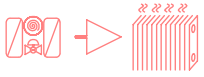
LEGENDE:

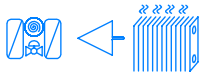
Ts-IN: Temperature renewable source - inlet [°C]
Th-OU: Temperature heating - outlet (flow) [°C]
Tc-OU: Temperature cooling - outlet (flow) [°C]
Qh nom: Heating capacity nominal
Qh min: Heating capacity minimal
Qh max: Heating capacity maximal
Pin nom: Power input at nominal heating capacity
Pin min: 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





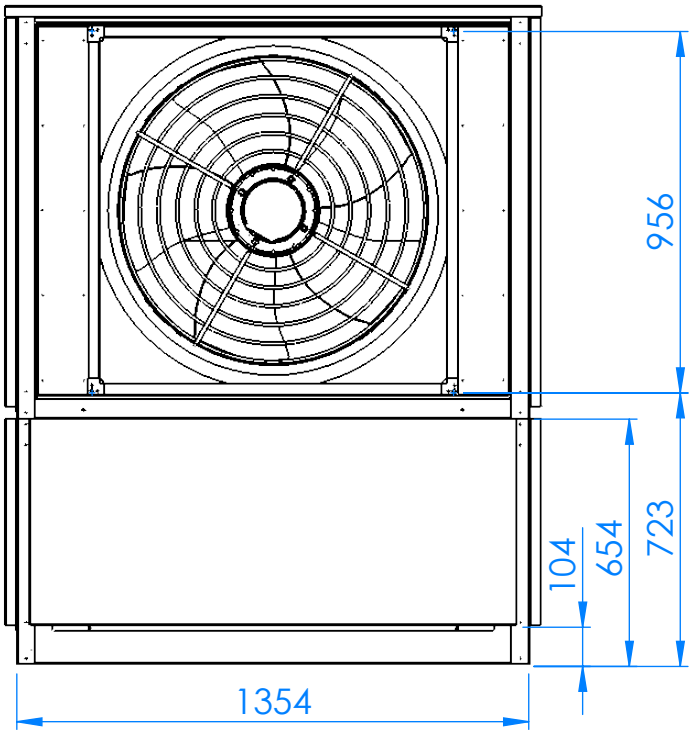


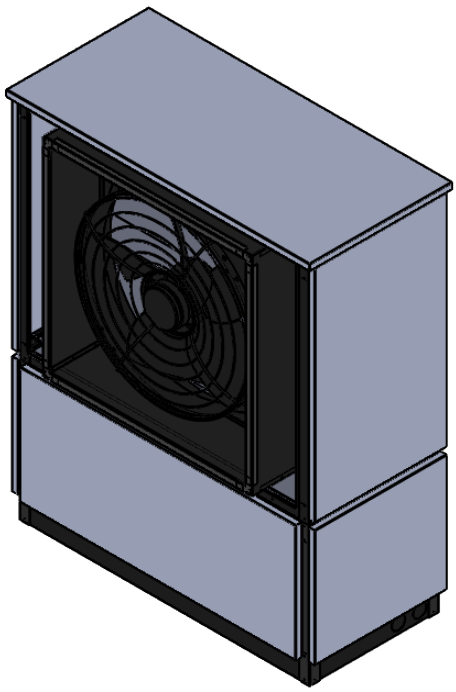
A - 

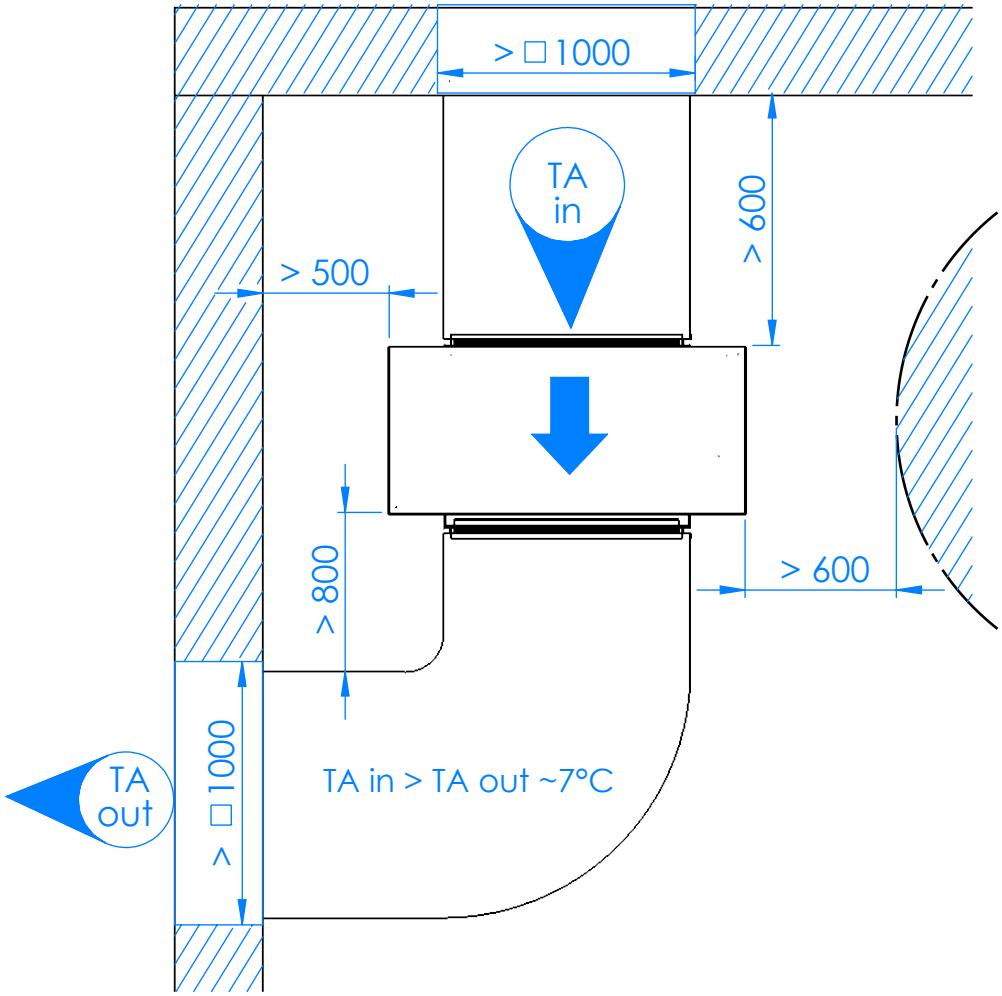
B - 

C - condens

E - electro






> □ 1000
TA in
> 600
> 500
> 800
> 600
TA out
> □ 1000
TA in > TA out ~7°C